

APPENDIX C – GEOTECHNICAL DATA

US ARMY CORPS OF ENGINEERS

**US DEPARTMENT OF INTERIOR
NATIONAL PARK SERVICE**

**CAPE HATTERAS NATIONAL SEASHORE
NORTH CAROLINA**

ENVIRONMENTAL ASSESSMENT

**BEACH RESTORATION TO PROTECT NC HIGHWAY 12
CLEAN WATER ACT 404 AND NPS SPECIAL USE PERMITS
AT BUXTON, DARE COUNTY, NORTH CAROLINA**

SEPTEMBER 2015

APPENDIX C

GEOTECHNICAL DATA REPORT

Beach Restoration to Protect NC Highway 12 at Buxton, Dare County, North Carolina

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[2403-TASK 2-APRIL 2015]

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PREFACE

This report contains geotechnical data on potential borrow sediments for a proposed beach nourishment project along ~3 miles of shoreline in Buxton, North Carolina, extending north into Cape Hatteras National Seashore. The primary borrow source is a shoal ~1.7 miles offshore of the old Cape Hatteras Lighthouse site. Other borrow areas considered included Oregon Inlet (limited evaluation herein), Pamlico Sound (rejected due to environmental considerations) and upland sand pits (rejected due to insufficient volume available within economic distances or high transportation costs due to distance from the project site). The report presents detailed results of beach sampling and borrow area sampling via cores. Sediment quality analyses demonstrate the similarity between native sediment on the beach and the quality of sand in a designated offshore area within the broader sand search area.

This report is prepared at the direction of the Dare County Board of Commissioners (Bob Woodward, Chairman) in support of planning and permitting for the Buxton project in close cooperation with the National Park Service.

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1.0 INTRODUCTION

This report provides sediment data for the Buxton, North Carolina, project area based on sampling and analysis in 2013–2014. Samples were obtained along the beach and inshore zone in accordance with North Carolina Technical Standards for Beach Fill Projects (15A NCAC 07H .0312) and National Park Service Beach Nourishment Guidance (NPS 2012). Ten stations (transects) were established along the Buxton project area and adjacent shoreline at 1,000 to 4,000-foot (ft) spacing (stations 1760+00 to 1980+00) for sampling at 14 cross-shore positions. An offshore sand search area encompassing ~450 acres was sampled by 3-inch borings at core spacing of ~1,000 ft (Fig 1.1). The borings were subsampled and analyzed for grain-size distribution and comparison with the existing beach sand.

Nourishment success depends on finding a source of sand that is similar in character to the native beach. The degree to which a particular borrow sediment matches the native beach sediments strongly influences project longevity and environmental impacts. Three outcomes are possible (Fig 1.2) (cf, Dean 1991, 2002):

- ***Borrow sediment is finer than native*** – The majority of fill will shift offshore and yield a more gently sloping profile. Dry beach will be narrowest.
- ***Borrow sediment is coarser than native*** – The majority of fill will tend to “perch” on the visible beach and yield a steeper profile through the surf zone. Dry beach will be widest.
- ***Borrow sediment matches the native sediment*** – The fill will tend to follow the natural contours of the profile and retain similar slopes and morphology.

It is generally accepted that environmental impacts of nourishment are most likely to be minimized if the borrow sediment “matches” the native (NRC 1995). However, the question of what constitutes “native” is still debatable. In some settings, such as many South Carolina beaches, sediments exist over a very narrow size range between the foredune and inshore zone [eg, mean = 0.18–0.22 millimeters (mm) with well-sorted sand at Isle of Palms SC]. In these cases, it is relatively easy to distinguish between “coarser” and “finer” than native. Most North Carolina beaches, by contrast, exhibit more variable sediment size distributions. Fine sand may dominate in the dunes and offshore while coarse sand dominates the inner surf zone.

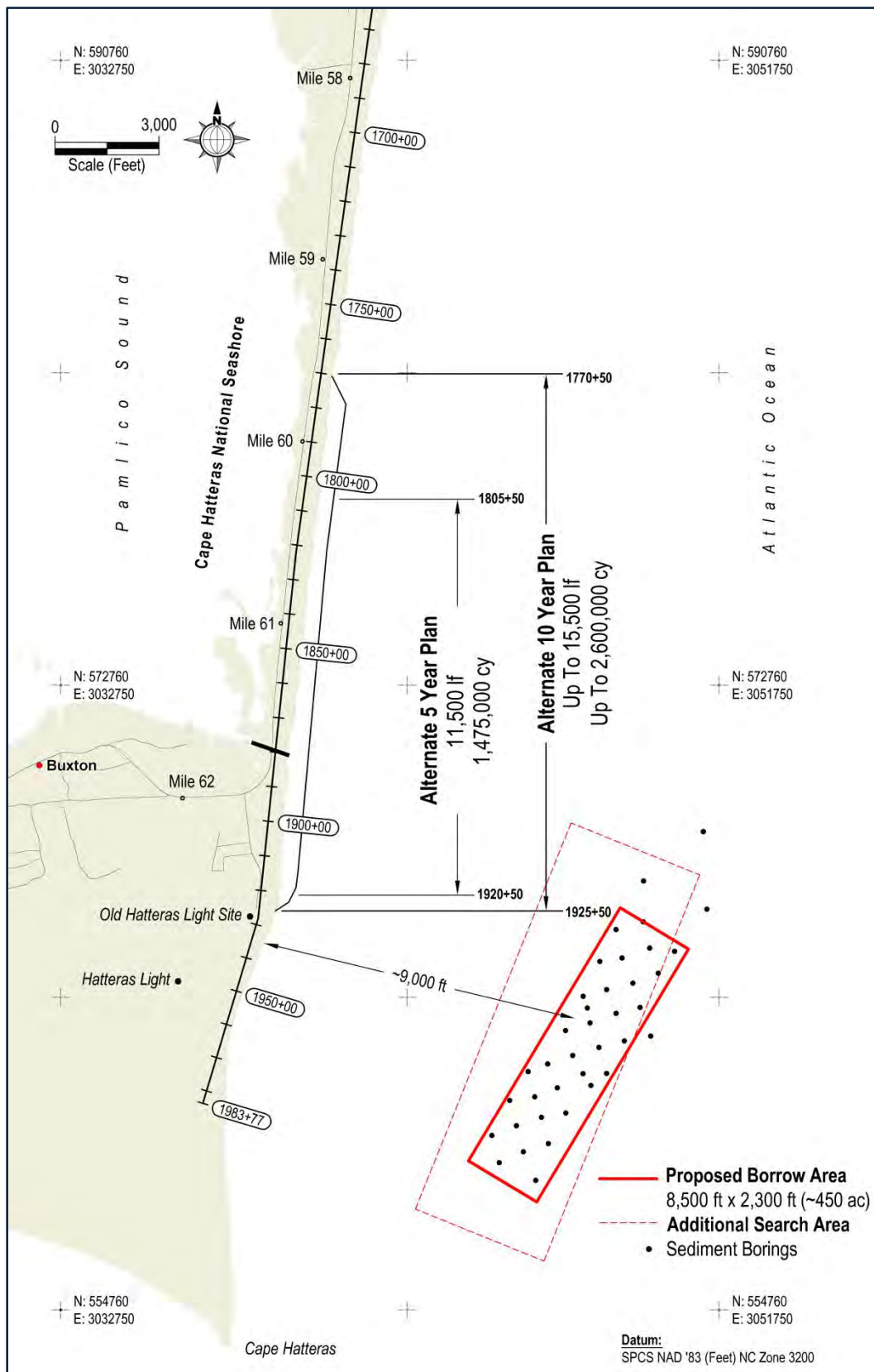


FIGURE 1.1. Map showing the Buxton project area, stationing along the beach, and offshore sand search area (location of borings).

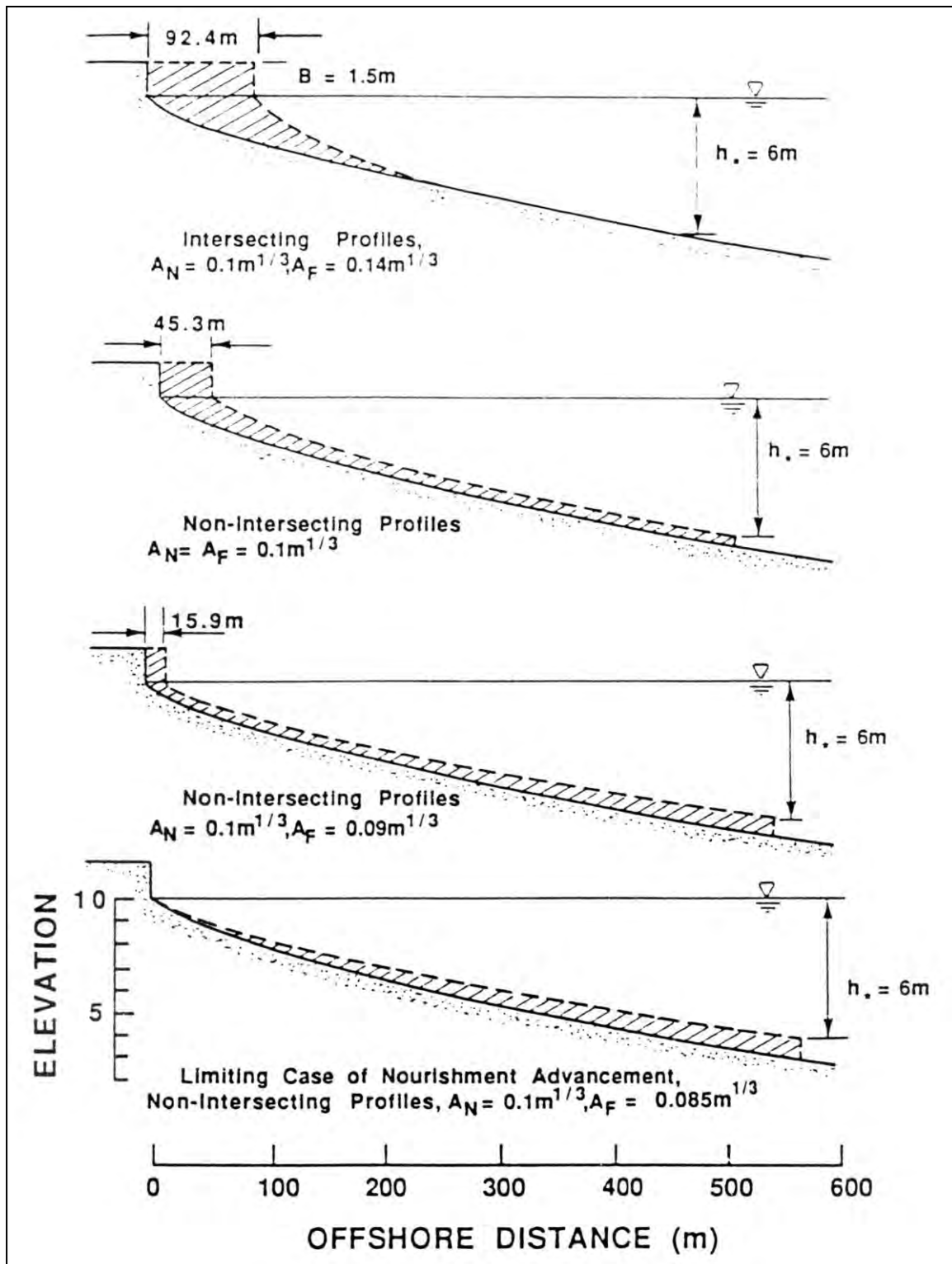


FIGURE 1.2. Effect of borrow material grain size (nourishment scale parameter, A_F) on the width of the dry beach for a fixed volume of nourishment sand added per unit beach length (from Dean 1991, Fig 25). In simple terms, coarser sand relative to the native sediment produces a wider visible beach than finer sand. [Note: 1 m $\approx$ 3.28 ft]

North Carolina beaches are typically composed of quartz sand in the medium size range [0.25–0.5 millimeter (mm) mean diameter]. Northern Outer Banks beaches tend to be coarser than southern North Carolina beaches with a wider range of sediment grain sizes (USACE 2000, 2010).

Waves and nearshore currents as well as winds sort the sediments of the littoral zone and introduce characteristic topography across the profile. Coarsest material tends to concentrate at the inshore “plunge” point of breaking waves where energy dissipation is focused (Miller & Ziegler 1958, Greenwood & Davidson-Arnott 1972, Komar 1998). Finer sands are winnowed and shifted offshore, leaving coarser sediments near the low watermark (Fig 1.3). Sands washed up the profile across the berm at high tide dry out and become sorted by winds, leading to accumulation of finer sand in the dunes.

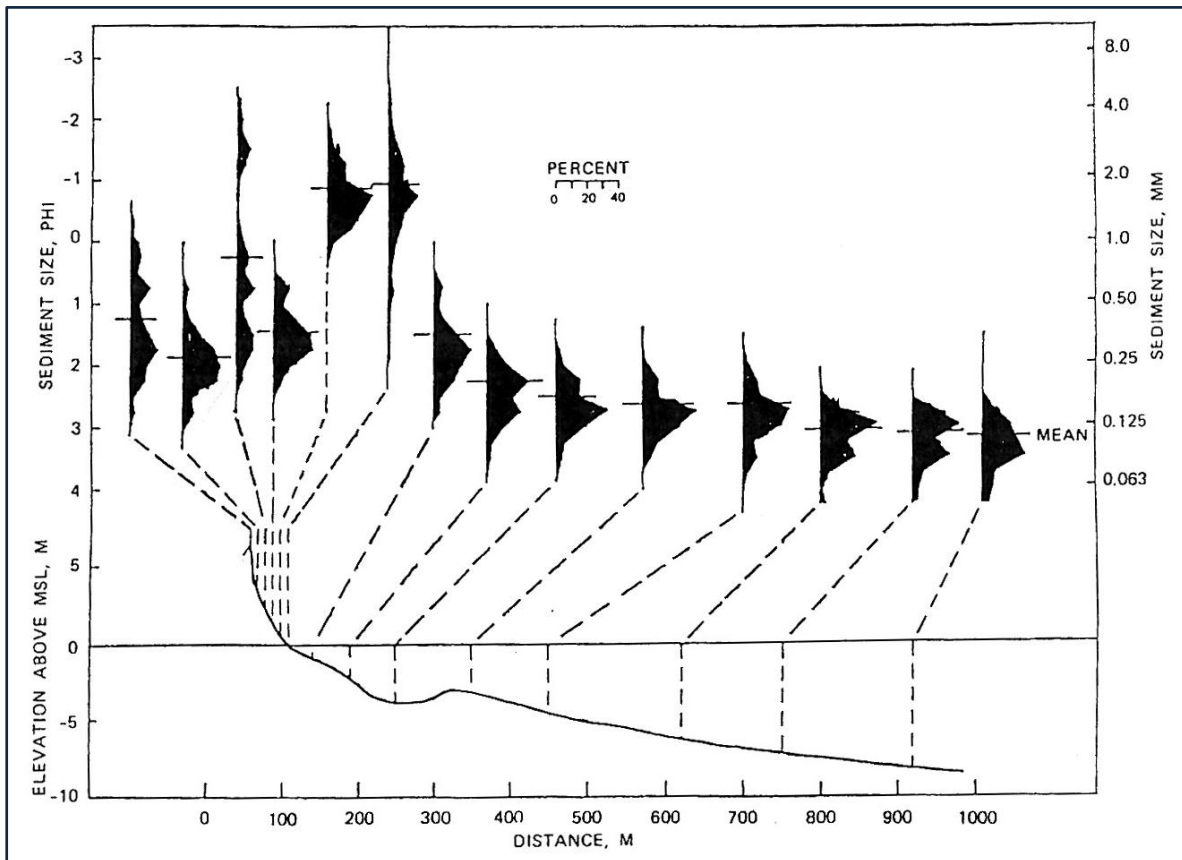


FIGURE 1.3. Grain size distributions along a profile at Duck, North Carolina, ~70 miles north of the Buxton project area, illustrating the variation in grain sizes as a function of position (from Birkemeier et al 1985).

Each sand size typically finds its equilibrium position across the profile with accumulations developing a particular slope and geometry. The longshore bar is often composed of fine sand (<0.25 mm diameter) which equilibrates at a gentler slope than the swash zone. Any suite of sediment sizes introduced to a beach by natural or artificial means will similarly sort under waves and migrate across the profile.

Figure 1.4 illustrates a typical profile across the littoral zone showing primary morphologic features such as the foredune, dry beach (berm), beach face, trough, and outer bar. A composite mean grain size of samples from each position for Nags Head (NC) (~50 miles north of the Buxton project area) is shown at the bottom of Figure 1.4. At Nags Head (pre-nourishment), the dune sands were typically ~0.3 mm mean diameter, whereas the swash zone samples were coarse (0.5–1.0 mm) or very coarse sand (1.0–2.0 mm). Seaward of the inner surf zone, sediments are consistently fine sand (0.12–0.25 mm).

The visible beach (ie, above low water) along most coasts tends to exhibit well-sorted (poorly graded) sands of some dominant size class. If such sand is desirable for aesthetics and other environmental reasons, prospective borrow areas should contain high proportions of those grain sizes (NPS 2012). Nourishment sediments within the size distribution that are finer than those of the dry-sand beach are likely to shift offshore during initial fill adjustment and erosion events, or be transported by winds toward the foredune, winnowing from the coarser sands.

Under North Carolina rules and standards for beach fill projects, any sediments within the sand-size range (0.0625–2.0 mm) are considered acceptable for use in nourishment projects. However, borrow areas must meet three important criteria:

- 1) Borrow sediments must not contain more than 5 percent mud (<0.0625 mm) by distribution above ambient conditions.
- 2) Borrow sediments must not contain more than 5 percent gravel (>2 mm) by distribution above ambient conditions.
- 3) Shell content (percent CaCO₃ material) may not exceed 15 percent by distribution above ambient conditions (ref — 15A NCAC 07H .0312).

The following sections provide detailed results of sampling and analyses performed to identify potential borrow sediments meeting state standards for beach fill. The potential borrow sediments are also evaluated in terms of their likely performance in widening the beach.

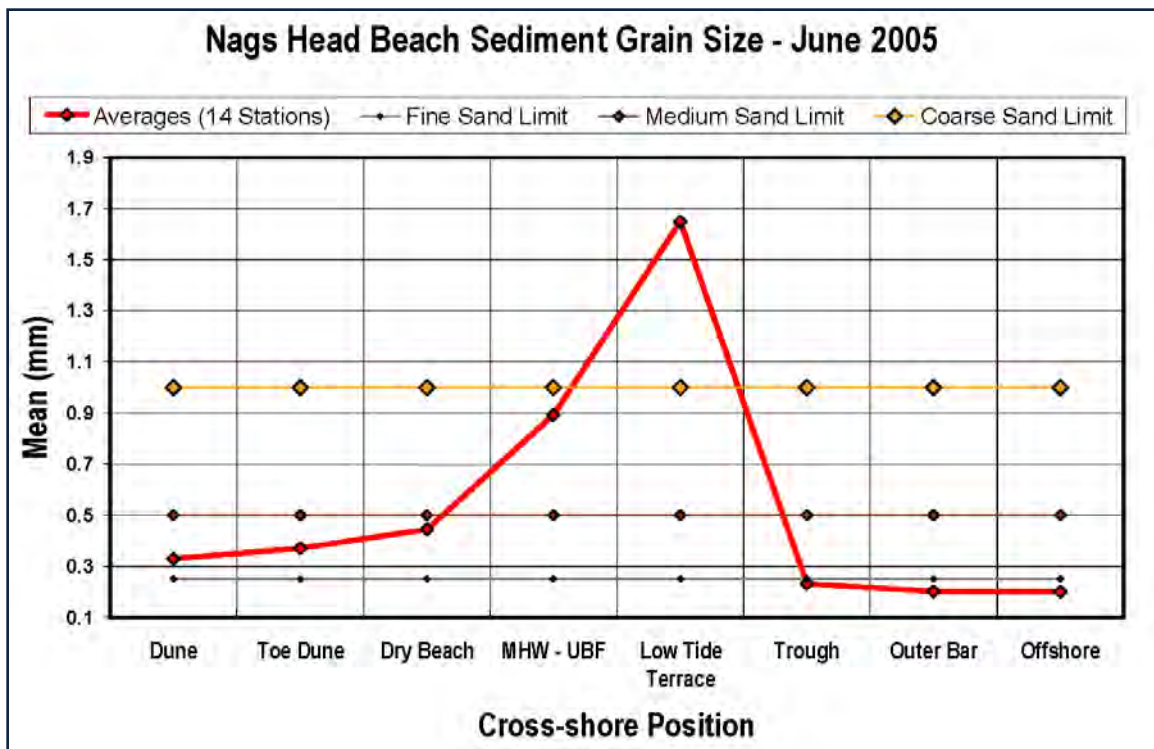
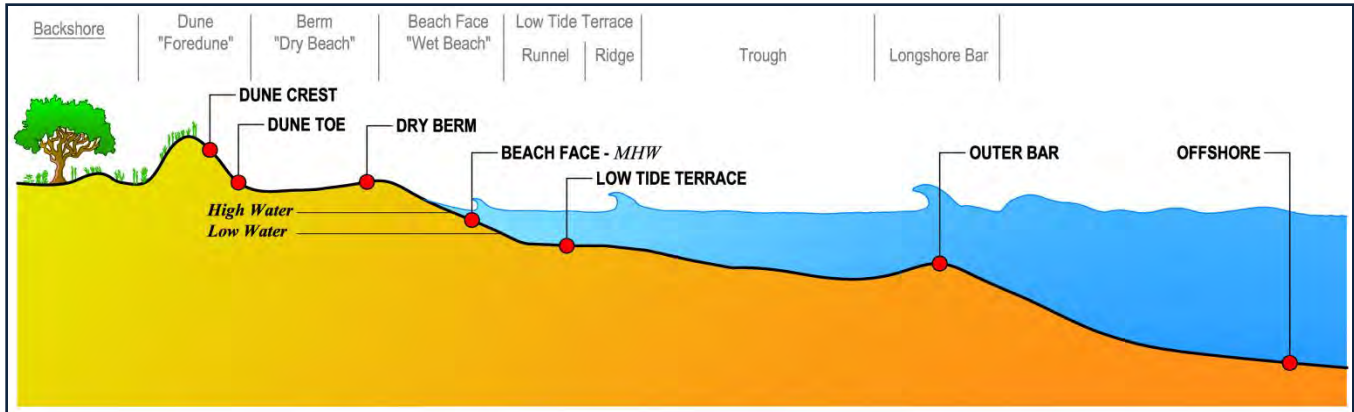


FIGURE 1.4. [UPPER] Littoral profile showing eight sediment sampling positions based on morphology. [LOWER] Overall trends in mean grain size by position across the profile based on 14 transects at Nags Head. Note predominance of finer sands in the foredune and underwater zone and coarsest sand in the active surf zone (after CSE 2005, USACE 2010).

2.0 METHODS

2.1 Beach Samples

CSE collected beach samples along the Buxton project area in August 2013 (summer beach conditions) across the subaerial beach and in October 2014 (fall beach conditions) encompassing the entire littoral profile to a water depth of -24 ft NAVD. Six transects (24 samples total) were sampled in 2013 (CSE 2013), and ten transects (140 samples total) were sampled in 2014. Figure 2.1 shows the cross-shore sample locations, and Figure 2.2 shows the sampling tool used for surface grabs in the upper 15 centimeters (cm) (6 inches) of substrate. Station locations for the 2014 samples are illustrated in Figure 2.3.

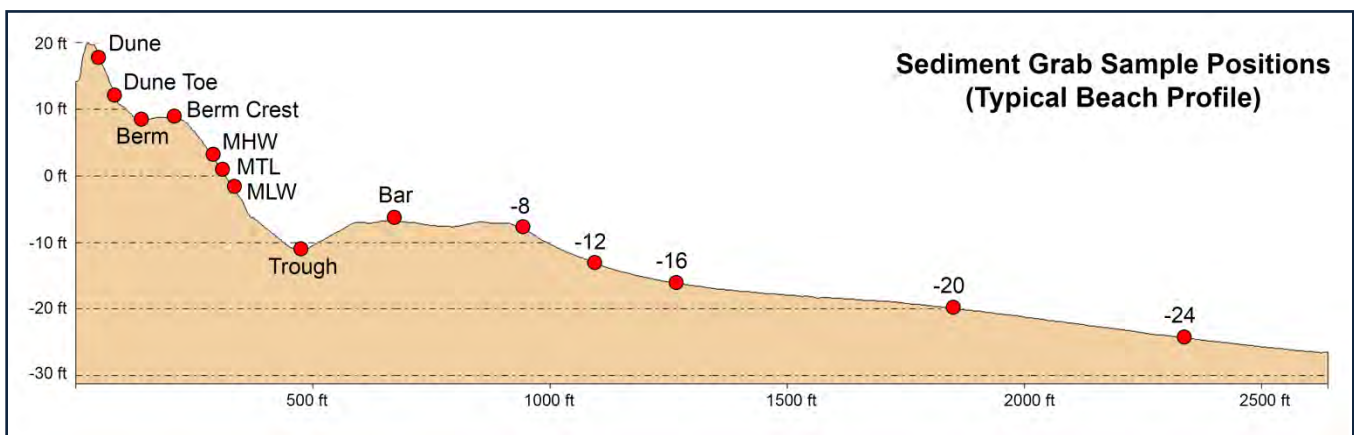


FIGURE 2.1. Sample positions for “beach” grab samples along Buxton following North Carolina sediment sampling criteria rules. The Buxton littoral profile exhibits a narrow berm (dry-sand beach) and deep trough separating the outer bar from the beach.



FIGURE 2.2. Uniform sediment samples were collected on the beach in the upper 6 inches (15 centimeters), mixed, and subsampled for laboratory testing.



FIGURE 2.3. Location of sediment sample transects (14 samples per transect) along the Buxton project area. Samples collected in October 2014.

Samples were inspected for mud then washed, dried, weighed in splits for analysis of grain size, gravel, and shell content. The split for grain size (~100 gram sample) was mechanically sieved at 0.25-phi intervals (ie, ~21 sieves in the sand size range) and each sub-sample was split, weighed, and recorded on lab sheets. The split for shell analysis (~20-gram sample) was immersed in diluted muriatic acid (ie, nearly pure hydrochloric acid—HCl). After ~24 hours or once there was no evidence of bubbling, the remainder was rinsed, dried, and reweighed to the nearest 0.01 gram. The difference represented the proportion of shell in the sample.

Summary tables of results, including sediment size distribution statistics, shell percentages, and fines percentages, are given in Section 3.0 (Results). Fines are defined here as material passing the US Standard Sieve #230 (ie, <0.0625 mm) and generally consists of minute fractions of silt. No beach samples were observed to contain measurable quantities of clays or organics. Gravel percentage was determined from the split retained on the US Standard Sieve #5 (>0.2 mm). In some cases, additional coarse sieves were used in the analysis for a breakdown of the small gravel sizes.

Sample splits were converted to percentages and graphed as frequency and cumulative frequency distributions. Standard statistical measures were computed including true-moment measures, graphic means, and standard deviations (ie, Inman 1952, Folk and Ward 1957). Results were reported in millimeters as well as standard phi units. Figure 2.4 shows a typical data sheet for one sample; the set of laboratory data sheets is given in Attachment 1.

Statistical composites of groups of samples were determined mathematically by averaging results for each individual size class for a given group of samples, then calculating moment measures for the composite. Composites were developed for each morphological unit sampled (ie, all dune samples combined, all toe-of-dune samples combined, etc). Groups of morphological units, such as dune and toe-of-dune, were also composited mathematically.

Results of composite size distributions are given after the individual sample results in Attachment 1. In general, they are identified on the data sheets as a morphological group or all samples. Multiple groups include a numerical value in the name corresponding to the applicable number of samples represented by the result (ie, All Samples—Comp 140, Subaerial Samples—Comp 60). Percent fines are given on the sample data sheets, and summary tables provide all key statistics including mean, standard deviation, skewness, percent shell, and percent gravel.

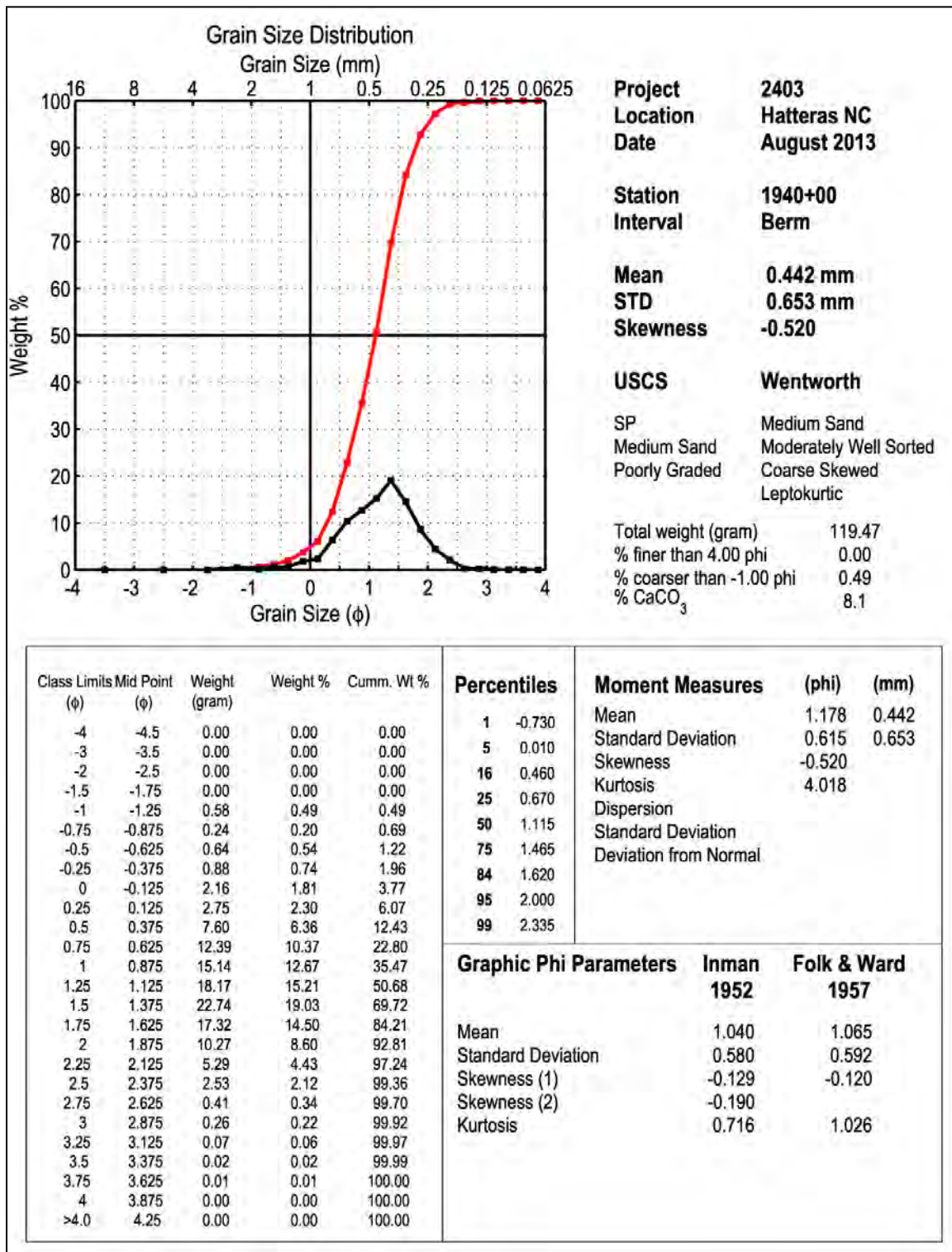


FIGURE 2.4. Representative data sheet for a berm sample along Buxton beach obtained in August 2013 (summer accretional conditions). Note: This station and sample position tested 0.598 mm in October 2014, reflecting erosional conditions following fall storms.

Summary tables of results, including shell and gravel percentages, follow in Section 3.0.

Consistent with North Carolina sediment standards, arithmetic (non-weighted) means of groups of samples were computed from tabulated results using simple statistics (ie, mean, standard deviation, and skewness). Mean is the commonly reported typical grain size; standard deviation is a measure of the degree of sorting; and skewness reflects the degree to which the sample contains higher proportions of coarse sediment or fine sediment. Most beaches tend to have well-sorted and slightly coarse (ie, negative), skewed sediments. Shell material often adds a coarse fraction, as do granules and pebbles which are common on Dare County beaches.

2.2 Borrow Samples

There are no designated offshore borrow areas in the Cape Hatteras vicinity. The USACE (R Keistler, USACE–Wilmington, pers comm, August 2013) and NCDOT delineated borrow areas off Rodanthe for emergency nourishment in the area around the NC Highway 12 S-curve near Mirlo Beach (USACE 2014).

Prior to the recent efforts of NCDOT/USACE and the present project team, the most detailed core data had been developed by the North Carolina Geological Survey (NCGS) with funding by Minerals Management Service and others (eg – Boss & Hoffman 2000, Hoffman et al 2001). A reconnaissance grid of borings obtained in the 1990s between Oregon Inlet and Cape Hatteras is summarized in an excellent report by NCGS (Hanna & Nickerson 2009). The Boss and Hoffman cores located within economical distances to Buxton (ie, <5 nautical miles) tend to contain high proportions of fine-grained material (including fine sand) or, in some cases, too much gravel.

CSE identified one boring off Buxton from the 1990s that contained relatively clean, medium sand (Fig 2.5). Core SNL-199 was identified as having “viable sand sizes” for nourishment (Hanna & Nickerson 2009). Table 2.1 provides a listing of NCGS cores along with CSE’s notes regarding the general suitability of the sediment for beach nourishment. The mean grain sizes of these cores were 0.26 mm to 0.34 mm (Hanna & Nickerson 2009), considerably finer than the existing sand on the Buxton subaerial beach. Fines (silty material) ranged from ~1.4 to 4.8 percent. Core spacing for the Boss and Hoffman borings was relatively large (typically >4,000 ft), which means that sediment quality over broad areas is unknown.

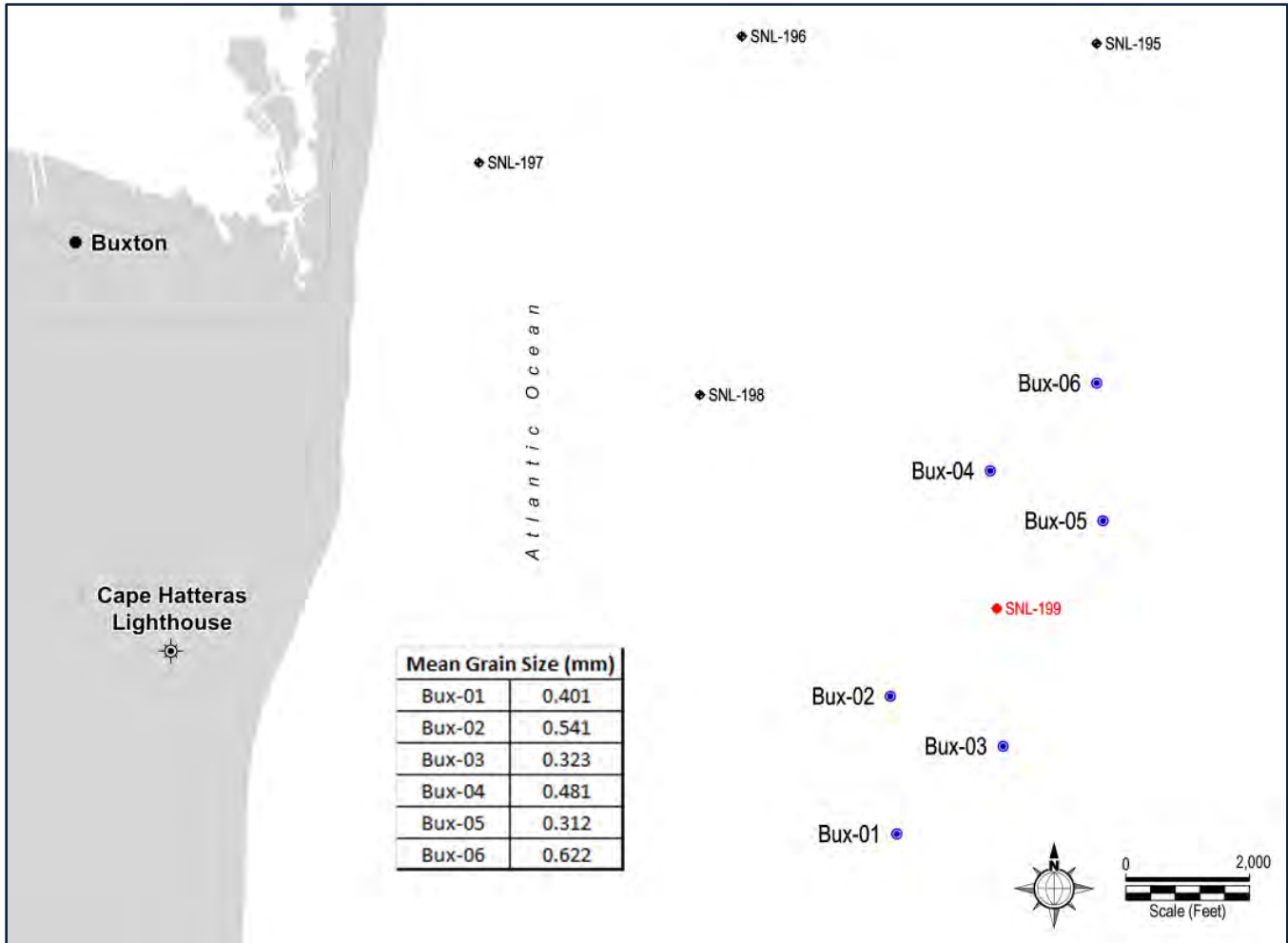


FIGURE 2.5. Locations of CSE borings off Buxton obtained in July 2013. Mean grain size (mm) applies to the upper 6 ft of each core, composited (weighted averages) from individual sediment samples. Positions of historical cores from NCGS (Boss & Hoffman 2000) are indicated.

TABLE 2.1. Listing of NCGS cores along with CSE's notes regarding the general suitability of the sediment for beach nourishment along Buxton (from CSE 2013).

CORE	Study Area	Latitude	Longitude	Water Depth (m)	Length (m)	Core TD Subsea (m)	CSE Comments
SNL-001	Diamond Shoals/Buxton	35.21146	-75.48593	7.3	2.82	10.1	Too Fine
SNL-004	Diamond Shoals/Buxton	35.2202	-75.45156	17.4	2.18	19.6	Too Fine
SNL-174	Buxton	35.37957	-75.47082	10.9	3.62	14.6	Fair to Good -
SNL-175	Buxton	35.38321	-75.45197	12.8	4.24	17	Too much Gravel
SNL-176	Buxton	35.37994	-75.42748	16.2	4.81	21	Too Fine
SNL-177	Buxton	35.36663	-75.45529	15.8	3.62	19.5	Too much Gravel
SNL-178	Buxton	35.36828	-75.47264	11	6.1	17.1	Too close to shore
SNL-179	Buxton	35.36968	-75.4864	8.2	3.87	12.1	
SNL-181	Buxton	35.34995	-75.46069	12.5	5.09	17.6	
SNL-182	Buxton	35.36296	-75.43228	15.2	3.78	19	Too Fine
SNL-183	Buxton	35.34019	-75.462	13.7	3.24	17	Too Fine
SNL-184	Buxton	35.34431	-75.47929	11.3	4.8	16.1	Too Fine
SNL-185	Buxton	35.33713	-75.49482	7.6	3.74	11.4	Too Fine
SNL-186	Buxton	35.32693	-75.48364	11.6	5.97	17.6	Too Fine
SNL-187	Buxton	35.31749	-75.46919	14.3	1.96	16.3	Too Fine
SNL-188	Buxton	35.33047	-75.44007	16.8	2.2	19	Too Fine
SNL-189	Buxton	35.3071	-75.47002	15.5	2.35	17.9	Marginal - Admixtures
SNL-190	Buxton	35.30536	-75.49003	12.5	4.24	16.7	Too Fine (top); Gravel (bot)
SNL-191	Buxton	35.3043	-75.50228	8.2	4.8	13	Too Fine; Too close to shore
SNL-192	Buxton	35.29499	-75.49234	12.5	3.04	15.5	Too Fine (top); Gravel (bot)
SNL-193	Buxton	35.28445	-75.47551	15.8	4.2	20	Too much Gravel
SNL-194	Buxton	35.28076	-75.45028	18.6	2.23	20.8	Too Fine
SNL-195	Buxton	35.27604	-75.47679	15.5	2.51	18.1	Too much Gravel
SNL-196	Buxton	35.27692	-75.49604	11.9	3.92	15.8	Too Fine
SNL-197	Buxton	35.27171	-75.51056	5.8	3.91	9.7	Too close to shore
SNL-198	Buxton	35.26101	-75.49901	11.6	6.05	17.6	Too Fine
SNL-199	Buxton	35.25103	-75.48331	10.4	6.11	16.5	***Excellent**
SNL-200	Buxton	35.24655	-75.45816	17.7	2.85	20.5	Too Fine

CSE (2013) used the favorable NCGS core (SNL-199) to lay out a relatively small sand search area off Buxton. The goal was to obtain several cores in a more closely spaced grid (typically <2,000 ft spacing) to determine whether the location with good-quality sand extended for several thousand feet. Six initial borings (Bux-01 to Bux-06) were obtained in August 2013 (see Fig 2.5). Based on the results of the August 2013 borings, CSE conducted a more detailed sampling (October 2014) and obtained 31 additional cores at ~1,000-ft spacing within the sand search area shown in Figure 2.6. The Buxton search grid targeted a shoal ~2 miles offshore of the old Cape Hatteras Lighthouse site. This grid surrounds the location of NCGS core SNL-199 shown in Figure 2.5.

Cores were obtained using CSE's proprietary system which creates a partial vacuum that allows penetration of a 3-inch aluminum core barrel into the substrate. The cores are retrieved by removing the core device, then capping and sealing the ends before they are brought to the coring vessel.

Lengths of CSE cores ranged from 3.4 ft to 9.5 ft. Omitting two short cores of poor-quality material, the average core length was 7.5 ft (n=35) at Buxton. Cores were spilt, logged by an NC-registered professional geologist, and subsampled for sediment analysis. The "saved" core half was photographed and archived in plastic sleeves. Subsamples representing the section lithology were taken from the other half of the core at full-section intervals as given on the core logs. Samples were dried, weighed, disaggregated (if mud was present) and/or washed of salts, dried, weighed, and subsampled (~100 grams) for grain-size analysis via dry sieves at 0.25-phi intervals in the sand size range and several intervals as appropriate up to the "pea" gravel range (-4.0 phi, or 16 mm).

Any pebbles, cobbles, or shells greater than 16-mm diameter were retained on the -4.0 phi sieve and included in the weight percentages. Visual inspections indicated that only trace amounts of mud occurred in most of the borings so mud analysis was only performed on a few samples. A separate subsample (~20 grams) was taken for "shell" analysis (CaCO₃ content) which was determined by acid-burning using dilute hydrochloric acid. Percent gravel was determined by sieving as the percent >2-mm diameter retained.

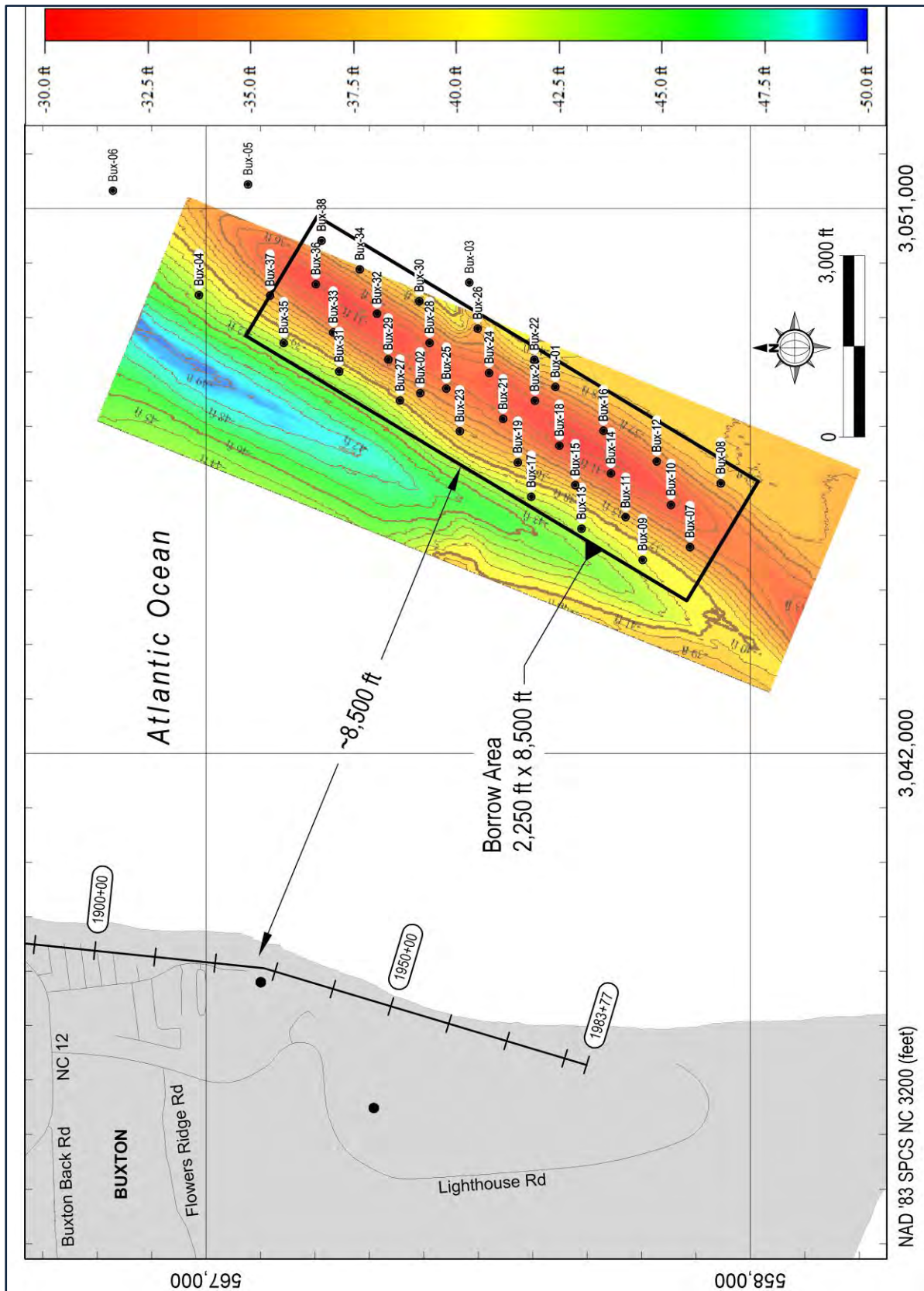


FIGURE 2.6. Location of 37 CSE borings off Buxton obtained in August 2013 and October 2014.

Figures 2.7 and 2.8 contain example photo-mosaic and core logs for CSE core Bux-01. The location of this core is shown in the inset panels of Figure 2.7. Attachment 2 contains the set of photo-mosaic and core logs. Attachment 3 contains the set of grain-size distributions (statistics, frequency, and cumulative frequency curves) for individual samples. Sample results were composited (weighted by section length) for the upper 4 ft, upper 6 ft, and upper 8 ft of substrate (Fig 2.9). This provides a practical operational result for evaluating sediment quality under representative dredge cuts.

Based on the objective of matching the native beach, CSE found that certain cores contained sediments that were too fine for use as beach nourishment in the Buxton setting. Visual inspection of cores provided initial guidance which was later confirmed by sediment testing. Nearly all cores contained grayish-tan sediments similar in color to the native beach with only trace amounts of mud, indicative of high-energy settings with good oxygenation. There was no evidence of anaerobic conditions or an odor of hydrogen sulfide (H_2S) in any of the cores.

Sediment quality for beach nourishment can be evaluated using the analytical model of James (1975), which is a standard method adopted by the USACE (CERC 1984). The James method computes an “overfill factor” (R_A), which uses two simple parameters (mean grain size and standard deviation) to compare a prospective borrow sediment with the native size distributions.

The overfill factor, R_A , compares these parameters (using phi units) with a prospective borrow material and yields a simple ratio between 1 and 10. A value of $R_A=1.0$ means the prospective borrow material matches or exceeds the native beach in terms of its potential performance (not necessarily a duplicate size distribution). A value of $R_A=1.5$ means that ~1.5 times more borrow material would have to be placed to provide performance equaling the native beach. Borrow material that is considerably finer than the native sediment may have R_A 's $\gg 1$ and, consequently, require many times more volume to yield the same performance as native sand. The overfill factor, R_A , is consistent with Dean's equilibrium profile predictions as previously illustrated in Figure 1.2.

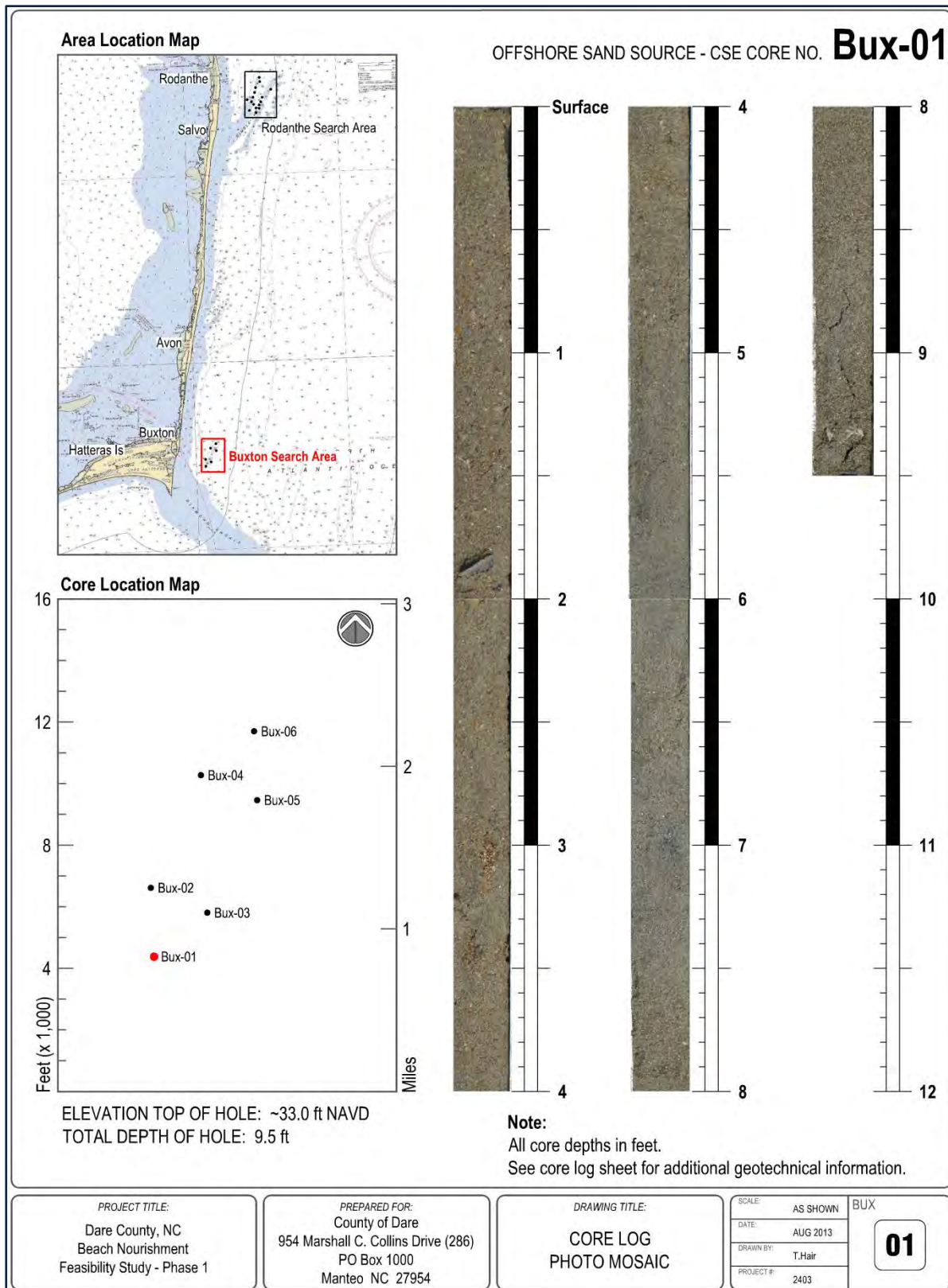


FIGURE 2.7. Example core photo log for BUX-01 obtained by CSE in August 2013 in water depths of ~33 ft.

CORE LOG		Coastal Science & Engineering			Sheet 1 of 1
PROJECT: 2403 - Dare County		COORDINATES:		HOLE NUMBER:	
LOCALITY: Buxton - Offshore		Northing: 561226.750 Easting: 3048052.106 Grid Datum: NAD '83		Bux-1 (as shown on title drawing and file no.)	
DATE: 2013-Jul-09		TOP ELEVATION: -33.00 ft. NAVD '88	DEVICE DESIGNATION: Coastal Science & Engineering		
BORE ANGLE: 90.00°		BOTTOM ELEVATION: -42.50 ft. NAVD '88	BARREL SIZE/TYPE: 3 in. Aluminum		
BURDEN THICKNESS: 9.5 ft.		WATER DEPTH: (operational note only)	GEOLOGIST: TWK - NC #1752		
CORE RECOVERY: 9.5 ft. (100.0%)			FIELD TEAM: DG, ST, TH		
Depth	Lithology	Classification Of Materials (Description)	Sample #	Remarks	
1		0.0 to 2.0 ft: Medium Sand / Coarse Sand mix - Mixed, clean, lt tan with minor shell	S1	S1: 0.0 ft. to 2.0 ft. Mean Grain Size: 0.428mm	
2		1.8 ft: Small Scallop - 4 cm fragment			
3		2.0 to 4.0 ft: Medium Sand / Coarse Sand mix - Mixed, clean, lt tan with minor shell. 3 cm mollusk fragment @ 2.2'. Scattered large shell clasts eg. 4-6 cm scallops	S2	S2: 2.0 ft. to 4.0 ft. Mean Grain Size: 0.402mm	
4		4.0 to 6.0 ft: Medium Sand - Clean, lt tan	S3	S3: 4.0 ft. to 6.0 ft. Mean Grain Size: 0.374mm	
5					
6		6.0 to 7.5 ft: Medium Sand - Mixed, clean, greyish lt tan	S4	S4: 6.0 ft. to 7.5 ft. Mean Grain Size: 0.375mm	
7					
8		7.5 to 9.5 ft: Medium Sand / Coarse Sand mix - Mixed, clean, lt tan	S5	S5: 7.5 ft. to 9.5 ft. Mean Grain Size: 0.440mm	
9		Sand dollar fragment			
10					

FIGURE 2.8. Core log for BUX-01 showing the lithology, sample intervals, and mean grain sizes.

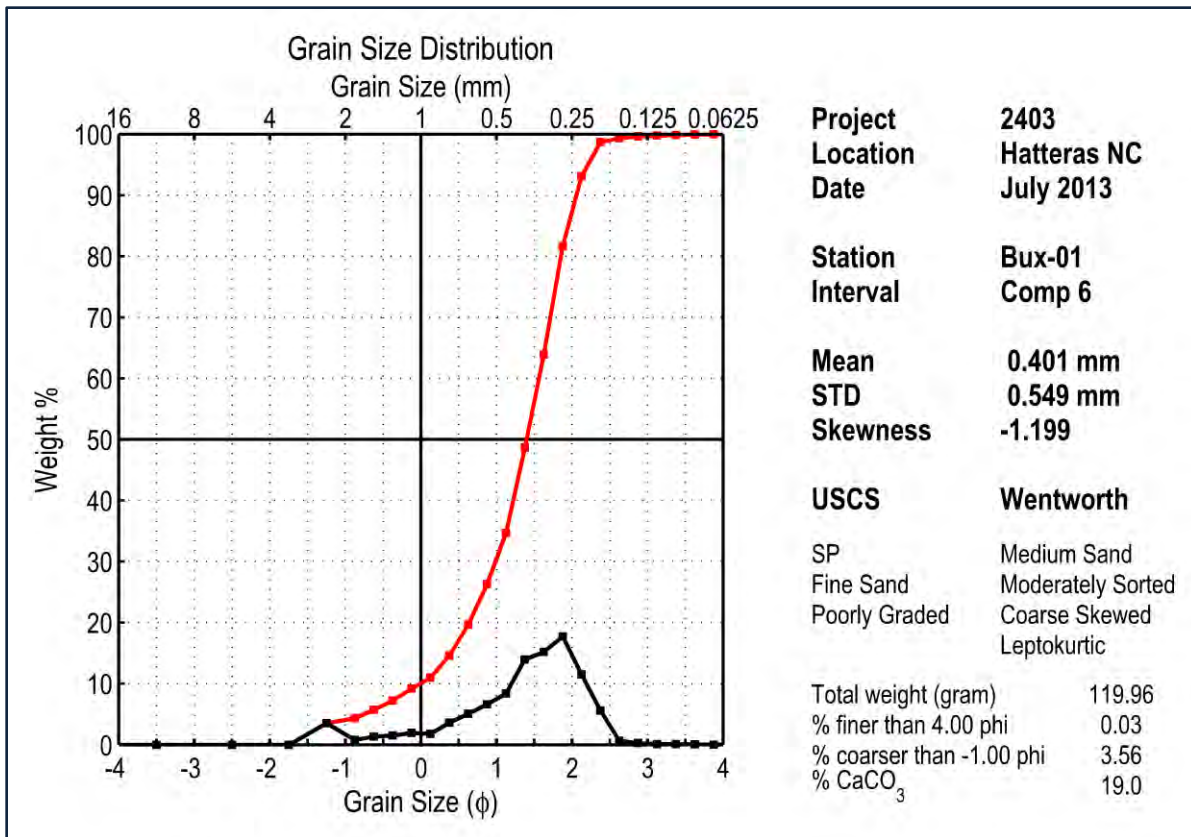


FIGURE 2.9. Example grain-size distribution (GSD) for the upper 6 ft of the Bux-01 core. Results were composited from individual samples (weighted) for the upper 4 ft, 6 ft, and 8 ft of substrate. See Attachment 3 for composite GSDs for each core calculated for the upper 4 ft, 6 ft, and 8 ft. These thicknesses are representative of typical dredging depths (excavation sections) for offshore sediments along the East Coast (USACE 2010).

The similarity between borrow sediments and native beach sediments was also evaluated by means of comparative size-frequency curves for composited samples, which offers a more critical comparison of the beach and borrow sediments. If the two frequency curves are similar, the nourished beach will generally maintain the same aesthetic qualities. In general the broader the size distribution of the native beach, the less likely there will be a perfect match with prospective borrow areas (Kana & Mohan 1998). As Gravens et al (2008) report, sediment grain size is the most important borrow material characteristic. However, it is often not possible to find areas that perfectly match the receiving beach, particularly if there is considerable cross-shore variability in grain sizes (ie, the case along Buxton).

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3.0 RESULTS – BEACH SAMPLES

3.1 Beach Statistics – October 2014

The Buxton project area grain-size distributions (GSDs) for October 2014 samples (140) are given in Attachment 1 and summarized in Tables 3.1 to 3.4. Table 3.2 lists the means by station and cross-shore position. Primary measures based on method of moments and graphical methods show that arithmetic mean grain size for all samples is 0.630 mm (coarse sand) with 6.2 percent shell and 6.6 percent gravel (Table 3.3). However, there is a wide range of sizes in the cross-shore direction. Averaging by sample position (Table 3.3), mean grain size ranges from ~0.20 mm seaward of the bar to >2.35 mm in the trough. The low-tide samples, marking the general area of the inshore surf break (“plunge point”), tested over 1.1 mm on average.

Figure 3.1 plots the results of all samples by station (north to south). Samples in the trough are considered extreme outliers with respect to all other samples. As Table 3.4 indicates, the trough contains a high shell and gravel percentage at 20.8 percent and 54.2 percent (respectively). This result is also quite different compared with samples at Duck and Nags Head (see Figs 1.3 and 1.4). Similarly, samples around the mean low watermark averaged 11.1 percent shell and 16.5 percent gravel, much higher than all other samples.

The mean grain size (unweighted, arithmetic means and standard deviations) by cross-shore sample position is shown in Figure 3.2. The relatively low standard deviation at each point indicates the results were fairly consistent from station to station. Compared with a similar graph for Nags Head (see Fig 1.3), the Buxton results are coarser, particularly in the foredune and trough. Coarsest sediments along Nags Head were observed along the mean low water zone. Nags Head dune samples tested ~0.3 to 0.35 mm (typical), whereas Buxton dune samples averaged ~0.50 to 0.58 mm in October 2014. This difference may reflect the previous manipulations of the Buxton dunes whereby storm deposits of coarse berm sand were scraped off Highway NC 12 and pushed up to form a protective dune (J Jennings, NCDOT, pers comm, August 2014). The underwater samples (seaward of the bar to –24 ft NAVD–North American Vertical Datum) along Buxton generally exhibit mean grain sizes <0.25 mm (fine sand), similar to underwater samples along Nags Head (see Fig 1.4).

Table 3.3 (lower) and Figure 3.3 show the sample averages omitting the trough samples. This has the effect of reducing average mean grain size (130 samples) to 0.504 mm and the shell and gravel content to 5.1 percent and 3.1 percent (respectively). Mean grain size

decreases from north to south along Buxton in the range of ~0.55–0.45 mm (see trend line in Fig 3.3). The percent shell and gravel by station with and without trough stations is shown in Figure 3.4. Shell content is relatively uniform (~5 percent) from north to south, whereas the gravel percent peaks near the center of the project area at ~5 percent (stations 1840+00–1870+00) and drops below 2 percent at the south end (omitting trough samples).

The grain-size distributions (Attachment 1-A) show nearly all gravel (sizes >2 mm, –1.0 phi) falls in the 2–8 mm (–1.0 phi to –3.0 phi) size range with few large shell clasts. No significant concentration of large clasts was observed along the beach at the time of CSE samplings in 2013 and 2014. However, there were fragments of broken asphalt in the dunes and in the vicinity of the shore-protection structures around the former Navy site and the Cape Hatteras Lighthouse site. A large clast survey will be conducted during summer conditions in 2015 per requirements under North Carolina sediment standards for beach nourishment.

Figures 3.5 and 3.6 show the mean grain sizes by station for groups of sample positions across the littoral zone. Dune samples (n=20) increase in size from north to south (range 0.4–0.7 mm) with arithmetic means ranging 0.515 mm to 0.577 mm. The visible beach (berm to mid-tide level) decreases in size from north to south within a range (trend) from ~0.75 mm to ~0.55 mm. As the results show (Fig 3.5, lower), there is a high range of mean grain sizes (0.2–1.4 mm) in the 40 samples analyzed. Samples at station 1840+00 skew the results coarser.

The low-tide “step” (wave plunge point) and trough (Fig 3.6, upper) show the widest range of mean sizes from 0.7 mm to 2.9 mm—material that is much coarser than is typical North Carolina beach sand. The grain sizes occur in the deep trough between the low tide line and outer bar. It is likely this surficial sediment in the trough represents a coarse lag deposit remaining after finer sands have been winnowed from the area under strong littoral currents.

Finally, the group of 60 underwater samples from the bar to a depth of –24 ft shows a predominance of 0.2–0.25 mm sand (Fig 3.6, lower). Bar samples skew the distribution with much coarser sands along northern stations (1760+00–1870+00). Omitting the bar samples, the trend line shows a slight increase from north to south, biased by results at stations 1920+00 and 1940+00.

TABLE 3.1a. Buxton project area beach sediment characteristics (statistical measures) in October 2014. See Attachment 1 for detailed frequency and cumulative frequency results of each sample.

Buxton Beach Sediment Characteristics		Method of Moments						Folk Graphical Method						
		Mean	STD	Mean	STD	Skew	Kurt	Mean	STD	ISTD	Skew	Kurt	Shell	Gravel
		mm	mm	phi				phi				%	%	
1760+00	Dune	0.373	0.596	1.421	0.747	-0.605	3.219	1.288	0.763	0.753	-0.309	1.070	2.2	0.2
1760+00	Dune Toe	0.568	0.576	0.816	0.795	0.092	2.692	0.678	0.835	0.810	0.087	0.935	6.6	0.8
1760+00	Berm	0.740	0.551	0.435	0.860	-0.051	2.427	0.320	0.920	0.908	-0.073	0.942	6.5	5.6
1760+00	BC	0.517	0.650	0.952	0.621	-0.077	3.108	0.833	0.618	0.618	-0.024	0.967	4.3	0.1
1760+00	MHW	0.358	0.682	1.482	0.552	-0.546	4.243	1.373	0.525	0.535	-0.102	1.077	2.5	0.1
1760+00	MTL	0.610	0.546	0.713	0.874	-0.182	2.514	0.597	0.913	0.891	-0.035	0.905	6.1	3.3
1760+00	MLW	0.669	0.508	0.581	0.978	-0.040	2.169	0.452	1.078	1.028	-0.055	0.825	6.9	5.3
1760+00	Trough	1.550	0.492	-0.632	1.023	0.180	3.081	-0.857	1.093	1.158	-0.160	1.178	13.5	33.8
1760+00	Bar	0.723	0.461	0.467	1.119	0.071	2.177	0.293	1.290	1.205	-0.087	0.841	2.7	13.8
1760+00	-8 ft NAVD	0.232	0.659	2.110	0.601	-1.225	6.155	2.028	0.498	0.552	-0.210	1.311	2.6	0.0
1760+00	-12 ft NAVD	0.208	0.693	2.268	0.530	-0.785	5.286	2.177	0.525	0.512	-0.129	1.133	2.4	0.0
1760+00	-16 ft NAVD	0.198	0.680	2.337	0.556	-1.238	7.213	2.250	0.485	0.501	-0.092	1.165	2.3	0.0
1760+00	-20 ft NAVD	0.257	0.637	1.959	0.652	-1.628	8.576	1.877	0.478	0.539	-0.120	1.176	10.5	0.8
1760+00	-24 ft NAVD	0.336	0.522	1.571	0.939	-1.180	4.450	1.502	0.815	0.902	-0.359	1.387	5.6	3.0
1790+00	Dune	0.448	0.566	1.157	0.820	-0.218	2.669	1.057	0.848	0.819	-0.094	0.880	3.6	0.6
1790+00	Dune Toe	0.503	0.637	0.992	0.651	-0.290	3.598	0.885	0.613	0.636	-0.068	1.074	3.5	0.4
1790+00	Berm	0.701	0.586	0.513	0.772	0.184	2.786	0.402	0.788	0.768	0.119	0.888	6.2	2.4
1790+00	BC	0.608	0.654	0.718	0.612	0.073	3.385	0.592	0.608	0.605	0.042	1.019	5.2	0.3
1790+00	MHW	0.736	0.575	0.443	0.798	-0.036	2.847	0.320	0.810	0.827	-0.094	1.052	7.9	4.6
1790+00	MTL	0.674	0.638	0.569	0.648	-0.170	3.601	0.437	0.633	0.635	-0.106	1.106	6.4	1.6
1790+00	MLW	0.838	0.695	0.255	0.524	-0.222	4.793	0.142	0.450	0.479	-0.160	1.081	9.2	2.5
1790+00	Trough	1.655	0.552	-0.727	0.857	-0.360	3.128	-0.890	0.925	0.965	-0.299	1.087	11.4	32.7
1790+00	Bar	0.943	0.425	0.085	1.234	-0.046	2.393	-0.080	1.390	1.340	-0.054	0.944	2.6	20.0
1790+00	-8 ft NAVD	0.230	0.673	2.122	0.571	-1.008	5.744	2.023	0.515	0.536	-0.200	1.197	2.2	0.1
1790+00	-12 ft NAVD	0.204	0.698	2.295	0.519	-0.841	5.614	2.200	0.513	0.500	-0.118	1.073	2.3	0.0
1790+00	-16 ft NAVD	0.197	0.686	2.343	0.543	-1.186	7.262	2.255	0.473	0.490	-0.068	1.215	2.3	0.0
1790+00	-20 ft NAVD	0.262	0.637	1.930	0.651	-1.483	7.166	1.850	0.505	0.574	-0.219	1.232	7.8	0.5
1790+00	-24 ft NAVD	0.398	0.484	1.330	1.048	-0.891	3.236	1.257	1.003	1.069	-0.388	1.156	4.5	5.3
1820+00	Dune	0.614	0.656	0.704	0.608	0.081	3.427	0.575	0.615	0.606	0.017	1.003	6.6	0.2
1820+00	Dune Toe	0.598	0.673	0.742	0.570	-0.104	3.797	0.632	0.538	0.552	0.017	1.043	5.7	0.3
1820+00	Berm	0.469	0.605	1.092	0.724	-0.522	4.039	0.990	0.645	0.684	-0.137	1.092	5.1	1.4
1820+00	BC	0.600	0.656	0.736	0.608	0.672	3.970	0.597	0.545	0.592	0.205	1.253	6.0	0.1
1820+00	MHW	0.644	0.668	0.634	0.581	0.608	5.098	0.493	0.480	0.539	0.111	1.372	5.0	0.3
1820+00	MTL	0.782	0.644	0.355	0.635	0.604	4.532	0.212	0.555	0.593	0.058	1.139	7.5	1.3
1820+00	MLW	1.780	0.569	-0.832	0.814	-0.377	2.975	-1.018	0.928	0.949	-0.318	1.068	11.9	36.2
1820+00	Trough	2.458	0.515	-1.297	0.958	-0.026	2.653	-1.605	1.228	1.131	-0.134	0.780	21.5	58.2
1820+00	Bar	0.676	0.454	0.564	1.140	-0.043	2.000	0.422	1.283	1.209	-0.077	0.815	2.9	12.7
1820+00	-8 ft NAVD	0.193	0.701	2.373	0.512	-0.975	6.908	2.283	0.458	0.469	0.004	1.039	2.0	0.1
1820+00	-12 ft NAVD	0.210	0.705	2.251	0.505	-0.705	5.294	2.162	0.490	0.488	-0.118	1.303	2.3	0.0
1820+00	-16 ft NAVD	0.206	0.676	2.281	0.564	-1.227	6.742	2.200	0.493	0.509	-0.161	1.317	2.3	0.0
1820+00	-20 ft NAVD	0.281	0.635	1.829	0.654	-1.402	7.292	1.748	0.535	0.576	-0.096	1.119	11.6	0.8
1820+00	-24 ft NAVD	0.338	0.558	1.565	0.842	-1.092	4.617	1.488	0.748	0.800	-0.280	1.219	5.7	1.6
1840+00	Dune	0.376	0.656	1.411	0.607	0.046	4.064	1.270	0.573	0.586	-0.033	1.119	1.8	0.1
1840+00	Dune Toe	0.500	0.610	1.000	0.713	-0.551	3.993	0.902	0.643	0.674	-0.152	1.083	5.3	1.6
1840+00	Berm	1.430	0.634	-0.516	0.658	-0.268	4.684	-0.688	0.658	0.692	-0.235	1.227	14.6	20.0
1840+00	BC	0.902	0.708	0.149	0.498	1.146	7.282	-0.002	0.440	0.457	0.124	1.051	9.3	0.3
1840+00	MHW	0.703	0.657	0.508	0.606	0.324	4.408	0.367	0.558	0.578	0.003	1.148	6.7	0.8
1840+00	MTL	1.026	0.645	-0.037	0.633	0.027	2.853	-0.165	0.640	0.662	-0.054	1.021	8.3	7.5
1840+00	MLW	1.414	0.529	-0.500	0.919	-0.535	2.844	-0.642	0.990	1.010	-0.362	0.995	10.9	27.1
1840+00	Trough	2.331	0.503	-1.221	0.990	0.042	2.963	-1.498	1.225	1.142	-0.281	0.812	23.4	48.7
1840+00	Bar	0.725	0.488	0.463	1.035	-0.030	2.270	0.323	1.135	1.099	-0.113	0.902	3.3	11.8
1840+00	-8 ft NAVD	0.210	0.686	2.253	0.544	-0.952	6.009	2.170	0.513	0.513	-0.118	1.252	2.2	0.0
1840+00	-12 ft NAVD	0.219	0.648	2.190	0.627	-1.362	7.081	2.128	0.563	0.567	-0.192	1.298	2.3	0.2
1840+00	-16 ft NAVD	0.207	0.634	2.274	0.656	-1.608	7.947	2.212	0.533	0.568	-0.167	1.226	2.1	0.2
1840+00	-20 ft NAVD	0.259	0.631	1.950	0.663	-1.356	6.480	1.860	0.518	0.591	-0.239	1.238	7.0	0.4
1840+00	-24 ft NAVD	0.181	0.659	2.462	0.601	-1.998	13.198	2.372	0.413	0.452	0.148	1.179	6.2	0.5
1870+00	Dune	0.609	0.625	0.715	0.678	-0.500	3.486	0.605	0.658	0.669	-0.126	1.076	6.5	1.9
1870+00	Dune Toe	0.625	0.654	0.677	0.612	0.060	3.836	0.548	0.593	0.598	-0.012	1.052	5.8	0.5
1870+00	Berm	0.439	0.638	1.188	0.649	-0.506	3.962	1.083	0.600	0.627	-0.162	1.058	3.1	0.3
1870+00	BC	0.485	0.651	1.043	0.620	-0.253	3.777	0.928	0.590	0.595	-0.084	0.984	3.1	0.4
1870+00	MHW	0.482	0.651	1.053	0.619	-0.248	3.893	0.942	0.580	0.592	-0.087	1.003	4.0	0.4
1870+00	MTL	0.894	0.525	0.161	0.930	-0.171	3.094	0.062	0.920	0.936	-0.112	1.021	9.1	11.1
1870+00	MLW	1.724	0.577	-0.786	0.793	-0.011	3.186	-0.933	0.788	0.872	-0.090	1.165	16.4	38.0
1870+00	Trough	2.738	0.529	-1.453	0.919	0.178	3.098	-1.773	1.183	1.081	-0.079	0.731	26.7	64.6
1870+00	Bar	0.856	0.452	0.225	1.146	-0.201	2.621	0.100	1.243	1.217	-0.128	0.954	2.4	15.2
1870+00	-8 ft NAVD	0.240	0.654	2.057	0.613	-1.334	6.812	1.945	0.470	0.538	-0.287	1.281	2.1	0.2
1870+00	-12 ft NAVD	0.211	0.668	2.246	0.582	-1.391	8.387	2.170	0.518	0.517	-0.140	1.248	1.7	0.2
1870+00	-16 ft NAVD	0.202	0.678	2.304	0.560	-1.406	8.035	2.217	0.460	0.491	-0.140	1.343	1.6	0.1
1870+00	-20 ft NAVD	0.263	0.628	1.928	0.672	-1.480	7.050	1.842	0.520	0.593	-0.234	1.232	7.3	0.6
1870+00	-24 ft NAVD	0.150	0.614	2.734	0.704	-2.258	13.659	2.670	0.445	0.513	-0.111	1.431	2.4	0.9

TABLE 3.1a (continued). Buxton project area beach sediment characteristics (statistical measures) in October 2014. See Attachment 1 for detailed frequency and cumulative frequency results of each sample.

Buxton Beach Sediment Characteristics		Method of Moments						Folk Graphical Method						
		Mean	STD	Mean	STD	Skew	Kurt	Mean	STD	ISTD	Skew	Kurt	Shell	Gravel
		mm	mm	phi				phi					%	%
1890+00	Dune	0.682	0.593	0.552	0.754	-0.205	4.159	0.437	0.708	0.754	-0.181	1.202	6.6	4.5
1890+00	Dune Toe	0.629	0.663	0.668	0.593	-0.321	3.785	0.553	0.568	0.579	-0.067	1.080	5.5	0.9
1890+00	Berm	0.575	0.639	0.798	0.647	-0.339	3.561	0.693	0.613	0.624	-0.061	1.022	5.3	0.9
1890+00	BC	0.523	0.672	0.935	0.573	-0.014	3.852	0.810	0.543	0.554	-0.030	0.993	3.9	0.1
1890+00	MHW	0.587	0.686	0.768	0.544	0.141	4.270	0.650	0.503	0.522	0.092	1.079	4.2	0.3
1890+00	MTL	0.696	0.741	0.524	0.432	0.265	5.736	0.395	0.375	0.406	0.051	1.326	6.1	0.4
1890+00	MLW	0.947	0.648	0.079	0.625	0.221	4.144	-0.058	0.563	0.616	-0.126	1.208	9.9	5.4
1890+00	Trough	2.215	0.547	-1.147	0.871	0.102	3.022	-1.452	1.100	1.045	-0.157	0.895	18.7	53.4
1890+00	Bar	0.432	0.479	1.211	1.061	-0.722	2.853	1.113	1.083	1.094	-0.378	1.053	3.5	5.3
1890+00	-8 ft NAVD	0.184	0.664	2.441	0.590	-1.604	11.468	2.343	0.433	0.465	0.096	1.169	3.0	0.3
1890+00	-12 ft NAVD	0.188	0.664	2.409	0.590	-1.786	12.720	2.323	0.418	0.458	0.073	1.335	2.9	0.4
1890+00	-16 ft NAVD	0.194	0.622	2.369	0.684	-2.217	12.453	2.317	0.418	0.493	-0.003	1.568	3.6	0.9
1890+00	-20 ft NAVD	0.195	0.630	2.360	0.667	-2.316	13.400	2.307	0.408	0.473	0.013	1.520	3.5	1.0
1890+00	-24 ft NAVD	0.162	0.681	2.628	0.554	-1.412	12.550	2.525	0.390	0.427	0.152	1.110	2.6	0.2
1900+00	Dune	0.527	0.599	0.924	0.740	-0.029	3.267	0.805	0.703	0.724	-0.016	1.039	4.8	0.7
1900+00	Dune Toe	0.528	0.809	0.922	0.305	-23.813	-214.462	0.873	0.495	0.507	-0.125	0.980	3.8	0.2
1900+00	Berm	0.521	0.681	0.940	0.554	-0.472	4.068	0.832	0.518	0.530	-0.102	0.998	4.0	0.3
1900+00	BC	0.486	0.709	1.041	0.496	-0.278	3.938	0.922	0.480	0.473	-0.075	0.921	3.4	0.1
1900+00	MHW	0.602	0.684	0.732	0.548	-0.529	4.429	0.635	0.485	0.512	-0.067	1.105	5.5	0.8
1900+00	MTL	0.549	0.714	0.866	0.487	-0.051	4.025	0.747	0.473	0.477	0.050	1.018	4.6	0.1
1900+00	MLW	1.251	0.492	-0.323	1.024	-0.732	4.107	-0.463	0.980	1.051	-0.275	1.182	9.6	21.5
1900+00	Trough	2.797	0.486	-1.484	1.040	0.143	3.650	-1.790	1.265	1.192	-0.179	0.795	25.3	65.5
1900+00	Bar	0.200	0.623	2.320	0.683	-1.583	8.128	2.247	0.533	0.594	-0.138	1.355	2.6	0.4
1900+00	-8 ft NAVD	0.202	0.625	2.307	0.678	-1.322	7.023	2.228	0.548	0.608	-0.135	1.349	3.8	0.3
1900+00	-12 ft NAVD	0.211	0.540	2.246	0.889	-1.754	7.012	2.213	0.598	0.746	-0.297	1.892	3.1	1.6
1900+00	-16 ft NAVD	0.219	0.524	2.189	0.933	-1.654	6.281	2.145	0.683	0.803	-0.359	1.812	3.7	2.0
1900+00	-20 ft NAVD	0.344	0.516	1.538	0.956	-0.885	3.808	1.458	0.883	0.929	-0.250	1.082	3.8	3.0
1900+00	-24 ft NAVD	0.322	0.514	1.633	0.959	-0.921	3.961	1.542	0.873	0.914	-0.272	1.078	5.7	2.8
1920+00	Dune	0.474	0.723	1.078	0.469	0.206	4.618	0.940	0.445	0.450	0.064	0.992	2.6	0.0
1920+00	Dune Toe	0.739	0.651	0.436	0.620	-0.213	3.983	0.313	0.563	0.596	-0.111	1.192	8.0	2.6
1920+00	Berm	0.727	0.638	0.459	0.649	0.038	4.278	0.328	0.593	0.618	-0.099	1.124	11.6	2.2
1920+00	BC	0.620	0.625	0.690	0.677	-0.037	3.710	0.570	0.643	0.662	0.040	1.131	5.8	1.6
1920+00	MHW	0.781	0.676	0.357	0.565	-0.195	3.607	0.235	0.540	0.552	-0.109	1.066	7.9	1.6
1920+00	MTL	0.525	0.691	0.930	0.533	-0.153	4.387	0.812	0.503	0.504	0.050	0.971	4.5	0.4
1920+00	MLW	1.054	0.635	-0.076	0.656	-5.607	-23.223	-0.133	0.823	0.867	-0.284	1.115	15.7	13.3
1920+00	Trough	2.905	0.501	-1.539	0.998	-0.020	2.663	-1.838	1.253	1.173	-0.131	0.775	19.9	66.8
1920+00	Bar	0.302	0.564	1.726	0.827	-0.689	3.269	1.603	0.828	0.801	-0.288	0.880	3.2	0.4
1920+00	-8 ft NAVD	0.223	0.673	2.163	0.571	-1.240	7.128	2.068	0.470	0.505	-0.220	1.283	2.0	0.1
1920+00	-12 ft NAVD	0.194	0.657	2.365	0.606	-1.429	8.639	2.285	0.480	0.524	-0.015	1.260	2.3	0.2
1920+00	-16 ft NAVD	0.204	0.653	2.290	0.614	-1.516	8.429	2.217	0.488	0.530	-0.095	1.347	2.6	0.2
1920+00	-20 ft NAVD	0.205	0.642	2.286	0.639	-1.698	8.891	2.218	0.495	0.545	-0.131	1.365	2.1	0.3
1920+00	-24 ft NAVD	0.476	0.593	1.072	0.755	-0.248	3.560	0.973	0.705	0.733	0.013	1.083	5.6	1.2
1940+00	Dune	0.564	0.590	0.826	0.761	-0.192	3.184	0.707	0.750	0.757	-0.063	1.033	6.9	1.2
1940+00	Dune Toe	0.495	0.649	1.015	0.624	-0.026	3.436	0.898	0.610	0.611	-0.016	0.963	4.6	0.1
1940+00	Berm	0.598	0.596	0.742	0.746	0.119	2.846	0.603	0.783	0.753	0.067	0.909	6.8	0.7
1940+00	BC	0.507	0.606	0.980	0.722	-0.041	3.187	0.860	0.698	0.702	0.008	0.960	4.8	0.8
1940+00	MHW	0.460	0.646	1.119	0.630	-0.121	3.309	0.998	0.618	0.619	-0.074	0.942	4.4	0.2
1940+00	MTL	0.475	0.604	1.074	0.728	-0.510	4.212	0.977	0.628	0.677	-0.141	1.118	4.0	1.5
1940+00	MLW	0.794	0.572	0.333	0.807	-0.055	2.605	0.233	0.843	0.856	-0.064	1.046	10.9	6.8
1940+00	Trough	2.458	0.533	-1.298	0.908	-0.103	2.627	-1.605	1.178	1.086	-0.161	0.797	26.3	59.2
1940+00	Bar	0.210	0.656	2.252	0.609	-1.182	6.630	2.167	0.525	0.554	-0.170	1.315	2.0	0.1
1940+00	-8 ft NAVD	0.224	0.639	2.159	0.646	-0.988	5.233	2.070	0.590	0.611	-0.257	1.204	2.0	0.1
1940+00	-12 ft NAVD	0.487	0.599	1.039	0.740	-0.272	3.602	0.938	0.685	0.716	0.012	1.098	4.9	1.3
1940+00	-16 ft NAVD	0.215	0.665	2.216	0.588	-2.368	13.527	2.142	0.348	0.425	-0.199	1.696	3.0	0.6
1940+00	-20 ft NAVD	0.191	0.685	2.390	0.546	-1.638	12.904	2.302	0.395	0.435	0.081	1.365	2.2	0.3
1940+00	-24 ft NAVD	0.489	0.593	1.032	0.754	-0.471	3.887	0.943	0.678	0.719	-0.035	1.124	5.2	2.0
1980+00	Dune	0.483	0.633	1.050	0.661	-0.176	2.833	0.933	0.663	0.666	-0.086	0.969	4.3	0.0
1980+00	Dune Toe	0.582	0.622	0.780	0.684	-0.287	3.547	0.665	0.663	0.668	-0.064	1.017	6.0	1.4
1980+00	Berm	0.565	0.650	0.824	0.622	-0.416	3.837	0.725	0.575	0.585	-0.052	0.994	6.2	1.1
1980+00	BC	0.549	0.621	0.866	0.687	-0.401	3.324	0.755	0.658	0.669	-0.128	1.011	6.0	1.0
1980+00	MHW	0.439	0.636	1.188	0.653	-0.506	3.926	1.080	0.618	0.631	-0.167	1.013	4.2	0.5
1980+00	MTL	0.570	0.539	0.811	0.891	-0.164	2.396	0.687	0.948	0.906	0.011	0.853	5.8	2.6
1980+00	MLW	0.830	0.469	0.269	1.091	-0.276	3.660	0.225	1.050	1.085	0.157	1.126	9.1	9.1
1980+00	Trough	2.484	0.522	-1.313	0.937	0.017	2.477	-1.623	1.220	1.118	-0.122	0.759	21.3	59.2
1980+00	Bar	0.220	0.694	2.184	0.528	-1.199	7.882	2.082	0.448	0.472	-0.189	1.222	1.9	0.1
1980+00	-8 ft NAVD	0.223	0.682	2.163	0.552	-1.559	9.553	2.065	0.448	0.475	-0.201	1.233	2.1	0.3
1980+00	-12 ft NAVD	0.190	0.614	2.394	0.703	-1.610	9.202	2.308	0.535	0.583	-0.043	1.254	2.2	0.7
1980+00	-16 ft NAVD	0.190	0.640	2.394	0.643	-1.321	8.472	2.298	0.518	0.558	-0.020	1.226	2.2	0.3
1980+00	-20 ft NAVD	0.189	0.704	2.405	0.507	-1.002	10.643	2.303	0.388	0.424	0.097	1.369	2.2	0.1
1980+00	-24 ft NAVD	0.152	0.638	2.719	0.649	-1.290	9.758	2.643	0.508	0.529	-0.028	1.005	3.3	0.3

TABLE 3.1b. Buxton project area beach sediment characteristics (descriptive) in October 2014. See Attachment 1 for detailed frequency and cumulative frequency results of each sample.

Sample	Interval	USCS Description			Wentworth Description			
1760+00	Dune	SP	Fine Sand	Poorly Graded	Medium Sand	Moderately Sorted	Coarse Skewed	Mesokurtic
1760+00	Dune Toe	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Sorted	Symmetrical	Mesokurtic
1760+00	Berm	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Sorted	Symmetrical	Platykurtic
1760+00	BC	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Well Sorted	Symmetrical	Mesokurtic
1760+00	MHW	SP	Fine Sand	Poorly Graded	Medium Sand	Moderately Well Sorted	Coarse Skewed	Leptokurtic
1760+00	MTL	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Sorted	Symmetrical	Platykurtic
1760+00	MLW	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Sorted	Symmetrical	Platykurtic
1760+00	Trough	SP	Medium Sand	Poorly Graded	Very Coarse Sand	Poorly Sorted	Symmetrical	Mesokurtic
1760+00	Bar	SP	Medium Sand	Poorly Graded	Coarse Sand	Poorly Sorted	Symmetrical	Platykurtic
1760+00	-8 ft NAVD	SP	Fine Sand	Poorly Graded	Fine Sand	Moderately Well Sorted	Coarse Skewed	Leptokurtic
1760+00	-12 ft NAVD	SP	Fine Sand	Poorly Graded	Fine Sand	Moderately Well Sorted	Coarse Skewed	Leptokurtic
1760+00	-16 ft NAVD	SP	Fine Sand	Poorly Graded	Fine Sand	Moderately Well Sorted	Coarse Skewed	Leptokurtic
1760+00	-20 ft NAVD	SP	Fine Sand	Poorly Graded	Medium Sand	Moderately Well Sorted	Strongly Coarse Skewed	Very Leptokurtic
1760+00	-24 ft NAVD	SP	Fine Sand	Poorly Graded	Medium Sand	Moderately Sorted	Coarse Skewed	Leptokurtic
1790+00	Dune	SP	Medium Sand	Poorly Graded	Medium Sand	Moderately Sorted	Symmetrical	Mesokurtic
1790+00	Dune Toe	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Well Sorted	Symmetrical	Mesokurtic
1790+00	Berm	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Sorted	Symmetrical	Mesokurtic
1790+00	BC	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Well Sorted	Symmetrical	Mesokurtic
1790+00	MHW	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Sorted	Symmetrical	Mesokurtic
1790+00	MTL	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Well Sorted	Symmetrical	Mesokurtic
1790+00	MLW	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Well Sorted	Symmetrical	Leptokurtic
1790+00	Trough	SP	Medium Sand	Poorly Graded	Very Coarse Sand	Moderately Sorted	Symmetrical	Mesokurtic
1790+00	Bar	SP	Medium Sand	Poorly Graded	Coarse Sand	Poorly Sorted	Symmetrical	Platykurtic
1790+00	-8 ft NAVD	SP	Fine Sand	Poorly Graded	Fine Sand	Moderately Well Sorted	Coarse Skewed	Leptokurtic
1790+00	-12 ft NAVD	SP	Fine Sand	Poorly Graded	Fine Sand	Moderately Well Sorted	Coarse Skewed	Leptokurtic
1790+00	-16 ft NAVD	SP	Fine Sand	Poorly Graded	Fine Sand	Moderately Well Sorted	Coarse Skewed	Leptokurtic
1790+00	-20 ft NAVD	SP	Fine Sand	Poorly Graded	Medium Sand	Moderately Well Sorted	Strongly Coarse Skewed	Leptokurtic
1790+00	-24 ft NAVD	SP	Fine Sand	Poorly Graded	Medium Sand	Poorly Sorted	Coarse Skewed	Mesokurtic
1820+00	Dune	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Well Sorted	Symmetrical	Mesokurtic
1820+00	Dune Toe	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Well Sorted	Symmetrical	Leptokurtic
1820+00	Berm	SP	Medium Sand	Poorly Graded	Medium Sand	Moderately Sorted	Coarse Skewed	Leptokurtic
1820+00	BC	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Well Sorted	Fine Skewed	Leptokurtic
1820+00	MHW	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Well Sorted	Fine Skewed	Leptokurtic
1820+00	MTL	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Well Sorted	Fine Skewed	Leptokurtic
1820+00	MLW	SP	Medium Sand	Poorly Graded	Very Coarse Sand	Moderately Sorted	Symmetrical	Mesokurtic
1820+00	Trough	SP	Coarse Sand	Poorly Graded	Granule	Moderately Sorted	Symmetrical	Mesokurtic
1820+00	Bar	SP	Medium Sand	Poorly Graded	Coarse Sand	Poorly Sorted	Symmetrical	Platykurtic
1820+00	-8 ft NAVD	SP	Fine Sand	Poorly Graded	Fine Sand	Moderately Well Sorted	Coarse Skewed	Leptokurtic
1820+00	-12 ft NAVD	SP	Fine Sand	Poorly Graded	Fine Sand	Moderately Well Sorted	Coarse Skewed	Leptokurtic
1820+00	-16 ft NAVD	SP	Fine Sand	Poorly Graded	Fine Sand	Moderately Well Sorted	Coarse Skewed	Leptokurtic
1820+00	-20 ft NAVD	SP	Fine Sand	Poorly Graded	Medium Sand	Moderately Well Sorted	Strongly Coarse Skewed	Leptokurtic
1820+00	-24 ft NAVD	SP	Fine Sand	Poorly Graded	Medium Sand	Moderately Sorted	Coarse Skewed	Leptokurtic
1840+00	Dune	SP	Fine Sand	Poorly Graded	Medium Sand	Moderately Well Sorted	Symmetrical	Leptokurtic
1840+00	Dune Toe	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Sorted	Coarse Skewed	Leptokurtic
1840+00	Berm	SP	Medium Sand	Poorly Graded	Very Coarse Sand	Moderately Well Sorted	Symmetrical	Leptokurtic
1840+00	BC	SP	Medium Sand	Poorly Graded	Coarse Sand	Well Sorted	Fine Skewed	Leptokurtic
1840+00	MHW	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Well Sorted	Symmetrical	Leptokurtic
1840+00	MTL	SP	Medium Sand	Poorly Graded	Very Coarse Sand	Moderately Well Sorted	Symmetrical	Mesokurtic
1840+00	MLW	SP	Medium Sand	Poorly Graded	Very Coarse Sand	Moderately Sorted	Coarse Skewed	Mesokurtic
1840+00	Trough	SP	Coarse Sand	Poorly Graded	Granule	Moderately Sorted	Symmetrical	Mesokurtic
1840+00	Bar	SP	Medium Sand	Poorly Graded	Coarse Sand	Poorly Sorted	Symmetrical	Platykurtic
1840+00	-8 ft NAVD	SP	Fine Sand	Poorly Graded	Fine Sand	Moderately Well Sorted	Coarse Skewed	Leptokurtic
1840+00	-12 ft NAVD	SP	Fine Sand	Poorly Graded	Fine Sand	Moderately Well Sorted	Strongly Coarse Skewed	Leptokurtic
1840+00	-16 ft NAVD	SP	Fine Sand	Poorly Graded	Fine Sand	Moderately Well Sorted	Strongly Coarse Skewed	Very Leptokurtic
1840+00	-20 ft NAVD	SP	Fine Sand	Poorly Graded	Medium Sand	Moderately Well Sorted	Strongly Coarse Skewed	Leptokurtic
1840+00	-24 ft NAVD	SP	Fine Sand	Poorly Graded	Fine Sand	Moderately Well Sorted	Strongly Coarse Skewed	Very Leptokurtic
1870+00	Dune	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Well Sorted	Coarse Skewed	Mesokurtic
1870+00	Dune Toe	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Well Sorted	Symmetrical	Leptokurtic
1870+00	Berm	SP	Medium Sand	Poorly Graded	Medium Sand	Moderately Well Sorted	Coarse Skewed	Leptokurtic
1870+00	BC	SP	Medium Sand	Poorly Graded	Medium Sand	Moderately Well Sorted	Symmetrical	Leptokurtic
1870+00	MHW	SP	Medium Sand	Poorly Graded	Medium Sand	Moderately Well Sorted	Symmetrical	Leptokurtic
1870+00	MTL	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Sorted	Symmetrical	Mesokurtic
1870+00	MLW	SP	Medium Sand	Poorly Graded	Very Coarse Sand	Moderately Sorted	Symmetrical	Mesokurtic
1870+00	Trough	SP	Coarse Sand	Poorly Graded	Granule	Moderately Sorted	Symmetrical	Mesokurtic
1870+00	Bar	SP	Medium Sand	Poorly Graded	Coarse Sand	Poorly Sorted	Symmetrical	Mesokurtic
1870+00	-8 ft NAVD	SP	Fine Sand	Poorly Graded	Fine Sand	Moderately Well Sorted	Strongly Coarse Skewed	Leptokurtic
1870+00	-12 ft NAVD	SP	Fine Sand	Poorly Graded	Fine Sand	Moderately Well Sorted	Strongly Coarse Skewed	Very Leptokurtic
1870+00	-16 ft NAVD	SP	Fine Sand	Poorly Graded	Fine Sand	Moderately Well Sorted	Strongly Coarse Skewed	Very Leptokurtic
1870+00	-20 ft NAVD	SP	Fine Sand	Poorly Graded	Medium Sand	Moderately Well Sorted	Strongly Coarse Skewed	Leptokurtic
1870+00	-24 ft NAVD	SP	Fine Sand	Poorly Graded	Fine Sand	Moderately Sorted	Strongly Coarse Skewed	Very Leptokurtic

TABLE 3.1b (continued). Buxton project area beach sediment characteristics (descriptive) in October 2014. See Attachment 1 for detailed frequency and cumulative frequency results of each sample.

Sample	Interval	USCS Description			Wentworth Description			
1890+00	Dune	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Sorted	Symmetrical	Leptokurtic
1890+00	Dune Toe	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Well Sorted	Symmetrical	Leptokurtic
1890+00	Berm	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Well Sorted	Symmetrical	Mesokurtic
1890+00	BC	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Well Sorted	Symmetrical	Leptokurtic
1890+00	MHW	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Well Sorted	Symmetrical	Leptokurtic
1890+00	MTL	SP	Medium Sand	Poorly Graded	Coarse Sand	Well Sorted	Symmetrical	Leptokurtic
1890+00	MLW	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Well Sorted	Symmetrical	Leptokurtic
1890+00	Trough	SP	Coarse Sand	Poorly Graded	Granule	Moderately Sorted	Symmetrical	Mesokurtic
1890+00	Bar	SP	Medium Sand	Poorly Graded	Medium Sand	Poorly Sorted	Coarse Skewed	Mesokurtic
1890+00	-8 ft NAVD	SP	Fine Sand	Poorly Graded	Fine Sand	Moderately Well Sorted	Strongly Coarse Skewed	Very Leptokurtic
1890+00	-12 ft NAVD	SP	Fine Sand	Poorly Graded	Fine Sand	Moderately Well Sorted	Strongly Coarse Skewed	Very Leptokurtic
1890+00	-16 ft NAVD	SP	Fine Sand	Poorly Graded	Fine Sand	Moderately Well Sorted	Strongly Coarse Skewed	Very Leptokurtic
1890+00	-20 ft NAVD	SP	Fine Sand	Poorly Graded	Fine Sand	Moderately Well Sorted	Strongly Coarse Skewed	Very Leptokurtic
1890+00	-24 ft NAVD	SP	Fine Sand	Poorly Graded	Fine Sand	Moderately Well Sorted	Strongly Coarse Skewed	Very Leptokurtic
1900+00	Dune	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Sorted	Symmetrical	Mesokurtic
1900+00	Dune Toe	SP	Medium Sand	Poorly Graded	Coarse Sand	Very Well Sorted	Strongly Coarse Skewed	Very Leptokurtic
1900+00	Berm	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Well Sorted	Coarse Skewed	Leptokurtic
1900+00	BC	SP	Medium Sand	Poorly Graded	Medium Sand	Well Sorted	Symmetrical	Leptokurtic
1900+00	MHW	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Well Sorted	Coarse Skewed	Leptokurtic
1900+00	MTL	SP	Medium Sand	Poorly Graded	Coarse Sand	Well Sorted	Symmetrical	Leptokurtic
1900+00	MLW	SP	Medium Sand	Poorly Graded	Very Coarse Sand	Poorly Sorted	Coarse Skewed	Leptokurtic
1900+00	Trough	SP	Coarse Sand	Poorly Graded	Granule	Poorly Sorted	Symmetrical	Mesokurtic
1900+00	Bar	SP	Fine Sand	Poorly Graded	Fine Sand	Moderately Well Sorted	Strongly Coarse Skewed	Very Leptokurtic
1900+00	-8 ft NAVD	SP	Fine Sand	Poorly Graded	Fine Sand	Moderately Well Sorted	Strongly Coarse Skewed	Leptokurtic
1900+00	-12 ft NAVD	SP	Fine Sand	Poorly Graded	Fine Sand	Moderately Sorted	Strongly Coarse Skewed	Leptokurtic
1900+00	-16 ft NAVD	SP	Fine Sand	Poorly Graded	Fine Sand	Moderately Sorted	Strongly Coarse Skewed	Leptokurtic
1900+00	-20 ft NAVD	SP	Fine Sand	Poorly Graded	Medium Sand	Moderately Sorted	Coarse Skewed	Leptokurtic
1900+00	-24 ft NAVD	SP	Fine Sand	Poorly Graded	Medium Sand	Moderately Sorted	Coarse Skewed	Leptokurtic
1920+00	Dune	SP	Medium Sand	Poorly Graded	Medium Sand	Well Sorted	Symmetrical	Leptokurtic
1920+00	Dune Toe	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Well Sorted	Symmetrical	Leptokurtic
1920+00	Berm	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Well Sorted	Symmetrical	Leptokurtic
1920+00	BC	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Well Sorted	Symmetrical	Leptokurtic
1920+00	MHW	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Well Sorted	Symmetrical	Mesokurtic
1920+00	MTL	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Well Sorted	Symmetrical	Leptokurtic
1920+00	MLW	SP	Medium Sand	Poorly Graded	Very Coarse Sand	Moderately Well Sorted	Strongly Coarse Skewed	Very Platykurtic
1920+00	Trough	SP	Coarse Sand	Poorly Graded	Granule	Moderately Sorted	Symmetrical	Mesokurtic
1920+00	Bar	SP	Fine Sand	Poorly Graded	Medium Sand	Moderately Sorted	Coarse Skewed	Mesokurtic
1920+00	-8 ft NAVD	SP	Fine Sand	Poorly Graded	Fine Sand	Moderately Well Sorted	Coarse Skewed	Leptokurtic
1920+00	-12 ft NAVD	SP	Fine Sand	Poorly Graded	Fine Sand	Moderately Well Sorted	Strongly Coarse Skewed	Very Leptokurtic
1920+00	-16 ft NAVD	SP	Fine Sand	Poorly Graded	Fine Sand	Moderately Well Sorted	Strongly Coarse Skewed	Very Leptokurtic
1920+00	-20 ft NAVD	SP	Fine Sand	Poorly Graded	Fine Sand	Moderately Well Sorted	Strongly Coarse Skewed	Very Leptokurtic
1920+00	-24 ft NAVD	SP	Medium Sand	Poorly Graded	Medium Sand	Moderately Sorted	Symmetrical	Mesokurtic
1940+00	Dune	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Sorted	Symmetrical	Mesokurtic
1940+00	Dune Toe	SP	Medium Sand	Poorly Graded	Medium Sand	Moderately Well Sorted	Symmetrical	Mesokurtic
1940+00	Berm	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Sorted	Symmetrical	Mesokurtic
1940+00	BC	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Sorted	Symmetrical	Mesokurtic
1940+00	MHW	SP	Medium Sand	Poorly Graded	Medium Sand	Moderately Well Sorted	Symmetrical	Mesokurtic
1940+00	MTL	SP	Medium Sand	Poorly Graded	Medium Sand	Moderately Sorted	Coarse Skewed	Leptokurtic
1940+00	MLW	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Sorted	Symmetrical	Mesokurtic
1940+00	Trough	SP	Coarse Sand	Poorly Graded	Granule	Moderately Sorted	Symmetrical	Mesokurtic
1940+00	Bar	SP	Fine Sand	Poorly Graded	Fine Sand	Moderately Well Sorted	Coarse Skewed	Leptokurtic
1940+00	-8 ft NAVD	SP	Fine Sand	Poorly Graded	Fine Sand	Moderately Well Sorted	Coarse Skewed	Leptokurtic
1940+00	-12 ft NAVD	SP	Medium Sand	Poorly Graded	Medium Sand	Moderately Sorted	Symmetrical	Mesokurtic
1940+00	-16 ft NAVD	SP	Fine Sand	Poorly Graded	Fine Sand	Moderately Well Sorted	Strongly Coarse Skewed	Very Leptokurtic
1940+00	-20 ft NAVD	SP	Fine Sand	Poorly Graded	Fine Sand	Moderately Well Sorted	Strongly Coarse Skewed	Very Leptokurtic
1940+00	-24 ft NAVD	SP	Medium Sand	Poorly Graded	Medium Sand	Moderately Sorted	Coarse Skewed	Leptokurtic
1980+00	Dune	SP	Medium Sand	Poorly Graded	Medium Sand	Moderately Well Sorted	Symmetrical	Mesokurtic
1980+00	Dune Toe	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Well Sorted	Symmetrical	Mesokurtic
1980+00	Berm	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Well Sorted	Symmetrical	Leptokurtic
1980+00	BC	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Well Sorted	Symmetrical	Mesokurtic
1980+00	MHW	SP	Medium Sand	Poorly Graded	Medium Sand	Moderately Well Sorted	Coarse Skewed	Leptokurtic
1980+00	MTL	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Sorted	Symmetrical	Platykurtic
1980+00	MLW	SP	Medium Sand	Poorly Graded	Coarse Sand	Poorly Sorted	Symmetrical	Mesokurtic
1980+00	Trough	SP	Coarse Sand	Poorly Graded	Granule	Moderately Sorted	Symmetrical	Platykurtic
1980+00	Bar	SP	Fine Sand	Poorly Graded	Fine Sand	Moderately Well Sorted	Coarse Skewed	Very Leptokurtic
1980+00	-8 ft NAVD	SP	Fine Sand	Poorly Graded	Fine Sand	Moderately Well Sorted	Strongly Coarse Skewed	Very Leptokurtic
1980+00	-12 ft NAVD	SP	Fine Sand	Poorly Graded	Fine Sand	Moderately Sorted	Strongly Coarse Skewed	Very Leptokurtic
1980+00	-16 ft NAVD	SP	Fine Sand	Poorly Graded	Fine Sand	Moderately Well Sorted	Strongly Coarse Skewed	Very Leptokurtic
1980+00	-20 ft NAVD	SP	Fine Sand	Poorly Graded	Fine Sand	Moderately Well Sorted	Coarse Skewed	Very Leptokurtic
1980+00	-24 ft NAVD	SP	Fine Sand	Poorly Graded	Fine Sand	Moderately Well Sorted	Coarse Skewed	Very Leptokurtic

TABLE 3.2. Mean grain size (mm) for October 2014 beach samples in the Buxton project area.

Position	Dune	Dune Toe	Berm	BC	MHW	MTL	MLW
1760+00	0.373	0.568	0.740	0.517	0.358	0.610	0.669
1790+00	0.448	0.503	0.701	0.608	0.736	0.674	0.838
1820+00	0.614	0.598	0.469	0.600	0.644	0.782	1.780
1840+00	0.376	0.500	1.430	0.902	0.703	1.026	1.414
1870+00	0.609	0.625	0.439	0.485	0.482	0.894	1.724
1890+00	0.682	0.629	0.575	0.523	0.587	0.696	0.947
1900+00	0.527	0.528	0.521	0.486	0.602	0.549	1.251
1920+00	0.474	0.739	0.727	0.620	0.781	0.525	1.054
1940+00	0.564	0.495	0.598	0.507	0.460	0.475	0.794
1980+00	0.483	0.582	0.565	0.549	0.439	0.570	0.830
Average	0.515	0.577	0.677	0.580	0.579	0.680	1.130

Position	Trough	Bar	-8 ft NAVD	-12 ft NAVD	-16 ft NAVD	-20 ft NAVD	-24 ft NAVD
1760+00	1.550	0.723	0.232	0.208	0.198	0.257	0.336
1790+00	1.655	0.943	0.230	0.204	0.197	0.262	0.398
1820+00	2.458	0.676	0.193	0.210	0.206	0.281	0.338
1840+00	2.331	0.725	0.210	0.219	0.207	0.259	0.181
1870+00	2.738	0.856	0.240	0.211	0.202	0.263	0.150
1890+00	2.215	0.432	0.184	0.188	0.194	0.195	0.162
1900+00	2.797	0.200	0.202	0.211	0.219	0.344	0.322
1920+00	2.905	0.302	0.223	0.194	0.204	0.205	0.476
1940+00	2.458	0.210	0.224	0.487	0.215	0.191	0.489
1980+00	2.484	0.220	0.223	0.190	0.190	0.189	0.152
Average	2.359	0.529	0.216	0.232	0.203	0.245	0.300

TABLE 3.3. Arithmetic mean grain size and related statistics based on 14 samples per transect (n=140). Lower table gives results omitting the 10 trough samples.

Station Average – All Samples – October 2014				
	Mean	STD	Shell	Gravel
	mm	mm	%	%
1760+00	0.524	0.589	5.3	4.8
1790+00	0.600	0.608	5.4	5.1
1820+00	0.704	0.623	6.9	8.1
1840+00	0.749	0.621	7.4	8.5
1870+00	0.709	0.610	6.6	9.6
1890+00	0.586	0.638	5.7	5.3
1900+00	0.626	0.608	6.0	7.1
1920+00	0.674	0.637	6.7	6.5
1940+00	0.583	0.617	6.3	5.4
1980+00	0.548	0.619	5.5	5.5
Average	0.630	0.617	6.2	6.6

Station Average Excluding Trough				
	Mean	STD	Shell (w/o Trough)	Gravel (w/o Trough)
	mm	mm	%	%
1760+00	0.519	0.612	4.9	2.9
1790+00	0.515	0.597	5.6	4.1
1820+00	0.569	0.631	5.7	4.2
1840+00	0.627	0.630	6.2	5.4
1870+00	0.552	0.617	5.1	5.4
1890+00	0.461	0.645	4.7	1.6
1900+00	0.459	0.618	4.5	2.6
1920+00	0.502	0.648	5.7	1.9
1940+00	0.439	0.623	4.7	1.2
1980+00	0.399	0.626	4.3	1.3
Average	0.504	0.625	5.1	3.1

TABLE 3.4. Arithmetic mean grain size and related statistics by sample position for 10 transects along the Buxton project area in October 2014.

Cross-Shore Averages – October 2014				
	Mean	STD	Shell	Gravel
	mm	mm	%	%
Dune	0.515	0.624	4.6	1.0
Dune Toe	0.577	0.655	5.5	0.9
Berm	0.677	0.632	6.7	2.9
BC	0.580	0.639	6.6	2.7
MHW	0.579	0.644	6.7	2.6
MTL	0.680	0.629	6.3	3.0
MLW	1.130	0.569	11.1	16.5
Trough	2.359	0.518	20.8	54.2
Bar	0.529	0.529	2.7	8.0
-8 ft NAVD	0.216	0.666	2.4	0.1
-12 ft NAVD	0.232	0.649	2.7	0.5
-16 ft NAVD	0.203	0.646	2.6	0.4
-20 ft NAVD	0.245	0.634	5.8	0.8
-24 ft NAVD	0.300	0.586	4.7	1.8
Average	0.630	0.616	6.4	6.8
Avg w/o Trough	0.497	0.623	5.3	3.2

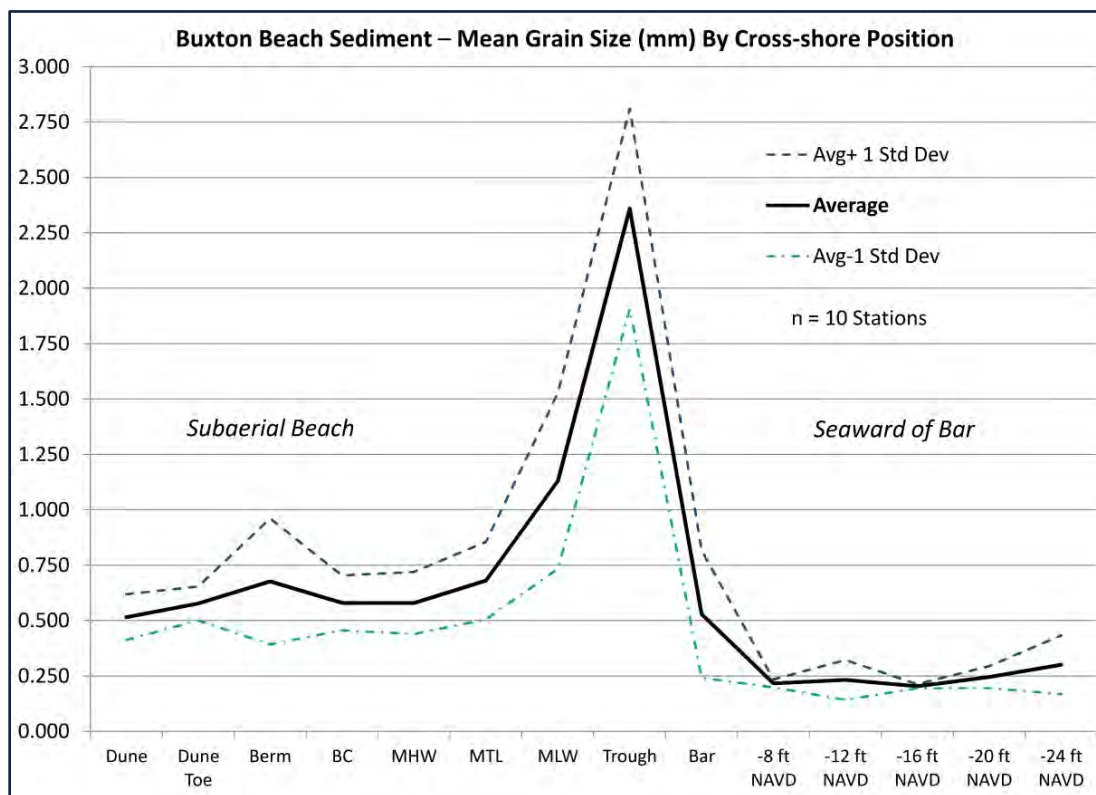
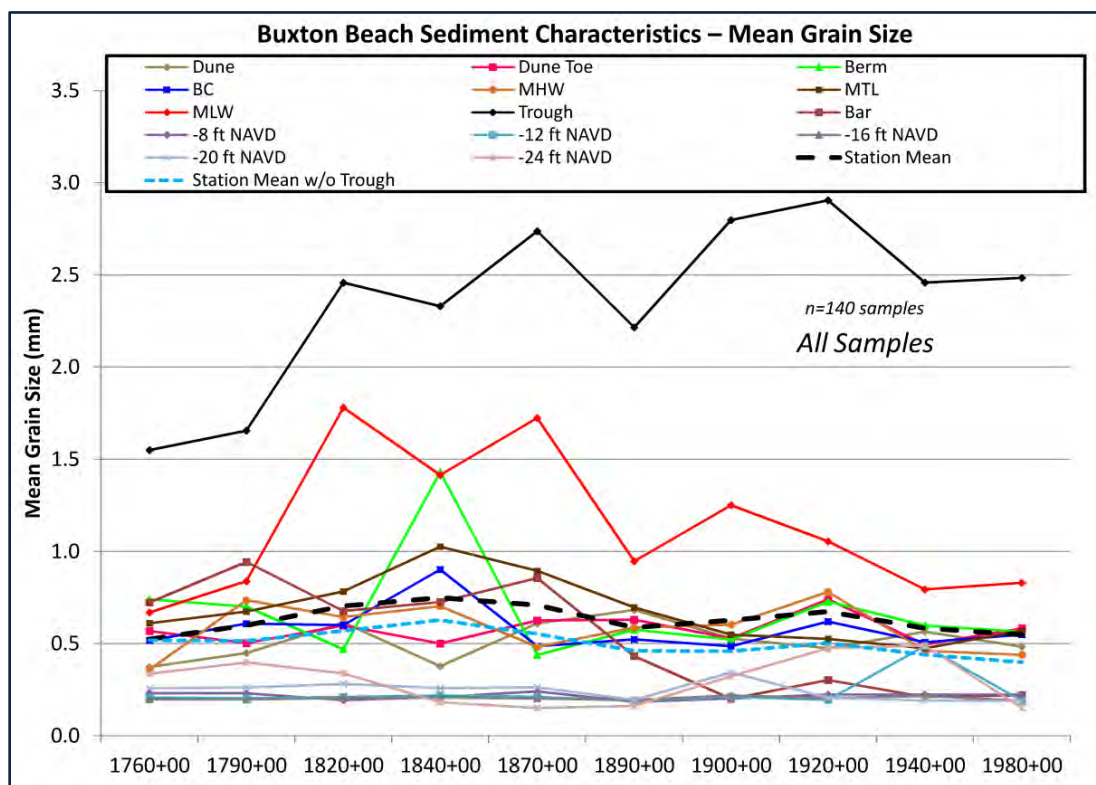


FIGURE 3.1 (upper). Mean grain size by station and sample position in October 2014.

FIGURE 3.2 (lower). Arithmetic mean grain size by sample position based on ten samples per station.

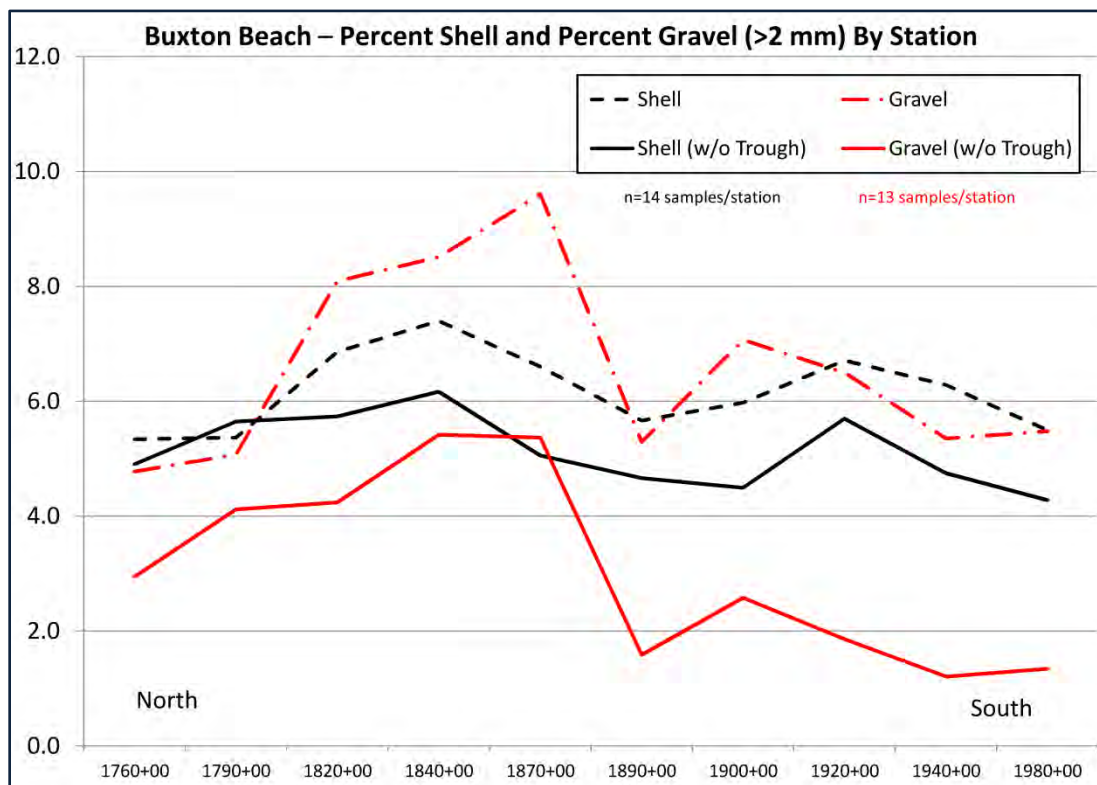
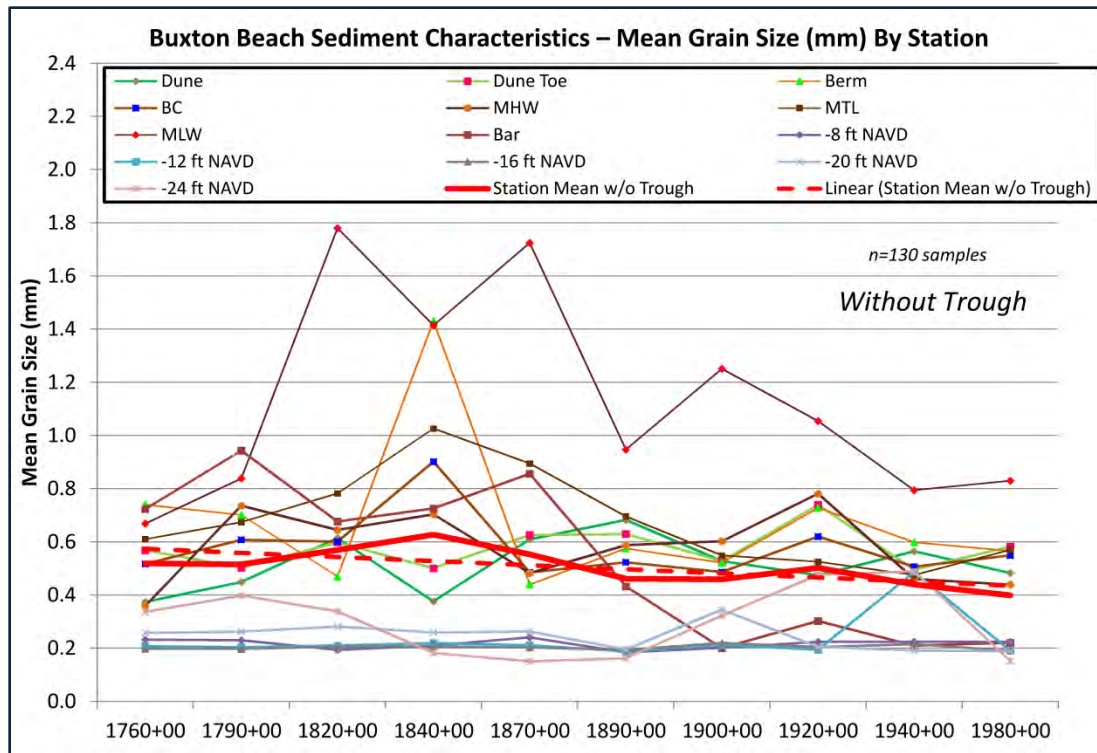


FIGURE 3.3 (upper). Mean grain size by station and sample position omitting the trough samples.

FIGURE 3.4 (lower). Percent shell and percent gravel (>2 mm) by station in October 2014 along the Buxton project area.

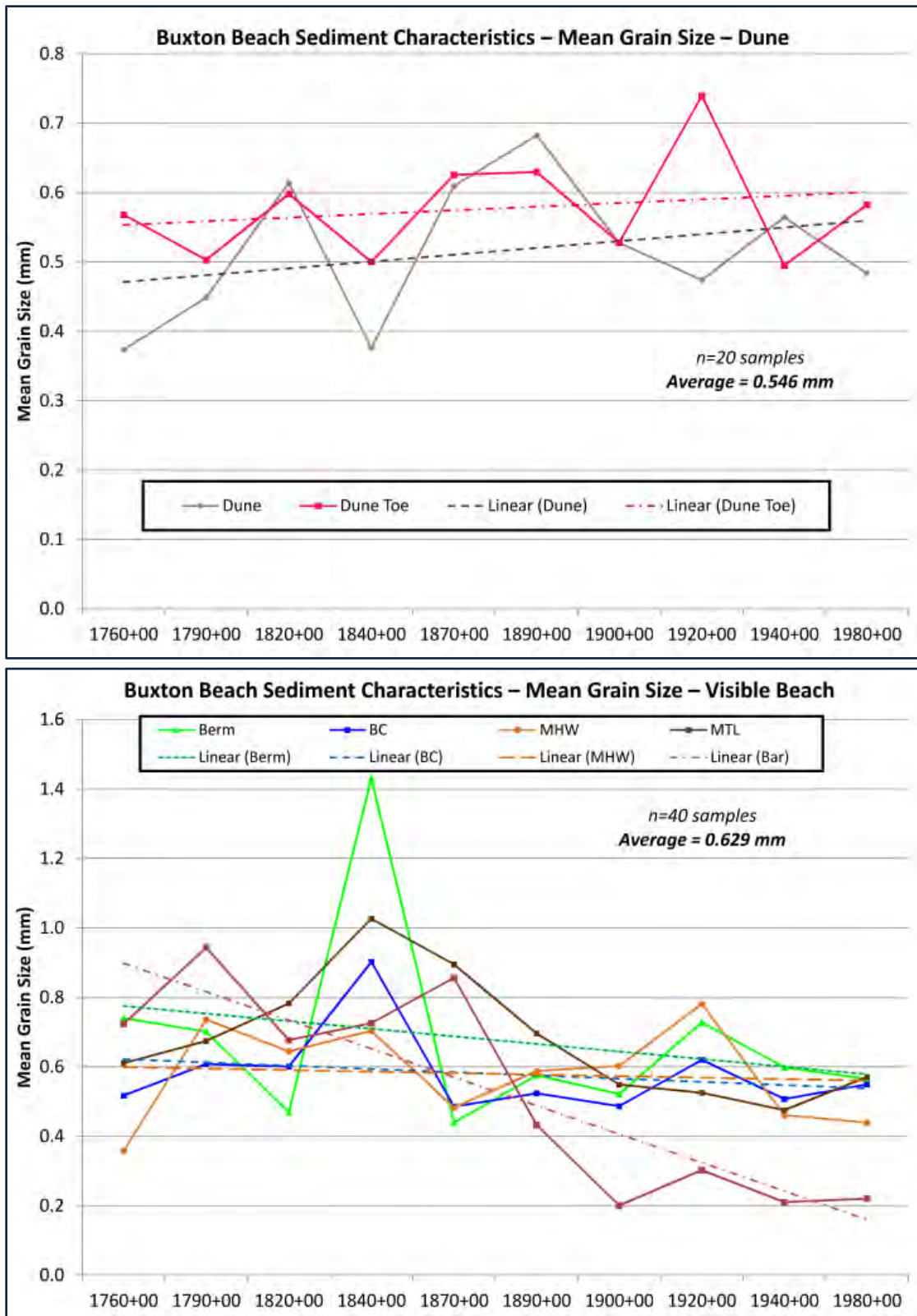


FIGURE 3.5. Alongshore trends in mean grain size for groups of samples along Buxton: (upper) dune area and (lower) subaerial beach to mid-tide level.

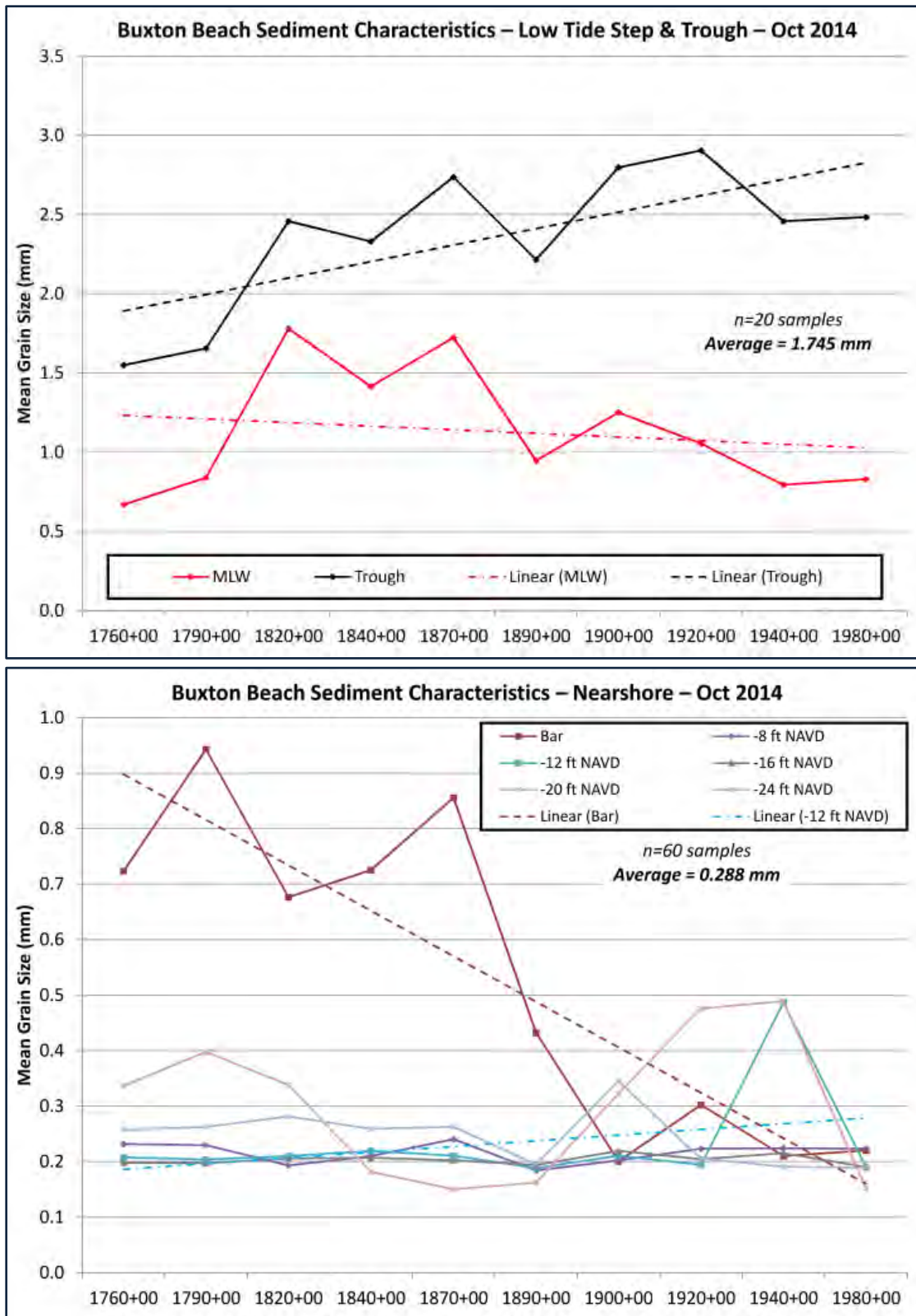


FIGURE 3.6. Alongshore trends in mean grain size for groups of samples along Buxton: (upper) low-tide plunge point and trough, and (lower) nearshore zone seaward of bar.

3.2 Comparative Sample Statistics

CSE performed limited sampling of the project beach in August 2013. Table 3.5 and Figure 3.7 show mean grain size, percent shell, and percent gravel for the subaerial beach at six stations. The August 2013 samples were consistently finer than the October 2014 samples (see Table 3.2) with means in the range 0.37 mm to 0.5 mm. Shell content was higher (~10 percent) while the gravel percentage was ~2.4 percent. This latter result confirms that shell material on the visible beach is predominantly small fragments <2 mm diameter (ie, within sand size ranges). The results in Tables 3.2 and 3.6 suggest surficial sand sizes in the Buxton project area (visible beach) fluctuate between the upper limit of medium sand (0.25–0.5 mm) and the lower limit of coarse sand (0.5–1.0 mm). Swift et al (1971) reported finer sediment in the Buxton area (Transect “11”) with berm samples testing around 0.3 mm.

A “typical” mean grain size is likely to fall between 0.4 mm and 0.6 mm, and probably vary with the season—finer during accretional periods and coarser during erosional periods. More sampling would be required to confirm this observation. Southern North Carolina beaches as well as a majority of beaches that have been nourished are dominated by finer sand (~0.25–0.3 mm typical) and are less likely to exhibit as large a difference in “native” sand sizes from season to season. Beaches of New England, where glacial moraines have yielded broad mixtures of gravel and sand, commonly exhibit wide grain-size variability (Colony 1932, Taney 1961).

TABLE 3.5. Native subaerial beach sediment sample mean grain-size, shell percentage, and gravel percentage for samples collected in August 2013. Note results are ~0.05 mm finer than samples from the subaerial beach in October 2014. The differences reflect summer accretional conditions versus fall erosional conditions.

Station	Mean Grain-Size Distribution (mm)						
	Dune Toe	Berm Middle	Beach Face	Low Tide Terrace	Averages All	% Shell (Average)	% Gravel (Average)
1790+63	0.469	0.469	0.373	0.461	0.443	5.2	1.9
1840+63	0.397	0.345	0.459	0.222	0.356	3.4	0.3
1890+63	0.613	0.352	0.464	0.540	0.492	11.8	4.4
1900+63	0.666	0.425	0.352	0.643	0.522	16.9	5.5
1940+63	0.368	0.442	0.277	0.347	0.359	14.0	0.9
1980+63	0.469	0.508	0.278	0.491	0.437	9.3	1.1
Averages	0.497	0.424	0.367	0.451	0.435	10.1	2.4

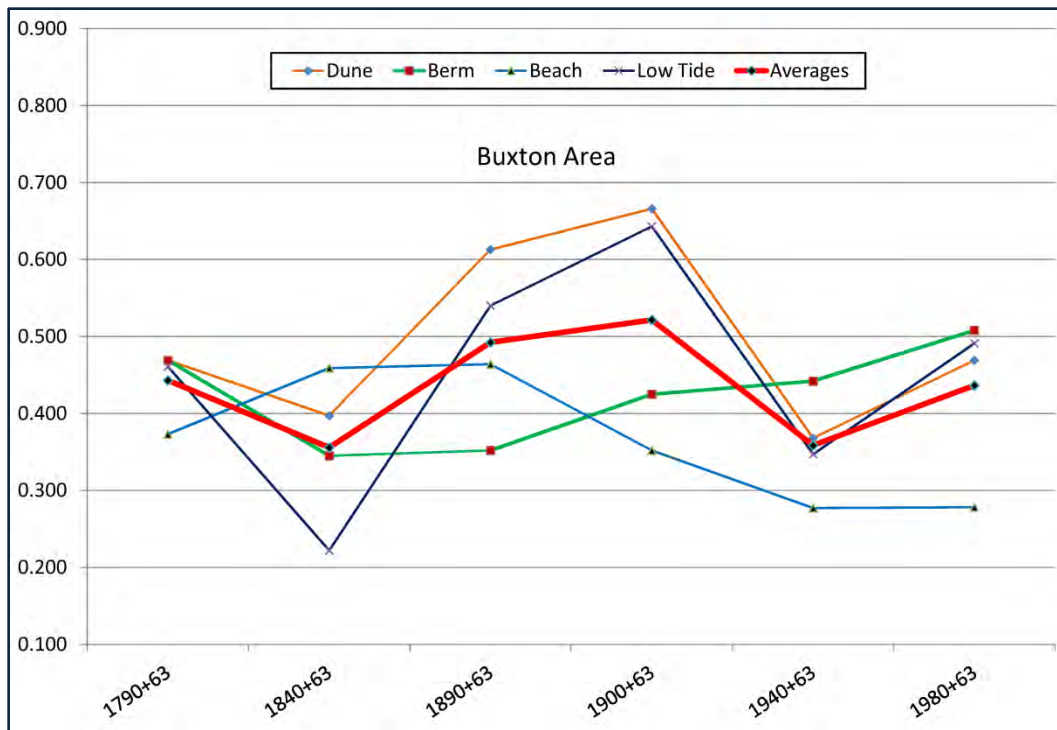


FIGURE 3.7. Sediment mean grain sizes for six transects in the Buxton area in August 2013. The overall trend (bold line) shows relative uniformity in the medium sand range (0.25–0.5 mm). Large variations are common in the low-tide zone due to differing exposures and cover of pea gravel lenses which occur along the Outer Banks. [After CSE 2013]

3.3 Selection of Native Mean Grain Size

According to North Carolina sediment standards for beach nourishment, the native sand should be determined based on an arithmetic average of means for all cross-shore sand samples. This simple calculation yields a mean and standard deviation of 0.630 mm and 0.617 mm (respectively) for the October 2014 samples (see Table 3.3). The principal problem with this result is it is biased in this case by the coarse outlier samples in the trough. Grain-size distributions are non-linear, so an average of mean grain sizes does not equal the mean grain size of the same collection of samples mixed in a bin, then tested for grain-size distribution (and resulting mean).

It can be shown that a more realistic mean for a group of samples (composite mean) can be computed using the results of each sample split. CSE combined results of all subsamples retained on each sieve to compute the total weight by each size class for a designated number of samples, the total weight of all subsamples, and the corresponding proportions of the total. Data were normalized to weight each total sample the same. This yields means and standard deviations via the method of moments, analogous to combining all physical samples into one big sample for sieving by standard lab methods.

Table 3.6 shows the results for selected groups of samples. All 140 samples (10 stations, 14 cross-shore samples each station) yielded a mean and standard deviation of 0.465 mm and 0.413 mm (respectively), considerably lower than the arithmetic mean. Excluding the trough samples, the mean drops to 0.411 mm and standard deviation increases to 0.464 mm. Other means for fewer samples are given in Table 3.6. If only the visible beach/dune samples are included, the resulting mean and standard deviation are 0.582 mm and 0.598 mm (respectively). [Note: This result would be lower for the August 2013 subaerial samples.] Under the Wentworth size classification, the composite means are in the medium sand-size range (0.25–0.5 mm) for calculations involving the majority of samples.

The subaerial samples have a composite mean in the lower coarse sand range (0.5–1.0 mm). Interestingly, the “beach” mixtures are poorly sorted when considered across the entire littoral zone, but better sorted in the visible beach zone. Few nourishment projects along the U.S. East Coast have involved such coarse sand and such wide admixtures across the profile. These ranges slightly exceed results along Nags Head (USACE 2010) and significantly exceed Bogue Banks (CSE 2001) where composite mean grain size was ~0.3–0.35 mm. Beach sediments in the southern part of North Carolina and northern part of South Carolina (the Grand Strand) are typically in the range of 0.2–0.3 mm with less cross-shore variation (eg, USACE 1993).

TABLE 3.6. “Native” mean grain size for Buxton. Results for selected groups of samples. The results in bold are considered most representative of the beach, consistent with size distributions for other Outer Banks localities (Birkemeier et al 1985, USACE 2010). [UW = underwater samples]

Buxton Beach Sediment Characteristics		Method of Moments					
		Mean	STD	Mean	STD	Skew	Kurt
		mm	mm	phi			
All Sta-Comp140	All X-Shore Samples	0.465	0.413	1.104	1.277	-0.612	3.164
All Sta-Comp130	Exclude Trough	0.411	0.464	1.284	1.108	-0.391	2.807
All Sta-Comp120	Exclude MLW & Trough	0.380	0.485	1.395	1.043	-0.344	2.672
All Sta-Comp60	Exclude All UW Samples	0.582	0.598	0.780	0.743	-0.256	3.349

Buxton Beach Sediment Characteristics		Folk Graphical Method				
		Mean	STD	ISTD	Skew	Kurt
		phi				
All Sta-Comp140	All X-Shore Samples	1.028	1.273	1.280	-0.146	0.949
All Sta-Comp130	Exclude Trough	1.190	1.118	1.093	-0.076	0.842
All Sta-Comp120	Exclude MLW & Trough	1.288	1.050	1.026	-0.084	0.826
All Sta-Comp60	Exclude All UW Samples	0.655	0.723	0.730	-0.029	1.029

Sample	Interval	USCS Description		
All Sta-Comp140	All X-Shore Samples	SP	Medium Sand	Poorly Graded
All Sta-Comp130	Exclude Trough	SP	Fine Sand	Poorly Graded
All Sta-Comp120	Exclude MLW & Trough	SP	Fine Sand	Poorly Graded
All Sta-Comp60	Exclude All UW Samples	SP	Medium Sand	Poorly Graded

Sample	Interval	Wentworth Description			
All Sta-Comp140	All X-Shore Samples	Medium Sand	Poorly Sorted	Coarse Skewed	Mesokurtic
All Sta-Comp130	Exclude Trough	Medium Sand	Poorly Sorted	Symmetrical	Mesokurtic
All Sta-Comp120	Exclude MLW & Trough	Medium Sand	Poorly Sorted	Symmetrical	Mesokurtic
All Sta-Comp60	Exclude All UW Samples	Coarse Sand	Moderately Sorted	Symmetrical	Mesokurtic

4.0 BORROW AREA INVESTIGATIONS

Two potential borrow areas for nourishment were evaluated for the Buxton project:

- 1) Offshore area "C" as delineated by CSE (2013) and illustrated in Figure 1.1.
- 2) Oregon Inlet channels and shoals.

Other potential borrow areas have been previously evaluated by CSE (2005, *Post-Isabel* Emergency Dune Restoration, unpublished report) and others (eg, Dolan & Lins 1986), and were rejected because of transportation distances and costs (eg, upland – off-island – borrow pits), insufficient quantities available (on-island borrow pits), sediments too fine (eg, Pamlico Sound deposits), or other environmental considerations [eg, NPS or USFWS protected areas within CAHA or Pea Island, such as the accreted lands of Cape Point (used for nourishment in the 1971 and 1973 projects–NPS 1980)].

Offshore Area "C" — Area C was delineated because of previous studies by Boss & Hoffman (2000) and CSE (2013). Borrow area C is strategically located ~1.7 miles offshore of Buxton (see Fig 2.6). Preliminary borings (CSE 2013) indicated the area of an offshore shoal (isolated ridge ~2 miles north of Diamond Shoals) contains beach-quality sediment similar to the sand quality of the Buxton beach. Up to 5 million cubic yards of beach-quality sand are potentially contained in the upper 8 ft of the bottom for the search area delineated. Water depths in Area C range from ~30 ft to ~45 ft and are therefore considered well outside the normal limits of the beach zone. Deeper water (~50 ft) exists between the shoal and longshore bar over 1 mile landward of the sand search area. Because the density of prior cores in Area C (~1 per 100 acres) was relatively low (2013), CSE was contracted by Dare County to collect ~30 additional borings and further evaluate the area sediment quality. In anticipation of an ~2.5 million cubic yard project for Buxton, only ~50 percent of Area C would be required.

Oregon Inlet — Oregon Inlet was considered as a potential borrow area for Buxton because of ongoing federal dredging of the channel and the possibility of piggy-backing on the federal project via Section 933, or some other funding means through the US Army Corps of Engineers. Section 933 projects, under federal regulations, allow a local sponsor to obtain dredged material for the difference in cost between what the federal government would pay for nearby disposal and what it costs to place the spoil on the local beach. Oregon Inlet is dredged on a regular basis, and material is usually disposed along Pea Island about one-half mile downcoast of the channel. Because of the comments received

during the public scoping for the Buxton project and the possibility of cost sharing with ongoing federal activities, Oregon Inlet sediments were considered as a potential sand source for Buxton, although transportation distances would be ~45 miles. CSE previously obtained sediment samples and short borings from sites in the inlet and on the Pea Island disposal area for purposes of evaluating sediment quality.

The following sections of the report summarize the results and evaluations of each potential borrow source.

4.1 Offshore Area C

CSE (2013) reviewed the borings obtained by Boss & Hoffman (2000), obtained six additional borings (Bux-01 to Bux-06) in August 2013 then completed a detailed bathymetric survey (200-ft spacing for track lines) of the shoal area off the old Cape Hatteras Lighthouse site. Figure 4.1 shows the location of the bathymetric survey area, and Figure 4.2 presents a contour map and representative cross-sections. The bathymetry confirms the ridge is oblique trending and similar to features described by others (eg, Swift et al 1973).

Ridges tend to contain coarser sediments and have lower concentrations of fines than the swales, although that is not always the case. Riggs et al (1995) discuss the importance of underlying geology on the distribution and thickness of surficial sediments. The northern Outer Banks, including the project area, tends to have a more plentiful supply of Holocene (recent) sediments, whereas southern portions of the North Carolina coast are sediment-starved.

Of the six borings obtained in August 2013, only four (Bux-01, Bux-02, and Bux-04, Bux-05) were considered to represent acceptable quality sediments for consideration as borrow material. The core logs in Attachment 2 and individual grain-size distributions in Attachment 3A show that cores Bux-03 through Bux-06 contained high proportions of dark gray, silty sand or coarse shell. For example, Bux-03 had mean grain sizes of 0.198 mm to 0.285 mm in the upper 4.3 ft of section and immediately below, a coarse shelly layer. Limited recovery at Bux-06 indicated that core consisted of an unacceptable upper layer of coarse shells and a lower layer of muddy fine sand.

The better quality sediments were found to be west of Bux-03 and approximately southwest of Bux-04 to Bux-06 along higher portions of an isolated offshore shoal. CSE obtained detailed bathymetry over the shoal (dashed box in Fig 4.1) to facilitate layout of a Phase 2 core sample grid.

Based on preliminary borings and the bathymetry, CSE delineated a search grid focusing on the higher portions of the ridge. Cores were collected on an ~1,000-ft grid within this subarea (inner box on Fig 4.2); 32 cores were attempted and 31 recovered within the Phase 2 offshore sand search area. Combined with the prior cores (CSE 2013), a total of 33 cores were available for analysis over an area roughly 2,300 ft by 8,500 ft (~450 acres). Four cores (Bux-03, Bux-04, Bux-05, Bux-06) are outside the box. The average core length was ~7.3 ft for all 37 cores recovered. Lengths ranged from 3.4 ft to 9.5 ft.

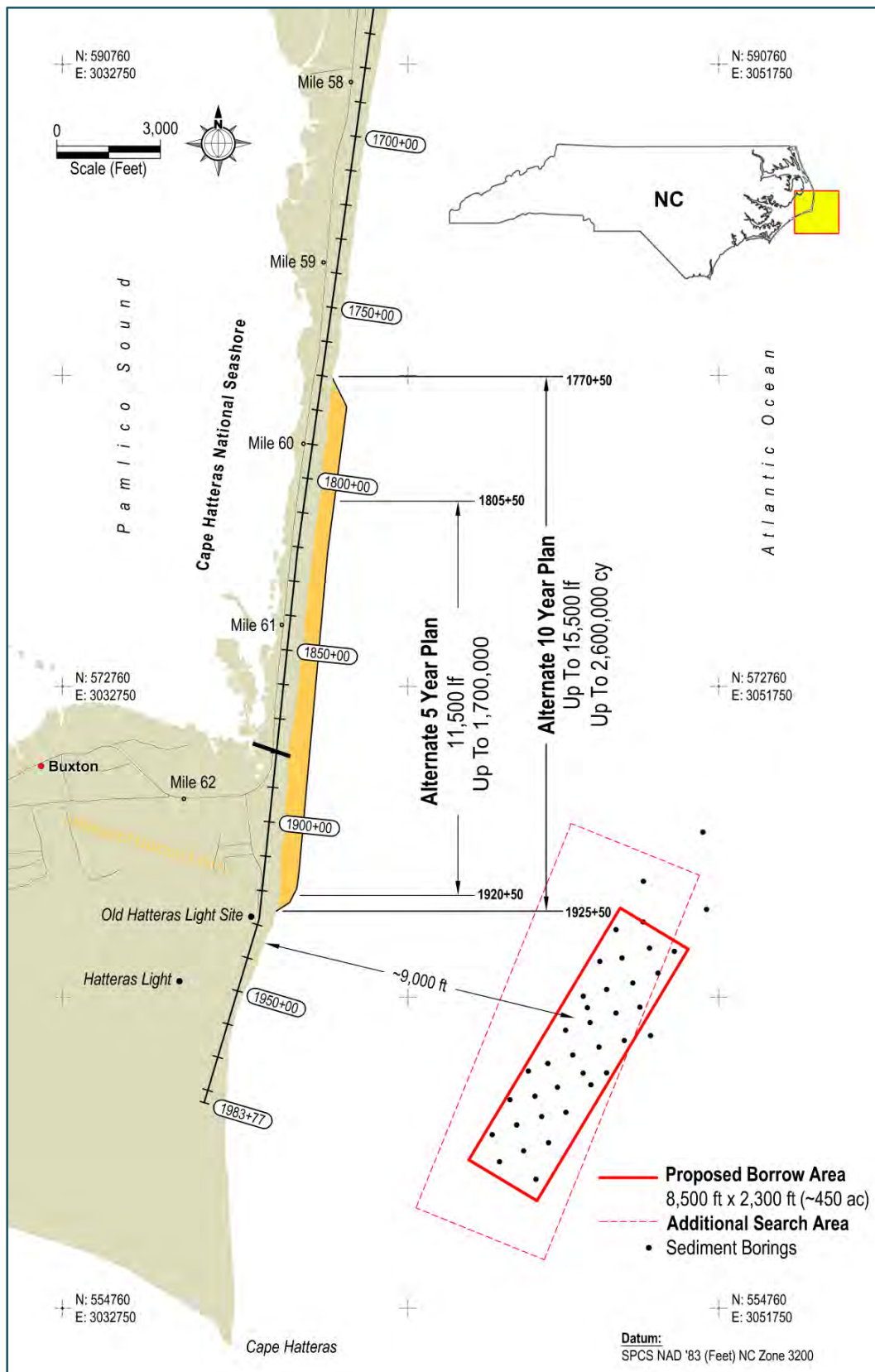


FIGURE 4.1. Location of primary offshore sand search area (solid line box) and limits of bathymetric survey (dashed line box) situated over a shoal area off Buxton and the old Cape Hatteras Lighthouse site.

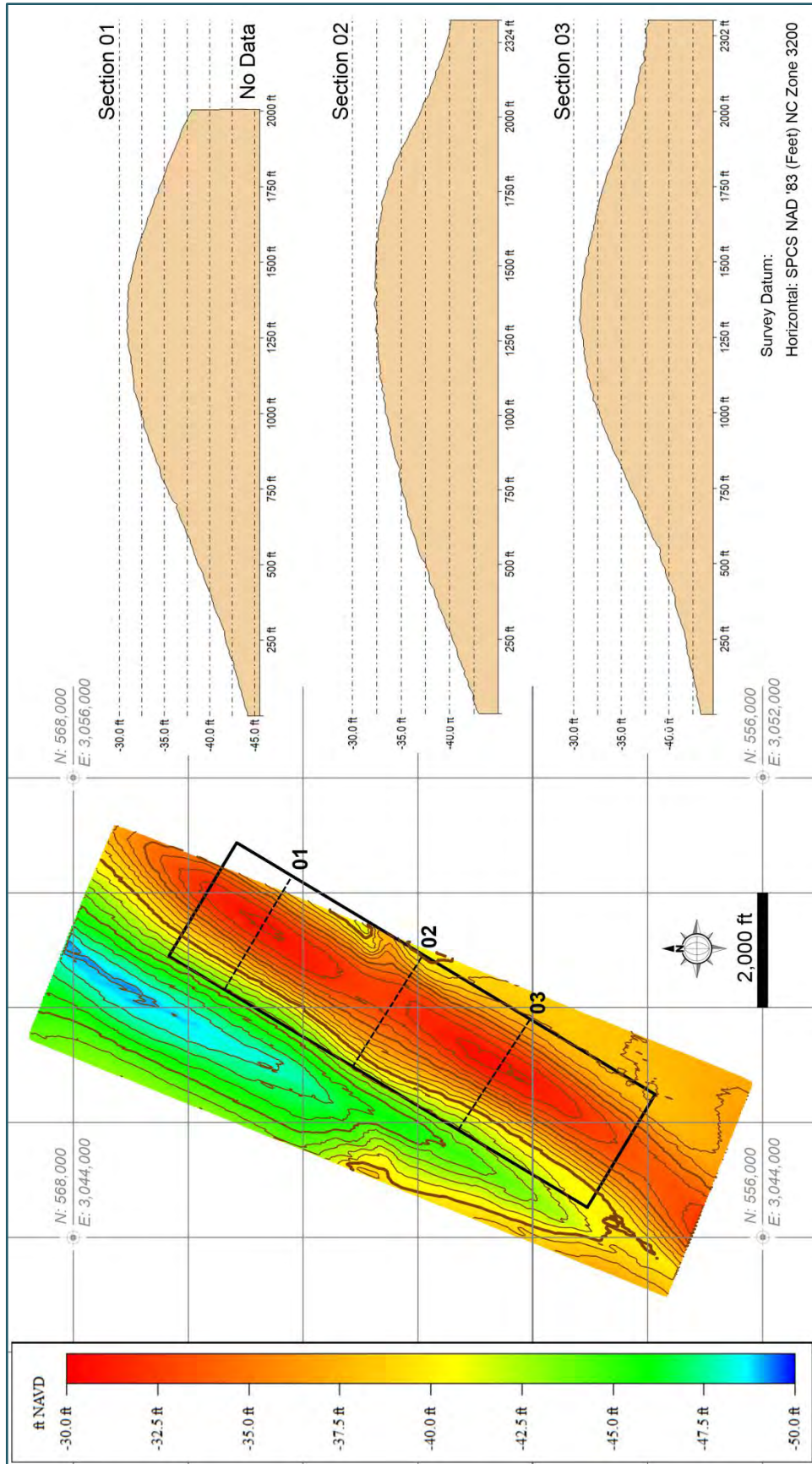


FIGURE 4.2. Bathymetry and sections through the proposed borrow area (black outline) based on field data collection by CSE in October 2014.

Figure 2.7 presented one of the cores (Bux-01) situated near the center east edge of the Phase 2 sand search area. For the most part, sediments in each core were light tan or grayish tan in color and consisted of various mixtures of medium to coarse sand with minor amounts of shell material. Munsell color numbers were interpreted for each sample. Granules and trace amounts of “pea” gravel also occurred in some cores. Core logs and photos of each core are provided in Attachment 2. Sample intervals varied according to lithology but with the intent of establishing size and quality information for the upper several feet. Recent experience indicates that shallow excavations by hopper dredge are likely to be more feasible in this setting than deep cuts by cutterhead dredge (USACE 2010).

The core logs in Attachment 2 document visual breaks in sediment type. In general, the CSE cores tend to have only trace amounts of mud. A couple of cores terminated in muddy layers, particularly sites close to the western side of Area C or in deeper water. Visually, the appearance of a majority of core sediments was similar to the beach. Cores contained similar mixtures of sand, granules, pea gravel, and shell fragments found on the beach along Buxton with only trace fines except an occasional mud lens as noted (see Attachment 2).

Table 4.1a–b lists the key descriptive statistics for each core sample along with the USCS and Wentworth description and the interpreted Munsell color. The unweighted arithmetic mean grain size for all samples is 0.45 mm (medium sand size comparable to the overall average mean grain size for the beach as discussed in Section 3.0). The unweighted arithmetic mean shell and gravel percentages for all 37 cores (135 samples) are 15.1 percent and 2.8 percent (respectively).

Shell percentages for individual samples ranged from 4.8 percent to 49 percent, while gravel (>2 mm) percentages were in the range 0.0–48.4 percent. Approximately 10 percent of the samples (14 out of 135) tested >25 percent shell, whereas 90 percent of the samples ranged between ~5 and 25 percent shell. Figure 4.3 shows the gravel (>2 mm) percentage corresponding to shell percentage in ranked order for each sample. The low gravel percentages confirm that shell material is predominantly small particles under 2 mm diameter. Core photo logs (Attachment 2) further confirm nearly all samples contained negligible concentrations of coarse (>2 mm) shell material. Of the outliers shown in Figure 4.3, two samples are from cores Bux-05 and Bux-06, both of which are outside the Phase 2 sand search grid. Grain-size distributions for each core sample are given in Attachment 3.

TABLE 4.1a. Offshore Area "C" sediment characteristics (statistical measures) for 37 cores (~135 samples obtained in August 2013 and October 2014). See Attachment 3 for detailed frequency and cumulative frequency results of each sample.

Buxton Borrow Area Sediment Characteristics		Method of Moments						Folk Graphical Method						
		Mean	STD	Mean	STD	Skew	Kurt	Mean	STD	ISTD	Skew	Kurt	Shell	Gravel
		mm	mm			phi				phi			%	%
Bux-01 S1	0.0-2.0	0.429	0.518	1.220	0.949	-1.157	3.861	1.147	0.825	0.938	-0.466	1.392	21.1	5.7
Bux-01 S2	2.0-4.0	0.402	0.546	1.315	0.872	-1.163	4.210	1.250	0.763	0.831	-0.380	1.230	19.5	3.3
Bux-01 S3	4.0-6.0	0.374	0.593	1.420	0.754	-1.111	4.922	1.345	0.670	0.701	-0.250	1.094	16.5	1.7
Bux-01 S4	6.0-7.5	0.375	0.604	1.413	0.728	-1.098	4.928	1.333	0.650	0.684	-0.247	1.136	17.4	1.3
Bux-01 S5	7.5-9.5	0.440	0.606	1.184	0.723	-0.242	3.467	1.080	0.718	0.707	-0.065	0.933	26.6	0.7
Bux-02 S1	0.0-2.6	0.588	0.626	0.767	0.676	-1.024	4.849	0.697	0.563	0.615	-0.347	1.270	28.1	3.4
Bux-02 S2	2.6-5.0	0.527	0.695	0.925	0.525	-1.069	6.929	0.845	0.430	0.460	-0.321	1.165	17.5	0.8
Bux-02 S3	5.0-6.9	0.464	0.713	1.109	0.489	-0.762	7.013	0.995	0.408	0.423	-0.289	1.067	18.2	0.3
Bux-03 S1	0.0-3.3	0.285	0.480	1.813	1.060	-1.010	3.718	1.748	0.975	1.020	-0.392	1.125	10.1	2.7
Bux-03 S2	3.3-4.3	0.198	0.504	2.336	0.990	-1.565	6.396	2.265	0.638	0.848	-0.265	2.310	15.4	2.0
Bux-03 S3	4.3-5.4	0.800	0.307	0.322	1.703	-0.632	2.673	0.120	1.913	1.818	-0.326	0.960	26.6	22.0
Bux-03 S4	5.4-6.0	0.281	0.653	1.829	0.614	-1.399	10.278	1.737	0.413	0.466	-0.128	1.290	7.9	1.0
Bux-04 S1	0.0-2.0	0.495	0.658	1.016	0.603	-0.177	9.177	0.912	0.385	0.449	-0.268	1.385	13.7	1.4
Bux-04 S2	2.0-4.0	0.424	0.641	1.236	0.642	1.243	9.000	1.047	0.325	0.517	0.100	2.283	11.7	0.5
Bux-04 S3	4.0-6.3	0.532	0.658	0.912	0.603	0.167	8.527	0.810	0.425	0.476	-0.106	1.219	17.6	1.3
Bux-04 S4	6.3-7.2	0.251	0.341	1.996	1.554	-0.379	1.685	2.125	1.545	1.435	-0.614	0.651	29.4	3.3
Bux-04 S5	7.2-7.9	0.481	0.495	1.057	1.014	1.150	4.742	0.798	0.543	0.835	0.282	2.382	22.4	1.9
Bux-05 S1	0.0-3.0	0.340	0.599	1.555	0.740	-1.566	6.744	1.502	0.548	0.637	-0.289	1.446	8.2	2.1
Bux-05 S2	3.0-4.3	0.415	0.572	1.270	0.807	-1.073	4.771	1.198	0.670	0.755	-0.252	1.346	13.9	3.0
Bux-05 S3	4.3-5.2	0.237	0.565	2.079	0.825	-1.583	6.675	2.027	0.640	0.706	-0.375	1.355	42.9	1.3
Bux-05 S4	5.2-6.3	0.192	0.558	2.382	0.843	-1.480	6.617	2.305	0.585	0.727	-0.228	1.677	14.4	0.7
Bux-06 S1	0.0-1.9	1.833	0.316	-0.874	1.661	0.512	2.733	-1.233	1.830	1.844	0.024	0.904	49.0	48.3
Bux-06 S2	1.9-3.4	0.158	0.436	2.664	1.197	-1.286	4.631	2.562	1.078	1.168	-0.339	1.911	28.3	1.6
Bux-07 S1	0 - 3.0	0.438	0.487	1.191	1.037	-2.388	8.944	1.260	0.390	0.819	-0.460	3.377	11.3	6.8
Bux-07 S2	3.0 - 6.3	0.423	0.612	1.241	0.708	-0.650	8.245	1.147	0.368	0.516	-0.204	2.112	11.4	2.8
Bux-08 S1	0 - 1.8	0.270	0.552	1.890	0.858	-1.312	5.910	1.837	0.620	0.752	-0.247	1.532	9.4	1.6
Bux-08 S2	1.8 - 4.1	0.217	0.503	2.205	0.990	-1.621	6.487	2.180	0.688	0.873	-0.295	1.563	6.9	2.9
Bux-08 S3	4.1 - 4.6	0.285	0.496	1.811	1.012	-1.037	4.141	1.735	0.915	0.974	-0.362	1.205	10.7	2.7
Bux-08 S4	4.6 - 7.6	0.216	0.613	2.208	0.706	-2.636	13.177	2.168	0.385	0.477	-0.233	1.852	4.8	1.6
Bux-09 S1	0 - 2.6	0.396	0.633	1.335	0.660	0.005	9.258	1.200	0.363	0.467	-0.060	1.661	6.7	1.4
Bux-09 S2	2.6 - 4.5	0.608	0.334	0.718	1.583	-1.456	5.934	0.722	0.853	1.368	-0.403	2.862	17.0	11.7
Bux-10 S1	0 - 2.6	0.338	0.684	1.564	0.549	-1.979	11.274	1.495	0.350	0.416	-0.191	1.372	8.2	1.0
Bux-10 S2	2.6 - 5.0	0.342	0.706	1.546	0.502	-1.222	12.132	1.458	0.318	0.372	-0.084	1.404	7.7	0.5
Bux-10 S3	5.0 - 7.2	0.361	0.694	1.470	0.527	-1.326	12.213	1.383	0.298	0.365	-0.191	1.503	7.0	0.7
Bux-11 S1	0 - 1.9	0.389	0.619	1.361	0.693	0.410	7.271	1.190	0.423	0.569	0.044	1.775	8.2	0.9
Bux-11 S2	1.9 - 3.3	0.210	0.453	2.252	1.141	-0.365	2.549	2.180	1.163	1.106	-0.192	0.774	9.7	0.7
Bux-11 S3	3.3 - 5.7	0.288	0.432	1.796	1.212	-0.206	2.697	1.705	1.195	1.193	0.195	0.883	10.8	2.7
Bux-12 S1	0 - 3.0	0.356	0.601	1.488	0.734	-1.709	7.185	1.438	0.478	0.608	-0.344	1.739	10.5	2.3
Bux-12 S2	3.0 - 4.0	0.246	0.553	2.025	0.855	-1.225	6.219	1.987	0.673	0.743	-0.038	1.177	7.0	1.7
Bux-12 S3	4.0 - 5.6	0.246	0.642	2.021	0.640	-0.373	5.896	1.920	0.558	0.573	0.189	1.053	6.2	0.2
Bux-12 S4	5.6 - 7.1	0.286	0.643	1.804	0.637	-0.908	8.450	1.703	0.470	0.524	0.086	1.323	6.9	0.8
Bux-14 S1	0 - 3.3	0.494	0.625	1.017	0.678	-1.298	4.907	0.937	0.575	0.620	-0.481	1.276	17.7	1.9
Bux-14 S2	3.3 - 4.6	0.578	0.555	0.791	0.849	-0.865	3.115	0.688	0.845	0.865	-0.472	1.103	21.1	5.6
Bux-14 S3	4.6 - 7.3	0.393	0.712	1.348	0.491	-1.387	8.584	1.255	0.358	0.403	-0.205	1.264	9.8	0.4
Bux-15 S1	0 - 3.0	0.410	0.739	1.286	0.437	-0.772	7.558	1.178	0.368	0.380	-0.222	1.106	8.0	0.1
Bux-15 S2	3.0 - 5.9	0.415	0.703	1.267	0.507	-0.481	9.271	1.155	0.388	0.404	-0.168	1.151	9.6	0.5
Bux-15 S3	5.9 - 6.4	0.267	0.541	1.904	0.885	0.674	3.072	1.767	0.873	0.855	0.460	0.892	6.0	0.1
Bux-16 S1	0 - 3.0	0.451	0.562	1.149	0.831	-1.143	4.071	1.072	0.740	0.793	-0.422	1.236	18.4	3.3
Bux-16 S2	3.0 - 6.0	0.357	0.581	1.487	0.782	-1.643	6.419	1.457	0.545	0.685	-0.316	1.705	11.3	2.8
Bux-16 S3	6.0 - 7.9	0.377	0.557	1.409	0.843	-1.303	5.132	1.340	0.685	0.783	-0.387	1.479	14.1	3.2
Bux-17 S1	0 - 2.9	0.445	0.721	1.169	0.471	0.724	12.838	1.030	0.303	0.329	-0.128	1.284	7.3	0.3
Bux-17 S2	2.9 - 3.5	0.561	0.606	0.833	0.722	0.042	6.943	0.723	0.485	0.573	-0.284	1.441	14.7	2.9
Bux-17 S3	3.5 - 4.2	0.109	0.528	3.193	0.922	-2.259	8.012	3.258	0.385	0.661	-0.408	3.052	6.0	0.4
Bux-17 S4	4.2 - 4.9	0.082	0.585	3.603	0.774	-1.799	5.766	3.583	0.428	0.624	-0.392	1.621	14.6	0.0
Bux-18 S1	0 - 3.0	0.503	0.612	0.993	0.707	-1.338	5.180	0.935	0.573	0.642	-0.382	1.276	17.1	3.4
Bux-18 S2	3.0 - 6.0	0.586	0.594	0.771	0.752	-1.157	4.305	0.700	0.635	0.743	-0.429	1.567	20.3	5.6
Bux-18 S3	6.0 - 9.3	0.494	0.628	1.017	0.670	-1.449	5.896	0.957	0.518	0.590	-0.391	1.327	21.7	2.9
Bux-19 S1	0 - 3.0	0.421	0.745	1.247	0.425	-1.151	11.750	1.147	0.308	0.329	-0.205	1.183	7.5	0.5
Bux-19 S2	3.0 - 6.0	0.415	0.755	1.269	0.405	0.514	12.516	1.153	0.283	0.308	-0.131	1.171	9.3	0.1
Bux-19 S3	6.0 - 7.6	0.433	0.713	1.207	0.489	0.573	10.982	1.067	0.338	0.355	-0.110	1.186	8.2	0.3
Bux-19 S4	7.6 - 9.3	0.534	0.655	0.904	0.611	0.618	10.928	0.792	0.388	0.444	-0.269	1.288	15.5	1.1
Bux-20 S1	0 - 2.5	0.452	0.677	1.144	0.564	-1.447	7.095	1.067	0.435	0.491	-0.208	1.370	11.9	1.1
Bux-20 S2	2.5 - 3.6	0.477	0.568	1.067	0.816	-1.045	4.206	0.987	0.693	0.765	-0.379	1.273	19.4	3.7
Bux-20 S3	3.6-4.8	0.408	0.591	1.295	0.758	-1.542	6.065	1.250	0.535	0.677	-0.317	1.774	20.1	3.2
Bux-20 S4	4.8 - 6.4	0.476	0.541	1.072	0.886	-1.052	3.717	0.993	0.788	0.870	-0.474	1.262	20.8	4.7
Bux-20 S5	6.4 - 7.3	0.389	0.551	1.363	0.859	-1.542	5.232	1.325	0.658	0.792	-0.454	1.605	15.4	4.2
Bux-20 S6	7.3 - 9.4	0.349	0.683	1.519	0.550	-1.235	6.965	1.423	0.465	0.484	-0.227	1.106	9.7	0.4
Bux-21 S1	0													

TABLE 4.1a (cont). Offshore Area “C” sediment characteristics (statistical measures) for 37 cores (~135 samples obtained in August 2013 and October 2014). See Attachment 3 for detailed frequency and cumulative frequency results of each sample.

Buxton Borrow Area Sediment Characteristics		Method of Moments						Folk Graphical Method					Shell %	Gravel %
		Mean	STD	Mean	STD	Skew	Kurt	Mean	STD	ISTD	Skew	Kurt		
		mm	mm	phi				phi						
Bux-24 S1	0 - 1.4	0.526	0.697	0.926	0.521	-1.397	6.294	0.848	0.430	0.467	-0.339	1.248	18.8	1.0
Bux-24 S2	1.4 - 2.3	0.438	0.744	1.192	0.427	-1.007	10.273	1.078	0.318	0.342	-0.066	1.255	22.2	0.4
Bux-24 S3	2.3 - 3.9	0.566	0.627	0.821	0.674	-1.274	4.729	0.762	0.553	0.623	-0.417	1.370	26.9	3.2
Bux-24 S4	3.9 - 5.6	0.467	0.604	1.099	0.727	-1.409	5.896	1.038	0.545	0.657	-0.344	1.589	25.3	3.7
Bux-24 S5	5.6 - 7.0	0.475	0.627	1.075	0.673	-0.996	4.777	0.998	0.588	0.625	-0.211	1.106	16.7	1.6
Bux-25 S1	0 - 2.0	0.627	0.685	0.673	0.546	-1.358	5.711	0.605	0.435	0.488	-0.292	1.318	18.5	2.3
Bux-25 S2	2.0 - 4.4	0.876	0.446	0.191	1.165	-1.484	5.364	0.197	0.928	1.125	-0.421	1.437	40.0	12.1
Bux-25 S3	4.4 - 5.6	0.523	0.722	0.936	0.469	-1.029	6.604	0.845	0.408	0.421	-0.299	1.069	17.0	0.5
Bux-25 S4	5.6 - 7.0	0.538	0.654	0.895	0.614	-1.011	5.333	0.818	0.525	0.563	-0.333	1.162	18.3	1.6
Bux-26 S1	0 - 3.0	0.301	0.660	1.733	0.600	-0.887	5.565	1.633	0.540	0.557	-0.082	1.064	5.6	0.3
Bux-26 S2	3.0 - 5.0	0.302	0.633	1.728	0.659	-0.942	5.937	1.627	0.563	0.599	-0.084	1.148	8.1	0.6
Bux-26 S3	5.0 - 6.8	0.425	0.512	1.236	0.967	-1.122	3.825	1.183	0.843	0.964	-0.435	1.505	17.3	5.8
Bux-26 S4	6.8 - 8.2	0.345	0.584	1.535	0.776	-1.541	6.605	1.498	0.568	0.673	-0.238	1.423	12.5	2.7
Bux-27 S1	0 - 3.0	0.512	0.706	0.967	0.503	-1.196	7.565	0.878	0.405	0.440	-0.271	1.262	13.6	0.9
Bux-27 S2	3.0 - 6.0	0.540	0.673	0.890	0.572	-0.618	9.126	0.798	0.373	0.432	-0.283	1.289	16.7	2.0
Bux-27 S3	6.0 - 7.4	0.412	0.636	1.279	0.654	1.472	7.696	1.058	0.338	0.520	0.240	2.402	9.5	0.2
Bux-28 S1	0 - 3.0	0.455	0.696	1.137	0.522	-1.448	7.508	1.048	0.423	0.448	-0.213	1.266	11.9	0.8
Bux-28 S2	3.0 - 6.0	0.579	0.606	0.788	0.722	-0.983	4.033	0.710	0.628	0.692	-0.331	1.363	22.7	3.8
Bux-28 S3	6.0 - 8.5	0.448	0.590	1.159	0.760	-1.358	5.363	1.103	0.598	0.711	-0.283	1.438	18.0	3.7
Bux-29 S1	0 - 3.0	0.600	0.630	0.737	0.666	-1.124	4.817	0.652	0.533	0.600	-0.445	1.356	23.8	3.5
Bux-29 S2	3.0 - 6.0	0.470	0.746	1.089	0.423	-1.735	13.179	0.993	0.305	0.335	-0.130	1.543	12.6	0.9
Bux-29 S3	6.0 - 9.0	0.499	0.708	1.003	0.498	-0.932	8.381	0.903	0.413	0.431	-0.262	1.148	16.0	0.8
Bux-30 S1	0 - 3.0	0.413	0.594	1.276	0.750	-1.163	5.023	1.205	0.620	0.699	-0.259	1.430	11.0	2.1
Bux-30 S2	3.0 - 5.0	0.397	0.661	1.332	0.597	-0.945	5.830	1.240	0.508	0.539	-0.095	1.198	10.5	0.6
Bux-30 S3	5.0 - 5.9	0.904	0.326	0.146	1.617	-0.821	2.466	-0.128	1.990	1.793	-0.585	0.889	31.9	24.5
Bux-30 S4	5.9 - 9.2	0.338	0.645	1.566	0.632	-2.045	9.926	1.502	0.415	0.476	-0.233	1.382	6.7	1.7
Bux-31 S1	0 - 2.5	0.624	0.698	0.681	0.520	-0.680	7.572	0.593	0.395	0.439	-0.228	1.362	18.1	1.4
Bux-31 S2	2.5 - 4.7	0.552	0.722	0.857	0.469	-0.726	8.077	0.757	0.345	0.388	-0.211	1.180	14.0	0.6
Bux-31 S3	4.7 - 6.3	0.561	0.662	0.834	0.595	0.300	9.207	0.720	0.385	0.441	-0.199	1.256	16.7	1.4
Bux-32 S1	0 - 1.8	0.414	0.700	1.272	0.515	-1.695	9.371	1.198	0.358	0.405	-0.188	1.238	10.4	0.8
Bux-32 S2	1.8 - 3.8	0.620	0.605	0.690	0.724	-0.760	4.235	0.583	0.663	0.704	-0.354	1.230	26.4	3.9
Bux-32 S3	3.8 - 4.8	0.409	0.656	1.288	0.608	-1.371	6.242	1.188	0.505	0.538	-0.353	1.236	12.8	0.9
Bux-32 S4	4.8 - 6.3	0.447	0.572	1.161	0.807	-1.364	4.784	1.095	0.635	0.750	-0.428	1.560	17.4	3.9
Bux-33 S1	0 - 3.0	0.546	0.635	0.873	0.655	-1.271	5.336	0.812	0.518	0.597	-0.365	1.409	20.1	2.9
Bux-33 S2	3.0 - 5.2	0.582	0.634	0.780	0.658	-1.290	5.175	0.717	0.508	0.590	-0.432	1.411	19.4	3.6
Bux-34 S1	0 - 2.4	0.351	0.682	1.509	0.552	-1.118	8.025	1.415	0.445	0.476	-0.101	1.194	7.8	0.7
Bux-34 S2	2.4 - 3.7	0.489	0.587	1.033	0.768	-1.305	5.025	0.992	0.575	0.715	-0.335	1.541	14.2	4.4
Bux-34 S3	3.7 - 4.9	0.499	0.693	1.002	0.529	-0.863	7.463	0.907	0.438	0.460	-0.176	1.133	15.4	1.0
Bux-34 S4	4.9 - 6.3	0.502	0.567	0.995	0.818	-0.302	4.153	0.902	0.675	0.768	-0.113	1.353	17.1	2.8
Bux-34 S5	6.3 - 7.6	0.333	0.580	1.585	0.787	-1.315	5.831	1.530	0.618	0.678	-0.229	1.163	11.2	2.2
Bux-35 S1	0 - 1.3	0.820	0.500	0.287	1.001	-1.695	5.901	0.243	0.793	0.945	-0.559	1.595	30.2	11.0
Bux-35 S2	1.3 - 3.0	0.524	0.736	0.931	0.442	-0.575	11.079	0.820	0.323	0.342	-0.286	1.108	13.5	0.6
Bux-35 S3	3.0 - 6.0	0.488	0.742	1.035	0.431	-0.156	14.768	0.913	0.280	0.307	-0.252	1.326	10.4	0.5
Bux-35 S4	6.0 - 8.0	0.413	0.686	1.275	0.544	1.432	11.827	1.123	0.355	0.377	-0.018	1.211	8.0	0.2
Bux-36 S1	0 - 1.8	0.656	0.498	0.609	1.006	-1.446	4.838	0.553	0.888	0.964	-0.523	1.341	26.9	8.6
Bux-36 S2	1.8 - 3.7	0.527	0.609	0.925	0.716	-1.256	4.732	0.860	0.593	0.660	-0.404	1.294	19.4	3.5
Bux-36 S3	3.7 - 4.7	0.363	0.695	1.461	0.524	-1.714	10.165	1.378	0.378	0.422	-0.252	1.372	8.3	0.8
Bux-36 S4	4.7 - 7.6	0.453	0.651	1.141	0.620	-1.586	6.763	1.063	0.485	0.548	-0.252	1.412	15.6	1.9
Bux-36 S5	7.6 - 9.4	0.409	0.683	1.290	0.551	-1.906	9.188	1.230	0.368	0.428	-0.207	1.214	11.5	1.3
Bux-37 S1	0 - 3.0	0.580	0.657	0.786	0.605	-1.288	6.000	0.708	0.450	0.528	-0.362	1.355	22.1	2.9
Bux-37 S2	3.0 - 5.0	0.440	0.726	1.185	0.461	-1.149	7.526	1.082	0.415	0.412	-0.058	1.074	16.6	0.4
Bux-37 S3	5.0 - 7.8	0.397	0.747	1.334	0.421	-0.461	8.298	1.230	0.345	0.367	-0.068	1.003	9.2	0.1
Bux-38 S1	0 - 1.6	0.307	0.677	1.702	0.562	-0.990	7.158	1.597	0.478	0.501	-0.097	1.125	6.4	0.3
Bux-38 S2	1.6 - 3.3	0.450	0.616	1.153	0.700	-1.340	6.162	1.075	0.515	0.614	-0.229	1.485	12.7	2.9
Bux-38 S3	3.3 - 5.5	0.485	0.690	1.043	0.536	-0.988	6.577	0.947	0.453	0.476	-0.188	1.146	11.5	0.8
Bux-38 S4	5.5 - 6.8	0.339	0.564	1.559	0.827	-1.084	4.416	1.475	0.750	0.782	-0.307	1.106	14.7	1.5

TABLE 4.1b. Offshore Area “C” sediment characteristics (descriptive) for 37 cores (~135 samples obtained in August 2013 and October 2014). See Attachment 3 for detailed frequency and cumulative frequency results of each sample.

Sample	Interval	Munsell Color	USCS Description			Wentworth Description			
Bux-01 S1	0.0-2.0	5Y6/4	SP	Medium Sand	Poorly Graded	Medium Sand	Moderately Sorted	Coarse Skewed	Leptokurtic
Bux-01 S2	2.0-4.0	5Y6/4	SP	Fine Sand	Poorly Graded	Medium Sand	Moderately Sorted	Coarse Skewed	Leptokurtic
Bux-01 S3	4.0-6.0	5Y6/4	SP	Fine Sand	Poorly Graded	Medium Sand	Moderately Sorted	Coarse Skewed	Leptokurtic
Bux-01 S4	6.0-7.5	5Y6/4	SP	Fine Sand	Poorly Graded	Medium Sand	Moderately Sorted	Coarse Skewed	Leptokurtic
Bux-01 S5	7.5-9.5	5Y6/4	SP	Medium Sand	Poorly Graded	Medium Sand	Moderately Sorted	Symmetrical Skewed	Mesokurtic
Bux-02 S1	0.0-2.6	5Y6/4	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Well Sorted	Coarse Skewed	Leptokurtic
Bux-02 S2	2.6-5.0	5Y6/4	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Well Sorted	Coarse Skewed	Leptokurtic
Bux-02 S3	5.0-6.9	5Y6/4	SP	Medium Sand	Poorly Graded	Medium Sand	Well Sorted	Coarse Skewed	Leptokurtic
Bux-03 S1	0.0-3.3	5Y4/2	SP	Fine Sand	Poorly Graded	Medium Sand	Poorly Sorted	Coarse Skewed	Leptokurtic
Bux-03 S2	3.3-4.3	5Y4/2	SP	Fine Sand	Poorly Graded	Fine Sand	Moderately Sorted	Strongly Coarse Skewed	Leptokurtic
Bux-03 S3	4.3-5.4	5Y4/2	SP	Medium Sand	Poorly Graded	Coarse Sand	Poorly Sorted	Coarse Skewed	Mesokurtic
Bux-03 S4	5.4-6.0	5Y3/2	SP	Fine Sand	Poorly Graded	Medium Sand	Moderately Well Sorted	Strongly Coarse Skewed	Very Leptokurtic
Bux-04 S1	0.0-2.0	5Y5/2	SP	Medium Sand	Poorly Graded	Medium Sand	Moderately Well Sorted	Symmetrical Skewed	Very Leptokurtic
Bux-04 S2	2.0-4.0	5Y5/2	SP	Medium Sand	Poorly Graded	Medium Sand	Moderately Well Sorted	Fine Skewed	Very Leptokurtic
Bux-04 S3	4.0-6.3	5Y5/2	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Well Sorted	Symmetrical Skewed	Very Leptokurtic
Bux-04 S4	6.3-7.2	5Y4/2	SP	Fine Sand	Poorly Graded	Medium Sand	Poorly Sorted	Symmetrical Skewed	Very Platykurtic
Bux-04 S5	7.2-7.9	5Y4/2	SP	Medium Sand	Poorly Graded	Medium Sand	Poorly Sorted	Fine Skewed	Leptokurtic
Bux-05 S1	0.0-3.0	5Y6/4	SP	Fine Sand	Poorly Graded	Medium Sand	Moderately Sorted	Strongly Coarse Skewed	Leptokurtic
Bux-05 S2	3.0-4.3	5Y6/4	SP	Fine Sand	Poorly Graded	Medium Sand	Moderately Sorted	Coarse Skewed	Leptokurtic
Bux-05 S3	4.3-5.2	5Y6/2	SP	Fine Sand	Poorly Graded	Fine Sand	Moderately Sorted	Strongly Coarse Skewed	Leptokurtic
Bux-05 S4	5.2-6.3	5Y4/2	SP	Fine Sand	Poorly Graded	Fine Sand	Moderately Sorted	Strongly Coarse Skewed	Leptokurtic
Bux-06 S1	0.0-1.9	5Y5/2	SP	Medium Sand	Poorly Graded	VCoarse Sand	Poorly Sorted	Fine Skewed	Mesokurtic
Bux-06 S2	1.9-3.4	5Y3/2	SM	Fine Sand	Poorly Graded	Fine Sand	Poorly Sorted	Coarse Skewed	Leptokurtic
Bux-07 S1	0 - 3.0	5Y6/4	SP	Medium Sand	Poorly Graded	Medium Sand	Poorly Sorted	Strongly Coarse Skewed	Very Leptokurtic
Bux-07 S2	3.0 - 6.3	5Y6/4	SP	Medium Sand	Poorly Graded	Medium Sand	Moderately Sorted	Coarse Skewed	Very Leptokurtic
Bux-08 S1	0 - 1.8	5Y5/2	SP	Fine Sand	Poorly Graded	Medium Sand	Moderately Sorted	Strongly Coarse Skewed	Leptokurtic
Bux-08 S2	1.8 - 4.1	5Y4/2	SP	Fine Sand	Poorly Graded	Fine Sand	Moderately Sorted	Strongly Coarse Skewed	Leptokurtic
Bux-08 S3	4.1 - 4.6	5Y6/4	SP	Fine Sand	Poorly Graded	Medium Sand	Poorly Sorted	Coarse Skewed	Leptokurtic
Bux-08 S4	4.6 - 7.6	5Y6/2	SP	Fine Sand	Poorly Graded	Fine Sand	Moderately Sorted	Strongly Coarse Skewed	Very Leptokurtic
Bux-09 S1	0 - 2.6	5Y6/4	SP	Fine Sand	Poorly Graded	Medium Sand	Moderately Well Sorted	Symmetrical	Very Leptokurtic
Bux-09 S2	2.6 - 4.5	5Y6/4	SP	Medium Sand	Poorly Graded	Coarse Sand	Poorly Sorted	Strongly Coarse Skewed	Leptokurtic
Bux-10 S1	0 - 2.6	5Y6/4	SP	Fine Sand	Poorly Graded	Medium Sand	Moderately Well Sorted	Strongly Coarse Skewed	Very Leptokurtic
Bux-10 S2	2.6 - 5.0	5Y6/4	SP	Fine Sand	Poorly Graded	Medium Sand	Moderately Well Sorted	Coarse Skewed	Very Leptokurtic
Bux-10 S3	5.0 - 7.2	5Y6/4	SP	Fine Sand	Poorly Graded	Medium Sand	Moderately Well Sorted	Strongly Coarse Skewed	Very Leptokurtic
Bux-11 S1	0 - 1.9	5Y5/2	SP	Fine Sand	Poorly Graded	Medium Sand	Moderately Well Sorted	Symmetrical	Leptokurtic
Bux-11 S2	1.9 - 3.3	5Y4/2	SP	Fine Sand	Poorly Graded	Fine Sand	Poorly Sorted	Symmetrical	Platykurtic
Bux-11 S3	3.3 - 5.7	5Y6/2	SP	Fine Sand	Poorly Graded	Medium Sand	Poorly Sorted	Symmetrical	Mesokurtic
Bux-12 S1	0 - 3.0	5Y6/4	SP	Fine Sand	Poorly Graded	Medium Sand	Moderately Sorted	Strongly Coarse Skewed	Leptokurtic
Bux-12 S2	3.0 - 4.0	5Y6/2	SP	Fine Sand	Poorly Graded	Fine Sand	Moderately Sorted	Coarse Skewed	Leptokurtic
Bux-12 S3	4.0 - 5.6	5Y6/2	SP	Fine Sand	Poorly Graded	Fine Sand	Moderately Well Sorted	Symmetrical	Leptokurtic
Bux-12 S4	5.6 - 7.1	5Y6/2	SP	Fine Sand	Poorly Graded	Medium Sand	Moderately Well Sorted	Coarse Skewed	Very Leptokurtic
Bux-14 S1	0 - 3.3	5Y6/4	SP	Medium Sand	Poorly Graded	Medium Sand	Moderately Well Sorted	Coarse Skewed	Leptokurtic
Bux-14 S2	3.3 - 4.6	5Y6/4	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Sorted	Coarse Skewed	Mesokurtic
Bux-14 S3	4.6 - 7.3	5Y6/4	SP	Fine Sand	Poorly Graded	Medium Sand	Well Sorted	Strongly Coarse Skewed	Very Leptokurtic
Bux-15 S1	0 - 3.0	5Y6/4	SP	Fine Sand	Poorly Graded	Medium Sand	Well Sorted	Coarse Skewed	Very Leptokurtic
Bux-15 S2	3.0 - 5.9	5Y6/4	SP	Fine Sand	Poorly Graded	Medium Sand	Moderately Well Sorted	Coarse Skewed	Very Leptokurtic
Bux-15 S3	5.9 - 6.4	5Y5/2	SP	Fine Sand	Poorly Graded	Medium Sand	Moderately Sorted	Fine Skewed	Mesokurtic
Bux-16 S1	0 - 3.0	5Y6/4	SP	Medium Sand	Poorly Graded	Medium Sand	Moderately Sorted	Coarse Skewed	Leptokurtic
Bux-16 S2	3.0 - 6.0	5Y6/4	SP	Fine Sand	Poorly Graded	Medium Sand	Moderately Sorted	Strongly Coarse Skewed	Leptokurtic
Bux-16 S3	6.0 - 7.9	5Y6/4	SP	Fine Sand	Poorly Graded	Medium Sand	Moderately Sorted	Strongly Coarse Skewed	Leptokurtic
Bux-17 S1	0 - 2.9	5Y6/2	SP	Medium Sand	Poorly Graded	Medium Sand	Well Sorted	Fine Skewed	Very Leptokurtic
Bux-17 S2	2.9 - 3.5	5Y3/2	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Sorted	Symmetrical	Leptokurtic
Bux-17 S3	3.5 - 4.2	5Y3/2	SP-SM	Fine Sand	Poorly Graded	Very Fine Sand	Moderately Sorted	Strongly Coarse Skewed	Very Leptokurtic
Bux-17 S4	4.2 - 4.9	10Y1/2	SM	Fine Sand	Poorly Graded	Very Fine Sand	Moderately Sorted	Strongly Coarse Skewed	Leptokurtic
Bux-18 S1	0 - 3.0	5Y6/4	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Sorted	Strongly Coarse Skewed	Leptokurtic
Bux-18 S2	3.0 - 6.0	5Y6/4	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Sorted	Coarse Skewed	Leptokurtic
Bux-18 S3	6.0 - 9.3	5Y6/4	SP	Medium Sand	Poorly Graded	Medium Sand	Moderately Well Sorted	Strongly Coarse Skewed	Leptokurtic
Bux-19 S1	0 - 3.0	5Y6/4	SP	Medium Sand	Poorly Graded	Medium Sand	Well Sorted	Coarse Skewed	Very Leptokurtic
Bux-19 S2	3.0 - 6.0	5Y6/4	SP	Fine Sand	Poorly Graded	Medium Sand	Well Sorted	Fine Skewed	Very Leptokurtic
Bux-19 S3	6.0 - 7.6	5Y5/2	SP	Medium Sand	Poorly Graded	Medium Sand	Well Sorted	Fine Skewed	Very Leptokurtic
Bux-19 S4	7.6 - 9.3	5Y5/2	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Well Sorted	Fine Skewed	Very Leptokurtic
Bux-20 S1	0 - 2.5	5Y6/4	SP	Medium Sand	Poorly Graded	Medium Sand	Moderately Well Sorted	Strongly Coarse Skewed	Leptokurtic
Bux-20 S2	2.5 - 3.6	5Y6/4	SP	Medium Sand	Poorly Graded	Medium Sand	Moderately Sorted	Coarse Skewed	Leptokurtic
Bux-20 S3	3.6-4.8	5Y6/4	SP	Fine Sand	Poorly Graded	Medium Sand	Moderately Sorted	Strongly Coarse Skewed	Leptokurtic
Bux-20 S4	4.8 - 6.4	5Y6/4	SP	Medium Sand	Poorly Graded	Medium Sand	Moderately Sorted	Coarse Skewed	Leptokurtic
Bux-20 S5	6.4 - 7.3	5Y6/4	SP	Fine Sand	Poorly Graded	Medium Sand	Moderately Sorted	Strongly Coarse Skewed	Leptokurtic
Bux-20 S6	7.3 - 9.4	5Y6/4	SP	Fine Sand	Poorly Graded	Medium Sand	Moderately Well Sorted	Coarse Skewed	Leptokurtic

TABLE 4.1b (cont). Offshore Area “C” sediment characteristics (descriptive) for 37 cores (~135 samples obtained in August 2013 and October 2014). See Attachment 3 for detailed frequency and cumulative frequency results of each sample.

Sample	Interval	Munsell Color	USCS Description			Wentworth Description			
Bux-21 S1	0 - 3.2	5Y6/4	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Well Sorted	Coarse Skewed	Leptokurtic
Bux-21 S2	3.2 - 4.9	5Y6/4	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Well Sorted	Coarse Skewed	Leptokurtic
Bux-21 S3	4.9 - 6.9	5Y6/4	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Well Sorted	Coarse Skewed	Leptokurtic
Bux-22 S1	0 - 2.2	5Y5/2	SP	Fine Sand	Poorly Graded	Medium Sand	Poorly Sorted	Coarse Skewed	Mesokurtic
Bux-22 S2	2.2 - 5.4	5Y5/2	SP	Fine Sand	Poorly Graded	Medium Sand	Moderately Sorted	Strongly Coarse Skewed	Very Leptokurtic
Bux-22 S3	5.4 - 6.9	5Y5/2	SP	Fine Sand	Poorly Graded	Medium Sand	Moderately Well Sorted	Coarse Skewed	Leptokurtic
Bux-22 S4	6.9 - 7.9	5Y5/2	SP	Fine Sand	Poorly Graded	Medium Sand	Moderately Well Sorted	Coarse Skewed	Very Leptokurtic
Bux-23 S1	0 - 2.2	5Y6/4	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Well Sorted	Coarse Skewed	Leptokurtic
Bux-23 S2	2.2 - 3.4	5Y6/4	SP	Medium Sand	Poorly Graded	Medium Sand	Well Sorted	Coarse Skewed	Very Leptokurtic
Bux-23 S3	3.4 - 5.2	5Y6/4	SP	Medium Sand	Poorly Graded	Coarse Sand	Well Sorted	Coarse Skewed	Very Leptokurtic
Bux-23 S4	5.2 - 6.5	5Y6/4	SP	Medium Sand	Poorly Graded	Medium Sand	Well Sorted	Symmetrical	Very Leptokurtic
Bux-23 S5	6.5 - 8.2	5Y5/2	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Sorted	Strongly Fine Skewed	Very Leptokurtic
Bux-24 S1	0 - 1.4	5Y6/2	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Well Sorted	Strongly Coarse Skewed	Leptokurtic
Bux-24 S2	1.4 - 2.3	5Y6/4	SP	Medium Sand	Poorly Graded	Medium Sand	Well Sorted	Coarse Skewed	Very Leptokurtic
Bux-24 S3	2.3 - 3.9	5Y6/4	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Well Sorted	Coarse Skewed	Leptokurtic
Bux-24 S4	3.9 - 5.6	5Y6/4	SP	Medium Sand	Poorly Graded	Medium Sand	Moderately Sorted	Strongly Coarse Skewed	Leptokurtic
Bux-24 S5	5.6 - 7.0	5Y6/2	SP	Medium Sand	Poorly Graded	Medium Sand	Moderately Well Sorted	Coarse Skewed	Leptokurtic
Bux-25 S1	0 - 2.0	5Y6/4	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Well Sorted	Strongly Coarse Skewed	Leptokurtic
Bux-25 S2	2.0 - 4.4	5Y6/4	SP	Medium Sand	Poorly Graded	Coarse Sand	Poorly Sorted	Strongly Coarse Skewed	Leptokurtic
Bux-25 S3	4.4 - 5.6	5Y6/4	SP	Medium Sand	Poorly Graded	Coarse Sand	Well Sorted	Coarse Skewed	Leptokurtic
Bux-25 S4	5.6 - 7.0	5Y6/4	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Well Sorted	Coarse Skewed	Leptokurtic
Bux-26 S1	0 - 3.0	5Y6/2	SP	Fine Sand	Poorly Graded	Medium Sand	Moderately Well Sorted	Coarse Skewed	Leptokurtic
Bux-26 S2	3.0 - 5.0	5Y6/2	SP	Fine Sand	Poorly Graded	Medium Sand	Moderately Well Sorted	Coarse Skewed	Leptokurtic
Bux-26 S3	5.0 - 6.8	5Y6/2	SP	Medium Sand	Poorly Graded	Medium Sand	Moderately Sorted	Coarse Skewed	Leptokurtic
Bux-26 S4	6.8 - 8.2	5Y5/2	SP	Fine Sand	Poorly Graded	Medium Sand	Moderately Sorted	Strongly Coarse Skewed	Leptokurtic
Bux-27 S1	0 - 3.0	5Y6/4	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Well Sorted	Coarse Skewed	Very Leptokurtic
Bux-27 S2	3.0 - 6.0	5Y6/4	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Well Sorted	Coarse Skewed	Very Leptokurtic
Bux-27 S3	6.0 - 7.4	5Y5/2	SP	Fine Sand	Poorly Graded	Medium Sand	Moderately Well Sorted	Strongly Fine Skewed	Very Leptokurtic
Bux-28 S1	0 - 3.0	5Y6/4	SP	Medium Sand	Poorly Graded	Medium Sand	Moderately Well Sorted	Strongly Coarse Skewed	Very Leptokurtic
Bux-28 S2	3.0 - 6.0	5Y6/4	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Sorted	Coarse Skewed	Leptokurtic
Bux-28 S3	6.0 - 8.5	5Y6/4	SP	Medium Sand	Poorly Graded	Medium Sand	Moderately Sorted	Strongly Coarse Skewed	Leptokurtic
Bux-29 S1	0 - 3.0	5Y6/4	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Well Sorted	Coarse Skewed	Leptokurtic
Bux-29 S2	3.0 - 6.0	5Y6/4	SP	Medium Sand	Poorly Graded	Medium Sand	Well Sorted	Strongly Coarse Skewed	Very Leptokurtic
Bux-29 S3	6.0 - 9.0	5Y6/4	SP	Medium Sand	Poorly Graded	Medium Sand	Well Sorted	Coarse Skewed	Very Leptokurtic
Bux-30 S1	0 - 3.0	5Y6/4	SP	Fine Sand	Poorly Graded	Medium Sand	Moderately Sorted	Coarse Skewed	Leptokurtic
Bux-30 S2	3.0 - 5.0	5Y6/4	SP	Fine Sand	Poorly Graded	Medium Sand	Moderately Well Sorted	Coarse Skewed	Leptokurtic
Bux-30 S3	5.0 - 5.9	5Y6/4	SP	Medium Sand	Poorly Graded	Coarse Sand	Poorly Sorted	Coarse Skewed	Platykurtic
Bux-30 S4	5.9 - 9.2	5Y6/4	SP	Fine Sand	Poorly Graded	Medium Sand	Moderately Well Sorted	Strongly Coarse Skewed	Very Leptokurtic
Bux-31 S1	0 - 2.5	5Y6/4	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Well Sorted	Coarse Skewed	Very Leptokurtic
Bux-31 S2	2.5 - 4.7	5Y6/4	SP	Medium Sand	Poorly Graded	Coarse Sand	Well Sorted	Coarse Skewed	Very Leptokurtic
Bux-31 S3	4.7 - 6.3	5Y6/4	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Well Sorted	Symmetrical	Very Leptokurtic
Bux-32 S1	0 - 1.8	5Y6/4	SP	Fine Sand	Poorly Graded	Medium Sand	Moderately Well Sorted	Strongly Coarse Skewed	Very Leptokurtic
Bux-32 S2	1.8 - 3.8	5Y6/4	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Sorted	Coarse Skewed	Leptokurtic
Bux-32 S3	3.8 - 4.8	5Y6/4	SP	Fine Sand	Poorly Graded	Medium Sand	Moderately Well Sorted	Strongly Coarse Skewed	Leptokurtic
Bux-32 S4	4.8 - 6.3	5Y6/4	SP	Medium Sand	Poorly Graded	Medium Sand	Moderately Sorted	Strongly Coarse Skewed	Leptokurtic
Bux-33 S1	0 - 3.0	5Y6/4	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Well Sorted	Coarse Skewed	Leptokurtic
Bux-33 S2	3.0 - 5.2	5Y6/4	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Well Sorted	Coarse Skewed	Leptokurtic
Bux-34 S1	0 - 2.4	5Y6/4	SP	Fine Sand	Poorly Graded	Medium Sand	Moderately Well Sorted	Coarse Skewed	Very Leptokurtic
Bux-34 S2	2.4 - 3.7	5Y6/4	SP	Medium Sand	Poorly Graded	Medium Sand	Moderately Sorted	Strongly Coarse Skewed	Leptokurtic
Bux-34 S3	3.7 - 4.9	5Y6/4	SP	Medium Sand	Poorly Graded	Medium Sand	Moderately Well Sorted	Coarse Skewed	Very Leptokurtic
Bux-34 S4	4.9 - 6.3	5Y6/4	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Sorted	Symmetrical	Leptokurtic
Bux-34 S5	6.3 - 7.6	5Y6/2	SP	Fine Sand	Poorly Graded	Medium Sand	Moderately Sorted	Strongly Coarse Skewed	Leptokurtic
Bux-35 S1	0 - 1.3	5Y6/4	SP	Medium Sand	Poorly Graded	Coarse Sand	Poorly Sorted	Strongly Coarse Skewed	Leptokurtic
Bux-35 S2	1.3 - 3.0	5Y6/4	SP	Medium Sand	Poorly Graded	Coarse Sand	Well Sorted	Coarse Skewed	Very Leptokurtic
Bux-35 S3	3.0 - 6.0	5Y5/2	SP	Medium Sand	Poorly Graded	Medium Sand	Well Sorted	Symmetrical	Very Leptokurtic
Bux-35 S4	6.0 - 8.0	5Y5/2	SP	Fine Sand	Poorly Graded	Medium Sand	Moderately Well Sorted	Strongly Fine Skewed	Very Leptokurtic
Bux-36 S1	0 - 1.8	5Y6/4	SP	Medium Sand	Poorly Graded	Coarse Sand	Poorly Sorted	Strongly Coarse Skewed	Leptokurtic
Bux-36 S2	1.8 - 3.7	5Y6/4	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Sorted	Coarse Skewed	Leptokurtic
Bux-36 S3	3.7 - 4.7	5Y6/4	SP	Fine Sand	Poorly Graded	Medium Sand	Moderately Well Sorted	Strongly Coarse Skewed	Very Leptokurtic
Bux-36 S4	4.7 - 7.6	5Y6/4	SP	Medium Sand	Poorly Graded	Medium Sand	Moderately Well Sorted	Strongly Coarse Skewed	Leptokurtic
Bux-36 S5	7.6 - 9.4	5Y6/4	SP	Fine Sand	Poorly Graded	Medium Sand	Moderately Well Sorted	Strongly Coarse Skewed	Very Leptokurtic
Bux-37 S1	0 - 3.0	5Y6/4	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Well Sorted	Coarse Skewed	Leptokurtic
Bux-37 S2	3.0 - 5.0	5Y6/4	SP	Medium Sand	Poorly Graded	Medium Sand	Well Sorted	Coarse Skewed	Very Leptokurtic
Bux-37 S3	5.0 - 7.8	5Y6/2	SP	Fine Sand	Poorly Graded	Medium Sand	Well Sorted	Coarse Skewed	Very Leptokurtic
Bux-38 S1	0 - 1.6	5Y6/4	SP	Fine Sand	Poorly Graded	Medium Sand	Moderately Well Sorted	Coarse Skewed	Leptokurtic
Bux-38 S2	1.6 - 3.3	5Y6/4	SP	Medium Sand	Poorly Graded	Medium Sand	Moderately Well Sorted	Strongly Coarse Skewed	Leptokurtic
Bux-38 S3	3.3 - 5.5	5Y6/4	SP	Medium Sand	Poorly Graded	Medium Sand	Moderately Well Sorted	Coarse Skewed	Leptokurtic
Bux-38 S4	5.5 - 6.8	5Y6/2	SP	Fine Sand	Poorly Graded	Medium Sand	Moderately Sorted	Coarse Skewed	Leptokurtic

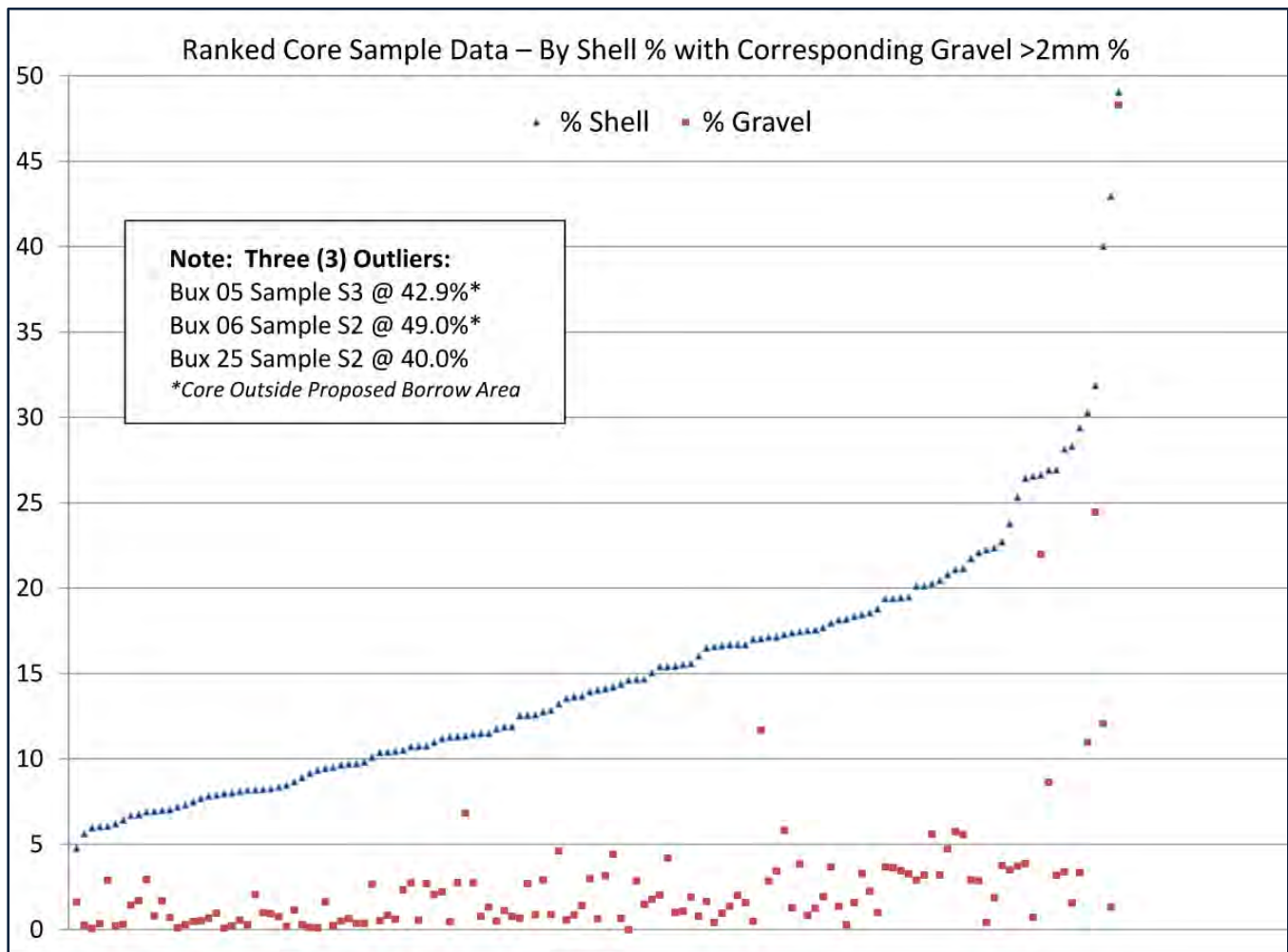


FIGURE 4.3. Shell percentage for 135 individual samples from 37 offshore cores with the corresponding gravel (>2 mm mean diameter) percentage.

For purposes of visualizing sediment quality within the sand search area, CSE computed weighted composite statistics to 4 ft, 6 ft, and 8 ft of section. Under operational conditions, dredges excavate to a particular depth, mixing sediments before discharge along the beach. The results of random length core samples were weighted proportionally over the applicable section. This yields a “composite” mean grain size, shell content, and gravel content for each designated interval.

Similarities between the results for each composite are a measure of the down-core consistency of the sediments. It is anticipated excavations will be restricted by design to the upper ~6–8 ft of substrate and possibly shallower if construction is via hopper dredge. A goal of the design is to leave sediments at the base of the excavation which are similar in size and character as the removed sediments. This improves the chance for rapid recovery

of benthic organisms (Van Dolah et al 1998, NPS 2012). Table 4.2, Table 4.3, and Table 4.4 provide key statistics for each core to the composited lengths of 4 ft, 6 ft, and 8 ft. The composite grain-size distributions for each set of data are given in Attachment 3-B. Table 4.4 provides average arithmetic mean sizes, standard deviations, shell percentages, and gravel percentages for individual samples and weighted composite samples.

Figure 4.4 shows selected composite statistics for each core within the sand search area. To more easily visualize the results, Figures 4.5–4.7 provide color isopach maps of mean grain size, shell percentages, and gravel percentages for Comp 4 and Comp 8 results. Given the close similarity between results for Comp 4 and Comp 8, and the fact the Comp 6 falls between the two sets of data, isopach maps for Comp 6 are not shown.

Coarsest sediments are found over a broad area encompassing the northern 75 percent of the search area. Mean grain size is slightly lower along the eastern edge and south end of the area. The size minima are at the southernmost corner of the grid (core Bux-08 ~0.25 mm). The coarsest samples are in the center of the search area (core Bux-25 ~0.7 mm). Figure 4.6 (percent shell) shows similar isopachs and a correlation of shell percentage with mean grain size. Gravel percentages (Fig 4.7) are generally low throughout the sand search area, peaking at ~7.1 percent (core Bux-25).

TABLE 4.2a. Composited offshore core sediment statistics to 4 ft based on weighted averages of individual samples. See Attachment 3-B for size frequency curves.

Buxton Borrow Area Sediment Characteristics		Method of Moments						Folk Graphical Method							
		Mean	STD	Mean	STD	Skew	Kurt	Mean	STD	ISTD	Skew	Kurt	Shell	Gravel	
		mm	mm			phi					phi		%	%	
Bux 1	0-4 ft Comp	0.415	0.531	1.268	0.913	-1.171	4.059	1.200	0.790	0.887	-0.423	1.332	20.3	4.5	
Bux 2	0-4 ft Comp	0.566	0.645	0.822	0.632	-1.106	5.504	0.750	0.515	0.562	-0.348	1.239	24.4	2.5	
Bux 3	0-4 ft Comp	0.267	0.477	1.904	1.067	-1.053	3.936	1.855	0.958	1.023	-0.446	1.187	11.0	2.6	
Bux 4	0-4 ft Comp	0.458	0.645	1.126	0.633	0.605	9.253	0.988	0.348	0.406	-0.176	1.306	12.7	1.0	
Bux 5	0-4 ft Comp	0.358	0.587	1.483	0.768	-1.406	5.955	1.423	0.603	0.685	-0.294	1.414	9.6	2.3	
Bux 6	0-4 ft Comp	0.622	0.204	0.685	2.293	-0.152	1.712	0.293	2.775	2.487	-0.084	0.705	39.9	27.7	
Bux 7	0-4 ft Comp	0.434	0.513	1.204	0.964	-2.297	9.646	1.230	0.395	0.710	-0.397	2.716	11.4	5.8	
Bux 8	0-4 ft Comp	0.239	0.519	2.063	0.946	-1.396	5.946	2.047	0.700	0.846	-0.227	1.491	8.0	2.4	
Bux 9	0-4 ft Comp	0.468	0.450	1.096	1.153	-2.065	11.241	1.072	0.508	0.837	-0.312	2.587	10.3	5.4	
Bux 10	0-4 ft Comp	0.340	0.692	1.557	0.532	-1.737	11.572	1.480	0.340	0.402	-0.143	1.378	8.0	0.8	
Bux 11	0-4 ft Comp	0.298	0.483	1.746	1.049	0.246	3.114	1.677	1.050	1.008	0.369	0.880	9.2	1.2	
Bux 12	0-4 ft Comp	0.327	0.576	1.613	0.797	-1.237	6.342	1.552	0.533	0.692	-0.145	1.857	9.6	2.2	
Bux 14	0-4 ft Comp	0.509	0.608	0.974	0.719	-1.229	4.478	0.895	0.623	0.664	-0.479	1.224	18.3	2.6	
Bux 15	0-4 ft Comp	0.412	0.729	1.281	0.456	-0.681	8.381	1.173	0.373	0.385	-0.211	1.111	8.4	0.2	
Bux 16	0-4 ft Comp	0.426	0.562	1.231	0.832	-1.212	4.381	1.160	0.718	0.788	-0.423	1.365	16.7	3.2	
Bux 17	0-4 ft Comp	0.394	0.542	1.345	0.884	1.248	5.411	1.063	0.403	0.679	0.229	2.718	8.2	0.7	
Bux 18	0-4 ft Comp	0.522	0.605	0.938	0.725	-1.279	4.886	0.878	0.585	0.665	-0.381	1.309	17.9	4.0	
Bux 19	0-4 ft Comp	0.420	0.748	1.253	0.420	-0.760	12.002	1.148	0.303	0.325	-0.178	1.188	7.9	0.4	
Bux 20	0-4 ft Comp	0.456	0.627	1.133	0.674	-1.318	5.853	1.060	0.523	0.605	-0.281	1.431	14.8	2.1	
Bux 21	0-4 ft Comp	0.584	0.634	0.777	0.658	-1.030	4.383	0.712	0.570	0.620	-0.215	1.208	19.4	2.9	
Bux 22	0-4 ft Comp	0.322	0.526	1.635	0.926	-1.276	4.826	1.592	0.738	0.859	-0.334	1.381	11.2	3.0	
Bux 23	0-4 ft Comp	0.547	0.675	0.871	0.567	-1.044	7.122	0.792	0.418	0.469	-0.356	1.259	7.7	1.7	
Bux 24	0-4 ft Comp	0.519	0.662	0.945	0.594	-1.405	6.161	0.877	0.458	0.523	-0.335	1.374	23.0	1.8	
Bux 25	0-4 ft Comp	0.741	0.521	0.433	0.940	-2.001	8.316	0.400	0.693	0.783	-0.411	1.383	29.3	7.1	
Bux 26	0-4 ft Comp	0.301	0.653	1.731	0.616	-0.908	5.737	1.630	0.545	0.569	-0.082	1.090	6.2	0.3	
Bux 27	0-4 ft Comp	0.520	0.695	0.945	0.525	-1.004	8.244	0.858	0.400	0.441	-0.276	1.278	14.4	1.2	
Bux 28	0-4 ft Comp	0.482	0.662	1.053	0.596	-1.405	6.291	0.973	0.480	0.529	-0.282	1.294	14.6	1.5	
Bux 29	0-4 ft Comp	0.565	0.645	0.823	0.634	-1.297	5.614	0.753	0.478	0.554	-0.471	1.409	21.0	2.9	
Bux 30	0-4 ft Comp	0.409	0.609	1.289	0.716	-1.161	5.310	1.217	0.590	0.661	-0.226	1.394	10.8	1.7	
Bux 31	0-4 ft Comp	0.598	0.702	0.742	0.510	-0.709	7.556	0.648	0.390	0.435	-0.198	1.274	16.6	1.1	
Bux 32	0-4 ft Comp	0.509	0.616	0.975	0.699	-1.091	4.895	0.903	0.585	0.638	-0.350	1.221	18.5	2.4	
Bux 33	0-4 ft Comp	0.557	0.634	0.846	0.657	-1.269	5.272	0.785	0.518	0.600	-0.381	1.430	19.9	3.1	
Bux 34	0-4 ft Comp	0.401	0.628	1.319	0.671	-1.309	6.653	1.242	0.518	0.578	-0.197	1.348	10.5	1.9	
Bux 35	0-4 ft Comp	0.591	0.597	0.758	0.743	-2.313	12.014	0.725	0.415	0.531	-0.431	1.591	18.2	3.9	
Bux 36	0-4 ft Comp	0.566	0.543	0.821	0.881	-1.556	5.834	0.767	0.728	0.811	-0.474	1.390	22.0	5.6	
Bux 37	0-4 ft Comp	0.543	0.660	0.882	0.599	-1.265	6.144	0.818	0.460	0.530	-0.285	1.387	20.7	2.3	
Bux 38	0-4 ft Comp	0.398	0.621	1.330	0.688	-1.043	5.898	1.250	0.565	0.611	-0.119	1.289	10.0	1.7	

TABLE 4.2b (cont). Composited offshore core sediment characteristics to 4 ft based on weighted averages of individual samples. See Attachment 3-B for size frequency curves.

Sample	Interval	USCS Description			Wentworth Description			
		SP	Fine Sand	Poorly Graded	Medium Sand	Moderately Sorted	Coarse Skewed	Leptokurtic
Bux 1	0-4 ft Comp	SP	Fine Sand	Poorly Graded	Medium Sand	Moderately Sorted	Coarse Skewed	Leptokurtic
Bux 2	0-4 ft Comp	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Well Sorted	Coarse Skewed	Leptokurtic
Bux 3	0-4 ft Comp	SP	Fine Sand	Poorly Graded	Medium Sand	Poorly Sorted	Coarse Skewed	Leptokurtic
Bux 4	0-4 ft Comp	SP	Medium Sand	Poorly Graded	Medium Sand	Moderately Well Sorted	Fine Skewed	Very Leptokurtic
Bux 5	0-4 ft Comp	SP	Fine Sand	Poorly Graded	Medium Sand	Moderately Sorted	Strongly Coarse Skewed	Leptokurtic
Bux 6	0-4 ft Comp	SP	Medium Sand	Poorly Graded	Coarse Sand	Very Poorly Sorted	Symmetrical	Platykurtic
Bux 7	0-4 ft Comp	SP	Medium Sand	Poorly Graded	Medium Sand	Moderately Sorted	Strongly Coarse Skewed	Very Leptokurtic
Bux 8	0-4 ft Comp	SP	Fine Sand	Poorly Graded	Fine Sand	Moderately Sorted	Strongly Coarse Skewed	Leptokurtic
Bux 9	0-4 ft Comp	SP	Medium Sand	Poorly Graded	Medium Sand	Poorly Sorted	Strongly Coarse Skewed	Very Leptokurtic
Bux 10	0-4 ft Comp	SP	Fine Sand	Poorly Graded	Medium Sand	Moderately Well Sorted	Strongly Coarse Skewed	Very Leptokurtic
Bux 11	0-4 ft Comp	SP	Fine Sand	Poorly Graded	Medium Sand	Poorly Sorted	Symmetrical	Mesokurtic
Bux 12	0-4 ft Comp	SP	Fine Sand	Poorly Graded	Medium Sand	Moderately Sorted	Coarse Skewed	Leptokurtic
Bux 14	0-4 ft Comp	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Sorted	Coarse Skewed	Leptokurtic
Bux 15	0-4 ft Comp	SP	Fine Sand	Poorly Graded	Medium Sand	Well Sorted	Coarse Skewed	Very Leptokurtic
Bux 16	0-4 ft Comp	SP	Medium Sand	Poorly Graded	Medium Sand	Moderately Sorted	Coarse Skewed	Leptokurtic
Bux 17	0-4 ft Comp	SP	Fine Sand	Poorly Graded	Medium Sand	Moderately Sorted	Fine Skewed	Leptokurtic
Bux 18	0-4 ft Comp	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Sorted	Coarse Skewed	Leptokurtic
Bux 19	0-4 ft Comp	SP	Fine Sand	Poorly Graded	Medium Sand	Well Sorted	Coarse Skewed	Very Leptokurtic
Bux 20	0-4 ft Comp	SP	Medium Sand	Poorly Graded	Medium Sand	Moderately Well Sorted	Strongly Coarse Skewed	Leptokurtic
Bux 21	0-4 ft Comp	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Well Sorted	Coarse Skewed	Leptokurtic
Bux 22	0-4 ft Comp	SP	Fine Sand	Poorly Graded	Medium Sand	Moderately Sorted	Coarse Skewed	Leptokurtic
Bux 23	0-4 ft Comp	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Well Sorted	Coarse Skewed	Leptokurtic
Bux 24	0-4 ft Comp	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Well Sorted	Strongly Coarse Skewed	Leptokurtic
Bux 25	0-4 ft Comp	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Well Sorted	Strongly Coarse Skewed	Very Leptokurtic
Bux 26	0-4 ft Comp	SP	Fine Sand	Poorly Graded	Medium Sand	Moderately Well Sorted	Coarse Skewed	Leptokurtic
Bux 27	0-4 ft Comp	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Well Sorted	Coarse Skewed	Very Leptokurtic
Bux 28	0-4 ft Comp	SP	Medium Sand	Poorly Graded	Medium Sand	Moderately Well Sorted	Strongly Coarse Skewed	Leptokurtic
Bux 29	0-4 ft Comp	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Well Sorted	Coarse Skewed	Leptokurtic
Bux 30	0-4 ft Comp	SP	Fine Sand	Poorly Graded	Medium Sand	Moderately Sorted	Coarse Skewed	Leptokurtic
Bux 31	0-4 ft Comp	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Well Sorted	Coarse Skewed	Very Leptokurtic
Bux 32	0-4 ft Comp	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Well Sorted	Coarse Skewed	Leptokurtic
Bux 33	0-4 ft Comp	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Well Sorted	Coarse Skewed	Leptokurtic
Bux 34	0-4 ft Comp	SP	Fine Sand	Poorly Graded	Medium Sand	Moderately Well Sorted	Strongly Coarse Skewed	Leptokurtic
Bux 35	0-4 ft Comp	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Sorted	Strongly Coarse Skewed	Very Leptokurtic
Bux 36	0-4 ft Comp	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Sorted	Strongly Coarse Skewed	Leptokurtic
Bux 37	0-4 ft Comp	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Well Sorted	Coarse Skewed	Leptokurtic
Bux 38	0-4 ft Comp	SP	Fine Sand	Poorly Graded	Medium Sand	Moderately Well Sorted	Coarse Skewed	Leptokurtic

TABLE 4.3a. Compositied offshore core sediment statistics to 6 ft based on weighted averages of individual samples. See Attachment 3-B for size frequency curves.

Buxton Borrow Area Sediment Characteristics		Method of Moments					Folk Graphical Method					Shell %	Gravel %
		Mean mm	STD mm	Mean	STD	phi	Mean	STD	ISTD	Skew	Kurt		
Bux 1	0-6 ft Comp	0.401	0.549	1.319	0.866	-1.199	1.255	0.740	0.820	-0.367	1.275	19.0	3.6
Bux 2	0-6 ft Comp	0.541	0.659	0.887	0.603	-1.120	0.812	0.488	0.535	-0.331	1.220	22.2	1.9
Bux 3	0-6 ft Comp	0.323	0.398	1.629	1.330	-1.376	1.585	1.140	1.237	-0.414	1.307	13.8	5.9
Bux 4	0-6 ft Comp	0.481	0.646	1.055	0.631	0.474	0.920	0.400	0.450	-0.196	1.264	14.3	1.1
Bux 5	0-6 ft Comp	0.312	0.550	1.682	0.864	-0.948	1.613	0.705	0.791	-0.154	1.297	15.5	2.0
Bux 6	0-6 ft Comp	0.622	0.204	0.685	2.293	-0.152	0.293	2.775	2.487	-0.084	0.705	39.9	27.7
Bux 7	0-6 ft Comp	0.430	0.541	1.216	0.885	-2.084	1.203	0.395	0.643	-0.347	2.434	11.4	4.8
Bux 8	0-6 ft Comp	0.237	0.532	2.076	0.911	-1.543	2.062	0.648	0.788	-0.271	1.590	7.5	2.2
Bux 9	0-6 ft Comp	0.483	0.429	1.050	1.220	-2.000	1.043	0.535	0.899	-0.322	2.650	11.1	6.2
Bux 10	0-6 ft Comp	0.344	0.694	1.540	0.527	-1.578	1.465	0.333	0.394	-0.123	1.402	7.8	0.7
Bux 11	0-6 ft Comp	0.295	0.466	1.761	1.102	0.072	1.687	1.100	1.064	0.323	0.843	9.7	1.6
Bux 12	0-6 ft Comp	0.301	0.586	1.731	0.770	-1.122	1.670	0.533	0.653	-0.008	1.608	8.5	1.6
Bux 14	0-6 ft Comp	0.483	0.612	1.049	0.708	-1.307	0.977	0.595	0.651	-0.466	1.329	16.6	2.4
Bux 15	0-6 ft Comp	0.410	0.713	1.286	0.489	-0.318	1.170	0.380	0.396	-0.186	1.138	8.7	0.3
Bux 16	0-6 ft Comp	0.402	0.564	1.314	0.825	-1.317	1.243	0.683	0.769	-0.425	1.475	14.9	3.0
Bux 17	0-6 ft Comp	0.337	0.465	1.568	1.106	1.038	1.650	1.230	1.149	0.588	2.833	9.1	0.6
Bux 18	0-6 ft Comp	0.542	0.599	0.882	0.738	-1.227	0.825	0.590	0.699	-0.392	1.418	18.7	4.5
Bux 19	0-6 ft Comp	0.418	0.750	1.259	0.415	-0.353	1.150	0.295	0.319	-0.170	1.187	8.4	0.3
Bux 20	0-6 ft Comp	0.454	0.599	1.138	0.739	-1.278	1.068	0.575	0.672	-0.340	1.443	16.7	2.8
Bux 21	0-6 ft Comp	0.558	0.637	0.841	0.650	-1.049	0.770	0.568	0.607	-0.256	1.144	18.2	2.4
Bux 22	0-6 ft Comp	0.306	0.553	1.710	0.855	-1.387	1.665	0.653	0.764	-0.305	1.369	10.2	2.3
Bux 23	0-6 ft Comp	0.520	0.689	0.942	0.537	-0.982	0.855	0.403	0.446	-0.315	1.311	8.5	1.2
Bux 24	0-6 ft Comp	0.501	0.641	0.996	0.642	-1.301	0.920	0.488	0.563	-0.316	1.369	23.2	2.3
Bux 25	0-6 ft Comp	0.684	0.537	0.549	0.896	-2.103	0.503	0.655	0.743	-0.406	1.404	26.8	5.8
Bux 26	0-6 ft Comp	0.321	0.605	1.641	0.725	-1.309	1.567	0.580	0.629	-0.143	1.182	8.4	1.4
Bux 27	0-6 ft Comp	0.527	0.686	0.925	0.543	-0.851	0.837	0.395	0.441	-0.271	1.290	15.2	1.5
Bux 28	0-6 ft Comp	0.512	0.637	0.967	0.652	-1.270	0.898	0.525	0.590	-0.316	1.302	17.3	2.2
Bux 29	0-6 ft Comp	0.532	0.666	0.911	0.587	-1.499	0.845	0.415	0.497	-0.398	1.566	18.2	2.2
Bux 30	0-6 ft Comp	0.457	0.504	1.129	0.987	-2.015	1.125	0.660	0.830	-0.343	1.701	13.9	5.0
Bux 31	0-6 ft Comp	0.584	0.693	0.776	0.529	-0.347	0.677	0.388	0.437	-0.197	1.265	16.3	1.1
Bux 32	0-6 ft Comp	0.482	0.607	1.052	0.721	-1.153	0.980	0.598	0.668	-0.324	1.271	17.6	2.5
Bux 33	0-6 ft Comp	0.563	0.634	0.828	0.658	-1.271	0.768	0.518	0.600	-0.396	1.422	19.8	3.3
Bux 34	0-6 ft Comp	0.431	0.617	1.214	0.698	-0.960	1.112	0.555	0.623	-0.166	1.280	12.4	1.9
Bux 35	0-6 ft Comp	0.551	0.633	0.860	0.660	-2.347	0.805	0.355	0.448	-0.444	1.524	15.6	2.6
Bux 36	0-6 ft Comp	0.513	0.564	0.964	0.826	-1.667	0.922	0.635	0.730	-0.396	1.387	19.0	4.2
Bux 37	0-6 ft Comp	0.496	0.669	1.010	0.581	-1.236	0.937	0.480	0.517	-0.204	1.236	18.1	1.6
Bux 38	0-6 ft Comp	0.411	0.622	1.281	0.684	-0.857	1.188	0.578	0.621	-0.067	1.276	10.8	1.4

TABLE 4.3b (cont). Composited offshore core sediment characteristics to 6 ft based on weighted averages of individual samples. See Attachment 3-B for size frequency curves.

Sample	Interval	USCS Description			Wentworth Description			
Bux 1	0-6 ft Comp	SP	Fine Sand	Poorly Graded	Medium Sand	Moderately Sorted	Coarse Skewed	Leptokurtic
Bux 2	0-6 ft Comp	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Well Sorted	Coarse Skewed	Leptokurtic
Bux 3	0-6 ft Comp	SP	Fine Sand	Poorly Graded	Medium Sand	Poorly Sorted	Strongly Coarse Skewed	Leptokurtic
Bux 4	0-6 ft Comp	SP	Medium Sand	Poorly Graded	Medium Sand	Moderately Well Sorted	Fine Skewed	Very Leptokurtic
Bux 5	0-6 ft Comp	SP	Fine Sand	Poorly Graded	Medium Sand	Moderately Sorted	Coarse Skewed	Leptokurtic
Bux 6	0-6 ft Comp	SP	Medium Sand	Poorly Graded	Coarse Sand	Very Poorly Sorted	Symmetrical	Platykurtic
Bux 7	0-6 ft Comp	SP	Medium Sand	Poorly Graded	Medium Sand	Moderately Sorted	Strongly Coarse Skewed	Very Leptokurtic
Bux 8	0-6 ft Comp	SP	Fine Sand	Poorly Graded	Fine Sand	Moderately Sorted	Strongly Coarse Skewed	Leptokurtic
Bux 9	0-6 ft Comp	SP	Medium Sand	Poorly Graded	Medium Sand	Poorly Sorted	Strongly Coarse Skewed	Very Leptokurtic
Bux 10	0-6 ft Comp	SP	Fine Sand	Poorly Graded	Medium Sand	Moderately Well Sorted	Strongly Coarse Skewed	Very Leptokurtic
Bux 11	0-6 ft Comp	SP	Fine Sand	Poorly Graded	Medium Sand	Poorly Sorted	Symmetrical	Mesokurtic
Bux 12	0-6 ft Comp	SP	Fine Sand	Poorly Graded	Medium Sand	Moderately Sorted	Coarse Skewed	Leptokurtic
Bux 14	0-6 ft Comp	SP	Medium Sand	Poorly Graded	Medium Sand	Moderately Sorted	Strongly Coarse Skewed	Leptokurtic
Bux 15	0-6 ft Comp	SP	Fine Sand	Poorly Graded	Medium Sand	Well Sorted	Symmetrical	Very Leptokurtic
Bux 16	0-6 ft Comp	SP	Fine Sand	Poorly Graded	Medium Sand	Moderately Sorted	Strongly Coarse Skewed	Leptokurtic
Bux 17	0-6 ft Comp	SP	Fine Sand	Poorly Graded	Medium Sand	Poorly Sorted	Fine Skewed	Mesokurtic
Bux 18	0-6 ft Comp	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Sorted	Coarse Skewed	Leptokurtic
Bux 19	0-6 ft Comp	SP	Fine Sand	Poorly Graded	Medium Sand	Well Sorted	Symmetrical	Very Leptokurtic
Bux 20	0-6 ft Comp	SP	Medium Sand	Poorly Graded	Medium Sand	Moderately Sorted	Coarse Skewed	Leptokurtic
Bux 21	0-6 ft Comp	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Well Sorted	Coarse Skewed	Leptokurtic
Bux 22	0-6 ft Comp	SP	Fine Sand	Poorly Graded	Medium Sand	Moderately Sorted	Strongly Coarse Skewed	Leptokurtic
Bux 23	0-6 ft Comp	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Well Sorted	Coarse Skewed	Very Leptokurtic
Bux 24	0-6 ft Comp	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Well Sorted	Strongly Coarse Skewed	Leptokurtic
Bux 25	0-6 ft Comp	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Sorted	Strongly Coarse Skewed	Very Leptokurtic
Bux 26	0-6 ft Comp	SP	Fine Sand	Poorly Graded	Medium Sand	Moderately Sorted	Strongly Coarse Skewed	Leptokurtic
Bux 27	0-6 ft Comp	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Well Sorted	Coarse Skewed	Very Leptokurtic
Bux 28	0-6 ft Comp	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Well Sorted	Coarse Skewed	Leptokurtic
Bux 29	0-6 ft Comp	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Well Sorted	Strongly Coarse Skewed	Leptokurtic
Bux 30	0-6 ft Comp	SP	Medium Sand	Poorly Graded	Medium Sand	Moderately Sorted	Strongly Coarse Skewed	Very Leptokurtic
Bux 31	0-6 ft Comp	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Well Sorted	Symmetrical	Very Leptokurtic
Bux 32	0-6 ft Comp	SP	Medium Sand	Poorly Graded	Medium Sand	Moderately Sorted	Coarse Skewed	Leptokurtic
Bux 33	0-6 ft Comp	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Well Sorted	Coarse Skewed	Leptokurtic
Bux 34	0-6 ft Comp	SP	Medium Sand	Poorly Graded	Medium Sand	Moderately Well Sorted	Coarse Skewed	Leptokurtic
Bux 35	0-6 ft Comp	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Well Sorted	Strongly Coarse Skewed	Very Leptokurtic
Bux 36	0-6 ft Comp	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Sorted	Strongly Coarse Skewed	Leptokurtic
Bux 37	0-6 ft Comp	SP	Medium Sand	Poorly Graded	Medium Sand	Moderately Well Sorted	Coarse Skewed	Leptokurtic
Bux 38	0-6 ft Comp	SP	Fine Sand	Poorly Graded	Medium Sand	Moderately Well Sorted	Coarse Skewed	Leptokurtic

TABLE 4.4a. Compositied offshore core sediment statistics to **8 ft** based on weighted averages of individual samples. See Attachment 3-C for size frequency curves.

Buxton Borrow Area Sediment Characteristics		Method of Moments						Folk Graphical Method							
		Mean	STD	Mean	STD	Skew	Kurt	Mean	STD	ISTD	Skew	Kurt	Shell	Gravel	
		mm	mm			phi				phi			%	%	
Bux 1	0-8 ft Comp	0.398	0.561	1.328	0.835	-1.157	4.501	1.258	0.728	0.790	-0.330	1.212	19.2	3.0	
Bux 2	0-8 ft Comp	0.530	0.663	0.916	0.594	-1.115	6.145	0.838	0.478	0.524	-0.309	1.204	21.7	1.6	
Bux 3	0-8 ft Comp	0.323	0.398	1.629	1.330	-1.376	5.201	1.585	1.140	1.237	-0.414	1.307	13.8	5.9	
Bux 4	0-8 ft Comp	0.449	0.544	1.156	0.879	0.976	5.521	0.920	0.455	0.743	0.114	2.288	16.9	1.4	
Bux 5	0-8 ft Comp	0.305	0.545	1.715	0.875	-0.914	4.877	1.640	0.718	0.799	-0.148	1.260	15.4	1.9	
Bux 6	0-8 ft Comp	0.622	0.204	0.685	2.293	-0.152	1.712	0.293	2.775	2.487	-0.084	0.705	39.9	27.7	
Bux 7	0-8 ft Comp	0.430	0.544	1.218	0.878	-2.054	10.218	1.200	0.393	0.630	-0.334	2.368	11.4	4.7	
Bux 8	0-8 ft Comp	0.233	0.545	2.103	0.875	-1.700	7.287	2.080	0.603	0.736	-0.287	1.657	6.9	2.1	
Bux 9	0-8 ft Comp	0.483	0.429	1.050	1.220	-2.000	10.221	1.043	0.535	0.899	-0.322	2.650	11.1	6.2	
Bux 10	0-8 ft Comp	0.347	0.694	1.528	0.527	-1.530	11.712	1.455	0.328	0.391	-0.125	1.430	7.7	0.7	
Bux 11	0-8 ft Comp	0.295	0.466	1.761	1.102	0.072	2.969	1.687	1.100	1.064	0.323	0.843	9.7	1.6	
Bux 12	0-8 ft Comp	0.299	0.594	1.742	0.752	-1.119	6.887	1.675	0.523	0.633	0.004	1.584	8.3	1.5	
Bux 14	0-8 ft Comp	0.465	0.623	1.106	0.683	-1.386	5.417	1.033	0.555	0.621	-0.433	1.396	15.4	2.0	
Bux 15	0-8 ft Comp	0.400	0.688	1.321	0.539	0.368	9.030	1.187	0.380	0.410	-0.136	1.193	8.6	0.3	
Bux 16	0-8 ft Comp	0.396	0.562	1.336	0.830	-1.307	4.886	1.263	0.680	0.773	-0.414	1.472	14.7	3.1	
Bux 17	0-8 ft Comp	0.337	0.465	1.568	1.106	1.038	3.496	1.650	1.230	1.149	0.588	2.833	9.1	0.6	
Bux 18	0-8 ft Comp	0.530	0.606	0.917	0.724	-1.282	4.908	0.857	0.573	0.663	-0.388	1.349	19.5	4.1	
Bux 19	0-8 ft Comp	0.426	0.732	1.230	0.450	-0.118	11.644	1.110	0.325	0.342	-0.181	1.185	8.7	0.3	
Bux 20	0-8 ft Comp	0.439	0.591	1.188	0.758	-1.289	5.167	1.123	0.600	0.699	-0.329	1.459	16.1	2.9	
Bux 21	0-8 ft Comp	0.552	0.639	0.856	0.646	-1.046	4.687	0.785	0.565	0.602	-0.268	1.130	18.0	2.2	
Bux 22	0-8 ft Comp	0.305	0.576	1.713	0.797	-1.390	6.208	1.658	0.610	0.697	-0.241	1.327	9.9	1.8	
Bux 23	0-8 ft Comp	0.513	0.672	0.964	0.573	-0.034	9.269	0.858	0.405	0.449	-0.263	1.319	9.3	1.1	
Bux 24	0-8 ft Comp	0.497	0.638	1.009	0.648	-1.239	5.706	0.933	0.510	0.580	-0.279	1.352	22.3	2.2	
Bux 25	0-8 ft Comp	0.661	0.547	0.597	0.871	-2.098	9.540	0.545	0.635	0.718	-0.398	1.372	25.6	5.2	
Bux 26	0-8 ft Comp	0.334	0.585	1.581	0.773	-1.385	6.128	1.528	0.593	0.674	-0.207	1.303	9.9	2.0	
Bux 27	0-8 ft Comp	0.504	0.668	0.990	0.581	-0.056	9.063	0.877	0.398	0.442	-0.220	1.342	14.1	1.3	
Bux 28	0-8 ft Comp	0.496	0.623	1.010	0.683	-1.229	5.209	0.947	0.548	0.627	-0.260	1.345	17.5	2.6	
Bux 29	0-8 ft Comp	0.524	0.675	0.934	0.567	-1.430	7.317	0.862	0.418	0.482	-0.355	1.480	17.6	1.9	
Bux 30	0-8 ft Comp	0.424	0.524	1.237	0.931	-2.127	9.240	1.227	0.623	0.755	-0.357	1.645	12.1	4.2	
Bux 31	0-8 ft Comp	0.583	0.691	0.779	0.533	-0.296	8.552	0.678	0.390	0.437	-0.192	1.249	16.3	1.1	
Bux 32	0-8 ft Comp	0.481	0.605	1.057	0.725	-1.161	4.859	0.987	0.598	0.671	-0.330	1.274	17.6	2.6	
Bux 33	0-8 ft Comp	0.563	0.634	0.828	0.658	-1.271	5.240	0.768	0.518	0.600	-0.396	1.422	19.8	3.3	
Bux 34	0-8 ft Comp	0.415	0.601	1.270	0.734	-0.894	5.191	1.182	0.613	0.672	-0.135	1.302	12.4	2.0	
Bux 35	0-8 ft Comp	0.515	0.634	0.957	0.658	-1.700	14.388	0.880	0.385	0.458	-0.294	1.542	13.7	2.1	
Bux 36	0-8 ft Comp	0.494	0.582	1.018	0.782	-1.739	7.114	0.975	0.583	0.677	-0.359	1.391	17.9	3.6	
Bux 37	0-8 ft Comp	0.470	0.677	1.088	0.564	-1.213	6.978	1.002	0.478	0.497	-0.156	1.127	16.0	1.2	
Bux 38	0-8 ft Comp	0.402	0.612	1.313	0.707	-0.828	5.118	1.225	0.613	0.654	-0.075	1.280	11.2	1.5	

TABLE 4.4b. Composited offshore core sediment statistics to **8 ft** based on weighted averages of individual samples. See Attachment 3-C for size frequency curves.

Sample	Interval	USCS Description			Wentworth Description			
		SP	Fine Sand	Poorly Graded	Medium Sand	Moderately Well Sorted	Coarse Skewed	Leptokurtic
Bux 1	0-8 ft Comp	SP	Fine Sand	Poorly Graded	Medium Sand	Moderately Well Sorted	Coarse Skewed	Leptokurtic
Bux 2	0-8 ft Comp	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Well Sorted	Coarse Skewed	Leptokurtic
Bux 3	0-8 ft Comp	SP	Fine Sand	Poorly Graded	Medium Sand	Poorly Sorted	Strongly Coarse Skewed	Leptokurtic
Bux 4	0-8 ft Comp	SP	Medium Sand	Poorly Graded	Medium Sand	Moderately Sorted	Fine Skewed	Leptokurtic
Bux 5	0-8 ft Comp	SP	Fine Sand	Poorly Graded	Medium Sand	Moderately Sorted	Coarse Skewed	Leptokurtic
Bux 6	0-8 ft Comp	SP	Medium Sand	Poorly Graded	Coarse Sand	Very Poorly Sorted	Symmetrical	Platykurtic
Bux 7	0-8 ft Comp	SP	Medium Sand	Poorly Graded	Medium Sand	Moderately Sorted	Strongly Coarse Skewed	Very Leptokurtic
Bux 8	0-8 ft Comp	SP	Fine Sand	Poorly Graded	Fine Sand	Moderately Sorted	Strongly Coarse Skewed	Leptokurtic
Bux 9	0-8 ft Comp	SP	Medium Sand	Poorly Graded	Medium Sand	Poorly Sorted	Strongly Coarse Skewed	Very Leptokurtic
Bux 10	0-8 ft Comp	SP	Fine Sand	Poorly Graded	Medium Sand	Moderately Well Sorted	Strongly Coarse Skewed	Very Leptokurtic
Bux 11	0-8 ft Comp	SP	Fine Sand	Poorly Graded	Medium Sand	Poorly Sorted	Symmetrical	Mesokurtic
Bux 12	0-8 ft Comp	SP	Fine Sand	Poorly Graded	Medium Sand	Moderately Sorted	Coarse Skewed	Leptokurtic
Bux 14	0-8 ft Comp	SP	Medium Sand	Poorly Graded	Medium Sand	Moderately Well Sorted	Strongly Coarse Skewed	Leptokurtic
Bux 15	0-8 ft Comp	SP	Fine Sand	Poorly Graded	Medium Sand	Moderately Well Sorted	Symmetrical	Very Leptokurtic
Bux 16	0-8 ft Comp	SP	Fine Sand	Poorly Graded	Medium Sand	Moderately Sorted	Strongly Coarse Skewed	Leptokurtic
Bux 17	0-8 ft Comp	SP	Fine Sand	Poorly Graded	Medium Sand	Poorly Sorted	Fine Skewed	Mesokurtic
Bux 18	0-8 ft Comp	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Sorted	Coarse Skewed	Leptokurtic
Bux 19	0-8 ft Comp	SP	Medium Sand	Poorly Graded	Medium Sand	Well Sorted	Symmetrical	Very Leptokurtic
Bux 20	0-8 ft Comp	SP	Medium Sand	Poorly Graded	Medium Sand	Moderately Sorted	Coarse Skewed	Leptokurtic
Bux 21	0-8 ft Comp	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Well Sorted	Coarse Skewed	Leptokurtic
Bux 22	0-8 ft Comp	SP	Fine Sand	Poorly Graded	Medium Sand	Moderately Sorted	Strongly Coarse Skewed	Leptokurtic
Bux 23	0-8 ft Comp	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Well Sorted	Symmetrical	Very Leptokurtic
Bux 24	0-8 ft Comp	SP	Medium Sand	Poorly Graded	Medium Sand	Moderately Well Sorted	Coarse Skewed	Leptokurtic
Bux 25	0-8 ft Comp	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Sorted	Strongly Coarse Skewed	Very Leptokurtic
Bux 26	0-8 ft Comp	SP	Fine Sand	Poorly Graded	Medium Sand	Moderately Sorted	Strongly Coarse Skewed	Leptokurtic
Bux 27	0-8 ft Comp	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Well Sorted	Symmetrical	Very Leptokurtic
Bux 28	0-8 ft Comp	SP	Medium Sand	Poorly Graded	Medium Sand	Moderately Well Sorted	Coarse Skewed	Leptokurtic
Bux 29	0-8 ft Comp	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Well Sorted	Strongly Coarse Skewed	Leptokurtic
Bux 30	0-8 ft Comp	SP	Medium Sand	Poorly Graded	Medium Sand	Moderately Sorted	Strongly Coarse Skewed	Very Leptokurtic
Bux 31	0-8 ft Comp	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Well Sorted	Symmetrical	Very Leptokurtic
Bux 32	0-8 ft Comp	SP	Medium Sand	Poorly Graded	Medium Sand	Moderately Sorted	Coarse Skewed	Leptokurtic
Bux 33	0-8 ft Comp	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Well Sorted	Coarse Skewed	Leptokurtic
Bux 34	0-8 ft Comp	SP	Fine Sand	Poorly Graded	Medium Sand	Moderately Sorted	Coarse Skewed	Leptokurtic
Bux 35	0-8 ft Comp	SP	Medium Sand	Poorly Graded	Coarse Sand	Moderately Well Sorted	Strongly Coarse Skewed	Very Leptokurtic
Bux 36	0-8 ft Comp	SP	Medium Sand	Poorly Graded	Medium Sand	Moderately Sorted	Strongly Coarse Skewed	Leptokurtic
Bux 37	0-8 ft Comp	SP	Medium Sand	Poorly Graded	Medium Sand	Moderately Well Sorted	Coarse Skewed	Leptokurtic
Bux 38	0-8 ft Comp	SP	Fine Sand	Poorly Graded	Medium Sand	Moderately Sorted	Coarse Skewed	Leptokurtic

TABLE 4.5. Average arithmetic mean grain size, standard deviation, shell percentage, and gravel percentage for 37 borings (135 samples) off Buxton ("All Samples"). Composites are weighted by applicable length of individual samples for the upper 4 ft of core (Comp 4), the upper 6 ft of core (Comp 6), and the upper 8 ft of core (Comp 8). Composite statics are based on 33 cores within the box shown in Figure 4.4. Standard deviation for shell and gravel percentages is given in parentheses.

Core Samples	Mean Size (mm)	Std Deviation (mm)	Shell (%)	Gravel (%)
All Samples	0.446	0.615	15.1 (7.5)	2.8 (5.2)
Comp 4 ft	0.466	0.609	14.8 (5.9)	2.5 (1.7)
Comp 6 ft	0.455	0.604	14.2 (4.8)	2.3 (1.4)
Comp 8 ft	0.447	0.605	14.5 (5.1)	2.5 (1.5)



FIGURE 4.4. Mean grain size, percent shell, and percent gravel for core composite samples to 4 ft and 8 ft in the Buxton offshore sand search area based on borings obtained in October 2014. Bux-13 was attempted but not recovered. Composite results to 6 ft (not shown) fall between the results for 4 ft and 8 ft.

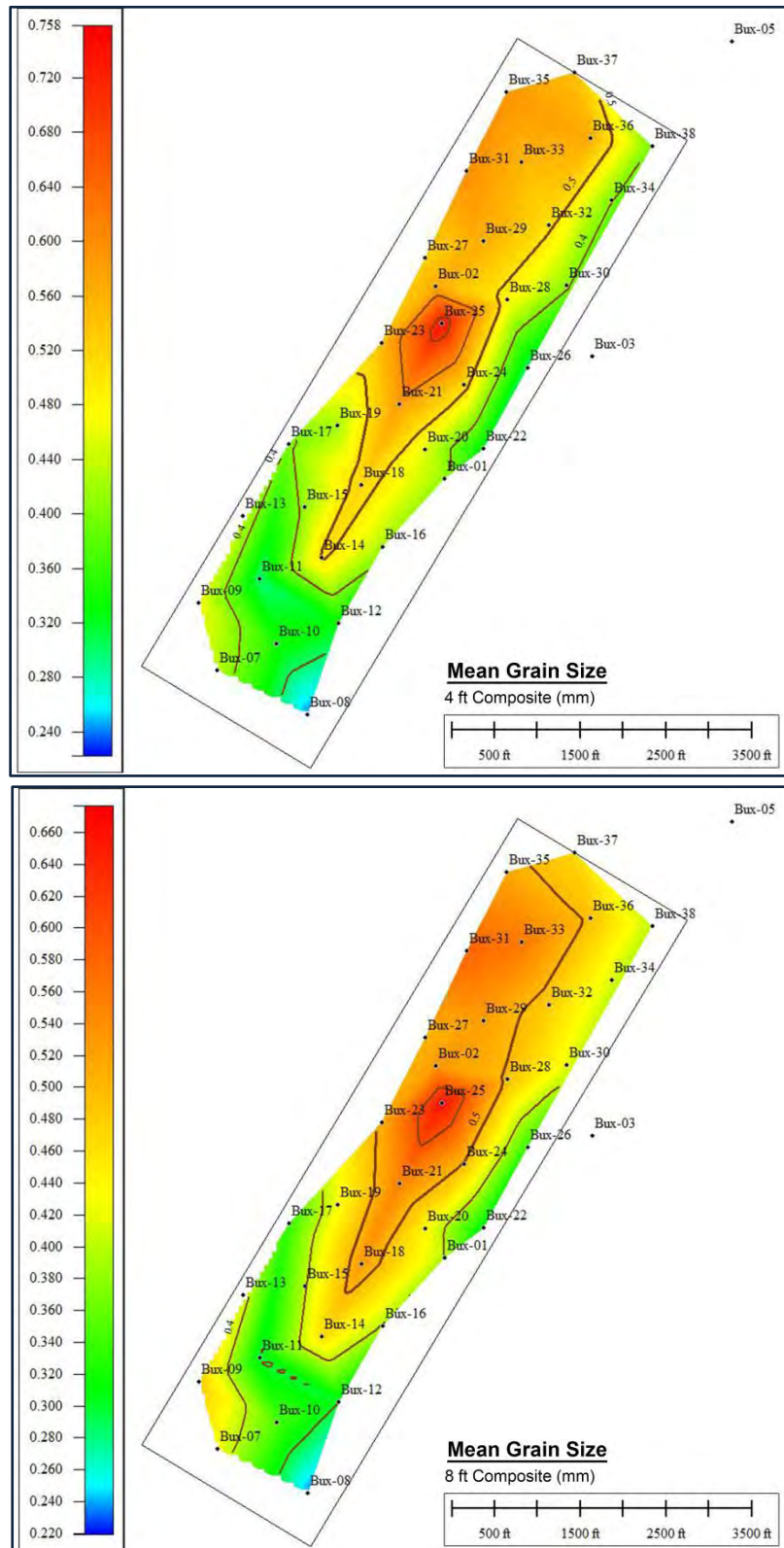


FIGURE 4.5. Isopach map of mean grain size to 4 ft (upper) and 8 ft (lower) based on 30+ cores within the indicated sand search grid off Buxton. Composite results to 6 ft are similar and fall between 4 ft and 8 ft results.

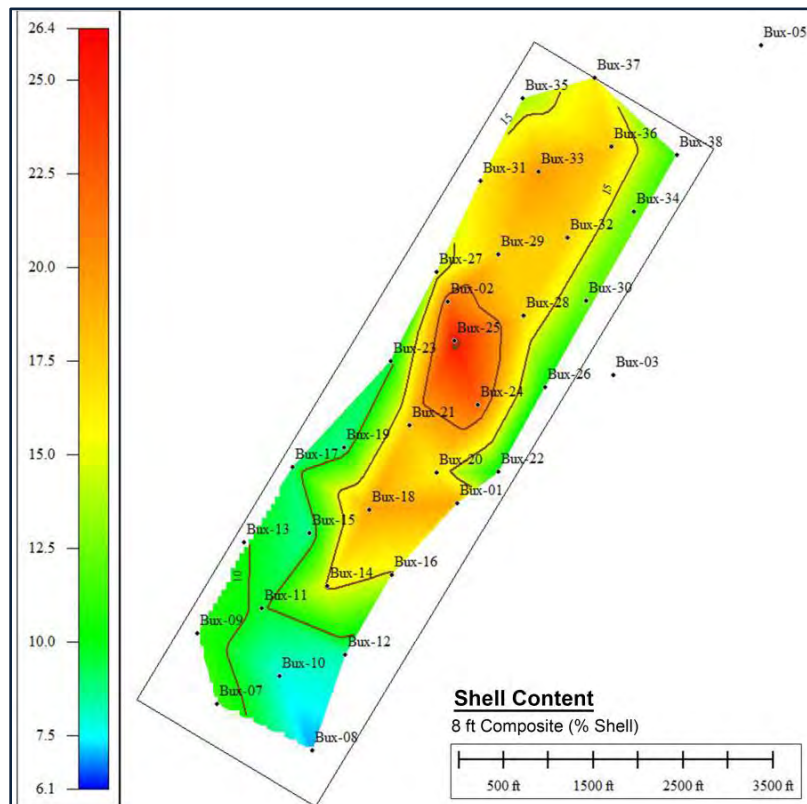
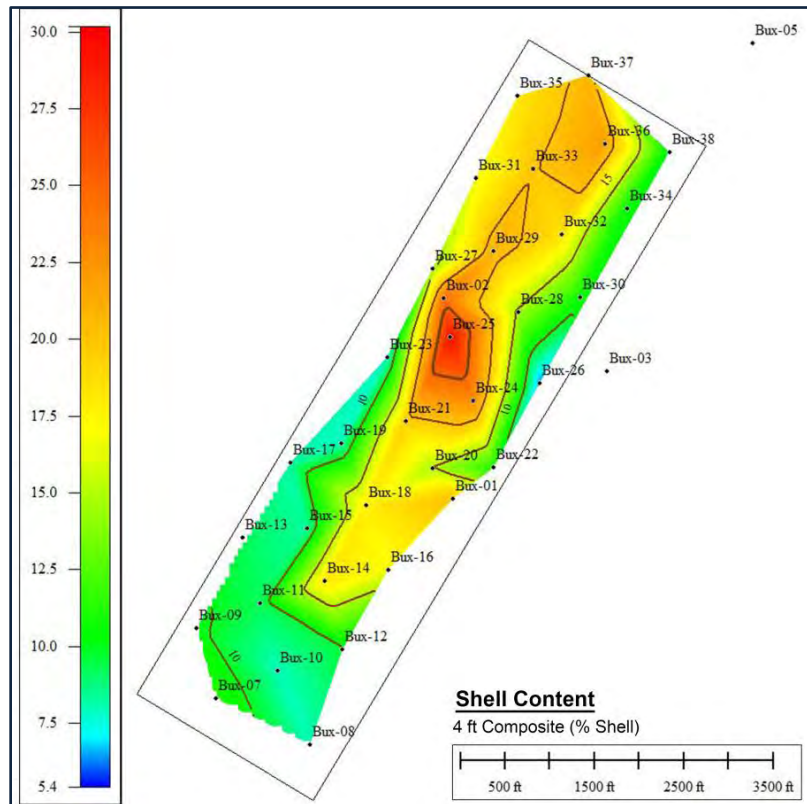


FIGURE 4.6. Isopach map of percent shell to 4 ft (upper) and 8 ft (lower) based on 30+ cores within the indicated sand search grid off Buxton. Composite results to 6 ft are similar and fall between 4 ft and 8 ft results.

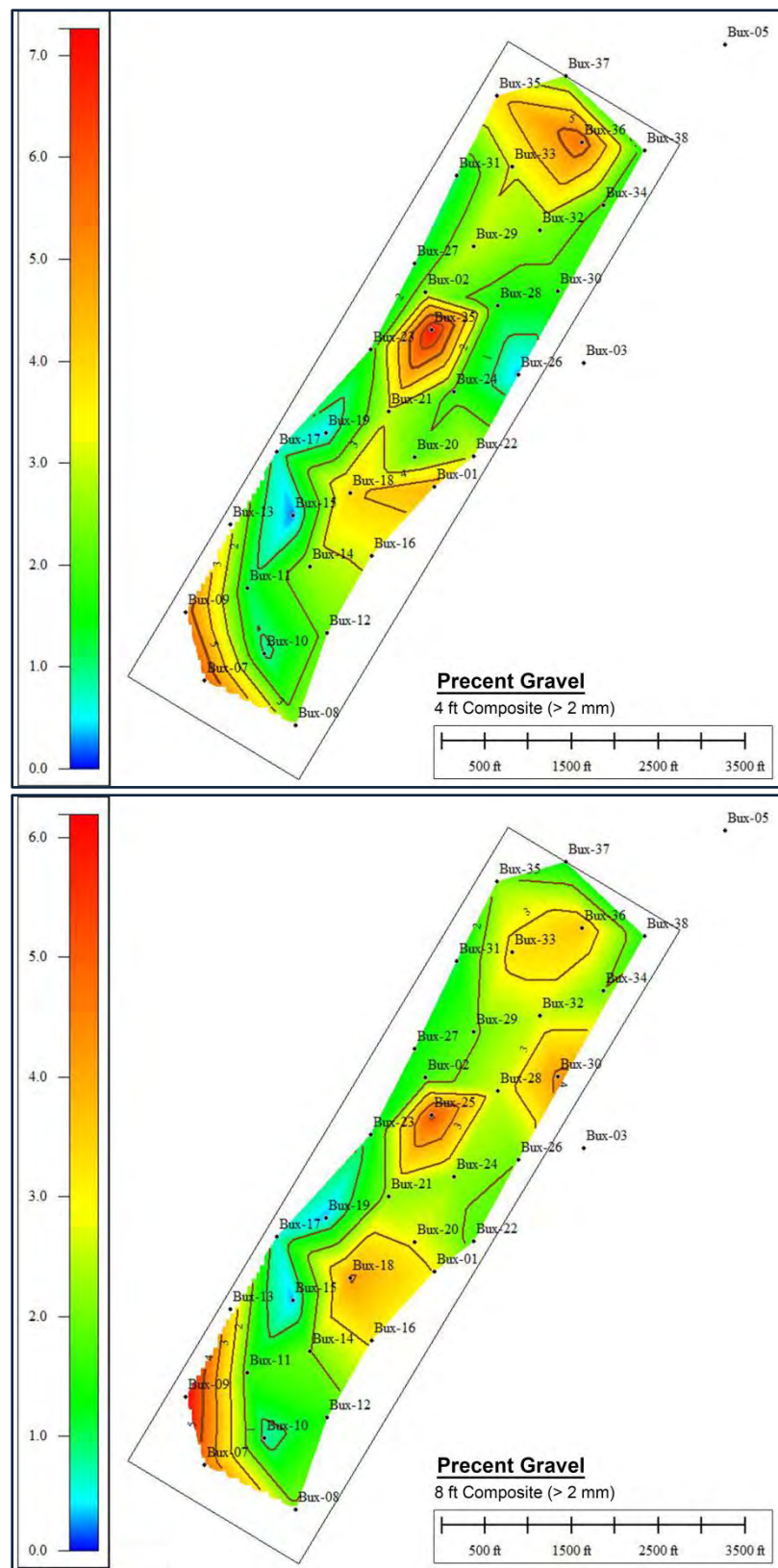


FIGURE 4.7. Isopach map of percent gravel to 4 ft (upper) and 8 ft (lower) based on 30+ cores within the indicated sand search grid off Buxton. Composite results to 6 ft are similar and fall between 4 ft and 8 ft results.

4.2 Oregon Inlet Channel Maintenance for Possible Borrow Source

As part of the review of alternative borrow sources, this section provides results of prior analyses of Oregon Inlet sediments. CSE (2005) obtained a limited number of samples and cores from the Oregon Inlet channel, adjacent spit, and Pea Island disposal area in consideration of possible use of Oregon Inlet dredge spoils for Dare County nourishment projects.

Under USACE Section 933, it is possible for communities to cost-share navigation projects, such as inlet maintenance, and place the spoil directly on the beach. This practice is encouraged to make “best use” of dredged material. If the cost of disposal onshore exceeds the least-cost disposal option (such as offshore disposal), a community has the option of paying the difference to the federal government and receiving the spoil. Such 933 projects have been implemented at Indian Beach and Pine Knoll Shores (NC) (cf, CSE 2004 and www.carteretcountyncgov/295/shore-protection).

A 933 project for Buxton would require transfer of material to an ocean-going hopper dredge, steaming ~45 miles to Buxton, and pumpout of the material via a submerged line to shore. At Bogue Banks (NC), similar projects involved steaming distances of ~20–25 miles. Presently, USACE disposes spoil from the inlet about 0.5 mile south along Pea Island. It is not considered feasible to perform maintenance in the inlet via hopper dredge because of depth limitations. Consequently, spoil would have to be pumped from cutterhead dredges offshore to a hopper dredge with pumpout capability.

For a 933 project to be cost effective, the difference in costs between Pea Island disposal and Buxton disposal would have to be less than the cost of using offshore Area C. Furthermore, the quality of sediment in the inlet would have to be comparable to Area C and the native beach. Otherwise, a larger volume of Oregon Inlet spoil would be required to achieve the same performance as Area C sediment (NRC 1995, Dean 2002).

Figure 4.8 shows localities in the inlet (via custom clam-shell grab sampler), on Bodie Island spit, and on the Pea Island disposal area previously sampled by CSE. Short cores were obtained on Bodie Island spit (OR-10 and OR-11) and on Pea Island (OR-12 and OR-13) to sample through a section of spoil material (ie, surface, 0–1 ft, and 1–2 ft below substrate) from recent inlet maintenance projects. The sediment test results are given in Table 4.6. (For additional information, see USACE 2010.) A glance at Table 4.6 shows that the typical grain size in Oregon Inlet, on Bodie Island spit, and on Pea Island (disposal area) averages ~0.3 mm (medium sand) with low percentages of gravel. This is considerably finer than the

native beach or the majority of samples tested from Buxton beach and offshore Area C. While the CSE sampling was by no means exhaustive, the general lack of coarse sand is not surprising and likely represents conditions for much of the inlet. Pre-project sediment sampling along the National Seashore on Bodie Island and along Nags Head prior to the 2011 nourishment project confirmed Nags Head sand sizes generally fine from north to south. The results for Oregon Inlet sediments reinforced this observed trend.

Based on the significantly finer grain size of Oregon Inlet sands and the long transportation distance, its use as a borrow area for the Buxton project is rejected.



FIGURE 4.8. Oregon Inlet, Bodie Island spit (Cape Hatteras National Seashore), and Pea Island showing general location of sediment samples obtained by CSE (2005) prior to the 2011 nourishment project along Nags Head (USACE 2010). Sample positions in red consisted of triplicate samples from the surface, 0–1 ft, and 1–2 ft below the substrate.

TABLE 4.6. Oregon Inlet sediment characteristics (June-July 2005 survey). Station OR-10 and station OR-11 are on Bodie Island spit; station OR-12 and station OR-13 are on Pea Island. [*P=pebble, G=granule, VCS=very coarse sand, CS=coarse sand, MS=medium sand, FS=fine sand, ms=moderately sorted, mws=moderately well sorted, ws=well sorted, ps=poorly sorted, c-s=coarse skewed, sc-s=strongly coarse skewed, f-s=fine skewed, sym=symmetrical size distribution, ns=nearly symmetrical.] (After CSE 2005, USACE 2010)

Locality (Borrow Area)	Core ID	Sample ID	Interval (ft)	Grain Size Distributions			% Coarser Than 2 mm	% <0.0625 mm	% Carbonate	Sediment Description*
				Mean (mm)	Std Dev (mm)	Skewness				
Oregon Inlet Shoals & Channel	OR-1	Grab	N/A	0.420	0.570	-0.276	11.9	0.00	2.8	MS,ps,sc-s
	OR-2	Grab	N/A	0.314	0.747	-0.237	0.3	0.00	0.4	MS,ws,ns
	OR-3	Grab	N/A	0.231	0.710	-0.548	0.0	0.01	0.6	FS,ws,c-s
	OR-4	Grab	N/A	0.311	0.461	-0.397	20.5	0.00	18.0	CS,vps,sc-s
	OR-5	Grab	N/A	0.688	0.579	0.199	19.0	0.00	2.6	CS,ps,c-s
	OR-6	Grab	N/A	0.192	0.793	-0.393	0.1	0.01	0.4	FS,vws,ns
	OR-7	Grab	N/A	0.233	0.699	-0.506	0.5	0.01	0.5	FS,ws,c-s
	OR-8	Grab	N/A	0.359	0.602	-0.206	1.0	0.00	2.9	MS,ms,ns
	OR-9	Grab	N/A	0.255	0.671	-0.784	1.7	0.00	0.7	FS,mws,c-s
	Averages			0.334	0.648	-0.350	6.1	0.00	3.2	MS,ms,c-s
Oregon Inlet Pea Island	OR-10	OR-10-A	Surface	0.247	0.775	0.086	0.0	0.00	0.3	FS,vws,fs
		OR-10-B	0-1'	0.244	0.785	-0.139	0.0	0.00	0.3	FS,vws,fs
		OR-10-C	1-2'	0.227	0.737	0.171	0.0	0.00	0.4	FS,ws,fs
	OR-11	OR-11-A	Surface	0.177	0.732	-0.218	0.0	0.01	0.3	FS,ws,ns
		OR-11-B	0-1'	0.223	0.776	0.008	0.0	0.02	2.7	FS,vws,ns
		OR-11-C	1-2'	0.242	0.773	-0.336	0.4	0.01	0.4	FS,vws,fs
	OR-12	OR-12-A	Surface	0.375	0.545	-0.425	2.6	0.00	2.6	MS,ms,sc-s
		OR-12-B	0-1'	0.324	0.691	-0.346	0.5	0.00	0.7	MS,mws,ns
		OR-12-C	1-2'	0.397	0.654	-0.189	0.5	0.01	1.2	MS,mws,ns
	OR-13	OR-13-A	Surface	0.310	0.709	0.031	0.2	0.01	0.4	MS,ws,ns
		OR-13-B	0-1'	0.282	0.734	-0.050	0.0	0.00	0.2	MS,ws,ns
		OR-13-C	1-2'	0.278	0.686	-0.236	0.0	0.00	0.2	MS,mws,c-s
	Averages			0.290	0.700	-0.196	0.5	0.00	1.0	MS,ws,ns

5.0 SEDIMENT COMPATIBILITY

CSE evaluated sediment compatibility by comparison of grain-size distribution (GSD) of all “native” beach and offshore borrow areas sampled. Select groups of beach and offshore samples were also compared. The GSDs of each group of samples are weighted composites using the results of individual sample splits to derive numeric results for each size interval. Four groups of native beach samples were considered:

Comp 140 – All samples (n=140)

Comp 130 – Excludes trough samples (n=130)

Comp 120 – Excludes trough and low-tide step samples (n=120)

Comp 60 – Subaerial samples from dune to mid tide (n=60)

Figure 5.1 contains the set of composited beach sample GSDs. A striking result is the poor sorting for the three groups which represent the majority of the October 2014 samples. Only Comp 60 (visible beach) showed moderate sorting. Poor sorting is reflected in the broad size-frequency distributions with no dominant size class. Large proportions of coarse sediment (<1.0 phi) are present in all composites. The size distribution narrows considerably for Comp 60 with a better defined peak in the 0.5–1.5 phi size range (~0.7–0.4 mm). Elimination of the trough and low-tide step samples drops the mean grain size from 0.456 mm (all samples) to 0.380 mm (Comp 120). Comp 60 mean is 0.582 mm versus a mean of ~0.435 mm for August 2013 (summer) subaerial samples.

Similar composite GSDs were computed for cores in the offshore sand search area. All cores in the box and selected cores within a smaller area of the box were evaluated. Table 5.1 lists the available cores and applicable cores for the analysis (ie, “All cores”– n=33 and “Select cores”– n=24). Weighted GSDs were computed for the upper 4 ft, upper 6 ft, and upper 8 ft composited length (Attachment 3).

Figure 5.2 contains the set of composited borrow area GSDs. The results show relative uniformity of size distribution with means ranging from 0.438 mm (all cores to “8 ft”) to 0.494 mm (select cores to “4 ft”). Composite borrow sediments were classed as moderately sorted and coarse skewed typical of most beaches (Komar 1998).

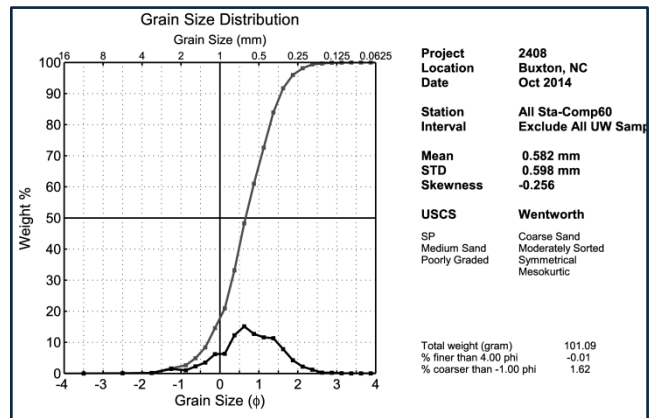
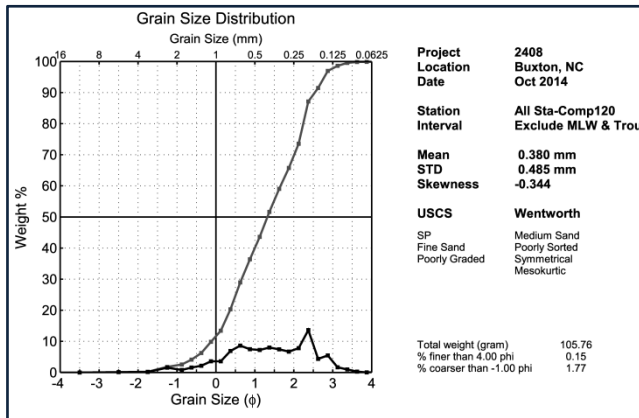
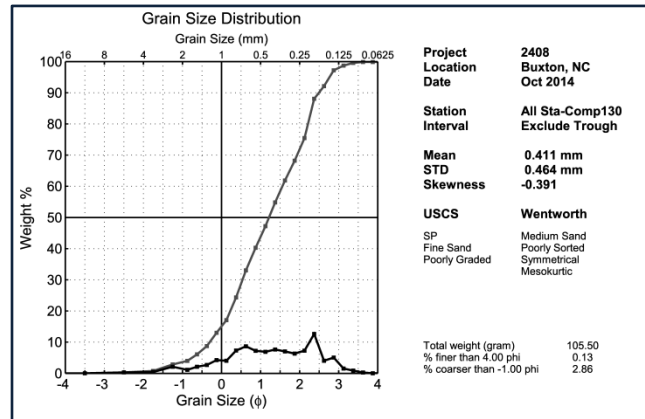
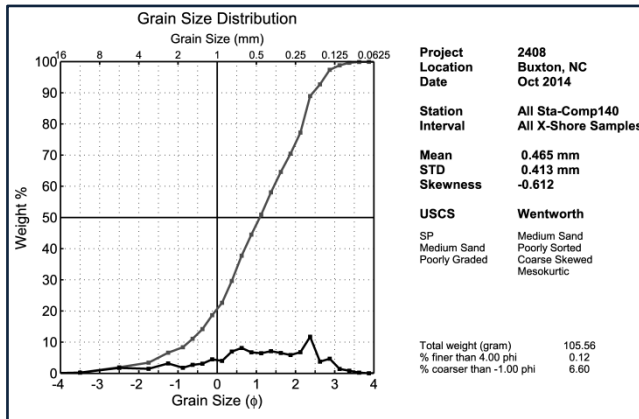


FIGURE 5.1. Grain-size distribution (frequency and cumulative frequency) for composited groups of October 2014 beach samples showing the poor sorting across the littoral zone from the dune to the -24-ft depth contour (Comp 140 n=140). The other graphs show results for select groups of beach samples.

TABLE 5.1. CSE cores obtained off the Buxton project area. Initial cores (August 2013) include four borings (shaded cells) outside the October 2014 sand search area, represented by "All Cores." "Select" cores are a subset of cores within the central ~75 percent of the sand search area.

Core #	Length (ft)	Easting	Northing	"All Cores"	Core #	"Select Cores" – 8 ft Composite			Meets NC Criteria
						Mean Size	Shell %	Gravel %	
Bux-01	9.5	3,048,052.11	561,226.75	Bux-01	Bux-02	0.530	21.7	1.6	No*
Bux-02	6.9	3,047,948.70	563,460.43	Bux-02	Bux-07	0.430	11.4	4.7	Yes
Bux-03*	6.6	3,049,777.00	562,649.68	Bux-07	Bux-09	0.483	11.1	6.2	Yes
Bux-04*	7.9	3,049,570.18	567,117.04	Bux-08	Bux-10	0.347	7.7	0.7	Yes
Bux-05*	6.3	3,051,398.48	566,306.29	Bux-09	Bux-11	0.295	9.7	1.6	Yes
Bux-06*	3.4	3,051,295.07	568,539.97	Bux-10	Bux-14	0.465	15.4	2.0	Yes
Bux-07	6.3	3,045,405.53	559,002.16	Bux-11	Bux-15	0.400	8.6	0.3	Yes
Bux-08	7.6	3,046,459.04	558,493.04	Bux-12	Bux-17	0.337	9.1	0.6	Yes
Bux-09	4.5	3,045,193.69	559,784.32	Bux-14	Bux-18	0.530	19.5	4.1	Yes
Bux-10	7.2	3,046,101.67	559,315.65	Bux-15	Bux-19	0.426	8.7	0.3	Yes
Bux-11	5.7	3,045,901.72	560,065.71	Bux-16	Bux-20	0.439	16.1	2.9	Yes
Bux-12	7.1	3,046,822.51	559,552.00	Bux-17	Bux-21	0.552	18.0	2.2	Yes
Bux-13	ND	3,045,708.57	560,794.90	Bux-18	Bux-23	0.513	9.3	1.1	Yes
Bux-14	7.3	3,046,623.90	560,309.27	Bux-19	Bux-24	0.497	22.3	2.2	No*
Bux-15	6.4	3,046,430.41	560,898.02	Bux-20	Bux-25	0.661	25.6	5.2	No*
Bux-16	7.9	3,047,327.59	560,431.72	Bux-21	Bux-27	0.504	14.1	1.3	Yes
Bux-17	4.9	3,046,238.24	561,625.71	Bux-22	Bux-28	0.496	17.5	2.6	Yes
Bux-18	9.3	3,047,081.22	561,159.82	Bux-23	Bux-29	0.524	17.6	1.9	Yes
Bux-19	9.3	3,046,803.59	561,847.64	Bux-24	Bux-31	0.583	16.3	1.1	Yes
Bux-20	9.4	3,047,824.83	561,565.93	Bux-25	Bux-32	0.481	17.6	2.6	Yes
Bux-21	6.9	3,047,525.05	562,090.97	Bux-26	Bux-33	0.563	19.8	3.3	Yes
Bux-22	7.9	3,048,503.65	561,573.20	Bux-27	Bux-35	0.515	13.7	2.1	Yes
Bux-23	8.2	3,047,320.20	562,807.20	Bux-28	Bux-36	0.494	17.9	3.6	Yes
Bux-24	7.0	3,048,283.05	562,321.28	Bux-29	Bux-37	0.470	16.0	1.2	Yes
Bux-25	7.0	3,048,025.59	563,028.85	Bux-30					
Bux-26	8.2	3,049,016.62	562,509.56	Bux-31	Averages	0.481	15.2	2.3	Yes
Bux-27	7.4	3,047,827.72	563,794.81	Bux-32					
Bux-28	8.5	3,048,779.51	563,305.25	Bux-33			*>15% shell over ambient		
Bux-29	9.0	3,048,506.09	563,988.74	Bux-34					
Bux-30	9.2	3,049,468.77	563,476.00	Bux-35					
Bux-31	6.3	3,048,308.39	564,799.63	Bux-36					
Bux-32	6.3	3,049,263.50	564,174.98	Bux-37					
Bux-33	5.2	3,048,951.92	564,897.99	Bux-38					
Bux-34	7.6	3,049,994.27	564,459.98						
Bux-35	8.0	3,048,776.92	565,716.91						
Bux-36	9.4	3,049,747.80	565,185.56	Search Area	"Select" Area				
Bux-37	7.8	3,049,561.71	565,942.48	2250 x 8500 ft	Irregular				
Bux-38	7.2	3,050,467.85	565,091.73	439.05 Acres	~273.7 Acres				
Average	7.3		<i>Applicable:</i>	<i>33 cores</i>	<i>24 cores</i>				
			~Core Density:	1 per 13.3 Ac	1 per 11.4 Ac				

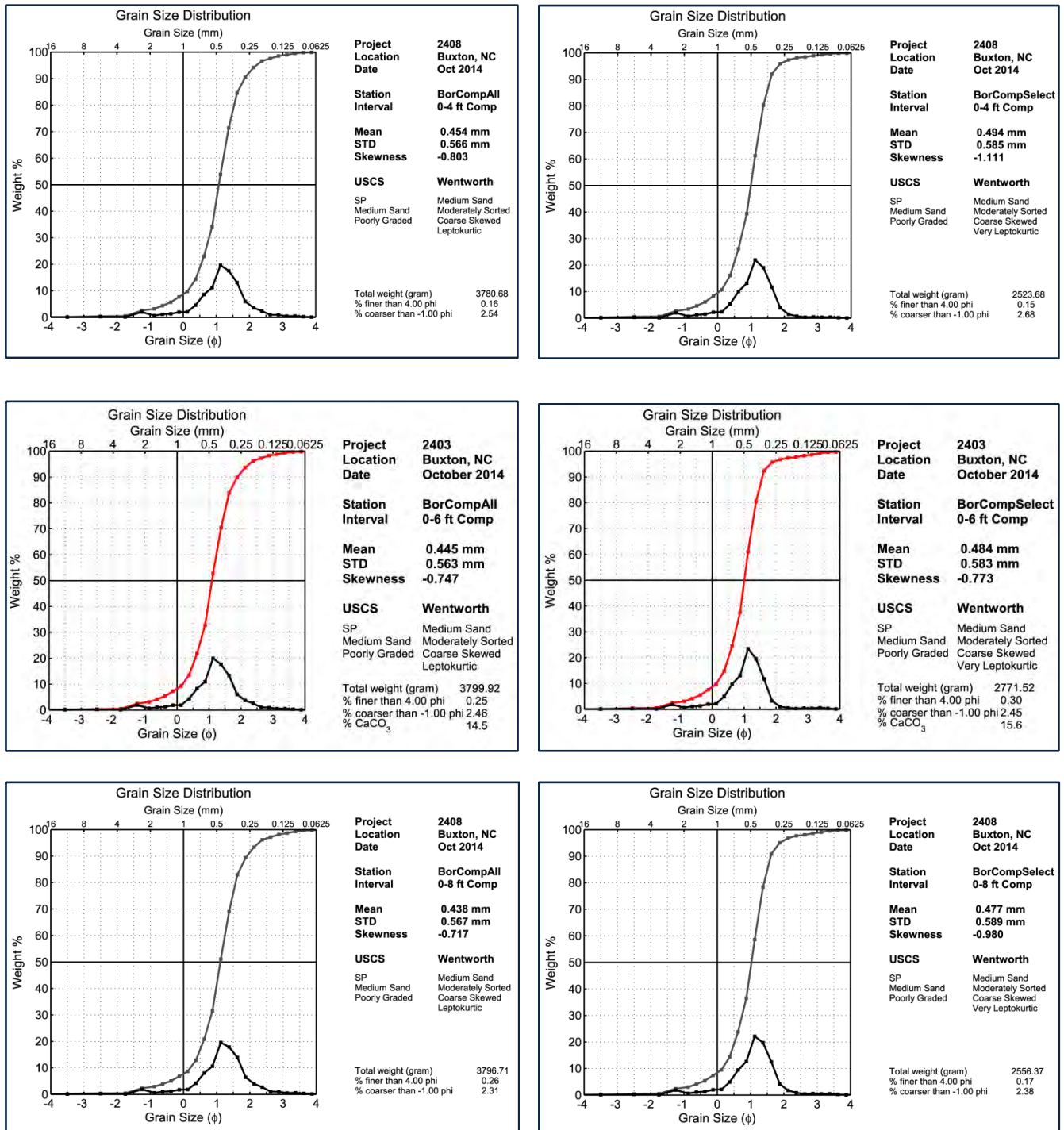


FIGURE 5.2. Grain-size distribution (frequency and cumulative frequency) for composited groups of offshore borings showing better sorting than the “beach” composites (Fig 5.1). The graphs include composite results for “all” (n=33) borings within the offshore sand search area and “select” (n=24) borings encompassing about 75 percent of the sand search area.

Figures 5.3–5.5 provide comparative frequency and cumulative frequency size distributions for native and borrow sediments. The first set of comparisons utilizes all beach samples ($n=140$) and four different borrow composites within the primary search box. Comparisons of beach sediments are made with the composite 4 ft, 6 ft, and 8 ft borrow sediments for all cores ($n=33$) and select cores ($n=24$). Note the close match in D_{50} for each comparison (ie, where the two cumulative curves intersect).

Figure 5.4 offers the same comparisons but utilizes Beach Comp 130 (excluding coarse trough samples). Figure 5.5 shows the comparisons utilizing Beach Comp 60, which omits all underwater samples from the native size distribution. The shapes of the frequency curves match more closely although the subaerial beach means are roughly 0.1–0.15 mm coarser under Comp 60. As previously discussed, sampling of the subaerial beach in August 2013 yielded a mean grain size of 0.435 mm, a result that is within 0.01–0.06 of the various combinations of borrow means in Figures 5.3–5.5.

CSE also computed overfill factors, R_A , for various combinations of native GSDs and each core. The overfill factor, R_A (CERC 1984) provides a measure of how a particular sediment will perform as beach nourishment. Low R_A 's are generally preferred, with ideal being equal to 1.0. To apply the method, a native sediment size must be assumed. In this case, three possible native size distributions were applied:

- 1) Comp 140 representing all sediments sampled on the beach to deep water in October 2014.
- 2) Comp 130 representing all but the trough sediments.
- 3) Comp 60 representing all subaerial beach samples.

In the first case, the mean grain size (M_z) is 0.465 mm. In the second case, $M_z=0.411$ mm, and in the third case, $M_z=0.582$ mm.

Table 5.2a provides the R_A 's for each core composite to 4 ft; Table 5.2b provides R_A 's for each core composite to 6 ft; and Table 5.2c provides R_A 's for each core composite to 8 ft. [Because mud was only found in trace amounts (order of 0.1 percent), it is not factored into the calculation here.] Each table lists the applicable mean and standard deviation in phi units which are required in the James (1975) formulation (CERC 1984). Inspection of Table 5.2 shows that R_A 's range from ~1.0 to >10. Approximately 60 percent of the samples have R_A 's less than 2.0 for the various combinations of native samples and composite core depths.

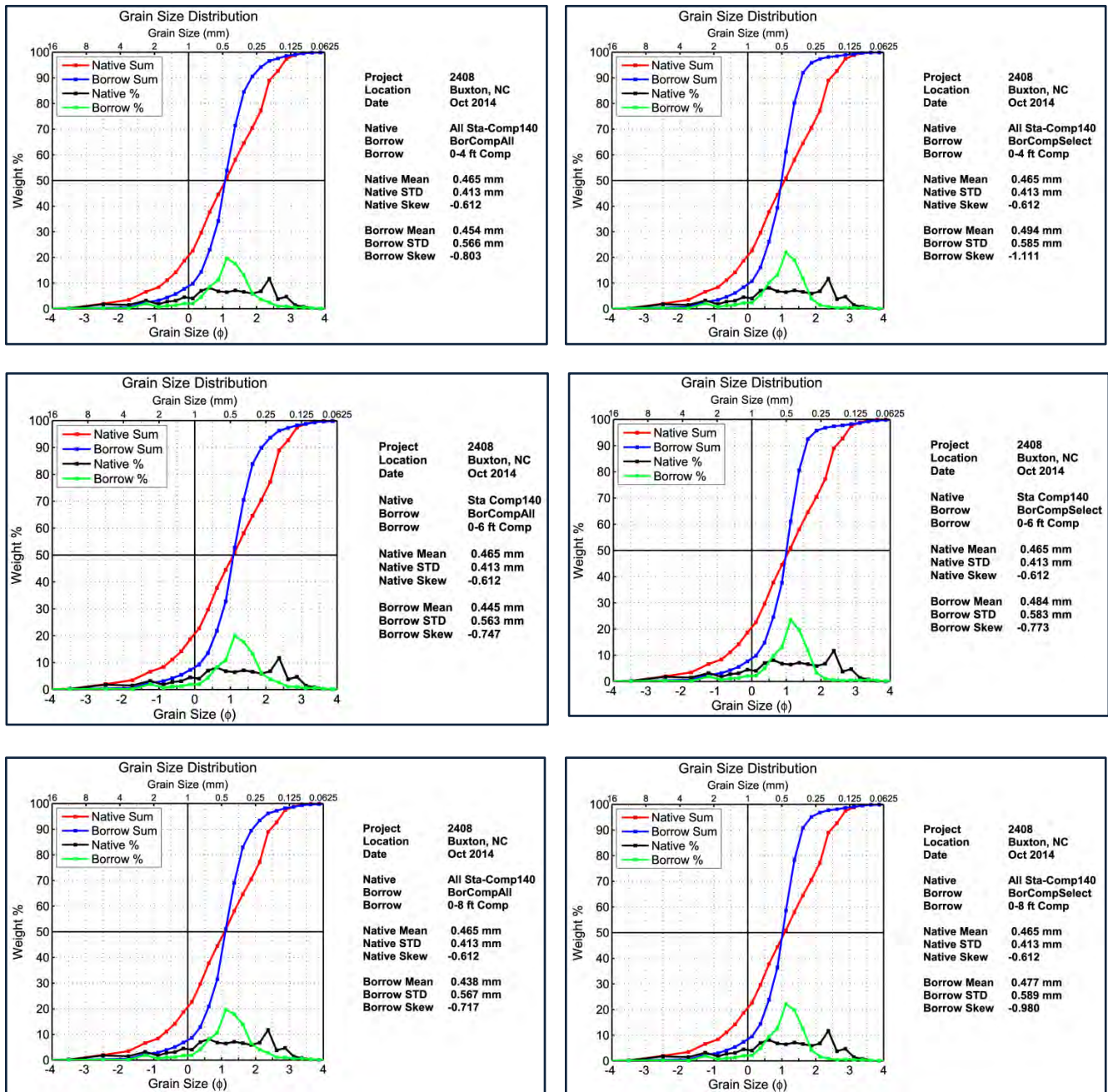


FIGURE 5.3. GSDs for Buxton native beach samples (n=140) compared with offshore samples to (upper) 4 ft (composite), to (middle) 6 ft composite, and to (lower) 8 ft (composite). "BorComp All" applies all 33 cores within the primary sand search area. "BorComp Select" applies to 24 cores from within the central ~75 percent of the sand search area.

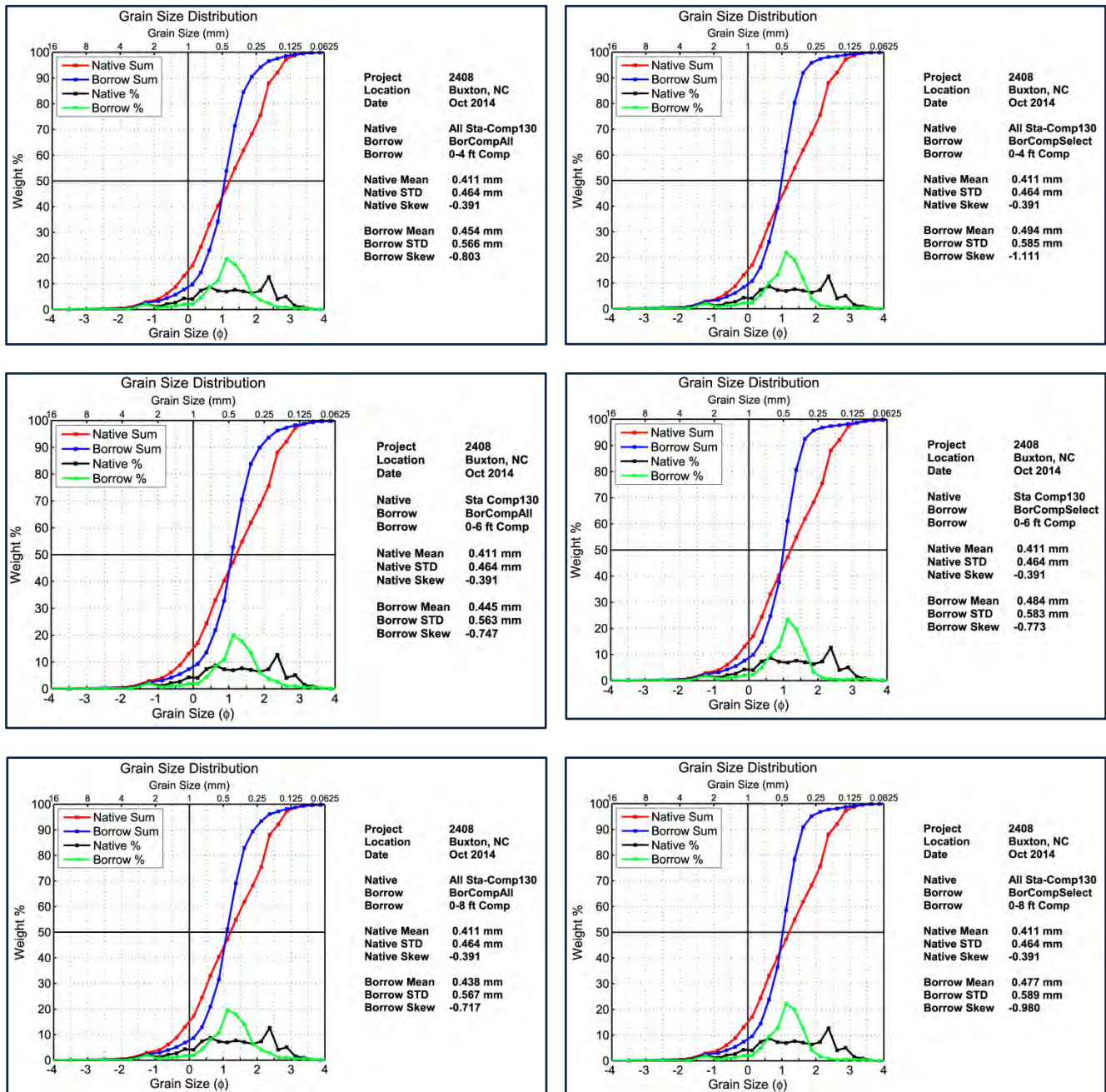


FIGURE 5.4. GSDs for Buxton native beach samples (n=130, omitting trough) compared with offshore samples to (upper) 4 ft (composite), to (middle) 6 ft (composite), and to (lower) 8 ft (composite). “BorComp All” applies to all 33 cores within the primary sand search area. “BorComp Select” applies to 24 cores from within the central ~75 percent of the sand search area.

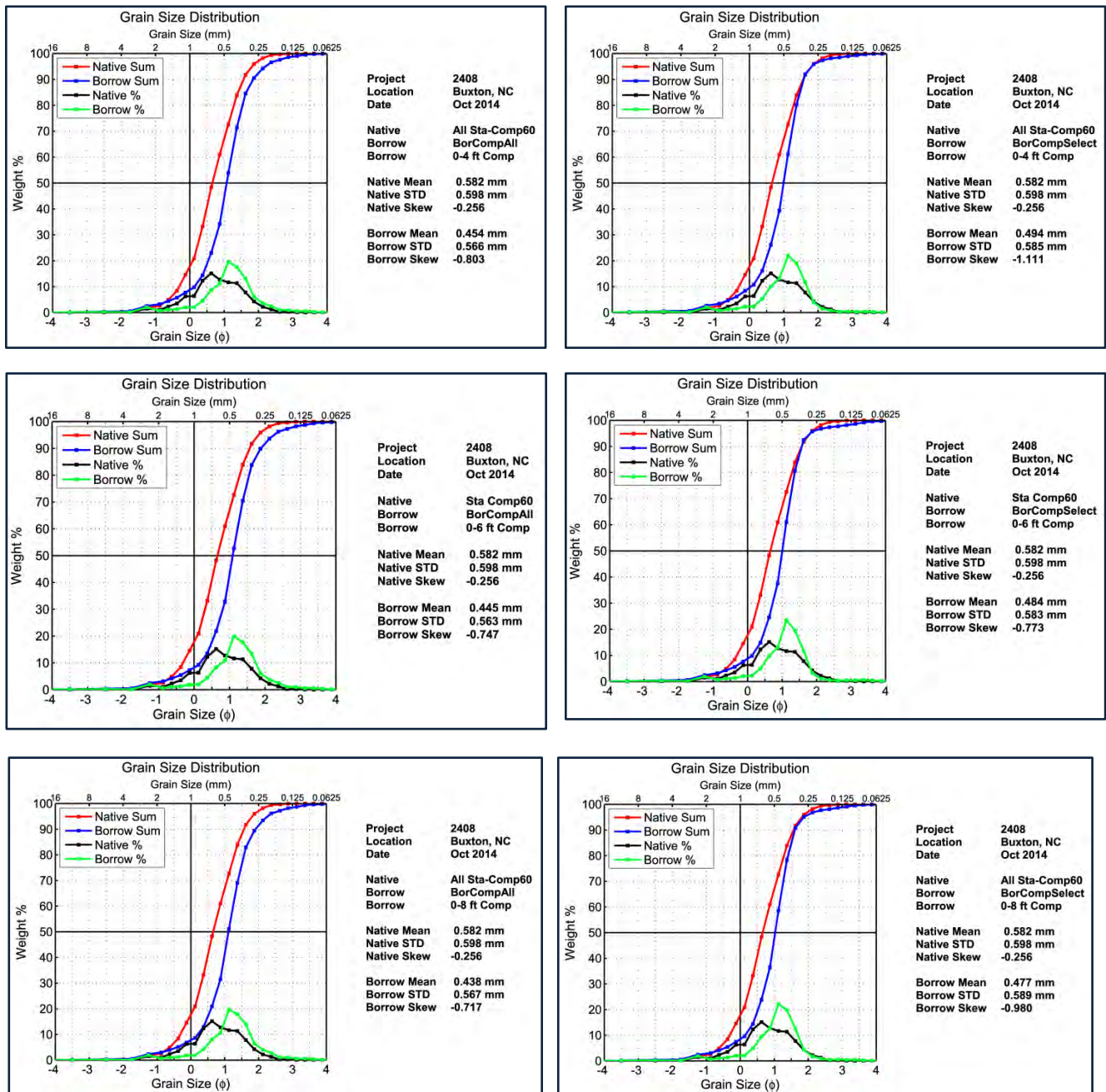


FIGURE 5.5. GSDs for Buxton native beach samples (n=60, only subaerial samples) compared with offshore samples to (upper) 4 ft (composite), to (middle) 6 ft (composite), and to (lower) 8 ft (composite). “BorComp All” applies to all 33 cores within the primary sand search area. “BorComp Select” applies to 24 cores from within the central ~75 percent of the sand search area.

TABLE 5.2a. Computed R_{AS} (overfill factor) for each composite core sample (4 ft composite) compared with three composite native beach results (Comp 140 – all beach samples; Comp 130 – exclude trough samples; Comp 60 – subaerial beach samples).

Buxton Borrow Area Sediment Characteristics		Method of Moments		Shell %	Gravel %	RA Comp140 Mn=1.104 Sn=1.277	RA Comp60 Mn=.780 Sn=.743	RA Comp130 Mn=1.284 Sn=1.108
		Mean	STD					
		phi	phi					
Bux 1	0-4 ft Comp	1.268	0.913	20.3	4.5	1.7	1.9	1.1
Bux 2	0-4 ft Comp	0.822	0.632	24.4	2.5	1.6	1.2	1.0
Bux 3	0-4 ft Comp	1.904	1.067	11.0	2.6	4.1	4.3	2.3
Bux 4	0-4 ft Comp	1.126	0.633	12.7	1.0	3.6	2.5	1.5
Bux 5	0-4 ft Comp	1.483	0.768	9.6	2.3	5.6	4.3	2.0
Bux 6	0-4 ft Comp	0.685	2.293	39.9	27.7	1.2	1.5	1.2
Bux 7	0-4 ft Comp	1.204	0.964	11.4	5.8	1.4	1.6	1.0
Bux 8	0-4 ft Comp	2.063	0.946	8.0	2.4	10.0	10.0	4.8
Bux 9	0-4 ft Comp	1.096	1.153	10.3	5.4	1.1	1.4	1.0
Bux 10	0-4 ft Comp	1.557	0.532	8.0	0.8	10.0	10.0	10.0
Bux 11	0-4 ft Comp	1.746	1.049	9.2	1.2	3.0	3.3	1.9
Bux 12	0-4 ft Comp	1.613	0.797	9.6	2.2	8.6	5.8	2.5
Bux 14	0-4 ft Comp	0.974	0.719	18.3	2.6	1.6	1.4	1.1
Bux 15	0-4 ft Comp	1.281	0.456	8.4	0.2	10.0	10.0	10.0
Bux 16	0-4 ft Comp	1.231	0.832	16.7	3.2	1.9	2.0	1.2
Bux 17	0-4 ft Comp	1.345	0.884	8.2	0.7	2.1	2.2	1.3
Bux 18	0-4 ft Comp	0.938	0.725	17.9	4.0	1.5	1.3	1.0
Bux 19	0-4 ft Comp	1.253	0.420	7.9	0.4	10.0	10.0	10.0
Bux 20	0-4 ft Comp	1.133	0.674	14.8	2.1	2.8	2.2	1.3
Bux 21	0-4 ft Comp	0.777	0.658	19.4	2.9	1.4	1.1	1.0
Bux 22	0-4 ft Comp	1.635	0.926	11.2	3.0	3.6	3.6	1.9
Bux 23	0-4 ft Comp	0.871	0.567	7.7	1.7	2.3	1.5	1.2
Bux 24	0-4 ft Comp	0.945	0.594	23.0	1.8	2.5	1.7	1.2
Bux 25	0-4 ft Comp	0.433	0.940	29.3	7.1	1.0	1.0	1.0
Bux 26	0-4 ft Comp	1.731	0.616	6.2	0.3	10.0	10.0	10.0
Bux 27	0-4 ft Comp	0.945	0.525	14.4	1.2	4.3	2.2	1.4
Bux 28	0-4 ft Comp	1.053	0.596	14.6	1.5	3.6	2.3	1.4
Bux 29	0-4 ft Comp	0.823	0.634	21.0	2.9	1.6	1.2	1.0
Bux 30	0-4 ft Comp	1.289	0.716	10.8	1.7	3.7	3.0	1.6
Bux 31	0-4 ft Comp	0.742	0.510	16.6	1.1	2.1	1.3	1.1
Bux 32	0-4 ft Comp	0.975	0.699	18.5	2.4	1.7	1.5	1.1
Bux 33	0-4 ft Comp	0.846	0.657	19.9	3.1	1.5	1.2	1.0
Bux 34	0-4 ft Comp	1.319	0.671	10.5	1.9	6.6	4.0	1.9
Bux 35	0-4 ft Comp	0.758	0.743	18.2	3.9	1.2	1.1	1.0
Bux 36	0-4 ft Comp	0.821	0.881	22.0	5.6	1.1	1.1	1.0
Bux 37	0-4 ft Comp	0.882	0.599	20.7	2.3	2.0	1.4	1.1
Bux 38	0-4 ft Comp	1.330	0.688	10.0	1.7	5.7	3.8	1.9

TABLE 5.2b. Computed R_{AS} (overfill factor) for each composite core sample (6 ft composite) compared with three composite native beach results (Comp 140 – all beach samples; Comp 130 – exclude trough samples; Comp 60 – subaerial beach samples).

Buxton Borrow Area Sediment Characteristics		Method of Moments		Shell %	Gravel %	RA Comp140 Mn=1.104 Sn=1.277	RA Comp60 Mn=.780 Sn=.743	RA Comp130 Mn=1.284 Sn=1.108
		Mean	STD					
		phi	phi					
Bux 1	0-6 ft Comp	1.319	0.866	19.2	3.0	2.1	2.2	1.3
Bux 2	0-6 ft Comp	0.887	0.603	21.7	1.6	2.0	1.4	1.1
Bux 3	0-6 ft Comp	1.629	1.330	13.8	5.9	1.6	2.1	1.3
Bux 4	0-6 ft Comp	1.055	0.631	16.9	1.4	2.8	2.1	1.3
Bux 5	0-6 ft Comp	1.682	0.864	15.4	1.9	6.2	5.1	2.4
Bux 6	0-6 ft Comp	0.685	2.293	39.9	27.7	1.6	1.5	1.2
Bux 7	0-6 ft Comp	1.216	0.885	11.4	4.7	1.6	1.8	1.1
Bux 8	0-6 ft Comp	2.076	0.911	6.9	2.1	10.0	10.0	6.2
Bux 9	0-6 ft Comp	1.050	1.220	11.1	6.2	1.0	1.4	1.0
Bux 10	0-6 ft Comp	1.540	0.527	7.7	0.7	10.0	10.0	10.0
Bux 11	0-6 ft Comp	1.761	1.102	9.7	1.6	2.7	3.1	1.8
Bux 12	0-6 ft Comp	1.731	0.770	8.3	1.5	10.0	10.0	4.1
Bux 14	0-6 ft Comp	1.049	0.708	15.4	2.0	2.0	1.7	1.1
Bux 15	0-6 ft Comp	1.286	0.489	8.6	0.3	10.0	10.0	7.3
Bux 16	0-6 ft Comp	1.314	0.825	14.7	3.1	2.4	2.3	1.3
Bux 17	0-6 ft Comp	1.568	1.106	9.1	0.6	2.0	2.3	1.4
Bux 18	0-6 ft Comp	0.882	0.738	19.5	4.1	1.4	1.2	1.0
Bux 19	0-6 ft Comp	1.259	0.415	8.7	0.3	10.0	10.0	10.0
Bux 20	0-6 ft Comp	1.138	0.739	16.1	2.9	2.1	1.9	1.2
Bux 21	0-6 ft Comp	0.841	0.650	18.0	2.2	1.6	1.2	1.0
Bux 22	0-6 ft Comp	1.710	0.855	9.9	1.8	7.7	5.9	2.7
Bux 23	0-6 ft Comp	0.942	0.537	9.3	1.1	3.7	2.0	1.4
Bux 24	0-6 ft Comp	0.996	0.642	22.3	2.2	2.2	1.7	1.2
Bux 25	0-6 ft Comp	0.549	0.896	25.6	5.2	1.0	1.0	1.0
Bux 26	0-6 ft Comp	1.641	0.725	9.9	2.0	10.0	10.0	3.9
Bux 27	0-6 ft Comp	0.925	0.543	14.1	1.3	3.3	1.9	1.3
Bux 28	0-6 ft Comp	0.967	0.652	17.5	2.6	2.0	1.6	1.1
Bux 29	0-6 ft Comp	0.911	0.587	17.6	1.9	2.3	1.6	1.2
Bux 30	0-6 ft Comp	1.129	0.987	12.1	4.2	1.2	1.5	1.0
Bux 31	0-6 ft Comp	0.776	0.529	16.3	1.1	2.1	1.3	1.1
Bux 32	0-6 ft Comp	1.052	0.721	17.6	2.6	1.9	1.7	1.1
Bux 33	0-6 ft Comp	0.828	0.658	19.8	3.3	1.5	1.2	1.0
Bux 34	0-6 ft Comp	1.214	0.698	12.4	2.0	3.2	2.6	1.4
Bux 35	0-6 ft Comp	0.860	0.660	13.7	2.1	3.2	1.2	1.0
Bux 36	0-6 ft Comp	0.964	0.826	17.9	3.6	3.2	1.3	1.0
Bux 37	0-6 ft Comp	1.010	0.581	16.0	1.2	1.6	2.1	1.4
Bux 38	0-6 ft Comp	1.281	0.684	11.2	1.5	4.6	1.5	1.7

TABLE 5.2c. Computed R_{AS} (overfill factor) for each composite core sample (8 ft composite) compared with three composite native beach results (Comp 140 – all beach samples; Comp 130 – exclude trough samples; Comp 60 – subaerial beach samples).

Buxton Borrow Area Sediment Characteristics		Method of Moments		Shell %	Gravel %	RA Comp140 Mn=1.104 Sn=1.277	RA Comp60 Mn=.780 Sn=.743	RA Comp130 Mn=1.284 Sn=1.108
		Mean	STD					
		phi	phi					
Bux 1	0-8 ft Comp	1.328	0.835	19.2	3.0	2.4	2.3	1.3
Bux 2	0-8 ft Comp	0.916	0.594	21.7	1.6	2.3	1.6	1.2
Bux 3	0-8 ft Comp	1.629	1.330	13.8	5.9	1.6	2.1	1.3
Bux 4	0-8 ft Comp	1.156	0.879	16.9	1.4	1.5	1.6	1.1
Bux 5	0-8 ft Comp	1.715	0.875	15.4	1.9	6.5	5.4	2.5
Bux 6	0-8 ft Comp	0.685	2.293	39.9	27.7	1.2	1.5	1.2
Bux 7	0-8 ft Comp	1.218	0.878	11.4	4.7	1.7	1.8	1.1
Bux 8	0-8 ft Comp	2.103	0.875	6.9	2.1	10.0	10.0	9.8
Bux 9	0-8 ft Comp	1.050	1.220	11.1	6.2	1.0	1.4	1.0
Bux 10	0-8 ft Comp	1.528	0.527	7.7	0.7	10.0	10.0	10.0
Bux 11	0-8 ft Comp	1.761	1.102	9.7	1.6	2.7	3.1	1.8
Bux 12	0-8 ft Comp	1.742	0.752	8.3	1.5	10.0	27.9	4.9
Bux 14	0-8 ft Comp	1.106	0.683	15.4	2.0	2.5	2.0	1.3
Bux 15	0-8 ft Comp	1.321	0.539	8.6	0.3	10.0	10.0	4.4
Bux 16	0-8 ft Comp	1.336	0.830	14.7	3.1	2.4	2.4	1.4
Bux 17	0-8 ft Comp	1.568	1.106	9.1	0.6	2.0	2.3	1.4
Bux 18	0-8 ft Comp	0.917	0.724	19.5	4.1	1.5	1.3	1.0
Bux 19	0-8 ft Comp	1.230	0.450	8.7	0.3	10.0	10.0	10.0
Bux 20	0-8 ft Comp	1.188	0.758	16.1	2.9	2.2	2.1	1.2
Bux 21	0-8 ft Comp	0.856	0.646	18.0	2.2	1.6	1.2	1.1
Bux 22	0-8 ft Comp	1.713	0.797	9.9	1.8	10.0	9.2	3.4
Bux 23	0-8 ft Comp	0.964	0.573	9.3	1.1	3.0	1.9	1.3
Bux 24	0-8 ft Comp	1.009	0.648	22.3	2.2	2.3	1.7	1.2
Bux 25	0-8 ft Comp	0.597	0.871	25.6	5.2	1.0	1.0	1.0
Bux 26	0-8 ft Comp	1.581	0.773	9.9	2.0	9.7	6.0	2.6
Bux 27	0-8 ft Comp	0.990	0.581	14.1	1.3	3.1	2.0	1.3
Bux 28	0-8 ft Comp	1.010	0.683	17.5	2.6	2.0	1.6	1.1
Bux 29	0-8 ft Comp	0.934	0.567	17.6	1.9	2.8	1.8	1.3
Bux 30	0-8 ft Comp	1.237	0.931	12.1	4.2	1.6	1.7	1.1
Bux 31	0-8 ft Comp	0.779	0.533	16.3	1.1	2.1	1.3	1.1
Bux 32	0-8 ft Comp	1.057	0.725	17.6	2.6	1.9	1.7	1.1
Bux 33	0-8 ft Comp	0.828	0.658	19.8	3.3	1.5	1.2	1.0
Bux 34	0-8 ft Comp	1.270	0.734	12.4	2.0	3.1	2.7	1.5
Bux 35	0-8 ft Comp	0.957	0.658	13.7	2.1	1.9	1.5	1.1
Bux 36	0-8 ft Comp	1.018	0.782	17.9	3.6	1.5	1.4	1.0
Bux 37	0-8 ft Comp	1.088	0.564	16.0	1.2	6.3	3.0	1.7
Bux 38	0-8 ft Comp	1.313	0.707	11.2	1.5	4.4	3.3	1.7

Nearly 80 percent of the core composites to 4 ft, 6 ft, or 8 ft have low R_A 's when compared with the Comp 130 native size distribution (omits the outlier trough samples). While R_A 's are not considered to be definitive in matching sediment texture for nourishment (Dean 2002), the results herein suggest the majority of cores will provide good nourishment performance. The overlap of the GSDs (Figs 5.3–5.5) further supports this finding.

Oregon Inlet sediment was compared with Nags Head sediment by CSE (CSE 2005, USACE 2010) and was found to be significantly finer than the Nags Head native beach. Table 4.6 (USACE 2010) previously showed that 14 of 21 samples had a mean grain size of <0.31 mm. Table 5.3 provides the phi measures used in the calculation of R_A 's. When compared against the Nags Head native mean grain size of 0.36 or 0.47, the Oregon Inlet sediments were found to have high R_A 's (>7.0). This means that at least seven times more sediment would be required to yield the same performance as sediments with R_A 's=1.0 along Nags Head. Based on the fact that Buxton native sediments test coarser than Nags Head sediments, CSE concludes that R_A 's for Buxton would be even higher, making Oregon Inlet sands even less stable for nourishment.

TABLE 5.3. Nags Head sediment compatibility comparing Oregon Inlet sediment with the Nags Head native beach sand. (Comp 110 is a composite of 110 beach samples from the foredune to the outer littoral zone.) [From USACE 2010]

Overfill Ratios Based On Native Beach Equals Composite of All Samples (Comp 110)						MzNative=	1.465	phi (0.362 mm)
						StdDevNat=	1.091	phi (0.469 mm)
Borrow	Core	Sample	Sediment	Moment Measures		X	Y	Overfill Ratio (R_A)
Area	ID	Number	Description**	M-phi-b	Sigma-b	(Mb-Mn)/SDn	(SDB/SDn)	(R_A) on Comp 110
Oregon Inlet	OR-1	N/A	MS,ps,sc-s	1.252	0.812	-0.20	0.74	1.24
	Channel	OR-2	N/A	MS,ws,ns	1.672	0.421	0.19	>10
Spit & Pea Island	OR-3	N/A	FS,ws,c-s	2.113	0.493	0.59	0.45	>10
	OR-4	N/A	CS,vps,sc-s	1.687	1.118	0.20	1.02	1.2
	OR-5	N/A	CS,ps,c-s	0.540	0.788	-0.85	0.72	1.02
	OR-6	N/A	FS,vws,ns	2.377	0.334	0.84	0.31	>10
	OR-7	N/A	FS,ws,c-s	2.103	0.516	0.58	0.47	>10
	OR-8	N/A	MS,ms,ns	1.479	0.733	0.01	0.67	1.7
	OR-9	N/A	FS,mws,c-s	1.974	0.576	0.47	0.53	>10
	OR-10	OR-10-A	FS,vws,f-s	2.015	0.367	0.50	0.34	>10
		OR-10-B	FS,vws,f-s	2.037	0.348	0.52	0.32	>10
		OR-10-C	FS,ws,f-s	2.139	0.441	0.62	0.40	>10
	OR-11	OR-11-A	FS,ws,ns	2.495	0.451	0.94	0.41	>10
		OR-11-B	FS,vws,ns	2.163	0.366	0.64	0.34	>10
		OR-11-C	FS,vws,f-s	2.047	0.371	0.53	0.34	>10
	OR-12	OR-12-A	MS,ms,sc-s	1.413	0.875	-0.05	0.80	1.24
		OR-12-B	MS,mws,ns	1.626	0.534	0.15	0.49	5.0
		OR-12-C	MS,mws,ns	1.333	0.613	-0.12	0.56	2.0
	OR-13	OR-13-A	MS,ws,ns	1.691	0.495	0.21	0.45	>10
		OR-13-B	MS,ws,ns	1.824	0.446	0.33	0.41	>10
		OR-13-C	MS,mws,c-s	1.848	0.543	0.35	0.50	>10
Average								>7.0

Table 5.1 provided a measure of the core density within the offshore sand search area (2,250 ft by 8,500 ft) and a central corridor representing ~75 percent of the sand search area (“Select Cores”). These areas total ~439 acres and 238 acres (respectively) and are represented by 33 cores and 24 cores. The corresponding range in core density is one core per 11.4–13.3 acres. This density exceeds North Carolina standards for offshore borrow areas under Code 15A NCAC 07H.0312.

The final borrow area for the Buxton project will be determined after results of cultural resource surveys (in progress). Nevertheless, the following areas potentially provide sufficient volume to accomplish an ~2.6 million cubic yard project (Table 5.4). The minimum excavation area to provide the design volume would be ~200 acres, assuming a dredge cut averaging ~8 ft deep. More realistically, to avoid deep dredge cuts, an area 250–300 acres (ie, ~60-70 percent of the offshore search area) could provide the design volume with excavations averaging 6–7 ft.

TABLE 5.4. Sediment volumes contained in the indicated areas and depths (section thickness).

Area Acres	Volume (cy)				
	To 4 ft	To 5 ft	To 6 ft	To 7 ft	To 8 ft
200					2,581,333
250				2,823,333	3,226,667
300			2,904,000	3,388,000	3,872,000
350		2,823,333	3,388,000	3,952,667	4,517,333
400	2,581,333	3,226,667	3,872,000	4,517,333	5,162,667

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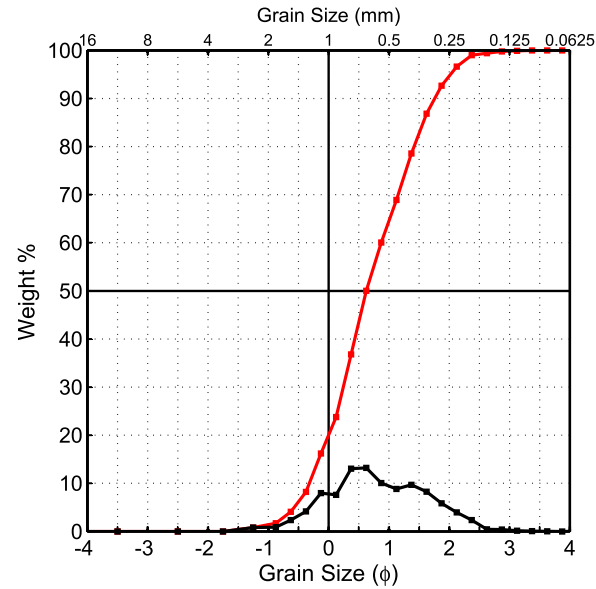
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ATTACHMENT 1A

SAMPLE GRAIN SIZE DISTRIBUTIONS (GSDs)

Individual Beach Samples

Grain Size Distribution



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1760+00
Interval Dune Toe

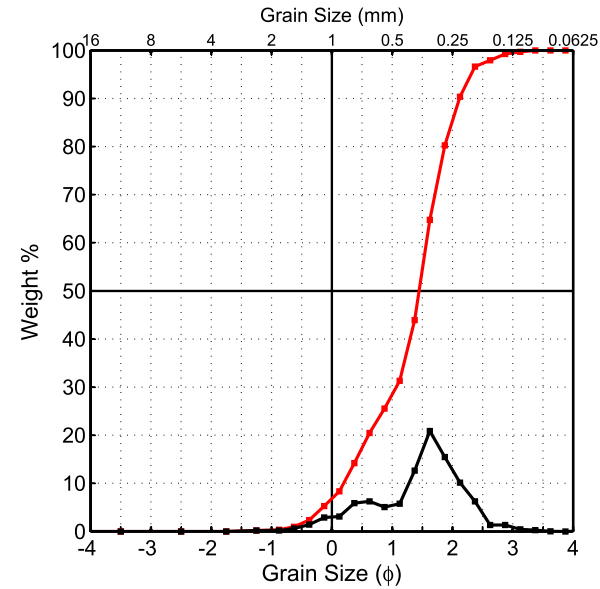
Mean 0.568 mm
STD 0.576 mm
Skewness 0.092

USCS Wentworth

SP Coarse Sand
 Medium Sand Moderately Sorted
 Poorly Graded Symmetrical
 Mesokurtic

Total weight (gram) 101.44
 % finer than 4.00 phi 0.02
 % coarser than -1.00 phi 0.82
 % CaCO₃ 6.6

Grain Size Distribution



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1760+00
Interval Dune

Mean 0.373 mm
STD 0.596 mm
Skewness -0.605

USCS Wentworth

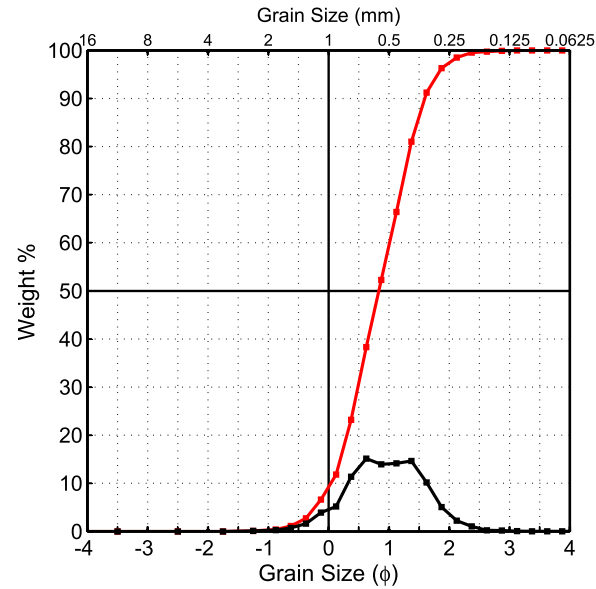
SP Medium Sand
 Fine Sand Moderately Sorted
 Poorly Graded Coarse Skewed
 Mesokurtic

Total weight (gram) 103.31
 % finer than 4.00 phi 0.01
 % coarser than -1.00 phi 0.16
 % CaCO₃ 2.2

Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-1.175	Mean		0.816	0.568
-3	-3.5	0.00	0.00	0.00	5	-0.570	Standard Deviation		0.795	0.576
-2	-2.5	0.00	0.00	0.00	16	-0.130	Skewness		0.092	
-1.5	-1.75	0.00	0.00	0.00	25	0.150	Kurtosis		2.692	
-1	-1.25	0.83	0.82	0.82	50	0.625	Dispersion			
-0.75	-0.875	0.90	0.89	1.71	75	1.285	Standard Deviation			
-0.5	-0.625	2.39	2.36	4.06	84	1.540	Deviation from Normal			
-0.25	-0.375	4.21	4.15	8.21	95	2.020				
0	-0.125	8.08	7.97	16.18	99	2.385				
0.25	0.125	7.72	7.61	23.79	Graphic Phi Parameters		Inman	Folk & Ward		
0.5	0.375	13.21	13.02	36.81			1952	1957		
0.75	0.625	13.38	13.19	50.00	Mean		0.705	0.678		
1	0.875	10.20	10.06	60.06	Standard Deviation		0.835	0.810		
1.25	1.125	8.97	8.84	68.90	Skewness (1)		0.096	0.087		
1.5	1.375	9.82	9.68	78.58	Skewness (2)		0.120			
1.75	1.625	8.36	8.24	86.82	Kurtosis		0.551	0.935		
2	1.875	5.93	5.85	92.67						
2.25	2.125	4.02	3.96	96.63						
2.5	2.375	2.39	2.36	98.98						
2.75	2.625	0.42	0.41	99.40						
3	2.875	0.38	0.37	99.77						
3.25	3.125	0.13	0.13	99.90						
3.5	3.375	0.07	0.07	99.97						
3.75	3.625	0.01	0.01	99.98						
4	3.875	0.00	0.00	99.98						
>4.0	4.25	0.02	0.02	100.00						

Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-0.620	Mean		1.421	0.373
-3	-3.5	0.00	0.00	0.00	5	-0.145	Standard Deviation		0.747	0.596
-2	-2.5	0.00	0.00	0.00	16	0.445	Skewness		-0.605	
-1.5	-1.75	0.00	0.00	0.00	25	0.850	Kurtosis		3.219	
-1	-1.25	0.17	0.16	0.16	50	1.450	Dispersion			
-0.75	-0.875	0.19	0.18	0.35	75	1.790	Standard Deviation			
-0.5	-0.625	0.63	0.61	0.96	84	1.970	Deviation from Normal			
-0.25	-0.375	1.44	1.39	2.35	95	2.310				
0	-0.125	2.99	2.89	5.25	99	2.830				
0.25	0.125	3.20	3.10	8.34	Graphic Phi Parameters		Inman	Folk & Ward		
0.5	0.375	6.06	5.87	14.21			1952	1957		
0.75	0.625	6.46	6.25	20.46	Mean		1.207	1.288		
1	0.875	5.23	5.06	25.53	Standard Deviation		0.762	0.753		
1.25	1.125	5.96	5.77	31.29	Skewness (1)		-0.318	-0.309		
1.5	1.375	13.05	12.63	43.93	Skewness (2)		-0.482			
1.75	1.625	21.54	20.85	64.78	Kurtosis		0.610	1.070		
2	1.875	15.97	15.46	80.23						
2.25	2.125	10.45	10.12	90.35						
2.5	2.375	6.46	6.25	96.60						
2.75	2.625	1.36	1.32	97.92						
3	2.875	1.37	1.33	99.24						
3.25	3.125	0.45	0.44	99.68						
3.5	3.375	0.29	0.28	99.96						
3.75	3.625	0.03	0.03	99.99						
4	3.875	0.00	0.00	99.99						
>4.0	4.25	0.01	0.01	100.00						

Grain Size Distribution



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1760+00
Interval BC

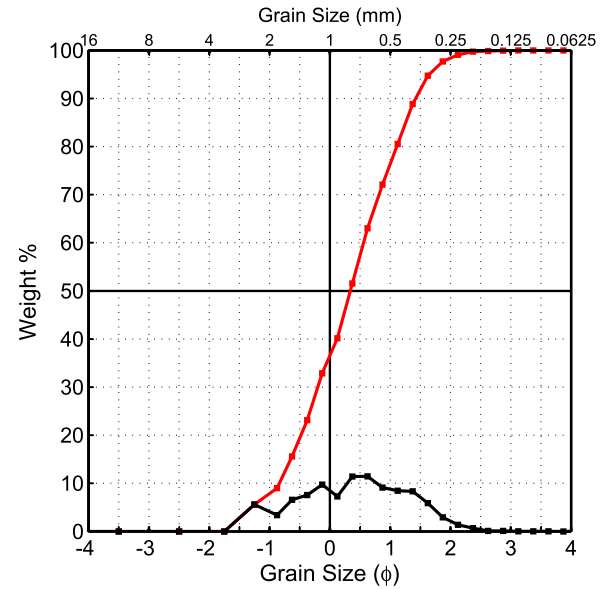
Mean 0.517 mm
STD 0.650 mm
Skewness -0.077

USCS Wentworth

SP Coarse Sand
 Medium Sand Moderately Well Sorted
 Poorly Graded Symmetrical Mesokurtic

Total weight (gram) 101.26
 % finer than 4.00 phi 0.00
 % coarser than -1.00 phi 0.12
 % CaCO₃ 4.3

Grain Size Distribution



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1760+00
Interval Berm

Mean 0.740 mm
STD 0.551 mm
Skewness -0.051

USCS Wentworth

SP Coarse Sand
 Medium Sand Moderately Sorted
 Poorly Graded Symmetrical Platykurtic

Total weight (gram) 100.04
 % finer than 4.00 phi 0.01
 % coarser than -1.00 phi 5.60
 % CaCO₃ 6.5

Limits (phi)	Mid Point (phi)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-0.670	Mean		0.952	0.517
-3	-3.5	0.00	0.00	0.00	5	-0.230	Standard Deviation		0.621	0.650
-2	-2.5	0.00	0.00	0.00	16	0.215	Skewness		-0.077	
-1.5	-1.75	0.00	0.00	0.00	25	0.405	Kurtosis		3.108	
-1	-1.25	0.12	0.12	0.12	50	0.835	Dispersion			
-0.75	-0.875	0.28	0.28	0.40	75	1.270	Standard Deviation			
-0.5	-0.625	0.74	0.73	1.13	84	1.450	Deviation from Normal			
-0.25	-0.375	1.62	1.60	2.73	95	1.810				
0	-0.125	3.95	3.90	6.63	99	2.245				
0.25	0.125	5.24	5.17	11.80						
0.5	0.375	11.52	11.38	23.18						
0.75	0.625	15.33	15.14	38.32						
1	0.875	14.12	13.94	52.26						
1.25	1.125	14.32	14.14	66.40						
1.5	1.375	14.82	14.64	81.04						
1.75	1.625	10.29	10.16	91.20						
2	1.875	5.14	5.08	96.28						
2.25	2.125	2.25	2.22	98.50						
2.5	2.375	1.04	1.03	99.52						
2.75	2.625	0.22	0.22	99.74						
3	2.875	0.17	0.17	99.91						
3.25	3.125	0.05	0.05	99.96						
3.5	3.375	0.02	0.02	99.98						
3.75	3.625	0.01	0.01	99.99						
4	3.875	0.01	0.01	100.00						
>4.0	4.25	0.00	0.00	100.00						

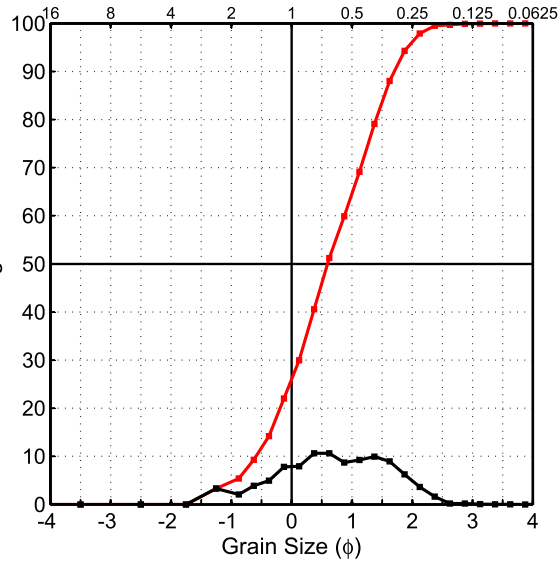
Percentiles		Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean				0.832	0.833
Standard Deviation				0.617	0.618
Skewness (1)				-0.004	-0.024
Skewness (2)				-0.073	
Kurtosis				0.652	0.967

Limits (phi)	Mid Point (phi)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-1.660	Mean		0.435	0.740
-3	-3.5	0.00	0.00	0.00	5	-1.305	Standard Deviation		0.860	0.551
-2	-2.5	0.00	0.00	0.00	16	-0.610	Skewness		-0.051	
-1.5	-1.75	0.00	0.00	0.00	25	-0.325	Kurtosis		2.427	
-1	-1.25	5.60	5.60	5.60	50	0.340	Dispersion			
-0.75	-0.875	3.39	3.39	8.99	75	0.960	Standard Deviation			
-0.5	-0.625	6.58	6.58	15.56	84	1.230	Deviation from Normal			
-0.25	-0.375	7.57	7.57	23.13	95	1.650				
0	-0.125	9.75	9.75	32.88	99	2.115				
0.25	0.125	7.26	7.26	40.13						
0.5	0.375	11.40	11.40	51.53						
0.75	0.625	11.47	11.47	62.99						
1	0.875	9.10	9.10	72.09						
1.25	1.125	8.44	8.44	80.53						
1.5	1.375	8.32	8.32	88.84						
1.75	1.625	5.89	5.89	94.73						
2	1.875	2.94	2.94	97.67						
2.25	2.125	1.39	1.39	99.06						
2.5	2.375	0.69	0.69	99.75						
2.75	2.625	0.11	0.11	99.86						
3	2.875	0.09	0.09	99.95						
3.25	3.125	0.02	0.02	99.97						
3.5	3.375	0.01	0.01	99.98						
3.75	3.625	0.01	0.01	99.99						
4	3.875	0.00	0.00	99.99						
>4.0	4.25	0.01	0.01	100.00						

Percentiles		Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean				0.310	0.320
Standard Deviation				0.920	0.908
Skewness (1)				-0.033	-0.073
Skewness (2)				-0.182	
Kurtosis				0.606	0.942

Grain Size Distribution

Grain Size (mm)



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1760+00
Interval MTL

Mean 0.610 mm
STD 0.546 mm
Skewness -0.182

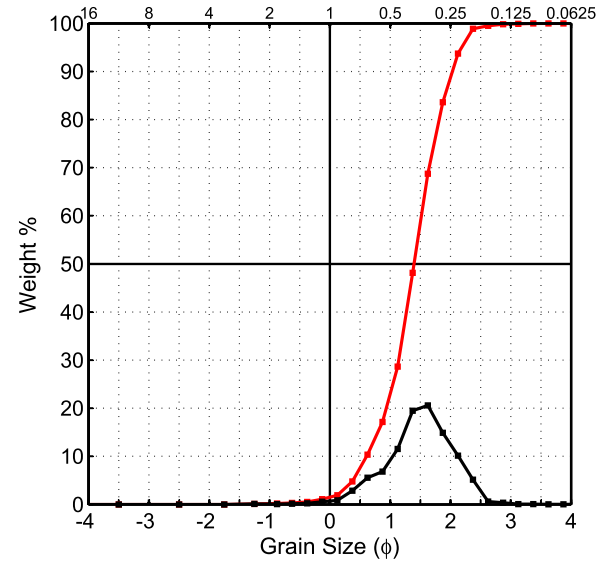
USCS Wentworth

SP Coarse Sand
 Medium Sand Moderately Sorted
 Poorly Graded Symmetrical
 Platykurtic

Total weight (gram) 99.47
 % finer than 4.00 phi 0.02
 % coarser than -1.00 phi 3.30
 % CaCO₃ 6.1

Grain Size Distribution

Grain Size (mm)



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1760+00
Interval MHW

Mean 0.358 mm
STD 0.682 mm
Skewness -0.546

USCS Wentworth

SP Medium Sand
 Fine Sand Moderately Well Sorted
 Poorly Graded Coarse Skewed
 Leptokurtic

Total weight (gram) 100.21
 % finer than 4.00 phi 0.02
 % coarser than -1.00 phi 0.12
 % CaCO₃ 2.5

Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-1.600	Mean		0.713	0.610
-3	-3.5	0.00	0.00	0.00	5	-0.945	Standard Deviation		0.874	0.546
-2	-2.5	0.00	0.00	0.00	16	-0.315	Skewness		-0.182	
-1.5	-1.75	0.00	0.00	0.00	25	-0.030	Kurtosis		2.514	
-1	-1.25	3.28	3.30	3.30	50	0.595	Dispersion			
-0.75	-0.875	2.07	2.08	5.38	75	1.270	Standard Deviation			
-0.5	-0.625	3.86	3.88	9.26	84	1.510	Deviation from Normal			
-0.25	-0.375	4.90	4.93	14.19	95	1.925				
0	-0.125	7.78	7.82	22.01	99	2.295				
0.25	0.125	7.90	7.94	29.95						
0.5	0.375	10.57	10.63	40.58						
0.75	0.625	10.56	10.62	51.19						
1	0.875	8.66	8.71	59.90						
1.25	1.125	9.19	9.24	69.14						
1.5	1.375	9.89	9.94	79.08						
1.75	1.625	8.91	8.96	88.04						
2	1.875	6.20	6.23	94.27						
2.25	2.125	3.62	3.64	97.91						
2.5	2.375	1.59	1.60	99.51						
2.75	2.625	0.19	0.19	99.70						
3	2.875	0.19	0.19	99.89						
3.25	3.125	0.05	0.05	99.94						
3.5	3.375	0.03	0.03	99.97						
3.75	3.625	0.01	0.01	99.98						
4	3.875	0.00	0.00	99.98						
>4.0	4.25	0.02	0.02	100.00						

Percentiles		Moment Measures		(phi)	(mm)
1	-1.600	Mean		0.713	0.610
5	-0.945	Standard Deviation		0.874	0.546
16	-0.315	Skewness		-0.182	
25	-0.030	Kurtosis		2.514	
50	0.595	Dispersion			
75	1.270	Standard Deviation			
84	1.510	Deviation from Normal			
95	1.925				
99	2.295				

Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean		0.597	0.597
Standard Deviation		0.912	0.891
Skewness (1)		0.003	-0.035
Skewness (2)		-0.115	
Kurtosis		0.573	0.905

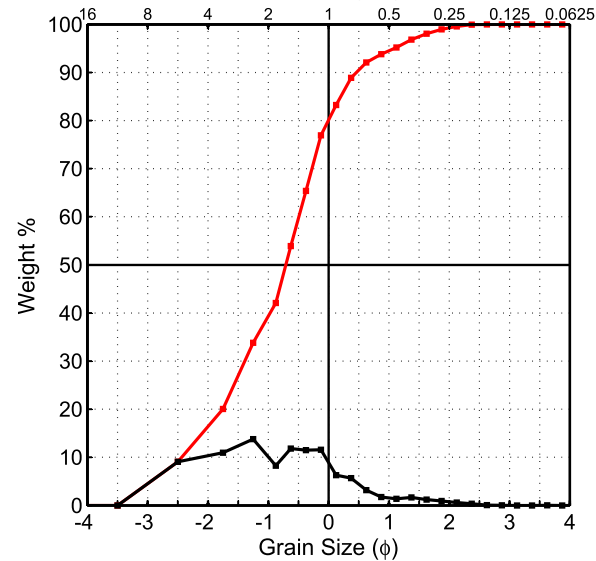
Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-0.165	Mean		1.482	0.358
-3	-3.5	0.00	0.00	0.00	5	0.385	Standard Deviation		0.552	0.682
-2	-2.5	0.00	0.00	0.00	16	0.835	Skewness		-0.546	
-1.5	-1.75	0.00	0.00	0.00	25	1.045	Kurtosis		4.243	
-1	-1.25	0.12	0.12	0.12	50	1.400	Dispersion			
-0.75	-0.875	0.06	0.06	0.18	75	1.730	Standard Deviation			
-0.5	-0.625	0.14	0.14	0.32	84	1.885	Deviation from Normal			
-0.25	-0.375	0.21	0.21	0.53	95	2.185				
0	-0.125	0.56	0.56	1.09	99	2.425				
0.25	0.125	0.83	0.83	1.92						
0.5	0.375	2.87	2.86	4.78						
0.75	0.625	5.56	5.55	10.33						
1	0.875	6.82	6.81	17.13						
1.25	1.125	11.55	11.53	28.66						
1.5	1.375	19.52	19.48	48.14						
1.75	1.625	20.64	20.60	68.74						
2	1.875	14.90	14.87	83.60						
2.25	2.125	10.14	10.12	93.72						
2.5	2.375	5.17	5.16	98.88						
2.75	2.625	0.60	0.60	99.48						
3	2.875	0.35	0.35	99.83						
3.25	3.125	0.08	0.08	99.91						
3.5	3.375	0.05	0.05	99.96						
3.75	3.625	0.01	0.01	99.97						
4	3.875	0.01	0.01	99.98						
>4.0	4.25	0.02	0.02	100.00						

Percentiles		Moment Measures		(phi)	(mm)
1	-0.165	Mean		1.482	0.358
5	0.385	Standard Deviation		0.552	0.682
16	0.835	Skewness		-0.546	
25	1.045	Kurtosis		4.243	
50	1.400	Dispersion			
75	1.730	Standard Deviation			
84	1.885	Deviation from Normal			
95	2.185				
99	2.425				

Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean		1.360	1.373
Standard Deviation		0.525	0.535
Skewness (1)		-0.076	-0.102
Skewness (2)		-0.219	
Kurtosis		0.714	1.077

Grain Size Distribution

Grain Size (mm)



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1760+00
Interval Trough

Mean 1.550 mm
STD 0.492 mm
Skewness 0.180

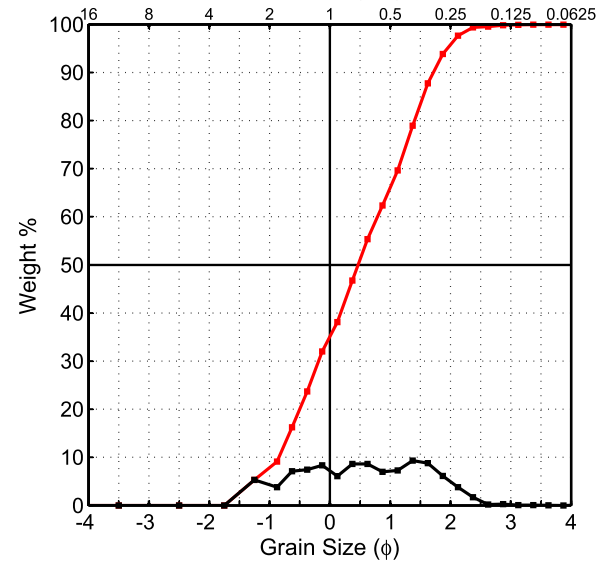
USCS Wentworth

SP Very Coarse Sand
 Medium Sand Poorly Sorted
 Poorly Graded Symmetrical
 Mesokurtic

Total weight (gram) 99.88
 % finer than 4.00 phi 0.00
 % coarser than -1.00 phi 33.81
 % CaCO₃ 13.5

Grain Size Distribution

Grain Size (mm)



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1760+00
Interval MLW

Mean 0.669 mm
STD 0.508 mm
Skewness -0.040

USCS Wentworth

SP Coarse Sand
 Medium Sand Moderately Sorted
 Poorly Graded Symmetrical
 Platykurtic

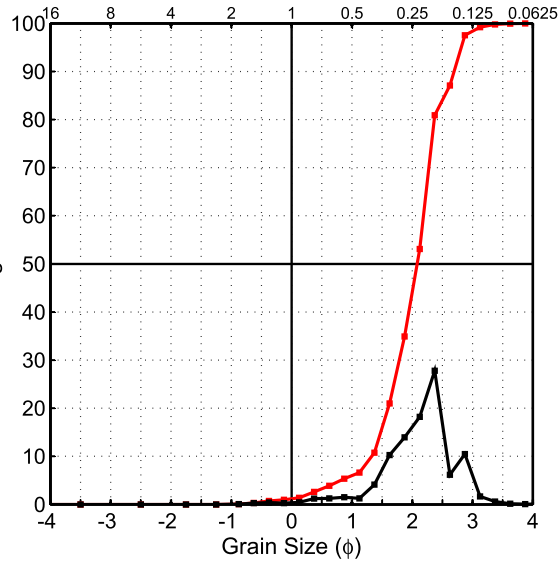
Total weight (gram) 99.77
 % finer than 4.00 phi 0.05
 % coarser than -1.00 phi 5.32
 % CaCO₃ 6.9

Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-3.390	Mean		-0.632	1.550
-3	-3.5	0.00	0.00	0.00	5	-2.950	Standard Deviation		1.023	0.492
-2	-2.5	9.05	9.06	9.06	16	-2.025	Skewness		0.180	
-1.5	-1.75	10.96	10.97	20.03	25	-1.570	Kurtosis		3.081	
-1	-1.25	13.76	13.78	33.81	50	-0.705	Dispersion			
-0.75	-0.875	8.26	8.27	42.08	75	-0.165	Standard Deviation			
-0.5	-0.625	11.80	11.81	53.89	84	0.160	Deviation from Normal			
-0.25	-0.375	11.47	11.48	65.38	95	1.090				
0	-0.125	11.54	11.55	76.93	99	1.890				
0.25	0.125	6.28	6.29	83.22	Graphic Phi Parameters					
0.5	0.375	5.67	5.68	88.90						
0.75	0.625	3.18	3.18	92.08	Inman		Folk & Ward			
1	0.875	1.72	1.72	93.80	1952		1957			
1.25	1.125	1.38	1.38	95.18	Mean		-0.932		-0.857	
1.5	1.375	1.66	1.66	96.85	Standard Deviation		1.093		1.158	
1.75	1.625	1.19	1.19	98.04	Skewness (1)		-0.208		-0.160	
2	1.875	0.93	0.93	98.97	Skewness (2)		-0.206			
2.25	2.125	0.61	0.61	99.58	Kurtosis		0.849		1.178	
2.5	2.375	0.34	0.34	99.92						
2.75	2.625	0.05	0.05	99.97						
3	2.875	0.03	0.03	100.00						
3.25	3.125	-0.01	-0.01	99.99						
3.5	3.375	0.00	0.00	99.99						
3.75	3.625	0.01	0.01	100.00						
4	3.875	0.00	0.00	100.00						
>4.0	4.25	0.00	0.00	100.00						

Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-1.655	Mean		0.581	0.669
-3	-3.5	0.00	0.00	0.00	5	-1.280	Standard Deviation		0.978	0.508
-2	-2.5	0.00	0.00	0.00	16	-0.635	Skewness		-0.040	
-1.5	-1.75	0.00	0.00	0.00	25	-0.335	Kurtosis		2.169	
-1	-1.25	5.31	5.32	5.32	50	0.470	Dispersion			
-0.75	-0.875	3.79	3.80	9.12	75	1.270	Standard Deviation			
-0.5	-0.625	7.09	7.11	16.23	84	1.520	Deviation from Normal			
-0.25	-0.375	7.43	7.45	23.67	95	1.950				
0	-0.125	8.32	8.34	32.01	99	2.325				
0.25	0.125	6.07	6.08	38.10	Graphic Phi Parameters					
0.5	0.375	8.62	8.64	46.74						
0.75	0.625	8.60	8.62	55.36	Inman		Folk & Ward			
1	0.875	6.96	6.98	62.33	1952		1957			
1.25	1.125	7.27	7.29	69.62	Mean		0.443		0.452	
1.5	1.375	9.29	9.31	78.93	Standard Deviation		1.077		1.028	
1.75	1.625	8.78	8.80	87.73	Skewness (1)		-0.026		-0.055	
2	1.875	6.10	6.11	93.85	Skewness (2)		-0.125			
2.25	2.125	3.79	3.80	97.64	Kurtosis		0.499		0.825	
2.5	2.375	1.71	1.71	99.36						
2.75	2.625	0.19	0.19	99.55						
3	2.875	0.26	0.26	99.81						
3.25	3.125	0.08	0.08	99.89						
3.5	3.375	0.05	0.05	99.94						
3.75	3.625	0.01	0.01	99.95						
4	3.875	0.00	0.00	99.95						
>4.0	4.25	0.05	0.05	100.00						

Grain Size Distribution

Grain Size (mm)



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1760+00
Interval -8 ft NAVD

Mean 0.232 mm
STD 0.659 mm
Skewness -1.225

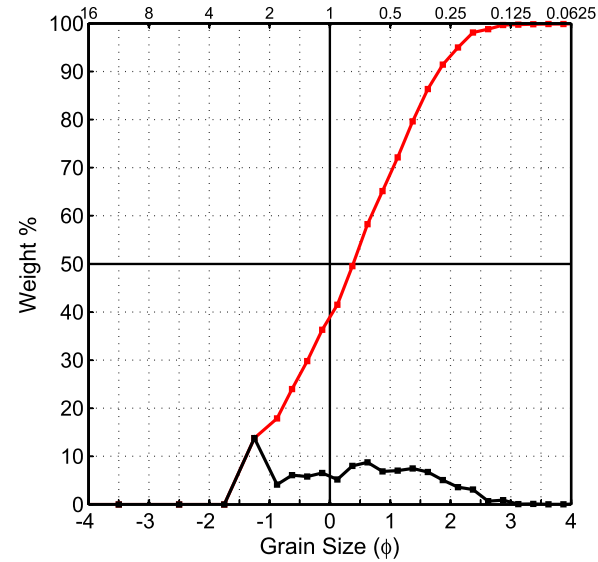
USCS Wentworth

SP Fine Sand
 Moderately Well Sorted
 Poorly Graded
 Leptokurtic

Total weight (gram) 100.98
 % finer than 4.00 phi 0.03
 % coarser than -1.00 phi 0.00
 % CaCO₃ 2.6

Grain Size Distribution

Grain Size (mm)



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1760+00
Interval Bar

Mean 0.723 mm
STD 0.461 mm
Skewness 0.071

USCS Wentworth

SP Coarse Sand
 Poorly Sorted
 Symmetrical
 Platykurtic

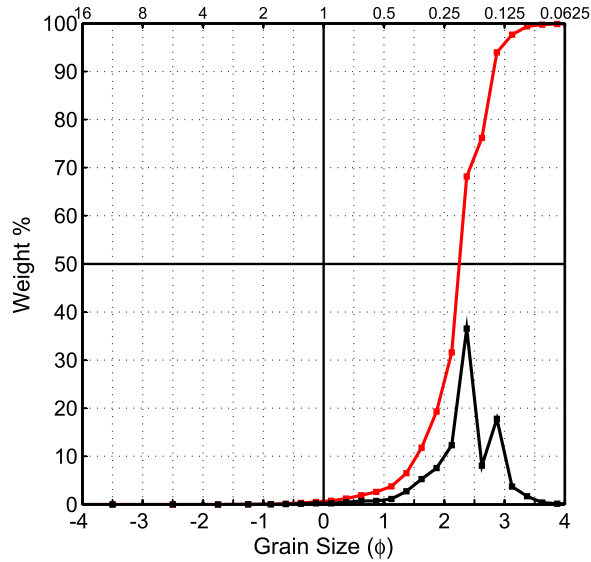
Total weight (gram) 100.32
 % finer than 4.00 phi 0.15
 % coarser than -1.00 phi 13.77
 % CaCO₃ 2.7

Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-0.100	Mean		2.110	0.232
-3	-3.5	0.00	0.00	0.00	5	0.815	Standard Deviation		0.601	0.659
-2	-2.5	0.00	0.00	0.00	16	1.505	Skewness		-1.225	
-1.5	-1.75	0.00	0.00	0.00	25	1.695	Kurtosis		6.155	
-1	-1.25	0.00	0.00	0.00	50	2.080	Dispersion			
-0.75	-0.875	0.08	0.08	0.08	75	2.320	Standard Deviation			
-0.5	-0.625	0.25	0.25	0.33	84	2.500	Deviation from Normal			
-0.25	-0.375	0.39	0.39	0.71	95	2.815				
0	-0.125	0.25	0.25	0.96	99	3.095				
0.25	0.125	0.42	0.42	1.38						
0.5	0.375	1.23	1.22	2.59						
0.75	0.625	1.27	1.26	3.85						
1	0.875	1.51	1.50	5.35						
1.25	1.125	1.27	1.26	6.61						
1.5	1.375	4.17	4.13	10.73						
1.75	1.625	10.35	10.25	20.98						
2	1.875	14.06	13.92	34.91						
2.25	2.125	18.38	18.20	53.11						
2.5	2.375	28.06	27.79	80.90						
2.75	2.625	6.24	6.18	87.08						
3	2.875	10.56	10.46	97.53						
3.25	3.125	1.68	1.66	99.20						
3.5	3.375	0.60	0.59	99.79						
3.75	3.625	0.13	0.13	99.92						
4	3.875	0.05	0.05	99.97						
>4.0	4.25	0.03	0.03	100.00						
					Graphic Phi Parameters		Inman 1952	Folk & Ward 1957		
					Mean		2.002	2.028		
					Standard Deviation		0.498	0.552		
					Skewness (1)		-0.156	-0.210		
					Skewness (2)		-0.533			
					Kurtosis		1.010	1.311		

Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-1.715	Mean		0.467	0.723
-3	-3.5	0.00	0.00	0.00	5	-1.570	Standard Deviation		1.119	0.461
-2	-2.5	0.00	0.00	0.00	16	-1.045	Skewness		0.071	
-1.5	-1.75	0.00	0.00	0.00	25	-0.580	Kurtosis		2.177	
-1	-1.25	13.81	13.77	13.77	50	0.390	Dispersion			
-0.75	-0.875	4.11	4.10	17.86	75	1.220	Standard Deviation			
-0.5	-0.625	6.12	6.10	23.96	84	1.535	Deviation from Normal			
-0.25	-0.375	5.83	5.81	29.77	95	2.125				
0	-0.125	6.56	6.54	36.31	99	2.690				
0.25	0.125	5.21	5.19	41.51						
0.5	0.375	8.03	8.00	49.51						
0.75	0.625	8.76	8.73	58.24						
1	0.875	6.90	6.88	65.12						
1.25	1.125	7.05	7.03	72.15						
1.5	1.375	7.50	7.48	79.63						
1.75	1.625	6.76	6.74	86.36						
2	1.875	5.06	5.04	91.41						
2.25	2.125	3.58	3.57	94.98						
2.5	2.375	3.12	3.11	98.09						
2.75	2.625	0.69	0.69	98.77						
3	2.875	0.88	0.88	99.65						
3.25	3.125	0.08	0.08	99.73						
3.5	3.375	0.09	0.09	99.82						
3.75	3.625	0.02	0.02	99.84						
4	3.875	0.01	0.01	99.85						
>4.0	4.25	0.15	0.15	100.00						
					Graphic Phi Parameters		Inman 1952	Folk & Ward 1957		
					Mean		0.245	0.293		
					Standard Deviation		1.290	1.205		
					Skewness (1)		-0.112	-0.087		
					Skewness (2)		-0.087			
					Kurtosis		0.432	0.841		

Grain Size Distribution

Grain Size (mm)



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1760+00
Interval -16 ft NAVD

Mean 0.198 mm
STD 0.680 mm
Skewness -1.238

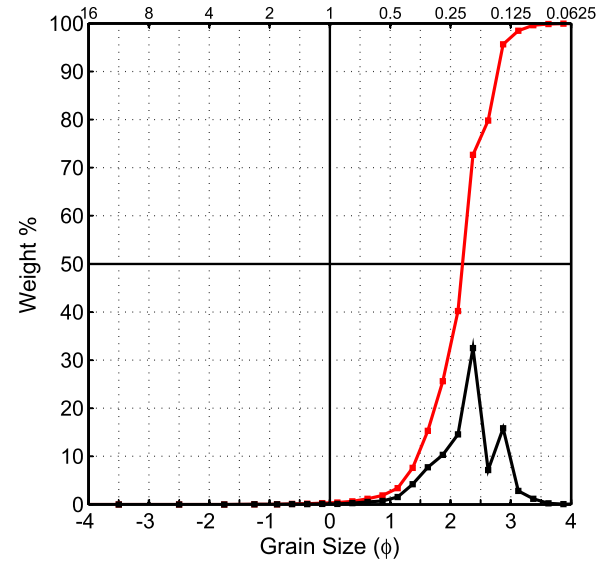
USCS Wentworth

SP Fine Sand
 Fine Sand Moderately Well Sorted
 Poorly Graded Coarse Skewed
 Leptokurtic

Total weight (gram) 99.62
 % finer than 4.00 phi 0.13
 % coarser than -1.00 phi 0.04
 % CaCO₃ 2.3

Grain Size Distribution

Grain Size (mm)



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1760+00
Interval -12 ft NAVD

Mean 0.208 mm
STD 0.693 mm
Skewness -0.785

USCS Wentworth

SP Fine Sand
 Fine Sand Moderately Well Sorted
 Poorly Graded Coarse Skewed
 Leptokurtic

Total weight (gram) 99.51
 % finer than 4.00 phi 0.07
 % coarser than -1.00 phi 0.01
 % CaCO₃ 2.4

Limits (phi)	Mid Point (phi)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles	Moment Measures (phi) (mm)		
-4	-4.5	0.00	0.00	0.00	1	0.260	Mean	2.337 0.198
-3	-3.5	0.00	0.00	0.00	5	1.240	Standard Deviation	0.556 0.680
-2	-2.5	0.00	0.00	0.00	16	1.765	Skewness	-1.238
-1.5	-1.75	0.00	0.00	0.00	25	1.990	Kurtosis	7.213
-1	-1.25	0.04	0.04	0.04	50	2.250	Dispersion	
-0.75	-0.875	0.03	0.03	0.07	75	2.590	Standard Deviation	
-0.5	-0.625	0.08	0.08	0.15	84	2.735	Deviation from Normal	
-0.25	-0.375	0.14	0.14	0.29	95	2.945		
0	-0.125	0.24	0.24	0.53	99	3.320		
0.25	0.125	0.23	0.23	0.76				
0.5	0.375	0.44	0.44	1.20				
0.75	0.625	0.71	0.71	1.92				
1	0.875	0.70	0.70	2.62				
1.25	1.125	1.13	1.13	3.75				
1.5	1.375	2.73	2.74	6.49				
1.75	1.625	5.25	5.27	11.76				
2	1.875	7.51	7.54	19.30				
2.25	2.125	12.25	12.30	31.60				
2.5	2.375	36.41	36.55	68.15				
2.75	2.625	8.00	8.03	76.18				
3	2.875	17.71	17.78	93.96				
3.25	3.125	3.68	3.69	97.65				
3.5	3.375	1.71	1.72	99.37				
3.75	3.625	0.37	0.37	99.74				
4	3.875	0.13	0.13	99.87				
>4.0	4.25	0.13	0.13	100.00				

Percentiles	Moment Measures (phi) (mm)		
1	0.260	Mean	2.337 0.198
5	1.240	Standard Deviation	0.556 0.680
16	1.765	Skewness	-1.238
25	1.990	Kurtosis	7.213
50	2.250	Dispersion	
75	2.590	Standard Deviation	
84	2.735	Deviation from Normal	
95	2.945		
99	3.320		

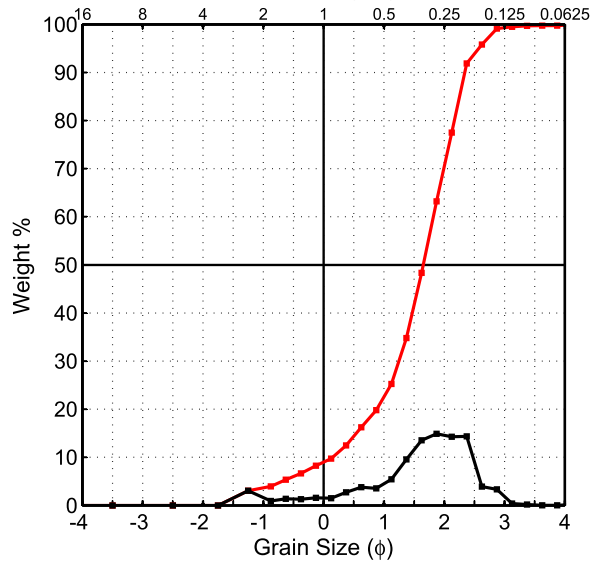
Graphic Phi Parameters	Inman 1952	Folk & Ward 1957
Mean	2.250	2.250
Standard Deviation	0.485	0.501
Skewness (1)	0.000	-0.092
Skewness (2)	-0.325	
Kurtosis	0.758	1.165

Limits (phi)	Mid Point (phi)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles	Moment Measures (phi) (mm)		
-4	-4.5	0.00	0.00	0.00	1	0.550	Mean	2.268 0.208
-3	-3.5	0.00	0.00	0.00	5	1.220	Standard Deviation	0.530 0.693
-2	-2.5	0.00	0.00	0.00	16	1.640	Skewness	-0.785
-1.5	-1.75	0.00	0.00	0.00	25	1.860	Kurtosis	5.286
-1	-1.25	0.01	0.01	0.01	50	2.200	Dispersion	
-0.75	-0.875	0.02	0.02	0.03	75	2.455	Standard Deviation	
-0.5	-0.625	0.06	0.06	0.09	84	2.690	Deviation from Normal	
-0.25	-0.375	0.07	0.07	0.16	95	2.865		
0	-0.125	0.11	0.11	0.27	99	3.245		
0.25	0.125	0.11	0.11	0.38				
0.5	0.375	0.27	0.27	0.65				
0.75	0.625	0.50	0.50	1.16				
1	0.875	0.70	0.70	1.86				
1.25	1.125	1.52	1.53	3.39				
1.5	1.375	4.17	4.19	7.58				
1.75	1.625	7.69	7.73	15.30				
2	1.875	10.26	10.31	25.62				
2.25	2.125	14.50	14.57	40.19				
2.5	2.375	32.33	32.49	72.68				
2.75	2.625	7.10	7.13	79.81				
3	2.875	15.76	15.84	95.65				
3.25	3.125	2.79	2.80	98.45				
3.5	3.375	1.15	1.16	99.61				
3.75	3.625	0.24	0.24	99.85				
4	3.875	0.08	0.08	99.93				
>4.0	4.25	0.07	0.07	100.00				

Graphic Phi Parameters	Inman 1952	Folk & Ward 1957
Mean	2.165	2.177
Standard Deviation	0.525	0.512
Skewness (1)	-0.067	-0.129
Skewness (2)	-0.300	
Kurtosis	0.567	1.133

Grain Size Distribution

Grain Size (mm)



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1760+00
Interval -24 ft NAVD

Mean 0.336 mm
STD 0.522 mm
Skewness -1.180

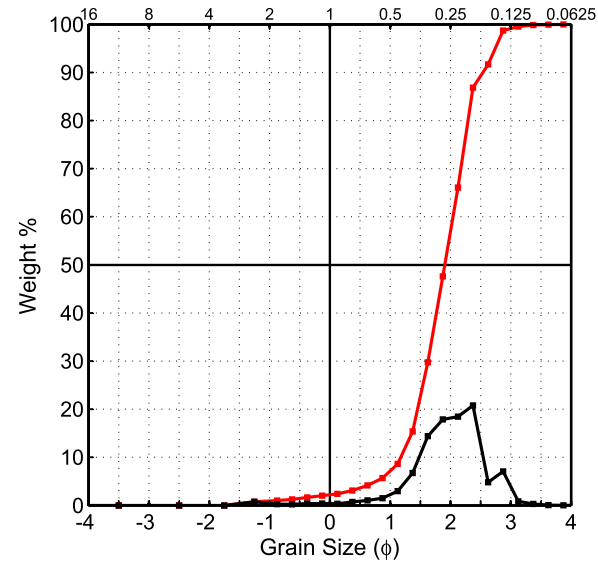
USCS Wentworth

SP Medium Sand
 Fine Sand Moderately Sorted
 Poorly Graded Coarse Skewed
 Leptokurtic

Total weight (gram) 99.98
 % finer than 4.00 phi 0.25
 % coarser than -1.00 phi 3.03
 % CaCO₃ 5.6

Grain Size Distribution

Grain Size (mm)



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1760+00
Interval -20 ft NAVD

Mean 0.257 mm
STD 0.637 mm
Skewness -1.628

USCS Wentworth

SP Medium Sand
 Fine Sand Moderately Well Sorted
 Poorly Graded Strongly Coarse Skewed
 Very Leptokurtic

Total weight (gram) 99.85
 % finer than 4.00 phi 0.04
 % coarser than -1.00 phi 0.76
 % CaCO₃ 10.5

Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-1.585	Mean		1.571	0.336
-3	-3.5	0.00	0.00	0.00	5	-0.690	Standard Deviation		0.939	0.522
-2	-2.5	0.00	0.00	0.00	16	0.610	Skewness		-1.180	
-1.5	-1.75	0.00	0.00	0.00	25	1.115	Kurtosis		4.450	
-1	-1.25	3.03	3.03	3.03	50	1.655	Dispersion			
-0.75	-0.875	0.93	0.93	3.96	75	2.080	Standard Deviation			
-0.5	-0.625	1.39	1.39	5.35	84	2.240	Deviation from Normal			
-0.25	-0.375	1.31	1.31	6.66	95	2.575				
0	-0.125	1.59	1.59	8.25	99	2.865				
0.25	0.125	1.49	1.49	9.74						
0.5	0.375	2.73	2.73	12.47						
0.75	0.625	3.78	3.78	16.25						
1	0.875	3.54	3.54	19.79						
1.25	1.125	5.44	5.44	25.24						
1.5	1.375	9.55	9.55	34.79						
1.75	1.625	13.55	13.55	48.34						
2	1.875	14.88	14.88	63.22						
2.25	2.125	14.26	14.26	77.49						
2.5	2.375	14.37	14.37	91.86						
2.75	2.625	3.93	3.93	95.79						
3	2.875	3.33	3.33	99.12						
3.25	3.125	0.38	0.38	99.50						
3.5	3.375	0.20	0.20	99.70						
3.75	3.625	0.02	0.02	99.72						
4	3.875	0.03	0.03	99.75						
>4.0	4.25	0.25	0.25	100.00						

Percentiles

Moment Measures

Graphic Phi Parameters

Inman

1952

Folk & Ward

1957

Mean
 Standard Deviation
 Skewness (1)
 Skewness (2)
 Kurtosis

1.425
 0.815
 -0.282
 -0.874
 1.003

1.502
 0.902
 -0.359
 1.387

Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-0.905	Mean		1.959	0.257
-3	-3.5	0.00	0.00	0.00	5	0.765	Standard Deviation		0.652	0.637
-2	-2.5	0.00	0.00	0.00	16	1.385	Skewness		-1.628	
-1.5	-1.75	0.00	0.00	0.00	25	1.540	Kurtosis		8.576	
-1	-1.25	0.76	0.76	0.76	50	1.905	Dispersion			
-0.75	-0.875	0.26	0.26	1.02	75	2.230	Standard Deviation			
-0.5	-0.625	0.24	0.24	1.26	84	2.340	Deviation from Normal			
-0.25	-0.375	0.38	0.38	1.64	95	2.745				
0	-0.125	0.39	0.39	2.03	99	2.965				
0.25	0.125	0.36	0.36	2.39						
0.5	0.375	0.70	0.70	3.09						
0.75	0.625	1.06	1.06	4.16						
1	0.875	1.50	1.50	5.66						
1.25	1.125	2.97	2.97	8.63						
1.5	1.375	6.73	6.74	15.37						
1.75	1.625	14.36	14.38	29.75						
2	1.875	17.83	17.86	47.61						
2.25	2.125	18.44	18.47	66.08						
2.5	2.375	20.74	20.77	86.85						
2.75	2.625	4.80	4.81	91.66						
3	2.875	7.04	7.05	98.71						
3.25	3.125	0.83	0.83	99.54						
3.5	3.375	0.32	0.32	99.86						
3.75	3.625	0.08	0.08	99.94						
4	3.875	0.02	0.02	99.96						
>4.0	4.25	0.04	0.04	100.00						

Percentiles

Moment Measures

Graphic Phi Parameters

Inman

1952

Folk & Ward

1957

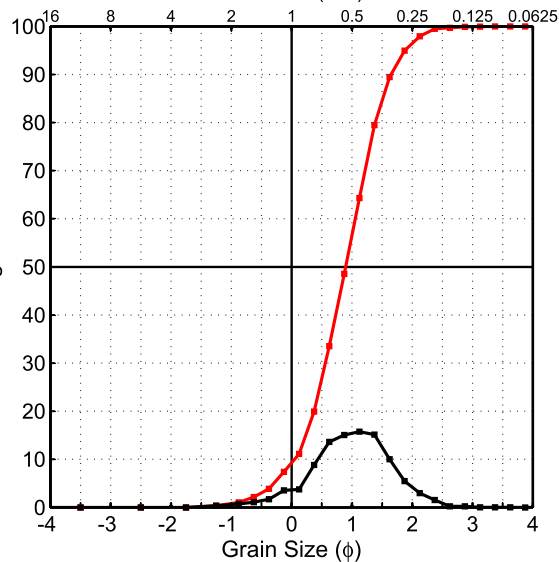
Mean
 Standard Deviation
 Skewness (1)
 Skewness (2)
 Kurtosis

1.862
 0.478
 -0.089
 -0.314
 1.073

1.877
 0.539
 -0.120
 1.176

Grain Size Distribution

Grain Size (mm)



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1790+00
Interval Dune Toe

Mean 0.503 mm
STD 0.637 mm
Skewness -0.290

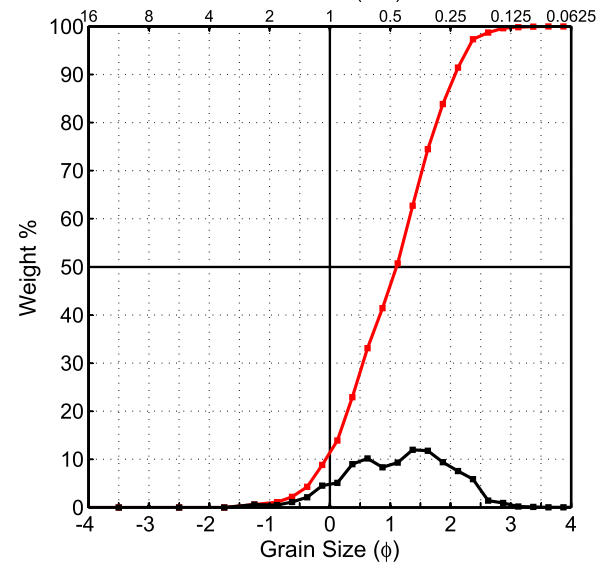
USCS Wentworth

SP Coarse Sand
 Medium Sand Moderately Well Sorted
 Poorly Graded Symmetrical Mesokurtic

Total weight (gram) 100.19
 % finer than 4.00 phi 0.02
 % coarser than -1.00 phi 0.36
 % CaCO₃ 3.5

Grain Size Distribution

Grain Size (mm)



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1790+00
Interval Dune

Mean 0.448 mm
STD 0.566 mm
Skewness -0.218

USCS Wentworth

SP Medium Sand
 Medium Sand Moderately Sorted
 Poorly Graded Symmetrical Mesokurtic

Total weight (gram) 100.27
 % finer than 4.00 phi 0.03
 % coarser than -1.00 phi 0.61
 % CaCO₃ 3.6

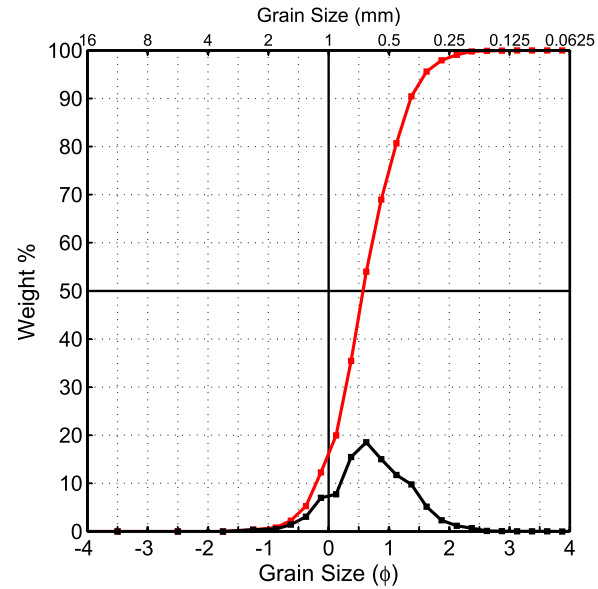
Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-0.905	Mean		0.992	0.503
-3	-3.5	0.00	0.00	0.00	5	-0.295	Standard Deviation		0.651	0.637
-2	-2.5	0.00	0.00	0.00	16	0.265	Skewness		-0.290	
-1.5	-1.75	0.00	0.00	0.00	25	0.470	Kurtosis		3.598	
-1	-1.25	0.36	0.36	0.36	50	0.900	Dispersion			
-0.75	-0.875	0.70	0.70	1.06	75	1.300	Standard Deviation			
-0.5	-0.625	1.08	1.08	2.14	84	1.490	Deviation from Normal			
-0.25	-0.375	1.72	1.72	3.85	95	1.880				
0	-0.125	3.53	3.52	7.38	99	2.300				
0.25	0.125	3.74	3.73	11.11						
0.5	0.375	8.83	8.81	19.92						
0.75	0.625	13.63	13.60	33.53						
1	0.875	15.06	15.03	48.56						
1.25	1.125	15.79	15.76	64.32						
1.5	1.375	15.18	15.15	79.47						
1.75	1.625	10.02	10.00	89.47						
2	1.875	5.49	5.48	94.95						
2.25	2.125	2.98	2.97	97.92						
2.5	2.375	1.55	1.55	99.47						
2.75	2.625	0.21	0.21	99.68						
3	2.875	0.22	0.22	99.90						
3.25	3.125	0.04	0.04	99.94						
3.5	3.375	0.03	0.03	99.97						
3.75	3.625	0.01	0.01	99.98						
4	3.875	0.00	0.00	99.98						
>4.0	4.25	0.02	0.02	100.00						

Percentiles		Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean				0.877	0.885
Standard Deviation				0.612	0.636
Skewness (1)				-0.037	-0.068
Skewness (2)				-0.176	
Kurtosis				0.776	1.074

Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-0.950	Mean		1.157	0.448
-3	-3.5	0.00	0.00	0.00	5	-0.335	Standard Deviation		0.820	0.566
-2	-2.5	0.00	0.00	0.00	16	0.185	Skewness		-0.218	
-1.5	-1.75	0.00	0.00	0.00	25	0.425	Kurtosis		2.669	
-1	-1.25	0.61	0.61	0.61	50	1.105	Dispersion			
-0.75	-0.875	0.49	0.49	1.10	75	1.640	Standard Deviation			
-0.5	-0.625	1.11	1.11	2.20	84	1.880	Deviation from Normal			
-0.25	-0.375	2.10	2.09	4.30	95	2.275				
0	-0.125	4.55	4.54	8.84	99	2.705				
0.25	0.125	5.10	5.09	13.92						
0.5	0.375	9.01	8.99	22.91						
0.75	0.625	10.22	10.19	33.10						
1	0.875	8.35	8.33	41.43						
1.25	1.125	9.33	9.30	50.73						
1.5	1.375	12.00	11.97	62.70						
1.75	1.625	11.81	11.78	74.48						
2	1.875	9.41	9.38	83.86						
2.25	2.125	7.59	7.57	91.43						
2.5	2.375	5.90	5.88	97.32						
2.75	2.625	1.40	1.40	98.71						
3	2.875	0.92	0.92	99.63						
3.25	3.125	0.20	0.20	99.83						
3.5	3.375	0.10	0.10	99.93						
3.75	3.625	0.03	0.03	99.96						
4	3.875	0.01	0.01	99.97						
>4.0	4.25	0.03	0.03	100.00						

Percentiles		Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean				1.033	1.057
Standard Deviation				0.847	0.819
Skewness (1)				-0.086	-0.094
Skewness (2)				-0.159	
Kurtosis				0.540	0.880

Grain Size Distribution



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1790+00
Interval BC

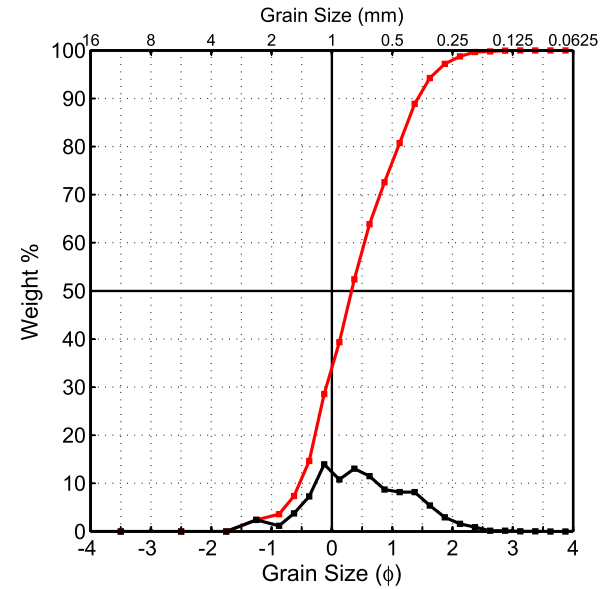
Mean 0.608 mm
STD 0.654 mm
Skewness 0.073

USCS Wentworth

SP Coarse Sand
 Medium Sand Moderately Well Sorted
 Poorly Graded Symmetrical Mesokurtic

Total weight (gram) 100.26
 % finer than 4.00 phi 0.01
 % coarser than -1.00 phi 0.34
 % CaCO₃ 5.2

Grain Size Distribution



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1790+00
Interval Berm

Mean 0.701 mm
STD 0.586 mm
Skewness 0.184

USCS Wentworth

SP Coarse Sand
 Medium Sand Moderately Sorted
 Poorly Graded Symmetrical Mesokurtic

Total weight (gram) 100.10
 % finer than 4.00 phi 0.01
 % coarser than -1.00 phi 2.40
 % CaCO₃ 6.2

Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-0.840	Mean		0.718	0.608
-3	-3.5	0.00	0.00	0.00	5	-0.395	Standard Deviation		0.612	0.654
-2	-2.5	0.00	0.00	0.00	16	-0.005	Skewness		0.073	
-1.5	-1.75	0.00	0.00	0.00	25	0.205	Kurtosis		3.385	
-1	-1.25	0.34	0.34	0.34	50	0.570	Dispersion			
-0.75	-0.875	0.47	0.47	0.81	75	1.005	Standard Deviation			
-0.5	-0.625	1.41	1.41	2.21	84	1.210	Deviation from Normal			
-0.25	-0.375	3.04	3.03	5.25	95	1.595				
0	-0.125	7.02	7.00	12.25	99	2.110				
0.25	0.125	7.75	7.73	19.98						
0.5	0.375	15.49	15.45	35.43						
0.75	0.625	18.59	18.55	53.98						
1	0.875	15.03	14.99	68.97						
1.25	1.125	11.76	11.73	80.70						
1.5	1.375	9.78	9.76	90.45						
1.75	1.625	5.16	5.15	95.60						
2	1.875	2.33	2.32	97.92						
2.25	2.125	1.16	1.16	99.08						
2.5	2.375	0.69	0.69	99.77						
2.75	2.625	0.11	0.11	99.88						
3	2.875	0.08	0.08	99.96						
3.25	3.125	0.01	0.01	99.97						
3.5	3.375	0.01	0.01	99.98						
3.75	3.625	0.01	0.01	99.99						
4	3.875	0.00	0.00	99.99						
>4.0	4.25	0.01	0.01	100.00						

Percentiles		Moment Measures		(phi)	(mm)
1	-0.840	Mean		0.718	0.608
5	-0.395	Standard Deviation		0.612	0.654
16	-0.005	Skewness		0.073	
25	0.205	Kurtosis		3.385	
50	0.570	Dispersion			
75	1.005	Standard Deviation			
84	1.210	Deviation from Normal			
95	1.595				
99	2.110				

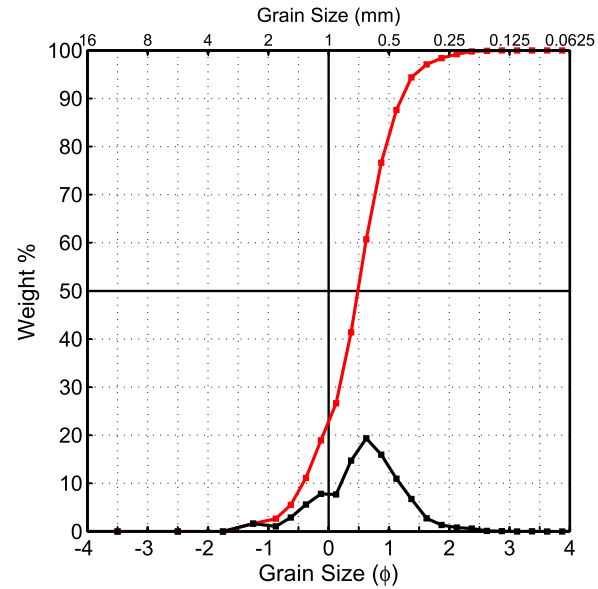
Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean		0.603	0.592
Standard Deviation		0.607	0.605
Skewness (1)		0.053	0.042
Skewness (2)		0.049	
Kurtosis		0.638	1.019

Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-1.540	Mean		0.513	0.701
-3	-3.5	0.00	0.00	0.00	5	-0.780	Standard Deviation		0.772	0.586
-2	-2.5	0.00	0.00	0.00	16	-0.350	Skewness		0.184	
-1.5	-1.75	0.00	0.00	0.00	25	-0.190	Kurtosis		2.786	
-1	-1.25	2.40	2.40	2.40	50	0.330	Dispersion			
-0.75	-0.875	1.18	1.18	3.58	75	0.950	Standard Deviation			
-0.5	-0.625	3.77	3.77	7.34	84	1.225	Deviation from Normal			
-0.25	-0.375	7.29	7.28	14.63	95	1.690				
0	-0.125	13.96	13.95	28.57	99	2.195				
0.25	0.125	10.79	10.78	39.35						
0.5	0.375	13.04	13.03	52.38						
0.75	0.625	11.48	11.47	63.85						
1	0.875	8.73	8.72	72.57						
1.25	1.125	8.16	8.15	80.72						
1.5	1.375	8.16	8.15	88.87						
1.75	1.625	5.38	5.37	94.25						
2	1.875	2.94	2.94	97.18						
2.25	2.125	1.56	1.56	98.74						
2.5	2.375	0.90	0.90	99.64						
2.75	2.625	0.15	0.15	99.79						
3	2.875	0.14	0.14	99.93						
3.25	3.125	0.04	0.04	99.97						
3.5	3.375	0.02	0.02	99.99						
3.75	3.625	0.00	0.00	99.99						
4	3.875	0.00	0.00	99.99						
>4.0	4.25	0.01	0.01	100.00						

Percentiles		Moment Measures		(phi)	(mm)
1	-1.540	Mean		0.513	0.701
5	-0.780	Standard Deviation		0.772	0.586
16	-0.350	Skewness		0.184	
25	-0.190	Kurtosis		2.786	
50	0.330	Dispersion			
75	0.950	Standard Deviation			
84	1.225	Deviation from Normal			
95	1.690				
99	2.195				

Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean		0.438	0.402
Standard Deviation		0.788	0.768
Skewness (1)		0.137	0.119
Skewness (2)		0.159	
Kurtosis		0.568	0.888

Grain Size Distribution



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1790+00
Interval MTL

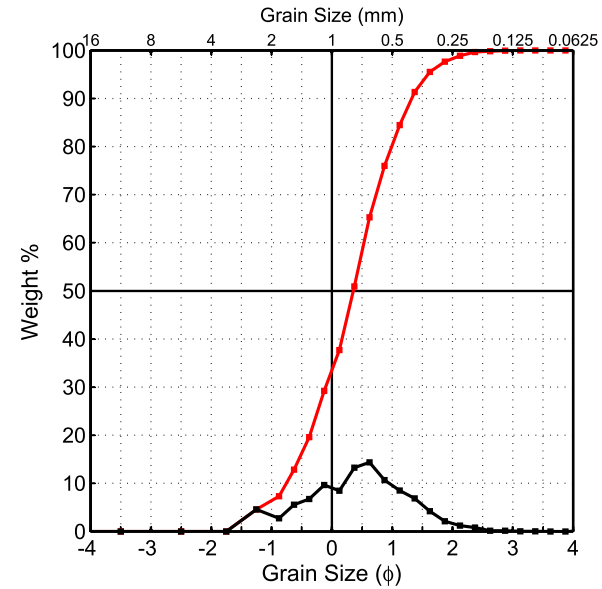
Mean 0.674 mm
STD 0.638 mm
Skewness -0.170

USCS Wentworth

SP Coarse Sand
 Medium Sand Moderately Well Sorted
 Poorly Graded Symmetrical Mesokurtic

Total weight (gram) 99.72
 % finer than 4.00 phi 0.01
 % coarser than -1.00 phi 1.60
 % CaCO₃ 6.4

Grain Size Distribution



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1790+00
Interval MHW

Mean 0.736 mm
STD 0.575 mm
Skewness -0.036

USCS Wentworth

SP Coarse Sand
 Medium Sand Moderately Sorted
 Poorly Graded Symmetrical Mesokurtic

Total weight (gram) 100.34
 % finer than 4.00 phi 0.01
 % coarser than -1.00 phi 4.55
 % CaCO₃ 7.9

Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-1.440	Mean		0.569	0.674
-3	-3.5	0.00	0.00	0.00	5	-0.670	Standard Deviation		0.648	0.638
-2	-2.5	0.00	0.00	0.00	16	-0.220	Skewness		-0.170	
-1.5	-1.75	0.00	0.00	0.00	25	0.070	Kurtosis		3.601	
-1	-1.25	1.60	1.60	1.60	50	0.485	Dispersion			
-0.75	-0.875	1.04	1.04	2.65	75	0.850	Standard Deviation			
-0.5	-0.625	2.87	2.88	5.53	84	1.045	Deviation from Normal			
-0.25	-0.375	5.59	5.61	11.13	95	1.435				
0	-0.125	7.79	7.81	18.94	99	2.065				
0.25	0.125	7.66	7.68	26.62						
0.5	0.375	14.70	14.74	41.36						
0.75	0.625	19.29	19.34	60.71						
1	0.875	15.90	15.94	76.65						
1.25	1.125	10.93	10.96	87.61						
1.5	1.375	6.73	6.75	94.36						
1.75	1.625	2.70	2.71	97.07						
2	1.875	1.32	1.33	98.40						
2.25	2.125	0.79	0.79	99.19						
2.5	2.375	0.60	0.60	99.79						
2.75	2.625	0.11	0.11	99.90						
3	2.875	0.08	0.08	99.98						
3.25	3.125	0.00	0.00	99.98						
3.5	3.375	0.01	0.01	99.99						
3.75	3.625	0.00	0.00	99.99						
4	3.875	0.00	0.00	99.99						
>4.0	4.25	0.01	0.01	100.00						

Percentiles		Moment Measures		(phi)	(mm)
1	-1.440	Mean		0.569	0.674
5	-0.670	Standard Deviation		0.648	0.638
16	-0.220	Skewness		-0.170	
25	0.070	Kurtosis		3.601	
50	0.485	Dispersion			
75	0.850	Standard Deviation			
84	1.045	Deviation from Normal			
95	1.435				
99	2.065				

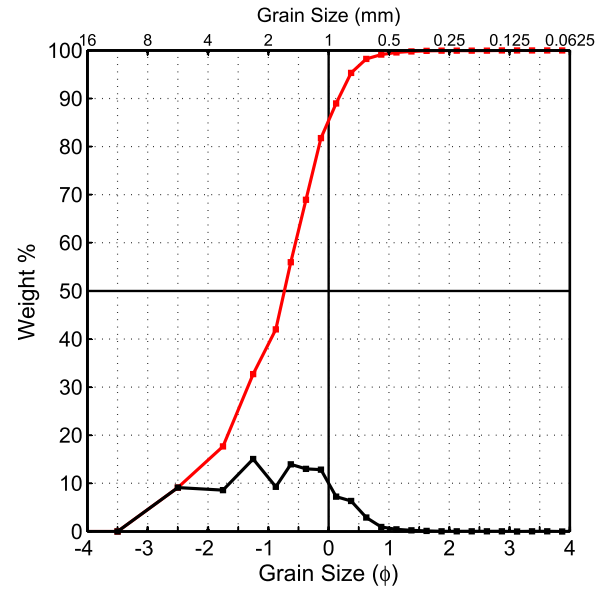
Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean		0.413	0.437
Standard Deviation		0.632	0.635
Skewness (1)		-0.115	-0.106
Skewness (2)		-0.162	
Kurtosis		0.664	1.106

Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-1.640	Mean		0.443	0.736
-3	-3.5	0.00	0.00	0.00	5	-1.190	Standard Deviation		0.798	0.575
-2	-2.5	0.00	0.00	0.00	16	-0.510	Skewness		-0.036	
-1.5	-1.75	0.00	0.00	0.00	25	-0.235	Kurtosis		2.847	
-1	-1.25	4.57	4.55	4.55	50	0.360	Dispersion			
-0.75	-0.875	2.75	2.74	7.30	75	0.850	Standard Deviation			
-0.5	-0.625	5.58	5.56	12.86	84	1.110	Deviation from Normal			
-0.25	-0.375	6.75	6.73	19.58	95	1.595				
0	-0.125	9.67	9.64	29.22	99	2.170				
0.25	0.125	8.49	8.46	37.68						
0.5	0.375	13.28	13.24	50.92						
0.75	0.625	14.42	14.37	65.29						
1	0.875	10.72	10.68	75.97						
1.25	1.125	8.52	8.49	84.46						
1.5	1.375	6.88	6.86	91.32						
1.75	1.625	4.21	4.20	95.52						
2	1.875	2.13	2.12	97.64						
2.25	2.125	1.23	1.23	98.86						
2.5	2.375	0.79	0.79	99.65						
2.75	2.625	0.15	0.15	99.80						
3	2.875	0.14	0.14	99.94						
3.25	3.125	0.03	0.03	99.97						
3.5	3.375	0.02	0.02	99.99						
3.75	3.625	0.00	0.00	99.99						
4	3.875	0.00	0.00	99.99						
>4.0	4.25	0.01	0.01	100.00						

Percentiles		Moment Measures		(phi)	(mm)
1	-1.640	Mean		0.443	0.736
5	-1.190	Standard Deviation		0.798	0.575
16	-0.510	Skewness		-0.036	
25	-0.235	Kurtosis		2.847	
50	0.360	Dispersion			
75	0.850	Standard Deviation			
84	1.110	Deviation from Normal			
95	1.595				
99	2.170				

Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean		0.300	0.320
Standard Deviation		0.810	0.827
Skewness (1)		-0.074	-0.094
Skewness (2)		-0.194	
Kurtosis		0.719	1.052

Grain Size Distribution



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1790+00
Interval Trough

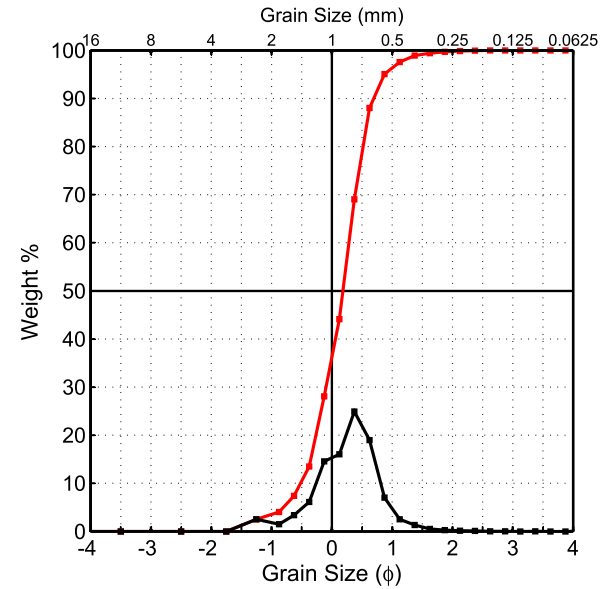
Mean 1.655 mm
STD 0.552 mm
Skewness -0.360

USCS Wentworth

SP Very Coarse Sand
 Medium Sand Moderately Sorted
 Poorly Graded Symmetrical
 Mesokurtic

Total weight (gram) 100.28
 % finer than 4.00 phi 0.02
 % coarser than -1.00 phi 32.72
 % CaCO_3 11.4

Grain Size Distribution



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1790+00
Interval MLW

Mean 0.838 mm
STD 0.695 mm
Skewness -0.222

USCS Wentworth

SP Coarse Sand
 Medium Sand Moderately Well Sorted
 Poorly Graded Symmetrical
 Leptokurtic

Total weight (gram) 99.67
 % finer than 4.00 phi 0.01
 % coarser than -1.00 phi 2.53
 % CaCO_3 9.2

Limits (ϕ)	Mid Point (ϕ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-3.390	Mean	-0.727	1.655	
-3	-3.5	0.00	0.00	0.00	5	-2.950	Standard Deviation	0.857	0.552	
-2	-2.5	9.13	9.10	9.10	16	-1.895	Skewness	-0.360		
-1.5	-1.75	8.59	8.57	17.67			Kurtosis	3.128		
-1	-1.25	15.09	15.05	32.72	25	-1.505	Dispersion			
-0.75	-0.875	9.32	9.29	42.01			Standard Deviation			
-0.5	-0.625	13.97	13.93	55.94	50	-0.730	Deviation from Normal			
-0.25	-0.375	13.03	12.99	68.94	75	-0.255				
0	-0.125	12.86	12.82	81.76	84	-0.045				
0.25	0.125	7.24	7.22	88.98	95	0.365				
0.5	0.375	6.34	6.32	95.30	99	0.840				
0.75	0.625	2.91	2.90	98.21						
1	0.875	0.92	0.92	99.12						
1.25	1.125	0.43	0.43	99.55						
1.5	1.375	0.23	0.23	99.78						
1.75	1.625	0.10	0.10	99.88						
2	1.875	0.04	0.04	99.92						
2.25	2.125	0.01	0.01	99.93						
2.5	2.375	0.01	0.01	99.94						
2.75	2.625	0.01	0.01	99.95						
3	2.875	0.01	0.01	99.96						
3.25	3.125	0.00	0.00	99.96						
3.5	3.375	0.01	0.01	99.97						
3.75	3.625	0.01	0.01	99.98						
4	3.875	0.00	0.00	99.98						
>4.0	4.25	0.02	0.02	100.00						

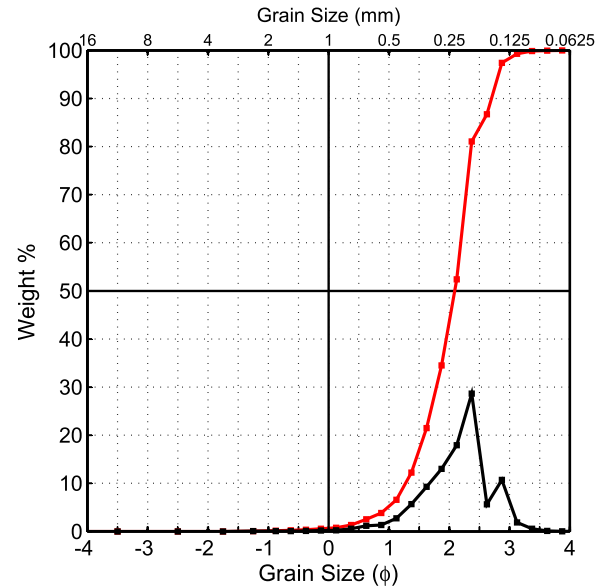
Percentiles		Moment Measures		(phi)	(mm)
1	-3.390	Mean	-0.727	1.655	
5	-2.950	Standard Deviation	0.857	0.552	
16	-1.895	Skewness	-0.360		
25	-1.505	Kurtosis	3.128		
50	-0.730	Dispersion			
75	-0.255	Standard Deviation			
84	-0.045	Deviation from Normal			
95	0.365				
99	0.840				

Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean		-0.970	-0.890
Standard Deviation		0.925	0.965
Skewness (1)		-0.259	-0.299
Skewness (2)		-0.608	
Kurtosis		0.792	1.087

Limits (ϕ)	Mid Point (ϕ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-1.550	Mean	0.255	0.838	
-3	-3.5	0.00	0.00	0.00	5	-0.800	Standard Deviation	0.524	0.695	
-2	-2.5	0.00	0.00	0.00	16	-0.330	Skewness	-0.222		
-1.5	-1.75	0.00	0.00	0.00			Kurtosis	4.793		
-1	-1.25	2.52	2.53	2.53	25	-0.180	Dispersion			
-0.75	-0.875	1.49	1.49	4.02			Standard Deviation			
-0.5	-0.625	3.35	3.36	7.38	50	0.185	Deviation from Normal			
-0.25	-0.375	6.10	6.12	13.50	75	0.455				
0	-0.125	14.52	14.57	28.07	84	0.570				
0.25	0.125	15.99	16.04	44.12	95	0.875				
0.5	0.375	24.83	24.91	69.03	99	1.425				
0.75	0.625	18.92	18.98	88.01						
1	0.875	7.02	7.04	95.05						
1.25	1.125	2.49	2.50	97.55						
1.5	1.375	1.34	1.34	98.90						
1.75	1.625	0.50	0.50	99.40						
2	1.875	0.28	0.28	99.68						
2.25	2.125	0.16	0.16	99.84						
2.5	2.375	0.11	0.11	99.95						
2.75	2.625	0.02	0.02	99.97						
3	2.875	0.01	0.01	99.98						
3.25	3.125	0.00	0.00	99.98						
3.5	3.375	0.01	0.01	99.99						
3.75	3.625	0.00	0.00	99.99						
4	3.875	0.00	0.00	99.99						
>4.0	4.25	0.01	0.01	100.00						

Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean		0.120	0.142
Standard Deviation		0.450	0.479
Skewness (1)		-0.144	-0.160
Skewness (2)		-0.328	
Kurtosis		0.861	1.081

Grain Size Distribution



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1790+00
Interval -8 ft NAVD

Mean 0.230 mm
STD 0.673 mm
Skewness -1.008

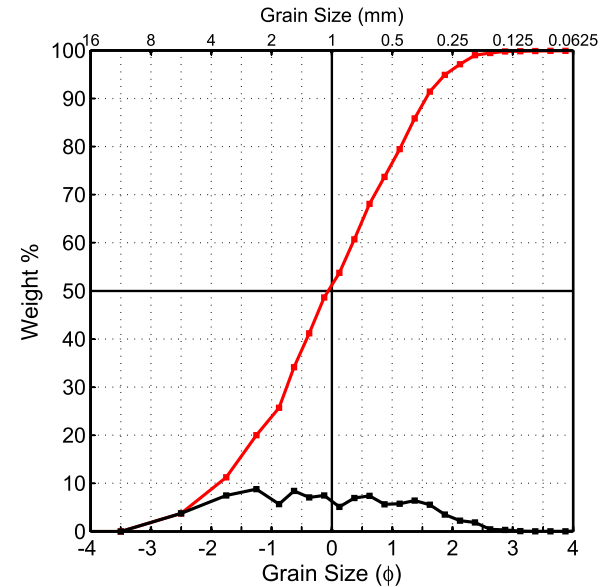
USCS Wentworth

SP Fine Sand
 Medium Sand Poorly Graded

Fine Sand
 Moderately Well Sorted
 Coarse Skewed
 Leptokurtic

Total weight (gram) 103.37
 % finer than 4.00 phi 0.03
 % coarser than -1.00 phi 0.08
 % CaCO_3 2.2

Grain Size Distribution



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1790+00
Interval Bar

Mean 0.943 mm
STD 0.425 mm
Skewness -0.046

USCS Wentworth

SP Coarse Sand
 Medium Sand Poorly Sorted
 Poorly Graded

Coarse Sand
 Poorly Sorted
 Symmetrical
 Platykurtic

Total weight (gram) 111.22
 % finer than 4.00 phi 0.09
 % coarser than -1.00 phi 20.01
 % CaCO_3 2.6

Limits (ϕ)	Mid Point (ϕ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles	Moment Measures	(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	Mean	2.122	0.230
-3	-3.5	0.00	0.00	0.00	5	Standard Deviation	0.571	0.673
-2	-2.5	0.00	0.00	0.00	16	Skewness	-1.008	
-1.5	-1.75	0.00	0.00	0.00	25	Kurtosis	5.744	
-1	-1.25	0.08	0.08	0.08	25	Dispersion		
-0.75	-0.875	0.07	0.07	0.15	50	Standard Deviation		
-0.5	-0.625	0.08	0.08	0.22	75	Deviation from Normal		
-0.25	-0.375	0.12	0.12	0.34	84			
0	-0.125	0.21	0.20	0.54	95			
0.25	0.125	0.24	0.23	0.77	99			
0.5	0.375	0.59	0.57	1.34				
0.75	0.625	1.21	1.17	2.52				
1	0.875	1.37	1.33	3.84				
1.25	1.125	2.82	2.73	6.57				
1.5	1.375	5.85	5.66	12.23				
1.75	1.625	9.58	9.27	21.50				
2	1.875	13.44	13.00	34.50				
2.25	2.125	18.51	17.91	52.40				
2.5	2.375	29.63	28.66	81.07				
2.75	2.625	5.84	5.65	86.72				
3	2.875	11.05	10.69	97.41				
3.25	3.125	1.94	1.88	99.28				
3.5	3.375	0.59	0.57	99.85				
3.75	3.625	0.10	0.10	99.95				
4	3.875	0.02	0.02	99.97				
>4.0	4.25	0.03	0.03	100.00				

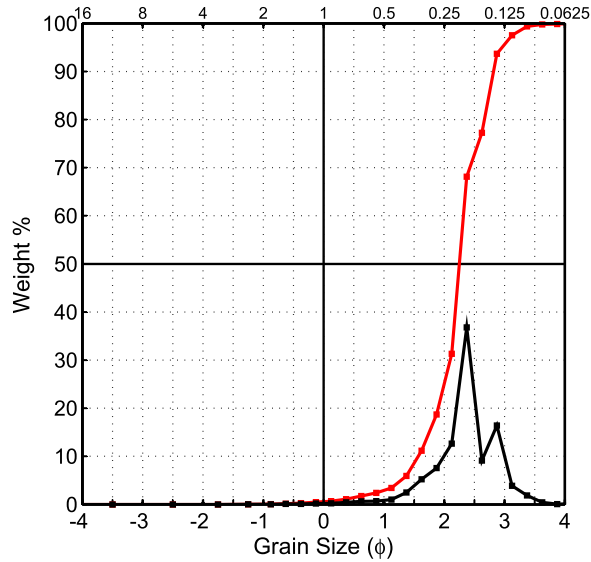
Graphic Phi Parameters	Inman 1952	Folk & Ward 1957
Mean	1.990	2.023
Standard Deviation	0.515	0.536
Skewness (1)	-0.194	-0.200
Skewness (2)	-0.369	
Kurtosis	0.786	1.197

Limits (ϕ)	Mid Point (ϕ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles	Moment Measures	(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	Mean	0.085	0.943
-3	-3.5	0.00	0.00	0.00	5	Standard Deviation	1.234	0.425
-2	-2.5	4.17	3.75	3.75	16	Skewness	-0.046	
-1.5	-1.75	8.33	7.49	11.24	25	Kurtosis	2.393	
-1	-1.25	9.76	8.78	20.01	25	Dispersion		
-0.75	-0.875	6.32	5.68	25.70	50	Standard Deviation		
-0.5	-0.625	9.37	8.42	34.12	75	Deviation from Normal		
-0.25	-0.375	7.86	7.07	41.19	84			
0	-0.125	8.29	7.45	48.64	95			
0.25	0.125	5.67	5.10	53.74	99			
0.5	0.375	7.73	6.95	60.69				
0.75	0.625	8.21	7.38	68.07				
1	0.875	6.26	5.63	73.70				
1.25	1.125	6.41	5.76	79.46				
1.5	1.375	7.11	6.39	85.86				
1.75	1.625	6.19	5.57	91.42				
2	1.875	3.89	3.50	94.92				
2.25	2.125	2.46	2.21	97.13				
2.5	2.375	2.07	1.86	98.99				
2.75	2.625	0.50	0.45	99.44				
3	2.875	0.36	0.32	99.77				
3.25	3.125	0.06	0.05	99.82				
3.5	3.375	0.04	0.04	99.86				
3.75	3.625	0.04	0.04	99.89				
4	3.875	0.02	0.02	99.91				
>4.0	4.25	0.10	0.09	100.00				

Graphic Phi Parameters	Inman 1952	Folk & Ward 1957
Mean	-0.090	-0.080
Standard Deviation	1.390	1.340
Skewness (1)	-0.022	-0.054
Skewness (2)	-0.133	
Kurtosis	0.532	0.944

Grain Size Distribution

Grain Size (mm)



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1790+00
Interval -16 ft NAVD

Mean 0.197 mm
STD 0.686 mm
Skewness -1.186

USCS Wentworth

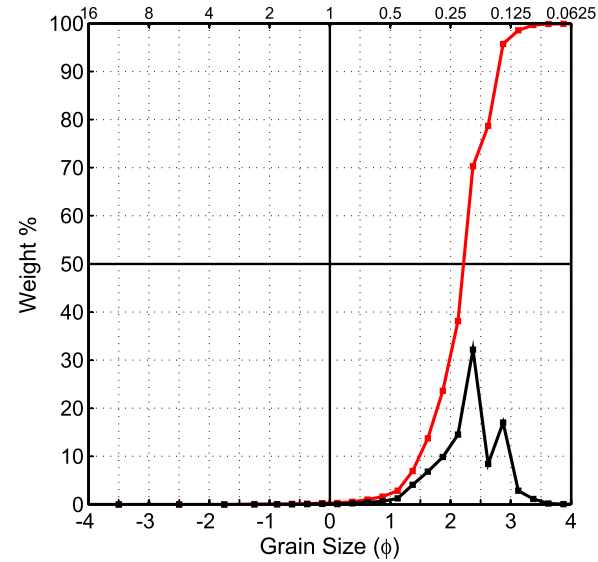
SP Fine Sand
 Poorly Graded

Fine Sand
 Moderately Well Sorted
 Coarse Skewed
 Leptokurtic

Total weight (gram) 108.98
 % finer than 4.00 phi 0.16
 % coarser than -1.00 phi 0.03
 % CaCO₃ 2.3

Grain Size Distribution

Grain Size (mm)



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1790+00
Interval -12 ft NAVD

Mean 0.204 mm
STD 0.698 mm
Skewness -0.841

USCS Wentworth

SP Fine Sand
 Poorly Graded

Fine Sand
 Moderately Well Sorted
 Coarse Skewed
 Leptokurtic

Total weight (gram) 104.67
 % finer than 4.00 phi 0.09
 % coarser than -1.00 phi 0.02
 % CaCO₃ 2.3

Limits (phi)	Mid Point (phi)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles	Moment Measures (phi) (mm)		
-4	-4.5	0.00	0.00	0.00	1	0.315	Mean	2.343 0.197
-3	-3.5	0.00	0.00	0.00	5	1.285	Standard Deviation	0.543 0.686
-2	-2.5	0.00	0.00	0.00	16	1.785	Skewness	-1.186
-1.5	-1.75	0.00	0.00	0.00	25	2.000	Kurtosis	7.262
-1	-1.25	0.03	0.03	0.03	50	2.250	Dispersion	
-0.75	-0.875	0.03	0.03	0.06	75	2.565	Standard Deviation	
-0.5	-0.625	0.09	0.08	0.14	84	2.730	Deviation from Normal	
-0.25	-0.375	0.13	0.12	0.26	95	2.960		
0	-0.125	0.22	0.20	0.46	99	3.325		
0.25	0.125	0.25	0.23	0.69				
0.5	0.375	0.45	0.41	1.10				
0.75	0.625	0.71	0.65	1.75				
1	0.875	0.72	0.66	2.41				
1.25	1.125	1.10	1.01	3.42				
1.5	1.375	2.70	2.48	5.90				
1.75	1.625	5.71	5.24	11.14				
2	1.875	8.24	7.56	18.70				
2.25	2.125	13.75	12.62	31.32				
2.5	2.375	40.10	36.80	68.11				
2.75	2.625	9.95	9.13	77.24				
3	2.875	17.89	16.42	93.66				
3.25	3.125	4.20	3.85	97.51				
3.5	3.375	2.01	1.84	99.36				
3.75	3.625	0.45	0.41	99.77				
4	3.875	0.08	0.07	99.84				
>4.0	4.25	0.17	0.16	100.00				

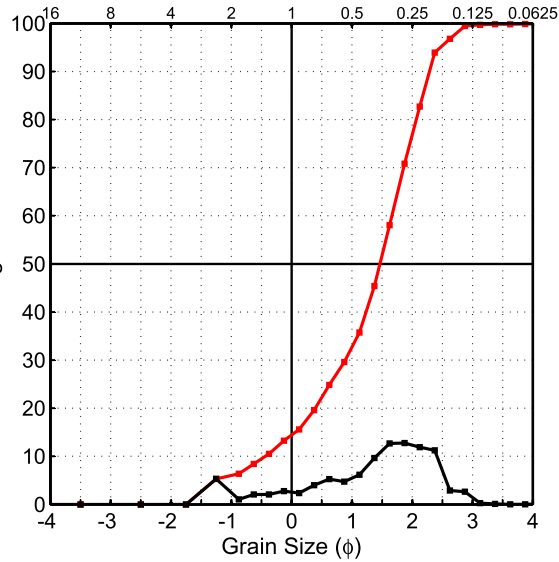
Graphic Phi Parameters	Inman 1952	Folk & Ward 1957
Mean	2.258	2.255
Standard Deviation	0.472	0.490
Skewness (1)	0.016	-0.068
Skewness (2)	-0.270	
Kurtosis	0.772	1.215

Limits (phi)	Mid Point (phi)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles	Moment Measures (phi) (mm)		
-4	-4.5	0.00	0.00	0.00	1	0.630	Mean	2.295 0.204
-3	-3.5	0.00	0.00	0.00	5	1.255	Standard Deviation	0.519 0.698
-2	-2.5	0.00	0.00	0.00	16	1.680	Skewness	-0.841
-1.5	-1.75	0.00	0.00	0.00	25	1.900	Kurtosis	5.614
-1	-1.25	0.02	0.02	0.02	50	2.215	Dispersion	
-0.75	-0.875	0.04	0.04	0.06	75	2.515	Standard Deviation	
-0.5	-0.625	0.03	0.03	0.09	84	2.705	Deviation from Normal	
-0.25	-0.375	0.08	0.08	0.16	95	2.865		
0	-0.125	0.09	0.09	0.25	99	3.230		
0.25	0.125	0.08	0.08	0.32				
0.5	0.375	0.24	0.23	0.55				
0.75	0.625	0.46	0.44	0.99				
1	0.875	0.66	0.63	1.62				
1.25	1.125	1.30	1.24	2.87				
1.5	1.375	4.26	4.07	6.94				
1.75	1.625	7.13	6.81	13.75				
2	1.875	10.32	9.86	23.61				
2.25	2.125	15.18	14.50	38.11				
2.5	2.375	33.68	32.18	70.29				
2.75	2.625	8.80	8.41	78.69				
3	2.875	17.80	17.01	95.70				
3.25	3.125	2.96	2.83	98.53				
3.5	3.375	1.19	1.14	99.67				
3.75	3.625	0.21	0.20	99.87				
4	3.875	0.05	0.05	99.91				
>4.0	4.25	0.09	0.09	100.00				

Graphic Phi Parameters	Inman 1952	Folk & Ward 1957
Mean	2.192	2.200
Standard Deviation	0.512	0.500
Skewness (1)	-0.044	-0.118
Skewness (2)	-0.302	
Kurtosis	0.571	1.073

Grain Size Distribution

Grain Size (mm)



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1790+00
Interval -24 ft NAVD

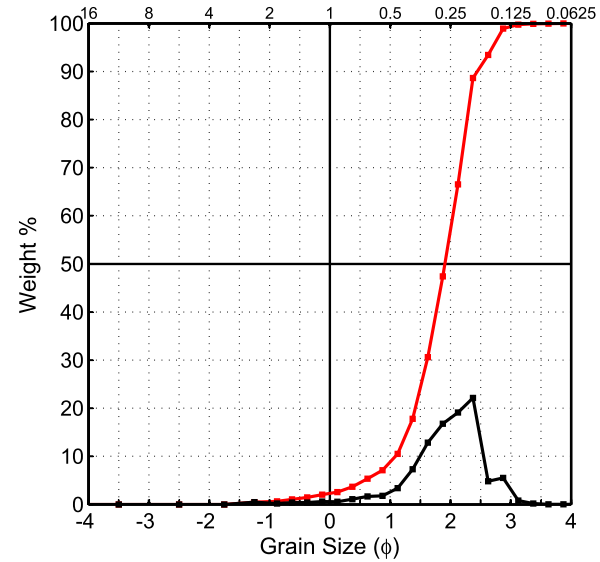
Mean 0.398 mm
STD 0.484 mm
Skewness -0.891

USCS Wentworth
SP Medium Sand
Fine Sand Poorly Sorted
Poorly Graded Coarse Skewed
Mesokurtic

Total weight (gram) 110.00
% finer than 4.00 phi 0.16
% coarser than -1.00 phi 5.31
% CaCO₃ 4.5

Grain Size Distribution

Grain Size (mm)



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1790+00
Interval -20 ft NAVD

Mean 0.262 mm
STD 0.637 mm
Skewness -1.483

USCS Wentworth
SP Medium Sand
Fine Sand Moderately Well Sorted
Poorly Graded Strongly Coarse Skewed
Leptokurtic

Total weight (gram) 106.04
% finer than 4.00 phi 0.04
% coarser than -1.00 phi 0.45
% CaCO₃ 7.8

Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-1.655	Mean		1.330	0.398
-3	-3.5	0.00	0.00	0.00	5	-1.280	Standard Deviation		1.048	0.484
-2	-2.5	0.00	0.00	0.00	16	0.150	Skewness		-0.891	
-1.5	-1.75	0.00	0.00	0.00	25	0.635	Kurtosis		3.236	
-1	-1.25	5.84	5.31	5.31	50	1.465	Dispersion			
-0.75	-0.875	1.15	1.05	6.35	75	1.965	Standard Deviation			
-0.5	-0.625	2.28	2.07	8.43	84	2.155	Deviation from Normal			
-0.25	-0.375	2.28	2.07	10.50	95	2.470				
0	-0.125	3.02	2.75	13.25	99	2.835				
0.25	0.125	2.58	2.35	15.59						
0.5	0.375	4.39	3.99	19.58						
0.75	0.625	5.79	5.26	24.85						
1	0.875	5.20	4.73	29.57						
1.25	1.125	6.77	6.15	35.73						
1.5	1.375	10.63	9.66	45.39						
1.75	1.625	13.93	12.66	58.05						
2	1.875	14.03	12.75	70.81						
2.25	2.125	13.07	11.88	82.69						
2.5	2.375	12.35	11.23	93.92						
2.75	2.625	3.16	2.87	96.79						
3	2.875	2.92	2.65	99.45						
3.25	3.125	0.28	0.25	99.70						
3.5	3.375	0.12	0.11	99.81						
3.75	3.625	0.02	0.02	99.83						
4	3.875	0.01	0.01	99.84						
>4.0	4.25	0.18	0.16	100.00						

Percentiles

Moment Measures

Graphic Phi Parameters

Inman 1952 Folk & Ward 1957

Mean 1.153
Standard Deviation 1.003
Skewness (1) -0.312
Skewness (2) -0.868
Kurtosis 0.870

1.257
1.069
-0.388
1.156

Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-0.655	Mean		1.930	0.262
-3	-3.5	0.00	0.00	0.00	5	0.575	Standard Deviation		0.651	0.637
-2	-2.5	0.00	0.00	0.00	16	1.315	Skewness		-1.483	
-1.5	-1.75	0.00	0.00	0.00	25	1.515	Kurtosis		7.166	
-1	-1.25	0.48	0.45	0.45	50	1.910	Dispersion			
-0.75	-0.875	0.21	0.20	0.65	75	2.220	Standard Deviation			
-0.5	-0.625	0.42	0.40	1.05	84	2.325	Deviation from Normal			
-0.25	-0.375	0.42	0.40	1.44	95	2.695				
0	-0.125	0.61	0.58	2.02	99	2.895				
0.25	0.125	0.57	0.54	2.56						
0.5	0.375	1.16	1.09	3.65						
0.75	0.625	1.78	1.68	5.33						
1	0.875	1.87	1.76	7.09						
1.25	1.125	3.60	3.39	10.49						
1.5	1.375	7.75	7.31	17.80						
1.75	1.625	13.60	12.83	30.62						
2	1.875	17.79	16.78	47.40						
2.25	2.125	20.26	19.11	66.50						
2.5	2.375	23.45	22.11	88.62						
2.75	2.625	5.12	4.83	93.45						
3	2.875	5.82	5.49	98.93						
3.25	3.125	0.84	0.79	99.73						
3.5	3.375	0.20	0.19	99.92						
3.75	3.625	0.04	0.04	99.95						
4	3.875	0.01	0.01	99.96						
>4.0	4.25	0.04	0.04	100.00						

Percentiles

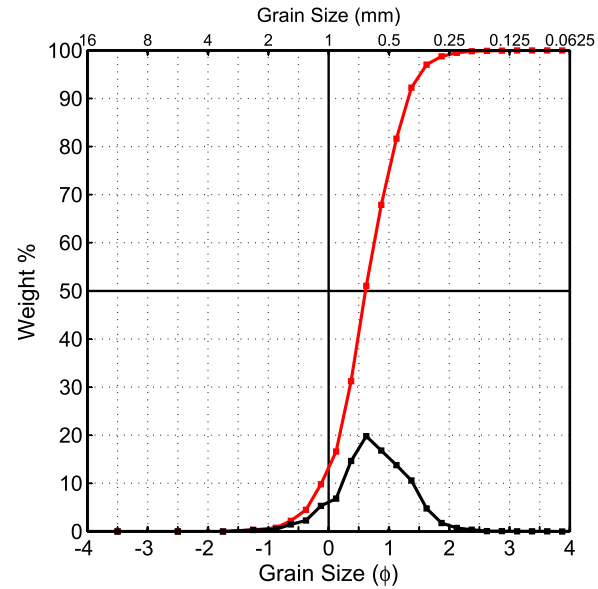
Moment Measures

Inman 1952 Folk & Ward 1957

Mean 1.820
Standard Deviation 0.505
Skewness (1) -0.178
Skewness (2) -0.545
Kurtosis 1.099

1.850
0.574
-0.219
1.232

Grain Size Distribution



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1820+00
Interval Dune Toe

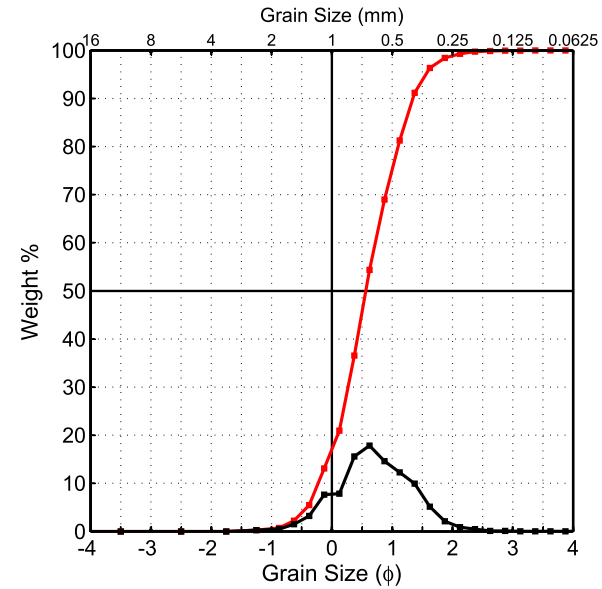
Mean 0.598 mm
STD 0.673 mm
Skewness -0.104

USCS Wentworth

SP Coarse Sand
 Medium Sand Moderately Well Sorted
 Poorly Graded Symmetrical Leptokurtic

Total weight (gram) 100.20
 % finer than 4.00 phi 0.02
 % coarser than -1.00 phi 0.32
 % CaCO₃ 5.7

Grain Size Distribution



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1820+00
Interval Dune

Mean 0.614 mm
STD 0.656 mm
Skewness 0.081

USCS Wentworth

SP Coarse Sand
 Medium Sand Moderately Well Sorted
 Poorly Graded Symmetrical Mesokurtic

Total weight (gram) 100.22
 % finer than 4.00 phi 0.02
 % coarser than -1.00 phi 0.25
 % CaCO₃ 6.6

Limits (ϕ)	Mid Point (ϕ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-0.830	Mean		0.742	0.598
-3	-3.5	0.00	0.00	0.00	5	-0.350	Standard Deviation		0.570	0.673
-2	-2.5	0.00	0.00	0.00	16	0.105	Skewness		-0.104	
-1.5	-1.75	0.00	0.00	0.00	25	0.270	Kurtosis		3.797	
-1	-1.25	0.32	0.32	0.32	50	0.610	Dispersion			
-0.75	-0.875	0.43	0.43	0.75	75	1.005	Standard Deviation			
-0.5	-0.625	1.46	1.46	2.21	84	1.180	Deviation from Normal			
-0.25	-0.375	2.27	2.27	4.47	95	1.520				
0	-0.125	5.33	5.32	9.79	99	1.955				
0.25	0.125	6.83	6.82	16.61						
0.5	0.375	14.66	14.63	31.24						
0.75	0.625	19.85	19.81	51.05						
1	0.875	16.84	16.81	67.85						
1.25	1.125	13.82	13.79	81.65						
1.5	1.375	10.62	10.60	92.25						
1.75	1.625	4.79	4.78	97.03						
2	1.875	1.74	1.74	98.76						
2.25	2.125	0.73	0.73	99.49						
2.5	2.375	0.34	0.34	99.83						
2.75	2.625	0.06	0.06	99.89						
3	2.875	0.06	0.06	99.95						
3.25	3.125	0.01	0.01	99.96						
3.5	3.375	0.01	0.01	99.97						
3.75	3.625	0.01	0.01	99.98						
4	3.875	0.00	0.00	99.98						
>4.0	4.25	0.02	0.02	100.00						

Percentiles		Moment Measures		(phi)	(mm)
1	-0.830	Mean		0.742	0.598
5	-0.350	Standard Deviation		0.570	0.673
16	0.105	Skewness		-0.104	
25	0.270	Kurtosis		3.797	
50	0.610	Dispersion			
75	1.005	Standard Deviation			
84	1.180	Deviation from Normal			
95	1.520				
99	1.955				

Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean		0.643	0.632
Standard Deviation		0.538	0.552
Skewness (1)		0.060	0.017
Skewness (2)		-0.047	
Kurtosis		0.740	1.043

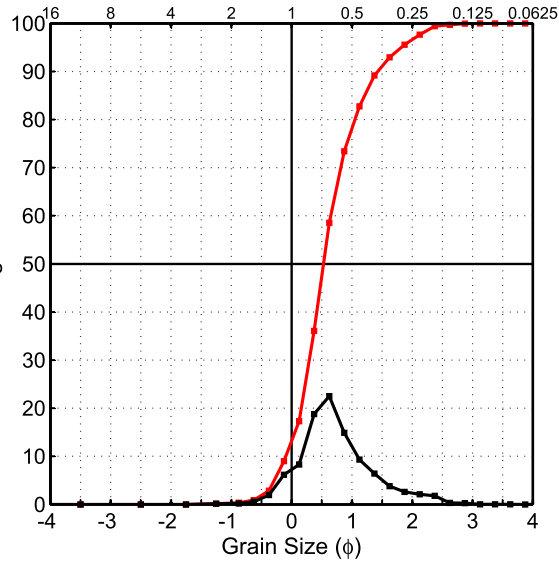
Limits (ϕ)	Mid Point (ϕ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-0.830	Mean		0.704	0.614
-3	-3.5	0.00	0.00	0.00	5	-0.410	Standard Deviation		0.608	0.656
-2	-2.5	0.00	0.00	0.00	16	-0.035	Skewness		0.081	
-1.5	-1.75	0.00	0.00	0.00	25	0.190	Kurtosis		3.427	
-1	-1.25	0.25	0.25	0.25	50	0.565	Dispersion			
-0.75	-0.875	0.47	0.47	0.72	75	0.995	Standard Deviation			
-0.5	-0.625	1.51	1.51	2.23	84	1.195	Deviation from Normal			
-0.25	-0.375	3.23	3.22	5.45	95	1.560				
0	-0.125	7.67	7.65	13.10	99	2.040				
0.25	0.125	7.87	7.85	20.95						
0.5	0.375	15.63	15.60	36.55						
0.75	0.625	17.87	17.83	54.38						
1	0.875	14.64	14.61	68.99						
1.25	1.125	12.31	12.28	81.27						
1.5	1.375	9.94	9.92	91.19						
1.75	1.625	5.14	5.13	96.32						
2	1.875	2.10	2.10	98.41						
2.25	2.125	0.88	0.88	99.29						
2.5	2.375	0.46	0.46	99.75						
2.75	2.625	0.09	0.09	99.84						
3	2.875	0.09	0.09	99.93						
3.25	3.125	0.02	0.02	99.95						
3.5	3.375	0.01	0.01	99.96						
3.75	3.625	0.01	0.01	99.97						
4	3.875	0.01	0.01	99.98						
>4.0	4.25	0.02	0.02	100.00						

Percentiles		Moment Measures		(phi)	(mm)
1	-0.830	Mean		0.704	0.614
5	-0.410	Standard Deviation		0.608	0.656
16	-0.035	Skewness		0.081	
25	0.190	Kurtosis		3.427	
50	0.565	Dispersion			
75	0.995	Standard Deviation			
84	1.195	Deviation from Normal			
95	1.560				
99	2.040				

Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean		0.580	0.575
Standard Deviation		0.615	0.606
Skewness (1)		0.024	0.017
Skewness (2)		0.016	
Kurtosis		0.602	1.003

Grain Size Distribution

Grain Size (mm)



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1820+00
Interval BC

Mean 0.600 mm
STD 0.656 mm
Skewness 0.672

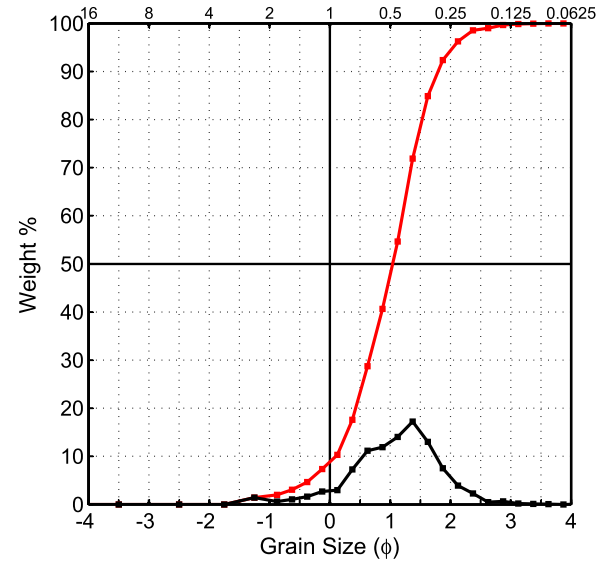
USCS Wentworth

SP Coarse Sand
 Medium Sand Moderately Well Sorted
 Poorly Graded Fine Skewed
 Leptokurtic

Total weight (gram) 100.39
 % finer than 4.00 phi 0.01
 % coarser than -1.00 phi 0.13
 % CaCO₃ 6.0

Grain Size Distribution

Grain Size (mm)



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1820+00
Interval Berm

Mean 0.469 mm
STD 0.605 mm
Skewness -0.522

USCS Wentworth

SP Medium Sand
 Medium Sand Moderately Sorted
 Poorly Graded Coarse Skewed
 Leptokurtic

Total weight (gram) 99.81
 % finer than 4.00 phi 0.01
 % coarser than -1.00 phi 1.39
 % CaCO₃ 5.1

Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-0.610	Mean		0.736	0.600
-3	-3.5	0.00	0.00	0.00	5	-0.285	Standard Deviation		0.608	0.656
-2	-2.5	0.00	0.00	0.00	16	0.085	Skewness		0.672	
-1.5	-1.75	0.00	0.00	0.00	25	0.230	Kurtosis		3.970	
-1	-1.25	0.13	0.13	0.13	50	0.530	Dispersion			
-0.75	-0.875	0.20	0.20	0.33	75	0.920	Standard Deviation			
-0.5	-0.625	0.57	0.57	0.90	84	1.175	Deviation from Normal			
-0.25	-0.375	1.95	1.94	2.84	95	1.825				
0	-0.125	6.19	6.17	9.00	99	2.320				
0.25	0.125	8.32	8.29	17.29						
0.5	0.375	18.83	18.76	36.05						
0.75	0.625	22.57	22.48	58.53						
1	0.875	14.94	14.88	73.41						
1.25	1.125	9.36	9.32	82.74						
1.5	1.375	6.44	6.41	89.15						
1.75	1.625	3.81	3.80	92.95						
2	1.875	2.60	2.59	95.54						
2.25	2.125	2.10	2.09	97.63						
2.5	2.375	1.77	1.76	99.39						
2.75	2.625	0.30	0.30	99.69						
3	2.875	0.26	0.26	99.95						
3.25	3.125	0.02	0.02	99.97						
3.5	3.375	0.01	0.01	99.98						
3.75	3.625	0.01	0.01	99.99						
4	3.875	0.00	0.00	99.99						
>4.0	4.25	0.01	0.01	100.00						

Percentiles		Moment Measures		(phi)	(mm)
1	-0.610	Mean		0.736	0.600
5	-0.285	Standard Deviation		0.608	0.656
16	0.085	Skewness		0.672	
25	0.230	Kurtosis		3.970	
50	0.530	Dispersion			
75	0.920	Standard Deviation			
84	1.175	Deviation from Normal			
95	1.825				
99	2.320				

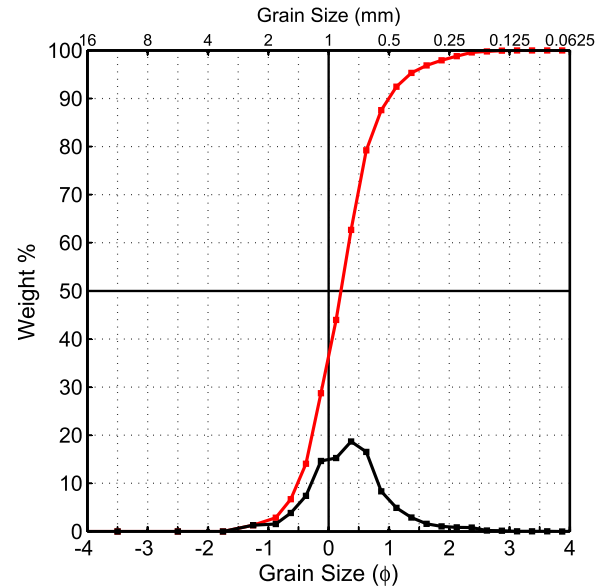
Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean		0.630	0.597
Standard Deviation		0.545	0.592
Skewness (1)		0.183	0.205
Skewness (2)		0.440	
Kurtosis		0.936	1.253

Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-1.390	Mean		1.092	0.469
-3	-3.5	0.00	0.00	0.00	5	-0.340	Standard Deviation		0.724	0.605
-2	-2.5	0.00	0.00	0.00	16	0.320	Skewness		-0.522	
-1.5	-1.75	0.00	0.00	0.00	25	0.540	Kurtosis		4.039	
-1	-1.25	1.39	1.39	1.39	50	1.040	Dispersion			
-0.75	-0.875	0.59	0.59	1.98	75	1.435	Standard Deviation			
-0.5	-0.625	1.05	1.05	3.04	84	1.610	Deviation from Normal			
-0.25	-0.375	1.61	1.61	4.65	95	2.045				
0	-0.125	2.68	2.69	7.33	99	2.620				
0.25	0.125	2.97	2.98	10.31						
0.5	0.375	7.27	7.28	17.59						
0.75	0.625	11.12	11.14	28.73						
1	0.875	11.87	11.89	40.63						
1.25	1.125	14.01	14.04	54.66						
1.5	1.375	17.18	17.21	71.88						
1.75	1.625	12.96	12.98	84.86						
2	1.875	7.49	7.50	92.37						
2.25	2.125	3.89	3.90	96.26						
2.5	2.375	2.26	2.26	98.53						
2.75	2.625	0.48	0.48	99.01						
3	2.875	0.63	0.63	99.64						
3.25	3.125	0.20	0.20	99.84						
3.5	3.375	0.09	0.09	99.93						
3.75	3.625	0.06	0.06	99.99						
4	3.875	0.00	0.00	99.99						
>4.0	4.25	0.01	0.01	100.00						

Percentiles		Moment Measures		(phi)	(mm)
1	-1.390	Mean		1.092	0.469
5	-0.340	Standard Deviation		0.724	0.605
16	0.320	Skewness		-0.522	
25	0.540	Kurtosis		4.039	
50	1.040	Dispersion			
75	1.435	Standard Deviation			
84	1.610	Deviation from Normal			
95	2.045				
99	2.620				

Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean		0.965	0.990
Standard Deviation		0.645	0.684
Skewness (1)		-0.116	-0.137
Skewness (2)		-0.291	
Kurtosis		0.849	1.092

Grain Size Distribution



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1820+00
Interval MTL

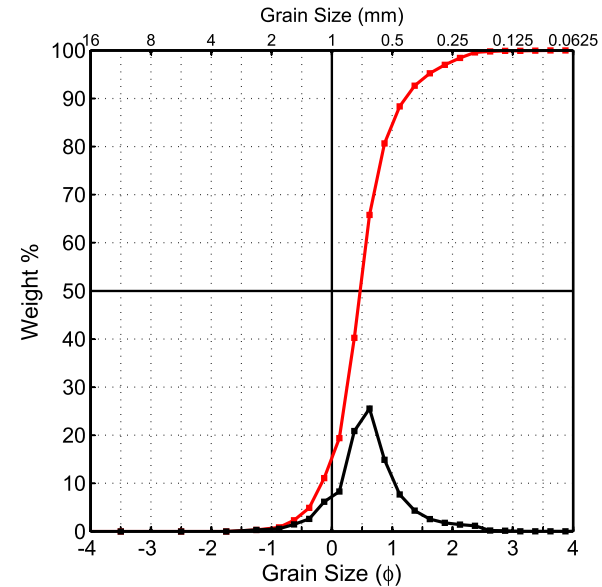
Mean 0.782 mm
STD 0.644 mm
Skewness 0.604

USCS Wentworth

SP Coarse Sand
 Medium Sand Moderately Well Sorted
 Poorly Graded Fine Skewed
 Leptokurtic

Total weight (gram) 100.36
 % finer than 4.00 phi 0.01
 % coarser than -1.00 phi 1.29
 % CaCO_3 7.5

Grain Size Distribution



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1820+00
Interval MHW

Mean 0.644 mm
STD 0.668 mm
Skewness 0.608

USCS Wentworth

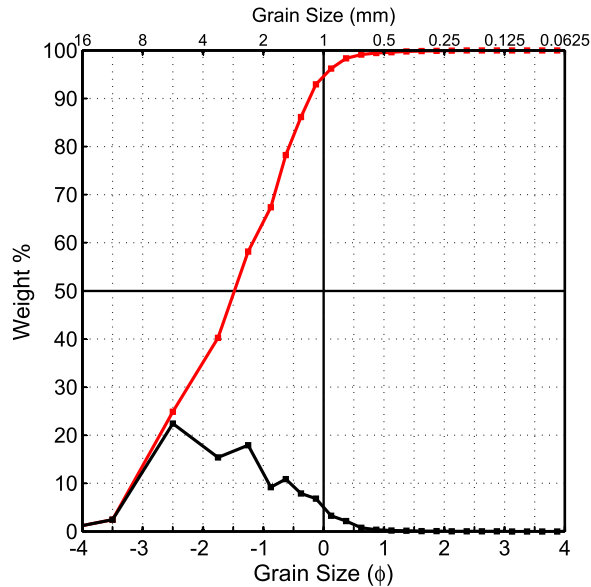
SP Coarse Sand
 Medium Sand Moderately Well Sorted
 Poorly Graded Fine Skewed
 Leptokurtic

Total weight (gram) 100.40
 % finer than 4.00 phi 0.03
 % coarser than -1.00 phi 0.32
 % CaCO_3 5.0

Limits (ϕ)	Mid Point (ϕ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-1.360	Mean		0.355	0.782
-3	-3.5	0.00	0.00	0.00	5	-0.735	Standard Deviation		0.635	0.644
-2	-2.5	0.00	0.00	0.00	16	-0.340	Skewness		0.604	
-1.5	-1.75	0.00	0.00	0.00	25	-0.190	Kurtosis		4.532	
-1	-1.25	1.29	1.29	1.29	50	0.205	Dispersion			
-0.75	-0.875	1.55	1.54	2.83	75	0.560	Standard Deviation			
-0.5	-0.625	3.86	3.85	6.68	84	0.770	Deviation from Normal			
-0.25	-0.375	7.43	7.40	14.08	95	1.350				
0	-0.125	14.70	14.65	28.73	99	2.195				
0.25	0.125	15.30	15.25	43.97	Graphic Phi Parameters		Inman	Folk & Ward		
0.5	0.375	18.78	18.71	62.68			1952	1957		
0.75	0.625	16.60	16.54	79.22	Mean		0.215	0.212		
1	0.875	8.36	8.33	87.55			0.555	0.593		
1.25	1.125	4.90	4.88	92.44	Standard Deviation		0.018	0.058		
1.5	1.375	2.88	2.87	95.31			0.185			
1.75	1.625	1.58	1.57	96.88	Skewness (1)		0.878	1.139		
2	1.875	1.05	1.05	97.93						
2.25	2.125	0.85	0.85	98.77	Skewness (2)					
2.5	2.375	0.80	0.80	99.57						
2.75	2.625	0.20	0.20	99.77	Kurtosis					
3	2.875	0.16	0.16	99.93						
3.25	3.125	0.03	0.03	99.96						
3.5	3.375	0.02	0.02	99.98						
3.75	3.625	0.01	0.01	99.99						
4	3.875	0.00	0.00	99.99						
>4.0	4.25	0.01	0.01	100.00						

Limits (ϕ)	Mid Point (ϕ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-0.850	Mean		0.634	0.644
-3	-3.5	0.00	0.00	0.00	5	-0.370	Standard Deviation		0.581	0.668
-2	-2.5	0.00	0.00	0.00	16	0.025	Skewness		0.608	
-1.5	-1.75	0.00	0.00	0.00	25	0.190	Kurtosis		5.098	
-1	-1.25	0.32	0.32	0.32	50	0.470	Dispersion			
-0.75	-0.875	0.54	0.54	0.86	75	0.780	Standard Deviation			
-0.5	-0.625	1.45	1.44	2.30	84	0.985	Deviation from Normal			
-0.25	-0.375	2.62	2.61	4.91	95	1.605				
0	-0.125	6.19	6.17	11.08	99	2.250				
0.25	0.125	8.33	8.30	19.37	Graphic Phi Parameters		Inman	Folk & Ward		
0.5	0.375	20.95	20.87	40.24			1952	1957		
0.75	0.625	25.64	25.54	65.77	Mean		0.505	0.493		
1	0.875	14.95	14.89	80.66			0.480	0.539		
1.25	1.125	7.72	7.69	88.35	Standard Deviation		0.073	0.111		
1.5	1.375	4.33	4.31	92.67			0.307			
1.75	1.625	2.56	2.55	95.22	Skewness (1)		1.057	1.372		
2	1.875	1.80	1.79	97.01						
2.25	2.125	1.41	1.40	98.41	Skewness (2)					
2.5	2.375	1.16	1.16	99.57						
2.75	2.625	0.19	0.19	99.76	Kurtosis					
3	2.875	0.14	0.14	99.90						
3.25	3.125	0.02	0.02	99.92						
3.5	3.375	0.02	0.02	99.94						
3.75	3.625	0.02	0.02	99.96						
4	3.875	0.01	0.01	99.97						
>4.0	4.25	0.03	0.03	100.00						

Grain Size Distribution



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1820+00
Interval Trough

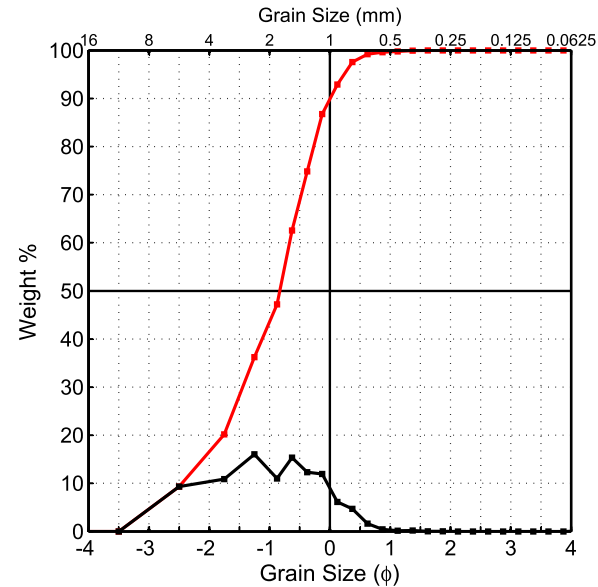
Mean 2.458 mm
STD 0.515 mm
Skewness -0.026

USCS Wentworth

SP Granule
 Coarse Sand Moderately Sorted
 Poorly Graded Symmetrical
 Mesokurtic

Total weight (gram) 100.34
 % finer than 4.00 phi 0.01
 % coarser than -1.00 phi 58.17
 % CaCO₃ 21.5

Grain Size Distribution



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1820+00
Interval MLW

Mean 1.780 mm
STD 0.569 mm
Skewness -0.377

USCS Wentworth

SP Very Coarse Sand
 Medium Sand Moderately Sorted
 Poorly Graded Symmetrical
 Mesokurtic

Total weight (gram) 99.86
 % finer than 4.00 phi 0.02
 % coarser than -1.00 phi 36.21
 % CaCO₃ 11.9

Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles	Moment Measures (phi) (mm)		
-4	-4.5	0.00	0.00	0.00	1	-4.090		
-3	-3.5	2.45	2.44	2.44	5	-3.385		
-2	-2.5	22.50	22.42	24.87	16	-2.895		
-1.5	-1.75	15.43	15.38	40.24	25	-2.495		
-1	-1.25	17.99	17.93	58.17	50	-1.480		
-0.75	-0.875	9.23	9.20	67.37	75	-0.700		
-0.5	-0.625	10.90	10.86	78.23	84	-0.440		
-0.25	-0.375	7.92	7.89	86.13	95	0.030		
0	-0.125	6.85	6.83	92.95	99	0.590		
0.25	0.125	3.28	3.27	96.22				
0.5	0.375	2.14	2.13	98.36				
0.75	0.625	0.76	0.76	99.11				
1	0.875	0.34	0.34	99.45				
1.25	1.125	0.18	0.18	99.63				
1.5	1.375	0.14	0.14	99.77				
1.75	1.625	0.08	0.08	99.85				
2	1.875	0.06	0.06	99.91				
2.25	2.125	0.03	0.03	99.94				
2.5	2.375	0.03	0.03	99.97				
2.75	2.625	0.01	0.01	99.98				
3	2.875	0.01	0.01	99.99				
3.25	3.125	0.00	0.00	99.99				
3.5	3.375	0.00	0.00	99.99				
3.75	3.625	0.00	0.00	99.99				
4	3.875	0.00	0.00	99.99				
>4.0	4.25	0.01	0.01	100.00				

Percentiles	Moment Measures (phi) (mm)		
1	-4.090		
5	-3.385		
16	-2.895		
25	-2.495		
50	-1.480		
75	-0.700		
84	-0.440		
95	0.030		
99	0.590		

Graphic Phi Parameters	Inman 1952	Folk & Ward 1957
Mean	-1.668	-1.605
Standard Deviation	1.228	1.131
Skewness (1)	-0.153	-0.134
Skewness (2)	-0.161	
Kurtosis	0.391	0.780

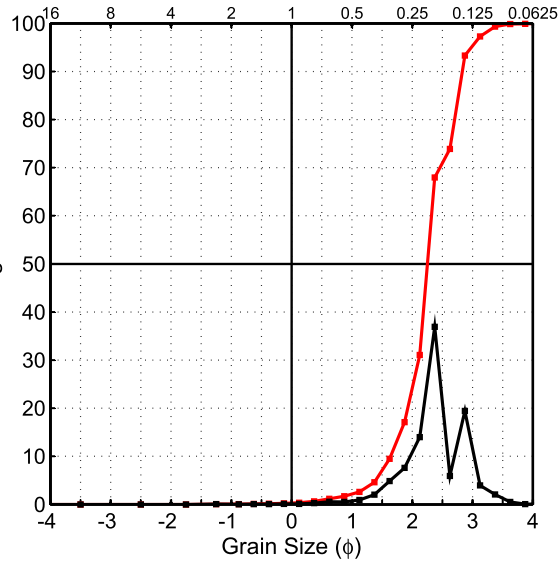
Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles	Moment Measures (phi) (mm)		
-4	-4.5	0.00	0.00	0.00	1	-3.395		
-3	-3.5	0.00	0.00	0.00	5	-2.965		
-2	-2.5	9.30	9.31	9.31	16	-2.040		
-1.5	-1.75	10.85	10.87	20.18	25	-1.600		
-1	-1.25	16.01	16.03	36.21	50	-0.830		
-0.75	-0.875	10.97	10.99	47.20	75	-0.370		
-0.5	-0.625	15.32	15.34	62.54	84	-0.185		
-0.25	-0.375	12.30	12.32	74.85	95	0.240		
0	-0.125	11.90	11.92	86.77	99	0.595		
0.25	0.125	6.11	6.12	92.89				
0.5	0.375	4.68	4.69	97.58				
0.75	0.625	1.62	1.62	99.20				
1	0.875	0.42	0.42	99.62				
1.25	1.125	0.15	0.15	99.77				
1.5	1.375	0.18	0.18	99.95				
1.75	1.625	0.02	0.02	99.97				
2	1.875	0.01	0.01	99.98				
2.25	2.125	0.00	0.00	99.98				
2.5	2.375	0.00	0.00	99.98				
2.75	2.625	0.00	0.00	99.98				
3	2.875	0.00	0.00	99.98				
3.25	3.125	0.00	0.00	99.98				
3.5	3.375	0.00	0.00	99.98				
3.75	3.625	0.00	0.00	99.98				
4	3.875	0.00	0.00	99.98				
>4.0	4.25	0.02	0.02	100.00				

Percentiles	Moment Measures (phi) (mm)		
1	-3.395		
5	-2.965		
16	-2.040		
25	-1.600		
50	-0.830		
75	-0.370		
84	-0.185		
95	0.240		
99	0.595		

Graphic Phi Parameters	Inman 1952	Folk & Ward 1957
Mean	-1.113	-1.018
Standard Deviation	0.927	0.949
Skewness (1)	-0.305	-0.318
Skewness (2)	-0.574	
Kurtosis	0.728	1.068

Grain Size Distribution

Grain Size (mm)



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1820+00
Interval -8 ft NAVD

Mean 0.193 mm
STD 0.701 mm
Skewness -0.975

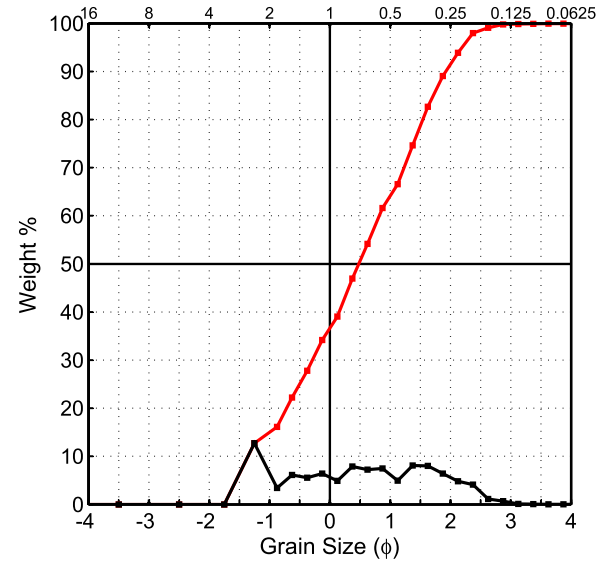
USCS Wentworth

SP Fine Sand
 Medium Sand Poorly Graded
 Coarse Skewed Leptokurtic

Total weight (gram) 118.44
 % finer than 4.00 phi 0.09
 % coarser than -1.00 phi 0.05
 % CaCO₃ 2.0

Grain Size Distribution

Grain Size (mm)



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1820+00
Interval Bar

Mean 0.676 mm
STD 0.454 mm
Skewness -0.043

USCS Wentworth

SP Coarse Sand
 Medium Sand Poorly Sorted Symmetrical Platykurtic
 Poorly Graded

Total weight (gram) 113.73
 % finer than 4.00 phi 0.07
 % coarser than -1.00 phi 12.71
 % CaCO₃ 2.9

Limits (phi)	Mid Point (phi)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles	Moment Measures (phi) (mm)		
-4	-4.5	0.00	0.00	0.00	1	0.550	Mean	2.373 0.193
-3	-3.5	0.00	0.00	0.00	5	1.395	Standard Deviation	0.512 0.701
-2	-2.5	0.00	0.00	0.00	16	1.840	Skewness	-0.975
-1.5	-1.75	0.00	0.00	0.00	25	2.015	Kurtosis	6.908
-1	-1.25	0.06	0.05	0.05	50	2.255	Dispersion	
-0.75	-0.875	0.01	0.01	0.06	75	2.640	Standard Deviation	
-0.5	-0.625	0.05	0.04	0.10	84	2.755	Deviation from Normal	
-0.25	-0.375	0.06	0.05	0.15	95	2.980		
0	-0.125	0.10	0.08	0.24	99	3.335		
0.25	0.125	0.12	0.10	0.34				
0.5	0.375	0.33	0.28	0.62				
0.75	0.625	0.65	0.55	1.17				
1	0.875	0.63	0.53	1.70				
1.25	1.125	1.08	0.91	2.61				
1.5	1.375	2.38	2.01	4.62				
1.75	1.625	5.75	4.85	9.47				
2	1.875	9.01	7.61	17.08				
2.25	2.125	16.56	13.98	31.06				
2.5	2.375	43.71	36.90	67.97				
2.75	2.625	7.02	5.93	73.89				
3	2.875	23.00	19.42	93.31				
3.25	3.125	4.70	3.97	97.28				
3.5	3.375	2.44	2.06	99.34				
3.75	3.625	0.59	0.50	99.84				
4	3.875	0.08	0.07	99.91				
>4.0	4.25	0.11	0.09	100.00				

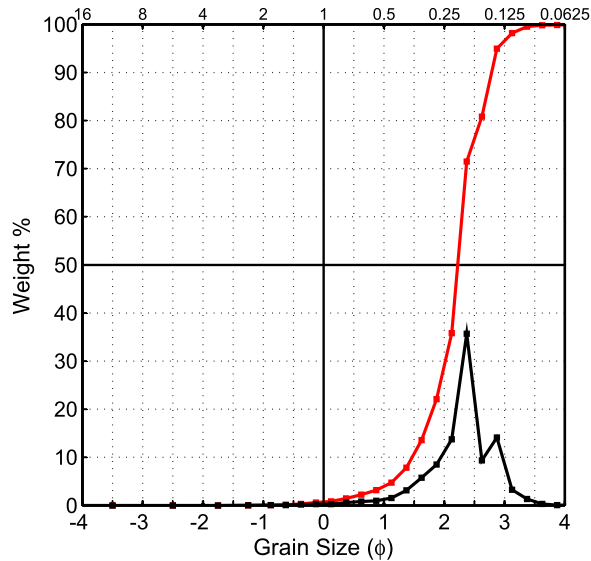
Graphic Phi Parameters	Inman 1952	Folk & Ward 1957
Mean	2.297	2.283
Standard Deviation	0.458	0.469
Skewness (1)	0.093	0.004
Skewness (2)	-0.148	
Kurtosis	0.732	1.039

Limits (phi)	Mid Point (phi)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles	Moment Measures (phi) (mm)		
-4	-4.5	0.00	0.00	0.00	1	-1.710	Mean	0.564 0.676
-3	-3.5	0.00	0.00	0.00	5	-1.555	Standard Deviation	1.140 0.454
-2	-2.5	0.00	0.00	0.00	16	-0.890	Skewness	-0.043
-1.5	-1.75	0.00	0.00	0.00	25	-0.500	Kurtosis	2.000
-1	-1.25	14.45	12.71	12.71	50	0.480	Dispersion	
-0.75	-0.875	3.88	3.41	16.12	75	1.385	Standard Deviation	
-0.5	-0.625	6.94	6.10	22.22	84	1.675	Deviation from Normal	
-0.25	-0.375	6.31	5.55	27.77	95	2.195		
0	-0.125	7.27	6.39	34.16	99	2.610		
0.25	0.125	5.56	4.89	39.05				
0.5	0.375	8.98	7.90	46.94				
0.75	0.625	8.20	7.21	54.15				
1	0.875	8.49	7.47	61.62				
1.25	1.125	5.62	4.94	66.56				
1.5	1.375	9.19	8.08	74.64				
1.75	1.625	9.12	8.02	82.66				
2	1.875	7.28	6.40	89.06				
2.25	2.125	5.46	4.80	93.86				
2.5	2.375	4.67	4.11	97.97				
2.75	2.625	1.26	1.11	99.08				
3	2.875	0.79	0.69	99.77				
3.25	3.125	0.10	0.09	99.86				
3.5	3.375	0.05	0.04	99.90				
3.75	3.625	0.02	0.02	99.92				
4	3.875	0.01	0.01	99.93				
>4.0	4.25	0.08	0.07	100.00				

Graphic Phi Parameters	Inman 1952	Folk & Ward 1957
Mean	0.392	0.422
Standard Deviation	1.283	1.209
Skewness (1)	-0.068	-0.077
Skewness (2)	-0.125	
Kurtosis	0.462	0.815

Grain Size Distribution

Grain Size (mm)



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1820+00
Interval -16 ft NAVD

Mean 0.206 mm
STD 0.676 mm
Skewness -1.227

USCS Wentworth

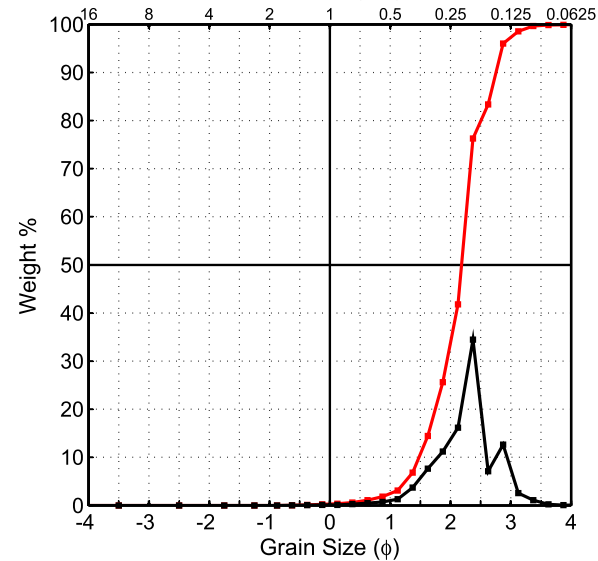
SP Fine Sand
 Poorly Graded

Fine Sand
 Moderately Well Sorted
 Coarse Skewed
 Leptokurtic

Total weight (gram) 107.53
 % finer than 4.00 phi 0.13
 % coarser than -1.00 phi 0.02
 % CaCO₃ 2.3

Grain Size Distribution

Grain Size (mm)



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1820+00
Interval -12 ft NAVD

Mean 0.210 mm
STD 0.705 mm
Skewness -0.705

USCS Wentworth

SP Fine Sand
 Poorly Graded

Fine Sand
 Moderately Well Sorted
 Coarse Skewed
 Leptokurtic

Total weight (gram) 115.69
 % finer than 4.00 phi 0.09
 % coarser than -1.00 phi 0.00
 % CaCO₃ 2.3

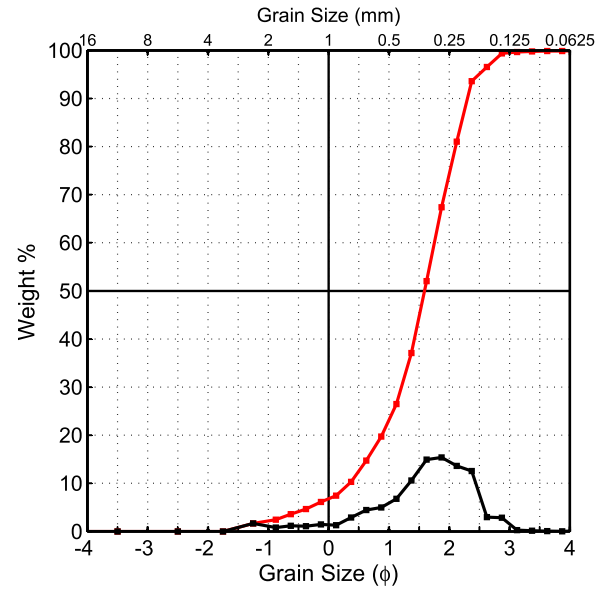
Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	0.190	Mean		2.281	0.206
-3	-3.5	0.00	0.00	0.00	5	1.145	Standard Deviation		0.564	0.676
-2	-2.5	0.00	0.00	0.00	16	1.695	Skewness		-1.227	
-1.5	-1.75	0.00	0.00	0.00	25	1.930	Kurtosis		6.742	
-1	-1.25	0.02	0.02	0.02	50	2.225	Dispersion			
-0.75	-0.875	0.05	0.05	0.07	75	2.470	Standard Deviation			
-0.5	-0.625	0.07	0.07	0.13	84	2.680	Deviation from Normal			
-0.25	-0.375	0.20	0.19	0.32	95	2.880				
0	-0.125	0.28	0.26	0.58	99	3.275				
0.25	0.125	0.28	0.26	0.84						
0.5	0.375	0.65	0.60	1.44						
0.75	0.625	0.84	0.78	2.22						
1	0.875	1.03	0.96	3.18						
1.25	1.125	1.66	1.54	4.72						
1.5	1.375	3.35	3.12	7.84						
1.75	1.625	6.18	5.75	13.59						
2	1.875	9.13	8.49	22.08						
2.25	2.125	14.77	13.74	35.81						
2.5	2.375	38.36	35.67	71.49						
2.75	2.625	10.04	9.34	80.82						
3	2.875	15.16	14.10	94.92						
3.25	3.125	3.51	3.26	98.19						
3.5	3.375	1.45	1.35	99.54						
3.75	3.625	0.31	0.29	99.82						
4	3.875	0.05	0.05	99.87						
>4.0	4.25	0.14	0.13	100.00						

Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean		2.188	2.200
Standard Deviation		0.492	0.509
Skewness (1)		-0.076	-0.161
Skewness (2)		-0.431	
Kurtosis		0.761	1.317

Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	0.580	Mean		2.251	0.210
-3	-3.5	0.00	0.00	0.00	5	1.250	Standard Deviation		0.505	0.705
-2	-2.5	0.00	0.00	0.00	16	1.660	Skewness		-0.705	
-1.5	-1.75	0.00	0.00	0.00	25	1.860	Kurtosis		5.294	
-1	-1.25	0.00	0.00	0.00	50	2.185	Dispersion			
-0.75	-0.875	0.00	0.00	0.00	75	2.365	Standard Deviation			
-0.5	-0.625	0.04	0.03	0.03	84	2.640	Deviation from Normal			
-0.25	-0.375	0.08	0.07	0.10	95	2.855				
0	-0.125	0.13	0.11	0.22	99	3.230				
0.25	0.125	0.13	0.11	0.33						
0.5	0.375	0.33	0.29	0.61						
0.75	0.625	0.55	0.48	1.09						
1	0.875	0.84	0.73	1.82						
1.25	1.125	1.50	1.30	3.11						
1.5	1.375	4.29	3.71	6.82						
1.75	1.625	8.82	7.62	14.44						
2	1.875	12.94	11.19	25.63						
2.25	2.125	18.71	16.17	41.80						
2.5	2.375	39.88	34.47	76.27						
2.75	2.625	8.20	7.09	83.36						
3	2.875	14.63	12.65	96.01						
3.25	3.125	2.95	2.55	98.56						
3.5	3.375	1.25	1.08	99.64						
3.75	3.625	0.26	0.22	99.86						
4	3.875	0.06	0.05	99.91						
>4.0	4.25	0.10	0.09	100.00						

Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean		2.150	2.162
Standard Deviation		0.490	0.488
Skewness (1)		-0.071	-0.118
Skewness (2)		-0.270	
Kurtosis		0.638	1.303

Grain Size Distribution



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1820+00
Interval -24 ft NAVD

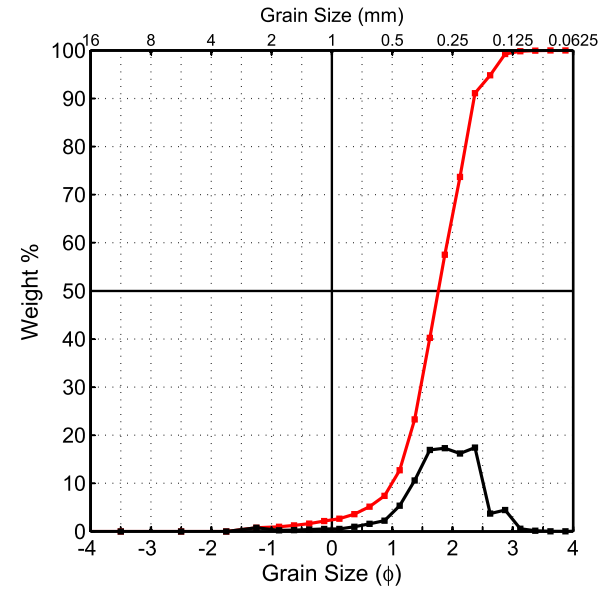
Mean 0.338 mm
STD 0.558 mm
Skewness -1.092

USCS Wentworth

SP Medium Sand
 Fine Sand Moderately Sorted
 Poorly Graded Coarse Skewed
 Leptokurtic

Total weight (gram) 111.69
 % finer than 4.00 phi 0.14
 % coarser than -1.00 phi 1.65
 % CaCO₃ 5.7

Grain Size Distribution



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1820+00
Interval -20 ft NAVD

Mean 0.281 mm
STD 0.635 mm
Skewness -1.402

USCS Wentworth

SP Medium Sand
 Fine Sand Moderately Well Sorted
 Poorly Graded Strongly Coarse Skewed
 Leptokurtic

Total weight (gram) 111.96
 % finer than 4.00 phi 0.01
 % coarser than -1.00 phi 0.78
 % CaCO₃ 11.6

Limits (ϕ)	Mid Point (ϕ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-1.445	Mean		1.565	0.338
-3	-3.5	0.00	0.00	0.00	5	-0.315	Standard Deviation		0.842	0.558
-2	-2.5	0.00	0.00	0.00	16	0.690	Skewness		-1.092	
-1.5	-1.75	0.00	0.00	0.00	25	1.070	Kurtosis		4.617	
-1	-1.25	1.84	1.65	1.65	50	1.590	Dispersion			
-0.75	-0.875	0.88	0.79	2.44	75	2.015	Standard Deviation			
-0.5	-0.625	1.29	1.15	3.59	84	2.185	Deviation from Normal			
-0.25	-0.375	1.19	1.07	4.66	95	2.495				
0	-0.125	1.63	1.46	6.12	99	2.840				
0.25	0.125	1.45	1.30	7.41						
0.5	0.375	3.21	2.87	10.29						
0.75	0.625	4.97	4.45	14.74						
1	0.875	5.55	4.97	19.71						
1.25	1.125	7.58	6.79	26.49						
1.5	1.375	11.82	10.58	37.08						
1.75	1.625	16.68	14.93	52.01						
2	1.875	17.19	15.39	67.40						
2.25	2.125	15.23	13.64	81.04						
2.5	2.375	14.02	12.55	93.59						
2.75	2.625	3.31	2.96	96.55						
3	2.875	3.16	2.83	99.38						
3.25	3.125	0.31	0.28	99.66						
3.5	3.375	0.14	0.13	99.79						
3.75	3.625	0.06	0.05	99.84						
4	3.875	0.02	0.02	99.86						
>4.0	4.25	0.16	0.14	100.00						

Percentiles		Moment Measures		(phi)	(mm)
1	-1.445	Mean		1.565	0.338
5	-0.315	Standard Deviation		0.842	0.558
16	0.690	Skewness		-1.092	
25	1.070	Kurtosis		4.617	
50	1.590	Dispersion			
75	2.015	Standard Deviation			
84	2.185	Deviation from Normal			
95	2.495				
99	2.840				

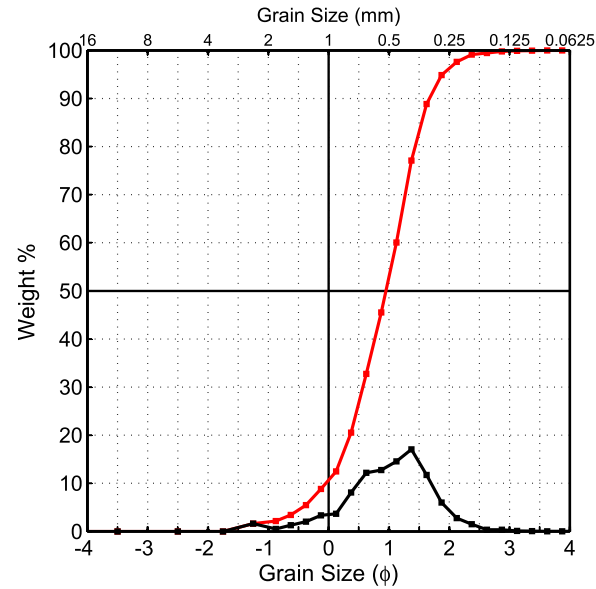
Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean		1.438	1.488
Standard Deviation		0.748	0.800
Skewness (1)		-0.204	-0.280
Skewness (2)		-0.669	
Kurtosis		0.880	1.219

Limits (ϕ)	Mid Point (ϕ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-0.860	Mean		1.829	0.281
-3	-3.5	0.00	0.00	0.00	5	0.600	Standard Deviation		0.654	0.635
-2	-2.5	0.00	0.00	0.00	16	1.205	Skewness		-1.402	
-1.5	-1.75	0.00	0.00	0.00	25	1.400	Kurtosis		7.292	
-1	-1.25	0.87	0.78	0.78	50	1.765	Dispersion			
-0.75	-0.875	0.23	0.21	0.98	75	2.145	Standard Deviation			
-0.5	-0.625	0.29	0.26	1.24	84	2.275	Deviation from Normal			
-0.25	-0.375	0.42	0.38	1.62	95	2.635				
0	-0.125	0.58	0.52	2.13	99	2.860				
0.25	0.125	0.56	0.50	2.63						
0.5	0.375	1.06	0.95	3.58						
0.75	0.625	1.75	1.56	5.14						
1	0.875	2.50	2.23	7.38						
1.25	1.125	5.97	5.33	12.71						
1.5	1.375	11.85	10.58	23.29						
1.75	1.625	18.95	16.93	40.22						
2	1.875	19.35	17.28	57.50						
2.25	2.125	18.14	16.20	73.70						
2.5	2.375	19.49	17.41	91.11						
2.75	2.625	4.13	3.69	94.80						
3	2.875	4.99	4.46	99.26						
3.25	3.125	0.64	0.57	99.83						
3.5	3.375	0.14	0.13	99.96						
3.75	3.625	0.03	0.03	99.98						
4	3.875	0.01	0.01	99.99						
>4.0	4.25	0.01	0.01	100.00						

Percentiles		Moment Measures		(phi)	(mm)
1	-0.860	Mean		1.829	0.281
5	0.600	Standard Deviation		0.654	0.635
16	1.205	Skewness		-1.402	
25	1.400	Kurtosis		7.292	
50	1.765	Dispersion			
75	2.145	Standard Deviation			
84	2.275	Deviation from Normal			
95	2.635				
99	2.860				

Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean		1.740	1.748
Standard Deviation		0.535	0.576
Skewness (1)		-0.047	-0.096
Skewness (2)		-0.276	
Kurtosis		0.902	1.119

Grain Size Distribution



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1840+00
Interval Dune Toe

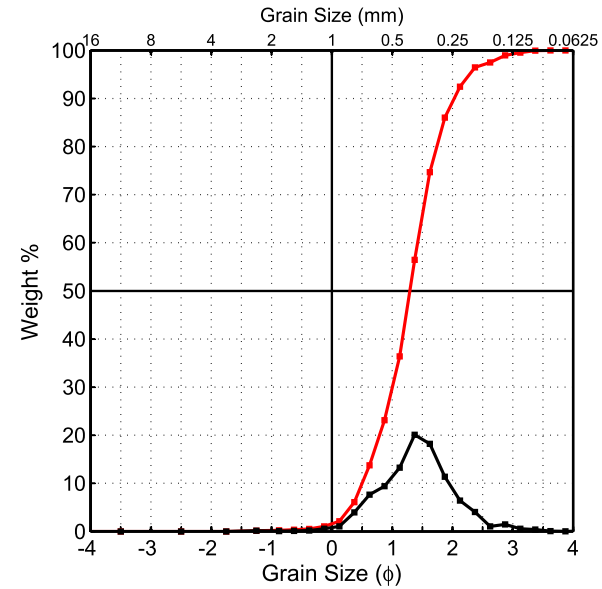
Mean 0.500 mm
STD 0.610 mm
Skewness -0.551

USCS Wentworth

SP Coarse Sand
 Medium Sand Moderately Sorted
 Poorly Graded Coarse Skewed
 Leptokurtic

Total weight (gram) 99.77
 % finer than 4.00 phi 0.02
 % coarser than -1.00 phi 1.61
 % CaCO₃ 5.3

Grain Size Distribution



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1840+00
Interval Dune

Mean 0.376 mm
STD 0.656 mm
Skewness 0.046

USCS Wentworth

SP Medium Sand
 Fine Sand Moderately Well Sorted
 Poorly Graded Symmetrical
 Leptokurtic

Total weight (gram) 99.56
 % finer than 4.00 phi 0.02
 % coarser than -1.00 phi 0.13
 % CaCO₃ 1.8

Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-1.440	Mean		1.000	0.500
-3	-3.5	0.00	0.00	0.00	5	-0.435	Standard Deviation		0.713	0.610
-2	-2.5	0.00	0.00	0.00	16	0.235	Skewness		-0.551	
-1.5	-1.75	0.00	0.00	0.00	25	0.465	Kurtosis		3.993	
-1	-1.25	1.61	1.61	1.61			Dispersion			
-0.75	-0.875	0.52	0.52	2.13	50	0.950	Standard Deviation			
-0.5	-0.625	1.30	1.30	3.44	75	1.345	Deviation from Normal			
-0.25	-0.375	2.03	2.03	5.47	84	1.520				
0	-0.125	3.33	3.34	8.81	95	1.890				
0.25	0.125	3.65	3.66	12.47	99	2.355				
0.5	0.375	8.05	8.07	20.54						
0.75	0.625	12.16	12.19	32.72						
1	0.875	12.74	12.77	45.50						
1.25	1.125	14.51	14.54	60.04						
1.5	1.375	17.03	17.07	77.11						
1.75	1.625	11.70	11.73	88.83						
2	1.875	6.00	6.01	94.85						
2.25	2.125	2.77	2.78	97.62						
2.5	2.375	1.48	1.48	99.11						
2.75	2.625	0.33	0.33	99.44						
3	2.875	0.34	0.34	99.78						
3.25	3.125	0.10	0.10	99.88						
3.5	3.375	0.06	0.06	99.94						
3.75	3.625	0.03	0.03	99.97						
4	3.875	0.01	0.01	99.98						
>4.0	4.25	0.02	0.02	100.00						

Percentiles		Moment Measures		(phi)	(mm)
1	-1.440	Mean		1.000	0.500
5	-0.435	Standard Deviation		0.713	0.610
16	0.235	Skewness		-0.551	
25	0.465	Kurtosis		3.993	
50	0.950	Dispersion			
75	1.345	Standard Deviation			
84	1.520	Deviation from Normal			
95	1.890				
99	2.355				

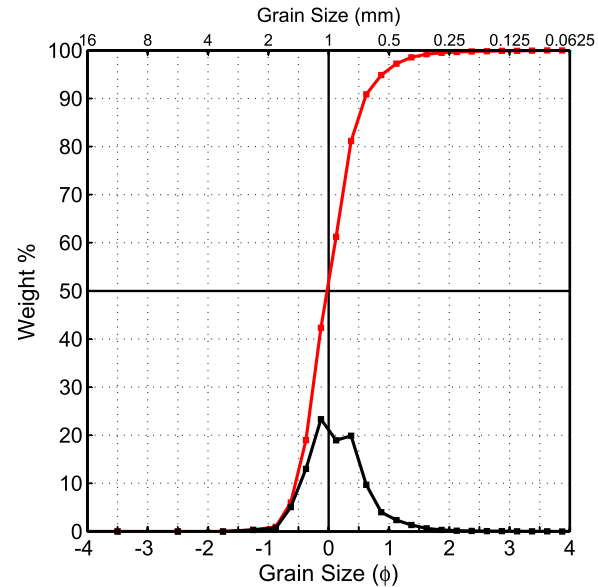
Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean		0.877	0.902
Standard Deviation		0.643	0.674
Skewness (1)		-0.113	-0.152
Skewness (2)		-0.346	
Kurtosis		0.809	1.083

Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-0.155	Mean		1.411	0.376
-3	-3.5	0.00	0.00	0.00	5	0.305	Standard Deviation		0.607	0.656
-2	-2.5	0.00	0.00	0.00	16	0.685	Skewness		0.046	
-1.5	-1.75	0.00	0.00	0.00	25	0.910	Kurtosis		4.064	
-1	-1.25	0.13	0.13	0.13			Dispersion			
-0.75	-0.875	0.08	0.08	0.21	50	1.295	Standard Deviation			
-0.5	-0.625	0.12	0.12	0.33	75	1.635	Deviation from Normal			
-0.25	-0.375	0.19	0.19	0.52	84	1.830				
0	-0.125	0.54	0.54	1.06	95	2.285				
0.25	0.125	1.06	1.06	2.13	99	2.890				
0.5	0.375	3.95	3.97	6.10						
0.75	0.625	7.59	7.62	13.72						
1	0.875	9.37	9.41	23.13						
1.25	1.125	13.19	13.25	36.38						
1.5	1.375	19.99	20.08	56.46						
1.75	1.625	18.12	18.20	74.66						
2	1.875	11.31	11.36	86.02						
2.25	2.125	6.38	6.41	92.43						
2.5	2.375	4.02	4.04	96.46						
2.75	2.625	1.03	1.03	97.50						
3	2.875	1.46	1.47	98.97						
3.25	3.125	0.57	0.57	99.54						
3.5	3.375	0.38	0.38	99.92						
3.75	3.625	0.05	0.05	99.97						
4	3.875	0.01	0.01	99.98						
>4.0	4.25	0.02	0.02	100.00						

Percentiles		Moment Measures		(phi)	(mm)
1	-0.155	Mean		1.411	0.376
5	0.305	Standard Deviation		0.607	0.656
16	0.685	Skewness		0.046	
25	0.910	Kurtosis		4.064	
50	1.295	Dispersion			
75	1.635	Standard Deviation			
84	1.830	Deviation from Normal			
95	2.285				
99	2.890				

Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean		1.258	1.270
Standard Deviation		0.573	0.586
Skewness (1)		-0.066	-0.033
Skewness (2)		0.000	
Kurtosis		0.729	1.119

Grain Size Distribution



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1840+00
Interval BC

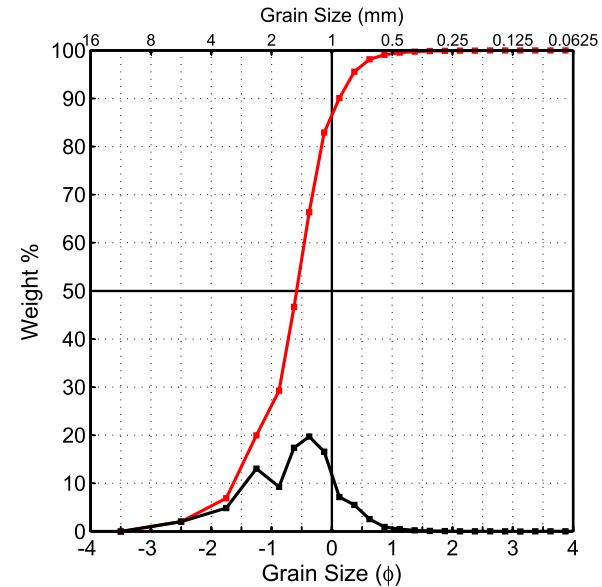
Mean 0.902 mm
STD 0.708 mm
Skewness 1.146

USCS Wentworth

SP Coarse Sand
 Medium Sand Well Sorted
 Poorly Graded Fine Skewed
 Leptokurtic

Total weight (gram) 100.20
 % finer than 4.00 phi 0.02
 % coarser than -1.00 phi 0.29
 % CaCO_3 9.3

Grain Size Distribution



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1840+00
Interval Berm

Mean 1.430 mm
STD 0.634 mm
Skewness -0.268

USCS Wentworth

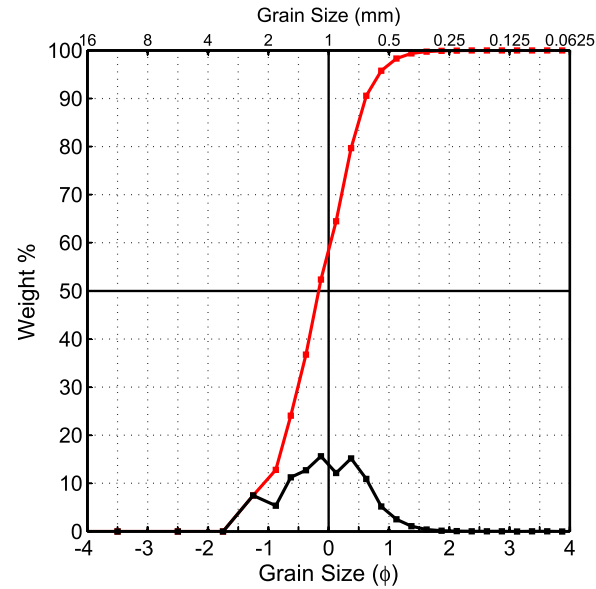
SP Very Coarse Sand
 Medium Sand Moderately Well Sorted
 Poorly Graded Symmetrical
 Leptokurtic

Total weight (gram) 99.97
 % finer than 4.00 phi 0.01
 % coarser than -1.00 phi 19.96
 % CaCO_3 14.6

Limits (ϕ)	Mid Point (ϕ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-0.875	Mean		0.149	0.902
-3	-3.5	0.00	0.00	0.00	5	-0.675	Standard Deviation		0.498	0.708
-2	-2.5	0.00	0.00	0.00	16	-0.430	Skewness		1.146	
-1.5	-1.75	0.00	0.00	0.00	25	-0.310	Kurtosis		7.282	
-1	-1.25	0.29	0.29	0.29	50	-0.025	Dispersion			
-0.75	-0.875	0.67	0.67	0.96	75	0.300	Standard Deviation			
-0.5	-0.625	5.05	5.04	6.00	84	0.450	Deviation from Normal			
-0.25	-0.375	13.01	12.98	18.98	95	0.890				
0	-0.125	23.37	23.32	42.31	99	1.555				
0.25	0.125	18.99	18.95	61.26	Graphic Phi Parameters		Inman	Folk & Ward		
0.5	0.375	19.94	19.90	81.16			1952	1957		
0.75	0.625	9.72	9.70	90.86	Mean		0.010	-0.002		
1	0.875	4.02	4.01	94.87			0.440	0.457		
1.25	1.125	2.36	2.36	97.23			0.080	0.124		
1.5	1.375	1.33	1.33	98.55			0.301			
1.75	1.625	0.63	0.63	99.18			0.778	1.051		
2	1.875	0.32	0.32	99.50						
2.25	2.125	0.16	0.16	99.66						
2.5	2.375	0.11	0.11	99.77						
2.75	2.625	0.06	0.06	99.83	Standard Deviation					
3	2.875	0.05	0.05	99.88						
3.25	3.125	0.02	0.02	99.90						
3.5	3.375	0.04	0.04	99.94						
3.75	3.625	0.04	0.04	99.98						
4	3.875	0.00	0.00	99.98						
>4.0	4.25	0.02	0.02	100.00						

Limits (ϕ)	Mid Point (ϕ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-3.010	Mean		-0.516	1.430
-3	-3.5	0.00	0.00	0.00	5	-2.045	Standard Deviation		0.658	0.634
-2	-2.5	2.04	2.04	2.04	16	-1.400	Skewness		-0.268	
-1.5	-1.75	4.86	4.86	6.90	25	-1.045	Kurtosis		4.684	
-1	-1.25	13.05	13.05	19.96	50	-0.580	Dispersion			
-0.75	-0.875	9.29	9.29	29.25	75	-0.245	Standard Deviation			
-0.5	-0.625	17.39	17.40	46.64	84	-0.085	Deviation from Normal			
-0.25	-0.375	19.72	19.73	66.37	95	0.350				
0	-0.125	16.54	16.54	82.91	99	0.855				
0.25	0.125	7.15	7.15	90.07	Graphic Phi Parameters		Inman	Folk & Ward		
0.5	0.375	5.49	5.49	95.56			1952	1957		
0.75	0.625	2.57	2.57	98.13	Mean		-0.742	-0.688		
1	0.875	0.94	0.94	99.07			0.657	0.692		
1.25	1.125	0.46	0.46	99.53			-0.247	-0.235		
1.5	1.375	0.21	0.21	99.74			-0.407			
1.75	1.625	0.10	0.10	99.84			0.821	1.227		
2	1.875	0.05	0.05	99.89						
2.25	2.125	0.03	0.03	99.92						
2.5	2.375	0.03	0.03	99.95						
2.75	2.625	0.01	0.01	99.96	Standard Deviation					
3	2.875	0.01	0.01	99.97						
3.25	3.125	-0.01	-0.01	99.96						
3.5	3.375	0.01	0.01	99.97						
3.75	3.625	0.01	0.01	99.98						
4	3.875	0.01	0.01	99.99						
>4.0	4.25	0.01	0.01	100.00						

Grain Size Distribution



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1840+00
Interval MTL

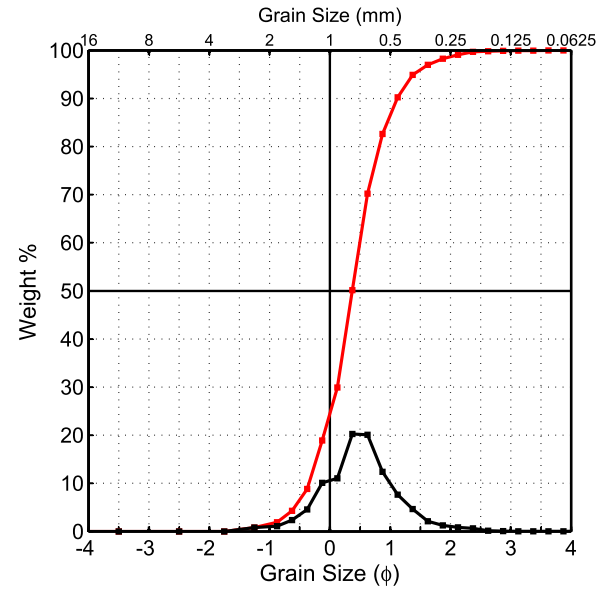
Mean 1.026 mm
STD 0.645 mm
Skewness 0.027

USCS Wentworth

SP Very Coarse Sand
 Medium Sand Moderately Well Sorted
 Poorly Graded Symmetrical Mesokurtic

Total weight (gram) 100.23
 % finer than 4.00 phi 0.00
 % coarser than -1.00 phi 7.47
 % CaCO₃ 8.3

Grain Size Distribution



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1840+00
Interval MHW

Mean 0.703 mm
STD 0.657 mm
Skewness 0.324

USCS Wentworth

SP Coarse Sand
 Medium Sand Moderately Well Sorted
 Poorly Graded Symmetrical Leptokurtic

Total weight (gram) 100.31
 % finer than 4.00 phi 0.02
 % coarser than -1.00 phi 0.80
 % CaCO₃ 6.7

Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-1.685	Mean		-0.037	1.026
-3	-3.5	0.00	0.00	0.00	5	-1.415	Standard Deviation		0.633	0.645
-2	-2.5	0.00	0.00	0.00	16	-0.805	Skewness		0.027	
-1.5	-1.75	0.00	0.00	0.00	25	-0.605	Kurtosis		2.853	
-1	-1.25	7.49	7.47	7.47	25	-0.605	Dispersion			
-0.75	-0.875	5.34	5.33	12.80	50	-0.165	Standard Deviation			
-0.5	-0.625	11.27	11.24	24.04	75	0.300	Deviation from Normal			
-0.25	-0.375	12.74	12.71	36.76	84	0.475				
0	-0.125	15.64	15.60	52.36	95	0.840				
0.25	0.125	12.15	12.12	64.48	99	1.290				
0.5	0.375	15.21	15.18	79.66						
0.75	0.625	10.94	10.91	90.57						
1	0.875	5.19	5.18	95.75						
1.25	1.125	2.54	2.53	98.28						
1.5	1.375	1.10	1.10	99.38						
1.75	1.625	0.37	0.37	99.75						
2	1.875	0.13	0.13	99.88						
2.25	2.125	0.05	0.05	99.93						
2.5	2.375	0.04	0.04	99.97						
2.75	2.625	0.01	0.01	99.98						
3	2.875	0.01	0.01	99.99						
3.25	3.125	-0.01	-0.01	99.98						
3.5	3.375	0.01	0.01	99.99						
3.75	3.625	0.01	0.01	100.00						
4	3.875	0.00	0.00	100.00						
>4.0	4.25	0.00	0.00	100.00						

Percentiles		Moment Measures		(phi)	(mm)
1	-1.685	Mean		-0.037	1.026
5	-1.415	Standard Deviation		0.633	0.645
16	-0.805	Skewness		0.027	
25	-0.605	Kurtosis		2.853	
25	-0.605	Dispersion			
50	-0.165	Standard Deviation			
75	0.300	Deviation from Normal			
84	0.475				
95	0.840				
99	1.290				

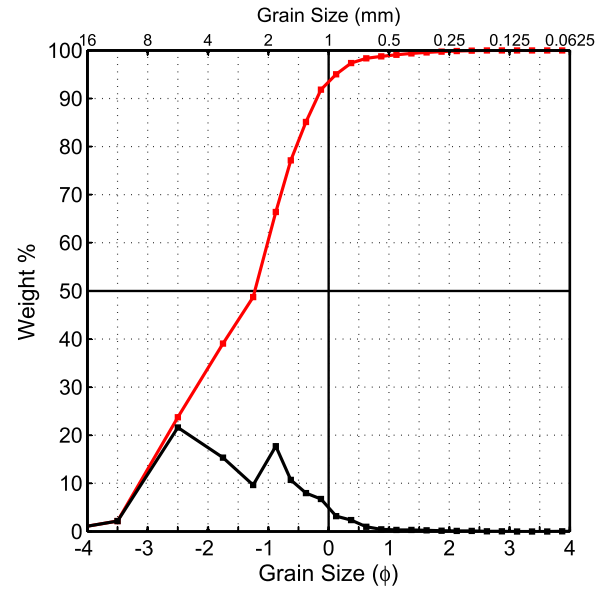
Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean		-0.165	-0.165
Standard Deviation		0.640	0.662
Skewness (1)		0.000	-0.054
Skewness (2)		-0.191	
Kurtosis		0.762	1.021

Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-1.180	Mean		0.508	0.703
-3	-3.5	0.00	0.00	0.00	5	-0.585	Standard Deviation		0.606	0.657
-2	-2.5	0.00	0.00	0.00	16	-0.195	Skewness		0.324	
-1.5	-1.75	0.00	0.00	0.00	25	0.015	Kurtosis		4.408	
-1	-1.25	0.80	0.80	0.80	25	0.015	Dispersion			
-0.75	-0.875	1.10	1.10	1.89	50	0.375	Standard Deviation			
-0.5	-0.625	2.38	2.37	4.27	75	0.720	Deviation from Normal			
-0.25	-0.375	4.56	4.55	8.81	84	0.920				
0	-0.125	10.11	10.08	18.89	95	1.390				
0.25	0.125	11.06	11.03	29.92	99	2.100				
0.5	0.375	20.30	20.24	50.15						
0.75	0.625	20.13	20.07	70.22						
1	0.875	12.43	12.39	82.61						
1.25	1.125	7.66	7.64	90.25						
1.5	1.375	4.65	4.64	94.89						
1.75	1.625	2.13	2.12	97.01						
2	1.875	1.24	1.24	98.25						
2.25	2.125	0.84	0.84	99.08						
2.5	2.375	0.62	0.62	99.70						
2.75	2.625	0.13	0.13	99.83						
3	2.875	0.08	0.08	99.91						
3.25	3.125	0.02	0.02	99.93						
3.5	3.375	0.02	0.02	99.95						
3.75	3.625	0.02	0.02	99.97						
4	3.875	0.01	0.01	99.98						
>4.0	4.25	0.02	0.02	100.00						

Percentiles		Moment Measures		(phi)	(mm)
1	-1.180	Mean		0.508	0.703
5	-0.585	Standard Deviation		0.606	0.657
16	-0.195	Skewness		0.324	
25	0.015	Kurtosis		4.408	
25	0.015	Dispersion			
50	0.375	Standard Deviation			
75	0.720	Deviation from Normal			
84	0.920				
95	1.390				
99	2.100				

Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean		0.363	0.367
Standard Deviation		0.557	0.578
Skewness (1)		-0.022	0.003
Skewness (2)		0.049	
Kurtosis		0.771	1.148

Grain Size Distribution



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1840+00
Interval Trough

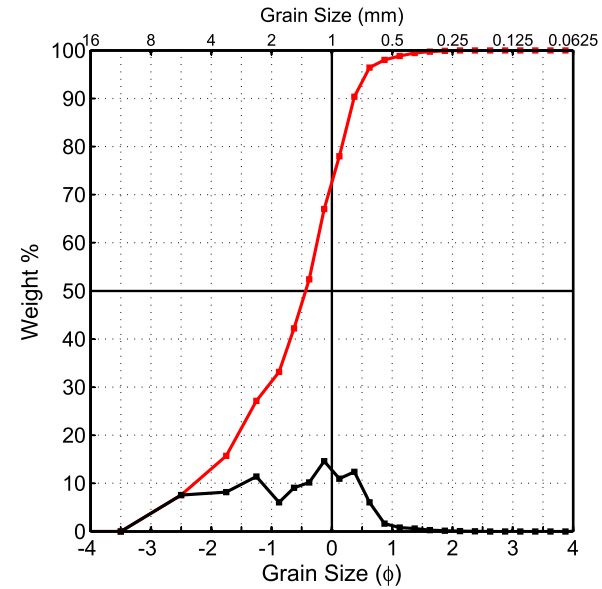
Mean 2.331 mm
STD 0.503 mm
Skewness 0.042

USCS Wentworth

SP Granule
 Coarse Sand Moderately Sorted
 Poorly Graded Symmetrical
 Mesokurtic

Total weight (gram) 99.59
 % finer than 4.00 phi 0.01
 % coarser than -1.00 phi 48.72
 % CaCO₃ 23.4

Grain Size Distribution



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1840+00
Interval MLW

Mean 1.414 mm
STD 0.529 mm
Skewness -0.535

USCS Wentworth

SP Very Coarse Sand
 Medium Sand Moderately Sorted
 Poorly Graded Coarse Skewed
 Mesokurtic

Total weight (gram) 100.19
 % finer than 4.00 phi 0.01
 % coarser than -1.00 phi 27.13
 % CaCO₃ 10.9

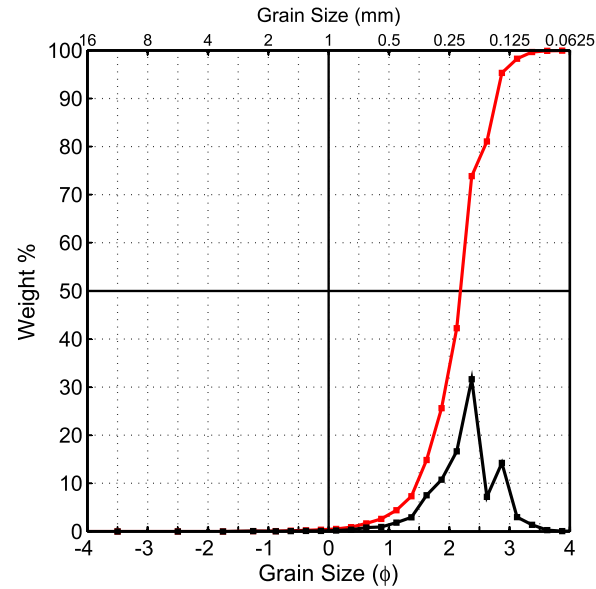
Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles	Moment Measures (phi) (mm)		
-4	-4.5	0.00	0.00	0.00	1	-4.030		
-3	-3.5	2.13	2.14	2.14	5	-3.370		
-2	-2.5	21.51	21.60	23.74	16	-2.860		
-1.5	-1.75	15.26	15.32	39.06	25	-2.440		
-1	-1.25	9.62	9.66	48.72	50	-1.225		
-0.75	-0.875	17.62	17.69	66.41	75	-0.675		
-0.5	-0.625	10.67	10.71	77.13	84	-0.410		
-0.25	-0.375	7.94	7.97	85.10	95	0.125		
0	-0.125	6.70	6.73	91.83	99	1.065		
0.25	0.125	3.17	3.18	95.01				
0.5	0.375	2.33	2.34	97.35				
0.75	0.625	0.97	0.97	98.32				
1	0.875	0.43	0.43	98.75				
1.25	1.125	0.32	0.32	99.08				
1.5	1.375	0.29	0.29	99.37				
1.75	1.625	0.21	0.21	99.58				
2	1.875	0.16	0.16	99.74				
2.25	2.125	0.10	0.10	99.84				
2.5	2.375	0.09	0.09	99.93				
2.75	2.625	0.03	0.03	99.96				
3	2.875	0.02	0.02	99.98				
3.25	3.125	0.00	0.00	99.98				
3.5	3.375	0.00	0.00	99.98				
3.75	3.625	0.00	0.00	99.98				
4	3.875	0.01	0.01	99.99				
>4.0	4.25	0.01	0.01	100.00				

Percentiles	Graphic Phi Parameters	Inman 1952	Folk & Ward 1957
Mean		-1.635	-1.498
Standard Deviation		1.225	1.142
Skewness (1)		-0.335	-0.281
Skewness (2)		-0.324	
Kurtosis		0.427	0.812

Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles	Moment Measures (phi) (mm)		
-4	-4.5	0.00	0.00	0.00	1	-3.365		
-3	-3.5	0.00	0.00	0.00	5	-2.835		
-2	-2.5	7.55	7.54	7.54	16	-1.735		
-1.5	-1.75	8.19	8.17	15.71	25	-1.345		
-1	-1.25	11.44	11.42	27.13	50	-0.435		
-0.75	-0.875	6.04	6.03	33.16	75	0.055		
-0.5	-0.625	9.07	9.05	42.21	84	0.245		
-0.25	-0.375	10.20	10.18	52.39	95	0.565		
0	-0.125	14.64	14.61	67.00	99	1.195		
0.25	0.125	10.99	10.97	77.97				
0.5	0.375	12.40	12.38	90.35				
0.75	0.625	6.06	6.05	96.40				
1	0.875	1.62	1.62	98.01				
1.25	1.125	0.82	0.82	98.83				
1.5	1.375	0.61	0.61	99.44				
1.75	1.625	0.28	0.28	99.72				
2	1.875	0.16	0.16	99.88				
2.25	2.125	0.08	0.08	99.96				
2.5	2.375	0.04	0.04	100.00				
2.75	2.625	0.00	0.00	100.00				
3	2.875	0.00	0.00	100.00				
3.25	3.125	-0.01	-0.01	99.99				
3.5	3.375	0.00	0.00	99.99				
3.75	3.625	0.00	0.00	99.99				
4	3.875	0.00	0.00	99.99				
>4.0	4.25	0.01	0.01	100.00				

Percentiles	Graphic Phi Parameters	Inman 1952	Folk & Ward 1957
Mean		-0.745	-0.642
Standard Deviation		0.990	1.010
Skewness (1)		-0.313	-0.362
Skewness (2)		-0.707	
Kurtosis		0.717	0.995

Grain Size Distribution



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1840+00
Interval -8 ft NAVD

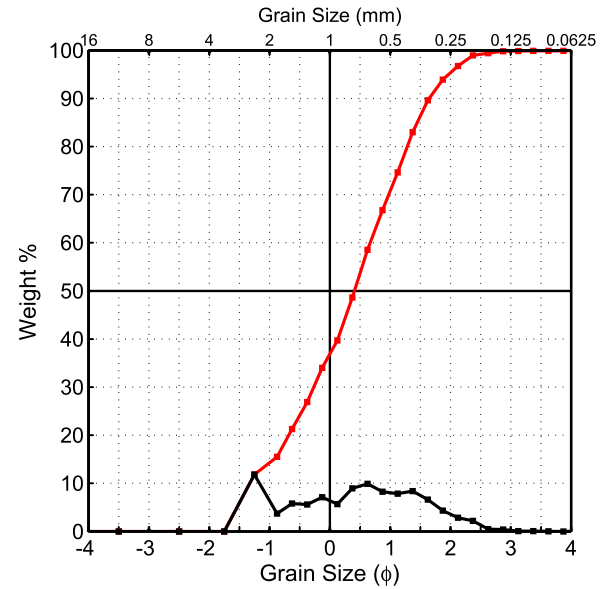
Mean 0.210 mm
STD 0.686 mm
Skewness -0.952

USCS Wentworth

SP Fine Sand
 Moderately Well Sorted
 Poorly Graded
 Leptokurtic

Total weight (gram) 109.24
 % finer than 4.00 phi 0.05
 % coarser than -1.00 phi 0.05
 % CaCO₃ 2.2

Grain Size Distribution



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1840+00
Interval Bar

Mean 0.725 mm
STD 0.488 mm
Skewness -0.030

USCS Wentworth

SP Coarse Sand
 Poorly Sorted
 Symmetrical
 Platykurtic

Total weight (gram) 109.54
 % finer than 4.00 phi 0.08
 % coarser than -1.00 phi 11.80
 % CaCO₃ 3.3

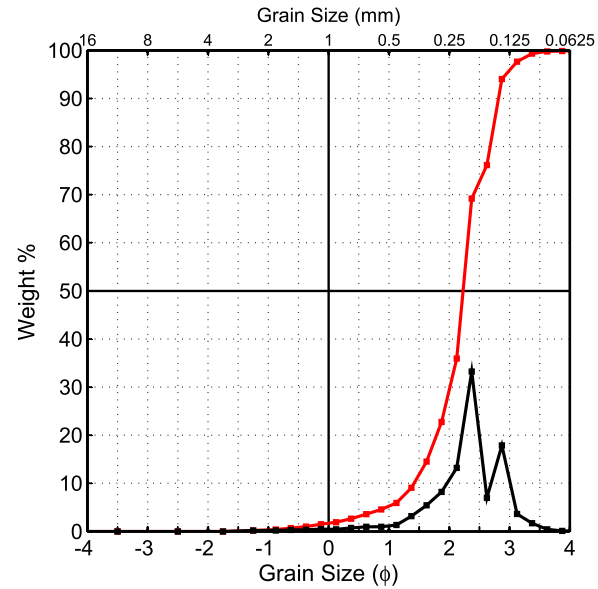
Limits (ϕ)	Mid Point (ϕ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles	Moment Measures	(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	Mean	2.253	0.210
-3	-3.5	0.00	0.00	0.00	5	Standard Deviation	0.544	0.686
-2	-2.5	0.00	0.00	0.00	16	Skewness	-0.952	
-1.5	-1.75	0.00	0.00	0.00	25	Kurtosis	6.009	
-1	-1.25	0.05	0.05	0.05	50	Dispersion		
-0.75	-0.875	0.03	0.03	0.07	75	Standard Deviation		
-0.5	-0.625	0.06	0.05	0.13	84	Deviation from Normal		
-0.25	-0.375	0.10	0.09	0.22	95			
0	-0.125	0.13	0.12	0.34	99			
0.25	0.125	0.19	0.17	0.51				
0.5	0.375	0.40	0.37	0.88				
0.75	0.625	0.87	0.80	1.68				
1	0.875	1.01	0.92	2.60				
1.25	1.125	1.97	1.80	4.40				
1.5	1.375	3.18	2.91	7.31				
1.75	1.625	8.23	7.53	14.85				
2	1.875	11.75	10.76	25.60				
2.25	2.125	18.17	16.63	42.24				
2.5	2.375	34.55	31.63	73.86				
2.75	2.625	7.87	7.20	81.07				
3	2.875	15.56	14.24	95.31				
3.25	3.125	3.24	2.97	98.28				
3.5	3.375	1.48	1.35	99.63				
3.75	3.625	0.30	0.27	99.91				
4	3.875	0.05	0.05	99.95				
>4.0	4.25	0.05	0.05	100.00				

Graphic Phi Parameters	Inman 1952	Folk & Ward 1957
Mean	2.162	2.170
Standard Deviation	0.512	0.513
Skewness (1)	-0.044	-0.118
Skewness (2)	-0.317	
Kurtosis	0.654	1.252

Limits (ϕ)	Mid Point (ϕ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles	Moment Measures	(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	Mean	0.463	0.725
-3	-3.5	0.00	0.00	0.00	5	Standard Deviation	1.035	0.488
-2	-2.5	0.00	0.00	0.00	16	Skewness	-0.030	
-1.5	-1.75	0.00	0.00	0.00	25	Kurtosis	2.270	
-1	-1.25	12.93	11.80	11.80	50	Dispersion		
-0.75	-0.875	4.04	3.69	15.49	75	Standard Deviation		
-0.5	-0.625	6.34	5.79	21.28	84	Deviation from Normal		
-0.25	-0.375	6.14	5.61	26.89	95			
0	-0.125	7.80	7.12	34.01	99			
0.25	0.125	6.22	5.68	39.68				
0.5	0.375	9.81	8.96	48.64				
0.75	0.625	10.83	9.89	58.53				
1	0.875	9.03	8.24	66.77				
1.25	1.125	8.61	7.86	74.63				
1.5	1.375	9.16	8.36	82.99				
1.75	1.625	7.25	6.62	89.61				
2	1.875	4.73	4.32	93.93				
2.25	2.125	3.10	2.83	96.76				
2.5	2.375	2.40	2.19	98.95				
2.75	2.625	0.51	0.47	99.42				
3	2.875	0.42	0.38	99.80				
3.25	3.125	0.06	0.05	99.85				
3.5	3.375	0.05	0.05	99.90				
3.75	3.625	0.02	0.02	99.92				
4	3.875	0.00	0.00	99.92				
>4.0	4.25	0.09	0.08	100.00				

Graphic Phi Parameters	Inman 1952	Folk & Ward 1957
Mean	0.280	0.323
Standard Deviation	1.135	1.099
Skewness (1)	-0.115	-0.113
Skewness (2)	-0.172	
Kurtosis	0.546	0.902

Grain Size Distribution



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1840+00
Interval -16 ft NAVD

Mean 0.207 mm
STD 0.634 mm
Skewness -1.608

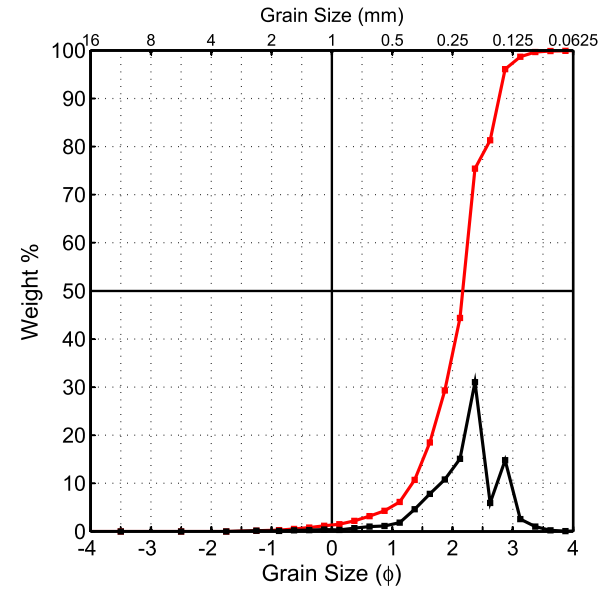
USCS Wentworth

SP Fine Sand
 Poorly Graded

Fine Sand
 Moderately Well Sorted
 Strongly Coarse Skewed
 Very Leptokurtic

Total weight (gram) 107.60
 % finer than 4.00 phi 0.16
 % coarser than -1.00 phi 0.20
 % CaCO₃ 2.1

Grain Size Distribution



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1840+00
Interval -12 ft NAVD

Mean 0.219 mm
STD 0.648 mm
Skewness -1.362

USCS Wentworth

SP Fine Sand
 Poorly Graded

Fine Sand
 Moderately Well Sorted
 Strongly Coarse Skewed
 Leptokurtic

Total weight (gram) 110.33
 % finer than 4.00 phi 0.10
 % coarser than -1.00 phi 0.16
 % CaCO₃ 2.3

Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-0.390	Mean		2.274	0.207
-3	-3.5	0.00	0.00	0.00	5	0.955	Standard Deviation		0.656	0.634
-2	-2.5	0.00	0.00	0.00	16	1.670	Skewness		-1.608	
-1.5	-1.75	0.00	0.00	0.00	25	1.920	Kurtosis		7.947	
-1	-1.25	0.22	0.20	0.20	50	2.230	Dispersion			
-0.75	-0.875	0.18	0.17	0.37	75	2.585	Standard Deviation			
-0.5	-0.625	0.31	0.29	0.66	84	2.735	Deviation from Normal			
-0.25	-0.375	0.39	0.36	1.02	95	2.945				
0	-0.125	0.50	0.46	1.49	99	3.325				
0.25	0.125	0.45	0.42	1.91						
0.5	0.375	0.77	0.72	2.62						
0.75	0.625	1.05	0.98	3.60						
1	0.875	1.05	0.98	4.57						
1.25	1.125	1.45	1.35	5.92						
1.5	1.375	3.41	3.17	9.09						
1.75	1.625	5.84	5.43	14.52						
2	1.875	8.84	8.22	22.73						
2.25	2.125	14.21	13.21	35.94						
2.5	2.375	35.76	33.23	69.17						
2.75	2.625	7.50	6.97	76.14						
3	2.875	19.24	17.88	94.02						
3.25	3.125	3.88	3.61	97.63						
3.5	3.375	1.83	1.70	99.33						
3.75	3.625	0.46	0.43	99.76						
4	3.875	0.09	0.08	99.84						
>4.0	4.25	0.17	0.16	100.00						

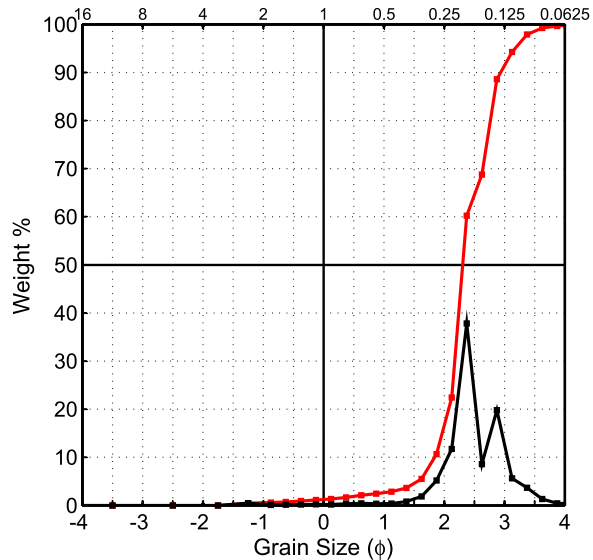
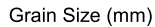
Percentiles		Moment Measures		(phi)	(mm)
1	-0.390	Mean		2.274	0.207
5	0.955	Standard Deviation		0.656	0.634
16	1.670	Skewness		-1.608	
25	1.920	Kurtosis		7.947	
50	2.230	Dispersion			
75	2.585	Standard Deviation			
84	2.735	Deviation from Normal			
95	2.945				
99	3.325				

Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean		2.202	2.212
Standard Deviation		0.532	0.568
Skewness (1)		-0.052	-0.167
Skewness (2)		-0.526	
Kurtosis		0.869	1.226

Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-0.240	Mean		2.190	0.219
-3	-3.5	0.00	0.00	0.00	5	0.970	Standard Deviation		0.627	0.648
-2	-2.5	0.00	0.00	0.00	16	1.545	Skewness		-1.362	
-1.5	-1.75	0.00	0.00	0.00	25	1.775	Kurtosis		7.081	
-1	-1.25	0.18	0.16	0.16	50	2.170	Dispersion			
-0.75	-0.875	0.12	0.11	0.27	75	2.370	Standard Deviation			
-0.5	-0.625	0.26	0.24	0.51	84	2.670	Deviation from Normal			
-0.25	-0.375	0.31	0.28	0.79	95	2.855				
0	-0.125	0.44	0.40	1.19	99	3.215				
0.25	0.125	0.36	0.33	1.51						
0.5	0.375	0.75	0.68	2.19						
0.75	0.625	1.09	0.99	3.18						
1	0.875	1.22	1.11	4.29						
1.25	1.125	2.03	1.84	6.13						
1.5	1.375	5.07	4.60	10.72						
1.75	1.625	8.59	7.79	18.51						
2	1.875	11.89	10.78	29.28						
2.25	2.125	16.65	15.09	44.38						
2.5	2.375	34.22	31.02	75.39						
2.75	2.625	6.52	5.91	81.30						
3	2.875	16.32	14.79	96.09						
3.25	3.125	2.82	2.56	98.65						
3.5	3.375	1.09	0.99	99.64						
3.75	3.625	0.24	0.22	99.85						
4	3.875	0.05	0.05	99.90						
>4.0	4.25	0.11	0.10	100.00						

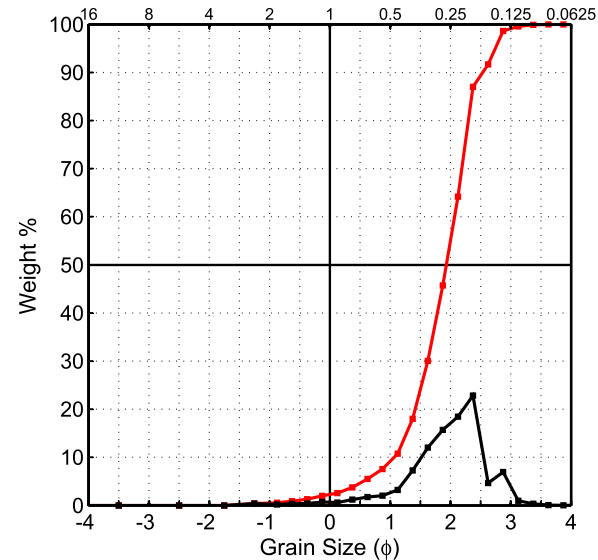
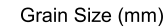
Percentiles		Moment Measures		(phi)	(mm)
1	-0.240	Mean		2.190	0.219
5	0.970	Standard Deviation		0.627	0.648
16	1.545	Skewness		-1.362	
25	1.775	Kurtosis		7.081	
50	2.170	Dispersion			
75	2.370	Standard Deviation			
84	2.670	Deviation from Normal			
95	2.855				
99	3.215				

Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean		2.107	2.128
Standard Deviation		0.563	0.567
Skewness (1)		-0.111	-0.192
Skewness (2)		-0.458	
Kurtosis		0.676	1.298



Project	2408
Location	Buxton, NC
Date	Oct 2014
Station	1840+00
Interval	-24 ft NAVD
Mean	0.181 mm
STD	0.659 mm
Skewness	-1.998
USCS	Wentworth
SP	Fine Sand
Fine Sand	Moderately Well Sorted
Poorly Graded	Strongly Coarse Skewed
	Very Leptokurtic

Total weight (gram)	100.16
% finer than 4.00 phi	0.33
% coarser than -1.00 phi	0.46
% CaCO ₃	6.2



Project	2408
Location	Buxton, NC
Date	Oct 2014
Station	1840+00
Interval	-20 ft NAVD
Mean	0.259 mm
STD	0.631 mm
Skewness	-1.356
USCS	Wentworth
SP	Medium Sand
Fine Sand	Moderately Well Sorted
Poorly Graded	Strongly Coarse Skewed Leptokurtic

Total weight (gram)	109.20
% finer than 4.00 phi	0.03
% coarser than -1.00 phi	0.38
% CaCO ₃	7.0

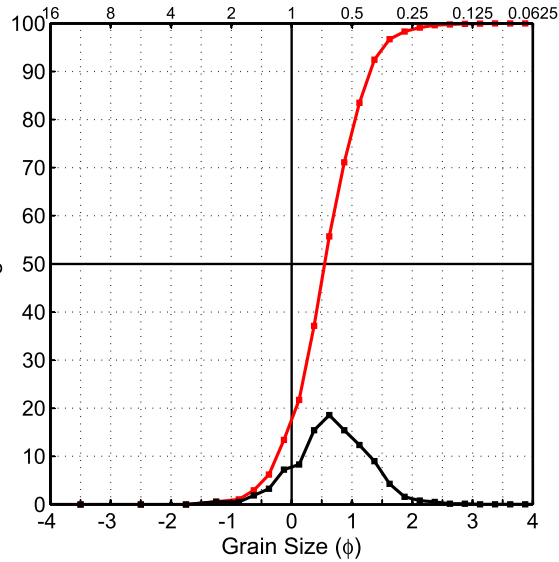
Limits (ϕ)	Mid Point (ϕ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-0.265	Mean		2.462	0.181
-3	-3.5	0.00	0.00	0.00	5	1.555	Standard Deviation		0.601	0.659
-2	-2.5	0.00	0.00	0.00	16	1.990	Skewness		-1.998	
-1.5	-1.75	0.00	0.00	0.00	25	2.140	Kurtosis		13.198	
-1	-1.25	0.46	0.46	0.46	50	2.310	Dispersion			
-0.75	-0.875	0.12	0.12	0.58	75	2.705	Standard Deviation			
-0.5	-0.625	0.14	0.14	0.72	84	2.815	Deviation from Normal			
-0.25	-0.375	0.19	0.19	0.91	95	3.180				
0	-0.125	0.21	0.21	1.12	99	3.580				
0.25	0.125	0.20	0.20	1.32						
0.5	0.375	0.35	0.35	1.67						
0.75	0.625	0.43	0.43	2.10						
1	0.875	0.34	0.34	2.44						
1.25	1.125	0.40	0.40	2.84						
1.5	1.375	0.81	0.81	3.64						
1.75	1.625	1.88	1.88	5.52						
2	1.875	5.17	5.16	10.68						
2.25	2.125	11.74	11.72	22.40						
2.5	2.375	37.86	37.80	60.20						
2.75	2.625	8.59	8.58	68.78						
3	2.875	19.83	19.80	88.58						
3.25	3.125	5.66	5.65	94.23						
3.5	3.375	3.67	3.66	97.89						
3.75	3.625	1.35	1.35	99.24						
4	3.875	0.43	0.43	99.67						
>4.0	4.25	0.33	0.33	100.00						

Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean		2.402	2.372
Standard Deviation		0.413	0.452
Skewness (1)		0.224	0.148
Skewness (2)		0.139	
Kurtosis		0.970	1.179

Limits (ϕ)	Mid Point (ϕ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles	Moment Measures	(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1 -0.550	Mean	1.950	0.259
-3	-3.5	0.00	0.00	0.00	5 0.555	Standard Deviation	0.663	0.631
-2	-2.5	0.00	0.00	0.00	16 1.305	Skewness	-1.356	
-1.5	-1.75	0.00	0.00	0.00	25 1.520	Kurtosis	6.480	
-1	-1.25	0.41	0.38	0.38	50 1.935	Dispersion		
-0.75	-0.875	0.18	0.16	0.54	75 2.245	Standard Deviation		
-0.5	-0.625	0.37	0.34	0.88	84 2.340	Deviation from Normal		
-0.25	-0.375	0.44	0.40	1.28	95 2.745			
0	-0.125	0.77	0.71	1.99	99 2.980			
0.25	0.125	0.64	0.59	2.57				
0.5	0.375	1.30	1.19	3.76				
0.75	0.625	1.90	1.74	5.50				
1	0.875	2.23	2.04	7.55				
1.25	1.125	3.49	3.20	10.74				
1.5	1.375	7.92	7.25	17.99				
1.75	1.625	13.13	12.02	30.02				
2	1.875	17.15	15.71	45.72				
2.25	2.125	20.16	18.46	64.18				
2.5	2.375	24.92	22.82	87.01				
2.75	2.625	5.09	4.66	91.67				
3	2.875	7.58	6.94	98.61				
3.25	3.125	1.04	0.95	99.56				
3.5	3.375	0.37	0.34	99.90				
3.75	3.625	0.07	0.06	99.96				
4	3.875	0.01	0.01	99.97				
>4.0	4.25	0.03	0.03	100.00				
					Graphic Phi Parameters	Inman 1952	Folk & Ward 1957	
					Mean	1.823	1.860	
					Standard Deviation	0.517	0.591	
					Skewness (1)	-0.217	-0.239	
					Skewness (2)	-0.551		
					Kurtosis	1.116	1.238	

Grain Size Distribution

Grain Size (mm)



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1870+00
Interval Dune Toe

Mean 0.625 mm
STD 0.654 mm
Skewness 0.060

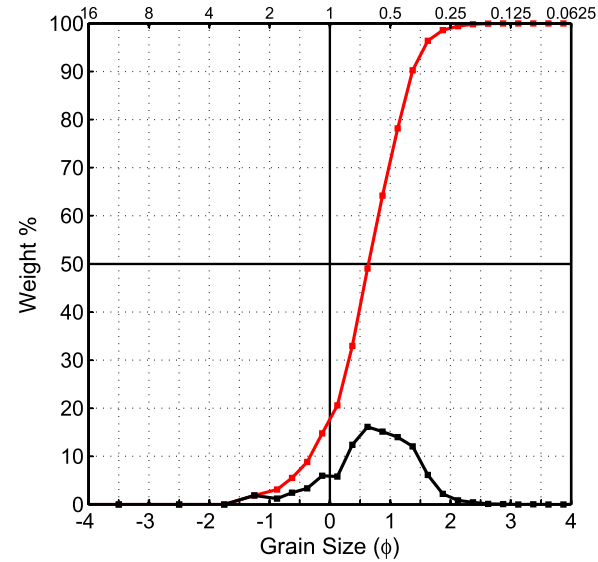
USCS Wentworth

SP Coarse Sand
 Medium Sand Moderately Well Sorted
 Poorly Graded Symmetrical
 Leptokurtic

Total weight (gram) 99.78
 % finer than 4.00 phi 0.02
 % coarser than -1.00 phi 0.54
 % CaCO₃ 5.8

Grain Size Distribution

Grain Size (mm)



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1870+00
Interval Dune

Mean 0.609 mm
STD 0.625 mm
Skewness -0.500

USCS Wentworth

SP Coarse Sand
 Medium Sand Moderately Well Sorted
 Poorly Graded Coarse Skewed
 Mesokurtic

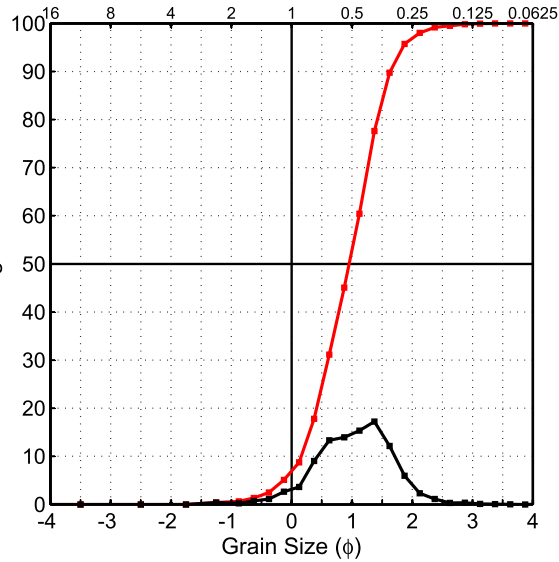
Total weight (gram) 99.96
 % finer than 4.00 phi 0.01
 % coarser than -1.00 phi 1.86
 % CaCO₃ 6.5

Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-0.905	Mean		0.677	0.625
-3	-3.5	0.00	0.00	0.00	5	-0.465	Standard Deviation		0.612	0.654
-2	-2.5	0.00	0.00	0.00	16	-0.045	Skewness		0.060	
-1.5	-1.75	0.00	0.00	0.00	25	0.180	Kurtosis		3.836	
-1	-1.25	0.54	0.54	0.54	50	0.550	Dispersion			
-0.75	-0.875	0.50	0.50	1.04	75	0.955	Standard Deviation			
-0.5	-0.625	1.87	1.87	2.92	84	1.140	Deviation from Normal			
-0.25	-0.375	3.26	3.27	6.18	95	1.525				
0	-0.125	7.21	7.23	13.41	99	2.090				
0.25	0.125	8.28	8.30	21.71	Graphic Phi Parameters		Inman	Folk & Ward		
0.5	0.375	15.39	15.42	37.13			1952	1957		
0.75	0.625	18.54	18.58	55.71	Graphic Phi Parameters		Inman	Folk & Ward		
1	0.875	15.38	15.41	71.13			1952	1957		
1.25	1.125	12.31	12.34	83.46	Graphic Phi Parameters		Inman	Folk & Ward		
1.5	1.375	8.98	9.00	92.46			Inman	Folk & Ward		
1.75	1.625	4.25	4.26	96.72	Graphic Phi Parameters		Inman	Folk & Ward		
2	1.875	1.59	1.59	98.32			Inman	Folk & Ward		
2.25	2.125	0.79	0.79	99.11	Graphic Phi Parameters		Inman	Folk & Ward		
2.5	2.375	0.50	0.50	99.61			Inman	Folk & Ward		
2.75	2.625	0.15	0.15	99.76	Graphic Phi Parameters		Inman	Folk & Ward		
3	2.875	0.14	0.14	99.90			Inman	Folk & Ward		
3.25	3.125	0.04	0.04	99.94	Graphic Phi Parameters		Inman	Folk & Ward		
3.5	3.375	0.02	0.02	99.96			Inman	Folk & Ward		
3.75	3.625	0.01	0.01	99.97	Graphic Phi Parameters		Inman	Folk & Ward		
4	3.875	0.01	0.01	99.98			Inman	Folk & Ward		
>4.0	4.25	0.02	0.02	100.00	Graphic Phi Parameters		Inman	Folk & Ward		
							Inman	Folk & Ward		

Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-1.480	Mean		0.715	0.609
-3	-3.5	0.00	0.00	0.00	5	-0.675	Standard Deviation		0.678	0.625
-2	-2.5	0.00	0.00	0.00	16	-0.070	Skewness		-0.500	
-1.5	-1.75	0.00	0.00	0.00	25	0.215	Kurtosis		3.486	
-1	-1.25	1.86	1.86	1.86	50	0.640	Dispersion			
-0.75	-0.875	1.22	1.22	3.08	75	1.070	Standard Deviation			
-0.5	-0.625	2.42	2.42	5.50	84	1.245	Deviation from Normal			
-0.25	-0.375	3.33	3.33	8.83	95	1.570				
0	-0.125	5.94	5.94	14.78	99	2.005				
0.25	0.125	5.78	5.78	20.56	Graphic Phi Parameters		Inman	Folk & Ward		
0.5	0.375	12.38	12.38	32.94			Inman	Folk & Ward		
0.75	0.625	16.10	16.11	49.05	Graphic Phi Parameters		Inman	Folk & Ward		
1	0.875	15.14	15.15	64.20			Inman	Folk & Ward		
1.25	1.125	13.96	13.97	78.16	Graphic Phi Parameters		Inman	Folk & Ward		
1.5	1.375	12.06	12.06	90.23			Inman	Folk & Ward		
1.75	1.625	6.13	6.13	96.36	Graphic Phi Parameters		Inman	Folk & Ward		
2	1.875	2.21	2.21	98.57			Inman	Folk & Ward		
2.25	2.125	0.84	0.84	99.41	Graphic Phi Parameters		Inman	Folk & Ward		
2.5	2.375	0.42	0.42	99.83			Inman	Folk & Ward		
2.75	2.625	0.09	0.09	99.92	Graphic Phi Parameters		Inman	Folk & Ward		
3	2.875	0.06	0.06	99.98			Inman	Folk & Ward		
3.25	3.125	0.00	0.00	99.98	Graphic Phi Parameters		Inman	Folk & Ward		
3.5	3.375	0.01	0.01	99.99			Inman	Folk & Ward		
3.75	3.625	0.00	0.00	99.99	Graphic Phi Parameters		Inman	Folk & Ward		
4	3.875	0.00	0.00	99.99			Inman	Folk & Ward		
>4.0	4.25	0.01	0.01	100.00	Graphic Phi Parameters		Inman	Folk & Ward		
							Inman	Folk & Ward		

Grain Size Distribution

Grain Size (mm)



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1870+00
Interval BC

Mean 0.485 mm
STD 0.651 mm
Skewness -0.253

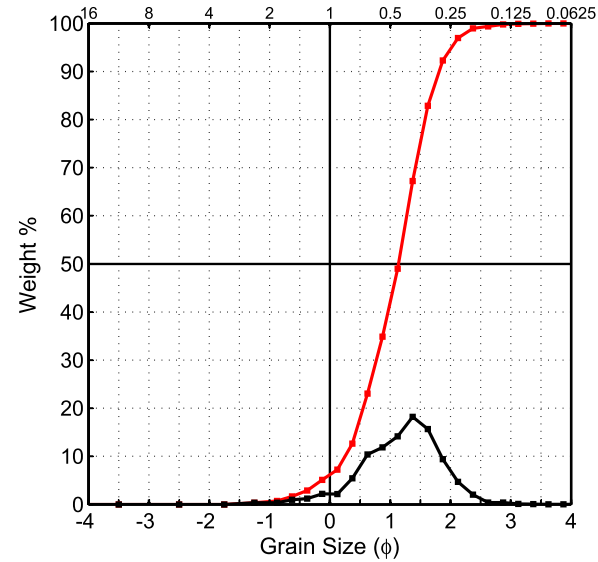
USCS Wentworth

SP Medium Sand
 Medium Sand Moderately Well Sorted
 Poorly Graded Symmetrical Leptokurtic

Total weight (gram) 99.78
 % finer than 4.00 phi 0.01
 % coarser than -1.00 phi 0.38
 % CaCO₃ 3.1

Grain Size Distribution

Grain Size (mm)



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1870+00
Interval Berm

Mean 0.439 mm
STD 0.638 mm
Skewness -0.506

USCS Wentworth

SP Medium Sand
 Medium Sand Moderately Well Sorted
 Poorly Graded Coarse Skewed Leptokurtic

Total weight (gram) 100.21
 % finer than 4.00 phi 0.02
 % coarser than -1.00 phi 0.34
 % CaCO₃ 3.1

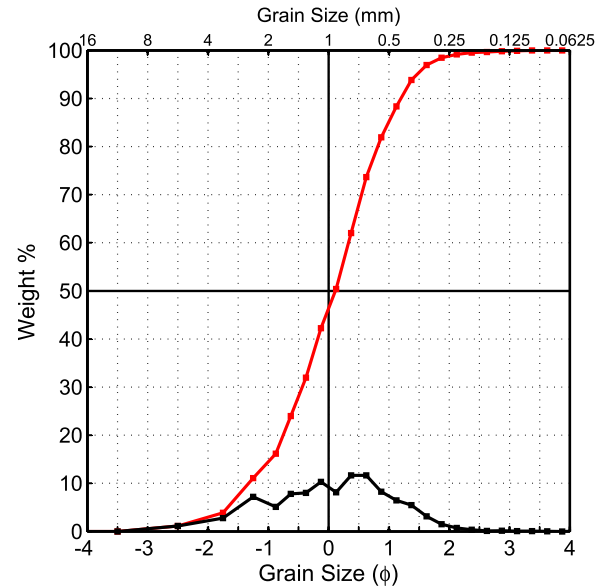
Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-0.740	Mean		1.043	0.485
-3	-3.5	0.00	0.00	0.00	5	-0.135	Standard Deviation		0.620	0.651
-2	-2.5	0.00	0.00	0.00	16	0.325	Skewness		-0.253	
-1.5	-1.75	0.00	0.00	0.00	25	0.510	Kurtosis		3.777	
-1	-1.25	0.38	0.38	0.38	50	0.955	Dispersion			
-0.75	-0.875	0.24	0.24	0.62	75	1.335	Standard Deviation			
-0.5	-0.625	0.71	0.71	1.33	84	1.505	Deviation from Normal			
-0.25	-0.375	1.13	1.13	2.47	95	1.845				
0	-0.125	2.64	2.65	5.11	99	2.340				
0.25	0.125	3.63	3.64	8.75						
0.5	0.375	9.03	9.05	17.80						
0.75	0.625	13.30	13.33	31.13						
1	0.875	13.90	13.93	45.06						
1.25	1.125	15.32	15.35	60.41						
1.5	1.375	17.17	17.21	77.62						
1.75	1.625	12.10	12.13	89.75						
2	1.875	5.94	5.95	95.70						
2.25	2.125	2.31	2.32	98.02						
2.5	2.375	1.14	1.14	99.16						
2.75	2.625	0.32	0.32	99.48						
3	2.875	0.34	0.34	99.82						
3.25	3.125	0.11	0.11	99.93						
3.5	3.375	0.05	0.05	99.98						
3.75	3.625	0.01	0.01	99.99						
4	3.875	0.00	0.00	99.99						
>4.0	4.25	0.01	0.01	100.00						

Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean		0.915	0.928
Standard Deviation		0.590	0.595
Skewness (1)		-0.068	-0.084
Skewness (2)		-0.169	
Kurtosis		0.678	0.984

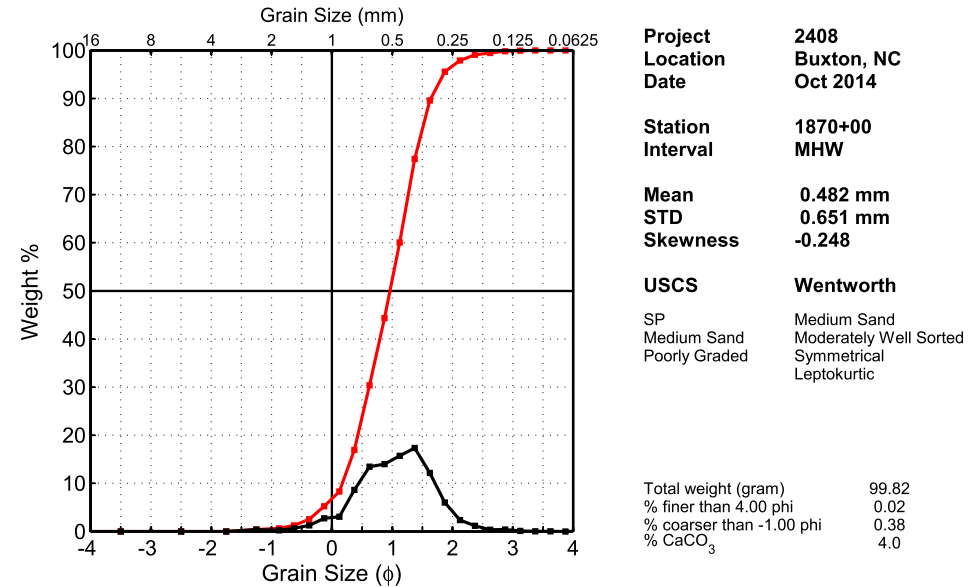
Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-0.795	Mean		1.188	0.439
-3	-3.5	0.00	0.00	0.00	5	-0.135	Standard Deviation		0.649	0.638
-2	-2.5	0.00	0.00	0.00	16	0.455	Skewness		-0.506	
-1.5	-1.75	0.00	0.00	0.00	25	0.665	Kurtosis		3.962	
-1	-1.25	0.34	0.34	0.34	50	1.140	Dispersion			
-0.75	-0.875	0.36	0.36	0.70	75	1.500	Standard Deviation			
-0.5	-0.625	0.96	0.96	1.66	84	1.655	Deviation from Normal			
-0.25	-0.375	1.23	1.23	2.88	95	2.020				
0	-0.125	2.20	2.20	5.08	99	2.390				
0.25	0.125	2.14	2.14	7.21						
0.5	0.375	5.45	5.44	12.65						
0.75	0.625	10.40	10.38	23.03						
1	0.875	11.86	11.84	34.87						
1.25	1.125	14.18	14.15	49.02						
1.5	1.375	18.23	18.19	67.21						
1.75	1.625	15.68	15.65	82.86						
2	1.875	9.43	9.41	92.27						
2.25	2.125	4.69	4.68	96.95						
2.5	2.375	2.03	2.03	98.97						
2.75	2.625	0.41	0.41	99.38						
3	2.875	0.40	0.40	99.78						
3.25	3.125	0.11	0.11	99.89						
3.5	3.375	0.06	0.06	99.95						
3.75	3.625	0.02	0.02	99.97						
4	3.875	0.01	0.01	99.98						
>4.0	4.25	0.02	0.02	100.00						

Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean		1.055	1.083
Standard Deviation		0.600	0.627
Skewness (1)		-0.142	-0.162
Skewness (2)		-0.329	
Kurtosis		0.796	1.058

Grain Size Distribution



Grain Size Distribution



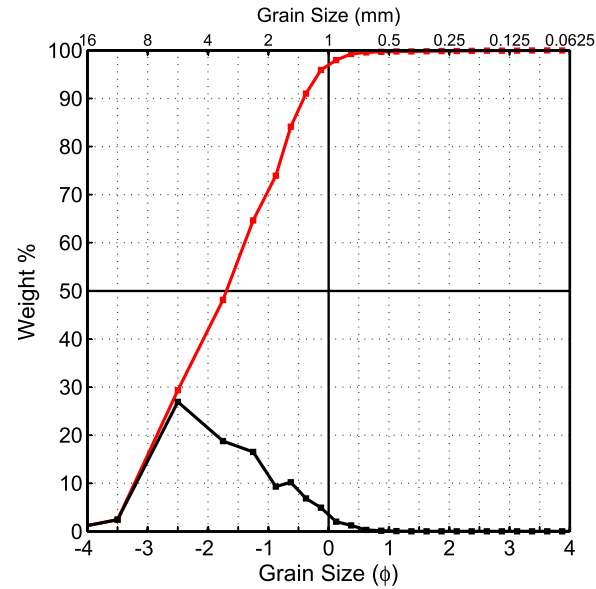
Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-2.610	Mean		0.161	0.894
-3	-3.5	0.00	0.00	0.00	5	-1.670	Standard Deviation		0.930	0.525
-2	-2.5	1.13	1.12	1.12	16	-0.885	Skewness		-0.171	
-1.5	-1.75	2.78	2.76	3.88			Kurtosis		3.094	
-1	-1.25	7.25	7.20	11.08	25	-0.595	Dispersion			
-0.75	-0.875	5.12	5.08	16.16	50	0.115	Standard Deviation			
-0.5	-0.625	7.87	7.81	23.97	75	0.665	Deviation from Normal			
-0.25	-0.375	8.05	7.99	31.96						
0	-0.125	10.36	10.28	42.24	84	0.955				
0.25	0.125	8.21	8.15	50.39	95	1.470				
0.5	0.375	11.72	11.63	62.02	99	2.060				
0.75	0.625	11.72	11.63	73.65						
1	0.875	8.32	8.26	81.91						
1.25	1.125	6.50	6.45	88.36						
1.5	1.375	5.50	5.46	93.82						
1.75	1.625	3.17	3.15	96.96						
2	1.875	1.52	1.51	98.47						
2.25	2.125	0.71	0.70	99.18						
2.5	2.375	0.37	0.37	99.54						
2.75	2.625	0.12	0.12	99.66						
3	2.875	0.16	0.16	99.82						
3.25	3.125	0.08	0.08	99.90						
3.5	3.375	0.07	0.07	99.97						
3.75	3.625	0.01	0.01	99.98						
4	3.875	0.00	0.00	99.98						
>4.0	4.25	0.02	0.02	100.00						

Percentiles		Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean				0.035	0.062
Standard Deviation				0.920	0.936
Skewness (1)				-0.087	-0.112
Skewness (2)				-0.234	
Kurtosis				0.707	1.021

Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-0.725	Mean		1.053	0.482
-3	-3.5	0.00	0.00	0.00	5	-0.145	Standard Deviation		0.619	0.651
-2	-2.5	0.00	0.00	0.00	16	0.350	Skewness		-0.248	
-1.5	-1.75	0.00	0.00	0.00			Kurtosis		3.893	
-1	-1.25	0.38	0.38	0.38	25	0.525	Dispersion			
-0.75	-0.875	0.24	0.24	0.62	50	0.965	Standard Deviation			
-0.5	-0.625	0.63	0.63	1.25	75	1.340	Deviation from Normal			
-0.25	-0.375	1.25	1.25	2.50						
0	-0.125	2.71	2.71	5.22	84	1.510				
0.25	0.125	3.06	3.07	8.28	95	1.850				
0.5	0.375	8.62	8.64	16.92	99	2.360				
0.75	0.625	13.43	13.45	30.37						
1	0.875	13.94	13.97	44.34						
1.25	1.125	15.69	15.72	60.06						
1.5	1.375	17.31	17.34	77.40						
1.75	1.625	12.14	12.16	89.56						
2	1.875	5.97	5.98	95.54						
2.25	2.125	2.36	2.36	97.91						
2.5	2.375	1.17	1.17	99.08						
2.75	2.625	0.36	0.36	99.44						
3	2.875	0.37	0.37	99.81						
3.25	3.125	0.12	0.12	99.93						
3.5	3.375	0.04	0.04	99.97						
3.75	3.625	0.01	0.01	99.98						
4	3.875	0.00	0.00	99.98						
>4.0	4.25	0.02	0.02	100.00						

Percentiles		Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean				0.930	0.942
Standard Deviation				0.580	0.592
Skewness (1)				-0.060	-0.087
Skewness (2)				-0.194	
Kurtosis				0.720	1.003

Grain Size Distribution



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1870+00
Interval Trough

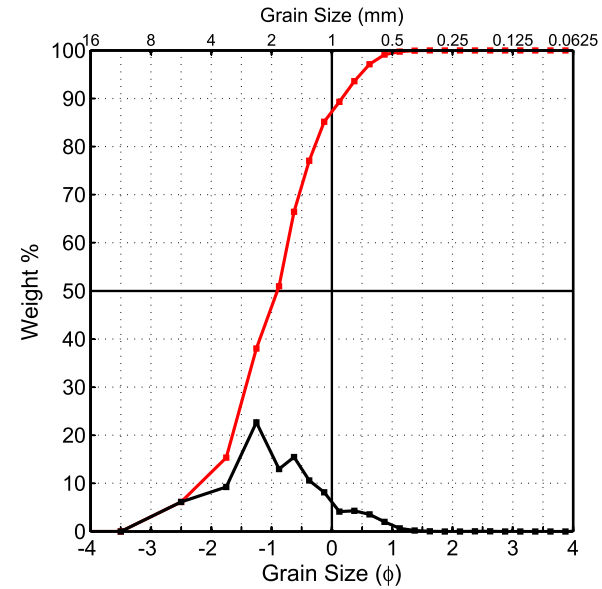
Mean 2.738 mm
STD 0.529 mm
Skewness 0.178

USCS Wentworth

SP Granule
 Coarse Sand Moderately Sorted
 Poorly Graded Symmetrical
 Mesokurtic

Total weight (gram) 100.31
 % finer than 4.00 phi 0.02
 % coarser than -1.00 phi 64.65
 % CaCO₃ 26.7

Grain Size Distribution



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1870+00
Interval MLW

Mean 1.724 mm
STD 0.577 mm
Skewness -0.011

USCS Wentworth

SP Very Coarse Sand
 Medium Sand Moderately Sorted
 Poorly Graded Symmetrical
 Mesokurtic

Total weight (gram) 99.95
 % finer than 4.00 phi 0.01
 % coarser than -1.00 phi 38.03
 % CaCO₃ 16.4

Limits (phi)	Mid Point (phi)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles	Moment Measures	(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	Mean	-1.453	2.738
-3	-3.5	2.43	2.42	2.42	5	Standard Deviation	0.919	0.529
-2	-2.5	26.99	26.91	29.33	16	Skewness	0.178	
-1.5	-1.75	18.85	18.79	48.12	25	Kurtosis	3.098	
-1	-1.25	16.58	16.53	64.65	25	Dispersion		
-0.75	-0.875	9.33	9.30	73.95	50	Standard Deviation		
-0.5	-0.625	10.23	10.20	84.15	50	Deviation from Normal		
-0.25	-0.375	6.89	6.87	91.02	75			
0	-0.125	4.94	4.92	95.94	84			
0.25	0.125	2.05	2.04	97.99	95			
0.5	0.375	1.27	1.27	99.25	99			
0.75	0.625	0.32	0.32	99.57				
1	0.875	0.13	0.13	99.70				
1.25	1.125	0.06	0.06	99.76				
1.5	1.375	0.02	0.02	99.78				
1.75	1.625	0.04	0.04	99.82				
2	1.875	0.03	0.03	99.85				
2.25	2.125	0.02	0.02	99.87				
2.5	2.375	0.03	0.03	99.90				
2.75	2.625	0.02	0.02	99.92				
3	2.875	0.02	0.02	99.94				
3.25	3.125	0.01	0.01	99.95				
3.5	3.375	0.01	0.01	99.96				
3.75	3.625	0.01	0.01	99.97				
4	3.875	0.01	0.01	99.98				
>4.0	4.25	0.02	0.02	100.00				

Percentiles	Moment Measures	(phi)	(mm)
1	Mean	-1.453	2.738
5	Standard Deviation	0.919	0.529
16	Skewness	0.178	
25	Kurtosis	3.098	
25	Dispersion		
50	Standard Deviation		
75	Deviation from Normal		
84			
95			
99			

Graphic Phi Parameters	Inman 1952	Folk & Ward 1957
Mean	-1.813	-1.773
Standard Deviation	1.183	1.081
Skewness (1)	-0.099	-0.079
Skewness (2)	-0.080	
Kurtosis	0.366	0.731

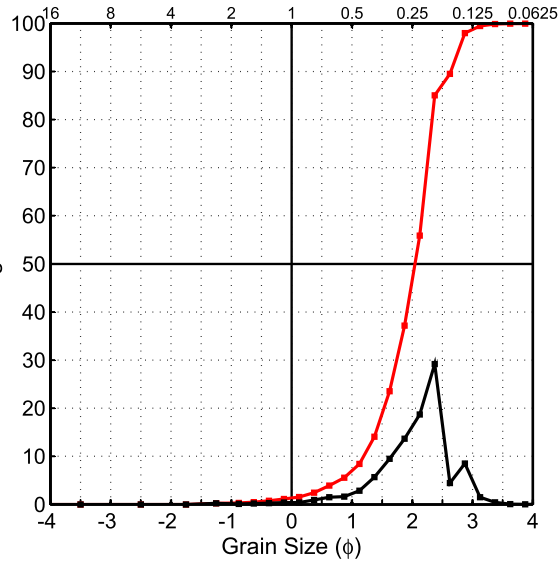
Limits (phi)	Mid Point (phi)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles	Moment Measures	(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	Mean	-0.786	1.724
-3	-3.5	0.00	0.00	0.00	5	Standard Deviation	0.793	0.577
-2	-2.5	6.10	6.10	6.10	16	Skewness	-0.011	
-1.5	-1.75	9.24	9.24	15.35	25	Kurtosis	3.186	
-1	-1.25	22.67	22.68	38.03	25	Dispersion		
-0.75	-0.875	12.94	12.95	50.98	50	Standard Deviation		
-0.5	-0.625	15.47	15.48	66.45	50	Deviation from Normal		
-0.25	-0.375	10.60	10.61	77.06	75			
0	-0.125	8.11	8.11	85.17	84			
0.25	0.125	4.12	4.12	89.29	95			
0.5	0.375	4.29	4.29	93.59	99			
0.75	0.625	3.54	3.54	97.13				
1	0.875	1.99	1.99	99.12				
1.25	1.125	0.63	0.63	99.75				
1.5	1.375	0.19	0.19	99.94				
1.75	1.625	0.03	0.03	99.97				
2	1.875	0.00	0.00	99.97				
2.25	2.125	0.00	0.00	99.97				
2.5	2.375	0.01	0.01	99.98				
2.75	2.625	0.01	0.01	99.99				
3	2.875	0.00	0.00	99.99				
3.25	3.125	0.00	0.00	99.99				
3.5	3.375	0.00	0.00	99.99				
3.75	3.625	0.00	0.00	99.99				
4	3.875	0.00	0.00	99.99				
>4.0	4.25	0.01	0.01	100.00				

Percentiles	Moment Measures	(phi)	(mm)
1	Mean	-0.786	1.724
5	Standard Deviation	0.793	0.577
16	Skewness	-0.011	
25	Kurtosis	3.186	
25	Dispersion		
50	Standard Deviation		
75	Deviation from Normal		
84			
95			
99			

Graphic Phi Parameters	Inman 1952	Folk & Ward 1957
Mean	-0.947	-0.933
Standard Deviation	0.788	0.872
Skewness (1)	-0.054	-0.090
Skewness (2)	-0.251	
Kurtosis	1.003	1.165

Grain Size Distribution

Grain Size (mm)



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1870+00
Interval -8 ft NAVD

Mean 0.240 mm
STD 0.654 mm
Skewness -1.334

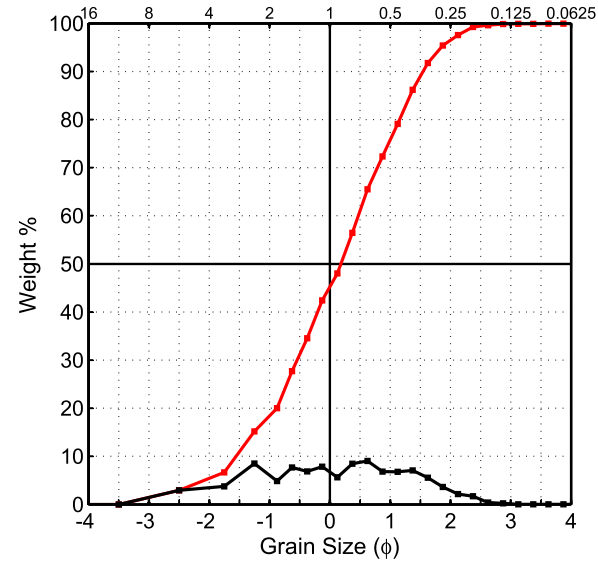
USCS Wentworth

SP Fine Sand
 Medium Sand Poorly Graded
 Poorly Graded Moderately Well Sorted
 Strongly Coarse Skewed
 Leptokurtic

Total weight (gram) 118.55
 % finer than 4.00 phi 0.04
 % coarser than -1.00 phi 0.24
 % CaCO₃ 2.1

Grain Size Distribution

Grain Size (mm)



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1870+00
Interval Bar

Mean 0.856 mm
STD 0.452 mm
Skewness -0.201

USCS Wentworth

SP Coarse Sand
 Medium Sand Poorly Sorted
 Poorly Graded Symmetrical
 Mesokurtic

Total weight (gram) 108.09
 % finer than 4.00 phi 0.06
 % coarser than -1.00 phi 15.16
 % CaCO₃ 2.4

Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-0.205	Mean		2.057	0.240
-3	-3.5	0.00	0.00	0.00	5	0.790	Standard Deviation		0.613	0.654
-2	-2.5	0.00	0.00	0.00	16	1.425	Skewness		-1.334	
-1.5	-1.75	0.00	0.00	0.00	25	1.650	Kurtosis		6.812	
-1	-1.25	0.28	0.24	0.24	50	2.045	Dispersion			
-0.75	-0.875	0.10	0.08	0.32	75	2.290	Standard Deviation			
-0.5	-0.625	0.20	0.17	0.49	84	2.365	Deviation from Normal			
-0.25	-0.375	0.30	0.25	0.74	95	2.790				
0	-0.125	0.45	0.38	1.12	99	3.050				
0.25	0.125	0.48	0.40	1.53						
0.5	0.375	1.07	0.90	2.43						
0.75	0.625	1.77	1.49	3.92						
1	0.875	1.94	1.64	5.56						
1.25	1.125	3.37	2.84	8.40						
1.5	1.375	6.70	5.65	14.05						
1.75	1.625	11.22	9.46	23.52						
2	1.875	16.17	13.64	37.16						
2.25	2.125	22.17	18.70	55.86						
2.5	2.375	34.61	29.19	85.05						
2.75	2.625	5.25	4.43	89.48						
3	2.875	10.06	8.49	97.97						
3.25	3.125	1.75	1.48	99.44						
3.5	3.375	0.49	0.41	99.86						
3.75	3.625	0.09	0.08	99.93						
4	3.875	0.03	0.03	99.96						
>4.0	4.25	0.05	0.04	100.00						

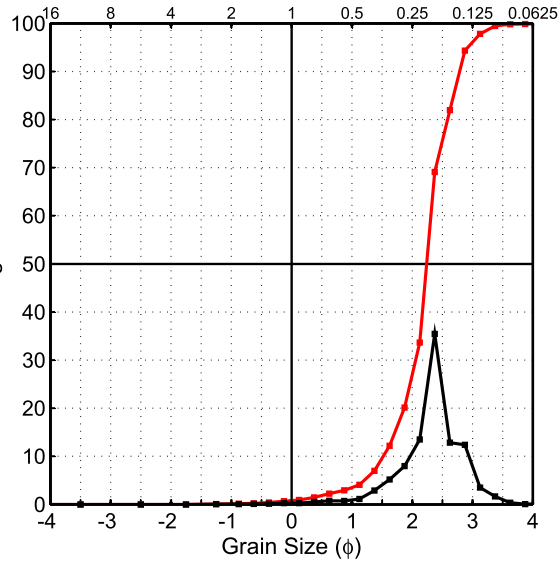
Percentiles		Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean				1.895	1.945
Standard Deviation				0.470	0.538
Skewness (1)				-0.319	-0.287
Skewness (2)				-0.543	
Kurtosis				1.128	1.281

Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-3.160	Mean		0.225	0.856
-3	-3.5	0.00	0.00	0.00	5	-2.085	Standard Deviation		1.146	0.452
-2	-2.5	3.16	2.92	2.92	16	-1.185	Skewness		-0.201	
-1.5	-1.75	4.05	3.75	6.67	25	-0.715	Kurtosis		2.621	
-1	-1.25	9.18	8.49	15.16	50	0.185	Dispersion			
-0.75	-0.875	5.25	4.86	20.02	75	0.975	Standard Deviation			
-0.5	-0.625	8.30	7.68	27.70	84	1.300	Deviation from Normal			
-0.25	-0.375	7.40	6.85	34.55	95	1.850				
0	-0.125	8.48	7.85	42.39	99	2.340				
0.25	0.125	6.07	5.62	48.01						
0.5	0.375	9.13	8.45	56.45						
0.75	0.625	9.77	9.04	65.49						
1	0.875	7.39	6.84	72.33						
1.25	1.125	7.33	6.78	79.11						
1.5	1.375	7.65	7.08	86.19						
1.75	1.625	6.01	5.56	91.75						
2	1.875	3.93	3.64	95.38						
2.25	2.125	2.34	2.16	97.55						
2.5	2.375	1.83	1.69	99.24						
2.75	2.625	0.42	0.39	99.63						
3	2.875	0.23	0.21	99.84						
3.25	3.125	0.04	0.04	99.88						
3.5	3.375	0.03	0.03	99.91						
3.75	3.625	0.02	0.02	99.93						
4	3.875	0.01	0.01	99.94						
>4.0	4.25	0.07	0.06	100.00						

Percentiles		Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean				0.057	0.100
Standard Deviation				1.242	1.217
Skewness (1)				-0.103	-0.128
Skewness (2)				-0.243	
Kurtosis				0.584	0.954

Grain Size Distribution

Grain Size (mm)



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1870+00
Interval -16 ft NAVD

Mean 0.202 mm
STD 0.678 mm
Skewness -1.406

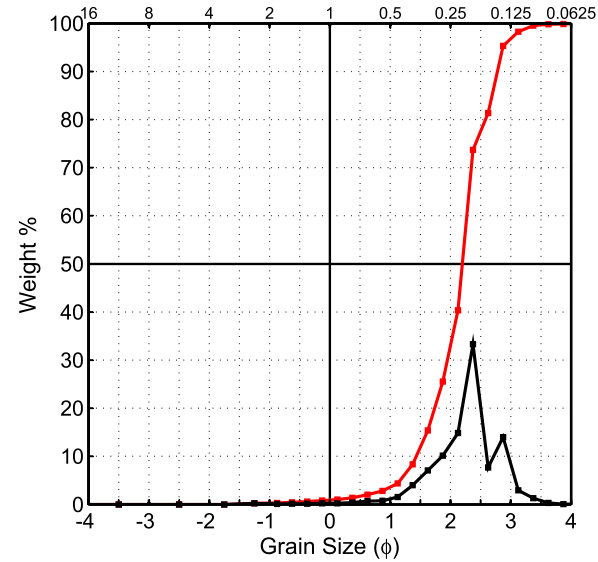
USCS Wentworth

SP Fine Sand
 Fine Sand Moderately Well Sorted
 Poorly Graded Strongly Coarse Skewed
 Very Leptokurtic

Total weight (gram) 122.66
 % finer than 4.00 phi 0.13
 % coarser than -1.00 phi 0.06
 % CaCO₃ 1.6

Grain Size Distribution

Grain Size (mm)



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1870+00
Interval -12 ft NAVD

Mean 0.211 mm
STD 0.668 mm
Skewness -1.391

USCS Wentworth

SP Fine Sand
 Fine Sand Moderately Well Sorted
 Poorly Graded Strongly Coarse Skewed
 Very Leptokurtic

Total weight (gram) 121.39
 % finer than 4.00 phi 0.12
 % coarser than -1.00 phi 0.22
 % CaCO₃ 1.7

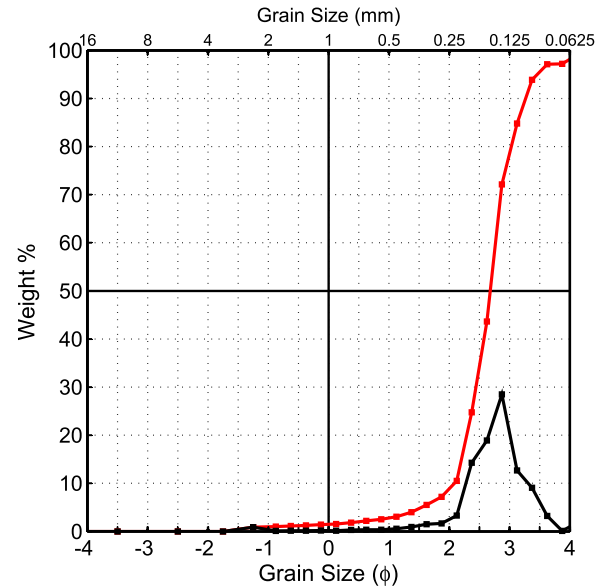
Limits (phi)	Mid Point (phi)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	0.160	Mean		2.304	0.202
-3	-3.5	0.00	0.00	0.00	5	1.205	Standard Deviation		0.560	0.678
-2	-2.5	0.00	0.00	0.00	16	1.745	Skewness		-1.406	
-1.5	-1.75	0.00	0.00	0.00	25	1.965	Kurtosis		8.035	
-1	-1.25	0.07	0.06	0.06	50	2.240	Dispersion			
-0.75	-0.875	0.10	0.08	0.14	75	2.490	Standard Deviation			
-0.5	-0.625	0.13	0.11	0.24	84	2.665	Deviation from Normal			
-0.25	-0.375	0.19	0.15	0.40	95	2.925				
0	-0.125	0.34	0.28	0.68	99	3.305				
0.25	0.125	0.31	0.25	0.93						
0.5	0.375	0.65	0.53	1.46						
0.75	0.625	0.95	0.77	2.23						
1	0.875	0.86	0.70	2.93						
1.25	1.125	1.39	1.13	4.07						
1.5	1.375	3.56	2.90	6.97						
1.75	1.625	6.37	5.19	12.16						
2	1.875	9.77	7.97	20.13						
2.25	2.125	16.57	13.51	33.64						
2.5	2.375	43.48	35.45	69.09						
2.75	2.625	15.77	12.86	81.94						
3	2.875	15.17	12.37	94.31						
3.25	3.125	4.27	3.48	97.79						
3.5	3.375	2.04	1.66	99.45						
3.75	3.625	0.44	0.36	99.81						
4	3.875	0.07	0.06	99.87						
>4.0	4.25	0.16	0.13	100.00						

Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean		2.205	2.217
Standard Deviation		0.460	0.491
Skewness (1)		-0.076	-0.140
Skewness (2)		-0.380	
Kurtosis		0.870	1.343

Limits (phi)	Mid Point (phi)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	0.120	Mean		2.246	0.211
-3	-3.5	0.00	0.00	0.00	5	1.165	Standard Deviation		0.582	0.668
-2	-2.5	0.00	0.00	0.00	16	1.640	Skewness		-1.391	
-1.5	-1.75	0.00	0.00	0.00	25	1.860	Kurtosis		8.387	
-1	-1.25	0.27	0.22	0.22	50	2.195	Dispersion			
-0.75	-0.875	0.12	0.10	0.32	75	2.420	Standard Deviation			
-0.5	-0.625	0.15	0.12	0.44	84	2.675	Deviation from Normal			
-0.25	-0.375	0.18	0.15	0.59	95	2.870				
0	-0.125	0.25	0.21	0.80	99	3.270				
0.25	0.125	0.25	0.21	1.01						
0.5	0.375	0.45	0.37	1.38						
0.75	0.625	0.81	0.67	2.04						
1	0.875	0.93	0.77	2.81						
1.25	1.125	1.86	1.53	4.34						
1.5	1.375	4.87	4.01	8.35						
1.75	1.625	8.55	7.04	15.40						
2	1.875	12.29	10.12	25.52						
2.25	2.125	18.01	14.84	40.36						
2.5	2.375	40.44	33.31	73.67						
2.75	2.625	9.30	7.66	81.33						
3	2.875	16.99	14.00	95.33						
3.25	3.125	3.55	2.92	98.25						
3.5	3.375	1.57	1.29	99.55						
3.75	3.625	0.35	0.29	99.84						
4	3.875	0.05	0.04	99.88						
>4.0	4.25	0.15	0.12	100.00						

Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean		2.157	2.170
Standard Deviation		0.517	0.517
Skewness (1)		-0.072	-0.140
Skewness (2)		-0.343	
Kurtosis		0.647	1.248

Grain Size Distribution



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1870+00
Interval -24 ft NAVD

Mean 0.150 mm
STD 0.614 mm
Skewness -2.258

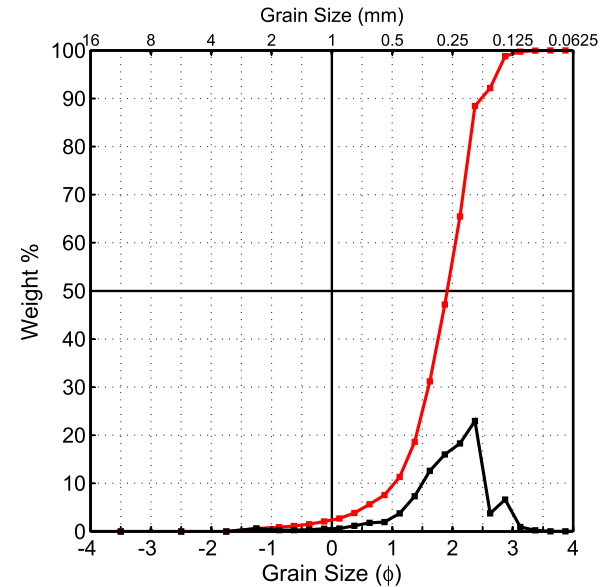
USCS Wentworth

SP Fine Sand
 Poorly Graded

Fine Sand
 Moderately Sorted
 Strongly Coarse Skewed
 Very Leptokurtic

Total weight (gram) 102.99
 % finer than 4.00 phi 2.80
 % coarser than -1.00 phi 0.88
 % CaCO_3 2.4

Grain Size Distribution



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1870+00
Interval -20 ft NAVD

Mean 0.263 mm
STD 0.628 mm
Skewness -1.480

USCS Wentworth

SP Medium Sand
 Poorly Graded

Medium Sand
 Moderately Well Sorted
 Strongly Coarse Skewed
 Leptokurtic

Total weight (gram) 127.68
 % finer than 4.00 phi 0.02
 % coarser than -1.00 phi 0.60
 % CaCO_3 7.3

Limits (ϕ)	Mid Point (ϕ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-0.855	Mean		2.734	0.150
-3	-3.5	0.00	0.00	0.00	5	1.540	Standard Deviation		0.704	0.614
-2	-2.5	0.00	0.00	0.00	16	2.220	Skewness		-2.258	
-1.5	-1.75	0.00	0.00	0.00	25	2.380	Kurtosis		13.659	
-1	-1.25	0.91	0.88	0.88	50	2.680	Dispersion			
-0.75	-0.875	0.11	0.11	0.99	75	2.930	Standard Deviation			
-0.5	-0.625	0.13	0.13	1.12	84	3.110	Deviation from Normal			
-0.25	-0.375	0.13	0.13	1.24	95	3.460				
0	-0.125	0.17	0.17	1.41	99	4.000				
0.25	0.125	0.14	0.14	1.54						
0.5	0.375	0.30	0.29	1.84						
0.75	0.625	0.35	0.34	2.17						
1	0.875	0.37	0.36	2.53						
1.25	1.125	0.55	0.53	3.07						
1.5	1.375	0.97	0.94	4.01						
1.75	1.625	1.55	1.51	5.52						
2	1.875	1.71	1.66	7.18						
2.25	2.125	3.41	3.31	10.49						
2.5	2.375	14.68	14.25	24.74						
2.75	2.625	19.45	18.89	43.63						
3	2.875	29.35	28.50	72.12						
3.25	3.125	13.05	12.67	84.79						
3.5	3.375	9.35	9.08	93.87						
3.75	3.625	3.33	3.23	97.11						
4	3.875	0.10	0.10	97.20						
>4.0	4.25	2.88	2.80	100.00						

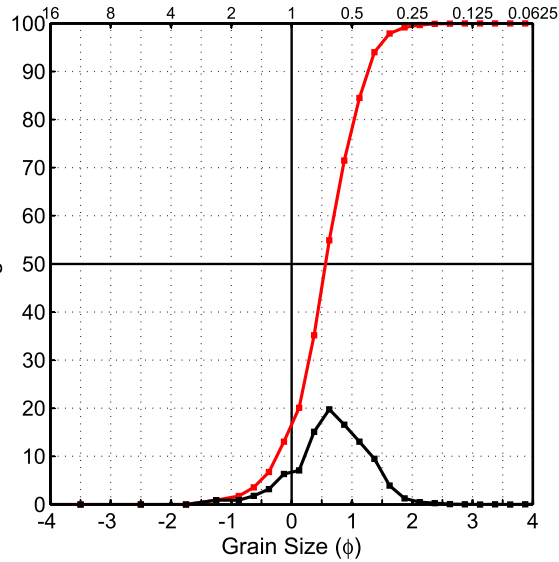
Percentiles		Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean				2.665	2.670
Standard Deviation				0.445	0.513
Skewness (1)				-0.034	-0.111
Skewness (2)				-0.404	
Kurtosis				1.157	1.431

Limits (ϕ)	Mid Point (ϕ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-0.755	Mean		1.928	0.263
-3	-3.5	0.00	0.00	0.00	5	0.535	Standard Deviation		0.672	0.628
-2	-2.5	0.00	0.00	0.00	16	1.285	Skewness		-1.480	
-1.5	-1.75	0.00	0.00	0.00	25	1.500	Kurtosis		7.050	
-1	-1.25	0.77	0.60	0.60	50	1.915	Dispersion			
-0.75	-0.875	0.34	0.27	0.87	75	2.230	Standard Deviation			
-0.5	-0.625	0.35	0.27	1.14	84	2.325	Deviation from Normal			
-0.25	-0.375	0.45	0.35	1.50	95	2.730				
0	-0.125	0.73	0.57	2.07	99	2.930				
0.25	0.125	0.77	0.60	2.67						
0.5	0.375	1.49	1.17	3.84						
0.75	0.625	2.29	1.79	5.63						
1	0.875	2.46	1.93	7.56						
1.25	1.125	4.79	3.75	11.31						
1.5	1.375	9.31	7.29	18.60						
1.75	1.625	16.06	12.58	31.18						
2	1.875	20.41	15.99	47.16						
2.25	2.125	23.35	18.29	65.45						
2.5	2.375	29.33	22.97	88.42						
2.75	2.625	4.77	3.74	92.16						
3	2.875	8.46	6.63	98.79						
3.25	3.125	1.19	0.93	99.72						
3.5	3.375	0.28	0.22	99.94						
3.75	3.625	0.05	0.04	99.98						
4	3.875	0.01	0.01	99.98						
>4.0	4.25	0.02	0.02	100.00						

Percentiles		Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean				1.805	1.842
Standard Deviation				0.520	0.593
Skewness (1)				-0.212	-0.234
Skewness (2)				-0.543	
Kurtosis				1.111	1.232

Grain Size Distribution

Grain Size (mm)



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1890+00
Interval Dune Toe

Mean 0.629 mm
STD 0.663 mm
Skewness -0.321

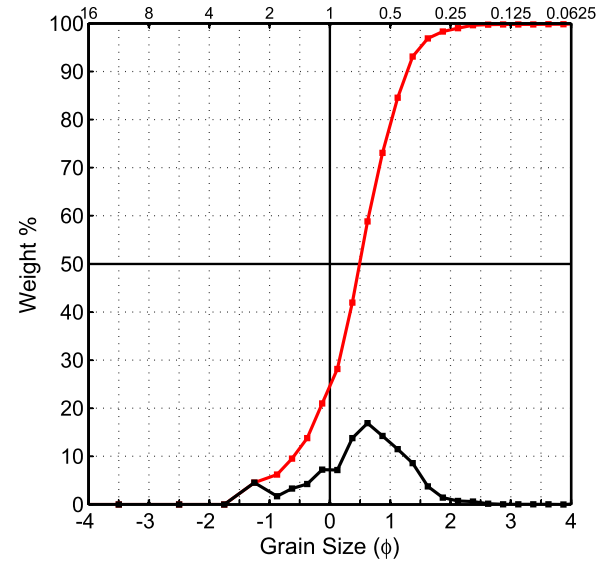
USCS Wentworth

SP Coarse Sand
 Medium Sand Moderately Well Sorted
 Poorly Graded Symmetrical
 Leptokurtic

Total weight (gram) 100.20
 % finer than 4.00 phi 0.01
 % coarser than -1.00 phi 0.87
 % CaCO₃ 5.5

Grain Size Distribution

Grain Size (mm)



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1890+00
Interval Dune

Mean 0.682 mm
STD 0.593 mm
Skewness -0.205

USCS Wentworth

SP Coarse Sand
 Medium Sand Moderately Sorted
 Poorly Graded Symmetrical
 Leptokurtic

Total weight (gram) 100.25
 % finer than 4.00 phi 0.20
 % coarser than -1.00 phi 4.51
 % CaCO₃ 6.6

Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-1.195	Mean		0.668	0.629
-3	-3.5	0.00	0.00	0.00	5	-0.510	Standard Deviation		0.593	0.663
-2	-2.5	0.00	0.00	0.00	16	-0.020	Skewness		-0.321	
-1.5	-1.75	0.00	0.00	0.00	25	0.205	Kurtosis		3.785	
-1	-1.25	0.87	0.87	0.87	50	0.565	Dispersion			
-0.75	-0.875	0.88	0.88	1.75	75	0.945	Standard Deviation			
-0.5	-0.625	1.80	1.80	3.54	84	1.115	Deviation from Normal			
-0.25	-0.375	3.18	3.17	6.72	95	1.440				
0	-0.125	6.32	6.31	13.02	99	1.845				
0.25	0.125	7.06	7.05	20.07						
0.5	0.375	15.10	15.07	35.14						
0.75	0.625	19.81	19.77	54.91						
1	0.875	16.60	16.57	71.48						
1.25	1.125	13.05	13.02	84.50						
1.5	1.375	9.51	9.49	93.99						
1.75	1.625	3.90	3.89	97.88						
2	1.875	1.27	1.27	99.15						
2.25	2.125	0.49	0.49	99.64						
2.5	2.375	0.25	0.25	99.89						
2.75	2.625	0.05	0.05	99.94						
3	2.875	0.03	0.03	99.97						
3.25	3.125	0.00	0.00	99.97						
3.5	3.375	0.01	0.01	99.98						
3.75	3.625	0.00	0.00	99.98						
4	3.875	0.01	0.01	99.99						
>4.0	4.25	0.01	0.01	100.00						

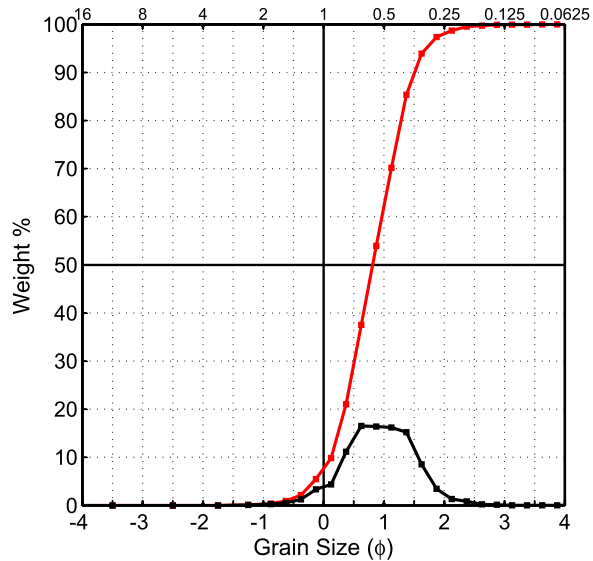
Percentiles		Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean				0.547	0.553
Standard Deviation				0.568	0.579
Skewness (1)				-0.031	-0.067
Skewness (2)				-0.176	
Kurtosis				0.718	1.080

Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-1.640	Mean		0.552	0.682
-3	-3.5	0.00	0.00	0.00	5	-1.140	Standard Deviation		0.754	0.593
-2	-2.5	0.00	0.00	0.00	16	-0.300	Skewness		-0.205	
-1.5	-1.75	0.00	0.00	0.00	25	0.015	Kurtosis		4.159	
-1	-1.25	4.52	4.51	4.51	50	0.495	Dispersion			
-0.75	-0.875	1.71	1.71	6.21	75	0.915	Standard Deviation			
-0.5	-0.625	3.32	3.31	9.53	84	1.115	Deviation from Normal			
-0.25	-0.375	4.25	4.24	13.77	95	1.500				
0	-0.125	7.25	7.23	21.00	99	2.120				
0.25	0.125	7.16	7.14	28.14						
0.5	0.375	13.83	13.80	41.94						
0.75	0.625	16.95	16.91	58.84						
1	0.875	14.28	14.24	73.09						
1.25	1.125	11.50	11.47	84.56						
1.5	1.375	8.58	8.56	93.12						
1.75	1.625	3.76	3.75	96.87						
2	1.875	1.42	1.42	98.28						
2.25	2.125	0.73	0.73	99.01						
2.5	2.375	0.58	0.58	99.59						
2.75	2.625	0.14	0.14	99.73						
3	2.875	0.04	0.04	99.77						
3.25	3.125	0.01	0.01	99.78						
3.5	3.375	0.01	0.01	99.79						
3.75	3.625	0.01	0.01	99.80						
4	3.875	0.00	0.00	99.80						
>4.0	4.25	0.20	0.20	100.00						

Percentiles		Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean				0.407	0.437
Standard Deviation				0.707	0.754
Skewness (1)				-0.124	-0.181
Skewness (2)				-0.445	
Kurtosis				0.866	1.202

Grain Size Distribution

Grain Size (mm)



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1890+00
Interval BC

Mean 0.523 mm
STD 0.672 mm
Skewness -0.014

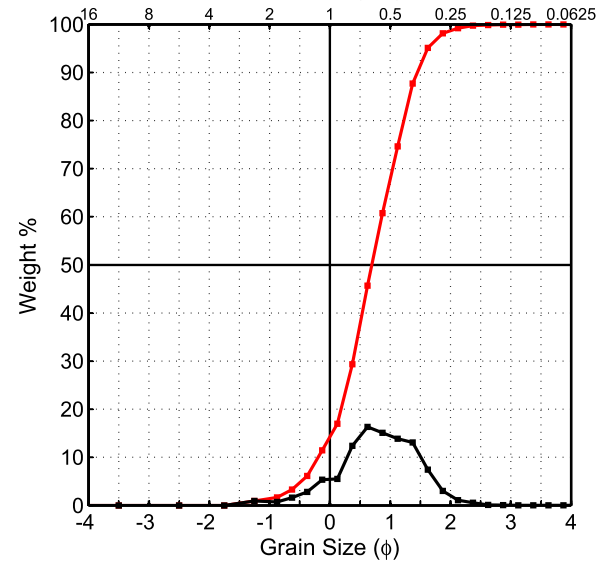
USCS Wentworth

SP Coarse Sand
 Medium Sand Moderately Well Sorted
 Poorly Graded Symmetrical
 Leptokurtic

Total weight (gram) 100.16
 % finer than 4.00 phi 0.03
 % coarser than -1.00 phi 0.12
 % CaCO₃ 3.9

Grain Size Distribution

Grain Size (mm)



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1890+00
Interval Berm

Mean 0.575 mm
STD 0.639 mm
Skewness -0.339

USCS Wentworth

SP Coarse Sand
 Medium Sand Moderately Well Sorted
 Poorly Graded Symmetrical
 Mesokurtic

Total weight (gram) 100.21
 % finer than 4.00 phi 0.01
 % coarser than -1.00 phi 0.94
 % CaCO₃ 5.3

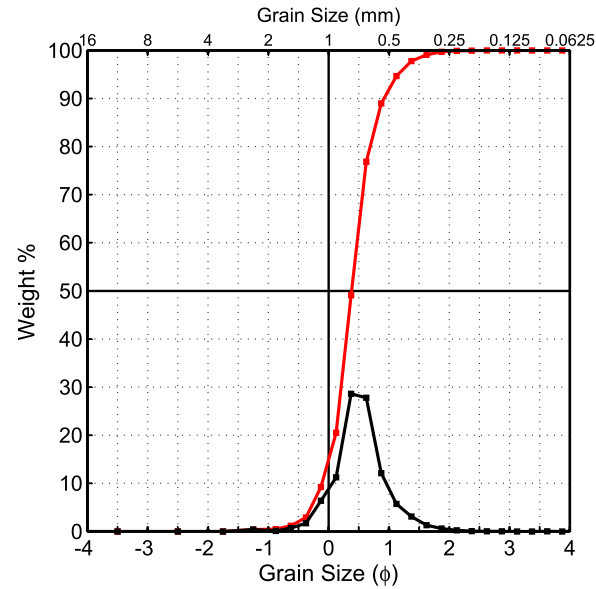
Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-0.610	Mean		0.935	0.523
-3	-3.5	0.00	0.00	0.00	5	-0.160	Standard Deviation		0.573	0.672
-2	-2.5	0.00	0.00	0.00	16	0.265	Skewness		-0.014	
-1.5	-1.75	0.00	0.00	0.00	25	0.435	Kurtosis		3.852	
-1	-1.25	0.12	0.12	0.12	50	0.815	Dispersion			
-0.75	-0.875	0.28	0.28	0.40	75	1.205	Standard Deviation			
-0.5	-0.625	0.52	0.52	0.92	84	1.350	Deviation from Normal			
-0.25	-0.375	1.24	1.24	2.16	95	1.705				
0	-0.125	3.33	3.32	5.48	99	2.220				
0.25	0.125	4.38	4.37	9.85						
0.5	0.375	11.19	11.17	21.03						
0.75	0.625	16.55	16.52	37.55						
1	0.875	16.43	16.40	53.95						
1.25	1.125	16.23	16.20	70.16						
1.5	1.375	15.24	15.22	85.37						
1.75	1.625	8.57	8.56	93.93						
2	1.875	3.45	3.44	97.37						
2.25	2.125	1.32	1.32	98.69						
2.5	2.375	0.83	0.83	99.52						
2.75	2.625	0.22	0.22	99.74						
3	2.875	0.16	0.16	99.90						
3.25	3.125	0.03	0.03	99.93						
3.5	3.375	0.02	0.02	99.95						
3.75	3.625	0.01	0.01	99.96						
4	3.875	0.01	0.01	99.97						
>4.0	4.25	0.03	0.03	100.00						

Percentiles		Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean				0.808	0.810
Standard Deviation				0.542	0.554
Skewness (1)				-0.014	-0.030
Skewness (2)				-0.078	
Kurtosis				0.719	0.993

Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-1.220	Mean		0.798	0.575
-3	-3.5	0.00	0.00	0.00	5	-0.475	Standard Deviation		0.647	0.639
-2	-2.5	0.00	0.00	0.00	16	0.080	Skewness		-0.339	
-1.5	-1.75	0.00	0.00	0.00	25	0.290	Kurtosis		3.561	
-1	-1.25	0.94	0.94	0.94	50	0.695	Dispersion			
-0.75	-0.875	0.72	0.72	1.66	75	1.130	Standard Deviation			
-0.5	-0.625	1.64	1.64	3.29	84	1.305	Deviation from Normal			
-0.25	-0.375	2.82	2.81	6.11	95	1.620				
0	-0.125	5.34	5.33	11.44	99	2.080				
0.25	0.125	5.53	5.52	16.95						
0.5	0.375	12.40	12.37	29.33						
0.75	0.625	16.37	16.34	45.66						
1	0.875	15.11	15.08	60.74						
1.25	1.125	13.90	13.87	74.61						
1.5	1.375	13.10	13.07	87.69						
1.75	1.625	7.44	7.42	95.11						
2	1.875	3.02	3.01	98.12						
2.25	2.125	1.08	1.08	99.20						
2.5	2.375	0.55	0.55	99.75						
2.75	2.625	0.11	0.11	99.86						
3	2.875	0.08	0.08	99.94						
3.25	3.125	0.01	0.01	99.95						
3.5	3.375	0.02	0.02	99.97						
3.75	3.625	0.01	0.01	99.98						
4	3.875	0.01	0.01	99.99						
>4.0	4.25	0.01	0.01	100.00						

Percentiles		Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean				0.693	0.693
Standard Deviation				0.613	0.624
Skewness (1)				-0.004	-0.061
Skewness (2)				-0.200	
Kurtosis				0.710	1.022

Grain Size Distribution



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1890+00
Interval MTL

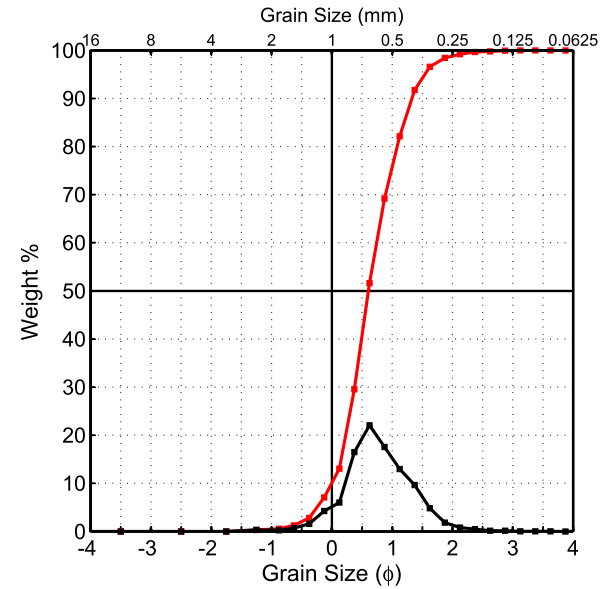
Mean 0.696 mm
STD 0.741 mm
Skewness 0.265

USCS Wentworth

SP Coarse Sand
 Medium Sand Well Sorted
 Poorly Graded Symmetrical
 Leptokurtic

Total weight (gram) 99.51
 % finer than 4.00 phi 0.01
 % coarser than -1.00 phi 0.37
 % CaCO_3 6.1

Grain Size Distribution



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1890+00
Interval MHW

Mean 0.587 mm
STD 0.686 mm
Skewness 0.141

USCS Wentworth

SP Coarse Sand
 Medium Sand Moderately Well Sorted
 Poorly Graded Symmetrical
 Leptokurtic

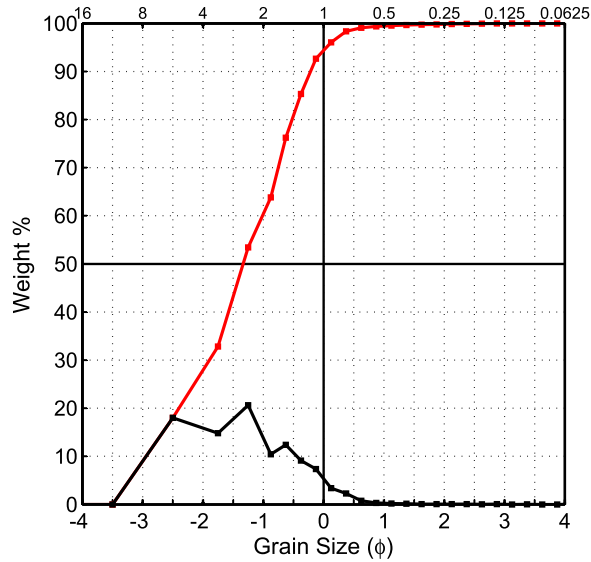
Total weight (gram) 99.64
 % finer than 4.00 phi 0.01
 % coarser than -1.00 phi 0.31
 % CaCO_3 4.2

Limits (ϕ)	Mid Point (ϕ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-0.685	Mean		0.524	0.696
-3	-3.5	0.00	0.00	0.00	5	-0.290	Standard Deviation		0.432	0.741
-2	-2.5	0.00	0.00	0.00	16	0.025	Skewness		0.265	
-1.5	-1.75	0.00	0.00	0.00	25	0.165	Kurtosis		5.736	
-1	-1.25	0.37	0.37	0.37	50	0.385	Dispersion			
-0.75	-0.875	0.11	0.11	0.48	75	0.610	Standard Deviation			
-0.5	-0.625	0.68	0.68	1.17	84	0.775	Deviation from Normal			
-0.25	-0.375	1.70	1.71	2.87	95	1.150				
0	-0.125	6.32	6.35	9.23	99	1.610				
0.25	0.125	11.20	11.26	20.48	Graphic Phi Parameters					
0.5	0.375	28.45	28.59	49.07						
0.75	0.625	27.65	27.79	76.86	Inman 1952		Folk & Ward 1957			
1	0.875	12.03	12.09	88.95						
1.25	1.125	5.70	5.73	94.67						
1.5	1.375	3.08	3.10	97.77						
1.75	1.625	1.30	1.31	99.08						
2	1.875	0.60	0.60	99.68						
2.25	2.125	0.21	0.21	99.89						
2.5	2.375	0.06	0.06	99.95						
2.75	2.625	0.02	0.02	99.97						
3	2.875	0.01	0.01	99.98						
3.25	3.125	0.00	0.00	99.98						
3.5	3.375	0.00	0.00	99.98						
3.75	3.625	0.01	0.01	99.99						
4	3.875	0.00	0.00	99.99						
>4.0	4.25	0.01	0.01	100.00						

Limits (ϕ)	Mid Point (ϕ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-0.715	Mean		0.768	0.587
-3	-3.5	0.00	0.00	0.00	5	-0.245	Standard Deviation		0.544	0.686
-2	-2.5	0.00	0.00	0.00	16	0.170	Skewness		0.141	
-1.5	-1.75	0.00	0.00	0.00	25	0.305	Kurtosis		4.270	
-1	-1.25	0.31	0.31	0.31	50	0.605	Dispersion			
-0.75	-0.875	0.24	0.24	0.55	75	0.985	Standard Deviation			
-0.5	-0.625	0.69	0.69	1.24	84	1.175	Deviation from Normal			
-0.25	-0.375	1.56	1.57	2.81	95	1.545				
0	-0.125	4.24	4.26	7.07	99	2.065				
0.25	0.125	5.96	5.98	13.05	Graphic Phi Parameters					
0.5	0.375	16.44	16.50	29.55						
0.75	0.625	21.98	22.06	51.61	Inman 1952		Folk & Ward 1957			
1	0.875	17.50	17.56	69.17						
1.25	1.125	12.92	12.97	82.14						
1.5	1.375	9.59	9.62	91.76						
1.75	1.625	4.81	4.83	96.59						
2	1.875	1.81	1.82	98.40						
2.25	2.125	0.79	0.79	99.20						
2.5	2.375	0.45	0.45	99.65						
2.75	2.625	0.13	0.13	99.78						
3	2.875	0.15	0.15	99.93						
3.25	3.125	0.03	0.03	99.96						
3.5	3.375	0.02	0.02	99.98						
3.75	3.625	0.01	0.01	99.99						
4	3.875	0.00	0.00	99.99						
>4.0	4.25	0.01	0.01	100.00						

Grain Size Distribution

Grain Size (mm)



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1890+00
Interval Trough

Mean 2.215 mm
STD 0.547 mm
Skewness 0.102

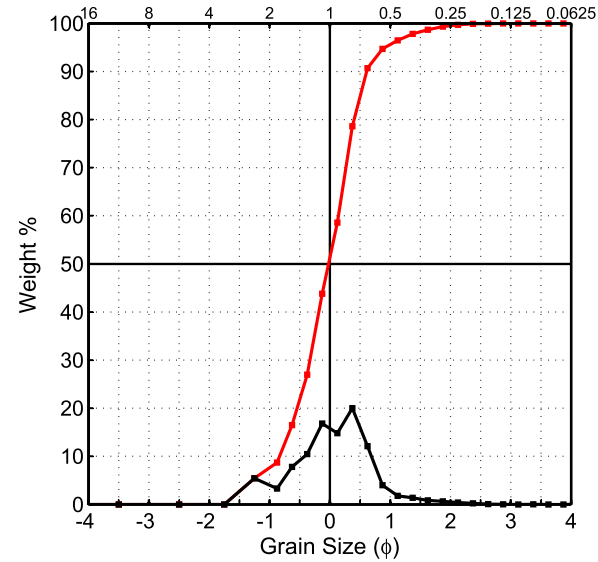
USCS Wentworth

SP Granule
 Coarse Sand Moderately Sorted
 Poorly Graded Symmetrical
 Mesokurtic

Total weight (gram) 100.09
 % finer than 4.00 phi 0.01
 % coarser than -1.00 phi 53.42
 % CaCO₃ 18.7

Grain Size Distribution

Grain Size (mm)



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1890+00
Interval MLW

Mean 0.947 mm
STD 0.648 mm
Skewness 0.221

USCS Wentworth

SP Coarse Sand
 Medium Sand Moderately Well Sorted
 Poorly Graded Symmetrical
 Leptokurtic

Total weight (gram) 100.37
 % finer than 4.00 phi 0.01
 % coarser than -1.00 phi 5.41
 % CaCO₃ 9.9

Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-3.445	Mean	-1.147	2.215	
-3	-3.5	0.00	0.00	0.00	5	-3.220	Standard Deviation	0.871	0.547	
-2	-2.5	18.03	18.01	18.01	16	-2.610	Skewness	0.102		
-1.5	-1.75	14.82	14.81	32.82	25	-2.145	Kurtosis	3.022		
-1	-1.25	20.62	20.60	53.42			Dispersion			
-0.75	-0.875	10.42	10.41	63.83	50	-1.335	Standard Deviation			
-0.5	-0.625	12.41	12.40	76.23	75	-0.650	Deviation from Normal			
-0.25	-0.375	9.10	9.09	85.32						
0	-0.125	7.35	7.34	92.66	84	-0.410				
0.25	0.125	3.40	3.40	96.06	95	0.045				
0.5	0.375	2.27	2.27	98.33	99	0.600				
0.75	0.625	0.74	0.74	99.07						
1	0.875	0.30	0.30	99.37						
1.25	1.125	0.17	0.17	99.54						
1.5	1.375	0.13	0.13	99.67						
1.75	1.625	0.07	0.07	99.74						
2	1.875	0.05	0.05	99.79						
2.25	2.125	0.05	0.05	99.84						
2.5	2.375	0.06	0.06	99.90						
2.75	2.625	0.03	0.03	99.93						
3	2.875	0.05	0.05	99.98						
3.25	3.125	0.00	0.00	99.98						
3.5	3.375	0.01	0.01	99.99						
3.75	3.625	0.00	0.00	99.99						
4	3.875	0.00	0.00	99.99						
>4.0	4.25	0.01	0.01	100.00						

Percentiles		Moment Measures		(phi)	(mm)
1	-3.445	Mean	-1.147	2.215	
5	-3.220	Standard Deviation	0.871	0.547	
16	-2.610	Skewness	0.102		
25	-2.145	Kurtosis	3.022		
50	-1.335	Dispersion			
75	-0.650	Standard Deviation			
84	-0.410	Deviation from Normal			
95	0.045				
99	0.600				

Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean		-1.510	-1.452
Standard Deviation		1.100	1.045
Skewness (1)		-0.159	-0.157
Skewness (2)		-0.230	
Kurtosis		0.484	0.895

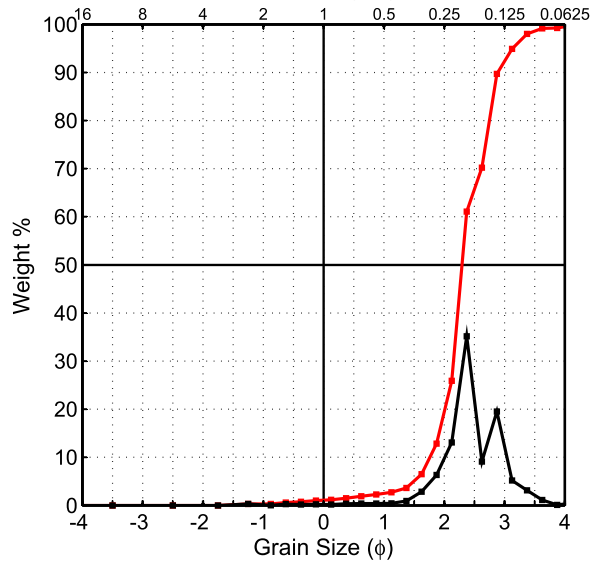
Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-1.660	Mean	0.079	0.947	
-3	-3.5	0.00	0.00	0.00	5	-1.290	Standard Deviation	0.625	0.648	
-2	-2.5	0.00	0.00	0.00	16	-0.640	Skewness	0.221		
-1.5	-1.75	0.00	0.00	0.00	25	-0.420	Kurtosis	4.144		
-1	-1.25	5.43	5.41	5.41			Dispersion			
-0.75	-0.875	3.31	3.30	8.71	50	-0.020	Standard Deviation			
-0.5	-0.625	7.82	7.79	16.50	75	0.330	Deviation from Normal			
-0.25	-0.375	10.52	10.48	26.98						
0	-0.125	16.86	16.80	43.78	84	0.485				
0.25	0.125	14.87	14.82	58.59	95	0.920				
0.5	0.375	20.08	20.01	78.60	99	1.755				
0.75	0.625	12.13	12.09	90.68						
1	0.875	4.01	4.00	94.68						
1.25	1.125	1.79	1.78	96.46						
1.5	1.375	1.36	1.35	97.82						
1.75	1.625	0.85	0.85	98.66						
2	1.875	0.65	0.65	99.31						
2.25	2.125	0.37	0.37	99.68						
2.5	2.375	0.21	0.21	99.89						
2.75	2.625	0.05	0.05	99.94						
3	2.875	0.04	0.04	99.98						
3.25	3.125	0.00	0.00	99.98						
3.5	3.375	0.01	0.01	99.99						
3.75	3.625	0.00	0.00	99.99						
4	3.875	0.00	0.00	99.99						
>4.0	4.25	0.01	0.01	100.00						

Percentiles		Moment Measures		(phi)	(mm)
1	-1.660	Mean	0.079	0.947	
5	-1.290	Standard Deviation	0.625	0.648	
16	-0.640	Skewness	0.221		
25	-0.420	Kurtosis	4.144		
50	-0.020	Dispersion			
75	0.330	Standard Deviation			
84	0.485	Deviation from Normal			
95	0.920				
99	1.755				

Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean		-0.078	-0.058
Standard Deviation		0.563	0.616
Skewness (1)		-0.102	-0.126
Skewness (2)		-0.293	
Kurtosis		0.964	1.208

Grain Size Distribution

Grain Size (mm)



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1890+00
Interval -8 ft NAVD

Mean 0.184 mm
STD 0.664 mm
Skewness -1.604

USCS Wentworth

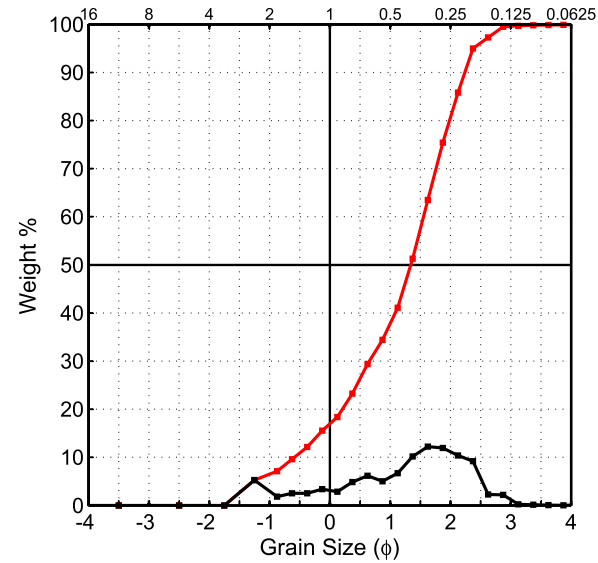
SP Fine Sand
 Poorly Graded

Fine Sand
 Moderately Well Sorted
 Strongly Coarse Skewed
 Very Leptokurtic

Total weight (gram) 99.70
 % finer than 4.00 phi 0.74
 % coarser than -1.00 phi 0.29
 % CaCO₃ 3.0

Grain Size Distribution

Grain Size (mm)



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1890+00
Interval Bar

Mean 0.432 mm
STD 0.479 mm
Skewness -0.722

USCS Wentworth

SP Medium Sand
 Poorly Graded

Medium Sand
 Poorly Sorted
 Coarse Skewed
 Mesokurtic

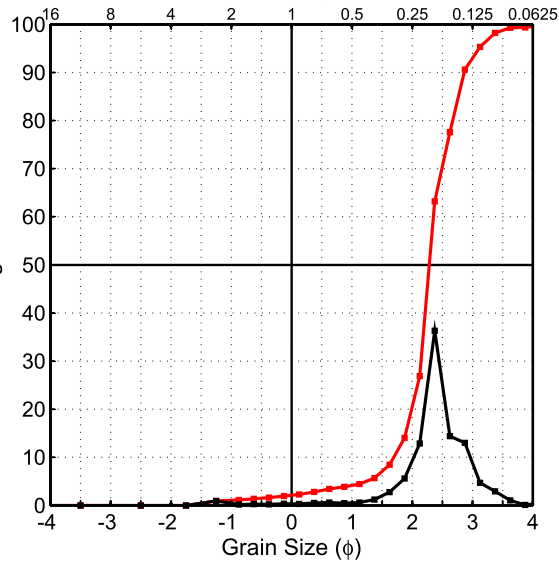
Total weight (gram) 110.60
 % finer than 4.00 phi 0.12
 % coarser than -1.00 phi 5.28
 % CaCO₃ 3.5

Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-0.100	Mean		2.441	0.184
-3	-3.5	0.00	0.00	0.00	5	1.495	Standard Deviation		0.590	0.664
-2	-2.5	0.00	0.00	0.00	16	1.935	Skewness		-1.604	
-1.5	-1.75	0.00	0.00	0.00	25	2.110	Kurtosis		11.468	
-1	-1.25	0.29	0.29	0.29	50	2.295	Dispersion			
-0.75	-0.875	0.03	0.03	0.32	75	2.685	Standard Deviation			
-0.5	-0.625	0.27	0.27	0.59	84	2.800	Deviation from Normal			
-0.25	-0.375	0.17	0.17	0.76	95	3.135				
0	-0.125	0.22	0.22	0.98	99	3.590				
0.25	0.125	0.18	0.18	1.16						
0.5	0.375	0.34	0.34	1.50						
0.75	0.625	0.39	0.39	1.90	Graphic Phi Parameters		Inman	Folk & Ward		
1	0.875	0.39	0.39	2.29			1952	1957		
1.25	1.125	0.43	0.43	2.72			Mean	2.367	2.343	
1.5	1.375	0.90	0.90	3.62			Standard Deviation	0.432	0.465	
1.75	1.625	2.85	2.86	6.48			Skewness (1)	0.168	0.096	
2	1.875	6.32	6.34	12.82			Skewness (2)	0.046		
2.25	2.125	13.04	13.08	25.90			Kurtosis	0.896	1.169	
2.5	2.375	35.07	35.18	61.07						
2.75	2.625	9.10	9.13	70.20						
3	2.875	19.44	19.50	89.70						
3.25	3.125	5.17	5.19	94.88						
3.5	3.375	3.14	3.15	98.03						
3.75	3.625	1.13	1.13	99.17						
4	3.875	0.09	0.09	99.26						
>4.0	4.25	0.74	0.74	100.00						

Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-1.655	Mean		1.211	0.432
-3	-3.5	0.00	0.00	0.00	5	-1.275	Standard Deviation		1.061	0.479
-2	-2.5	0.00	0.00	0.00	16	-0.085	Skewness		-0.722	
-1.5	-1.75	0.00	0.00	0.00	25	0.445	Kurtosis		2.853	
-1	-1.25	5.84	5.28	5.28	50	1.345	Dispersion			
-0.75	-0.875	2.00	1.81	7.09	75	1.865	Standard Deviation			
-0.5	-0.625	2.80	2.53	9.62	84	2.080	Deviation from Normal			
-0.25	-0.375	2.80	2.53	12.15	95	2.375				
0	-0.125	3.73	3.37	15.52	99	2.820				
0.25	0.125	3.16	2.86	18.38						
0.5	0.375	5.37	4.86	23.24						
0.75	0.625	6.81	6.16	29.39	Graphic Phi Parameters		Inman	Folk & Ward		
1	0.875	5.57	5.04	34.43			1952	1957		
1.25	1.125	7.39	6.68	41.11			Mean	0.998	1.113	
1.5	1.375	11.24	10.16	51.27			Standard Deviation	1.083	1.094	
1.75	1.625	13.52	12.22	63.50			Skewness (1)	-0.321	-0.378	
2	1.875	13.18	11.92	75.42			Skewness (2)	-0.734		
2.25	2.125	11.49	10.39	85.80			Kurtosis	0.686	1.053	
2.5	2.375	10.15	9.18	94.98						
2.75	2.625	2.53	2.29	97.27						
3	2.875	2.44	2.21	99.48						
3.25	3.125	0.24	0.22	99.69						
3.5	3.375	0.14	0.13	99.82						
3.75	3.625	0.05	0.05	99.86						
4	3.875	0.02	0.02	99.88						
>4.0	4.25	0.13	0.12	100.00						

Grain Size Distribution

Grain Size (mm)



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1890+00
Interval -16 ft NAVD

Mean 0.194 mm
STD 0.622 mm
Skewness -2.217

USCS Wentworth

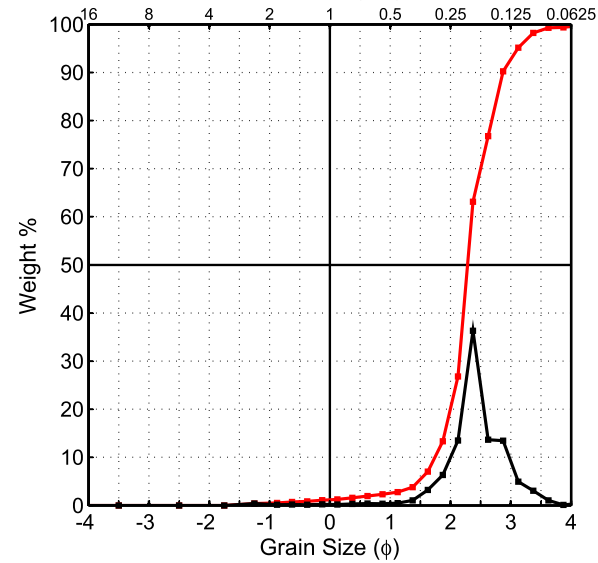
SP Fine Sand
 Poorly Graded

Fine Sand
 Moderately Well Sorted
 Strongly Coarse Skewed
 Very Leptokurtic

Total weight (gram) 105.35
 % finer than 4.00 phi 0.65
 % coarser than -1.00 phi 0.94
 % CaCO₃ 3.6

Grain Size Distribution

Grain Size (mm)



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1890+00
Interval -12 ft NAVD

Mean 0.188 mm
STD 0.664 mm
Skewness -1.786

USCS Wentworth

SP Fine Sand
 Poorly Graded

Fine Sand
 Moderately Well Sorted
 Strongly Coarse Skewed
 Very Leptokurtic

Total weight (gram) 105.70
 % finer than 4.00 phi 0.64
 % coarser than -1.00 phi 0.40
 % CaCO₃ 2.9

Limits (phi)	Mid Point (phi)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-1.125	Mean		2.369	0.194
-3	-3.5	0.00	0.00	0.00	5	1.235	Standard Deviation		0.684	0.622
-2	-2.5	0.00	0.00	0.00	16	1.915	Skewness		-2.217	
-1.5	-1.75	0.00	0.00	0.00	25	2.090	Kurtosis		12.453	
-1	-1.25	0.99	0.94	0.94	50	2.285	Dispersion			
-0.75	-0.875	0.19	0.18	1.12	75	2.580	Standard Deviation			
-0.5	-0.625	0.27	0.26	1.38	84	2.750	Deviation from Normal			
-0.25	-0.375	0.25	0.24	1.61	95	3.110				
0	-0.125	0.37	0.35	1.96	99	3.560				
0.25	0.125	0.34	0.32	2.29						
0.5	0.375	0.55	0.52	2.81						
0.75	0.625	0.63	0.60	3.41						
1	0.875	0.49	0.47	3.87						
1.25	1.125	0.61	0.58	4.45						
1.5	1.375	1.29	1.22	5.68						
1.75	1.625	2.91	2.76	8.44						
2	1.875	5.89	5.59	14.03						
2.25	2.125	13.56	12.87	26.90						
2.5	2.375	38.25	36.31	63.21						
2.75	2.625	15.15	14.38	77.59						
3	2.875	13.71	13.01	90.60						
3.25	3.125	4.94	4.69	95.29						
3.5	3.375	3.08	2.92	98.22						
3.75	3.625	1.11	1.05	99.27						
4	3.875	0.09	0.09	99.35						
>4.0	4.25	0.68	0.65	100.00						

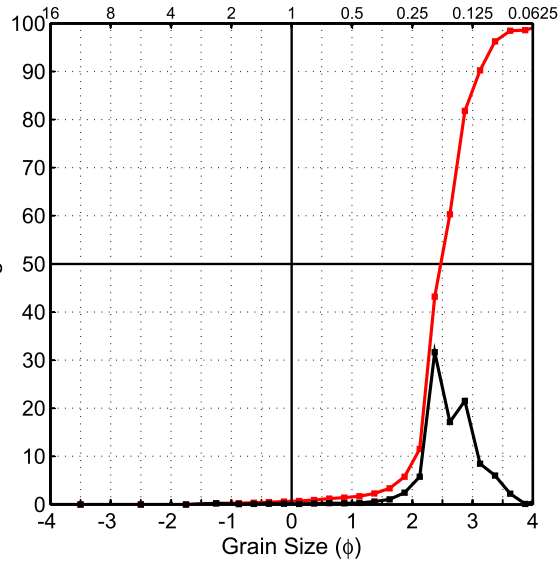
Percentiles		Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean		2.333		2.317	
Standard Deviation		0.417		0.493	
Skewness (1)		0.114		-0.003	
Skewness (2)		-0.269			
Kurtosis		1.246		1.568	

Limits (phi)	Mid Point (phi)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-0.210	Mean		2.409	0.188
-3	-3.5	0.00	0.00	0.00	5	1.470	Standard Deviation		0.590	0.664
-2	-2.5	0.00	0.00	0.00	16	1.925	Skewness		-1.786	
-1.5	-1.75	0.00	0.00	0.00	25	2.090	Kurtosis		12.720	
-1	-1.25	0.42	0.40	0.40	50	2.285	Dispersion			
-0.75	-0.875	0.13	0.12	0.52	75	2.595	Standard Deviation			
-0.5	-0.625	0.19	0.18	0.70	84	2.760	Deviation from Normal			
-0.25	-0.375	0.16	0.15	0.85	95	3.115				
0	-0.125	0.24	0.23	1.08	99	3.560				
0.25	0.125	0.18	0.17	1.25						
0.5	0.375	0.34	0.32	1.57						
0.75	0.625	0.40	0.38	1.95						
1	0.875	0.37	0.35	2.30						
1.25	1.125	0.48	0.45	2.75						
1.5	1.375	1.10	1.04	3.79						
1.75	1.625	3.40	3.22	7.01						
2	1.875	6.67	6.31	13.32						
2.25	2.125	14.26	13.49	26.81						
2.5	2.375	38.37	36.30	63.11						
2.75	2.625	14.44	13.66	76.77						
3	2.875	14.23	13.46	90.24						
3.25	3.125	5.20	4.92	95.16						
3.5	3.375	3.24	3.07	98.22						
3.75	3.625	1.11	1.05	99.27						
4	3.875	0.09	0.09	99.36						
>4.0	4.25	0.68	0.64	100.00						

Percentiles		Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean		2.342		2.323	
Standard Deviation		0.417		0.458	
Skewness (1)		0.138		0.073	
Skewness (2)		0.018			
Kurtosis		0.970		1.335	

Grain Size Distribution

Grain Size (mm)



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1890+00
Interval -24 ft NAVD

Mean 0.162 mm
STD 0.681 mm
Skewness -1.412

USCS Wentworth

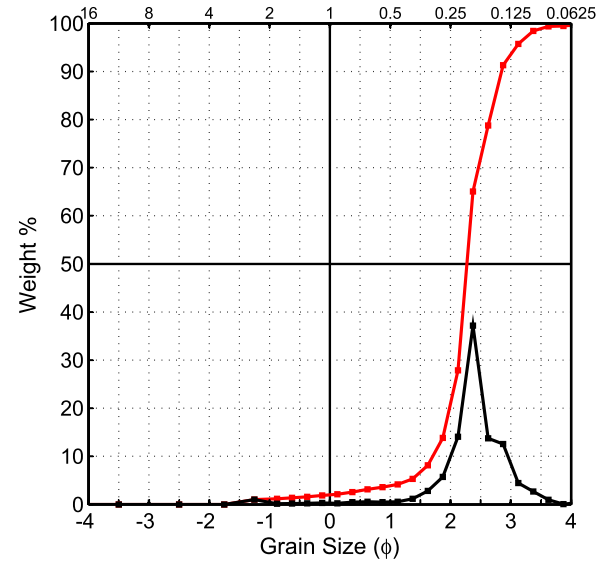
SP Fine Sand
 Poorly Graded

Fine Sand
 Moderately Well Sorted
 Strongly Coarse Skewed
 Very Leptokurtic

Total weight (gram) 116.77
 % finer than 4.00 phi 1.42
 % coarser than -1.00 phi 0.21
 % CaCO₃ 2.6

Grain Size Distribution

Grain Size (mm)



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1890+00
Interval -20 ft NAVD

Mean 0.195 mm
STD 0.630 mm
Skewness -2.316

USCS Wentworth

SP Fine Sand
 Poorly Graded

Fine Sand
 Moderately Well Sorted
 Strongly Coarse Skewed
 Very Leptokurtic

Total weight (gram) 110.49
 % finer than 4.00 phi 0.56
 % coarser than -1.00 phi 1.00
 % CaCO₃ 3.5

Limits (phi)	Mid Point (phi)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles	Moment Measures (phi) (mm)		
-4	-4.5	0.00	0.00	0.00	1	0.450	Mean	2.628 0.162
-3	-3.5	0.00	0.00	0.00	5	1.795	Standard Deviation	0.554 0.681
-2	-2.5	0.00	0.00	0.00	16	2.160	Skewness	-1.412
-1.5	-1.75	0.00	0.00	0.00	25	2.230	Kurtosis	12.550
-1	-1.25	0.24	0.21	0.21	50	2.475	Dispersion	
-0.75	-0.875	0.06	0.05	0.26	75	2.795	Standard Deviation	
-0.5	-0.625	0.10	0.09	0.34	84	2.940	Deviation from Normal	
-0.25	-0.375	0.15	0.13	0.47	95	3.325		
0	-0.125	0.15	0.13	0.60	99	3.985		
0.25	0.125	0.14	0.12	0.72				
0.5	0.375	0.23	0.20	0.92				
0.75	0.625	0.32	0.27	1.19				
1	0.875	0.26	0.22	1.41				
1.25	1.125	0.35	0.30	1.71				
1.5	1.375	0.67	0.57	2.29				
1.75	1.625	1.24	1.06	3.35				
2	1.875	2.83	2.42	5.77				
2.25	2.125	6.73	5.76	11.54				
2.5	2.375	36.93	31.63	43.16				
2.75	2.625	20.01	17.14	60.30				
3	2.875	25.11	21.50	81.80				
3.25	3.125	9.86	8.44	90.25				
3.5	3.375	7.02	6.01	96.26				
3.75	3.625	2.59	2.22	98.48				
4	3.875	0.12	0.10	98.58				
>4.0	4.25	1.66	1.42	100.00				

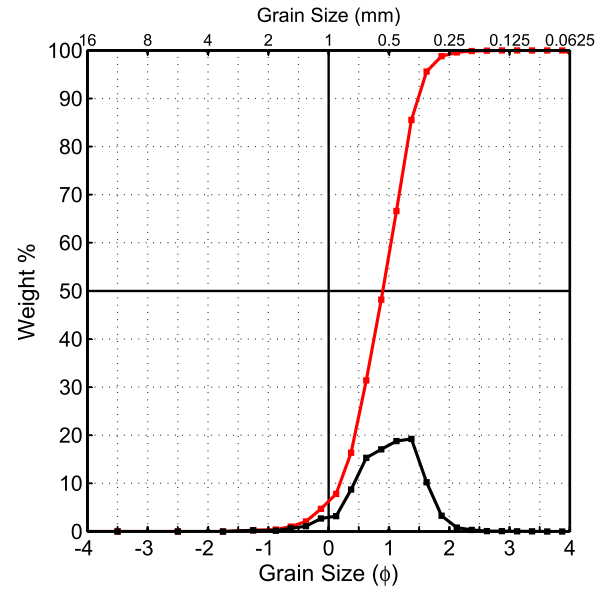
Percentiles	Moment Measures (phi) (mm)		
1	0.450	Mean	2.628 0.162
5	1.795	Standard Deviation	0.554 0.681
16	2.160	Skewness	-1.412
25	2.230	Kurtosis	12.550
50	2.475	Dispersion	
75	2.795	Standard Deviation	
84	2.940	Deviation from Normal	
95	3.325		
99	3.985		

Graphic Phi Parameters	Inman 1952	Folk & Ward 1957
Mean	2.550	2.525
Standard Deviation	0.390	0.427
Skewness (1)	0.192	0.152
Skewness (2)	0.218	
Kurtosis	0.962	1.110

Limits (phi)	Mid Point (phi)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles	Moment Measures (phi) (mm)		
-4	-4.5	0.00	0.00	0.00	1	-1.250	Mean	2.360 0.195
-3	-3.5	0.00	0.00	0.00	5	1.305	Standard Deviation	0.667 0.630
-2	-2.5	0.00	0.00	0.00	16	1.915	Skewness	-2.316
-1.5	-1.75	0.00	0.00	0.00	25	2.075	Kurtosis	13.400
-1	-1.25	1.11	1.00	1.00	50	2.275	Dispersion	
-0.75	-0.875	0.17	0.15	1.16	75	2.555	Standard Deviation	
-0.5	-0.625	0.22	0.20	1.36	84	2.730	Deviation from Normal	
-0.25	-0.375	0.24	0.22	1.57	95	3.085		
0	-0.125	0.32	0.29	1.86	99	3.525		
0.25	0.125	0.27	0.24	2.11				
0.5	0.375	0.50	0.45	2.56				
0.75	0.625	0.62	0.56	3.12				
1	0.875	0.50	0.45	3.57				
1.25	1.125	0.62	0.56	4.14				
1.5	1.375	1.31	1.19	5.32				
1.75	1.625	3.09	2.80	8.12				
2	1.875	6.29	5.69	13.81				
2.25	2.125	15.52	14.05	27.86				
2.5	2.375	41.08	37.18	65.04				
2.75	2.625	15.16	13.72	78.76				
3	2.875	13.86	12.54	91.30				
3.25	3.125	4.90	4.43	95.74				
3.5	3.375	2.98	2.70	98.43				
3.75	3.625	1.05	0.95	99.38				
4	3.875	0.06	0.05	99.44				
>4.0	4.25	0.62	0.56	100.00				

Graphic Phi Parameters	Inman 1952	Folk & Ward 1957
Mean	2.322	2.307
Standard Deviation	0.407	0.473
Skewness (1)	0.117	0.013
Skewness (2)	-0.196	
Kurtosis	1.184	1.520

Grain Size Distribution



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1900+00
Interval Dune Toe

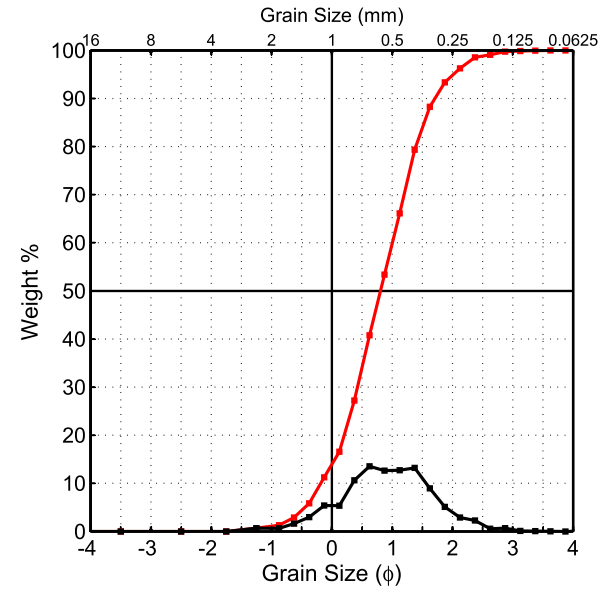
Mean 0.528 mm
STD 0.809 mm
Skewness -23.813

USCS Wentworth

SP Coarse Sand
 Medium Sand Very Well Sorted
 Poorly Graded Strongly Coarse Skewed
 Very Platykurtic

Total weight (gram) 98.04
 % finer than 4.00 phi -1.76
 % coarser than -1.00 phi 0.22
 % CaCO₃ 3.8

Grain Size Distribution



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1900+00
Interval Dune

Mean 0.527 mm
STD 0.599 mm
Skewness -0.029

USCS Wentworth

SP Coarse Sand
 Medium Sand Moderately Sorted
 Poorly Graded Symmetrical
 Mesokurtic

Total weight (gram) 100.01
 % finer than 4.00 phi 0.04
 % coarser than -1.00 phi 0.66
 % CaCO₃ 4.8

Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-0.625	Mean		0.922	0.528
-3	-3.5	0.00	0.00	0.00	5	-0.100	Standard Deviation		0.305	0.809
-2	-2.5	0.00	0.00	0.00	16	0.365	Skewness		-23.813	
-1.5	-1.75	0.00	0.00	0.00	25	0.520	Kurtosis		-214.462	
-1	-1.25	0.22	0.22	0.22	50	0.900	Dispersion			
-0.75	-0.875	0.16	0.16	0.39	75	1.235	Standard Deviation			
-0.5	-0.625	0.61	0.62	1.01	84	1.355	Deviation from Normal			
-0.25	-0.375	1.07	1.09	2.10	95	1.610				
0	-0.125	2.61	2.66	4.76	99	1.945				
0.25	0.125	3.12	3.18	7.95						
0.5	0.375	8.55	8.72	16.67						
0.75	0.625	14.98	15.28	31.95						
1	0.875	16.73	17.06	49.01						
1.25	1.125	18.42	18.79	67.80						
1.5	1.375	18.86	19.24	87.04						
1.75	1.625	10.03	10.23	97.27						
2	1.875	3.20	3.26	100.53						
2.25	2.125	0.77	0.79	101.32						
2.5	2.375	0.31	0.32	101.63						
2.75	2.625	0.06	0.06	101.69						
3	2.875	0.05	0.05	101.74						
3.25	3.125	0.01	0.01	101.75						
3.5	3.375	0.01	0.01	101.76						
3.75	3.625	0.00	0.00	101.76						
4	3.875	0.00	0.00	101.76						
>4.0	4.25	-1.73	-1.76	100.00						

Percentiles		Moment Measures		(phi)	(mm)
1	-0.625	Mean		0.922	0.528
5	-0.100	Standard Deviation		0.305	0.809
16	0.365	Skewness		-23.813	
25	0.520	Kurtosis		-214.462	
50	0.900	Dispersion			
75	1.235	Standard Deviation			
84	1.355	Deviation from Normal			
95	1.610				
99	1.945				

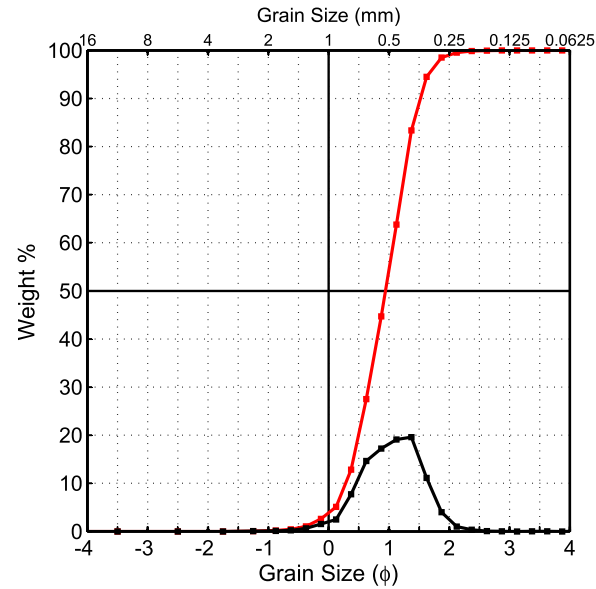
Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean		0.860	0.873
Standard Deviation		0.495	0.507
Skewness (1)		-0.081	-0.125
Skewness (2)		-0.293	
Kurtosis		0.727	0.980

Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-1.050	Mean		0.924	0.527
-3	-3.5	0.00	0.00	0.00	5	-0.445	Standard Deviation		0.740	0.599
-2	-2.5	0.00	0.00	0.00	16	0.100	Skewness		-0.029	
-1.5	-1.75	0.00	0.00	0.00	25	0.325	Kurtosis		3.267	
-1	-1.25	0.66	0.66	0.66	50	0.810	Dispersion			
-0.75	-0.875	0.63	0.63	1.29	75	1.295	Standard Deviation			
-0.5	-0.625	1.60	1.60	2.89	84	1.505	Deviation from Normal			
-0.25	-0.375	2.96	2.96	5.85	95	2.015				
0	-0.125	5.38	5.38	11.23	99	2.590				
0.25	0.125	5.34	5.34	16.57						
0.5	0.375	10.64	10.64	27.21						
0.75	0.625	13.54	13.54	40.75						
1	0.875	12.65	12.65	53.39						
1.25	1.125	12.73	12.73	66.12						
1.5	1.375	13.20	13.20	79.32						
1.75	1.625	8.95	8.95	88.27						
2	1.875	5.09	5.09	93.36						
2.25	2.125	2.90	2.90	96.26						
2.5	2.375	2.27	2.27	98.53						
2.75	2.625	0.55	0.55	99.08						
3	2.875	0.66	0.66	99.74						
3.25	3.125	0.12	0.12	99.86						
3.5	3.375	0.07	0.07	99.93						
3.75	3.625	0.03	0.03	99.96						
4	3.875	0.00	0.00	99.96						
>4.0	4.25	0.04	0.04	100.00						

Percentiles		Moment Measures		(phi)	(mm)
1	-1.050	Mean		0.924	0.527
5	-0.445	Standard Deviation		0.740	0.599
16	0.100	Skewness		-0.029	
25	0.325	Kurtosis		3.267	
50	0.810	Dispersion			
75	1.295	Standard Deviation			
84	1.505	Deviation from Normal			
95	2.015				
99	2.590				

Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean		0.802	0.805
Standard Deviation		0.702	0.724
Skewness (1)		-0.011	-0.016
Skewness (2)		-0.036	
Kurtosis		0.751	1.039

Grain Size Distribution



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1900+00
Interval BC

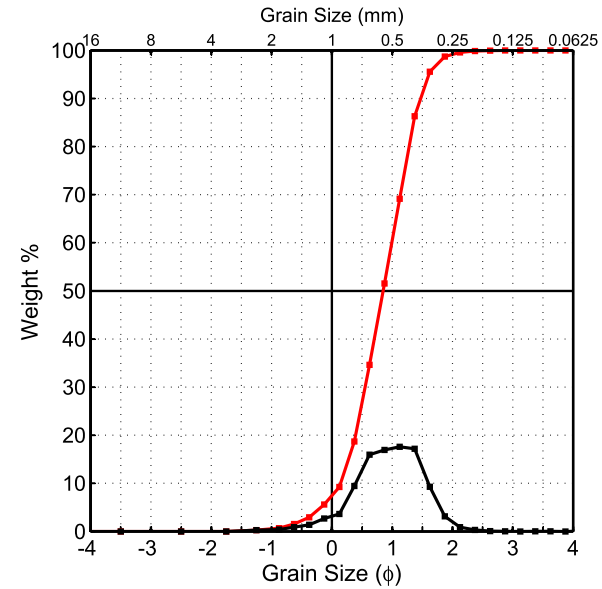
Mean 0.486 mm
STD 0.709 mm
Skewness -0.278

USCS Wentworth

SP Medium Sand
 Poorly Graded
 Well Sorted
 Symmetrical
 Leptokurtic

Total weight (gram) 99.76
 % finer than 4.00 phi 0.02
 % coarser than -1.00 phi 0.06
 % CaCO_3 3.4

Grain Size Distribution



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1900+00
Interval Berm

Mean 0.521 mm
STD 0.681 mm
Skewness -0.472

USCS Wentworth

SP Coarse Sand
 Medium Sand
 Poorly Graded
 Moderately Well Sorted
 Coarse Skewed
 Leptokurtic

Total weight (gram) 100.05
 % finer than 4.00 phi 0.02
 % coarser than -1.00 phi 0.26
 % CaCO_3 4.0

Limits (ϕ)	Mid Point (ϕ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-0.395	Mean		1.041	0.486
-3	-3.5	0.00	0.00	0.00	5	0.115	Standard Deviation		0.496	0.709
-2	-2.5	0.00	0.00	0.00	16	0.430	Skewness		-0.278	
-1.5	-1.75	0.00	0.00	0.00	25	0.585	Kurtosis		3.938	
-1	-1.25	0.06	0.06	0.06	50	0.945	Dispersion			
-0.75	-0.875	0.12	0.12	0.18	75	1.270	Standard Deviation			
-0.5	-0.625	0.24	0.24	0.42	84	1.390	Deviation from Normal			
-0.25	-0.375	0.63	0.63	1.05	95	1.655				
0	-0.125	1.54	1.54	2.60	99	1.995				
0.25	0.125	2.49	2.50	5.09						
0.5	0.375	7.72	7.74	12.83						
0.75	0.625	14.62	14.66	27.49						
1	0.875	17.16	17.20	44.69						
1.25	1.125	19.06	19.11	63.79						
1.5	1.375	19.53	19.58	83.37						
1.75	1.625	11.10	11.13	94.50						
2	1.875	4.00	4.01	98.51						
2.25	2.125	1.01	1.01	99.52						
2.5	2.375	0.34	0.34	99.86						
2.75	2.625	0.06	0.06	99.92						
3	2.875	0.04	0.04	99.96						
3.25	3.125	0.00	0.00	99.96						
3.5	3.375	0.01	0.01	99.97						
3.75	3.625	0.01	0.01	99.98						
4	3.875	0.00	0.00	99.98						
>4.0	4.25	0.02	0.02	100.00						

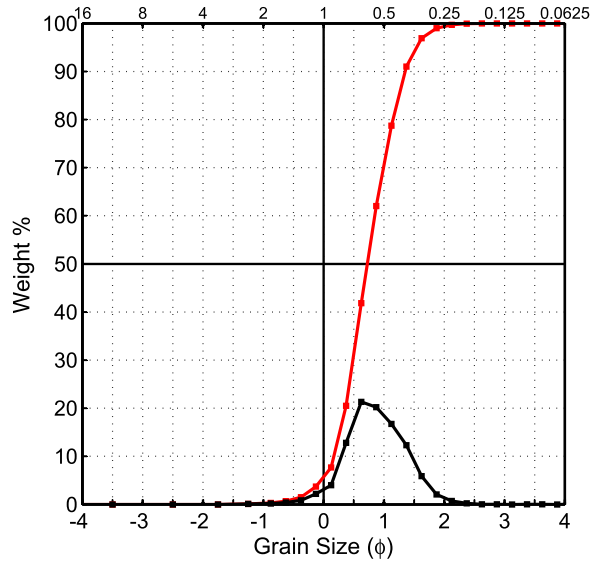
Percentiles		Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean				0.910	0.922
Standard Deviation				0.480	0.473
Skewness (1)				-0.073	-0.075
Skewness (2)				-0.125	
Kurtosis				0.604	0.921

Limits (ϕ)	Mid Point (ϕ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-0.780	Mean		0.940	0.521
-3	-3.5	0.00	0.00	0.00	5	-0.180	Standard Deviation		0.554	0.681
-2	-2.5	0.00	0.00	0.00	16	0.305	Skewness		-0.472	
-1.5	-1.75	0.00	0.00	0.00	25	0.475	Kurtosis		4.068	
-1	-1.25	0.26	0.26	0.26	50	0.850	Dispersion			
-0.75	-0.875	0.40	0.40	0.66	75	1.210	Standard Deviation			
-0.5	-0.625	0.89	0.89	1.55	84	1.340	Deviation from Normal			
-0.25	-0.375	1.36	1.36	2.91	95	1.610				
0	-0.125	2.70	2.70	5.61	99	1.965				
0.25	0.125	3.62	3.62	9.23						
0.5	0.375	9.46	9.46	18.68						
0.75	0.625	15.94	15.93	34.61						
1	0.875	16.94	16.93	51.54						
1.25	1.125	17.60	17.59	69.14						
1.5	1.375	17.17	17.16	86.30						
1.75	1.625	9.26	9.26	95.55						
2	1.875	3.14	3.14	98.69						
2.25	2.125	0.88	0.88	99.57						
2.5	2.375	0.29	0.29	99.86						
2.75	2.625	0.06	0.06	99.92						
3	2.875	0.04	0.04	99.96						
3.25	3.125	0.00	0.00	99.96						
3.5	3.375	0.01	0.01	99.97						
3.75	3.625	0.01	0.01	99.98						
4	3.875	0.00	0.00	99.98						
>4.0	4.25	0.02	0.02	100.00						

Percentiles		Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean				0.822	0.832
Standard Deviation				0.518	0.530
Skewness (1)				-0.053	-0.102
Skewness (2)				-0.261	
Kurtosis				0.729	0.998

Grain Size Distribution

Grain Size (mm)



Project
Location
Date

2408
Buxton, NC
Oct 2014

Station
Interval

1900+00
MTL

Mean
STD
Skewness

0.549 mm
0.714 mm
-0.051

USCS
Wentworth

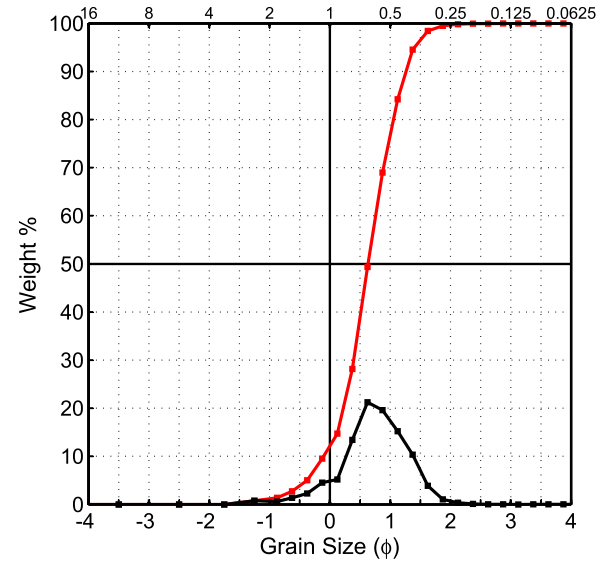
SP
Medium Sand
Poorly Graded

Coarse Sand
Well Sorted
Symmetrical
Leptokurtic

Total weight (gram) 99.34
% finer than 4.00 phi 0.01
% coarser than -1.00 phi 0.11
% CaCO₃ 4.6

Grain Size Distribution

Grain Size (mm)



Project
Location
Date

2408
Buxton, NC
Oct 2014

Station
Interval

1900+00
MHW

Mean
STD
Skewness

0.602 mm
0.684 mm
-0.529

USCS
Wentworth

SP
Medium Sand
Poorly Graded

Coarse Sand
Moderately Well Sorted
Coarse Skewed
Leptokurtic

Total weight (gram) 100.00
% finer than 4.00 phi 0.01
% coarser than -1.00 phi 0.77
% CaCO₃ 5.5

Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-0.525	Mean		0.866	0.549
-3	-3.5	0.00	0.00	0.00	5	-0.045	Standard Deviation		0.487	0.714
-2	-2.5	0.00	0.00	0.00	16	0.285	Skewness		-0.051	
-1.5	-1.75	0.00	0.00	0.00	25	0.430	Kurtosis		4.025	
-1	-1.25	0.11	0.11	0.11			Dispersion			
-0.75	-0.875	0.18	0.18	0.29	50	0.725	Standard Deviation			
-0.5	-0.625	0.37	0.37	0.66	75	1.070	Deviation from Normal			
-0.25	-0.375	0.82	0.83	1.49						
0	-0.125	2.19	2.20	3.69	84	1.230				
0.25	0.125	3.97	4.00	7.69	95	1.545				
0.5	0.375	12.73	12.81	20.51	99	1.875				
0.75	0.625	21.17	21.31	41.82						
1	0.875	20.07	20.20	62.02						
1.25	1.125	16.61	16.72	78.74						
1.5	1.375	12.21	12.29	91.03						
1.75	1.625	5.84	5.88	96.91						
2	1.875	2.07	2.08	98.99						
2.25	2.125	0.70	0.70	99.70						
2.5	2.375	0.23	0.23	99.93						
2.75	2.625	0.03	0.03	99.96						
3	2.875	0.01	0.01	99.97						
3.25	3.125	0.00	0.00	99.97						
3.5	3.375	0.01	0.01	99.98						
3.75	3.625	0.01	0.01	99.99						
4	3.875	0.00	0.00	99.99						
>4.0	4.25	0.01	0.01	100.00						

Percentiles

Moment Measures

Graphic Phi Parameters

Inman 1952 Folk & Ward 1957

Mean
Standard Deviation
Skewness (1)
Skewness (2)
Kurtosis

0.758
0.472
0.069
0.053
0.683

0.747
0.477
0.050
1.018

Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-1.105	Mean		0.732	0.602
-3	-3.5	0.00	0.00	0.00	5	-0.375	Standard Deviation		0.548	0.684
-2	-2.5	0.00	0.00	0.00	16	0.150	Skewness		-0.529	
-1.5	-1.75	0.00	0.00	0.00	25	0.315	Kurtosis		4.429	
-1	-1.25	0.77	0.77	0.77			Dispersion			
-0.75	-0.875	0.59	0.59	1.36	50	0.635	Standard Deviation			
-0.5	-0.625	1.36	1.36	2.72	75	0.975	Deviation from Normal			
-0.25	-0.375	2.29	2.29	5.01						
0	-0.125	4.51	4.51	9.52	84	1.120				
0.25	0.125	5.20	5.20	14.72	95	1.405				
0.5	0.375	13.42	13.42	28.14	99	1.760				
0.75	0.625	21.24	21.24	49.38						
1	0.875	19.61	19.61	68.99						
1.25	1.125	15.21	15.21	84.20						
1.5	1.375	10.34	10.34	94.54						
1.75	1.625	3.88	3.88	98.42						
2	1.875	1.06	1.06	99.48						
2.25	2.125	0.33	0.33	99.81						
2.5	2.375	0.11	0.11	99.92						
2.75	2.625	0.03	0.03	99.95						
3	2.875	0.02	0.02	99.97						
3.25	3.125	-0.01	-0.01	99.96						
3.5	3.375	0.01	0.01	99.97						
3.75	3.625	0.01	0.01	99.98						
4	3.875	0.01	0.01	99.99						
>4.0	4.25	0.01	0.01	100.00						

Percentiles

Moment Measures

Graphic Phi Parameters

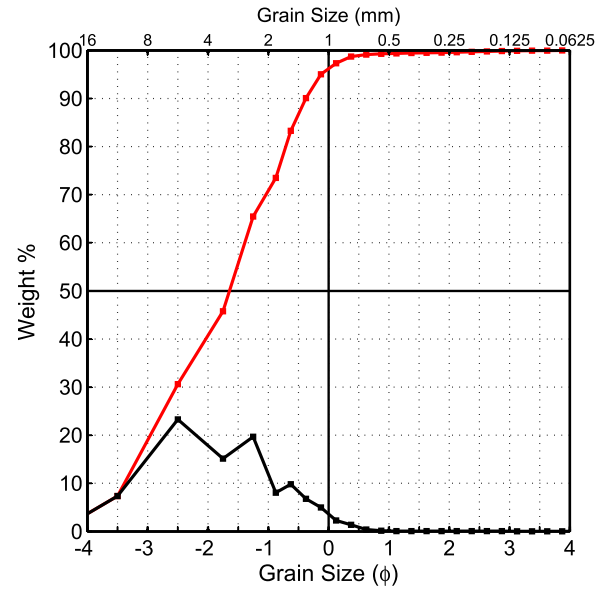
Inman 1952 Folk & Ward 1957

Mean
Standard Deviation
Skewness (1)
Skewness (2)
Kurtosis

0.635
0.485
0.000
-0.247
0.835

0.635
0.512
-0.067
1.105

Grain Size Distribution



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1900+00
Interval Trough

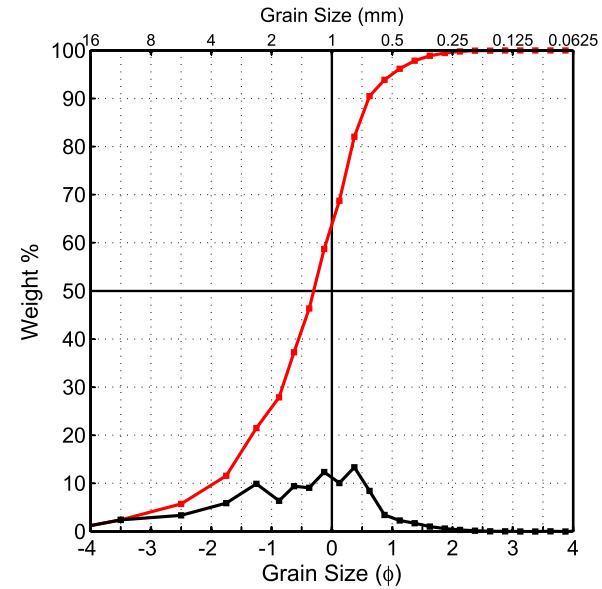
Mean 2.797 mm
STD 0.486 mm
Skewness 0.143

USCS Wentworth

SP Granule
Coarse Sand Poorly Sorted
Poorly Graded Symmetrical
Mesokurtic

Total weight (gram) 109.99
% finer than 4.00 phi 0.03
% coarser than -1.00 phi 65.45
% CaCO₃ 25.3

Grain Size Distribution



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1900+00
Interval MLW

Mean 1.251 mm
STD 0.492 mm
Skewness -0.732

USCS Wentworth

SP Very Coarse Sand
Medium Sand Poorly Sorted
Poorly Graded Coarse Skewed
Leptokurtic

Total weight (gram) 100.41
% finer than 4.00 phi 0.01
% coarser than -1.00 phi 21.48
% CaCO₃ 9.6

Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles	Moment Measures	(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	Mean	-1.484	2.797
-3	-3.5	8.07	7.34	7.34	5	Standard Deviation	1.040	0.486
-2	-2.5	25.61	23.28	30.62	16	Skewness	0.143	
-1.5	-1.75	16.65	15.14	45.76	25	Kurtosis	3.650	
-1	-1.25	21.66	19.69	65.45	25	Dispersion		
-0.75	-0.875	8.84	8.04	73.49	50	Standard Deviation		
-0.5	-0.625	10.77	9.79	83.28	75	Deviation from Normal		
-0.25	-0.375	7.45	6.77	90.05	84			
0	-0.125	5.47	4.97	95.03	95			
0.25	0.125	2.52	2.29	97.32	99			
0.5	0.375	1.53	1.39	98.71				
0.75	0.625	0.44	0.40	99.11				
1	0.875	0.17	0.15	99.26				
1.25	1.125	0.09	0.08	99.35				
1.5	1.375	0.09	0.08	99.43				
1.75	1.625	0.07	0.06	99.49				
2	1.875	0.06	0.05	99.55				
2.25	2.125	0.09	0.08	99.63				
2.5	2.375	0.09	0.08	99.71				
2.75	2.625	0.08	0.07	99.78				
3	2.875	0.08	0.07	99.85				
3.25	3.125	0.04	0.04	99.89				
3.5	3.375	0.03	0.03	99.92				
3.75	3.625	0.03	0.03	99.95				
4	3.875	0.03	0.03	99.97				
>4.0	4.25	0.03	0.03	100.00				

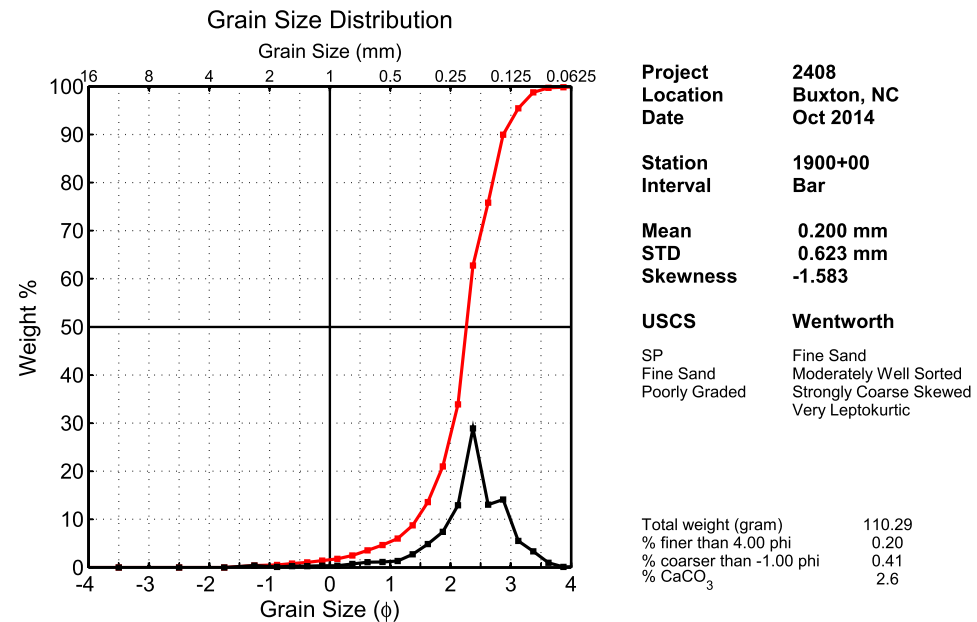
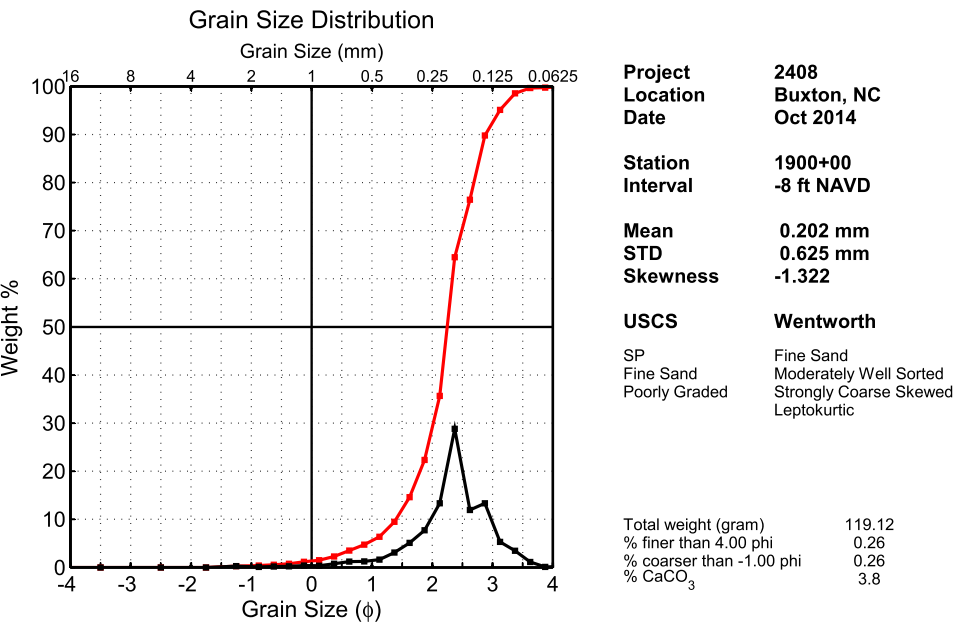
Percentiles	Moment Measures	(phi)	(mm)
1	Mean	-1.484	2.797
5	Standard Deviation	1.040	0.486
16	Skewness	0.143	
25	Kurtosis	3.650	
25	Dispersion		
50	Standard Deviation		
75	Deviation from Normal		
84			
95			
99			

Graphic Phi Parameters	Inman 1952	Folk & Ward 1957
Mean	-1.865	-1.790
Standard Deviation	1.265	1.192
Skewness (1)	-0.178	-0.179
Skewness (2)	-0.263	
Kurtosis	0.460	0.795

Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles	Moment Measures	(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	Mean	-0.323	1.251
-3	-3.5	2.39	2.38	2.38	5	Standard Deviation	1.024	0.492
-2	-2.5	3.34	3.33	5.71	16	Skewness	-0.732	
-1.5	-1.75	5.89	5.87	11.57	25	Kurtosis	4.107	
-1	-1.25	9.95	9.91	21.48	25	Dispersion		
-0.75	-0.875	6.40	6.37	27.86	50	Standard Deviation		
-0.5	-0.625	9.44	9.40	37.26	75	Deviation from Normal		
-0.25	-0.375	9.12	9.08	46.34	84			
0	-0.125	12.40	12.35	58.69	95			
0.25	0.125	10.10	10.06	68.75	99			
0.5	0.375	13.37	13.32	82.06				
0.75	0.625	8.43	8.40	90.46				
1	0.875	3.44	3.43	93.89				
1.25	1.125	2.29	2.28	96.17				
1.5	1.375	1.70	1.69	97.86				
1.75	1.625	1.01	1.01	98.86				
2	1.875	0.60	0.60	99.46				
2.25	2.125	0.30	0.30	99.76				
2.5	2.375	0.16	0.16	99.92				
2.75	2.625	0.03	0.03	99.95				
3	2.875	0.03	0.03	99.98				
3.25	3.125	0.00	0.00	99.98				
3.5	3.375	0.00	0.00	99.98				
3.75	3.625	0.01	0.01	99.99				
4	3.875	0.00	0.00	99.99				
>4.0	4.25	0.01	0.01	100.00				

Percentiles	Moment Measures	(phi)	(mm)
1	Mean	-0.323	1.251
5	Standard Deviation	1.024	0.492
16	Skewness	-0.732	
25	Kurtosis	4.107	
25	Dispersion		
50	Standard Deviation		
75	Deviation from Normal		
84			
95			
99			

Graphic Phi Parameters	Inman 1952	Folk & Ward 1957
Mean	-0.545	-0.463
Standard Deviation	0.980	1.051
Skewness (1)	-0.250	-0.275
Skewness (2)	-0.569	
Kurtosis	0.890	1.182



Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-0.230	Mean		2.307	0.202
-3	-3.5	0.00	0.00	0.00	5	0.915	Standard Deviation		0.678	0.625
-2	-2.5	0.00	0.00	0.00	16	1.670	Skewness		-1.322	
-1.5	-1.75	0.00	0.00	0.00	25	1.925	Kurtosis		7.023	
-1	-1.25	0.31	0.26	0.26	25	1.925	Dispersion			
-0.75	-0.875	0.14	0.12	0.38	50	2.250	Standard Deviation			
-0.5	-0.625	0.20	0.17	0.55	75	2.595	Deviation from Normal			
-0.25	-0.375	0.27	0.23	0.77	84	2.765				
0	-0.125	0.47	0.39	1.17	95	3.120				
0.25	0.125	0.41	0.34	1.51	99	3.475				
0.5	0.375	0.92	0.77	2.28						
0.75	0.625	1.44	1.21	3.49						
1	0.875	1.49	1.25	4.74						
1.25	1.125	1.95	1.64	6.38						
1.5	1.375	3.69	3.10	9.48						
1.75	1.625	6.09	5.11	14.59						
2	1.875	9.21	7.73	22.32						
2.25	2.125	15.89	13.34	35.66						
2.5	2.375	34.34	28.83	64.49						
2.75	2.625	14.22	11.94	76.43						
3	2.875	15.89	13.34	89.77						
3.25	3.125	6.34	5.32	95.09						
3.5	3.375	4.12	3.46	98.55						
3.75	3.625	1.32	1.11	99.66						
4	3.875	0.10	0.08	99.74						
>4.0	4.25	0.31	0.26	100.00						

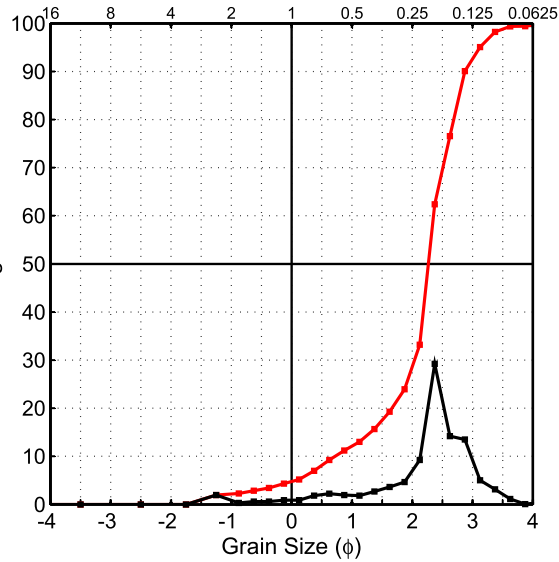
Percentiles		Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean				2.217	2.228
Standard Deviation				0.547	0.608
Skewness (1)				-0.059	-0.135
Skewness (2)				-0.425	
Kurtosis				1.014	1.349

Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-0.430	Mean		2.320	0.200
-3	-3.5	0.00	0.00	0.00	5	0.940	Standard Deviation		0.683	0.623
-2	-2.5	0.00	0.00	0.00	16	1.705	Skewness		-1.583	
-1.5	-1.75	0.00	0.00	0.00	25	1.955	Kurtosis		8.128	
-1	-1.25	0.45	0.41	0.41	25	1.955	Dispersion			
-0.75	-0.875	0.11	0.10	0.51	50	2.265	Standard Deviation			
-0.5	-0.625	0.30	0.27	0.78	75	2.610	Deviation from Normal			
-0.25	-0.375	0.31	0.28	1.06	84	2.770				
0	-0.125	0.40	0.36	1.42	95	3.105				
0.25	0.125	0.38	0.34	1.77	99	3.435				
0.5	0.375	0.77	0.70	2.47						
0.75	0.625	1.18	1.07	3.54						
1	0.875	1.24	1.12	4.66						
1.25	1.125	1.47	1.33	5.99						
1.5	1.375	3.01	2.73	8.72						
1.75	1.625	5.36	4.86	13.58						
2	1.875	8.15	7.39	20.97						
2.25	2.125	14.24	12.91	33.88						
2.5	2.375	31.86	28.89	62.77						
2.75	2.625	14.37	13.03	75.80						
3	2.875	15.58	14.13	89.93						
3.25	3.125	6.08	5.51	95.44						
3.5	3.375	3.67	3.33	98.77						
3.75	3.625	1.04	0.94	99.71						
4	3.875	0.10	0.09	99.80						
>4.0	4.25	0.22	0.20	100.00						

Percentiles		Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean				2.237	2.247
Standard Deviation				0.532	0.594
Skewness (1)				-0.052	-0.138
Skewness (2)				-0.455	
Kurtosis				1.033	1.355

Grain Size Distribution

Grain Size (mm)



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1900+00
Interval -16 ft NAVD

Mean 0.219 mm
STD 0.524 mm
Skewness -1.654

USCS Wentworth

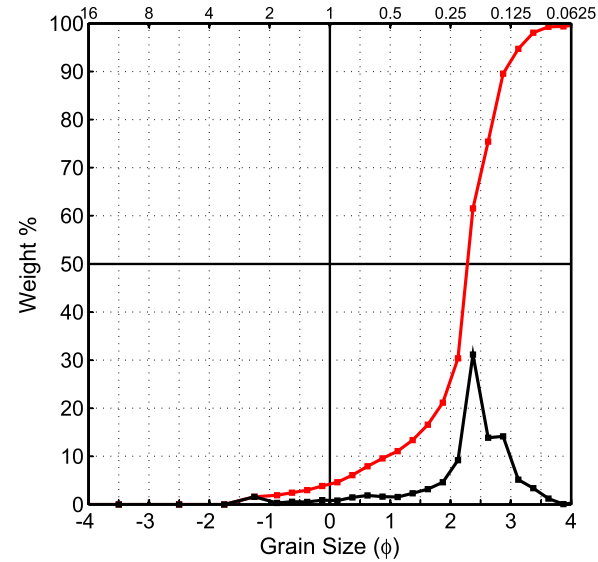
SP Fine Sand
 Poorly Graded

Fine Sand
 Moderately Sorted
 Strongly Coarse Skewed
 Leptokurtic

Total weight (gram) 121.85
 % finer than 4.00 phi 0.57
 % coarser than -1.00 phi 1.96
 % CaCO₃ 3.7

Grain Size Distribution

Grain Size (mm)



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1900+00
Interval -12 ft NAVD

Mean 0.211 mm
STD 0.540 mm
Skewness -1.754

USCS Wentworth

SP Fine Sand
 Poorly Graded

Fine Sand
 Moderately Sorted
 Strongly Coarse Skewed
 Leptokurtic

Total weight (gram) 129.83
 % finer than 4.00 phi 0.65
 % coarser than -1.00 phi 1.59
 % CaCO₃ 3.1

Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-1.495	Mean		2.189	0.219
-3	-3.5	0.00	0.00	0.00	5	0.070	Standard Deviation		0.933	0.524
-2	-2.5	0.00	0.00	0.00	16	1.400	Skewness		-1.654	
-1.5	-1.75	0.00	0.00	0.00	25	1.905	Kurtosis		6.281	
-1	-1.25	2.39	1.96	1.96	50	2.270	Dispersion			
-0.75	-0.875	0.36	0.30	2.26	75	2.595	Standard Deviation			
-0.5	-0.625	0.70	0.57	2.83	84	2.765	Deviation from Normal			
-0.25	-0.375	0.71	0.58	3.41	95	3.120				
0	-0.125	1.08	0.89	4.30	99	3.545				
0.25	0.125	1.09	0.89	5.19						
0.5	0.375	2.20	1.81	7.00						
0.75	0.625	2.72	2.23	9.23						
1	0.875	2.38	1.95	11.19						
1.25	1.125	2.20	1.81	12.99						
1.5	1.375	3.27	2.68	15.68						
1.75	1.625	4.40	3.61	19.29						
2	1.875	5.68	4.66	23.95						
2.25	2.125	11.25	9.23	33.18						
2.5	2.375	35.59	29.21	62.39						
2.75	2.625	17.28	14.18	76.57						
3	2.875	16.43	13.48	90.05						
3.25	3.125	6.13	5.03	95.08						
3.5	3.375	3.82	3.14	98.22						
3.75	3.625	1.39	1.14	99.36						
4	3.875	0.08	0.07	99.43						
>4.0	4.25	0.70	0.57	100.00						

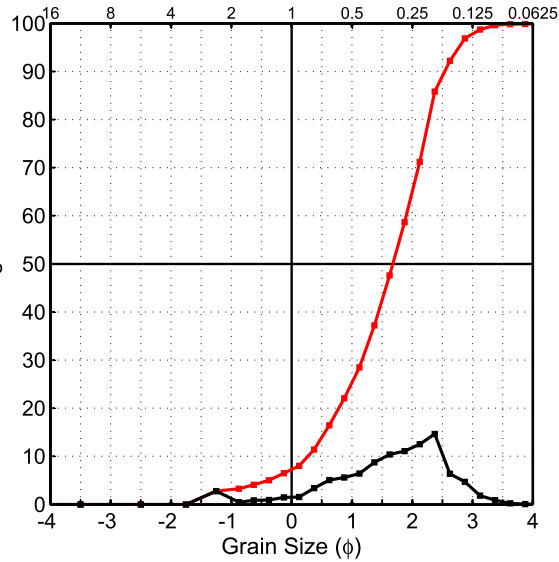
Percentiles		Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean				2.082	2.145
Standard Deviation				0.682	0.803
Skewness (1)				-0.275	-0.359
Skewness (2)				-0.989	
Kurtosis				1.234	1.812

Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-1.435	Mean		2.246	0.211
-3	-3.5	0.00	0.00	0.00	5	0.195	Standard Deviation		0.889	0.540
-2	-2.5	0.00	0.00	0.00	16	1.580	Skewness		-1.754	
-1.5	-1.75	0.00	0.00	0.00	25	1.980	Kurtosis		7.012	
-1	-1.25	2.07	1.59	1.59	50	2.285	Dispersion			
-0.75	-0.875	0.40	0.31	1.90	75	2.620	Standard Deviation			
-0.5	-0.625	0.70	0.54	2.44	84	2.775	Deviation from Normal			
-0.25	-0.375	0.66	0.51	2.95	95	3.150				
0	-0.125	1.13	0.87	3.82	99	3.565				
0.25	0.125	1.02	0.79	4.61						
0.5	0.375	1.89	1.46	6.06						
0.75	0.625	2.44	1.88	7.94						
1	0.875	2.11	1.63	9.57						
1.25	1.125	1.97	1.52	11.08						
1.5	1.375	2.99	2.30	13.39						
1.75	1.625	4.13	3.18	16.57						
2	1.875	5.96	4.59	21.16						
2.25	2.125	11.94	9.20	30.36						
2.5	2.375	40.45	31.16	61.51						
2.75	2.625	18.02	13.88	75.39						
3	2.875	18.37	14.15	89.54						
3.25	3.125	6.69	5.15	94.69						
3.5	3.375	4.38	3.37	98.07						
3.75	3.625	1.58	1.22	99.28						
4	3.875	0.08	0.06	99.35						
>4.0	4.25	0.85	0.65	100.00						

Percentiles		Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean				2.178	2.213
Standard Deviation				0.597	0.746
Skewness (1)				-0.180	-0.297
Skewness (2)				-1.025	
Kurtosis				1.473	1.892

Grain Size Distribution

Grain Size (mm)



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1900+00
Interval -24 ft NAVD

Mean 0.322 mm
STD 0.514 mm
Skewness -0.921

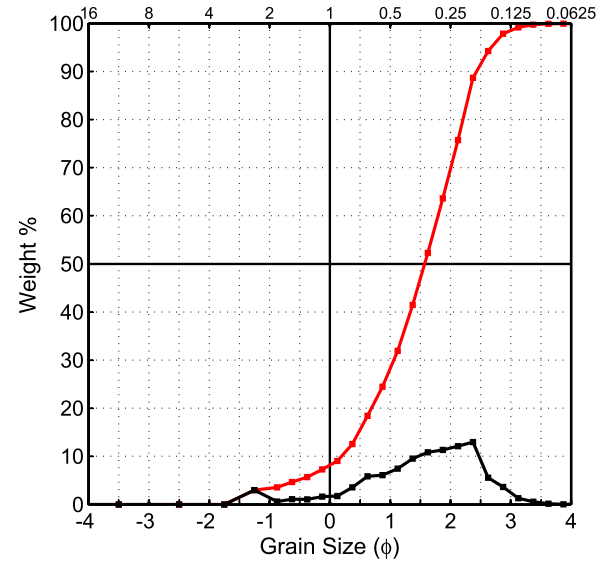
USCS Wentworth

SP Medium Sand
 Fine Sand Moderately Sorted
 Poorly Graded Coarse Skewed
 Leptokurtic

Total weight (gram) 126.48
 % finer than 4.00 phi 0.13
 % coarser than -1.00 phi 2.76
 % CaCO₃ 5.7

Grain Size Distribution

Grain Size (mm)



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1900+00
Interval -20 ft NAVD

Mean 0.344 mm
STD 0.516 mm
Skewness -0.885

USCS Wentworth

SP Medium Sand
 Fine Sand Moderately Sorted
 Poorly Graded Coarse Skewed
 Leptokurtic

Total weight (gram) 109.24
 % finer than 4.00 phi 0.07
 % coarser than -1.00 phi 2.96
 % CaCO₃ 3.8

Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-1.570	Mean		1.633	0.322
-3	-3.5	0.00	0.00	0.00	5	-0.380	Standard Deviation		0.959	0.514
-2	-2.5	0.00	0.00	0.00	16	0.600	Skewness		-0.921	
-1.5	-1.75	0.00	0.00	0.00	25	0.990	Kurtosis		3.961	
-1	-1.25	3.49	2.76	2.76	50	1.680	Dispersion			
-0.75	-0.875	0.61	0.48	3.24	75	2.190	Standard Deviation			
-0.5	-0.625	1.06	0.84	4.08	84	2.345	Deviation from Normal			
-0.25	-0.375	1.19	0.94	5.02	95	2.775				
0	-0.125	1.84	1.45	6.48	99	3.205				
0.25	0.125	1.96	1.55	8.02						
0.5	0.375	4.26	3.37	11.39						
0.75	0.625	6.41	5.07	16.46						
1	0.875	7.05	5.57	22.04						
1.25	1.125	8.13	6.43	28.46						
1.5	1.375	11.04	8.73	37.19						
1.75	1.625	13.15	10.40	47.59						
2	1.875	14.02	11.08	58.67						
2.25	2.125	15.81	12.50	71.17						
2.5	2.375	18.50	14.63	85.80						
2.75	2.625	8.07	6.38	92.18						
3	2.875	5.95	4.70	96.88						
3.25	3.125	2.32	1.83	98.72						
3.5	3.375	1.12	0.89	99.60						
3.75	3.625	0.27	0.21	99.82						
4	3.875	0.06	0.05	99.87						
>4.0	4.25	0.17	0.13	100.00						

Percentiles

Moment Measures

Graphic Phi Parameters

Inman 1952

Folk & Ward 1957

Mean
 Standard Deviation
 Skewness (1)
 Skewness (2)
 Kurtosis

1.472
 0.872
 -0.238
 -0.553
 0.808

1.542
 0.914
 -0.272
 1.078

Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-1.580	Mean		1.538	0.344
-3	-3.5	0.00	0.00	0.00	5	-0.540	Standard Deviation		0.956	0.516
-2	-2.5	0.00	0.00	0.00	16	0.520	Skewness		-0.885	
-1.5	-1.75	0.00	0.00	0.00	25	0.890	Kurtosis		3.808	
-1	-1.25	3.23	2.96	2.96	50	1.570	Dispersion			
-0.75	-0.875	0.66	0.60	3.56	75	2.110	Standard Deviation			
-0.5	-0.625	1.19	1.09	4.65	84	2.285	Deviation from Normal			
-0.25	-0.375	1.13	1.03	5.68	95	2.680				
0	-0.125	1.75	1.60	7.29	99	3.090				
0.25	0.125	1.89	1.73	9.02						
0.5	0.375	3.87	3.54	12.56						
0.75	0.625	6.39	5.85	18.41						
1	0.875	6.64	6.08	24.49						
1.25	1.125	8.11	7.42	31.91						
1.5	1.375	10.42	9.54	41.45						
1.75	1.625	11.84	10.84	52.29						
2	1.875	12.39	11.34	63.63						
2.25	2.125	13.23	12.11	75.74						
2.5	2.375	14.15	12.95	88.69						
2.75	2.625	6.05	5.54	94.23						
3	2.875	3.97	3.63	97.87						
3.25	3.125	1.43	1.31	99.18						
3.5	3.375	0.62	0.57	99.74						
3.75	3.625	0.17	0.16	99.90						
4	3.875	0.03	0.03	99.93						
>4.0	4.25	0.08	0.07	100.00						

Percentiles

Moment Measures

Graphic Phi Parameters

Inman 1952

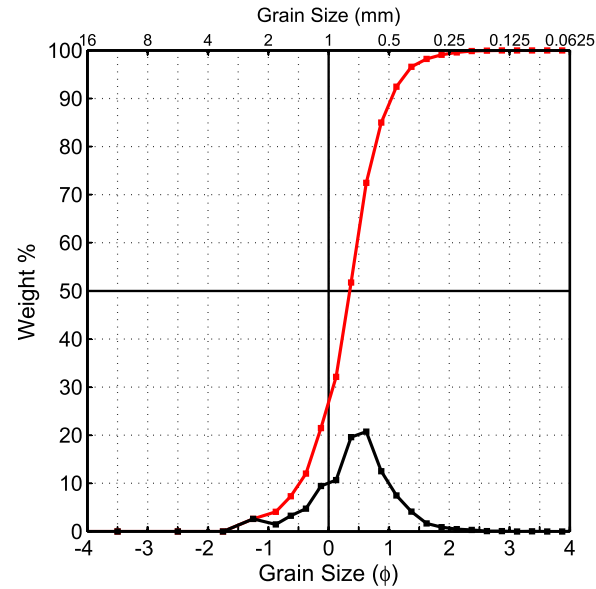
Folk & Ward 1957

Mean
 Standard Deviation
 Skewness (1)
 Skewness (2)
 Kurtosis

1.403
 0.883
 -0.190
 -0.567
 0.824

1.458
 0.929
 -0.250
 1.082

Grain Size Distribution



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1920+00
Interval Dune Toe

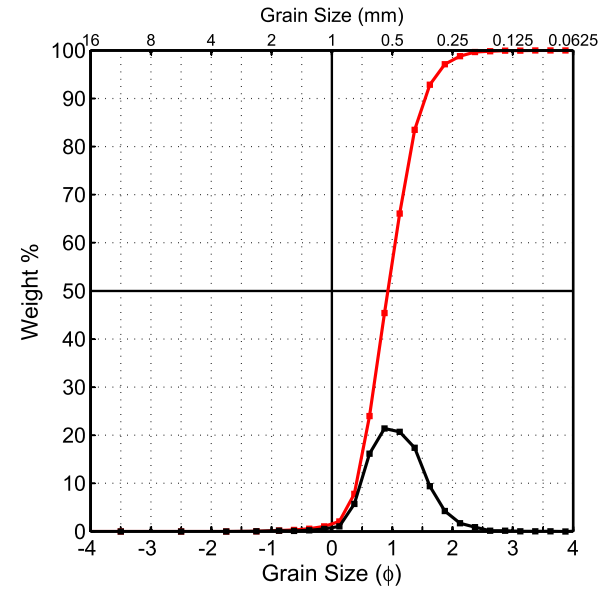
Mean 0.739 mm
STD 0.651 mm
Skewness -0.213

USCS Wentworth

SP Coarse Sand
 Medium Sand Moderately Well Sorted
 Poorly Graded Symmetrical
 Leptokurtic

Total weight (gram) 99.78
 % finer than 4.00 phi 0.01
 % coarser than -1.00 phi 2.60
 % CaCO₃ 8.0

Grain Size Distribution



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1920+00
Interval Dune

Mean 0.474 mm
STD 0.723 mm
Skewness 0.206

USCS Wentworth

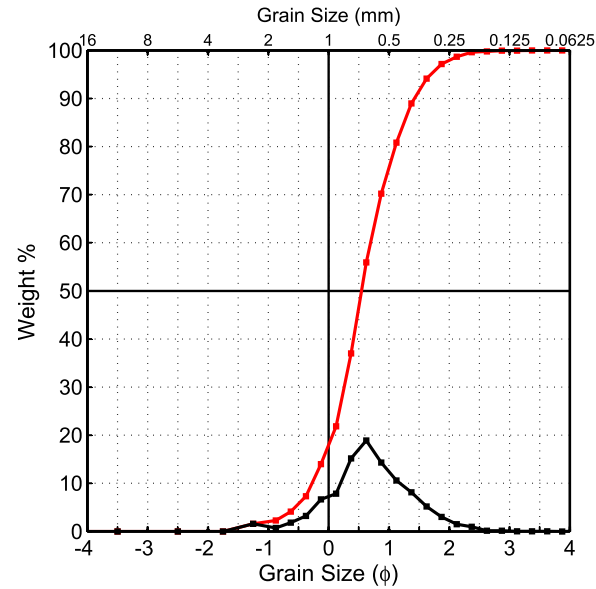
SP Medium Sand
 Medium Sand Well Sorted
 Poorly Graded Symmetrical
 Leptokurtic

Total weight (gram) 99.26
 % finer than 4.00 phi 0.02
 % coarser than -1.00 phi 0.04
 % CaCO₃ 2.6

Limits (phi)	Mid Point (phi)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-1.555	Mean		0.436	0.739
-3	-3.5	0.00	0.00	0.00	5	-0.800	Standard Deviation		0.620	0.651
-2	-2.5	0.00	0.00	0.00	16	-0.270	Skewness		-0.213	
-1.5	-1.75	0.00	0.00	0.00	25	-0.040	Kurtosis		3.983	
-1	-1.25	2.59	2.60	2.60	50	0.355	Dispersion			
-0.75	-0.875	1.46	1.46	4.06	75	0.675	Standard Deviation			
-0.5	-0.625	3.23	3.24	7.30	84	0.855	Deviation from Normal			
-0.25	-0.375	4.71	4.72	12.02	95	1.280				
0	-0.125	9.43	9.45	21.47	99	1.845				
0.25	0.125	10.64	10.66	32.13	Graphic Phi Parameters		Inman	Folk & Ward		
0.5	0.375	19.55	19.59	51.72			1952	1957		
0.75	0.625	20.71	20.76	72.48	Graphic Phi Parameters		Inman	Folk & Ward		
1	0.875	12.50	12.53	85.01			1952	1957		
1.25	1.125	7.44	7.46	92.46	Graphic Phi Parameters		Inman	Folk & Ward		
1.5	1.375	4.12	4.13	96.59			1952	1957		
1.75	1.625	1.64	1.64	98.24	Graphic Phi Parameters		Inman	Folk & Ward		
2	1.875	0.86	0.86	99.10			1952	1957		
2.25	2.125	0.48	0.48	99.58	Graphic Phi Parameters		Inman	Folk & Ward		
2.5	2.375	0.29	0.29	99.87			1952	1957		
2.75	2.625	0.06	0.06	99.93	Graphic Phi Parameters		Inman	Folk & Ward		
3	2.875	0.05	0.05	99.98			1952	1957		
3.25	3.125	0.00	0.00	99.98	Graphic Phi Parameters		Inman	Folk & Ward		
3.5	3.375	0.01	0.01	99.99			1952	1957		
3.75	3.625	0.00	0.00	99.99	Graphic Phi Parameters		Inman	Folk & Ward		
4	3.875	0.00	0.00	99.99			1952	1957		
>4.0	4.25	0.01	0.01	100.00	Graphic Phi Parameters		Inman	Folk & Ward		
							1952	1957		

Limits (phi)	Mid Point (phi)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-0.150	Mean		1.078	0.474
-3	-3.5	0.00	0.00	0.00	5	0.250	Standard Deviation		0.469	0.723
-2	-2.5	0.00	0.00	0.00	16	0.500	Skewness		0.206	
-1.5	-1.75	0.00	0.00	0.00	25	0.635	Kurtosis		4.618	
-1	-1.25	0.04	0.04	0.04	50	0.930	Dispersion			
-0.75	-0.875	0.16	0.16	0.20	75	1.255	Standard Deviation			
-0.5	-0.625	0.11	0.11	0.31	84	1.390	Deviation from Normal			
-0.25	-0.375	0.23	0.23	0.54	95	1.750				
0	-0.125	0.50	0.50	1.05	99	2.190				
0.25	0.125	1.03	1.04	2.09	Graphic Phi Parameters		Inman	Folk & Ward		
0.5	0.375	5.69	5.73	7.82			1952	1957		
0.75	0.625	16.04	16.16	23.98	Graphic Phi Parameters		Inman	Folk & Ward		
1	0.875	21.24	21.40	45.38			1952	1957		
1.25	1.125	20.55	20.70	66.08	Graphic Phi Parameters		Inman	Folk & Ward		
1.5	1.375	17.26	17.39	83.47			1952	1957		
1.75	1.625	9.33	9.40	92.87	Graphic Phi Parameters		Inman	Folk & Ward		
2	1.875	4.20	4.23	97.10			1952	1957		
2.25	2.125	1.67	1.68	98.78	Graphic Phi Parameters		Inman	Folk & Ward		
2.5	2.375	0.86	0.87	99.65			1952	1957		
2.75	2.625	0.15	0.15	99.80	Graphic Phi Parameters		Inman	Folk & Ward		
3	2.875	0.13	0.13	99.93			1952	1957		
3.25	3.125	0.02	0.02	99.95	Graphic Phi Parameters		Inman	Folk & Ward		
3.5	3.375	0.02	0.02	99.97			1952	1957		
3.75	3.625	0.01	0.01	99.98	Graphic Phi Parameters		Inman	Folk & Ward		
4	3.875	0.00	0.00	99.98			1952	1957		
>4.0	4.25	0.02	0.02	100.00	Graphic Phi Parameters		Inman	Folk & Ward		
							1952	1957		

Grain Size Distribution



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1920+00
Interval BC

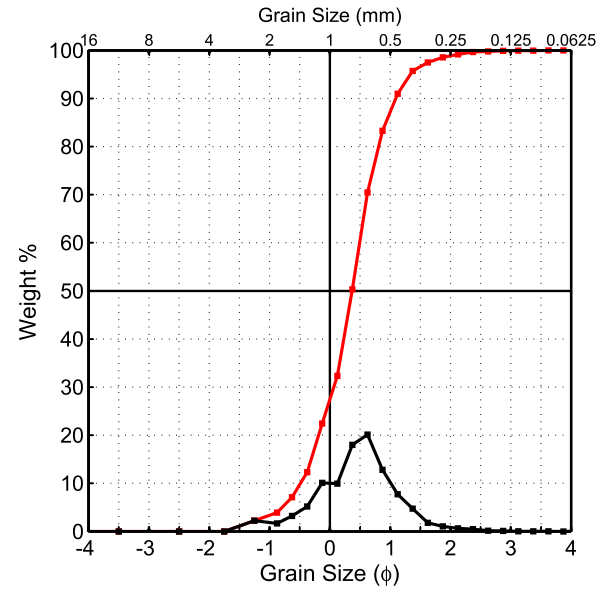
Mean 0.620 mm
STD 0.625 mm
Skewness -0.037

USCS Wentworth

SP Coarse Sand
 Medium Sand Moderately Well Sorted
 Poorly Graded Symmetrical
 Leptokurtic

Total weight (gram) 99.97
 % finer than 4.00 phi 0.02
 % coarser than -1.00 phi 1.57
 % CaCO₃ 5.8

Grain Size Distribution



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1920+00
Interval Berm

Mean 0.727 mm
STD 0.638 mm
Skewness 0.038

USCS Wentworth

SP Coarse Sand
 Medium Sand Moderately Well Sorted
 Poorly Graded Symmetrical
 Leptokurtic

Total weight (gram) 100.08
 % finer than 4.00 phi 0.04
 % coarser than -1.00 phi 2.23
 % CaCO₃ 11.6

Limits (ϕ)	Mid Point (ϕ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-1.430	Mean		0.690	0.620
-3	-3.5	0.00	0.00	0.00	5	-0.555	Standard Deviation		0.677	0.625
-2	-2.5	0.00	0.00	0.00	16	-0.060	Skewness		-0.037	
-1.5	-1.75	0.00	0.00	0.00	25	0.175	Kurtosis		3.710	
-1	-1.25	1.57	1.57	1.57	50	0.545	Dispersion			
-0.75	-0.875	0.71	0.71	2.28	75	0.990	Standard Deviation			
-0.5	-0.625	1.82	1.82	4.10	84	1.225	Deviation from Normal			
-0.25	-0.375	3.22	3.22	7.32	95	1.695				
0	-0.125	6.66	6.66	13.98	99	2.215				
0.25	0.125	7.86	7.86	21.85						
0.5	0.375	15.15	15.15	37.00						
0.75	0.625	18.90	18.91	55.91						
1	0.875	14.29	14.29	70.20						
1.25	1.125	10.60	10.60	80.80						
1.5	1.375	8.14	8.14	88.95						
1.75	1.625	5.18	5.18	94.13						
2	1.875	3.02	3.02	97.15						
2.25	2.125	1.50	1.50	98.65						
2.5	2.375	0.95	0.95	99.60						
2.75	2.625	0.16	0.16	99.76						
3	2.875	0.16	0.16	99.92						
3.25	3.125	0.03	0.03	99.95						
3.5	3.375	0.02	0.02	99.97						
3.75	3.625	0.01	0.01	99.98						
4	3.875	0.00	0.00	99.98						
>4.0	4.25	0.02	0.02	100.00						

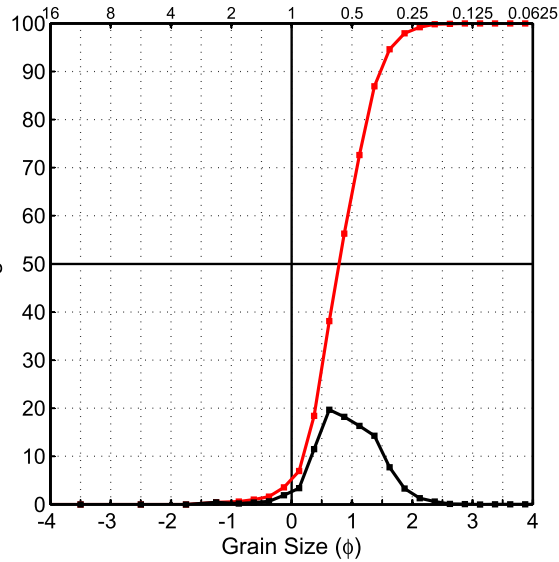
Percentiles		Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean				0.582	0.570
Standard Deviation				0.643	0.662
Skewness (1)				0.058	0.040
Skewness (2)				0.039	
Kurtosis				0.751	1.131

Limits (ϕ)	Mid Point (ϕ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-1.525	Mean		0.459	0.727
-3	-3.5	0.00	0.00	0.00	5	-0.790	Standard Deviation		0.649	0.638
-2	-2.5	0.00	0.00	0.00	16	-0.285	Skewness		0.038	
-1.5	-1.75	0.00	0.00	0.00	25	-0.060	Kurtosis		4.278	
-1	-1.25	2.23	2.23	2.23	50	0.370	Dispersion			
-0.75	-0.875	1.68	1.68	3.91	75	0.715	Standard Deviation			
-0.5	-0.625	3.20	3.20	7.10	84	0.900	Deviation from Normal			
-0.25	-0.375	5.19	5.19	12.29	95	1.335				
0	-0.125	10.12	10.11	22.40	99	2.060				
0.25	0.125	9.93	9.92	32.32						
0.5	0.375	18.00	17.99	50.31						
0.75	0.625	20.16	20.14	70.45						
1	0.875	12.81	12.80	83.25						
1.25	1.125	7.74	7.73	90.99						
1.5	1.375	4.73	4.73	95.71						
1.75	1.625	1.77	1.77	97.48						
2	1.875	1.05	1.05	98.53						
2.25	2.125	0.64	0.64	99.17						
2.5	2.375	0.47	0.47	99.64						
2.75	2.625	0.14	0.14	99.78						
3	2.875	0.12	0.12	99.90						
3.25	3.125	0.03	0.03	99.93						
3.5	3.375	0.02	0.02	99.95						
3.75	3.625	0.01	0.01	99.96						
4	3.875	0.00	0.00	99.96						
>4.0	4.25	0.04	0.04	100.00						

Percentiles		Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean				0.307	0.328
Standard Deviation				0.593	0.618
Skewness (1)				-0.105	-0.099
Skewness (2)				-0.165	
Kurtosis				0.793	1.124

Grain Size Distribution

Grain Size (mm)



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1920+00
Interval MTL

Mean 0.525 mm
STD 0.691 mm
Skewness -0.153

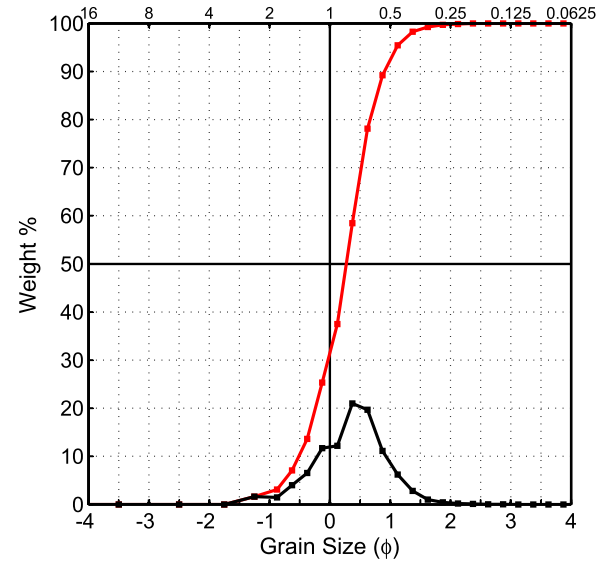
USCS Wentworth

SP Coarse Sand
 Medium Sand Moderately Well Sorted
 Poorly Graded Symmetrical
 Leptokurtic

Total weight (gram) 99.46
 % finer than 4.00 phi 0.01
 % coarser than -1.00 phi 0.43
 % CaCO₃ 4.5

Grain Size Distribution

Grain Size (mm)



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1920+00
Interval MHW

Mean 0.781 mm
STD 0.676 mm
Skewness -0.195

USCS Wentworth

SP Coarse Sand
 Medium Sand Moderately Well Sorted
 Poorly Graded Symmetrical
 Mesokurtic

Total weight (gram) 99.90
 % finer than 4.00 phi 0.01
 % coarser than -1.00 phi 1.60
 % CaCO₃ 7.9

Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-0.625	Mean		0.930	0.525
-3	-3.5	0.00	0.00	0.00	5	-0.015	Standard Deviation		0.533	0.691
-2	-2.5	0.00	0.00	0.00	16	0.320	Skewness		-0.153	
-1.5	-1.75	0.00	0.00	0.00	25	0.460	Kurtosis		4.387	
-1	-1.25	0.43	0.43	0.43	50	0.790	Dispersion			
-0.75	-0.875	0.17	0.17	0.60	75	1.165	Standard Deviation			
-0.5	-0.625	0.39	0.39	1.00	84	1.325	Deviation from Normal			
-0.25	-0.375	0.62	0.62	1.62	95	1.655				
0	-0.125	1.91	1.92	3.54	99	2.085				
0.25	0.125	3.37	3.39	6.93						
0.5	0.375	11.43	11.49	18.42						
0.75	0.625	19.59	19.70	38.12						
1	0.875	18.09	18.19	56.30						
1.25	1.125	16.25	16.34	72.64						
1.5	1.375	14.19	14.27	86.91						
1.75	1.625	7.66	7.70	94.61						
2	1.875	3.29	3.31	97.92						
2.25	2.125	1.29	1.30	99.22						
2.5	2.375	0.60	0.60	99.82						
2.75	2.625	0.09	0.09	99.91						
3	2.875	0.05	0.05	99.96						
3.25	3.125	0.00	0.00	99.96						
3.5	3.375	0.01	0.01	99.97						
3.75	3.625	0.01	0.01	99.98						
4	3.875	0.01	0.01	99.99						
>4.0	4.25	0.01	0.01	100.00						

Percentiles		Moment Measures		(phi)	(mm)
1	-0.625	Mean		0.930	0.525
5	-0.015	Standard Deviation		0.533	0.691
16	0.320	Skewness		-0.153	
25	0.460	Kurtosis		4.387	
50	0.790	Dispersion			
75	1.165	Standard Deviation			
84	1.325	Deviation from Normal			
95	1.655				
99	2.085				

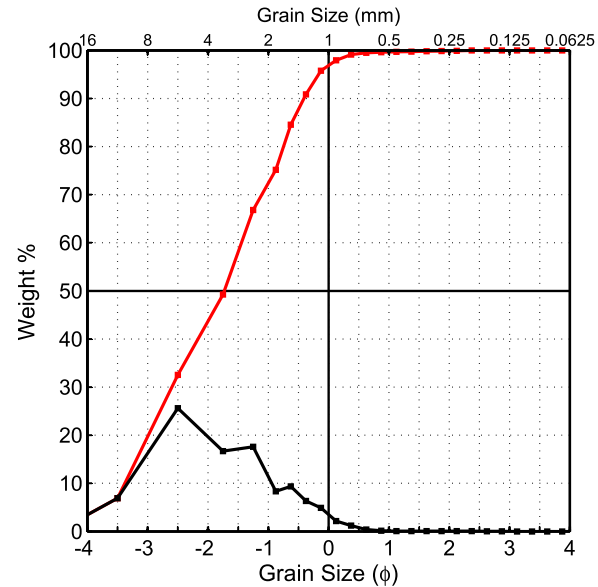
Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean		0.822	0.812
Standard Deviation		0.502	0.504
Skewness (1)		0.065	0.050
Skewness (2)		0.060	
Kurtosis		0.662	0.971

Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-1.440	Mean		0.357	0.781
-3	-3.5	0.00	0.00	0.00	5	-0.755	Standard Deviation		0.565	0.676
-2	-2.5	0.00	0.00	0.00	16	-0.325	Skewness		-0.195	
-1.5	-1.75	0.00	0.00	0.00	25	-0.130	Kurtosis		3.607	
-1	-1.25	1.60	1.60	1.60	50	0.275	Dispersion			
-0.75	-0.875	1.47	1.47	3.07	75	0.585	Standard Deviation			
-0.5	-0.625	3.99	3.99	7.07	84	0.755	Deviation from Normal			
-0.25	-0.375	6.54	6.55	13.61	95	1.105				
0	-0.125	11.69	11.70	25.32	99	1.560				
0.25	0.125	12.16	12.17	37.49						
0.5	0.375	20.95	20.97	58.46						
0.75	0.625	19.64	19.66	78.12						
1	0.875	11.10	11.11	89.23						
1.25	1.125	6.20	6.21	95.44						
1.5	1.375	2.82	2.82	98.26						
1.75	1.625	1.00	1.00	99.26						
2	1.875	0.43	0.43	99.69						
2.25	2.125	0.18	0.18	99.87						
2.5	2.375	0.09	0.09	99.96						
2.75	2.625	0.02	0.02	99.98						
3	2.875	0.02	0.02	100.00						
3.25	3.125	0.00	0.00	100.00						
3.5	3.375	0.00	0.00	100.00						
3.75	3.625	0.00	0.00	100.00						
4	3.875	-0.01	-0.01	99.99						
>4.0	4.25	0.01	0.01	100.00						

Percentiles		Moment Measures		(phi)	(mm)
1	-1.440	Mean		0.357	0.781
5	-0.755	Standard Deviation		0.565	0.676
16	-0.325	Skewness		-0.195	
25	-0.130	Kurtosis		3.607	
50	0.275	Dispersion			
75	0.585	Standard Deviation			
84	0.755	Deviation from Normal			
95	1.105				
99	1.560				

Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean		0.215	0.235
Standard Deviation		0.540	0.552
Skewness (1)		-0.111	-0.109
Skewness (2)		-0.185	
Kurtosis		0.722	1.066

Grain Size Distribution



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1920+00
Interval Trough

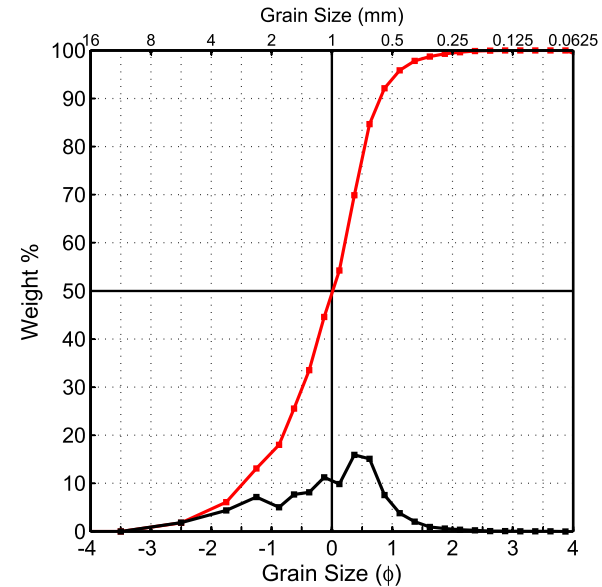
Mean 2.905 mm
STD 0.501 mm
Skewness -0.020

USCS Wentworth

SP Granule
 Coarse Sand Moderately Sorted
 Poorly Graded Symmetrical
 Mesokurtic

Total weight (gram) 124.20
 % finer than 4.00 phi 0.00
 % coarser than -1.00 phi 66.83
 % CaCO₃ 19.9

Grain Size Distribution



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1920+00
Interval MLW

Mean 1.054 mm
STD 0.635 mm
Skewness -5.607

USCS Wentworth

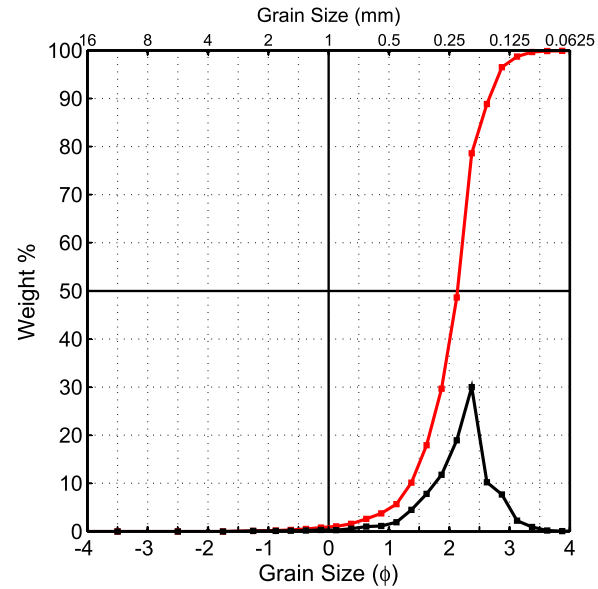
SP Very Coarse Sand
 Medium Sand Moderately Well Sorted
 Poorly Graded Strongly Coarse Skewed
 Very Platykurtic

Total weight (gram) 98.69
 % finer than 4.00 phi -1.75
 % coarser than -1.00 phi 13.31
 % CaCO₃ 15.7

Limits (phi)	Mid Point (phi)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-4.125	Mean	-1.539	2.905	
-3	-3.5	8.59	6.92	6.92	5	-3.775	Standard Deviation	0.998	0.501	
-2	-2.5	31.83	25.63	32.54	16	-3.145	Skewness	-0.020		
-1.5	-1.75	20.74	16.70	49.24	25	-2.795	Kurtosis	2.663		
-1	-1.25	21.84	17.58	66.83	50	-1.730	Dispersion			
-0.75	-0.875	10.36	8.34	75.17	75	-0.885	Standard Deviation			
-0.5	-0.625	11.63	9.36	84.53	84	-0.640	Deviation from Normal			
-0.25	-0.375	7.85	6.32	90.85	95	-0.165				
0	-0.125	6.08	4.90	95.75	99	0.350				
0.25	0.125	2.69	2.17	97.91	Graphic Phi Parameters		Inman	Folk & Ward		
0.5	0.375	1.50	1.21	99.12			1952	1957		
0.75	0.625	0.46	0.37	99.49	Mean		-1.893	-1.838		
1	0.875	0.16	0.13	99.62			1.252	1.173		
1.25	1.125	0.09	0.07	99.69	Standard Deviation		-0.130	-0.131		
1.5	1.375	0.07	0.06	99.75			-0.192			
1.75	1.625	0.06	0.05	99.80	Skewness (1)		0.441	0.775		
2	1.875	0.06	0.05	99.85						
2.25	2.125	0.07	0.06	99.90	Skewness (2)					
2.5	2.375	0.08	0.06	99.97						
2.75	2.625	0.02	0.02	99.98	Kurtosis					
3	2.875	0.02	0.02	100.00						
3.25	3.125	0.00	0.00	100.00						
3.5	3.375	0.00	0.00	100.00						
3.75	3.625	0.00	0.00	100.00						
4	3.875	0.00	0.00	100.00						
>4.0	4.25	0.00	0.00	100.00						

Limits (phi)	Mid Point (phi)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-2.940	Mean	-0.076	1.054	
-3	-3.5	0.00	0.00	0.00	5	-1.935	Standard Deviation	0.656	0.635	
-2	-2.5	1.79	1.81	1.81	16	-1.030	Skewness	-5.607		
-1.5	-1.75	4.30	4.36	6.17	25	-0.645	Kurtosis	-23.223		
-1	-1.25	7.05	7.14	13.31	50	0.015	Dispersion			
-0.75	-0.875	4.95	5.02	18.33	75	0.460	Standard Deviation			
-0.5	-0.625	7.57	7.67	26.00	84	0.615	Deviation from Normal			
-0.25	-0.375	8.01	8.12	34.12	95	1.070				
0	-0.125	11.08	11.23	45.34	99	1.750				
0.25	0.125	9.70	9.83	55.17	Graphic Phi Parameters		Inman	Folk & Ward		
0.5	0.375	15.71	15.92	71.09			1952	1957		
0.75	0.625	14.88	15.08	86.17	Mean		-0.208	-0.133		
1	0.875	7.45	7.55	93.72			0.822	0.867		
1.25	1.125	3.75	3.80	97.52	Standard Deviation		-0.271	-0.284		
1.5	1.375	1.99	2.02	99.53			-0.544			
1.75	1.625	0.90	0.91	100.45	Skewness (1)		0.827	1.115		
2	1.875	0.57	0.58	101.02						
2.25	2.125	0.34	0.34	101.37	Skewness (2)					
2.5	2.375	0.24	0.24	101.61						
2.75	2.625	0.06	0.06	101.67	Kurtosis					
3	2.875	0.05	0.05	101.72						
3.25	3.125	0.01	0.01	101.73						
3.5	3.375	0.01	0.01	101.74						
3.75	3.625	0.01	0.01	101.75						
4	3.875	0.00	0.00	101.75						
>4.0	4.25	-1.73	-1.75	100.00						

Grain Size Distribution



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1920+00
Interval -8 ft NAVD

Mean 0.223 mm
STD 0.673 mm
Skewness -1.240

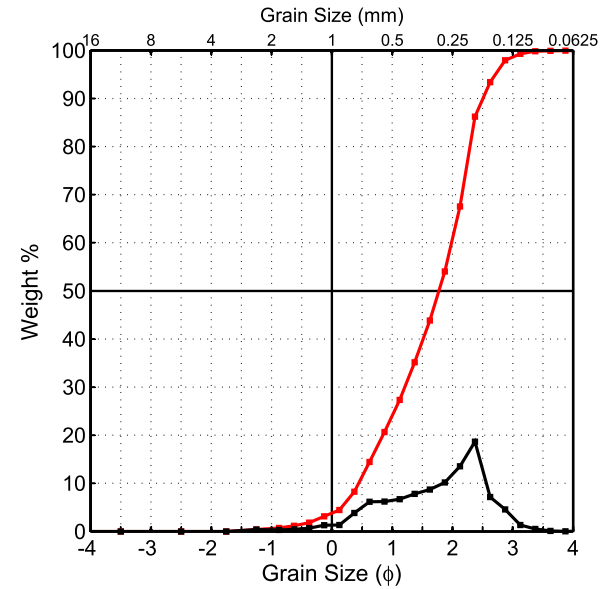
USCS Wentworth

SP Fine Sand
 Poorly Graded

Fine Sand
 Moderately Well Sorted
 Coarse Skewed
 Leptokurtic

Total weight (gram) 105.80
 % finer than 4.00 phi 0.09
 % coarser than -1.00 phi 0.09
 % CaCO₃ 2.0

Grain Size Distribution



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1920+00
Interval Bar

Mean 0.302 mm
STD 0.564 mm
Skewness -0.689

USCS Wentworth

SP Medium Sand
 Poorly Graded

Medium Sand
 Moderately Well Sorted
 Coarse Skewed
 Mesokurtic

Total weight (gram) 119.91
 % finer than 4.00 phi 0.08
 % coarser than -1.00 phi 0.41
 % CaCO₃ 3.2

Limits (phi)	Mid Point (phi)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles	Moment Measures	(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	Mean	2.163	0.223
-3	-3.5	0.00	0.00	0.00	5	Standard Deviation	0.571	0.673
-2	-2.5	0.00	0.00	0.00	16	Skewness	-1.240	
-1.5	-1.75	0.00	0.00	0.00	25	Kurtosis	7.128	
-1	-1.25	0.09	0.09	0.09	50	Dispersion		
-0.75	-0.875	0.09	0.09	0.17	75	Standard Deviation		
-0.5	-0.625	0.14	0.13	0.30	84	Deviation from Normal		
-0.25	-0.375	0.20	0.19	0.49	95			
0	-0.125	0.31	0.29	0.78	99			
0.25	0.125	0.27	0.26	1.04				
0.5	0.375	0.58	0.55	1.59				
0.75	0.625	1.08	1.02	2.61				
1	0.875	1.19	1.12	3.73				
1.25	1.125	2.03	1.92	5.65				
1.5	1.375	4.73	4.47	10.12				
1.75	1.625	8.24	7.79	17.91				
2	1.875	12.44	11.76	29.67				
2.25	2.125	20.04	18.94	48.61				
2.5	2.375	31.73	29.99	78.60				
2.75	2.625	10.83	10.24	88.84				
3	2.875	8.11	7.67	96.50				
3.25	3.125	2.35	2.22	98.72				
3.5	3.375	0.98	0.93	99.65				
3.75	3.625	0.21	0.20	99.85				
4	3.875	0.07	0.07	99.91				
>4.0	4.25	0.09	0.09	100.00				

Percentiles	Moment Measures	(phi)	(mm)
1	Mean	2.163	0.223
5	Standard Deviation	0.571	0.673
16	Skewness	-1.240	
25	Kurtosis	7.128	
50	Dispersion		
75	Standard Deviation		
84	Deviation from Normal		
95			
99			

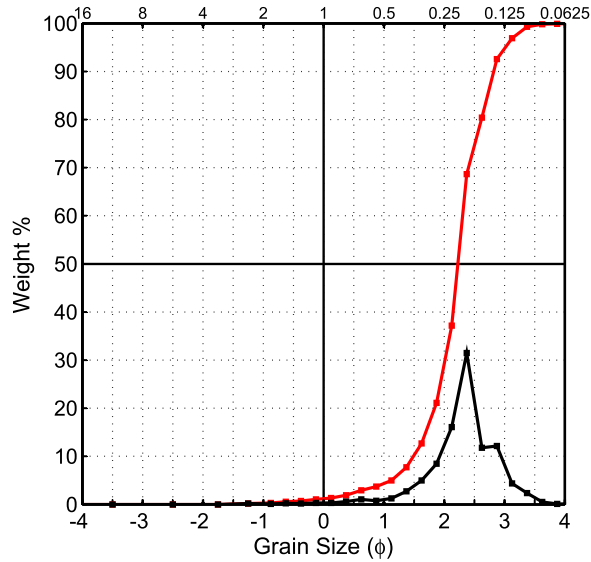
Graphic Phi Parameters	Inman 1952	Folk & Ward 1957
Mean	2.035	2.068
Standard Deviation	0.470	0.505
Skewness (1)	-0.213	-0.220
Skewness (2)	-0.431	
Kurtosis	0.899	1.283

Limits (phi)	Mid Point (phi)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles	Moment Measures	(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	Mean	1.726	0.302
-3	-3.5	0.00	0.00	0.00	5	Standard Deviation	0.827	0.564
-2	-2.5	0.00	0.00	0.00	16	Skewness	-0.689	
-1.5	-1.75	0.00	0.00	0.00	25	Kurtosis	3.269	
-1	-1.25	0.49	0.41	0.41	50	Dispersion		
-0.75	-0.875	0.39	0.33	0.73	75	Standard Deviation		
-0.5	-0.625	0.50	0.42	1.15	84	Deviation from Normal		
-0.25	-0.375	0.82	0.68	1.83	95			
0	-0.125	1.54	1.28	3.12	99			
0.25	0.125	1.59	1.33	4.45				
0.5	0.375	4.58	3.82	8.26				
0.75	0.625	7.40	6.17	14.44				
1	0.875	7.45	6.21	20.65				
1.25	1.125	8.03	6.70	27.35				
1.5	1.375	9.35	7.80	35.14				
1.75	1.625	10.42	8.69	43.83				
2	1.875	12.21	10.18	54.02				
2.25	2.125	16.25	13.55	67.57				
2.5	2.375	22.37	18.66	86.22				
2.75	2.625	8.58	7.16	93.38				
3	2.875	5.48	4.57	97.95				
3.25	3.125	1.62	1.35	99.30				
3.5	3.375	0.61	0.51	99.81				
3.75	3.625	0.12	0.10	99.91				
4	3.875	0.02	0.02	99.92				
>4.0	4.25	0.09	0.08	100.00				

Graphic Phi Parameters	Inman 1952	Folk & Ward 1957
Mean	1.517	1.603
Standard Deviation	0.827	0.801
Skewness (1)	-0.311	-0.288
Skewness (2)	-0.408	
Kurtosis	0.544	0.880

Grain Size Distribution

Grain Size (mm)



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1920+00
Interval -16 ft NAVD

Mean 0.204 mm
STD 0.653 mm
Skewness -1.516

USCS Wentworth

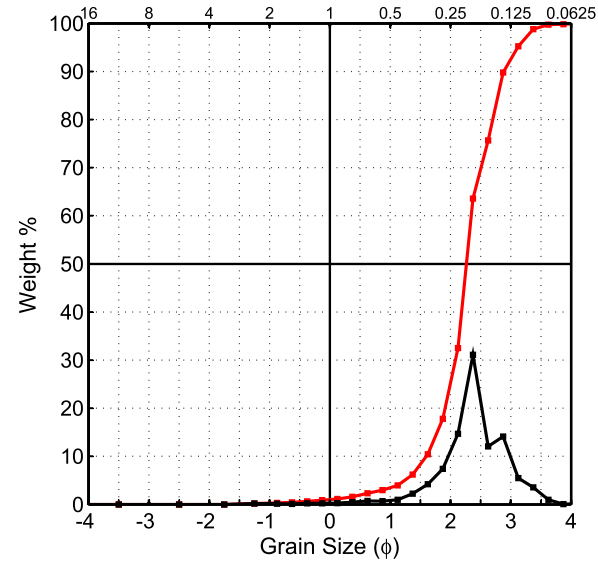
SP Fine Sand
 Poorly Graded

Fine Sand
 Moderately Well Sorted
 Strongly Coarse Skewed
 Very Leptokurtic

Total weight (gram) 108.77
 % finer than 4.00 phi 0.12
 % coarser than -1.00 phi 0.19
 % CaCO₃ 2.6

Grain Size Distribution

Grain Size (mm)



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1920+00
Interval -12 ft NAVD

Mean 0.194 mm
STD 0.657 mm
Skewness -1.429

USCS Wentworth

SP Fine Sand
 Poorly Graded

Fine Sand
 Moderately Well Sorted
 Strongly Coarse Skewed
 Very Leptokurtic

Total weight (gram) 121.36
 % finer than 4.00 phi 0.17
 % coarser than -1.00 phi 0.19
 % CaCO₃ 2.3

Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-0.150	Mean		2.290	0.204
-3	-3.5	0.00	0.00	0.00	5	1.125	Standard Deviation		0.614	0.653
-2	-2.5	0.00	0.00	0.00	16	1.725	Skewness		-1.516	
-1.5	-1.75	0.00	0.00	0.00	25	1.935	Kurtosis		8.429	
-1	-1.25	0.21	0.19	0.19	50	2.225	Dispersion			
-0.75	-0.875	0.13	0.12	0.31	75	2.510	Standard Deviation			
-0.5	-0.625	0.24	0.22	0.53	84	2.700	Deviation from Normal			
-0.25	-0.375	0.22	0.20	0.74	95	3.015				
0	-0.125	0.32	0.29	1.03	99	3.345				
0.25	0.125	0.32	0.29	1.32						
0.5	0.375	0.63	0.58	1.90						
0.75	0.625	1.13	1.04	2.94						
1	0.875	0.83	0.76	3.71						
1.25	1.125	1.38	1.27	4.97						
1.5	1.375	2.97	2.73	7.70						
1.75	1.625	5.40	4.96	12.67						
2	1.875	9.18	8.44	21.11						
2.25	2.125	17.47	16.06	37.17						
2.5	2.375	34.23	31.47	68.64						
2.75	2.625	12.81	11.78	80.42						
3	2.875	13.21	12.14	92.56						
3.25	3.125	4.74	4.36	96.92						
3.5	3.375	2.57	2.36	99.28						
3.75	3.625	0.56	0.51	99.80						
4	3.875	0.09	0.08	99.88						
>4.0	4.25	0.13	0.12	100.00						

Percentiles		Moment Measures		(phi)	(mm)
1	-0.150	Mean		2.290	0.204
5	1.125	Standard Deviation		0.614	0.653
16	1.725	Skewness		-1.516	
25	1.935	Kurtosis		8.429	
50	2.225	Dispersion			
75	2.510	Standard Deviation			
84	2.700	Deviation from Normal			
95	3.015				
99	3.345				

Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean		2.213	2.217
Standard Deviation		0.488	0.530
Skewness (1)		-0.026	-0.095
Skewness (2)		-0.318	
Kurtosis		0.938	1.347

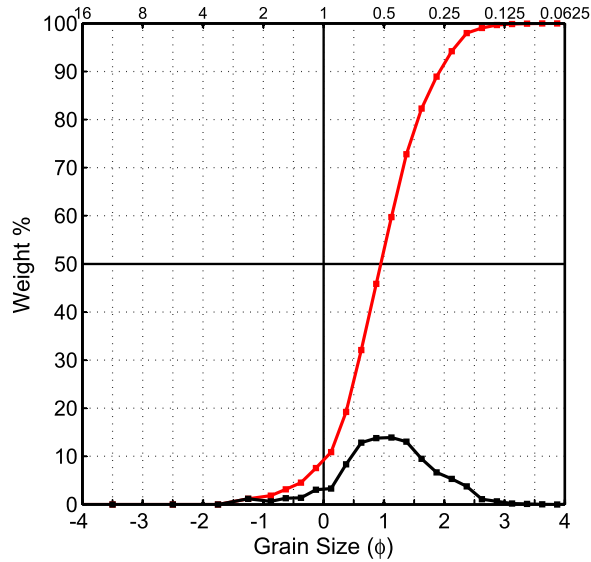
Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	0.010	Mean		2.365	0.194
-3	-3.5	0.00	0.00	0.00	5	1.240	Standard Deviation		0.606	0.657
-2	-2.5	0.00	0.00	0.00	16	1.815	Skewness		-1.429	
-1.5	-1.75	0.00	0.00	0.00	25	2.000	Kurtosis		8.639	
-1	-1.25	0.23	0.19	0.19	50	2.265	Dispersion			
-0.75	-0.875	0.15	0.12	0.31	75	2.610	Standard Deviation			
-0.5	-0.625	0.13	0.11	0.42	84	2.775	Deviation from Normal			
-0.25	-0.375	0.26	0.21	0.63	95	3.115				
0	-0.125	0.28	0.23	0.87	99	3.430				
0.25	0.125	0.30	0.25	1.11						
0.5	0.375	0.55	0.45	1.57						
0.75	0.625	0.89	0.73	2.30						
1	0.875	0.83	0.68	2.98						
1.25	1.125	1.19	0.98	3.96						
1.5	1.375	2.72	2.24	6.20						
1.75	1.625	5.10	4.20	10.41						
2	1.875	8.96	7.38	17.79						
2.25	2.125	17.82	14.68	32.47						
2.5	2.375	37.76	31.11	63.59						
2.75	2.625	14.63	12.06	75.64						
3	2.875	17.14	14.12	89.77						
3.25	3.125	6.65	5.48	95.25						
3.5	3.375	4.30	3.54	98.79						
3.75	3.625	1.17	0.96	99.75						
4	3.875	0.09	0.07	99.83						
>4.0	4.25	0.21	0.17	100.00						

Percentiles		Moment Measures		(phi)	(mm)
1	0.010	Mean		2.365	0.194
5	1.240	Standard Deviation		0.606	0.657
16	1.815	Skewness		-1.429	
25	2.000	Kurtosis		8.639	
50	2.265	Dispersion			
75	2.610	Standard Deviation			
84	2.775	Deviation from Normal			
95	3.115				
99	3.430				

Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean		2.295	2.285
Standard Deviation		0.480	0.524
Skewness (1)		0.063	-0.015
Skewness (2)		-0.182	
Kurtosis		0.953	1.260

Grain Size Distribution

Grain Size (mm)



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1920+00
Interval -24 ft NAVD

Mean 0.476 mm
STD 0.593 mm
Skewness -0.248

USCS Wentworth

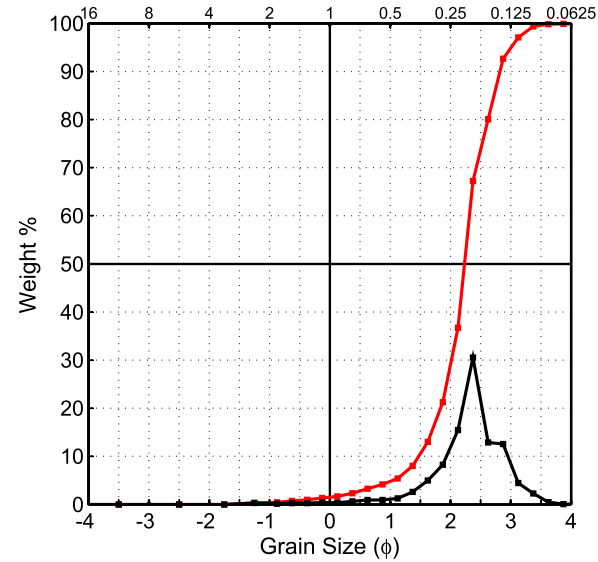
SP Medium Sand
 Poorly Graded

Medium Sand
 Moderately Sorted
 Symmetrical
 Mesokurtic

Total weight (gram) 130.36
 % finer than 4.00 phi 0.02
 % coarser than -1.00 phi 1.18
 % CaCO₃ 5.6

Grain Size Distribution

Grain Size (mm)



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1920+00
Interval -20 ft NAVD

Mean 0.205 mm
STD 0.642 mm
Skewness -1.698

USCS Wentworth

SP Fine Sand
 Poorly Graded

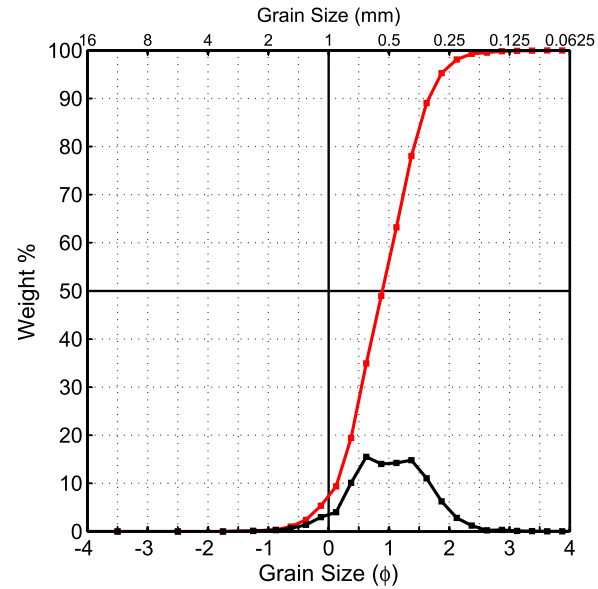
Fine Sand
 Moderately Well Sorted
 Strongly Coarse Skewed
 Very Leptokurtic

Total weight (gram) 107.40
 % finer than 4.00 phi 0.09
 % coarser than -1.00 phi 0.31
 % CaCO₃ 2.1

Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures	(phi)	(mm)	
-4	-4.5	0.00	0.00	0.00	1	-1.325	Mean	1.072	0.476	
-3	-3.5	0.00	0.00	0.00	5	-0.335	Standard Deviation	0.755	0.593	
-2	-2.5	0.00	0.00	0.00	16	0.280	Skewness	-0.248		
-1.5	-1.75	0.00	0.00	0.00	25	0.485	Kurtosis	3.560		
-1	-1.25	1.54	1.18	1.18	50	0.950	Dispersion			
-0.75	-0.875	0.84	0.64	1.83	75	1.435	Standard Deviation			
-0.5	-0.625	1.70	1.30	3.13	84	1.690	Deviation from Normal			
-0.25	-0.375	1.81	1.39	4.52	95	2.175				
0	-0.125	3.97	3.05	7.56	99	2.615				
0.25	0.125	4.32	3.31	10.88						
0.5	0.375	10.88	8.35	19.22						
0.75	0.625	16.74	12.84	32.07						
1	0.875	17.96	13.78	45.84						
1.25	1.125	18.12	13.90	59.74						
1.5	1.375	17.02	13.06	72.80						
1.75	1.625	12.35	9.47	82.27						
2	1.875	8.68	6.66	88.93						
2.25	2.125	6.90	5.29	94.22						
2.5	2.375	4.90	3.76	97.98						
2.75	2.625	1.39	1.07	99.05						
3	2.875	0.81	0.62	99.67						
3.25	3.125	0.22	0.17	99.84						
3.5	3.375	0.14	0.11	99.95						
3.75	3.625	0.04	0.03	99.98						
4	3.875	0.00	0.00	99.98						
>4.0	4.25	0.03	0.02	100.00						
					Graphic Phi Parameters		Inman 1952	Folk & Ward 1957		
							Mean	0.985	0.973	
							Standard Deviation	0.705	0.733	
							Skewness (1)	0.050	0.013	
							Skewness (2)	-0.043		
							Kurtosis	0.780	1.083	

Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-0.355	Mean		2.286	0.205
-3	-3.5	0.00	0.00	0.00	5	1.045	Standard Deviation		0.639	0.642
-2	-2.5	0.00	0.00	0.00	16	1.715	Skewness		-1.698	
-1.5	-1.75	0.00	0.00	0.00	25	1.935	Kurtosis		8.891	
-1	-1.25	0.33	0.31	0.31	50	2.235	Dispersion			
-0.75	-0.875	0.15	0.14	0.45	75	2.525	Standard Deviation			
-0.5	-0.625	0.27	0.25	0.70	84	2.705	Deviation from Normal			
-0.25	-0.375	0.29	0.27	0.97	95	3.010				
0	-0.125	0.40	0.37	1.34	99	3.335				
0.25	0.125	0.36	0.34	1.68						
0.5	0.375	0.70	0.65	2.33						
0.75	0.625	0.98	0.91	3.24						
1	0.875	1.00	0.93	4.17						
1.25	1.125	1.32	1.23	5.40						
1.5	1.375	2.81	2.62	8.02						
1.75	1.625	5.34	4.97	12.99						
2	1.875	8.87	8.26	21.25						
2.25	2.125	16.60	15.46	36.70						
2.5	2.375	32.78	30.52	67.23						
2.75	2.625	13.82	12.87	80.09						
3	2.875	13.49	12.56	92.65						
3.25	3.125	4.75	4.42	97.08						
3.5	3.375	2.44	2.27	99.35						
3.75	3.625	0.52	0.48	99.83						
4	3.875	0.08	0.07	99.91						
>4.0	4.25	0.10	0.09	100.00						
					Graphic Phi Parameters		Inman 1952	Folk & Ward 1957		
					Mean		2.210	2.218		
					Standard Deviation		0.495	0.545		
					Skewness (1)		-0.051	-0.131		
					Skewness (2)		-0.419			
					Kurtosis		0.985	1.365		

Grain Size Distribution



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1940+00
Interval Dune Toe

Mean 0.495 mm
STD 0.649 mm
Skewness -0.026

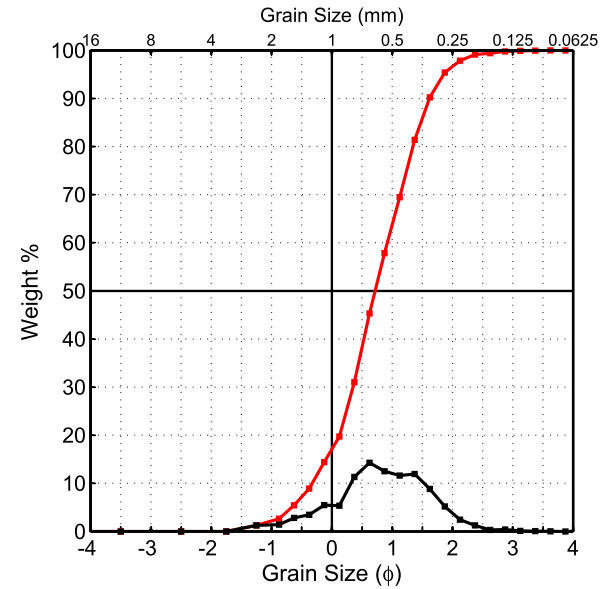
USCS Wentworth

SP Medium Sand
 Poorly Graded

Medium Sand
 Moderately Well Sorted
 Symmetrical
 Mesokurtic

Total weight (gram) 100.56
 % finer than 4.00 phi 0.03
 % coarser than -1.00 phi 0.12
 % CaCO₃ 4.6

Grain Size Distribution



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1940+00
Interval Dune

Mean 0.564 mm
STD 0.590 mm
Skewness -0.192

USCS Wentworth

SP Coarse Sand
 Moderately Sorted
 Symmetrical
 Mesokurtic

Total weight (gram) 100.33
 % finer than 4.00 phi 0.03
 % coarser than -1.00 phi 1.25
 % CaCO₃ 6.9

Limits (phi)	Mid Point (phi)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-0.630	Mean		1.015	0.495
-3	-3.5	0.00	0.00	0.00	5	-0.155	Standard Deviation		0.624	0.649
-2	-2.5	0.00	0.00	0.00	16	0.290	Skewness		-0.026	
-1.5	-1.75	0.00	0.00	0.00	25	0.465	Kurtosis		3.436	
-1	-1.25	0.12	0.12	0.12	50	0.895	Dispersion			
-0.75	-0.875	0.25	0.25	0.37	75	1.325	Standard Deviation			
-0.5	-0.625	0.65	0.65	1.01	84	1.510	Deviation from Normal			
-0.25	-0.375	1.38	1.37	2.39	95	1.865				
0	-0.125	2.97	2.95	5.34	99	2.315				
0.25	0.125	4.03	4.01	9.35						
0.5	0.375	10.15	10.09	19.44						
0.75	0.625	15.57	15.48	34.92						
1	0.875	14.11	14.03	48.96						
1.25	1.125	14.33	14.25	63.21						
1.5	1.375	14.89	14.81	78.01						
1.75	1.625	11.09	11.03	89.04						
2	1.875	6.28	6.25	95.29						
2.25	2.125	2.83	2.81	98.10						
2.5	2.375	1.20	1.19	99.29						
2.75	2.625	0.22	0.22	99.51						
3	2.875	0.30	0.30	99.81						
3.25	3.125	0.09	0.09	99.90						
3.5	3.375	0.05	0.05	99.95						
3.75	3.625	0.01	0.01	99.96						
4	3.875	0.01	0.01	99.97						
>4.0	4.25	0.03	0.03	100.00						

Percentiles		Moment Measures		(phi)	(mm)
1	-0.630	Mean		1.015	0.495
5	-0.155	Standard Deviation		0.624	0.649
16	0.290	Skewness		-0.026	
25	0.465	Kurtosis		3.436	
50	0.895	Dispersion			
75	1.325	Standard Deviation			
84	1.510	Deviation from Normal			
95	1.865				
99	2.315				

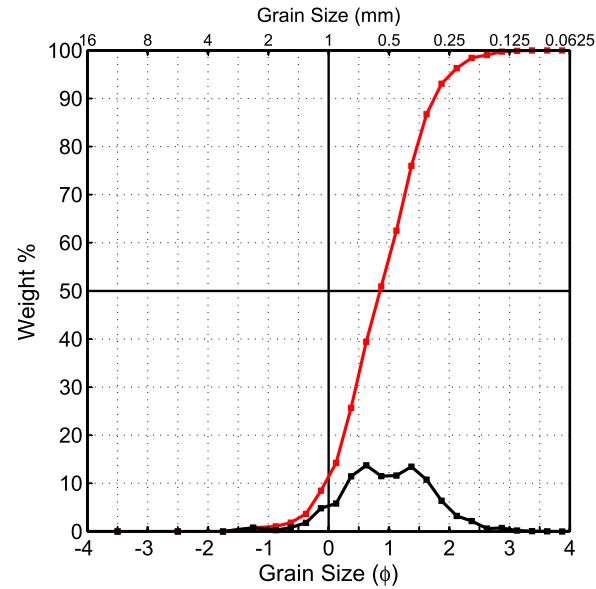
Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean		0.900	0.898
Standard Deviation		0.610	0.611
Skewness (1)		0.008	-0.016
Skewness (2)		-0.066	
Kurtosis		0.656	0.963

Limits (phi)	Mid Point (phi)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-1.350	Mean		0.826	0.564
-3	-3.5	0.00	0.00	0.00	5	-0.665	Standard Deviation		0.761	0.590
-2	-2.5	0.00	0.00	0.00	16	-0.050	Skewness		-0.192	
-1.5	-1.75	0.00	0.00	0.00	25	0.240	Kurtosis		3.184	
-1	-1.25	1.25	1.25	1.25	50	0.720	Dispersion			
-0.75	-0.875	1.41	1.41	2.65	75	1.240	Standard Deviation			
-0.5	-0.625	2.80	2.79	5.44	84	1.450	Deviation from Normal			
-0.25	-0.375	3.49	3.48	8.92	95	1.855				
0	-0.125	5.49	5.47	14.39	99	2.355				
0.25	0.125	5.36	5.34	19.74						
0.5	0.375	11.34	11.30	31.04						
0.75	0.625	14.33	14.28	45.32						
1	0.875	12.57	12.53	57.85						
1.25	1.125	11.64	11.60	69.45						
1.5	1.375	11.99	11.95	81.40						
1.75	1.625	8.87	8.84	90.25						
2	1.875	5.18	5.16	95.41						
2.25	2.125	2.44	2.43	97.84						
2.5	2.375	1.26	1.26	99.10						
2.75	2.625	0.30	0.30	99.40						
3	2.875	0.37	0.37	99.77						
3.25	3.125	0.11	0.11	99.88						
3.5	3.375	0.07	0.07	99.95						
3.75	3.625	0.02	0.02	99.97						
4	3.875	0.00	0.00	99.97						
>4.0	4.25	0.03	0.03	100.00						

Percentiles		Moment Measures		(phi)	(mm)
1	-1.350	Mean		0.826	0.564
5	-0.665	Standard Deviation		0.761	0.590
16	-0.050	Skewness		-0.192	
25	0.240	Kurtosis		3.184	
50	0.720	Dispersion			
75	1.240	Standard Deviation			
84	1.450	Deviation from Normal			
95	1.855				
99	2.355				

Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean		0.700	0.707
Standard Deviation		0.750	0.757
Skewness (1)		-0.027	-0.063
Skewness (2)		-0.167	
Kurtosis		0.680	1.033

Grain Size Distribution



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1940+00
Interval BC

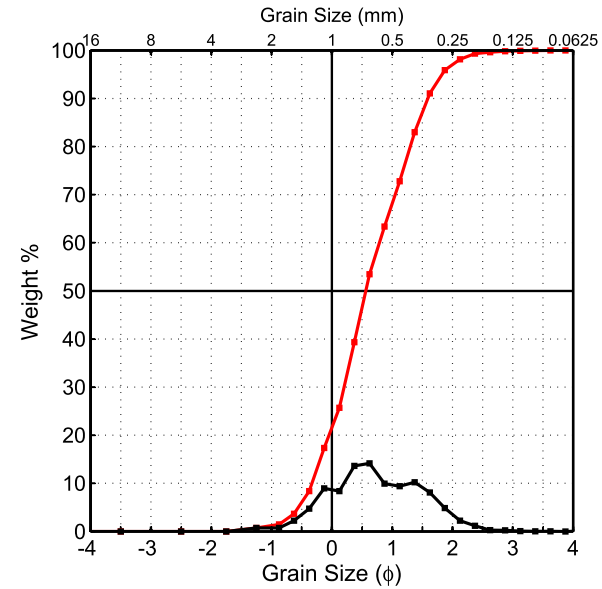
Mean 0.507 mm
STD 0.606 mm
Skewness -0.041

USCS Wentworth

SP Coarse Sand
 Medium Sand Moderately Sorted
 Poorly Graded Symmetrical
 Mesokurtic

Total weight (gram) 99.98
 % finer than 4.00 phi 0.01
 % coarser than -1.00 phi 0.75
 % CaCO_3 4.8

Grain Size Distribution



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1940+00
Interval Berm

Mean 0.598 mm
STD 0.596 mm
Skewness 0.119

USCS Wentworth

SP Coarse Sand
 Medium Sand Moderately Sorted
 Poorly Graded Symmetrical
 Mesokurtic

Total weight (gram) 100.55
 % finer than 4.00 phi 0.03
 % coarser than -1.00 phi 0.74
 % CaCO_3 6.8

Limits (ϕ)	Mid Point (ϕ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-0.915	Mean		0.980	0.507
-3	-3.5	0.00	0.00	0.00	5	-0.305	Standard Deviation		0.722	0.606
-2	-2.5	0.00	0.00	0.00	16	0.165	Skewness		-0.041	
-1.5	-1.75	0.00	0.00	0.00	25	0.360	Kurtosis		3.187	
-1	-1.25	0.75	0.75	0.75	50	0.855	Dispersion			
-0.75	-0.875	0.28	0.28	1.03	75	1.355	Standard Deviation			
-0.5	-0.625	0.81	0.81	1.84	84	1.560	Deviation from Normal			
-0.25	-0.375	1.80	1.80	3.64	95	2.025				
0	-0.125	4.80	4.80	8.44	99	2.615				
0.25	0.125	5.79	5.79	14.23						
0.5	0.375	11.44	11.44	25.68						
0.75	0.625	13.75	13.75	39.43						
1	0.875	11.48	11.48	50.91						
1.25	1.125	11.61	11.61	62.52						
1.5	1.375	13.44	13.44	75.97						
1.75	1.625	10.73	10.73	86.70						
2	1.875	6.36	6.36	93.06						
2.25	2.125	3.22	3.22	96.28						
2.5	2.375	2.14	2.14	98.42						
2.75	2.625	0.61	0.61	99.03						
3	2.875	0.70	0.70	99.73						
3.25	3.125	0.18	0.18	99.91						
3.5	3.375	0.07	0.07	99.98						
3.75	3.625	0.01	0.01	99.99						
4	3.875	0.00	0.00	99.99						
>4.0	4.25	0.01	0.01	100.00						

Percentiles		Moment Measures		(phi)	(mm)
1	-0.915	Mean		0.980	0.507
5	-0.305	Standard Deviation		0.722	0.606
16	0.165	Skewness		-0.041	
25	0.360	Kurtosis		3.187	
50	0.855	Dispersion			
75	1.355	Standard Deviation			
84	1.560	Deviation from Normal			
95	2.025				
99	2.615				

Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean		0.863	0.860
Standard Deviation		0.698	0.702
Skewness (1)		0.011	0.008
Skewness (2)		0.007	
Kurtosis		0.670	0.960

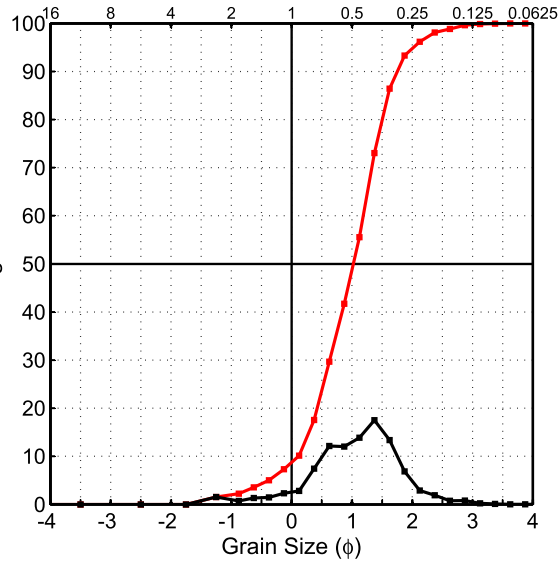
Limits (ϕ)	Mid Point (ϕ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-1.115	Mean		0.742	0.598
-3	-3.5	0.00	0.00	0.00	5	-0.555	Standard Deviation		0.746	0.596
-2	-2.5	0.00	0.00	0.00	16	-0.160	Skewness		0.119	
-1.5	-1.75	0.00	0.00	0.00	25	0.105	Kurtosis		2.846	
-1	-1.25	0.74	0.74	0.74	50	0.565	Dispersion			
-0.75	-0.875	0.73	0.73	1.46	75	1.180	Standard Deviation			
-0.5	-0.625	2.23	2.22	3.68	84	1.405	Deviation from Normal			
-0.25	-0.375	4.74	4.71	8.39	95	1.830				
0	-0.125	8.98	8.93	17.32	99	2.310				
0.25	0.125	8.43	8.38	25.71						
0.5	0.375	13.68	13.61	39.31						
0.75	0.625	14.23	14.15	53.47						
1	0.875	9.97	9.92	63.38						
1.25	1.125	9.44	9.39	72.77						
1.5	1.375	10.27	10.21	82.98						
1.75	1.625	8.12	8.08	91.06						
2	1.875	4.86	4.83	95.89						
2.25	2.125	2.25	2.24	98.13						
2.5	2.375	1.19	1.18	99.31						
2.75	2.625	0.28	0.28	99.59						
3	2.875	0.24	0.24	99.83						
3.25	3.125	0.08	0.08	99.91						
3.5	3.375	0.04	0.04	99.95						
3.75	3.625	0.02	0.02	99.97						
4	3.875	0.00	0.00	99.97						
>4.0	4.25	0.03	0.03	100.00						

Percentiles		Moment Measures		(phi)	(mm)
1	-1.115	Mean		0.742	0.598
5	-0.555	Standard Deviation		0.746	0.596
16	-0.160	Skewness		0.119	
25	0.105	Kurtosis		2.846	
50	0.565	Dispersion			
75	1.180	Standard Deviation			
84	1.405	Deviation from Normal			
95	1.830				
99	2.310				

Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean		0.623	0.603
Standard Deviation		0.782	0.753
Skewness (1)		0.073	0.067
Skewness (2)		0.093	
Kurtosis		0.524	0.909

Grain Size Distribution

Grain Size (mm)



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1940+00
Interval MTL

Mean 0.475 mm
STD 0.604 mm
Skewness -0.510

USCS Wentworth

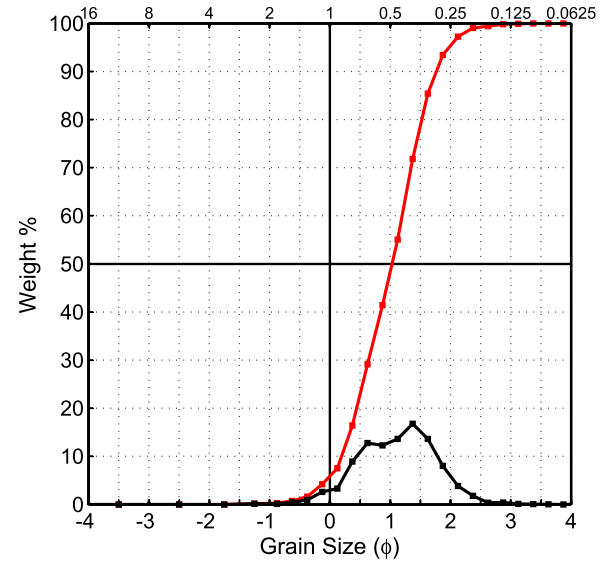
SP Medium Sand
 Poorly Graded

Medium Sand
 Moderately Sorted
 Coarse Skewed
 Leptokurtic

Total weight (gram) 100.12
 % finer than 4.00 phi 0.03
 % coarser than -1.00 phi 1.52
 % CaCO₃ 4.0

Grain Size Distribution

Grain Size (mm)



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1940+00
Interval MHW

Mean 0.460 mm
STD 0.646 mm
Skewness -0.121

USCS Wentworth

SP Medium Sand
 Poorly Graded

Medium Sand
 Moderately Well Sorted
 Symmetrical
 Mesokurtic

Total weight (gram) 100.14
 % finer than 4.00 phi 0.03
 % coarser than -1.00 phi 0.16
 % CaCO₃ 4.4

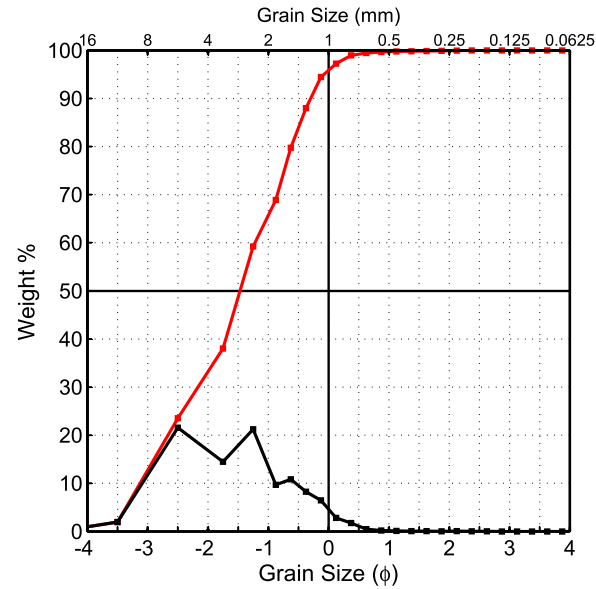
Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-1.420	Mean		1.074	0.475
-3	-3.5	0.00	0.00	0.00	5	-0.375	Standard Deviation		0.728	0.604
-2	-2.5	0.00	0.00	0.00	16	0.325	Skewness		-0.510	
-1.5	-1.75	0.00	0.00	0.00	25	0.530	Kurtosis		4.212	
-1	-1.25	1.52	1.52	1.52	50	1.025	Dispersion			
-0.75	-0.875	0.72	0.72	2.24	75	1.410	Standard Deviation			
-0.5	-0.625	1.32	1.32	3.56	84	1.580	Deviation from Normal			
-0.25	-0.375	1.46	1.46	5.01	95	2.025				
0	-0.125	2.30	2.30	7.31	99	2.680				
0.25	0.125	2.82	2.82	10.13						
0.5	0.375	7.44	7.43	17.56						
0.75	0.625	12.14	12.13	29.68						
1	0.875	12.03	12.02	41.70						
1.25	1.125	13.87	13.85	55.55						
1.5	1.375	17.52	17.50	73.05						
1.75	1.625	13.38	13.36	86.42						
2	1.875	6.88	6.87	93.29						
2.25	2.125	2.90	2.90	96.18						
2.5	2.375	1.90	1.90	98.08						
2.75	2.625	0.74	0.74	98.82						
3	2.875	0.81	0.81	99.63						
3.25	3.125	0.22	0.22	99.85						
3.5	3.375	0.09	0.09	99.94						
3.75	3.625	0.02	0.02	99.96						
4	3.875	0.01	0.01	99.97						
>4.0	4.25	0.03	0.03	100.00						

Percentiles		Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean				0.952	0.977
Standard Deviation				0.628	0.677
Skewness (1)				-0.116	-0.141
Skewness (2)				-0.319	
Kurtosis				0.912	1.118

Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-0.540	Mean		1.119	0.460
-3	-3.5	0.00	0.00	0.00	5	-0.065	Standard Deviation		0.630	0.646
-2	-2.5	0.00	0.00	0.00	16	0.365	Skewness		-0.121	
-1.5	-1.75	0.00	0.00	0.00	25	0.545	Kurtosis		3.309	
-1	-1.25	0.16	0.16	0.16	50	1.030	Dispersion			
-0.75	-0.875	0.10	0.10	0.26	75	1.435	Standard Deviation			
-0.5	-0.625	0.44	0.44	0.70	84	1.600	Deviation from Normal			
-0.25	-0.375	0.91	0.91	1.61	95	1.980				
0	-0.125	2.59	2.59	4.19	99	2.370				
0.25	0.125	3.31	3.31	7.50						
0.5	0.375	8.92	8.91	16.41						
0.75	0.625	12.76	12.74	29.15						
1	0.875	12.29	12.27	41.42						
1.25	1.125	13.64	13.62	55.04						
1.5	1.375	16.78	16.76	71.80						
1.75	1.625	13.63	13.61	85.41						
2	1.875	8.02	8.01	93.42						
2.25	2.125	3.84	3.83	97.25						
2.5	2.375	1.80	1.80	99.05						
2.75	2.625	0.35	0.35	99.40						
3	2.875	0.41	0.41	99.81						
3.25	3.125	0.10	0.10	99.91						
3.5	3.375	0.05	0.05	99.96						
3.75	3.625	0.01	0.01	99.97						
4	3.875	0.00	0.00	99.97						
>4.0	4.25	0.03	0.03	100.00						

Percentiles		Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean				0.982	0.998
Standard Deviation				0.618	0.619
Skewness (1)				-0.077	-0.074
Skewness (2)				-0.117	
Kurtosis				0.656	0.942

Grain Size Distribution



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1940+00
Interval Trough

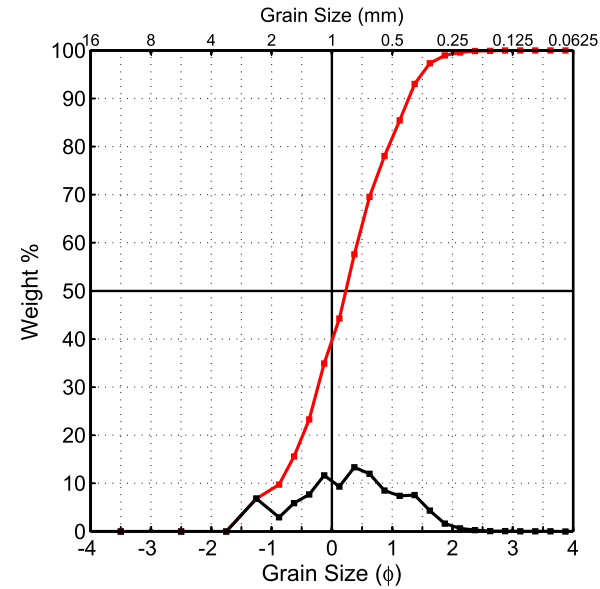
Mean 2.458 mm
STD 0.533 mm
Skewness -0.103

USCS Wentworth

SP Granule
 Coarse Sand Moderately Sorted
 Poorly Graded Symmetrical
 Mesokurtic

Total weight (gram) 114.19
 % finer than 4.00 phi 0.00
 % coarser than -1.00 phi 59.23
 % CaCO₃ 26.3

Grain Size Distribution



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1940+00
Interval MLW

Mean 0.794 mm
STD 0.572 mm
Skewness -0.055

USCS Wentworth

SP Coarse Sand
 Medium Sand Moderately Sorted
 Poorly Graded Symmetrical
 Mesokurtic

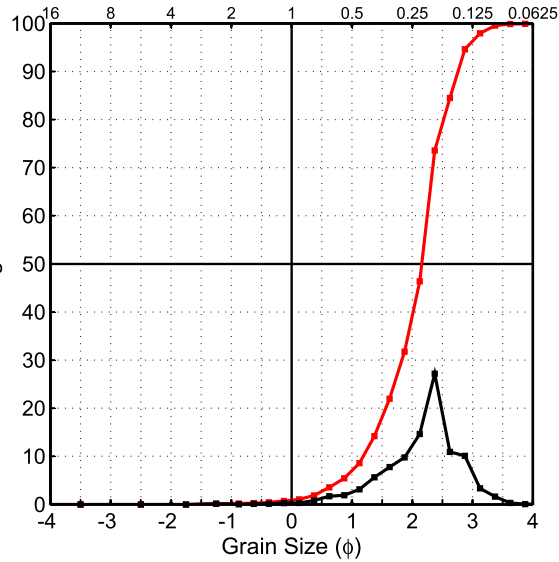
Total weight (gram) 100.12
 % finer than 4.00 phi 0.01
 % coarser than -1.00 phi 6.80
 % CaCO₃ 10.9

Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-3.990	Mean		-1.298	2.458
-3	-3.5	2.24	1.96	1.96	5	-3.360	Standard Deviation		0.908	0.533
-2	-2.5	24.62	21.56	23.52	16	-2.850	Skewness		-0.103	
-1.5	-1.75	16.55	14.49	38.02	25	-2.425	Kurtosis		2.627	
-1	-1.25	24.23	21.22	59.23	50	-1.470	Dispersion			
-0.75	-0.875	11.04	9.67	68.90	75	-0.735	Standard Deviation			
-0.5	-0.625	12.39	10.85	79.75	84	-0.495	Deviation from Normal			
-0.25	-0.375	9.41	8.24	87.99	95	-0.075				
0	-0.125	7.37	6.45	94.45	99	0.390				
0.25	0.125	3.20	2.80	97.25	Graphic Phi Parameters					
0.5	0.375	1.97	1.73	98.98						
0.75	0.625	0.55	0.48	99.46	Mean		Inman	Folk & Ward		
1	0.875	0.22	0.19	99.65			1952	1957		
1.25	1.125	0.12	0.11	99.75	Standard Deviation					
1.5	1.375	0.08	0.07	99.82	Skewness (1)					
1.75	1.625	0.05	0.04	99.87	Skewness (2)					
2	1.875	0.04	0.04	99.90	Kurtosis					
2.25	2.125	0.05	0.04	99.95						
2.5	2.375	0.04	0.04	99.98						
2.75	2.625	0.02	0.02	100.00						
3	2.875	0.00	0.00	100.00						
3.25	3.125	0.00	0.00	100.00						
3.5	3.375	0.00	0.00	100.00						
3.75	3.625	0.00	0.00	100.00						
4	3.875	0.00	0.00	100.00						
>4.0	4.25	0.00	0.00	100.00						

Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-1.675	Mean		0.333	0.794
-3	-3.5	0.00	0.00	0.00	5	-1.380	Standard Deviation		0.807	0.572
-2	-2.5	0.00	0.00	0.00	16	-0.610	Skewness		-0.055	
-1.5	-1.75	0.00	0.00	0.00	25	-0.340	Kurtosis		2.605	
-1	-1.25	6.81	6.80	6.80	50	0.235	Dispersion			
-0.75	-0.875	2.92	2.92	9.72	75	0.785	Standard Deviation			
-0.5	-0.625	5.89	5.88	15.60	84	1.075	Deviation from Normal			
-0.25	-0.375	7.67	7.66	23.26	95	1.490				
0	-0.125	11.67	11.66	34.92	99	1.900				
0.25	0.125	9.34	9.33	44.25	Graphic Phi Parameters					
0.5	0.375	13.35	13.33	57.58						
0.75	0.625	11.98	11.97	69.55	Mean		Inman	Folk & Ward		
1	0.875	8.49	8.48	78.03			1952	1957		
1.25	1.125	7.41	7.40	85.43	Standard Deviation					
1.5	1.375	7.58	7.57	93.00	Skewness (1)					
1.75	1.625	4.32	4.31	97.31	Skewness (2)					
2	1.875	1.63	1.63	98.94	Kurtosis					
2.25	2.125	0.63	0.63	99.57						
2.5	2.375	0.27	0.27	99.84						
2.75	2.625	0.06	0.06	99.90						
3	2.875	0.06	0.06	99.96						
3.25	3.125	0.01	0.01	99.97						
3.5	3.375	0.01	0.01	99.98						
3.75	3.625	0.01	0.01	99.99						
4	3.875	0.00	0.00	99.99						
>4.0	4.25	0.01	0.01	100.00						

Grain Size Distribution

Grain Size (mm)



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1940+00
Interval -8 ft NAVD

Mean 0.224 mm
STD 0.639 mm
Skewness -0.988

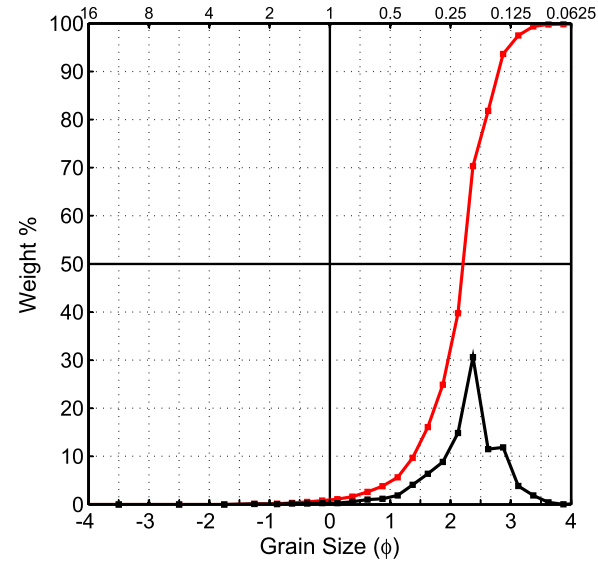
USCS Wentworth

SP Fine Sand
 Fine Sand Moderately Well Sorted
 Poorly Graded Coarse Skewed
 Leptokurtic

Total weight (gram) 105.09
 % finer than 4.00 phi 0.11
 % coarser than -1.00 phi 0.14
 % CaCO₃ 2.0

Grain Size Distribution

Grain Size (mm)



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1940+00
Interval Bar

Mean 0.210 mm
STD 0.656 mm
Skewness -1.182

USCS Wentworth

SP Fine Sand
 Fine Sand Moderately Well Sorted
 Poorly Graded Coarse Skewed
 Leptokurtic

Total weight (gram) 107.00
 % finer than 4.00 phi 0.19
 % coarser than -1.00 phi 0.08
 % CaCO₃ 2.0

Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles	Moment Measures (phi) (mm)		
-4	-4.5	0.00	0.00	0.00	1	0.090	Mean	2.159 0.224
-3	-3.5	0.00	0.00	0.00	5	0.820	Standard Deviation	0.646 0.639
-2	-2.5	0.00	0.00	0.00	16	1.435	Skewness	-0.988
-1.5	-1.75	0.00	0.00	0.00	25	1.700	Kurtosis	5.233
-1	-1.25	0.15	0.14	0.14	50	2.160	Dispersion	
-0.75	-0.875	0.03	0.03	0.17	75	2.410	Standard Deviation	
-0.5	-0.625	0.12	0.11	0.29	84	2.615	Deviation from Normal	
-0.25	-0.375	0.17	0.16	0.45	95	2.905		
0	-0.125	0.30	0.29	0.73	99	3.295		
0.25	0.125	0.33	0.31	1.05				
0.5	0.375	0.85	0.81	1.86				
0.75	0.625	1.77	1.68	3.54				
1	0.875	1.98	1.88	5.42				
1.25	1.125	3.30	3.14	8.56				
1.5	1.375	5.92	5.63	14.20				
1.75	1.625	8.17	7.77	21.97				
2	1.875	10.27	9.77	31.74				
2.25	2.125	15.39	14.64	46.39				
2.5	2.375	28.57	27.19	73.58				
2.75	2.625	11.47	10.91	84.49				
3	2.875	10.62	10.11	94.60				
3.25	3.125	3.49	3.32	97.92				
3.5	3.375	1.70	1.62	99.53				
3.75	3.625	0.32	0.30	99.84				
4	3.875	0.05	0.05	99.89				
>4.0	4.25	0.12	0.11	100.00				

Percentiles	Moment Measures (phi) (mm)		
1	0.090	Mean	2.159 0.224
5	0.820	Standard Deviation	0.646 0.639
16	1.435	Skewness	-0.988
25	1.700	Kurtosis	5.233
50	2.160	Dispersion	
75	2.410	Standard Deviation	
84	2.615	Deviation from Normal	
95	2.905		
99	3.295		

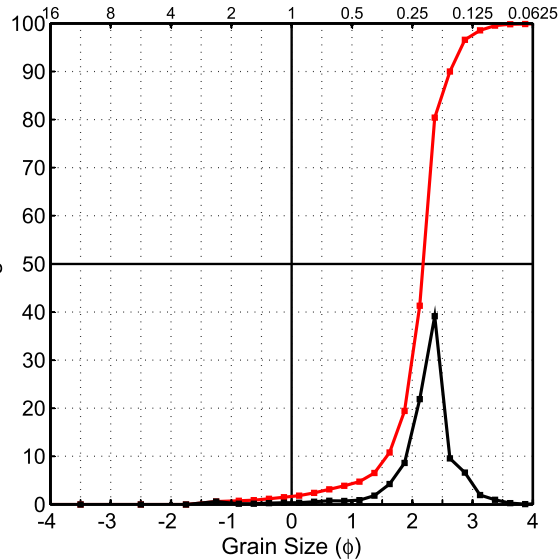
Graphic Phi Parameters	Inman 1952	Folk & Ward 1957
Mean	2.025	2.070
Standard Deviation	0.590	0.611
Skewness (1)	-0.229	-0.257
Skewness (2)	-0.504	
Kurtosis	0.767	1.204

Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles	Moment Measures (phi) (mm)		
-4	-4.5	0.00	0.00	0.00	1	0.055	Mean	2.252 0.210
-3	-3.5	0.00	0.00	0.00	5	1.040	Standard Deviation	0.609 0.656
-2	-2.5	0.00	0.00	0.00	16	1.620	Skewness	-1.182
-1.5	-1.75	0.00	0.00	0.00	25	1.875	Kurtosis	6.630
-1	-1.25	0.09	0.08	0.08	50	2.210	Dispersion	
-0.75	-0.875	0.07	0.07	0.15	75	2.475	Standard Deviation	
-0.5	-0.625	0.19	0.18	0.33	84	2.670	Deviation from Normal	
-0.25	-0.375	0.21	0.20	0.52	95	2.965		
0	-0.125	0.30	0.28	0.80	99	3.325		
0.25	0.125	0.29	0.27	1.07				
0.5	0.375	0.59	0.55	1.63				
0.75	0.625	1.06	0.99	2.62				
1	0.875	1.24	1.16	3.78				
1.25	1.125	1.98	1.85	5.63				
1.5	1.375	4.36	4.07	9.70				
1.75	1.625	6.82	6.37	16.07				
2	1.875	9.44	8.82	24.90				
2.25	2.125	15.88	14.84	39.74				
2.5	2.375	32.74	30.60	70.34				
2.75	2.625	12.27	11.47	81.80				
3	2.875	12.67	11.84	93.64				
3.25	3.125	4.11	3.84	97.49				
3.5	3.375	2.01	1.88	99.36				
3.75	3.625	0.44	0.41	99.78				
4	3.875	0.04	0.04	99.81				
>4.0	4.25	0.20	0.19	100.00				

Graphic Phi Parameters	Inman 1952	Folk & Ward 1957
Mean	2.145	2.167
Standard Deviation	0.525	0.554
Skewness (1)	-0.124	-0.170
Skewness (2)	-0.395	
Kurtosis	0.833	1.315

Grain Size Distribution

Grain Size (mm)



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1940+00
Interval -16 ft NAVD

Mean 0.215 mm
STD 0.665 mm
Skewness -2.368

USCS Wentworth

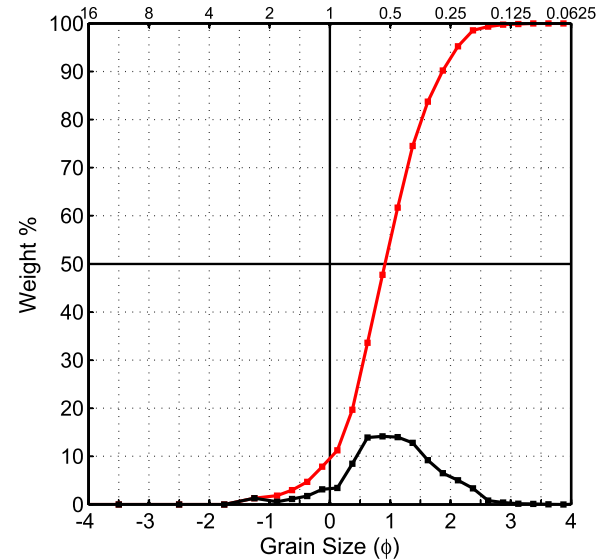
SP Fine Sand
 Poorly Graded

Fine Sand
 Moderately Well Sorted
 Strongly Coarse Skewed
 Very Leptokurtic

Total weight (gram) 109.54
 % finer than 4.00 phi 0.14
 % coarser than -1.00 phi 0.58
 % CaCO₃ 3.0

Grain Size Distribution

Grain Size (mm)



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1940+00
Interval -12 ft NAVD

Mean 0.487 mm
STD 0.599 mm
Skewness -0.272

USCS Wentworth

SP Medium Sand
 Poorly Graded

Medium Sand
 Moderately Sorted
 Symmetrical
 Mesokurtic

Total weight (gram) 105.25
 % finer than 4.00 phi 0.02
 % coarser than -1.00 phi 1.28
 % CaCO₃ 4.9

Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-0.525	Mean		2.216	0.215
-3	-3.5	0.00	0.00	0.00	5	1.160	Standard Deviation		0.588	0.665
-2	-2.5	0.00	0.00	0.00	16	1.775	Skewness		-2.368	
-1.5	-1.75	0.00	0.00	0.00	25	1.940	Kurtosis		13.527	
-1	-1.25	0.64	0.58	0.58	50	2.180	Dispersion			
-0.75	-0.875	0.17	0.16	0.74	75	2.340	Standard Deviation			
-0.5	-0.625	0.17	0.16	0.89	84	2.470	Deviation from Normal			
-0.25	-0.375	0.29	0.26	1.16	95	2.815				
0	-0.125	0.36	0.33	1.49	99	3.240				
0.25	0.125	0.36	0.33	1.82						
0.5	0.375	0.62	0.57	2.38						
0.75	0.625	0.82	0.75	3.13						
1	0.875	0.80	0.73	3.86						
1.25	1.125	0.96	0.88	4.74						
1.5	1.375	1.98	1.81	6.55						
1.75	1.625	4.66	4.25	10.80						
2	1.875	9.44	8.62	19.42						
2.25	2.125	23.96	21.87	41.29						
2.5	2.375	42.84	39.11	80.40						
2.75	2.625	10.49	9.58	89.98						
3	2.875	7.25	6.62	96.59						
3.25	3.125	2.14	1.95	98.55						
3.5	3.375	1.07	0.98	99.53						
3.75	3.625	0.31	0.28	99.81						
4	3.875	0.06	0.05	99.86						
>4.0	4.25	0.15	0.14	100.00						

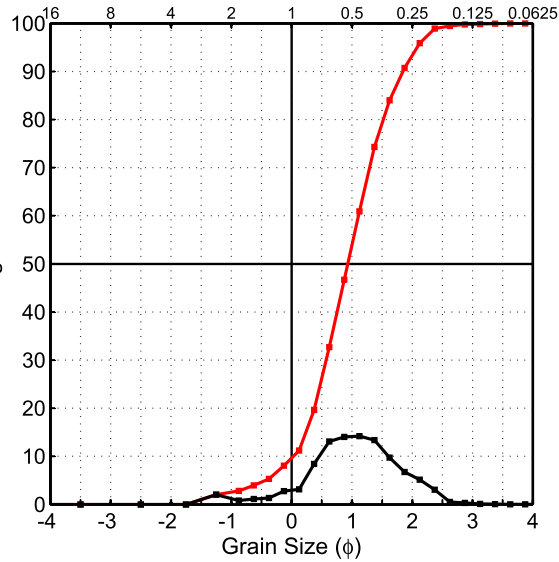
Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean		2.122	2.142
Standard Deviation		0.347	0.425
Skewness (1)		-0.165	-0.199
Skewness (2)		-0.554	
Kurtosis		1.381	1.696

Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-1.360	Mean		1.039	0.487
-3	-3.5	0.00	0.00	0.00	5	-0.350	Standard Deviation		0.740	0.599
-2	-2.5	0.00	0.00	0.00	16	0.265	Skewness		-0.272	
-1.5	-1.75	0.00	0.00	0.00	25	0.470	Kurtosis		3.602	
-1	-1.25	1.35	1.28	1.28	50	0.915	Dispersion			
-0.75	-0.875	0.58	0.55	1.83	75	1.390	Standard Deviation			
-0.5	-0.625	1.18	1.12	2.95	84	1.635	Deviation from Normal			
-0.25	-0.375	1.84	1.75	4.70	95	2.115				
0	-0.125	3.29	3.13	7.83	99	2.520				
0.25	0.125	3.59	3.41	11.24						
0.5	0.375	8.89	8.45	19.69						
0.75	0.625	14.63	13.90	33.59						
1	0.875	14.89	14.15	47.73						
1.25	1.125	14.71	13.98	61.71						
1.5	1.375	13.49	12.82	74.53						
1.75	1.625	9.66	9.18	83.71						
2	1.875	6.81	6.47	90.18						
2.25	2.125	5.30	5.04	95.21						
2.5	2.375	3.51	3.33	98.55						
2.75	2.625	0.83	0.79	99.33						
3	2.875	0.43	0.41	99.74						
3.25	3.125	0.14	0.13	99.88						
3.5	3.375	0.09	0.09	99.96						
3.75	3.625	0.02	0.02	99.98						
4	3.875	0.00	0.00	99.98						
>4.0	4.25	0.02	0.02	100.00						

Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean		0.950	0.938
Standard Deviation		0.685	0.716
Skewness (1)		0.051	0.012
Skewness (2)		-0.047	
Kurtosis		0.799	1.098

Grain Size Distribution

Grain Size (mm)

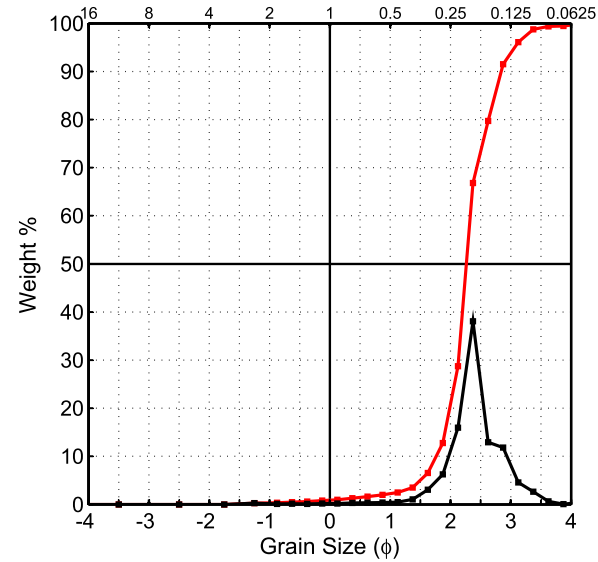


Project 2408
Location Buxton, NC
Date Oct 2014
Station 1940+00
Interval -24 ft NAVD
Mean 0.489 mm
STD 0.593 mm
Skewness -0.471
USCS Wentworth
 SP Medium Sand
 Poorly Graded Moderately Sorted
 Coarse Skewed
 Leptokurtic

Total weight (gram) 110.85
 % finer than 4.00 phi 0.03
 % coarser than -1.00 phi 2.01
 % CaCO₃ 5.2

Grain Size Distribution

Grain Size (mm)



Project 2408
Location Buxton, NC
Date Oct 2014
Station 1940+00
Interval -20 ft NAVD
Mean 0.191 mm
STD 0.685 mm
Skewness -1.638
USCS Wentworth
 SP Fine Sand
 Poorly Graded Moderately Well Sorted
 Strongly Coarse Skewed
 Very Leptokurtic

Total weight (gram) 104.85
 % finer than 4.00 phi 0.55
 % coarser than -1.00 phi 0.28
 % CaCO₃ 2.2

Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-1.500	Mean		1.032	0.489
-3	-3.5	0.00	0.00	0.00	5	-0.430	Standard Deviation		0.754	0.593
-2	-2.5	0.00	0.00	0.00	16	0.270	Skewness		-0.471	
-1.5	-1.75	0.00	0.00	0.00	25	0.480	Kurtosis		3.887	
-1	-1.25	2.23	2.01	2.01	50	0.935	Dispersion			
-0.75	-0.875	0.90	0.81	2.82	75	1.395	Standard Deviation			
-0.5	-0.625	1.26	1.14	3.96	84	1.625	Deviation from Normal			
-0.25	-0.375	1.49	1.34	5.30	95	2.080				
0	-0.125	3.05	2.75	8.06	99	2.410				
0.25	0.125	3.47	3.13	11.19						
0.5	0.375	9.35	8.43	19.62						
0.75	0.625	14.49	13.07	32.69						
1	0.875	15.55	14.03	46.72						
1.25	1.125	15.75	14.21	60.93						
1.5	1.375	14.81	13.36	74.29						
1.75	1.625	10.76	9.71	84.00						
2	1.875	7.48	6.75	90.74						
2.25	2.125	5.70	5.14	95.89						
2.5	2.375	3.37	3.04	98.93						
2.75	2.625	0.57	0.51	99.44						
3	2.875	0.36	0.32	99.77						
3.25	3.125	0.12	0.11	99.87						
3.5	3.375	0.07	0.06	99.94						
3.75	3.625	0.03	0.03	99.96						
4	3.875	0.01	0.01	99.97						
>4.0	4.25	0.03	0.03	100.00						

Percentiles		Moment Measures		(phi)	(mm)
1	-1.500	Mean		1.032	0.489
5	-0.430	Standard Deviation		0.754	0.593
16	0.270	Skewness		-0.471	
25	0.480	Kurtosis		3.887	
50	0.935	Dispersion			
75	1.395	Standard Deviation			
84	1.625	Deviation from Normal			
95	2.080				
99	2.410				

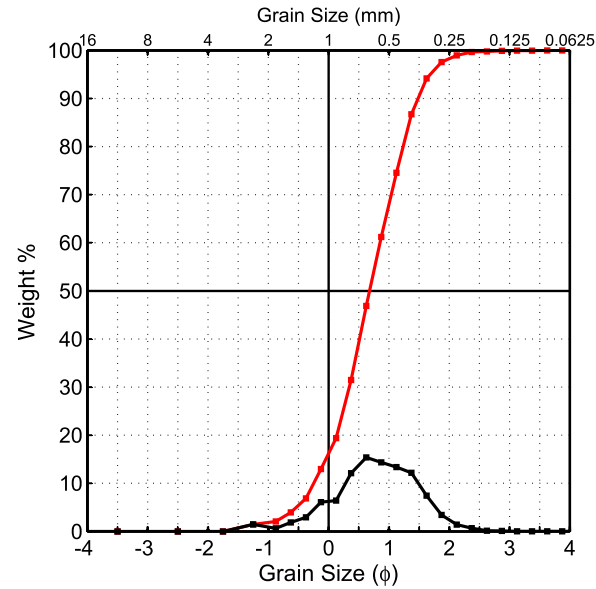
Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean		0.948	0.943
Standard Deviation		0.677	0.719
Skewness (1)		0.018	-0.035
Skewness (2)		-0.162	
Kurtosis		0.852	1.124

Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	0.155	Mean		2.390	0.191
-3	-3.5	0.00	0.00	0.00	5	1.500	Standard Deviation		0.546	0.685
-2	-2.5	0.00	0.00	0.00	16	1.925	Skewness		-1.638	
-1.5	-1.75	0.00	0.00	0.00	25	2.065	Kurtosis		12.904	
-1	-1.25	0.29	0.28	0.28	50	2.265	Dispersion			
-0.75	-0.875	0.09	0.09	0.36	75	2.535	Standard Deviation			
-0.5	-0.625	0.13	0.12	0.49	84	2.715	Deviation from Normal			
-0.25	-0.375	0.12	0.11	0.60	95	3.065				
0	-0.125	0.19	0.18	0.78	99	3.475				
0.25	0.125	0.19	0.18	0.96						
0.5	0.375	0.34	0.32	1.29						
0.75	0.625	0.36	0.34	1.63						
1	0.875	0.39	0.37	2.00						
1.25	1.125	0.48	0.46	2.46						
1.5	1.375	1.08	1.03	3.49						
1.75	1.625	3.18	3.03	6.52						
2	1.875	6.54	6.24	12.76						
2.25	2.125	16.73	15.96	28.72						
2.5	2.375	39.92	38.07	66.79						
2.75	2.625	13.54	12.91	79.70						
3	2.875	12.39	11.82	91.52						
3.25	3.125	4.79	4.57	96.09						
3.5	3.375	2.79	2.66	98.75						
3.75	3.625	0.66	0.63	99.38						
4	3.875	0.07	0.07	99.45						
>4.0	4.25	0.58	0.55	100.00						

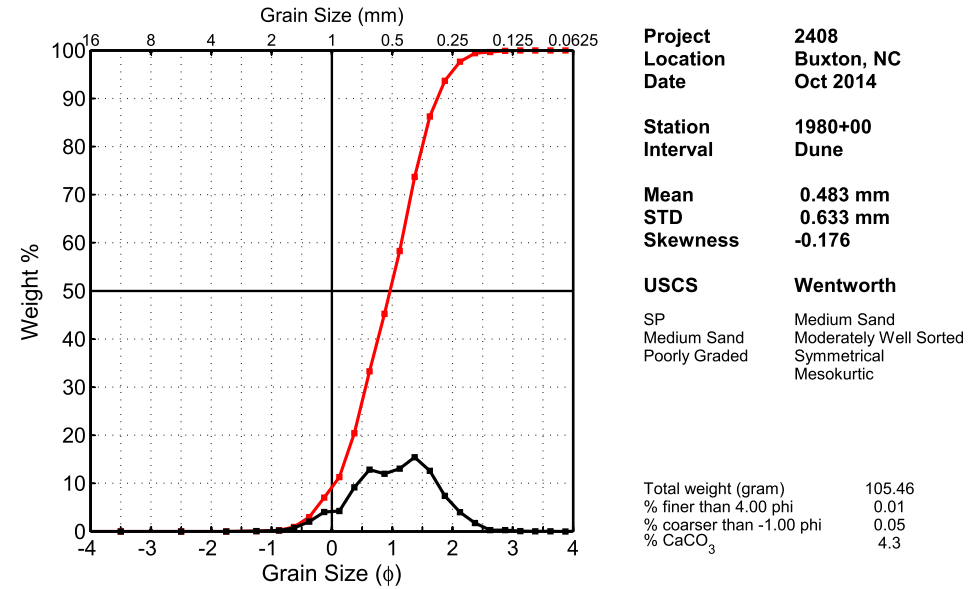
Percentiles		Moment Measures		(phi)	(mm)
1	0.155	Mean		2.390	0.191
5	1.500	Standard Deviation		0.546	0.685
16	1.925	Skewness		-1.638	
25	2.065	Kurtosis		12.904	
50	2.265	Dispersion			
75	2.535	Standard Deviation			
84	2.715	Deviation from Normal			
95	3.065				
99	3.475				

Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean		2.320	2.302
Standard Deviation		0.395	0.435
Skewness (1)		0.139	0.081
Skewness (2)		0.044	
Kurtosis		0.981	1.365

Grain Size Distribution



Grain Size Distribution



Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-1.400	Mean		0.780	0.582
-3	-3.5	0.00	0.00	0.00	5	-0.535	Standard Deviation		0.684	0.622
-2	-2.5	0.00	0.00	0.00	16	-0.005	Skewness		-0.287	
-1.5	-1.75	0.00	0.00	0.00	25	0.240	Kurtosis		3.547	
-1	-1.25	1.65	1.43	1.43	50	0.680	Dispersion			
-0.75	-0.875	0.75	0.65	2.09	75	1.135	Standard Deviation			
-0.5	-0.625	2.16	1.88	3.96	84	1.320	Deviation from Normal			
-0.25	-0.375	3.35	2.91	6.87	95	1.685				
0	-0.125	7.01	6.09	12.96	99	2.135				
0.25	0.125	7.38	6.41	19.37						
0.5	0.375	13.94	12.11	31.49						
0.75	0.625	17.69	15.37	46.85						
1	0.875	16.50	14.34	61.19						
1.25	1.125	15.37	13.35	74.54						
1.5	1.375	14.01	12.17	86.72						
1.75	1.625	8.57	7.45	94.16						
2	1.875	3.92	3.41	97.57						
2.25	2.125	1.61	1.40	98.97						
2.5	2.375	0.78	0.68	99.64						
2.75	2.625	0.17	0.15	99.79						
3	2.875	0.13	0.11	99.90						
3.25	3.125	0.03	0.03	99.93						
3.5	3.375	0.02	0.02	99.95						
3.75	3.625	0.02	0.02	99.97						
4	3.875	0.01	0.01	99.97						
>4.0	4.25	0.03	0.03	100.00						

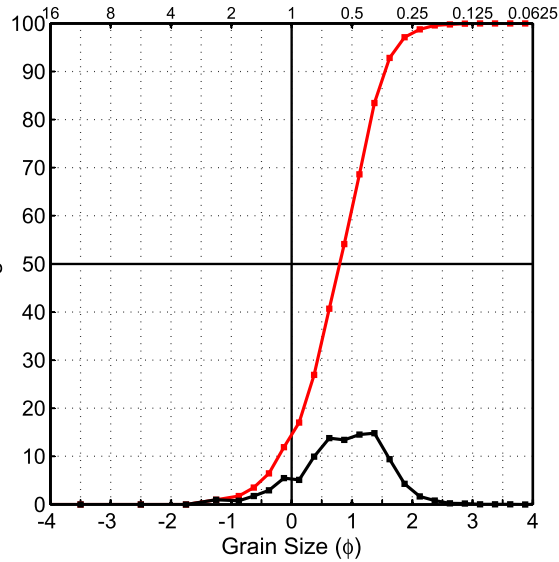
Percentiles		Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean				0.657	0.665
Standard Deviation				0.662	0.668
Skewness (1)				-0.034	-0.064
Skewness (2)				-0.158	
Kurtosis				0.675	1.017

Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-0.615	Mean		1.050	0.483
-3	-3.5	0.00	0.00	0.00	5	-0.250	Standard Deviation		0.661	0.633
-2	-2.5	0.00	0.00	0.00	16	0.255	Skewness		-0.176	
-1.5	-1.75	0.00	0.00	0.00	25	0.465	Kurtosis		2.833	
-1	-1.25	0.05	0.05	0.05	50	0.965	Dispersion			
-0.75	-0.875	0.19	0.18	0.23	75	1.400	Standard Deviation			
-0.5	-0.625	0.75	0.71	0.94	84	1.580	Deviation from Normal			
-0.25	-0.375	2.14	2.03	2.97	95	1.960				
0	-0.125	4.27	4.05	7.02	99	2.315				
0.25	0.125	4.48	4.25	11.26						
0.5	0.375	9.66	9.16	20.42						
0.75	0.625	13.55	12.85	33.27						
1	0.875	12.63	11.98	45.25						
1.25	1.125	13.76	13.05	58.30						
1.5	1.375	16.25	15.41	73.71						
1.75	1.625	13.26	12.57	86.28						
2	1.875	7.79	7.39	93.67						
2.25	2.125	4.21	3.99	97.66						
2.5	2.375	1.84	1.74	99.40						
2.75	2.625	0.26	0.25	99.65						
3	2.875	0.27	0.26	99.91						
3.25	3.125	0.06	0.06	99.96						
3.5	3.375	0.02	0.02	99.98						
3.75	3.625	0.01	0.01	99.99						
4	3.875	0.00	0.00	99.99						
>4.0	4.25	0.01	0.01	100.00						

Percentiles		Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean				0.917	0.933
Standard Deviation				0.663	0.666
Skewness (1)				-0.072	-0.086
Skewness (2)				-0.166	
Kurtosis				0.668	0.969

Grain Size Distribution

Grain Size (mm)



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1980+00
Interval BC

Mean 0.549 mm
STD 0.621 mm
Skewness -0.401

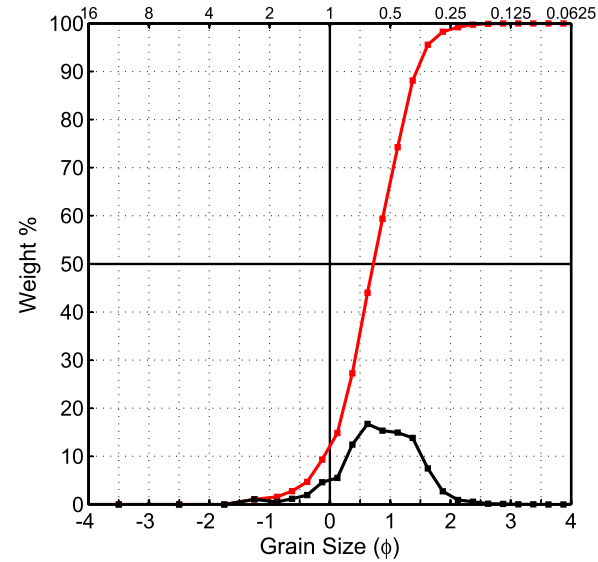
USCS Wentworth

SP Coarse Sand
 Medium Sand Moderately Well Sorted
 Poorly Graded Symmetrical Mesokurtic

Total weight (gram) 115.87
 % finer than 4.00 phi 0.01
 % coarser than -1.00 phi 0.96
 % CaCO₃ 6.0

Grain Size Distribution

Grain Size (mm)



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1980+00
Interval Berm

Mean 0.565 mm
STD 0.650 mm
Skewness -0.416

USCS Wentworth

SP Coarse Sand
 Medium Sand Moderately Well Sorted
 Poorly Graded Symmetrical Leptokurtic

Total weight (gram) 107.86
 % finer than 4.00 phi 0.01
 % coarser than -1.00 phi 1.06
 % CaCO₃ 6.2

Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-1.230	Mean		0.866	0.549
-3	-3.5	0.00	0.00	0.00	5	-0.495	Standard Deviation		0.687	0.621
-2	-2.5	0.00	0.00	0.00	16	0.075	Skewness		-0.401	
-1.5	-1.75	0.00	0.00	0.00	25	0.325	Kurtosis		3.324	
-1	-1.25	1.11	0.96	0.96	50	0.800	Dispersion			
-0.75	-0.875	0.90	0.78	1.73	75	1.235	Standard Deviation			
-0.5	-0.625	2.03	1.75	3.49	84	1.390	Deviation from Normal			
-0.25	-0.375	3.41	2.94	6.43	95	1.750				
0	-0.125	6.35	5.48	11.91	99	2.200				
0.25	0.125	5.90	5.09	17.00						
0.5	0.375	11.50	9.92	26.93						
0.75	0.625	15.95	13.77	40.69						
1	0.875	15.56	13.43	54.12						
1.25	1.125	16.80	14.50	68.62						
1.5	1.375	17.16	14.81	83.43						
1.75	1.625	10.89	9.40	92.83						
2	1.875	4.95	4.27	97.10						
2.25	2.125	1.92	1.66	98.76						
2.5	2.375	0.93	0.80	99.56						
2.75	2.625	0.25	0.22	99.78						
3	2.875	0.19	0.16	99.94						
3.25	3.125	0.03	0.03	99.97						
3.5	3.375	0.02	0.02	99.98						
3.75	3.625	0.01	0.01	99.99						
4	3.875	0.00	0.00	99.99						
>4.0	4.25	0.01	0.01	100.00						

Percentiles		Moment Measures		(phi)	(mm)
1	-1.230	Mean		0.866	0.549
5	-0.495	Standard Deviation		0.687	0.621
16	0.075	Skewness		-0.401	
25	0.325	Kurtosis		3.324	
50	0.800	Dispersion			
75	1.235	Standard Deviation			
84	1.390	Deviation from Normal			
95	1.750				
99	2.200				

Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean		0.732	0.755
Standard Deviation		0.658	0.669
Skewness (1)		-0.103	-0.128
Skewness (2)		-0.262	
Kurtosis		0.707	1.011

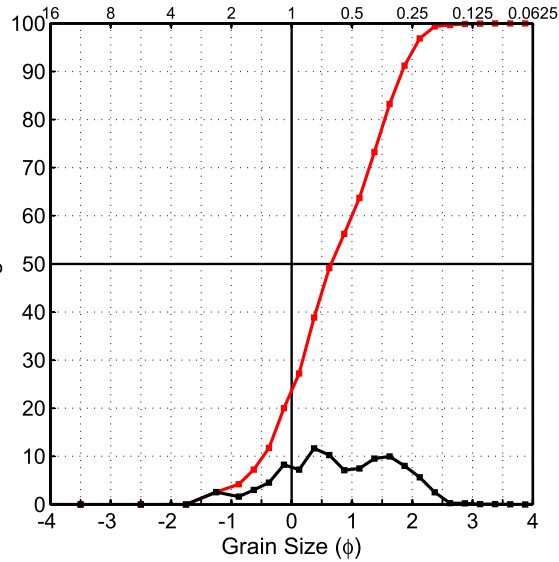
Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-1.275	Mean		0.824	0.565
-3	-3.5	0.00	0.00	0.00	5	-0.360	Standard Deviation		0.622	0.650
-2	-2.5	0.00	0.00	0.00	16	0.150	Skewness		-0.416	
-1.5	-1.75	0.00	0.00	0.00	25	0.330	Kurtosis		3.837	
-1	-1.25	1.14	1.06	1.06	50	0.725	Dispersion			
-0.75	-0.875	0.55	0.51	1.57	75	1.140	Standard Deviation			
-0.5	-0.625	1.28	1.19	2.75	84	1.300	Deviation from Normal			
-0.25	-0.375	2.10	1.95	4.70	95	1.605				
0	-0.125	4.98	4.62	9.32	99	2.070				
0.25	0.125	5.95	5.52	14.83						
0.5	0.375	13.41	12.43	27.27						
0.75	0.625	18.05	16.73	44.00						
1	0.875	16.55	15.34	59.35						
1.25	1.125	16.11	14.94	74.28						
1.5	1.375	14.90	13.81	88.10						
1.75	1.625	8.06	7.47	95.57						
2	1.875	2.92	2.71	98.28						
2.25	2.125	0.99	0.92	99.19						
2.5	2.375	0.59	0.55	99.74						
2.75	2.625	0.15	0.14	99.88						
3	2.875	0.10	0.09	99.97						
3.25	3.125	0.01	0.01	99.98						
3.5	3.375	0.01	0.01	99.99						
3.75	3.625	0.00	0.00	99.99						
4	3.875	0.00	0.00	99.99						
>4.0	4.25	0.01	0.01	100.00						

Percentiles		Moment Measures		(phi)	(mm)
1	-1.275	Mean		0.824	0.565
5	-0.360	Standard Deviation		0.622	0.650
16	0.150	Skewness		-0.416	
25	0.330	Kurtosis		3.837	
50	0.725	Dispersion			
75	1.140	Standard Deviation			
84	1.300	Deviation from Normal			
95	1.605				
99	2.070				

Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean		0.725	0.725
Standard Deviation		0.575	0.585
Skewness (1)		-0.000	-0.052
Skewness (2)		-0.178	
Kurtosis		0.709	0.994

Grain Size Distribution

Grain Size (mm)



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1980+00
Interval MTL

Mean 0.570 mm
STD 0.539 mm
Skewness -0.164

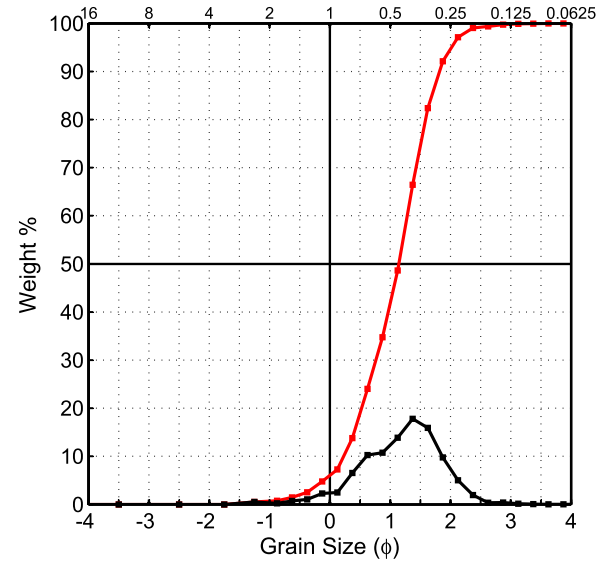
USCS Wentworth

SP Coarse Sand
 Medium Sand Moderately Sorted
 Poorly Graded Symmetrical
 Platykurtic

Total weight (gram) 106.07
 % finer than 4.00 phi 0.02
 % coarser than -1.00 phi 2.57
 % CaCO₃ 5.8

Grain Size Distribution

Grain Size (mm)



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1980+00
Interval MHW

Mean 0.439 mm
STD 0.636 mm
Skewness -0.506

USCS Wentworth

SP Medium Sand
 Medium Sand Moderately Well Sorted
 Poorly Graded Coarse Skewed
 Leptokurtic

Total weight (gram) 109.63
 % finer than 4.00 phi 0.02
 % coarser than -1.00 phi 0.51
 % CaCO₃ 4.2

Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-1.555	Mean		0.811	0.570
-3	-3.5	0.00	0.00	0.00	5	-0.810	Standard Deviation		0.891	0.539
-2	-2.5	0.00	0.00	0.00	16	-0.245	Skewness		-0.164	
-1.5	-1.75	0.00	0.00	0.00	25	0.050	Kurtosis		2.396	
-1	-1.25	2.73	2.57	2.57	50	0.655	Dispersion			
-0.75	-0.875	1.72	1.62	4.20	75	1.420	Standard Deviation			
-0.5	-0.625	3.20	3.02	7.21	84	1.650	Deviation from Normal			
-0.25	-0.375	4.78	4.51	11.72	95	2.040				
0	-0.125	8.77	8.27	19.99	99	2.335				
0.25	0.125	7.67	7.23	27.22						
0.5	0.375	12.35	11.64	38.86						
0.75	0.625	10.90	10.28	49.14						
1	0.875	7.53	7.10	56.24						
1.25	1.125	7.93	7.48	63.71						
1.5	1.375	10.12	9.54	73.25						
1.75	1.625	10.58	9.97	83.23						
2	1.875	8.48	7.99	91.22						
2.25	2.125	5.98	5.64	96.86						
2.5	2.375	2.67	2.52	99.38						
2.75	2.625	0.29	0.27	99.65						
3	2.875	0.22	0.21	99.86						
3.25	3.125	0.07	0.07	99.92						
3.5	3.375	0.05	0.05	99.97						
3.75	3.625	0.01	0.01	99.98						
4	3.875	0.00	0.00	99.98						
>4.0	4.25	0.02	0.02	100.00						

Percentiles		Moment Measures		(phi)	(mm)
1	-1.555	Mean		0.811	0.570
5	-0.810	Standard Deviation		0.891	0.539
16	-0.245	Skewness		-0.164	
25	0.050	Kurtosis		2.396	
50	0.655	Dispersion			
75	1.420	Standard Deviation			
84	1.650	Deviation from Normal			
95	2.040				
99	2.335				

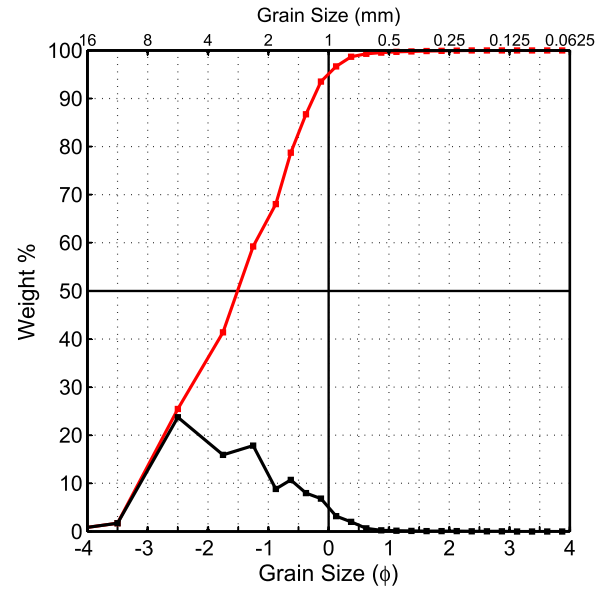
Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean		0.702	0.687
Standard Deviation		0.948	0.906
Skewness (1)		0.050	0.011
Skewness (2)		-0.042	
Kurtosis		0.504	0.853

Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-0.785	Mean		1.188	0.439
-3	-3.5	0.00	0.00	0.00	5	-0.105	Standard Deviation		0.653	0.636
-2	-2.5	0.00	0.00	0.00	16	0.430	Skewness		-0.506	
-1.5	-1.75	0.00	0.00	0.00	25	0.650	Kurtosis		3.926	
-1	-1.25	0.56	0.51	0.51	50	1.145	Dispersion			
-0.75	-0.875	0.26	0.24	0.75	75	1.510	Standard Deviation			
-0.5	-0.625	0.78	0.71	1.46	84	1.665	Deviation from Normal			
-0.25	-0.375	1.14	1.04	2.50	95	2.020				
0	-0.125	2.50	2.28	4.78	99	2.370				
0.25	0.125	2.72	2.48	7.26						
0.5	0.375	7.14	6.51	13.77						
0.75	0.625	11.24	10.25	24.03						
1	0.875	11.77	10.74	34.76						
1.25	1.125	15.21	13.87	48.64						
1.5	1.375	19.52	17.81	66.44						
1.75	1.625	17.46	15.93	82.37						
2	1.875	10.69	9.75	92.12						
2.25	2.125	5.48	5.00	97.12						
2.5	2.375	2.11	1.92	99.04						
2.75	2.625	0.36	0.33	99.37						
3	2.875	0.41	0.37	99.74						
3.25	3.125	0.15	0.14	99.88						
3.5	3.375	0.08	0.07	99.95						
3.75	3.625	0.02	0.02	99.97						
4	3.875	0.01	0.01	99.98						
>4.0	4.25	0.02	0.02	100.00						

Percentiles		Moment Measures		(phi)	(mm)
1	-0.785	Mean		1.188	0.439
5	-0.105	Standard Deviation		0.653	0.636
16	0.430	Skewness		-0.506	
25	0.650	Kurtosis		3.926	
50	1.145	Dispersion			
75	1.510	Standard Deviation			
84	1.665	Deviation from Normal			
95	2.020				
99	2.370				

Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean		1.047	1.080
Standard Deviation		0.618	0.631
Skewness (1)		-0.158	-0.167
Skewness (2)		-0.304	
Kurtosis		0.721	1.013

Grain Size Distribution



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1980+00
Interval Trough

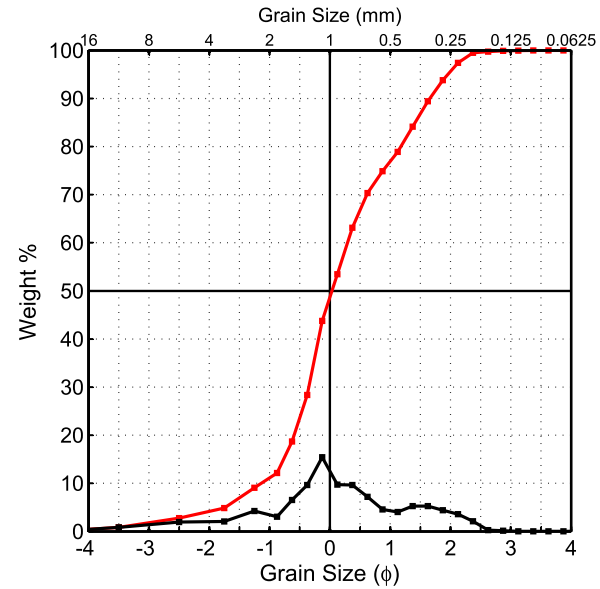
Mean 2.484 mm
STD 0.522 mm
Skewness 0.017

USCS Wentworth

SP Granule
 Coarse Sand Moderately Sorted
 Poorly Graded Symmetrical
 Platykurtic

Total weight (gram) 114.75
 % finer than 4.00 phi 0.00
 % coarser than -1.00 phi 59.22
 % CaCO₃ 21.3

Grain Size Distribution



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1980+00
Interval MLW

Mean 0.830 mm
STD 0.469 mm
Skewness -0.276

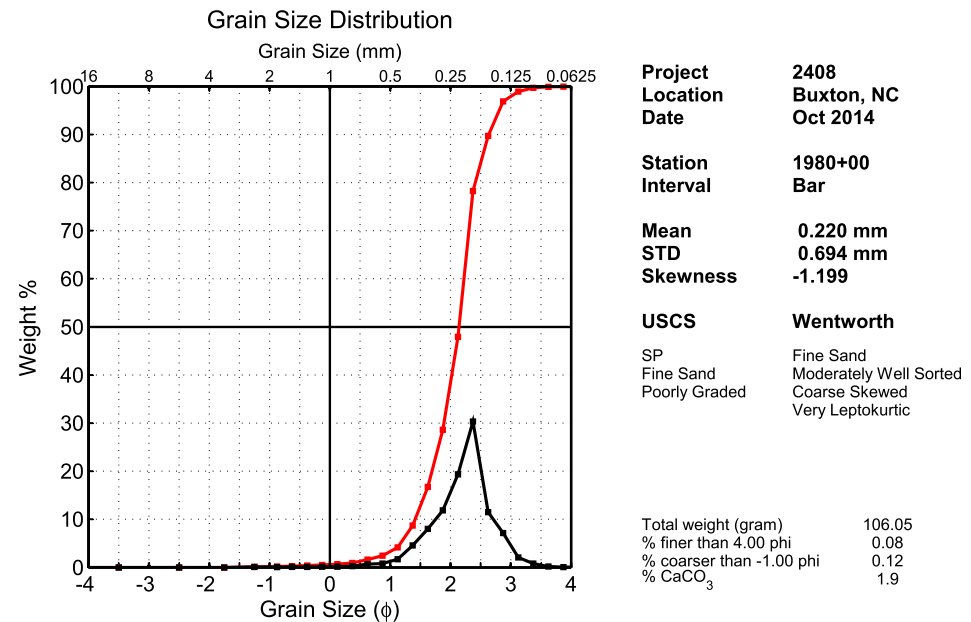
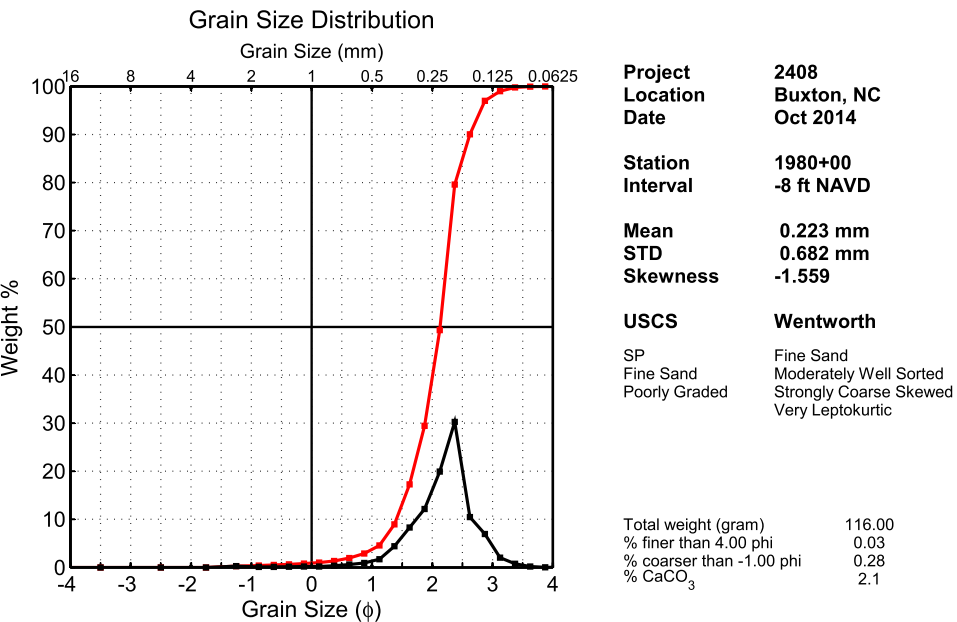
USCS Wentworth

SP Coarse Sand
 Medium Sand Poorly Sorted
 Poorly Graded Symmetrical
 Mesokurtic

Total weight (gram) 125.54
 % finer than 4.00 phi 0.02
 % coarser than -1.00 phi 9.09
 % CaCO₃ 9.1

Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-3.920	Mean		-1.313	2.484
-3	-3.5	1.97	1.72	1.72	5	-3.360	Standard Deviation		0.937	0.522
-2	-2.5	27.24	23.74	25.46	16	-2.900	Skewness		0.017	
-1.5	-1.75	18.27	15.92	41.38	25	-2.520	Kurtosis		2.477	
-1	-1.25	20.48	17.85	59.22	50	-1.510	Dispersion			
-0.75	-0.875	10.11	8.81	68.03	75	-0.710	Standard Deviation			
-0.5	-0.625	12.29	10.71	78.75	84	-0.460	Deviation from Normal			
-0.25	-0.375	9.13	7.96	86.70	95	-0.010				
0	-0.125	7.82	6.81	93.52	99	0.515				
0.25	0.125	3.63	3.16	96.68	Graphic Phi Parameters					
0.5	0.375	2.26	1.97	98.65						
0.75	0.625	0.73	0.64	99.29	Inman		Folk & Ward			
1	0.875	0.27	0.24	99.52	1952		1957			
1.25	1.125	0.18	0.16	99.68	Mean		-1.680		-1.623	
1.5	1.375	0.12	0.10	99.78	Standard Deviation		1.220		1.118	
1.75	1.625	0.09	0.08	99.86	Skewness (1)		-0.139		-0.122	
2	1.875	0.06	0.05	99.91	Skewness (2)		-0.143			
2.25	2.125	0.05	0.04	99.96	Kurtosis		0.373		0.759	
2.5	2.375	0.03	0.03	99.98						
2.75	2.625	0.01	0.01	99.99						
3	2.875	0.01	0.01	100.00						
3.25	3.125	0.00	0.00	100.00						
3.5	3.375	0.00	0.00	100.00						
3.75	3.625	0.00	0.00	100.00						
4	3.875	0.00	0.00	100.00						
>4.0	4.25	0.00	0.00	100.00						

Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-3.410	Mean		0.269	0.830
-3	-3.5	1.04	0.83	0.83	5	-1.735	Standard Deviation		1.091	0.469
-2	-2.5	2.44	1.94	2.77	16	-0.730	Skewness		-0.276	
-1.5	-1.75	2.62	2.09	4.86	25	-0.460	Kurtosis		3.660	
-1	-1.25	5.31	4.23	9.09	50	0.035	Dispersion			
-0.75	-0.875	3.85	3.07	12.16	75	0.885	Standard Deviation			
-0.5	-0.625	8.20	6.53	18.69	84	1.370	Deviation from Normal			
-0.25	-0.375	12.13	9.66	28.35	95	1.960				
0	-0.125	19.33	15.40	43.75	99	2.315				
0.25	0.125	12.21	9.73	53.47	Graphic Phi Parameters					
0.5	0.375	12.11	9.65	63.12						
0.75	0.625	9.03	7.19	70.31	Inman		Folk & Ward			
1	0.875	5.72	4.56	74.87	1952		1957			
1.25	1.125	5.04	4.01	78.88	Mean		0.320		0.225	
1.5	1.375	6.61	5.27	84.15	Standard Deviation		1.050		1.085	
1.75	1.625	6.59	5.25	89.40	Skewness (1)		0.271		0.157	
2	1.875	5.51	4.39	93.79	Skewness (2)		0.074			
2.25	2.125	4.51	3.59	97.38	Kurtosis		0.760		1.126	
2.5	2.375	2.65	2.11	99.49						
2.75	2.625	0.31	0.25	99.74						
3	2.875	0.20	0.16	99.90						
3.25	3.125	0.05	0.04	99.94						
3.5	3.375	0.03	0.02	99.96						
3.75	3.625	0.02	0.02	99.98						
4	3.875	0.01	0.01	99.98						
>4.0	4.25	0.02	0.02	100.00						



Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	0.125	Mean		2.163	0.223
-3	-3.5	0.00	0.00	0.00	5	1.150	Standard Deviation		0.552	0.682
-2	-2.5	0.00	0.00	0.00	16	1.585	Skewness		-1.559	
-1.5	-1.75	0.00	0.00	0.00	25	1.785	Kurtosis		9.553	
-1	-1.25	0.32	0.28	0.28			Dispersion			
-0.75	-0.875	0.12	0.10	0.38	50	2.130	Standard Deviation			
-0.5	-0.625	0.14	0.12	0.50	75	2.335	Deviation from Normal			
-0.25	-0.375	0.16	0.14	0.64						
0	-0.125	0.21	0.18	0.82	84	2.480				
0.25	0.125	0.21	0.18	1.00	95	2.805				
0.5	0.375	0.39	0.34	1.34	99	3.125				
0.75	0.625	0.70	0.60	1.94						
1	0.875	1.09	0.94	2.88						
1.25	1.125	1.95	1.68	4.56						
1.5	1.375	5.11	4.41	8.97						
1.75	1.625	9.64	8.31	17.28						
2	1.875	14.07	12.13	29.41						
2.25	2.125	23.11	19.92	49.33						
2.5	2.375	35.08	30.24	79.57						
2.75	2.625	12.13	10.46	90.03						
3	2.875	8.07	6.96	96.98						
3.25	3.125	2.34	2.02	99.00						
3.5	3.375	0.88	0.76	99.76						
3.75	3.625	0.20	0.17	99.93						
4	3.875	0.04	0.03	99.97						
>4.0	4.25	0.04	0.03	100.00						

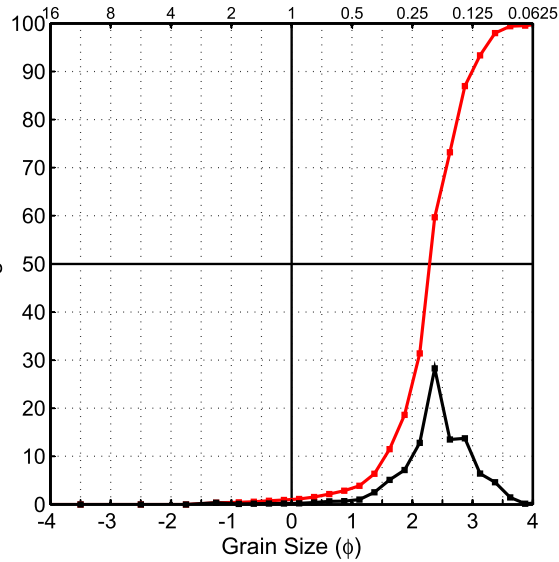
Percentiles		Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean				2.032	2.065
Standard Deviation				0.448	0.475
Skewness (1)				-0.218	-0.201
Skewness (2)				-0.341	
Kurtosis				0.849	1.233

Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	0.400	Mean		2.184	0.220
-3	-3.5	0.00	0.00	0.00	5	1.170	Standard Deviation		0.528	0.694
-2	-2.5	0.00	0.00	0.00	16	1.605	Skewness		-1.199	
-1.5	-1.75	0.00	0.00	0.00	25	1.800	Kurtosis		7.882	
-1	-1.25	0.13	0.12	0.12			Dispersion			
-0.75	-0.875	0.05	0.05	0.17	50	2.140	Standard Deviation			
-0.5	-0.625	0.11	0.10	0.27	75	2.350	Deviation from Normal			
-0.25	-0.375	0.12	0.11	0.39						
0	-0.125	0.15	0.14	0.53	84	2.500				
0.25	0.125	0.15	0.14	0.67	95	2.810				
0.5	0.375	0.28	0.26	0.93	99	3.155				
0.75	0.625	0.73	0.69	1.62						
1	0.875	0.85	0.80	2.42						
1.25	1.125	1.82	1.72	4.14						
1.5	1.375	4.85	4.57	8.71						
1.75	1.625	8.49	8.01	16.72						
2	1.875	12.59	11.87	28.59						
2.25	2.125	20.50	19.33	47.92						
2.5	2.375	32.15	30.32	78.24						
2.75	2.625	12.17	11.48	89.71						
3	2.875	7.57	7.14	96.85						
3.25	3.125	2.18	2.06	98.91						
3.5	3.375	0.84	0.79	99.70						
3.75	3.625	0.19	0.18	99.88						
4	3.875	0.05	0.05	99.92						
>4.0	4.25	0.08	0.08	100.00						

Percentiles		Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean				2.053	2.082
Standard Deviation				0.448	0.472
Skewness (1)				-0.196	-0.189
Skewness (2)				-0.335	
Kurtosis				0.832	1.222

Grain Size Distribution

Grain Size (mm)



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1980+00
Interval -16 ft NAVD

Mean 0.190 mm
STD 0.640 mm
Skewness -1.321

USCS Wentworth

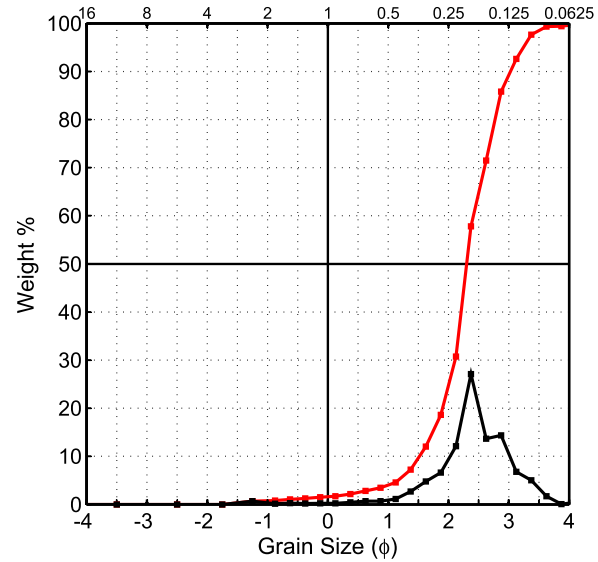
SP Fine Sand
 Poorly Graded

Fine Sand
 Moderately Well Sorted
 Strongly Coarse Skewed
 Very Leptokurtic

Total weight (gram) 104.27
 % finer than 4.00 phi 0.47
 % coarser than -1.00 phi 0.35
 % CaCO₃ 2.2

Grain Size Distribution

Grain Size (mm)



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1980+00
Interval -12 ft NAVD

Mean 0.190 mm
STD 0.614 mm
Skewness -1.610

USCS Wentworth

SP Fine Sand
 Poorly Graded

Fine Sand
 Moderately Sorted
 Strongly Coarse Skewed
 Very Leptokurtic

Total weight (gram) 108.93
 % finer than 4.00 phi 0.60
 % coarser than -1.00 phi 0.67
 % CaCO₃ 2.2

Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-0.020	Mean		2.394	0.190
-3	-3.5	0.00	0.00	0.00	5	1.240	Standard Deviation		0.643	0.640
-2	-2.5	0.00	0.00	0.00	16	1.785	Skewness		-1.321	
-1.5	-1.75	0.00	0.00	0.00	25	2.000	Kurtosis		8.472	
-1	-1.25	0.36	0.35	0.35	50	2.290	Dispersion			
-0.75	-0.875	0.09	0.09	0.43	75	2.660	Standard Deviation			
-0.5	-0.625	0.14	0.13	0.57	84	2.820	Deviation from Normal			
-0.25	-0.375	0.18	0.17	0.74	95	3.215				
0	-0.125	0.18	0.17	0.91	99	3.555				
0.25	0.125	0.22	0.21	1.12						
0.5	0.375	0.41	0.39	1.52						
0.75	0.625	0.68	0.65	2.17						
1	0.875	0.72	0.69	2.86						
1.25	1.125	1.04	1.00	3.86						
1.5	1.375	2.61	2.50	6.36						
1.75	1.625	5.33	5.11	11.47						
2	1.875	7.43	7.13	18.60						
2.25	2.125	13.34	12.79	31.39						
2.5	2.375	29.50	28.29	59.68						
2.75	2.625	14.08	13.50	73.19						
3	2.875	14.34	13.75	86.94						
3.25	3.125	6.70	6.43	93.36						
3.5	3.375	4.79	4.59	97.96						
3.75	3.625	1.50	1.44	99.40						
4	3.875	0.14	0.13	99.53						
>4.0	4.25	0.49	0.47	100.00						

Percentiles		Moment Measures		(phi)	(mm)
1	-0.020	Mean		2.394	0.190
5	1.240	Standard Deviation		0.643	0.640
16	1.785	Skewness		-1.321	
25	2.000	Kurtosis		8.472	
50	2.290	Dispersion			
75	2.660	Standard Deviation			
84	2.820	Deviation from Normal			
95	3.215				
99	3.555				

Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean		2.303	2.298
Standard Deviation		0.518	0.558
Skewness (1)		0.024	-0.020
Skewness (2)		-0.121	
Kurtosis		0.908	1.226

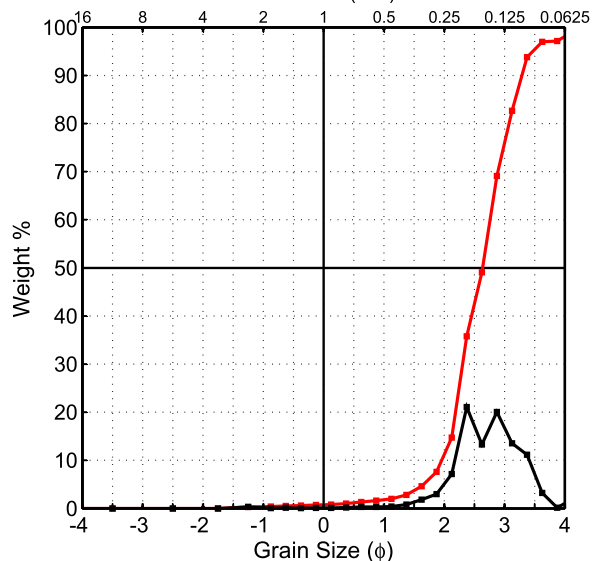
Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-0.680	Mean		2.394	0.190
-3	-3.5	0.00	0.00	0.00	5	1.165	Standard Deviation		0.703	0.614
-2	-2.5	0.00	0.00	0.00	16	1.775	Skewness		-1.610	
-1.5	-1.75	0.00	0.00	0.00	25	2.005	Kurtosis		9.202	
-1	-1.25	0.73	0.67	0.67	50	2.305	Dispersion			
-0.75	-0.875	0.15	0.14	0.81	75	2.685	Standard Deviation			
-0.5	-0.625	0.27	0.25	1.06	84	2.845	Deviation from Normal			
-0.25	-0.375	0.21	0.19	1.25	95	3.245				
0	-0.125	0.25	0.23	1.48	99	3.575				
0.25	0.125	0.23	0.21	1.69						
0.5	0.375	0.48	0.44	2.13						
0.75	0.625	0.72	0.66	2.79						
1	0.875	0.73	0.67	3.46						
1.25	1.125	1.21	1.11	4.57						
1.5	1.375	2.91	2.67	7.24						
1.75	1.625	5.18	4.76	12.00						
2	1.875	7.21	6.62	18.62						
2.25	2.125	13.18	12.10	30.72						
2.5	2.375	29.50	27.08	57.80						
2.75	2.625	14.88	13.66	71.46						
3	2.875	15.65	14.37	85.83						
3.25	3.125	7.38	6.77	92.60						
3.5	3.375	5.48	5.03	97.63						
3.75	3.625	1.86	1.71	99.34						
4	3.875	0.07	0.06	99.40						
>4.0	4.25	0.65	0.60	100.00						

Percentiles		Moment Measures		(phi)	(mm)
1	-0.680	Mean		2.394	0.190
5	1.165	Standard Deviation		0.703	0.614
16	1.775	Skewness		-1.610	
25	2.005	Kurtosis		9.202	
50	2.305	Dispersion			
75	2.685	Standard Deviation			
84	2.845	Deviation from Normal			
95	3.245				
99	3.575				

Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean		2.310	2.308
Standard Deviation		0.535	0.583
Skewness (1)		0.009	-0.043
Skewness (2)		-0.187	
Kurtosis		0.944	1.254

Grain Size Distribution

Grain Size (mm)



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1980+00
Interval -24 ft NAVD

Mean 0.152 mm
STD 0.638 mm
Skewness -1.290

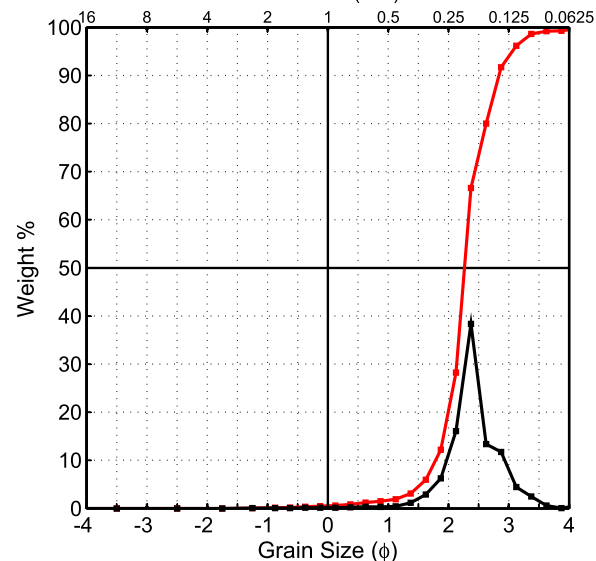
USCS Wentworth

SP Fine Sand
 Fine Sand Moderately Well Sorted
 Poorly Graded Coarse Skewed
 Very Leptokurtic

Total weight (gram) 107.60
 % finer than 4.00 phi 2.83
 % coarser than -1.00 phi 0.32
 % CaCO₃ 3.3

Grain Size Distribution

Grain Size (mm)



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1980+00
Interval -20 ft NAVD

Mean 0.189 mm
STD 0.704 mm
Skewness -1.002

USCS Wentworth

SP Fine Sand
 Fine Sand Moderately Well Sorted
 Poorly Graded Coarse Skewed
 Very Leptokurtic

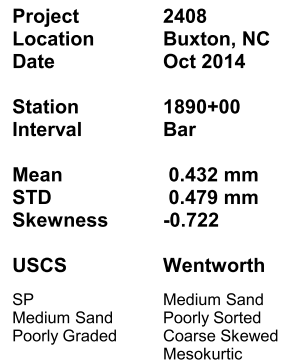
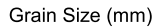
Total weight (gram) 109.79
 % finer than 4.00 phi 0.72
 % coarser than -1.00 phi 0.07
 % CaCO₃ 2.2

Limits (phi)	Mid Point (phi)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles	Moment Measures (phi) (mm)		
-4	-4.5	0.00	0.00	0.00	1	0.350	Mean	2.719 0.152
-3	-3.5	0.00	0.00	0.00	5	1.655	Standard Deviation	0.649 0.638
-2	-2.5	0.00	0.00	0.00	16	2.140	Skewness	-1.290
-1.5	-1.75	0.00	0.00	0.00	25	2.245	Kurtosis	9.758
-1	-1.25	0.34	0.32	0.32	50	2.635	Dispersion	
-0.75	-0.875	0.07	0.07	0.38	75	2.985	Standard Deviation	
-0.5	-0.625	0.16	0.15	0.53	84	3.155	Deviation from Normal	
-0.25	-0.375	0.08	0.07	0.60	95	3.470		
0	-0.125	0.12	0.11	0.72	99	4.000		
0.25	0.125	0.11	0.10	0.82				
0.5	0.375	0.22	0.20	1.02				
0.75	0.625	0.32	0.30	1.32				
1	0.875	0.31	0.29	1.61				
1.25	1.125	0.42	0.39	2.00				
1.5	1.375	0.88	0.82	2.82				
1.75	1.625	1.94	1.80	4.62				
2	1.875	3.20	2.97	7.59				
2.25	2.125	7.68	7.14	14.73				
2.5	2.375	22.65	21.05	35.78				
2.75	2.625	14.31	13.30	49.08				
3	2.875	21.55	20.03	69.11				
3.25	3.125	14.56	13.53	82.64				
3.5	3.375	11.99	11.14	93.78				
3.75	3.625	3.47	3.22	97.01				
4	3.875	0.17	0.16	97.17				
>4.0	4.25	3.05	2.83	100.00				

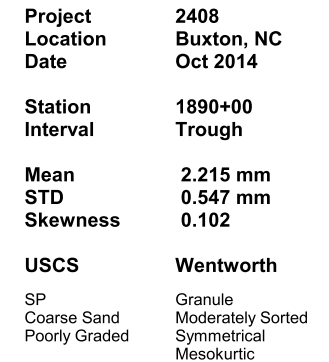
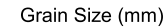
Graphic Phi Parameters	Inman 1952	Folk & Ward 1957
Mean	2.648	2.643
Standard Deviation	0.508	0.529
Skewness (1)	0.025	-0.028
Skewness (2)	-0.143	
Kurtosis	0.788	1.005

Limits (phi)	Mid Point (phi)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles	Moment Measures (phi) (mm)		
-4	-4.5	0.00	0.00	0.00	1	0.490	Mean	2.405 0.189
-3	-3.5	0.00	0.00	0.00	5	1.540	Standard Deviation	0.507 0.704
-2	-2.5	0.00	0.00	0.00	16	1.935	Skewness	-1.002
-1.5	-1.75	0.00	0.00	0.00	25	2.075	Kurtosis	10.643
-1	-1.25	0.08	0.07	0.07	50	2.265	Dispersion	
-0.75	-0.875	0.08	0.07	0.15	75	2.530	Standard Deviation	
-0.5	-0.625	0.06	0.05	0.20	84	2.710	Deviation from Normal	
-0.25	-0.375	0.14	0.13	0.33	95	3.060		
0	-0.125	0.16	0.15	0.47	99	3.535		
0.25	0.125	0.14	0.13	0.60				
0.5	0.375	0.26	0.24	0.84				
0.75	0.625	0.39	0.36	1.19				
1	0.875	0.35	0.32	1.51				
1.25	1.125	0.45	0.41	1.92				
1.5	1.375	1.27	1.16	3.08				
1.75	1.625	3.15	2.87	5.95				
2	1.875	6.84	6.23	12.18				
2.25	2.125	17.64	16.07	28.24				
2.5	2.375	42.11	38.36	66.60				
2.75	2.625	14.69	13.38	79.98				
3	2.875	12.86	11.71	91.69				
3.25	3.125	4.90	4.46	96.16				
3.5	3.375	2.70	2.46	98.62				
3.75	3.625	0.65	0.59	99.21				
4	3.875	0.08	0.07	99.28				
>4.0	4.25	0.79	0.72	100.00				

Graphic Phi Parameters	Inman 1952	Folk & Ward 1957
Mean	2.322	2.303
Standard Deviation	0.387	0.424
Skewness (1)	0.148	0.097
Skewness (2)	0.090	
Kurtosis	0.961	1.369



Total weight (gram)	110.60
% finer than 4.00 phi	0.12
% coarser than -1.00 phi	5.28
% CaCO ₃	3.5



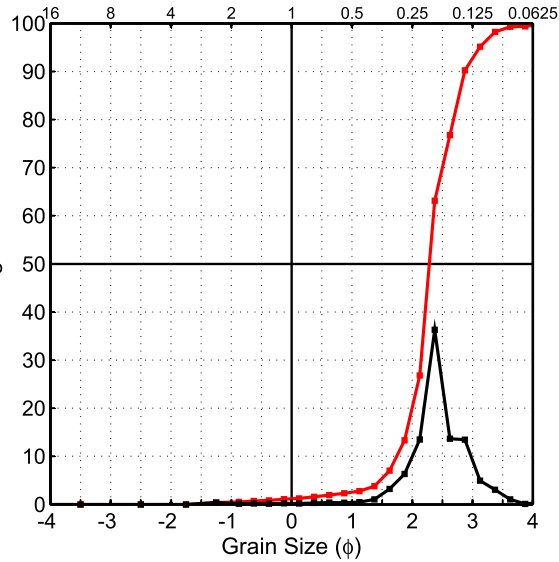
Total weight (gram)	100.09
% finer than 4.00 phi	0.01
% coarser than -1.00 phi	53.42
% CaCO ₃	18.7

Limits (ϕ)	Mid Point (ϕ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles	Moment Measures	(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1 -1.655	Mean	1.211	0.432
-3	-3.5	0.00	0.00	0.00	5 -1.275	Standard Deviation	1.061	0.479
-2	-2.5	0.00	0.00	0.00	16 -0.085	Skewness	-0.722	
-1.5	-1.75	0.00	0.00	0.00	25 0.445	Kurtosis	2.853	
-1	-1.25	5.84	5.28	5.28	50 1.345	Dispersion		
-0.75	-0.875	2.00	1.81	7.09	75 1.865	Standard Deviation		
-0.5	-0.625	2.80	2.53	9.62	84 2.080	Deviation from Normal		
-0.25	-0.375	2.80	2.53	12.15	95 2.375			
0	-0.125	3.73	3.37	15.52	99 2.820			
0.25	0.125	3.16	2.86	18.38				
0.5	0.375	5.37	4.86	23.24				
0.75	0.625	6.81	6.16	29.39				
1	0.875	5.57	5.04	34.43				
1.25	1.125	7.39	6.68	41.11				
1.5	1.375	11.24	10.16	51.27				
1.75	1.625	13.52	12.22	63.50				
2	1.875	13.18	11.92	75.42				
2.25	2.125	11.49	10.39	85.80				
2.5	2.375	10.15	9.18	94.98				
2.75	2.625	2.53	2.29	97.27				
3	2.875	2.44	2.21	99.48				
3.25	3.125	0.24	0.22	99.69				
3.5	3.375	0.14	0.13	99.82				
3.75	3.625	0.05	0.05	99.86				
4	3.875	0.02	0.02	99.88				
>4.0	4.25	0.13	0.12	100.00				
					Graphic Phi Parameters	Inman 1952	Folk & Ward 1957	
					Mean	0.998	1.113	
					Standard Deviation	1.083	1.094	
					Skewness (1)	-0.321	-0.378	
					Skewness (2)	-0.734		
					Kurtosis	0.686	1.053	

Limits (ϕ)	Mid Point (ϕ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles	Moment Measures	(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1 -3.445	Mean	-1.147	2.215
-3	-3.5	0.00	0.00	0.00	5 -3.220	Standard Deviation	0.871	0.547
-2	-2.5	18.03	18.01	18.01	16 -2.610	Skewness	0.102	
-1.5	-1.75	14.82	14.81	32.82	25 -2.145	Kurtosis	3.022	
-1	-1.25	20.62	20.60	53.42	50 -1.335	Dispersion		
-0.75	-0.875	10.42	10.41	63.83	75 -0.650	Standard Deviation		
-0.5	-0.625	12.41	12.40	76.23	84 -0.410	Deviation from Normal		
-0.25	-0.375	9.10	9.09	85.32	95 0.045			
0	-0.125	7.35	7.34	92.66	99 0.600			
0.25	0.125	3.40	3.40	96.06				
0.5	0.375	2.27	2.27	98.33				
0.75	0.625	0.74	0.74	99.07				
1	0.875	0.30	0.30	99.37				
1.25	1.125	0.17	0.17	99.54				
1.5	1.375	0.13	0.13	99.67				
1.75	1.625	0.07	0.07	99.74				
2	1.875	0.05	0.05	99.79				
2.25	2.125	0.05	0.05	99.84				
2.5	2.375	0.06	0.06	99.90				
2.75	2.625	0.03	0.03	99.93				
3	2.875	0.05	0.05	99.98				
3.25	3.125	0.00	0.00	99.98				
3.5	3.375	0.01	0.01	99.99				
3.75	3.625	0.00	0.00	99.99				
4	3.875	0.00	0.00	99.99				
>4.0	4.25	0.01	0.01	100.00				
					Graphic Phi Parameters	Inman 1952	Folk & Ward 1957	
					Mean	-1.510	-1.452	
					Standard Deviation	1.100	1.045	
					Skewness (1)	-0.159	-0.157	
					Skewness (2)	-0.230		
					Kurtosis	0.484	0.895	

Grain Size Distribution

Grain Size (mm)



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1890+00
Interval -12 ft NAVD

Mean 0.188 mm
STD 0.664 mm
Skewness -1.786

USCS Wentworth

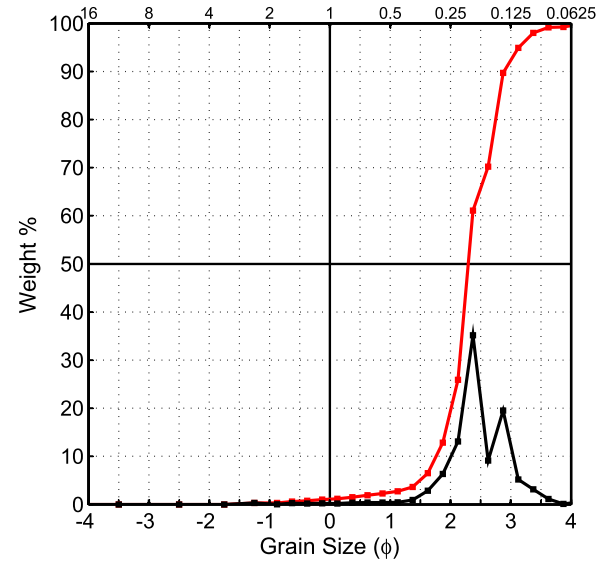
SP Fine Sand
 Poorly Graded

Fine Sand
 Moderately Well Sorted
 Strongly Coarse Skewed
 Very Leptokurtic

Total weight (gram) 105.70
 % finer than 4.00 phi 0.64
 % coarser than -1.00 phi 0.40
 % CaCO₃ 2.9

Grain Size Distribution

Grain Size (mm)



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1890+00
Interval -8 ft NAVD

Mean 0.184 mm
STD 0.664 mm
Skewness -1.604

USCS Wentworth

SP Fine Sand
 Poorly Graded

Fine Sand
 Moderately Well Sorted
 Strongly Coarse Skewed
 Very Leptokurtic

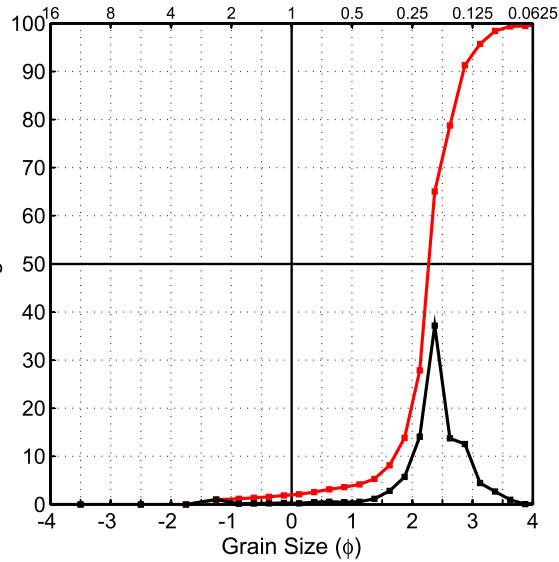
Total weight (gram) 99.70
 % finer than 4.00 phi 0.74
 % coarser than -1.00 phi 0.29
 % CaCO₃ 3.0

Limits (phi)	Mid Point (phi)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-0.210	Mean		2.409	0.188
-3	-3.5	0.00	0.00	0.00	5	1.470	Standard Deviation		0.590	0.664
-2	-2.5	0.00	0.00	0.00	16	1.925	Skewness		-1.786	
-1.5	-1.75	0.00	0.00	0.00	25	2.090	Kurtosis		12.720	
-1	-1.25	0.42	0.40	0.40	50	2.285	Dispersion			
-0.75	-0.875	0.13	0.12	0.52	75	2.595	Standard Deviation			
-0.5	-0.625	0.19	0.18	0.70	84	2.760	Deviation from Normal			
-0.25	-0.375	0.16	0.15	0.85	95	3.115				
0	-0.125	0.24	0.23	1.08	99	3.560				
0.25	0.125	0.18	0.17	1.25						
0.5	0.375	0.34	0.32	1.57						
0.75	0.625	0.40	0.38	1.95	Graphic Phi Parameters		Inman	Folk & Ward		
1	0.875	0.37	0.35	2.30			1952	1957		
1.25	1.125	0.48	0.45	2.75						
1.5	1.375	1.10	1.04	3.79						
1.75	1.625	3.40	3.22	7.01						
2	1.875	6.67	6.31	13.32						
2.25	2.125	14.26	13.49	26.81						
2.5	2.375	38.37	36.30	63.11						
2.75	2.625	14.44	13.66	76.77						
3	2.875	14.23	13.46	90.24						
3.25	3.125	5.20	4.92	95.16						
3.5	3.375	3.24	3.07	98.22						
3.75	3.625	1.11	1.05	99.27						
4	3.875	0.09	0.09	99.36						
>4.0	4.25	0.68	0.64	100.00						

Limits (phi)	Mid Point (phi)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-0.100	Mean		2.441	0.184
-3	-3.5	0.00	0.00	0.00	5	1.495	Standard Deviation		0.590	0.664
-2	-2.5	0.00	0.00	0.00	16	1.935	Skewness		-1.604	
-1.5	-1.75	0.00	0.00	0.00	25	2.110	Kurtosis		11.468	
-1	-1.25	0.29	0.29	0.29	50	2.295	Dispersion			
-0.75	-0.875	0.03	0.03	0.32	75	2.685	Standard Deviation			
-0.5	-0.625	0.27	0.27	0.59	84	2.800	Deviation from Normal			
-0.25	-0.375	0.17	0.17	0.76	95	3.135				
0	-0.125	0.22	0.22	0.98	99	3.590				
0.25	0.125	0.18	0.18	1.16						
0.5	0.375	0.34	0.34	1.50						
0.75	0.625	0.39	0.39	1.90	Graphic Phi Parameters		Inman	Folk & Ward		
1	0.875	0.39	0.39	2.29			1952	1957		
1.25	1.125	0.43	0.43	2.72						
1.5	1.375	0.90	0.90	3.62						
1.75	1.625	2.85	2.86	6.48						
2	1.875	6.32	6.34	12.82						
2.25	2.125	13.04	13.08	25.90						
2.5	2.375	35.07	35.18	61.07						
2.75	2.625	9.10	9.13	70.20						
3	2.875	19.44	19.50	89.70						
3.25	3.125	5.17	5.19	94.88						
3.5	3.375	3.14	3.15	98.03						
3.75	3.625	1.13	1.13	99.17						
4	3.875	0.09	0.09	99.26						
>4.0	4.25	0.74	0.74	100.00						

Grain Size Distribution

Grain Size (mm)



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1890+00
Interval -20 ft NAVD

Mean 0.195 mm
STD 0.630 mm
Skewness -2.316

USCS Wentworth

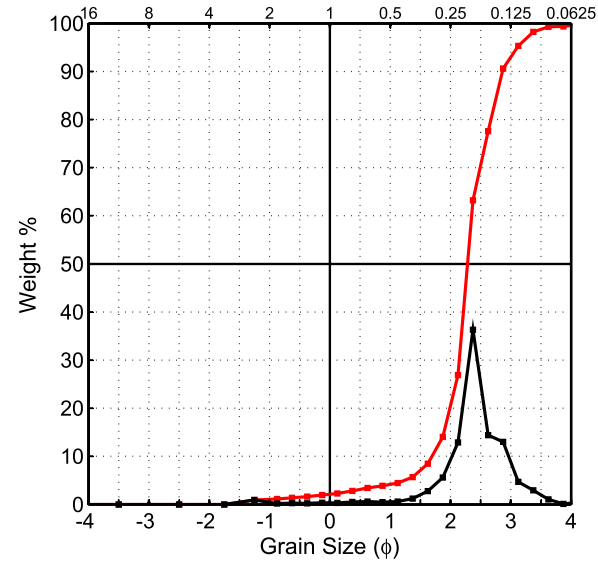
SP Fine Sand
 Poorly Graded

Fine Sand
 Moderately Well Sorted
 Strongly Coarse Skewed
 Very Leptokurtic

Total weight (gram) 110.49
 % finer than 4.00 phi 0.56
 % coarser than -1.00 phi 1.00
 % CaCO₃ 3.5

Grain Size Distribution

Grain Size (mm)



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1890+00
Interval -16 ft NAVD

Mean 0.194 mm
STD 0.622 mm
Skewness -2.217

USCS Wentworth

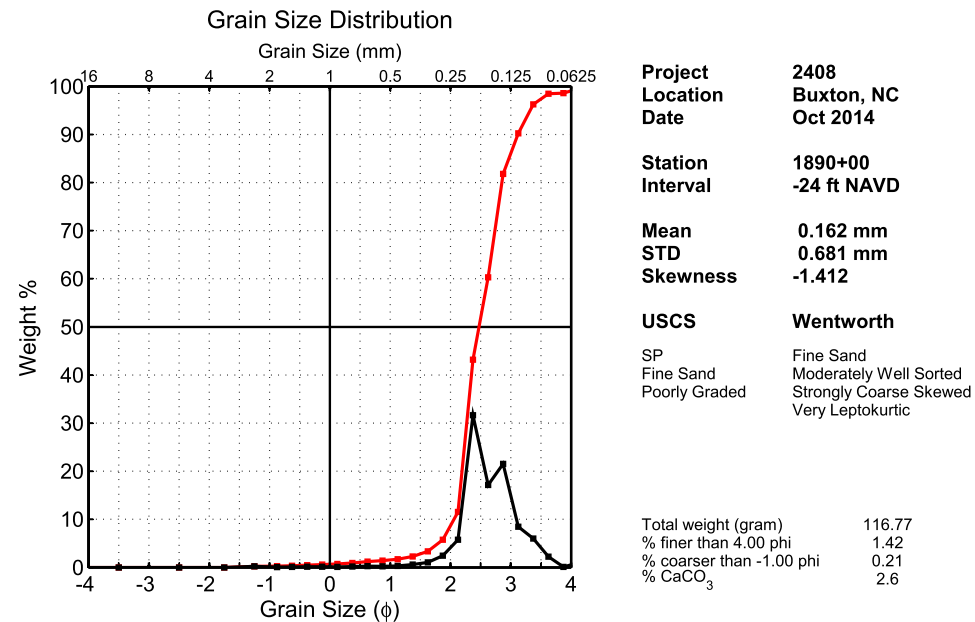
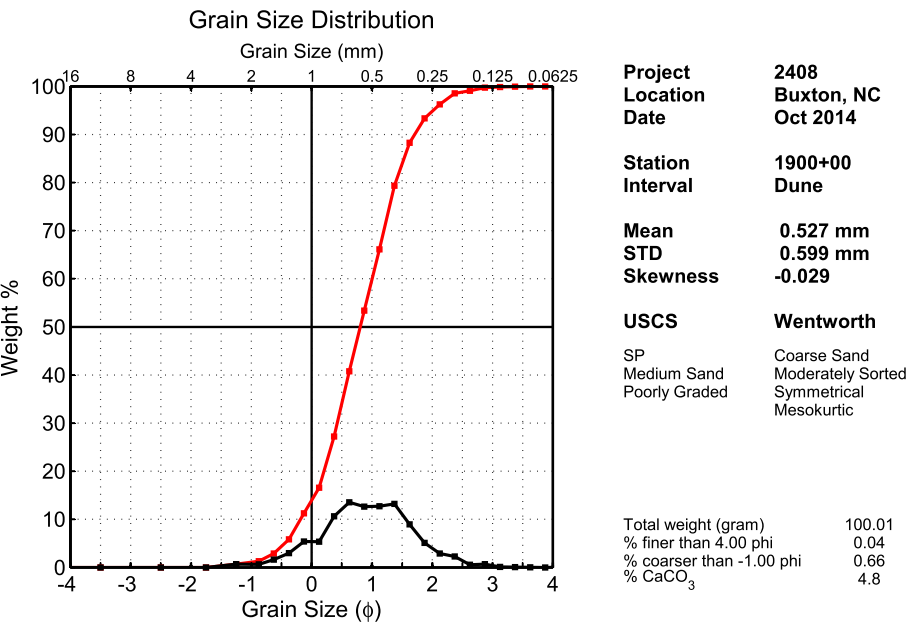
SP Fine Sand
 Poorly Graded

Fine Sand
 Moderately Well Sorted
 Strongly Coarse Skewed
 Very Leptokurtic

Total weight (gram) 105.35
 % finer than 4.00 phi 0.65
 % coarser than -1.00 phi 0.94
 % CaCO₃ 3.6

Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures	(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-1.250	Mean	2.360	0.195
-3	-3.5	0.00	0.00	0.00	5	1.305	Standard Deviation	0.667	0.630
-2	-2.5	0.00	0.00	0.00	16	1.915	Skewness	-2.316	
-1.5	-1.75	0.00	0.00	0.00	25	2.075	Kurtosis	13.400	
-1	-1.25	1.11	1.00	1.00	50	2.275	Dispersion		
-0.75	-0.875	0.17	0.15	1.16	75	2.555	Standard Deviation		
-0.5	-0.625	0.22	0.20	1.36	84	2.730	Deviation from Normal		
-0.25	-0.375	0.24	0.22	1.57	95	3.085			
0	-0.125	0.32	0.29	1.86	99	3.525			
0.25	0.125	0.27	0.24	2.11					
0.5	0.375	0.50	0.45	2.56					
0.75	0.625	0.62	0.56	3.12					
1	0.875	0.50	0.45	3.57					
1.25	1.125	0.62	0.56	4.14					
1.5	1.375	1.31	1.19	5.32					
1.75	1.625	3.09	2.80	8.12					
2	1.875	6.29	5.69	13.81					
2.25	2.125	15.52	14.05	27.86					
2.5	2.375	41.08	37.18	65.04					
2.75	2.625	15.16	13.72	78.76					
3	2.875	13.86	12.54	91.30					
3.25	3.125	4.90	4.43	95.74					
3.5	3.375	2.98	2.70	98.43					
3.75	3.625	1.05	0.95	99.38					
4	3.875	0.06	0.05	99.44					
>4.0	4.25	0.62	0.56	100.00					
					Graphic Phi Parameters		Inman	Folk & Ward	
							1952	1957	
					Mean		2.322	2.307	
					Standard Deviation		0.407	0.473	
					Skewness (1)		0.117	0.013	
					Skewness (2)		-0.196		
					Kurtosis		1.184	1.520	

Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-1.125	Mean		2.369	0.194
-3	-3.5	0.00	0.00	0.00	5	1.235	Standard Deviation		0.684	0.622
-2	-2.5	0.00	0.00	0.00	16	1.915	Skewness		-2.217	
-1.5	-1.75	0.00	0.00	0.00	25	2.090	Kurtosis		12.453	
-1	-1.25	0.99	0.94	0.94	50	2.285	Dispersion			
-0.75	-0.875	0.19	0.18	1.12	75	2.580	Standard Deviation			
-0.5	-0.625	0.27	0.26	1.38	84	2.750	Deviation from Normal			
-0.25	-0.375	0.25	0.24	1.61	95	3.110				
0	-0.125	0.37	0.35	1.96	99	3.560				
0.25	0.125	0.34	0.32	2.29						
0.5	0.375	0.55	0.52	2.81						
0.75	0.625	0.63	0.60	3.41						
1	0.875	0.49	0.47	3.87						
1.25	1.125	0.61	0.58	4.45						
1.5	1.375	1.29	1.22	5.68						
1.75	1.625	2.91	2.76	8.44						
2	1.875	5.89	5.59	14.03						
2.25	2.125	13.56	12.87	26.90						
2.5	2.375	38.25	36.31	63.21						
2.75	2.625	15.15	14.38	77.59						
3	2.875	13.71	13.01	90.60						
3.25	3.125	4.94	4.69	95.29						
3.5	3.375	3.08	2.92	98.22						
3.75	3.625	1.11	1.05	99.27						
4	3.875	0.09	0.09	99.35						
>4.0	4.25	0.68	0.65	100.00						
					Graphic Phi Parameters		Inman	Folk & Ward		
							1952	1957		
					Mean		2.333	2.317		
					Standard Deviation		0.417	0.493		
					Skewness (1)		0.114	-0.003		
					Skewness (2)		-0.269			
					Kurtosis		1.246	1.568		



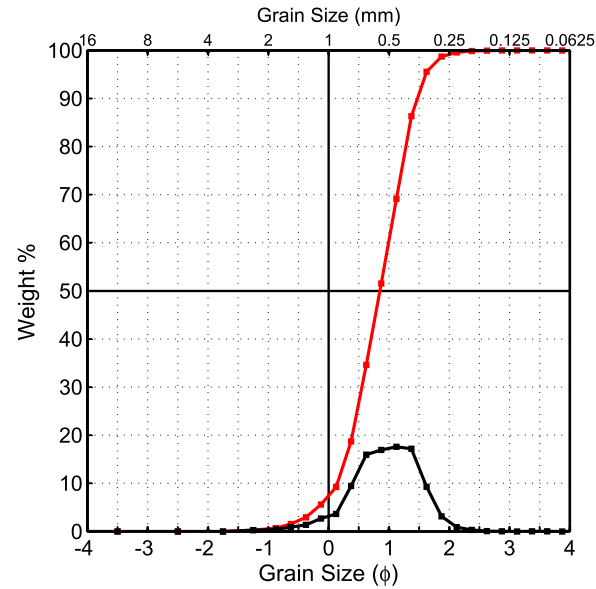
Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-1.050	Mean		0.924	0.527
-3	-3.5	0.00	0.00	0.00	5	-0.445	Standard Deviation		0.740	0.599
-2	-2.5	0.00	0.00	0.00	16	0.100	Skewness		-0.029	
-1.5	-1.75	0.00	0.00	0.00	25	0.325	Kurtosis		3.267	
-1	-1.25	0.66	0.66	0.66	50	0.810	Dispersion			
-0.75	-0.875	0.63	0.63	1.29	75	1.295	Standard Deviation			
-0.5	-0.625	1.60	1.60	2.89	84	1.505	Deviation from Normal			
-0.25	-0.375	2.96	2.96	5.85	95	2.015				
0	-0.125	5.38	5.38	11.23	99	2.590				
0.25	0.125	5.34	5.34	16.57						
0.5	0.375	10.64	10.64	27.21						
0.75	0.625	13.54	13.54	40.75						
1	0.875	12.65	12.65	53.39						
1.25	1.125	12.73	12.73	66.12						
1.5	1.375	13.20	13.20	79.32						
1.75	1.625	8.95	8.95	88.27						
2	1.875	5.09	5.09	93.36						
2.25	2.125	2.90	2.90	96.26						
2.5	2.375	2.27	2.27	98.53						
2.75	2.625	0.55	0.55	99.08						
3	2.875	0.66	0.66	99.74						
3.25	3.125	0.12	0.12	99.86						
3.5	3.375	0.07	0.07	99.93						
3.75	3.625	0.03	0.03	99.96						
4	3.875	0.00	0.00	99.96						
>4.0	4.25	0.04	0.04	100.00						

Percentiles		Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean				0.802	0.805
Standard Deviation				0.702	0.724
Skewness (1)				-0.011	-0.016
Skewness (2)				-0.036	
Kurtosis				0.751	1.039

Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	0.450	Mean		2.628	0.162
-3	-3.5	0.00	0.00	0.00	5	1.795	Standard Deviation		0.554	0.681
-2	-2.5	0.00	0.00	0.00	16	2.160	Skewness		-1.412	
-1.5	-1.75	0.00	0.00	0.00	25	2.230	Kurtosis		12.550	
-1	-1.25	0.24	0.21	0.21	50	2.475	Dispersion			
-0.75	-0.875	0.06	0.05	0.26	75	2.795	Standard Deviation			
-0.5	-0.625	0.10	0.09	0.34	84	2.940	Deviation from Normal			
-0.25	-0.375	0.15	0.13	0.47	95	3.325				
0	-0.125	0.15	0.13	0.60	99	3.985				
0.25	0.125	0.14	0.12	0.72						
0.5	0.375	0.23	0.20	0.92						
0.75	0.625	0.32	0.27	1.19						
1	0.875	0.26	0.22	1.41						
1.25	1.125	0.35	0.30	1.71						
1.5	1.375	0.67	0.57	2.29						
1.75	1.625	1.24	1.06	3.35						
2	1.875	2.83	2.42	5.77						
2.25	2.125	6.73	5.76	11.54						
2.5	2.375	36.93	31.63	43.16						
2.75	2.625	20.01	17.14	60.30						
3	2.875	25.11	21.50	81.80						
3.25	3.125	9.86	8.44	90.25						
3.5	3.375	7.02	6.01	96.26						
3.75	3.625	2.59	2.22	98.48						
4	3.875	0.12	0.10	98.58						
>4.0	4.25	1.66	1.42	100.00						

Percentiles		Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean				2.550	2.525
Standard Deviation				0.390	0.427
Skewness (1)				0.192	0.152
Skewness (2)				0.218	
Kurtosis				0.962	1.110

Grain Size Distribution



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1900+00
Interval Berm

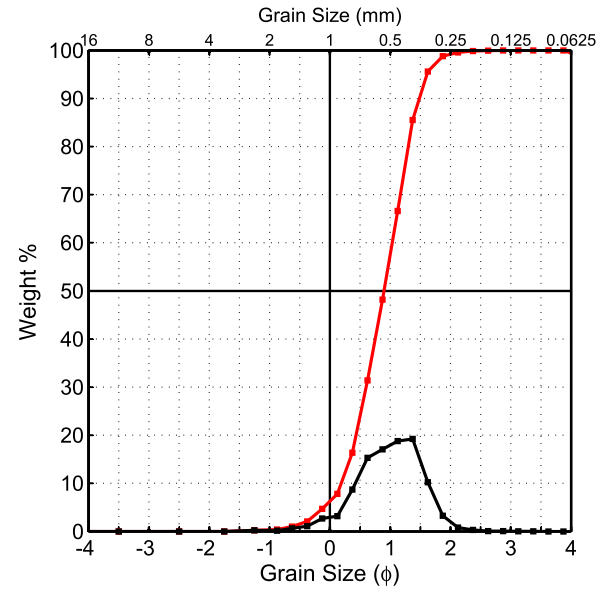
Mean 0.521 mm
STD 0.681 mm
Skewness -0.472

USCS Wentworth

SP Coarse Sand
 Medium Sand Moderately Well Sorted
 Poorly Graded Coarse Skewed
 Leptokurtic

Total weight (gram) 100.05
 % finer than 4.00 phi 0.02
 % coarser than -1.00 phi 0.26
 % CaCO₃ 4.0

Grain Size Distribution



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1900+00
Interval Dune Toe

Mean 0.528 mm
STD 0.809 mm
Skewness -23.813

USCS Wentworth

SP Coarse Sand
 Medium Sand Very Well Sorted
 Poorly Graded Strongly Coarse Skewed
 Very Platykurtic

Total weight (gram) 98.04
 % finer than 4.00 phi -1.76
 % coarser than -1.00 phi 0.22
 % CaCO₃ 3.8

Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-0.780	Mean		0.940	0.521
-3	-3.5	0.00	0.00	0.00	5	-0.180	Standard Deviation		0.554	0.681
-2	-2.5	0.00	0.00	0.00	16	0.305	Skewness		-0.472	
-1.5	-1.75	0.00	0.00	0.00	25	0.475	Kurtosis		4.068	
-1	-1.25	0.26	0.26	0.26	50	0.850	Dispersion			
-0.75	-0.875	0.40	0.40	0.66	75	1.210	Standard Deviation			
-0.5	-0.625	0.89	0.89	1.55	84	1.340	Deviation from Normal			
-0.25	-0.375	1.36	1.36	2.91	95	1.610				
0	-0.125	2.70	2.70	5.61	99	1.965				
0.25	0.125	3.62	3.62	9.23						
0.5	0.375	9.46	9.46	18.68						
0.75	0.625	15.94	15.93	34.61						
1	0.875	16.94	16.93	51.54						
1.25	1.125	17.60	17.59	69.14						
1.5	1.375	17.17	17.16	86.30						
1.75	1.625	9.26	9.26	95.55						
2	1.875	3.14	3.14	98.69						
2.25	2.125	0.88	0.88	99.57						
2.5	2.375	0.29	0.29	99.86						
2.75	2.625	0.06	0.06	99.92						
3	2.875	0.04	0.04	99.96						
3.25	3.125	0.00	0.00	99.96						
3.5	3.375	0.01	0.01	99.97						
3.75	3.625	0.01	0.01	99.98						
4	3.875	0.00	0.00	99.98						
>4.0	4.25	0.02	0.02	100.00						

Percentiles		Moment Measures		(phi)	(mm)
1	-0.780	Mean		0.940	0.521
5	-0.180	Standard Deviation		0.554	0.681
16	0.305	Skewness		-0.472	
25	0.475	Kurtosis		4.068	
50	0.850	Dispersion			
75	1.210	Standard Deviation			
84	1.340	Deviation from Normal			
95	1.610				
99	1.965				

Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean		0.822	0.832
Standard Deviation		0.518	0.530
Skewness (1)		-0.053	-0.102
Skewness (2)		-0.261	
Kurtosis		0.729	0.998

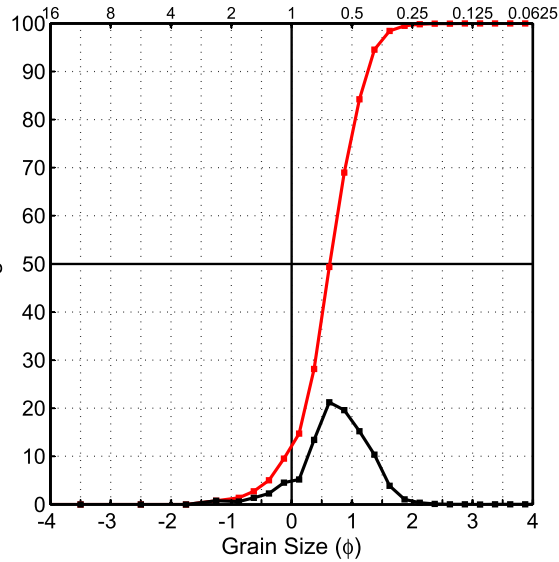
Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-0.625	Mean		0.922	0.528
-3	-3.5	0.00	0.00	0.00	5	-0.100	Standard Deviation		0.305	0.809
-2	-2.5	0.00	0.00	0.00	16	0.365	Skewness		-23.813	
-1.5	-1.75	0.00	0.00	0.00	25	0.520	Kurtosis		-214.462	
-1	-1.25	0.22	0.22	0.22	50	0.900	Dispersion			
-0.75	-0.875	0.16	0.16	0.39	75	1.235	Standard Deviation			
-0.5	-0.625	0.61	0.62	1.01	84	1.355	Deviation from Normal			
-0.25	-0.375	1.07	1.09	2.10	95	1.610				
0	-0.125	2.61	2.66	4.76	99	1.945				
0.25	0.125	3.12	3.18	7.95						
0.5	0.375	8.55	8.72	16.67						
0.75	0.625	14.98	15.28	31.95						
1	0.875	16.73	17.06	49.01						
1.25	1.125	18.42	18.79	67.80						
1.5	1.375	18.86	19.24	87.04						
1.75	1.625	10.03	10.23	97.27						
2	1.875	3.20	3.26	100.53						
2.25	2.125	0.77	0.79	101.32						
2.5	2.375	0.31	0.32	101.63						
2.75	2.625	0.06	0.06	101.69						
3	2.875	0.05	0.05	101.74						
3.25	3.125	0.01	0.01	101.75						
3.5	3.375	0.01	0.01	101.76						
3.75	3.625	0.00	0.00	101.76						
4	3.875	0.00	0.00	101.76						
>4.0	4.25	-1.73	-1.76	100.00						

Percentiles		Moment Measures		(phi)	(mm)
1	-0.625	Mean		0.922	0.528
5	-0.100	Standard Deviation		0.305	0.809
16	0.365	Skewness		-23.813	
25	0.520	Kurtosis		-214.462	
50	0.900	Dispersion			
75	1.235	Standard Deviation			
84	1.355	Deviation from Normal			
95	1.610				
99	1.945				

Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean		0.860	0.873
Standard Deviation		0.495	0.507
Skewness (1)		-0.081	-0.125
Skewness (2)		-0.293	
Kurtosis		0.727	0.980

Grain Size Distribution

Grain Size (mm)



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1900+00
Interval MHW

Mean 0.602 mm
STD 0.684 mm
Skewness -0.529

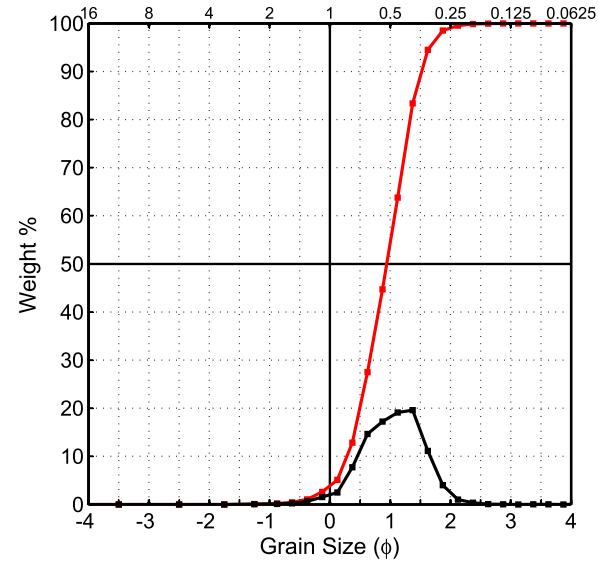
USCS Wentworth

SP Coarse Sand
 Medium Sand Moderately Well Sorted
 Poorly Graded Coarse Skewed
 Leptokurtic

Total weight (gram) 100.00
 % finer than 4.00 phi 0.01
 % coarser than -1.00 phi 0.77
 % CaCO₃ 5.5

Grain Size Distribution

Grain Size (mm)



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1900+00
Interval BC

Mean 0.486 mm
STD 0.709 mm
Skewness -0.278

USCS Wentworth

SP Medium Sand
 Medium Sand Well Sorted
 Poorly Graded Symmetrical
 Leptokurtic

Total weight (gram) 99.76
 % finer than 4.00 phi 0.02
 % coarser than -1.00 phi 0.06
 % CaCO₃ 3.4

Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-1.105	Mean		0.732	0.602
-3	-3.5	0.00	0.00	0.00	5	-0.375	Standard Deviation		0.548	0.684
-2	-2.5	0.00	0.00	0.00	16	0.150	Skewness		-0.529	
-1.5	-1.75	0.00	0.00	0.00	25	0.315	Kurtosis		4.429	
-1	-1.25	0.77	0.77	0.77	50	0.635	Dispersion			
-0.75	-0.875	0.59	0.59	1.36	75	0.975	Standard Deviation			
-0.5	-0.625	1.36	1.36	2.72	84	1.120	Deviation from Normal			
-0.25	-0.375	2.29	2.29	5.01	95	1.405				
0	-0.125	4.51	4.51	9.52	99	1.760				
0.25	0.125	5.20	5.20	14.72						
0.5	0.375	13.42	13.42	28.14						
0.75	0.625	21.24	21.24	49.38						
1	0.875	19.61	19.61	68.99						
1.25	1.125	15.21	15.21	84.20						
1.5	1.375	10.34	10.34	94.54						
1.75	1.625	3.88	3.88	98.42						
2	1.875	1.06	1.06	99.48						
2.25	2.125	0.33	0.33	99.81						
2.5	2.375	0.11	0.11	99.92						
2.75	2.625	0.03	0.03	99.95						
3	2.875	0.02	0.02	99.97						
3.25	3.125	-0.01	-0.01	99.96						
3.5	3.375	0.01	0.01	99.97						
3.75	3.625	0.01	0.01	99.98						
4	3.875	0.01	0.01	99.99						
>4.0	4.25	0.01	0.01	100.00						

Percentiles		Moment Measures		(phi)	(mm)
1	-1.105	Mean		0.732	0.602
5	-0.375	Standard Deviation		0.548	0.684
16	0.150	Skewness		-0.529	
25	0.315	Kurtosis		4.429	
50	0.635	Dispersion			
75	0.975	Standard Deviation			
84	1.120	Deviation from Normal			
95	1.405				
99	1.760				

Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean		0.635	0.635
Standard Deviation		0.485	0.512
Skewness (1)		0.000	-0.067
Skewness (2)		-0.247	
Kurtosis		0.835	1.105

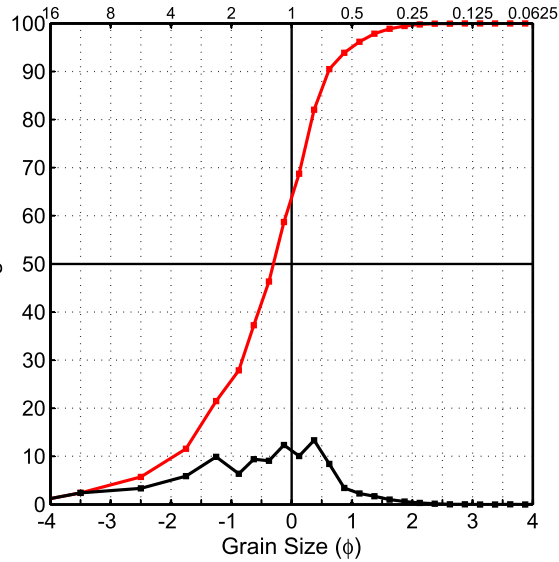
Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-0.395	Mean		1.041	0.486
-3	-3.5	0.00	0.00	0.00	5	0.115	Standard Deviation		0.496	0.709
-2	-2.5	0.00	0.00	0.00	16	0.430	Skewness		-0.278	
-1.5	-1.75	0.00	0.00	0.00	25	0.585	Kurtosis		3.938	
-1	-1.25	0.06	0.06	0.06	50	0.945	Dispersion			
-0.75	-0.875	0.12	0.12	0.18	75	1.270	Standard Deviation			
-0.5	-0.625	0.24	0.24	0.42	84	1.390	Deviation from Normal			
-0.25	-0.375	0.63	0.63	1.05	95	1.655				
0	-0.125	1.54	1.54	2.60	99	1.995				
0.25	0.125	2.49	2.50	5.09						
0.5	0.375	7.72	7.74	12.83						
0.75	0.625	14.62	14.66	27.49						
1	0.875	17.16	17.20	44.69						
1.25	1.125	19.06	19.11	63.79						
1.5	1.375	19.53	19.58	83.37						
1.75	1.625	11.10	11.13	94.50						
2	1.875	4.00	4.01	98.51						
2.25	2.125	1.01	1.01	99.52						
2.5	2.375	0.34	0.34	99.86						
2.75	2.625	0.06	0.06	99.92						
3	2.875	0.04	0.04	99.96						
3.25	3.125	0.00	0.00	99.96						
3.5	3.375	0.01	0.01	99.97						
3.75	3.625	0.01	0.01	99.98						
4	3.875	0.00	0.00	99.98						
>4.0	4.25	0.02	0.02	100.00						

Percentiles		Moment Measures		(phi)	(mm)
1	-0.395	Mean		1.041	0.486
5	0.115	Standard Deviation		0.496	0.709
16	0.430	Skewness		-0.278	
25	0.585	Kurtosis		3.938	
50	0.945	Dispersion			
75	1.270	Standard Deviation			
84	1.390	Deviation from Normal			
95	1.655				
99	1.995				

Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean		0.910	0.922
Standard Deviation		0.480	0.473
Skewness (1)		-0.073	-0.075
Skewness (2)		-0.125	
Kurtosis		0.604	0.921

Grain Size Distribution

Grain Size (mm)



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1900+00
Interval MLW

Mean 1.251 mm
STD 0.492 mm
Skewness -0.732

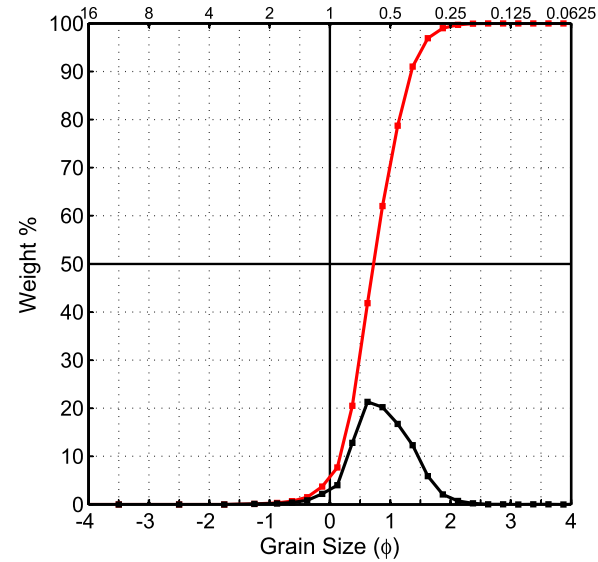
USCS Wentworth

SP Very Coarse Sand
 Medium Sand Poorly Sorted
 Poorly Graded Coarse Skewed
 Leptokurtic

Total weight (gram) 100.41
 % finer than 4.00 phi 0.01
 % coarser than -1.00 phi 21.48
 % CaCO₃ 9.6

Grain Size Distribution

Grain Size (mm)



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1900+00
Interval MTL

Mean 0.549 mm
STD 0.714 mm
Skewness -0.051

USCS Wentworth

SP Coarse Sand
 Medium Sand Well Sorted
 Poorly Graded Symmetrical
 Leptokurtic

Total weight (gram) 99.34
 % finer than 4.00 phi 0.01
 % coarser than -1.00 phi 0.11
 % CaCO₃ 4.6

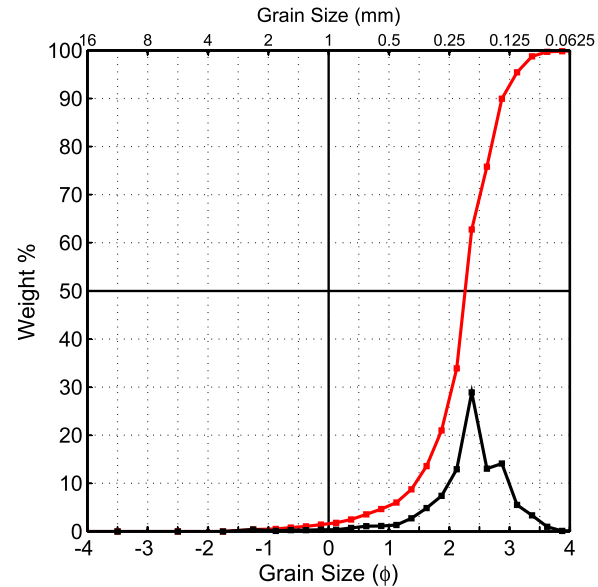
Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-4.080	Mean	-0.323	1.251	
-3	-3.5	2.39	2.38	2.38	5	-2.710	Standard Deviation	1.024	0.492	
-2	-2.5	3.34	3.33	5.71	16	-1.525	Skewness	-0.732		
-1.5	-1.75	5.89	5.87	11.57	25	-1.045	Kurtosis	4.107		
-1	-1.25	9.95	9.91	21.48	50	-0.300	Dispersion			
-0.75	-0.875	6.40	6.37	27.86	75	0.240	Standard Deviation			
-0.5	-0.625	9.44	9.40	37.26	84	0.435	Deviation from Normal			
-0.25	-0.375	9.12	9.08	46.34	95	0.995				
0	-0.125	12.40	12.35	58.69	99	1.680				
0.25	0.125	10.10	10.06	68.75						
0.5	0.375	13.37	13.32	82.06						
0.75	0.625	8.43	8.40	90.46						
1	0.875	3.44	3.43	93.89						
1.25	1.125	2.29	2.28	96.17						
1.5	1.375	1.70	1.69	97.86						
1.75	1.625	1.01	1.01	98.86						
2	1.875	0.60	0.60	99.46						
2.25	2.125	0.30	0.30	99.76						
2.5	2.375	0.16	0.16	99.92						
2.75	2.625	0.03	0.03	99.95						
3	2.875	0.03	0.03	99.98						
3.25	3.125	0.00	0.00	99.98						
3.5	3.375	0.00	0.00	99.98						
3.75	3.625	0.01	0.01	99.99						
4	3.875	0.00	0.00	99.99						
>4.0	4.25	0.01	0.01	100.00						

Percentiles		Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean				-0.545	-0.463
Standard Deviation				0.980	1.051
Skewness (1)				-0.250	-0.275
Skewness (2)				-0.569	
Kurtosis				0.890	1.182

Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-0.525	Mean	0.866	0.549	
-3	-3.5	0.00	0.00	0.00	5	-0.045	Standard Deviation	0.487	0.714	
-2	-2.5	0.00	0.00	0.00	16	0.285	Skewness	-0.051		
-1.5	-1.75	0.00	0.00	0.00	25	0.430	Kurtosis	4.025		
-1	-1.25	0.11	0.11	0.11	50	0.725	Dispersion			
-0.75	-0.875	0.18	0.18	0.29	75	1.070	Standard Deviation			
-0.5	-0.625	0.37	0.37	0.66	84	1.230	Deviation from Normal			
-0.25	-0.375	0.82	0.83	1.49	95	1.545				
0	-0.125	2.19	2.20	3.69	99	1.875				
0.25	0.125	3.97	4.00	7.69						
0.5	0.375	12.73	12.81	20.51						
0.75	0.625	21.17	21.31	41.82						
1	0.875	20.07	20.20	62.02						
1.25	1.125	16.61	16.72	78.74						
1.5	1.375	12.21	12.29	91.03						
1.75	1.625	5.84	5.88	96.91						
2	1.875	2.07	2.08	98.99						
2.25	2.125	0.70	0.70	99.70						
2.5	2.375	0.23	0.23	99.93						
2.75	2.625	0.03	0.03	99.96						
3	2.875	0.01	0.01	99.97						
3.25	3.125	0.00	0.00	99.97						
3.5	3.375	0.01	0.01	99.98						
3.75	3.625	0.01	0.01	99.99						
4	3.875	0.00	0.00	99.99						
>4.0	4.25	0.01	0.01	100.00						

Percentiles		Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean				0.758	0.747
Standard Deviation				0.472	0.477
Skewness (1)				0.069	0.050
Skewness (2)				0.053	
Kurtosis				0.683	1.018

Grain Size Distribution



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1900+00
Interval Bar

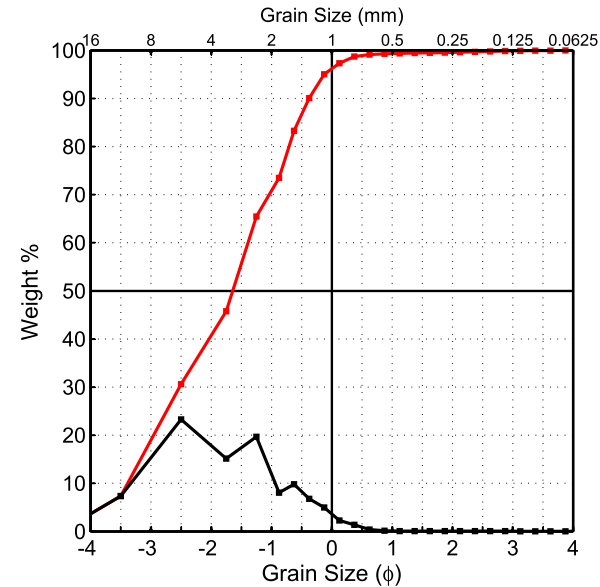
Mean 0.200 mm
STD 0.623 mm
Skewness -1.583

USCS Wentworth

SP Fine Sand
 Coarse Sand Moderately Well Sorted
 Poorly Graded Strongly Coarse Skewed
 Very Leptokurtic

Total weight (gram) 110.29
 % finer than 4.00 phi 0.20
 % coarser than -1.00 phi 0.41
 % CaCO_3 2.6

Grain Size Distribution



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1900+00
Interval Trough

Mean 2.797 mm
STD 0.486 mm
Skewness 0.143

USCS Wentworth

SP Granule
 Coarse Sand Poorly Sorted
 Poorly Graded Symmetrical
 Mesokurtic

Total weight (gram) 109.99
 % finer than 4.00 phi 0.03
 % coarser than -1.00 phi 65.45
 % CaCO_3 25.3

Limits (ϕ)	Mid Point (ϕ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-0.430	Mean		2.320	0.200
-3	-3.5	0.00	0.00	0.00	5	0.940	Standard Deviation		0.683	0.623
-2	-2.5	0.00	0.00	0.00	16	1.705	Skewness		-1.583	
-1.5	-1.75	0.00	0.00	0.00	25	1.955	Kurtosis		8.128	
-1	-1.25	0.45	0.41	0.41	50	2.265	Dispersion			
-0.75	-0.875	0.11	0.10	0.51	75	2.610	Standard Deviation			
-0.5	-0.625	0.30	0.27	0.78	84	2.770	Deviation from Normal			
-0.25	-0.375	0.31	0.28	1.06	95	3.105				
0	-0.125	0.40	0.36	1.42	99	3.435				
0.25	0.125	0.38	0.34	1.77						
0.5	0.375	0.77	0.70	2.47						
0.75	0.625	1.18	1.07	3.54						
1	0.875	1.24	1.12	4.66						
1.25	1.125	1.47	1.33	5.99						
1.5	1.375	3.01	2.73	8.72						
1.75	1.625	5.36	4.86	13.58						
2	1.875	8.15	7.39	20.97						
2.25	2.125	14.24	12.91	33.88						
2.5	2.375	31.86	28.89	62.77						
2.75	2.625	14.37	13.03	75.80						
3	2.875	15.58	14.13	89.93						
3.25	3.125	6.08	5.51	95.44						
3.5	3.375	3.67	3.33	98.77						
3.75	3.625	1.04	0.94	99.71						
4	3.875	0.10	0.09	99.80						
>4.0	4.25	0.22	0.20	100.00						

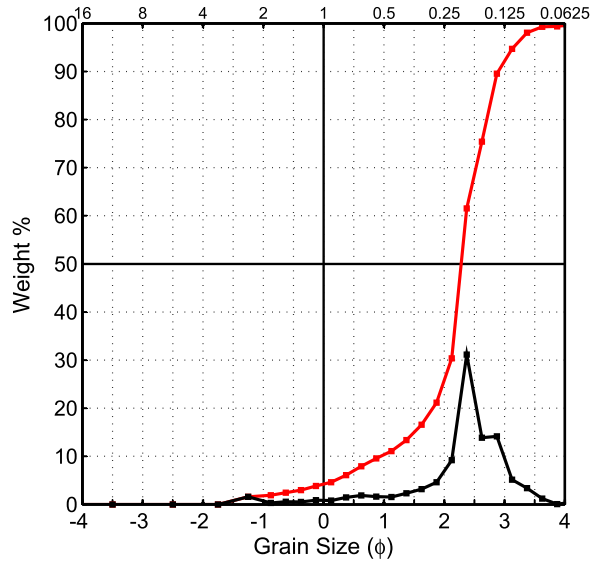
Percentiles		Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean				2.237	2.247
Standard Deviation				0.532	0.594
Skewness (1)				-0.052	-0.138
Skewness (2)				-0.455	
Kurtosis				1.033	1.355

Limits (ϕ)	Mid Point (ϕ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-4.125	Mean		-1.484	2.797
-3	-3.5	8.07	7.34	7.34	5	-3.820	Standard Deviation		1.040	0.486
-2	-2.5	25.61	23.28	30.62	16	-3.130	Skewness		0.143	
-1.5	-1.75	16.65	15.14	45.76	25	-2.740	Kurtosis		3.650	
-1	-1.25	21.66	19.69	65.45	50	-1.640	Dispersion			
-0.75	-0.875	8.84	8.04	73.49	75	-0.835	Standard Deviation			
-0.5	-0.625	10.77	9.79	83.28	84	-0.600	Deviation from Normal			
-0.25	-0.375	7.45	6.77	90.05	95	-0.125				
0	-0.125	5.47	4.97	95.03	99	0.555				
0.25	0.125	2.52	2.29	97.32						
0.5	0.375	1.53	1.39	98.71						
0.75	0.625	0.44	0.40	99.11						
1	0.875	0.17	0.15	99.26						
1.25	1.125	0.09	0.08	99.35						
1.5	1.375	0.09	0.08	99.43						
1.75	1.625	0.07	0.06	99.49						
2	1.875	0.06	0.05	99.55						
2.25	2.125	0.09	0.08	99.63						
2.5	2.375	0.09	0.08	99.71						
2.75	2.625	0.08	0.07	99.78						
3	2.875	0.08	0.07	99.85						
3.25	3.125	0.04	0.04	99.89						
3.5	3.375	0.03	0.03	99.92						
3.75	3.625	0.03	0.03	99.95						
4	3.875	0.03	0.03	99.97						
>4.0	4.25	0.03	0.03	100.00						

Percentiles		Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean				-1.865	-1.790
Standard Deviation				1.265	1.192
Skewness (1)				-0.178	-0.179
Skewness (2)				-0.263	
Kurtosis				0.460	0.795

Grain Size Distribution

Grain Size (mm)



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1900+00
Interval -12 ft NAVD

Mean 0.211 mm
STD 0.540 mm
Skewness -1.754

USCS Wentworth

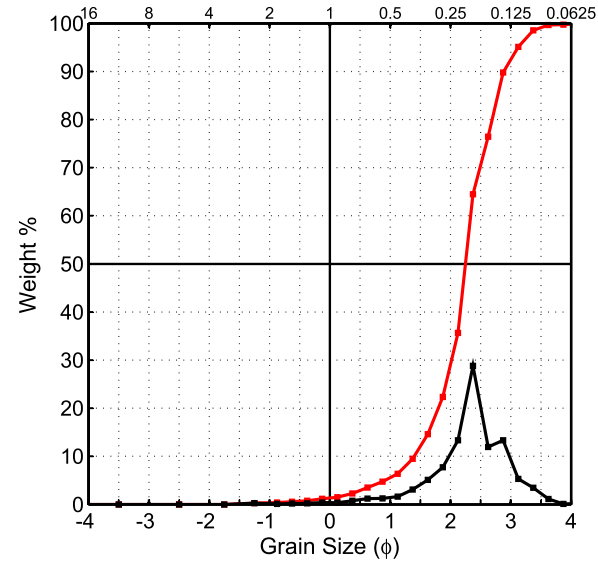
SP Fine Sand
 Poorly Graded

Fine Sand
 Moderately Sorted
 Strongly Coarse Skewed
 Leptokurtic

Total weight (gram) 129.83
 % finer than 4.00 phi 0.65
 % coarser than -1.00 phi 1.59
 % CaCO₃ 3.1

Grain Size Distribution

Grain Size (mm)



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1900+00
Interval -8 ft NAVD

Mean 0.202 mm
STD 0.625 mm
Skewness -1.322

USCS Wentworth

SP Fine Sand
 Poorly Graded

Fine Sand
 Moderately Well Sorted
 Strongly Coarse Skewed
 Leptokurtic

Total weight (gram) 119.12
 % finer than 4.00 phi 0.26
 % coarser than -1.00 phi 0.26
 % CaCO₃ 3.8

Limits (phi)	Mid Point (phi)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-1.435	Mean	2.246	0.211	
-3	-3.5	0.00	0.00	0.00	5	0.195	Standard Deviation	0.889	0.540	
-2	-2.5	0.00	0.00	0.00	16	1.580	Skewness	-1.754		
-1.5	-1.75	0.00	0.00	0.00	25	1.980	Kurtosis	7.012		
-1	-1.25	2.07	1.59	1.59	50	2.285	Dispersion			
-0.75	-0.875	0.40	0.31	1.90	75	2.620	Standard Deviation			
-0.5	-0.625	0.70	0.54	2.44	84	2.775	Deviation from Normal			
-0.25	-0.375	0.66	0.51	2.95	95	3.150				
0	-0.125	1.13	0.87	3.82	99	3.565				
0.25	0.125	1.02	0.79	4.61						
0.5	0.375	1.89	1.46	6.06						
0.75	0.625	2.44	1.88	7.94						
1	0.875	2.11	1.63	9.57						
1.25	1.125	1.97	1.52	11.08						
1.5	1.375	2.99	2.30	13.39						
1.75	1.625	4.13	3.18	16.57						
2	1.875	5.96	4.59	21.16						
2.25	2.125	11.94	9.20	30.36						
2.5	2.375	40.45	31.16	61.51						
2.75	2.625	18.02	13.88	75.39						
3	2.875	18.37	14.15	89.54						
3.25	3.125	6.69	5.15	94.69						
3.5	3.375	4.38	3.37	98.07						
3.75	3.625	1.58	1.22	99.28						
4	3.875	0.08	0.06	99.35						
>4.0	4.25	0.85	0.65	100.00						

Percentiles

Moment Measures

Graphic Phi Parameters

Inman 1952 Folk & Ward 1957

Mean
 Standard Deviation
 Skewness (1)
 Skewness (2)
 Kurtosis

2.178
 0.597
 -0.180
 -1.025
 1.473

2.213
 0.746
 -0.297
 -0.297
 1.892

Limits (phi)	Mid Point (phi)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-0.230	Mean	2.307	0.202	
-3	-3.5	0.00	0.00	0.00	5	0.915	Standard Deviation	0.678	0.625	
-2	-2.5	0.00	0.00	0.00	16	1.670	Skewness	-1.322		
-1.5	-1.75	0.00	0.00	0.00	25	1.925	Kurtosis	7.023		
-1	-1.25	0.31	0.26	0.26	50	2.250	Dispersion			
-0.75	-0.875	0.14	0.12	0.38	75	2.595	Standard Deviation			
-0.5	-0.625	0.20	0.17	0.55	84	2.765	Deviation from Normal			
-0.25	-0.375	0.27	0.23	0.77	95	3.120				
0	-0.125	0.47	0.39	1.17	99	3.475				
0.25	0.125	0.41	0.34	1.51						
0.5	0.375	0.92	0.77	2.28						
0.75	0.625	1.44	1.21	3.49						
1	0.875	1.49	1.25	4.74						
1.25	1.125	1.95	1.64	6.38						
1.5	1.375	3.69	3.10	9.48						
1.75	1.625	6.09	5.11	14.59						
2	1.875	9.21	7.73	22.32						
2.25	2.125	15.89	13.34	35.66						
2.5	2.375	34.34	28.83	64.49						
2.75	2.625	14.22	11.94	76.43						
3	2.875	15.89	13.34	89.77						
3.25	3.125	6.34	5.32	95.09						
3.5	3.375	4.12	3.46	98.55						
3.75	3.625	1.32	1.11	99.66						
4	3.875	0.10	0.08	99.74						
>4.0	4.25	0.31	0.26	100.00						

Percentiles

Moment Measures

Graphic Phi Parameters

Inman 1952 Folk & Ward 1957

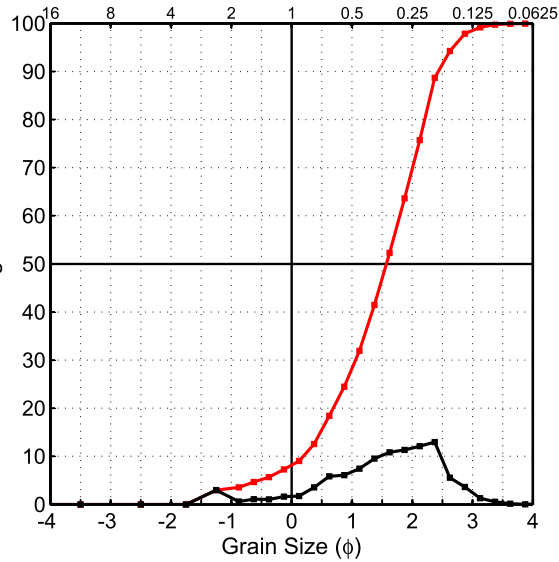
Mean
 Standard Deviation
 Skewness (1)
 Skewness (2)
 Kurtosis

2.217
 0.547
 -0.059
 -0.425
 1.014

2.228
 0.608
 -0.135
 -0.135
 1.349

Grain Size Distribution

Grain Size (mm)



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1900+00
Interval -20 ft NAVD

Mean 0.344 mm
STD 0.516 mm
Skewness -0.885

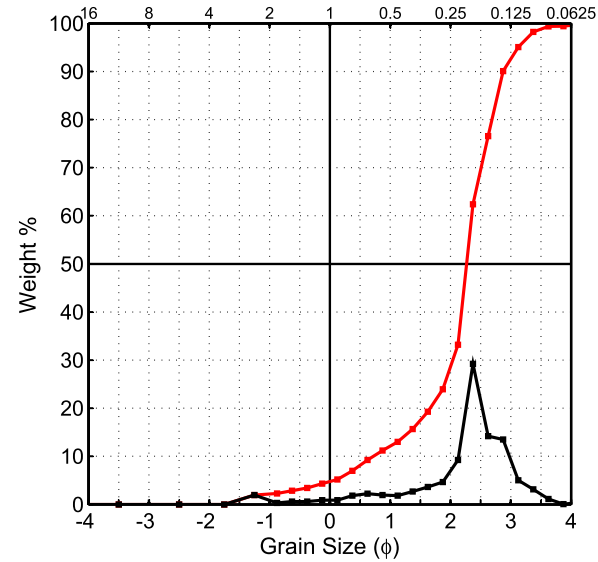
USCS Wentworth

SP Medium Sand
 Fine Sand Moderately Sorted
 Poorly Graded Coarse Skewed
 Leptokurtic

Total weight (gram) 109.24
 % finer than 4.00 phi 0.07
 % coarser than -1.00 phi 2.96
 % CaCO₃ 3.8

Grain Size Distribution

Grain Size (mm)



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1900+00
Interval -16 ft NAVD

Mean 0.219 mm
STD 0.524 mm
Skewness -1.654

USCS Wentworth

SP Fine Sand
 Fine Sand Moderately Sorted
 Poorly Graded Strongly Coarse Skewed
 Leptokurtic

Total weight (gram) 121.85
 % finer than 4.00 phi 0.57
 % coarser than -1.00 phi 1.96
 % CaCO₃ 3.7

Limits (phi)	Mid Point (phi)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-1.580	Mean	1.538	0.344	
-3	-3.5	0.00	0.00	0.00	5	-0.540	Standard Deviation	0.956	0.516	
-2	-2.5	0.00	0.00	0.00	16	0.520	Skewness	-0.885		
-1.5	-1.75	0.00	0.00	0.00	25	0.890	Kurtosis	3.808		
-1	-1.25	3.23	2.96	2.96	50	1.570	Dispersion			
-0.75	-0.875	0.66	0.60	3.56	75	2.110	Standard Deviation			
-0.5	-0.625	1.19	1.09	4.65	84	2.285	Deviation from Normal			
-0.25	-0.375	1.13	1.03	5.68	95	2.680				
0	-0.125	1.75	1.60	7.29	99	3.090				
0.25	0.125	1.89	1.73	9.02						
0.5	0.375	3.87	3.54	12.56						
0.75	0.625	6.39	5.85	18.41						
1	0.875	6.64	6.08	24.49						
1.25	1.125	8.11	7.42	31.91						
1.5	1.375	10.42	9.54	41.45						
1.75	1.625	11.84	10.84	52.29						
2	1.875	12.39	11.34	63.63						
2.25	2.125	13.23	12.11	75.74						
2.5	2.375	14.15	12.95	88.69						
2.75	2.625	6.05	5.54	94.23						
3	2.875	3.97	3.63	97.87						
3.25	3.125	1.43	1.31	99.18						
3.5	3.375	0.62	0.57	99.74						
3.75	3.625	0.17	0.16	99.90						
4	3.875	0.03	0.03	99.93						
>4.0	4.25	0.08	0.07	100.00						

Percentiles		Moment Measures		(phi)	(mm)
1	-1.580	Mean	1.538	0.344	
5	-0.540	Standard Deviation	0.956	0.516	
16	0.520	Skewness	-0.885		
25	0.890	Kurtosis	3.808		
50	1.570	Dispersion			
75	2.110	Standard Deviation			
84	2.285	Deviation from Normal			
95	2.680				
99	3.090				

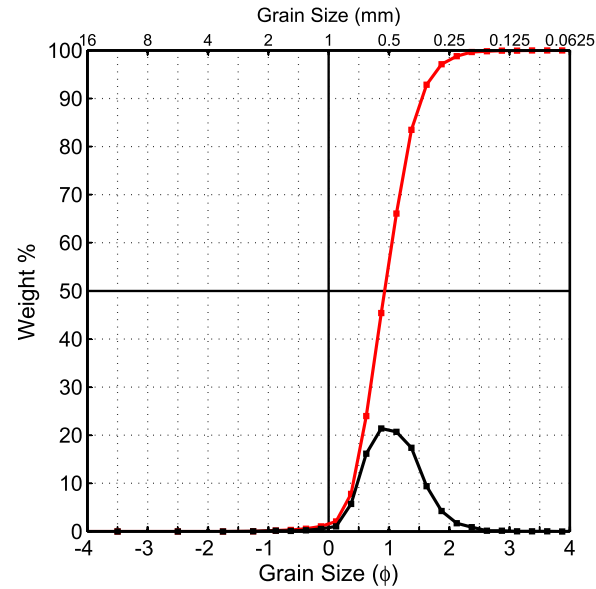
Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean		1.403	1.458
Standard Deviation		0.883	0.929
Skewness (1)		-0.190	-0.250
Skewness (2)		-0.567	
Kurtosis		0.824	1.082

Limits (phi)	Mid Point (phi)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-1.495	Mean	2.189	0.219	
-3	-3.5	0.00	0.00	0.00	5	0.070	Standard Deviation	0.933	0.524	
-2	-2.5	0.00	0.00	0.00	16	1.400	Skewness	-1.654		
-1.5	-1.75	0.00	0.00	0.00	25	1.905	Kurtosis	6.281		
-1	-1.25	2.39	1.96	1.96	50	2.270	Dispersion			
-0.75	-0.875	0.36	0.30	2.26	75	2.595	Standard Deviation			
-0.5	-0.625	0.70	0.57	2.83	84	2.765	Deviation from Normal			
-0.25	-0.375	0.71	0.58	3.41	95	3.120				
0	-0.125	1.08	0.89	4.30	99	3.545				
0.25	0.125	1.09	0.89	5.19						
0.5	0.375	2.20	1.81	7.00						
0.75	0.625	2.72	2.23	9.23						
1	0.875	2.38	1.95	11.19						
1.25	1.125	2.20	1.81	12.99						
1.5	1.375	3.27	2.68	15.68						
1.75	1.625	4.40	3.61	19.29						
2	1.875	5.68	4.66	23.95						
2.25	2.125	11.25	9.23	33.18						
2.5	2.375	35.59	29.21	62.39						
2.75	2.625	17.28	14.18	76.57						
3	2.875	16.43	13.48	90.05						
3.25	3.125	6.13	5.03	95.08						
3.5	3.375	3.82	3.14	98.22						
3.75	3.625	1.39	1.14	99.36						
4	3.875	0.08	0.07	99.43						
>4.0	4.25	0.70	0.57	100.00						

Percentiles		Moment Measures		(phi)	(mm)
1	-1.495	Mean	2.189	0.219	
5	0.070	Standard Deviation	0.933	0.524	
16	1.400	Skewness	-1.654		
25	1.905	Kurtosis	6.281		
50	2.270	Dispersion			
75	2.595	Standard Deviation			
84	2.765	Deviation from Normal			
95	3.120				
99	3.545				

Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean		2.082	2.145
Standard Deviation		0.682	0.803
Skewness (1)		-0.275	-0.359
Skewness (2)		-0.989	
Kurtosis		1.234	1.812

Grain Size Distribution



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1920+00
Interval Dune

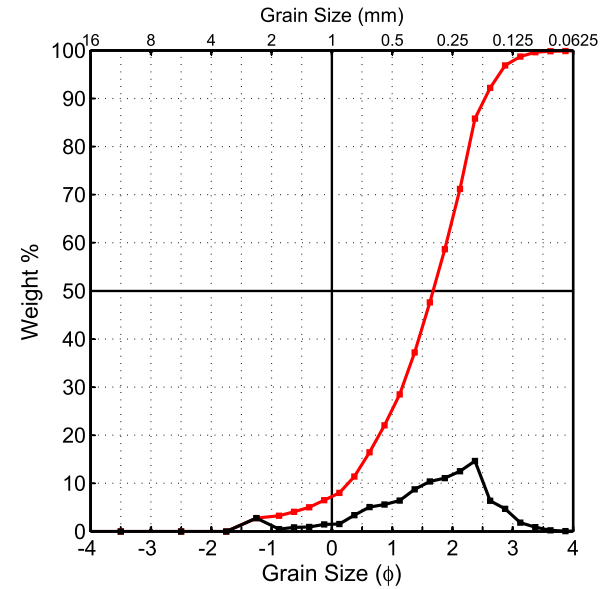
Mean 0.474 mm
STD 0.723 mm
Skewness 0.206

USCS Wentworth

SP Medium Sand
Medium Sand Well Sorted
Poorly Graded Symmetrical
Leptokurtic

Total weight (gram) 99.26
% finer than 4.00 phi 0.02
% coarser than -1.00 phi 0.04
% CaCO₃ 2.6

Grain Size Distribution



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1900+00
Interval -24 ft NAVD

Mean 0.322 mm
STD 0.514 mm
Skewness -0.921

USCS Wentworth

SP Medium Sand
Fine Sand Moderately Sorted
Poorly Graded Coarse Skewed
Leptokurtic

Total weight (gram) 126.48
% finer than 4.00 phi 0.13
% coarser than -1.00 phi 2.76
% CaCO₃ 5.7

Limits (phi)	Mid Point (phi)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-0.150	Mean		1.078	0.474
-3	-3.5	0.00	0.00	0.00	5	0.250	Standard Deviation		0.469	0.723
-2	-2.5	0.00	0.00	0.00	16	0.500	Skewness		0.206	
-1.5	-1.75	0.00	0.00	0.00	25	0.635	Kurtosis		4.618	
-1	-1.25	0.04	0.04	0.04	50	0.930	Dispersion			
-0.75	-0.875	0.16	0.16	0.20	75	1.255	Standard Deviation			
-0.5	-0.625	0.11	0.11	0.31	84	1.390	Deviation from Normal			
-0.25	-0.375	0.23	0.23	0.54	95	1.750				
0	-0.125	0.50	0.50	1.05	99	2.190				
0.25	0.125	1.03	1.04	2.09						
0.5	0.375	5.69	5.73	7.82						
0.75	0.625	16.04	16.16	23.98						
1	0.875	21.24	21.40	45.38						
1.25	1.125	20.55	20.70	66.08						
1.5	1.375	17.26	17.39	83.47						
1.75	1.625	9.33	9.40	92.87						
2	1.875	4.20	4.23	97.10						
2.25	2.125	1.67	1.68	98.78						
2.5	2.375	0.86	0.87	99.65						
2.75	2.625	0.15	0.15	99.80						
3	2.875	0.13	0.13	99.93						
3.25	3.125	0.02	0.02	99.95						
3.5	3.375	0.02	0.02	99.97						
3.75	3.625	0.01	0.01	99.98						
4	3.875	0.00	0.00	99.98						
>4.0	4.25	0.02	0.02	100.00						

Percentiles		Moment Measures		(phi)	(mm)
1	-0.150	Mean		1.078	0.474
5	0.250	Standard Deviation		0.469	0.723
16	0.500	Skewness		0.206	
25	0.635	Kurtosis		4.618	
50	0.930	Dispersion			
75	1.255	Standard Deviation			
84	1.390	Deviation from Normal			
95	1.750				
99	2.190				

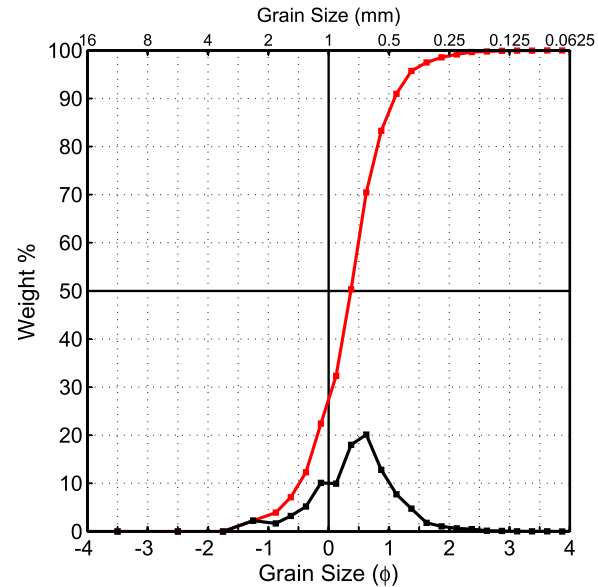
Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean		0.945	0.940
Standard Deviation		0.445	0.450
Skewness (1)		0.034	0.064
Skewness (2)		0.157	
Kurtosis		0.685	0.992

Limits (phi)	Mid Point (phi)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-1.570	Mean		1.633	0.322
-3	-3.5	0.00	0.00	0.00	5	-0.380	Standard Deviation		0.959	0.514
-2	-2.5	0.00	0.00	0.00	16	0.600	Skewness		-0.921	
-1.5	-1.75	0.00	0.00	0.00	25	0.990	Kurtosis		3.961	
-1	-1.25	3.49	2.76	2.76	50	1.680	Dispersion			
-0.75	-0.875	0.61	0.48	3.24	75	2.190	Standard Deviation			
-0.5	-0.625	1.06	0.84	4.08	84	2.345	Deviation from Normal			
-0.25	-0.375	1.19	0.94	5.02	95	2.775				
0	-0.125	1.84	1.45	6.48	99	3.205				
0.25	0.125	1.96	1.55	8.02						
0.5	0.375	4.26	3.37	11.39						
0.75	0.625	6.41	5.07	16.46						
1	0.875	7.05	5.57	22.04						
1.25	1.125	8.13	6.43	28.46						
1.5	1.375	11.04	8.73	37.19						
1.75	1.625	13.15	10.40	47.59						
2	1.875	14.02	11.08	58.67						
2.25	2.125	15.81	12.50	71.17						
2.5	2.375	18.50	14.63	85.80						
2.75	2.625	8.07	6.38	92.18						
3	2.875	5.95	4.70	96.88						
3.25	3.125	2.32	1.83	98.72						
3.5	3.375	1.12	0.89	99.60						
3.75	3.625	0.27	0.21	99.82						
4	3.875	0.06	0.05	99.87						
>4.0	4.25	0.17	0.13	100.00						

Percentiles		Moment Measures		(phi)	(mm)
1	-1.570	Mean		1.633	0.322
5	-0.380	Standard Deviation		0.959	0.514
16	0.600	Skewness		-0.921	
25	0.990	Kurtosis		3.961	
50	1.680	Dispersion			
75	2.190	Standard Deviation			
84	2.345	Deviation from Normal			
95	2.775				
99	3.205				

Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean		1.472	1.542
Standard Deviation		0.872	0.914
Skewness (1)		-0.238	-0.272
Skewness (2)		-0.553	
Kurtosis		0.808	1.078

Grain Size Distribution



Project 2408
Location Buxton, NC
Date Oct 2014

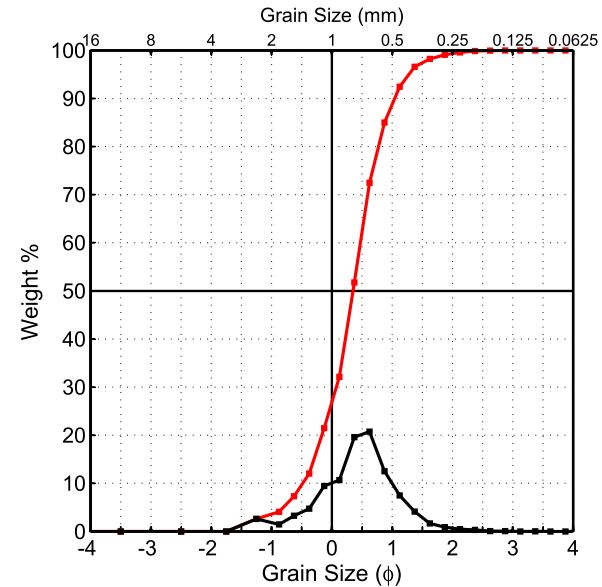
Station 1920+00
Interval Berm

Mean 0.727 mm
STD 0.638 mm
Skewness 0.038

USCS Wentworth
 SP Coarse Sand
 Medium Sand Moderately Well Sorted
 Poorly Graded Symmetrical
 Leptokurtic

Total weight (gram) 100.08
 % finer than 4.00 phi 0.04
 % coarser than -1.00 phi 2.23
 % CaCO₃ 11.6

Grain Size Distribution



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1920+00
Interval Dune Toe

Mean 0.739 mm
STD 0.651 mm
Skewness -0.213

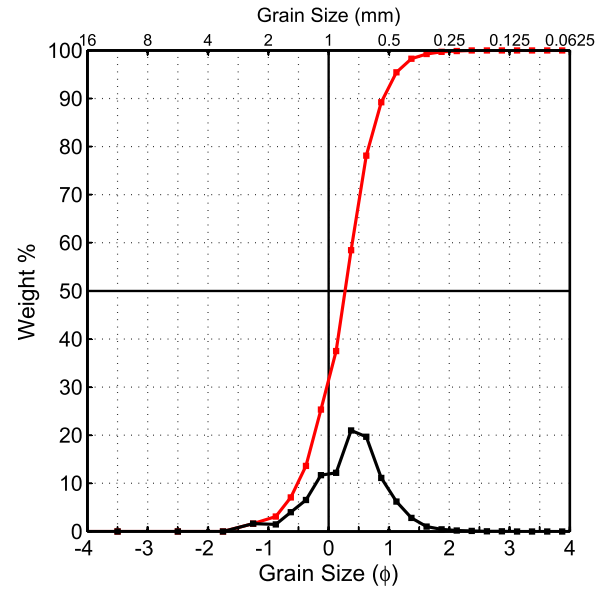
USCS Wentworth
 SP Coarse Sand
 Medium Sand Moderately Well Sorted
 Poorly Graded Symmetrical
 Leptokurtic

Total weight (gram) 99.78
 % finer than 4.00 phi 0.01
 % coarser than -1.00 phi 2.60
 % CaCO₃ 8.0

Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-1.525	Mean		0.459	0.727
-3	-3.5	0.00	0.00	0.00	5	-0.790	Standard Deviation		0.649	0.638
-2	-2.5	0.00	0.00	0.00	16	-0.285	Skewness		0.038	
-1.5	-1.75	0.00	0.00	0.00	25	-0.060	Kurtosis		4.278	
-1	-1.25	2.23	2.23	2.23	50	0.370	Dispersion			
-0.75	-0.875	1.68	1.68	3.91	75	0.715	Standard Deviation			
-0.5	-0.625	3.20	3.20	7.10	84	0.900	Deviation from Normal			
-0.25	-0.375	5.19	5.19	12.29	95	1.335				
0	-0.125	10.12	10.11	22.40	99	2.060				
0.25	0.125	9.93	9.92	32.32	Graphic Phi Parameters		Inman	Folk & Ward		
0.5	0.375	18.00	17.99	50.31			1952	1957		
0.75	0.625	20.16	20.14	70.45	Mean		0.307	0.328		
1	0.875	12.81	12.80	83.25	Standard Deviation		0.593	0.618		
1.25	1.125	7.74	7.73	90.99	Skewness (1)		-0.105	-0.099		
1.5	1.375	4.73	4.73	95.71	Skewness (2)		-0.165			
1.75	1.625	1.77	1.77	97.48	Kurtosis		0.793	1.124		
2	1.875	1.05	1.05	98.53						
2.25	2.125	0.64	0.64	99.17						
2.5	2.375	0.47	0.47	99.64						
2.75	2.625	0.14	0.14	99.78						
3	2.875	0.12	0.12	99.90						
3.25	3.125	0.03	0.03	99.93						
3.5	3.375	0.02	0.02	99.95						
3.75	3.625	0.01	0.01	99.96						
4	3.875	0.00	0.00	99.96						
>4.0	4.25	0.04	0.04	100.00						

Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-1.555	Mean		0.436	0.739
-3	-3.5	0.00	0.00	0.00	5	-0.800	Standard Deviation		0.620	0.651
-2	-2.5	0.00	0.00	0.00	16	-0.270	Skewness		-0.213	
-1.5	-1.75	0.00	0.00	0.00	25	-0.040	Kurtosis		3.983	
-1	-1.25	2.59	2.60	2.60	50	0.355	Dispersion			
-0.75	-0.875	1.46	1.46	4.06	75	0.675	Standard Deviation			
-0.5	-0.625	3.23	3.24	7.30	84	0.855	Deviation from Normal			
-0.25	-0.375	4.71	4.72	12.02	95	1.280				
0	-0.125	9.43	9.45	21.47	99	1.845				
0.25	0.125	10.64	10.66	32.13	Graphic Phi Parameters		Inman	Folk & Ward		
0.5	0.375	19.55	19.59	51.72			1952	1957		
0.75	0.625	20.71	20.76	72.48	Mean		0.292	0.313		
1	0.875	12.50	12.53	85.01	Standard Deviation		0.563	0.596		
1.25	1.125	7.44	7.46	92.46	Skewness (1)		-0.111	-0.111		
1.5	1.375	4.12	4.13	96.59	Skewness (2)		-0.204			
1.75	1.625	1.64	1.64	98.24	Kurtosis		0.849	1.192		
2	1.875	0.86	0.86	99.10						
2.25	2.125	0.48	0.48	99.58						
2.5	2.375	0.29	0.29	99.87						
2.75	2.625	0.06	0.06	99.93						
3	2.875	0.05	0.05	99.98						
3.25	3.125	0.00	0.00	99.98						
3.5	3.375	0.01	0.01	99.99						
3.75	3.625	0.00	0.00	99.99						
4	3.875	0.00	0.00	99.99						
>4.0	4.25	0.01	0.01	100.00						

Grain Size Distribution



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1920+00
Interval MHW

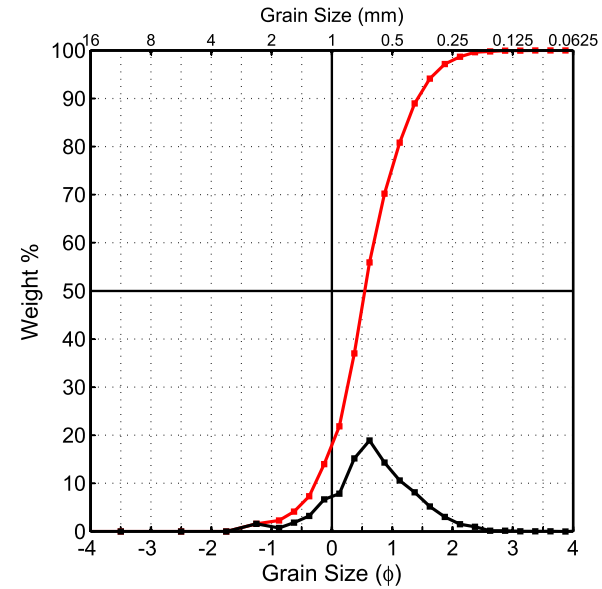
Mean 0.781 mm
STD 0.676 mm
Skewness -0.195

USCS Wentworth

SP Coarse Sand
 Medium Sand Moderately Well Sorted
 Poorly Graded Symmetrical
 Mesokurtic

Total weight (gram) 99.90
 % finer than 4.00 phi 0.01
 % coarser than -1.00 phi 1.60
 % CaCO₃ 7.9

Grain Size Distribution



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1920+00
Interval BC

Mean 0.620 mm
STD 0.625 mm
Skewness -0.037

USCS Wentworth

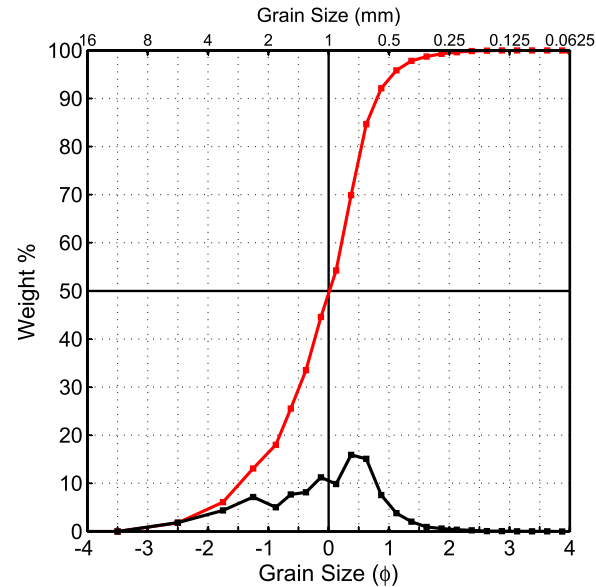
SP Coarse Sand
 Medium Sand Moderately Well Sorted
 Poorly Graded Symmetrical
 Leptokurtic

Total weight (gram) 99.97
 % finer than 4.00 phi 0.02
 % coarser than -1.00 phi 1.57
 % CaCO₃ 5.8

Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-1.440	Mean		0.357	0.781
-3	-3.5	0.00	0.00	0.00	5	-0.755	Standard Deviation		0.565	0.676
-2	-2.5	0.00	0.00	0.00	16	-0.325	Skewness		-0.195	
-1.5	-1.75	0.00	0.00	0.00	25	-0.130	Kurtosis		3.607	
-1	-1.25	1.60	1.60	1.60	50	0.275	Dispersion			
-0.75	-0.875	1.47	1.47	3.07	75	0.585	Standard Deviation			
-0.5	-0.625	3.99	3.99	7.07	84	0.755	Deviation from Normal			
-0.25	-0.375	6.54	6.55	13.61	95	1.105				
0	-0.125	11.69	11.70	25.32	99	1.560				
0.25	0.125	12.16	12.17	37.49	Graphic Phi Parameters		Inman	Folk & Ward		
0.5	0.375	20.95	20.97	58.46			1952	1957		
0.75	0.625	19.64	19.66	78.12	Mean		0.215	0.235		
1	0.875	11.10	11.11	89.23			0.540	0.552		
1.25	1.125	6.20	6.21	95.44	Standard Deviation		-0.111	-0.109		
1.5	1.375	2.82	2.82	98.26			-0.185			
1.75	1.625	1.00	1.00	99.26	Skewness (1)		0.722	1.066		
2	1.875	0.43	0.43	99.69						
2.25	2.125	0.18	0.18	99.87	Skewness (2)					
2.5	2.375	0.09	0.09	99.96						
2.75	2.625	0.02	0.02	99.98	Kurtosis					
3	2.875	0.02	0.02	100.00						
3.25	3.125	0.00	0.00	100.00						
3.5	3.375	0.00	0.00	100.00						
3.75	3.625	0.00	0.00	100.00						
4	3.875	-0.01	-0.01	99.99						
>4.0	4.25	0.01	0.01	100.00						

Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-1.430	Mean		0.690	0.620
-3	-3.5	0.00	0.00	0.00	5	-0.555	Standard Deviation		0.677	0.625
-2	-2.5	0.00	0.00	0.00	16	-0.060	Skewness		-0.037	
-1.5	-1.75	0.00	0.00	0.00	25	0.175	Kurtosis		3.710	
-1	-1.25	1.57	1.57	1.57	50	0.545	Dispersion			
-0.75	-0.875	0.71	0.71	2.28	75	0.990	Standard Deviation			
-0.5	-0.625	1.82	1.82	4.10	84	1.225	Deviation from Normal			
-0.25	-0.375	3.22	3.22	7.32	95	1.695				
0	-0.125	6.66	6.66	13.98	99	2.215				
0.25	0.125	7.86	7.86	21.85	Graphic Phi Parameters		Inman	Folk & Ward		
0.5	0.375	15.15	15.15	37.00			1952	1957		
0.75	0.625	18.90	18.91	55.91	Mean		0.582	0.570		
1	0.875	14.29	14.29	70.20			0.643	0.662		
1.25	1.125	10.60	10.60	80.80	Standard Deviation		0.058	0.040		
1.5	1.375	8.14	8.14	88.95			0.039			
1.75	1.625	5.18	5.18	94.13	Skewness (1)		0.751	1.131		
2	1.875	3.02	3.02	97.15						
2.25	2.125	1.50	1.50	98.65	Skewness (2)					
2.5	2.375	0.95	0.95	99.60						
2.75	2.625	0.16	0.16	99.76	Kurtosis					
3	2.875	0.16	0.16	99.92						
3.25	3.125	0.03	0.03	99.95						
3.5	3.375	0.02	0.02	99.97						
3.75	3.625	0.01	0.01	99.98						
4	3.875	0.00	0.00	99.98						
>4.0	4.25	0.02	0.02	100.00						

Grain Size Distribution



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1920+00
Interval MLW

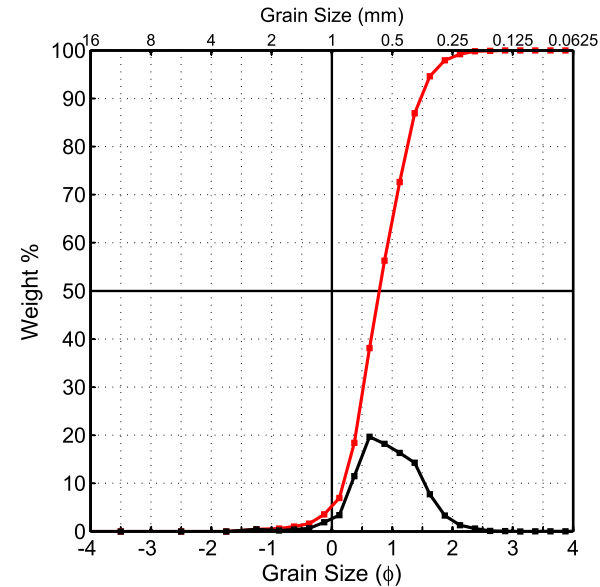
Mean 1.054 mm
STD 0.635 mm
Skewness -5.607

USCS Wentworth

SP Very Coarse Sand
 Medium Sand Moderately Well Sorted
 Poorly Graded Strongly Coarse Skewed
 Very Platykurtic

Total weight (gram) 98.69
 % finer than 4.00 phi -1.75
 % coarser than -1.00 phi 13.31
 % CaCO₃ 15.7

Grain Size Distribution



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1920+00
Interval MTL

Mean 0.525 mm
STD 0.691 mm
Skewness -0.153

USCS Wentworth

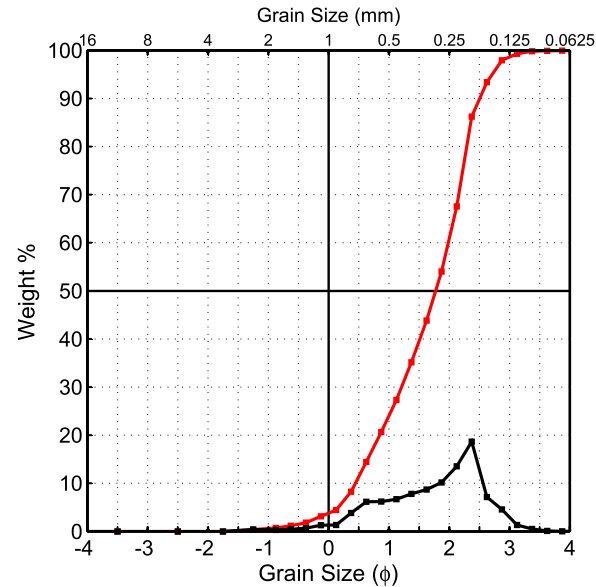
SP Coarse Sand
 Medium Sand Moderately Well Sorted
 Poorly Graded Symmetrical
 Leptokurtic

Total weight (gram) 99.46
 % finer than 4.00 phi 0.01
 % coarser than -1.00 phi 0.43
 % CaCO₃ 4.5

Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)		
-4	-4.5	0.00	0.00	0.00	1	-2.940	Mean		-0.076	1.054		
-3	-3.5	0.00	0.00	0.00	5	-1.935	Standard Deviation		0.656	0.635		
-2	-2.5	1.79	1.81	1.81	16	-1.030	Skewness		-5.607			
-1.5	-1.75	4.30	4.36	6.17	25	-0.645	Kurtosis		-23.223			
-1	-1.25	7.05	7.14	13.31	50	0.015	Dispersion					
-0.75	-0.875	4.95	5.02	18.33	75	0.460	Standard Deviation					
-0.5	-0.625	7.57	7.67	26.00	84	0.615	Deviation from Normal					
-0.25	-0.375	8.01	8.12	34.12	95	1.070						
0	-0.125	11.08	11.23	45.34	99	1.750						
0.25	0.125	9.70	9.83	55.17	Graphic Phi Parameters						Inman	Folk & Ward
0.5	0.375	15.71	15.92	71.09							1952	1957
0.75	0.625	14.88	15.08	86.17	Mean		-0.208		-0.133			
1	0.875	7.45	7.55	93.72	Standard Deviation		0.822		0.867			
1.25	1.125	3.75	3.80	97.52	Skewness (1)		-0.271		-0.284			
1.5	1.375	1.99	2.02	99.53	Skewness (2)		-0.544					
1.75	1.625	0.90	0.91	100.45	Kurtosis		0.827		1.115			
2	1.875	0.57	0.58	101.02								
2.25	2.125	0.34	0.34	101.37								
2.5	2.375	0.24	0.24	101.61								
2.75	2.625	0.06	0.06	101.67								
3	2.875	0.05	0.05	101.72								
3.25	3.125	0.01	0.01	101.73								
3.5	3.375	0.01	0.01	101.74								
3.75	3.625	0.01	0.01	101.75								
4	3.875	0.00	0.00	101.75								
>4.0	4.25	-1.73	-1.75	100.00								

Limits (ϕ)	Mid Point (ϕ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-0.625	Mean		0.930	0.525
-3	-3.5	0.00	0.00	0.00	5	-0.015	Standard Deviation		0.533	0.691
-2	-2.5	0.00	0.00	0.00	16	0.320	Skewness		-0.153	
-1.5	-1.75	0.00	0.00	0.00	25	0.460	Kurtosis		4.387	
-1	-1.25	0.43	0.43	0.43	50	0.790	Dispersion			
-0.75	-0.875	0.17	0.17	0.60	75	1.165	Standard Deviation			
-0.5	-0.625	0.39	0.39	1.00	84	1.325	Deviation from Normal			
-0.25	-0.375	0.62	0.62	1.62	95	1.655				
0	-0.125	1.91	1.92	3.54	99	2.085				
0.25	0.125	3.37	3.39	6.93	Graphic Phi Parameters					
0.5	0.375	11.43	11.49	18.42						
0.75	0.625	19.59	19.70	38.12	Inman		Folk & Ward			
1	0.875	18.09	18.19	56.30	1952		1957			
1.25	1.125	16.25	16.34	72.64	Mean		0.822		0.812	
1.5	1.375	14.19	14.27	86.91	Standard Deviation		0.502		0.504	
1.75	1.625	7.66	7.70	94.61	Skewness (1)		0.065		0.050	
2	1.875	3.29	3.31	97.92	Skewness (2)		0.060			
2.25	2.125	1.29	1.30	99.22	Kurtosis		0.662		0.971	
2.5	2.375	0.60	0.60	99.82						
2.75	2.625	0.09	0.09	99.91						
3	2.875	0.05	0.05	99.96						
3.25	3.125	0.00	0.00	99.96						
3.5	3.375	0.01	0.01	99.97						
3.75	3.625	0.01	0.01	99.98						
4	3.875	0.01	0.01	99.99						
>4.0	4.25	0.01	0.01	100.00						

Grain Size Distribution



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1920+00
Interval Bar

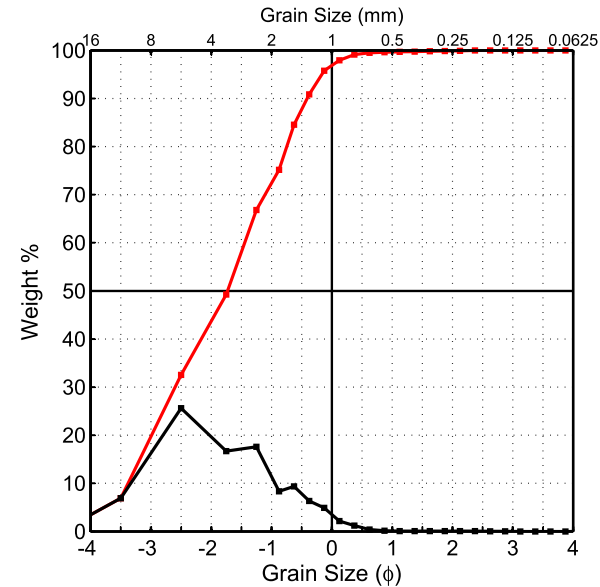
Mean 0.302 mm
STD 0.564 mm
Skewness -0.689

USCS Wentworth

SP Medium Sand
 Fine Sand Moderately Sorted
 Poorly Graded Coarse Skewed
 Mesokurtic

Total weight (gram) 119.91
 % finer than 4.00 phi 0.08
 % coarser than -1.00 phi 0.41
 % CaCO₃ 3.2

Grain Size Distribution



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1920+00
Interval Trough

Mean 2.905 mm
STD 0.501 mm
Skewness -0.020

USCS Wentworth

SP Granule
 Coarse Sand Moderately Sorted
 Poorly Graded Symmetrical
 Mesokurtic

Total weight (gram) 124.20
 % finer than 4.00 phi 0.00
 % coarser than -1.00 phi 66.83
 % CaCO₃ 19.9

Limits (phi)	Mid Point (phi)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-0.715	Mean		1.726	0.302
-3	-3.5	0.00	0.00	0.00	5	0.160	Standard Deviation		0.827	0.564
-2	-2.5	0.00	0.00	0.00	16	0.690	Skewness		-0.689	
-1.5	-1.75	0.00	0.00	0.00	25	1.035	Kurtosis		3.269	
-1	-1.25	0.49	0.41	0.41	50	1.775	Dispersion			
-0.75	-0.875	0.39	0.33	0.73	75	2.225	Standard Deviation			
-0.5	-0.625	0.50	0.42	1.15	84	2.345	Deviation from Normal			
-0.25	-0.375	0.82	0.68	1.83	95	2.715				
0	-0.125	1.54	1.28	3.12	99	3.070				
0.25	0.125	1.59	1.33	4.45						
0.5	0.375	4.58	3.82	8.26						
0.75	0.625	7.40	6.17	14.44						
1	0.875	7.45	6.21	20.65						
1.25	1.125	8.03	6.70	27.35						
1.5	1.375	9.35	7.80	35.14						
1.75	1.625	10.42	8.69	43.83						
2	1.875	12.21	10.18	54.02						
2.25	2.125	16.25	13.55	67.57						
2.5	2.375	22.37	18.66	86.22						
2.75	2.625	8.58	7.16	93.38						
3	2.875	5.48	4.57	97.95						
3.25	3.125	1.62	1.35	99.30						
3.5	3.375	0.61	0.51	99.81						
3.75	3.625	0.12	0.10	99.91						
4	3.875	0.02	0.02	99.92						
>4.0	4.25	0.09	0.08	100.00						

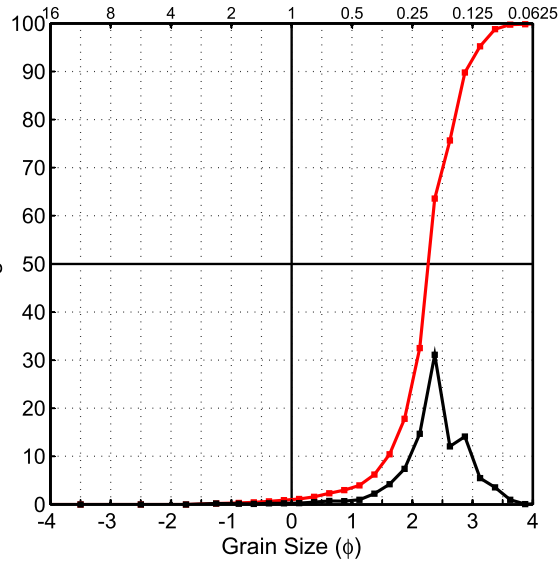
Percentiles		Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean				1.517	1.603
Standard Deviation				0.827	0.801
Skewness (1)				-0.311	-0.288
Skewness (2)				-0.408	
Kurtosis				0.544	0.880

Limits (phi)	Mid Point (phi)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-4.125	Mean		-1.539	2.905
-3	-3.5	8.59	6.92	6.92	5	-3.775	Standard Deviation		0.998	0.501
-2	-2.5	31.83	25.63	32.54	16	-3.145	Skewness		-0.020	
-1.5	-1.75	20.74	16.70	49.24	25	-2.795	Kurtosis		2.663	
-1	-1.25	21.84	17.58	66.83	50	-1.730	Dispersion			
-0.75	-0.875	10.36	8.34	75.17	75	-0.885	Standard Deviation			
-0.5	-0.625	11.63	9.36	84.53	84	-0.640	Deviation from Normal			
-0.25	-0.375	7.85	6.32	90.85	95	-0.165				
0	-0.125	6.08	4.90	95.75	99	0.350				
0.25	0.125	2.69	2.17	97.91						
0.5	0.375	1.50	1.21	99.12						
0.75	0.625	0.46	0.37	99.49						
1	0.875	0.16	0.13	99.62						
1.25	1.125	0.09	0.07	99.69						
1.5	1.375	0.07	0.06	99.75						
1.75	1.625	0.06	0.05	99.80						
2	1.875	0.06	0.05	99.85						
2.25	2.125	0.07	0.06	99.90						
2.5	2.375	0.08	0.06	99.97						
2.75	2.625	0.02	0.02	99.98						
3	2.875	0.02	0.02	100.00						
3.25	3.125	0.00	0.00	100.00						
3.5	3.375	0.00	0.00	100.00						
3.75	3.625	0.00	0.00	100.00						
4	3.875	0.00	0.00	100.00						
>4.0	4.25	0.00	0.00	100.00						

Percentiles		Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean				-1.893	-1.838
Standard Deviation				1.252	1.173
Skewness (1)				-0.130	-0.131
Skewness (2)				-0.192	
Kurtosis				0.441	0.775

Grain Size Distribution

Grain Size (mm)



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1920+00
Interval -12 ft NAVD

Mean 0.194 mm
STD 0.657 mm
Skewness -1.429

USCS Wentworth

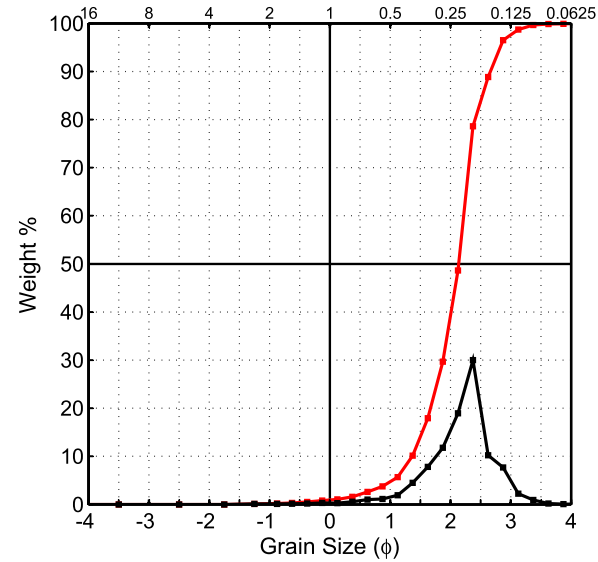
SP Fine Sand
 Poorly Graded

Fine Sand
 Moderately Well Sorted
 Strongly Coarse Skewed
 Very Leptokurtic

Total weight (gram) 121.36
 % finer than 4.00 phi 0.17
 % coarser than -1.00 phi 0.19
 % CaCO₃ 2.3

Grain Size Distribution

Grain Size (mm)



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1920+00
Interval -8 ft NAVD

Mean 0.223 mm
STD 0.673 mm
Skewness -1.240

USCS Wentworth

SP Fine Sand
 Poorly Graded

Fine Sand
 Moderately Well Sorted
 Coarse Skewed
 Leptokurtic

Total weight (gram) 105.80
 % finer than 4.00 phi 0.09
 % coarser than -1.00 phi 0.09
 % CaCO₃ 2.0

Limits (phi)	Mid Point (phi)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	0.010	Mean		2.365	0.194
-3	-3.5	0.00	0.00	0.00	5	1.240	Standard Deviation		0.606	0.657
-2	-2.5	0.00	0.00	0.00	16	1.815	Skewness		-1.429	
-1.5	-1.75	0.00	0.00	0.00	25	2.000	Kurtosis		8.639	
-1	-1.25	0.23	0.19	0.19	50	2.265	Dispersion			
-0.75	-0.875	0.15	0.12	0.31	75	2.610	Standard Deviation			
-0.5	-0.625	0.13	0.11	0.42	84	2.775	Deviation from Normal			
-0.25	-0.375	0.26	0.21	0.63	95	3.115				
0	-0.125	0.28	0.23	0.87	99	3.430				
0.25	0.125	0.30	0.25	1.11						
0.5	0.375	0.55	0.45	1.57						
0.75	0.625	0.89	0.73	2.30						
1	0.875	0.83	0.68	2.98						
1.25	1.125	1.19	0.98	3.96						
1.5	1.375	2.72	2.24	6.20						
1.75	1.625	5.10	4.20	10.41						
2	1.875	8.96	7.38	17.79						
2.25	2.125	17.82	14.68	32.47						
2.5	2.375	37.76	31.11	63.59						
2.75	2.625	14.63	12.06	75.64						
3	2.875	17.14	14.12	89.77						
3.25	3.125	6.65	5.48	95.25						
3.5	3.375	4.30	3.54	98.79						
3.75	3.625	1.17	0.96	99.75						
4	3.875	0.09	0.07	99.83						
>4.0	4.25	0.21	0.17	100.00						

Percentiles		Moment Measures		(phi)	(mm)
1	0.010	Mean		2.365	0.194
5	1.240	Standard Deviation		0.606	0.657
16	1.815	Skewness		-1.429	
25	2.000	Kurtosis		8.639	
50	2.265	Dispersion			
75	2.610	Standard Deviation			
84	2.775	Deviation from Normal			
95	3.115				
99	3.430				

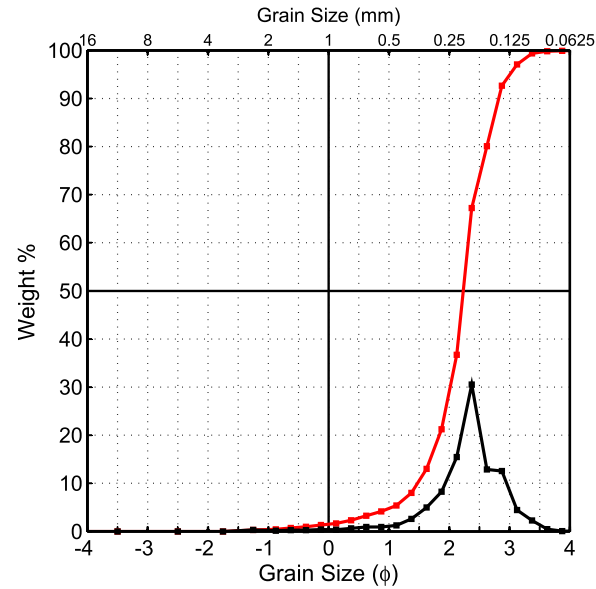
Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean		2.295	2.285
Standard Deviation		0.480	0.524
Skewness (1)		0.063	-0.015
Skewness (2)		-0.182	
Kurtosis		0.953	1.260

Limits (phi)	Mid Point (phi)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	0.085	Mean		2.163	0.223
-3	-3.5	0.00	0.00	0.00	5	1.040	Standard Deviation		0.571	0.673
-2	-2.5	0.00	0.00	0.00	16	1.565	Skewness		-1.240	
-1.5	-1.75	0.00	0.00	0.00	25	1.775	Kurtosis		7.128	
-1	-1.25	0.09	0.09	0.09	50	2.135	Dispersion			
-0.75	-0.875	0.09	0.09	0.17	75	2.345	Standard Deviation			
-0.5	-0.625	0.14	0.13	0.30	84	2.505	Deviation from Normal			
-0.25	-0.375	0.20	0.19	0.49	95	2.825				
0	-0.125	0.31	0.29	0.78	99	3.200				
0.25	0.125	0.27	0.26	1.04						
0.5	0.375	0.58	0.55	1.59						
0.75	0.625	1.08	1.02	2.61						
1	0.875	1.19	1.12	3.73						
1.25	1.125	2.03	1.92	5.65						
1.5	1.375	4.73	4.47	10.12						
1.75	1.625	8.24	7.79	17.91						
2	1.875	12.44	11.76	29.67						
2.25	2.125	20.04	18.94	48.61						
2.5	2.375	31.73	29.99	78.60						
2.75	2.625	10.83	10.24	88.84						
3	2.875	8.11	7.67	96.50						
3.25	3.125	2.35	2.22	98.72						
3.5	3.375	0.98	0.93	99.65						
3.75	3.625	0.21	0.20	99.85						
4	3.875	0.07	0.07	99.91						
>4.0	4.25	0.09	0.09	100.00						

Percentiles		Moment Measures		(phi)	(mm)
1	0.085	Mean		2.163	0.223
5	1.040	Standard Deviation		0.571	0.673
16	1.565	Skewness		-1.240	
25	1.775	Kurtosis		7.128	
50	2.135	Dispersion			
75	2.345	Standard Deviation			
84	2.505	Deviation from Normal			
95	2.825				
99	3.200				

Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean		2.035	2.068
Standard Deviation		0.470	0.505
Skewness (1)		-0.213	-0.220
Skewness (2)		-0.431	
Kurtosis		0.899	1.283

Grain Size Distribution



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1920+00
Interval -20 ft NAVD

Mean 0.205 mm
STD 0.642 mm
Skewness -1.698

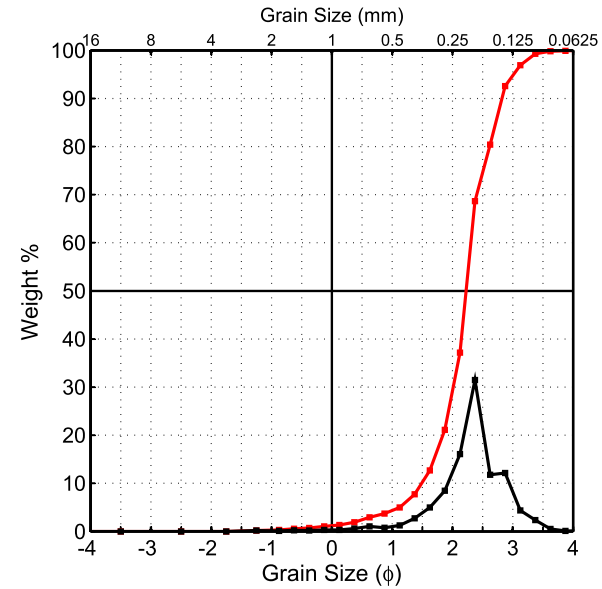
USCS Wentworth

SP Fine Sand
 Poorly Graded

Fine Sand
 Moderately Well Sorted
 Strongly Coarse Skewed
 Very Leptokurtic

Total weight (gram) 107.40
 % finer than 4.00 phi 0.09
 % coarser than -1.00 phi 0.31
 % CaCO₃ 2.1

Grain Size Distribution



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1920+00
Interval -16 ft NAVD

Mean 0.204 mm
STD 0.653 mm
Skewness -1.516

USCS Wentworth

SP Fine Sand
 Poorly Graded

Fine Sand
 Moderately Well Sorted
 Strongly Coarse Skewed
 Very Leptokurtic

Total weight (gram) 108.77
 % finer than 4.00 phi 0.12
 % coarser than -1.00 phi 0.19
 % CaCO₃ 2.6

Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-0.355	Mean		2.286	0.205
-3	-3.5	0.00	0.00	0.00	5	1.045	Standard Deviation		0.639	0.642
-2	-2.5	0.00	0.00	0.00	16	1.715	Skewness		-1.698	
-1.5	-1.75	0.00	0.00	0.00	25	1.935	Kurtosis		8.891	
-1	-1.25	0.33	0.31	0.31	50	2.235	Dispersion			
-0.75	-0.875	0.15	0.14	0.45	75	2.525	Standard Deviation			
-0.5	-0.625	0.27	0.25	0.70	84	2.705	Deviation from Normal			
-0.25	-0.375	0.29	0.27	0.97	95	3.010				
0	-0.125	0.40	0.37	1.34	99	3.335				
0.25	0.125	0.36	0.34	1.68						
0.5	0.375	0.70	0.65	2.33						
0.75	0.625	0.98	0.91	3.24						
1	0.875	1.00	0.93	4.17						
1.25	1.125	1.32	1.23	5.40						
1.5	1.375	2.81	2.62	8.02						
1.75	1.625	5.34	4.97	12.99						
2	1.875	8.87	8.26	21.25						
2.25	2.125	16.60	15.46	36.70						
2.5	2.375	32.78	30.52	67.23						
2.75	2.625	13.82	12.87	80.09						
3	2.875	13.49	12.56	92.65						
3.25	3.125	4.75	4.42	97.08						
3.5	3.375	2.44	2.27	99.35						
3.75	3.625	0.52	0.48	99.83						
4	3.875	0.08	0.07	99.91						
>4.0	4.25	0.10	0.09	100.00						

Percentiles		Moment Measures		(phi)	(mm)
1	-0.355	Mean		2.286	0.205
5	1.045	Standard Deviation		0.639	0.642
16	1.715	Skewness		-1.698	
25	1.935	Kurtosis		8.891	
50	2.235	Dispersion			
75	2.525	Standard Deviation			
84	2.705	Deviation from Normal			
95	3.010				
99	3.335				

Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean		2.210	2.218
Standard Deviation		0.495	0.545
Skewness (1)		-0.051	-0.131
Skewness (2)		-0.419	
Kurtosis		0.985	1.365

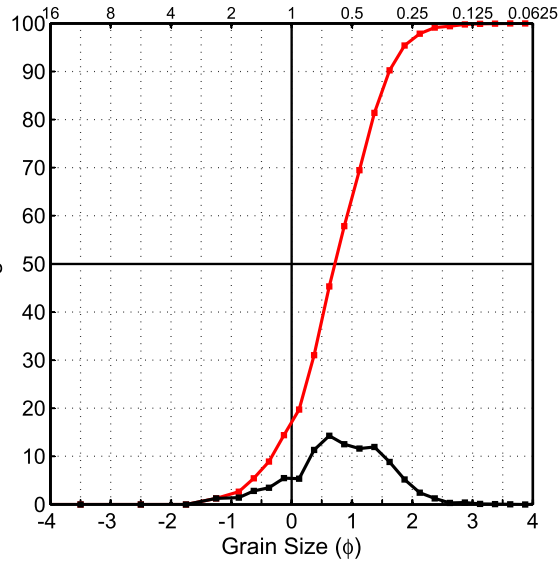
Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-0.150	Mean		2.290	0.204
-3	-3.5	0.00	0.00	0.00	5	1.125	Standard Deviation		0.614	0.653
-2	-2.5	0.00	0.00	0.00	16	1.725	Skewness		-1.516	
-1.5	-1.75	0.00	0.00	0.00	25	1.935	Kurtosis		8.429	
-1	-1.25	0.21	0.19	0.19	50	2.225	Dispersion			
-0.75	-0.875	0.13	0.12	0.31	75	2.510	Standard Deviation			
-0.5	-0.625	0.24	0.22	0.53	84	2.700	Deviation from Normal			
-0.25	-0.375	0.22	0.20	0.74	95	3.015				
0	-0.125	0.32	0.29	1.03	99	3.345				
0.25	0.125	0.32	0.29	1.32						
0.5	0.375	0.63	0.58	1.90						
0.75	0.625	1.13	1.04	2.94						
1	0.875	0.83	0.76	3.71						
1.25	1.125	1.38	1.27	4.97						
1.5	1.375	2.97	2.73	7.70						
1.75	1.625	5.40	4.96	12.67						
2	1.875	9.18	8.44	21.11						
2.25	2.125	17.47	16.06	37.17						
2.5	2.375	34.23	31.47	68.64						
2.75	2.625	12.81	11.78	80.42						
3	2.875	13.21	12.14	92.56						
3.25	3.125	4.74	4.36	96.92						
3.5	3.375	2.57	2.36	99.28						
3.75	3.625	0.56	0.51	99.80						
4	3.875	0.09	0.08	99.88						
>4.0	4.25	0.13	0.12	100.00						

Percentiles		Moment Measures		(phi)	(mm)
1	-0.150	Mean		2.290	0.204
5	1.125	Standard Deviation		0.614	0.653
16	1.725	Skewness		-1.516	
25	1.935	Kurtosis		8.429	
50	2.225	Dispersion			
75	2.510	Standard Deviation			
84	2.700	Deviation from Normal			
95	3.015				
99	3.345				

Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean		2.213	2.217
Standard Deviation		0.488	0.530
Skewness (1)		-0.026	-0.095
Skewness (2)		-0.318	
Kurtosis		0.938	1.347

Grain Size Distribution

Grain Size (mm)



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1940+00
Interval Dune

Mean 0.564 mm
STD 0.590 mm
Skewness -0.192

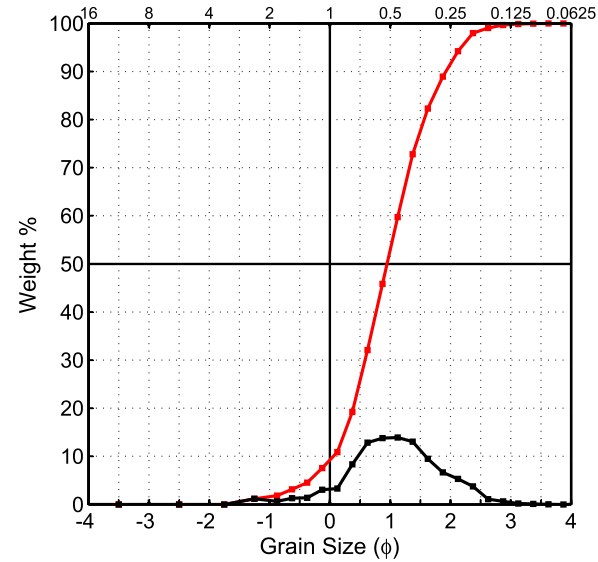
USCS Wentworth

SP Coarse Sand
 Medium Sand Moderately Sorted
 Poorly Graded Symmetrical
 Mesokurtic

Total weight (gram) 100.33
 % finer than 4.00 phi 0.03
 % coarser than -1.00 phi 1.25
 % CaCO₃ 6.9

Grain Size Distribution

Grain Size (mm)



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1920+00
Interval -24 ft NAVD

Mean 0.476 mm
STD 0.593 mm
Skewness -0.248

USCS Wentworth

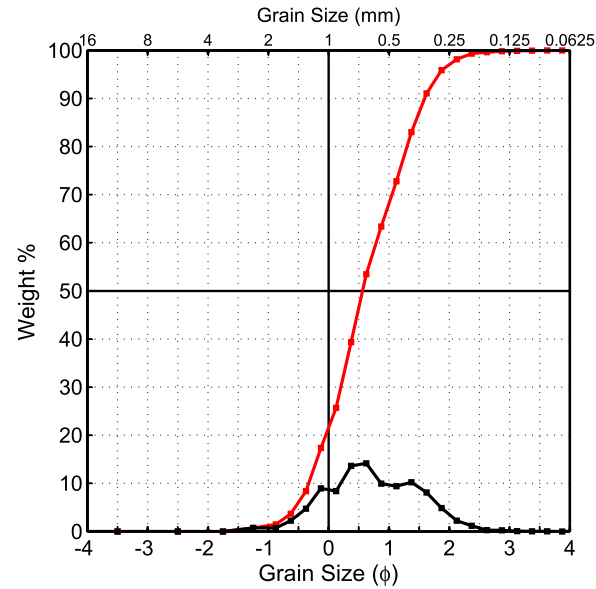
SP Medium Sand
 Medium Sand Moderately Sorted
 Poorly Graded Symmetrical
 Mesokurtic

Total weight (gram) 130.36
 % finer than 4.00 phi 0.02
 % coarser than -1.00 phi 1.18
 % CaCO₃ 5.6

Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-1.350	Mean		0.826	0.564
-3	-3.5	0.00	0.00	0.00	5	-0.665	Standard Deviation		0.761	0.590
-2	-2.5	0.00	0.00	0.00	16	-0.050	Skewness		-0.192	
-1.5	-1.75	0.00	0.00	0.00	25	0.240	Kurtosis		3.184	
-1	-1.25	1.25	1.25	1.25	50	0.720	Dispersion			
-0.75	-0.875	1.41	1.41	2.65	75	1.240	Standard Deviation			
-0.5	-0.625	2.80	2.79	5.44	84	1.450	Deviation from Normal			
-0.25	-0.375	3.49	3.48	8.92	95	1.855				
0	-0.125	5.49	5.47	14.39	99	2.355				
0.25	0.125	5.36	5.34	19.74	Graphic Phi Parameters		Inman	Folk & Ward		
0.5	0.375	11.34	11.30	31.04			1952	1957		
0.75	0.625	14.33	14.28	45.32	Mean		0.700	0.707		
1	0.875	12.57	12.53	57.85	Standard Deviation		0.750	0.757		
1.25	1.125	11.64	11.60	69.45	Skewness (1)		-0.027	-0.063		
1.5	1.375	11.99	11.95	81.40	Skewness (2)		-0.167			
1.75	1.625	8.87	8.84	90.25	Kurtosis		0.680	1.033		
2	1.875	5.18	5.16	95.41						
2.25	2.125	2.44	2.43	97.84						
2.5	2.375	1.26	1.26	99.10						
2.75	2.625	0.30	0.30	99.40						
3	2.875	0.37	0.37	99.77						
3.25	3.125	0.11	0.11	99.88						
3.5	3.375	0.07	0.07	99.95						
3.75	3.625	0.02	0.02	99.97						
4	3.875	0.00	0.00	99.97						
>4.0	4.25	0.03	0.03	100.00						

Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-1.325	Mean		1.072	0.476
-3	-3.5	0.00	0.00	0.00	5	-0.335	Standard Deviation		0.755	0.593
-2	-2.5	0.00	0.00	0.00	16	0.280	Skewness		-0.248	
-1.5	-1.75	0.00	0.00	0.00	25	0.485	Kurtosis		3.560	
-1	-1.25	1.54	1.18	1.18	50	0.950	Dispersion			
-0.75	-0.875	0.84	0.64	1.83	75	1.435	Standard Deviation			
-0.5	-0.625	1.70	1.30	3.13	84	1.690	Deviation from Normal			
-0.25	-0.375	1.81	1.39	4.52	95	2.175				
0	-0.125	3.97	3.05	7.56	99	2.615				
0.25	0.125	4.32	3.31	10.88	Graphic Phi Parameters		Inman	Folk & Ward		
0.5	0.375	10.88	8.35	19.22			1952	1957		
0.75	0.625	16.74	12.84	32.07	Mean		0.985	0.973		
1	0.875	17.96	13.78	45.84	Standard Deviation		0.705	0.733		
1.25	1.125	18.12	13.90	59.74	Skewness (1)		0.050	0.013		
1.5	1.375	17.02	13.06	72.80	Skewness (2)		-0.043			
1.75	1.625	12.35	9.47	82.27	Kurtosis		0.780	1.083		
2	1.875	8.68	6.66	88.93						
2.25	2.125	6.90	5.29	94.22						
2.5	2.375	4.90	3.76	97.98						
2.75	2.625	1.39	1.07	99.05						
3	2.875	0.81	0.62	99.67						
3.25	3.125	0.22	0.17	99.84						
3.5	3.375	0.14	0.11	99.95						
3.75	3.625	0.04	0.03	99.98						
4	3.875	0.00	0.00	99.98						
>4.0	4.25	0.03	0.02	100.00						

Grain Size Distribution



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1940+00
Interval Berm

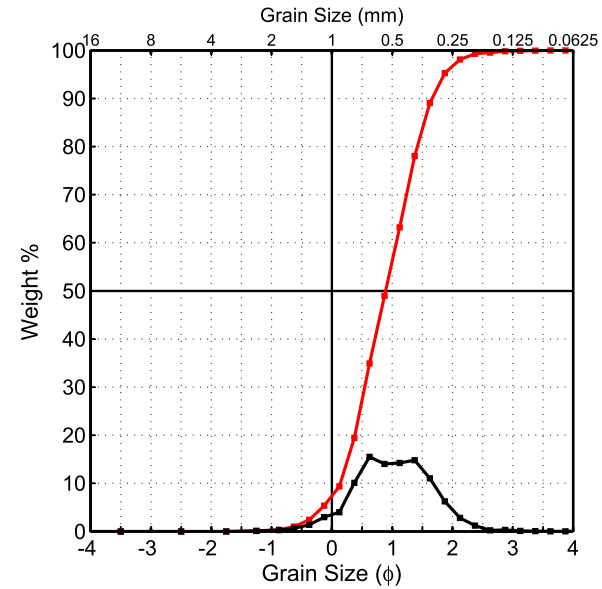
Mean 0.598 mm
STD 0.596 mm
Skewness 0.119

USCS Wentworth

SP Coarse Sand
 Medium Sand Moderately Sorted
 Poorly Graded Symmetrical
 Mesokurtic

Total weight (gram) 100.55
 % finer than 4.00 phi 0.03
 % coarser than -1.00 phi 0.74
 % CaCO₃ 6.8

Grain Size Distribution



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1940+00
Interval Dune Toe

Mean 0.495 mm
STD 0.649 mm
Skewness -0.026

USCS Wentworth

SP Medium Sand
 Medium Sand Moderately Well Sorted
 Poorly Graded Symmetrical
 Mesokurtic

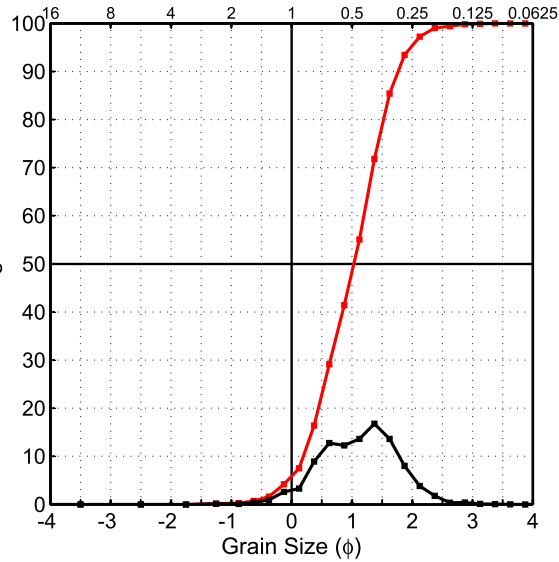
Total weight (gram) 100.56
 % finer than 4.00 phi 0.03
 % coarser than -1.00 phi 0.12
 % CaCO₃ 4.6

Limits (ϕ)	Mid Point (ϕ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-1.115	Mean		0.742	0.598
-3	-3.5	0.00	0.00	0.00	5	-0.555	Standard Deviation		0.746	0.596
-2	-2.5	0.00	0.00	0.00	16	-0.160	Skewness		0.119	
-1.5	-1.75	0.00	0.00	0.00	25	0.105	Kurtosis		2.846	
-1	-1.25	0.74	0.74	0.74	50	0.565	Dispersion			
-0.75	-0.875	0.73	0.73	1.46	75	1.180	Standard Deviation			
-0.5	-0.625	2.23	2.22	3.68	84	1.405	Deviation from Normal			
-0.25	-0.375	4.74	4.71	8.39	95	1.830				
0	-0.125	8.98	8.93	17.32	99	2.310				
0.25	0.125	8.43	8.38	25.71						
0.5	0.375	13.68	13.61	39.31	Graphic Phi Parameters		Inman	Folk & Ward		
0.75	0.625	14.23	14.15	53.47			1952	1957		
1	0.875	9.97	9.92	63.38						
1.25	1.125	9.44	9.39	72.77						
1.5	1.375	10.27	10.21	82.98						
1.75	1.625	8.12	8.08	91.06						
2	1.875	4.86	4.83	95.89						
2.25	2.125	2.25	2.24	98.13						
2.5	2.375	1.19	1.18	99.31						
2.75	2.625	0.28	0.28	99.59						
3	2.875	0.24	0.24	99.83						
3.25	3.125	0.08	0.08	99.91						
3.5	3.375	0.04	0.04	99.95						
3.75	3.625	0.02	0.02	99.97						
4	3.875	0.00	0.00	99.97						
>4.0	4.25	0.03	0.03	100.00						

Limits (ϕ)	Mid Point (ϕ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-0.630	Mean		1.015	0.495
-3	-3.5	0.00	0.00	0.00	5	-0.155	Standard Deviation		0.624	0.649
-2	-2.5	0.00	0.00	0.00	16	0.290	Skewness		-0.026	
-1.5	-1.75	0.00	0.00	0.00	25	0.465	Kurtosis		3.436	
-1	-1.25	0.12	0.12	0.12	50	0.895	Dispersion			
-0.75	-0.875	0.25	0.25	0.37	75	1.325	Standard Deviation			
-0.5	-0.625	0.65	0.65	1.01	84	1.510	Deviation from Normal			
-0.25	-0.375	1.38	1.37	2.39	95	1.865				
0	-0.125	2.97	2.95	5.34	99	2.315				
0.25	0.125	4.03	4.01	9.35						
0.5	0.375	10.15	10.09	19.44	Graphic Phi Parameters		Inman	Folk & Ward		
0.75	0.625	15.57	15.48	34.92			1952	1957		
1	0.875	14.11	14.03	48.96						
1.25	1.125	14.33	14.25	63.21						
1.5	1.375	14.89	14.81	78.01						
1.75	1.625	11.09	11.03	89.04						
2	1.875	6.28	6.25	95.29						
2.25	2.125	2.83	2.81	98.10						
2.5	2.375	1.20	1.19	99.29						
2.75	2.625	0.22	0.22	99.51						
3	2.875	0.30	0.30	99.81						
3.25	3.125	0.09	0.09	99.90						
3.5	3.375	0.05	0.05	99.95						
3.75	3.625	0.01	0.01	99.96						
4	3.875	0.01	0.01	99.97						
>4.0	4.25	0.03	0.03	100.00						

Grain Size Distribution

Grain Size (mm)



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1940+00
Interval MHW

Mean 0.460 mm
STD 0.646 mm
Skewness -0.121

USCS Wentworth

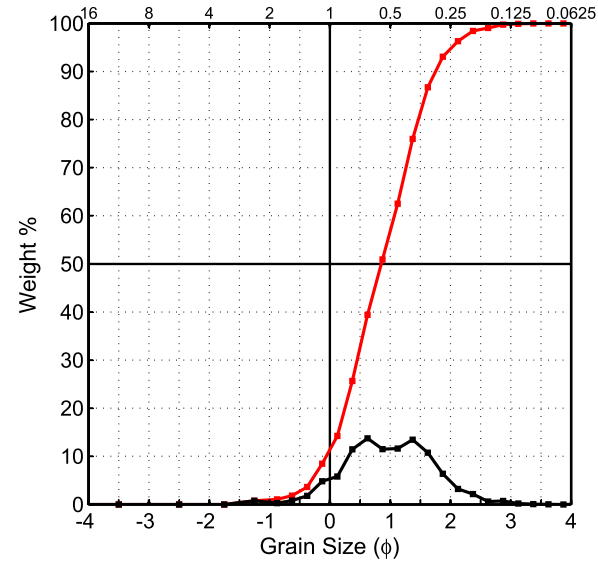
SP Medium Sand
 Poorly Graded

Medium Sand
 Moderately Well Sorted
 Symmetrical
 Mesokurtic

Total weight (gram) 100.14
 % finer than 4.00 phi 0.03
 % coarser than -1.00 phi 0.16
 % CaCO₃ 4.4

Grain Size Distribution

Grain Size (mm)



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1940+00
Interval BC

Mean 0.507 mm
STD 0.606 mm
Skewness -0.041

USCS Wentworth

SP Coarse Sand
 Medium Sand
 Poorly Graded

Coarse Sand
 Moderately Sorted
 Symmetrical
 Mesokurtic

Total weight (gram) 99.98
 % finer than 4.00 phi 0.01
 % coarser than -1.00 phi 0.75
 % CaCO₃ 4.8

Limits (phi)	Mid Point (phi)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-0.540	Mean		1.119	0.460
-3	-3.5	0.00	0.00	0.00	5	-0.065	Standard Deviation		0.630	0.646
-2	-2.5	0.00	0.00	0.00	16	0.365	Skewness		-0.121	
-1.5	-1.75	0.00	0.00	0.00	25	0.545	Kurtosis		3.309	
-1	-1.25	0.16	0.16	0.16	50	1.030	Dispersion			
-0.75	-0.875	0.10	0.10	0.26	75	1.435	Standard Deviation			
-0.5	-0.625	0.44	0.44	0.70	84	1.600	Deviation from Normal			
-0.25	-0.375	0.91	0.91	1.61	95	1.980				
0	-0.125	2.59	2.59	4.19	99	2.370				
0.25	0.125	3.31	3.31	7.50						
0.5	0.375	8.92	8.91	16.41						
0.75	0.625	12.76	12.74	29.15						
1	0.875	12.29	12.27	41.42						
1.25	1.125	13.64	13.62	55.04						
1.5	1.375	16.78	16.76	71.80						
1.75	1.625	13.63	13.61	85.41						
2	1.875	8.02	8.01	93.42						
2.25	2.125	3.84	3.83	97.25						
2.5	2.375	1.80	1.80	99.05						
2.75	2.625	0.35	0.35	99.40						
3	2.875	0.41	0.41	99.81						
3.25	3.125	0.10	0.10	99.91						
3.5	3.375	0.05	0.05	99.96						
3.75	3.625	0.01	0.01	99.97						
4	3.875	0.00	0.00	99.97						
>4.0	4.25	0.03	0.03	100.00						

Percentiles		Moment Measures		(phi)	(mm)
1	-0.540	Mean		1.119	0.460
5	-0.065	Standard Deviation		0.630	0.646
16	0.365	Skewness		-0.121	
25	0.545	Kurtosis		3.309	
50	1.030	Dispersion			
75	1.435	Standard Deviation			
84	1.600	Deviation from Normal			
95	1.980				
99	2.370				

Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean		0.982	0.998
Standard Deviation		0.618	0.619
Skewness (1)		-0.077	-0.074
Skewness (2)		-0.117	
Kurtosis		0.656	0.942

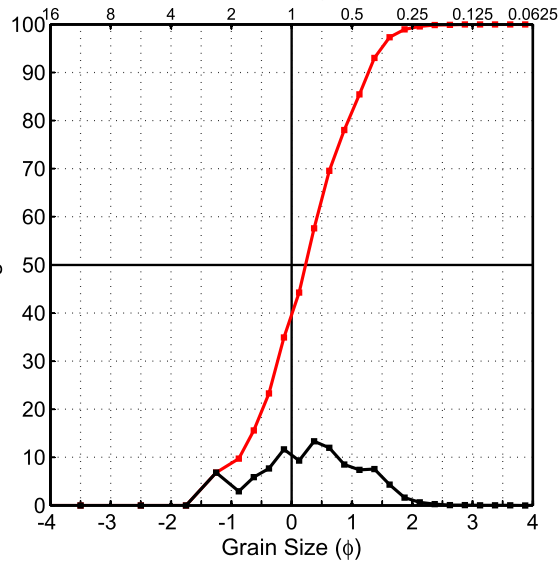
Limits (phi)	Mid Point (phi)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-0.915	Mean		0.980	0.507
-3	-3.5	0.00	0.00	0.00	5	-0.305	Standard Deviation		0.722	0.606
-2	-2.5	0.00	0.00	0.00	16	0.165	Skewness		-0.041	
-1.5	-1.75	0.00	0.00	0.00	25	0.360	Kurtosis		3.187	
-1	-1.25	0.75	0.75	0.75	50	0.855	Dispersion			
-0.75	-0.875	0.28	0.28	1.03	75	1.355	Standard Deviation			
-0.5	-0.625	0.81	0.81	1.84	84	1.560	Deviation from Normal			
-0.25	-0.375	1.80	1.80	3.64	95	2.025				
0	-0.125	4.80	4.80	8.44	99	2.615				
0.25	0.125	5.79	5.79	14.23						
0.5	0.375	11.44	11.44	25.68						
0.75	0.625	13.75	13.75	39.43						
1	0.875	11.48	11.48	50.91						
1.25	1.125	11.61	11.61	62.52						
1.5	1.375	13.44	13.44	75.97						
1.75	1.625	10.73	10.73	86.70						
2	1.875	6.36	6.36	93.06						
2.25	2.125	3.22	3.22	96.28						
2.5	2.375	2.14	2.14	98.42						
2.75	2.625	0.61	0.61	99.03						
3	2.875	0.70	0.70	99.73						
3.25	3.125	0.18	0.18	99.91						
3.5	3.375	0.07	0.07	99.98						
3.75	3.625	0.01	0.01	99.99						
4	3.875	0.00	0.00	99.99						
>4.0	4.25	0.01	0.01	100.00						

Percentiles		Moment Measures		(phi)	(mm)
1	-0.915	Mean		0.980	0.507
5	-0.305	Standard Deviation		0.722	0.606
16	0.165	Skewness		-0.041	
25	0.360	Kurtosis		3.187	
50	0.855	Dispersion			
75	1.355	Standard Deviation			
84	1.560	Deviation from Normal			
95	2.025				
99	2.615				

Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean		0.863	0.860
Standard Deviation		0.698	0.702
Skewness (1)		0.011	0.008
Skewness (2)		0.007	
Kurtosis		0.670	0.960

Grain Size Distribution

Grain Size (mm)



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1940+00
Interval MLW

Mean 0.794 mm
STD 0.572 mm
Skewness -0.055

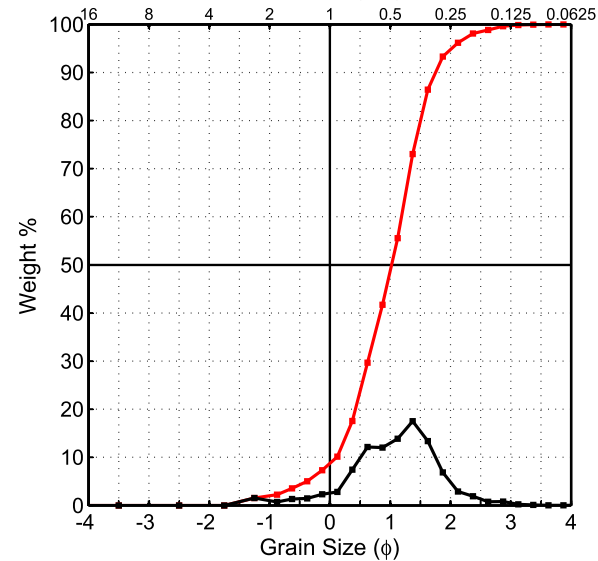
USCS Wentworth

SP Coarse Sand
 Medium Sand Moderately Sorted
 Poorly Graded Symmetrical
 Mesokurtic

Total weight (gram) 100.12
 % finer than 4.00 phi 0.01
 % coarser than -1.00 phi 6.80
 % CaCO₃ 10.9

Grain Size Distribution

Grain Size (mm)



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1940+00
Interval MTL

Mean 0.475 mm
STD 0.604 mm
Skewness -0.510

USCS Wentworth

SP Medium Sand
 Medium Sand Moderately Sorted
 Poorly Graded Coarse Skewed
 Leptokurtic

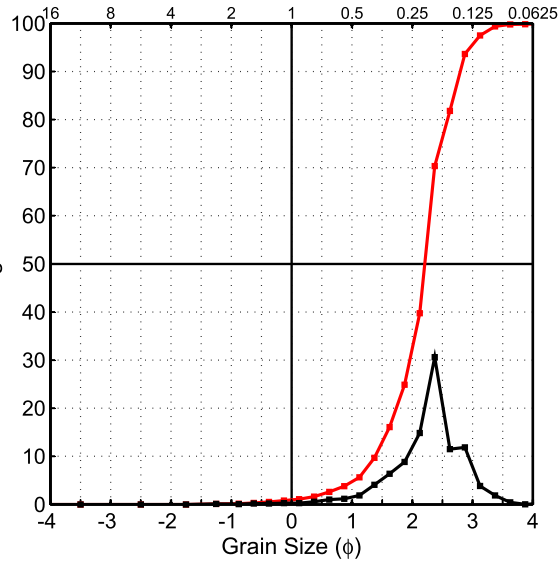
Total weight (gram) 100.12
 % finer than 4.00 phi 0.03
 % coarser than -1.00 phi 1.52
 % CaCO₃ 4.0

Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-1.675	Mean	0.333	0.794	
-3	-3.5	0.00	0.00	0.00	5	-1.380	Standard Deviation	0.807	0.572	
-2	-2.5	0.00	0.00	0.00	16	-0.610	Skewness	-0.055		
-1.5	-1.75	0.00	0.00	0.00	25	-0.340	Kurtosis	2.605		
-1	-1.25	6.81	6.80	6.80	50	0.235	Dispersion			
-0.75	-0.875	2.92	2.92	9.72	75	0.785	Standard Deviation			
-0.5	-0.625	5.89	5.88	15.60	84	1.075	Deviation from Normal			
-0.25	-0.375	7.67	7.66	23.26	95	1.490				
0	-0.125	11.67	11.66	34.92	99	1.900				
0.25	0.125	9.34	9.33	44.25						
0.5	0.375	13.35	13.33	57.58						
0.75	0.625	11.98	11.97	69.55						
1	0.875	8.49	8.48	78.03						
1.25	1.125	7.41	7.40	85.43	Graphic Phi Parameters		Inman	Folk & Ward		
1.5	1.375	7.58	7.57	93.00			1952	1957		
1.75	1.625	4.32	4.31	97.31						
2	1.875	1.63	1.63	98.94						
2.25	2.125	0.63	0.63	99.57						
2.5	2.375	0.27	0.27	99.84						
2.75	2.625	0.06	0.06	99.90						
3	2.875	0.06	0.06	99.96						
3.25	3.125	0.01	0.01	99.97			Mean	0.232	0.233	
3.5	3.375	0.01	0.01	99.98			Standard Deviation	0.842	0.856	
3.75	3.625	0.01	0.01	99.99			Skewness (1)	-0.003	-0.064	
4	3.875	0.00	0.00	99.99			Skewness (2)	-0.214		
>4.0	4.25	0.01	0.01	100.00			Kurtosis	0.703	1.046	

Limits (ϕ)	Mid Point (ϕ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-1.420	Mean		1.074	0.475
-3	-3.5	0.00	0.00	0.00	5	-0.375	Standard Deviation		0.728	0.604
-2	-2.5	0.00	0.00	0.00	16	0.325	Skewness		-0.510	
-1.5	-1.75	0.00	0.00	0.00	25	0.530	Kurtosis		4.212	
-1	-1.25	1.52	1.52	1.52	50	1.025	Dispersion			
-0.75	-0.875	0.72	0.72	2.24	75	1.410	Standard Deviation			
-0.5	-0.625	1.32	1.32	3.56	84	1.580	Deviation from Normal			
-0.25	-0.375	1.46	1.46	5.01	95	2.025				
0	-0.125	2.30	2.30	7.31	99	2.680				
0.25	0.125	2.82	2.82	10.13						
0.5	0.375	7.44	7.43	17.56						
0.75	0.625	12.14	12.13	29.68	Graphic Phi Parameters		Inman	Folk & Ward		
1	0.875	12.03	12.02	41.70			1952	1957		
1.25	1.125	13.87	13.85	55.55						
1.5	1.375	17.52	17.50	73.05						
1.75	1.625	13.38	13.36	86.42						
2	1.875	6.88	6.87	93.29						
2.25	2.125	2.90	2.90	96.18						
2.5	2.375	1.90	1.90	98.08						
2.75	2.625	0.74	0.74	98.82			Mean	0.952	0.977	
3	2.875	0.81	0.81	99.63			Standard Deviation	0.628	0.677	
3.25	3.125	0.22	0.22	99.85			Skewness (1)	-0.116	-0.141	
3.5	3.375	0.09	0.09	99.94			Skewness (2)	-0.319		
3.75	3.625	0.02	0.02	99.96			Kurtosis	0.912	1.118	
4	3.875	0.01	0.01	99.97						
>4.0	4.25	0.03	0.03	100.00						

Grain Size Distribution

Grain Size (mm)



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1940+00
Interval Bar

Mean 0.210 mm
STD 0.656 mm
Skewness -1.182

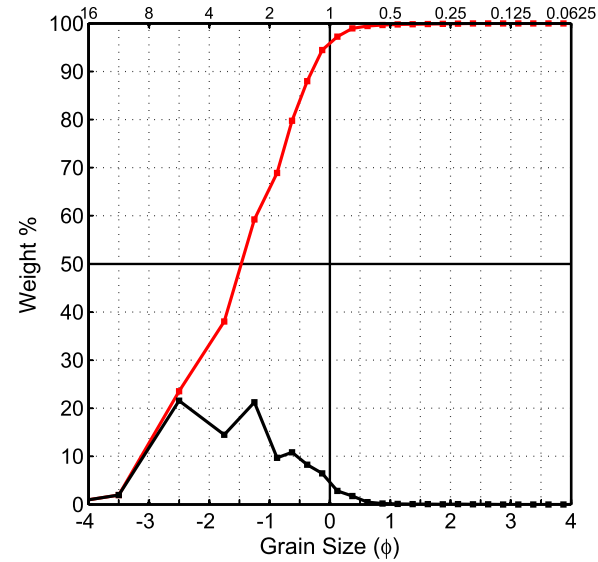
USCS Wentworth

SP Fine Sand
 Coarse Sand Poorly Graded
 Moderately Well Sorted
 Coarse Skewed
 Leptokurtic

Total weight (gram) 107.00
 % finer than 4.00 phi 0.19
 % coarser than -1.00 phi 0.08
 % CaCO₃ 2.0

Grain Size Distribution

Grain Size (mm)



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1940+00
Interval Trough

Mean 2.458 mm
STD 0.533 mm
Skewness -0.103

USCS Wentworth

SP Granule
 Coarse Sand Moderately Sorted
 Poorly Graded Symmetrical
 Mesokurtic

Total weight (gram) 114.19
 % finer than 4.00 phi 0.00
 % coarser than -1.00 phi 59.23
 % CaCO₃ 26.3

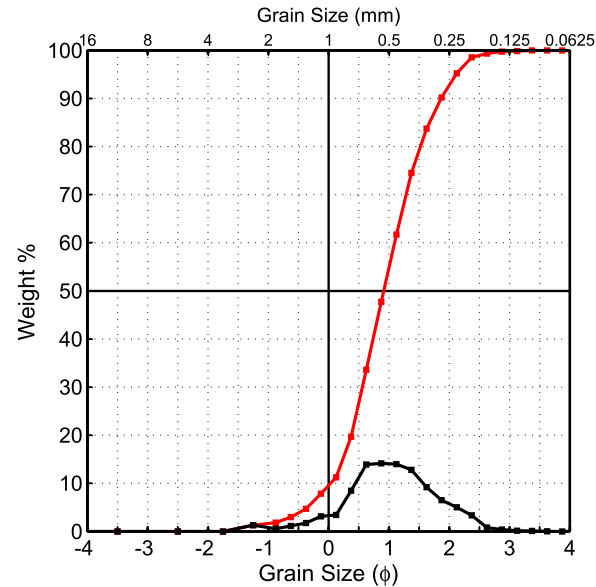
Limits (phi)	Mid Point (phi)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles	Moment Measures (phi) (mm)		
-4	-4.5	0.00	0.00	0.00	1	0.055	Mean	2.252 0.210
-3	-3.5	0.00	0.00	0.00	5	1.040	Standard Deviation	0.609 0.656
-2	-2.5	0.00	0.00	0.00	16	1.620	Skewness	-1.182
-1.5	-1.75	0.00	0.00	0.00	25	1.875	Kurtosis	6.630
-1	-1.25	0.09	0.08	0.08	50	2.210	Dispersion	
-0.75	-0.875	0.07	0.07	0.15	75	2.475	Standard Deviation	
-0.5	-0.625	0.19	0.18	0.33	84	2.670	Deviation from Normal	
-0.25	-0.375	0.21	0.20	0.52	95	2.965		
0	-0.125	0.30	0.28	0.80	99	3.325		
0.25	0.125	0.29	0.27	1.07				
0.5	0.375	0.59	0.55	1.63				
0.75	0.625	1.06	0.99	2.62				
1	0.875	1.24	1.16	3.78				
1.25	1.125	1.98	1.85	5.63				
1.5	1.375	4.36	4.07	9.70				
1.75	1.625	6.82	6.37	16.07				
2	1.875	9.44	8.82	24.90				
2.25	2.125	15.88	14.84	39.74				
2.5	2.375	32.74	30.60	70.34				
2.75	2.625	12.27	11.47	81.80				
3	2.875	12.67	11.84	93.64				
3.25	3.125	4.11	3.84	97.49				
3.5	3.375	2.01	1.88	99.36				
3.75	3.625	0.44	0.41	99.78				
4	3.875	0.04	0.04	99.81				
>4.0	4.25	0.20	0.19	100.00				

Graphic Phi Parameters	Inman 1952	Folk & Ward 1957
Mean	2.145	2.167
Standard Deviation	0.525	0.554
Skewness (1)	-0.124	-0.170
Skewness (2)	-0.395	
Kurtosis	0.833	1.315

Limits (phi)	Mid Point (phi)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles	Moment Measures (phi) (mm)		
-4	-4.5	0.00	0.00	0.00	1	-3.990	Mean	-1.298 2.458
-3	-3.5	2.24	1.96	1.96	5	-3.360	Standard Deviation	0.908 0.533
-2	-2.5	24.62	21.56	23.52	16	-2.850	Skewness	-0.103
-1.5	-1.75	16.55	14.49	38.02	25	-2.425	Kurtosis	2.627
-1	-1.25	24.23	21.22	59.23	50	-1.470	Dispersion	
-0.75	-0.875	11.04	9.67	68.90	75	-0.735	Standard Deviation	
-0.5	-0.625	12.39	10.85	79.75	84	-0.495	Deviation from Normal	
-0.25	-0.375	9.41	8.24	87.99	95	-0.075		
0	-0.125	7.37	6.45	94.45	99	0.390		
0.25	0.125	3.20	2.80	97.25				
0.5	0.375	1.97	1.73	98.98				
0.75	0.625	0.55	0.48	99.46				
1	0.875	0.22	0.19	99.65				
1.25	1.125	0.12	0.11	99.75				
1.5	1.375	0.08	0.07	99.82				
1.75	1.625	0.05	0.04	99.87				
2	1.875	0.04	0.04	99.90				
2.25	2.125	0.05	0.04	99.95				
2.5	2.375	0.04	0.04	99.98				
2.75	2.625	0.02	0.02	100.00				
3	2.875	0.00	0.00	100.00				
3.25	3.125	0.00	0.00	100.00				
3.5	3.375	0.00	0.00	100.00				
3.75	3.625	0.00	0.00	100.00				
4	3.875	0.00	0.00	100.00				
>4.0	4.25	0.00	0.00	100.00				

Graphic Phi Parameters	Inman 1952	Folk & Ward 1957
Mean	-1.672	-1.605
Standard Deviation	1.177	1.086
Skewness (1)	-0.172	-0.161
Skewness (2)	-0.210	
Kurtosis	0.395	0.797

Grain Size Distribution



Project 2408
Location Buxton, NC
Date Oct 2014

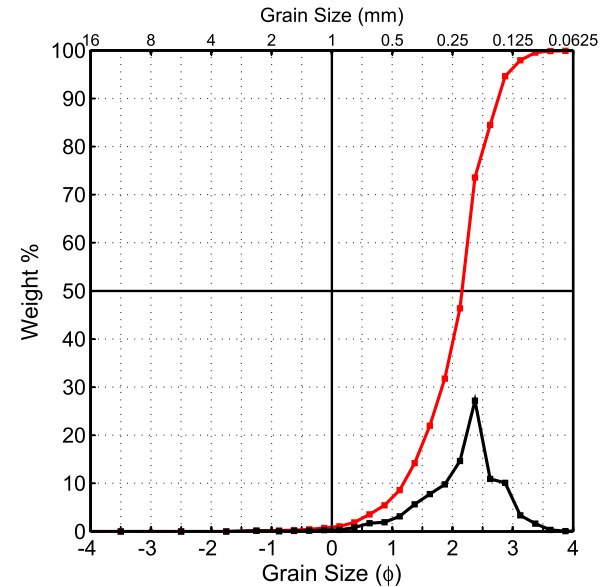
Station 1940+00
Interval -12 ft NAVD

Mean 0.487 mm
STD 0.599 mm
Skewness -0.272

USCS Wentworth
 SP Medium Sand
 Medium Sand Moderately Sorted
 Poorly Graded Symmetrical
 Mesokurtic

Total weight (gram) 105.25
 % finer than 4.00 phi 0.02
 % coarser than -1.00 phi 1.28
 % CaCO₃ 4.9

Grain Size Distribution



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1940+00
Interval -8 ft NAVD

Mean 0.224 mm
STD 0.639 mm
Skewness -0.988

USCS Wentworth
 SP Fine Sand
 Fine Sand Moderately Well Sorted
 Poorly Graded Coarse Skewed
 Leptokurtic

Total weight (gram) 105.09
 % finer than 4.00 phi 0.11
 % coarser than -1.00 phi 0.14
 % CaCO₃ 2.0

Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-1.360	Mean		1.039	0.487
-3	-3.5	0.00	0.00	0.00	5	-0.350	Standard Deviation		0.740	0.599
-2	-2.5	0.00	0.00	0.00	16	0.265	Skewness		-0.272	
-1.5	-1.75	0.00	0.00	0.00	25	0.470	Kurtosis		3.602	
-1	-1.25	1.35	1.28	1.28	50	0.915	Dispersion			
-0.75	-0.875	0.58	0.55	1.83	75	1.390	Standard Deviation			
-0.5	-0.625	1.18	1.12	2.95	84	1.635	Deviation from Normal			
-0.25	-0.375	1.84	1.75	4.70	95	2.115				
0	-0.125	3.29	3.13	7.83	99	2.520				
0.25	0.125	3.59	3.41	11.24						
0.5	0.375	8.89	8.45	19.69						
0.75	0.625	14.63	13.90	33.59						
1	0.875	14.89	14.15	47.73						
1.25	1.125	14.71	13.98	61.71						
1.5	1.375	13.49	12.82	74.53						
1.75	1.625	9.66	9.18	83.71						
2	1.875	6.81	6.47	90.18						
2.25	2.125	5.30	5.04	95.21						
2.5	2.375	3.51	3.33	98.55						
2.75	2.625	0.83	0.79	99.33						
3	2.875	0.43	0.41	99.74						
3.25	3.125	0.14	0.13	99.88						
3.5	3.375	0.09	0.09	99.96						
3.75	3.625	0.02	0.02	99.98						
4	3.875	0.00	0.00	99.98						
>4.0	4.25	0.02	0.02	100.00						

Percentiles		Moment Measures		(phi)	(mm)
1	-1.360	Mean		1.039	0.487
5	-0.350	Standard Deviation		0.740	0.599
16	0.265	Skewness		-0.272	
25	0.470	Kurtosis		3.602	
50	0.915	Dispersion			
75	1.390	Standard Deviation			
84	1.635	Deviation from Normal			
95	2.115				
99	2.520				

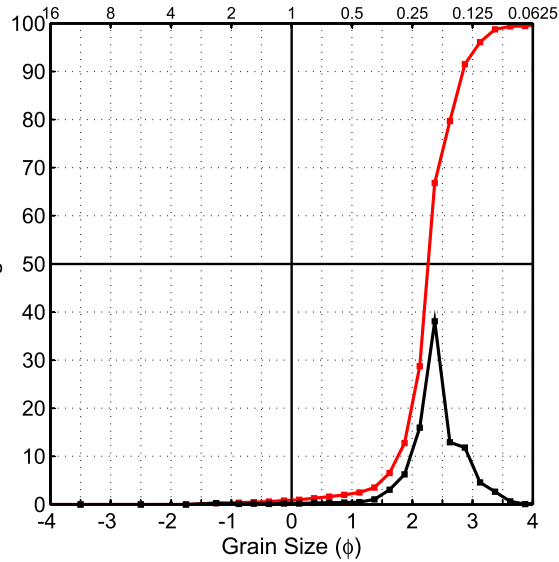
Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean		0.950	0.938
Standard Deviation		0.685	0.716
Skewness (1)		0.051	0.012
Skewness (2)		-0.047	
Kurtosis		0.799	1.098

Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	0.090	Mean		2.159	0.224
-3	-3.5	0.00	0.00	0.00	5	0.820	Standard Deviation		0.646	0.639
-2	-2.5	0.00	0.00	0.00	16	1.435	Skewness		-0.988	
-1.5	-1.75	0.00	0.00	0.00	25	1.700	Kurtosis		5.233	
-1	-1.25	0.15	0.14	0.14	50	2.160	Dispersion			
-0.75	-0.875	0.03	0.03	0.17	75	2.410	Standard Deviation			
-0.5	-0.625	0.12	0.11	0.29	84	2.615	Deviation from Normal			
-0.25	-0.375	0.17	0.16	0.45	95	2.905				
0	-0.125	0.30	0.29	0.73	99	3.295				
0.25	0.125	0.33	0.31	1.05						
0.5	0.375	0.85	0.81	1.86						
0.75	0.625	1.77	1.68	3.54						
1	0.875	1.98	1.88	5.42						
1.25	1.125	3.30	3.14	8.56						
1.5	1.375	5.92	5.63	14.20						
1.75	1.625	8.17	7.77	21.97						
2	1.875	10.27	9.77	31.74						
2.25	2.125	15.39	14.64	46.39						
2.5	2.375	28.57	27.19	73.58						
2.75	2.625	11.47	10.91	84.49						
3	2.875	10.62	10.11	94.60						
3.25	3.125	3.49	3.32	97.92						
3.5	3.375	1.70	1.62	99.53						
3.75	3.625	0.32	0.30	99.84						
4	3.875	0.05	0.05	99.89						
>4.0	4.25	0.12	0.11	100.00						

Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean		2.025	2.070
Standard Deviation		0.590	0.611
Skewness (1)		-0.229	-0.257
Skewness (2)		-0.504	
Kurtosis		0.767	1.204

Grain Size Distribution

Grain Size (mm)



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1940+00
Interval -20 ft NAVD

Mean 0.191 mm
STD 0.685 mm
Skewness -1.638

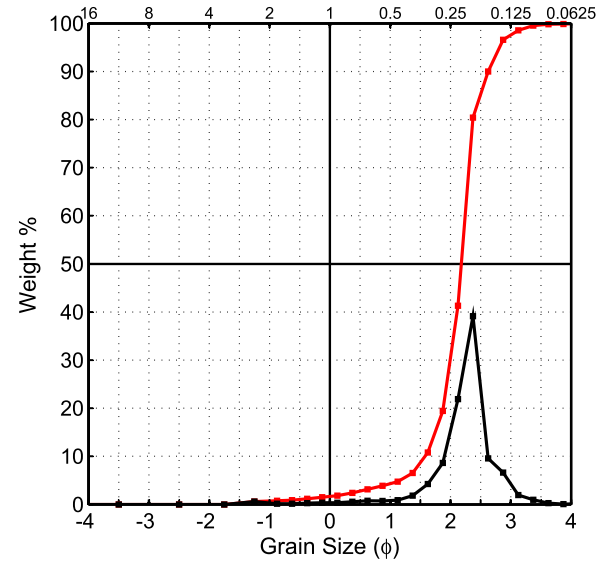
USCS Wentworth

SP Fine Sand
 Fine Sand Moderately Well Sorted
 Poorly Graded Strongly Coarse Skewed
 Very Leptokurtic

Total weight (gram) 104.85
 % finer than 4.00 phi 0.55
 % coarser than -1.00 phi 0.28
 % CaCO₃ 2.2

Grain Size Distribution

Grain Size (mm)



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1940+00
Interval -16 ft NAVD

Mean 0.215 mm
STD 0.665 mm
Skewness -2.368

USCS Wentworth

SP Fine Sand
 Fine Sand Moderately Well Sorted
 Poorly Graded Strongly Coarse Skewed
 Very Leptokurtic

Total weight (gram) 109.54
 % finer than 4.00 phi 0.14
 % coarser than -1.00 phi 0.58
 % CaCO₃ 3.0

Limits (phi)	Mid Point (phi)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles	Moment Measures (phi) (mm)		
-4	-4.5	0.00	0.00	0.00	1	0.155	Mean	2.390 0.191
-3	-3.5	0.00	0.00	0.00	5	1.500	Standard Deviation	0.546 0.685
-2	-2.5	0.00	0.00	0.00	16	1.925	Skewness	-1.638
-1.5	-1.75	0.00	0.00	0.00	25	2.065	Kurtosis	12.904
-1	-1.25	0.29	0.28	0.28	50	2.265	Dispersion	
-0.75	-0.875	0.09	0.09	0.36	75	2.535	Standard Deviation	
-0.5	-0.625	0.13	0.12	0.49	84	2.715	Deviation from Normal	
-0.25	-0.375	0.12	0.11	0.60	95	3.065		
0	-0.125	0.19	0.18	0.78	99	3.475		
0.25	0.125	0.19	0.18	0.96				
0.5	0.375	0.34	0.32	1.29				
0.75	0.625	0.36	0.34	1.63				
1	0.875	0.39	0.37	2.00				
1.25	1.125	0.48	0.46	2.46				
1.5	1.375	1.08	1.03	3.49				
1.75	1.625	3.18	3.03	6.52				
2	1.875	6.54	6.24	12.76				
2.25	2.125	16.73	15.96	28.72				
2.5	2.375	39.92	38.07	66.79				
2.75	2.625	13.54	12.91	79.70				
3	2.875	12.39	11.82	91.52				
3.25	3.125	4.79	4.57	96.09				
3.5	3.375	2.79	2.66	98.75				
3.75	3.625	0.66	0.63	99.38				
4	3.875	0.07	0.07	99.45				
>4.0	4.25	0.58	0.55	100.00				

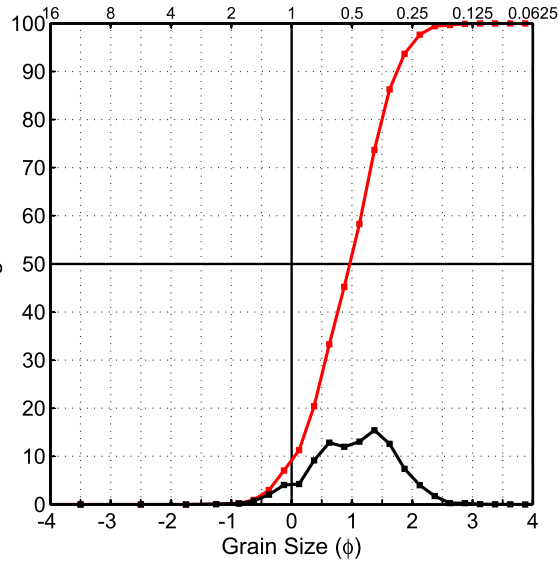
Graphic Phi Parameters	Inman 1952	Folk & Ward 1957
Mean	2.320	2.302
Standard Deviation	0.395	0.435
Skewness (1)	0.139	0.081
Skewness (2)	0.044	
Kurtosis	0.981	1.365

Limits (phi)	Mid Point (phi)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles	Moment Measures (phi) (mm)		
-4	-4.5	0.00	0.00	0.00	1	-0.525	Mean	2.216 0.215
-3	-3.5	0.00	0.00	0.00	5	1.160	Standard Deviation	0.588 0.665
-2	-2.5	0.00	0.00	0.00	16	1.775	Skewness	-2.368
-1.5	-1.75	0.00	0.00	0.00	25	1.940	Kurtosis	13.527
-1	-1.25	0.64	0.58	0.58	50	2.180	Dispersion	
-0.75	-0.875	0.17	0.16	0.74	75	2.340	Standard Deviation	
-0.5	-0.625	0.17	0.16	0.89	84	2.470	Deviation from Normal	
-0.25	-0.375	0.29	0.26	1.16	95	2.815		
0	-0.125	0.36	0.33	1.49	99	3.240		
0.25	0.125	0.36	0.33	1.82				
0.5	0.375	0.62	0.57	2.38				
0.75	0.625	0.82	0.75	3.13				
1	0.875	0.80	0.73	3.86				
1.25	1.125	0.96	0.88	4.74				
1.5	1.375	1.98	1.81	6.55				
1.75	1.625	4.66	4.25	10.80				
2	1.875	9.44	8.62	19.42				
2.25	2.125	23.96	21.87	41.29				
2.5	2.375	42.84	39.11	80.40				
2.75	2.625	10.49	9.58	89.98				
3	2.875	7.25	6.62	96.59				
3.25	3.125	2.14	1.95	98.55				
3.5	3.375	1.07	0.98	99.53				
3.75	3.625	0.31	0.28	99.81				
4	3.875	0.06	0.05	99.86				
>4.0	4.25	0.15	0.14	100.00				

Graphic Phi Parameters	Inman 1952	Folk & Ward 1957
Mean	2.122	2.142
Standard Deviation	0.347	0.425
Skewness (1)	-0.165	-0.199
Skewness (2)	-0.554	
Kurtosis	1.381	1.696

Grain Size Distribution

Grain Size (mm)



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1980+00
Interval Dune

Mean 0.483 mm
STD 0.633 mm
Skewness -0.176

USCS Wentworth

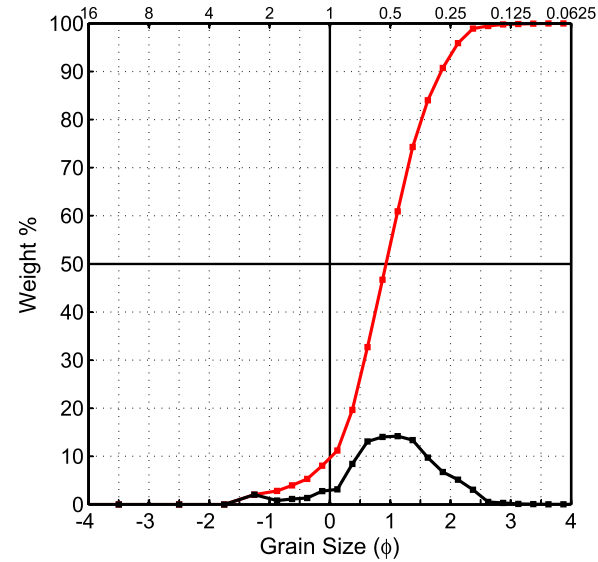
SP Medium Sand
 Poorly Graded

Medium Sand
 Moderately Well Sorted
 Symmetrical
 Mesokurtic

Total weight (gram) 105.46
 % finer than 4.00 phi 0.01
 % coarser than -1.00 phi 0.05
 % CaCO₃ 4.3

Grain Size Distribution

Grain Size (mm)



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1940+00
Interval -24 ft NAVD

Mean 0.489 mm
STD 0.593 mm
Skewness -0.471

USCS Wentworth

SP Medium Sand
 Poorly Graded

Medium Sand
 Moderately Sorted
 Coarse Skewed
 Leptokurtic

Total weight (gram) 110.85
 % finer than 4.00 phi 0.03
 % coarser than -1.00 phi 2.01
 % CaCO₃ 5.2

Limits (phi)	Mid Point (phi)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-0.615	Mean		1.050	0.483
-3	-3.5	0.00	0.00	0.00	5	-0.250	Standard Deviation		0.661	0.633
-2	-2.5	0.00	0.00	0.00	16	0.255	Skewness		-0.176	
-1.5	-1.75	0.00	0.00	0.00	25	0.465	Kurtosis		2.833	
-1	-1.25	0.05	0.05	0.05	50	0.965	Dispersion			
-0.75	-0.875	0.19	0.18	0.23	75	1.400	Standard Deviation			
-0.5	-0.625	0.75	0.71	0.94	84	1.580	Deviation from Normal			
-0.25	-0.375	2.14	2.03	2.97	95	1.960				
0	-0.125	4.27	4.05	7.02	99	2.315				
0.25	0.125	4.48	4.25	11.26						
0.5	0.375	9.66	9.16	20.42						
0.75	0.625	13.55	12.85	33.27						
1	0.875	12.63	11.98	45.25						
1.25	1.125	13.76	13.05	58.30						
1.5	1.375	16.25	15.41	73.71						
1.75	1.625	13.26	12.57	86.28						
2	1.875	7.79	7.39	93.67						
2.25	2.125	4.21	3.99	97.66						
2.5	2.375	1.84	1.74	99.40						
2.75	2.625	0.26	0.25	99.65						
3	2.875	0.27	0.26	99.91						
3.25	3.125	0.06	0.06	99.96						
3.5	3.375	0.02	0.02	99.98						
3.75	3.625	0.01	0.01	99.99						
4	3.875	0.00	0.00	99.99						
>4.0	4.25	0.01	0.01	100.00						

Percentiles		Moment Measures		(phi)	(mm)
1	-0.615	Mean		1.050	0.483
5	-0.250	Standard Deviation		0.661	0.633
16	0.255	Skewness		-0.176	
25	0.465	Kurtosis		2.833	
50	0.965	Dispersion			
75	1.400	Standard Deviation			
84	1.580	Deviation from Normal			
95	1.960				
99	2.315				

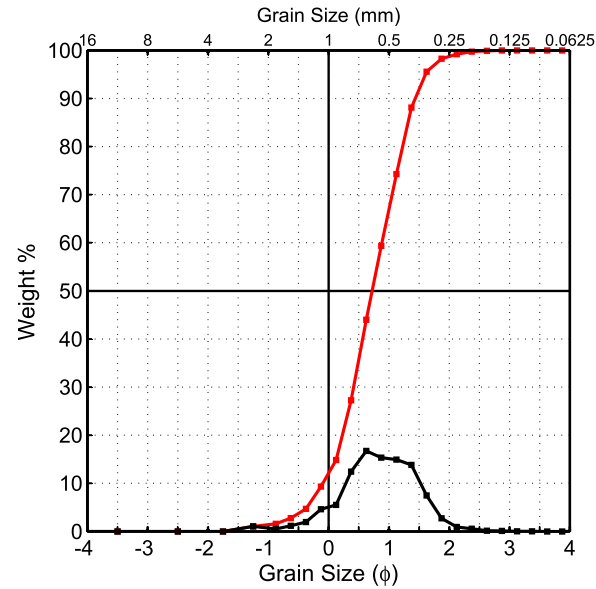
Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean		0.917	0.933
Standard Deviation		0.663	0.666
Skewness (1)		-0.072	-0.086
Skewness (2)		-0.166	
Kurtosis		0.668	0.969

Limits (phi)	Mid Point (phi)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-1.500	Mean		1.032	0.489
-3	-3.5	0.00	0.00	0.00	5	-0.430	Standard Deviation		0.754	0.593
-2	-2.5	0.00	0.00	0.00	16	0.270	Skewness		-0.471	
-1.5	-1.75	0.00	0.00	0.00	25	0.480	Kurtosis		3.887	
-1	-1.25	2.23	2.01	2.01	50	0.935	Dispersion			
-0.75	-0.875	0.90	0.81	2.82	75	1.395	Standard Deviation			
-0.5	-0.625	1.26	1.14	3.96	84	1.625	Deviation from Normal			
-0.25	-0.375	1.49	1.34	5.30	95	2.080				
0	-0.125	3.05	2.75	8.06	99	2.410				
0.25	0.125	3.47	3.13	11.19						
0.5	0.375	9.35	8.43	19.62						
0.75	0.625	14.49	13.07	32.69						
1	0.875	15.55	14.03	46.72						
1.25	1.125	15.75	14.21	60.93						
1.5	1.375	14.81	13.36	74.29						
1.75	1.625	10.76	9.71	84.00						
2	1.875	7.48	6.75	90.74						
2.25	2.125	5.70	5.14	95.89						
2.5	2.375	3.37	3.04	98.93						
2.75	2.625	0.57	0.51	99.44						
3	2.875	0.36	0.32	99.77						
3.25	3.125	0.12	0.11	99.87						
3.5	3.375	0.07	0.06	99.94						
3.75	3.625	0.03	0.03	99.96						
4	3.875	0.01	0.01	99.97						
>4.0	4.25	0.03	0.03	100.00						

Percentiles		Moment Measures		(phi)	(mm)
1	-1.500	Mean		1.032	0.489
5	-0.430	Standard Deviation		0.754	0.593
16	0.270	Skewness		-0.471	
25	0.480	Kurtosis		3.887	
50	0.935	Dispersion			
75	1.395	Standard Deviation			
84	1.625	Deviation from Normal			
95	2.080				
99	2.410				

Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean		0.948	0.943
Standard Deviation		0.677	0.719
Skewness (1)		0.018	-0.035
Skewness (2)		-0.162	
Kurtosis		0.852	1.124

Grain Size Distribution



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1980+00
Interval Berm

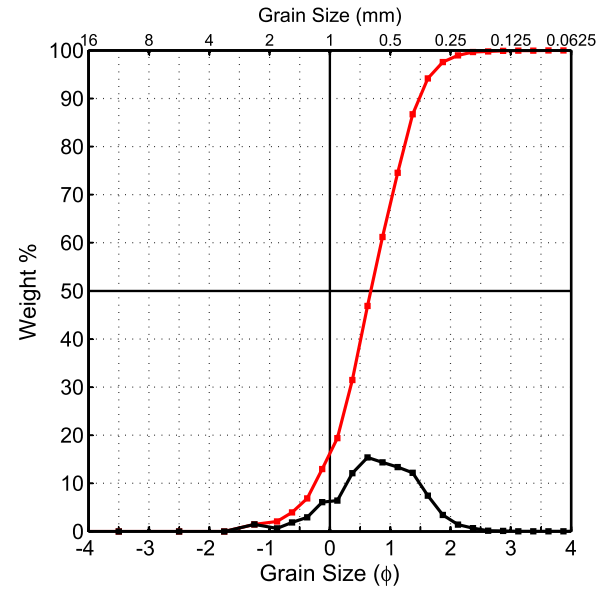
Mean 0.565 mm
STD 0.650 mm
Skewness -0.416

USCS Wentworth

SP Coarse Sand
 Medium Sand Moderately Well Sorted
 Poorly Graded Symmetrical
 Leptokurtic

Total weight (gram) 107.86
 % finer than 4.00 phi 0.01
 % coarser than -1.00 phi 1.06
 % CaCO₃ 6.2

Grain Size Distribution



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1980+00
Interval Dune Toe

Mean 0.582 mm
STD 0.622 mm
Skewness -0.287

USCS Wentworth

SP Coarse Sand
 Medium Sand Moderately Well Sorted
 Poorly Graded Symmetrical
 Mesokurtic

Total weight (gram) 115.10
 % finer than 4.00 phi 0.03
 % coarser than -1.00 phi 1.43
 % CaCO₃ 6.0

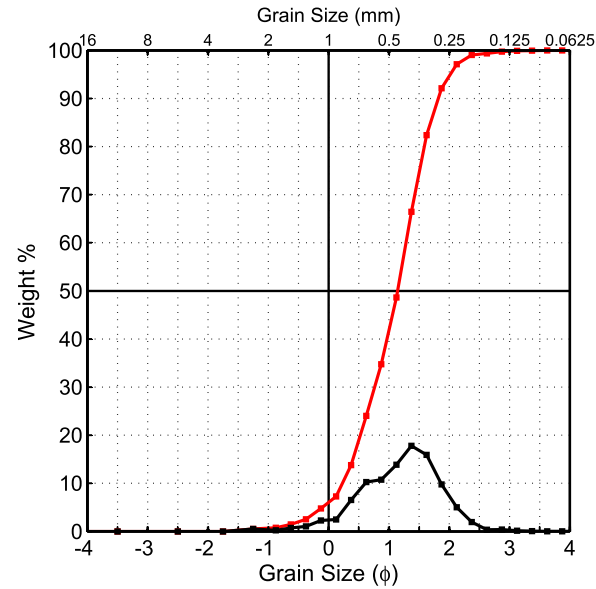
Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-1.275	Mean		0.824	0.565
-3	-3.5	0.00	0.00	0.00	5	-0.360	Standard Deviation		0.622	0.650
-2	-2.5	0.00	0.00	0.00	16	0.150	Skewness		-0.416	
-1.5	-1.75	0.00	0.00	0.00	25	0.330	Kurtosis		3.837	
-1	-1.25	1.14	1.06	1.06	50	0.725	Dispersion			
-0.75	-0.875	0.55	0.51	1.57	75	1.140	Standard Deviation			
-0.5	-0.625	1.28	1.19	2.75	84	1.300	Deviation from Normal			
-0.25	-0.375	2.10	1.95	4.70	95	1.605				
0	-0.125	4.98	4.62	9.32	99	2.070				
0.25	0.125	5.95	5.52	14.83						
0.5	0.375	13.41	12.43	27.27						
0.75	0.625	18.05	16.73	44.00						
1	0.875	16.55	15.34	59.35						
1.25	1.125	16.11	14.94	74.28						
1.5	1.375	14.90	13.81	88.10						
1.75	1.625	8.06	7.47	95.57						
2	1.875	2.92	2.71	98.28						
2.25	2.125	0.99	0.92	99.19						
2.5	2.375	0.59	0.55	99.74						
2.75	2.625	0.15	0.14	99.88						
3	2.875	0.10	0.09	99.97						
3.25	3.125	0.01	0.01	99.98						
3.5	3.375	0.01	0.01	99.99						
3.75	3.625	0.00	0.00	99.99						
4	3.875	0.00	0.00	99.99						
>4.0	4.25	0.01	0.01	100.00						

Percentiles		Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean				0.725	0.725
Standard Deviation				0.575	0.585
Skewness (1)				-0.000	-0.052
Skewness (2)				-0.178	
Kurtosis				0.709	0.994

Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-1.400	Mean		0.780	0.582
-3	-3.5	0.00	0.00	0.00	5	-0.535	Standard Deviation		0.684	0.622
-2	-2.5	0.00	0.00	0.00	16	-0.005	Skewness		-0.287	
-1.5	-1.75	0.00	0.00	0.00	25	0.240	Kurtosis		3.547	
-1	-1.25	1.65	1.43	1.43	50	0.680	Dispersion			
-0.75	-0.875	0.75	0.65	2.09	75	1.135	Standard Deviation			
-0.5	-0.625	2.16	1.88	3.96	84	1.320	Deviation from Normal			
-0.25	-0.375	3.35	2.91	6.87	95	1.685				
0	-0.125	7.01	6.09	12.96	99	2.135				
0.25	0.125	7.38	6.41	19.37						
0.5	0.375	13.94	12.11	31.49						
0.75	0.625	17.69	15.37	46.85						
1	0.875	16.50	14.34	61.19						
1.25	1.125	15.37	13.35	74.54						
1.5	1.375	14.01	12.17	86.72						
1.75	1.625	8.57	7.45	94.16						
2	1.875	3.92	3.41	97.57						
2.25	2.125	1.61	1.40	98.97						
2.5	2.375	0.78	0.68	99.64						
2.75	2.625	0.17	0.15	99.79						
3	2.875	0.13	0.11	99.90						
3.25	3.125	0.03	0.03	99.93						
3.5	3.375	0.02	0.02	99.95						
3.75	3.625	0.02	0.02	99.97						
4	3.875	0.01	0.01	99.97						
>4.0	4.25	0.03	0.03	100.00						

Percentiles		Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean				0.657	0.665
Standard Deviation				0.662	0.668
Skewness (1)				-0.034	-0.064
Skewness (2)				-0.158	
Kurtosis				0.675	1.017

Grain Size Distribution



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1980+00
Interval MHW

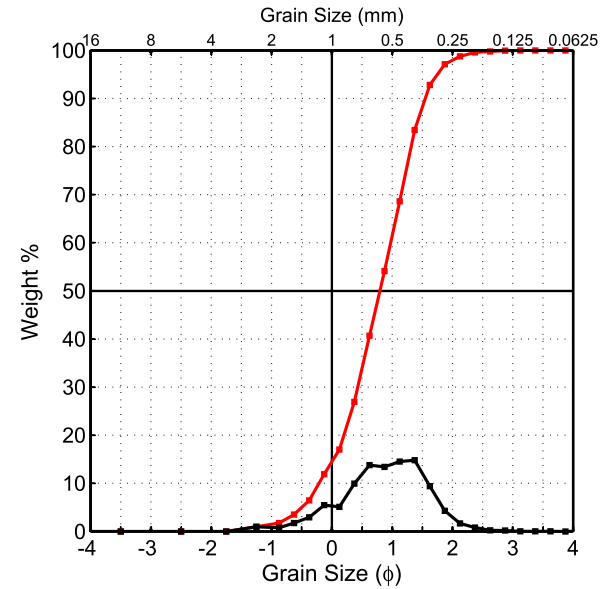
Mean 0.439 mm
STD 0.636 mm
Skewness -0.506

USCS Wentworth

SP Medium Sand
 Medium Sand Moderately Well Sorted
 Poorly Graded Coarse Skewed
 Leptokurtic

Total weight (gram) 109.63
 % finer than 4.00 phi 0.02
 % coarser than -1.00 phi 0.51
 % CaCO₃ 4.2

Grain Size Distribution



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1980+00
Interval BC

Mean 0.549 mm
STD 0.621 mm
Skewness -0.401

USCS Wentworth

SP Coarse Sand
 Medium Sand Moderately Well Sorted
 Poorly Graded Symmetrical
 Mesokurtic

Total weight (gram) 115.87
 % finer than 4.00 phi 0.01
 % coarser than -1.00 phi 0.96
 % CaCO₃ 6.0

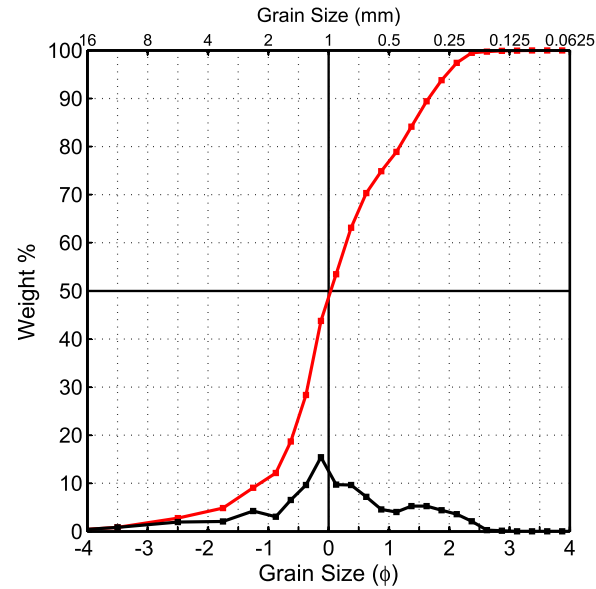
Limits (phi)	Mid Point (phi)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-0.785	Mean		1.188	0.439
-3	-3.5	0.00	0.00	0.00	5	-0.105	Standard Deviation		0.653	0.636
-2	-2.5	0.00	0.00	0.00	16	0.430	Skewness		-0.506	
-1.5	-1.75	0.00	0.00	0.00	25	0.650	Kurtosis		3.926	
-1	-1.25	0.56	0.51	0.51			Dispersion			
-0.75	-0.875	0.26	0.24	0.75	50	1.145	Standard Deviation			
-0.5	-0.625	0.78	0.71	1.46	75	1.510	Deviation from Normal			
-0.25	-0.375	1.14	1.04	2.50						
0	-0.125	2.50	2.28	4.78	84	1.665				
0.25	0.125	2.72	2.48	7.26	95	2.020				
0.5	0.375	7.14	6.51	13.77	99	2.370				
0.75	0.625	11.24	10.25	24.03						
1	0.875	11.77	10.74	34.76						
1.25	1.125	15.21	13.87	48.64						
1.5	1.375	19.52	17.81	66.44						
1.75	1.625	17.46	15.93	82.37						
2	1.875	10.69	9.75	92.12						
2.25	2.125	5.48	5.00	97.12						
2.5	2.375	2.11	1.92	99.04						
2.75	2.625	0.36	0.33	99.37						
3	2.875	0.41	0.37	99.74						
3.25	3.125	0.15	0.14	99.88						
3.5	3.375	0.08	0.07	99.95						
3.75	3.625	0.02	0.02	99.97						
4	3.875	0.01	0.01	99.98						
>4.0	4.25	0.02	0.02	100.00						

Percentiles		Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean				1.047	1.080
Standard Deviation				0.618	0.631
Skewness (1)				-0.158	-0.167
Skewness (2)				-0.304	
Kurtosis				0.721	1.013

Limits (phi)	Mid Point (phi)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-1.230	Mean		0.866	0.549
-3	-3.5	0.00	0.00	0.00	5	-0.495	Standard Deviation		0.687	0.621
-2	-2.5	0.00	0.00	0.00	16	0.075	Skewness		-0.401	
-1.5	-1.75	0.00	0.00	0.00	25	0.325	Kurtosis		3.324	
-1	-1.25	1.11	0.96	0.96			Dispersion			
-0.75	-0.875	0.90	0.78	1.73	50	0.800	Standard Deviation			
-0.5	-0.625	2.03	1.75	3.49	75	1.235	Deviation from Normal			
-0.25	-0.375	3.41	2.94	6.43						
0	-0.125	6.35	5.48	11.91	84	1.390				
0.25	0.125	5.90	5.09	17.00	95	1.750				
0.5	0.375	11.50	9.92	26.93	99	2.200				
0.75	0.625	15.95	13.77	40.69						
1	0.875	15.56	13.43	54.12						
1.25	1.125	16.80	14.50	68.62						
1.5	1.375	17.16	14.81	83.43						
1.75	1.625	10.89	9.40	92.83						
2	1.875	4.95	4.27	97.10						
2.25	2.125	1.92	1.66	98.76						
2.5	2.375	0.93	0.80	99.56						
2.75	2.625	0.25	0.22	99.78						
3	2.875	0.19	0.16	99.94						
3.25	3.125	0.03	0.03	99.97						
3.5	3.375	0.02	0.02	99.98						
3.75	3.625	0.01	0.01	99.99						
4	3.875	0.00	0.00	99.99						
>4.0	4.25	0.01	0.01	100.00						

Percentiles		Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean				0.732	0.755
Standard Deviation				0.658	0.669
Skewness (1)				-0.103	-0.128
Skewness (2)				-0.262	
Kurtosis				0.707	1.011

Grain Size Distribution



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1980+00
Interval MLW

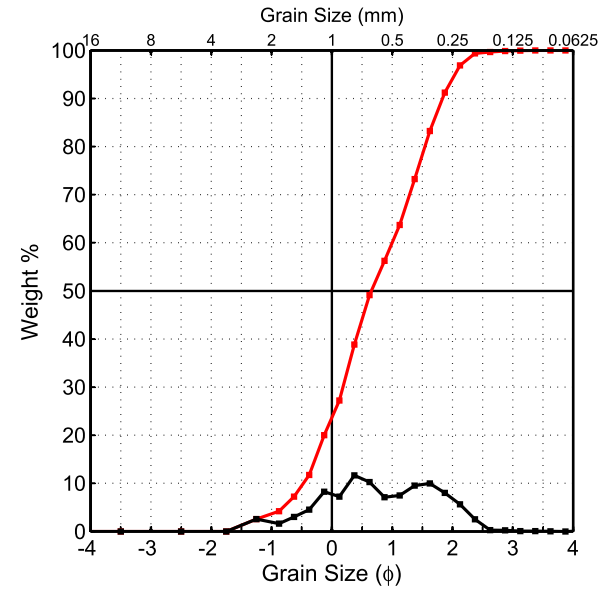
Mean 0.830 mm
STD 0.469 mm
Skewness -0.276

USCS Wentworth

SP Coarse Sand
 Medium Sand Poorly Sorted
 Poorly Graded Symmetrical
 Mesokurtic

Total weight (gram) 125.54
 % finer than 4.00 phi 0.02
 % coarser than -1.00 phi 9.09
 % CaCO₃ 9.1

Grain Size Distribution



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1980+00
Interval MTL

Mean 0.570 mm
STD 0.539 mm
Skewness -0.164

USCS Wentworth

SP Coarse Sand
 Medium Sand Moderately Sorted
 Poorly Graded Symmetrical
 Platykurtic

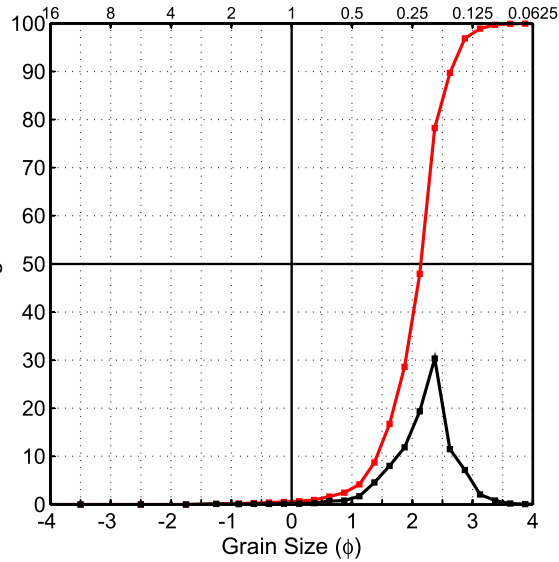
Total weight (gram) 106.07
 % finer than 4.00 phi 0.02
 % coarser than -1.00 phi 2.57
 % CaCO₃ 5.8

Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-3.410	Mean		0.269	0.830
-3	-3.5	1.04	0.83	0.83	5	-1.735	Standard Deviation		1.091	0.469
-2	-2.5	2.44	1.94	2.77	16	-0.730	Skewness		-0.276	
-1.5	-1.75	2.62	2.09	4.86	25	-0.460	Kurtosis		3.660	
-1	-1.25	5.31	4.23	9.09	50	0.035	Dispersion			
-0.75	-0.875	3.85	3.07	12.16	75	0.885	Standard Deviation			
-0.5	-0.625	8.20	6.53	18.69	84	1.370	Deviation from Normal			
-0.25	-0.375	12.13	9.66	28.35	95	1.960				
0	-0.125	19.33	15.40	43.75	99	2.315				
0.25	0.125	12.21	9.73	53.47						
0.5	0.375	12.11	9.65	63.12						
0.75	0.625	9.03	7.19	70.31						
1	0.875	5.72	4.56	74.87						
1.25	1.125	5.04	4.01	78.88	Graphic Phi Parameters		Inman	Folk & Ward		
1.5	1.375	6.61	5.27	84.15			1952	1957		
1.75	1.625	6.59	5.25	89.40						
2	1.875	5.51	4.39	93.79						
2.25	2.125	4.51	3.59	97.38						
2.5	2.375	2.65	2.11	99.49						
2.75	2.625	0.31	0.25	99.74			Mean	0.320	0.225	
3	2.875	0.20	0.16	99.90			Standard Deviation	1.050	1.085	
3.25	3.125	0.05	0.04	99.94			Skewness (1)	0.271	0.157	
3.5	3.375	0.03	0.02	99.96			Skewness (2)	0.074		
3.75	3.625	0.02	0.02	99.98			Kurtosis	0.760	1.126	
4	3.875	0.01	0.01	99.98						
>4.0	4.25	0.02	0.02	100.00						

Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles	Moment Measures	(phi)	(mm)	
-4	-4.5	0.00	0.00	0.00	1 -1.555	Mean	0.811	0.570	
-3	-3.5	0.00	0.00	0.00	5 -0.810	Standard Deviation	0.891	0.539	
-2	-2.5	0.00	0.00	0.00	16 -0.245	Skewness	-0.164		
-1.5	-1.75	0.00	0.00	0.00	25 0.050	Kurtosis	2.396		
-1	-1.25	2.73	2.57	2.57	50 0.655	Dispersion			
-0.75	-0.875	1.72	1.62	4.20	75 1.420	Standard Deviation			
-0.5	-0.625	3.20	3.02	7.21	84 1.650	Deviation from Normal			
-0.25	-0.375	4.78	4.51	11.72	95 2.040				
0	-0.125	8.77	8.27	19.99	99 2.335				
0.25	0.125	7.67	7.23	27.22					
0.5	0.375	12.35	11.64	38.86					
0.75	0.625	10.90	10.28	49.14	Graphic Phi Parameters		Inman	Folk & Ward	
1	0.875	7.53	7.10	56.24			1952	1957	
1.25	1.125	7.93	7.48	63.71					
1.5	1.375	10.12	9.54	73.25					
1.75	1.625	10.58	9.97	83.23			Mean	0.702	0.687
2	1.875	8.48	7.99	91.22			Standard Deviation	0.948	0.906
2.25	2.125	5.98	5.64	96.86			Skewness (1)	0.050	0.011
2.5	2.375	2.67	2.52	99.38			Skewness (2)	-0.042	
2.75	2.625	0.29	0.27	99.65			Kurtosis	0.504	0.853
3	2.875	0.22	0.21	99.86					
3.25	3.125	0.07	0.07	99.92					
3.5	3.375	0.05	0.05	99.97					
3.75	3.625	0.01	0.01	99.98					
4	3.875	0.00	0.00	99.98					
>4.0	4.25	0.02	0.02	100.00					

Grain Size Distribution

Grain Size (mm)



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1980+00
Interval Bar

Mean 0.220 mm
STD 0.694 mm
Skewness -1.199

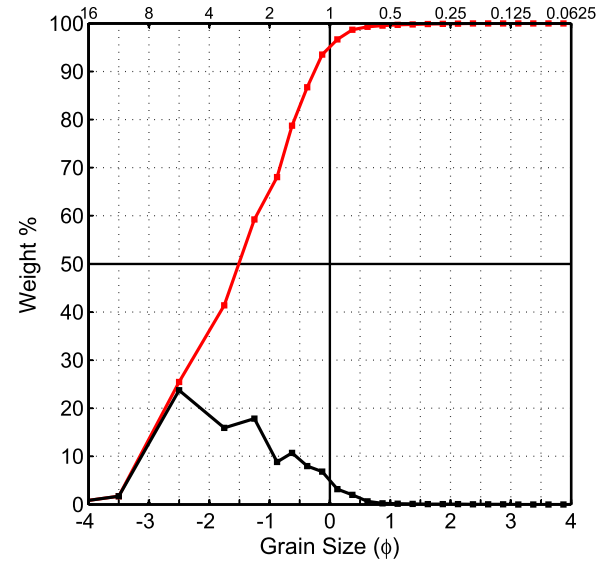
USCS Wentworth

SP Fine Sand
 Coarse Sand Poorly Graded
 Moderately Well Sorted
 Coarse Skewed
 Very Leptokurtic

Total weight (gram) 106.05
 % finer than 4.00 phi 0.08
 % coarser than -1.00 phi 0.12
 % CaCO₃ 1.9

Grain Size Distribution

Grain Size (mm)



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1980+00
Interval Trough

Mean 2.484 mm
STD 0.522 mm
Skewness 0.017

USCS Wentworth

SP Granule
 Coarse Sand Moderately Sorted
 Poorly Graded Symmetrical
 Platykurtic

Total weight (gram) 114.75
 % finer than 4.00 phi 0.00
 % coarser than -1.00 phi 59.22
 % CaCO₃ 21.3

Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles	Moment Measures	(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	Mean	2.184	0.220
-3	-3.5	0.00	0.00	0.00	5	Standard Deviation	0.528	0.694
-2	-2.5	0.00	0.00	0.00	16	Skewness	-1.199	
-1.5	-1.75	0.00	0.00	0.00	25	Kurtosis	7.882	
-1	-1.25	0.13	0.12	0.12	50	Dispersion		
-0.75	-0.875	0.05	0.05	0.17	75	Standard Deviation		
-0.5	-0.625	0.11	0.10	0.27	84	Deviation from Normal		
-0.25	-0.375	0.12	0.11	0.39	95			
0	-0.125	0.15	0.14	0.53	99			
0.25	0.125	0.15	0.14	0.67				
0.5	0.375	0.28	0.26	0.93				
0.75	0.625	0.73	0.69	1.62				
1	0.875	0.85	0.80	2.42				
1.25	1.125	1.82	1.72	4.14				
1.5	1.375	4.85	4.57	8.71				
1.75	1.625	8.49	8.01	16.72				
2	1.875	12.59	11.87	28.59				
2.25	2.125	20.50	19.33	47.92				
2.5	2.375	32.15	30.32	78.24				
2.75	2.625	12.17	11.48	89.71				
3	2.875	7.57	7.14	96.85				
3.25	3.125	2.18	2.06	98.91				
3.5	3.375	0.84	0.79	99.70				
3.75	3.625	0.19	0.18	99.88				
4	3.875	0.05	0.05	99.92				
>4.0	4.25	0.08	0.08	100.00				

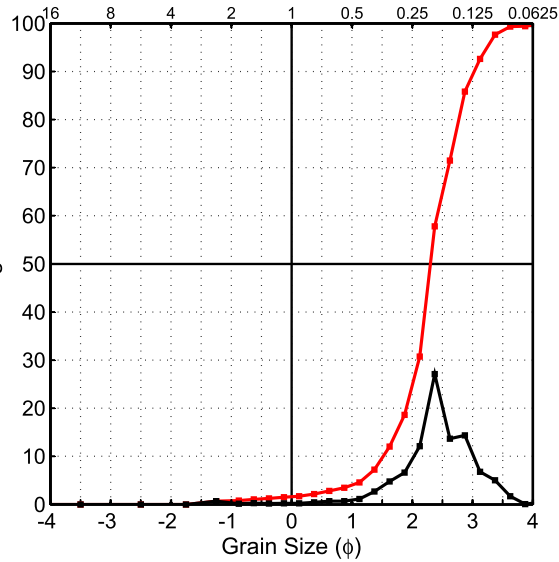
Graphic Phi Parameters	Inman 1952	Folk & Ward 1957
Mean	2.053	2.082
Standard Deviation	0.448	0.472
Skewness (1)	-0.196	-0.189
Skewness (2)	-0.335	
Kurtosis	0.832	1.222

Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles	Moment Measures	(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	Mean	-1.313	2.484
-3	-3.5	1.97	1.72	1.72	5	Standard Deviation	0.937	0.522
-2	-2.5	27.24	23.74	25.46	16	Skewness	0.017	
-1.5	-1.75	18.27	15.92	41.38	25	Kurtosis	2.477	
-1	-1.25	20.48	17.85	59.22	50	Dispersion		
-0.75	-0.875	10.11	8.81	68.03	75	Standard Deviation		
-0.5	-0.625	12.29	10.71	78.75	84	Deviation from Normal		
-0.25	-0.375	9.13	7.96	86.70	95			
0	-0.125	7.82	6.81	93.52	99			
0.25	0.125	3.63	3.16	96.68				
0.5	0.375	2.26	1.97	98.65				
0.75	0.625	0.73	0.64	99.29				
1	0.875	0.27	0.24	99.52				
1.25	1.125	0.18	0.16	99.68				
1.5	1.375	0.12	0.10	99.78				
1.75	1.625	0.09	0.08	99.86				
2	1.875	0.06	0.05	99.91				
2.25	2.125	0.05	0.04	99.96				
2.5	2.375	0.03	0.03	99.98				
2.75	2.625	0.01	0.01	99.99				
3	2.875	0.01	0.01	100.00				
3.25	3.125	0.00	0.00	100.00				
3.5	3.375	0.00	0.00	100.00				
3.75	3.625	0.00	0.00	100.00				
4	3.875	0.00	0.00	100.00				
>4.0	4.25	0.00	0.00	100.00				

Graphic Phi Parameters	Inman 1952	Folk & Ward 1957
Mean	-1.680	-1.623
Standard Deviation	1.220	1.118
Skewness (1)	-0.139	-0.122
Skewness (2)	-0.143	
Kurtosis	0.373	0.759

Grain Size Distribution

Grain Size (mm)



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1980+00
Interval -12 ft NAVD

Mean 0.190 mm
STD 0.614 mm
Skewness -1.610

USCS Wentworth

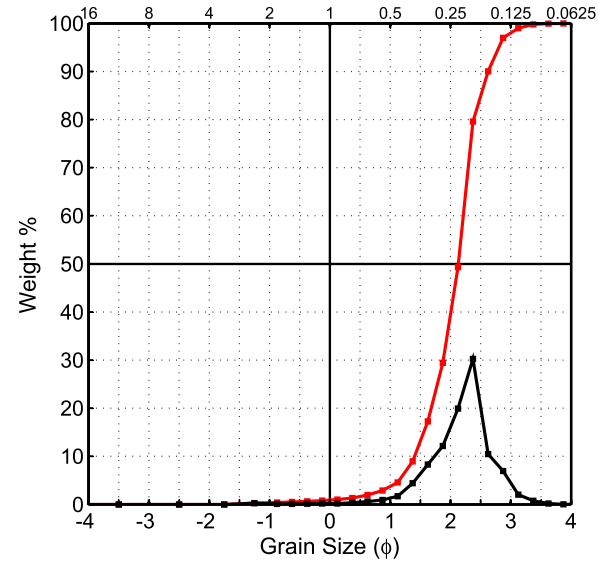
SP Fine Sand
 Poorly Graded

Fine Sand
 Moderately Sorted
 Strongly Coarse Skewed
 Very Leptokurtic

Total weight (gram) 108.93
 % finer than 4.00 phi 0.60
 % coarser than -1.00 phi 0.67
 % CaCO₃ 2.2

Grain Size Distribution

Grain Size (mm)



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1980+00
Interval -8 ft NAVD

Mean 0.223 mm
STD 0.682 mm
Skewness -1.559

USCS Wentworth

SP Fine Sand
 Poorly Graded

Fine Sand
 Moderately Well Sorted
 Strongly Coarse Skewed
 Very Leptokurtic

Total weight (gram) 116.00
 % finer than 4.00 phi 0.03
 % coarser than -1.00 phi 0.28
 % CaCO₃ 2.1

Limits (phi)	Mid Point (phi)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-0.680	Mean		2.394	0.190
-3	-3.5	0.00	0.00	0.00	5	1.165	Standard Deviation		0.703	0.614
-2	-2.5	0.00	0.00	0.00	16	1.775	Skewness		-1.610	
-1.5	-1.75	0.00	0.00	0.00	25	2.005	Kurtosis		9.202	
-1	-1.25	0.73	0.67	0.67	25	2.005	Dispersion			
-0.75	-0.875	0.15	0.14	0.81	50	2.305	Standard Deviation			
-0.5	-0.625	0.27	0.25	1.06	75	2.685	Deviation from Normal			
-0.25	-0.375	0.21	0.19	1.25	84	2.845				
0	-0.125	0.25	0.23	1.48	95	3.245				
0.25	0.125	0.23	0.21	1.69	99	3.575				
0.5	0.375	0.48	0.44	2.13						
0.75	0.625	0.72	0.66	2.79						
1	0.875	0.73	0.67	3.46						
1.25	1.125	1.21	1.11	4.57						
1.5	1.375	2.91	2.67	7.24						
1.75	1.625	5.18	4.76	12.00						
2	1.875	7.21	6.62	18.62						
2.25	2.125	13.18	12.10	30.72						
2.5	2.375	29.50	27.08	57.80						
2.75	2.625	14.88	13.66	71.46						
3	2.875	15.65	14.37	85.83						
3.25	3.125	7.38	6.77	92.60						
3.5	3.375	5.48	5.03	97.63						
3.75	3.625	1.86	1.71	99.34						
4	3.875	0.07	0.06	99.40						
>4.0	4.25	0.65	0.60	100.00						

Percentiles		Moment Measures		(phi)	(mm)
1	-0.680	Mean		2.394	0.190
5	1.165	Standard Deviation		0.703	0.614
16	1.775	Skewness		-1.610	
25	2.005	Kurtosis		9.202	
25	2.005	Dispersion			
50	2.305	Standard Deviation			
75	2.685	Deviation from Normal			
84	2.845				
95	3.245				
99	3.575				

Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean		2.310	2.308
Standard Deviation		0.535	0.583
Skewness (1)		0.009	-0.043
Skewness (2)		-0.187	
Kurtosis		0.944	1.254

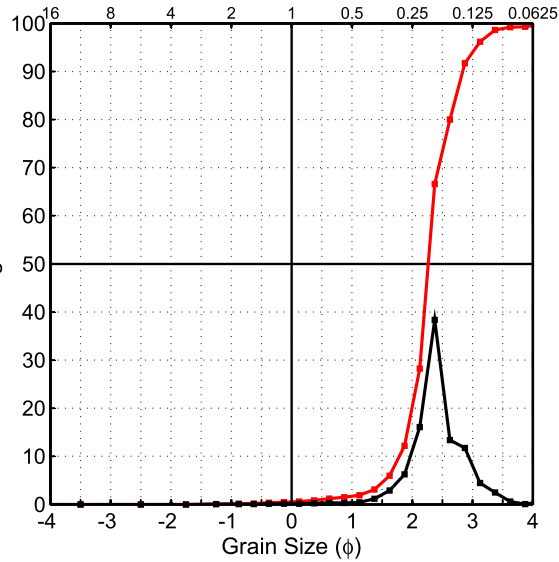
Limits (phi)	Mid Point (phi)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	0.125	Mean		2.163	0.223
-3	-3.5	0.00	0.00	0.00	5	1.150	Standard Deviation		0.552	0.682
-2	-2.5	0.00	0.00	0.00	16	1.585	Skewness		-1.559	
-1.5	-1.75	0.00	0.00	0.00	25	1.785	Kurtosis		9.553	
-1	-1.25	0.32	0.28	0.28	25	1.785	Dispersion			
-0.75	-0.875	0.12	0.10	0.38	50	2.130	Standard Deviation			
-0.5	-0.625	0.14	0.12	0.50	75	2.335	Deviation from Normal			
-0.25	-0.375	0.16	0.14	0.64	84	2.480				
0	-0.125	0.21	0.18	0.82	95	2.805				
0.25	0.125	0.21	0.18	1.00	99	3.125				
0.5	0.375	0.39	0.34	1.34						
0.75	0.625	0.70	0.60	1.94						
1	0.875	1.09	0.94	2.88						
1.25	1.125	1.95	1.68	4.56						
1.5	1.375	5.11	4.41	8.97						
1.75	1.625	9.64	8.31	17.28						
2	1.875	14.07	12.13	29.41						
2.25	2.125	23.11	19.92	49.33						
2.5	2.375	35.08	30.24	79.57						
2.75	2.625	12.13	10.46	90.03						
3	2.875	8.07	6.96	96.98						
3.25	3.125	2.34	2.02	99.00						
3.5	3.375	0.88	0.76	99.76						
3.75	3.625	0.20	0.17	99.93						
4	3.875	0.04	0.03	99.97						
>4.0	4.25	0.04	0.03	100.00						

Percentiles		Moment Measures		(phi)	(mm)
1	0.125	Mean		2.163	0.223
5	1.150	Standard Deviation		0.552	0.682
16	1.585	Skewness		-1.559	
25	1.785	Kurtosis		9.553	
25	1.785	Dispersion			
50	2.130	Standard Deviation			
75	2.335	Deviation from Normal			
84	2.480				
95	2.805				
99	3.125				

Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean		2.032	2.065
Standard Deviation		0.448	0.475
Skewness (1)		-0.218	-0.201
Skewness (2)		-0.341	
Kurtosis		0.849	1.233

Grain Size Distribution

Grain Size (mm)



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1980+00
Interval -20 ft NAVD

Mean 0.189 mm
STD 0.704 mm
Skewness -1.002

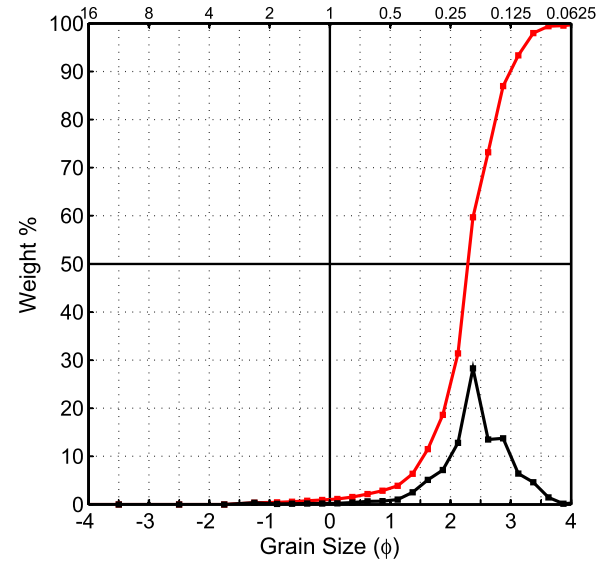
USCS Wentworth

SP Fine Sand
 Fine Sand Moderately Well Sorted
 Poorly Graded Coarse Skewed
 Very Leptokurtic

Total weight (gram) 109.79
 % finer than 4.00 phi 0.72
 % coarser than -1.00 phi 0.07
 % CaCO₃ 2.2

Grain Size Distribution

Grain Size (mm)



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1980+00
Interval -16 ft NAVD

Mean 0.190 mm
STD 0.640 mm
Skewness -1.321

USCS Wentworth

SP Fine Sand
 Fine Sand Moderately Well Sorted
 Poorly Graded Strongly Coarse Skewed
 Very Leptokurtic

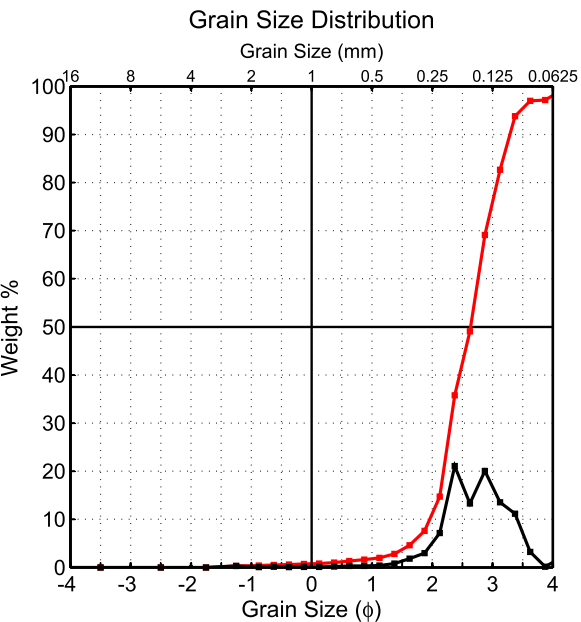
Total weight (gram) 104.27
 % finer than 4.00 phi 0.47
 % coarser than -1.00 phi 0.35
 % CaCO₃ 2.2

Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles	Moment Measures (phi) (mm)		
-4	-4.5	0.00	0.00	0.00	1	0.490	Mean	2.405 0.189
-3	-3.5	0.00	0.00	0.00	5	1.540	Standard Deviation	0.507 0.704
-2	-2.5	0.00	0.00	0.00	16	1.935	Skewness	-1.002
-1.5	-1.75	0.00	0.00	0.00	25	2.075	Kurtosis	10.643
-1	-1.25	0.08	0.07	0.07	50	2.265	Dispersion	
-0.75	-0.875	0.08	0.07	0.15	75	2.530	Standard Deviation	
-0.5	-0.625	0.06	0.05	0.20	84	2.710	Deviation from Normal	
-0.25	-0.375	0.14	0.13	0.33	95	3.060		
0	-0.125	0.16	0.15	0.47	99	3.535		
0.25	0.125	0.14	0.13	0.60				
0.5	0.375	0.26	0.24	0.84				
0.75	0.625	0.39	0.36	1.19				
1	0.875	0.35	0.32	1.51				
1.25	1.125	0.45	0.41	1.92				
1.5	1.375	1.27	1.16	3.08				
1.75	1.625	3.15	2.87	5.95				
2	1.875	6.84	6.23	12.18				
2.25	2.125	17.64	16.07	28.24				
2.5	2.375	42.11	38.36	66.60				
2.75	2.625	14.69	13.38	79.98				
3	2.875	12.86	11.71	91.69				
3.25	3.125	4.90	4.46	96.16				
3.5	3.375	2.70	2.46	98.62				
3.75	3.625	0.65	0.59	99.21				
4	3.875	0.08	0.07	99.28				
>4.0	4.25	0.79	0.72	100.00				

Graphic Phi Parameters	Inman 1952	Folk & Ward 1957
Mean	2.322	2.303
Standard Deviation	0.387	0.424
Skewness (1)	0.148	0.097
Skewness (2)	0.090	
Kurtosis	0.961	1.369

Limits (φ)	Mid Point (φ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles	Moment Measures (phi) (mm)		
-4	-4.5	0.00	0.00	0.00	1	-0.020	Mean	2.394 0.190
-3	-3.5	0.00	0.00	0.00	5	1.240	Standard Deviation	0.643 0.640
-2	-2.5	0.00	0.00	0.00	16	1.785	Skewness	-1.321
-1.5	-1.75	0.00	0.00	0.00	25	2.000	Kurtosis	8.472
-1	-1.25	0.36	0.35	0.35	50	2.290	Dispersion	
-0.75	-0.875	0.09	0.09	0.43	75	2.660	Standard Deviation	
-0.5	-0.625	0.14	0.13	0.57	84	2.820	Deviation from Normal	
-0.25	-0.375	0.18	0.17	0.74	95	3.215		
0	-0.125	0.18	0.17	0.91	99	3.555		
0.25	0.125	0.22	0.21	1.12				
0.5	0.375	0.41	0.39	1.52				
0.75	0.625	0.68	0.65	2.17				
1	0.875	0.72	0.69	2.86				
1.25	1.125	1.04	1.00	3.86				
1.5	1.375	2.61	2.50	6.36				
1.75	1.625	5.33	5.11	11.47				
2	1.875	7.43	7.13	18.60				
2.25	2.125	13.34	12.79	31.39				
2.5	2.375	29.50	28.29	59.68				
2.75	2.625	14.08	13.50	73.19				
3	2.875	14.34	13.75	86.94				
3.25	3.125	6.70	6.43	93.36				
3.5	3.375	4.79	4.59	97.96				
3.75	3.625	1.50	1.44	99.40				
4	3.875	0.14	0.13	99.53				
>4.0	4.25	0.49	0.47	100.00				

Graphic Phi Parameters	Inman 1952	Folk & Ward 1957
Mean	2.303	2.298
Standard Deviation	0.518	0.558
Skewness (1)	0.024	-0.020
Skewness (2)	-0.121	
Kurtosis	0.908	1.226



Project 2408
Location Buxton, NC
Date Oct 2014

Station 1980+00
Interval -24 ft NAVD

Mean 0.152 mm
STD 0.638 mm
Skewness -1.290

USCS Wentworth

SP Fine Sand
Fine Sand Moderately Well Sorted
Poorly Graded Coarse Skewed
Very Leptokurtic

Total weight (gram) 107.60
% finer than 4.00 phi 2.83
% coarser than -1.00 phi 0.32
% CaCO₃ 3.3

Limits (ϕ)	Mid Point (ϕ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles		Moment Measures		
-4	-4.5	0.00	0.00	0.00	1	0.350	Mean	(phi)	(mm)
-3	-3.5	0.00	0.00	0.00	5	1.655	Standard Deviation	2.719	0.152
-2	-2.5	0.00	0.00	0.00	16	2.140	Skewness	0.649	0.638
-1.5	-1.75	0.00	0.00	0.00	25	2.245	Kurtosis	-1.290	
-1	-1.25	0.34	0.32	0.32	50	2.635	Dispersion	9.758	
-0.75	-0.875	0.07	0.07	0.38	75	2.985	Standard Deviation		
-0.5	-0.625	0.16	0.15	0.53	84	3.155	Deviation from Normal		
-0.25	-0.375	0.08	0.07	0.60	95	3.470			
0	-0.125	0.12	0.11	0.72	99	4.000			
0.25	0.125	0.11	0.10	0.82					
0.5	0.375	0.22	0.20	1.02					
0.75	0.625	0.32	0.30	1.32					
1	0.875	0.31	0.29	1.61					
1.25	1.125	0.42	0.39	2.00					
1.5	1.375	0.88	0.82	2.82					
1.75	1.625	1.94	1.80	4.62					
2	1.875	3.20	2.97	7.59					
2.25	2.125	7.68	7.14	14.73					
2.5	2.375	22.65	21.05	35.78					
2.75	2.625	14.31	13.30	49.08					
3	2.875	21.55	20.03	69.11					
3.25	3.125	14.56	13.53	82.64					
3.5	3.375	11.99	11.14	93.78					
3.75	3.625	3.47	3.22	97.01					
4	3.875	0.17	0.16	97.17					
>4.0	4.25	3.05	2.83	100.00					

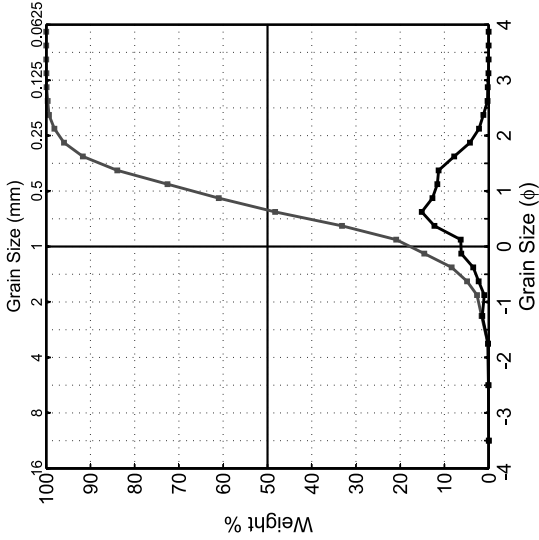
Percentiles		Graphic Phi Parameters		
		Inman	Folk & Ward	
		1952	1957	
Mean		2.648	2.643	
Standard Deviation		0.508	0.529	
Skewness (1)		0.025	-0.028	
Skewness (2)		-0.143		
Kurtosis		0.788	1.005	

ATTACHMENT 1B

SAMPLE GRAIN SIZE DISTRIBUTIONS (GSDs)

Beach Composite Samples

Grain Size Distribution



Project
Location
Date

Station
Interval

Mean
STD
Skewness

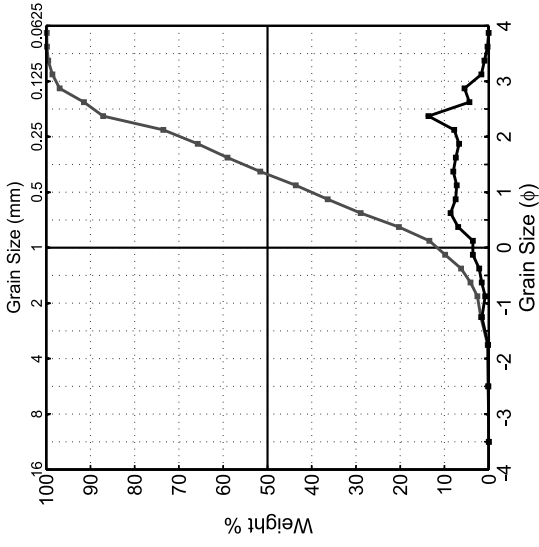
USCS

SP

Total weight (gram)
% finer than 4.00 phi
% coarser than -1.00 phi

101.09
-0.01
1.62

Grain Size Distribution



Project
Location
Date

Station
Interval

Mean
STD
Skewness

USCS

SP

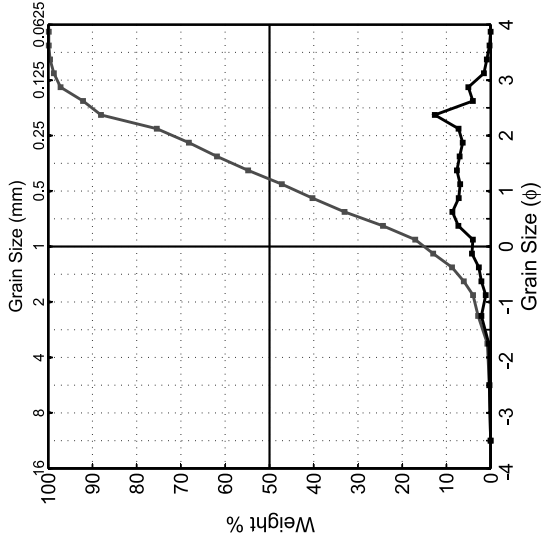
Total weight (gram)
% finer than 4.00 phi
% coarser than -1.00 phi

105.76
0.15
1.77

Limits (phi)	Mid Point (phi)	Weight (gram)	Weight % Cumm. Wt %	Percentiles	Moment Measures	Graphic Phi Parameters	Inman 1952	Folk & Ward 1957
-4	-4.5	0.00	0.00	1	-1.465	Mean	0.780	0.582
-3	-3.5	0.00	0.00	5	-0.615	Standard Deviation	0.743	0.598
-2	-2.5	0.00	0.00	16	-0.070	Skewness	-0.256	
-1.5	-1.75	0.13	0.18	25	0.210	Kurtosis	3.349	
-1	-1.25	1.45	1.44	50	0.660	Dispersion		
-0.5	-0.625	1.03	1.01	75	1.180	Standard Deviation		
-0.25	-0.375	2.28	2.26	84	1.375	Deviation from Normal		
0	-0.125	6.27	6.20	95	1.820			
0.25	0.125	6.41	6.34	99	2.300			
0.5	0.375	12.39	12.25					
0.75	0.625	15.28	15.11					
1	0.875	12.95	12.71					
1.25	1.125	11.75	11.63					
1.5	1.375	11.46	11.34					
1.75	1.625	7.87	7.79					
2	1.875	4.28	4.23					
2.25	2.125	2.23	2.20					
2.5	2.375	1.24	1.23					
2.75	2.625	0.26	0.25					
3	2.875	0.25	0.24					
3.25	3.125	0.07	0.07					
3.5	3.375	0.04	0.04					
3.75	3.625	0.01	0.01					
4	3.875	0.00	0.00					
>4.0	4.25	-0.01	-0.01					

Limits (phi)	Mid Point (phi)	Weight (gram)	Weight % Cumm. Wt %	Percentiles	Moment Measures	Graphic Phi Parameters	Inman 1952	Folk & Ward 1957
-4	-4.5	0.00	0.00	1	-1.500	Mean	1.395	0.380
-3	-3.5	0.00	0.00	5	-0.520	Standard Deviation	1.043	0.485
-2	-2.5	0.09	0.08	16	0.220	Skewness	-0.344	
-1.5	-1.75	0.17	0.24	25	0.510	Kurtosis	2.672	
-1	-1.25	1.62	1.77	50	1.325	Dispersion		
-0.5	-0.625	0.83	0.78	75	2.150	Standard Deviation		
-0.25	-0.375	2.26	2.14	84	2.320	Deviation from Normal		
0	-0.125	3.79	3.58	95	2.785			
0.25	0.125	3.78	3.57	99	3.235			
0.5	0.375	7.28	6.89					
0.75	0.625	9.12	8.63					
1	0.875	7.89	7.46					
1.25	1.125	7.64	7.23					
1.5	1.375	8.47	8.01					
1.75	1.625	7.85	7.43					
2	1.875	7.09	6.70					
2.25	2.125	8.23	7.78					
2.5	2.375	14.38	13.60					
2.75	2.625	4.60	4.35					
3	2.875	5.78	5.47					
3.25	3.125	1.74	1.65					
3.5	3.375	1.01	0.95					
3.75	3.625	0.30	0.28					
4	3.875	0.03	0.03					
>4.0	4.25	0.16	0.15					

Grain Size Distribution



Project
Location
Date

Station
Interval

Mean
STD
Skewness

USCS

SP

2408
Buxton, NC
Oct 2014

All Sta-Comp130
Exclude Trough

0.411 mm
0.464 mm
-0.391

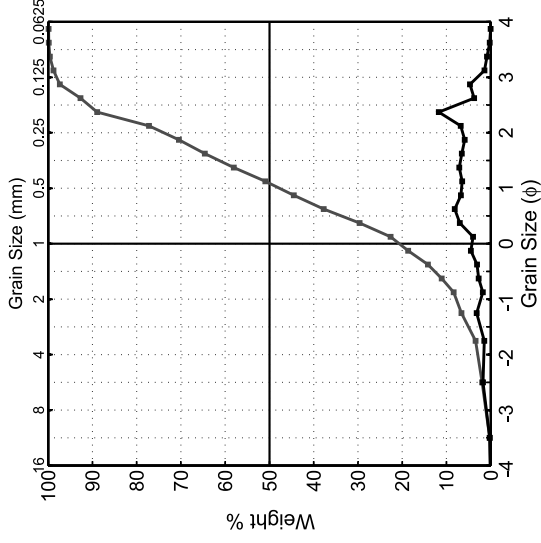
Wentworth

Medium Sand
Poorly Sorted
Symmetrical
Mesokurtic

Total weight (gram)
% finer than 4.00 phi
% coarser than -1.00 phi

105.50
0.13
2.86

Grain Size Distribution



Project
Location
Date

Station
Interval

Mean
STD
Skewness

USCS

SP

2408
Buxton, NC
Oct 2014

All Sta-Comp140
All X-Shore Samples

0.465 mm
0.413 mm
-0.612

Wentworth

Medium Sand
Poorly Sorted
Coarse Skewed
Mesokurtic

Total weight (gram)
% finer than 4.00 phi
% coarser than -1.00 phi

105.56
0.12
6.60

Limits (phi)	Mid Point (phi)	Weight (gram)	Weight % Cumulative	Moment Measures	
				Percentiles	
-4	-4.5	0.00	0.00	1	-1.695
-3	-3.5	0.03	0.03	5	-0.755
-2	-2.5	0.32	0.30	16	0.060
-1.5	-1.75	0.47	0.45	25	0.395
-1	-1.25	2.21	2.09	50	1.215
-0.5	-0.625	2.21	2.09	75	2.110
-0.25	-0.375	2.81	2.66	84	2.295
0	-0.125	4.49	4.26	95	2.770
0.25	0.125	4.25	4.03	99	3.210
0.5	0.375	7.72	7.32	Graphic Phi Parameters	
0.75	0.625	9.15	8.67		
1	0.875	7.64	7.24	Graphic Phi Parameters	
1.25	1.125	7.30	6.92		
1.5	1.375	6.05	5.63	Graphic Phi Parameters	
1.75	1.625	7.43	7.04		
2	1.875	6.66	6.32	Graphic Phi Parameters	
2.25	2.125	13.31	12.62		
2.5	2.375	4.26	4.03	Graphic Phi Parameters	
2.75	2.625	5.34	5.06		
3	2.875	1.61	1.52	Graphic Phi Parameters	
3.25	3.125	0.93	0.88		
3.5	3.375	0.27	0.26	Graphic Phi Parameters	
3.75	3.625	0.03	0.03		
4	3.875	0.14	0.13	Graphic Phi Parameters	
>4.0	4.25	0.00	100.00		

Limits (phi)	Mid Point (phi)	Weight (gram)	Weight % Cumulative	Moment Measures	
				Percentiles	
-4	-4.5	0.00	0.00	1	-3.050
-3	-3.5	0.22	0.21	5	-1.500
-2	-2.5	1.84	1.74	16	-0.275
-1.5	-1.75	1.55	1.47	25	0.210
-1	-1.25	3.35	3.17	50	1.090
-0.5	-0.625	2.89	2.73	75	2.045
-0.25	-0.375	3.25	3.08	84	2.270
0	-0.125	4.72	4.47	95	2.750
0.25	0.125	4.22	3.99	99	3.190
0.5	0.375	7.36	6.98	Graphic Phi Parameters	
0.75	0.625	8.58	8.13		
1	0.875	7.13	6.75	Graphic Phi Parameters	
1.25	1.125	6.80	6.44		
1.5	1.375	7.50	7.10	Graphic Phi Parameters	
1.75	1.625	6.91	6.55		
2	1.875	6.20	5.87	Graphic Phi Parameters	
2.25	2.125	7.13	6.76		
2.5	2.375	12.37	11.72	Graphic Phi Parameters	
2.75	2.625	3.95	3.74		
3	2.875	4.96	4.70	Graphic Phi Parameters	
3.25	3.125	1.49	1.41		
3.5	3.375	0.87	0.82	Graphic Phi Parameters	
3.75	3.625	0.26	0.24		
4	3.875	0.03	0.03	Graphic Phi Parameters	
>4.0	4.25	0.13	0.12		

Moment Measures

Mean
Standard Deviation
Skewness
Kurtosis
Dispersion
Standard Deviation
Deviation from Normal

1.284
1.108
-0.391
2.807

Percentiles

1
5
16
25
50
75
84
95
99

-1.695
-0.755
0.060
0.395
1.215
2.110
2.295
2.770
3.210

Graphic Phi Parameters

Mean
Standard Deviation
Skewness (1)
Skewness (2)
Kurtosis

1.178
1.117
-0.034
-0.186
0.577

Folk & Ward 1957

1.190
1.093
-0.076
0.842

Moment Measures

Mean
Standard Deviation
Skewness
Kurtosis
Dispersion
Standard Deviation
Deviation from Normal

1.104
1.277
-0.612
3.164

Percentiles

1
5
16
25
50
75
84
95
99

-3.050
-1.500
-0.275
0.210
1.090
2.045
2.270
2.750
3.190

Graphic Phi Parameters

Mean
Standard Deviation
Skewness (1)
Skewness (2)
Kurtosis

0.998
1.273
-0.365
0.670
0.949

Folk & Ward 1957

1.028
1.280
-0.146
0.949

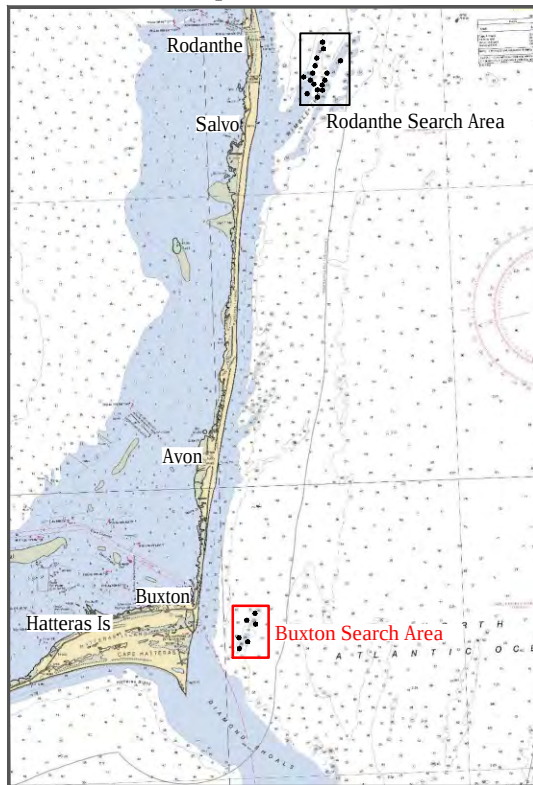
ATTACHMENT 2

CORE LOGS AND PHOTO LOGS

CORE LOG		Coastal Science & Engineering			Sheet 1 of 53	
PROJECT: 2403 - Dare County		COORDINATES:		HOLE NUMBER:		
LOCALITY: Buxton - Offshore		Northing: 561226.750 Easting: 3048052.106 Grid Datum: NAD '83		Bux-1 (as shown on title drawing and file no.)		
DATE: 2013-Jul-09	TOP ELEVATION:	-33.00 ft. NAVD '88	DEVICE DESIGNATION:	Coastal Science & Engineering		
BORE ANGLE: 90.00°						
BURDEN THICKNESS:	9.5 ft.	BOTTOM ELEVATION:	-42.50 ft. NAVD '88	BARREL SIZE/TYPE:	3 in. Aluminum	
CORE RECOVERY:	9.5 ft. (100.0%)	WATER DEPTH:	GEOLOGIST: TWK - NC #1752 FIELD TEAM: DG, ST, TH			
(operational note only)						

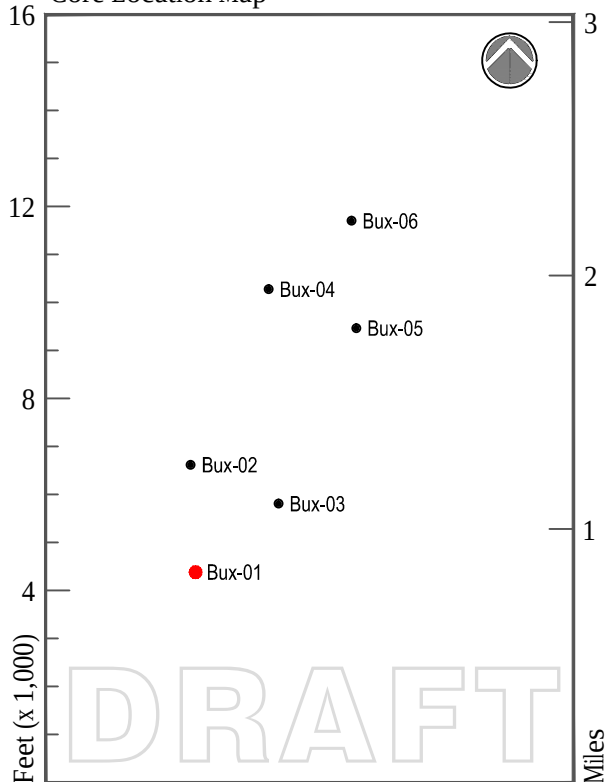
Depth	Lithology	Classification Of Materials (Description)	Sample #	Remarks
1		0.0 to 2.0 ft: Medium Sand / Coarse Sand mix - Mixed, clean, lt tan with minor shell	S1	S1: 0.0 ft. to 2.0 ft. Shell: 21.1% Mean Grain Size: 0.428mm
2		-- 1.8 ft: Small Scallop - 4 cm fragment		
3		2.0 to 4.0 ft: Medium Sand / Coarse Sand mix - Mixed, clean, lt tan with minor shell. 3 cm mollusk fragment @ 2.2'. Scattered large shell clasts eg. 4-6 cm scallops	S2	S2: 2.0 ft. to 4.0 ft. Shell: 19.5% Mean Grain Size: 0.402mm
4				
5		4.0 to 6.0 ft: Medium Sand - Clean, lt tan	S3	S3: 4.0 ft. to 6.0 ft. Shell: 16.5% Mean Grain Size: 0.374mm
6				
7		6.0 to 7.5 ft: Medium Sand - Mixed, clean, greyish lt tan	S4	S4: 6.0 ft. to 7.5 ft. Shell: 17.4% Mean Grain Size: 0.375mm
8				
9		7.5 to 9.5 ft: Medium Sand / Coarse Sand mix - Mixed, clean, lt tan	S5	S5: 7.5 ft. to 9.5 ft. Shell: 26.6% Mean Grain Size: 0.440mm
10				
		Sand dollar fragment		

Area Location Map

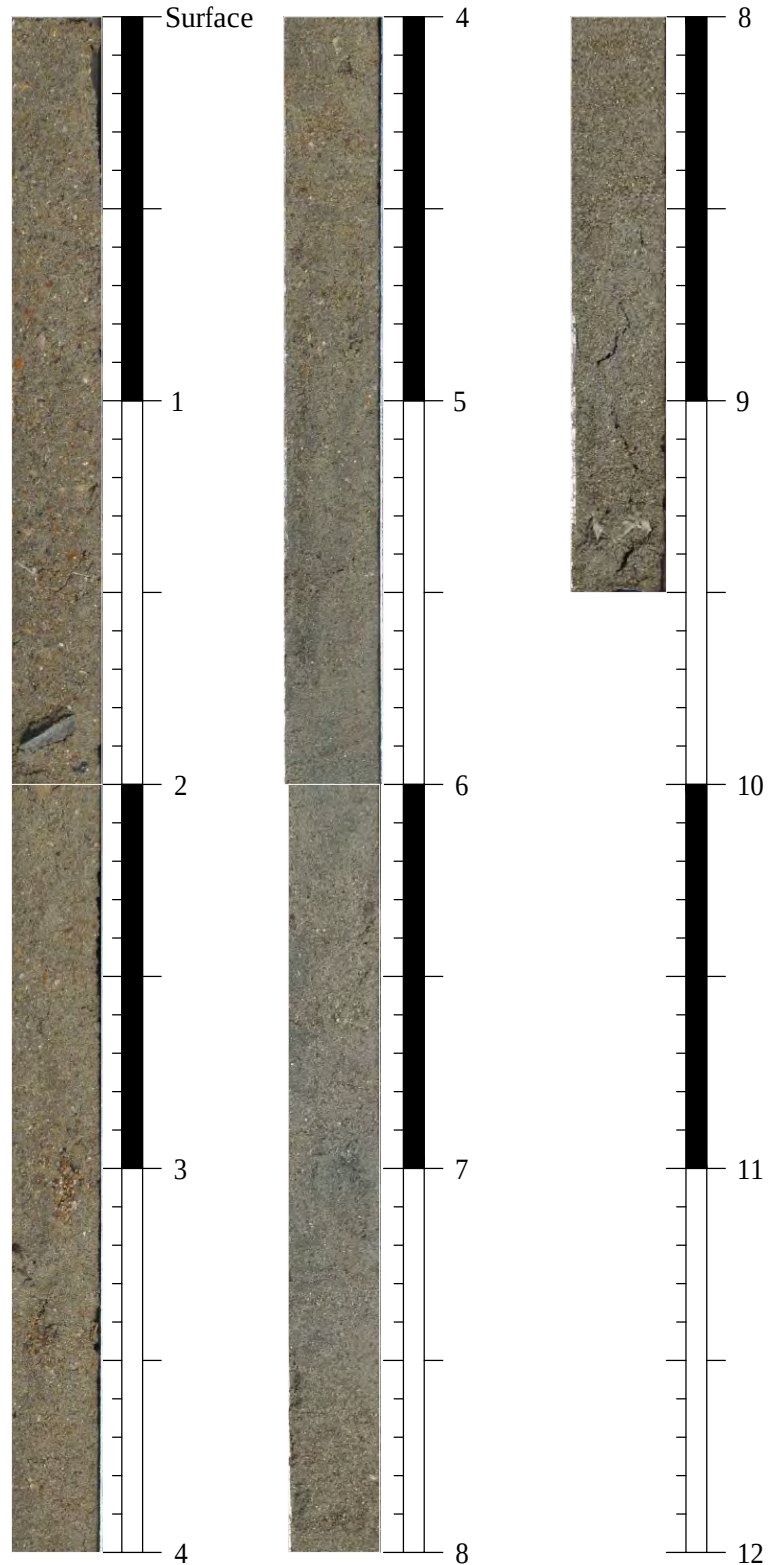


OFFSHORE SAND SOURCE - CSE CORE NO. **Bux-01**

Core Location Map



ELEVATION TOP OF HOLE: ~33.0 ft NAVD
TOTAL DEPTH OF HOLE: 9.5 ft



Note:
All core depths in feet.
See core log sheet for additional geotechnical information.

PROJECT TITLE:

Dare County, NC
Beach Nourishment
Feasibility Study - Phase 1

PREPARED FOR:

County of Dare
954 Marshall C. Collins Drive (286)
PO Box 1000
Manteo NC 27954

DRAWING TITLE:

CORE LOG
PHOTO MOSAIC

SCALE:

AS SHOWN

DATE:

AUG 2013

DRAWN BY:

T.Hair

PROJECT #:

2403

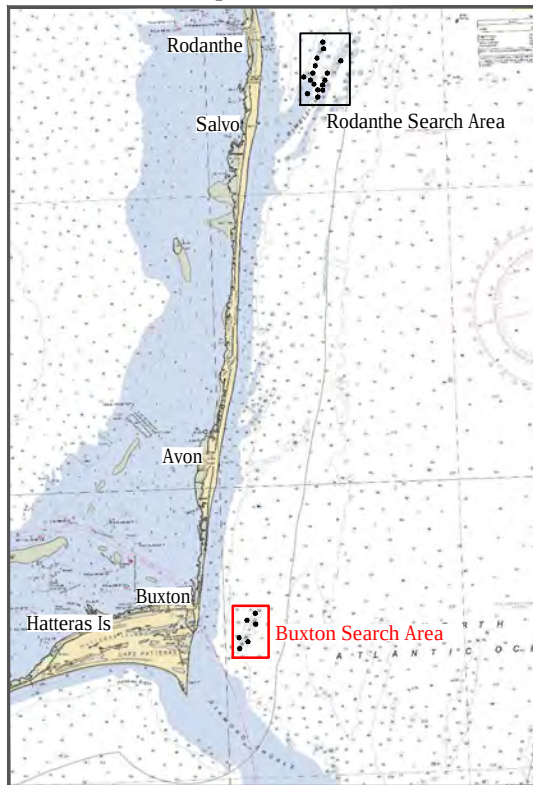
BUX

01

CORE LOG		Coastal Science & Engineering			Sheet 2 of 53	
PROJECT: 2403 - Dare County		COORDINATES:		HOLE NUMBER:		
LOCALITY: Buxton - Offshore		Northing: 563460.426 Easting: 3047948.695 Grid Datum: NAD '83		Bux-2 (as shown on title drawing and file no.)		
DATE: 2013-Jul-09	TOP ELEVATION:	-31.00 ft. NAVD '88	DEVICE DESIGNATION:	Coastal Science & Engineering		
BORE ANGLE: 90.00°						
BURDEN THICKNESS: 6.9 ft.	BOTTOM ELEVATION:	-37.90 ft. NAVD '88	BARREL SIZE/TYPE:	3 in. Aluminum		
CORE RECOVERY: 6.9 ft. (100.0%)	WATER DEPTH:	(operational note only)		GEOLOGIST:	TWK - NC #1752	
				FIELD TEAM:	TH, DG, ST	

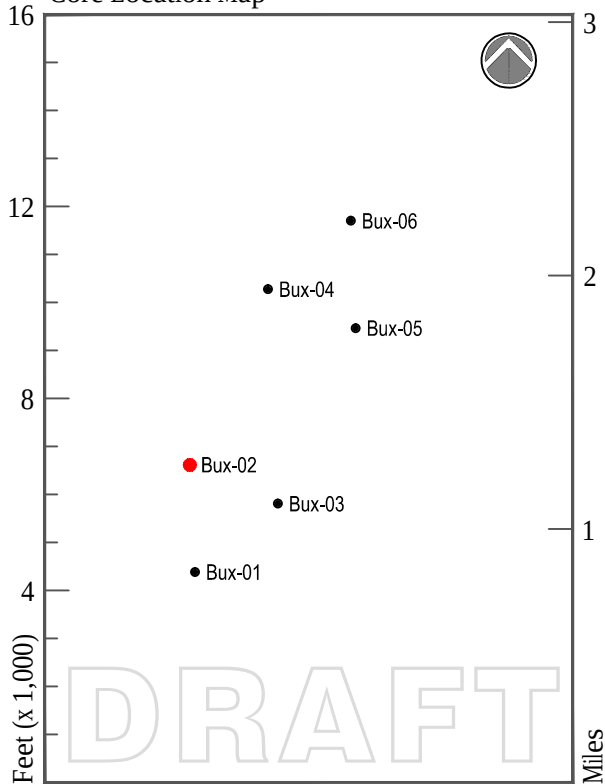
Depth	Lithology	Classification Of Materials (Description)	Sample #	Remarks
1		0.0 to 2.6 ft: Medium Sand with Crushed Shell - Increasing shell @ 1.6' to 2.6'	S1	S1: 0.0 ft. to 2.6 ft. Shell: 28.1% Mean Grain Size: 0.588mm
2				
3		2.6 to 5.0 ft: Medium Sand with Crushed Shell - Mixed, clean, tan, trace shell	S2	S2: 2.6 ft. to 5.0 ft. Shell: 17.5% Mean Grain Size: 0.527mm
4				
5	5.0 to 6.9 ft: Medium Sand with Crushed Shell - Mixed, clean, tan, trace shell	S3	S3: 5.0 ft. to 6.9 ft. Shell: 18.2% Mean Grain Size: 0.464mm	
6	6.0 ft: Shell Fragment - 5 cm shell fragment			
7				
8				
9				
10				

Area Location Map

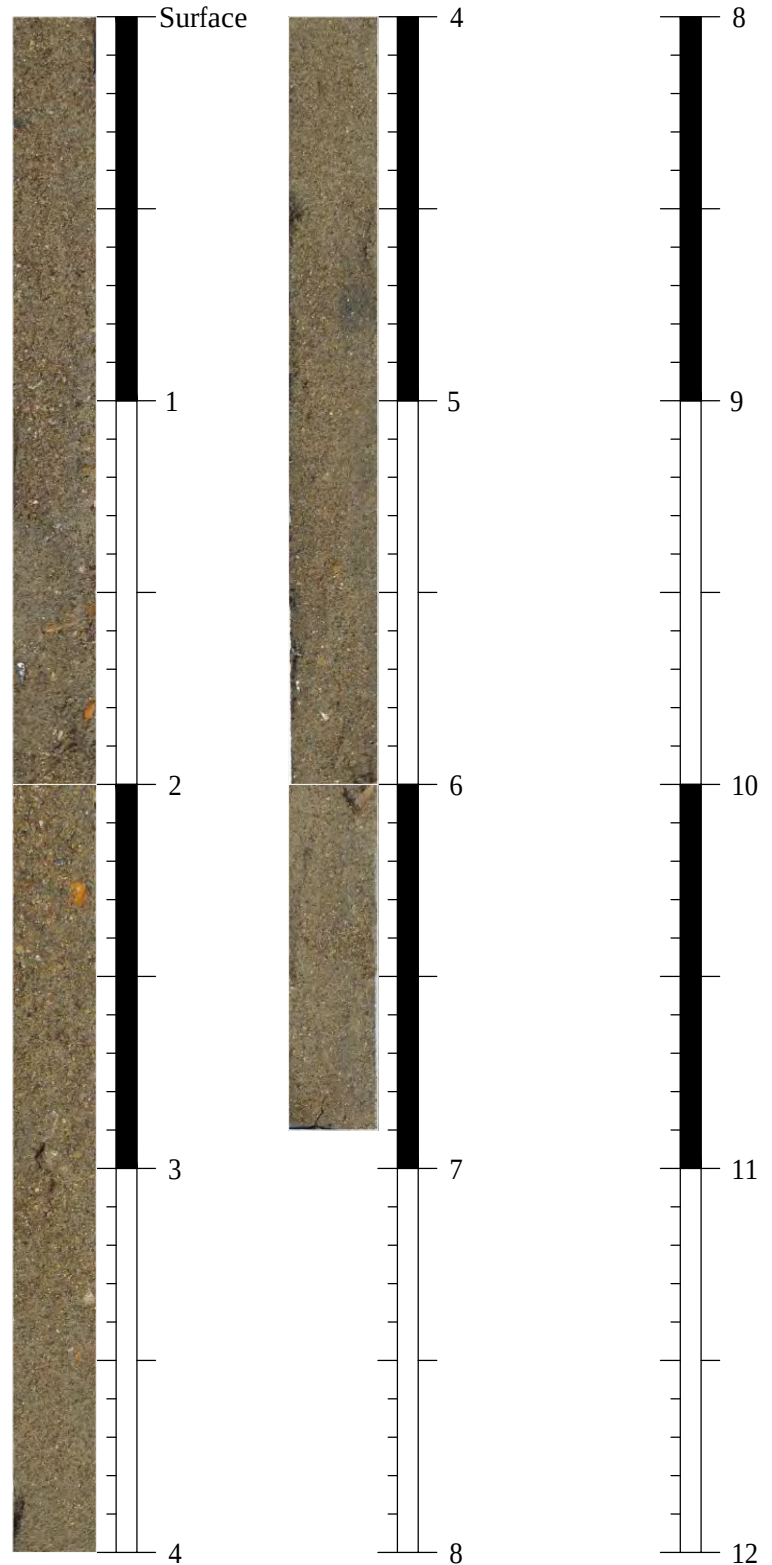


OFFSHORE SAND SOURCE - CSE CORE NO. Bux-02

Core Location Map



ELEVATION TOP OF HOLE: ~31.0 ft NAVD
TOTAL DEPTH OF HOLE: 6.9 ft



Note:
All core depths in feet.
See core log sheet for additional geotechnical information.

PROJECT TITLE:

Dare County, NC
Beach Nourishment
Feasibility Study - Phase 1

PREPARED FOR:

County of Dare
954 Marshall C. Collins Drive (286)
PO Box 1000
Manteo NC 27954

DRAWING TITLE:

CORE LOG
PHOTO MOSAIC

SCALE:

AS SHOWN

DATE:

AUG 2013

DRAWN BY:

T.Hair

PROJECT #:

2403

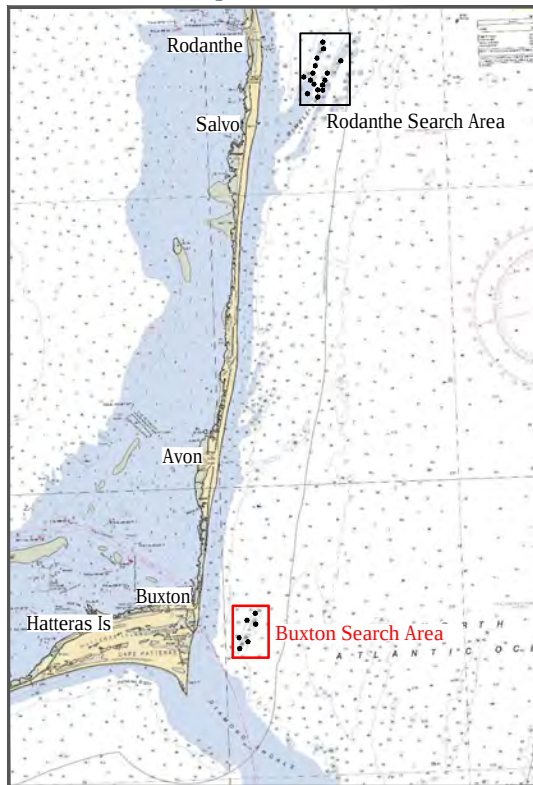
BUX

02

CORE LOG		Coastal Science & Engineering			Sheet 3 of 53	
PROJECT: 2403 - Dare County		COORDINATES:		HOLE NUMBER:		
LOCALITY: Buxton - Offshore		Northing: 562649.684 Easting: 3049777.000 Grid Datum: NAD '83		Bux-3 (as shown on title drawing and file no.)		
DATE: 2013-Jul-09	TOP ELEVATION:	-37.00 ft. NAVD '88	DEVICE DESIGNATION:	Coastal Science & Engineering		
BORE ANGLE: 90.00°						
BURDEN THICKNESS: 6.6 ft.	BOTTOM ELEVATION:	-43.60 ft. NAVD '88	BARREL SIZE/TYPE:	3 in. Aluminum		
CORE RECOVERY: 6.6 ft. (100.0%)	WATER DEPTH:	(operational note only)		GEOLOGIST:	TWK - NC #1752	
				FIELD TEAM:	TH, DG, ST	

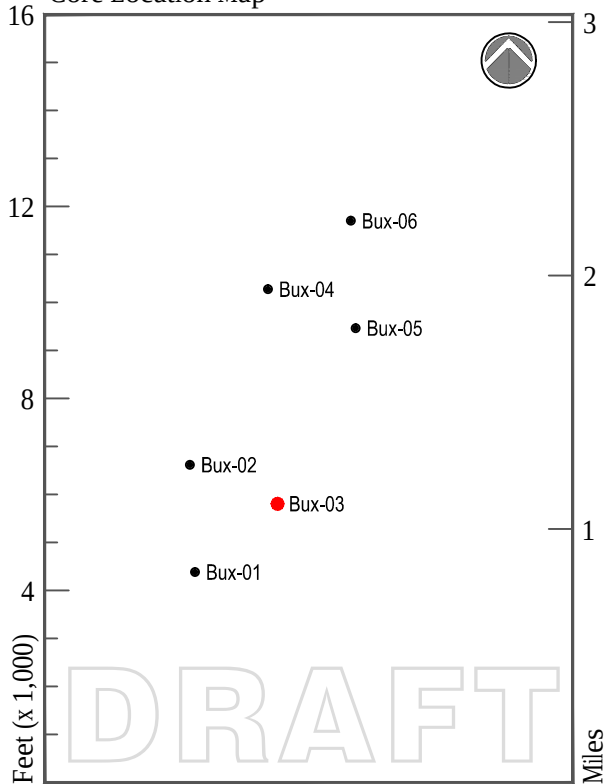
Depth	Lithology	Classification Of Materials (Description)	Sample #	Remarks	
1		0.0 to 3.3 ft: Fine Sand / Medium Sand mix - Clean, tannish med grey. Minor shell (~5%)	S1	S1: 0.0 ft. to 3.3 ft. Shell: 10.1% Mean Grain Size: 0.285mm	
2					
3					
4		3.3 to 4.3 ft: Fine Sand - Silty, med grey with minor crushed shell		S2	S2: 3.3 ft. to 4.3 ft. Shell: 15.4% Mean Grain Size: 0.198mm
5		Mixed sand, granules and shells. Clean, med grey -- 5.0 ft: Shell Fragment - 4 cm Quahog fragment		S3	S3: 4.3 ft. to 5.4 ft. Shell: 26.6% Mean Grain Size: 0.800mm
6		5.4 to 6.0 ft: Medium Sand - Clean, lt grey	S4	S4: 5.4 ft. to 6.0 ft. Shell: 7.9% Mean Grain Size: 0.281mm	
		6.0 to 6.6 ft: Clay - Stiff, dark grey	S5	S5: 6.0 ft. to 6.6 ft. No Sample	
7					
8					
9					
10					

Area Location Map

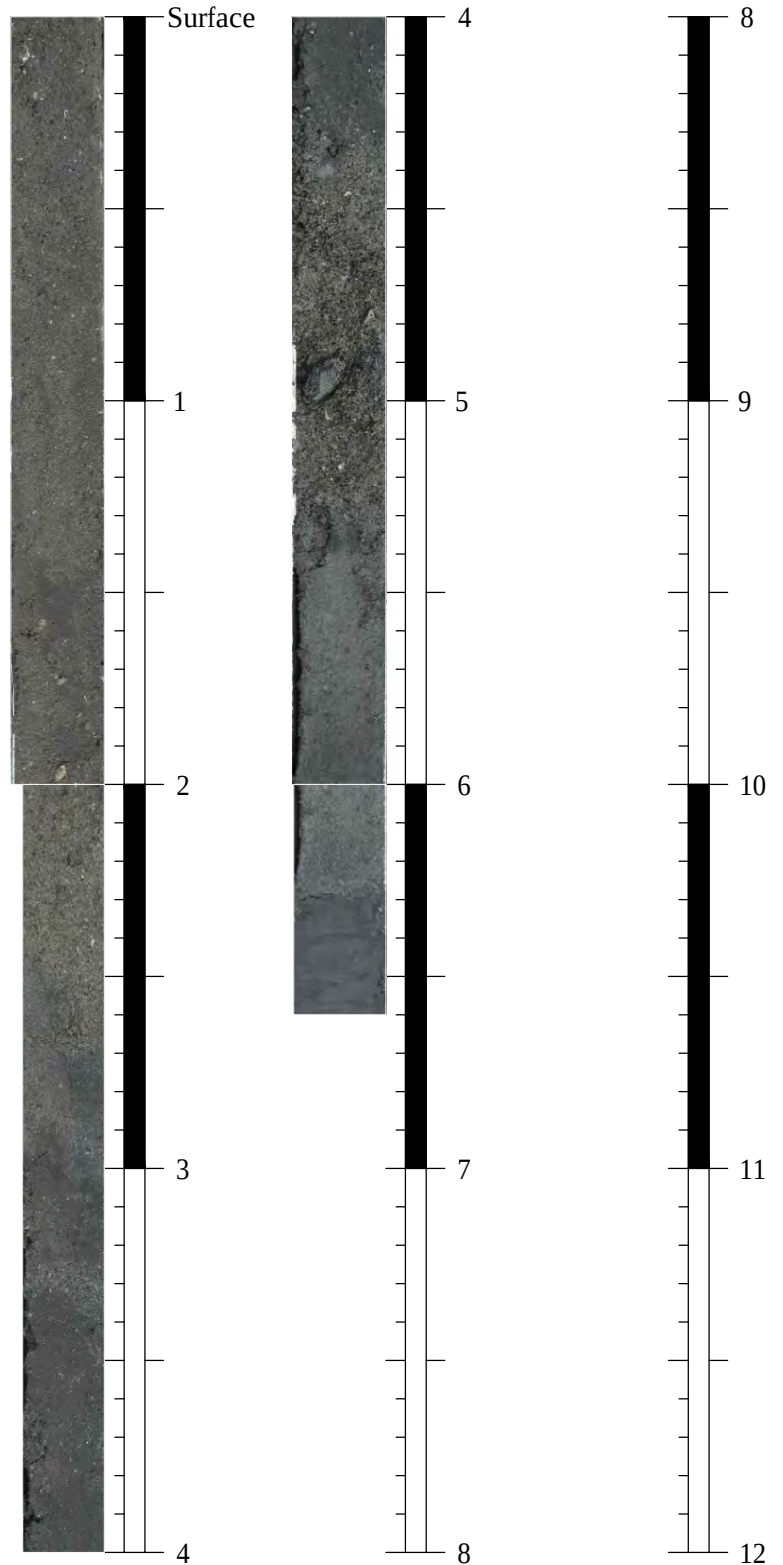


OFFSHORE SAND SOURCE - CSE CORE NO. Bux-03

Core Location Map



ELEVATION TOP OF HOLE: ~37.0 ft NAVD
TOTAL DEPTH OF HOLE: 6.6 ft



Note:
All core depths in feet.
See core log sheet for additional geotechnical information.

PROJECT TITLE:

Dare County, NC
Beach Nourishment
Feasibility Study - Phase 1

PREPARED FOR:

County of Dare
954 Marshall C. Collins Drive (286)
PO Box 1000
Manteo NC 27954

DRAWING TITLE:

CORE LOG
PHOTO MOSAIC

SCALE:

AS SHOWN

DATE:

AUG 2013

DRAWN BY:

T.Hair

PROJECT #:

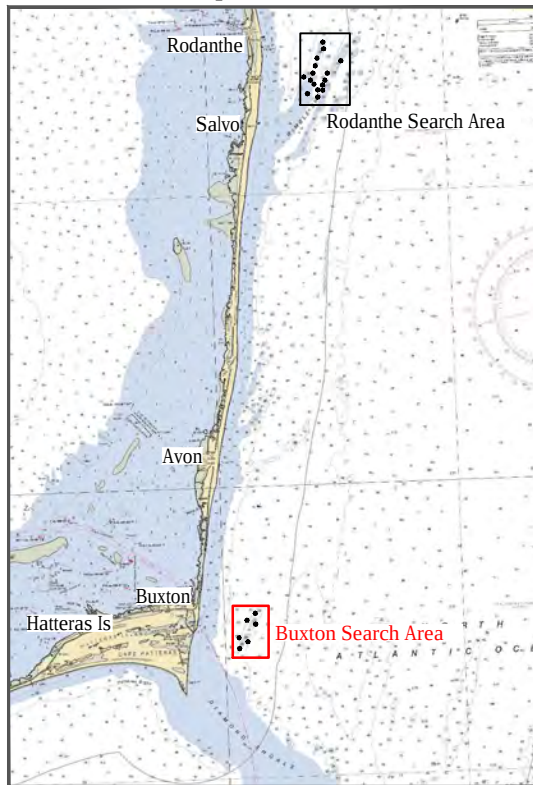
2403

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03

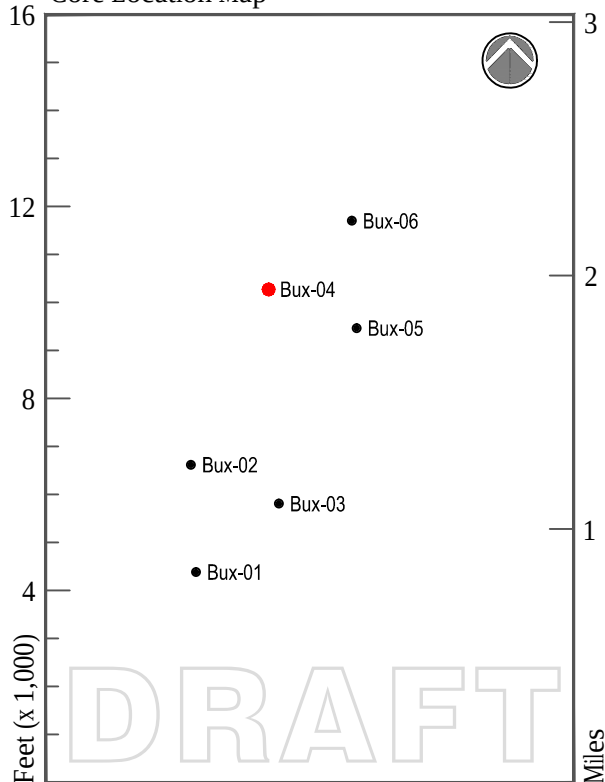
CORE LOG		Coastal Science & Engineering			Sheet 4 of 53	
PROJECT: 2403 - Dare County		COORDINATES:		HOLE NUMBER:		
LOCALITY: Buxton - Offshore		Northing: 567117.035 Easting: 3049570.179 Grid Datum: NAD '83		Bux-4 (as shown on title drawing and file no.)		
DATE: 2013-Jul-09	TOP ELEVATION:	-41.00 ft. NAVD '88	DEVICE DESIGNATION:	Coastal Science & Engineering		
BORE ANGLE: 90.00°						
BURDEN THICKNESS:	7.9 ft.	BOTTOM ELEVATION:	-48.90 ft. NAVD '88	BARREL SIZE/TYPE:	3 in. Aluminum	
CORE RECOVERY:	7.9 ft. (100.0%)	WATER DEPTH:	GEOLOGIST: TWK - NC #1752 FIELD TEAM: ST, DG, LF			
(operational note only)						
Depth	Lithology	Classification Of Materials (Description)	Sample #	Remarks		
1		0.0 to 2.0 ft: Medium Sand / Coarse Sand mix - Mixed, clean, greyish tan. Minor shell (10%)	S1	S1: 0.0 ft. to 2.0 ft. Shell: 13.7% Mean Grain Size: 0.495mm		
2		2.0 to 4.0 ft: Medium Sand / Coarse Sand mix - Mixed, clean, greyish tan	S2	S2: 2.0 ft. to 4.0 ft. Shell: 11.7% Mean Grain Size: 0.424mm		
3						
4		4.0 to 6.4 ft: Medium Sand / Coarse Sand mix - Mixed MS, CS, clean greyish tan grading to CS with minor shells	S3	S3: 4.0 ft. to 6.4 ft. Shell: 17.6% Mean Grain Size: 0.532mm		
5						
6		6.4 to 7.2 ft: Fine Sand - Silty, med grey. Shelly MS layer @ 6.7'-6.9'	S4	S4: 6.4 ft. to 7.2 ft. Shell: 29.4% Mean Grain Size: 0.251mm		
7		1 cm Mud clast				
8		7.2 to 7.9 ft: Medium Sand / Coarse Sand mix - Mixed, med grey	S5	S5: 7.2 ft. to 7.9 ft. Shell: 22.4% Mean Grain Size: 0.481mm		
9						
10						

Area Location Map

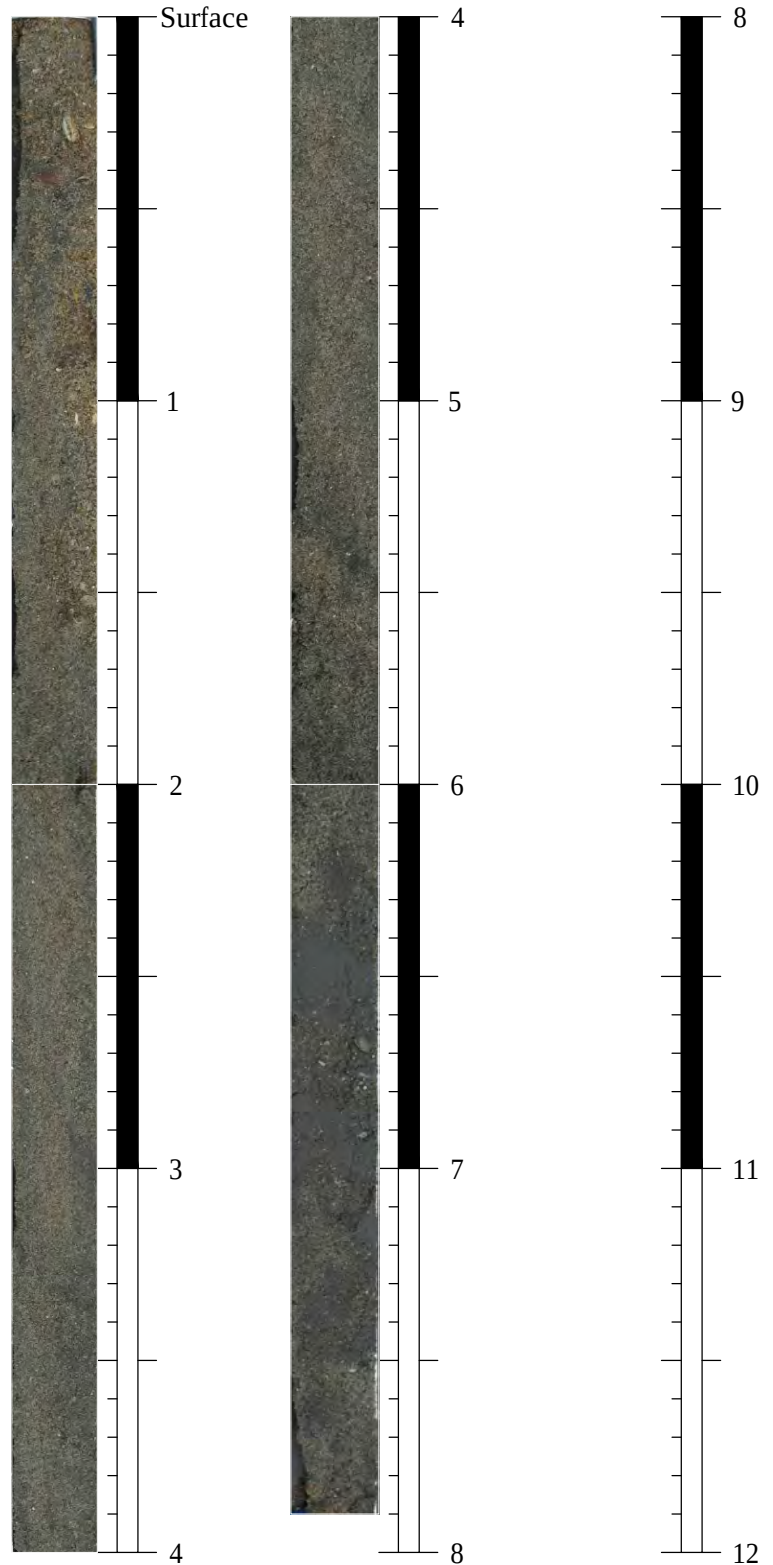


OFFSHORE SAND SOURCE - CSE CORE NO. **Bux-04**

Core Location Map



ELEVATION TOP OF HOLE: ~41.0 ft NAVD
TOTAL DEPTH OF HOLE: 7.9 ft



Note:
All core depths in feet.
See core log sheet for additional geotechnical information.

PROJECT TITLE:

Dare County, NC
Beach Nourishment
Feasibility Study - Phase 1

PREPARED FOR:

County of Dare
954 Marshall C. Collins Drive (286)
PO Box 1000
Manteo NC 27954

DRAWING TITLE:

CORE LOG
PHOTO MOSAIC

SCALE:

AS SHOWN

DATE:

AUG 2013

DRAWN BY:

T.Hair

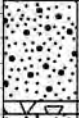
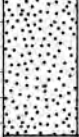
PROJECT #:

2403

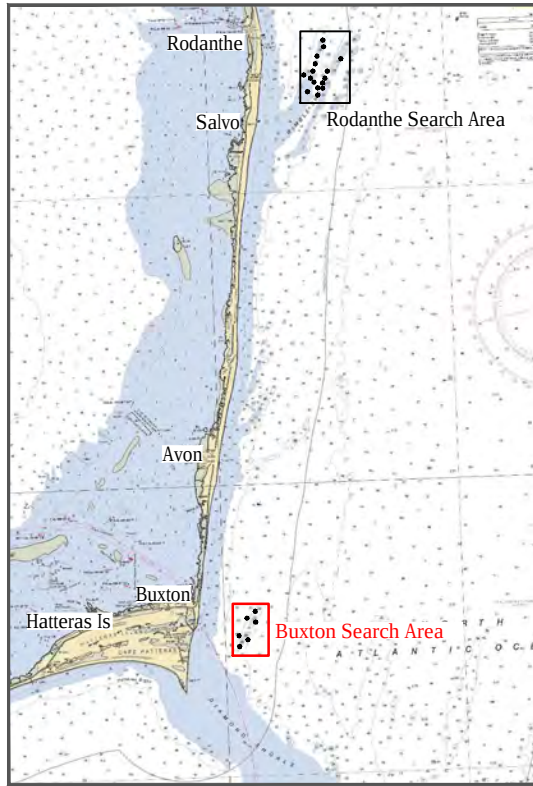
BUX

04

CORE LOG		Coastal Science & Engineering			Sheet 5 of 53	
PROJECT: 2403 - Dare County		COORDINATES:		HOLE NUMBER:		
LOCALITY: Buxton - Offshore		Northing: 566306.293 Easting: 3051398.484 Grid Datum: NAD '83		Bux-5 (as shown on title drawing and file no.)		
DATE: 2013-Jul-09	TOP ELEVATION:	-38.00 ft. NAVD '88	DEVICE DESIGNATION:	Coastal Science & Engineering		
BORE ANGLE: 90.00°						
BURDEN THICKNESS: 6.3 ft.	BOTTOM ELEVATION:	-44.30 ft. NAVD '88	BARREL SIZE/TYPE:	3 in. Aluminum		
CORE RECOVERY: 6.3 ft. (100.0%)	WATER DEPTH:	(operational note only)		GEOLOGIST:	TWK - NC #1752	
				FIELD TEAM:	DG, ST, LF	

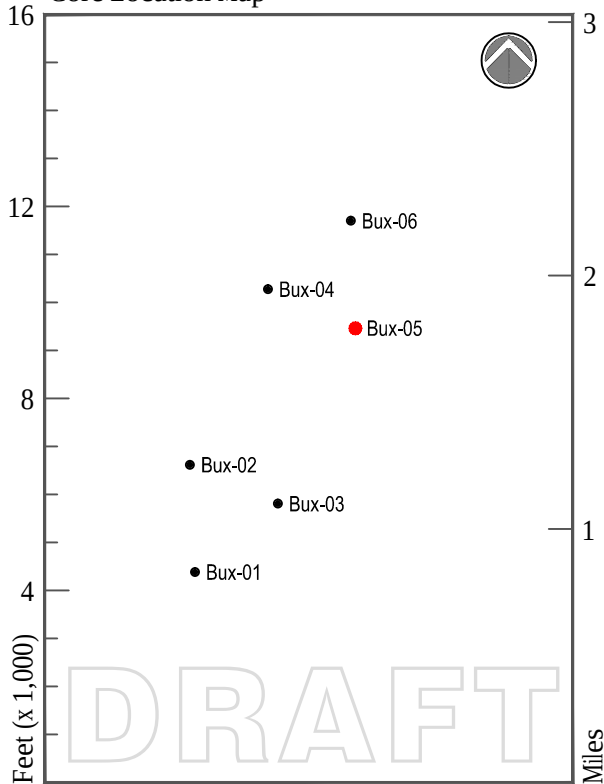
Depth	Lithology	Classification Of Materials (Description)	Sample #	Remarks
1		0.0 to 3.0 ft: Medium Sand with minor shell fragments. Clean, lt tan	S1	S1: 0.0 ft. to 3.0 ft. Shell: 8.2% Mean Grain Size: 0.340mm
2				
3				
4				
5		3.0 to 4.3 ft: Medium Sand / Coarse Sand mix - Mixed, clean, lt tan	S2	S2: 3.0 ft. to 4.3 ft. Shell: 13.9% Mean Grain Size: 0.415mm
6				
7		4.3 to 5.1 ft: Fine Sand / Medium Sand mix - Clean, lt grey. Crushed shell lens @ 5.1'-5.2'	S3	S3: 4.3 ft. to 5.2 ft. Shell: 42.9% Mean Grain Size: 0.237mm
8				
9		5.2 to 6.3 ft: Fine Sand - Silty, med grey with minor shell fragments	S4	S4: 5.2 ft. to 6.3 ft. Shell: 14.4% Mean Grain Size: 0.192mm
10				

Area Location Map

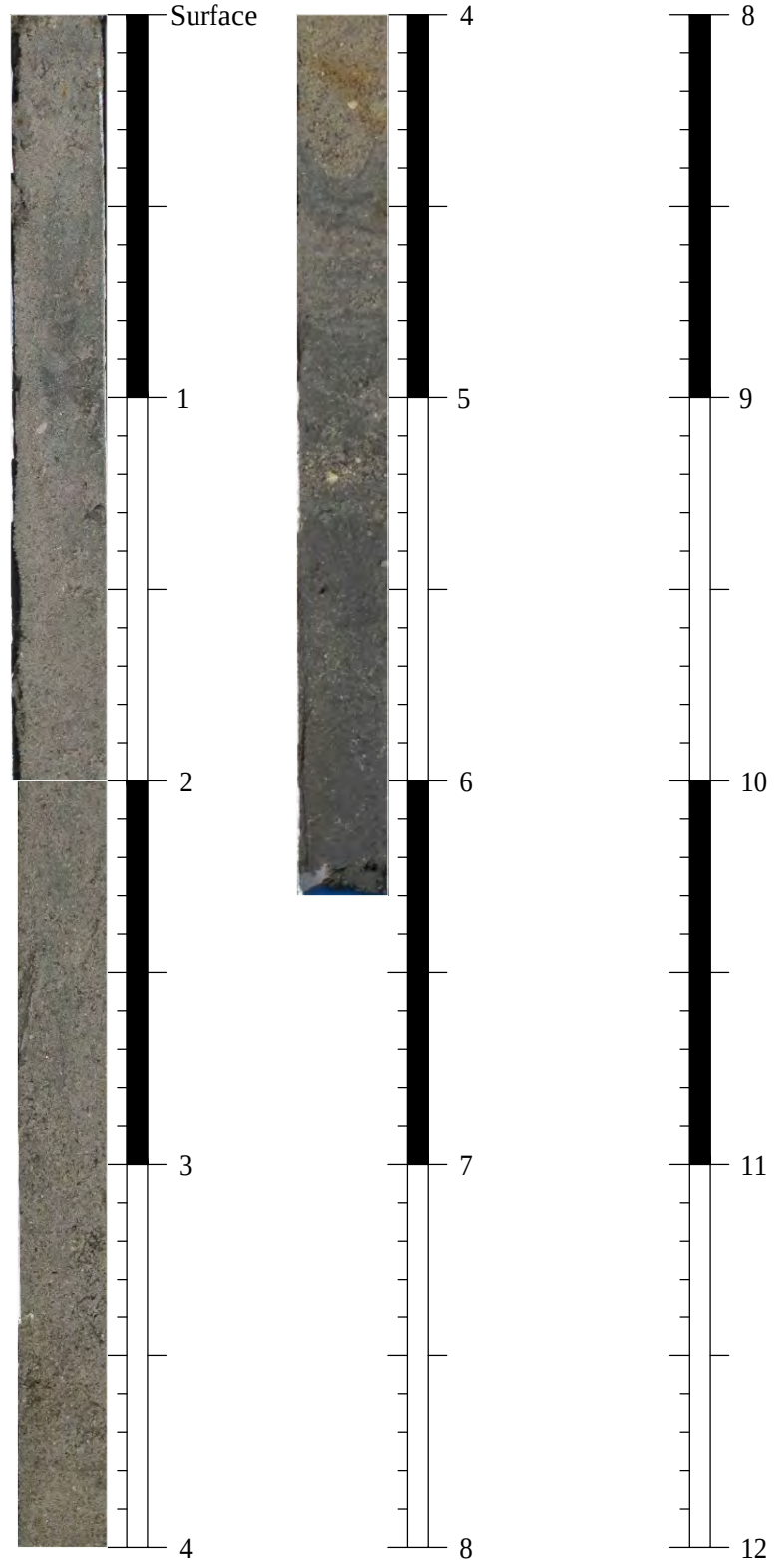


OFFSHORE SAND SOURCE - CSE CORE NO. Bux-05

Core Location Map



ELEVATION TOP OF HOLE: ~38.0 ft NAVD
TOTAL DEPTH OF HOLE: 6.3 ft



Note:
All core depths in feet.
See core log sheet for additional geotechnical information.

PROJECT TITLE:

Dare County, NC
Beach Nourishment
Feasibility Study - Phase 1

PREPARED FOR:

County of Dare
954 Marshall C. Collins Drive (286)
PO Box 1000
Manteo NC 27954

DRAWING TITLE:

CORE LOG
PHOTO MOSAIC

SCALE:

AS SHOWN

DATE:

AUG 2013

DRAWN BY:

T.Hair

PROJECT #:

2403

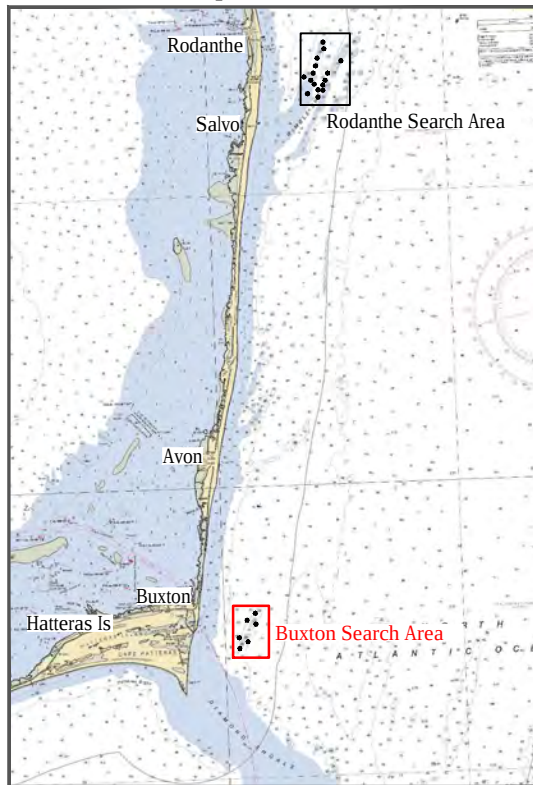
BUX

05

CORE LOG		Coastal Science & Engineering			Sheet 6 of 53	
PROJECT: 2403 - Dare County		COORDINATES:		HOLE NUMBER:		
LOCALITY: Buxton - Offshore		Northing: 568539.969 Easting: 3051295.073 Grid Datum: NAD '83		Bux-6 (as shown on title drawing and file no.)		
DATE: 2013-Jul-09	TOP ELEVATION:	-45.00 ft. NAVD '88	DEVICE DESIGNATION:	Coastal Science & Engineering		
BORE ANGLE: 90.00°						
BURDEN THICKNESS: 3.4 ft.	BOTTOM ELEVATION:	-48.40 ft. NAVD '88	BARREL SIZE/TYPE:	3 in. Aluminum		
CORE RECOVERY: 3.4 ft. (100.0%)	WATER DEPTH:	(operational note only)		GEOLOGIST:	TWK - NC #1752	
				FIELD TEAM:	TH, DG, LF	

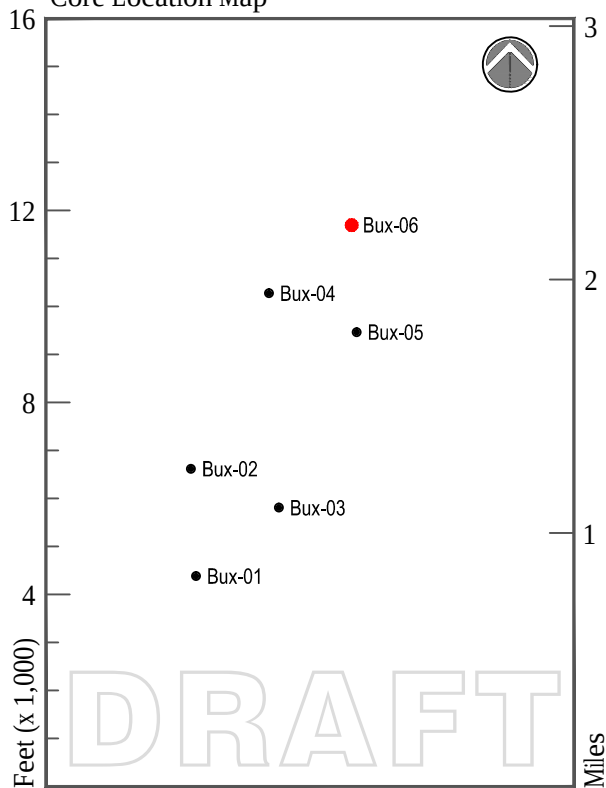
Depth	Lithology	Classification Of Materials (Description)	Sample #	Remarks
1		Mixed granules, shell hash and fragments. Clean, greyish tan	S1	S1: 0.0 ft. to 1.9 ft. Shell: 49.0% Mean Grain Size: 1.833mm
		7cm Quahog fragment		
		6cm Quahog fragment		
2		1.9 to 3.4 ft: Very Fine Sand - Muddy, dk grey	S2	S2: 1.9 ft. to 3.4 ft. Shell: 28.3% Mean Grain Size: 0.158mm
3		2.9 to 3.0 ft: Clay lens		
4				
5				
6				
7				
8				
9				
10				

Area Location Map

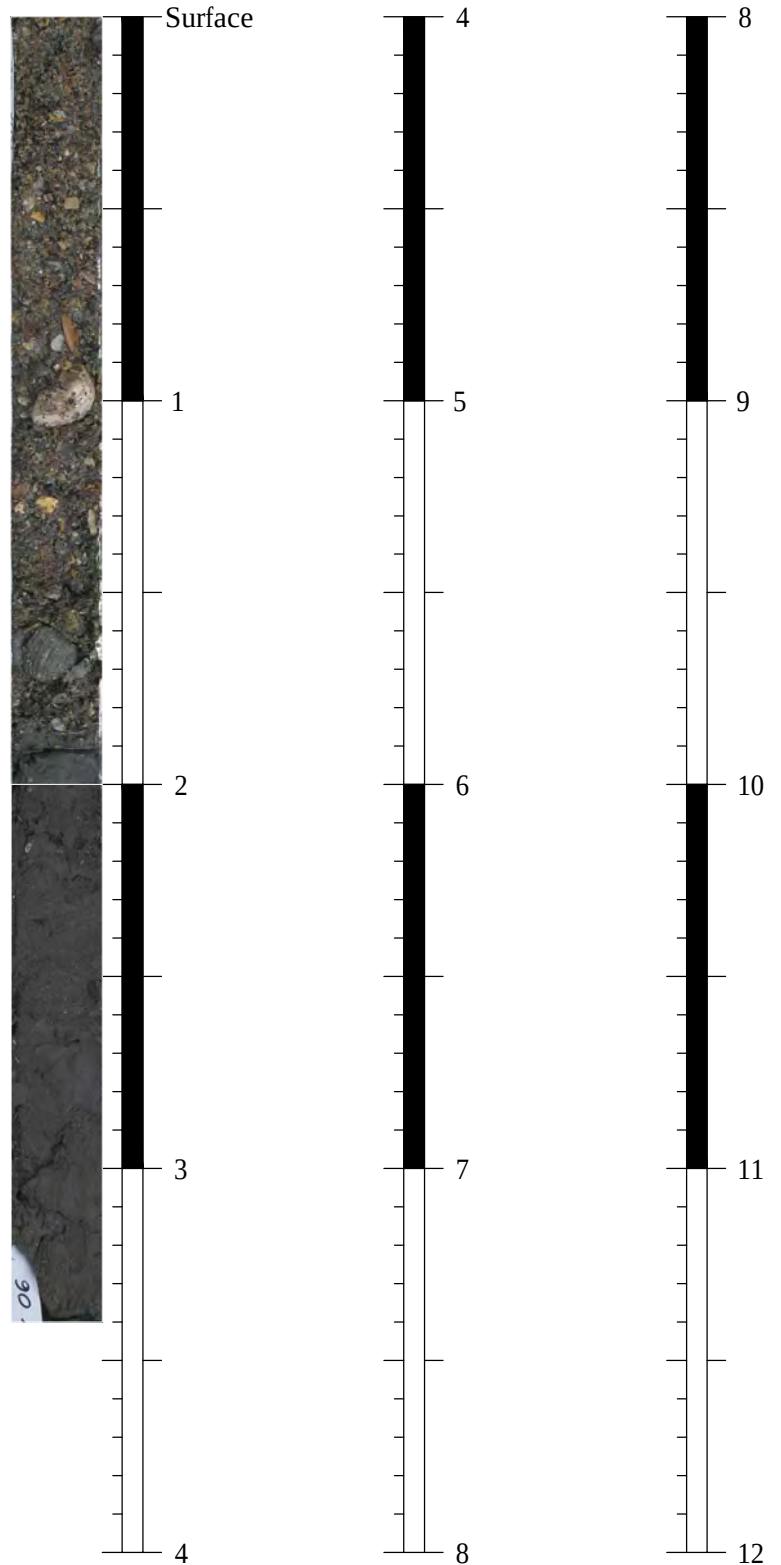


OFFSHORE SAND SOURCE - CSE CORE NO. Bux-06

Core Location Map



ELEVATION TOP OF HOLE: ~33.0 ft NAVD
TOTAL DEPTH OF HOLE: 3.4 ft



Note:
All core depths in feet.
See core log sheet for additional geotechnical information.

PROJECT TITLE:

Dare County, NC
Beach Nourishment
Feasibility Study - Phase 1

PREPARED FOR:

County of Dare
954 Marshall C. Collins Drive (286)
PO Box 1000
Manteo NC 27954

DRAWING TITLE:

CORE LOG
PHOTO MOSAIC

SCALE:

AS SHOWN

BUX

DATE:

AUG 2013

DRAWN BY:

T.Hair

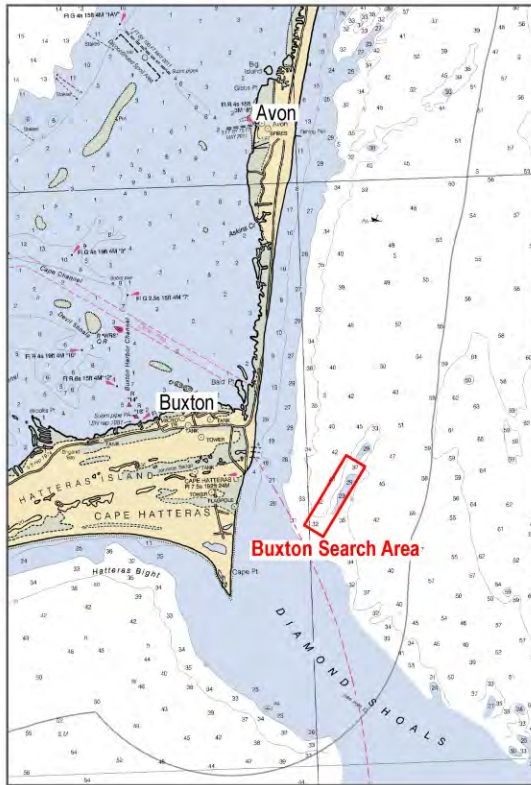
PROJECT #:

2403

06

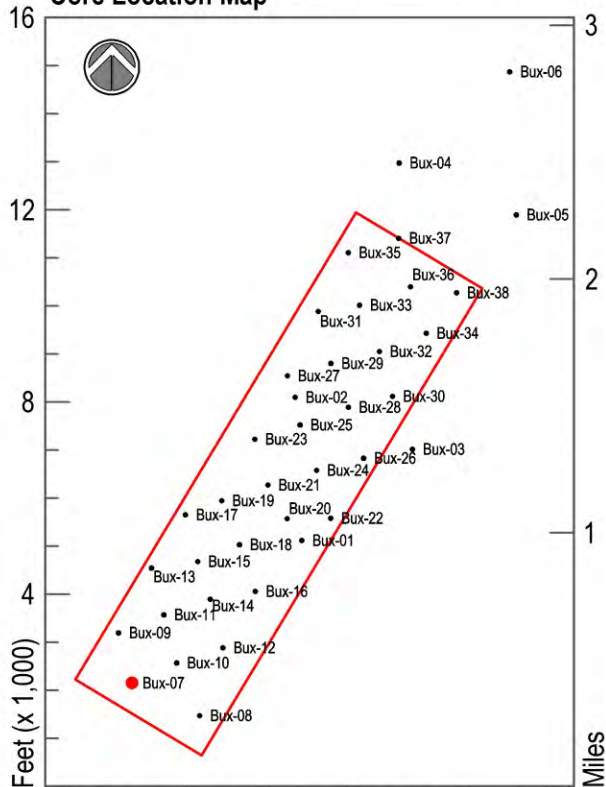
CORE LOG		Coastal Science & Engineering			Sheet 7 of 53	
PROJECT: 2403 - Dare County		COORDINATES:		HOLE NUMBER:		
LOCALITY: Buxton - Offshore		Northing: 559002.160 Easting: 3045405.530 Grid Datum: NAD '83		Bux-7 (as shown on title drawing and file no.)		
DATE:		TOP ELEVATION:	-35.27 ft. NAVD '88	DEVICE DESIGNATION:	Coastal Science & Engineering	
BORE ANGLE:	90.00°	BOTTOM ELEVATION:	-41.57 ft. NAVD '88	BARREL SIZE/TYPE:	3 in. Aluminum	
BURDEN THICKNESS:	6.3 ft.	WATER DEPTH:		GEOLOGIST:	TWK - NC #1752	
CORE RECOVERY:	6.3 ft. (100.0%)	(operational note only)		FIELD TEAM:	DG, TH, LF	
Depth	Lithology	Classification Of Materials (Description)	Sample #	Remarks		
1		0.0 to 3.0 ft: Medium Sand - Clean, tan uniform w/ shell frags and trace pea gravel	S1	S1: 0.0 ft. to 3.0 ft. Shell: 11.3% Mean Grain Size: 0.438mm		
2						
3		3.0 to 6.3 ft: Medium Sand - Clean, tan uniform w/ shell frags and trace pea gravel	S2	S2: 3.0 ft. to 6.3 ft. Shell: 11.4% Mean Grain Size: 0.423mm		
4						
5						
6						
7						
8						
9						
10						

Area Location Map

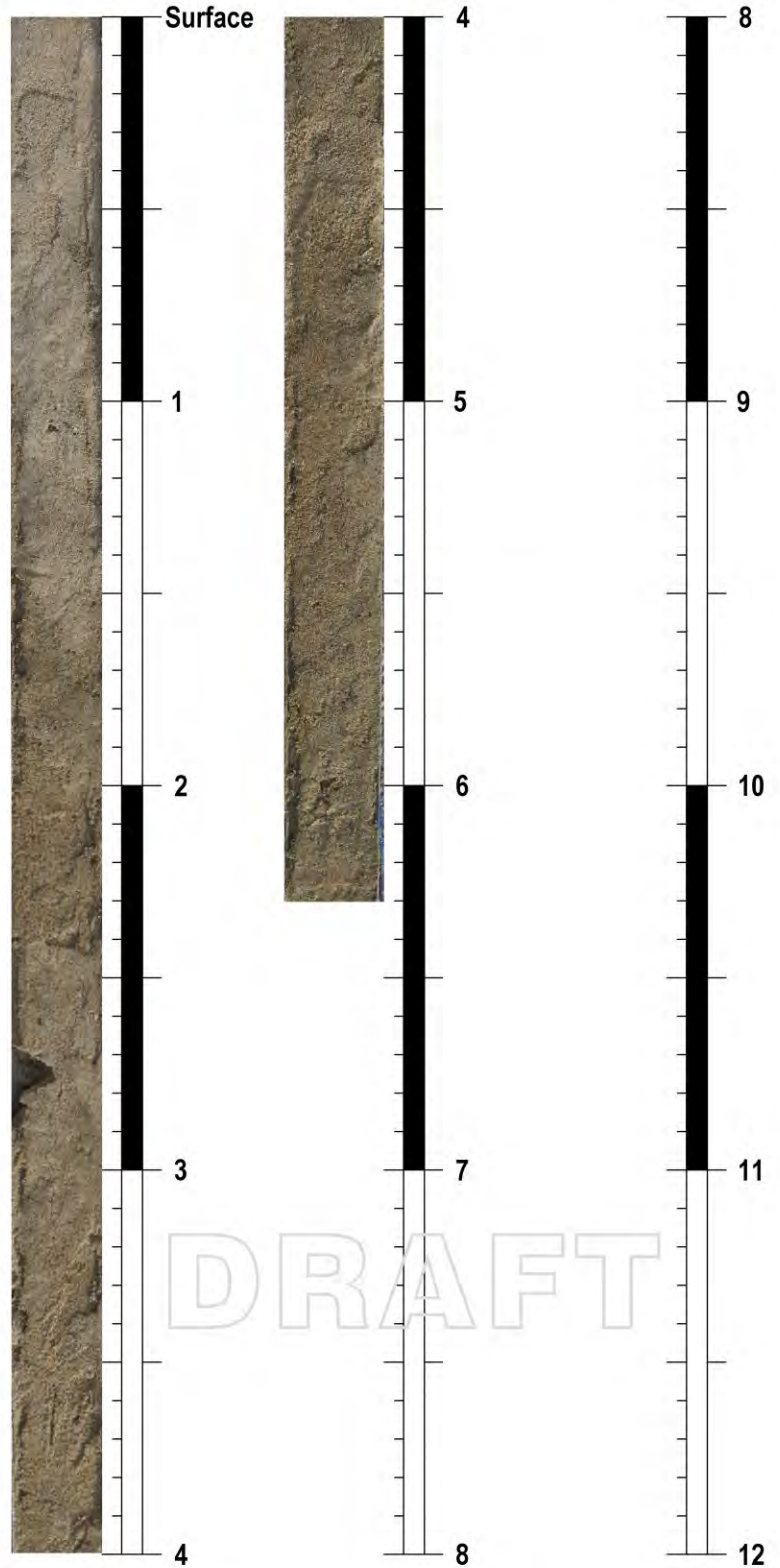


OFFSHORE SAND SOURCE - CSE CORE NO. **Bux-07**

Core Location Map



ELEVATION TOP OF HOLE: 35.3 ft NAVD
TOTAL DEPTH OF HOLE: 6.3 ft



Note:
All core depths in feet.
See core log sheet for additional geotechnical information.

PROJECT TITLE:

Dare County, NC
Beach Nourishment
Feasibility Study - Phase 1

PREPARED FOR:

County of Dare
954 Marshall C. Collins Drive (286)
PO Box 1000
Manteo NC 27954

DRAWING TITLE:

CORE LOG
PHOTO MOSAIC

SCALE:

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DATE:

Jan 2015

DRAWN BY:

T.Hair

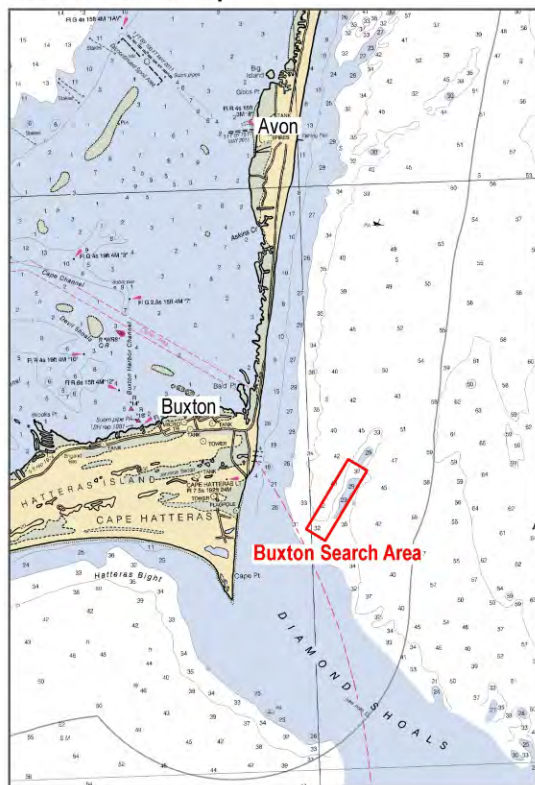
PROJECT #:

2403-02

07

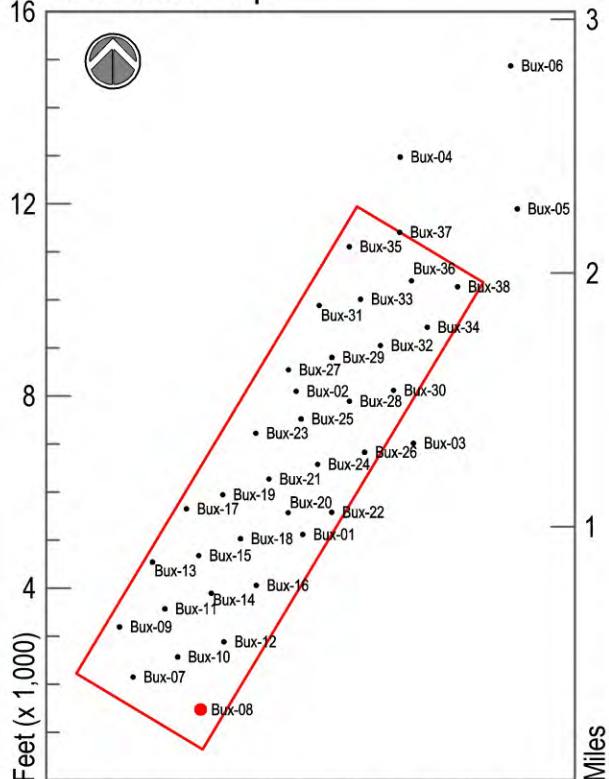
CORE LOG		Coastal Science & Engineering			Sheet 8 of 53	
PROJECT: 2403 - Dare County		COORDINATES:		HOLE NUMBER:		
LOCALITY: Buxton, NC		Northing: 558493.040 Easting: 3046459.040 Grid Datum: NAD '83		Bux-8 (as shown on title drawing and file no.)		
DATE: 2014-Oct-20	TOP ELEVATION:	-36.86 ft. NAVD '88	DEVICE DESIGNATION:	Coastal Science & Engineering		
BORE ANGLE: 90.00°						
BURDEN THICKNESS: 7.6 ft.	BOTTOM ELEVATION:	-44.46 ft. NAVD '88	BARREL SIZE/TYPE:	3 in. Aluminum		
CORE RECOVERY: 7.6 ft. (100.0%)	WATER DEPTH:	-34.00 ft. (operational note only)	GEOLOGIST: FIELD TEAM:	TWK - NC #1752 TH, DG, LF		
Depth	Lithology	Classification Of Materials (Description)	Sample #	Remarks		
1		0.0 to 1.8 ft: Fine Sand - Greyish tan, uniform w/ minor shell and trace pea gravel. Shell fragments (2-4 cm) @ 1.8 ft	S1	S1: 0.0 ft. to 1.8 ft. Shell: 9.4% Mean Grain Size: 0.270mm		
2		1.8 to 4.1 ft: Fine Sand - Clean, med grey, unifrom w shattered shell clasts	S2	S2: 1.8 ft. to 4.1 ft. Shell: 6.9% Mean Grain Size: 0.217mm		
3						
4		4.1 to 4.6 ft: Medium Sand - Clean, tan w/ minor shell fragments and pea gravel	S3	S3: 4.1 ft. to 4.6 ft. Shell: 10.7% Mean Grain Size: 0.285mm		
5		4.6 to 7.6 ft: Fine Sand - Clean, light grey, uniform w/ scattered shell clasts and trace pea gravel. Shell fragment (2cm) @ 6.0 ft and scallop (3cm) @ 7.3 ft	S4	S4: 4.6 ft. to 7.6 ft. Shell: 4.8% Mean Grain Size: 0.216mm		
6	— 6.0 ft: Shell Fragment					
7	— 7.3 ft: Medium Scallop					
8						
9						
10						

Area Location Map

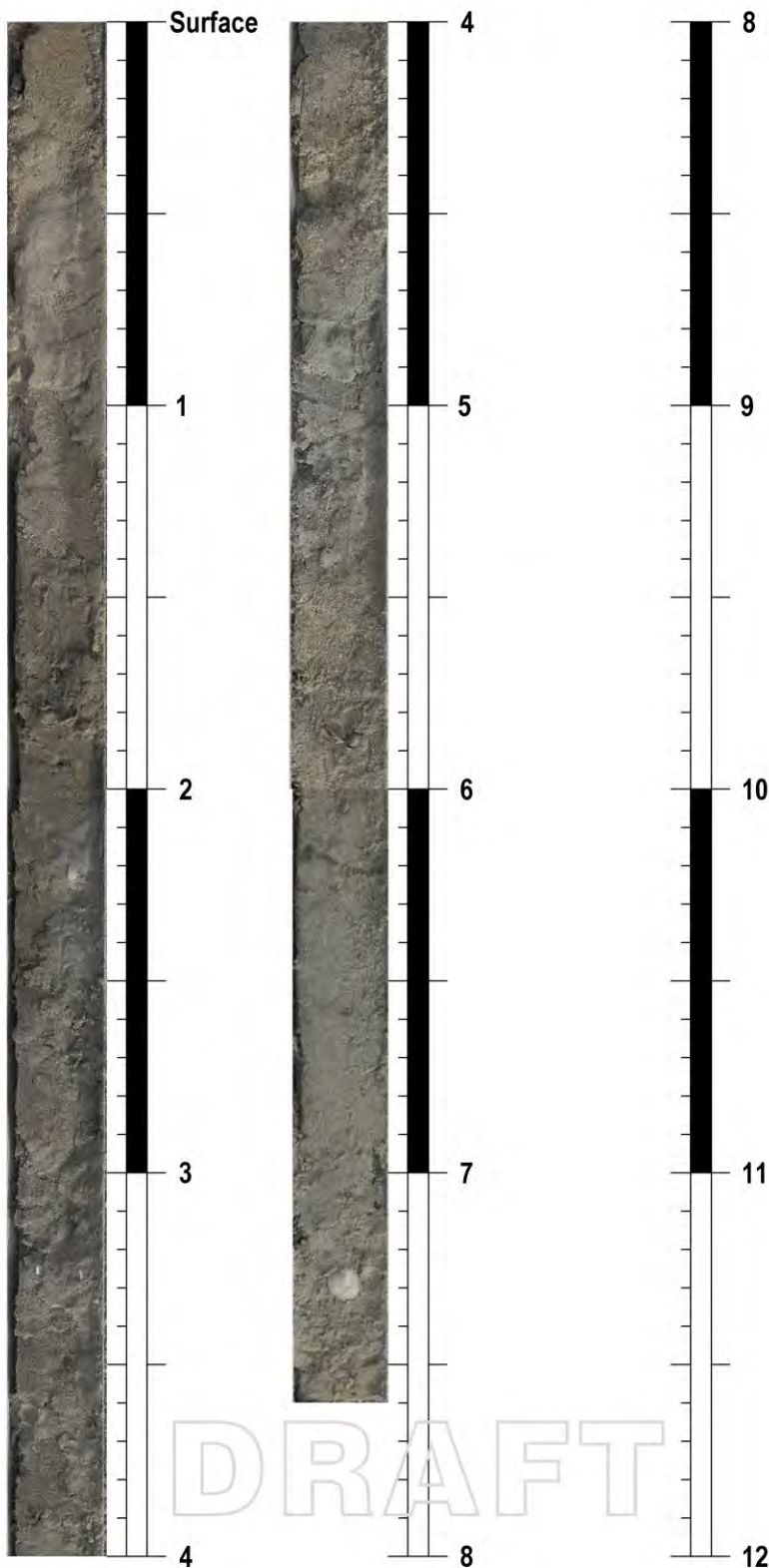


OFFSHORE SAND SOURCE - CSE CORE NO. **Bux-08**

Core Location Map



ELEVATION TOP OF HOLE: -36.8 ft NAVD
TOTAL DEPTH OF HOLE: 7.6 ft



Note:
All core depths in feet.
See core log sheet for additional geotechnical information.

PROJECT TITLE:

Dare County, NC
Beach Nourishment
Feasibility Study - Phase 1

PREPARED FOR:

County of Dare
954 Marshall C. Collins Drive (286)
PO Box 1000
Manteo NC 27954

DRAWING TITLE:

CORE LOG
PHOTO MOSAIC

SCALE:

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Jan 2015

DRAWN BY:

T.Hair

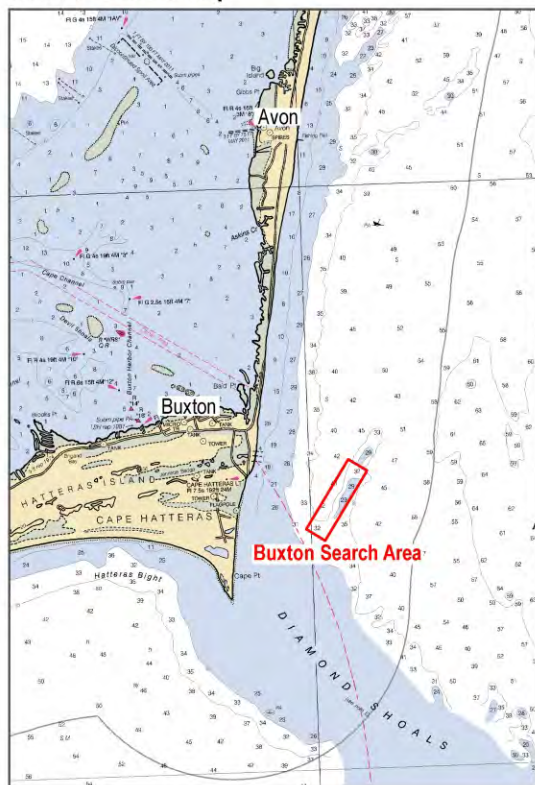
PROJECT #:

2403-02

08

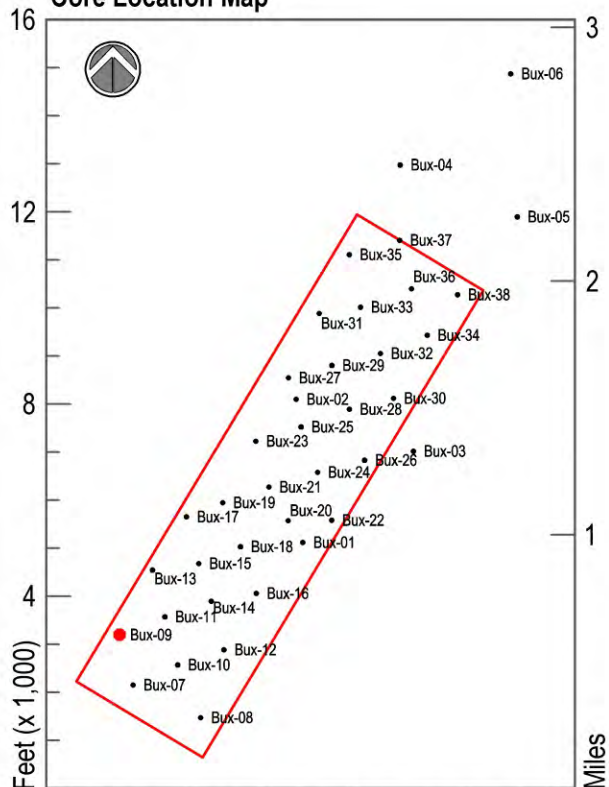
CORE LOG		Coastal Science & Engineering			Sheet 9 of 53	
PROJECT: 2403 - Dare County		COORDINATES:		HOLE NUMBER:		
LOCALITY: Buxton, NC		Northing: 559784.320 Easting: 3045193.690 Grid Datum: NAD '83		Bux-9 (as shown on title drawing and file no.)		
DATE: 2014-Oct-20	TOP ELEVATION:	-40.90 ft. NAVD '88	DEVICE DESIGNATION:	Coastal Science & Engineering		
BORE ANGLE: 90.00°						
BURDEN THICKNESS: 4.5 ft.	BOTTOM ELEVATION:	-45.40 ft. NAVD '88	BARREL SIZE/TYPE:	3 in. Aluminum		
CORE RECOVERY: 4.5 ft. (100.0%)	WATER DEPTH:	-39.00 ft. (operational note only)	GEOLOGIST: FIELD TEAM:	TWK - NC #1752 TH, DG, LF		
Depth	Lithology	Classification Of Materials (Description)	Sample #	Remarks		
1		0.0 to 2.6 ft: Medium Sand - Clean, tan, unifor w/ trace shell and pea gravel	S1	S1: 0.0 ft. to 2.6 ft. Shell: 6.7% Mean Grain Size: 0.396mm		
2						
3		2.6 to 4.5 ft: Medium Sand / Coarse Sand mix - Clean, tan, becoming shellier and coarser @ bottom	S2	S2: 2.6 ft. to 4.5 ft. Shell: 17.0% Mean Grain Size: 0.608mm		
4						
5		-- 4.0 ft: Medium Scallop - 4 cm fragment -- 4.2 ft: Medium Clam - 6 cm Quahog fragment				
6						
7						
8						
9						
10						

Area Location Map

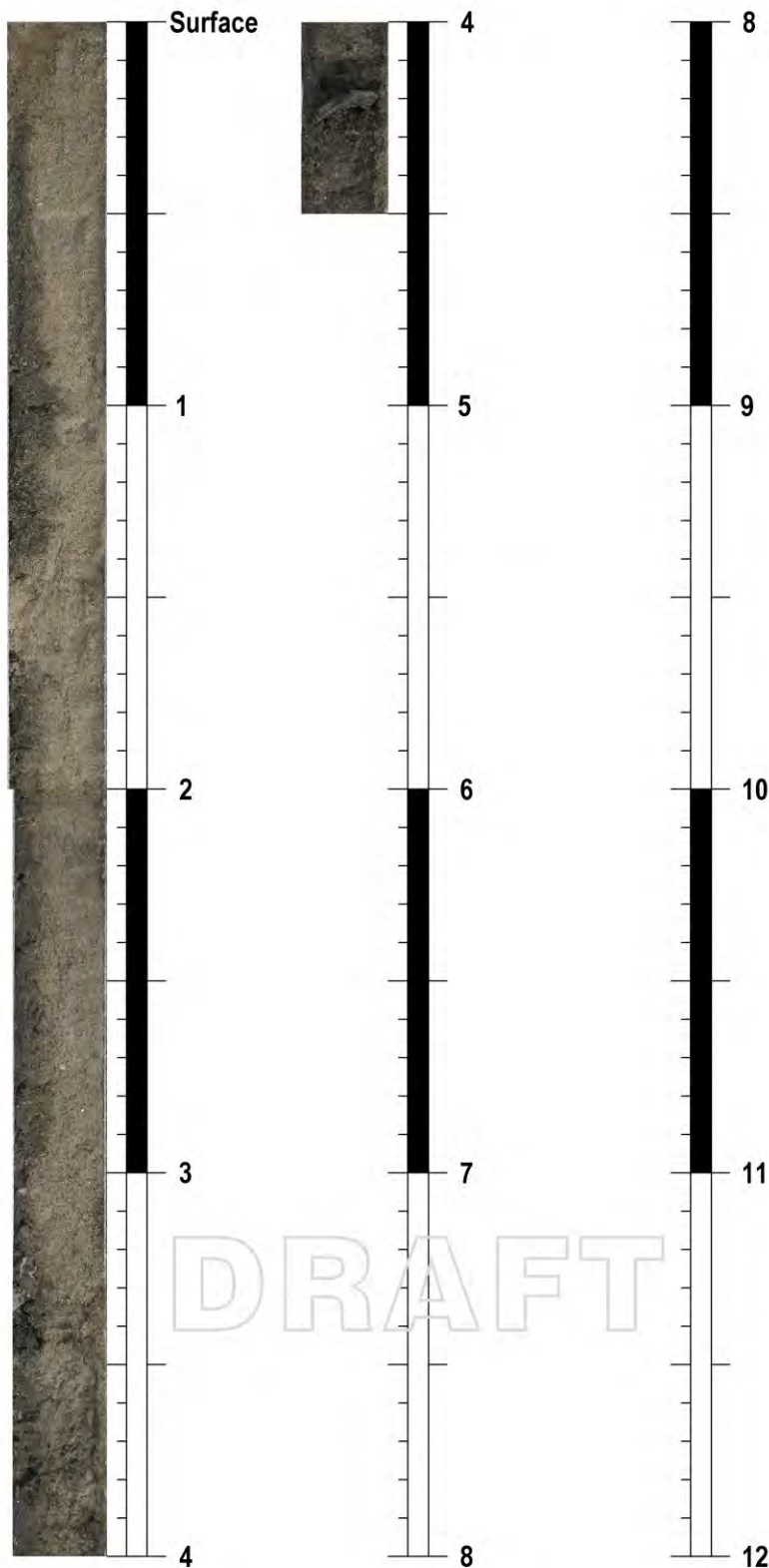


OFFSHORE SAND SOURCE - CSE CORE NO. **Bux-09**

Core Location Map



ELEVATION TOP OF HOLE: -40.9 ft NAVD
TOTAL DEPTH OF HOLE: 4.5 ft



Note:
All core depths in feet.
See core log sheet for additional geotechnical information.

PROJECT TITLE:

Dare County, NC
Beach Nourishment
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PREPARED FOR:

County of Dare
954 Marshall C. Collins Drive (286)
PO Box 1000
Manteo NC 27954

DRAWING TITLE:

CORE LOG
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SCALE:

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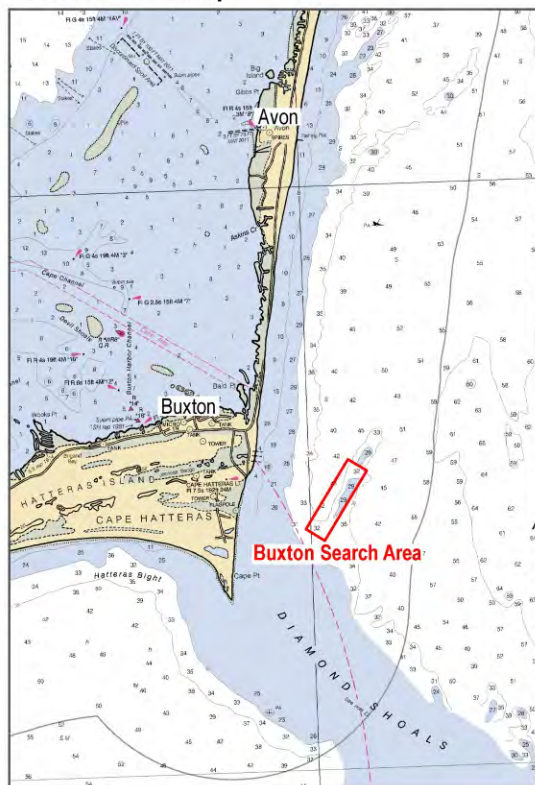
PROJECT #:

2403-02

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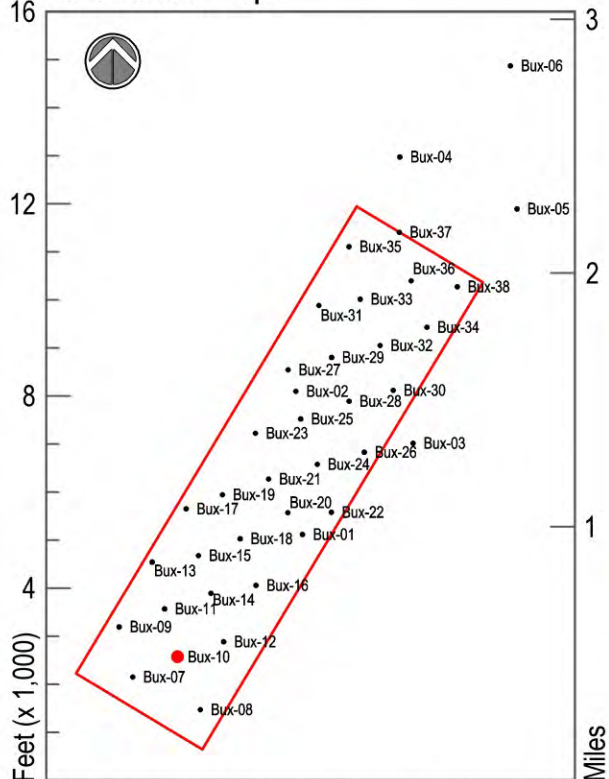
CORE LOG		Coastal Science & Engineering			Sheet 10 of 53	
PROJECT: 2403 - Dare County		COORDINATES:			HOLE NUMBER:	
LOCALITY: Buxton, NC		Northing: 559315.650 Easting: 3046101.670 Grid Datum: NAD '83			Bux-10 (as shown on title drawing and file no.)	
DATE: 2014-Oct-20	TOP ELEVATION:	-31.94 ft. NAVD '88	DEVICE DESIGNATION:	Coastal Science & Engineering		
BORE ANGLE: 90.00°						
BURDEN THICKNESS: 7.2 ft.	BOTTOM ELEVATION:	-39.14 ft. NAVD '88	BARREL SIZE/TYPE:	3 in. Aluminum		
CORE RECOVERY: 7.2 ft. (100.0%)	WATER DEPTH:	-30.00 ft. (operational note only)	GEOLOGIST: FIELD TEAM:	TWK - NC #1752 TH, DG, LF		
Depth	Lithology	Classification Of Materials (Description)	Sample #	Remarks		
1		0.0 to 2.6 ft: Medium Sand - Clean, tan, uniform w/ minor shell and trace pea gravel	S1	S1: 0.0 ft. to 2.6 ft. Shell: 8.2% Mean Grain Size: 0.338mm		
2						
3		2.6 to 5.0 ft: Medium Sand - Clean, tan, uniform w/ trace shell and pea gravel	S2	S2: 2.6 ft. to 5.0 ft. Shell: 7.7% Mean Grain Size: 0.342mm		
4						
5		5.0 to 7.2 ft: Medium Sand - Clean, tan uniform w/ trace shell and pea gravel	S3	S3: 5.0 ft. to 7.2 ft. Shell: 7.0% Mean Grain Size: 0.361mm		
6						
7						
8						
9						
10						

Area Location Map

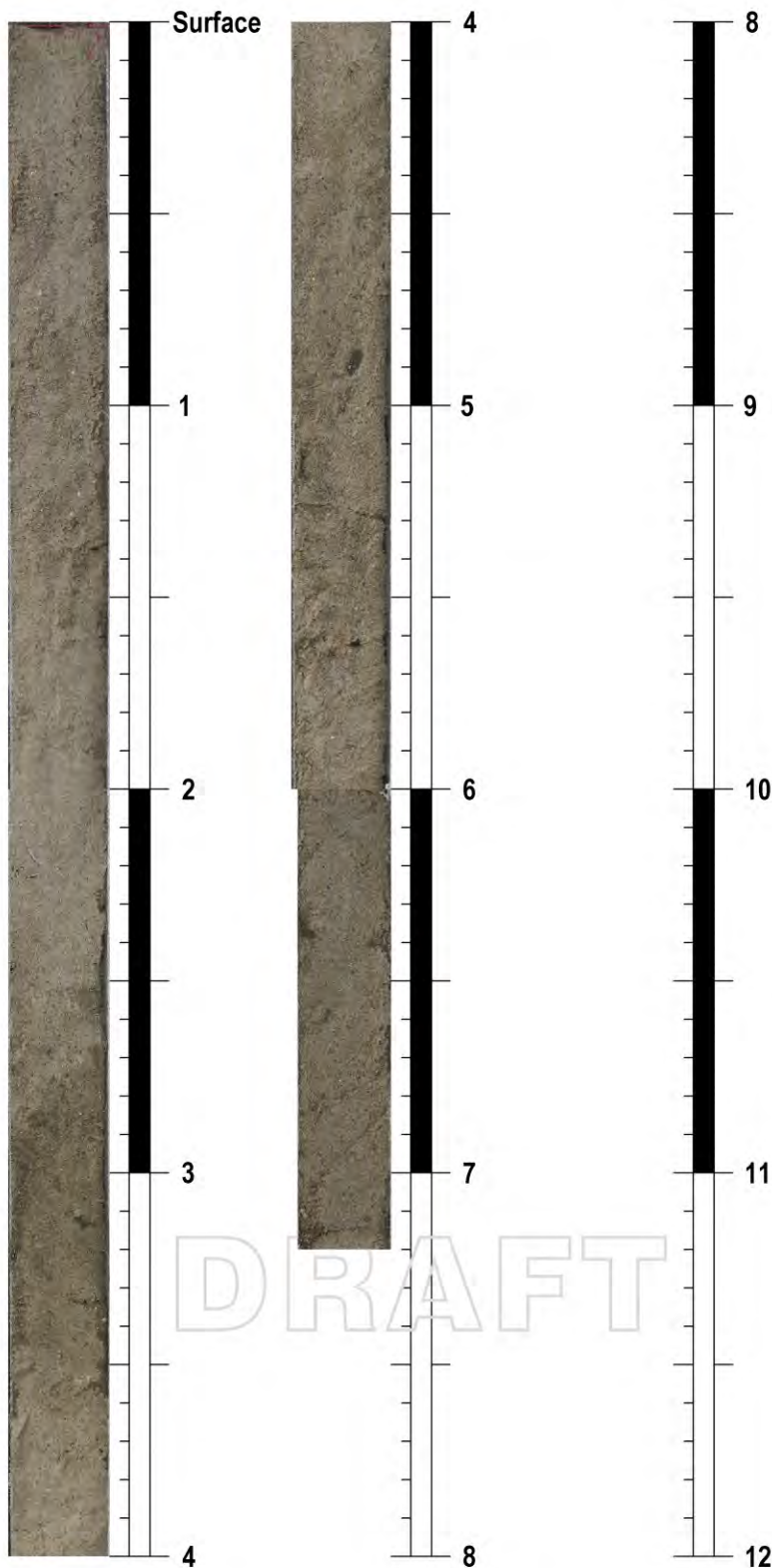


OFFSHORE SAND SOURCE - CSE CORE NO. **Bux-10**

Core Location Map



ELEVATION TOP OF HOLE: _ ft NAVD
TOTAL DEPTH OF HOLE: 7.2 ft



Note:
All core depths in feet.
See core log sheet for additional geotechnical information.

PROJECT TITLE:

Dare County, NC
Beach Nourishment
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PREPARED FOR:

County of Dare
954 Marshall C. Collins Drive (286)
PO Box 1000
Manteo NC 27954

DRAWING TITLE:

CORE LOG
PHOTO MOSAIC

SCALE:

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DATE:

Jan 2015

DRAWN BY:

T.Hair

PROJECT #:

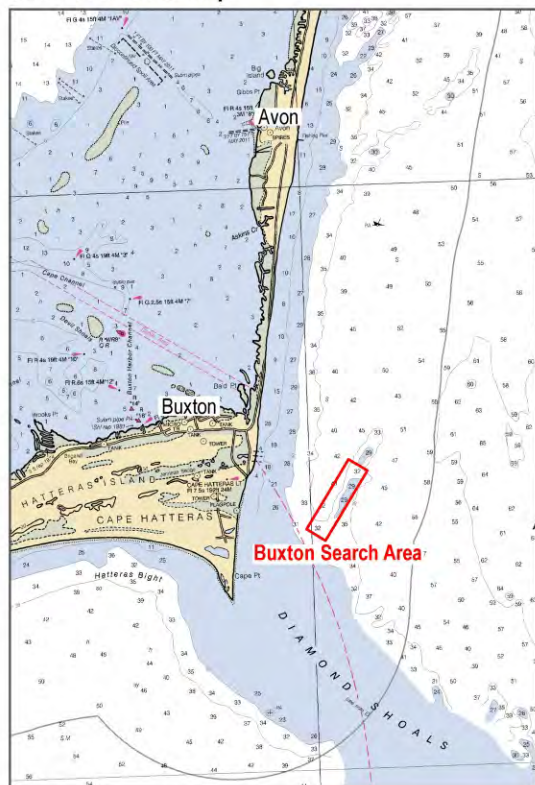
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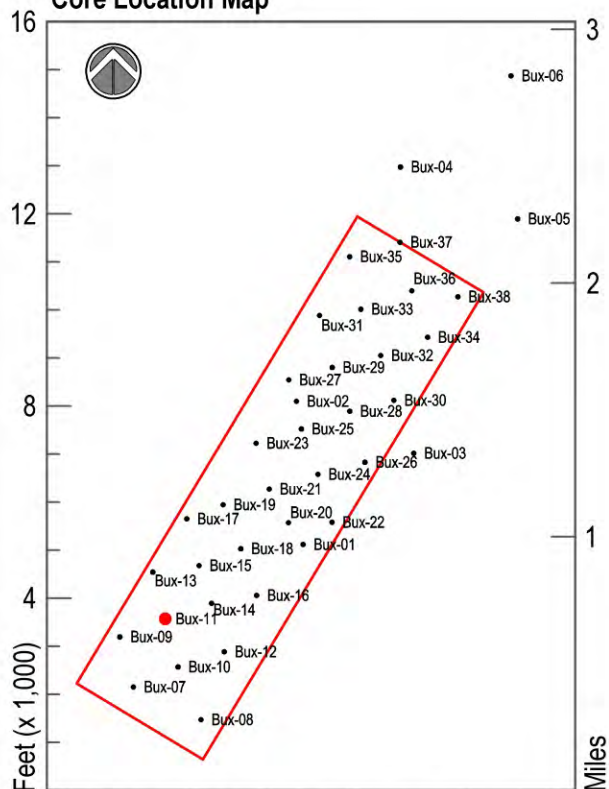
CORE LOG		Coastal Science & Engineering			Sheet 11 of 53	
PROJECT: 2403 - Dare County		COORDINATES:		HOLE NUMBER:		
LOCALITY: Buxton, NC		Northing: 560065.710 Easting: 3045901.720 Grid Datum: NAD '83		Bux-11 (as shown on title drawing and file no.)		
DATE: 2014-Oct-20	TOP ELEVATION:	-37.49 ft. NAVD '88	DEVICE DESIGNATION:	Coastal Science & Engineering		
BORE ANGLE: 90.00°						
BURDEN THICKNESS: 5.7 ft.	BOTTOM ELEVATION:	-43.19 ft. NAVD '88	BARREL SIZE/TYPE:	3 in. Aluminum		
CORE RECOVERY: 5.7 ft. (100.0%)	WATER DEPTH:	-37.00 ft. (operational note only)	GEOLOGIST: FIELD TEAM:	TWK - NC #1752 TH, DG, LF		
Depth	Lithology	Classification Of Materials (Description)	Sample #	Remarks		
1		0.0 to 1.8 ft: Medium Sand - Clean, greyish tan, uniform w/ shell concentration @ 1.9 ft 5cm surf clam	S1	S1: 0.0 ft. to 1.9 ft. Shell: 8.2% Mean Grain Size: 0.389mm		
2		1.9 to 3.3 ft: Fine Sand - Clean, medium grey, uniform w/ trace shell, pea gravel	S2	S2: 1.9 ft. to 3.3 ft. Shell: 9.7% Mean Grain Size: 0.210mm		
3		3.3 to 5.7 ft: Fine Sand / Medium Sand mix - Tannish medium grey w/ trace shell fragments, pea gravel	S3	S3: 3.3 ft. to 5.7 ft. Shell: 10.8% Mean Grain Size: 0.288mm		
4						
5						
6						
7						
8						
9						
10						

Area Location Map

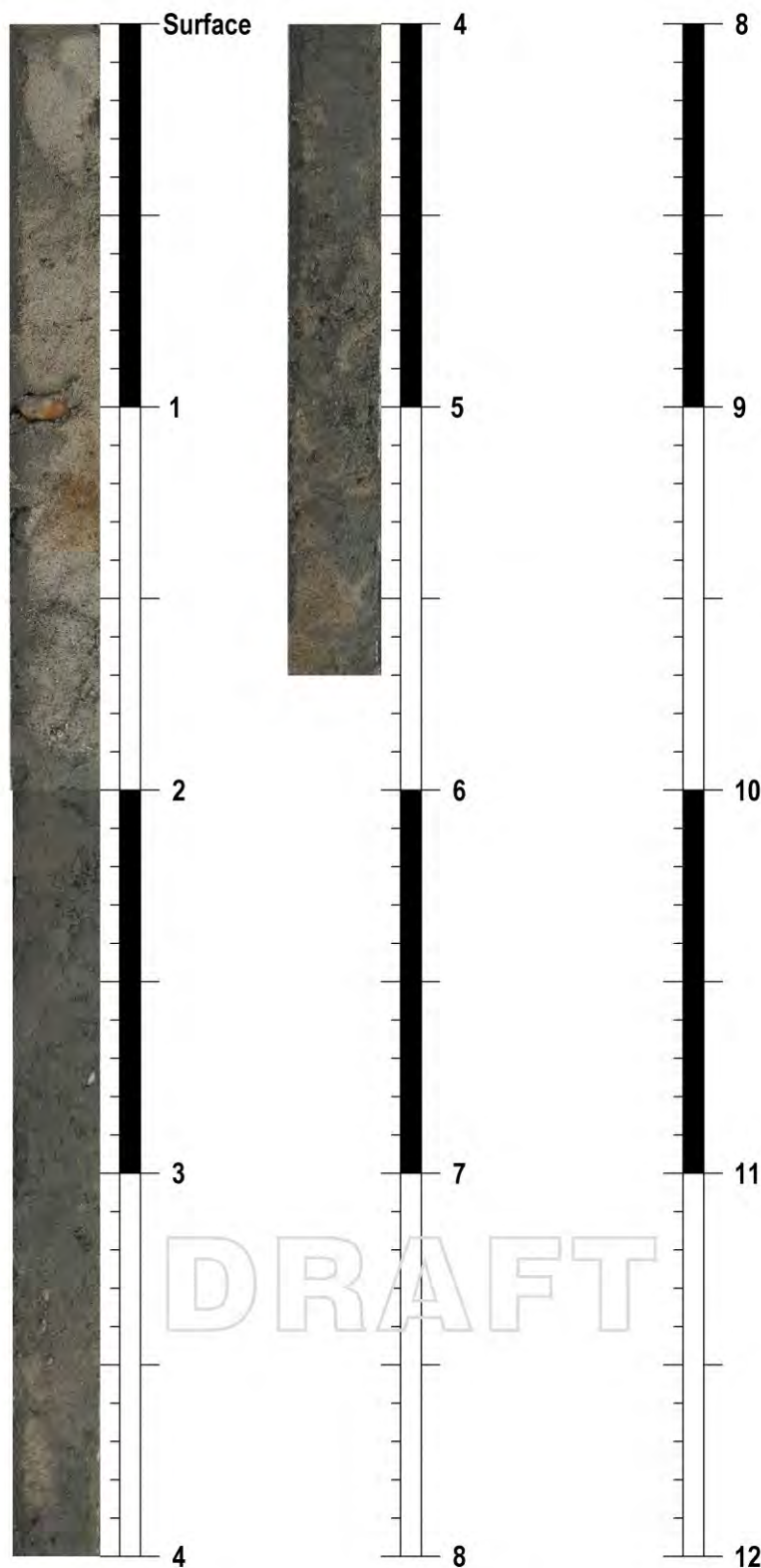


OFFSHORE SAND SOURCE - CSE CORE NO. **Bux-11**

Core Location Map



ELEVATION TOP OF HOLE: _ ft NAVD
TOTAL DEPTH OF HOLE: 5.7 ft



Note:
All core depths in feet.
See core log sheet for additional geotechnical information.

PROJECT TITLE:

Dare County, NC
Beach Nourishment
Feasibility Study - Phase 1

PREPARED FOR:

County of Dare
954 Marshall C. Collins Drive (286)
PO Box 1000
Manteo NC 27954

DRAWING TITLE:

CORE LOG
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SCALE:

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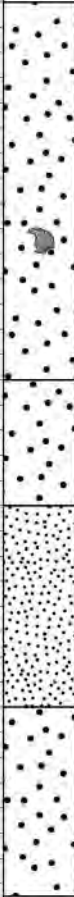
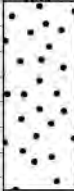
DRAWN BY:

T.Hair

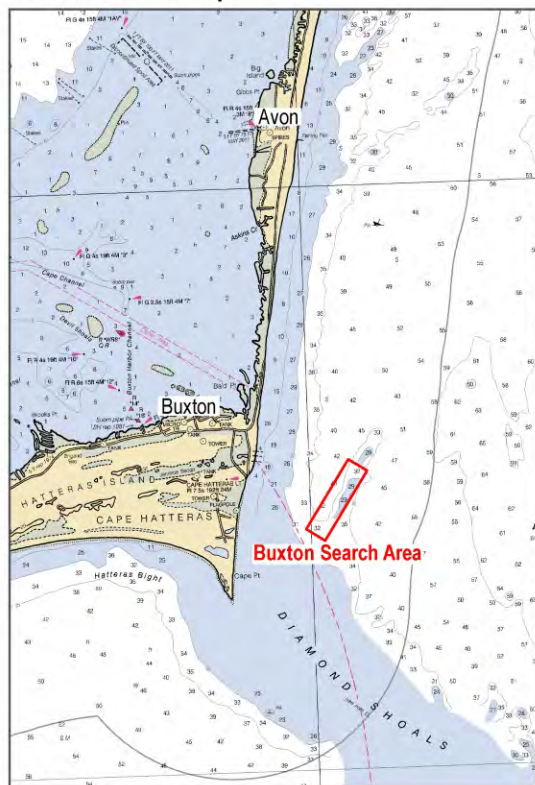
PROJECT #:

2403-02

11

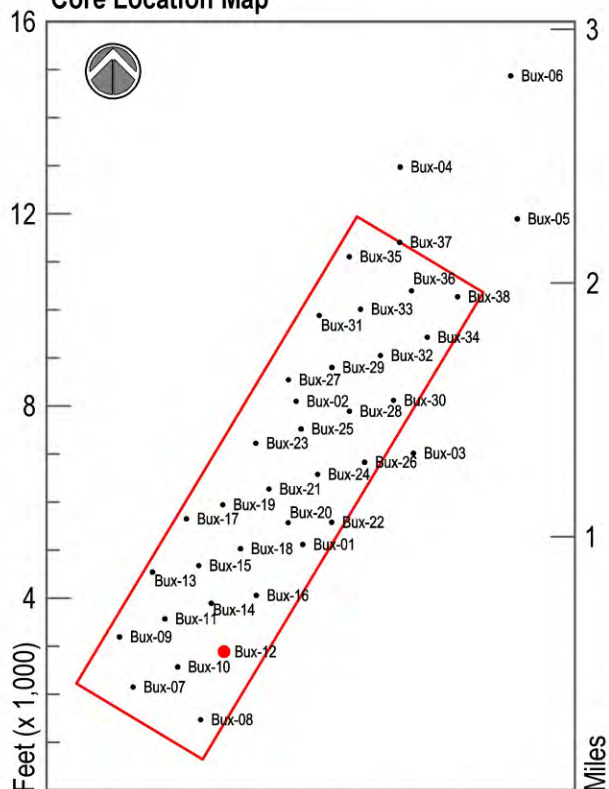
CORE LOG		Coastal Science & Engineering			Sheet 12 of 53	
PROJECT: 2403 - Dare County		COORDINATES:		HOLE NUMBER:		
LOCALITY: Buxton, NC		Northing: 559552.000 Easting: 3046822.510 Grid Datum: NAD '83		Bux-12 (as shown on title drawing and file no.)		
DATE: 2014-Oct-20	TOP ELEVATION:	-33.55 ft. NAVD '88	DEVICE DESIGNATION:	Coastal Science & Engineering		
BORE ANGLE: 90.00°						
BURDEN THICKNESS: 7.1 ft.	BOTTOM ELEVATION:	-40.65 ft. NAVD '88	BARREL SIZE/TYPE:	3 in. Aluminum		
CORE RECOVERY: 7.1 ft. (100.0%)	WATER DEPTH:	-33.00 ft. (operational note only)	GEOLOGIST: FIELD TEAM:	TWK - NC #1752 TH, DG, LF		
Depth	Lithology	Classification Of Materials (Description)	Sample #	Remarks		
1		0.0 to 3.0 ft: Medium Sand - Clean, tan, uniform w/ minor shell fragments and trace pea gravel	S1	S1: 0.0 ft. to 3.0 ft. Shell: 10.5% Mean Grain Size: 0.356mm		
2		1.9 ft: Shell Fragment - 2 cm				
3		3.0 to 4.0 ft: Medium Sand - Clean, tan, graded with minor shell fragments and trace pea gravel	S2	S2: 3.0 ft. to 4.0 ft. Shell: 7.0% Mean Grain Size: 0.246mm		
4		4.0 to 5.6 ft: Fine Sand - Clean, tannish light grey w/ trace shell, pea gravel	S3	S3: 4.0 ft. to 5.6 ft. Shell: 6.2% Mean Grain Size: 0.246mm		
5		5.6 to 7.1 ft: Medium Sand - Clean, tannish light grey, uniform w/ trace shell, pea gravel	S4	S4: 5.6 ft. to 7.1 ft. Shell: 6.9% Mean Grain Size: 0.286mm		
6						
7						
8						
9						
10						

Area Location Map

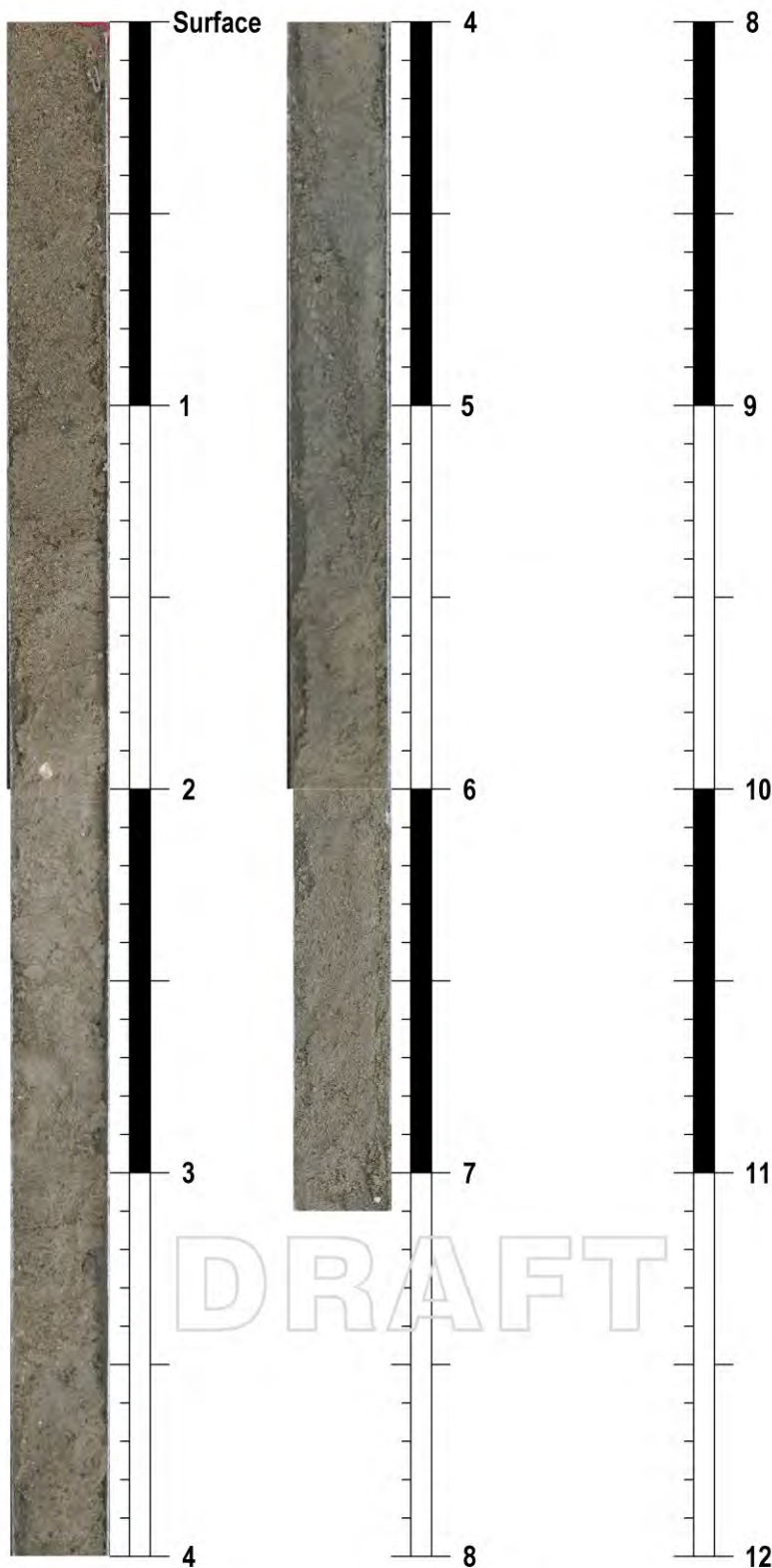


OFFSHORE SAND SOURCE - CSE CORE NO. **Bux-12**

Core Location Map



ELEVATION TOP OF HOLE: -33.5 ft NAVD
TOTAL DEPTH OF HOLE: 7.1 ft



Note:

All core depths in feet.
See core log sheet for additional geotechnical information.

PROJECT TITLE:

Dare County, NC
Beach Nourishment
Feasibility Study - Phase 1

PREPARED FOR:

County of Dare
954 Marshall C. Collins Drive (286)
PO Box 1000
Manteo NC 27954

DRAWING TITLE:

CORE LOG
PHOTO MOSAIC

SCALE:

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DATE:

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DRAWN BY:

T.Hair

PROJECT #:

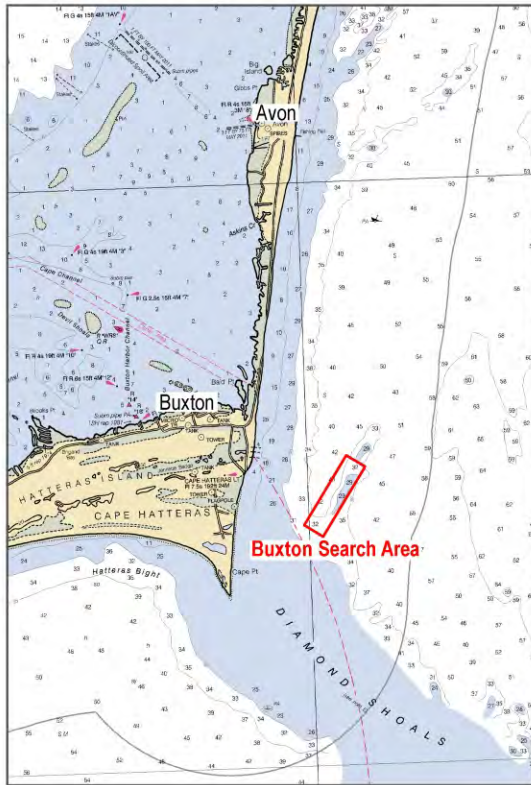
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12

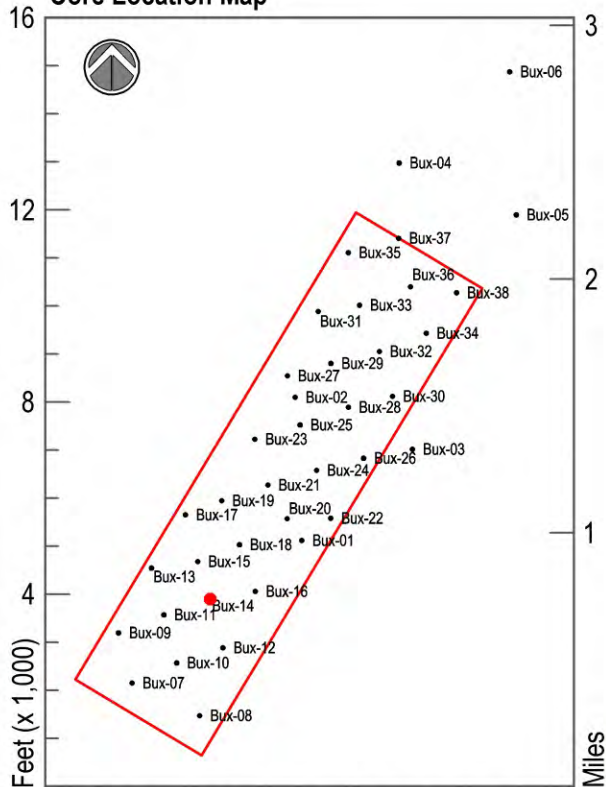
CORE LOG		Coastal Science & Engineering			Sheet 13 of 53	
PROJECT: 2403 - Dare County		COORDINATES:		HOLE NUMBER:		
LOCALITY: Buxton, NC		Northing: 560309.270 Easting: 3046623.900 Grid Datum: NAD '83		Bux-14 (as shown on title drawing and file no.)		
DATE: 2014-Oct-20	TOP ELEVATION:	-31.60 ft. NAVD '88	DEVICE DESIGNATION:	Coastal Science & Engineering		
BORE ANGLE: 90.00°						
BURDEN THICKNESS: 7.3 ft.	BOTTOM ELEVATION:	-38.90 ft. NAVD '88	BARREL SIZE/TYPE:	3 in. Aluminum		
CORE RECOVERY: 7.3 ft. (100.0%)	WATER DEPTH:	-30.00 ft. (operational note only)	GEOLOGIST: FIELD TEAM:	TWK - NC #1752 TH, DG, LF		
Depth	Lithology	Classification Of Materials (Description)	Sample #	Remarks		
1		0.0 to 3.3 ft: Medium Sand / Coarse Sand mix - Clean, tan, uniform w/ minor crushed shell, pea gravel	S1	S1: 0.0 ft. to 3.3 ft. Shell: 17.7% Mean Grain Size: 0.494mm		
2						
3						
4		3.3 to 4.6 ft: Coarse Sand - Clean, tan w/ minor crushed shell and trace pea gravel	S2	S2: 3.3 ft. to 4.6 ft. Shell: 21.1% Mean Grain Size: 0.578mm		
5						
6						
7		4.6 to 7.3 ft: Medium Sand / Coarse Sand mix - Clean, tan, uniform w/ trace shell and pea gravel - 5.4 ft: Shell Fragment - 3 cm	S3	S3: 4.6 ft. to 7.3 ft. Shell: 9.8% Mean Grain Size: 0.393mm		
8						
9						
10						

Area Location Map

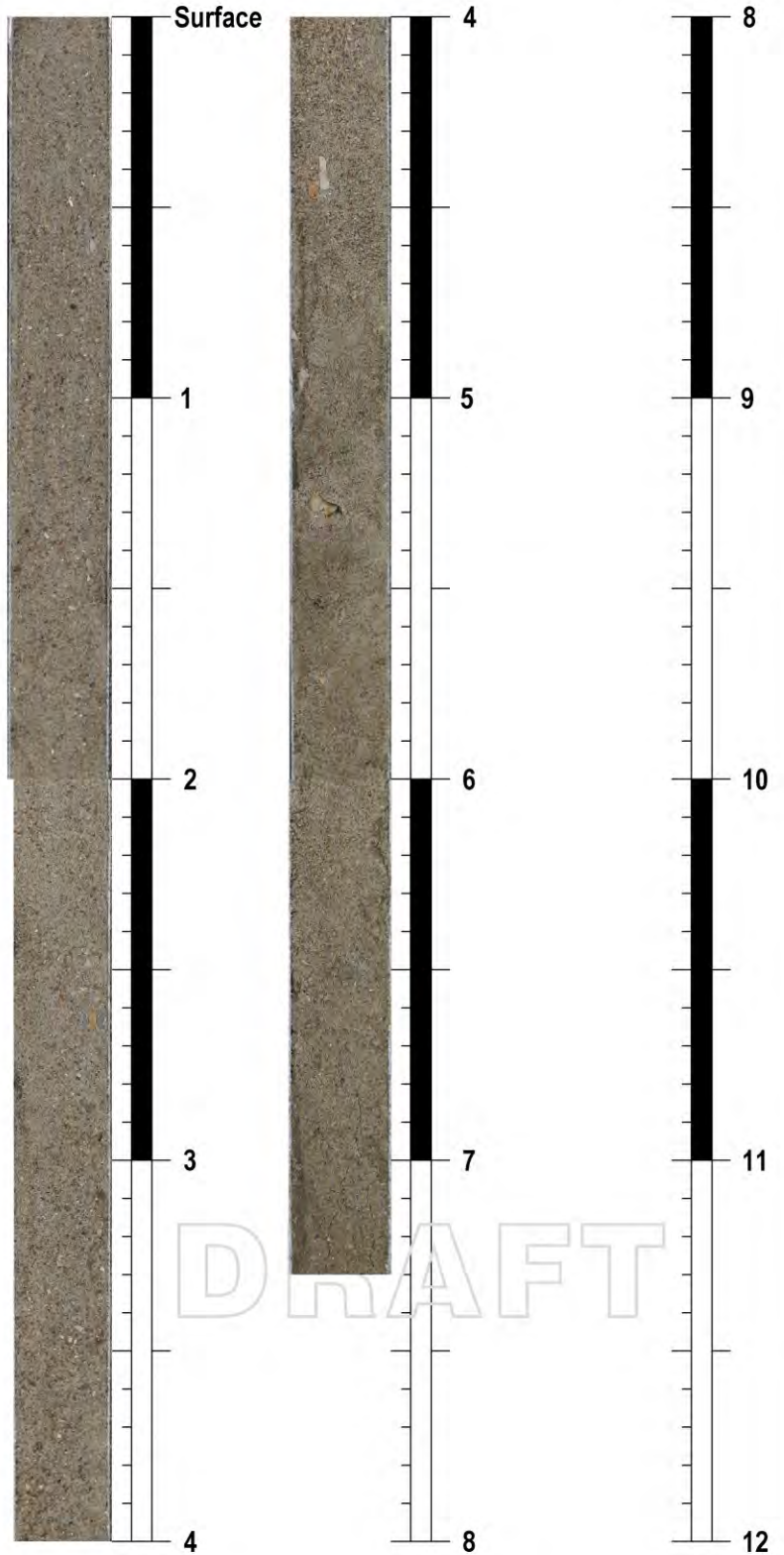


OFFSHORE SAND SOURCE - CSE CORE NO. **Bux-14**

Core Location Map



ELEVATION TOP OF HOLE: -31.6 ft NAVD
TOTAL DEPTH OF HOLE: 7.3 ft



Note:

All core depths in feet.

See core log sheet for additional geotechnical information.

PROJECT TITLE:

Dare County, NC
Beach Nourishment
Feasibility Study - Phase 1

PREPARED FOR:

County of Dare
954 Marshall C. Collins Drive (286)
PO Box 1000
Manteo NC 27954

DRAWING TITLE:

CORE LOG
PHOTO MOSAIC

SCALE:

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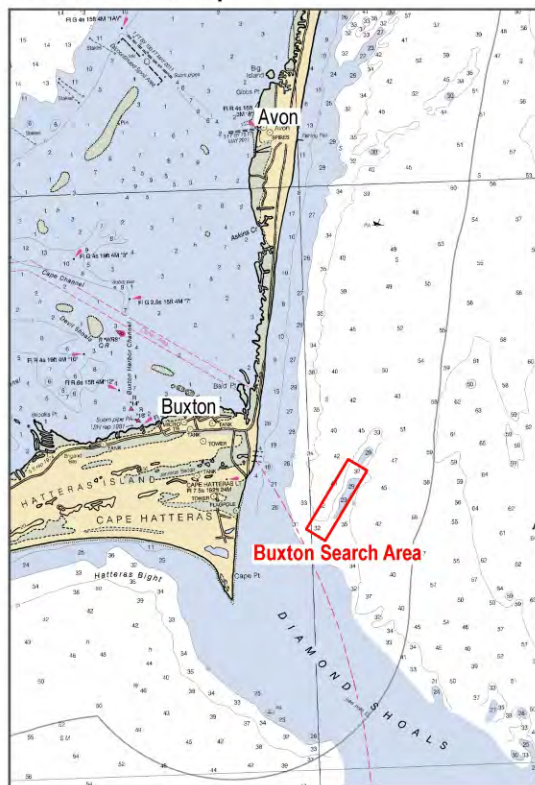
PROJECT #:

2403-02

14

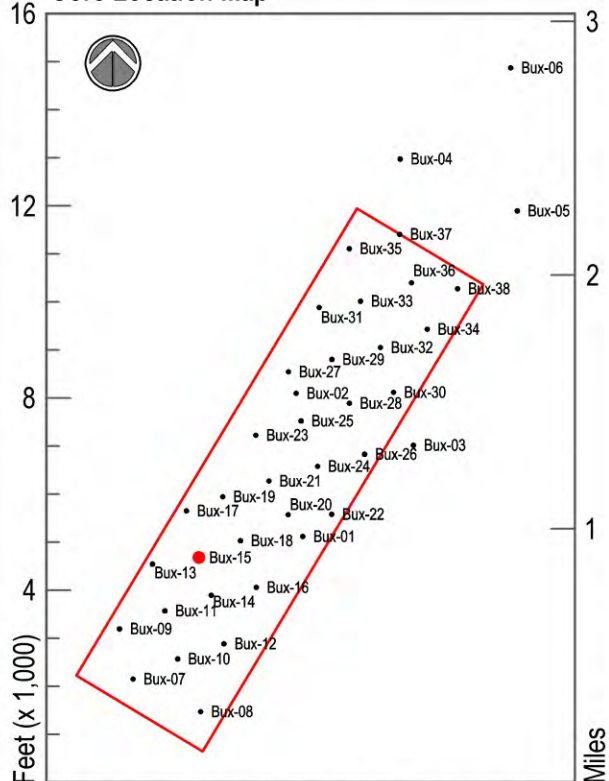
CORE LOG		Coastal Science & Engineering			Sheet 14 of 53	
PROJECT: 2403 - Dare County		COORDINATES:		HOLE NUMBER:		
LOCALITY: Buxton, NC		Northing: 560898.020 Easting: 3046430.410 Grid Datum: NAD '83		Bux-15 (as shown on title drawing and file no.)		
DATE: 2014-Oct-20	TOP ELEVATION:	-36.93 ft. NAVD '88	DEVICE DESIGNATION:	Coastal Science & Engineering		
BORE ANGLE: 90.00°						
BURDEN THICKNESS: 6.4 ft.	BOTTOM ELEVATION:	-43.33 ft. NAVD '88	BARREL SIZE/TYPE:	3 in. Aluminum		
CORE RECOVERY: 6.4 ft. (100.0%)	WATER DEPTH:	-37.00 ft. (operational note only)	GEOLOGIST: FIELD TEAM:	TWK - NC #1752 TH, DG, LF		
Depth	Lithology	Classification Of Materials (Description)	Sample #	Remarks		
1		0.0 to 3.0 ft: Medium Sand - Clean, tan, uniform w/ trace shell and pea gravel	S1	S1: 0.0 ft. to 3.0 ft. Shell: 8.0% Mean Grain Size: 0.410mm		
2						
3		3.0 to 5.9 ft: Medium Sand - Clean, tan, uniform w/ trace shell, pea gravel	S2	S2: 3.0 ft. to 5.9 ft. Shell: 9.6% Mean Grain Size: 0.415mm		
4						
5		-- 5.3 ft: Small Clam - 2 cm				
6		5.9 to 6.4 ft: Fine Sand - Silty, medium grey	S3	S3: 5.9 ft. to 6.4 ft. Shell: 6.0% Mean Grain Size: 0.267mm		
7						
8						
9						
10						

Area Location Map

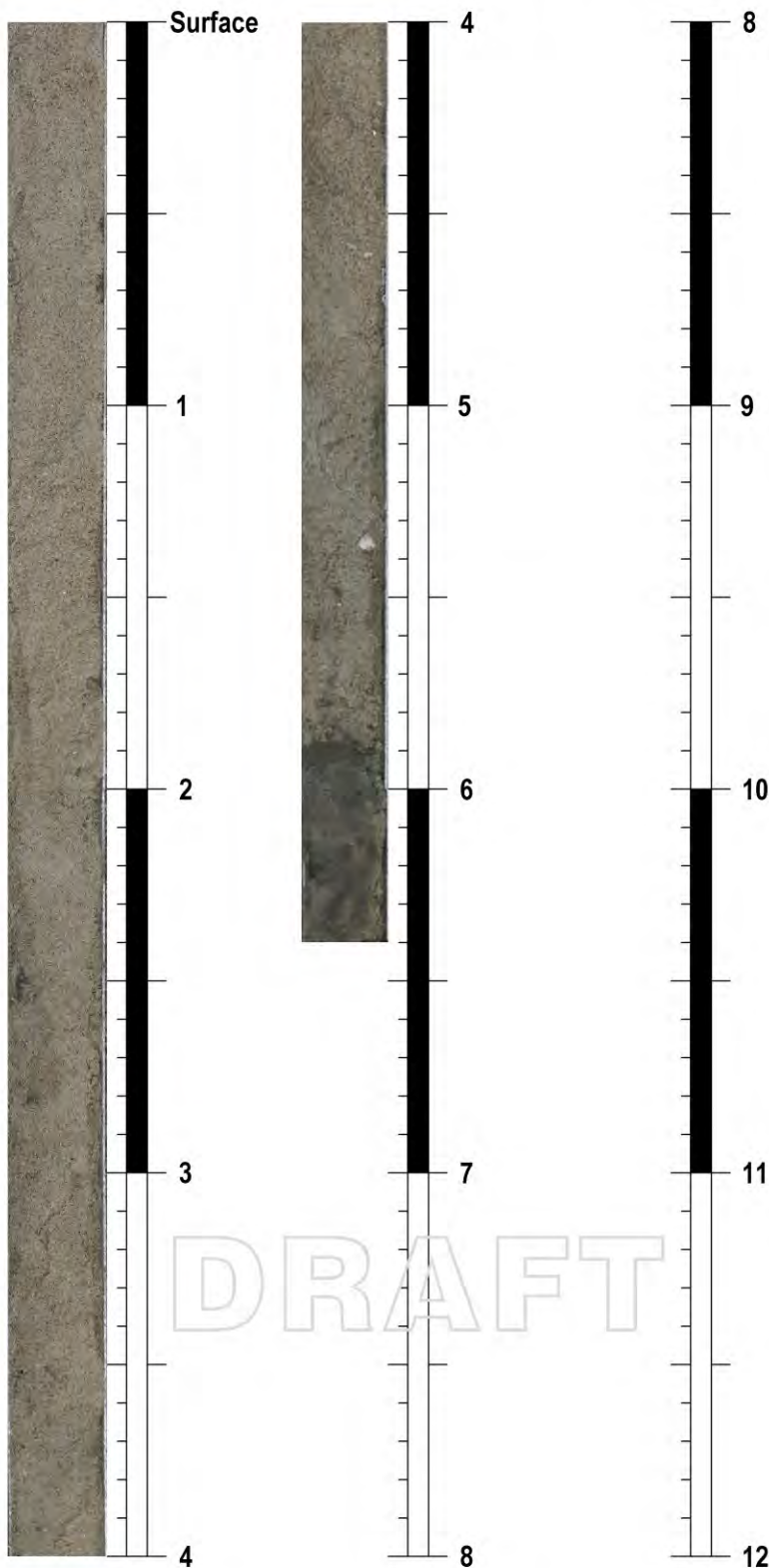


OFFSHORE SAND SOURCE - CSE CORE NO. **Bux-15**

Core Location Map



ELEVATION TOP OF HOLE: -36.9 ft NAVD
TOTAL DEPTH OF HOLE: 6.4 ft



Note:

All core depths in feet.
See core log sheet for additional geotechnical information.

PROJECT TITLE:

Dare County, NC
Beach Nourishment
Feasibility Study - Phase 1

PREPARED FOR:

County of Dare
954 Marshall C. Collins Drive (286)
PO Box 1000
Manteo NC 27954

DRAWING TITLE:

CORE LOG
PHOTO MOSAIC

SCALE:

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DATE:

Jan 2015

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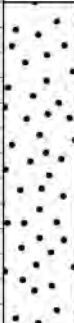
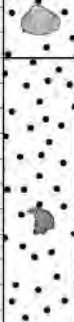
T.Hair

PROJECT #:

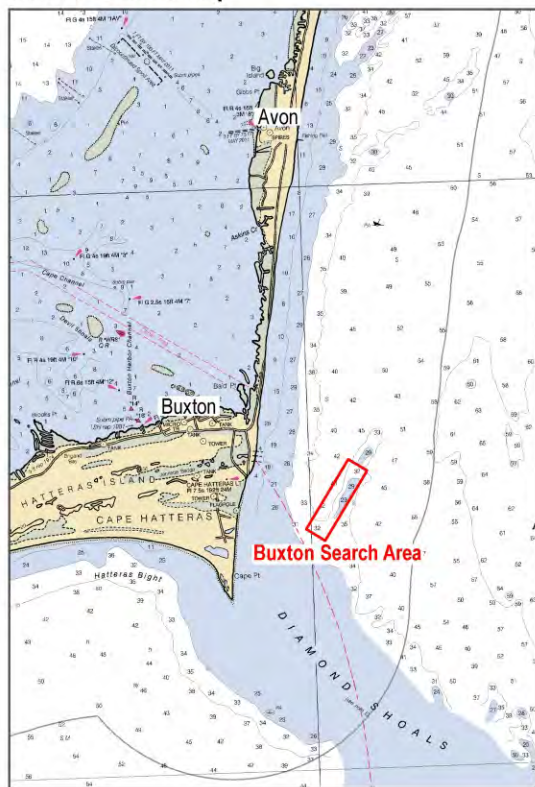
2403-02

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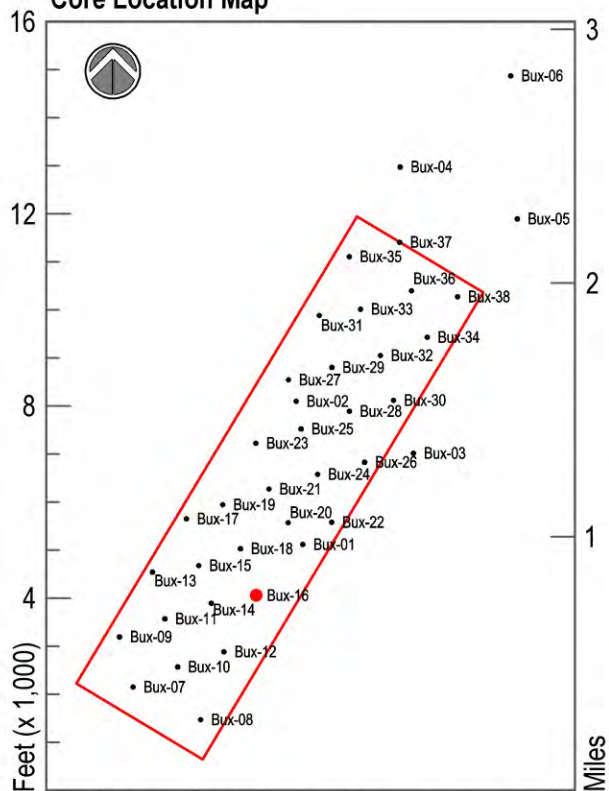
CORE LOG		Coastal Science & Engineering			Sheet 15 of 53	
PROJECT: 2403 - Dare County		COORDINATES:		HOLE NUMBER:		
LOCALITY: Buxton, NC		Northing: 560431.720 Easting: 3047327.590 Grid Datum: NAD '83		Bux-16 (as shown on title drawing and file no.)		
DATE: 2014-Oct-20	TOP ELEVATION:	-32.61 ft. NAVD '88	DEVICE DESIGNATION:	Coastal Science & Engineering		
BORE ANGLE: 90.00°						
BURDEN THICKNESS:	7.9 ft.	BOTTOM ELEVATION:	-40.51 ft. NAVD '88	BARREL SIZE/TYPE:	3 in. Aluminum	
CORE RECOVERY:	7.9 ft. (100.0%)	WATER DEPTH:	-31.00 ft. (operational note only)	GEOLOGIST: FIELD TEAM:	TWK - NC #1752 TH, DG, LF	
Depth	Lithology	Classification Of Materials (Description)		Sample #	Remarks	
1		0.0 to 3.0 ft: Medium Sand - Clean, tan w/ minor shell		S1	S1: 0.0 ft. to 3.0 ft. Shell: 18.4% Mean Grain Size: 0.451mm	
2		-- 2.7 ft: Medium Clam - Quahog fragment (4cm)				
3		3.0 to 6.0 ft: Medium Sand - Clean, tan w/ minor shell. Finer than upper unit (S1)		S2	S2: 3.0 ft. to 6.0 ft. Shell: 11.3% Mean Grain Size: 0.357mm	
4		-- 4.3 ft: Shell Fragment - 7 cm				
5		Tannish light grey w/ muddy sand clast (3cm) @ 6.3 ft and mottling @ 6.6 ft		S3	S3: 6.0 ft. to 7.9 ft. Shell: 14.1% Mean Grain Size: 0.377mm	
6		6.7 to 7.6 ft: Medium Sand - Clean, tan w/ shell concentration @ 7.3 -7.6 ft				
7	7.6 to 7.9 ft: Fine Sand - Clean tannish light grey, uniform					
8						
9						
10						

Area Location Map

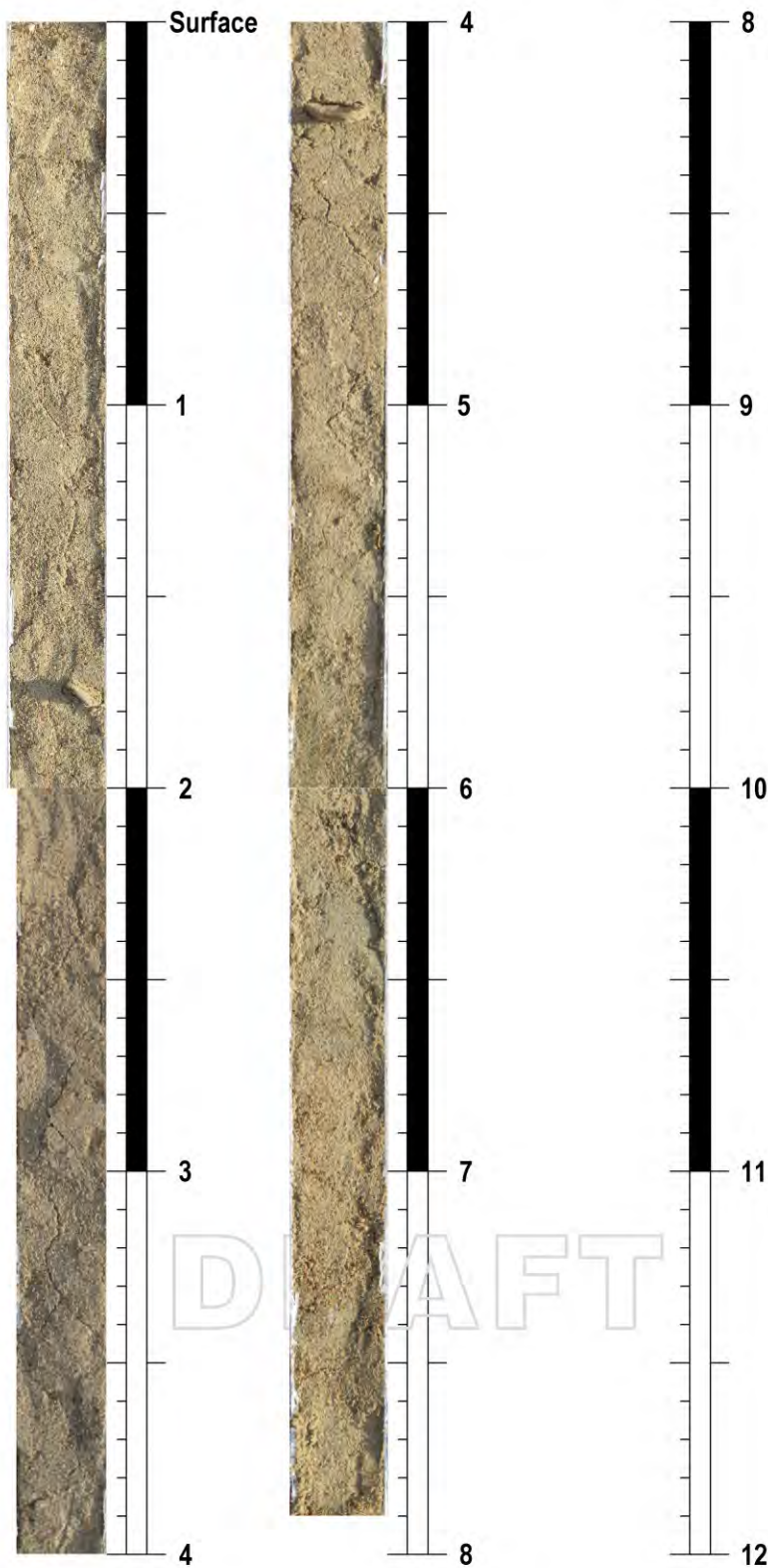


OFFSHORE SAND SOURCE - CSE CORE NO. **Bux-16**

Core Location Map



ELEVATION TOP OF HOLE: -32.6 ft NAVD
TOTAL DEPTH OF HOLE: 7.9 ft



Note:
All core depths in feet.
See core log sheet for additional geotechnical information.

PROJECT TITLE:

Dare County, NC
Beach Nourishment
Feasibility Study - Phase 1

PREPARED FOR:

County of Dare
954 Marshall C. Collins Drive (286)
PO Box 1000
Manteo NC 27954

DRAWING TITLE:

CORE LOG
PHOTO MOSAIC

SCALE:

AS SHOWN

BUX

DATE:

Jan 2015

DRAWN BY:

T.Hair

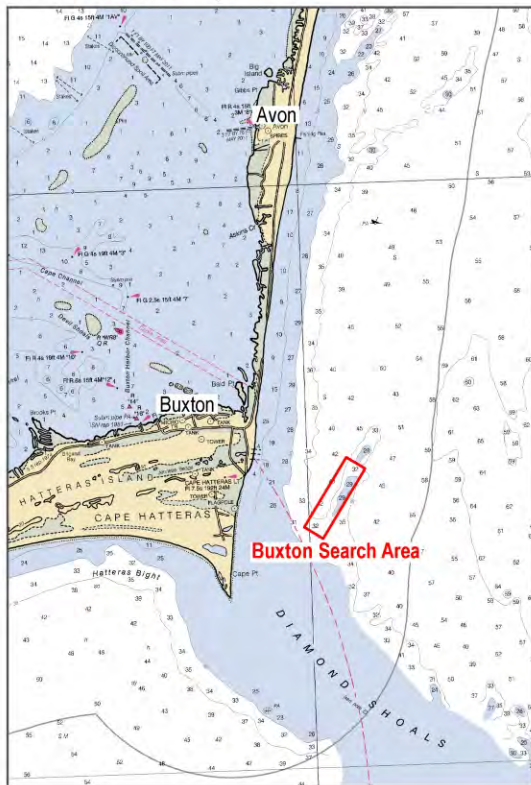
PROJECT #:

2403-02

16

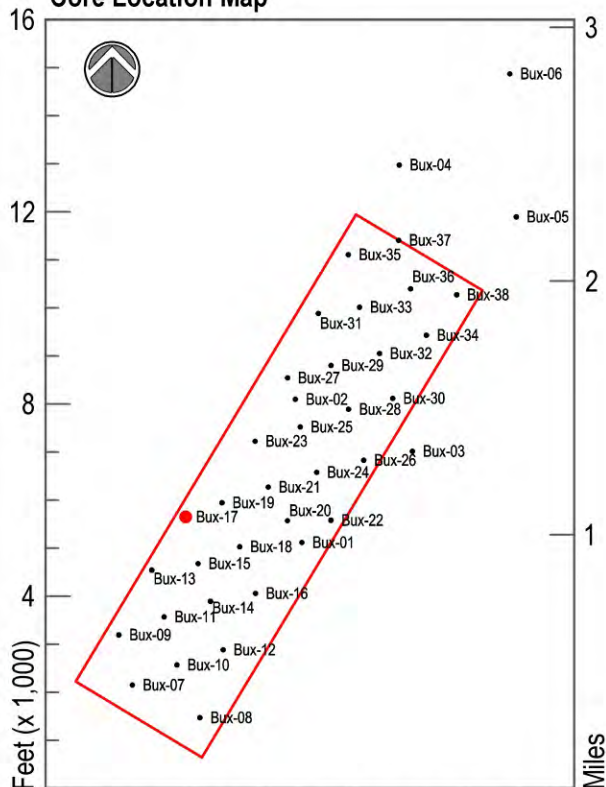
CORE LOG		Coastal Science & Engineering			Sheet 16 of 53	
PROJECT: 2403 - Dare County		COORDINATES:		HOLE NUMBER:		
LOCALITY: Buxton, NC		Northing: 561625.710 Easting: 3046238.240 Grid Datum: NAD '83		Bux-17 (as shown on title drawing and file no.)		
DATE: 2014-Oct-20	TOP ELEVATION:	-41.90 ft. NAVD '88	DEVICE DESIGNATION:	Coastal Science & Engineering		
BORE ANGLE: 90.00°						
BURDEN THICKNESS: 4.9 ft.	BOTTOM ELEVATION:	-46.80 ft. NAVD '88	BARREL SIZE/TYPE:	3 in. Aluminum		
CORE RECOVERY: 4.9 ft. (100.0%)	WATER DEPTH:	-41.00 ft. (operational note only)	GEOLOGIST: FIELD TEAM:	TWK - NC #1752 TH, DG, LF		
Depth	Lithology	Classification Of Materials (Description)	Sample #	Remarks		
1		0.0 to 2.9 ft: Medium Sand - Clean, tan, moderately graded w/ trace shell, pea gravel	S1	S1: 0.0 ft. to 2.9 ft. Shell: 7.3% Mean Grain Size: 0.445mm		
2						
3		2.9 to 3.5 ft: Coarse Sand - Clean, tan to dark grey, graded w/ minor shell and granules	S2	S2: 2.9 ft. to 3.5 ft. Shell: 14.7% Mean Grain Size: 0.561mm		
4		3.5 to 4.2 ft: Very Fine Sand - Mixed, dark grey w/ mud	S3	S3: 3.5 ft. to 4.2 ft. Shell: 6.0% Mean Grain Size: 0.109mm		
		4.2 to 4.6 ft: Mud	S4	S4: 4.2 ft. to 4.9 ft. Shell: 14.6% Mean Grain Size: 0.082mm		
	4.6 to 4.9 ft: Very Fine Sand - grey-black					
5						
6						
7						
8						
9						
10						

Area Location Map

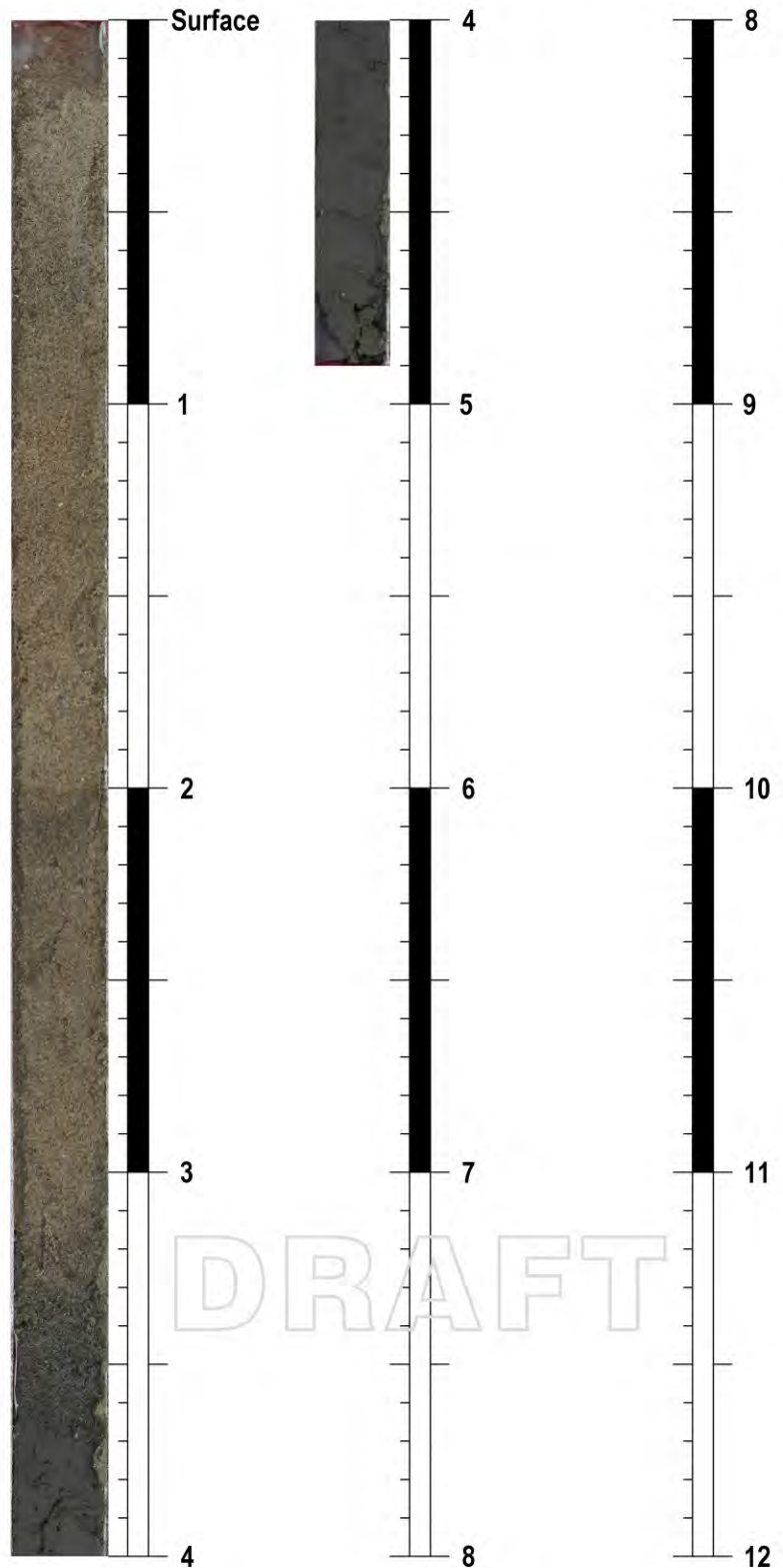


OFFSHORE SAND SOURCE - CSE CORE NO. **Bux-17**

Core Location Map



ELEVATION TOP OF HOLE: -41.9 ft NAVD
TOTAL DEPTH OF HOLE: 4.9 ft



Note:

All core depths in feet.
See core log sheet for additional geotechnical information.

PROJECT TITLE:

Dare County, NC
Beach Nourishment
Feasibility Study - Phase 1

PREPARED FOR:

County of Dare
954 Marshall C. Collins Drive (286)
PO Box 1000
Manteo NC 27954

DRAWING TITLE:

CORE LOG
PHOTO MOSAIC

SCALE:

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DATE:

Jan 2015

DRAWN BY:

T.Hair

PROJECT #:

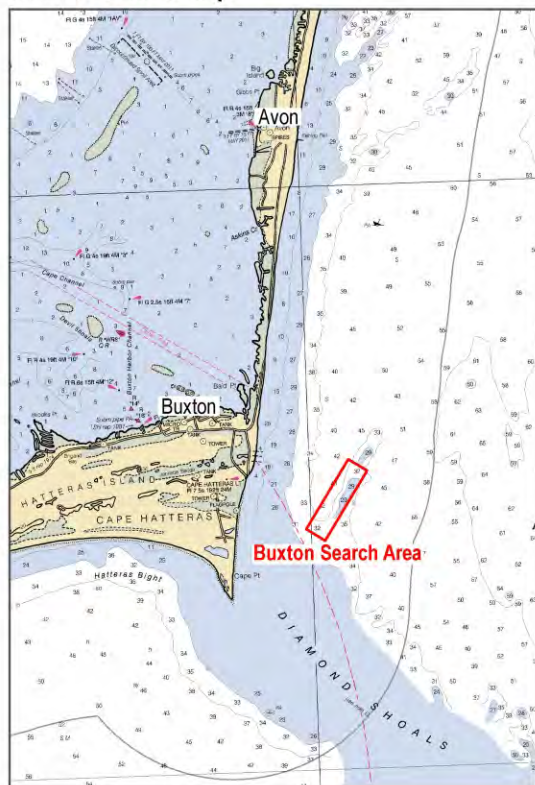
2403-02

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CORE LOG		Coastal Science & Engineering			Sheet 17 of 53	
PROJECT: 2403 - Dare County		COORDINATES:		HOLE NUMBER:		
LOCALITY: Buxton, NC		Northing: 561159.820 Easting: 3047081.220 Grid Datum: NAD '83		Bux-18 (as shown on title drawing and file no.)		
DATE: 2014-Oct-27	TOP ELEVATION:	-31.42 ft. NAVD '88	DEVICE DESIGNATION:	Coastal Science & Engineering		
BORE ANGLE: 90.00°						
BURDEN THICKNESS: 9.3 ft.	BOTTOM ELEVATION:	-40.72 ft. NAVD '88	BARREL SIZE/TYPE:	3 in. Aluminum		
CORE RECOVERY: 9.3 ft. (100.0%)	WATER DEPTH:	-32.00 ft. (operational note only)	GEOLOGIST: FIELD TEAM:	TWK - NC #1752 DG, LF, ST		

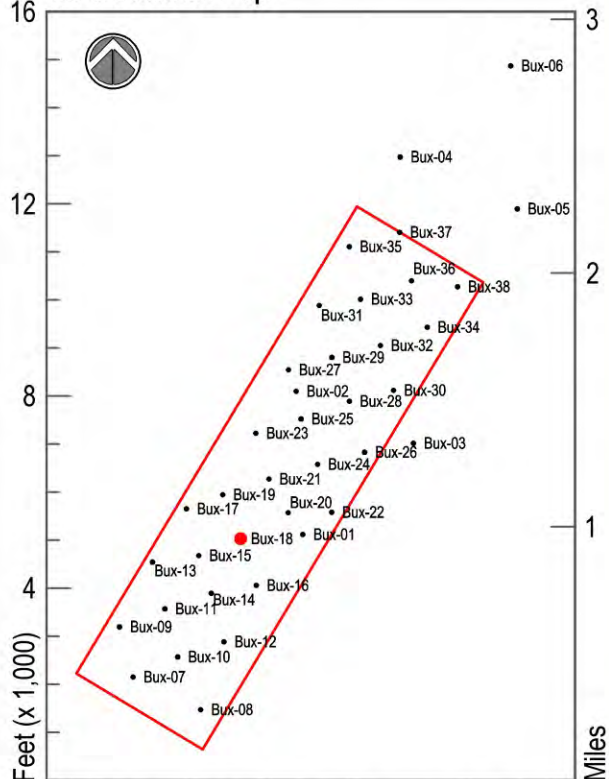
Depth	Lithology	Classification Of Materials (Description)	Sample #	Remarks
1		0.0 to 3.0 ft: Medium Sand - Clean, tan w/ minor crushed shell	S1	S1: 0.0 ft. to 3.0 ft. Shell: 17.1% Mean Grain Size: 0.503mm
2		— 1.3 ft: Shell Fragment - 3 cm		
3		3.0 to 6.0 ft: Coarse Sand - Clean, tan w/ minor shell	S2	S2: 3.0 ft. to 6.0 ft. Shell: 20.3% Mean Grain Size: 0.586mm
4		— 4.1 ft: Shell Fragment - Scattered large shell clasts (2cm)		
5				
6		6.0 to 9.3 ft: Medium Sand - Clean, tan w/ minor shell	S3	S3: 6.0 ft. to 9.3 ft. Shell: 21.7% Mean Grain Size: 0.494mm
7		— 6.6 ft: Shell Cluster		
8		— 7.2 ft: Shell Cluster		
9				
10				

Area Location Map

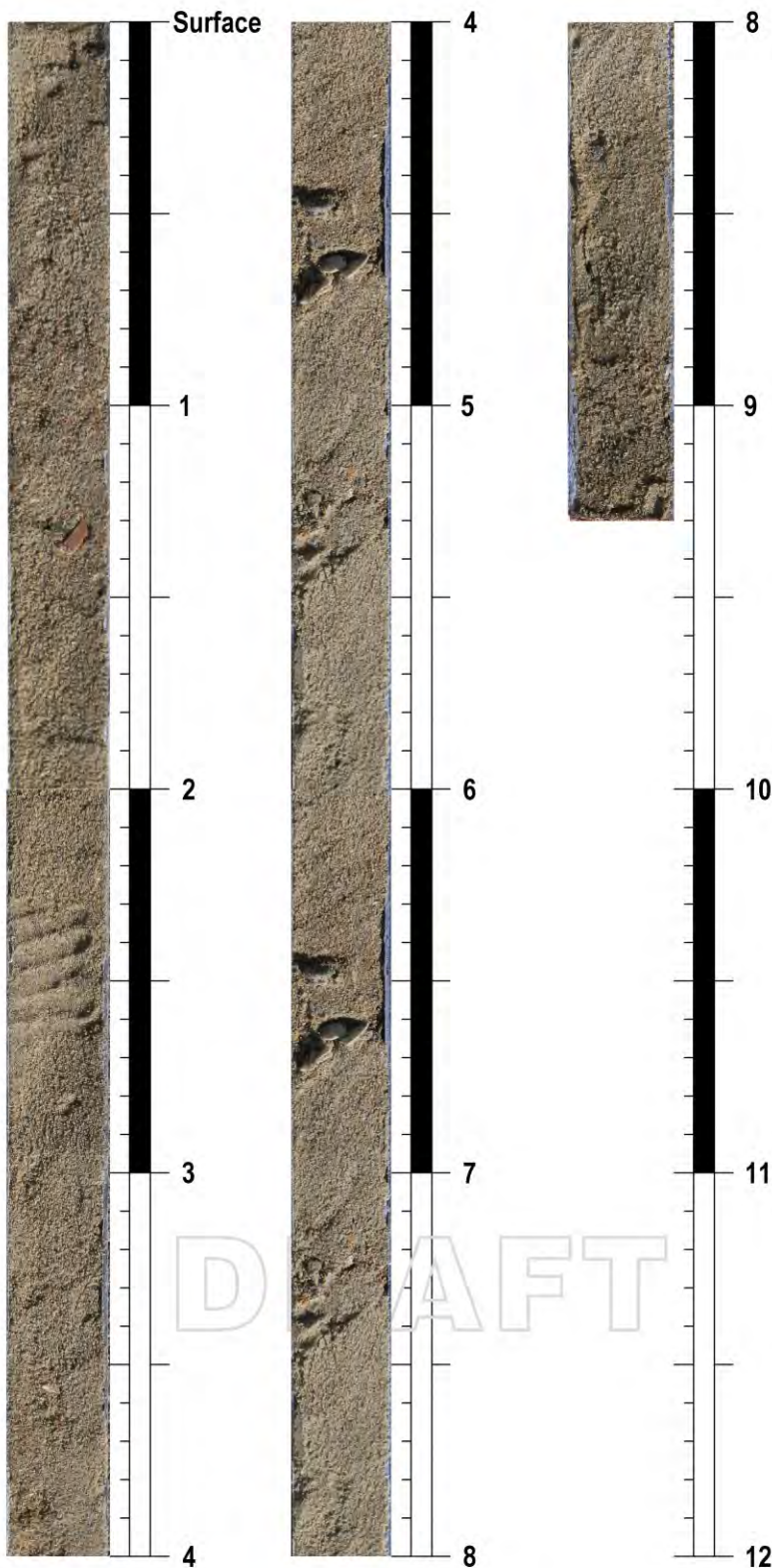


OFFSHORE SAND SOURCE - CSE CORE NO. **Bux-18**

Core Location Map



ELEVATION TOP OF HOLE: -31.4 ft NAVD
TOTAL DEPTH OF HOLE: 9.3 ft



Note:

All core depths in feet.
See core log sheet for additional geotechnical information.

PROJECT TITLE:

Dare County, NC
Beach Nourishment
Feasibility Study - Phase 1

PREPARED FOR:

County of Dare
954 Marshall C. Collins Drive (286)
PO Box 1000
Manteo NC 27954

DRAWING TITLE:

CORE LOG
PHOTO MOSAIC

SCALE:

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DATE:

Jan 2015

DRAWN BY:

T.Hair

PROJECT #:

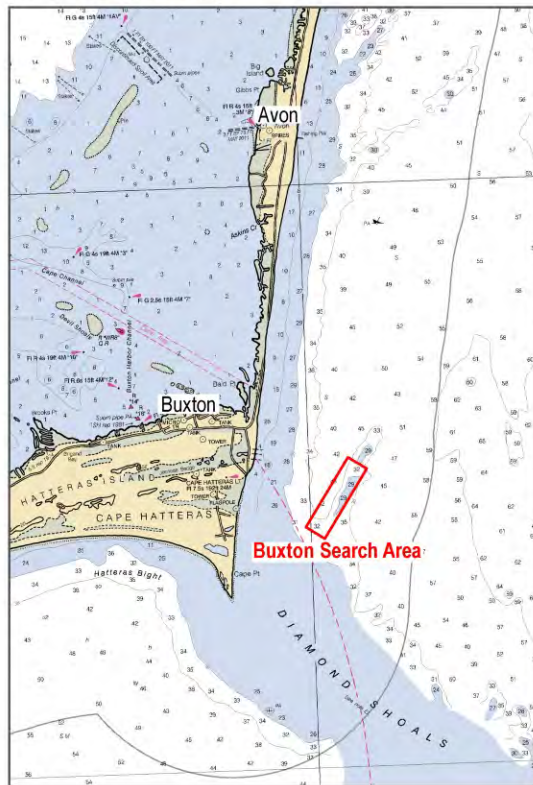
2403-02

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CORE LOG		Coastal Science & Engineering			Sheet 18 of 53	
PROJECT: 2403 - Dare County		COORDINATES:		HOLE NUMBER:		
LOCALITY: Buxton, NC		Northing: 561847.640 Easting: 3046803.590 Grid Datum: NAD '83		Bux-19 (as shown on title drawing and file no.)		
DATE: 2014-Oct-21	TOP ELEVATION:	-37.86 ft. NAVD '88	DEVICE DESIGNATION:	Coastal Science & Engineering		
BORE ANGLE: 90.00°						
BURDEN THICKNESS: 9.3 ft.	BOTTOM ELEVATION:	-47.16 ft. NAVD '88	BARREL SIZE/TYPE:	3 in. Aluminum		
CORE RECOVERY: 9.3 ft. (100.0%)	WATER DEPTH:	-35.00 ft. (operational note only)	GEOLOGIST: FIELD TEAM:	TWK - NC #1752 TH, DG, LF		

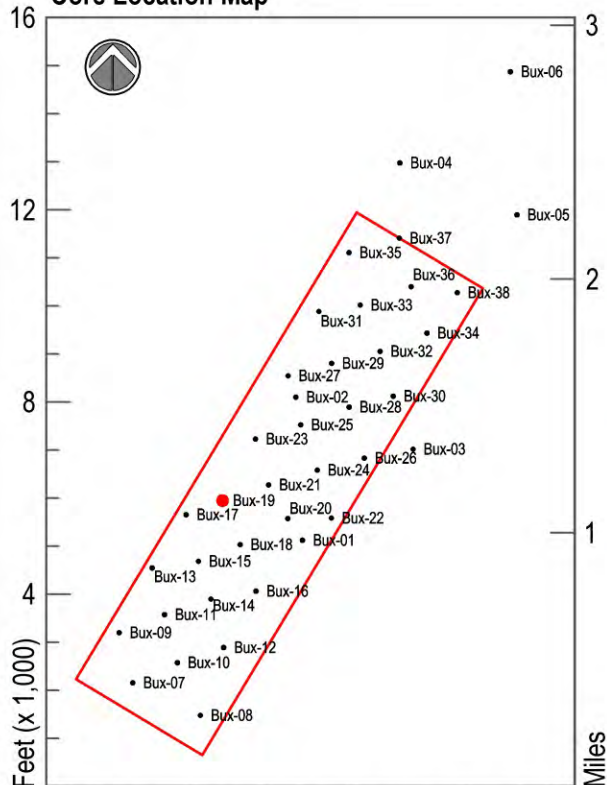
Depth	Lithology	Classification Of Materials (Description)	Sample #	Remarks
1		0.0 to 3.0 ft: Medium Sand - Clean, tan, uniform w/ trace shell	S1	S1: 0.0 ft. to 3.0 ft. Shell: 7.5% Mean Grain Size: 0.421mm
2				
3		3.0 to 6.0 ft: Medium Sand - Clean, tan, uniform w/ trace shell	S2	S2: 3.0 ft. to 6.0 ft. Shell: 9.3% Mean Grain Size: 0.415mm
4				
5		6.0 to 7.6 ft: Medium Sand - Clean, greyish tan, uniform w/ trace shell	S3	S3: 6.0 ft. to 7.6 ft. Shell: 8.2% Mean Grain Size: 0.433mm
6				
7		7.6 to 9.3 ft: Medium Sand / Coarse Sand mix - Graded, tannish to medium grey w/ minor shell fragments and minor heavy minerals	S4	S4: 7.6 ft. to 9.3 ft. Shell: 15.5% Mean Grain Size: 0.534mm
8				
9		8.8 ft: Small Clam - 3 cm		
10				

Area Location Map

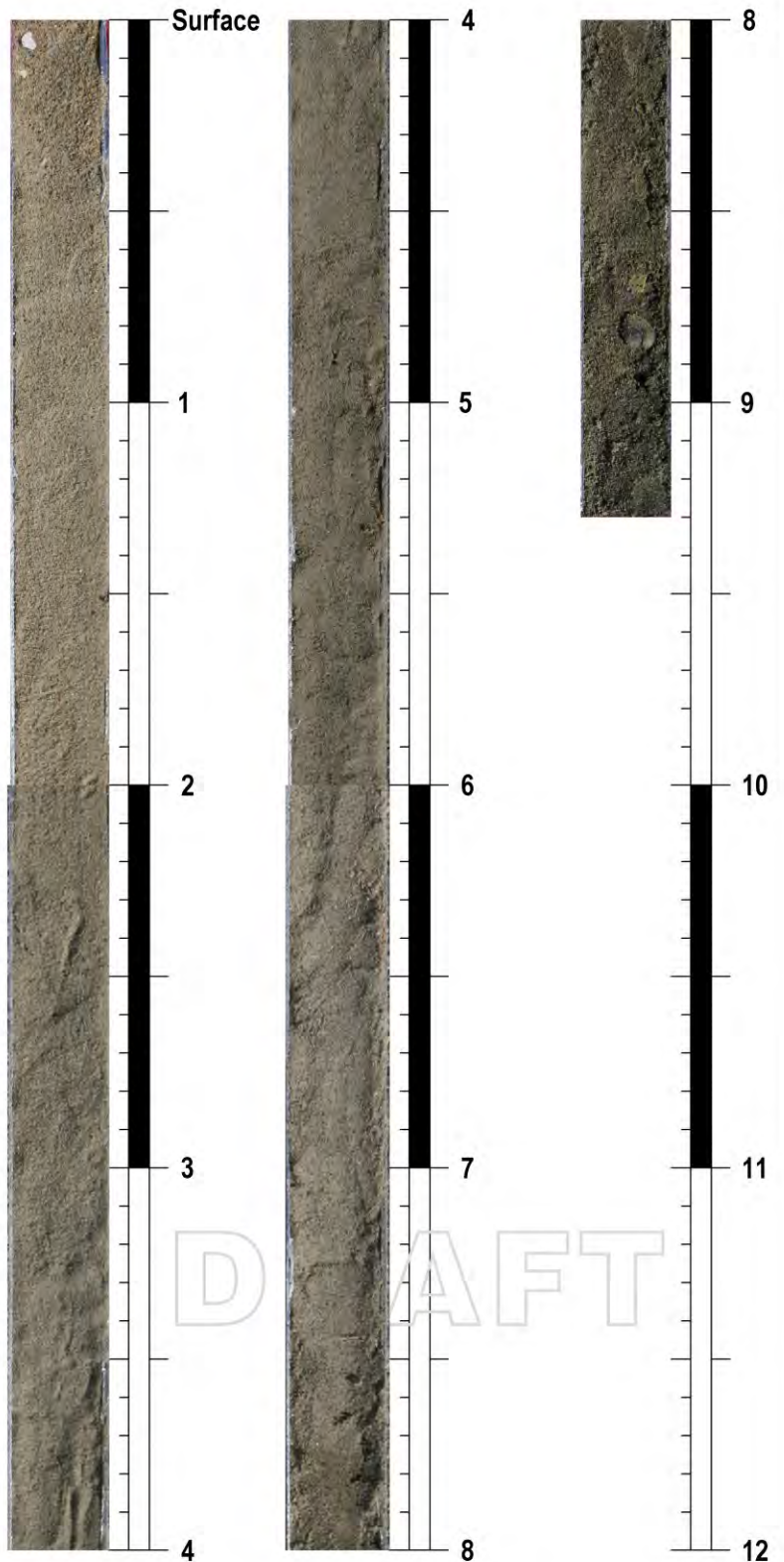


OFFSHORE SAND SOURCE - CSE CORE NO. **Bux-19**

Core Location Map



ELEVATION TOP OF HOLE: -37.9 ft NAVD
TOTAL DEPTH OF HOLE: 9.3 ft



Note:

All core depths in feet.
See core log sheet for additional geotechnical information.

PROJECT TITLE:

Dare County, NC
Beach Nourishment
Feasibility Study - Phase 1

PREPARED FOR:

County of Dare
954 Marshall C. Collins Drive (286)
PO Box 1000
Manteo NC 27954

DRAWING TITLE:

CORE LOG
PHOTO MOSAIC

SCALE:

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DATE:

Jan 2015

DRAWN BY:

T.Hair

PROJECT #:

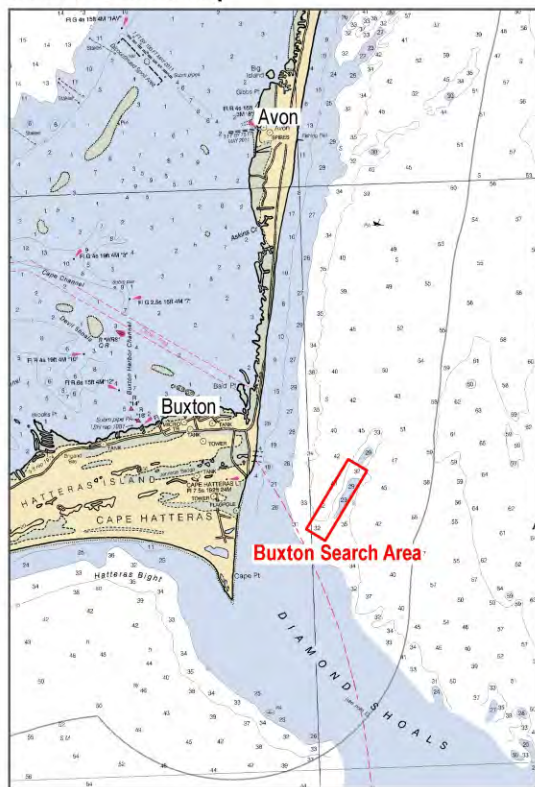
2403-02

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CORE LOG		Coastal Science & Engineering			Sheet 19 of 53	
PROJECT: 2403 - Dare County		COORDINATES:		HOLE NUMBER:		
LOCALITY: Buxton, NC		Northing: 561565.930 Easting: 3047824.830 Grid Datum: NAD '83		Bux-20 (as shown on title drawing and file no.)		
DATE: 2014-Oct-27	TOP ELEVATION:	-31.91 ft. NAVD '88	DEVICE DESIGNATION:	Coastal Science & Engineering		
BORE ANGLE: 90.00°						
BURDEN THICKNESS: 9.4 ft.	BOTTOM ELEVATION:	-41.31 ft. NAVD '88	BARREL SIZE/TYPE:	3 in. Aluminum		
CORE RECOVERY: 9.4 ft. (100.0%)	WATER DEPTH:	-33.00 ft. (operational note only)	GEOLOGIST: FIELD TEAM:	TWK - NC #1752 DG, LF, ST		

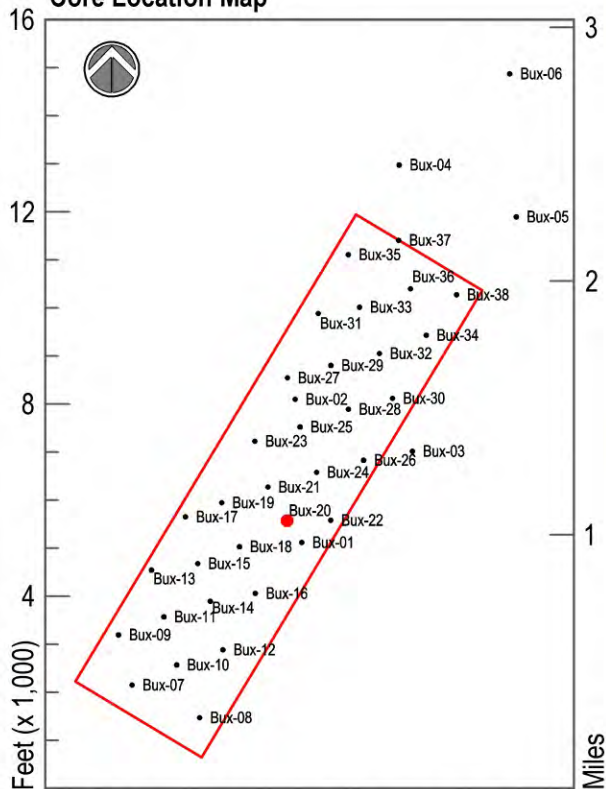
Depth	Lithology	Classification Of Materials (Description)	Sample #	Remarks
1		0.0 to 2.5 ft: Medium Sand - Clean, tan w/ trace shell fragments	S1	S1: 0.0 ft. to 2.5 ft. Shell: 11.9% Mean Grain Size: 0.452mm
2		-- 2.4 ft: Medium Scallop - 5 cm		
3		2.5 to 3.6 ft: Medium Sand - Clean, tan w/ minor shell fragments	S2	S2: 2.5 ft. to 3.6 ft. Shell: 19.4% Mean Grain Size: 0.477mm
4		3.6 to 4.8 ft: Fine Sand - Clean, tan w/ minor shell		S3: 3.6 ft. to 4.8 ft. Shell: 20.1% Mean Grain Size: 0.408mm
5		4.8 to 6.4 ft: Medium Sand with Crushed Shell - Mixed w/ shell fragments, clean. 3 cm shell fragment @ 5.0 ft	S4	S4: 4.8 ft. to 6.4 ft. Shell: 20.8% Mean Grain Size: 0.476mm
6		6.4 to 7.3 ft: Fine Sand with Crushed Shell - Mixed w/ shell fragments, mostly Donax concentrated @ 6.8 - 7.2 ft, clean		S5: 6.4 ft. to 7.3 ft. Shell: 15.4% Mean Grain Size: 0.389mm
7		7.3 to 9.4 ft: Fine Sand - Grading to medium sand, clean, tan	S6	S6: 7.3 ft. to 9.4 ft. Shell: 9.7% Mean Grain Size: 0.349mm
8		-- 7.9 ft: Shell Fragment - Gastropod (3cm)		
9				
10				

Area Location Map

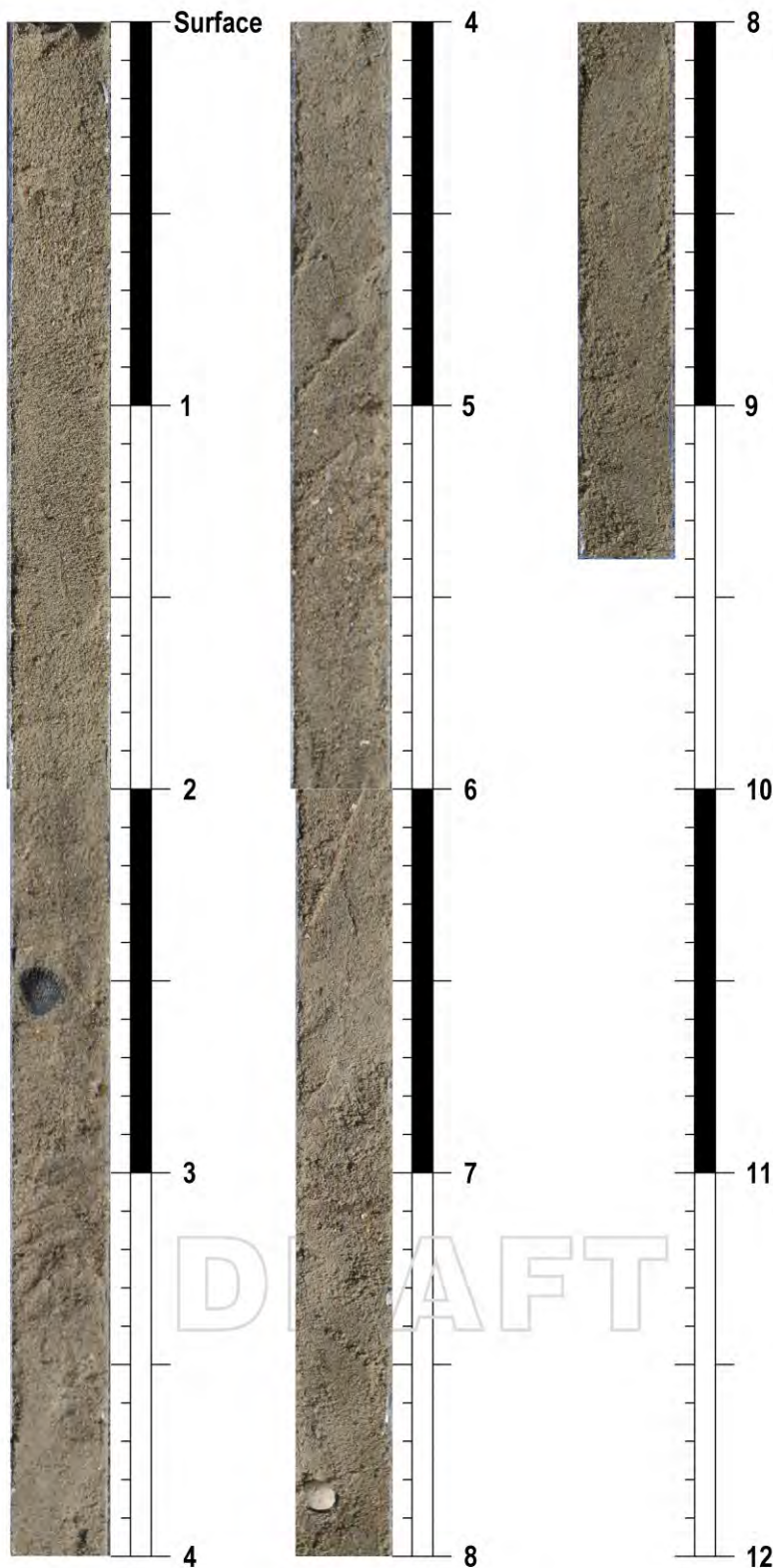


OFFSHORE SAND SOURCE - CSE CORE NO. **Bux-20**

Core Location Map



ELEVATION TOP OF HOLE: -31.9 ft NAVD
TOTAL DEPTH OF HOLE: 9.4 ft



Note:

All core depths in feet.
See core log sheet for additional geotechnical information.

PROJECT TITLE:

Dare County, NC
Beach Nourishment
Feasibility Study - Phase 1

PREPARED FOR:

County of Dare
954 Marshall C. Collins Drive (286)
PO Box 1000
Manteo NC 27954

DRAWING TITLE:

CORE LOG
PHOTO MOSAIC

SCALE:

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DATE:

Jan 2015

DRAWN BY:

T.Hair

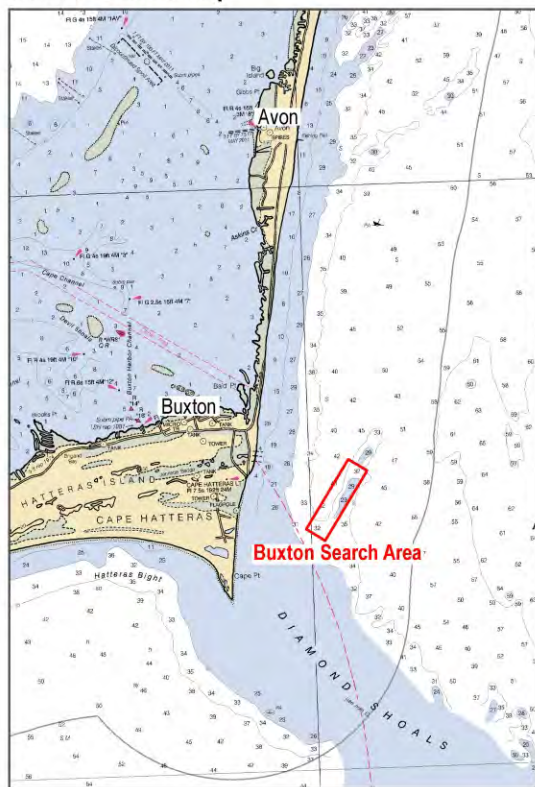
PROJECT #:

2403-02

20

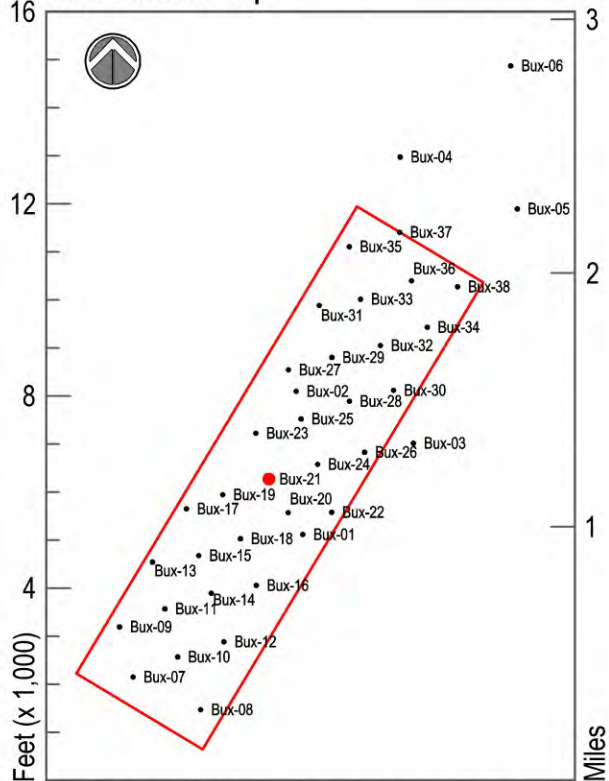
CORE LOG		Coastal Science & Engineering			Sheet 20 of 53	
PROJECT: 2403 - Dare County		COORDINATES:		HOLE NUMBER:		
LOCALITY: Buxton, NC		Northing: 562090.970 Easting: 3047525.050 Grid Datum: NAD '83		Bux-21 (as shown on title drawing and file no.)		
DATE: 2014-Oct-27	TOP ELEVATION:	-33.06 ft. NAVD '88	DEVICE DESIGNATION:	Coastal Science & Engineering		
BORE ANGLE: 90.00°						
BURDEN THICKNESS: 6.9 ft.	BOTTOM ELEVATION:	-39.96 ft. NAVD '88	BARREL SIZE/TYPE:	3 in. Aluminum		
CORE RECOVERY: 6.9 ft. (100.0%)	WATER DEPTH:	-34.00 ft. (operational note only)	GEOLOGIST: FIELD TEAM:	TWK - NC #1752 DG, LF, ST		
Depth	Lithology	Classification Of Materials (Description)	Sample #	Remarks		
1		0.0 to 3.2 ft: Coarse Sand - Clean, tan w/ moderate shell hash	S1	S1: 0.0 ft. to 3.2 ft. Shell: 20.4% Mean Grain Size: 0.605mm		
2		1.8 ft: Shell Fragment - 2 cm				
3						
4		3.2 to 4.9 ft: Medium Sand - Clean, tan becoming shellier @ base of section	S2	S2: 3.2 ft. to 4.9 ft. Shell: 15.0% Mean Grain Size: 0.503mm		
5						
6		4.9 to 6.9 ft: Medium Sand / Coarse Sand mix - Clean, tan w/ moderate shell	S3	S3: 4.9 ft. to 6.9 ft. Shell: 16.6% Mean Grain Size: 0.514mm		
7						
8						
9						
10						

Area Location Map

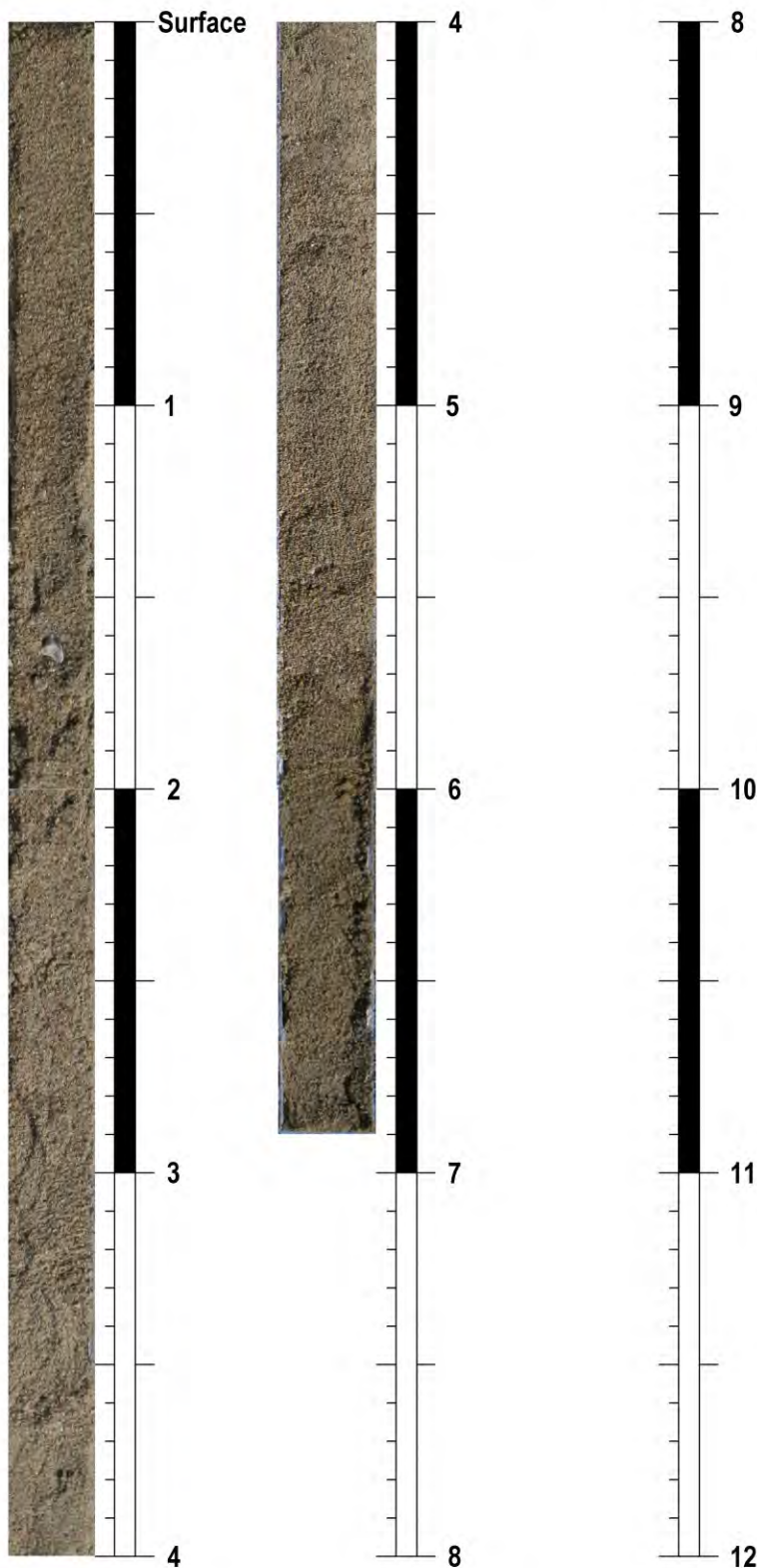


OFFSHORE SAND SOURCE - CSE CORE NO. **Bux-21**

Core Location Map



ELEVATION TOP OF HOLE: -33.1 ft NAVD
TOTAL DEPTH OF HOLE: 6.9 ft



Note:

All core depths in feet.
See core log sheet for additional geotechnical information.

PROJECT TITLE:

Dare County, NC
Beach Nourishment
Feasibility Study - Phase 1

PREPARED FOR:

County of Dare
954 Marshall C. Collins Drive (286)
PO Box 1000
Manteo NC 27954

DRAWING TITLE:

CORE LOG
PHOTO MOSAIC

SCALE:

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DATE:

Jan 2015

DRAWN BY:

T.Hair

PROJECT #:

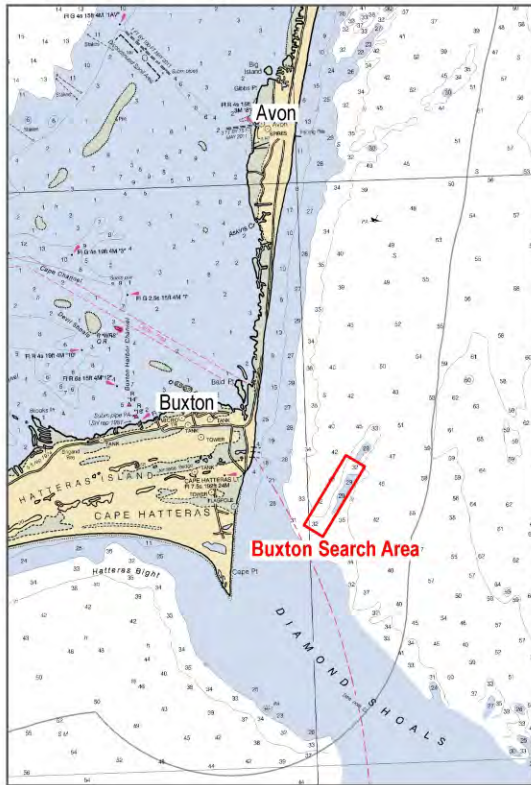
2403-02

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21

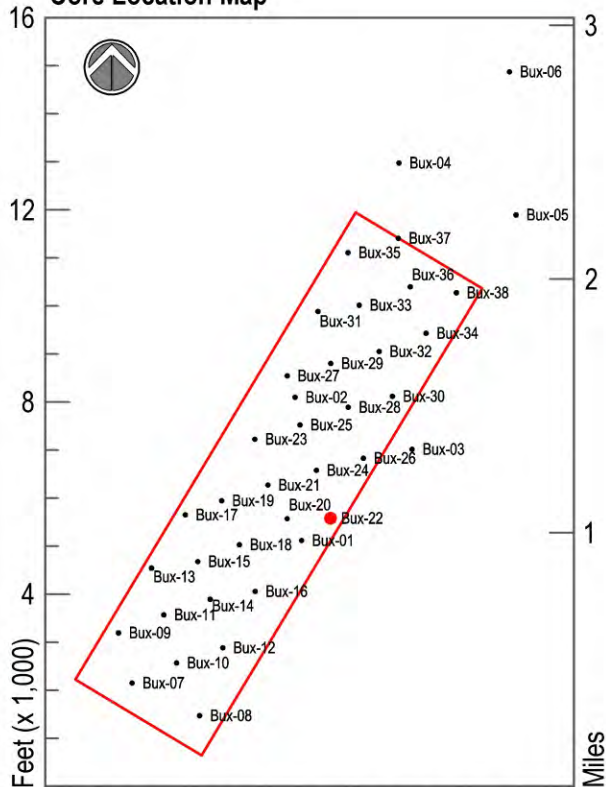
CORE LOG		Coastal Science & Engineering			Sheet 21 of 53	
PROJECT: 2403 - Dare County		COORDINATES:		HOLE NUMBER:		
LOCALITY: Buxton, NC		Northing: 561573.200 Easting: 3048503.650 Grid Datum: NAD '83		Bux-22 (as shown on title drawing and file no.)		
DATE: 2014-Oct-27	TOP ELEVATION:	-38.58 ft. NAVD '88	DEVICE DESIGNATION:	Coastal Science & Engineering		
BORE ANGLE: 90.00°						
BURDEN THICKNESS: 7.9 ft.	BOTTOM ELEVATION:	-46.48 ft. NAVD '88	BARREL SIZE/TYPE:	3 in. Aluminum		
CORE RECOVERY: 7.9 ft. (100.0%)	WATER DEPTH:	-36.00 ft. (operational note only)	GEOLOGIST: FIELD TEAM:	TWK - NC #1752 DG, LF, ST		
Depth	Lithology	Classification Of Materials (Description)	Sample #	Remarks		
1		0.0 to 2.2 ft: Medium Sand - Clean, greyish tan, w/ minor shell fragments	S1	S1: 0.0 ft. to 2.2 ft. Shell: 13.2% Mean Grain Size: 0.373mm		
2						
3		2.2 to 5.4 ft: Fine Sand - Clean, greyish tan w/ trace mud (mottling) @ 4.1 - 4.6ft and 5.2 - 5.4ft. Minor shell fragments throughout	S2	S2: 2.2 ft. to 5.4 ft. Shell: 8.7% Mean Grain Size: 0.272mm		
4						
5						
6		5.4 to 6.9 ft: Fine Sand - Clean, tannish light grey, uniform w/ trace shell fragments	S3	S3: 5.4 ft. to 6.9 ft. Shell: 7.2% Mean Grain Size: 0.287mm		
7						
8		6.9 to 7.9 ft: Medium Sand - Clean, light grey w/ trace shell fragments -- 7.5 ft: Small Clam - Surf clam (2cm)	S4	S4: 6.9 ft. to 7.9 ft. Shell: 10.7% Mean Grain Size: 0.319mm		
9						
10						

Area Location Map

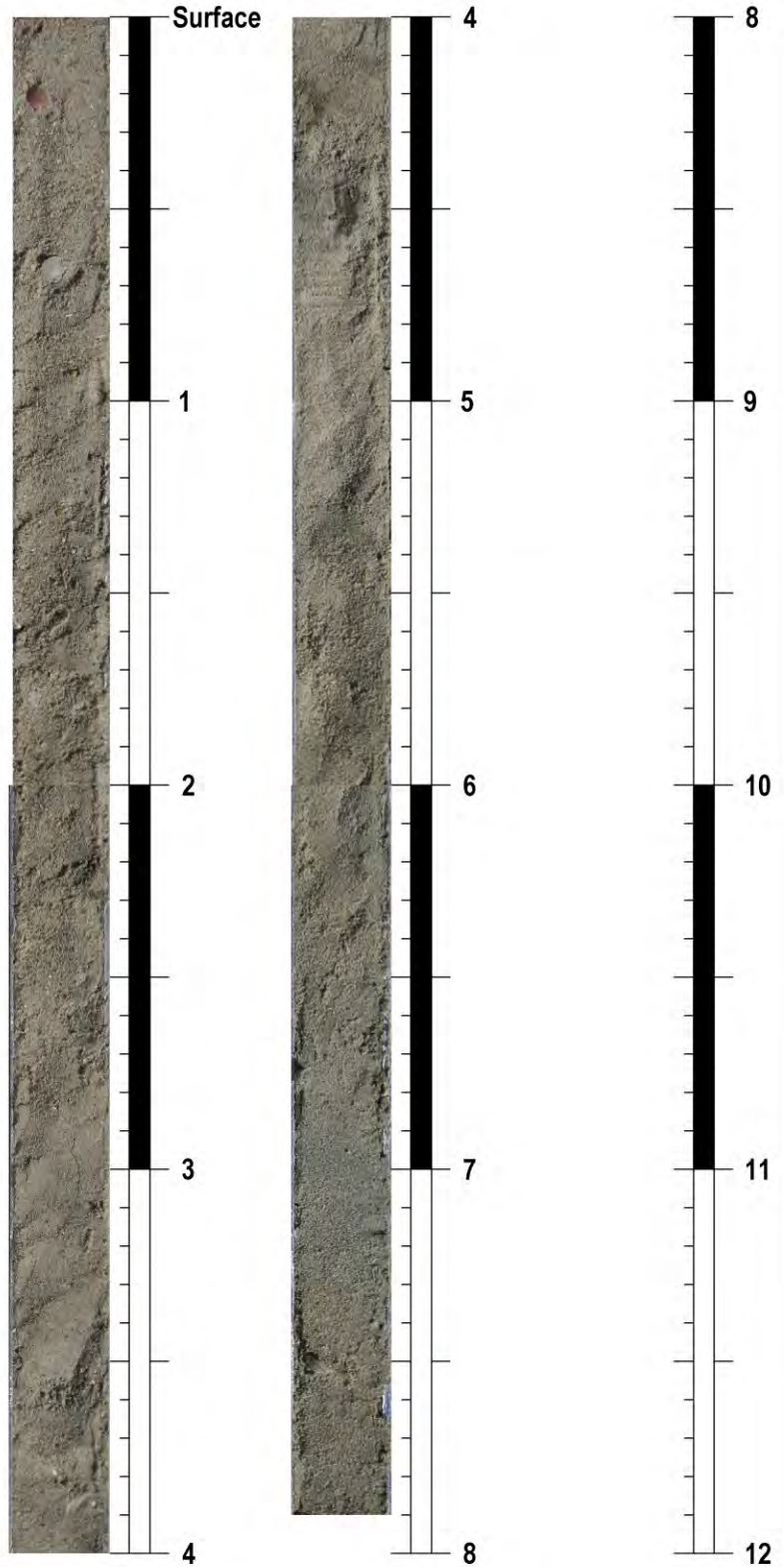


OFFSHORE SAND SOURCE - CSE CORE NO. **Bux-22**

Core Location Map



ELEVATION TOP OF HOLE: -38.6 ft NAVD
TOTAL DEPTH OF HOLE: 7.9 ft



Note:

All core depths in feet.
See core log sheet for additional geotechnical information.

PROJECT TITLE:

Dare County, NC
Beach Nourishment
Feasibility Study - Phase 1

PREPARED FOR:

County of Dare
954 Marshall C. Collins Drive (286)
PO Box 1000
Manteo NC 27954

DRAWING TITLE:

CORE LOG
PHOTO MOSAIC

SCALE:

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BUX

DATE:

Jan 2015

DRAWN BY:

T.Hair

PROJECT #:

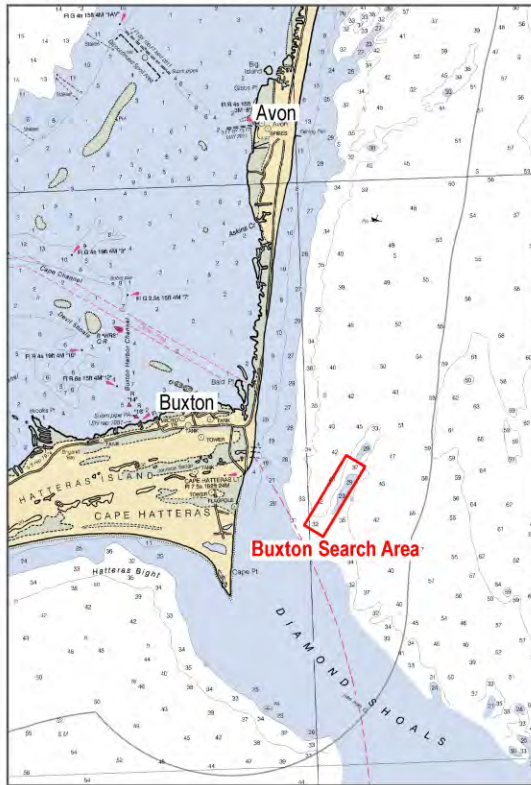
2403-02

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CORE LOG		Coastal Science & Engineering			Sheet 22 of 53	
PROJECT: 2403 - Dare County		COORDINATES:		HOLE NUMBER:		
LOCALITY: Buxton, NC		Northing: 562807.200 Easting: 3047320.200 Grid Datum: NAD '83		Bux-23 (as shown on title drawing and file no.)		
DATE: 2014-Oct-28	TOP ELEVATION:	-37.47 ft. NAVD '88	DEVICE DESIGNATION:	Coastal Science & Engineering		
BORE ANGLE: 90.00°						
BURDEN THICKNESS: 8.2 ft.	BOTTOM ELEVATION:	-45.67 ft. NAVD '88	BARREL SIZE/TYPE:	3 in. Aluminum		
CORE RECOVERY: 8.2 ft. (100.0%)	WATER DEPTH:	-36.00 ft. (operational note only)	GEOLOGIST: FIELD TEAM:	TWK - NC #1752 DG, LF, ST		

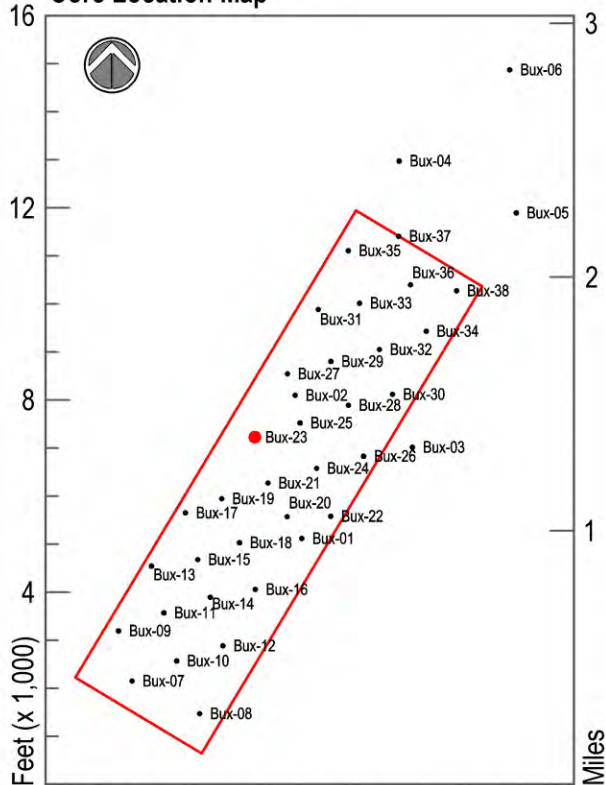
Depth	Lithology	Classification Of Materials (Description)	Sample #	Remarks	
1		0.0 to 2.2 ft: Coarse Sand - Clean, tan w/ moderate shell fragments	S1	S1: 0.0 ft. to 2.2 ft. Shell: 6.0% Mean Grain Size: 0.614mm	
2					
3		2.2 to 3.4 ft: Medium Sand - Clean, tan w/ trace shell fragments		S2	S2: 2.2 ft. to 3.4 ft. Shell: 8.9% Mean Grain Size: 0.466mm
4		3.4 to 5.2 ft: Medium Sand - Clean, tan. Above unit slightly coarser		S3	S3: 3.4 ft. to 5.2 ft. Shell: 11.3% Mean Grain Size: 0.503mm
5					
6		5.2 to 6.5 ft: Medium Sand - Clean, tan w/ trace shell. Slightly finer than unit above	S4	S4: 5.2 ft. to 6.5 ft. Shell: 8.5% Mean Grain Size: 0.440mm	
7		6.5 to 8.2 ft: Medium Sand / Coarse Sand mix - Graded to coarse sand, tannish medium grey w. trace mud and shell	S5	S5: 6.5 ft. to 8.2 ft. Shell: 12.5% Mean Grain Size: 0.511mm	
8					
9					
10					

Area Location Map

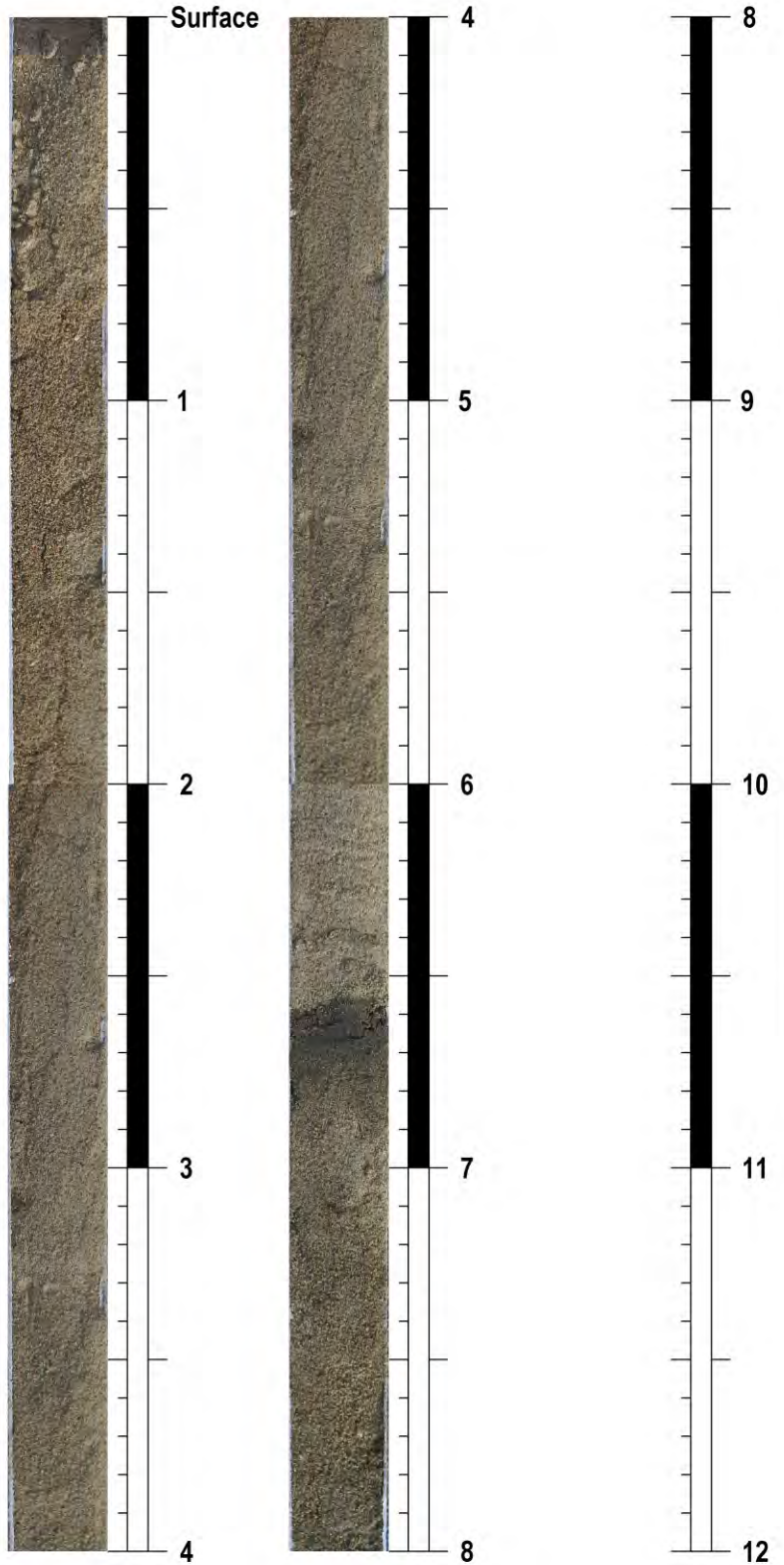


OFFSHORE SAND SOURCE - CSE CORE NO. **Bux-23**

Core Location Map



ELEVATION TOP OF HOLE: -37.5 ft NAVD
TOTAL DEPTH OF HOLE: 8.2 ft



Note:

All core depths in feet.

See core log sheet for additional geotechnical information.

PROJECT TITLE:

Dare County, NC
Beach Nourishment
Feasibility Study - Phase 1

PREPARED FOR:

County of Dare
954 Marshall C. Collins Drive (286)
PO Box 1000
Manteo NC 27954

DRAWING TITLE:

CORE LOG
PHOTO MOSAIC

SCALE:

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DATE:

Jan 2015

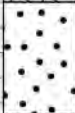
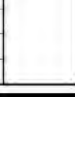
DRAWN BY:

T.Hair

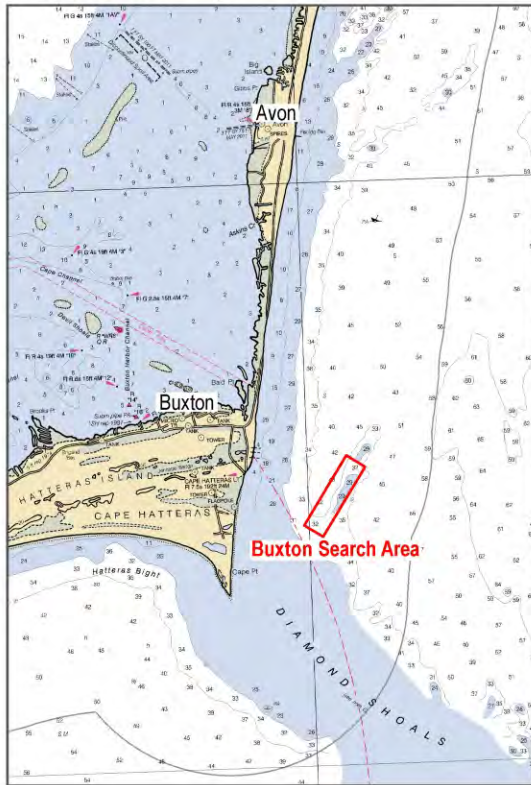
PROJECT #:

2403-02

23

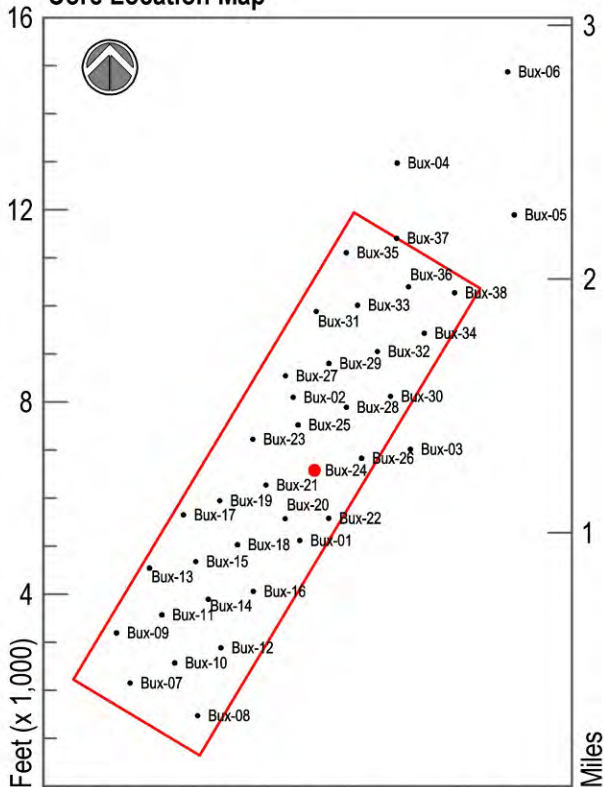
CORE LOG		Coastal Science & Engineering			Sheet 23 of 53	
PROJECT: 2403 - Dare County		COORDINATES:		HOLE NUMBER:		
LOCALITY: Buxton, NC		Northing: 562321.280 Easting: 3048283.050 Grid Datum: NAD '83		Bux-24 (as shown on title drawing and file no.)		
DATE: 2014-Oct-27	TOP ELEVATION:	-32.39 ft. NAVD '88	DEVICE DESIGNATION:	Coastal Science & Engineering		
BORE ANGLE: 90.00°						
BURDEN THICKNESS: 7.0 ft.	BOTTOM ELEVATION:	-39.39 ft. NAVD '88	BARREL SIZE/TYPE:	3 in. Aluminum		
CORE RECOVERY: 7 ft. (100.0%)	WATER DEPTH:	-34.00 ft. (operational note only)	GEOLOGIST: FIELD TEAM:	TWK - NC #1752 DG, LF, ST		
Depth	Lithology	Classification Of Materials (Description)	Sample #	Remarks		
1		0.0 to 1.4 ft: Coarse Sand - Clean, tan, coarse layer from 0.0 to 0.3ft. Medium sand @ bottom of section w/ minor shell fragments	S1	S1: 0.0 ft. to 1.4 ft. Shell: 18.8% Mean Grain Size: 0.526mm		
2		1.4 to 2.3 ft: Medium Sand - Clean, tan, uniform w/ trace shell	S2	S2: 1.4 ft. to 2.3 ft. Shell: 22.2% Mean Grain Size: 0.438mm		
3		2.3 to 3.9 ft: Medium Sand / Coarse Sand mix - Clean, tan w/ shell hash concentrations @ 3.2ft and 3.5 - 3.9ft	S3	S3: 2.3 ft. to 3.9 ft. Shell: 26.9% Mean Grain Size: 0.566mm		
4		3.9 to 5.6 ft: Medium Sand - Clean, tan w/ silty sand clast (mottling) @ 4.7 - 4.8ft and 5.1 - 5.3ft w/ trace shell	S4	S4: 3.9 ft. to 5.6 ft. Shell: 25.3% Mean Grain Size: 0.467mm		
5						
6		5.6 to 7.0 ft: Coarse Sand - Clean, tan w/ moderate shell fragments	S5	S5: 5.6 ft. to 7.0 ft. Shell: 16.7% Mean Grain Size: 0.475mm		
7						
8						
9						
10						

Area Location Map

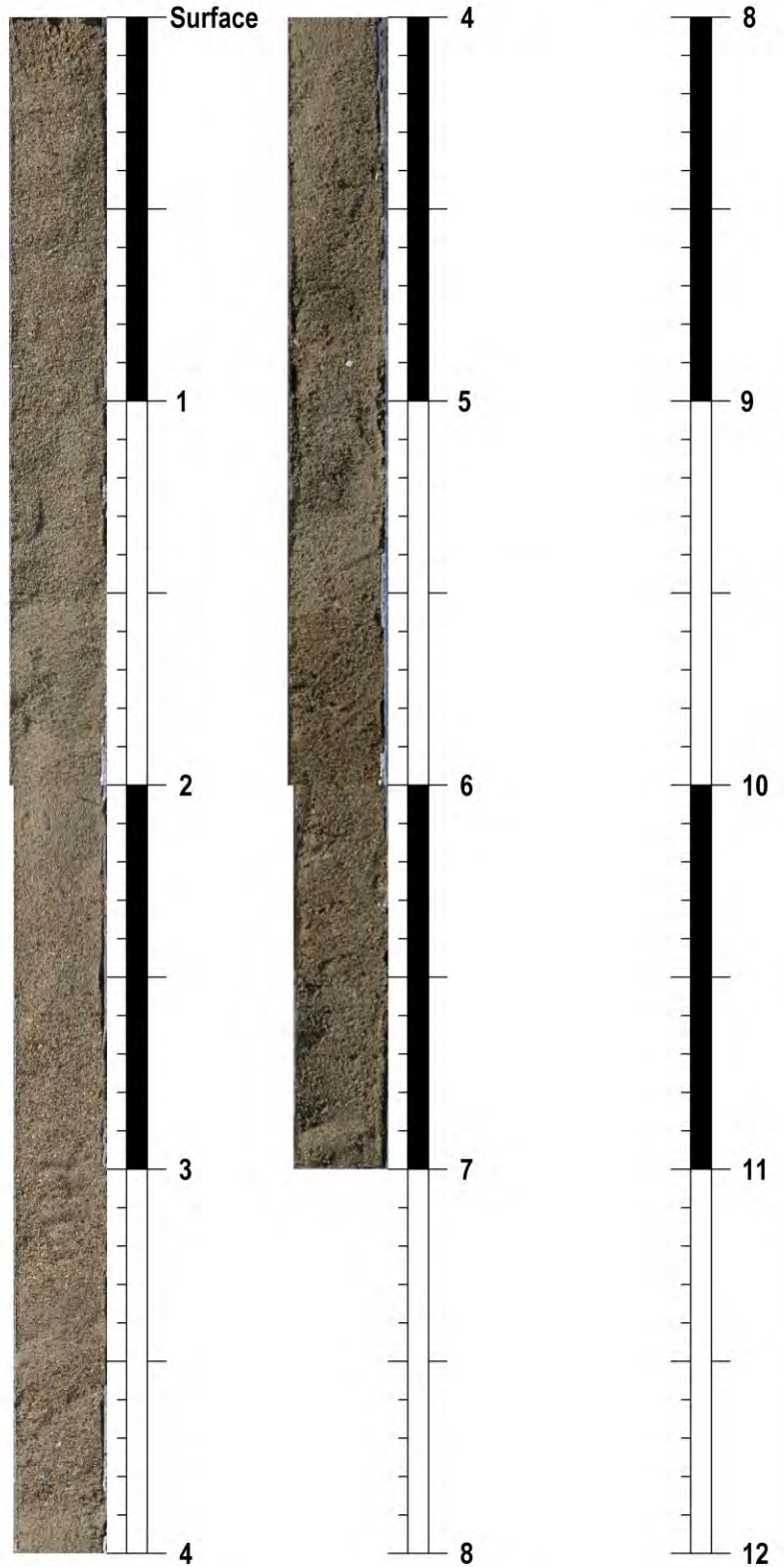


OFFSHORE SAND SOURCE - CSE CORE NO. **Bux-24**

Core Location Map



ELEVATION TOP OF HOLE: -32.4 ft NAVD
TOTAL DEPTH OF HOLE: 7.0 ft



Note:

All core depths in feet.

See core log sheet for additional geotechnical information.

PROJECT TITLE:

Dare County, NC
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PREPARED FOR:

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PO Box 1000
Manteo NC 27954

DRAWING TITLE:

CORE LOG
PHOTO MOSAIC

SCALE:

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DATE:

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T.Hair

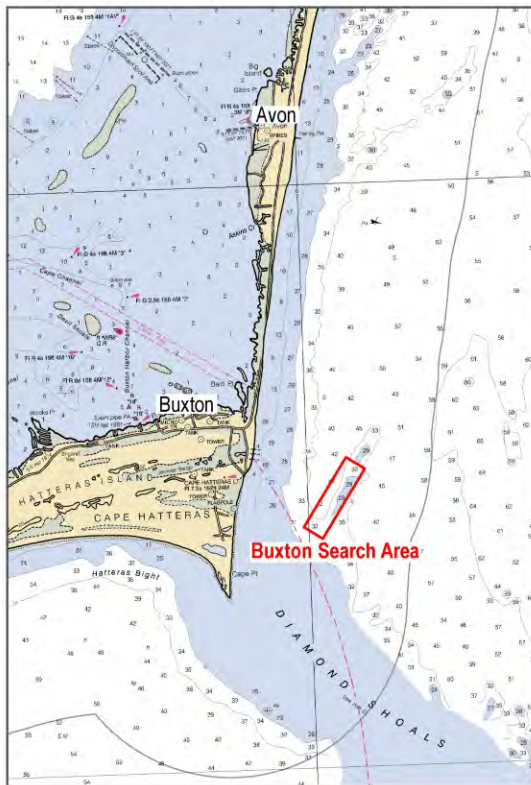
PROJECT #:

2403-02

24

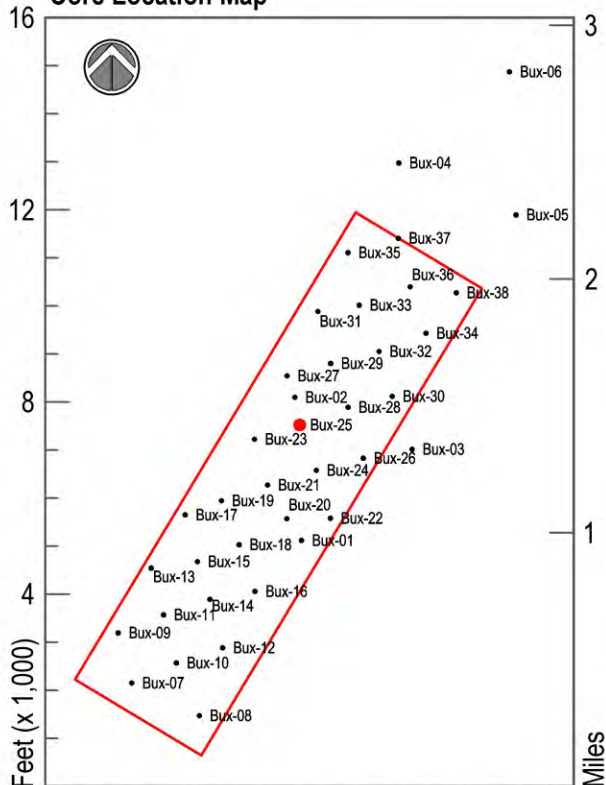
CORE LOG		Coastal Science & Engineering			Sheet 24 of 53	
PROJECT: 2403 - Dare County		COORDINATES:		HOLE NUMBER:		
LOCALITY: Buxton, NC		Northing: 563028.850 Easting: 3048025.590 Grid Datum: NAD '83		Bux-25 (as shown on title drawing and file no.)		
DATE: 2014-Oct-27	TOP ELEVATION:	-33.51 ft. NAVD '88	DEVICE DESIGNATION:	Coastal Science & Engineering		
BORE ANGLE: 90.00°						
BURDEN THICKNESS: 7.0 ft.	BOTTOM ELEVATION:	-40.51 ft. NAVD '88	BARREL SIZE/TYPE:	3 in. Aluminum		
CORE RECOVERY: 7 ft. (100.0%)	WATER DEPTH:	-34.00 ft. (operational note only)	GEOLOGIST: FIELD TEAM:	TWK - NC #1752 DG, LF, ST		
Depth	Lithology	Classification Of Materials (Description)	Sample #	Remarks		
1		0.0 to 2.0 ft: Coarse Sand - Clean, tan w/ minor grading and moderate shell fragments	S1	S1: 0.0 ft. to 2.0 ft. Shell: 18.5% Mean Grain Size: 0.627mm		
2		2.0 to 4.4 ft: Coarse Sand with Crushed Shell - Clean, tan w/ concentration of large shell fragments @ 3.5 - 3.7ft	S2	S2: 2.0 ft. to 4.4 ft. Shell: 40.0% Mean Grain Size: 0.876mm		
3						
4		-- 3.5 ft: Shell Fragment - 5 cm				
5		4.4 to 5.6 ft: Medium Sand / Coarse Sand mix - Clean, tan, uniform w/ minor shell fragments	S3	S3: 4.4 ft. to 5.6 ft. Shell: 17.0% Mean Grain Size: 0.523mm		
6		5.6 to 7.0 ft: Medium Sand / Coarse Sand mix - Clean, tan w/ crushed shell concentrations @ 5.6 - 5.7ft and 6.7 - 7.0ft	S4	S4: 5.6 ft. to 7.0 ft. Shell: 18.3% Mean Grain Size: 0.538mm		
7						
8						
9						
10						

Area Location Map

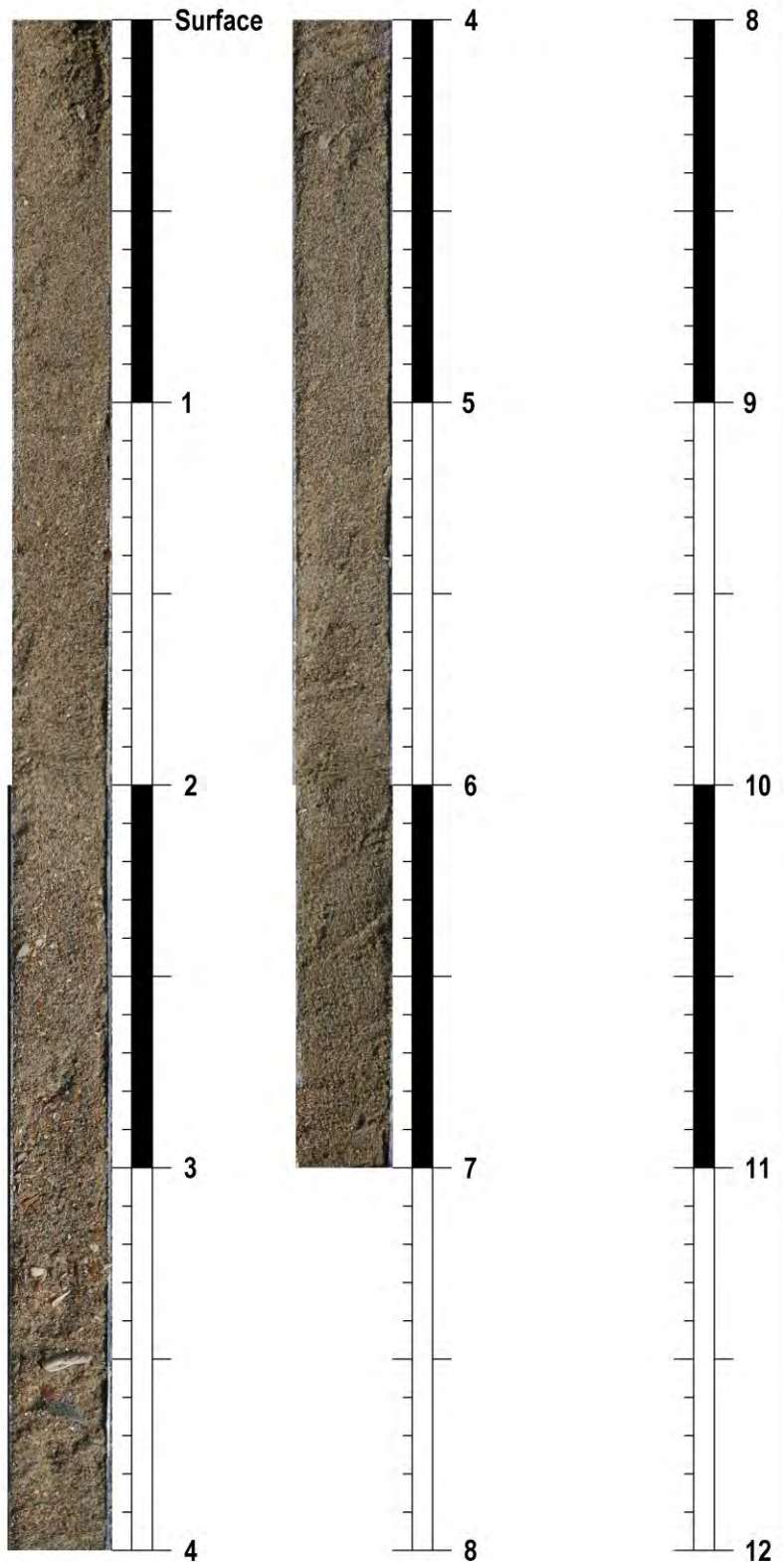


OFFSHORE SAND SOURCE - CSE CORE NO. **Bux-25**

Core Location Map



ELEVATION TOP OF HOLE: -33.5 ft NAVD
TOTAL DEPTH OF HOLE: 7.0 ft



Note:

All core depths in feet.

See core log sheet for additional geotechnical information.

PROJECT TITLE:

Dare County, NC
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954 Marshall C. Collins Drive (286)
PO Box 1000
Manteo NC 27954

DRAWING TITLE:

CORE LOG
PHOTO MOSAIC

SCALE:

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DATE:

Jan 2015

DRAWN BY:

T.Hair

PROJECT #:

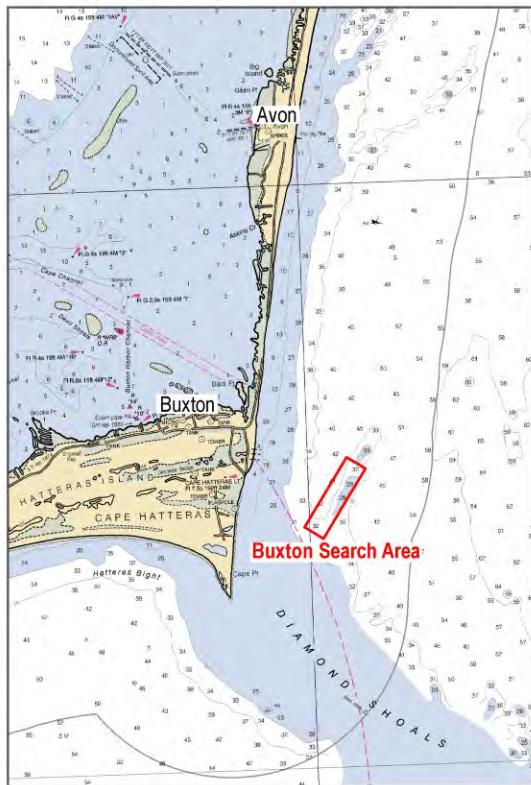
2403-02

25

CORE LOG		Coastal Science & Engineering			Sheet 25 of 53	
PROJECT: 2403 - Dare County		COORDINATES:		HOLE NUMBER:		
LOCALITY: Buxton, NC		Northing: 562509.560 Easting: 3049016.620 Grid Datum: NAD '83		Bux-26 (as shown on title drawing and file no.)		
DATE: 2014-Oct-27	TOP ELEVATION:	-36.24 ft. NAVD '88	DEVICE DESIGNATION:	Coastal Science & Engineering		
BORE ANGLE: 90.00°						
BURDEN THICKNESS: 8.2 ft.	BOTTOM ELEVATION:	-44.44 ft. NAVD '88	BARREL SIZE/TYPE:	3 in. Aluminum		
CORE RECOVERY: 8.2 ft. (100.0%)	WATER DEPTH:	-35.00 ft. (operational note only)	GEOLOGIST: FIELD TEAM:	TWK - NC #1752 DG, LF, ST		

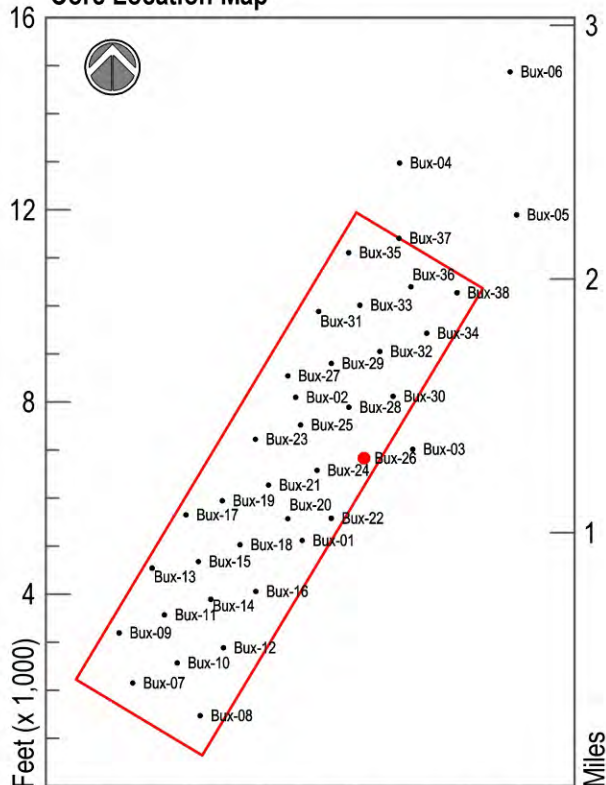
Depth	Lithology	Classification Of Materials (Description)	Sample #	Remarks
1		0.0 to 3.0 ft: Medium Sand - Clean, greyish light tan, uniform w/ trace shells	S1	S1: 0.0 ft. to 3.0 ft. Shell: 5.6% Mean Grain Size: 0.301mm
2				
3		3.0 to 5.0 ft: Medium Sand - Clean, greyish light tan, uniform trace shell	S2	S2: 3.0 ft. to 5.0 ft. Shell: 8.1% Mean Grain Size: 0.302mm
4		-- 4.0 ft: Shell Fragment - 3 cm		
5		5.0 to 6.8 ft: Medium Sand - Shelly, clean, light tan w/ shell concentrations @ 5.3 - 5.6ft and 5.9 - 6.2ft	S3	S3: 5.0 ft. to 6.8 ft. Shell: 17.3% Mean Grain Size: 0.425mm
6		-- 6.6 ft: Large Clam - Old Quahog (7cm)		
7		6.8 to 8.2 ft: Medium Sand - Clean, tannish grey	S4	S4: 6.8 ft. to 8.2 ft. Shell: 12.5% Mean Grain Size: 0.345mm
8		-- 7.6 ft: Mud Clast - w/ sand -- 7.8 ft: Mud Clast - w/ sand		
9				
10				

Area Location Map

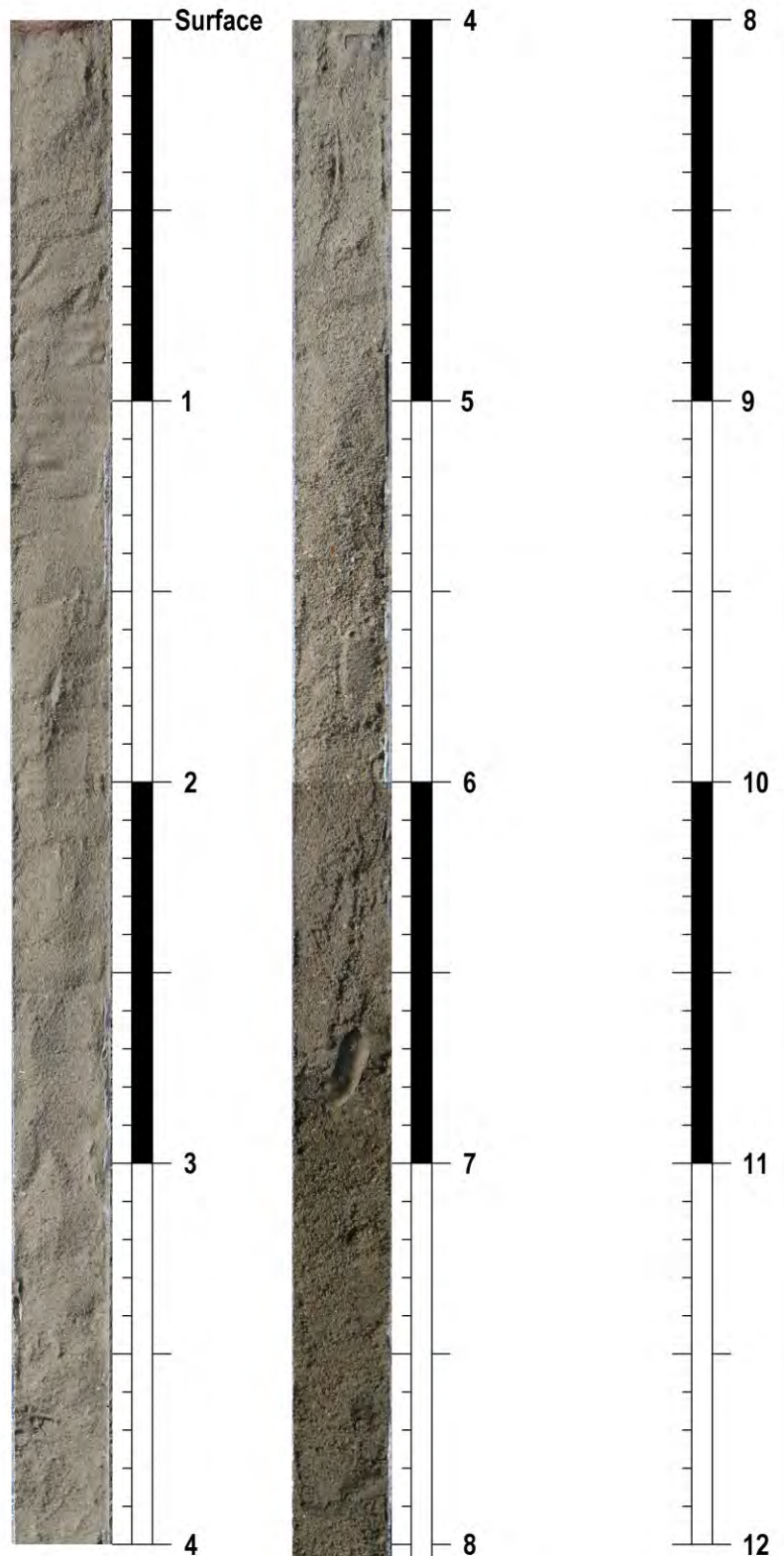


OFFSHORE SAND SOURCE - CSE CORE NO. **Bux-26**

Core Location Map



ELEVATION TOP OF HOLE: -36.2 ft NAVD
TOTAL DEPTH OF HOLE: 8.2 ft



Note:
All core depths in feet.
See core log sheet for additional geotechnical information.

PROJECT TITLE:

Dare County, NC
Beach Nourishment
Feasibility Study - Phase 1

PREPARED FOR:

County of Dare
954 Marshall C. Collins Drive (286)
PO Box 1000
Manteo NC 27954

DRAWING TITLE:

CORE LOG
PHOTO MOSAIC

SCALE:

AS SHOWN

DATE:

Jan 2015

DRAWN BY:

T.Hair

PROJECT #:

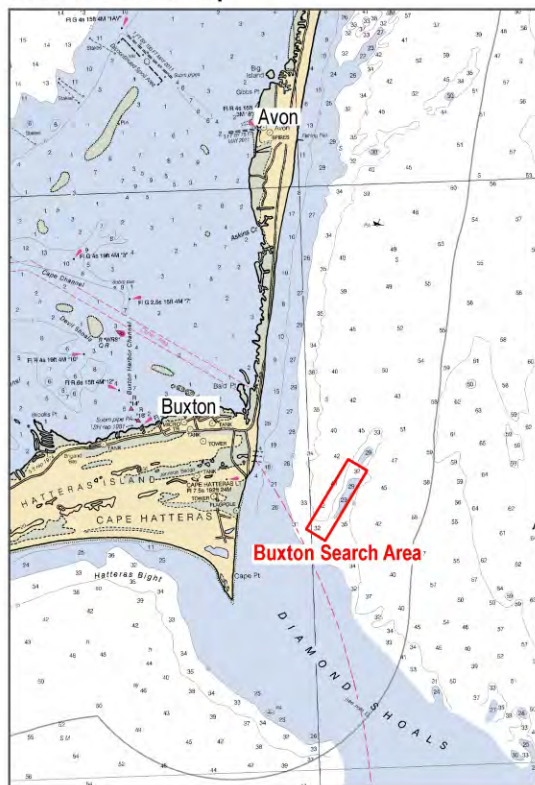
2403-02

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26

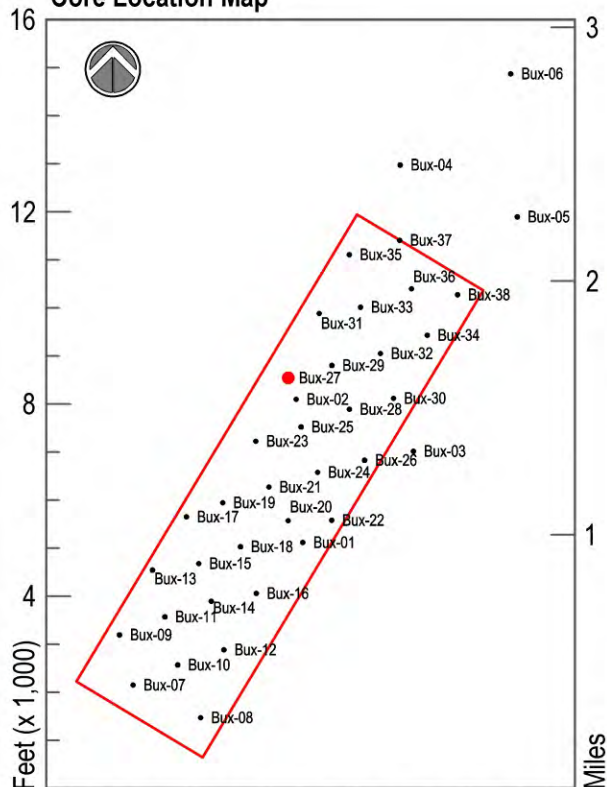
CORE LOG		Coastal Science & Engineering			Sheet 1 of 1	
PROJECT: 2403 - Dare County		COORDINATES:		HOLE NUMBER:		
LOCALITY: Buxton, NC		Northing: 563794.810 Easting: 3047827.720 Grid Datum: NAD '83		Bux-27 (as shown on title drawing and file no.)		
DATE: 2014-Oct-28	TOP ELEVATION:	-39.78 ft. NAVD '88	DEVICE DESIGNATION:	Coastal Science & Engineering		
BORE ANGLE: 90.00°						
BURDEN THICKNESS: 7.4 ft.	BOTTOM ELEVATION:	-47.18 ft. NAVD '88	BARREL SIZE/TYPE:	3 in. Aluminum		
CORE RECOVERY: 7.4 ft. (100.0%)	WATER DEPTH:	-37.00 ft. (operational note only)	GEOLOGIST: FIELD TEAM:	TWK - NC #1752 DG, LF, ST		
Depth	Lithology	Classification Of Materials (Description)	Sample #	Remarks		
1		0.0 to 3.0 ft: Medium Sand - Clean, tan, uniform w/ minor shell fragments	S1	S1: 0.0 ft. to 3.0 ft. Shell: 13.6% Mean Grain Size: 0.512mm		
2		 2.1 ft: Medium Scallop - 4 cm				
3		3.0 to 6.0 ft: Coarse Sand - Clean, tan w/ minor shell fragments	S2	S2: 3.0 ft. to 6.0 ft. Shell: 16.7% Mean Grain Size: 0.540mm		
4						
5						
6		6.0 to 7.4 ft: Medium Sand - Clean, tannish grey w/ mottling @ 6.0 - 7.1ft	S3	S3: 6.0 ft. to 7.4 ft. Shell: 9.5% Mean Grain Size: 0.412mm		
7						
8						
9						
10						

Area Location Map

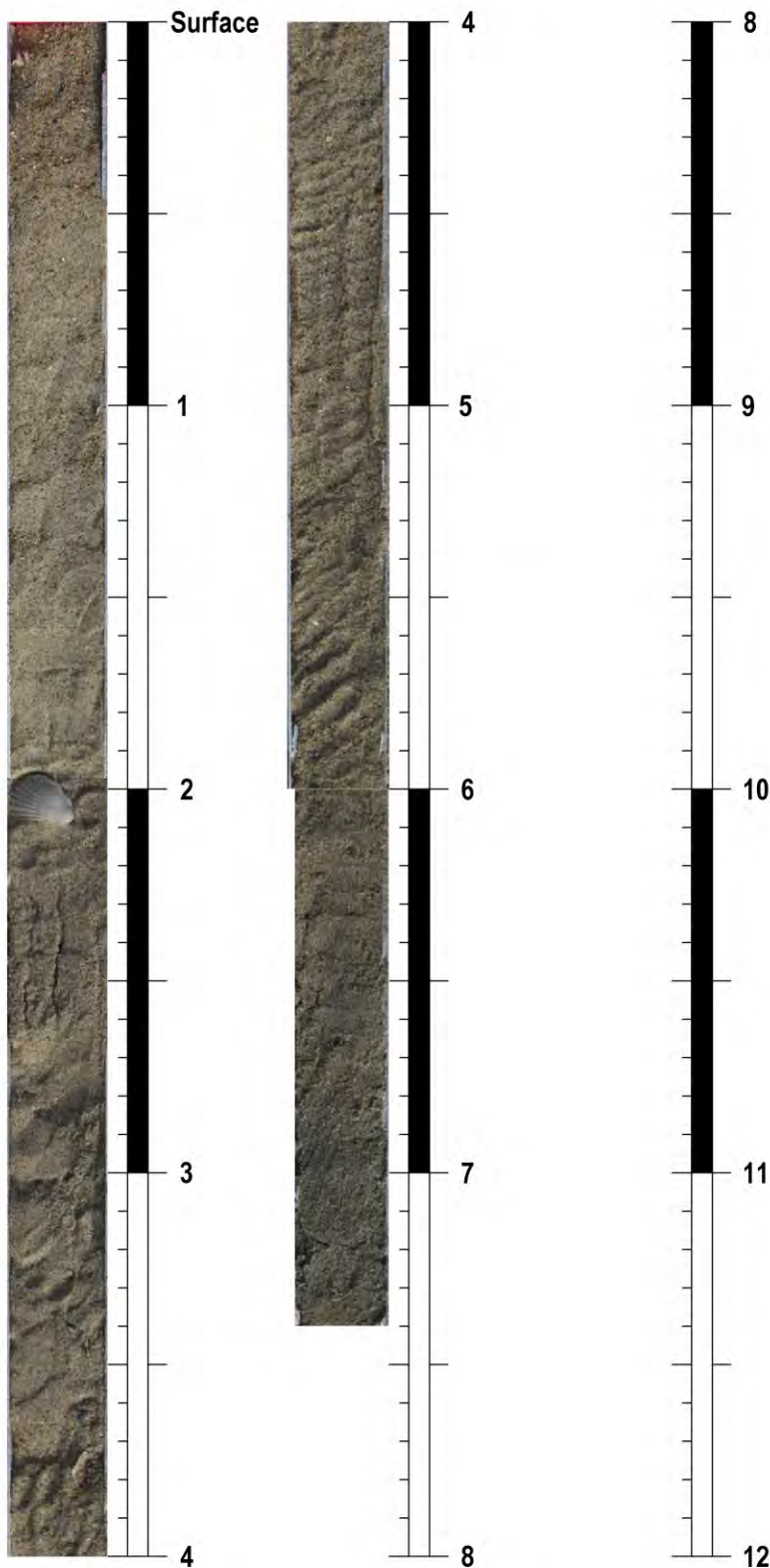


OFFSHORE SAND SOURCE - CSE CORE NO. **Bux-27**

Core Location Map



ELEVATION TOP OF HOLE: -39.8 ft NAVD
TOTAL DEPTH OF HOLE: 7.4 ft



Note:

All core depths in feet.
See core log sheet for additional geotechnical information.

PROJECT TITLE:

Dare County, NC
Beach Nourishment
Feasibility Study - Phase 1

PREPARED FOR:

County of Dare
954 Marshall C. Collins Drive (286)
PO Box 1000
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DRAWING TITLE:

CORE LOG
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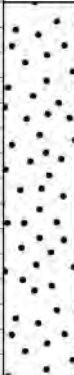
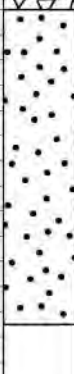
T.Hair

PROJECT #:

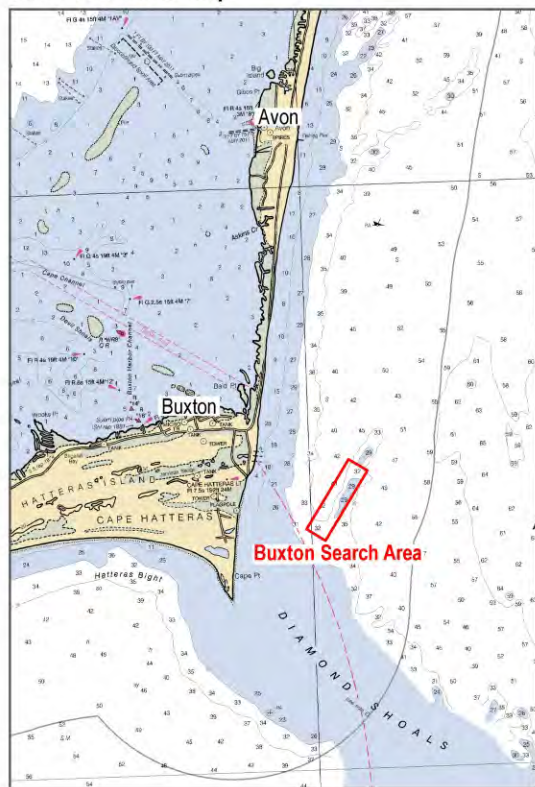
2403-02

27

CORE LOG		Coastal Science & Engineering			Sheet 27 of 53	
PROJECT: 2403 - Dare County		COORDINATES:		HOLE NUMBER:		
LOCALITY: Buxton, NC		Northing: 563305.250 Easting: 3048779.510 Grid Datum: NAD '83		Bux-28 (as shown on title drawing and file no.)		
DATE: 2014-Oct-27	TOP ELEVATION:	-32.37 ft. NAVD '88	DEVICE DESIGNATION:	Coastal Science & Engineering		
BORE ANGLE: 90.00°						
BURDEN THICKNESS:	BOTTOM ELEVATION:	-40.87 ft. NAVD '88	BARREL SIZE/TYPE:	3 in. Aluminum		
CORE RECOVERY:	WATER DEPTH:	-34.00 ft. (operational note only)	GEOLOGIST: FIELD TEAM:	TWK - NC #1752 DG, LF, ST		
8.5 ft. (100.0%)						

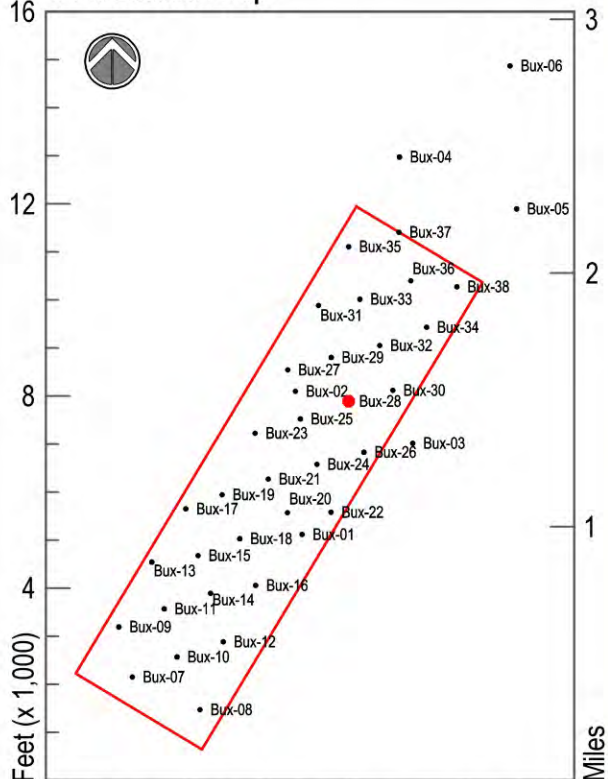
Depth	Lithology	Classification Of Materials (Description)	Sample #	Remarks
1		0.0 to 3.0 ft: Medium Sand - Clean, tan, uniform w/ minor crushed shell	S1	S1: 0.0 ft. to 3.0 ft. Shell: 11.9% Mean Grain Size: 0.455mm
2		3.0 to 3.9 ft: Medium Sand - Clean, tan w/ moderate crushed shell		
3			3.9 to 5.1 ft: Medium Sand with Crushed Shell - Clean and tan w/ shell cluster @ 4.2 ft	S2
4	5.1 to 6.0 ft: Medium Sand with Crushed Shell - Clean and tan w/ shell cluster @ 5.4 ft			
5			6.0 to 8.5 ft: Medium Sand - Clean, tan w/ minor crushed shell and Donax shell lens @ 6.5-6.6ft	S3
6				
7				
8				
9				
10				

Area Location Map

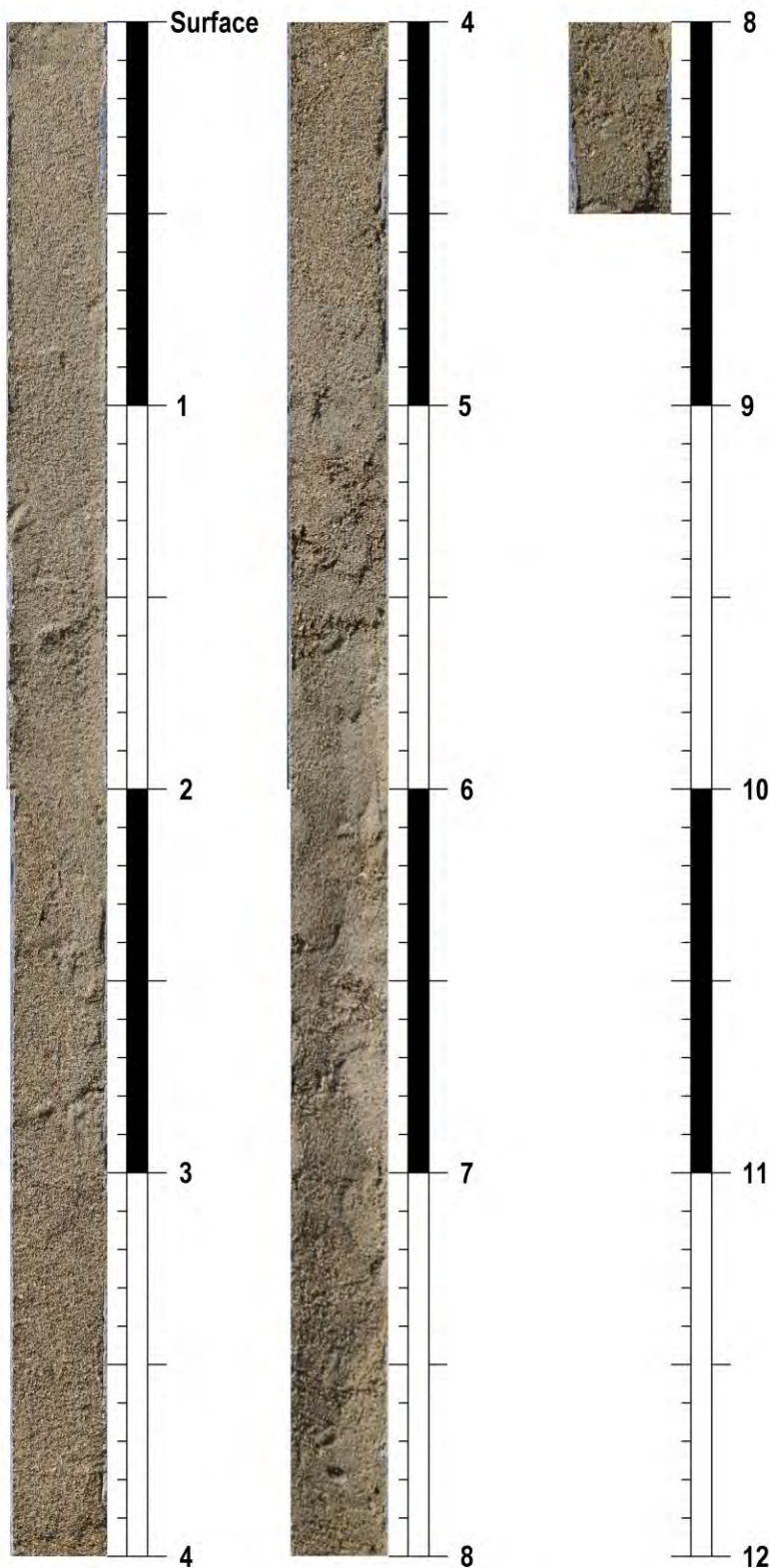


OFFSHORE SAND SOURCE - CSE CORE NO. **Bux-28**

Core Location Map



ELEVATION TOP OF HOLE: -32.4 ft NAVD
TOTAL DEPTH OF HOLE: 8.5 ft



Note:

All core depths in feet.
See core log sheet for additional geotechnical information.

PROJECT TITLE:

Dare County, NC
Beach Nourishment
Feasibility Study - Phase 1

PREPARED FOR:

County of Dare
954 Marshall C. Collins Drive (286)
PO Box 1000
Manteo NC 27954

DRAWING TITLE:

CORE LOG
PHOTO MOSAIC

SCALE:

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DATE:

Jan 2015

DRAWN BY:

T.Hair

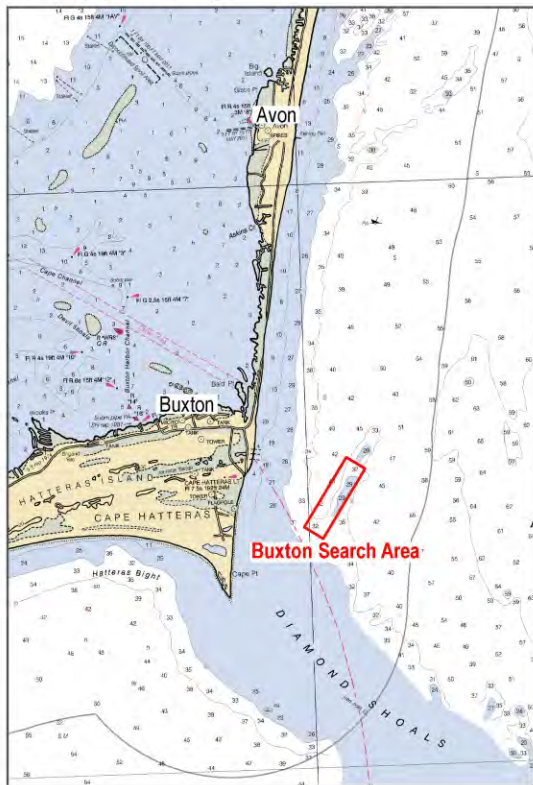
PROJECT #:

2403-02

28

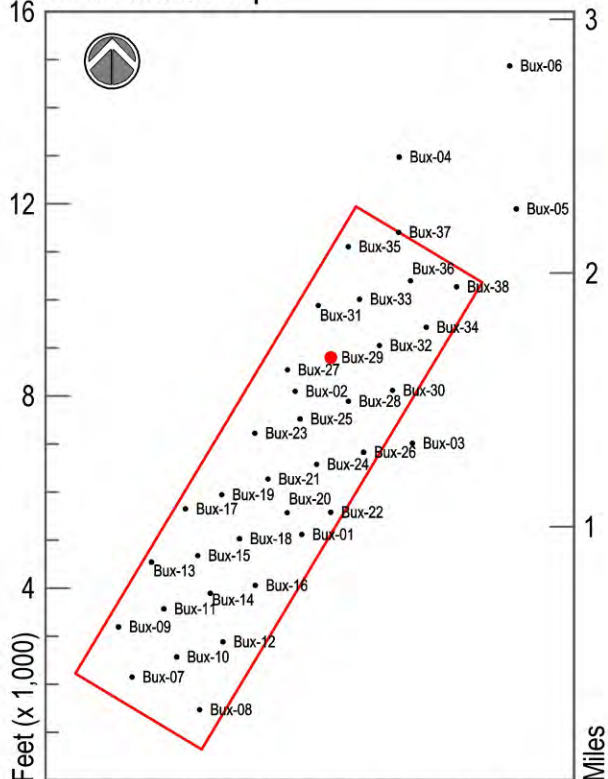
CORE LOG		Coastal Science & Engineering			Sheet 28 of 53	
PROJECT: 2403 - Dare County		COORDINATES:		HOLE NUMBER:		
LOCALITY: Buxton, NC		Northing: 563988.740 Easting: 3048506.090 Grid Datum: NAD '83		Bux-29 (as shown on title drawing and file no.)		
DATE: 2014-Oct-28	TOP ELEVATION:	-33.41 ft. NAVD '88	DEVICE DESIGNATION:	Coastal Science & Engineering		
BORE ANGLE: 90.00°						
BURDEN THICKNESS: 9.0 ft.	BOTTOM ELEVATION:	-42.41 ft. NAVD '88	BARREL SIZE/TYPE:	3 in. Aluminum		
CORE RECOVERY: 9 ft. (100.0%)	WATER DEPTH:	-32.00 ft. (operational note only)	GEOLOGIST: FIELD TEAM:	TWK - NC #1752 DG, LF, ST		
Depth	Lithology	Classification Of Materials (Description)	Sample #	Remarks		
1		0.0 to 3.0 ft: Medium Sand / Coarse Sand mix - Clean, tan w/ moderate shell trace pea gravel -- 1.2 ft: Shell Fragment - 3 cm	S1	S1: 0.0 ft. to 3.0 ft. Shell: 23.8% Mean Grain Size: 0.600mm		
2						
3		-- 2.8 ft: Shell Fragment - 6cm				
4		3.0 to 6.0 ft: Medium Sand - Clean, tan w/ minor shell and mottling @ 3.6 - 3.9ft	S2	S2: 3.0 ft. to 6.0 ft. Shell: 12.6% Mean Grain Size: 0.470mm		
5						
6						
7		6.0 to 9.0 ft: Medium Sand - Clean, tan w/ minor shell and muddy sand lens @ 8.75 ft -- 6.5 ft: Shell Fragment - 2 cm	S3	S3: 6.0 ft. to 9.0 ft. Shell: 16.0% Mean Grain Size: 0.499mm		
8						
9						
10						

Area Location Map

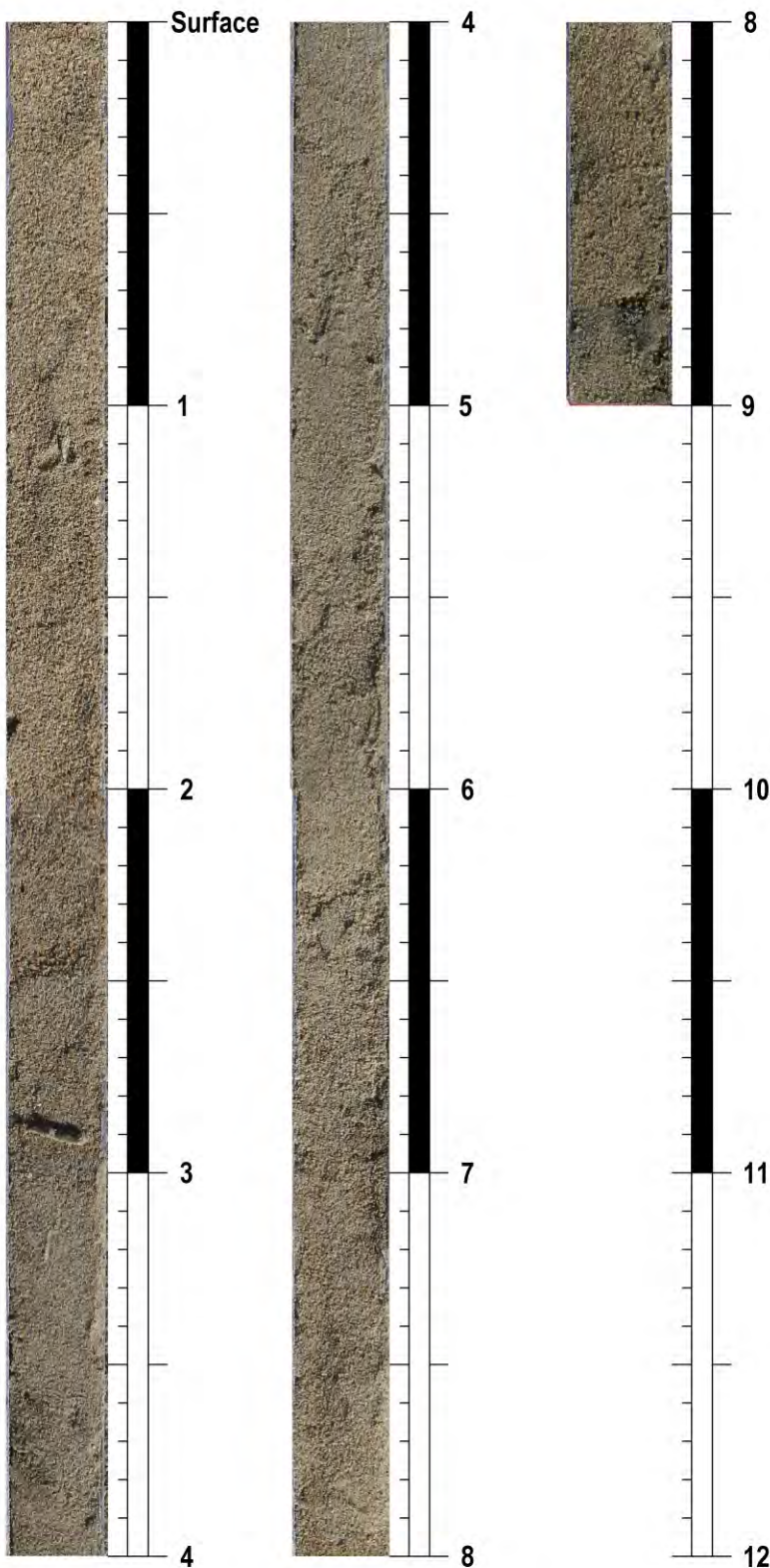


OFFSHORE SAND SOURCE - CSE CORE NO. **Bux-29**

Core Location Map



ELEVATION TOP OF HOLE: -33.4 ft NAVD
TOTAL DEPTH OF HOLE: 9.0 ft



Note:

All core depths in feet.
See core log sheet for additional geotechnical information.

PROJECT TITLE:

Dare County, NC
Beach Nourishment
Feasibility Study - Phase 1

PREPARED FOR:

County of Dare
954 Marshall C. Collins Drive (286)
PO Box 1000
Manteo NC 27954

DRAWING TITLE:

CORE LOG
PHOTO MOSAIC

SCALE:

AS SHOWN

BUX

DATE:

Jan 2015

DRAWN BY:

T.Hair

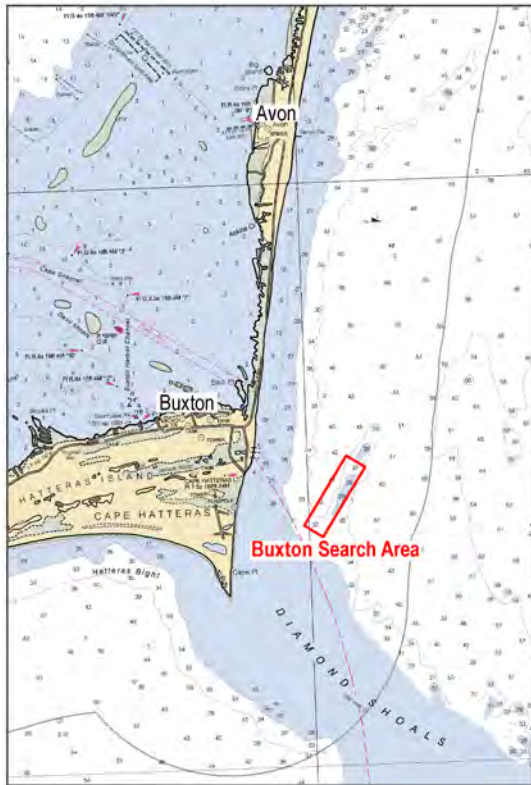
PROJECT #:

2403-02

29

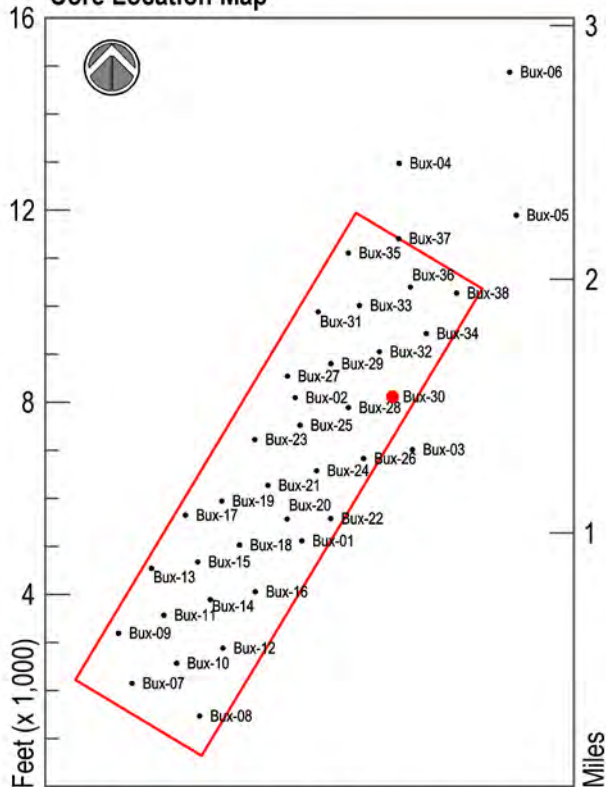
CORE LOG		Coastal Science & Engineering			Sheet 29 of 53	
PROJECT: 2403 - Dare County		COORDINATES:		HOLE NUMBER:		
LOCALITY: Buxton, NC		Northing: 563476.000 Easting: 3049468.770 Grid Datum: NAD '83		Bux-30 (as shown on title drawing and file no.)		
DATE: 2014-Oct-27	TOP ELEVATION:	-37.91 ft. NAVD '88	DEVICE DESIGNATION:	Coastal Science & Engineering		
BORE ANGLE: 90.00°						
BURDEN THICKNESS: 9.2 ft.	BOTTOM ELEVATION:	-47.11 ft. NAVD '88	BARREL SIZE/TYPE:	3 in. Aluminum		
CORE RECOVERY: 9.2 ft. (100.0%)	WATER DEPTH:	-37.00 ft. (operational note only)	GEOLOGIST: FIELD TEAM:	TWK - NC #1752 DG, LF, ST		
Depth	Lithology	Classification Of Materials (Description)	Sample #	Remarks		
1		0.0 to 3.0 ft: Fine Sand / Medium Sand mix - Grading to medium sand, clean, tan w/ minor shell. Shell concentration @ 1.3 - 1.5ft	S1	S1: 0.0 ft. to 3.0 ft. Shell: 11.0% Mean Grain Size: 0.413mm		
2						
3		3.0 to 5.0 ft: Medium Sand - Clean, tan, uniform w/ trace shell	S2	S2: 3.0 ft. to 5.0 ft. Shell: 10.5% Mean Grain Size: 0.397mm		
4						
5		5.0 to 5.9 ft: Medium Sand / Coarse Sand mix - Clean, tan w/ moderate shell and minor pea gravel	S3	S3: 5.0 ft. to 5.9 ft. Shell: 31.9% Mean Grain Size: 0.904mm		
6						
7		5.9 to 9.2 ft: Medium Sand - Clean, tan, uniform w/ trace shell and mottling @ 6.0ft and 6.7 - 7.1ft	S4	S4: 5.9 ft. to 9.2 ft. Shell: 6.7% Mean Grain Size: 0.338mm		
8						
9						
10						

Area Location Map

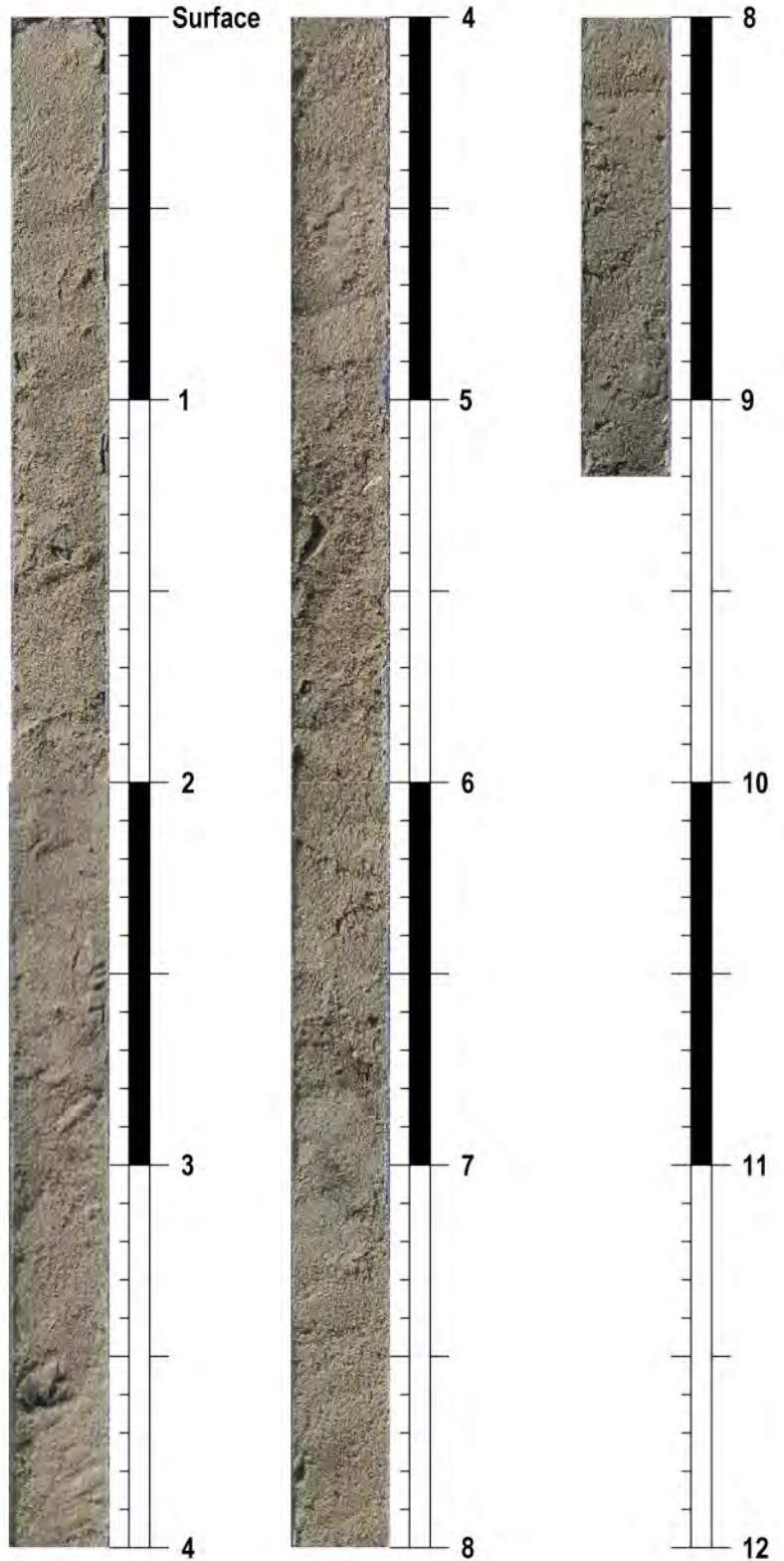


OFFSHORE SAND SOURCE - CSE CORE NO. **Bux-30**

Core Location Map



ELEVATION TOP OF HOLE: -37.9 ft NAVD
TOTAL DEPTH OF HOLE: 9.2 ft



Note:

All core depths in feet.

See core log sheet for additional geotechnical information.

PROJECT TITLE:

Dare County, NC
Beach Nourishment
Feasibility Study - Phase 1

PREPARED FOR:

County of Dare
954 Marshall C. Collins Drive (286)
PO Box 1000
Manteo NC 27954

DRAWING TITLE:

CORE LOG
PHOTO MOSAIC

SCALE:

AS SHOWN

BUX

DATE:

Jan 2015

DRAWN BY:

T.Hair

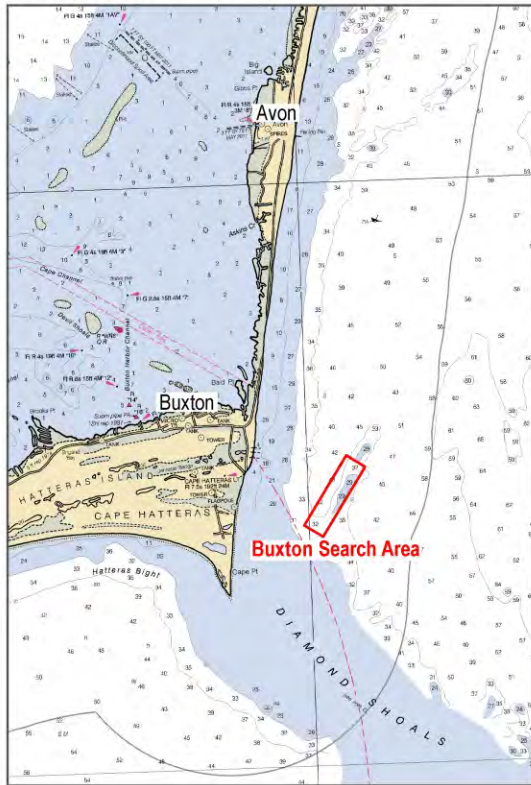
PROJECT #:

2403-02

30

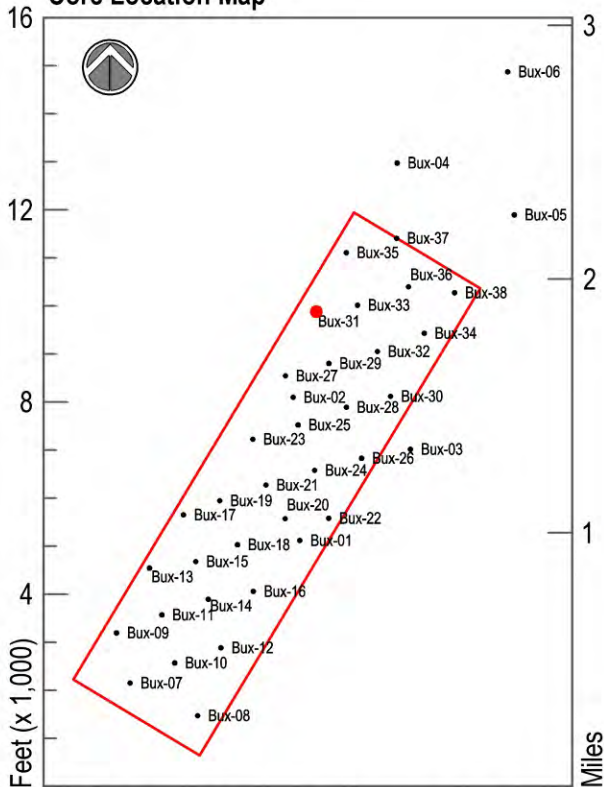
CORE LOG		Coastal Science & Engineering			Sheet 30 of 53	
PROJECT: 2403 - Dare County		COORDINATES:		HOLE NUMBER:		
LOCALITY: Buxton, NC		Northing: 564799.630 Easting: 3048308.390 Grid Datum: NAD '83		Bux-31 (as shown on title drawing and file no.)		
DATE: 2014-Oct-28	TOP ELEVATION:	-41.71 ft. NAVD '88	DEVICE DESIGNATION:	Coastal Science & Engineering		
BORE ANGLE: 90.00°						
BURDEN THICKNESS: 6.3 ft.	BOTTOM ELEVATION:	-48.01 ft. NAVD '88	BARREL SIZE/TYPE:	3 in. Aluminum		
CORE RECOVERY: 6.3 ft. (100.0%)	WATER DEPTH:	-42.00 ft. (operational note only)	GEOLOGIST: FIELD TEAM:	TWK - NC #1752 DG, LF, ST		
Depth	Lithology	Classification Of Materials (Description)	Sample #	Remarks		
1		0.0 to 2.5 ft: Coarse Sand - Clean, tan w/ moderate crushed shell	S1	S1: 0.0 ft. to 2.5 ft. Shell: 18.1% Mean Grain Size: 0.624mm		
2						
3			2.5 to 4.7 ft: Coarse Sand - Clean, tan w/ minor shell fragments	S2	S2: 2.5 ft. to 4.7 ft. Shell: 14.0% Mean Grain Size: 0.552mm	
4						
5		— 4.4 ft: Medium Scallop - 4 cm	S3			
6						
7		4.7 to 6.3 ft: Coarse Sand - Clean, tannish grey w/ minor shell fragments and mottling @ 4.8 - 5.8ft		S3: 4.7 ft. to 6.3 ft. Shell: 16.7% Mean Grain Size: 0.561mm		
8						
9						
10						

Area Location Map

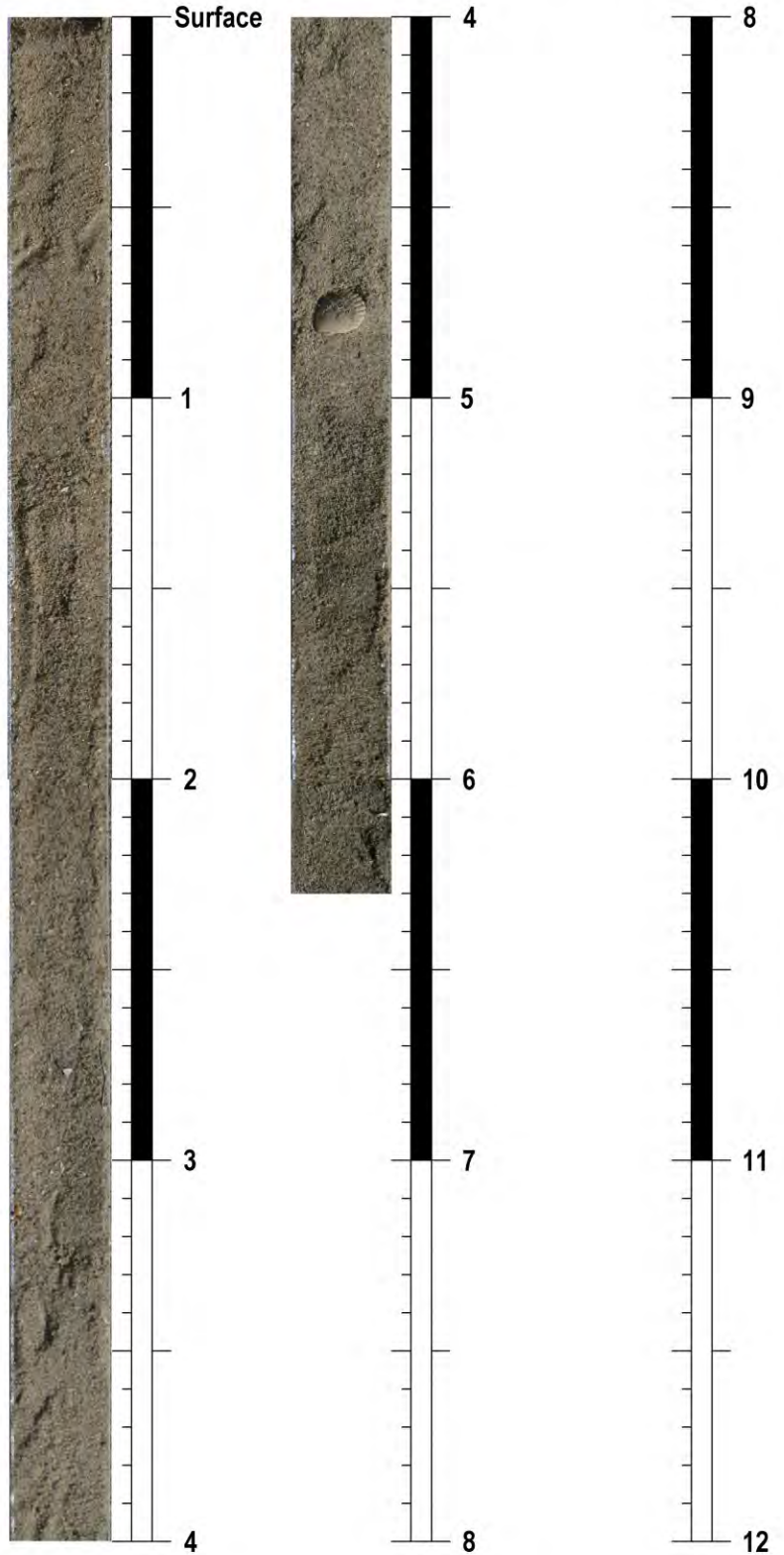


OFFSHORE SAND SOURCE - CSE CORE NO. **Bux-31**

Core Location Map



ELEVATION TOP OF HOLE: -41.7 ft NAVD
TOTAL DEPTH OF HOLE: 6.3 ft



Note:

All core depths in feet.

See core log sheet for additional geotechnical information.

PROJECT TITLE:

Dare County, NC
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Feasibility Study - Phase 1

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County of Dare
954 Marshall C. Collins Drive (286)
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Manteo NC 27954

DRAWING TITLE:

CORE LOG
PHOTO MOSAIC

SCALE:

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DATE:

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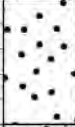
DRAWN BY:

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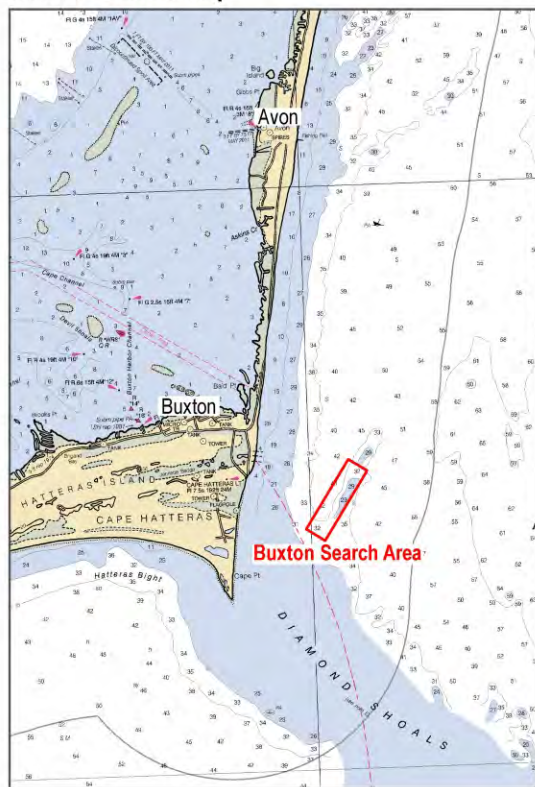
PROJECT #:

2403-02

31

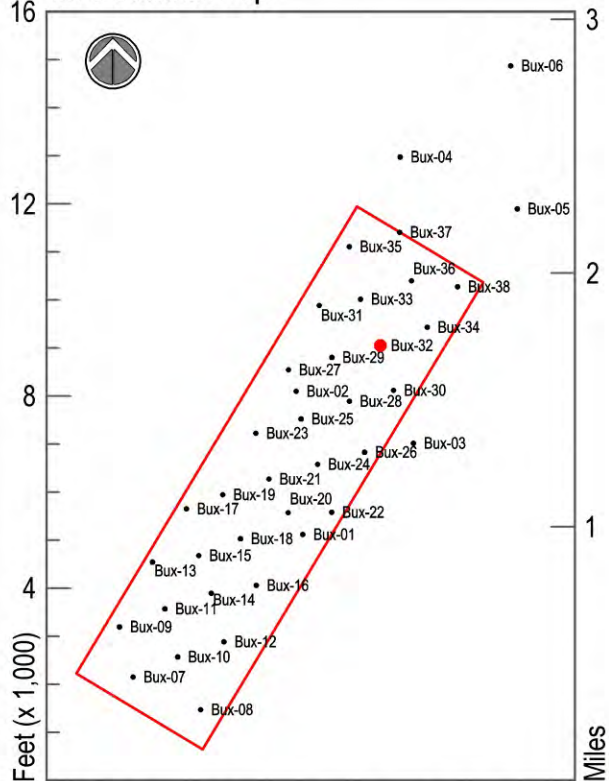
CORE LOG		Coastal Science & Engineering			Sheet 31 of 53	
PROJECT: 2403 - Dare County		COORDINATES:		HOLE NUMBER:		
LOCALITY: Buxton, NC		Northing: 564174.980 Easting: 3049263.500 Grid Datum: NAD '83		Bux-32 (as shown on title drawing and file no.)		
DATE: 2014-Oct-27	TOP ELEVATION:	-31.51 ft. NAVD '88	DEVICE DESIGNATION:	Coastal Science & Engineering		
BORE ANGLE: 90.00°						
BURDEN THICKNESS: 6.3 ft.	BOTTOM ELEVATION:	-37.81 ft. NAVD '88	BARREL SIZE/TYPE:	3 in. Aluminum		
CORE RECOVERY: 6.3 ft. (100.0%)	WATER DEPTH:	-33.00 ft. (operational note only)	GEOLOGIST: FIELD TEAM:	TWK - NC #1752 DG, LF, ST		
Depth	Lithology	Classification Of Materials (Description)	Sample #	Remarks		
1		0.0 to 1.8 ft: Medium Sand - Clean, tan, uniform w/ minor shell hash	S1	S1: 0.0 ft. to 1.8 ft. Shell: 10.4% Mean Grain Size: 0.414mm		
2		1.8 to 3.8 ft: Coarse Sand - Clean, tan w/ moderate shell hash	S2	S2: 1.8 ft. to 3.8 ft. Shell: 26.4% Mean Grain Size: 0.620mm		
3		3.8 to 4.8 ft: Medium Sand - Clean, tan w/ trace shell fragments	S3	S3: 3.8 ft. to 4.8 ft. Shell: 12.8% Mean Grain Size: 0.409mm		
4		4.8 to 6.3 ft: Medium Sand / Coarse Sand mix - Clean, tan w/ minor shell fragments and trace pea gravel	S4	S4: 4.8 ft. to 6.3 ft. Shell: 17.4% Mean Grain Size: 0.447mm		
5						
6						
7						
8						
9						
10						

Area Location Map

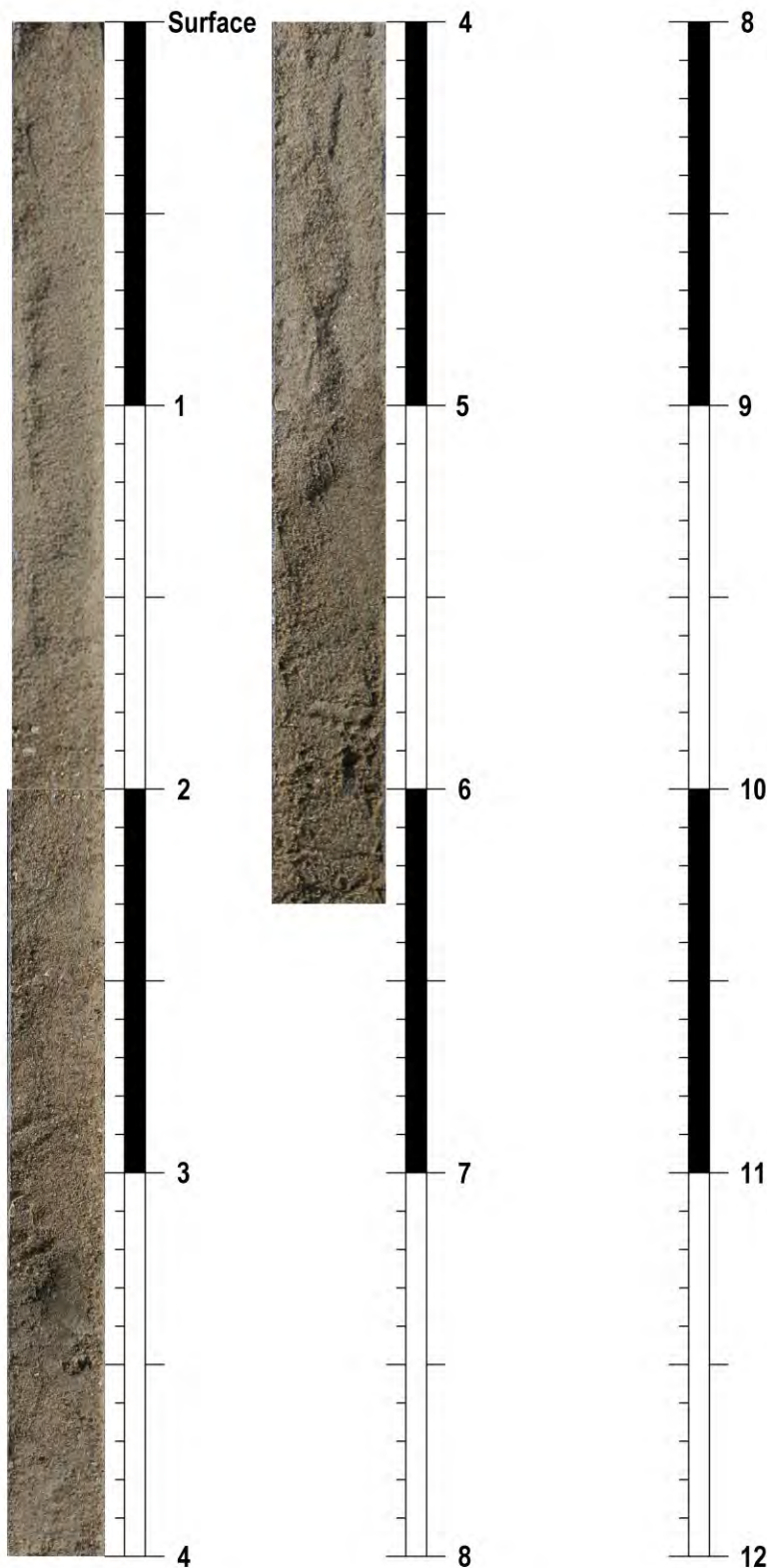


OFFSHORE SAND SOURCE - CSE CORE NO. **Bux-32**

Core Location Map



ELEVATION TOP OF HOLE: -31.5 ft NAVD
TOTAL DEPTH OF HOLE: 6.3 ft



Note:

All core depths in feet.
See core log sheet for additional geotechnical information.

PROJECT TITLE:

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Manteo NC 27954

DRAWING TITLE:

CORE LOG
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SCALE:

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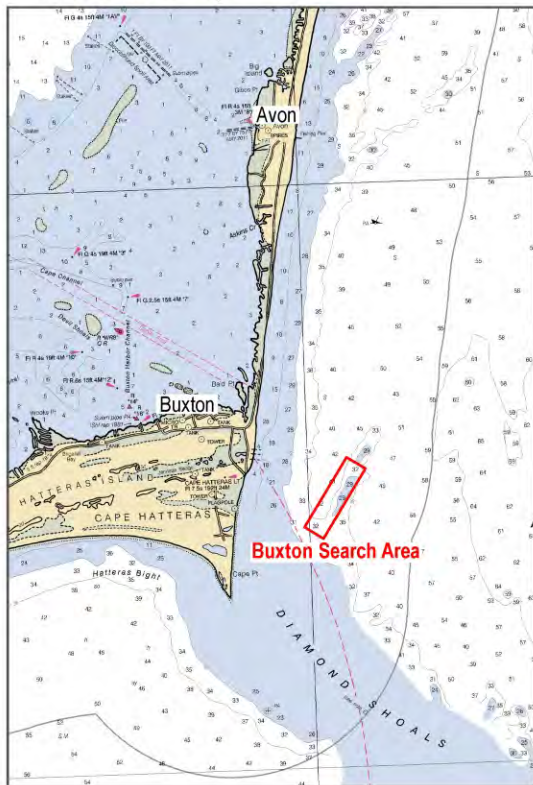
PROJECT #:

2403-02

32

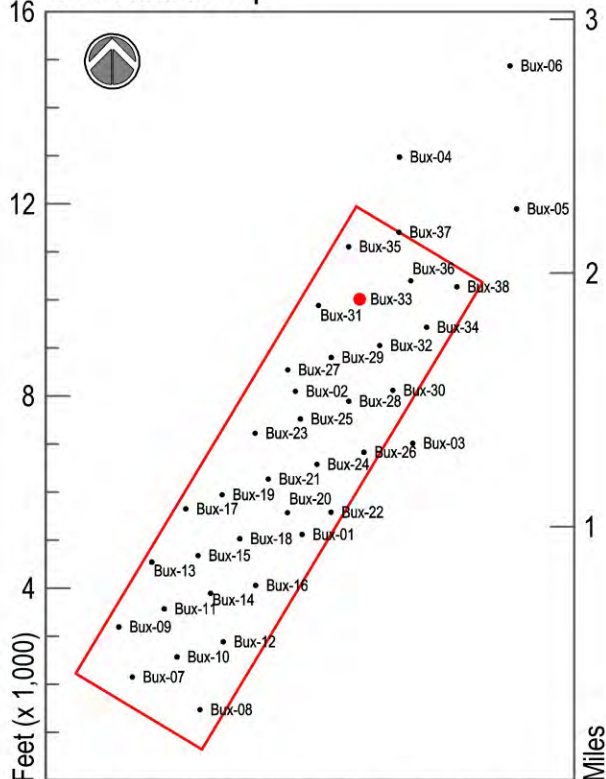
CORE LOG		Coastal Science & Engineering			Sheet 32 of 53	
PROJECT: 2403 - Dare County		COORDINATES:		HOLE NUMBER:		
LOCALITY: Buxton, NC		Northing: 564897.990 Easting: 3048951.920 Grid Datum: NAD '83		Bux-33 (as shown on title drawing and file no.)		
DATE: 2014-Oct-27	TOP ELEVATION:	-34.59 ft. NAVD '88	DEVICE DESIGNATION:	Coastal Science & Engineering		
BORE ANGLE: 90.00°						
BURDEN THICKNESS: 5.2 ft.	BOTTOM ELEVATION:	-39.79 ft. NAVD '88	BARREL SIZE/TYPE:	3 in. Aluminum		
CORE RECOVERY: 5.2 ft. (100.0%)	WATER DEPTH:	-35.00 ft. (operational note only)	GEOLOGIST: FIELD TEAM:	TWK - NC #1752 DG, LF, ST		
Depth	Lithology	Classification Of Materials (Description)	Sample #	Remarks		
1		0.0 to 3.0 ft: Coarse Sand - Clean, tan, uniform to bottom w/ minor crushed shell and trace pea gravel	S1	S1: 0.0 ft. to 3.0 ft. Shell: 20.1% Mean Grain Size: 0.546mm		
2		1.0 ft: Medium Clam - Quahog fragment (5cm)				
3		3.0 to 5.2 ft: Coarse Sand - Clean, tan, uniform to bottom w/ minor crushed shell and trace pea gravel	S2	S2: 3.0 ft. to 5.2 ft. Shell: 19.4% Mean Grain Size: 0.582mm		
4						
5						
6						
7						
8						
9						
10						

Area Location Map

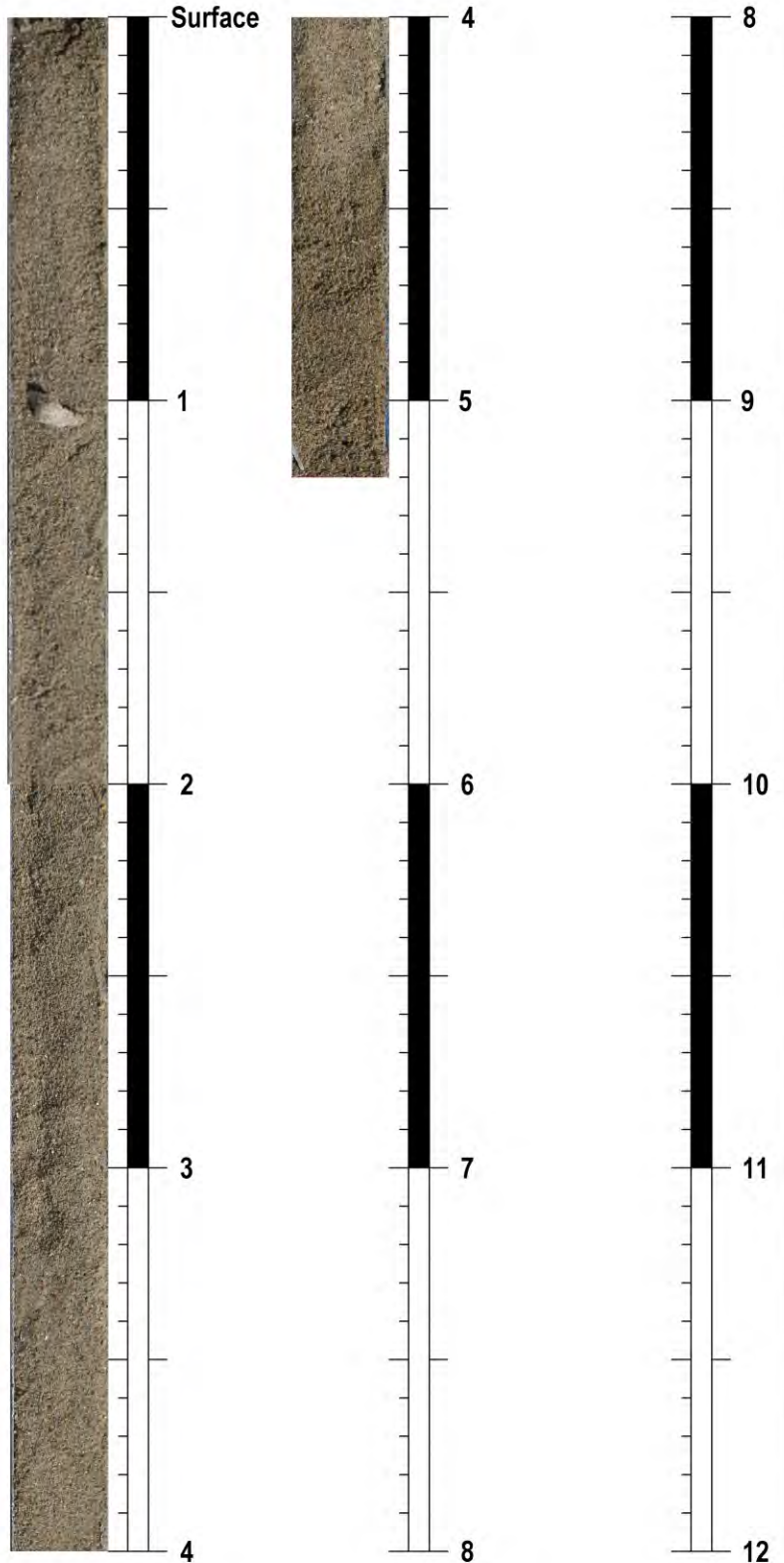


OFFSHORE SAND SOURCE - CSE CORE NO. **Bux-33**

Core Location Map



ELEVATION TOP OF HOLE: -34.6 ft NAVD
TOTAL DEPTH OF HOLE: 5.2 ft



Note:

All core depths in feet.
See core log sheet for additional geotechnical information.

PROJECT TITLE:

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DRAWING TITLE:

CORE LOG
PHOTO MOSAIC

SCALE:

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DATE:

Jan 2015

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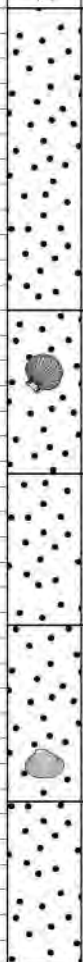
T.Hair

PROJECT #:

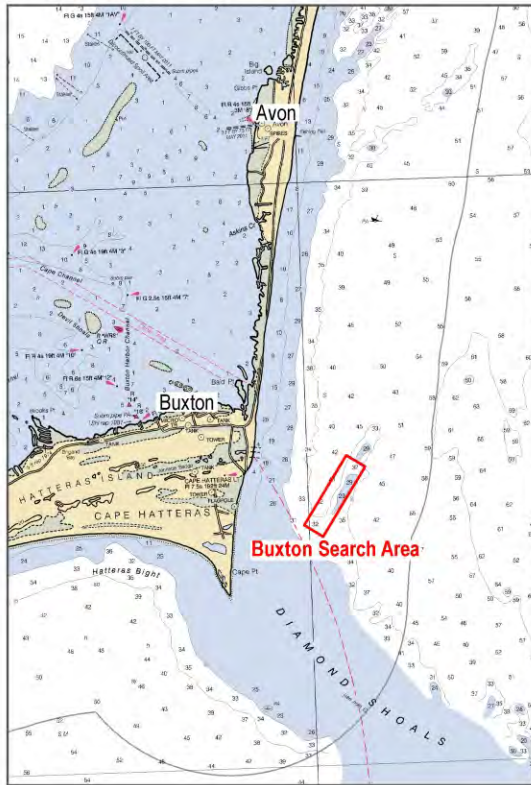
2403-02

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33

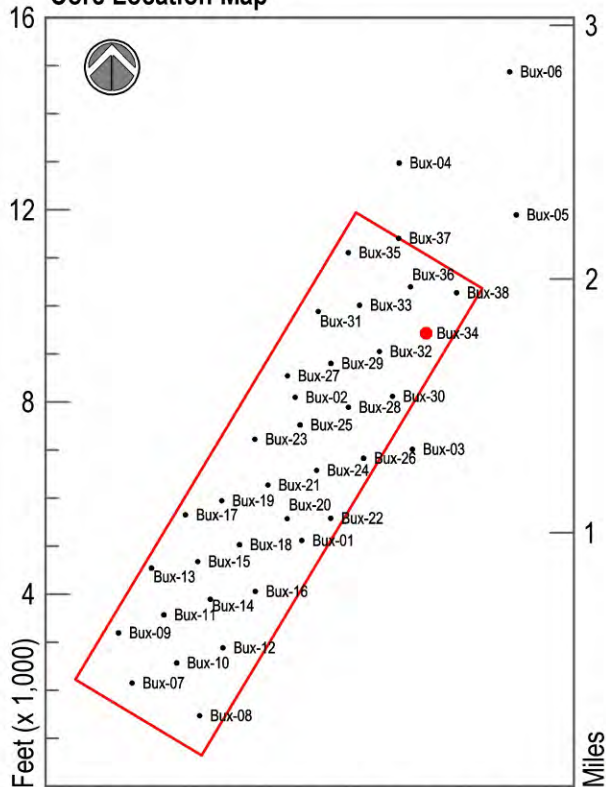
CORE LOG		Coastal Science & Engineering			Sheet 33 of 53	
PROJECT: 2403 - Dare County		COORDINATES:		HOLE NUMBER:		
LOCALITY: Buxton, NC		Northing: 564459.980 Easting: 3049994.270 Grid Datum: NAD '83		Bux-34 (as shown on title drawing and file no.)		
DATE: 2014-Oct-27	TOP ELEVATION:	-36.50 ft. NAVD '88	DEVICE DESIGNATION:	Coastal Science & Engineering		
BORE ANGLE: 90.00°						
BURDEN THICKNESS: 7.6 ft.	BOTTOM ELEVATION:	-44.10 ft. NAVD '88	BARREL SIZE/TYPE:	3 in. Aluminum		
CORE RECOVERY: 7.6 ft. (100.0%)	WATER DEPTH:	-38.00 ft. (operational note only)	GEOLOGIST: FIELD TEAM:	TWK - NC #1752 DG, LF, ST		
Depth	Lithology	Classification Of Materials (Description)	Sample #	Remarks		
1		0.0 to 2.4 ft: Medium Sand - Clean, tan, uniform w trace shell fragments	S1	S1: 0.0 ft. to 2.4 ft. Shell: 7.8% Mean Grain Size: 0.351mm		
2						
3		2.4 to 3.7 ft: Medium Sand - Clean, tan w/ minor shell fragments -- 2.9 ft: Medium Scallop - 5 cm		S2	S2: 2.4 ft. to 3.7 ft. Shell: 14.2% Mean Grain Size: 0.489mm	
4		3.7 to 4.9 ft: Medium Sand - Clean, tan w/ muddy sand clasts @ 4.5 - 4.8ft		S3	S3: 3.7 ft. to 4.9 ft. Shell: 15.4% Mean Grain Size: 0.499mm	
5		4.9 to 6.3 ft: Medium Sand - Shelly, clean, with crushed shell layers @ 4.95, 5.25, and 5.45ft		S4	S4: 4.9 ft. to 6.3 ft. Shell: 17.1% Mean Grain Size: 0.502mm	
6		-- 6.0 ft: Medium Clam - 5 cm				
7		6.3 to 7.6 ft: Medium Sand - Clean, lt grey w/ trace shell	S5	S5: 6.3 ft. to 7.6 ft. Shell: 11.2% Mean Grain Size: 0.333mm		
8						
9						
10						

Area Location Map

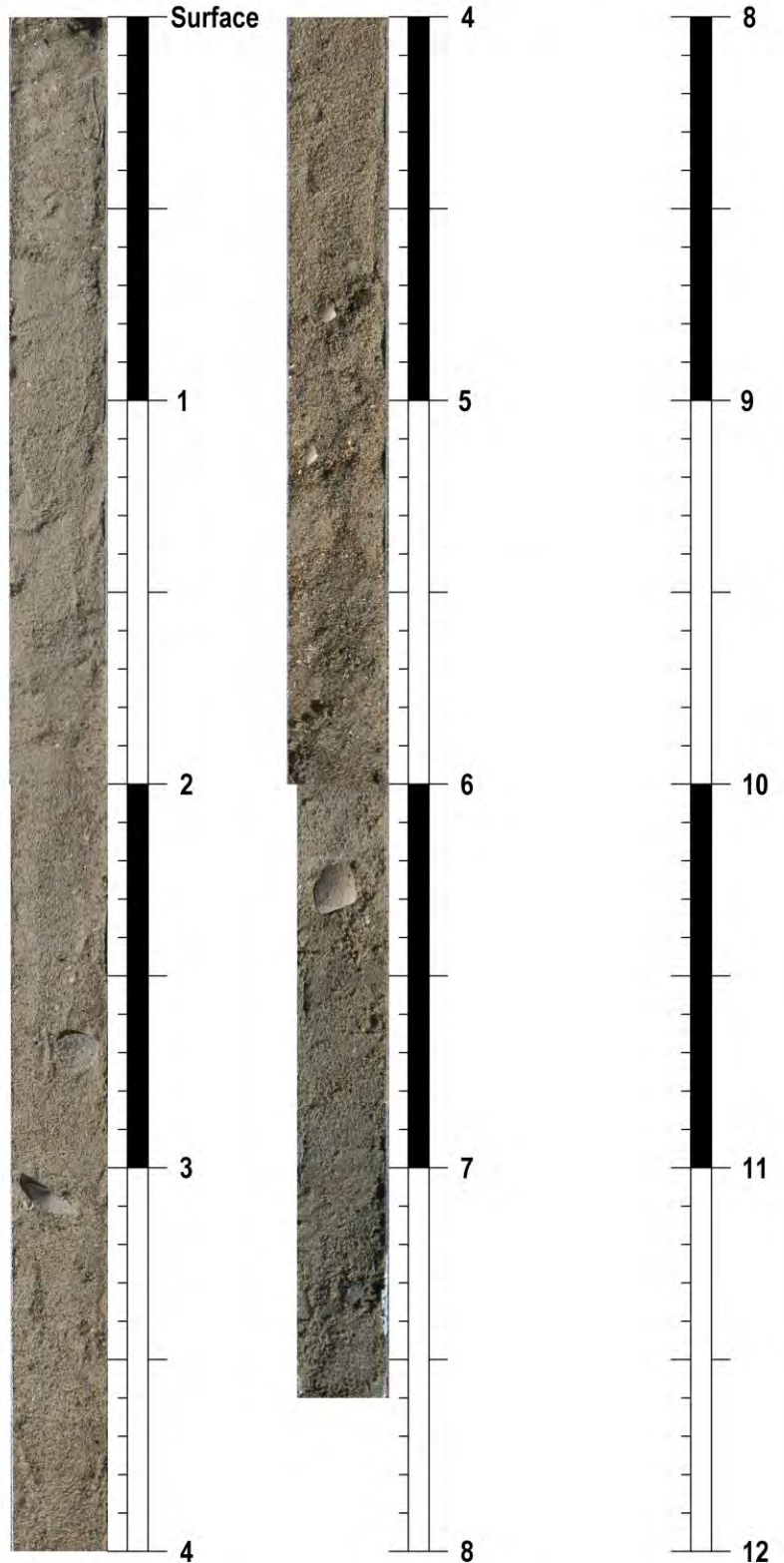


OFFSHORE SAND SOURCE - CSE CORE NO. **Bux-34**

Core Location Map



ELEVATION TOP OF HOLE: -36.5 ft NAVD
TOTAL DEPTH OF HOLE: 7.6 ft



Note:

All core depths in feet.

See core log sheet for additional geotechnical information.

PROJECT TITLE:

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DRAWING TITLE:

CORE LOG
PHOTO MOSAIC

SCALE:

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DATE:

Jan 2015

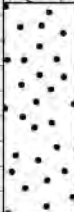
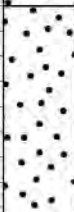
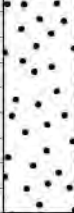
DRAWN BY:

T.Hair

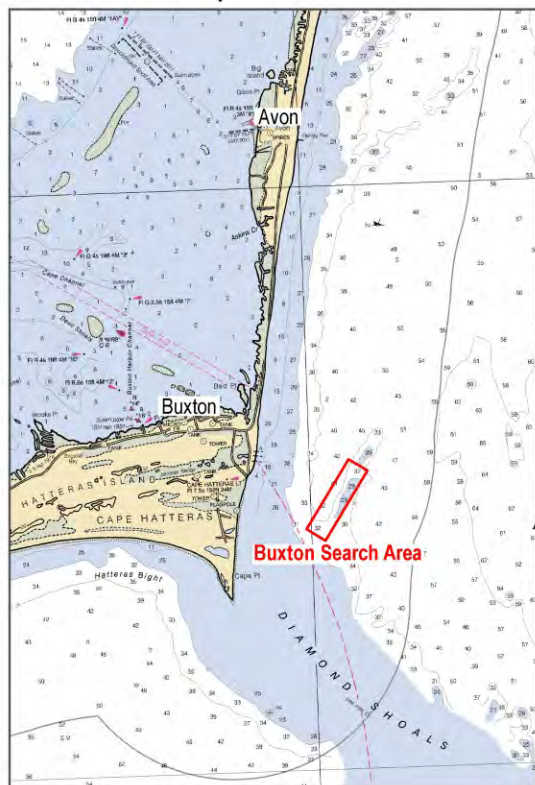
PROJECT #:

2403-02

34

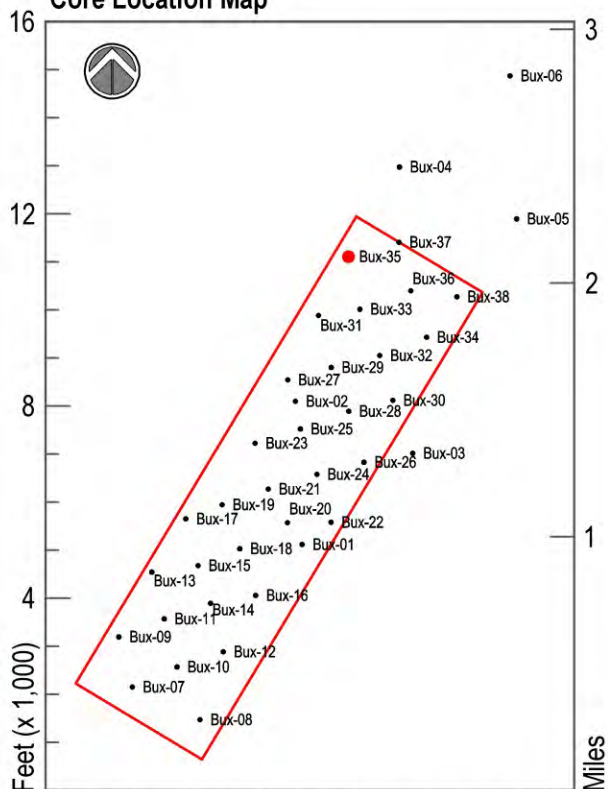
CORE LOG		Coastal Science & Engineering			Sheet 34 of 53	
PROJECT: 2403 - Dare County		COORDINATES:			HOLE NUMBER:	
LOCALITY: Buxton, NC		Northing: 565716.910 Easting: 3048776.920 Grid Datum: NAD '83			Bux-35 (as shown on title drawing and file no.)	
DATE: 2014-Oct-28		TOP ELEVATION:	-41.90 ft. NAVD '88	DEVICE DESIGNATION:	Coastal Science & Engineering	
BORE ANGLE: 90.00°						
BURDEN THICKNESS: 8.0 ft.		BOTTOM ELEVATION:	-49.90 ft. NAVD '88	BARREL SIZE/TYPE:	3 in. Aluminum	
CORE RECOVERY: 8 ft. (100.0%)		WATER DEPTH:	-41.00 ft. (operational note only)	GEOLOGIST: FIELD TEAM:	TWK - NC #1752 DG, LF, ST	
Depth	Lithology	Classification Of Materials (Description)		Sample #	Remarks	
1		0.0 to 1.3 ft: Coarse Sand - Clean, tan w/ moderate shell		S1	S1: 0.0 ft. to 1.3 ft. Shell: 30.2% Mean Grain Size: 0.820mm	
2		1.3 to 3.0 ft: Medium Sand - Clean, tan, uniform w/ minor shell		S2	S2: 1.3 ft. to 3.0 ft. Shell: 13.5% Mean Grain Size: 0.524mm	
3		3.0 to 6.0 ft: Medium Sand - Clean, greyish tan, uniform w/ trace shell and mottling @ 5.4ft		S3	S3: 3.0 ft. to 6.0 ft. Shell: 10.4% Mean Grain Size: 0.488mm	
4						
5						
6						
7		6.0 to 8.0 ft: Medium Sand - Light to medium grey w/ mottling - muddy sand clasts @ 6.2ft and 7.0 - 7.8ft		S4	S4: 6.0 ft. to 8.0 ft. Shell: 8.0% Mean Grain Size: 0.413mm	
8						
9						
10						

Area Location Map

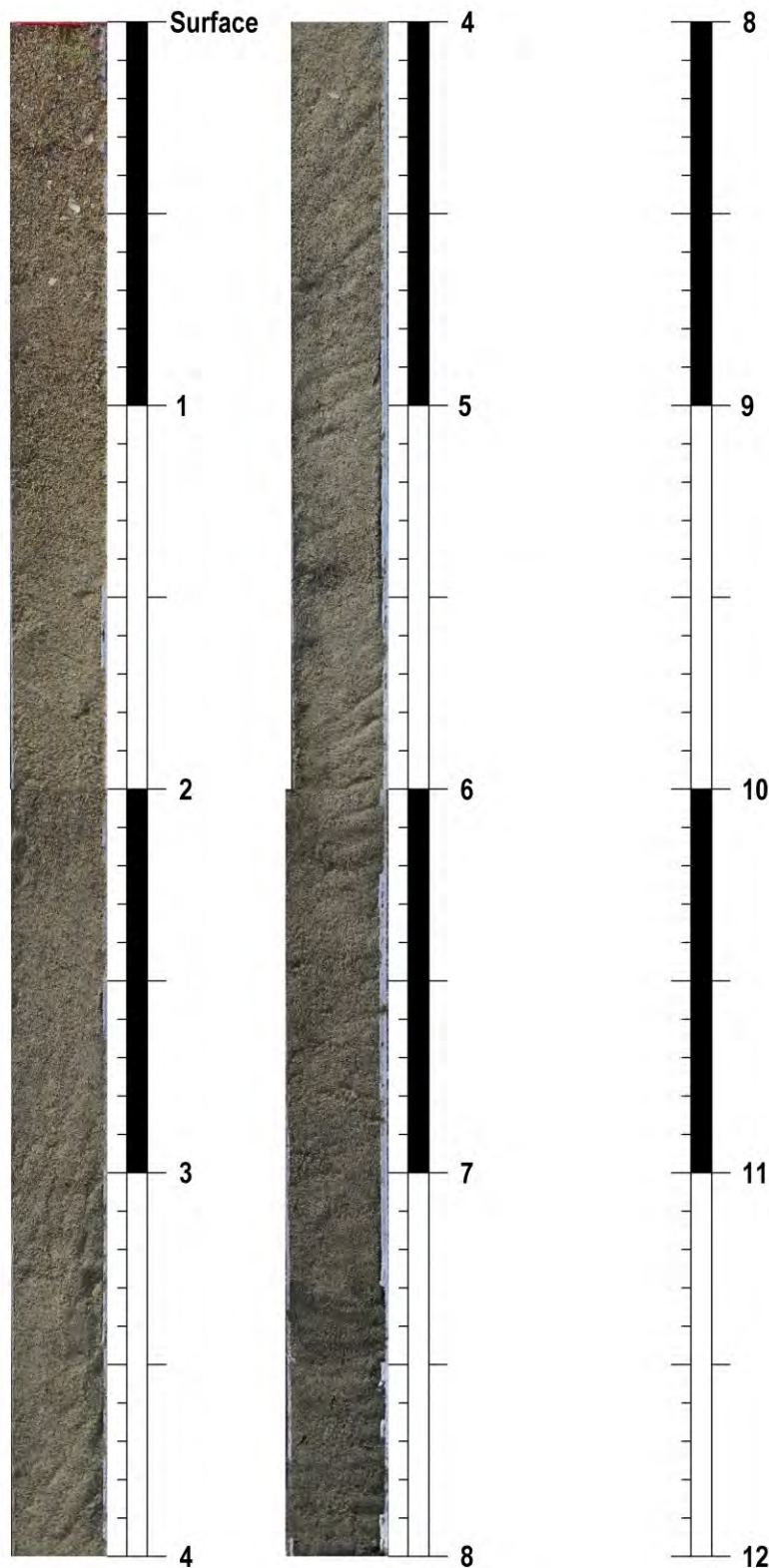


OFFSHORE SAND SOURCE - CSE CORE NO. **Bux-35**

Core Location Map



ELEVATION TOP OF HOLE: -41.9 ft NAVD
TOTAL DEPTH OF HOLE: 8.0 ft



Note:

All core depths in feet.
See core log sheet for additional geotechnical information.

PROJECT TITLE:

Dare County, NC
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PREPARED FOR:

County of Dare
954 Marshall C. Collins Drive (286)
PO Box 1000
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DRAWING TITLE:

CORE LOG
PHOTO MOSAIC

SCALE:

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DRAWN BY:

T.Hair

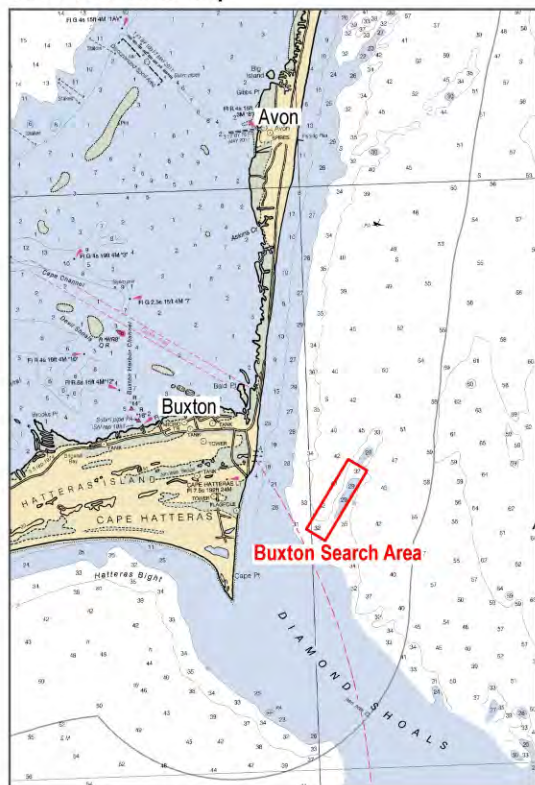
PROJECT #:

2403-02

35

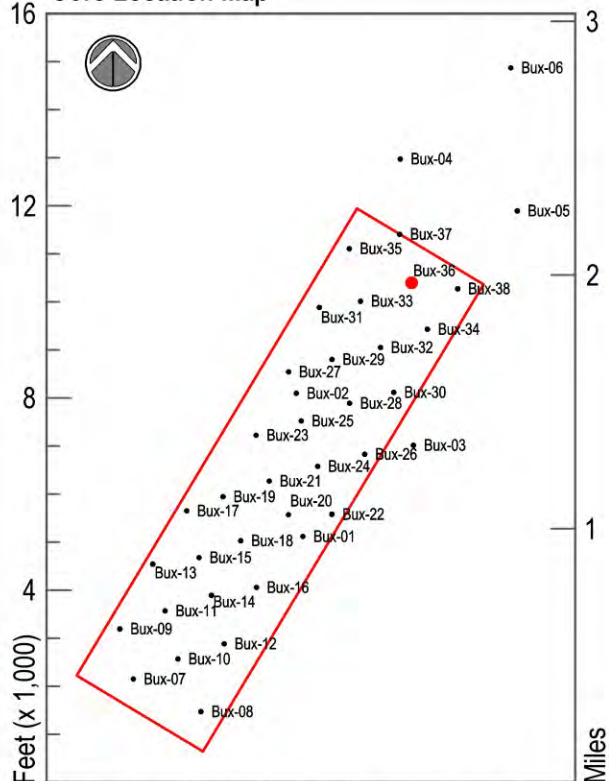
CORE LOG		Coastal Science & Engineering			Sheet 35 of 53	
PROJECT: 2403 - Dare County		COORDINATES:		HOLE NUMBER:		
LOCALITY: Buxton, NC		Northing: 565185.560 Easting: 3049747.800 Grid Datum: NAD '83		Bux-36 (as shown on title drawing and file no.)		
DATE: 2014-Oct-27	TOP ELEVATION:	-31.09 ft. NAVD '88	DEVICE DESIGNATION:	Coastal Science & Engineering		
BORE ANGLE: 90.00°						
BURDEN THICKNESS: 9.4 ft.	BOTTOM ELEVATION:	-40.49 ft. NAVD '88	BARREL SIZE/TYPE:	3 in. Aluminum		
CORE RECOVERY: 9.4 ft. (100.0%)	WATER DEPTH:	-31.00 ft. (operational note only)	GEOLOGIST: FIELD TEAM:	TWK - NC #1752 DG, LF, ST		
Depth	Lithology	Classification Of Materials (Description)	Sample #	Remarks		
1		0.0 to 1.8 ft: Coarse Sand - Clean, tan w/ minor shell and trace pea gravel	S1	S1: 0.0 ft. to 1.8 ft. Shell: 26.9% Mean Grain Size: 0.656mm		
2		1.8 to 3.7 ft: Coarse Sand - Clean, tan w/ minor shell	S2	S2: 1.8 ft. to 3.7 ft. Shell: 19.4% Mean Grain Size: 0.527mm		
3		-- 2.3 ft: Shell Fragment - 2 cm				
4		-- 3.1 ft: Shell Fragment - 2 cm	S3	S3: 3.7 ft. to 4.7 ft. Shell: 8.3% Mean Grain Size: 0.363mm		
5		-- 3.3 ft: Shell Fragment - 3 cm				
6		3.7 to 4.7 ft: Medium Sand - Clean, tan w/ minor shell	S4	S4: 4.7 ft. to 7.6 ft. Shell: 15.6% Mean Grain Size: 0.453mm		
7		4.7 to 7.6 ft: Medium Sand - Clean, tan w/ shell concentration @ 4.7 - 5.0ft and mottling @ 7.3 - 7.6ft				
8		7.6 to 9.4 ft: Medium Sand - Clean, tan, uniform	S5	S5: 7.6 ft. to 9.4 ft. Shell: 11.5% Mean Grain Size: 0.409mm		
9						
10						

Area Location Map

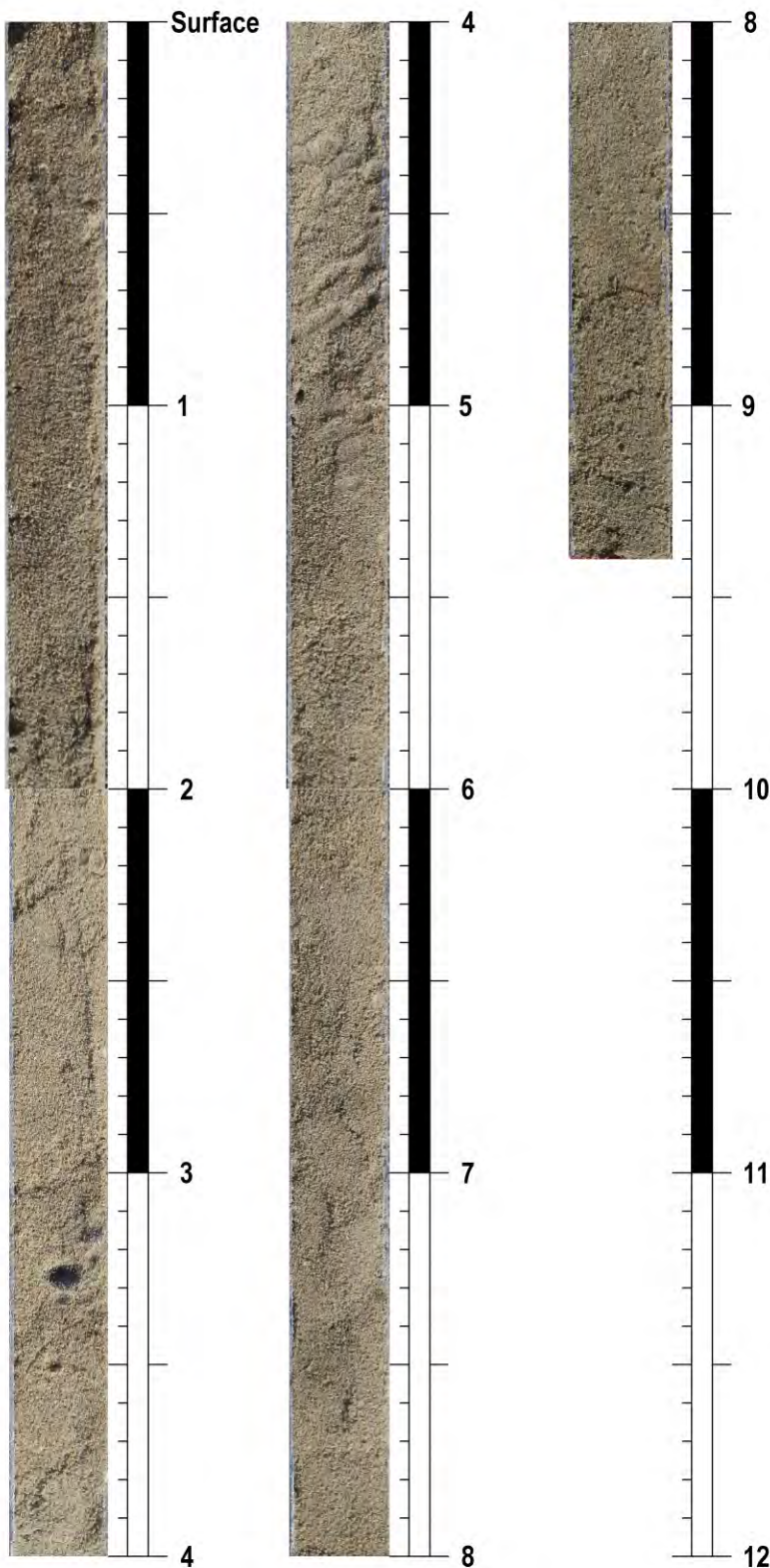


OFFSHORE SAND SOURCE - CSE CORE NO. **Bux-36**

Core Location Map



ELEVATION TOP OF HOLE: -31.1 ft NAVD
TOTAL DEPTH OF HOLE: 9.4 ft



Note:

All core depths in feet.
See core log sheet for additional geotechnical information.

PROJECT TITLE:

Dare County, NC
Beach Nourishment
Feasibility Study - Phase 1

PREPARED FOR:

County of Dare
954 Marshall C. Collins Drive (286)
PO Box 1000
Manteo NC 27954

DRAWING TITLE:

CORE LOG
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SCALE:

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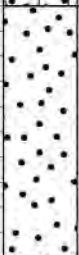
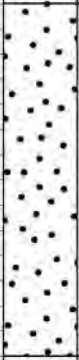
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T.Hair

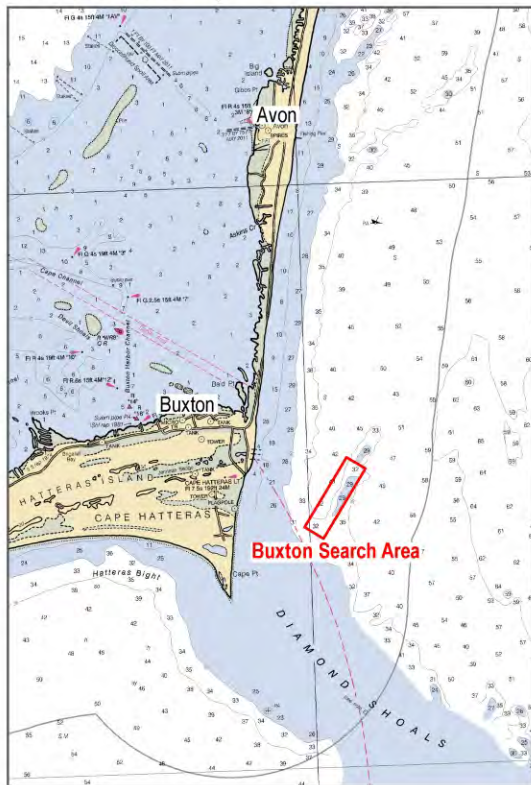
PROJECT #:

2403-02

36

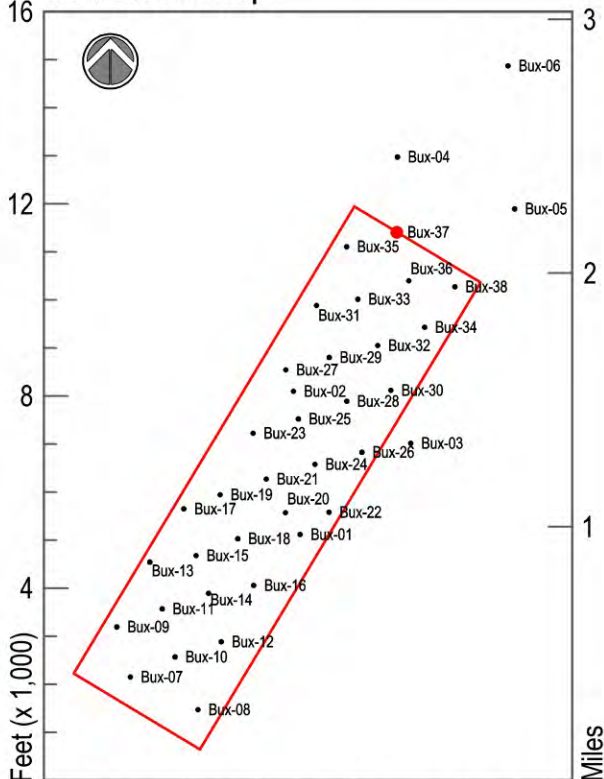
CORE LOG		Coastal Science & Engineering			Sheet 36 of 53	
PROJECT: 2403 - Dare County		COORDINATES:		HOLE NUMBER:		
LOCALITY: Buxton, NC		Northing: 565942.480 Easting: 3049561.710 Grid Datum: NAD '83		Bux-37 (as shown on title drawing and file no.)		
DATE: 2014-Oct-28	TOP ELEVATION:	-36.20 ft. NAVD '88	DEVICE DESIGNATION:	Coastal Science & Engineering		
BORE ANGLE: 90.00°						
BURDEN THICKNESS: 7.8 ft.	BOTTOM ELEVATION:	-44.00 ft. NAVD '88	BARREL SIZE/TYPE:	3 in. Aluminum		
CORE RECOVERY: 7.8 ft. (100.0%)	WATER DEPTH:	-36.00 ft. (operational note only)	GEOLOGIST: FIELD TEAM:	TWK - NC #1752 DG, LF, ST		
Depth	Lithology	Classification Of Materials (Description)	Sample #	Remarks		
1		0.0 to 3.0 ft: Medium Sand / Coarse Sand mix - Moderate crushed shell present	S1	S1: 0.0 ft. to 3.0 ft. Shell: 22.1% Mean Grain Size: 0.580mm		
2						
3			3.0 to 5.0 ft: Medium Sand - Clean, tan, uniform w/ trace shell	S2	S2: 3.0 ft. to 5.0 ft. Shell: 16.6% Mean Grain Size: 0.440mm	
4						
5		5.0 to 7.8 ft: Medium Sand - Clean, tan, uniform	S3	S3: 5.0 ft. to 7.8 ft. Shell: 9.2% Mean Grain Size: 0.397mm		
6						
7						
8						
9						
10						

Area Location Map

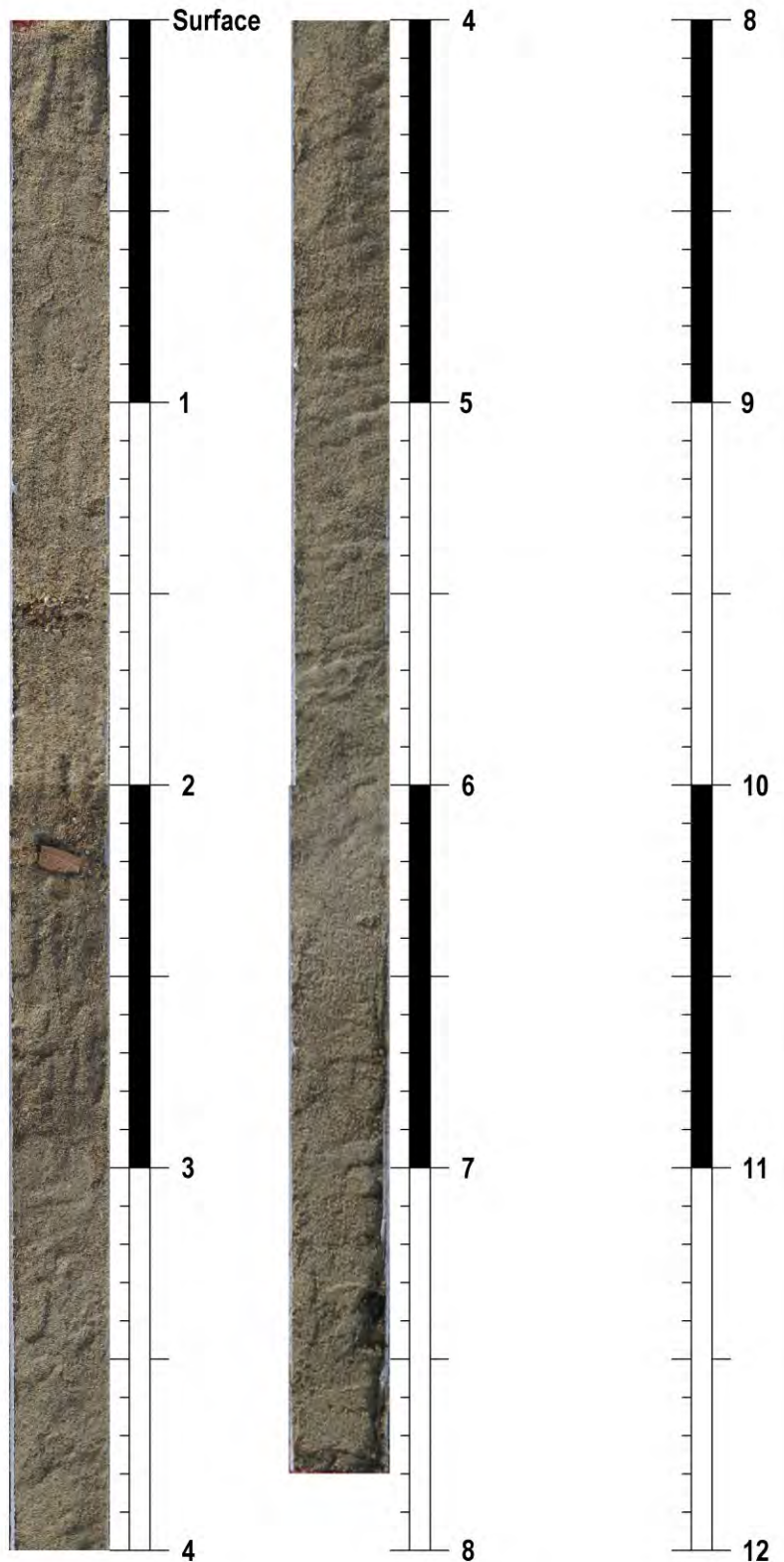


OFFSHORE SAND SOURCE - CSE CORE NO. **Bux-37**

Core Location Map



ELEVATION TOP OF HOLE: -36.2 ft NAVD
TOTAL DEPTH OF HOLE: 7.8 ft



Note:

All core depths in feet.
See core log sheet for additional geotechnical information.

PROJECT TITLE:

Dare County, NC
Beach Nourishment
Feasibility Study - Phase 1

PREPARED FOR:

County of Dare
954 Marshall C. Collins Drive (286)
PO Box 1000
Manteo NC 27954

DRAWING TITLE:

CORE LOG
PHOTO MOSAIC

SCALE:

AS SHOWN

BUX

DATE:

Jan 2015

DRAWN BY:

T.Hair

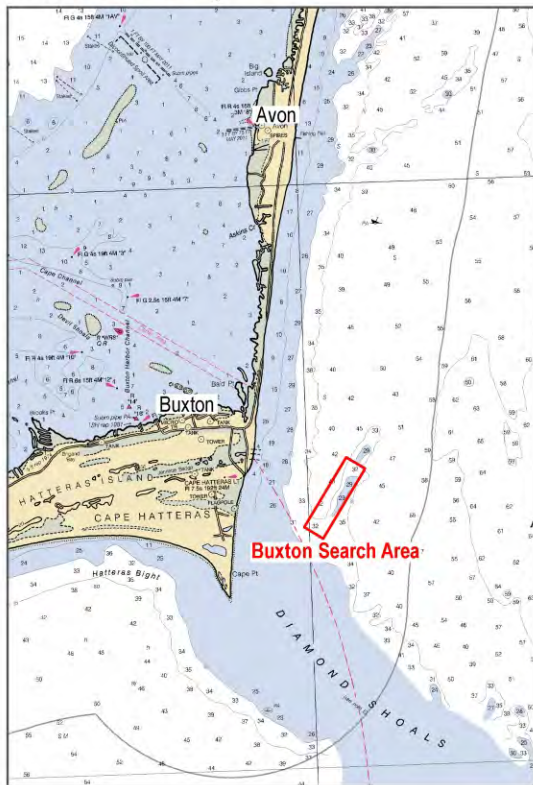
PROJECT #:

2403-02

37

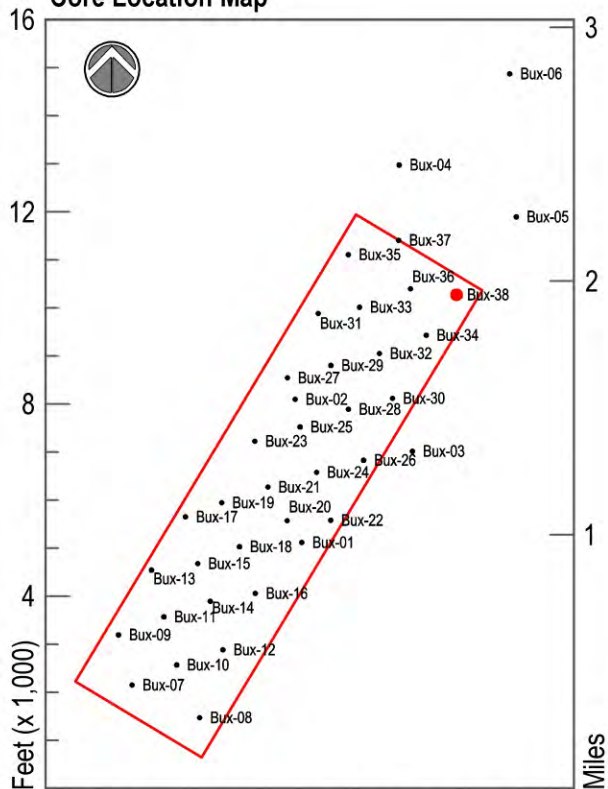
CORE LOG		Coastal Science & Engineering			Sheet 37 of 53	
PROJECT: 2403 - Dare County		COORDINATES:		HOLE NUMBER:		
LOCALITY: Buxton, NC		Northing: 565091.730 Easting: 3050467.850 Grid Datum: NAD '83		Bux-38 (as shown on title drawing and file no.)		
DATE: 2014-Oct-28	TOP ELEVATION:	-35.00 ft. NAVD '88	DEVICE DESIGNATION:	Coastal Science & Engineering		
BORE ANGLE: 90.00°						
BURDEN THICKNESS: 7.2 ft.	BOTTOM ELEVATION:	-42.20 ft. NAVD '88	BARREL SIZE/TYPE:	3 in. Aluminum		
CORE RECOVERY: 7.2 ft. (100.0%)	WATER DEPTH:	-38.00 ft. (operational note only)	GEOLOGIST: FIELD TEAM:	TWK - NC #1752 DG, LF, ST		
Depth	Lithology	Classification Of Materials (Description)	Sample #	Remarks		
1		0.0 to 1.6 ft: Medium Sand - Clean, tan, uniform w/ trace shell	S1	S1: 0.0 ft. to 1.6 ft. Shell: 6.4% Mean Grain Size: 0.307mm		
2		1.6 to 3.3 ft: Medium Sand - Clean, tan w/ minor shell and isolated clasts	S2	S2: 1.6 ft. to 3.3 ft. Shell: 12.7% Mean Grain Size: 0.450mm		
3		3.3 to 5.5 ft: Medium Sand - Clean, tan w/ minor shell — 3.9 ft: Medium Scallop - 4 cm	S3	S3: 3.3 ft. to 5.5 ft. Shell: 11.5% Mean Grain Size: 0.485mm		
4						
5		5.5 to 6.8 ft: Medium Sand - Clean, light grey w/ minor shell and shell concentration @ 6.4 - 6.5ft	S4	S4: 5.5 ft. to 6.8 ft. Shell: 14.7% Mean Grain Size: 0.339mm		
6		6.8 to 7.2 ft: Mud - Sandy, dark grey, estimated >50% mud	S5	S5: 6.8 ft. to 7.2 ft.		
7		No Sample				
8						
9						
10						

Area Location Map

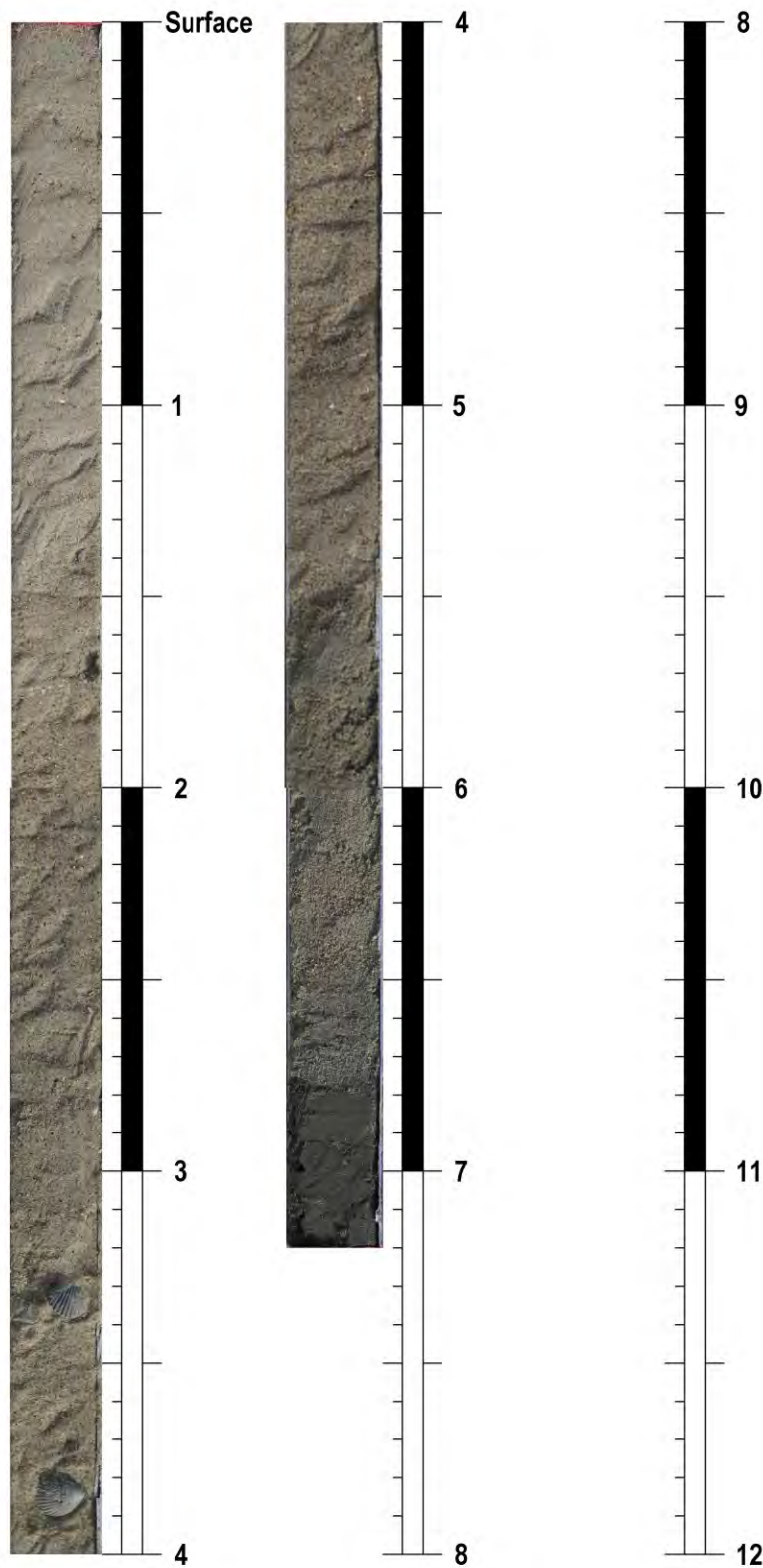


OFFSHORE SAND SOURCE - CSE CORE NO. **Bux-38**

Core Location Map



ELEVATION TOP OF HOLE: -36.5 ft NAVD
TOTAL DEPTH OF HOLE: 7.2 ft



Note:
All core depths in feet.
See core log sheet for additional geotechnical information.

PROJECT TITLE:

Dare County, NC
Beach Nourishment
Feasibility Study - Phase 1

PREPARED FOR:

County of Dare
954 Marshall C. Collins Drive (286)
PO Box 1000
Manteo NC 27954

DRAWING TITLE:

CORE LOG
PHOTO MOSAIC

SCALE:

AS SHOWN

BUX

DATE:

Jan 2015

DRAWN BY:

T.Hair

PROJECT #:

2403-02

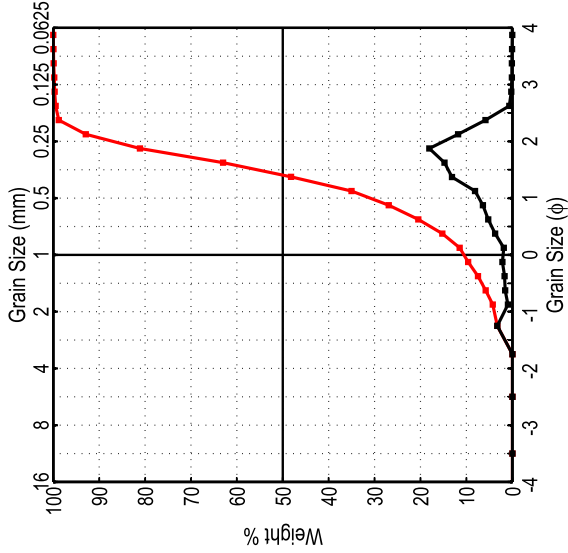
38

ATTACHMENT 3A

SAMPLE GRAIN SIZE DISTRIBUTIONS (GSDs)

Individual Core Samples

Grain Size Distribution



Project 2403
Location Hatteras NC
Date July 2013
Station Bux-01-S2
Interval 2.0-4.0
Mean 0.402 mm
STD 0.546 mm
Skewness -1.163
USCS Wentworth
SP Medium Sand
Fine Sand Moderately Sorted
Poorly Graded Coarse Skewed
Leptokurtic
Total weight (gram) 120.49
% finer than 4.00 phi 0.04
% coarser than -1.00 phi 3.28
% CaCO₃ 19.5

Class Limits Mid Point			Weight %			Cum. Wt %		
(phi)	(phi)	(phi)	(gram)	(phi)	(phi)	(phi)	(phi)	(phi)
-4	-4.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-3	-3.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-2	-2.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-1	-1.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-0.75	-0.875	1.18	0.98	4.26	3.28	3.28	3.28	3.28
-0.5	-0.625	1.88	1.56	5.82	7.49	7.49	7.49	7.49
-0.25	-0.375	2.02	1.68	7.49	9.17	9.17	9.17	9.17
0	-0.125	2.59	2.15	9.64	11.49	11.49	11.49	11.49
0.25	0.125	2.23	3.76	15.25	15.25	15.25	15.25	15.25
0.75	0.625	6.31	5.24	20.49	20.49	20.49	20.49	20.49
1	0.875	7.73	6.42	26.91	26.91	26.91	26.91	26.91
1.25	1.125	9.80	8.13	35.04	35.04	35.04	35.04	35.04
1.5	1.375	15.85	13.15	48.19	48.19	48.19	48.19	48.19
1.75	1.625	17.83	14.80	62.99	62.99	62.99	62.99	62.99
2	1.875	21.80	18.09	81.09	81.09	81.09	81.09	81.09
2.25	2.125	14.26	11.84	92.92	92.92	92.92	92.92	92.92
2.5	2.375	7.07	5.87	98.79	98.79	98.79	98.79	98.79
2.75	2.625	0.79	0.66	99.68	99.68	99.68	99.68	99.68
3	2.875	0.29	0.24	99.98	99.98	99.98	99.98	99.98
3.25	3.125	0.11	0.09	99.78	99.78	99.78	99.78	99.78
3.5	3.375	0.12	0.10	99.88	99.88	99.88	99.88	99.88
3.75	3.625	0.07	0.06	99.93	99.93	99.93	99.93	99.93
4	3.875	0.03	0.02	99.96	99.96	99.96	99.96	99.96
>4.0	4.25	0.05	0.04	100.00	100.00	100.00	100.00	100.00

Moment Measures		
Mean	1.315	0.402
Standard Deviation	0.872	0.546
Skewness	-1.163	
Kurtosis	4.210	
Dispersion	5.0	
Standard Deviation	1.790	
Deviation from Normal	1.935	

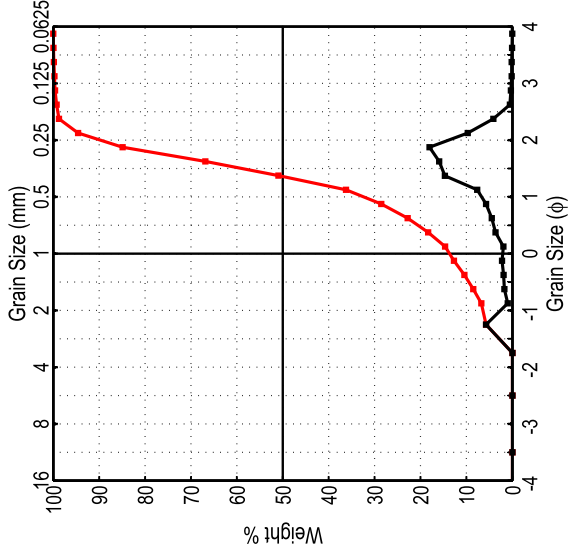
Percentiles		
1	-1.595	
5	-0.755	
16	0.410	
25	0.800	
50	1.405	
75	1.790	
84	1.935	
95	2.215	
99	2.455	

Graphic Phi Parameters		
Mean	1.173	1.250
Standard Deviation	0.762	0.831
Skewness (1)	-0.305	-0.380
Skewness (2)	-0.885	
Kurtosis	0.948	1.230

Inman 1952		
Mean	1.173	1.250
Standard Deviation	0.762	0.831
Skewness (1)	-0.305	-0.380
Skewness (2)	-0.885	
Kurtosis	0.948	1.230

Folk & Ward 1957		
Mean	1.173	1.250
Standard Deviation	0.762	0.831
Skewness (1)	-0.305	-0.380
Skewness (2)	-0.885	
Kurtosis	0.948	1.230

Grain Size Distribution



Project 2403
Location Hatteras NC
Date July 2013
Station Bux-01-S1
Interval 0.0-2.0
Mean 0.429 mm
STD 0.518 mm
Skewness -1.157
USCS Wentworth
SP Medium Sand
Medium Sand Moderately Sorted
Poorly Graded Coarse Skewed
Leptokurtic
Total weight (gram) 119.77
% finer than 4.00 phi 0.03
% coarser than -1.00 phi 5.74
% CaCO₃ 21.1

Class Limits Mid Point			Weight %			Cum. Wt %		
(phi)	(phi)	(phi)	(gram)	(phi)	(phi)	(phi)	(phi)	(phi)
-4	-4.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-3	-3.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-2	-2.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-1	-1.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-0.75	-0.875	1.23	6.88	5.74	6.77	5.74	5.74	5.74
-0.5	-0.625	2.10	1.75	8.52	8.52	8.52	8.52	8.52
-0.25	-0.375	2.29	2.26	10.44	10.44	10.44	10.44	10.44
0	-0.125	2.71	2.26	12.70	12.70	12.70	12.70	12.70
0.25	0.125	2.34	1.95	14.65	14.65	14.65	14.65	14.65
0.5	0.375	4.41	3.68	18.34	18.34	18.34	18.34	18.34
0.75	0.625	5.36	4.48	22.81	22.81	22.81	22.81	22.81
1	0.875	6.88	5.74	28.55	28.55	28.55	28.55	28.55
1.25	1.125	9.18	7.66	36.22	36.22	36.22	36.22	36.22
1.5	1.375	17.61	14.70	50.92	50.92	50.92	50.92	50.92
1.75	1.625	19.08	15.93	66.85	66.85	66.85	66.85	66.85
2	1.875	21.59	18.03	84.88	84.88	84.88	84.88	84.88
2.25	2.125	11.63	9.71	94.59	94.59	94.59	94.59	94.59
2.5	2.375	4.96	4.14	98.73	98.73	98.73	98.73	98.73
2.75	2.625	0.62	0.52	99.25	99.25	99.25	99.25	99.25
3	2.875	0.39	0.33	99.57	99.57	99.57	99.57	99.57
3.25	3.125	0.18	0.15	99.72	99.72	99.72	99.72	99.72
3.5	3.375	0.16	0.13	99.86	99.86	99.86	99.86	99.86
3.75	3.625	0.09	0.08	99.93	99.93	99.93	99.93	99.93
4	3.875	0.05	0.04	99.97	99.97	99.97	99.97	99.97
>4.0	4.25	0.03	0.03	100.00	100.00	100.00	100.00	100.00

Moment Measures		
Mean	1.220	0.429
Standard Deviation	0.949	0.518
Skewness	-1.157	
Kurtosis	3.861	
Dispersion	5.0	
Standard Deviation	1.360	
Deviation from Normal	1.865	

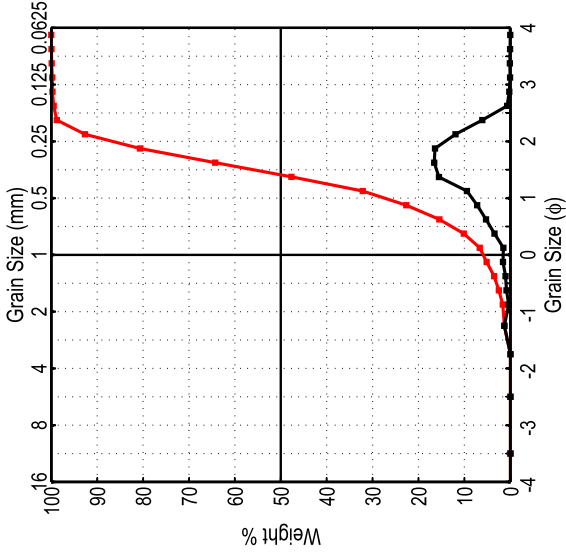
Percentiles		
1	-1.665	
5	-1.315	
16	0.215	
25	0.720	
50	1.360	
75	1.740	
84	1.865	
95	2.150	
99	2.505	

Graphic Phi Parameters		
Mean	1.040	1.147
Standard Deviation	0.825	0.938
Skewness (1)	-0.388	-0.466
Skewness (2)	-1.142	
Kurtosis	1.100	1.392

Inman 1952		
Mean	1.040	1.147
Standard Deviation	0.825	0.938
Skewness (1)	-0.388	-0.466
Skewness (2)	-1.142	
Kurtosis	1.100	1.392

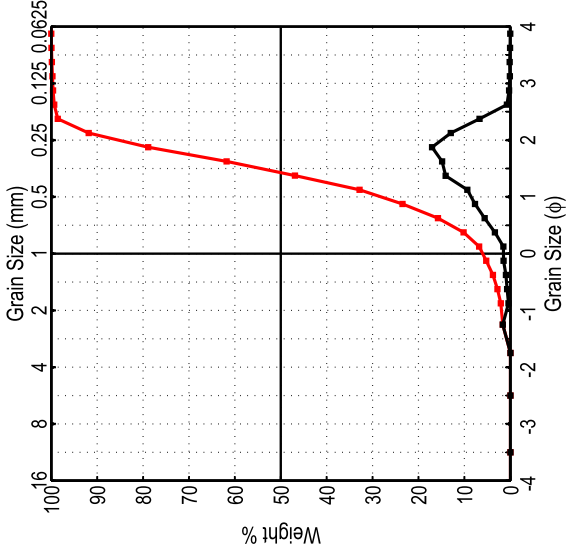
Folk & Ward 1957		
Mean	1.040	1.147
Standard Deviation	0.825	0.938
Skewness (1)	-0.388	-0.466
Skewness (2)	-1.142	
Kurtosis	1.100	1.392

Grain Size Distribution



Project 2403
Location Hatteras NC
Date July 2013
Station Bux-01-S4
Interval 6.0-7.5
Mean 0.375 mm
STD 0.604 mm
Skewness -1.098
USCS Wentworth
SP Medium Sand
Fine Sand Moderately Sorted
Poorly Graded Coarse Skewed
Leptokurtic
Total weight (gram) 120.35
% finer than 4.00 phi 0.03
% coarser than -1.00 phi 1.29
% CaCO₃ 17.4

Grain Size Distribution

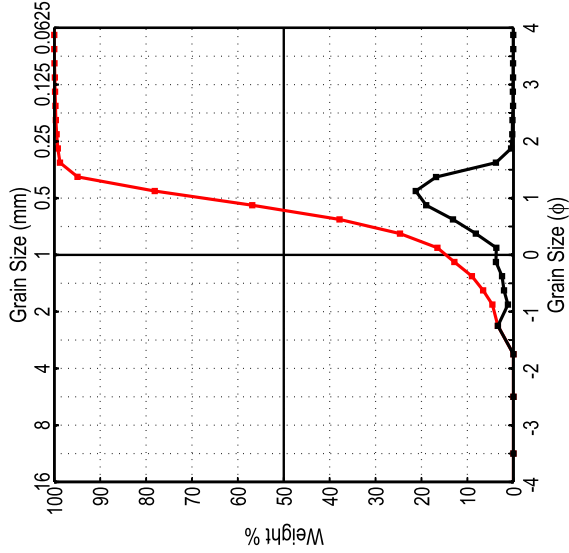


Project 2403
Location Hatteras NC
Date July 2013
Station Bux-01-S3
Interval 4.0-6.0
Mean 0.374 mm
STD 0.593 mm
Skewness -1.111
USCS Wentworth
SP Medium Sand
Fine Sand Moderately Sorted
Poorly Graded Coarse Skewed
Leptokurtic
Total weight (gram) 119.61
% finer than 4.00 phi 0.03
% coarser than -1.00 phi 1.66
% CaCO₃ 16.5

Class Limits Mid Point			Weight	Weight %	Cumm. Wt %	Percentiles				Moment Measures				Graphic Phi Parameters				Folk & Ward			
(phi)	(phi)	(gram)	(gram)			1	5	16	25	50	75	84	95	99	Mean	Standard Deviation	Skewness (1)	Kurtosis	1952	1957	
-4	-4.5	0.00	0.00	0.00	0.00	-1.360	-0.150	0.645	0.935	1.410	1.790	1.945	2.220	2.455	1.295	0.650	-0.177	-0.577	0.823	1.333	
-3	-3.5	0.00	0.00	0.00	0.00														0.684	0.674	
-2	-2.5	0.00	0.00	0.00	0.00														-0.247	-0.247	
-1.5	-1.75	0.00	0.00	0.00	0.00															4.928	
-1	-1.25	1.35	1.29	1.29	1.29																
-0.75	-0.875	0.44	0.37	1.65	0.37																
-0.5	-0.625	1.03	0.86	2.51	1.04																
-0.25	-0.375	1.25	1.04	3.55	1.04																
0	-0.125	1.93	1.60	5.15	1.60																
0.25	0.125	1.84	1.53	6.68	1.53																
0.5	0.375	4.18	3.47	10.15	3.47																
0.75	0.625	6.39	5.31	15.46	5.31																
1	0.875	8.69	7.22	22.68	7.22																
1.25	1.125	11.39	9.46	32.15	9.46																
1.5	1.375	18.72	15.55	47.70	15.55																
1.75	1.625	19.94	16.57	64.27	16.57																
2	1.875	19.75	16.41	80.68	16.41																
2.25	2.125	14.40	11.97	92.65	11.97																
2.5	2.375	7.38	6.13	98.78	6.13																
2.75	2.625	0.85	0.71	99.48	0.71																
3	2.875	0.26	0.22	99.70	0.22																
3.25	3.125	0.10	0.08	99.78	0.08																
3.5	3.375	0.12	0.10	99.88	0.10																
3.75	3.625	0.06	0.05	99.93	0.05																
4	3.875	0.04	0.03	99.97	0.03																
>4.0	4.25	0.04	0.03	100.00	0.03																

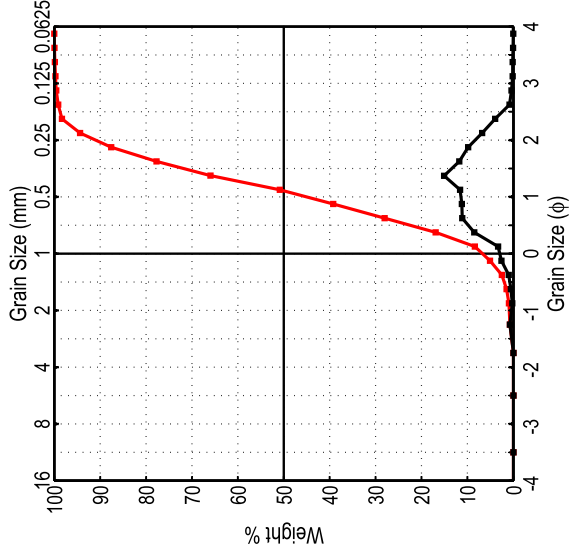
Class Limits Mid Point			Weight %	Cumm. Wt %	Percentiles									Moment Measures				Graphic Phi Parameters				Folk & Ward	
(phi)	(phi)	Weight (gram)			1	5	16	25	50	75	84	95	99	Mean	Standard Deviation	Skewness (1)	Kurtosis	Inman 1952	1957				
-4	-4.5	0.00	0.00	0.00															1.420	0.374			
-3	-3.5	0.00	0.00	0.00															0.754	0.593			
-2	-2.5	0.00	0.00	0.00															-1.111				
-1.5	-1.75	0.00	0.00	0.00															4.922				
-1	-1.25	1.98	1.66	1.66																			
-0.75	-0.875	0.50	0.42	2.07																			
-0.5	-0.625	0.87	0.73	2.80																			
-0.25	-0.375	1.18	0.99	3.79																			
0	-0.125	1.78	1.49	5.28																			
0.25	0.125	1.83	1.53	6.81																			
0.5	0.375	4.03	3.37	10.17																			
0.75	0.625	6.68	5.58	15.76																			
1	0.875	9.23	7.72	23.48																			
1.25	1.125	11.20	9.36	32.84																			
1.5	1.375	16.85	14.09	46.93																			
1.75	1.625	17.80	14.88	61.81																			
2	1.875	20.39	17.05	78.86																			
2.25	2.125	15.50	12.96	91.82																			
2.5	2.375	8.05	6.73	98.55																			
2.75	2.625	0.92	0.77	99.31																			
3	2.875	0.35	0.29	99.61																			
3.25	3.125	0.15	0.13	99.73																			
3.5	3.375	0.16	0.13	99.87																			
3.75	3.625	0.09	0.08	99.94																			
4	3.875	0.03	0.03	99.97																			
>4.0	4.25	0.04	0.03	100.00																			

Grain Size Distribution



Project 2403
Location Hatteras NC
Date July 2013
Station Bux-02-S1
Interval 0.0-2.6
Mean 0.588 mm
STD 0.626 mm
Skewness -1.024
USCS Wentworth
SP Coarse Sand
Medium Sand Moderately Well Sorted
Poorly Graded Coarse Skewed
Leptokurtic
Total weight (gram) 119.89
% finer than 4.00 phi 0.02
% coarser than -1.00 phi 3.39
% CaCO₃ 28.1

Grain Size Distribution

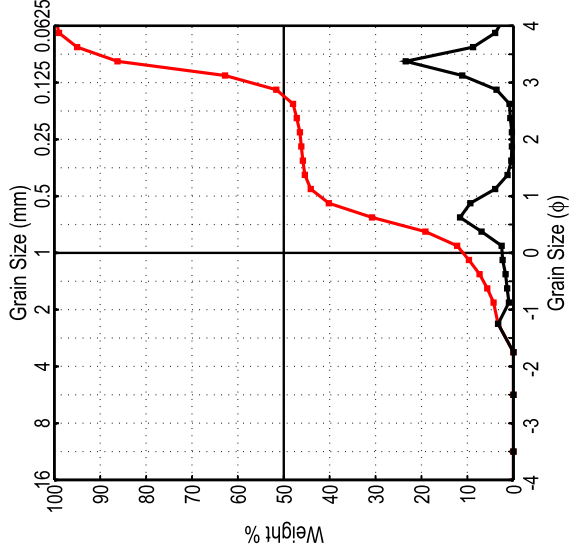


Project 2403
Location Hatteras NC
Date July 2013
Station Bux-01-S5
Interval 7.5-9.5
Mean 0.440 mm
STD 0.606 mm
Skewness -0.242
USCS Wentworth
SP Medium Sand
Medium Sand Poorly Graded
Moderately Sorted Symmetrical
Mesokurtic
Total weight (gram) 120.41
% finer than 4.00 phi 0.04
% coarser than -1.00 phi 0.73
% CaCO₃ 26.6

Percentiles					Moment Measures	
1	-1.600	Weight %	Cumm. Wt %		Mean	(phi)
5	-0.820	0.00	0.00		Standard Deviation	(mm)
16	0.090	0.00	0.00		Skewness	0.767 0.588
25	0.380	0.00	0.00		Kurtosis	0.676 0.626
50	0.785	3.39	3.39		Dispersion	-1.024 4.849
75	1.090	4.55	6.59		Standard Deviation	
84	1.215	6.59	9.05		Deviation from Normal	
95	1.380	2.46	9.05			
99	1.760	3.78	12.83			
Graphic Phi Parameters					Inman	Folk & Ward
					1952	1957
Mean					0.652	0.697
Standard Deviation					0.563	0.615
Skewness (1)					-0.236	-0.347
Skewness (2)					-0.898	
Kurtosis					0.956	1.270

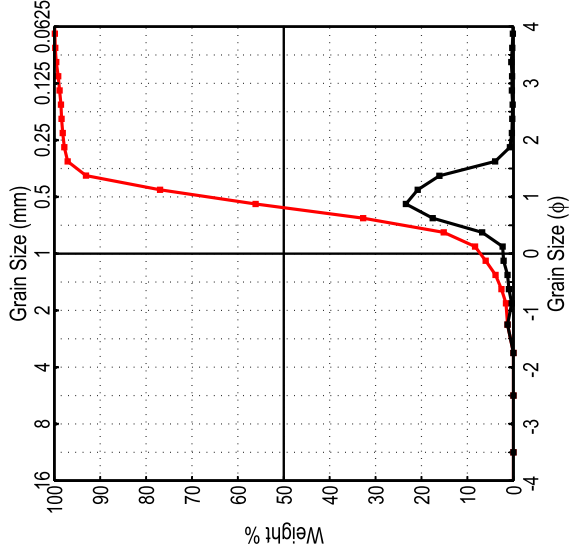
Percentiles					Moment Measures	
1	-0.850	Weight %	Cumm. Wt %		Mean	(phi)
5	-0.135	0.00	0.00		Standard Deviation	(mm)
16	0.350	0.00	0.00		Skewness	1.184 0.440
25	0.555	0.00	0.00		Kurtosis	0.723 0.606
50	1.105	0.00	0.00		Dispersion	-0.242 3.467
75	1.565	0.22	0.95		Standard Deviation	
84	1.785	0.54	1.49		Deviation from Normal	
95	2.165	1.01	2.50			
99	2.585	2.59	5.09			
Graphic Phi Parameters					Inman	Folk & Ward
					1952	1957
Mean					1.068	1.080
Standard Deviation					0.718	0.707
Skewness (1)					-0.052	-0.065
Skewness (2)					-0.125	
Kurtosis					0.603	0.933

Grain Size Distribution



Project 2403
Location Hatteras NC
Date July 2013
Station Bux-04-S4
Interval 6.3-7.2
Mean 0.251 mm
STD 0.341 mm
Skewness -0.379
USCS Wentworth
SP Medium Sand
Fine Sand Poorly Sorted
Poorly Graded Symmetrical
Very Platykurtic
Total weight (gram) 119.36
% finer than 4.00 phi 1.04
% coarser than -1.00 phi 3.34
% CaCO₃ 29.4

Grain Size Distribution

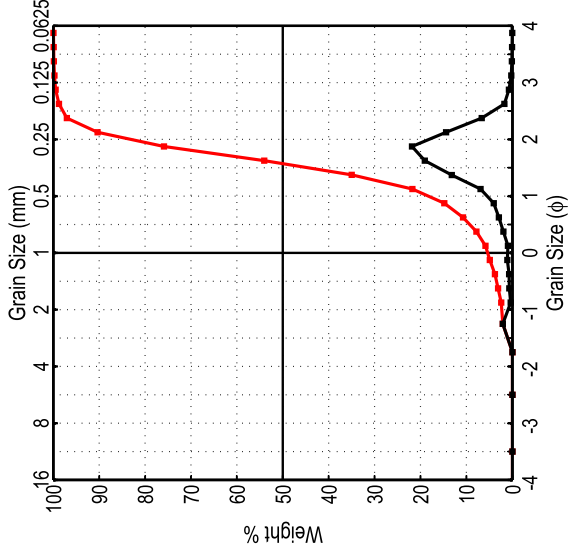


Project 2403
Location Hatteras NC
Date July 2013
Station Bux-04-S3
Interval 4.0-6.3
Mean 0.532 mm
STD 0.658 mm
Skewness 0.167
USCS Wentworth
SP Coarse Sand
Medium Sand Moderately Well Sorted
Poorly Graded Symmetrical
Very Leptokurtic
Total weight (gram) 119.83
% finer than 4.00 phi 0.13
% coarser than -1.00 phi 1.26
% CaCO₃ 17.6

Class Limits Mid Point			Weight	Weight %	Cumm. Wt %	Percentiles					Moment Measures					Graphic Phi Parameters					Folk & Ward				
(φ)	(φ)	(φ)	(gram)			1	5	16	25	50	75	84	95	99	Mean	Standard Deviation	Skewness	Kurtosis	Dispersion	Standard Deviation	Deviation from Normal	Inman	1952	1957	
-4	-4.5	0.00	0.00	0.00	0.00	-1.600	-0.750	0.260	0.500	2.765	3.255	3.350	3.625	3.890	1.996	0.251	1.554	-0.379	1.685						
-3	-3.5	0.00	0.00	0.00	0.00																				
-2	-2.5	0.00	0.00	0.00	0.00																				
-1.5	-1.75	0.00	0.00	0.00	0.00																				
-1	-1.25	3.39	3.39	3.34	3.34																				
-0.75	-0.875	1.16	1.16	0.97	4.31																				
-0.5	-0.625	1.62	1.62	1.36	5.67																				
-0.25	-0.375	2.00	1.68	1.68	7.35																				
0	-0.125	2.79	2.34	2.34	9.68																				
0.25	0.125	3.06	2.56	2.56	12.25																				
0.5	0.375	8.26	6.92	6.92	19.17																				
0.75	0.625	13.86	11.61	11.61	30.78																				
1	0.875	11.21	9.39	9.39	40.17																				
1.25	1.125	4.74	3.97	3.97	44.14																				
1.5	1.375	1.52	1.27	1.27	45.42																				
1.75	1.625	0.52	0.44	0.44	45.85																				
2	1.875	0.37	0.31	0.31	46.16																				
2.25	2.125	0.37	0.31	0.31	46.47																				
2.5	2.375	0.81	0.68	0.68	47.15																				
2.75	2.625	0.98	0.82	0.82	47.97																				
3	2.875	4.39	3.68	3.68	51.65																				
3.25	3.125	13.29	11.13	11.13	62.78																				
3.5	3.375	27.98	23.44	23.44	86.23																				
3.75	3.625	10.45	8.76	8.76	94.98																				
4	3.875	4.75	3.98	3.98	98.96																				
>4.0	4.25	1.24	1.04	1.04	100.00																				

Class Limits Mid Point			Weight (gram)	Weight %	Cumm. Wt %	Percentiles										Moment Measures					Graphic Phi Parameters					Folk & Ward	
(φ)	(φ)	(φ)				1	5	16	25	50	75	84	95	99	Mean	Standard Deviation	Skewness	Kurtosis	Mean	Standard Deviation	Skewness (1)	Skewness (2)	Kurtosis	1957			
-4	-4.5	0.00	0.00	0.00	0.00	-1.355	0.912	0.532																			
-3	-3.5	0.00	0.00	0.00	0.00	-0.245	0.603	0.658																			
-2	-2.5	0.00	0.00	0.00	0.00	0.385	0.167																				
-1.5	-1.75	0.00	0.00	0.00	0.00	0.515	8.527																				
-1	-1.25	1.51	1.26	1.26	1.26	0.810																					
-0.75	-0.875	0.44	0.37	1.63	0.37	1.100																					
-0.5	-0.625	1.16	0.97	2.60	0.97	1.100																					
-0.25	-0.375	1.54	1.29	3.88	1.29																						
0	-0.125	2.55	2.13	6.01	2.13																						
0.25	0.125	2.79	2.33	8.34	2.33																						
0.5	0.375	8.17	6.82	15.15	6.82																						
0.75	0.625	21.06	17.57	32.73	17.57																						
1	0.875	28.03	23.39	56.12	23.39																						
1.25	1.125	24.95	20.82	76.94	20.82																						
1.5	1.375	19.32	16.12	93.07	16.12																						
1.75	1.625	4.78	3.99	97.05	3.99																						
2	1.875	0.88	0.73	97.79	0.73																						
2.25	2.125	0.40	0.33	98.12	0.33																						
2.5	2.375	0.30	0.25	98.37	0.25																						
2.75	2.625	0.18	0.15	98.52	0.15																						
3	2.875	0.37	0.31	98.83	0.31																						
3.25	3.125	0.35	0.29	99.12	0.29																						
3.5	3.375	0.52	0.43	99.56	0.43																						
3.75	3.625	0.26	0.22	99.77	0.22																						
4	3.875	0.11	0.09	99.87	0.09																						
>4.0	4.25	0.16	0.13	100.00	0.13																						

Grain Size Distribution



Project 2403

Location Hatteras NC

Date July 2013

Station Bux-05-S1

Interval 0.0-3.0

Mean 0.340 mm

STD 0.599 mm

Skewness -1.566

USCS Wentworth

SP Medium Sand

Fine Sand Moderately Sorted

Poorly Graded Strongly Coarse Skewed

Leptokurtic

Total weight (gram) 119.57

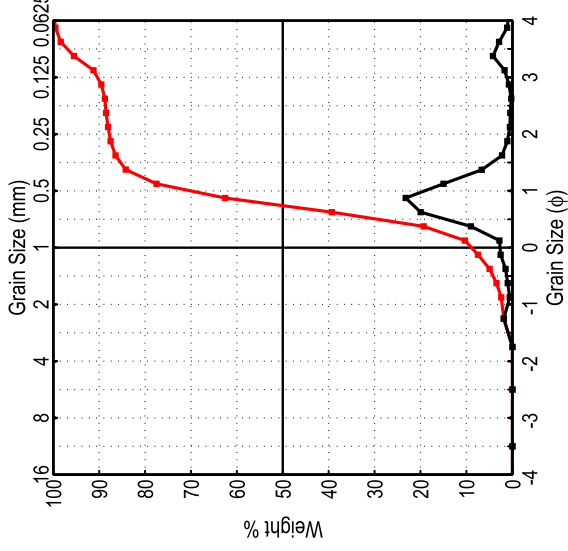
% finer than 4.00 phi 0.05

% coarser than -1.00 phi 2.07

% CaCO_3 8.2

Class Limits Mid Point			Weight %			Cummn. Wt %			Percentiles			Moment Measures			Folk & Ward				
(ϕ)	(ϕ)	(g)	(g)	(g)	(g)	(g)	(g)	(g)	1	5	16	25	50	75	84	95	99	(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-1.510	-0.100	0.920	1.185	1.570	1.865	2.015	2.300	2.715	1.555	0.340
-3	-3.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.100	0.920	1.185	1.570	1.865	2.015	2.300	2.715	2.995	0.740	0.599
-2	-2.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.920	1.185	1.570	1.865	2.015	2.300	2.715	2.995	3.310	-1.566	6.744
-1.5	-1.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.185	1.570	1.865	2.015	2.300	2.715	2.995	3.310	3.625	6.744	
-1	-1.25	2.47	2.07	2.07	2.07	2.07	2.07	2.07	1.570	1.865	2.015	2.300	2.715	2.995	3.310	3.625	3.940		
-0.75	-0.875	0.45	0.38	2.44	0.65	3.09	0.71	3.81	2.015	2.300	2.715	2.995	3.310	3.625	3.940	4.255	4.570		
-0.5	-0.625	0.78	0.65	3.09	0.71	3.81	0.71	3.81	2.300	2.715	2.995	3.310	3.625	3.940	4.255	4.570	4.885		
-0.25	-0.375	0.85	0.71	3.81	0.71	3.81	0.71	3.81	2.715	2.995	3.310	3.625	3.940	4.255	4.570	4.885	5.200		
0	-0.125	1.31	1.10	4.90	0.95	5.85	0.95	5.85	2.995	3.310	3.625	3.940	4.255	4.570	4.885	5.200	5.515		
0.25	0.125	1.14	1.96	7.81	1.96	7.81	1.96	7.81	3.310	3.625	3.940	4.255	4.570	4.885	5.200	5.515	5.830		
0.5	0.375	2.34	3.53	2.95	2.95	10.76	2.95	10.76	3.625	3.940	4.255	4.570	4.885	5.200	5.515	5.830	6.145		
0.75	0.625	3.53	4.85	4.06	4.06	14.82	4.06	14.82	3.940	4.255	4.570	4.885	5.200	5.515	5.830	6.145	6.460		
1	0.875	4.85	6.94	6.94	6.94	21.76	6.94	21.76	4.255	4.570	4.885	5.200	5.515	5.830	6.145	6.460	6.775		
1.25	1.125	8.30	13.21	13.21	13.21	34.97	13.21	34.97	4.570	4.885	5.200	5.515	5.830	6.145	6.460	6.775	7.090		
1.5	1.375	15.79	19.05	19.05	19.05	54.02	19.05	54.02	4.885	5.200	5.515	5.830	6.145	6.460	6.775	7.090	7.405	1.502	
1.75	1.625	22.78	26.15	26.15	26.15	75.89	26.15	75.89	5.200	5.515	5.830	6.145	6.460	6.775	7.090	7.405	7.720	0.637	
2	1.875	26.15	30.32	30.32	30.32	90.32	30.32	90.32	5.515	5.830	6.145	6.460	6.775	7.090	7.405	7.720	8.035	-0.289	
2.25	2.125	17.25	17.25	17.25	17.25	14.43	17.25	14.43	5.830	6.145	6.460	6.775	7.090	7.405	7.720	8.035	8.350		
2.5	2.375	7.99	6.68	6.68	6.68	97.00	6.68	97.00	6.145	6.460	6.775	7.090	7.405	7.720	8.035	8.350	8.665		
2.75	2.625	2.07	1.73	1.73	1.73	98.73	1.73	98.73	6.460	6.775	7.090	7.405	7.720	8.035	8.350	8.665	8.980		
3	2.875	0.90	0.75	0.75	0.75	99.48	0.75	99.48	6.775	7.090	7.405	7.720	8.035	8.350	8.665	8.980	9.295	1.446	
3.25	3.125	0.27	0.23	0.23	0.23	99.71	0.23	99.71	7.090	7.405	7.720	8.035	8.350	8.665	8.980	9.295	9.610		
3.5	3.375	0.15	0.13	0.13	0.13	99.83	0.13	99.83	7.405	7.720	8.035	8.350	8.665	8.980	9.295	9.610	9.925		
3.75	3.625	0.09	0.08	0.08	0.08	99.91	0.08	99.91	7.720	8.035	8.350	8.665	8.980	9.295	9.610	9.925	10.240		
4	3.875	0.05	0.04	0.04	0.04	99.95	0.04	99.95	8.035	8.350	8.665	8.980	9.295	9.610	9.925	10.240	10.555		
>4.0	4.25	0.06	0.05	0.05	0.05	100.00	0.05	100.00	8.350	8.665	8.980	9.295	9.610	9.925	10.240	10.555	10.870		

Grain Size Distribution



Project 2403

Location Hatteras NC

Date July 2013

Station Bux-04-S5

Interval 7.2-7.9

Mean 0.481 mm

STD 0.495 mm

Skewness 1.150

USCS Wentworth

SP Medium Sand

Poorly Graded Poorly Sorted

Leptokurtic

Total weight (gram) 120.11

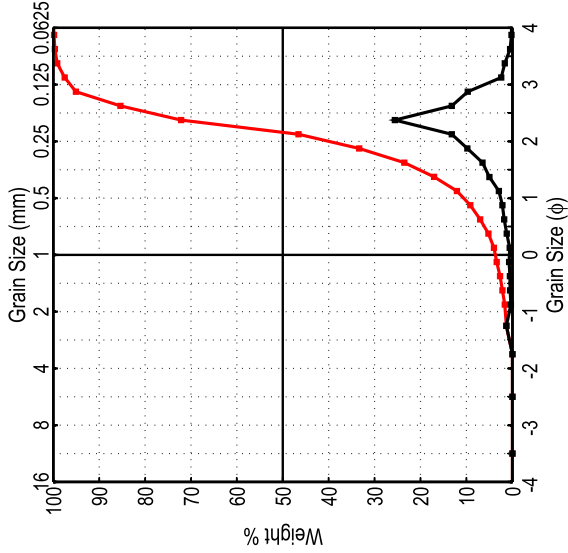
% finer than 4.00 phi 0.47

% coarser than -1.00 phi 1.87

% CaCO_3 22.4

Class Limits Mid Point			Weight %		Cum. Wt %		Percentiles			Moment Measures			Folk & Ward		
(ϕ)	(ϕ)	(gram)													
-4	-4.5	0.00	0.00	0.00	0.00	0.00	1	-1.485	Mean	Standard Deviation	Skewness	Kurtosis	Dispersion	Deviation from Normal	
-3	-3.5	0.00	0.00	0.00	0.00	0.00	5	-0.370							
-2	-2.5	0.00	0.00	0.00	0.00	0.00	16	0.285							
-1.5	-1.75	0.00	0.00	0.00	0.00	0.00	25	0.445							
-1	-1.25	2.25	1.87	1.87	1.87	1.87	50	0.740							
-0.75	-0.875	0.68	0.57	2.44	2.44	2.44	75	1.085							
-0.5	-0.625	1.23	1.02	3.46	3.46	3.46	84	1.370							
-0.25	-0.375	1.77	1.47	4.94	4.94	4.94	95	3.350							
0	-0.125	3.05	2.54	7.48	7.48	7.48	99	3.760							
0.25	0.125	3.40	2.83	10.31	10.31	10.31									
0.5	0.375	10.83	9.02	19.32	19.32	19.32									
0.75	0.625	24.00	19.98	39.31	39.31	39.31									
1	0.875	27.89	23.22	62.53	62.53	62.53									
1.25	1.125	17.99	14.98	77.50	77.50	77.50									
1.5	1.375	8.02	6.68	84.18	84.18	84.18									
1.75	1.625	2.71	2.26	86.44	86.44	86.44									
2	1.875	1.29	1.07	87.51	87.51	87.51									
2.25	2.125	0.64	0.53	88.04	88.04	88.04									
2.5	2.375	0.54	0.45	88.49	88.49	88.49									
2.75	2.625	0.30	0.25	88.74	88.74	88.74									
3	2.875	0.90	0.75	89.49	89.49	89.49									
3.25	3.125	2.06	1.72	91.21	91.21	91.21									
3.5	3.375	5.10	4.25	95.45	95.45	95.45									
3.75	3.625	3.59	2.91	98.37	98.37	98.37									
4	3.875	1.39	1.16	99.53	99.53	99.53									
>4.0	4.25	0.57	0.47	100.00	100.00	100.00									
							Graphic Phi Parameters			Inman	Folk & Ward				
										1952	1957				
										0.828	0.798				
										0.542	0.835				
										0.161	0.282				
										1.382	1.382				
										2.429	2.382				
											Kurtosis				

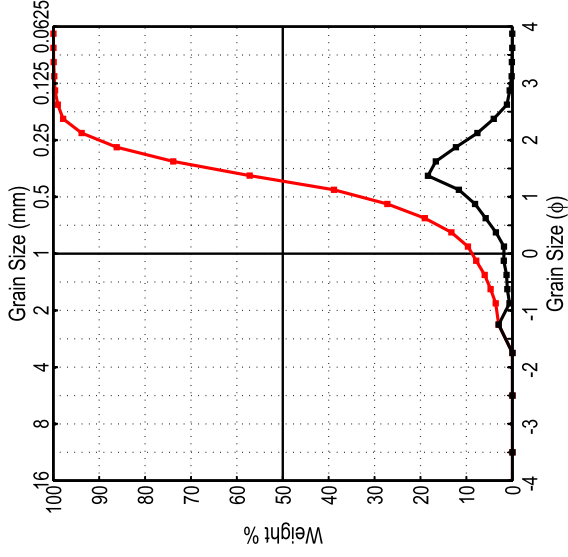
Grain Size Distribution



Project 2403
Location Hatteras NC
Date July 2013
Station Bux-05-S3
Interval 4.3-5.2
Mean 0.237 mm
STD 0.565 mm
Skewness -1.583
USCS Wentworth
SP Fine Sand
Fine Sand Moderately Sorted
Poorly Graded Strongly Coarse Skewed
Leptokurtic
Total weight (gram) 119.74
% finer than 4.00 phi 0.19
% coarser than -1.00 phi 1.33
% CaCO₃ 42.9

Class Limits Mid Point			Weight %			Cum. Wt %			Percentiles			Moment Measures			Graphic Phi Parameters			Folk & Ward		
(φ)	(φ)	(mm)	(gram)	(φ)	(mm)	(gram)	(φ)	(mm)	1	5	16	Mean	Standard Deviation	Skewness	Inman 1952	Mean	Standard Deviation	Skewness (1)	Kurtosis	1957
-4	-4.5	0.00	0.00	0.00	0.237	0.00	-1.375	0.237	1	5	16	2.079	0.825	0.565	1.960	2.027	0.706	0.375	1.355	1.957
-3	-3.5	0.00	0.00	0.00	0.565	0.00	0.330	0.565	5	16	25	0.825	0.565	-1.583	0.640	0.706	0.375	-0.375	1.355	1.957
-2	-2.5	0.00	0.00	0.00	1.320	0.00	-1.320	1.320	16	25	50	-1.583	1.320	6.675	-0.313	0.706	0.375	-0.375	1.355	1.957
-1.5	-1.75	0.00	0.00	0.00	1.660	0.00	1.660	1.660	25	50	75	6.675	1.660	6.675	-0.871	0.988	1.355	-0.871	1.355	1.957
-1	-1.25	0.00	0.00	0.00	2.160	0.00	2.160	2.160	50	75	84	2.160	2.160	2.160	0.988	1.355	1.355	1.355	1.355	1.957
-0.75	-0.875	0.40	0.33	1.66	0.48	0.48	1.66	0.48	75	84	95	0.48	0.48	0.48	0.988	1.355	1.355	1.355	1.355	1.957
-0.5	-0.625	0.58	0.66	0.55	0.55	0.55	0.66	0.55	84	95	99	0.55	0.55	0.55	0.988	1.355	1.355	1.355	1.355	1.957
-0.25	-0.375	0.66	0.66	0.66	0.66	0.66	0.375	0.66	95	99	100	0.66	0.66	0.66	0.988	1.355	1.355	1.355	1.355	1.957
0	-0.125	0.87	0.73	0.73	0.73	0.73	0.125	0.73	100	100	100	0.73	0.73	0.73	0.988	1.355	1.355	1.355	1.355	1.957
0.25	0.125	0.70	0.58	0.58	0.58	0.58	0.375	0.58	100	100	100	0.58	0.58	0.58	0.988	1.355	1.355	1.355	1.355	1.957
0.5	0.375	1.45	1.21	1.21	1.21	1.21	0.625	1.21	100	100	100	1.21	1.21	1.21	0.988	1.355	1.355	1.355	1.355	1.957
0.75	0.625	2.13	1.78	1.78	1.78	1.78	0.875	1.78	100	100	100	1.78	1.78	1.78	0.988	1.355	1.355	1.355	1.355	1.957
1	0.875	2.57	2.15	2.15	2.15	2.15	1.125	2.15	100	100	100	2.15	2.15	2.15	0.988	1.355	1.355	1.355	1.355	1.957
1.25	1.125	3.50	2.92	2.92	2.92	2.92	1.375	2.92	100	100	100	2.92	2.92	2.92	0.988	1.355	1.355	1.355	1.355	1.957
1.5	1.375	5.99	5.00	5.00	5.00	5.00	1.625	5.00	100	100	100	5.00	5.00	5.00	0.988	1.355	1.355	1.355	1.355	1.957
1.75	1.625	7.76	6.48	6.48	6.48	6.48	1.875	6.48	100	100	100	6.48	6.48	6.48	0.988	1.355	1.355	1.355	1.355	1.957
2	1.875	11.74	9.80	9.80	9.80	9.80	2.125	9.80	100	100	100	9.80	9.80	9.80	0.988	1.355	1.355	1.355	1.355	1.957
2.25	2.125	15.82	13.21	13.21	13.21	13.21	2.375	13.21	100	100	100	13.21	13.21	13.21	0.988	1.355	1.355	1.355	1.355	1.957
2.5	2.375	30.63	25.58	25.58	25.58	25.58	2.625	25.58	100	100	100	25.58	25.58	25.58	0.988	1.355	1.355	1.355	1.355	1.957
2.75	2.625	15.80	13.20	13.20	13.20	13.20	2.875	13.20	100	100	100	13.20	13.20	13.20	0.988	1.355	1.355	1.355	1.355	1.957
3	2.875	11.64	9.72	9.72	9.72	9.72	3.125	9.72	100	100	100	9.72	9.72	9.72	0.988	1.355	1.355	1.355	1.355	1.957
3.25	3.125	2.89	2.41	2.41	2.41	2.41	3.375	2.41	100	100	100	2.41	2.41	2.41	0.988	1.355	1.355	1.355	1.355	1.957
3.5	3.375	1.98	1.65	1.65	1.65	1.65	3.625	1.65	100	100	100	1.65	1.65	1.65	0.988	1.355	1.355	1.355	1.355	1.957
3.75	3.625	0.59	0.49	0.49	0.49	0.49	3.875	0.49	100	100	100	0.49	0.49	0.49	0.988	1.355	1.355	1.355	1.355	1.957
4	3.875	0.22	0.18	0.18	0.18	0.18	4.125	0.18	100	100	100	0.18	0.18	0.18	0.988	1.355	1.355	1.355	1.355	1.957
>4.0	4.25	0.23	0.19	0.19	0.19	0.19	4.5	0.19	100	100	100	0.19	0.19	0.19	0.988	1.355	1.355	1.355	1.355	1.957

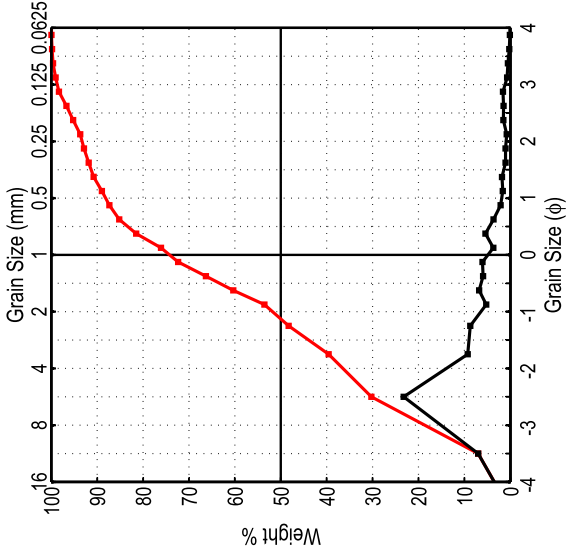
Grain Size Distribution



Project 2403
Location Hatteras NC
Date July 2013
Station Bux-05-S2
Interval 3.0-4.3
Mean 0.415 mm
STD 0.572 mm
Skewness -1.073
USCS Wentworth
SP Medium Sand
Fine Sand Moderately Sorted
Poorly Graded Coarse Skewed
Leptokurtic
Total weight (gram) 120.41
% finer than 4.00 phi 0.05
% coarser than -1.00 phi 3.00
% CaCO₃ 13.9

Class Limits Mid Point			Weight %			Cum. Wt %			Percentiles			Moment Measures			Graphic Phi Parameters			Folk & Ward		
(φ)	(φ)	(mm)	(gram)	(φ)	(mm)	(gram)	(φ)	(mm)	1	5	16	Mean	Standard Deviation	Skewness	Inman 1952	Mean	Standard Deviation	Skewness (1)	Kurtosis	1957
-4	-4.5	0.00	0.00	0.00	0.415	0.00	-1.585	0.415	1	5	16	2.079	0.825	0.572	1.960	2.027	0.706	0.375	1.355	1.957
-3	-3.5	0.00	0.00	0.00	0.572	0.00	0.330	0.572	5	16	25	0.825	0.572	-1.073	0.640	0.706	0.375	-0.375	1.355	1.957
-2	-2.5	0.00	0.00	0.00	1.320	0.00	-1.320	1.320	16	25	50	-1.073	1.320	4.771	-0.313	0.706	0.375	-0.375	1.355	1.957
-1.5	-1.75	0.00	0.00	0.00	1.660	0.00	1.660	1.660	25	50	75	4.771	1.660	4.771	-0.871	0.988	1.355	-0.871	1.355	1.957
-1	-1.25	0.00	0.00	0.00	2.160	0.00	2.160	2.160	50	75	84	2.160	2.160	2.160	0.988	1.355	1.355	1.355	1.355	1.957
-0.75	-0.875	0.76	0.63	0.63	0.63	0.63	0.875	0.63	75	84	95	0.63	0.63	0.63	0.988	1.355	1.355	1.355	1.355	1.957
-0.5	-0.625	1.34	1.11	1.11	1.11	1.11	1.125	1.11	84	95	99	1.11	1.11	1.11	0.988	1.355	1.355	1.355	1.355	1.957
-0.25	-0.375	1.53	1.53	1.53	1.53	1.53	1.375	1.53	95	99	100	1.53	1.53	1.53	0.988	1.355	1.355	1.355	1.355	1.957
0	-0.125	2.25	1.87	1.87	1.87	1.87	1.625	1.87	100	100	100	1.87	1.87	1.87	0.988	1.355	1.355	1.355	1.355	1.957
0.25	0.125	2.17	1.80	1.80	1.80	1.80	1.875	1.80	100	100	100	1.80	1.80	1.80	0.988	1.355	1.355	1.355	1.355	1.957
0.5	0.375	4.33	3.60	3.60	3.60	3.60	2.125	3.60	100	100	100	3.60	3.60	3.60	0.988	1.355	1.355	1.355	1.355	1.957
0.75	0.625	6.98	5.80	5.80	5.80	5.80	2.375	5.80	100	100	100	5.80	5.80	5.80	0.988	1.355	1.355	1.355	1.355	1.957
1	0.875	9.80	8.14	8.14	8.14	8.14	2.625	8.14	100	100	100	8.14	8.14	8.14	0.988	1.355	1.355	1.355	1.355	1.957
1.25	1.125	14.00	11.63	11.63	11.63	11.63	2.875	11.63	100	100	100	11.63	11.63	11.63	0.988	1.355	1.355	1.355	1.355	1.957
1.5	1.375	22.12	18.37	18.37	18.37	18.37	3.125	18.37	100	100	100	18.37	18.37	18.37	0.988	1.355	1.355	1.355	1.355	1.957
1.75	1.625	20.05	16.65	16.65	16.65	16.65	3.375	16.65	100	100	100	16.65	16.65	16.65	0.988	1.355	1.355	1.355	1.355	1.957
2	1.875	14.82	12.31	12.31	12.31	12.31	3.625	12.31	100	100	100	12.31	12.31	12.31	0.988	1.355	1.355	1.355	1.355	1.957
2.25	2.125	9.18	7.62	7.62	7.62	7.62	3.875	7.62	100	100	100	7.62	7.62	7.62	0.988	1.355	1.355	1.355	1.355	1.957
2.5	2.375	4.86	4.04	4.04	4.04	4.04	4.125	4.04	100	100	100	4.04	4.04	4.04	0.988	1.355	1.355	1.355	1.355	1.957
2.75	2.625	1.42	1.18	1.18	1.18	1.18	4.375	1.18	100	100	100	1.18	1.18	1.18	0.988	1.355	1.355	1.355	1.355	1.957
3	2.875	0.70	0.58	0.58	0.58	0.58	4.625	0.58	100	100	100	0.58	0.58	0.58	0.988	1.355	1.355	1.355	1.355	1.957
3.25	3.125	0.20	0.17	0.17	0.17	0.17	4.875	0.17	100	100	100	0.17	0.17	0.17	0.988	1.355	1.355	1.355	1.355	1.957
3.5	3.375	0.15	0.12	0.12	0.12	0.12	5.125	0.12	100	100	100	0.12	0.12	0.12	0.988	1.355	1.355	1.355	1.355	1.957
3.75	3.625	0.05	0.04	0.04	0.04	0.04	5.375	0.04	100	100	100	0.04	0.04	0.04	0.988	1.355	1.355	1.355	1.355	1.957
4	3.875	0.03	0.02	0.02	0.02	0.02	5.625	0.02	100	100	100	0.02	0.02	0.02	0.988	1.355	1.355	1.355	1.355	1.957
>4.0	4.25	0.06	0.05	0.05	0.05	0.05	5.875	0.05	100	100	100	0.05	0.05	0.05	0.988	1.355	1.355	1.355	1.355	1.957

Grain Size Distribution



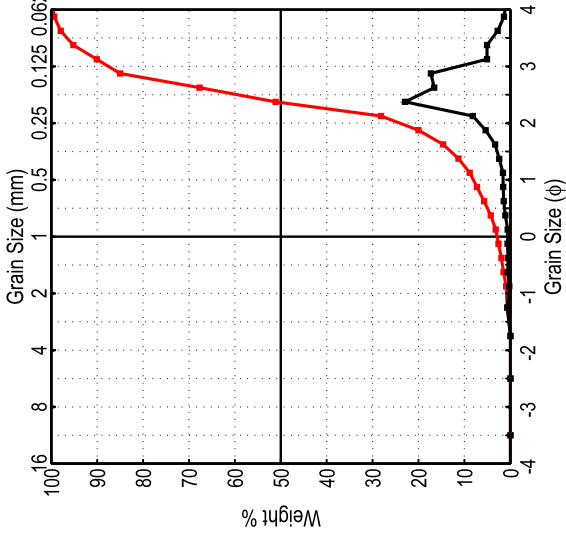
Project 2403
Location Hatteras NC
Date July 2013
Station Bux-06-S1
Interval 0.0-1.9
Mean 1.833 mm
STD 0.316 mm
Skewness 0.512
USCS Wentworth
SP Very Coarse Sand
Medium Sand Poorly Sorted
Poorly Graded Fine Skewed
Mesokurtic
Total weight (gram) 119.87
% finer than 4.00 phi 0.08
% coarser than -1.00 phi 48.30
% CaCO₃ 49.0

Class Limits Mid Point			Weight %			Cumulative Weight %		
(phi)	(mm)	(g)	(phi)	(mm)	(g)	(phi)	(mm)	(g)
-4	4.75	0.00	-4.125	1.833	0.00	1	4.75	0.00
-3	3.5	8.43	-3.790	1.661	7.03	5	3.790	7.03
-2	2.5	27.87	-3.115	0.512	23.25	16	3.115	30.28
-1.5	1.75	11.12	-2.725	2.733	9.28	25	2.725	39.56
-1	1.25	10.48	-1.130		8.74	50	1.130	48.30
-0.75	0.875	6.32	0.055		5.27	75	0.055	53.57
-0.5	0.625	8.13			6.78	84	0.545	60.36
-0.25	0.375	7.12			5.94	95	2.340	66.30
0	0.25	7.28			6.07	99	3.110	72.37
0.25	0.125	4.44			3.70			76.07
0.5	0.375	6.48			5.41			81.48
0.75	0.625	4.42			3.69			85.17
1	0.875	2.56			2.14			87.30
1.25	1.125	1.98			1.65			88.95
1.5	1.375	2.16			1.80			90.76
1.75	1.625	1.26			1.05			91.81
2	1.875	1.27			1.06			92.87
2.25	2.125	0.97			0.81			93.68
2.5	2.375	1.85			1.54			95.22
2.75	2.625	1.77			1.48			96.70
3	2.875	1.95			1.63			98.32
3.25	3.125	0.87			0.73			99.05
3.5	3.375	0.63			0.53			99.57
3.75	3.625	0.28			0.23			99.81
4	3.875	0.14			0.12			99.92
>4.0	4.25	0.09			0.08			100.00

Moment Measures			Percentiles		
Mean	Standard Deviation	Skewness	1	5	16
-0.874	1.833	0.512	-4.125	-3.790	-3.115
Deviation from Normal			25	50	75
2.733	-1.130	0.055	-2.725	-1.130	0.055
Graphic Phi Parameters			84	95	99
0.545	2.340	3.110	0.545	2.340	3.110

Inman 1952			Folk & Ward 1957		
Mean	Standard Deviation	Skewness (1)	Mean	Standard Deviation	Skewness (1)
-1.285	1.830	-0.085	-1.233	1.844	0.024
Skewness (2)	Kurtosis		0.221	0.675	0.904

Grain Size Distribution

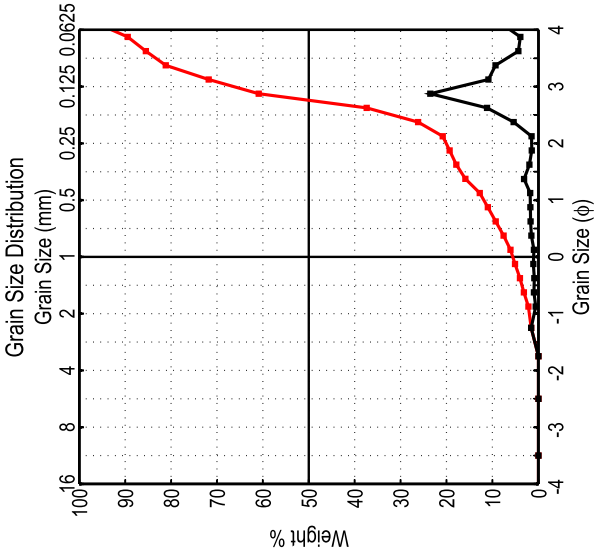


Project 2403
Location Hatteras NC
Date July 2013
Station Bux-05-S4
Interval 5.2-6.3
Mean 0.192 mm
STD 0.558 mm
Skewness -1.480
USCS Wentworth
SP Fine Sand
Moderately Sorted
Strongly Coarse Skewed
Leptokurtic
Total weight (gram) 119.67
% finer than 4.00 phi 0.66
% coarser than -1.00 phi 0.67
% CaCO₃ 14.4

Class Limits Mid Point			Weight %			Cumulative Weight %		
(phi)	(mm)	(g)	(phi)	(mm)	(g)	(phi)	(mm)	(g)
-4	4.75	0.00	-4.5	0.00	0.00	1	-8.30	0.00
-3	3.5	0.00	-3.5	0.00	0.00	5	0.500	0.00
-2	2.5	0.00	-2.5	0.00	0.00	16	1.690	0.00
-1.5	1.75	0.00	-1.75	0.00	0.00	25	2.030	0.00
-1	1.25	0.80	-1.25	0.67	0.67	50	2.365	0.00
-0.75	0.875	0.28	-0.75	0.23	0.90	75	2.730	0.00
-0.5	0.625	0.68	-0.5	0.57	1.47	84	2.860	0.00
-0.25	0.375	0.58	-0.25	0.48	1.96	95	3.365	0.00
0	0.25	0.76	0	0.64	2.59	99	3.815	0.00
0.25	0.125	0.71	0.25	0.59	3.18			
0.5	0.375	1.29	0.5	1.08	4.26			
0.75	0.625	1.74	0.75	1.45	5.72			
1	0.875	1.86	1	1.55	7.27			
1.25	1.125	1.91	1.25	1.60	8.87			
1.5	1.375	2.91	1.5	2.43	11.30			
1.75	1.625	3.99	1.75	3.33	14.63			
2	1.875	6.45	2	5.39	20.02			
2.25	2.125	9.76	2.25	8.16	28.18			
2.5	2.375	27.44	2.5	22.93	51.11			
2.75	2.625	19.83	2.75	16.57	67.68			
3	2.875	20.72	3	17.31	84.99			
3.25	3.125	6.08	3.25	5.08	90.07			
3.5	3.375	6.08	3.5	5.08	95.15			
3.75	3.625	3.33	3.75	2.78	97.94			
4	3.875	1.68	4	1.40	99.34			
>4.0	4.25	0.79	>4.0	0.66	100.00			

Moment Measures			Percentiles		
Mean	Standard Deviation	Skewness	1	5	16
2.382	0.192	0.843	-8.30	0.500	1.690
Kurtosis	Dispersion	Standard Deviation	25	50	75
-1.480	6.617	2.365	2.030	2.365	2.730
Deviation from Normal			84	95	99
2.860	-0.739	3.815	2.860	3.365	3.815

Inman 1952			Folk & Ward 1957		
Mean	Standard Deviation	Skewness (1)	Mean	Standard Deviation	Skewness (1)
2.275	0.585	-0.154	2.305	0.727	-0.228
Skewness (2)	Kurtosis		-0.739	1.449	1.677



Project 2403
Location Hatteras NC
Date July 2013

Station Bux-06-S2
Interval 1.9-3.4

Mean 0.158 mm
STD 0.436 mm
Skewness -1.286

USCS Wentworth

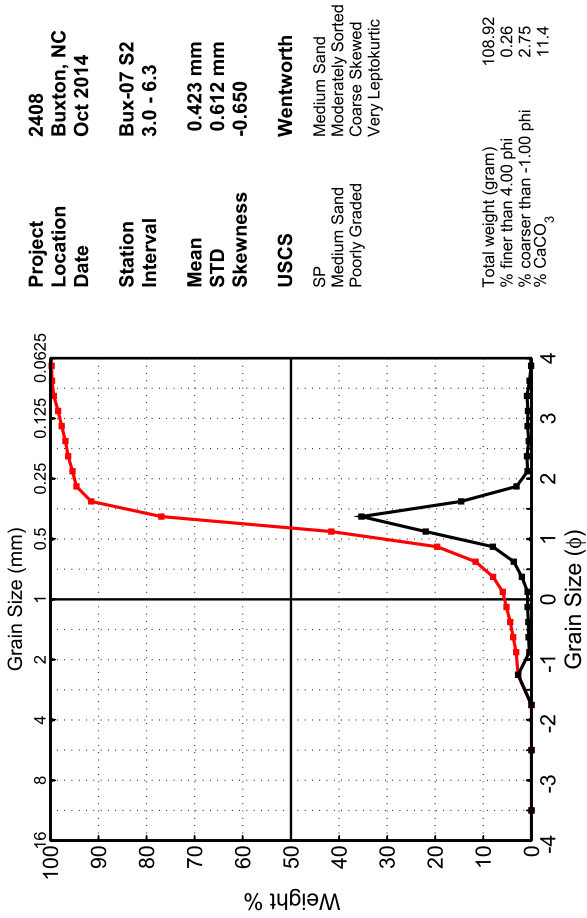
SM Fine Sand
Poorly Sorted
Coarse Skewed
Leptokurtic

Total weight (gram) 119.61
% finer than 4.00 phi 10.59
% coarser than -1.00 phi 1.58
% CaCO_3 28.3

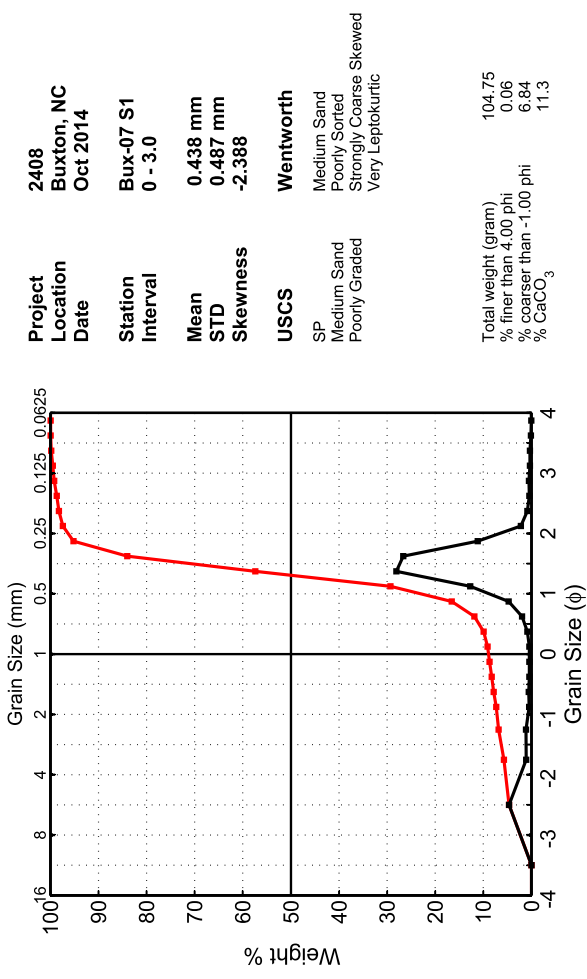
Moment Measures			Percentiles		
Mean	2.664	(phi) 0.158	1	-1.435	
Standard Deviation	1.197	0.436	5	-0.150	
Skewness	-1.286		16	1.385	
Kurtosis	4.631		25	2.320	
Dispersion			50	2.760	
Standard Deviation			75	3.210	
Deviation from Normal			84	3.540	
			95	4.000	
			99	4.000	
Graphic Phi Parameters			Inman 1952		
			Folk & Ward 1957		
Mean	2.462	2.562			
Standard Deviation	1.078	1.168			
Skewness (1)	-0.276	-0.339			
Skewness (2)	-0.775				
Kurtosis	0.926	1.911			

Class Limits	Mid Point	Weight	Weight %	Cumm. Wt %
(ϕ)	(ϕ)	(gram)		
-4	-4.5	0.00	0.00	0.00
-3	-3.5	0.00	0.00	0.00
-2	-2.5	0.00	0.00	0.00
-1.5	-1.75	0.00	0.00	0.00
-1	-1.25	1.89	1.58	1.58
-0.75	-0.875	0.69	0.58	2.16
-0.5	-0.625	1.18	0.99	3.14
-0.25	-0.375	1.05	0.88	4.02
0	-0.125	1.29	1.08	5.10
0.25	0.125	1.16	0.97	6.07
0.5	0.375	1.80	1.50	7.57
0.75	0.625	2.03	1.70	9.27
1	0.875	2.09	1.75	11.02
1.25	1.125	2.11	1.76	12.78
1.5	1.375	3.73	3.12	15.90
1.75	1.625	2.36	1.97	17.87
2	1.875	1.73	1.45	19.32
2.25	2.125	1.79	1.50	20.82
2.5	2.375	6.44	5.38	26.20
2.75	2.625	13.39	11.19	37.40
3	2.875	28.12	23.51	60.91
3.25	3.125	13.02	10.89	71.79
3.5	3.375	11.18	9.35	81.14
3.75	3.625	5.21	4.36	85.49
4	3.875	4.68	3.91	89.41
>4.0	4.25	12.67	10.59	100.00

Grain Size Distribution



Grain Size Distribution



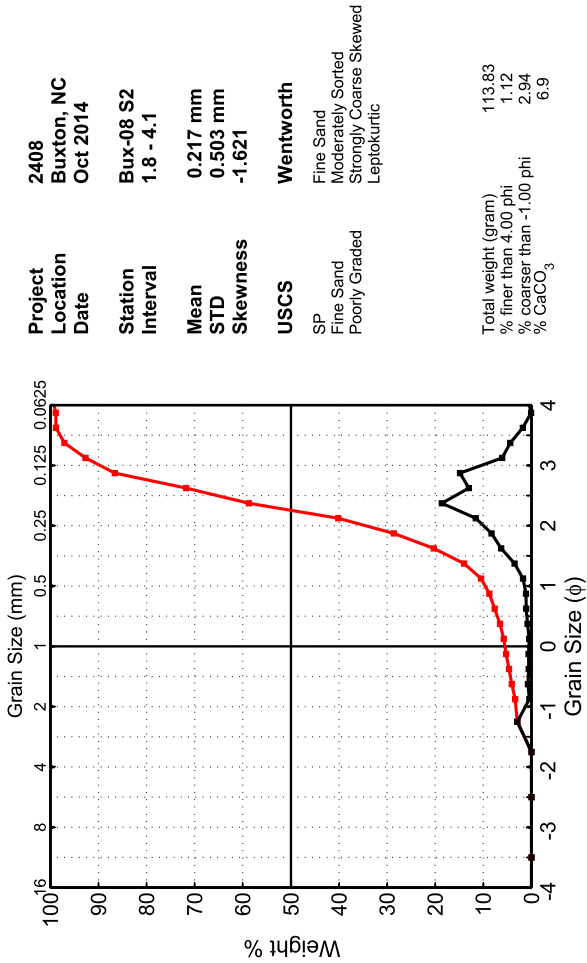
Limits (phi)			Percentiles			Weight % Cum. Wt %			Moment Measures		
-4	-3	-2	1	5	16	0.00	0.00	0.00	Mean	(phi)	(mm)
-1.5	-1.75	-2.5	25	50	75	0.00	0.00	0.00	Standard Deviation	1.241	0.423
-0.75	-0.875	-1.25	84	95	99	0.00	0.00	0.00	Skewness	0.708	0.612
-0.25	-0.375	-0.625	1	2	3	0.00	0.00	0.00	Kurtosis	-0.650	8.245
0	0.125	0.375	16	25	35	0.00	0.00	0.00	Dispersion		
0.5	0.375	0.25	50	75	84	0.00	0.00	0.00	Standard Deviation		
1	0.875	1.125	84	95	99	0.00	0.00	0.00	Deviation from Normal		
1.25	1.125	1.00				0.00	0.00	0.00			
1.5	1.375	1.25				0.00	0.00	0.00			
1.75	1.625	1.50				0.00	0.00	0.00			
2	1.875	1.75				0.00	0.00	0.00			
2.25	2.125	2.00				0.00	0.00	0.00			
2.5	2.375	2.25				0.00	0.00	0.00			
2.75	2.625	2.50				0.00	0.00	0.00			
3	2.875	2.75				0.00	0.00	0.00			
3.25	3.125	3.00				0.00	0.00	0.00			
3.5	3.375	3.25				0.00	0.00	0.00			
3.75	3.625	3.50				0.00	0.00	0.00			
4	3.875	3.75				0.00	0.00	0.00			
>4.0	4.25	4.00				0.00	0.00	0.00			

Graphic Phi Parameters			Inman 1952			Folk & Ward 1957		
Mean	Standard Deviation	Skewness (1)	1.127	0.368	-0.156	1.147	0.516	-0.204
Skewness (2)	Kurtosis		-0.748	1.980		2.112		

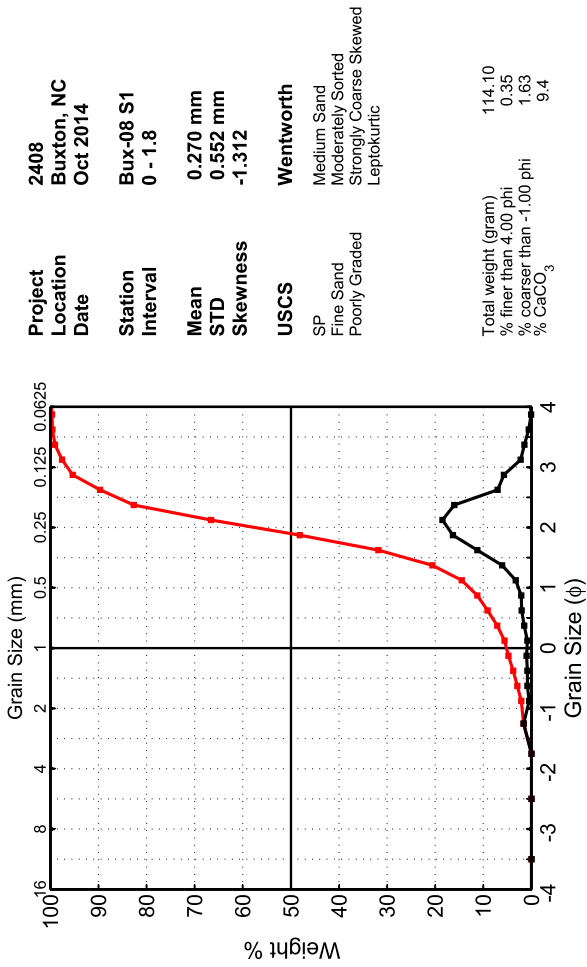
Limits (phi)			Percentiles			Weight % Cum. Wt %			Moment Measures		
-4	-3	-2	1	5	16	0.00	0.00	0.00	Mean	(phi)	(mm)
-1.5	-1.75	-2.5	25	50	75	0.00	0.00	0.00	Standard Deviation	1.191	0.438
-0.75	-0.875	-1.25	84	95	99	0.00	0.00	0.00	Skewness	1.037	0.487
-0.25	-0.375	-0.625	1	2	3	0.00	0.00	0.00	Kurtosis	-2.388	8.944
0	0.125	0.375	16	25	35	0.00	0.00	0.00	Dispersion		
0.5	0.375	0.25	50	75	84	0.00	0.00	0.00	Standard Deviation		
1	0.875	1.125	84	95	99	0.00	0.00	0.00	Deviation from Normal		
1.25	1.125	1.00				0.00	0.00	0.00			
1.5	1.375	1.25				0.00	0.00	0.00			
1.75	1.625	1.50				0.00	0.00	0.00			
2	1.875	1.75				0.00	0.00	0.00			
2.25	2.125	2.00				0.00	0.00	0.00			
2.5	2.375	2.25				0.00	0.00	0.00			
2.75	2.625	2.50				0.00	0.00	0.00			
3	2.875	2.75				0.00	0.00	0.00			
3.25	3.125	3.00				0.00	0.00	0.00			
3.5	3.375	3.25				0.00	0.00	0.00			
3.75	3.625	3.50				0.00	0.00	0.00			
4	3.875	3.75				0.00	0.00	0.00			
>4.0	4.25	4.00				0.00	0.00	0.00			

Graphic Phi Parameters			Inman 1952			Folk & Ward 1957		
Mean	Standard Deviation	Skewness (1)	1.235	0.390	-0.192	1.260	0.819	-0.460
Skewness (2)	Kurtosis		-3.846	4.282		3.377		

Grain Size Distribution



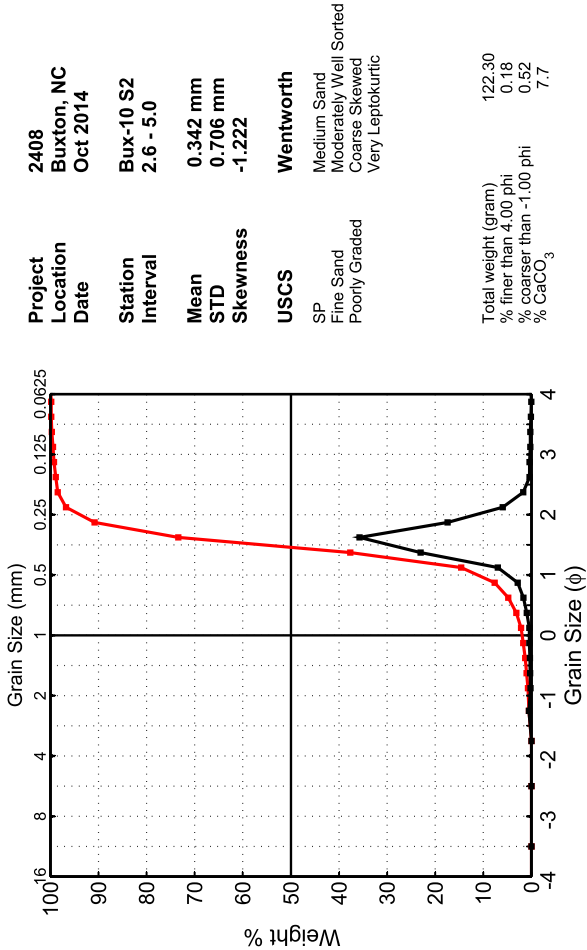
Grain Size Distribution



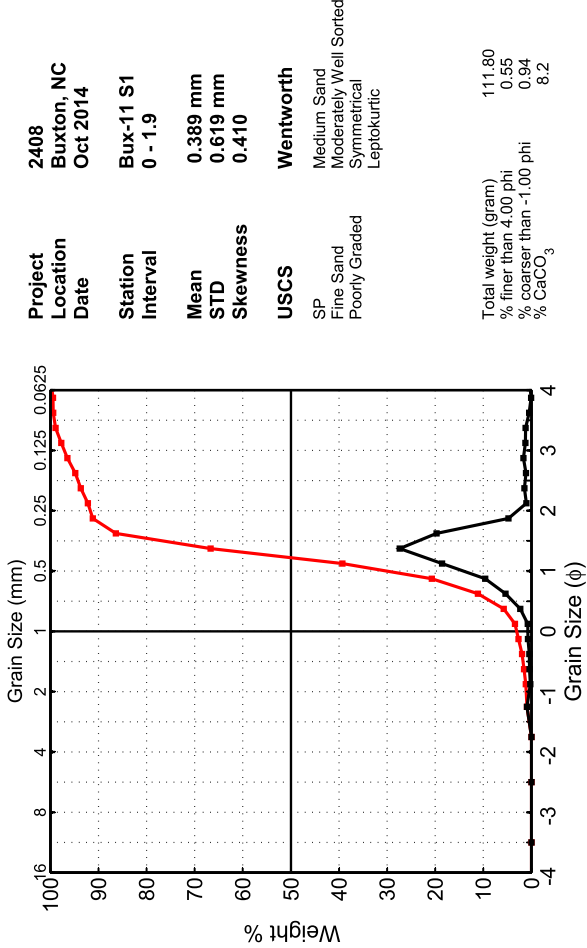
Limits (ϕ)	Mid Point (ϕ)	Weight (gram)	Weight % Cum. Wt %	Percentiles		Moment Measures		Graphic Phi Parameters		Folk & Ward 1957	
				1	5	Mean	Standard Deviation	Mean	Inman 1952	Mean	Inman 1952
-4	-4.5	0.00	0.00	-1.580	-0.235	2.205	0.217	2.205	0.990	2.180	0.873
-3	-3.5	0.00	0.00			0.990	0.503	0.990		0.688	
-2	-2.5	0.00	0.00	16	1.455	-1.621		-1.621		-0.164	
-1.5	-1.75	0.00	0.00			6.487		6.487		-0.295	
-1	-1.25	0.00	0.00	25	1.765					1.538	
-0.75	-0.875	0.50	2.94	50	2.255						
-0.5	-0.625	0.81	3.38	75	2.680						
-0.25	-0.375	0.65	0.71	84	2.830						
0	-0.125	0.68	0.60	95	3.255						
0.25	0.125	0.54	0.47	99	3.915						
0.5	0.375	0.90	0.79								
0.75	0.625	1.25	1.10								
1	0.875	1.27	1.12								
1.25	1.125	1.98	1.74								
1.5	1.375	4.00	3.51								
1.75	1.625	7.17	6.30								
2	1.875	9.46	8.31								
2.25	2.125	13.16	11.56								
2.5	2.375	21.17	18.60								
2.75	2.625	14.78	12.98								
3	2.875	16.89	14.84								
3.25	3.125	6.93	6.09								
3.5	3.375	5.00	4.39								
3.75	3.625	2.01	1.77								
4	3.875	0.05	0.04								
>4.0	4.25	1.28	1.12								

Limits (ϕ)	Mid Point (ϕ)	Weight (gram)	Weight % Cum. Wt %	Percentiles		Moment Measures		Graphic Phi Parameters		Folk & Ward 1957	
				1	5	Mean	Standard Deviation	Mean	Inman 1952	Mean	Inman 1952
-4	-4.5	0.00	0.00	-1.445	-0.055	1.890	0.270	1.890	0.858	1.837	0.752
-3	-3.5	0.00	0.00			-1.312		-1.312		-0.247	
-2	-2.5	0.00	0.00	16	1.185	5.910		5.910		1.532	
-1.5	-1.75	0.00	0.00	25	1.475						
-1	-1.25	0.00	0.00	50	1.900						
-0.75	-0.875	0.55	0.48	75	2.255						
-0.5	-0.625	0.94	0.82	84	2.425						
-0.25	-0.375	0.95	0.83	95	2.860						
0	-0.125	1.14	1.00	99	3.370						
0.25	0.125	0.96	0.84								
0.5	0.375	1.69	1.48								
0.75	0.625	2.32	2.03								
1	0.875	2.41	2.11								
1.25	1.125	3.71	3.25								
1.5	1.375	6.93	6.07								
1.75	1.625	12.84	11.25								
2	1.875	18.61	16.31								
2.25	2.125	21.10	18.49								
2.5	2.375	18.28	16.02								
2.75	2.625	7.99	7.00								
3	2.875	6.52	5.71								
3.25	3.125	2.54	2.23								
3.5	3.375	1.66	1.45								
3.75	3.625	0.61	0.53								
4	3.875	0.09	0.08								
>4.0	4.25	0.40	0.35								

Grain Size Distribution



Grain Size Distribution



Limits (phi)			Weight % Cum.			Weight % Cum. Wt %		
-4	-3	-2	0.00	0.00	0.00	0.00	0.00	0.00
-1.5	-1.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-0.75	-0.875	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-0.5	-0.625	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-0.25	-0.375	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	-0.125	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.25	0.375	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.5	0.625	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.75	0.875	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1	1.125	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.25	1.375	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.5	1.625	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.75	1.875	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	2.125	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.25	2.375	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.5	2.625	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.75	2.875	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	3.125	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3.25	3.375	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3.5	3.625	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3.75	3.875	0.00	0.00	0.00	0.00	0.00	0.00	0.00
>4.0		0.00	0.00	0.00	0.00	0.00	0.00	0.00

Limits (phi)			Weight % Cum.			Weight % Cum. Wt %		
-4	-3	-2	0.00	0.00	0.00	0.00	0.00	0.00
-1.5	-1.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-0.75	-0.875	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-0.5	-0.625	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-0.25	-0.375	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	-0.125	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.25	0.375	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.5	0.625	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.75	0.875	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1	1.125	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.25	1.375	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.5	1.625	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.75	1.875	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	2.125	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.25	2.375	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.5	2.625	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.75	2.875	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	3.125	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3.25	3.375	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3.5	3.625	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3.75	3.875	0.00	0.00	0.00	0.00	0.00	0.00	0.00
>4.0		0.00	0.00	0.00	0.00	0.00	0.00	0.00

Limits (phi)			Weight % Cum.			Weight % Cum. Wt %		
-4	-3	-2	0.00	0.00	0.00	0.00	0.00	0.00
-1.5	-1.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-0.75	-0.875	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-0.5	-0.625	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-0.25	-0.375	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	-0.125	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.25	0.375	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.5	0.625	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.75	0.875	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1	1.125	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.25	1.375	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.5	1.625	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.75	1.875	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	2.125	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.25	2.375	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.5	2.625	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.75	2.875	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	3.125	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3.25	3.375	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3.5	3.625	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3.75	3.875	0.00	0.00	0.00	0.00	0.00	0.00	0.00
>4.0		0.00	0.00	0.00	0.00	0.00	0.00	0.00

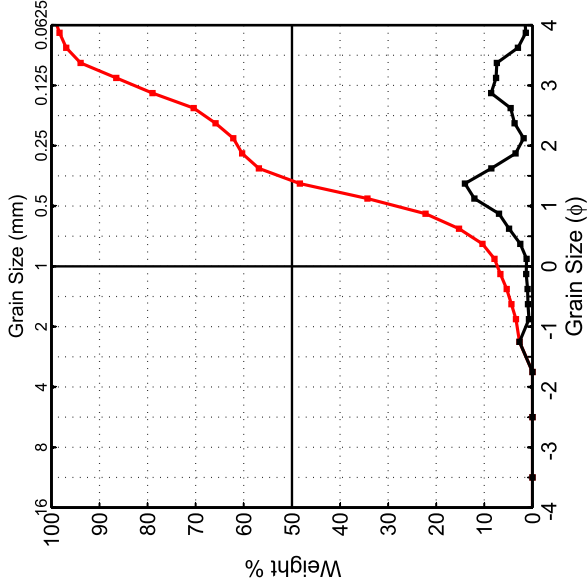
Limits (phi)			Weight % Cum.			Weight % Cum. Wt %		
-4	-3	-2	0.00	0.00	0.00	0.00	0.00	0.00
-1.5	-1.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-0.75	-0.875	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-0.5	-0.625	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-0.25	-0.375	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	-0.125	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.25	0.375	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.5	0.625	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.75	0.875	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1	1.125	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.25	1.375	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.5	1.625	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.75	1.875	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	2.125	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.25	2.375	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.5	2.625	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.75	2.875	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	3.125	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3.25	3.375	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3.5	3.625	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3.75	3.875	0.00	0.00	0.00	0.00	0.00	0.00	0.00
>4.0		0.00	0.00	0.00	0.00	0.00	0.00	0.00

Limits (phi)			Weight % Cum.			Weight % Cum. Wt %		
-4	-3	-2	0.00	0.00	0.00	0.00	0.00	0.00
-1.5	-1.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-0.75	-0.875	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-0.5	-0.625	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-0.25	-0.375	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	-0.125	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.25	0.375	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.5	0.625	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.75	0.875	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1	1.125	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.25	1.375	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.5	1.625	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.75	1.875	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	2.125	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.25	2.375	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.5	2.625	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.75	2.875	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	3.125	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3.25	3.375	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3.5	3.625	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3.75	3.875	0.00	0.00	0.00	0.00	0.00	0.00	0.00
>4.0		0.00	0.00	0.00	0.00	0.00	0.00	0.00

Limits (phi)			Weight % Cum.			Weight % Cum. Wt %		
-4	-3	-2	0.00	0.00	0.00	0.00	0.00	0.00
-1.5	-1.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-0.75	-0.875	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-0.5	-0.625	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-0.25	-0.375	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	-0.125	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.25	0.375	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.5	0.625	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.75	0.875	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1	1.125	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.25	1.375	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.5	1.625	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.75	1.875	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	2.125	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.25	2.375	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.5	2.625	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.75	2.875	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	3.125	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3.25	3.375	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3.5	3.625	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3.75	3.875	0.00	0.00	0.00	0.00	0.00	0.00	0.00
>4.0		0.00	0.00	0.00	0.00	0.00	0.00	0.00

Limits (phi)			Weight % Cum.			Weight % Cum. Wt %		
-4	-3	-2	0.00	0.00	0.00	0.00	0.00	0.00
-1.5	-1.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-0.75	-0.875	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-0.5	-0.625	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-0.25	-0.375	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	-0.125	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.25	0.375	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.5	0.625	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.75	0.875	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1	1.125	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.25	1.375	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Grain Size Distribution



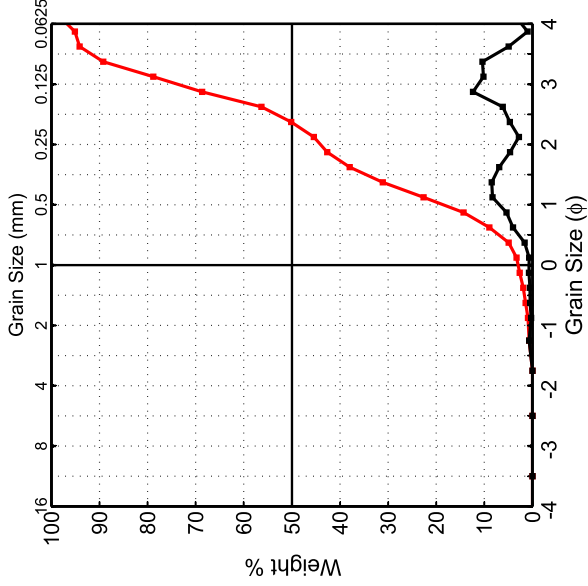
Project
Location
Date
Station
Interval
Mean
STD
Skewness
USCS
SP

2408
Buxton, NC
Oct 2014
Bux-11 S3
3.3 - 5.7
0.288 mm
0.432 mm
-0.206
Wentworth
Medium Sand
Poorly Sorted
Mesokurtic

Total weight (gram)
% finer than 4.00 phi
% coarser than -1.00 phi
% CaCO₃

116.38
1.70
2.70
10.8

Grain Size Distribution



Project
Location
Date
Station
Interval
Mean
STD
Skewness
USCS
SP

2408
Buxton, NC
Oct 2014
Bux-11 S2
1.9 - 3.3
0.210 mm
0.453 mm
-0.365
Wentworth
Fine Sand
Poorly Sorted
Symmetrical
Platykurtic

Total weight (gram)
% finer than 4.00 phi
% coarser than -1.00 phi
% CaCO₃

109.61
4.88
0.66
9.7

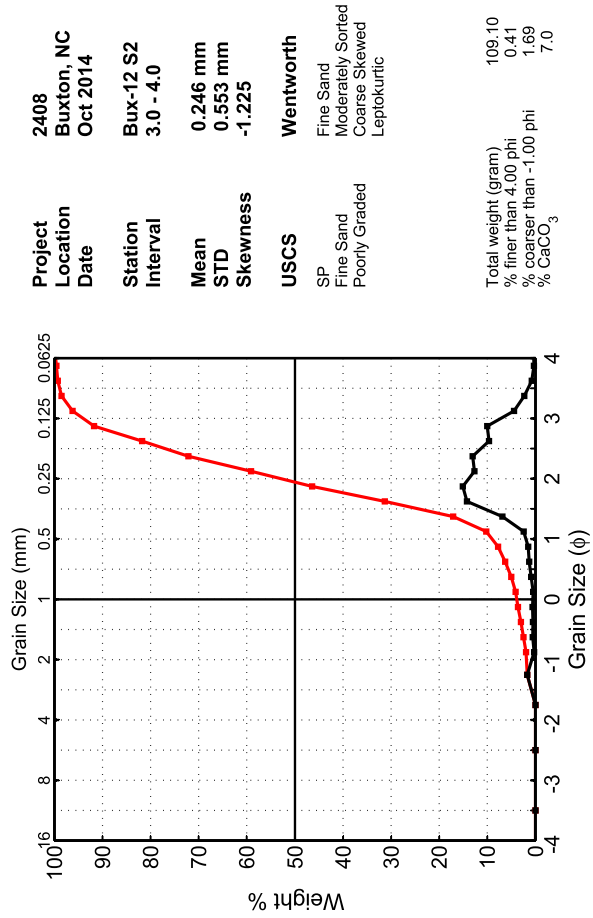
Limits				Percentiles				Moment Measures			
(phi)	Mid Point (phi)	Weight (gram)	Weight % Cum. Wt %	1	5	16	25	50	75	84	95
-4	-4.5	0.00	0.00	-1.565	-0.465	0.650	0.935	1.425	2.760	3.040	3.465
-3	-3.5	0.00	0.00	-0.465	0.650	0.935	1.425	2.760	3.040	3.465	4.000
-2	-2.5	0.00	0.00	0.650	0.935	1.425	2.760	3.040	3.465	4.000	
-1.5	-1.75	0.00	0.00	0.935	1.425	2.760	3.040	3.465	4.000		
-1	-1.25	3.14	2.70	1.425	2.760	3.040	3.465	4.000			
-0.75	-0.875	0.83	0.71	2.760	3.040	3.465	4.000				
-0.5	-0.625	1.09	0.94	3.040	3.465	4.000					
-0.25	-0.375	1.18	1.01	3.465	4.000						
0	-0.125	1.52	1.31	4.000							
0.25	0.125	1.41	1.21								
0.5	0.375	2.93	2.52								
0.75	0.625	5.67	4.87								
1	0.875	8.08	6.94								
1.25	1.125	14.05	12.07								
1.5	1.375	16.34	14.04								
1.75	1.625	9.94	8.54								
2	1.875	4.06	3.49								
2.25	2.125	2.12	1.82								
2.5	2.375	4.32	3.71								
2.75	2.625	5.27	4.53								
3	2.875	9.98	8.58								
3.25	3.125	8.77	7.54								
3.5	3.375	8.60	7.39								
3.75	3.625	3.50	3.01								
4	3.875	1.60	1.37								
>4.0	4.25	1.98	1.70								

Graphic Phi Parameters				Folk & Ward 1957			
Mean	Standard Deviation	Skewness (1)	Kurtosis	2.087	1.163	-0.239	-0.192
2.087	1.163	-0.239	-0.192	0.490	0.774		

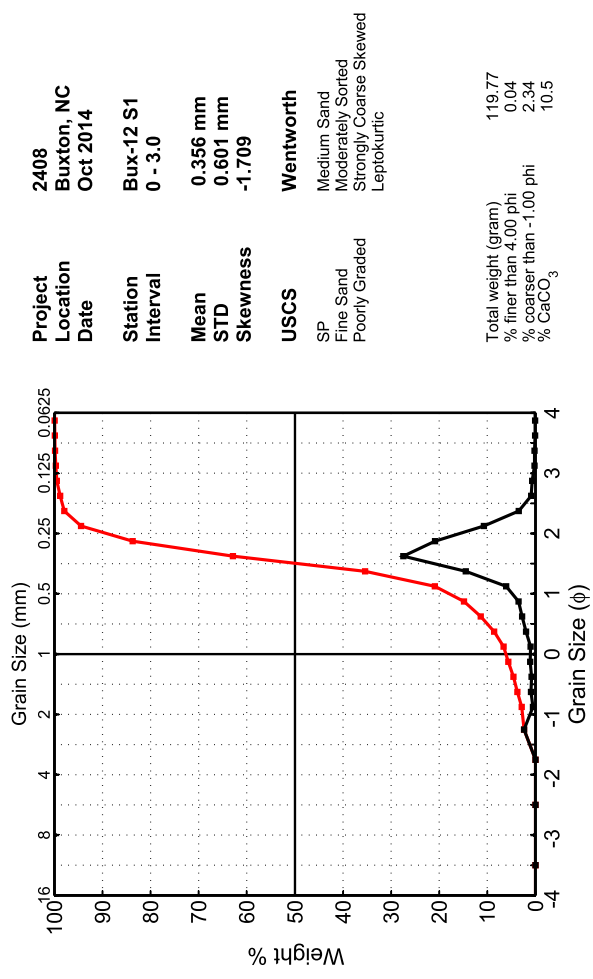
Limits				Percentiles				Moment Measures			
(phi)	Mid Point (phi)	Weight (gram)	Weight % Cum. Wt %	1	5	16	25	50	75	84	95
-4	-4.5	0.00	0.00	-0.840	0.380	0.925	1.195	2.365	3.030	3.250	3.845
-3	-3.5	0.00	0.00	0.380	0.925	1.195	2.365	3.030	3.250	3.845	4.000
-2	-2.5	0.00	0.00	0.925	1.195	2.365	3.030	3.250	3.845	4.000	
-1.5	-1.75	0.00	0.00	1.195	2.365	3.030	3.250	3.845	4.000		
-1	-1.25	0.72	0.66	2.365	3.030	3.250	3.845	4.000			
-0.75	-0.875	0.31	0.28	3.030	3.250	3.845	4.000				
-0.5	-0.625	0.50	0.46	3.250	3.845	4.000					
-0.25	-0.375	0.57	0.52	3.845	4.000						
0	-0.125	0.78	0.71	4.000							
0.25	0.125	0.74	0.68								
0.5	0.375	1.79	1.63								
0.75	0.625	4.40	4.01								
1	0.875	5.88	5.36								
1.25	1.125	9.11	8.31								
1.5	1.375	9.27	8.46								
1.75	1.625	7.58	6.92								
2	1.875	5.09	4.64								
2.25	2.125	3.07	2.80								
2.5	2.375	5.15	4.70								
2.75	2.625	6.76	6.17								
3	2.875	13.53	12.34								
3.25	3.125	11.15	10.17								
3.5	3.375	11.39	10.39								
3.75	3.625	5.39	4.92								
4	3.875	1.08	0.99								
>4.0	4.25	5.35	4.88								

Graphic Phi Parameters				Folk & Ward 1957			
Mean	Standard Deviation	Skewness (1)	Kurtosis	2.087	1.163	-0.239	-0.192
2.087	1.163	-0.239	-0.192	0.490	0.774		

Grain Size Distribution



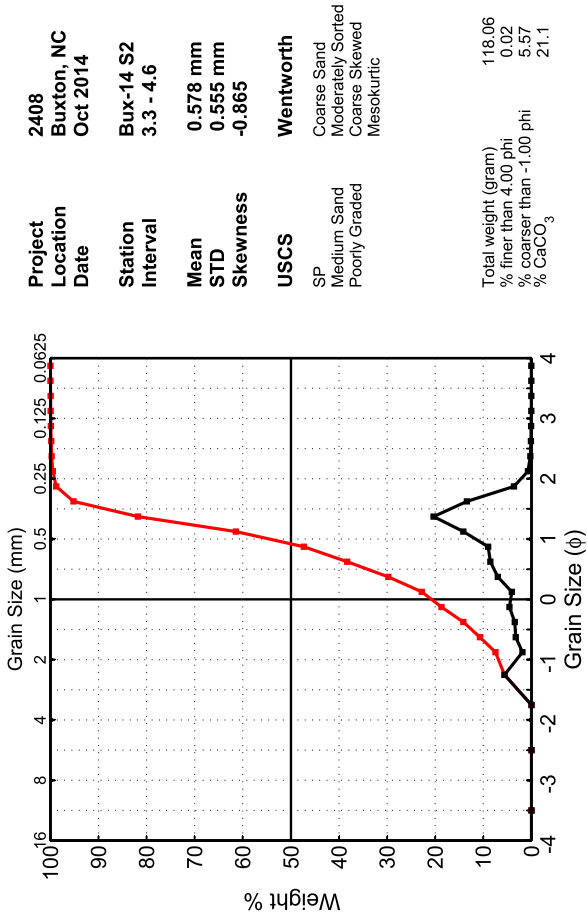
Grain Size Distribution



Limits			Weight % Cum. Wt %			Percentiles			Moment Measures		
(phi)	Mid Point (phi)	Weight (gram)								(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	0.00	1	-1.455	Mean	2.025	1.987	0.246
-3	-3.5	0.00	0.00	0.00	0.00	5	0.375	Standard Deviation	0.855	0.743	0.553
-2	-2.5	0.00	0.00	0.00	0.00	16	1.335	Skewness	-1.225	-0.038	
-1.5	-1.75	0.00	0.00	0.00	0.00	25	1.515	Kurtosis	6.219		
-1	-1.25	1.84	1.69	1.69	1.69	50	1.945	Dispersion			
-0.75	-0.875	0.27	0.25	1.93	1.93	75	2.450	Standard Deviation			
-0.5	-0.625	0.61	0.56	2.49	2.49	84	2.680	Deviation from Normal			
-0.25	-0.375	0.57	0.52	3.02	3.02	95	3.060				
0	-0.125	0.67	0.61	3.63	3.63	99	3.540				
0.25	0.125	0.53	0.49	4.12	4.12						
0.5	0.375	0.97	0.89	5.00	5.00						
0.75	0.625	1.39	1.27	6.28	6.28						
1	0.875	1.62	1.48	7.76	7.76						
1.25	1.125	2.67	2.45	10.21	10.21						
1.5	1.375	7.50	6.87	17.09	17.09						
1.75	1.625	15.53	14.23	31.32	31.32						
2	1.875	16.46	15.09	46.41	46.41						
2.25	2.125	13.84	12.69	59.09	59.09						
2.5	2.375	14.21	13.02	72.12	72.12						
2.75	2.625	10.51	9.63	81.75	81.75						
3	2.875	10.92	10.01	91.76	91.76						
3.25	3.125	4.84	4.44	96.20	96.20						
3.5	3.375	2.51	2.30	98.50	98.50						
3.75	3.625	0.84	0.77	99.27	99.27						
4	3.875	0.35	0.32	99.59	99.59						
>4.0	4.25	0.45	0.41	100.00	100.00						

Graphic Phi Parameters			Inman 1952		Folk & Ward 1957	
Mean			2.007		1.987	
Standard Deviation			0.672		0.743	
Skewness (1)			0.093		-0.038	
Skewness (2)			-0.338			
Kurtosis			0.996		1.177	

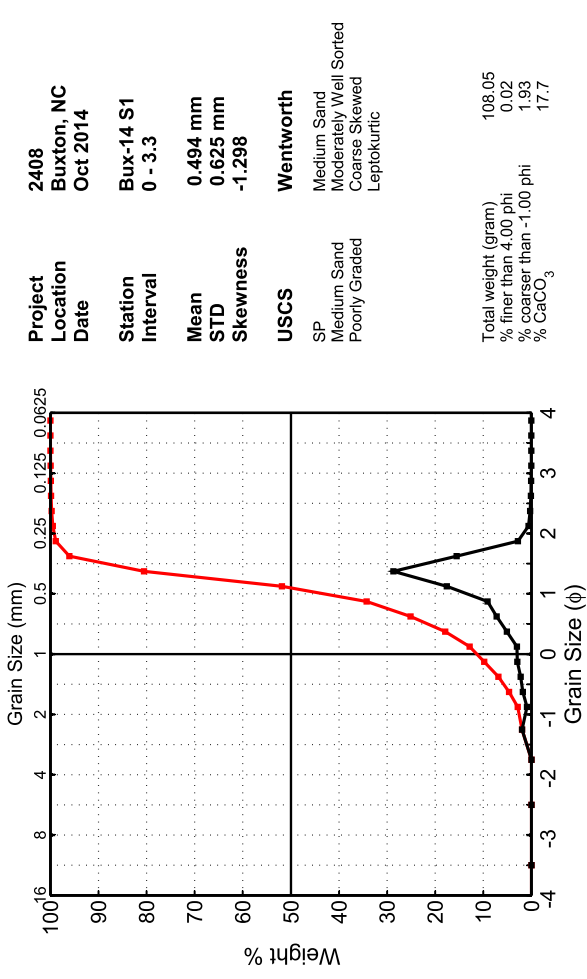
Grain Size Distribution



Limits (phi)			Percentiles			Moment Measures		
-4	-3	-2	1	5	16	Mean	Standard Deviation	Skewness
-1.5	-1.75	-2.5	16	50	84	Kurtosis	Dispersion	Standard Deviation
-0.75	-0.875	-1.25	25	75	95	Deviation from Normal		
-0.5	-0.625	-1.00	50	90	99			
-0.25	-0.375	-0.75	75	95	99			
0	0.125	0.375	84	90	95			
0.25	0.375	0.625	95	99	99			
0.5	0.625	0.875	99	99	99			
0.75	0.875	1.125	1	5	16			
1	1.125	1.375	16	50	84			
1.25	1.375	1.625	25	75	95			
1.5	1.625	1.875	50	90	95			
1.75	1.875	2.125	75	95	99			
2	2.125	2.375	95	99	99			
2.25	2.375	2.625	99	99	99			
2.5	2.625	2.875	1	5	16			
2.75	2.875	3.125	16	50	84			
3	3.125	3.375	25	75	95			
3.25	3.375	3.625	50	90	95			
3.5	3.625	3.875	75	95	99			
3.75	3.875	4.125	95	99	99			
4	4.125	4.375	99	99	99			
>4.0	4.375	4.625	100	100	100			

Graphic Phi Parameters			Folk & Ward 1957		
Mean	Standard Deviation	Skewness (1)	Mean	Standard Deviation	Skewness (1)
0.570	0.845	-0.420	0.855	0.575	-0.426
0.570	0.845	-0.905	-1.022	-1.022	-1.022
0.728	1.103		0.909	0.909	0.909

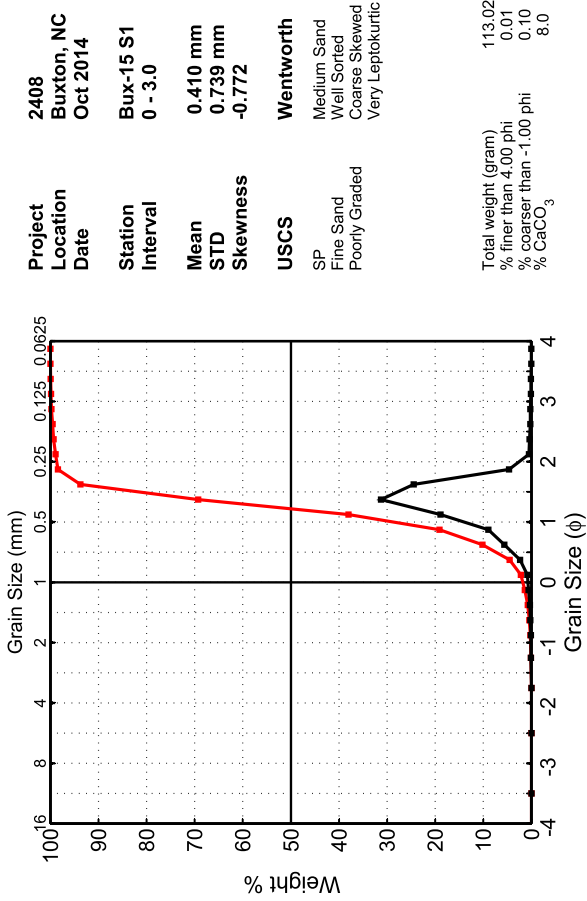
Grain Size Distribution



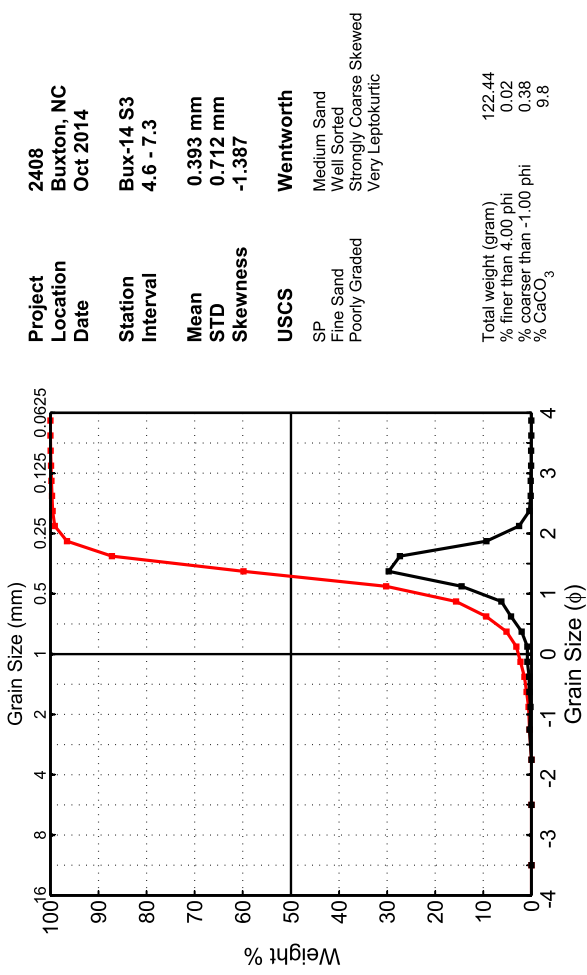
Limits (phi)			Percentiles			Moment Measures		
-4	-3	-2	1	5	16	Mean	Standard Deviation	Skewness
-1.5	-1.75	-2.5	16	50	84	Kurtosis	Dispersion	Standard Deviation
-0.75	-0.875	-1.25	25	75	95	Deviation from Normal		
-0.5	-0.625	-1.00	50	90	99			
-0.25	-0.375	-0.75	75	95	99			
0	0.125	0.375	84	90	95			
0.25	0.375	0.625	95	99	99			
0.5	0.625	0.875	99	99	99			
0.75	0.875	1.125	1	5	16			
1	1.125	1.375	16	50	84			
1.25	1.375	1.625	25	75	95			
1.5	1.625	1.875	50	90	95			
1.75	1.875	2.125	75	95	99			
2	2.125	2.375	95	99	99			
2.25	2.375	2.625	99	99	99			
2.5	2.625	2.875	1	5	16			
2.75	2.875	3.125	16	50	84			
3	3.125	3.375	25	75	95			
3.25	3.375	3.625	50	90	95			
3.5	3.625	3.875	75	95	99			
3.75	3.875	4.125	95	99	99			
4	4.125	4.375	99	99	99			
>4.0	4.375	4.625	100	100	100			

Graphic Phi Parameters			Folk & Ward 1957		
Mean	Standard Deviation	Skewness (1)	Mean	Standard Deviation	Skewness (1)
0.855	0.575	-0.426	0.937	0.620	-0.481
0.855	0.575	-1.022	1.276	1.276	1.276

Grain Size Distribution



Grain Size Distribution



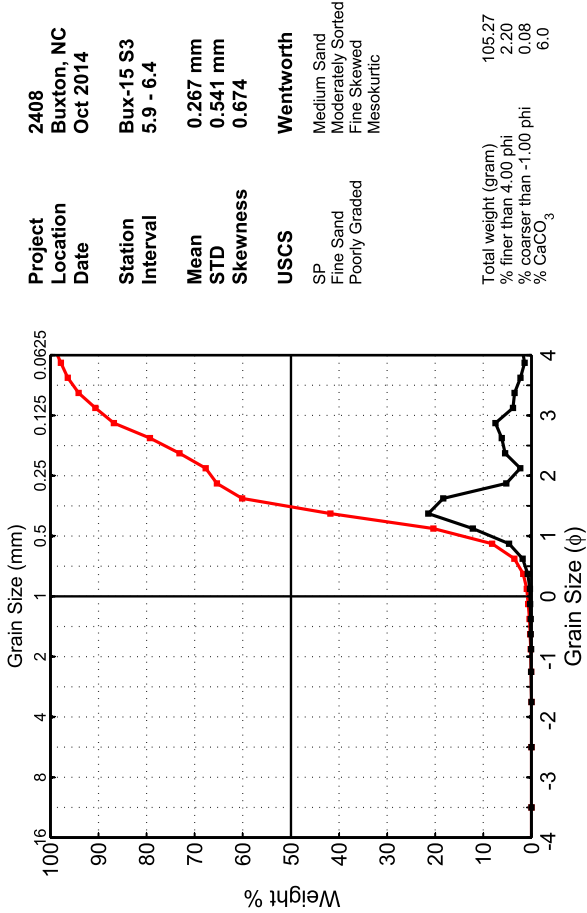
Percentiles				Moment Measures	
Limits (phi)	Mid Point (phi)	Weight (gram)	Weight % Cum. Wt %	Mean	(phi)
-4	-4.5	0.00	0.00	Standard Deviation	(mm)
-3	-3.5	0.00	0.00	Skewness	1.286 0.410
-2	-2.5	0.00	0.00	Kurtosis	0.437 0.739
-1.5	-1.75	0.00	0.00	Dispersion	-0.772 7.558
-0.75	-0.875	0.13	0.10	Standard Deviation	
-0.5	-0.625	0.25	0.22	Deviation from Normal	
-0.25	-0.375	0.36	0.32		
0	-0.125	0.68	0.60		
0.25	0.125	0.96	0.85		
0.5	0.375	2.64	4.54		
0.75	0.625	6.36	5.63		
1	0.875	10.11	8.95		
1.25	1.125	21.35	18.89		
1.5	1.375	35.35	31.28		
1.75	1.625	27.65	24.46		
2	1.875	5.27	4.66		
2.25	2.125	0.59	0.52		
2.5	2.375	0.45	0.40		
2.75	2.625	0.25	0.22		
3	2.875	0.24	0.21		
3.25	3.125	0.10	0.09		
3.5	3.375	0.11	0.10		
3.75	3.625	0.04	0.04		
4	3.875	0.01	0.01		
>4.0	4.25	0.01	0.01		

Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean		1.158	1.178
Standard Deviation		0.367	0.380
Skewness (1)		-0.170	-0.222
Skewness (2)		-0.483	
Kurtosis		0.762	1.106

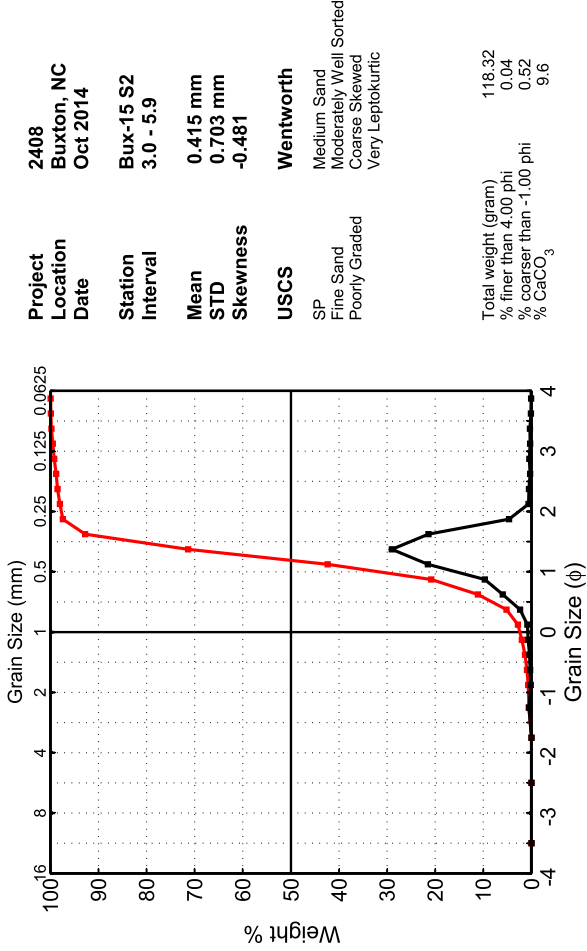
Percentiles		Moment Measures	
Limits (phi)	Mid Point (phi)	Weight (gram)	Weight % Cum. Wt %
-4	-4.5	0.00	0.00
-3	-3.5	0.00	0.00
-2	-2.5	0.00	0.00
-1.5	-1.75	0.00	0.00
-0.75	-0.875	0.25	0.20
-0.5	-0.625	0.52	0.42
-0.25	-0.375	0.56	0.46
0	-0.125	1.01	0.82
0.25	0.125	1.05	0.86
0.5	0.375	2.48	2.03
0.75	0.625	5.19	5.17
1	0.875	7.67	9.41
1.25	1.125	17.77	15.67
1.5	1.375	36.32	30.19
1.75	1.625	33.47	59.85
2	1.875	11.44	29.66
2.25	2.125	3.11	27.34
2.5	2.375	0.54	96.53
2.75	2.625	0.17	99.51
3	2.875	0.16	99.65
3.25	3.125	0.09	99.78
3.5	3.375	0.10	99.85
3.75	3.625	0.04	99.93
4	3.875	0.02	99.97
>4.0	4.25	0.02	99.98
		0.02	100.00

Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean		1.237	1.255
Standard Deviation		0.357	0.403
Skewness (1)		-0.147	-0.205
Skewness (2)		-0.545	
Kurtosis		1.070	1.264

Grain Size Distribution

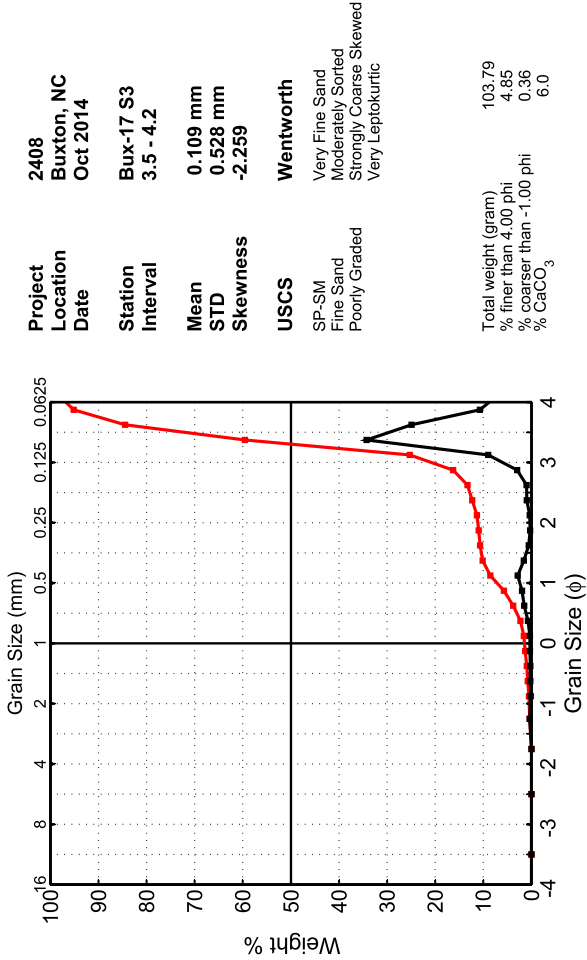


Grain Size Distribution

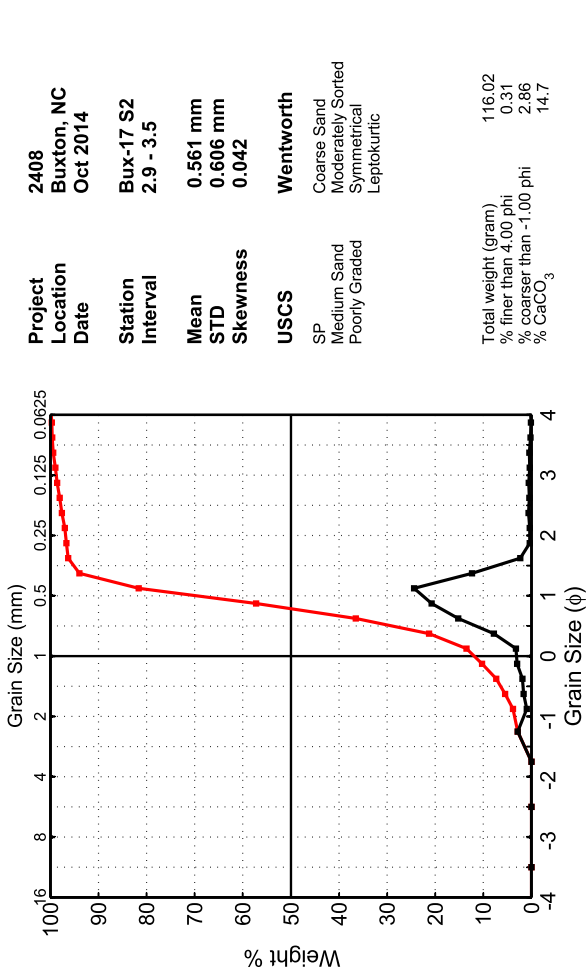


Limits (phi)			Weight % Cum. Wt %			Percentiles			Moment Measures		
-4	-3	-2	0.00	0.00	0.00	1	0.140	0.00	Mean	(phi)	(mm)
-3	-2	-1	0.00	0.00	0.00	5	0.705	0.00	Standard Deviation		0.267
-2	-1	0	0.00	0.00	0.00	16	1.035	0.00	Skewness		0.885
-1	0	1	0.00	0.00	0.00	25	1.180	0.08	Kurtosis		0.674
-1	0	1	0.00	0.00	0.00	50	1.485	0.12	Dispersion		3.072
-0.75	-0.5	-0.25	0.05	0.05	0.05	75	2.450	0.25	Standard Deviation		
-0.5	-0.25	0	0.12	0.12	0.12	84	2.780	0.39	Deviation from Normal		
0	-0.125	0.28	0.15	0.14	0.14	95	3.470	0.66			
0.25	0.125	0.31	0.28	0.29	0.29	99	4.000	0.95			
0.5	0.375	0.79	0.31	0.32	0.32			1.70			
0.75	0.625	1.92	0.465	0.465	0.465			8.17			
1	0.875	4.89	12.20	12.20	20.37			8.17			
1.25	1.125	12.84	21.44	21.44	41.81			8.17			
1.5	1.375	22.57	18.34	60.15	60.15			5.22			
1.75	1.625	19.31	5.22	65.37	65.37			5.22			
2	1.875	5.50	2.44	2.32	67.69			5.22			
2.25	2.125	2.44	5.46	73.15	73.15			5.22			
2.5	2.375	5.75	6.16	79.31	79.31			5.22			
2.75	2.625	6.48	7.48	86.79	86.79			5.22			
3	2.875	7.87	7.48	90.63	90.63			5.22			
3.25	3.125	4.05	3.85	94.12	94.12			5.22			
3.5	3.375	3.67	3.49	96.38	96.38			5.22			
3.75	3.625	2.38	2.26	97.80	97.80			5.22			
4	3.875	1.49	1.42	97.80	97.80			5.22			
>4.0	4.25	2.32	2.20	100.00	100.00			5.22			
						Graphic Phi Parameters			Folk & Ward 1957		
						Inman 1952					
						Mean			1.908		
						Standard Deviation			0.873		
						Skewness (1)			0.855		
						Skewness (2)			0.484		
						Kurtosis			0.691		
									0.585		
									0.892		

Grain Size Distribution



Grain Size Distribution



Moment Measures				Percentiles			
Mean	3.193	(phi)	0.109	1	-0.345	Weight % Cumm. Wt %	0.00
Standard Deviation	0.922	(mm)	0.528	5	0.780	0.00	0.00
Skewness	-2.259			16	2.850	0.00	0.00
Kurtosis	8.012			25	3.115	0.00	0.00
Dispersion				50	3.305	0.36	0.36
Standard Deviation				75	3.530	0.14	0.50
Deviation from Normal				84	3.620	0.24	0.74
				95	3.870	0.22	0.96
				99	4.000	0.33	1.29
						0.34	0.33
						0.30	0.29
						0.74	1.56
						0.71	2.29
						1.55	3.79
						1.93	5.71
						2.00	8.55
						2.94	28.3
						1.65	1.59
						1.375	0.57
						1.625	0.55
						0.29	0.28
						0.38	10.69
						1.02	10.96
						0.98	0.37
						1.03	11.33
						0.99	12.31
						2.98	13.31
						3.09	16.28
						3.93	25.27
						3.125	8.99
						3.375	35.57
						3.625	59.54
						11.10	24.92
						4	10.69
						3.875	95.15
						4.25	100.00
						4.85	100.00

Moment Measures				Percentiles			
Mean	0.833	(phi)	0.561	1	-1.575	Weight % Cumm. Wt %	0.00
Standard Deviation	0.722	(mm)	0.606	5	-0.695	0.00	0.00
Skewness	0.042			16	0.205	0.00	0.00
Kurtosis	6.943			25	0.435	0.00	0.00
Dispersion				50	0.790	0.00	0.00
Standard Deviation				75	1.055	0.88	2.86
Deviation from Normal				84	1.175	1.60	3.84
				95	1.485	1.84	5.45
				99	3.145	2.14	7.29
						2.97	10.27
						3.22	13.49
						7.78	21.27
						0.625	36.50
						15.23	57.23
						24.05	81.62
						28.30	93.98
						14.33	96.29
						2.68	96.65
						0.42	96.98
						0.39	97.60
						0.71	98.03
						0.51	98.60
						0.66	98.97
						0.42	99.41
						0.51	99.69
						0.23	99.69
						0.10	100.00
						0.31	100.00

Graphic Phi Parameters

Mean	Standard Deviation	Skewness (1)	Skewness (2)	Kurtosis
0.690	0.485	-0.206	-0.814	1.247
0.723	0.573	-0.284	1.441	

Folk & Ward

Mean	Standard Deviation	Skewness (1)	Skewness (2)	Kurtosis
0.690	0.485	-0.206	-0.814	1.247
0.723	0.573	-0.284	1.441	

Inman

Mean	Standard Deviation	Skewness (1)	Skewness (2)	Kurtosis
0.690	0.485	-0.206	-0.814	1.247
0.723	0.573	-0.284	1.441	

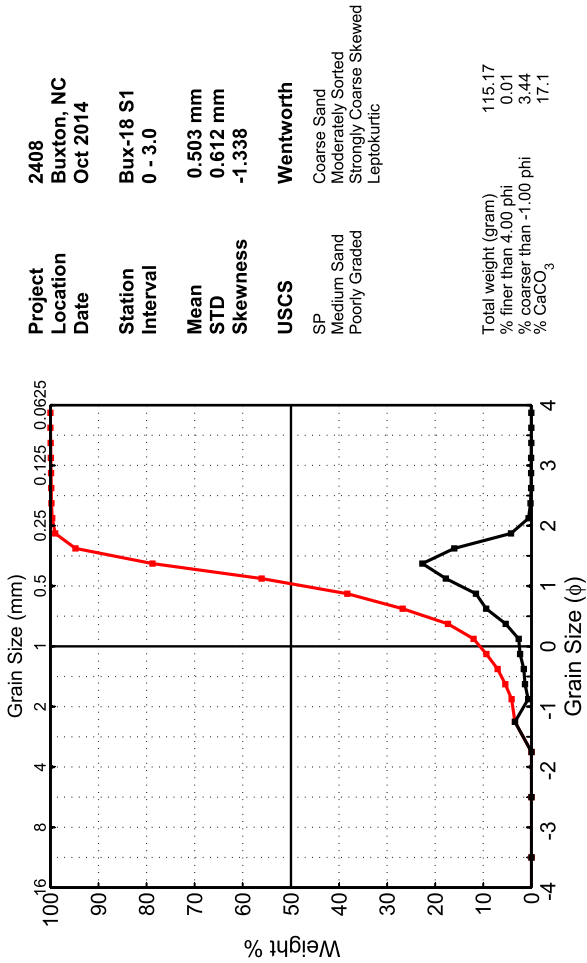
1952

Mean	Standard Deviation	Skewness (1)	Skewness (2)	Kurtosis
0.690	0.485	-0.206	-0.814	1.247
0.723	0.573	-0.284	1.441	

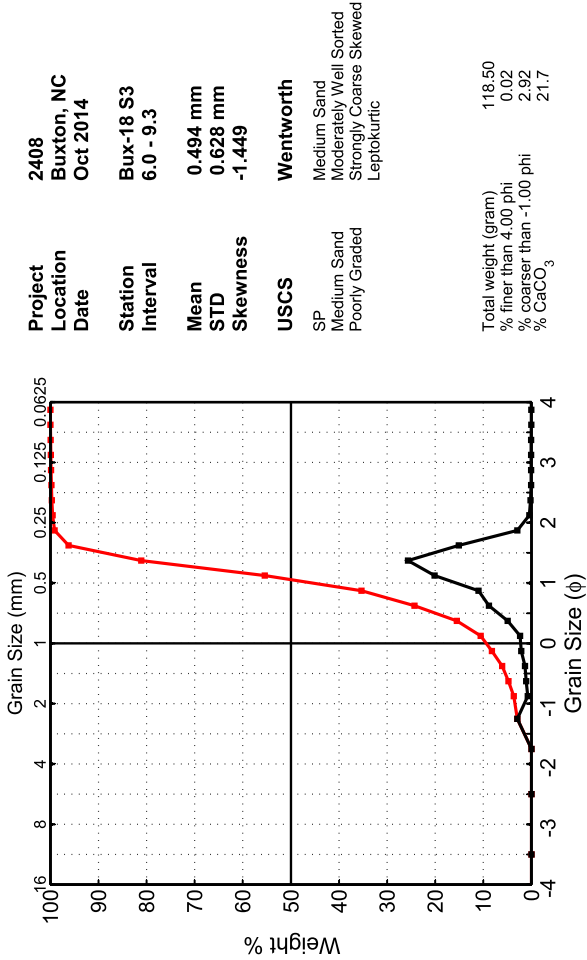
1957

Mean	Standard Deviation	Skewness (1)	Skewness (2)	Kurtosis
0.690	0.485	-0.206	-0.814	1.247
0.723	0.573	-0.284	1.441	

Grain Size Distribution



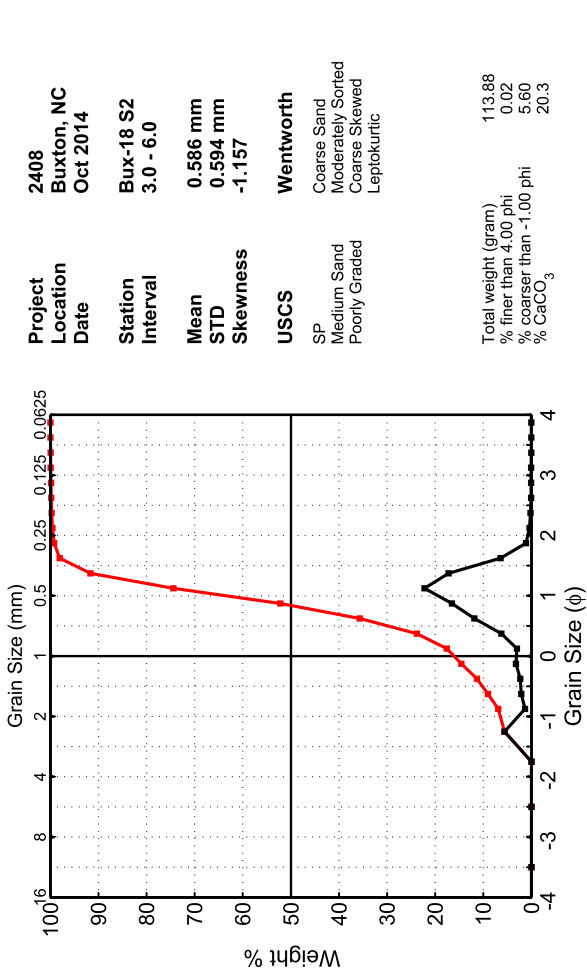
Grain Size Distribution



Percentiles			Moment Measures		
Limits (phi)	Mid Point (phi)	Weight (gram)	Weight % Cum. Wt %		
-4	-4.5	0.00	0.00	Mean	1.017
-3	-3.5	0.00	0.00	Standard Deviation	0.670
-2	-2.5	0.00	0.00	Skewness	-1.449
-1.5	-1.75	0.00	0.00	Kurtosis	5.896
-0.75	-1.25	3.46	2.92	Dispersion	
-0.5	-0.875	0.90	0.76	Standard Deviation	
-0.25	-0.625	1.29	1.09	Deviation from Normal	
0	-0.375	1.58	1.33		
0.25	-0.125	2.48	2.09		
0.5	0.125	2.80	2.36		
0.75	0.375	5.85	4.94		
1	0.625	10.45	8.82		
1.25	0.875	13.02	10.99		
1.5	1.125	23.87	20.14		
1.75	1.375	30.41	25.66		
2	1.625	17.90	15.11		
2.25	1.875	3.46	2.92		
2.5	2.125	0.49	0.41		
2.75	2.375	0.20	0.17		
3	2.625	0.09	0.08		
3.25	2.875	0.07	0.06		
3.5	3.125	0.05	0.04		
3.75	3.375	0.06	0.05		
4	3.625	0.03	0.03		
>4.0	4.25	0.02	0.02		

Graphic Phi Parameters			Folk & Ward 1957		
Mean	Standard Deviation	Skewness (1)	Mean	Standard Deviation	Skewness (1)
0.907	0.517	-0.285	0.957	0.590	-0.391
1.111	-1.048		1.327		
	Kurtosis				

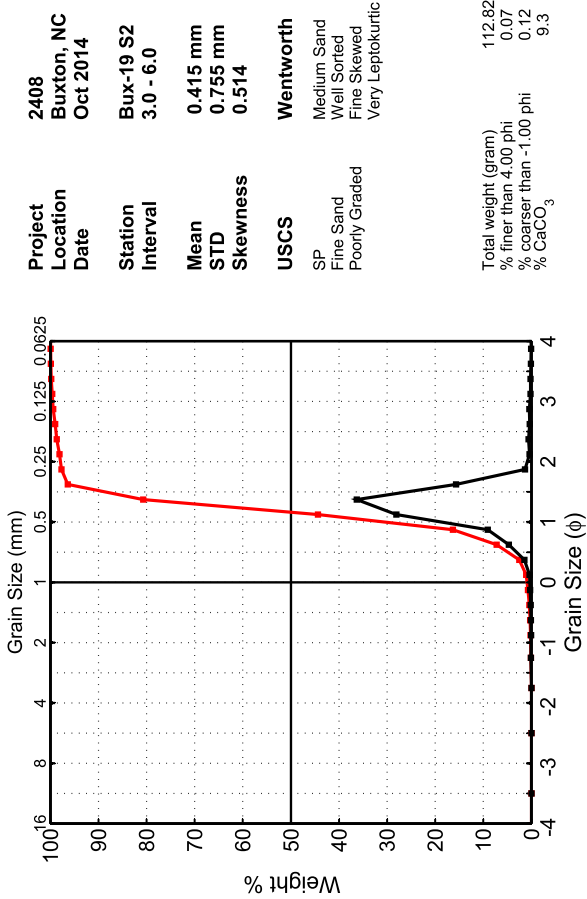
Grain Size Distribution



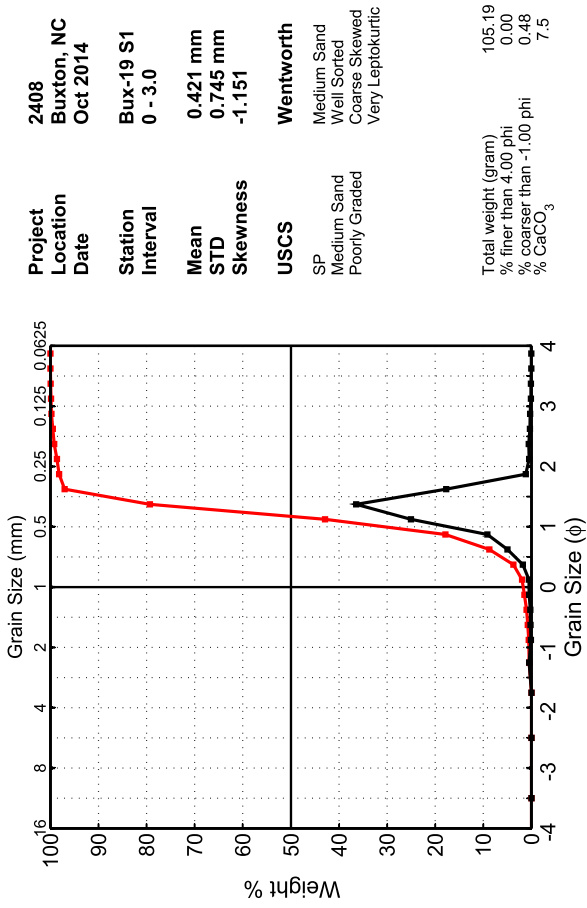
Percentiles			Moment Measures		
Limits (phi)	Mid Point (phi)	Weight (gram)	Weight % Cum. Wt %		
-4	-4.5	0.00	0.00	Mean	0.771
-3	-3.5	0.00	0.00	Standard Deviation	0.752
-2	-2.5	0.00	0.00	Skewness	-1.157
-1.5	-1.75	0.00	0.00	Kurtosis	4.305
-0.75	-1.25	6.38	5.60	Dispersion	
-0.5	-0.875	1.50	1.32	Standard Deviation	
-0.25	-0.625	2.39	2.10	Deviation from Normal	
0	-0.375	2.62	2.30		
0.25	-0.125	3.67	3.22		
0.5	0.125	3.45	3.03		
0.75	0.375	7.11	6.24		
1	0.625	13.52	11.87		
1.25	0.875	18.80	16.51		
1.5	1.125	25.32	22.23		
1.75	1.375	19.63	17.24		
2	1.625	7.29	6.40		
2.25	1.875	1.27	1.12		
2.5	2.125	0.42	0.37		
2.75	2.375	0.21	0.18		
3	2.625	0.09	0.08		
3.25	2.875	0.07	0.06		
3.5	3.125	0.05	0.04		
3.75	3.375	0.04	0.04		
4	3.625	0.02	0.02		
>4.0	4.25	0.02	0.02		

Graphic Phi Parameters			Folk & Ward 1957		
Mean	Standard Deviation	Skewness (1)	Mean	Standard Deviation	Skewness (1)
0.630	0.635	-0.331	0.700	0.743	-0.429
1.213	-1.165		1.567		
	Kurtosis				

Grain Size Distribution

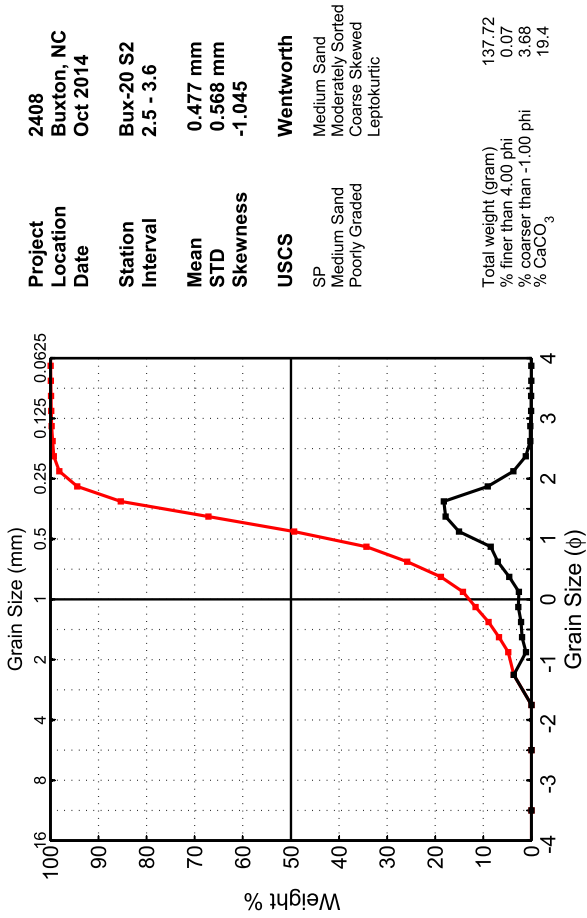


Grain Size Distribution

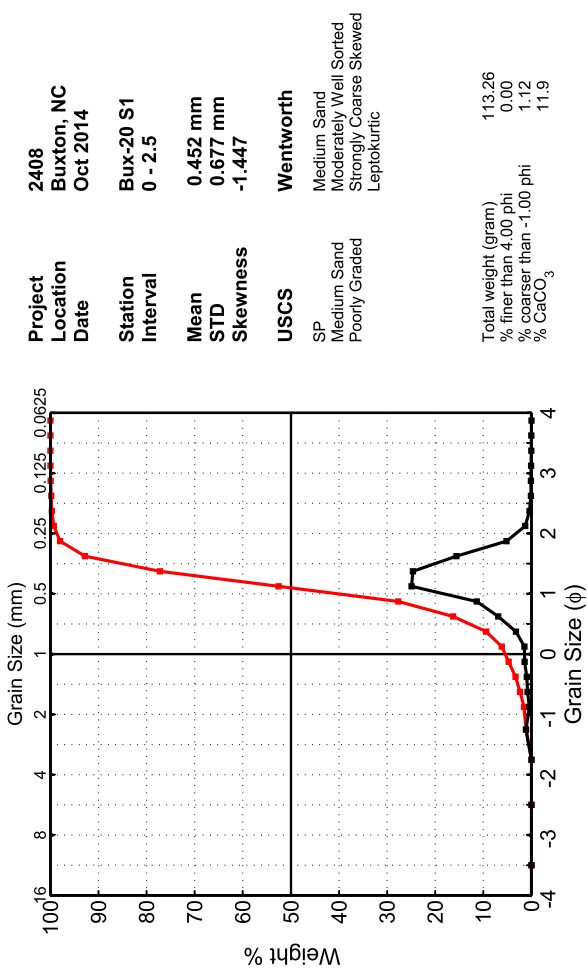


Limits			Weight % Cum. Wt %			Percentiles			Moment Measures			Graphic Phi Parameters			Folk & Ward		
(phi)																	
-4	-4.5	0.00	0.00	0.00	0.00	1	0.070	Mean	1.269	(phi)	0.415	Inman 1952	Mean Standard Deviation Skewness (1) Skewness (2) Kurtosis	1.148 0.283 -0.062 -0.389 1.171	Folk & Ward 1957	0.308 -0.131	
-3	-3.5	0.00	0.00	0.00	0.00	5	0.505	Standard Deviation	0.405	0.755							
-2	-2.5	0.00	0.00	0.00	0.00	16	0.865	Skewness	0.514	12.516							
-1.5	-1.75	0.00	0.00	0.00	0.00	25	0.950	Kurtosis									
-1	-1.25	0.13	0.12	0.12	0.12	50	1.165	Dispersion									
-0.75	-0.875	0.07	0.06	0.06	0.06	75	1.335	Standard Deviation									
-0.5	-0.625	0.10	0.09	0.09	0.09	84	1.430	Deviation from Normal									
-0.25	-0.375	0.18	0.16	0.16	0.16	95	1.605										
0	-0.125	0.31	0.27	0.27	0.27	99	2.625										
0.25	0.125	0.43	0.38	0.38	0.38												
0.5	0.375	1.64	1.45	1.45	1.45												
0.75	0.625	5.31	4.71	4.71	4.71												
1	0.875	10.24	9.08	16.32	16.32												
1.25	1.125	31.66	28.06	44.38	44.38												
1.5	1.375	40.96	36.31	80.69	80.69												
1.75	1.625	17.68	15.67	96.36	96.36												
2	1.875	1.48	1.31	97.67	97.67												
2.25	2.125	0.46	0.41	98.07	98.07												
2.5	2.375	0.67	0.59	98.67	98.67												
2.75	2.625	0.37	0.33	99.00	99.00												
3	2.875	0.48	0.43	99.42	99.42												
3.25	3.125	0.21	0.19	99.61	99.61												
3.5	3.375	0.21	0.19	99.80	99.80												
3.75	3.625	0.10	0.09	99.88	99.88												
4	3.875	0.05	0.04	99.93	99.93												
>4.0	4.25	0.08	0.07	100.00	100.00												

Grain Size Distribution

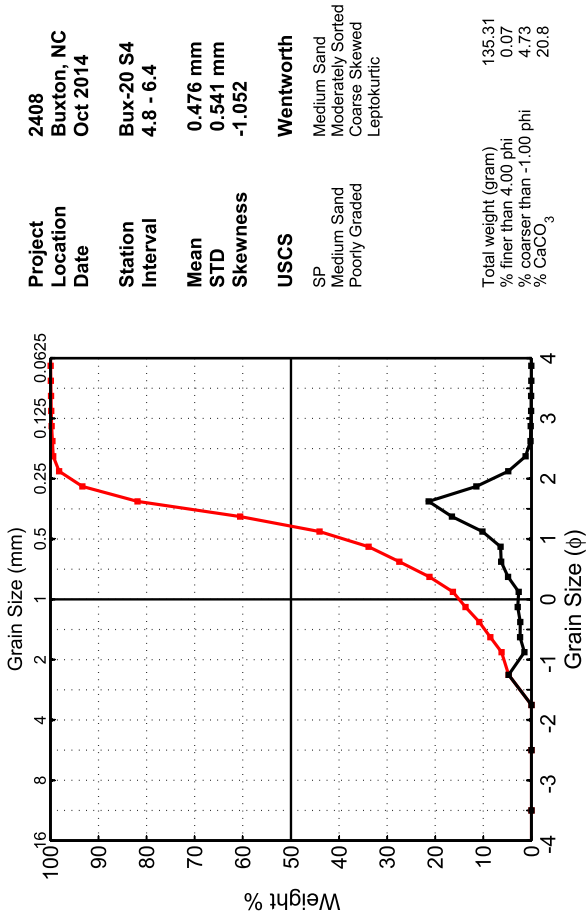


Grain Size Distribution

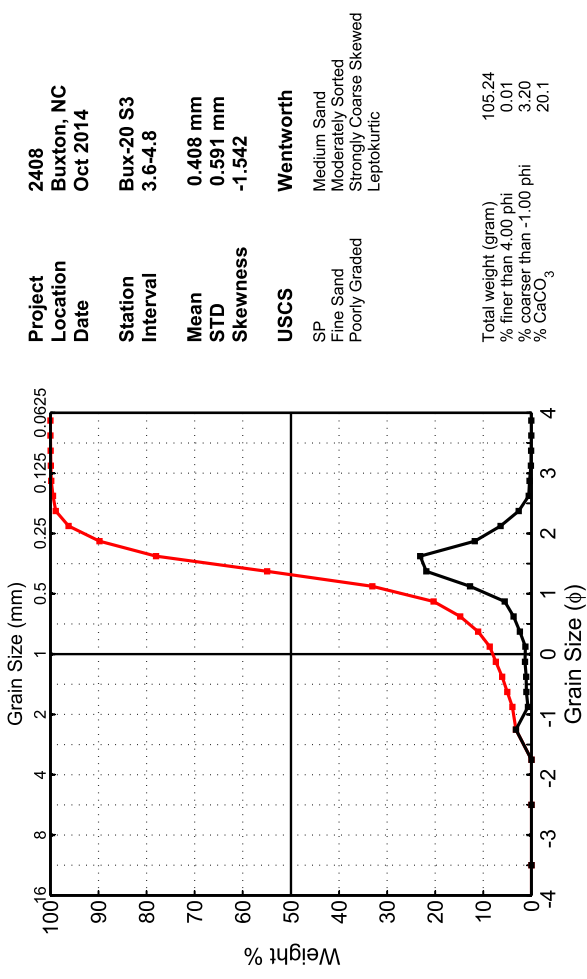


Limits (phi)			Mid Point (phi)			Weight (gram)			Weight % Cumm. Wt %			Percentiles			Moment Measures			Graphic Phi Parameters			Inman 1952			Folk & Ward 1957		
-4	-3	-2	-4.5	0.00	0.00	0.00	0.00	0.00	0.00	1	-1.615	Mean	Standard Deviation	Skewness	Kurtosis	Standard Deviation	Deviation from Normal	Mean	Standard Deviation	Skewness (1)	Kurtosis	Mean	Standard Deviation	Skewness (2)	Kurtosis	
-3	-2	-1.5	-3.5	0.00	0.00	0.00	0.00	0.00	0.00	5	-0.850	1.54	1.12	4.80	6.75	8.91	11.63	3.74	98.14	99.30	99.54	99.75	99.82	99.88	99.91	
-2	-1.5	-1	-2.5	0.00	0.00	0.00	0.00	0.00	0.00	16	0.220	5.07	3.68	3.68	2.16	2.72	11.63	2.59	14.22	18.84	25.84	34.29	49.33	67.15	78.82	
-1.5	-1	-0.75	-1.25	0.00	0.00	0.00	0.00	0.00	0.00	25	0.595	2.68	1.95	1.95	1.62	2.16	11.63	2.59	14.22	18.84	25.84	34.29	49.33	67.15	78.82	
-1	-0.75	-0.5	-0.875	0.00	0.00	0.00	0.00	0.00	0.00	50	1.135	2.98	2.16	2.16	1.62	2.16	11.63	2.59	14.22	18.84	25.84	34.29	49.33	67.15	78.82	
-0.75	-0.5	-0.25	-0.625	0.00	0.00	0.00	0.00	0.00	0.00	75	1.485	3.74	2.72	2.72	1.62	2.16	11.63	2.59	14.22	18.84	25.84	34.29	49.33	67.15	78.82	
-0.5	-0.25	0	-0.125	0.00	0.00	0.00	0.00	0.00	0.00	84	1.605	3.57	2.59	2.59	1.62	2.16	11.63	2.59	14.22	18.84	25.84	34.29	49.33	67.15	78.82	
-0.25	0	0.25	0.125	0.00	0.00	0.00	0.00	0.00	0.00	95	1.915	6.36	6.36	4.62	7.00	25.84	18.84	2.59	14.22	18.84	25.84	34.29	49.33	67.15	78.82	
0	0.25	0.5	0.375	0.00	0.00	0.00	0.00	0.00	0.00	99	2.310	9.64	7.00	7.00	25.84	18.84	25.84	2.59	14.22	18.84	25.84	34.29	49.33	67.15	78.82	
0.25	0.5	0.75	0.625	0.00	0.00	0.00	0.00	0.00	0.00			11.64	8.45	15.05	17.82	18.20	85.35	9.05	94.40	98.14	99.30	99.54	99.75	99.82	99.88	
0.5	0.75	1	0.875	0.00	0.00	0.00	0.00	0.00	0.00			20.72	24.54	17.82	18.20	85.35	9.05	94.40	98.14	99.30	99.54	99.75	99.82	99.88	99.91	
1	1.25	1.5	1.125	0.00	0.00	0.00	0.00	0.00	0.00			25.72	25.06	18.20	85.35	9.05	94.40	98.14	99.30	99.54	99.75	99.82	99.88	99.91	99.93	
1.25	1.5	1.75	1.375	0.00	0.00	0.00	0.00	0.00	0.00			24.54	17.82	18.20	85.35	9.05	94.40	98.14	99.30	99.54	99.75	99.82	99.88	99.91	99.93	
1.5	1.75	2	1.625	0.00	0.00	0.00	0.00	0.00	0.00			16.25	25.06	18.20	85.35	9.05	94.40	98.14	99.30	99.54	99.75	99.82	99.88	99.91	99.93	
1.75	2	2.25	1.875	0.00	0.00	0.00	0.00	0.00	0.00			12.47	12.47	9.05	94.40	98.14	99.30	99.54	99.75	99.82	99.88	99.91	99.93	99.93	100.00	
2	2.25	2.5	2.125	0.00	0.00	0.00	0.00	0.00	0.00			5.15	3.74	98.14	99.30	99.54	99.75	99.82	99.88	99.91	99.93	99.93	99.93	99.93	100.00	
2.25	2.5	2.75	2.375	0.00	0.00	0.00	0.00	0.00	0.00			1.60	1.16	99.30	99.54	99.75	99.82	99.88	99.91	99.93	99.93	99.93	99.93	99.93	100.00	
2.5	2.75	3	2.625	0.00	0.00	0.00	0.00	0.00	0.00			0.33	0.24	99.54	99.75	99.82	99.88	99.91	99.93	99.93	99.93	99.93	99.93	99.93	100.00	
2.75	3	3.25	2.875	0.00	0.00	0.00	0.00	0.00	0.00			0.29	0.21	99.75	99.82	99.88	99.91	99.93	99.93	99.93	99.93	99.93	99.93	99.93	100.00	
3	3.25	3.5	3.125	0.00	0.00	0.00	0.00	0.00	0.00			0.09	0.07	99.82	99.88	99.91	99.93	99.93	99.93	99.93	99.93	99.93	99.93	99.93	100.00	
3.25	3.5	3.75	3.375	0.00	0.00	0.00	0.00	0.00	0.00			0.08	0.06	99.88	99.91	99.93	99.93	99.93	99.93	99.93	99.93	99.93	99.93	99.93	100.00	
3.5	3.75	4	3.625	0.00	0.00	0.00	0.00	0.00	0.00			0.05	0.04	99.91	99.93	99.93	99.93	99.93	99.93	99.93	99.93	99.93	99.93	99.93	100.00	
3.75	4	>4.0	3.875	0.00	0.00	0.00	0.00	0.00	0.00			0.03	0.02	99.93	99.93	99.93	99.93	99.93	99.93	99.93	99.93	99.93	99.93	99.93	100.00	
>4.0			4.25	0.09	0.07	0.00	0.00	0.00	0.00			0.09	0.07	99.93	99.93	99.93	99.93	99.93	99.93	99.93	99.93	99.93	99.93	99.93	100.00	

Grain Size Distribution



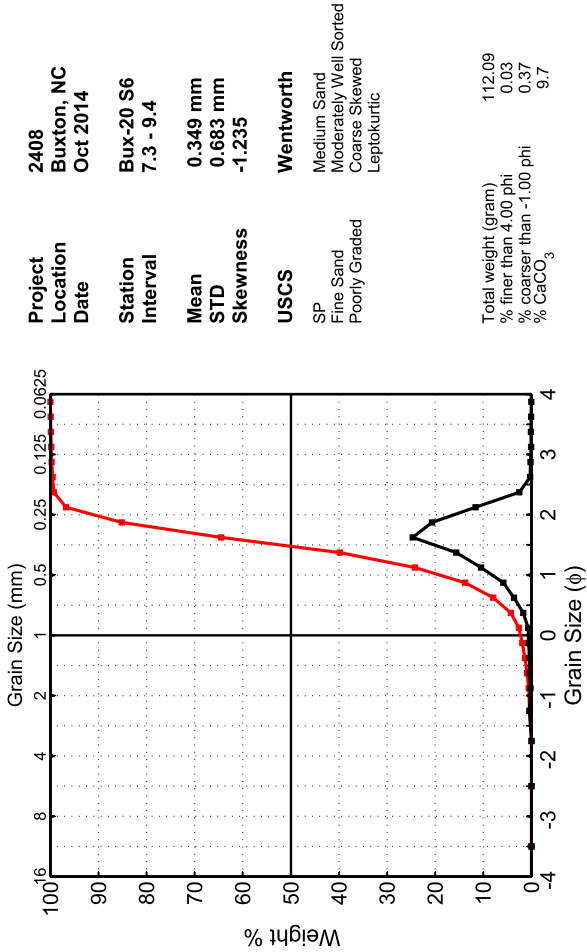
Grain Size Distribution



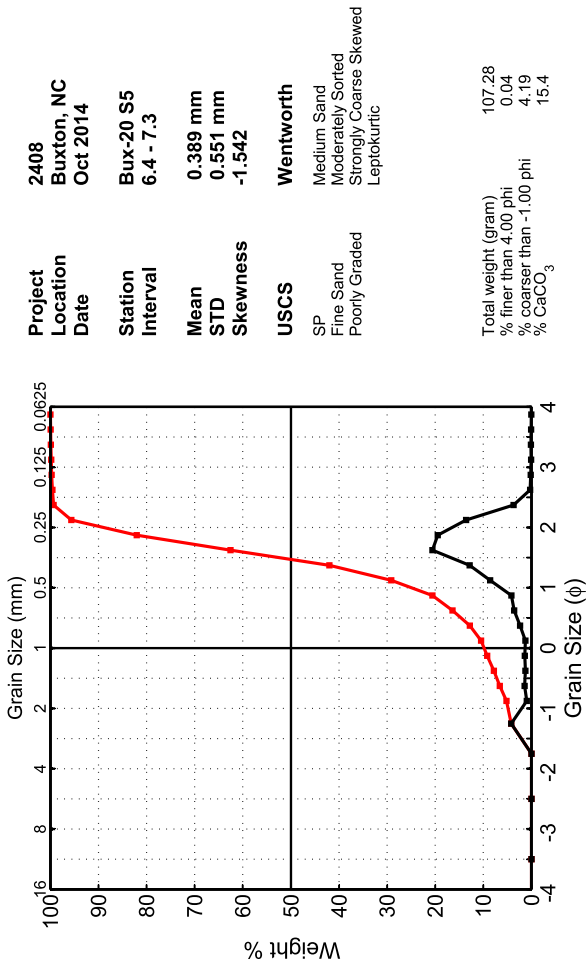
Limits			Weight % Cum. Wt %			Moment Measures		
(ϕ)	Mid Point (ϕ)	Weight (gram)				(phi)	(mm)	
-4	-4.5	0.00	0.00	1	-1.645	Mean	1.072	0.476
-3	-3.5	0.00	0.00	5	-1.180	Standard Deviation	0.886	0.541
-2	-2.5	0.00	0.00	16	0.095	Skewness	-1.052	
-1.5	-1.75	0.00	0.00	25	0.525	Kurtosis	3.717	
-1	-1.25	6.40	4.73	50	1.215	Dispersion		
-0.75	-0.875	1.97	1.46	75	1.545	Standard Deviation		
-0.5	-0.625	3.18	2.35	84	1.670	Deviation from Normal		
-0.25	-0.375	3.11	2.30	95	1.960			
0	-0.125	3.87	13.69	99	2.295			
0.25	0.125	3.57	2.64					
0.5	0.375	6.57	4.86					
0.75	0.625	8.50	6.28					
1	0.875	8.65	6.39					
1.25	1.125	13.75	10.16					
1.5	1.375	22.36	16.53					
1.75	1.625	28.87	21.34					
2	1.875	15.50	93.34					
2.25	2.125	6.53	4.83					
2.5	2.375	1.65	98.17					
2.75	2.625	0.27	99.39					
3	2.875	0.22	99.59					
3.25	3.125	0.09	99.75					
3.5	3.375	0.08	99.82					
3.75	3.625	0.05	99.87					
4	3.875	0.03	99.91					
>4.0	4.25	0.09	99.93					
			100.00					

Graphic Phi Parameters			Inman 1952			Folk & Ward 1957		

Grain Size Distribution



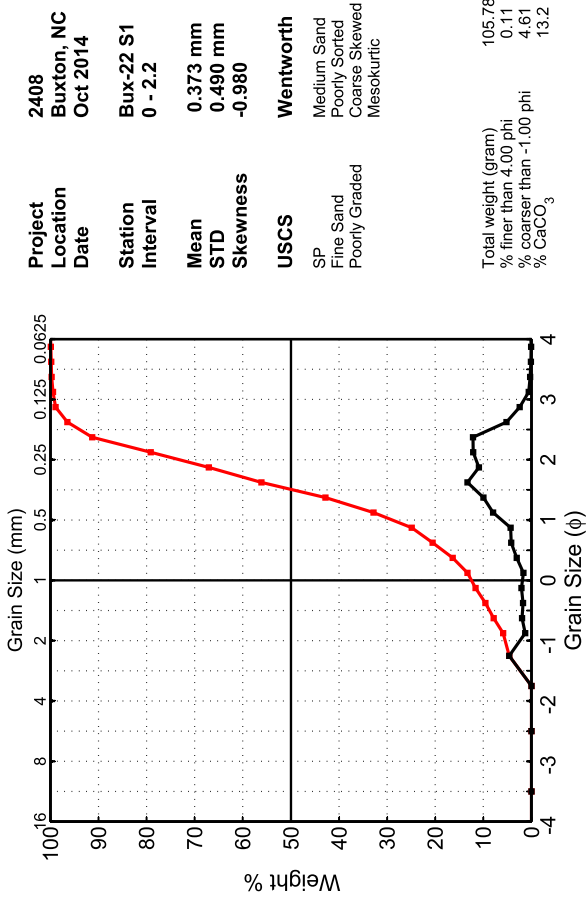
Grain Size Distribution



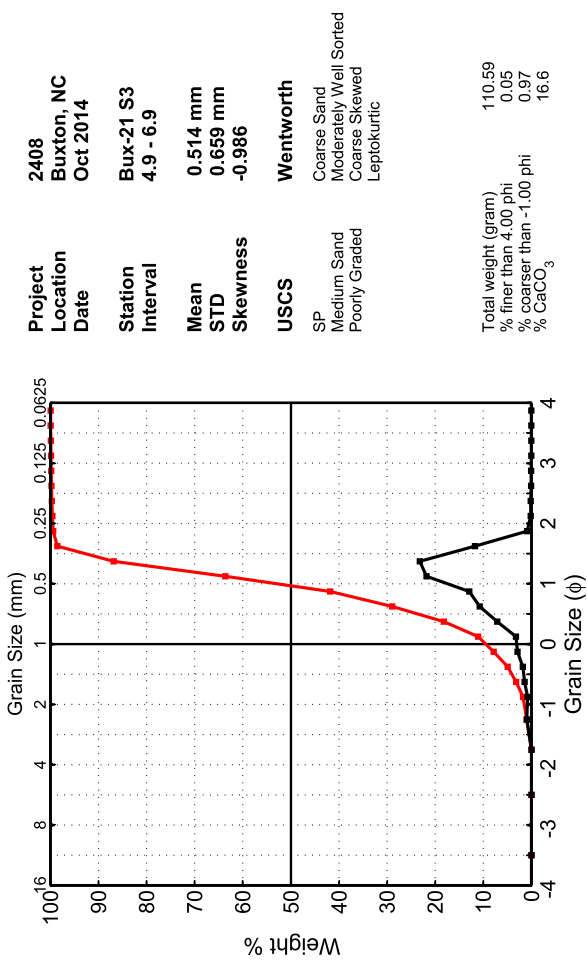
Percentiles					Moment Measures				
1	-0.585	0.00	0.00	0.00	Mean	1.519	(phi)	(mm)	
5	0.425	0.00	0.00	0.00	Standard Deviation	0.550		0.349	
16	0.930	0.00	0.00	0.00	Skewness	-1.235		0.683	
25	1.135	0.00	0.00	0.00	Kurtosis	6.965			
50	1.480	0.37	0.37	0.37	Dispersion				
75	1.750	0.57	0.57	0.57	Standard Deviation				
84	1.860	0.94	0.94	0.94	Deviation from Normal				
95	2.085	1.31	1.31	1.31					
99	2.350	1.92	1.92	1.92					
Graphic Phi Parameters					Inman 1952				
					Folk & Ward 1957				
Mean					1.395				
Standard Deviation					0.465				
Skewness (1)					-0.183				
Skewness (2)					-0.484				
Kurtosis					0.785				

Percentiles					Moment Measures				
1	-1.630	0.00	0.00	0.00	Mean	1.363	(phi)	(mm)	
5	-0.940	0.00	0.00	0.00	Standard Deviation	0.859		0.389	
16	0.595	0.00	0.00	0.00	Skewness	-1.542		0.551	
25	1.005	0.00	0.00	0.00	Kurtosis	5.232			
50	1.470	0.98	0.98	0.98	Dispersion				
75	1.785	1.42	1.42	1.42	Standard Deviation				
84	1.910	1.23	1.23	1.23	Deviation from Normal				
95	2.115	1.38	1.38	1.38					
99	2.355	1.25	1.25	1.25					
Graphic Phi Parameters					Inman 1952				
					Folk & Ward 1957				
Mean					1.252				
Standard Deviation					0.658				
Skewness (1)					-0.331				
Skewness (2)					-1.342				
Kurtosis					1.323				

Grain Size Distribution



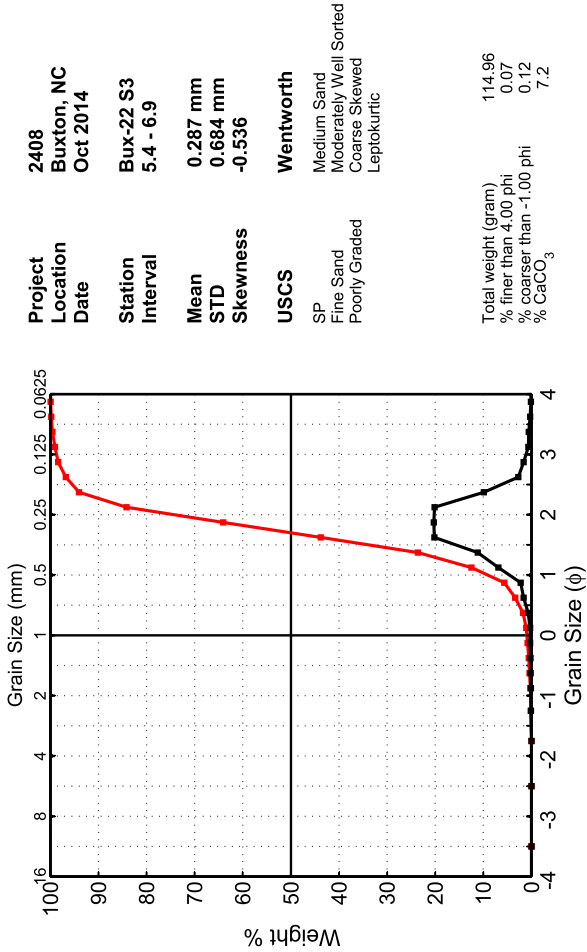
Grain Size Distribution



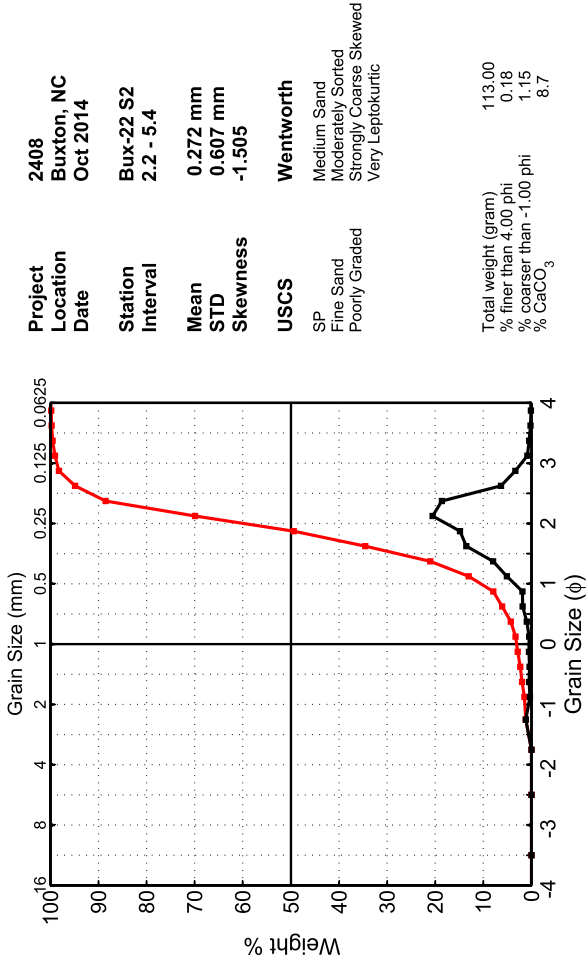
Limits (phi)	Mid Point (phi)	Weight (gram)	Weight % Cum. Wt %	Percentiles		Moment Measures		Graphic Phi Parameters		Folk & Ward	
				1	5	Mean	Standard Deviation	Inman 1952	Inman 1952	Mean	Standard Deviation
-4	-4.5	0.00	0.00	-1.640	-1.135	1.424	0.373	1.285	1.285	1.360	0.940
-3	-3.5	0.00	0.00			1.030	0.490	0.940	0.940	1.029	0.239
-2	-2.5	0.00	0.00			-0.980		-0.239	-0.239	-0.336	-0.851
-1.5	-1.75	0.00	0.00	16	0.345	3.574					
-1	-1.25	0.00	0.00	25	0.880						
-0.75	-0.875	1.35	1.28	50	1.510						
-0.5	-0.625	2.05	1.94	75	2.040						
-0.25	-0.375	1.84	1.74	84	2.225						
0	-0.125	2.18	2.06								
0.25	0.125	1.77	1.67	95	2.555						
0.5	0.375	3.24	3.06	99	2.915						
0.75	0.625	4.42	4.18								
1	0.875	4.59	4.34								
1.25	1.125	8.42	7.96								
1.5	1.375	10.56	9.98								
1.75	1.625	14.05	13.28								
2	1.875	11.56	10.93								
2.25	2.125	12.82	12.12								
2.5	2.375	12.83	12.13								
2.75	2.625	5.48	5.18								
3	2.875	2.59	2.45								
3.25	3.125	0.57	0.54								
3.5	3.375	0.28	0.26								
3.75	3.625	0.11	0.10								
4	3.875	0.07	0.07								
>4.0	4.25	0.12	0.11								

Limits (phi)	Mid Point (phi)	Weight (gram)	Weight % Cum. Wt %	Percentiles		Moment Measures		Graphic Phi Parameters		Folk & Ward	
				1	5	Mean	Standard Deviation	Inman 1952	Inman 1952	Mean	Standard Deviation
-4	-4.5	0.00	0.00	-1.235	-0.370	0.960	0.514	0.822	0.822	0.872	0.522
-3	-3.5	0.00	0.00			0.602	0.659	0.522	0.522	0.552	-0.282
-2	-2.5	0.00	0.00	16	0.300	-0.986		-0.282	-0.282	-0.339	-0.727
-1.5	-1.75	0.00	0.00	25	0.535	5.354					
-1	-1.25	1.07	0.97	50	0.970						
-0.75	-0.875	0.87	0.79	75	1.250						
-0.5	-0.625	1.55	1.40	84	1.345						
-0.25	-0.375	1.98	1.79	95	1.550						
0	-0.125	3.21	2.90	99	1.755						
0.25	0.125	3.57	3.23								
0.5	0.375	7.86	7.11								
0.75	0.625	11.87	10.73								
1	0.875	14.27	12.90								
1.25	1.125	24.11	21.80								
1.5	1.375	25.66	23.20								
1.75	1.625	12.96	11.72								
2	1.875	0.97	0.86								
2.25	2.125	0.18	0.16								
2.5	2.375	0.14	0.13								
2.75	2.625	0.07	0.06								
3	2.875	0.05	0.05								
3.25	3.125	0.03	0.03								
3.5	3.375	0.04	0.04								
3.75	3.625	0.04	0.04								
4	3.875	0.04	0.04								
>4.0	4.25	0.05	0.05								

Grain Size Distribution



Grain Size Distribution



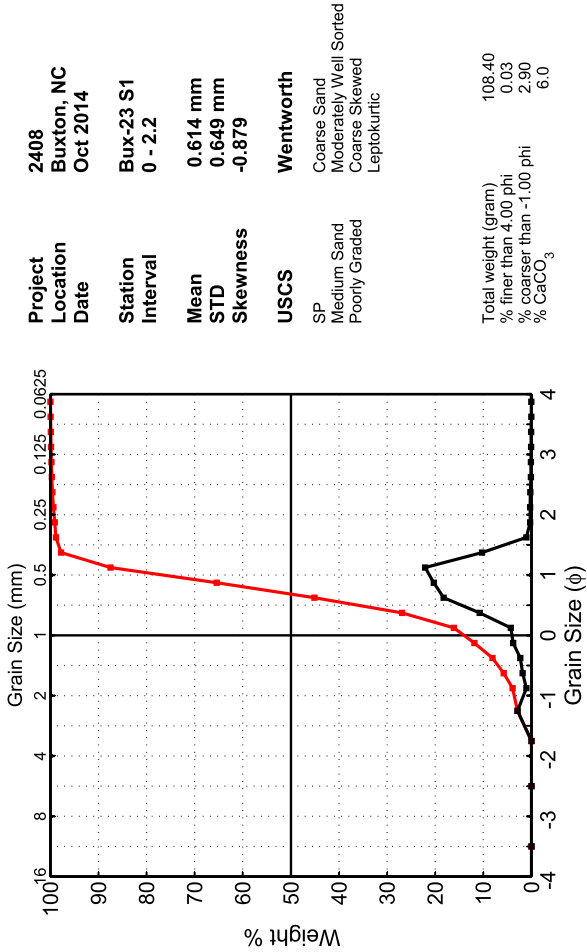
Limits			Percentiles			Moment Measures			Graphic Phi Parameters			Folk & Ward		
(phi)	Mid Point (phi)	Weight (gram)	Weight % Cum. Wt %	1	5	16	25	50	75	84	95	99	1952	1957
-4	-4.5	0.00	0.00	0.050	0.805	1.205	1.390	1.700	2.010	2.125	2.460	3.115		
-3	-3.5	0.00	0.00											
-2	-2.5	0.00	0.00											
-1.5	-1.75	0.00	0.00											
-1	-1.25	0.14	0.12											
-0.75	-0.875	0.12	0.10											
-0.5	-0.625	0.18	0.23											
-0.25	-0.375	0.19	0.38											
0	-0.125	0.30	0.81											
0.25	0.125	0.31	0.27											
0.5	0.375	0.76	0.66											
0.75	0.625	1.87	1.63											
1	0.875	2.58	2.24											
1.25	1.125	7.87	6.85											
1.5	1.375	12.84	11.17											
1.75	1.625	23.17	20.15											
2	1.875	23.32	20.29											
2.25	2.125	23.13	20.12											
2.5	2.375	11.35	9.87											
2.75	2.625	3.12	2.71											
3	2.875	1.87	1.63											
3.25	3.125	0.72	0.63											
3.5	3.375	0.63	0.55											
3.75	3.625	0.29	0.25											
4	3.875	0.12	0.10											
>4.0	4.25	0.08	0.07											

Moment Measures			Graphic Phi Parameters			Folk & Ward		
Mean	Standard Deviation	Skewness	Mean	Standard Deviation	Skewness	Mean	Standard Deviation	Skewness
1.801	0.547	-0.536	1.665	0.460	-0.076	1.677	0.481	-0.079
6.380			0.799			1.094		

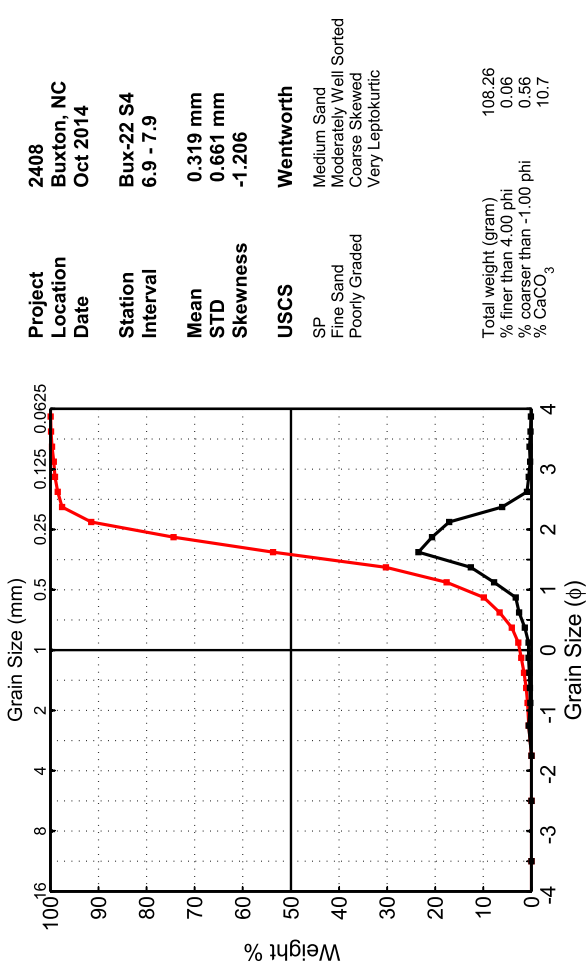
Limits			Percentiles			Moment Measures			Graphic Phi Parameters			Folk & Ward		
(phi)	Mid Point (phi)	Weight (gram)	Weight % Cum. Wt %	1	5	16	25	50	75	84	95	99	1952	1957
-4	-4.5	0.00	0.00	-1.315	0.475	1.220	1.450	1.880	2.195	2.315	2.635	3.110		
-3	-3.5	0.00	0.00											
-2	-2.5	0.00	0.00											
-1.5	-1.75	0.00	0.00											
-1	-1.25	1.30	1.15											
-0.75	-0.875	0.36	0.32											
-0.5	-0.625	0.52	0.46											
-0.25	-0.375	0.44	0.39											
0	-0.125	0.58	0.51											
0.25	0.125	0.54	0.48											
0.5	0.375	1.09	0.96											
0.75	0.625	2.04	1.81											
1	0.875	2.09	1.85											
1.25	1.125	5.76	5.10											
1.5	1.375	9.02	7.98											
1.75	1.625	15.30	13.54											
2	1.875	16.77	14.84											
2.25	2.125	23.21	20.54											
2.5	2.375	21.01	18.59											
2.75	2.625	7.16	6.34											
3	2.875	3.79	3.35											
3.25	3.125	0.94	0.83											
3.5	3.375	0.55	0.49											
3.75	3.625	0.21	0.19											
4	3.875	0.12	0.11											
>4.0	4.25	0.20	0.18											

Moment Measures			Graphic Phi Parameters			Folk & Ward		
Mean	Standard Deviation	Skewness	Mean	Standard Deviation	Skewness	Mean	Standard Deviation	Skewness
1.877	0.720	-1.505	1.767	0.548	-0.205	1.805	0.601	-0.253
7.545			0.973	-0.594		1.188		

Grain Size Distribution



Grain Size Distribution



Limits (phi)			Percentiles			Moment Measures		
-4	-3	-2	1	5	16	Mean	Standard Deviation	Skewness
-1.5	-1.75	-2.5	0.120	0.000	0.000	Kurtosis	Dispersion	Standard Deviation
-0.75	-0.875	-1.125	0.330	0.000	0.000	Deviation from Normal		
-0.5	-0.625	-0.875	0.500	0.000	0.000			
-0.25	-0.375	-0.625	0.685	0.000	0.000			
0	-0.125	-0.375	0.807	0.000	0.000			
0.25	0.125	0.375	0.985	0.000	0.000			
0.5	0.375	0.625	1.085	0.000	0.000			
0.75	0.625	0.875	1.310	0.000	0.000			
1	0.875	1.125	1.785	0.000	0.000			
1.25	1.125	1.375	87.51	0.000	0.000			
1.5	1.375	1.625	22.10	0.000	0.000			
1.75	1.625	1.875	10.26	0.000	0.000			
2	1.875	2.125	1.06	0.000	0.000			
2.25	2.125	2.375	0.27	0.000	0.000			
2.5	2.375	2.625	0.28	0.000	0.000			
2.75	2.625	2.875	0.21	0.000	0.000			
3	2.875	3.125	0.10	0.000	0.000			
3.25	3.125	3.375	0.07	0.000	0.000			
3.5	3.375	3.625	0.07	0.000	0.000			
3.75	3.625	3.875	0.04	0.000	0.000			
4	3.875	4.125	0.03	0.000	0.000			
>4.0			0.03	0.000	0.000			

Limits (phi)			Percentiles			Moment Measures		
-4	-3	-2	1	5	16	Mean	Standard Deviation	Skewness
-1.5	-1.75	-2.5	0.120	0.000	0.000	Kurtosis	Dispersion	Standard Deviation
-0.75	-0.875	-1.125	0.330	0.000	0.000	Deviation from Normal		
-0.5	-0.625	-0.875	0.500	0.000	0.000			
-0.25	-0.375	-0.625	0.685	0.000	0.000			
0	-0.125	-0.375	0.807	0.000	0.000			
0.25	0.125	0.375	0.985	0.000	0.000			
0.5	0.375	0.625	1.085	0.000	0.000			
0.75	0.625	0.875	1.310	0.000	0.000			
1	0.875	1.125	1.785	0.000	0.000			
1.25	1.125	1.375	87.51	0.000	0.000			
1.5	1.375	1.625	22.10	0.000	0.000			
1.75	1.625	1.875	10.26	0.000	0.000			
2	1.875	2.125	1.06	0.000	0.000			
2.25	2.125	2.375	0.27	0.000	0.000			
2.5	2.375	2.625	0.28	0.000	0.000			
2.75	2.625	2.875	0.21	0.000	0.000			
3	2.875	3.125	0.10	0.000	0.000			
3.25	3.125	3.375	0.07	0.000	0.000			
3.5	3.375	3.625	0.07	0.000	0.000			
3.75	3.625	3.875	0.04	0.000	0.000			
4	3.875	4.125	0.03	0.000	0.000			
>4.0			0.03	0.000	0.000			

Limits (phi)			Percentiles			Moment Measures		
-4	-3	-2	1	5	16	Mean	Standard Deviation	Skewness
-1.5	-1.75	-2.5	0.120	0.000	0.000	Kurtosis	Dispersion	Standard Deviation
-0.75	-0.875	-1.125	0.330	0.000	0.000	Deviation from Normal		
-0.5	-0.625	-0.875	0.500	0.000	0.000			
-0.25	-0.375	-0.625	0.685	0.000	0.000			
0	-0.125	-0.375	0.807	0.000	0.000			
0.25	0.125	0.375	0.985	0.000	0.000			
0.5	0.375	0.625	1.085	0.000	0.000			
0.75	0.625	0.875	1.310	0.000	0.000			
1	0.875	1.125	1.785	0.000	0.000			
1.25	1.125	1.375	87.51	0.000	0.000			
1.5	1.375	1.625	22.10	0.000	0.000			
1.75	1.625	1.875	10.26	0.000	0.000			
2	1.875	2.125	1.06	0.000	0.000			
2.25	2.125	2.375	0.27	0.000	0.000			
2.5	2.375	2.625	0.28	0.000	0.000			
2.75	2.625	2.875	0.21	0.000	0.000			
3	2.875	3.125	0.10	0.000	0.000			
3.25	3.125	3.375	0.07	0.000	0.000			
3.5	3.375	3.625	0.07	0.000	0.000			
3.75	3.625	3.875	0.04	0.000	0.000			
4	3.875	4.125	0.03	0.000	0.000			
>4.0			0.03	0.000	0.000			

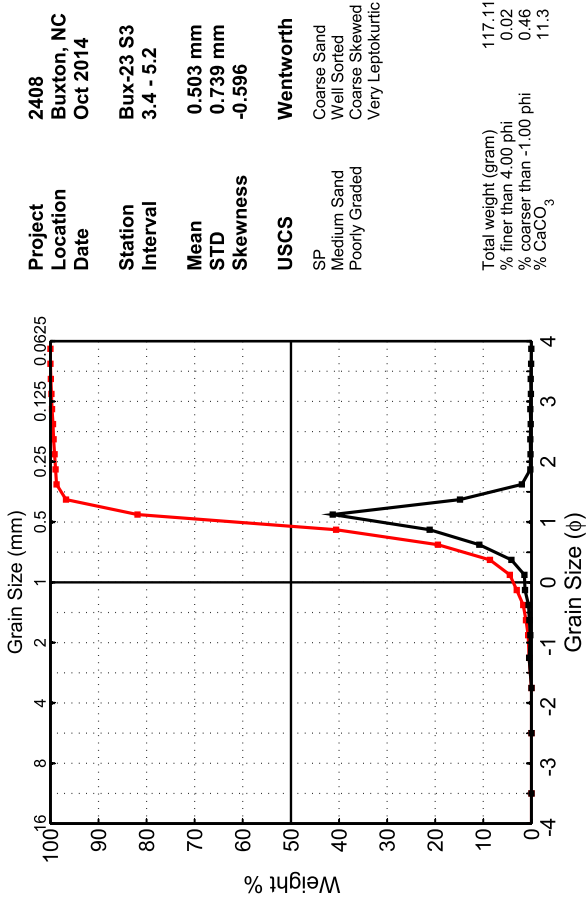
Limits (phi)			Percentiles			Moment Measures		
-4	-3	-2	1	5	16	Mean	Standard Deviation	Skewness
-1.5	-1.75	-2.5	0.120	0.000	0.000	Kurtosis	Dispersion	Standard Deviation
-0.75	-0.875	-1.125	0.330	0.000	0.000	Deviation from Normal		
-0.5	-0.625	-0.875	0.500	0.000	0.000			
-0.25	-0.375	-0.625	0.685	0.000	0.000			
0	-0.125	-0.375	0.807	0.000	0.000			
0.25	0.125	0.375	0.985	0.000	0.000			
0.5	0.375	0.625	1.085	0.000	0.000			
0.75	0.625	0.875	1.310	0.000	0.000			
1	0.875	1.125	1.785	0.000	0.000			
1.25	1.125	1.375	87.51	0.000	0.000			
1.5	1.375	1.625	22.10	0.000	0.000			
1.75	1.625	1.875	10.26	0.000	0.000			
2	1.875	2.125	1.06	0.000	0.000			
2.25	2.125	2.375	0.27	0.000	0.000			
2.5	2.375	2.625	0.28	0.000	0.000			
2.75	2.625	2.875	0.21	0.000	0.000			
3	2.875	3.125	0.10	0.000	0.000			
3.25	3.125	3.375	0.07	0.000	0.000			
3.5	3.375	3.625	0.07	0.000	0.000			
3.75	3.625	3.875	0.04	0.000	0.000			
4	3.875	4.125	0.03	0.000	0.000			
>4.0			0.03	0.000	0.000			

Limits (phi)			Percentiles			Moment Measures		
-4	-3	-2	1	5	16	Mean	Standard Deviation	Skewness
-1.5	-1.75	-2.5	0.120	0.000	0.000	Kurtosis	Dispersion	Standard Deviation
-0.75	-0.875	-1.125	0.330	0.000	0.000	Deviation from Normal		
-0.5	-0.625	-0.875	0.500	0.000	0.000			
-0.25	-0.375	-0.625	0.685	0.000	0.000			
0	-0.125	-0.375	0.807	0.000	0.000			
0.25	0.125	0.375	0.985	0.000	0.000			
0.5	0.375	0.625	1.085	0.000	0.000			
0.75	0.625	0.875	1.310	0.000	0.000			
1	0.875	1.125	1.785	0.000	0.000			
1.25	1.125	1.375	87.51	0.000	0.000			
1.5	1.375	1.625	22.10	0.000	0.000			
1.75	1.625	1.875	10.26	0.000	0.000			
2	1.875	2.125	1.06	0.000	0.000			
2.25	2.125	2.375	0.27	0.000	0.000			
2.5	2.375	2.625	0.28	0.000	0.000			
2.75	2.625	2.875	0.21	0.000	0.000			
3	2.875	3.125	0.10	0.000	0.000			
3.25	3.125	3.375	0.07	0.000	0.000			
3.5	3.375	3.625	0.07	0.000	0.000			
3.75	3.625	3.875	0.04	0.000	0.000			
4	3.875	4.125	0.03	0.000	0.000			
>4.0			0.03	0.000	0.000			

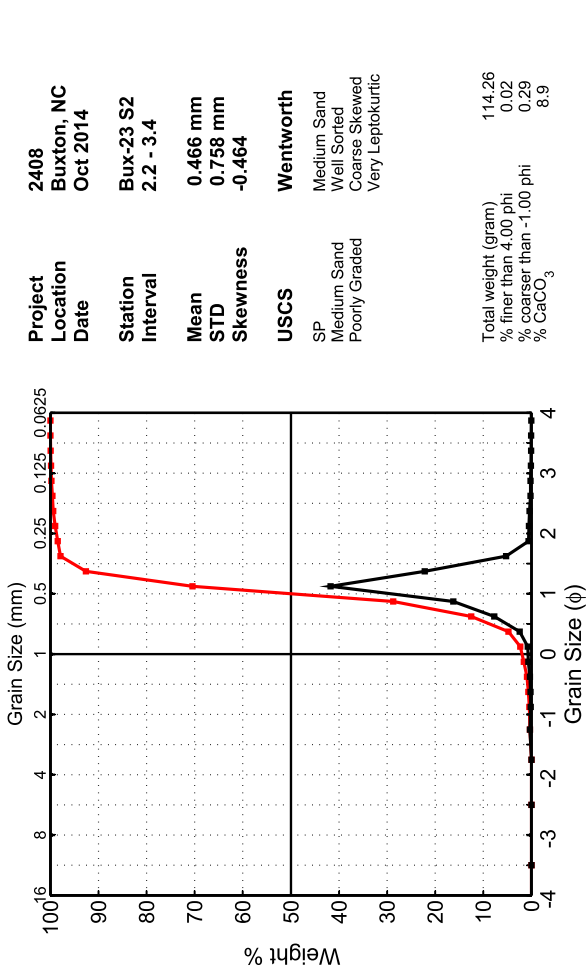
Limits (phi)			Percentiles			Moment Measures		
-4	-3	-2	1	5	16	Mean	Standard Deviation	Skewness
-1.5	-1.75	-2.5	0.120	0.000	0.000	Kurtosis	Dispersion	Standard Deviation
-0.75	-0.875	-1.125	0.330	0.000	0.000	Deviation from Normal		
-0.5	-0.625	-0.875	0.500	0.000	0.000			
-0.25	-0.375	-0.625	0.685	0.000	0.000			
0	-0.125	-0.375	0.807	0.000	0.000			
0.25	0.125	0.375	0.985	0.000	0.000			
0.5	0.375	0.625	1.085	0.000	0.000			
0.75	0.625	0.875	1.310	0.000	0.000			
1	0.875	1.125	1.785	0.000	0.000			
1.25	1.125	1.375	87.51	0.000	0.000			
1.5	1.375	1.625	22.10	0.000	0.000			
1.75	1.625	1.875	10.26	0.000	0.000			
2	1.875	2.125	1.06	0.000	0.000			
2.25	2.125	2.375	0.27	0.000	0.000			
2.5	2.375	2.625	0.28	0.000	0.000			
2.75	2.625	2.875	0.21	0.000	0.000			
3	2.875	3.125	0.10	0.000	0.000			
3.25	3.125	3.375	0.07	0.000	0.000			
3.5	3.375	3.625	0.07	0.000	0.000			
3.75	3.625	3.875	0.04	0.000	0.000			
4	3.875	4.125	0.03	0.000	0.000			
>4.0			0.03	0.000	0.000			

Limits (phi)			Percentiles			Moment Measures		
-4	-3	-2	1	5	16	Mean	Standard Deviation	Skewness
-1.5	-1.75	-2.5	0.120	0.000	0.000	Kurtosis	Dispersion	Standard Deviation
-0.75	-0.875	-1.125	0.330	0.000	0.000	Deviation from Normal		
-0.5	-0.625	-0.875	0.500	0.000	0.000			
-0.25	-0.375	-0.625	0.685	0.000	0.000			
0	-0.125	-0.375	0.807	0.000	0.000			
0.25	0.125	0.375	0.985	0.000	0.000			
0.5	0.375	0.625	1.085	0.000	0.000			
0.75	0.625	0.875	1.310	0.000	0.000			
1	0.875	1.125	1.785	0.000	0.000			
1.25	1.125	1.375	87.51	0.000	0.000			

Grain Size Distribution



Grain Size Distribution



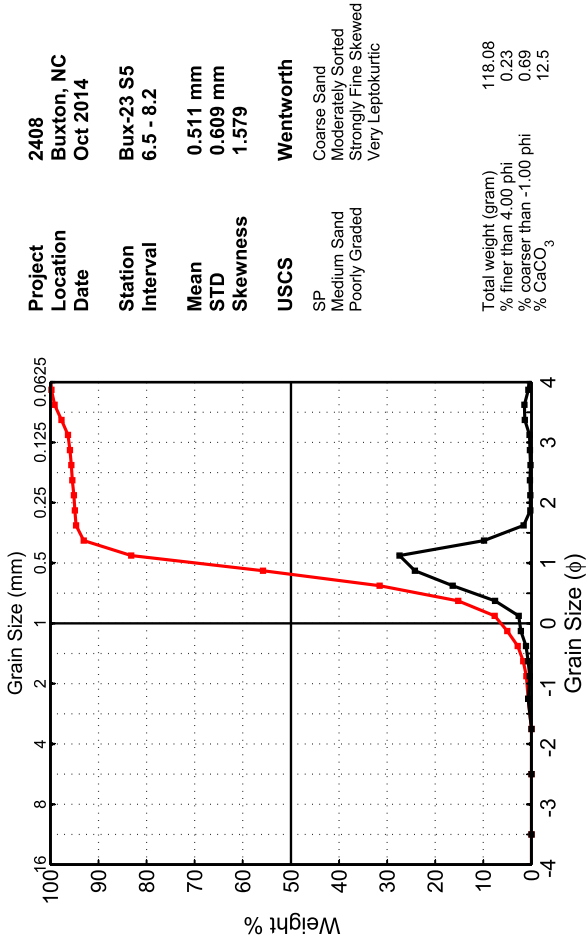
Percentiles			Moment Measures		
Limits (ϕ)	Mid Point (ϕ)	Weight (gram)	Weight % Cumm. Wt %	Mean	(phi) (mm)
-4	-4.5	0.00	0.00	Standard Deviation	0.991 0.503
-3	-3.5	0.00	0.00	Skewness	0.435 0.739
-2	-2.5	0.00	0.00	Kurtosis	-0.596 11.348
-1.5	-1.75	0.00	0.00	Dispersion	
-0.75	-1.25	0.54	0.00	Standard Deviation	
-0.5	-0.875	0.26	0.46	Deviation from Normal	
-0.25	-0.625	0.50	0.22		
0	-0.375	0.69	0.88		
0.25	-0.125	1.56	1.11		
0.5	0.125	1.69	1.70		
0.75	0.375	4.47	3.03		
1	0.625	8.62	4.47		
1.25	0.875	12.67	8.62		
1.5	1.125	24.77	19.43		
1.75	1.375	21.15	40.59		
2	1.625	41.31	81.90		
2.25	1.875	17.37	96.73		
2.5	2.125	2.33	98.72		
2.75	2.375	0.24	99.11		
3	2.625	0.22	99.45		
3.25	2.875	0.15	99.66		
3.5	3.125	0.14	99.78		
3.75	3.375	0.16	99.91		
4	3.625	0.06	99.97		
>4.0	4.25	0.02	100.00		

Graphic Phi Parameters			Inman 1952			Folk & Ward 1957		
Mean	Standard Deviation	Skewness (1)	Mean	Standard Deviation	Skewness (1)	Mean	Standard Deviation	Skewness (1)
0.853	0.308	-0.252	0.853	0.308	-0.252	0.878	0.334	-0.277
0.935	-0.585		0.935	-0.585		1.235		

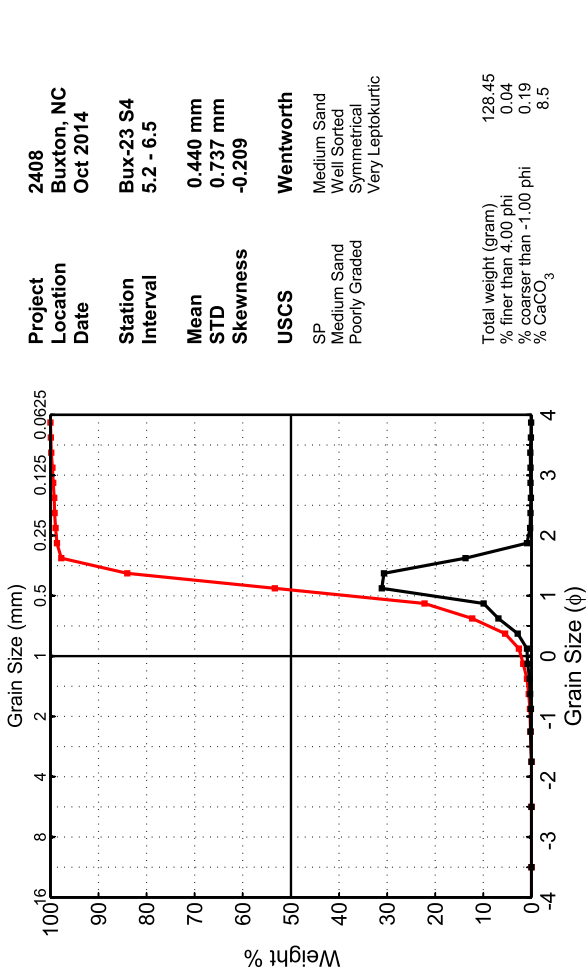
Percentiles			Moment Measures		
Limits (ϕ)	Mid Point (ϕ)	Weight (gram)	Weight % Cumm. Wt %	Mean	(phi) (mm)
-4	-4.5	0.00	0.00	Standard Deviation	1.102 0.466
-3	-3.5	0.00	0.00	Skewness	0.400 0.758
-2	-2.5	0.00	0.00	Kurtosis	-0.464 12.034
-1.5	-1.75	0.00	0.00	Dispersion	
-0.75	-1.25	0.33	0.00	Standard Deviation	
-0.5	-0.875	0.17	0.29	Deviation from Normal	
-0.25	-0.625	0.23	0.44		
0	-0.375	0.33	0.64		
0.25	-0.125	0.73	0.93		
0.5	0.125	0.86	1.57		
0.75	0.375	2.80	2.32		
1	0.625	8.83	4.77		
1.25	0.875	18.54	12.50		
1.5	1.125	47.69	28.72		
1.75	1.375	25.32	70.46		
2	1.625	6.00	92.62		
2.25	1.875	0.68	97.87		
2.5	2.125	0.60	98.47		
2.75	2.375	0.46	98.99		
3	2.625	0.21	99.40		
3.25	2.875	0.20	99.58		
3.5	3.125	0.10	99.75		
3.75	3.375	0.09	99.84		
4	3.625	0.05	99.92		
>4.0	4.25	0.02	99.96		
		0.02	99.98		
		0.02	100.00		

Graphic Phi Parameters			Inman 1952			Folk & Ward 1957		
Mean	Standard Deviation	Skewness (1)	Mean	Standard Deviation	Skewness (1)	Mean	Standard Deviation	Skewness (1)
0.980	0.300	-0.067	0.980	0.300	-0.067	0.987	0.318	-0.092
0.850	-0.217		0.850	-0.217		1.281		

Grain Size Distribution

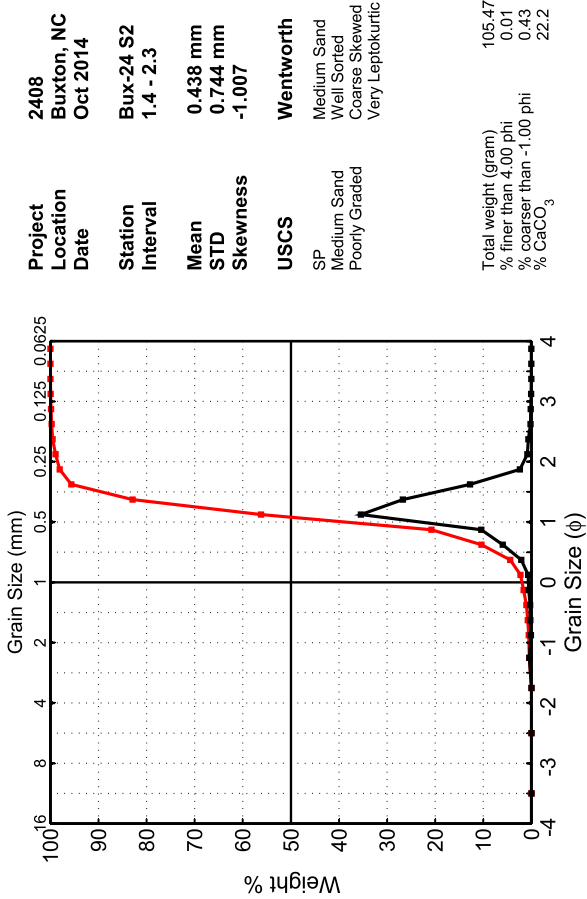


Grain Size Distribution

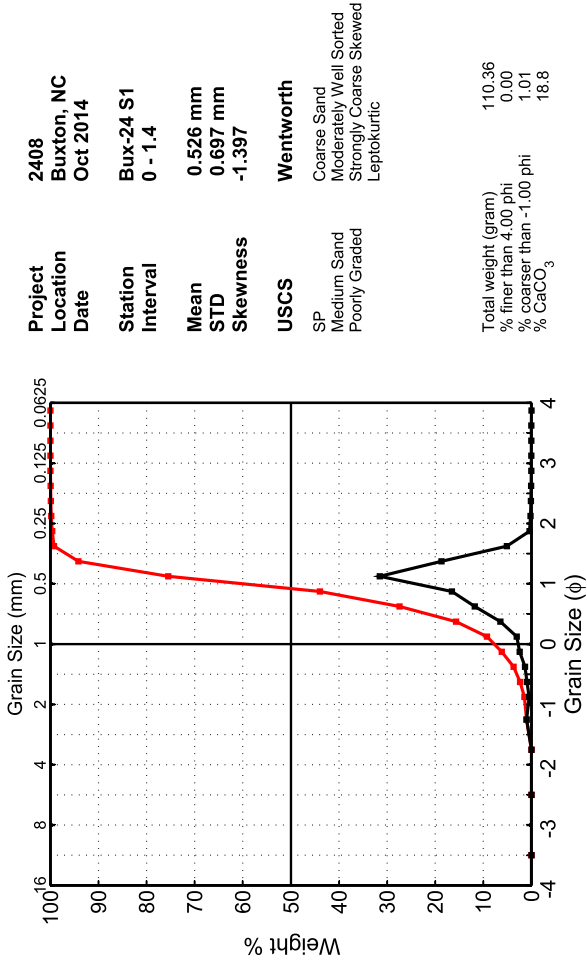


Limits			Weight % Cum. Wt %			Percentiles			Moment Measures			Graphic Phi Parameters			Inman 1952			Folk & Ward 1957		
(phi)	Mid Point (phi)	Weight (gram)																		
-4	-4.5	0.00	0.00	0.00	0.00	1	-0.900	Mean	0.969	(phi)	(mm)									
-3	-3.5	0.00	0.00	0.00	0.00	5	-0.125	Standard Deviation	0.716											0.511
-2	-2.5	0.00	0.00	0.00	0.00	16	0.385	Skewness	1.579											0.609
-1.5	-1.75	0.00	0.00	0.00	0.00	25	0.525	Kurtosis	9.201											
-1	-1.25	0.81	0.69	0.69	0.69	25	0.525	Dispersion												
-0.75	-0.875	0.40	0.34	1.02	1.71	50	0.815	Standard Deviation												
-0.5	-0.625	0.81	0.69	1.12	2.83	75	1.050	Deviation from Normal												
-0.25	-0.375	1.32	1.12	2.83	5.01	84	1.145													
0	-0.125	2.57	2.18	2.64	7.65	95	2.005													
0.25	0.125	3.12	2.64	7.65	15.19	99	3.605													
0.5	0.375	8.91	7.55	15.19	31.57															
0.75	0.625	19.34	16.38	31.57	55.78															
1	0.875	28.58	24.20	55.78																
1.25	1.125	32.38	27.42	83.20																
1.5	1.375	11.63	9.85	93.05																
1.75	1.625	1.89	1.60	94.65																
2	1.875	0.28	0.24	94.88																
2.25	2.125	0.26	0.22	95.11																
2.5	2.375	0.38	0.32	95.43																
2.75	2.625	0.23	0.19	95.62																
3	2.875	0.34	0.29	95.91																
3.25	3.125	0.48	0.41	96.32																
3.5	3.375	1.60	1.36	97.67																
3.75	3.625	1.71	1.45	99.12																
4	3.875	0.77	0.65	99.77																
>4.0	4.25	0.27	0.23	100.00																

Grain Size Distribution



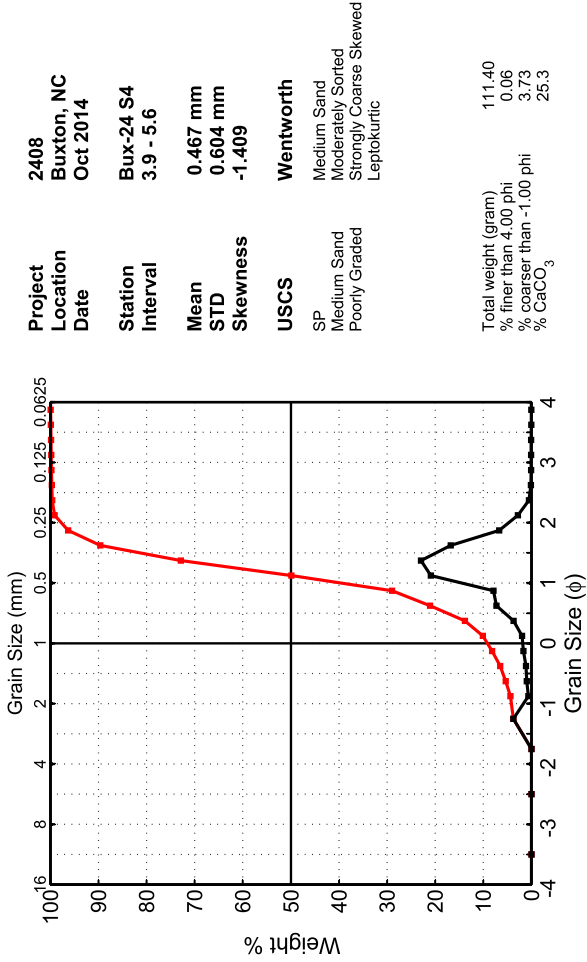
Grain Size Distribution



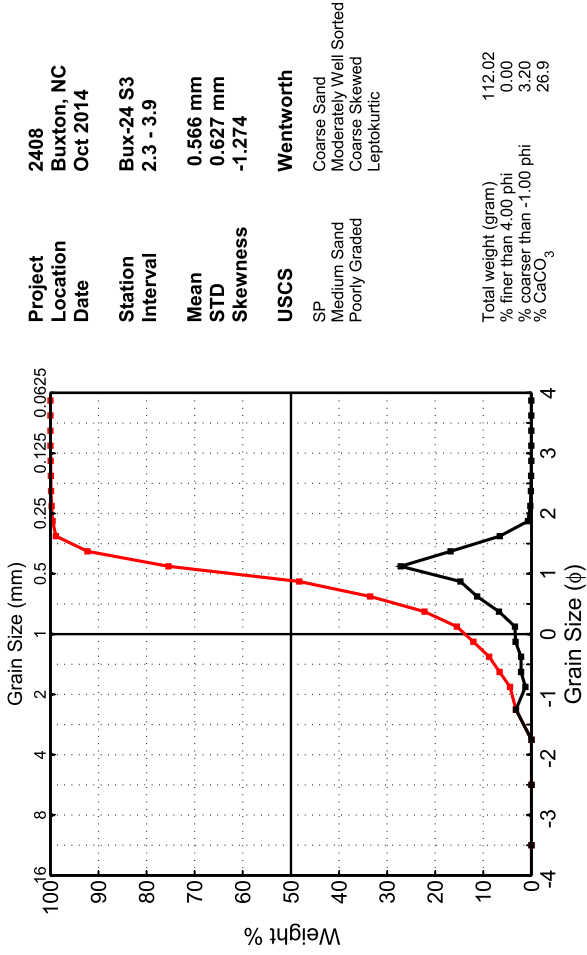
Limits				Percentiles				Moment Measures				Graphic Phi Parameters				Folk & Ward 1957			
4	-4	-4.5	0.00	0.00	0.00	0.00	0.00	Mean	1.192	(phi)	(mm)	1	-0.415	0.00	0.00	Mean	1.077	1.078	
3	-3	-3.5	0.00	0.00	0.00	0.00	0.00	Standard Deviation	0.427		0.438	5	0.400	0.00	0.00	Standard Deviation	0.318	0.342	
2	-2	-2.5	0.00	0.00	0.00	0.00	0.00	Skewness	-1.007		0.744	16	0.760	0.00	0.00	Skewness (1)	-0.008	-0.066	
1.5	-1.5	-1.75	0.00	0.00	0.00	0.00	0.00	Kurtosis	10.273			25	0.905	0.00	0.00	Skewness (2)	-0.236		
1	-1	-1.25	0.00	0.00	0.00	0.00	0.00	Dispersion				50	1.080	0.54	0.54	Kurtosis	1.255		
0.75	-0.75	-0.875	0.12	0.43	0.43	0.43	0.43	Standard Deviation				75	1.300	0.27	1.04				
0.5	-0.5	-0.625	0.24	0.23	0.77	0.77	0.77	Deviation from Normal				84	1.395	0.57	1.61				
0.25	-0.25	-0.375	0.29	0.27	1.04	1.04	1.04					95	1.610	0.67	2.29				
0.125	0	-0.125	0.60	0.57	1.61	1.61	1.61					99	2.165	2.29	4.41				
0.075	0.25	0.125	0.71	0.67	2.29	2.29	2.29							10.36	20.77				
0.05	0.5	0.375	2.24	2.12	4.41	4.41	4.41							56.20	82.90				
0.025	0.75	0.625	6.28	5.95	10.36	10.36	10.36							26.70	35.42				
0.01	1	0.875	10.98	10.41	20.77	20.77	20.77							12.76	12.76				
0.005	1.25	1.125	37.36	35.42	56.20	56.20	56.20							98.06	98.06				
0.0025	1.5	1.375	28.16	26.70	82.90	82.90	82.90							98.90	98.90				
0.001	1.75	1.625	13.48	12.76	95.66	95.66	95.66							99.54	99.54				
0.0005	2	1.875	2.53	2.40	98.06	98.06	98.06							99.66	99.66				
0.00025	2.25	2.125	0.89	0.84	98.90	98.90	98.90							99.86	99.86				
0.0001	2.5	2.375	0.67	0.64	99.54	99.54	99.54							99.98	99.98				
0.00005	2.75	2.625	0.19	0.18	99.72	99.72	99.72							99.99	99.99				
0.000025	3	2.875	0.15	0.14	99.86	99.86	99.86							99.99	99.99				
0.00001	3.25	3.125	0.07	0.07	99.92	99.92	99.92							99.99	99.99				
0.000005	3.5	3.375	0.04	0.04	99.96	99.96	99.96							99.99	99.99				
0.0000025	3.75	3.625	0.02	0.02	99.98	99.98	99.98							99.99	99.99				
0.000001	4	3.875	0.01	0.01	99.99	99.99	99.99							99.99	99.99				
0.0000005	4.25	4.25	0.01	0.01	100.00	100.00	100.00							100.00	100.00				

Limits				Percentiles				Moment Measures				Graphic Phi Parameters				Folk & Ward 1957			
4	-4	-4.5	0.00	0.00	0.00	0.00	0.00	Mean	1.192	(phi)	(mm)	1	-1.255	0.00	0.00	Mean	0.810	0.848	
3	-3	-3.5	0.00	0.00	0.00	0.00	0.00	Standard Deviation	0.427		0.526	5	-0.245	0.00	0.00	Standard Deviation	0.430	0.467	
2	-2	-2.5	0.00	0.00	0.00	0.00	0.00	Skewness	-1.007		-1.397	16	0.380	0.00	0.00	Skewness (1)	-0.267	-0.339	
1.5	-1.5	-1.75	0.00	0.00	0.00	0.00	0.00	Kurtosis	10.273		6.294	25	0.575	0.00	0.00	Skewness (2)	-0.791		
1	-1	-1.25	0.00	0.00	0.00	0.00	0.00	Dispersion				50	0.925	1.46	1.46	Kurtosis	0.930	1.248	
0.75	-0.75	-0.875	0.50	0.45	1.01	1.01	1.01	Standard Deviation				75	1.120	2.37	3.72				
0.5	-0.5	-0.625	1.01	0.92	2.37	2.37	2.37	Deviation from Normal				84	1.240	6.18	6.18				
0.25	-0.25	-0.375	1.49	1.35	3.72	3.72	3.72					95	1.415	9.22	15.67				
0.125	0	-0.125	2.71	2.46	6.18	6.18	6.18					99	1.615	27.43	43.96				
0.075	0.25	0.125	3.35	3.04	9.22	9.22	9.22							75.47	75.47				
0.05	0.5	0.375	7.12	6.45	15.67	15.67	15.67							31.52	31.52				
0.025	0.75	0.625	12.98	11.76	27.43	27.43	27.43							18.69	18.69				
0.01	1	0.875	18.24	16.53	43.96	43.96	43.96							9.25	9.25				
0.005	1.25	1.125	34.78	31.52	75.47	75.47	75.47							99.63	99.63				
0.0025	1.5	1.375	20.63	18.69	94.16	94.16	94.16							99.81	99.81				
0.001	1.75	1.625	5.61	5.08	99.25	99.25	99.25							99.90	99.90				
0.0005	2	1.875	0.42	0.38	99.63	99.63	99.63							99.95	99.95				
0.00025	2.25	2.125	0.20	0.18	99.81	99.81	99.81							99.96	99.96				
0.0001	2.5	2.375	0.10	0.09	99.90	99.90	99.90							99.98	99.98				
0.00005	2.75	2.625	0.05	0.05	99.95	99.95	99.95							99.99	99.99				
0.000025	3	2.875	0.02	0.02	99.96	99.96	99.96							99.99	99.99				
0.00001	3.25	3.125	0.02	0.02	99.98	99.98	99.98							99.99	99.99				
0.000005	3.5	3.375	0.01	0.01	99.99	99.99	99.99							99.99	99.99				
0.0000025	3.75	3.625	0.01	0.01	99.99	99.99	99.99							99.99	99.99				
0.000001	4	3.875	0.00	0.00	100.00	100.00	100.00							100.00	100.00				
0.0000005	4.25	4.25	0.00	0.00	100.00	100.00	100.00							100.00	100.00				

Grain Size Distribution



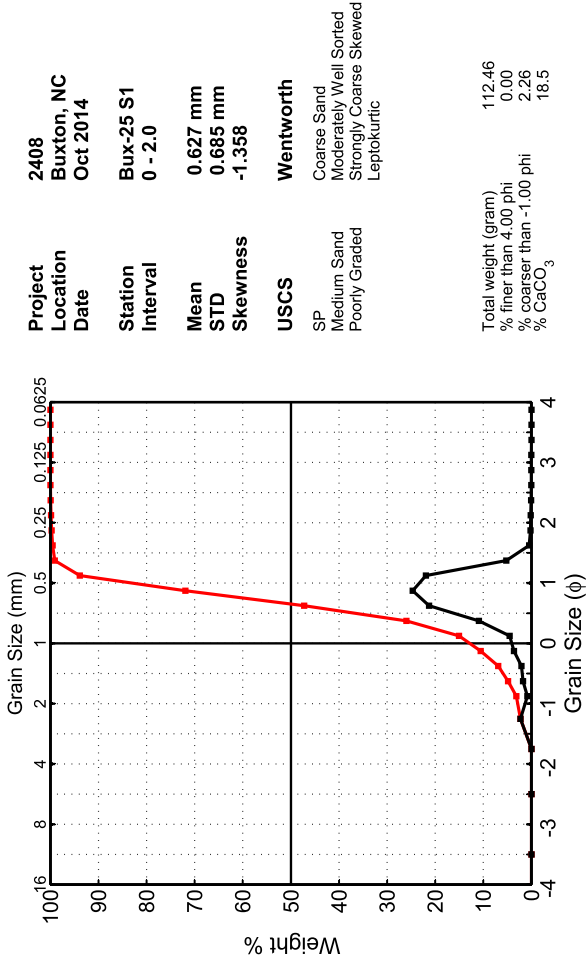
Grain Size Distribution



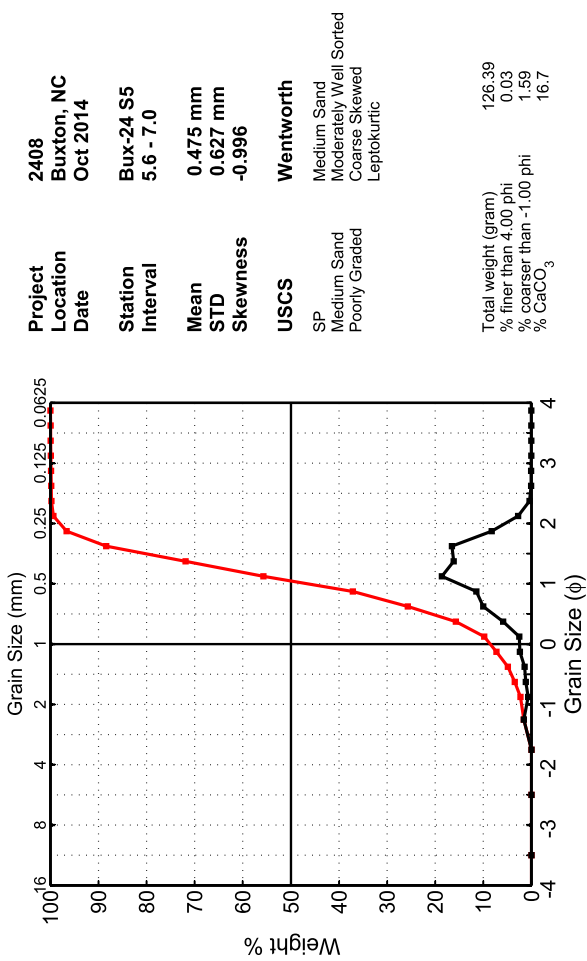
Percentiles			Moment Measures			Graphic Phi Parameters		Folk & Ward	
Limits (phi)	Mid Point (phi)	Weight (gram)	Weight % Cumm. Wt %	Mean	Standard Deviation	Inman 1952	Inman 1952	Mean	Standard Deviation
-4	-4.5	0.00	0.00	0.00	0.00	1	-1.615	0.995	0.995
-3	-3.5	0.00	0.00	0.00	0.00	5	-0.715	0.545	0.545
-2	-2.5	0.00	0.00	0.00	0.00	16	0.450	-0.239	-0.239
-1.5	-1.75	0.00	0.00	0.00	0.00	25	0.750	-1.046	-1.046
-0.75	-0.875	0.72	3.73	3.73	3.73	50	1.125	1.330	1.330
-0.5	-0.625	1.08	0.97	5.35	4.38	75	1.405		
-0.25	-0.375	1.25	1.12	6.47	6.47	84	1.540		
0	-0.125	1.87	1.68	8.15	8.15	95	1.825		
0.25	0.125	2.17	1.95	10.10	10.10	99	2.115		
0.5	0.375	4.14	3.72	13.82	13.82	Graphic Phi Parameters			
0.75	0.625	8.09	7.26	21.08	21.08	Folk & Ward 1957			
1	0.875	8.79	7.89	28.97	28.97	Mean			
1.25	1.125	23.31	20.92	49.89	49.89	Standard Deviation			
1.5	1.375	25.59	22.97	72.86	72.86	Skewness (1)			
1.75	1.625	18.67	16.76	89.62	89.62	Skewness (2)			
2	1.875	7.44	6.68	96.30	96.30	Kurtosis			
2.25	2.125	3.12	2.80	99.10	99.10				
2.5	2.375	0.58	0.52	99.62	99.62				
2.75	2.625	0.10	0.09	99.71	99.71				
3	2.875	0.08	0.07	99.78	99.78				
3.25	3.125	0.05	0.04	99.83	99.83				
3.5	3.375	0.05	0.04	99.87	99.87				
3.75	3.625	0.04	0.04	99.91	99.91				
4	3.875	0.03	0.03	99.94	99.94				
>4.0	4.25	0.07	0.06	100.00	100.00				

Percentiles			Moment Measures			Graphic Phi Parameters		Folk & Ward	
Limits (phi)	Mid Point (phi)	Weight (gram)	Weight % Cumm. Wt %	Mean	Standard Deviation	Inman 1952	Inman 1952	Mean	Standard Deviation
-4	-4.5	0.00	0.00	0.00	0.00	1	-1.595	0.698	0.698
-3	-3.5	0.00	0.00	0.00	0.00	5	-0.810	0.552	0.552
-2	-2.5	0.00	0.00	0.00	0.00	16	0.145	-0.348	-0.348
-1.5	-1.75	0.00	0.00	0.00	0.00	25	0.435	-1.005	-1.005
-0.75	-0.875	3.58	3.20	3.20	3.20	50	0.890	1.072	1.072
-0.5	-0.625	2.41	2.15	6.61	6.61	75	1.120		
-0.25	-0.375	2.43	2.17	8.78	8.78	84	1.250		
0	-0.125	3.70	3.30	12.08	12.08	95	1.480		
0.25	0.125	3.82	3.41	15.49	15.49	99	1.685		
0.5	0.375	7.55	6.74	22.23	22.23	Graphic Phi Parameters			
0.75	0.625	12.64	11.28	33.51	33.51	Folk & Ward 1957			
1	0.875	16.54	14.77	48.28	48.28	Mean			
1.25	1.125	30.45	27.18	75.46	75.46	Standard Deviation			
1.5	1.375	18.85	16.83	92.29	92.29	Skewness (1)			
1.75	1.625	7.34	6.55	98.84	98.84	Skewness (2)			
2	1.875	0.78	0.70	99.54	99.54	Kurtosis			
2.25	2.125	0.24	0.21	99.75	99.75				
2.5	2.375	0.11	0.10	99.85	99.85				
2.75	2.625	0.06	0.05	99.90	99.90				
3	2.875	0.04	0.04	99.94	99.94				
3.25	3.125	0.03	0.03	99.96	99.96				
3.5	3.375	0.02	0.02	99.98	99.98				
3.75	3.625	0.01	0.01	99.99	99.99				
4	3.875	0.01	0.01	100.00	100.00				
>4.0	4.25	0.00	0.00	100.00	100.00				

Grain Size Distribution



Grain Size Distribution



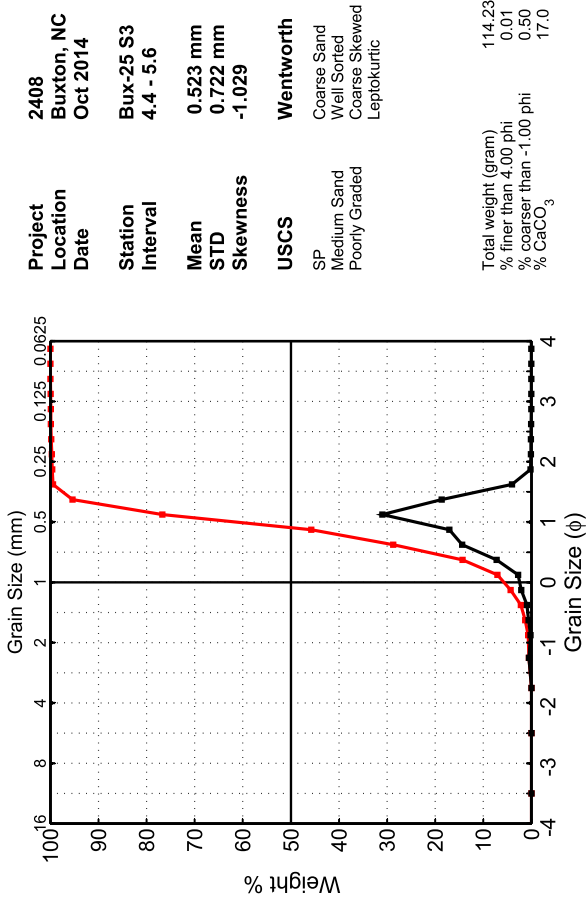
Percentiles			Moment Measures		
Limits (phi)	Mid Point (phi)	Weight (gram)	Weight % Cum. Wt %	Mean	(phi)
-4	-4.5	0.00	0.00	Standard Deviation	(mm)
-3	-3.5	0.00	0.00	Skewness	0.673 0.627
-2	-2.5	0.00	0.00	Kurtosis	0.546 0.685
-1.5	-1.75	0.00	0.00	Dispersion	-1.358 5.711
-1	-1.25	0.00	0.00	Standard Deviation	
-0.75	-0.875	0.96	0.85	Deviation from Normal	
-0.5	-0.625	1.94	1.73		
-0.25	-0.375	2.34	2.08		
0	-0.125	4.08	3.63		
0.25	0.125	5.08	4.52		
0.5	0.375	12.26	10.90		
0.75	0.625	23.93	21.28		
1	0.875	27.76	24.68		
1.25	1.125	24.68	21.95		
1.5	1.375	5.85	5.20		
1.75	1.625	0.53	0.47		
2	1.875	0.22	0.20		
2.25	2.125	0.15	0.13		
2.5	2.375	0.07	0.06		
2.75	2.625	0.03	0.03		
3	2.875	0.02	0.02		
3.25	3.125	0.02	0.02		
3.5	3.375	0.00	0.00		
3.75	3.625	0.00	0.00		
4	3.875	0.00	0.00		
>4.0	4.25	0.00	0.00		

Graphic Phi Parameters			Inman 1952			Folk & Ward 1957		
Mean	Standard Deviation	Skewness (1)	0.580	0.435	0.605	0.972	0.998	
Skewness (2)	Kurtosis		-0.172	-0.292	0.488	0.588	0.625	
			-0.845	1.052	-0.292	-0.132	-0.211	
						-0.540		
						0.860	1.106	

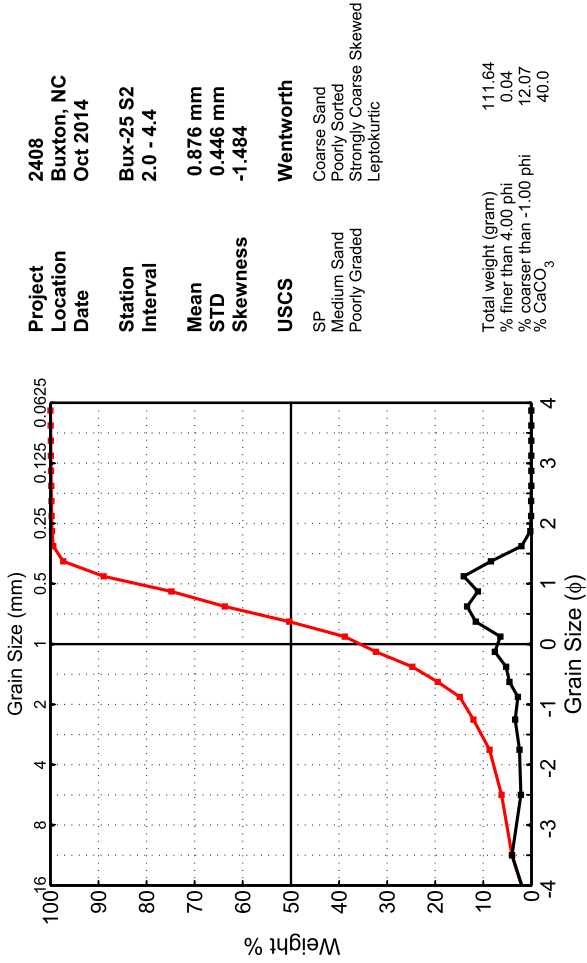
Percentiles			Moment Measures		
Limits (phi)	Mid Point (phi)	Weight (gram)	Weight % Cum. Wt %	Mean	(phi)
-4	-4.5	0.00	0.00	Standard Deviation	(mm)
-3	-3.5	0.00	0.00	Skewness	1.075 0.475
-2	-2.5	0.00	0.00	Kurtosis	0.673 0.627
-1.5	-1.75	0.00	0.00	Dispersion	-0.996 4.777
-1	-1.25	0.00	0.00	Standard Deviation	
-0.75	-0.875	0.86	0.68	Deviation from Normal	
-0.5	-0.625	1.50	1.19		
-0.25	-0.375	1.79	1.42		
0	-0.125	3.05	2.41		
0.25	0.125	3.19	2.52		
0.5	0.375	7.44	5.89		
0.75	0.625	12.63	9.99		
1	0.875	14.45	11.43		
1.25	1.125	23.52	18.61		
1.5	1.375	20.42	16.16		
1.75	1.625	20.86	16.50		
2	1.875	10.42	8.24		
2.25	2.125	3.47	2.75		
2.5	2.375	0.49	0.37		
2.75	2.625	0.07	0.07		
3	2.875	0.06	0.05		
3.25	3.125	0.04	0.03		
3.5	3.375	0.04	0.03		
3.75	3.625	0.02	0.02		
4	3.875	0.02	0.02		
>4.0	4.25	0.04	0.03		

Graphic Phi Parameters			Inman 1952			Folk & Ward 1957		
Mean	Standard Deviation	Skewness (1)	0.972	0.588	0.998	0.972	0.998	
Skewness (2)	Kurtosis		-0.132	-0.588	0.625	-0.132	0.625	
			-0.540	-0.540	-0.211	-0.540	-0.211	
			0.860	0.860	1.106	0.860	1.106	

Grain Size Distribution



Grain Size Distribution



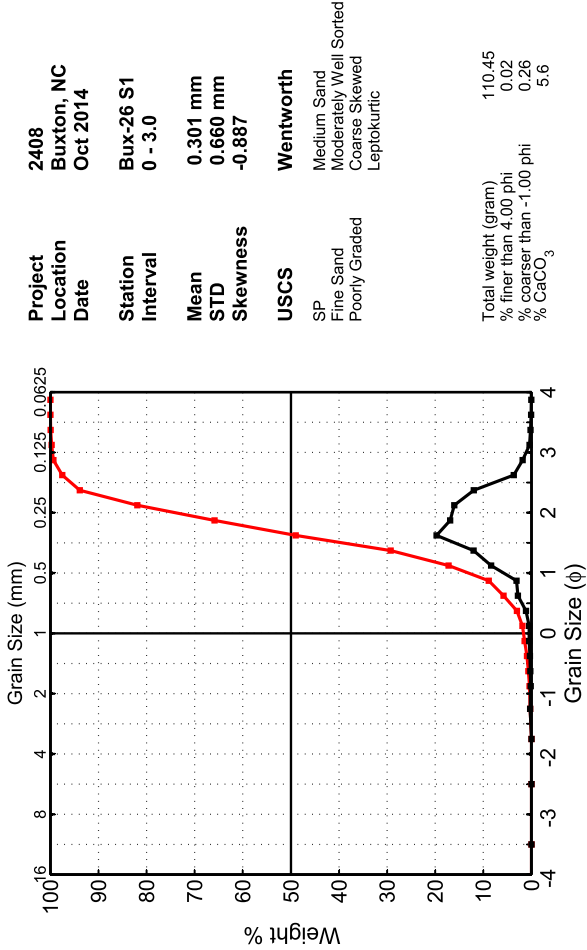
Percentiles				Moment Measures			
Limits (phi)	Mid Point (phi)	Weight (gram)	Weight % Cum. Wt %	Mean	(phi)	(mm)	
-4	-4.5	0.00	0.00	Standard Deviation	0.936	0.523	
-3	-3.5	0.00	0.00	Skewness	0.469	0.722	
-2	-2.5	0.00	0.00	Kurtosis	-1.029		
-1.5	-1.75	0.00	0.00	Dispersion	6.604		
-0.75	-1.25	0.57	0.50	Standard Deviation			
-0.5	-0.875	0.22	0.19	Deviation from Normal			
-0.25	-0.625	0.68	0.60				
0	-0.375	1.05	0.92				
0.25	-0.125	2.41	2.11				
0.5	0.125	3.15	2.76				
0.75	0.375	8.26	7.23				
1	0.625	16.46	14.41				
1.25	0.875	19.48	17.05				
1.5	1.125	35.38	30.97				
1.75	1.375	21.29	18.64				
2	1.625	4.63	4.05				
2.25	1.875	0.19	0.17				
2.5	2.125	0.13	0.11				
2.75	2.375	0.12	0.11				
3	2.625	0.07	0.06				
3.25	2.875	0.04	0.04				
3.5	3.125	0.04	0.04				
3.75	3.375	0.02	0.02				
4	3.625	0.02	0.02				
>4.0	3.875	0.01	0.01				
	4.25	0.01	0.01				

Graphic Phi Parameters				Folk & Ward 1957			
Mean	Standard Deviation	Skewness (1)	Kurtosis	Mean	Standard Deviation	Skewness (1)	Kurtosis
0.812	0.407	-0.239	-0.632	0.113	0.927	-0.272	-1.340
0.845	0.421	-0.299	1.069	0.197	1.125	-0.421	1.437

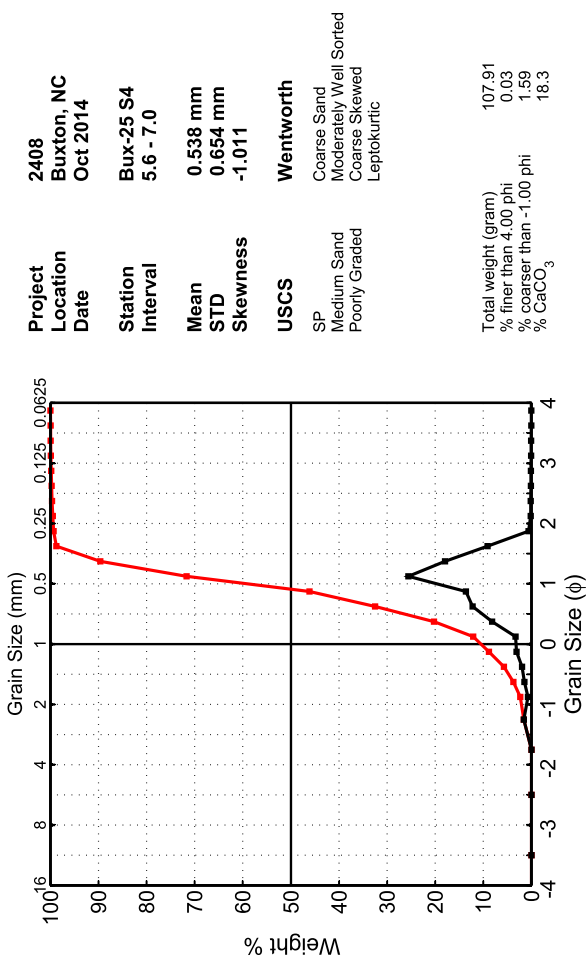
Percentiles				Moment Measures			
Limits (phi)	Mid Point (phi)	Weight (gram)	Weight % Cum. Wt %	Mean	(phi)	(mm)	
-4	-4.5	0.00	0.00	Standard Deviation	0.191	0.876	
-3	-3.5	4.51	4.04	Skewness	1.165	0.446	
-2	-2.5	2.43	2.18	Kurtosis	-1.484		
-1.5	-1.75	2.76	2.47	Dispersion	5.364		
-0.75	-1.25	3.78	3.39	Standard Deviation			
-0.5	-0.875	3.14	2.81	Deviation from Normal			
-0.25	-0.625	5.12	4.59				
0	-0.375	5.89	5.28				
0.25	-0.125	8.48	7.60				
0.5	0.125	7.20	6.45				
0.75	0.375	12.91	11.56				
1	0.625	14.93	13.37				
1.25	0.875	12.41	11.12				
1.5	1.125	15.70	14.06				
1.75	1.375	9.40	8.42				
2	1.625	2.33	2.09				
2.25	1.875	0.27	0.24				
2.5	2.125	0.09	0.08				
2.75	2.375	0.06	0.05				
3	2.625	0.04	0.04				
3.25	2.875	0.03	0.03				
3.5	3.125	0.03	0.03				
3.75	3.375	0.03	0.03				
4	3.625	0.03	0.03				
>4.0	3.875	0.03	0.03				
	4.25	0.04	0.04				

Graphic Phi Parameters				Folk & Ward 1957			
Mean	Standard Deviation	Skewness (1)	Kurtosis	Mean	Standard Deviation	Skewness (1)	Kurtosis
0.113	0.927	-0.272	-1.340	0.197	1.125	-0.421	1.437

Grain Size Distribution



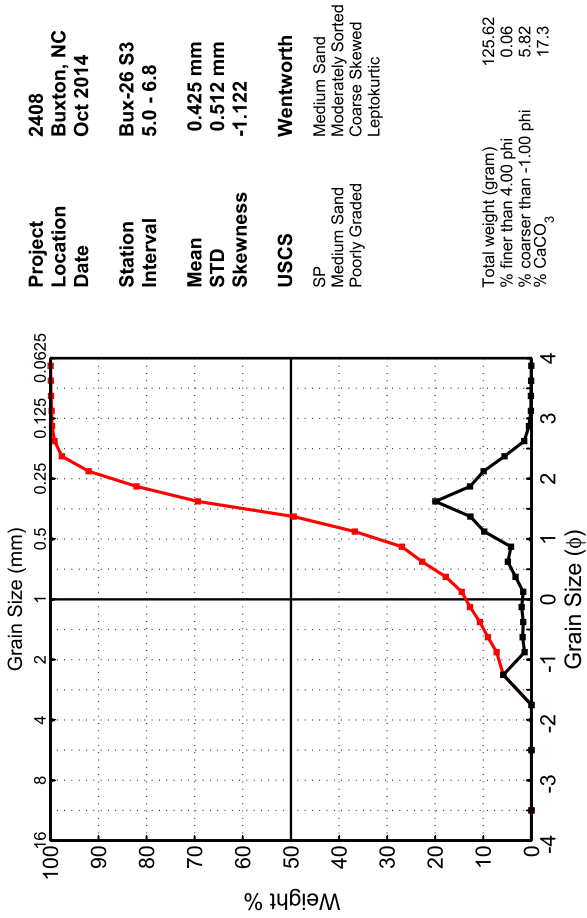
Grain Size Distribution



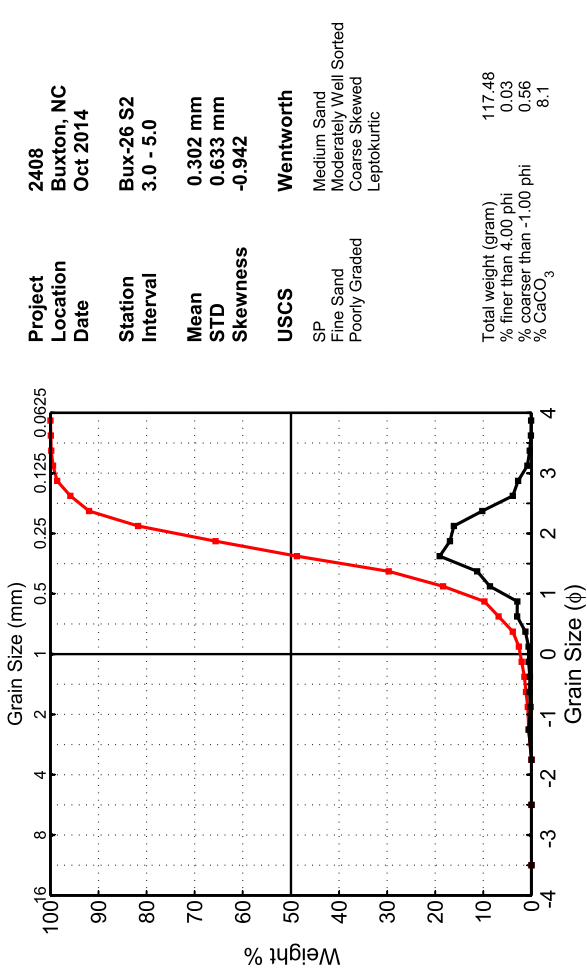
Limits			Weight % Cum. Wt %			Percentiles			Moment Measures			Folk & Ward				
(phi)	Mid Point (phi)	Weight (gram)				1	5	16	25	50	75	84	95	99	Inman 1952	1957
-4	-4.5	0.00	0.00	0.00	0.00	-0.335	0.555	1.090	1.285	1.640	2.015	2.170	2.450	2.825	Mean	1.733
-3	-3.5	0.00	0.00	0.00	0.00					Standard Deviation					0.600	0.301
-2	-2.5	0.00	0.00	0.00	0.00					Skewness					-0.887	0.660
-1.5	-1.75	0.00	0.00	0.00	0.00					Kurtosis					5.565	
-1	-1.25	0.29	0.26	0.26	0.26					Standard Deviation						
-0.75	-0.875	0.14	0.13	0.39	0.39					Deviation from Normal						
-0.5	-0.625	0.26	0.24	0.62	0.62											
-0.25	-0.375	0.33	0.30	0.92	0.92											
0	-0.125	0.54	0.49	1.41	1.41											
0.25	0.125	0.52	0.47	1.88	1.88											
0.5	0.375	1.24	1.12	3.01	3.01											
0.75	0.625	3.08	2.79	5.79	5.79											
1	0.875	3.41	3.09	8.88	8.88											
1.25	1.125	9.23	8.36	17.24	17.24											
1.5	1.375	13.26	12.01	29.24	29.24											
1.75	1.625	21.80	19.74	48.98	48.98											
2	1.875	18.66	16.89	65.88	65.88											
2.25	2.125	17.71	16.03	81.91	81.91											
2.5	2.375	13.22	11.97	93.88	93.88											
2.75	2.625	4.04	3.66	97.54	97.54											
3	2.875	2.00	1.81	99.35	99.35											
3.25	3.125	0.44	0.40	99.75	99.75											
3.5	3.375	0.20	0.18	99.93	99.93											
3.75	3.625	0.05	0.05	99.97	99.97											
4	3.875	0.01	0.01	99.98	99.98											
>4.0	4.25	0.02	0.02	100.00	100.00											
															1.630	1.633
															0.540	0.557
															-0.019	-0.082
															-0.255	
															0.755	1.064

Limits			Weight % Cum. Wt %			Percentiles			Moment Measures			Folk & Ward						
(phi)	Mid Point (phi)	Weight (gram)				1	5	16	25	50	75	84	95	99	Mean	Standard Deviation	Kurtosis	Skewness
-4	-4.5	0.00	0.00	0.00	0.00	-1.435	-0.465	0.245	0.470	0.915	1.170	1.295	1.520	1.735	0.895	0.538	0.654	-1.011
-3	-3.5	0.00	0.00	0.00	0.00										5.333			
-2	-2.5	0.00	0.00	0.00	0.00													
-1.5	-1.75	0.00	0.00	0.00	0.00													
-1	-1.25	1.72	1.59	1.59	1.59													
-0.75	-0.875	0.78	0.72	0.72	0.72													
-0.5	-0.625	1.56	1.45	1.45	1.45													
-0.25	-0.375	2.10	1.95	1.95	1.95													
0	-0.125	3.35	3.10	3.10	3.10													
0.25	0.125	3.54	3.28	3.28	3.28													
0.5	0.375	8.81	8.16	20.26	20.26													
0.75	0.625	13.21	12.24	32.50	32.50													
1	0.875	14.70	13.62	46.12	46.12													
1.25	1.125	27.58	25.56	71.68	71.68													
1.5	1.375	19.38	17.96	89.64	89.64													
1.75	1.625	9.82	9.10	98.74	98.74													
2	1.875	0.65	0.60	99.34	99.34													
2.25	2.125	0.17	0.16	99.50	99.50													
2.5	2.375	0.17	0.16	99.66	99.66													
2.75	2.625	0.10	0.09	99.75	99.75													
3	2.875	0.09	0.08	99.83	99.83													
3.25	3.125	0.05	0.05	99.88	99.88													
3.5	3.375	0.05	0.05	99.93	99.93													
3.75	3.625	0.03	0.03	99.95	99.95													
4	3.875	0.02	0.02	99.97	99.97													
>4.0	4.25	0.03	0.03	100.00	100.00													
															</			

Grain Size Distribution



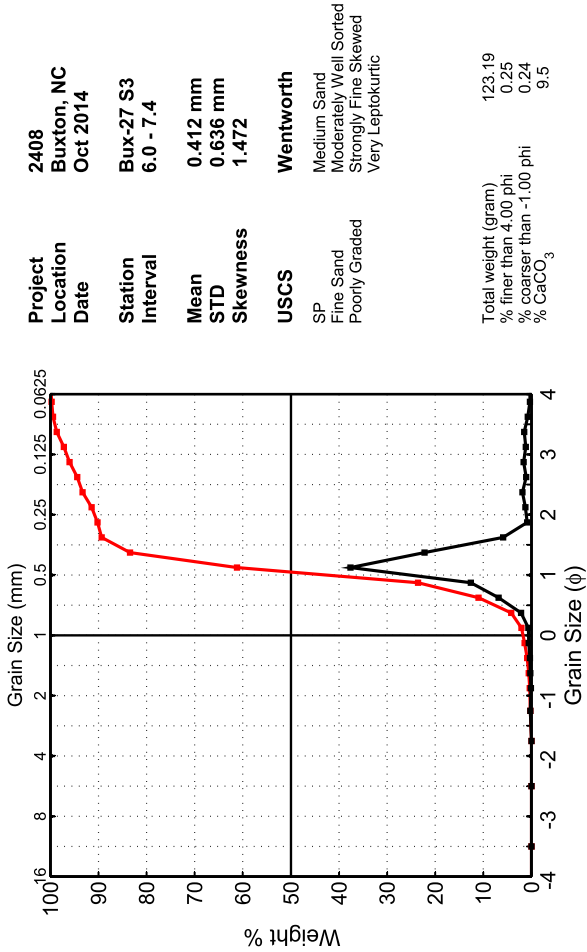
Grain Size Distribution



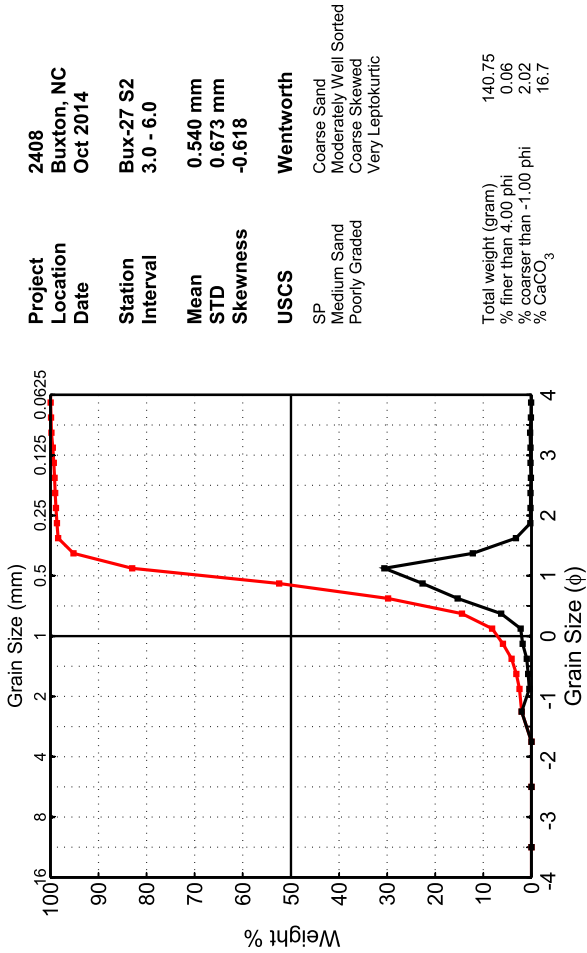
Limits (ϕ)	Mid Point (ϕ)	Weight (gram)	Weight % Cum. Wt %	Percentiles		Moment Measures		Graphic Phi Parameters		Folk & Ward	
				1	5	Mean	Standard Deviation	Inman 1952	1957	Mean	Standard Deviation
-4	-4.5	0.00	0.00	-1.665	-1.320	1.236	0.425	1.082	1.183	1.617	1.627
-3	-3.5	0.00	0.00			0.967	0.512	0.843	0.964	0.562	0.599
-2	-2.5	0.00	0.00	16	25	-1.122	3.825	-0.359	-0.435	-0.049	-0.084
-1.5	-1.75	0.00	0.00	0.240	0.760			-1.086	1.505	0.867	1.148
-1	-1.25	0.00	0.00	1.385	1.735						
-0.75	-0.875	7.31	5.82	50	75						
-0.5	-0.625	2.28	1.81	10.72	17.35						
-0.25	-0.375	2.13	1.70	10.72	17.35						
0	-0.125	2.54	2.02	12.74	19.96						
0.25	0.125	2.16	1.72	14.46	22.69						
0.5	0.375	4.16	3.31	17.78	26.91						
0.75	0.625	6.17	4.91	22.69	36.71						
1	0.875	5.31	4.23	26.91	49.39						
1.25	1.125	12.30	9.79	36.71	69.34						
1.5	1.375	15.93	12.68	49.39	82.08						
1.75	1.625	25.07	19.96	69.34	92.08						
2	1.875	16.00	12.74	82.08	99.62						
2.25	2.125	12.48	9.93	92.08	99.11						
2.5	2.375	7.04	5.60	97.62	99.11						
2.75	2.625	1.87	1.49	99.11	99.11						
3	2.875	0.66	0.53	99.63	99.75						
3.25	3.125	0.15	0.12	99.75	99.86						
3.5	3.375	0.14	0.11	99.86	99.91						
3.75	3.625	0.06	0.05	99.91	99.94						
4	3.875	0.04	0.03	99.94	100.00						
>4.0	4.25	0.07	0.06	100.00							

Limits (ϕ)	Mid Point (ϕ)	Weight (gram)	Weight % Cum. Wt %	Percentiles		Moment Measures		Graphic Phi Parameters		Folk & Ward	
				1	5	Mean	Standard Deviation	Inman 1952	1957	Mean	Standard Deviation
-4	-4.5	0.00	0.00	-0.710	-0.470	1.728	0.302	1.617	1.627	1.617	1.627
-3	-3.5	0.00	0.00			0.659	0.633	0.562	0.599	0.562	0.599
-2	-2.5	0.00	0.00	16	25	-0.942	5.937	-0.049	-0.084	-0.049	-0.084
-1.5	-1.75	0.00	0.00	1.055	1.270			0.867	1.148	0.867	1.148
-1	-1.25	0.00	0.00	1.055	1.270						
-0.75	-0.875	0.66	0.56	25	50						
-0.5	-0.625	0.22	0.19	50	75						
-0.25	-0.375	0.45	0.38	75	84						
0	-0.125	0.38	0.32	84	95						
0.25	0.125	0.68	0.58	95	99						
0.5	0.375	1.46	2.61	2.570	2.995						
0.75	0.625	3.50	2.98	6.84							
1	0.875	3.44	2.93	9.76							
1.25	1.125	10.12	8.61	18.38							
1.5	1.375	13.27	11.30	29.67							
1.75	1.625	22.39	19.06	48.73							
2	1.875	19.87	16.91	65.65							
2.25	2.125	18.92	16.10	81.75							
2.5	2.375	11.99	10.21	91.96							
2.75	2.625	4.55	3.87	95.83							
3	2.875	3.25	2.77	98.60							
3.25	3.125	1.01	0.86	99.46							
3.5	3.375	0.42	0.36	99.81							
3.75	3.625	0.12	0.10	99.91							
4	3.875	0.06	0.05	99.97							
>4.0	4.25	0.04	0.03	100.00							

Grain Size Distribution



Grain Size Distribution



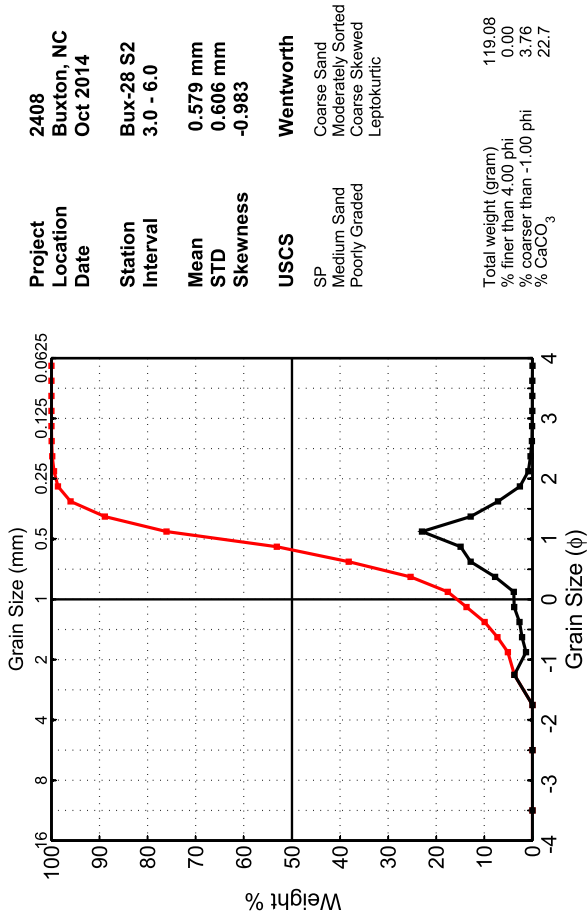
Percentiles			Moment Measures		
Limits (phi)	Mid Point (phi)	Weight (gram)	Weight % Cumm. Wt %	Mean	(phi)
-4	-4.5	0.00	0.00	Standard Deviation	(mm)
-3	-3.5	0.00	0.00	Skewness	0.1279 0.412
-2	-2.5	0.00	0.00	Kurtosis	0.654 0.636
-1.5	-1.75	0.00	0.00	Dispersion	1.472
-0.75	-1.25	0.30	0.24	Standard Deviation	7.696
-0.5	-0.875	0.13	0.11	Deviation from Normal	
-0.25	-0.625	0.27	0.35		
0	-0.375	0.36	0.57		
0.25	-0.125	0.69	0.86		
0.5	0.125	0.79	1.42		
0.75	0.375	2.64	2.06		
1	0.625	8.38	4.20		
1.25	0.875	15.49	11.01		
1.5	1.125	46.34	23.58		
1.75	1.375	27.38	61.20		
2	1.625	7.26	83.42		
2.25	1.875	1.06	89.32		
2.5	2.125	1.55	90.16		
2.75	2.375	2.28	91.44		
3	2.625	1.36	93.29		
3.25	2.875	1.99	94.39		
3.5	3.125	1.46	96.01		
3.75	3.375	1.84	97.19		
4	3.625	0.93	98.68		
>4.0	3.875	0.38	99.44		
	4.25	0.31	99.75		
		0.25	100.00		

Graphic Phi Parameters			Folk & Ward		
Mean	Standard Deviation	Skewness (1)	Inman 1952	1957	
1.063	0.337	0.240	1.063	1.058	
0.337	0.037	1.519	0.337	0.520	
1.519	2.430		1.519	2.402	
Kurtosis					

Percentiles			Moment Measures		
Limits (phi)	Mid Point (phi)	Weight (gram)	Weight % Cumm. Wt %	Mean	(phi)
-4	-4.5	0.00	0.00	Standard Deviation	(mm)
-3	-3.5	0.00	0.00	Skewness	0.890 0.540
-2	-2.5	0.00	0.00	Kurtosis	0.572 0.673
-1.5	-1.75	0.00	0.00	Dispersion	-0.618 9.126
-0.75	-1.25	2.84	2.02	Standard Deviation	
-0.5	-0.875	0.62	0.44	Deviation from Normal	
-0.25	-0.625	0.96	0.68		
0	-0.375	1.35	3.14		
0.25	-0.125	2.58	4.10		
0.5	0.125	3.15	5.93		
0.75	0.375	8.83	8.17		
1	0.625	21.61	14.44		
1.25	0.875	31.84	29.80		
1.5	1.125	43.05	52.42		
1.75	1.375	17.13	83.01		
2	1.625	4.52	95.18		
2.25	1.875	0.33	98.39		
2.5	2.125	0.27	98.62		
2.75	2.375	0.25	98.81		
3	2.625	0.16	98.99		
3.25	2.875	0.27	99.10		
3.5	3.125	0.27	99.30		
3.75	3.375	0.39	99.49		
4	3.625	0.15	99.77		
>4.0	3.875	0.09	99.87		
	4.25	0.09	99.94		
		0.06	100.00		

Graphic Phi Parameters			Folk & Ward		
Mean	Standard Deviation	Skewness (1)	Inman 1952	1957	
0.772	0.373	-0.208	0.772	0.798	
-0.208	-0.208	-0.779	-0.208	-0.283	
1.174	1.174		1.174	1.289	
Kurtosis					

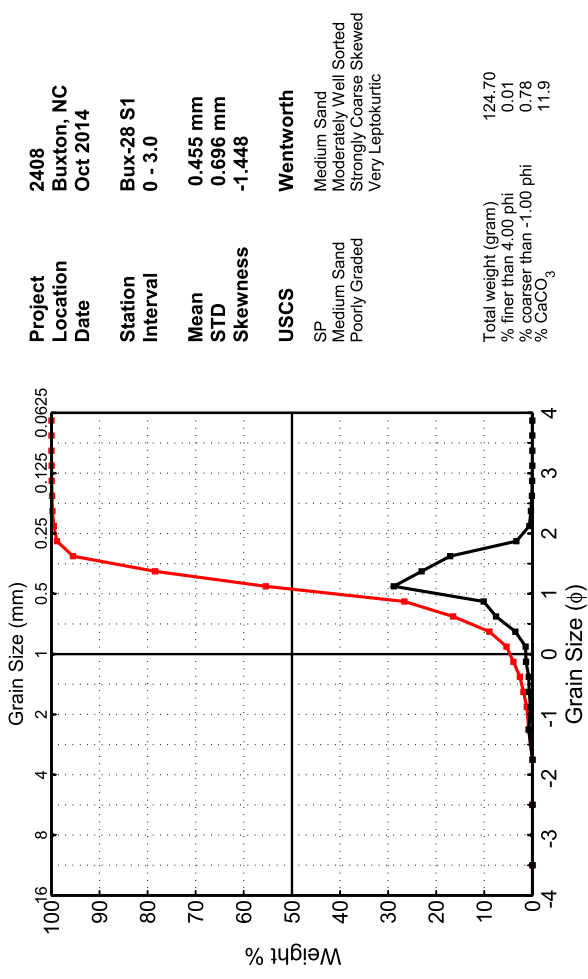
Grain Size Distribution



Limits				Mid Point				Weight				Weight % Cum. Wt %				Percentiles				Moment Measures				Phi				mm											
(phi)				(phi)				(gram)																															
-4				-4.5				0.00				0.00				1				-1.615				Mean				0.788				0.579							
-3				-3.5				0.00				0.00				5				-0.905				Standard Deviation				0.722				0.606							
-2				-2.5				0.00				0.00				16				0.025				Skewness				-0.983											
-1.5				-1.75				0.00				0.00				25				0.365				Kurtosis				4.033											
-1				-1.25				4.48				3.76				25				0.365				Dispersion															
-0.75				-0.875				1.60				1.34				51.1				50				0.825				Standard Deviation											
-0.5				-0.625				2.57				2.16				7.26				75				1.115				Deviation from Normal											
-0.25				-0.375				3.18				2.67				9.93				84				1.280															
0				-0.125				4.49				3.77				13.71				95				1.590															
0.25				0.125				4.62				3.88				17.58				99				1.985															
0.5				0.375				9.24				7.76				25.34																							
0.75				0.625				15.28				12.83				38.18																							
1				0.875				17.79				14.94				53.12																							
1.25				1.125				27.31				22.93				76.05																							
1.5				1.375				15.28				12.83				88.88																							
1.75				1.625				8.50				7.14				96.02																							
2				1.875				3.11				2.61				98.63																							
2.25				2.125				0.98				0.82				99.45																							
2.5				2.375				0.45				0.38				99.83																							
2.75				2.625				0.11				0.09				99.92																							
3				2.875				0.05				0.04				99.97																							
3.25				3.125				0.02				0.02				99.98																							
3.5				3.375				0.01				0.01				99.99																							
3.75				3.625				0.01				0.01				100.00																							
4				3.875				0.00				0.00				100.00																							
>4.0				4.25				0.00				0.00				100.00																							

Graphic Phi Parameters				Inman 1952		Folk & Ward 1957	
Mean				0.652		0.710	
Standard Deviation				0.627		0.692	
Skewness (1)				-0.275		-0.331	
Skewness (2)				-0.769			
Kurtosis				0.988		1.363	

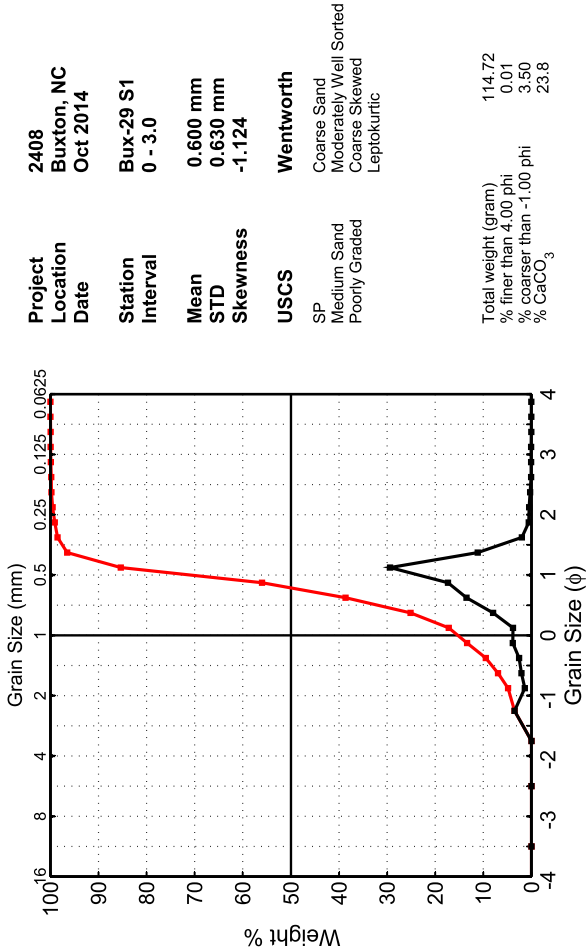
Grain Size Distribution



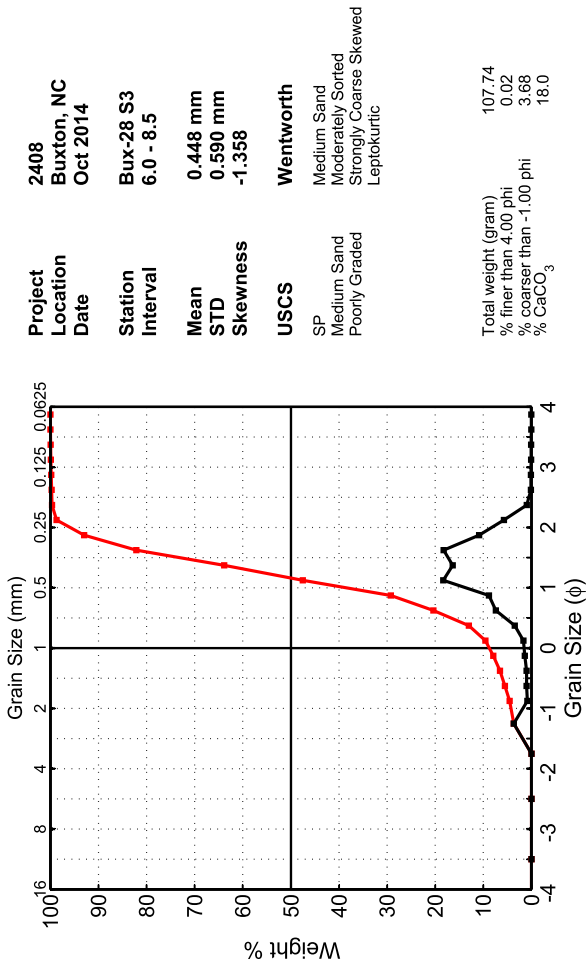
Limits (phi)	Mid Point (phi)	Weight (gram)	Weight % Cum. Wt %	Percentiles		Moment Measures		(phi)	(mm)
				1	5	Mean	Standard Deviation		
-4	-4.5	0.00	0.00	-1.045	0.055	0.00	0.00	1.137	0.455
-3	-3.5	0.00	0.00	5	0.610	0.00	0.00	0.522	0.696
-2	-2.5	0.00	0.00	16	0.835	0.00	0.00	-1.448	
-1.5	-1.75	0.00	0.00	25	1.080	0.78	0.78	7.508	
-1	-1.25	0.97	0.78	50	1.340	0.41	1.19		
-0.75	-0.875	0.51	0.41	75	1.455	0.66	1.84		
-0.5	-0.625	0.82	0.66	84	1.615	0.77	2.61		
-0.25	-0.375	0.96	0.77	95	1.935	1.35	5.39		
0	-0.125	1.68	1.35	99	1.935	1.43	16.48		
0.25	0.125	1.78	1.43			3.54	8.93		
0.5	0.375	4.42	3.54			7.55	16.48		
0.75	0.625	9.41	7.55			10.13	26.61		
1	0.875	12.63	10.13			23.02	78.43		
1.25	1.125	35.92	28.81			95.52	98.85		
1.5	1.375	28.70	23.02			99.47	99.78		
1.75	1.625	21.31	17.09			99.78	99.87		
2	1.875	4.16	3.34			99.92	99.95		
2.25	2.125	0.77	0.62			99.95	99.99		
2.5	2.375	0.39	0.31			99.99	100.00		
2.75	2.625	0.11	0.09			1.033	1.048		
3	2.875	0.06	0.05			0.423	0.448		
3.25	3.125	0.04	0.03			-0.112	-0.213		
3.5	3.375	0.02	0.02			-0.580			
3.75	3.625	0.02	0.02			0.846			
4	3.875	0.01	0.01				1.266		
>4.0	4.25	0.01	0.01						

Graphic Phi Parameters		Inman 1952	Folk & Ward 1957
Mean		1.033	1.048
Standard Deviation		0.423	0.448
Skewness (1)		-0.112	-0.213
Skewness (2)		-0.580	
Kurtosis		0.846	1.266

Grain Size Distribution



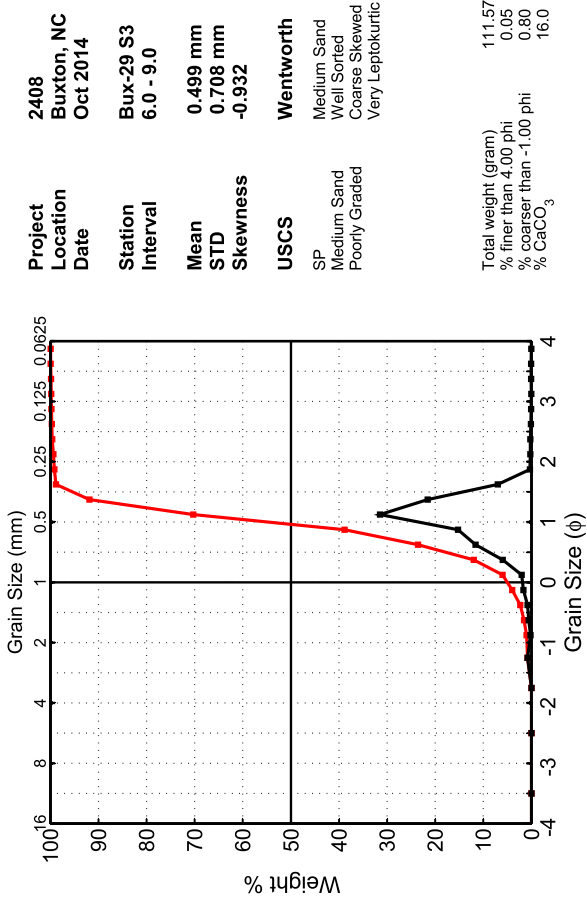
Grain Size Distribution



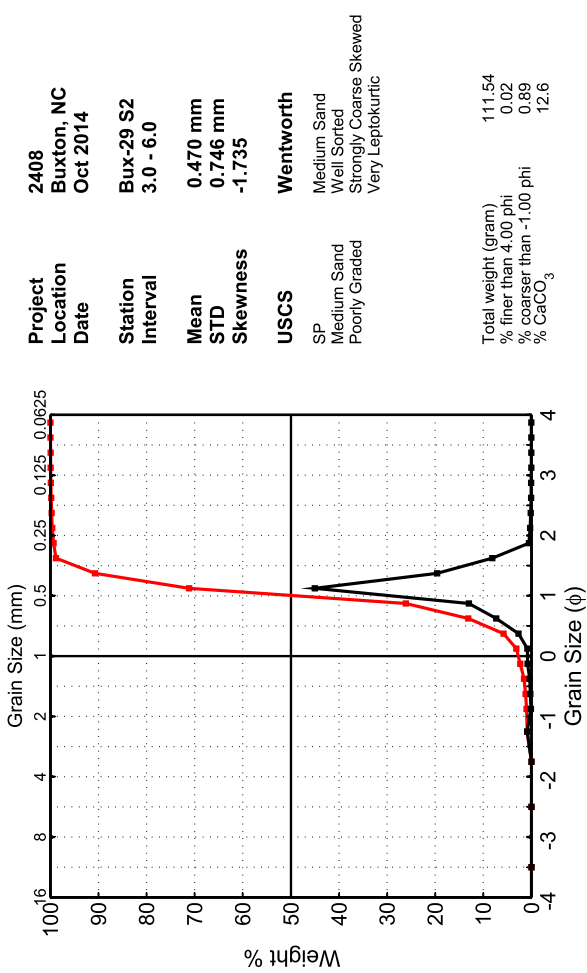
Limits (phi)	Mid Point (phi)	Weight (gram)	Weight % Cum. Wt %	Percentiles		Moment Measures		Graphic Phi Parameters		Folk & Ward	
				1	5	Mean	Standard Deviation	Inman	1952	Mean	Standard Deviation
-4	-4.5	0.00	0.00	-1.605	-0.860	0.737	0.600	0.582	0.582	0.652	0.652
-3	-3.5	0.00	0.00	-0.860	-0.430	0.666	0.630	0.532	0.532	0.600	0.600
-2	-2.5	0.00	0.00	-0.430	-0.215	-1.124	4.817	-0.390	-0.390	-0.445	-0.445
-1.5	-1.75	0.00	0.00	0.050	0.100	4.817		-1.033	-1.033	1.356	1.356
-1	-1.25	0.00	0.00	0.370	0.740			1.066	1.066		
-0.75	-0.875	1.56	1.36	0.790	1.580						
-0.5	-0.625	2.38	2.07	1.035	2.070						
-0.25	-0.375	2.92	2.55	1.340	2.920						
0	-0.125	4.44	3.87	1.850	4.440						
0.25	0.125	4.37	3.81								
0.5	0.375	9.14	7.97								
0.75	0.625	15.49	13.50								
1	0.875	19.91	17.36								
1.25	1.125	33.71	29.38								
1.5	1.375	12.78	11.14								
1.75	1.625	2.30	2.00								
2	1.875	0.62	0.54								
2.25	2.125	0.53	0.46								
2.5	2.375	0.29	0.25								
2.75	2.625	0.07	0.06								
3	2.875	0.06	0.05								
3.25	3.125	0.05	0.04								
3.5	3.375	0.03	0.03								
3.75	3.625	0.02	0.02								
4	3.875	0.02	0.02								
>4.0	4.25	0.01	0.01								

Limits (phi)	Mid Point (phi)	Weight (gram)	Weight % Cum. Wt %	Percentiles		Moment Measures		Graphic Phi Parameters		Folk & Ward	
				1	5	Mean	Standard Deviation	Inman	1952	Mean	Standard Deviation
-4	-4.5	0.00	0.00	-1.615	-0.755	1.159	0.448	1.073	1.073	1.103	1.103
-3	-3.5	0.00	0.00	-0.755	-0.475	0.760	0.590	0.597	0.597	0.711	0.711
-2	-2.5	0.00	0.00	-0.475	-0.255	-1.358	5.363	-0.155	-0.155	-0.283	-0.283
-1.5	-1.75	0.00	0.00	0.255	0.755	5.363		-0.937	-0.937	1.438	1.438
-1	-1.25	0.00	0.00	0.755	1.165			1.276	1.276		
-0.75	-0.875	0.91	0.84	1.165	1.530						
-0.5	-0.625	1.07	0.99	1.530	1.670						
-0.25	-0.375	1.09	1.01	1.670	1.965						
0	-0.125	1.50	1.39	1.965	2.205						
0.25	0.125	1.78	1.65	2.205							
0.5	0.375	3.71	3.44								
0.75	0.625	7.95	7.38								
1	0.875	9.49	8.81								
1.25	1.125	19.73	18.31								
1.5	1.375	17.62	16.35								
1.75	1.625	19.55	18.24								
2	1.875	11.73	10.89								
2.25	2.125	6.14	5.70								
2.5	2.375	1.04	0.97								
2.75	2.625	0.09	0.08								
3	2.875	0.06	0.06								
3.25	3.125	0.06	0.06								
3.5	3.375	0.06	0.06								
3.75	3.625	0.04	0.04								
4	3.875	0.01	0.01								
>4.0	4.25	0.02	0.02								

Grain Size Distribution



Grain Size Distribution



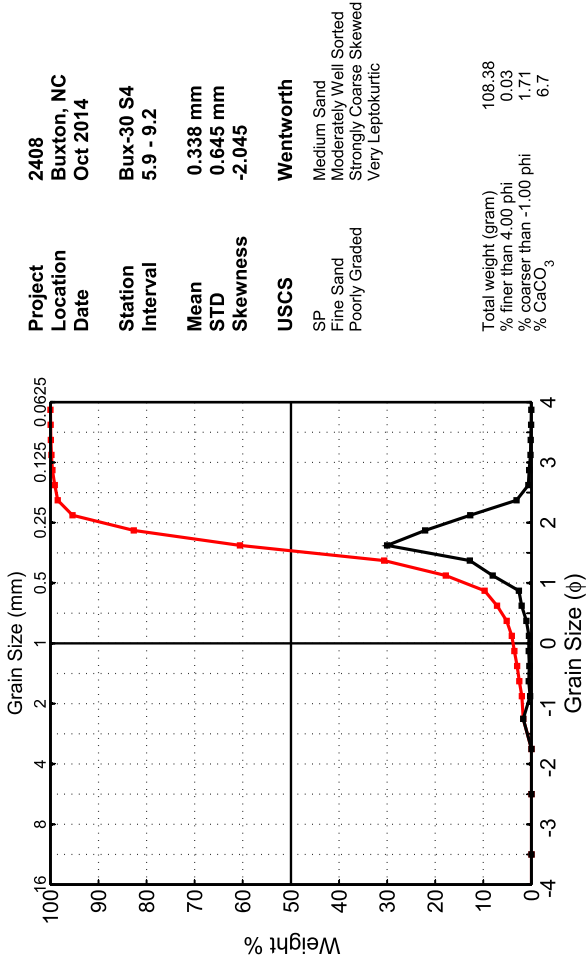
Moment Measures				Percentiles			
Mean	1.003	(phi)	(mm)	1	-0.875	Weight %	Cumm. Wt %
Standard Deviation	0.498		0.708	5	0.000	0.00	0.00
Skewness	-0.932			16	0.460	0.00	0.00
Kurtosis	8.381			25	0.650	0.00	0.00
Dispersion				50	0.965	0.80	0.80
Standard Deviation				75	1.180	0.99	0.99
Deviation from Normal				84	1.285	1.55	1.55
				95	1.485	2.33	3.98
				99	1.740	3.01	6.01
						11.62	23.58
						15.25	38.84
						31.46	70.30
						21.56	91.86
						6.99	98.85
						0.31	99.17
						0.22	99.38
						0.22	99.60
						0.12	99.70
						0.09	99.78
						0.04	99.82
						0.05	99.87
						0.03	99.92
						0.03	99.95
						0.05	100.00

Graphic Phi Parameters				Folk & Ward			
Mean	0.873		0.903	Mean	0.985		0.993
Standard Deviation	0.413		0.431	Standard Deviation	0.305		0.335
Skewness (1)	-0.224		-0.262	Skewness (1)	-0.082		-0.130
Skewness (2)	-0.539			Skewness (2)	-0.352		
Kurtosis	0.800		1.148	Kurtosis	0.975		1.543

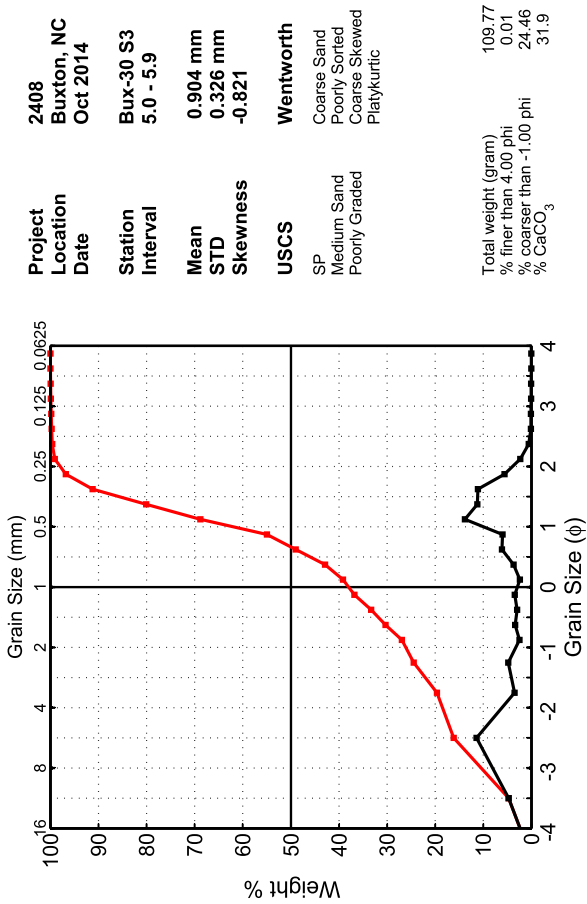
Moment Measures				Percentiles			
Mean	1.089	(phi)	(mm)	1	-0.860	Weight %	Cumm. Wt %
Standard Deviation	0.423		0.470	5	0.300	0.00	0.00
Skewness	-1.735			16	0.680	0.00	0.00
Kurtosis	13.179			25	0.855	0.00	0.00
Dispersion				50	1.010	0.89	0.89
Standard Deviation				75	1.175	0.99	0.99
Deviation from Normal				84	1.290	1.19	1.19
				95	1.505	1.52	1.52
				99	1.710	2.31	2.31
						3.14	3.14
						5.80	5.80
						7.32	7.32
						13.13	13.13
						26.12	26.12
						45.02	45.02
						71.14	71.14
						19.58	90.72
						8.11	98.83
						0.49	99.33
						0.27	99.60
						0.15	99.75
						0.08	99.83
						0.05	99.88
						0.04	99.92
						0.03	99.95
						0.03	99.97
						0.01	99.98
						0.02	100.00

Graphic Phi Parameters				Folk & Ward			
Mean	0.985		0.993	Mean	0.985		0.993
Standard Deviation	0.305		0.335	Standard Deviation	0.305		0.335
Skewness (1)	-0.082		-0.130	Skewness (1)	-0.082		-0.130
Skewness (2)	-0.352			Skewness (2)	-0.352		
Kurtosis	0.975		1.543	Kurtosis	0.975		1.543

Grain Size Distribution



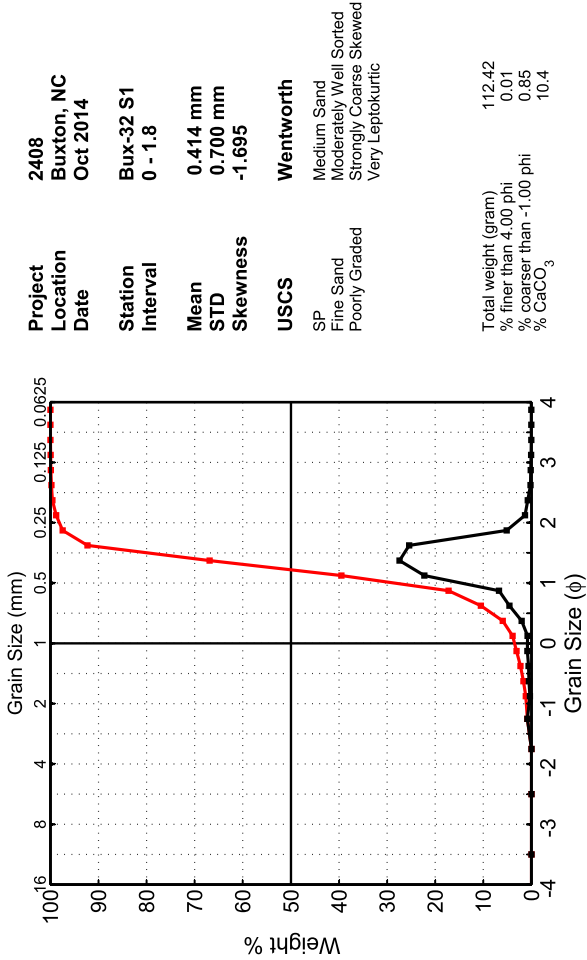
Grain Size Distribution



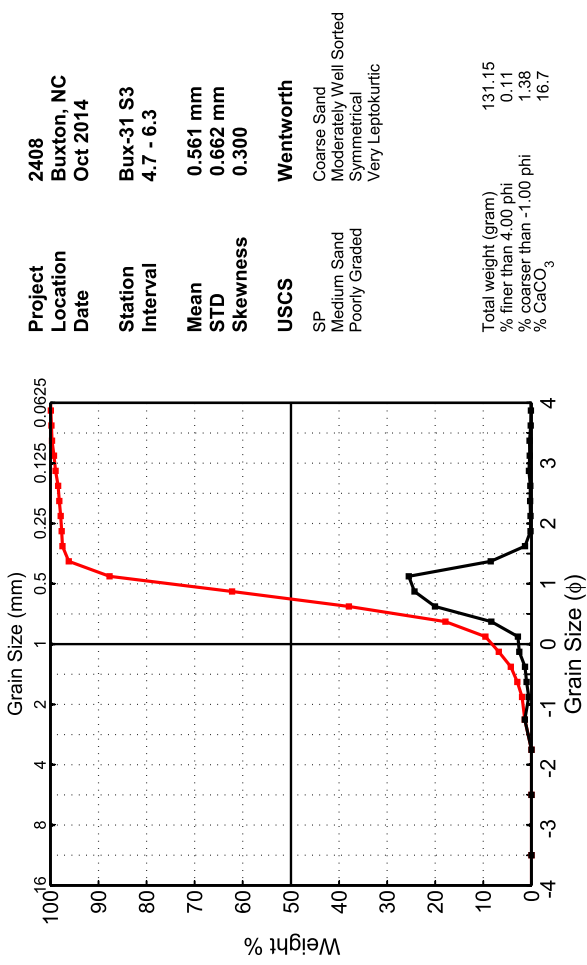
Limits			Mid Point			Weight			Weight % Cum. Wt %			Percentiles			Moment Measures			Graphic Phi Parameters			Inman			Folk & Ward		
(phi)			(phi)			(gram)															1952			1957		
-4	-4	-4.5	0.00	0.00	0.00	0.00	0.00	0.00	1	-1.455	Mean	1.566	0.338													
-3	-3	-3.5	0.00	0.00	0.00	0.00	0.00	0.00	5	0.345	Standard Deviation	0.632	0.645													
-2	-2	-2.5	0.00	0.00	0.00	0.00	0.00	0.00	16	1.070	Skewness	-2.045														
-1.5	-1.5	-1.75	0.00	0.00	0.00	0.00	0.00	0.00	25	1.265	Kurtosis	9.926														
-1	-1	-1.25	1.85	1.71	1.71	1.71	1.71	1.71	50	1.535	Standard Deviation															
-0.75	-0.75	-0.875	0.31	0.29	0.29	0.29	0.29	0.29	75	1.790	Deviation from Normal															
-0.5	-0.5	-0.625	0.59	0.54	0.54	0.54	0.54	0.54	84	1.900																
-0.25	-0.25	-0.375	0.48	0.44	0.44	0.44	0.44	0.44	95	2.115																
0	0	-0.125	0.62	0.57	0.57	0.57	0.57	0.57	99	2.585																
0.25	0.25	0.125	0.56	0.52	0.52	0.52	0.52	0.52																		
0.5	0.5	0.375	1.15	1.06	1.06	1.06	1.06	1.06																		
0.75	0.75	0.625	2.19	2.02	2.02	2.02	2.02	2.02																		
1	1	0.875	2.81	2.59	2.59	2.59	2.59	2.59																		
1.25	1.25	1.125	8.73	8.05	8.05	8.05	8.05	8.05																		
1.5	1.5	1.375	13.88	12.81	12.81	12.81	12.81	12.81																		
1.75	1.75	1.625	32.49	29.98	29.98	29.98	29.98	29.98																		
2	2	1.875	23.94	22.09	22.09	22.09	22.09	22.09																		
2.25	2.25	2.125	13.80	12.73	12.73	12.73	12.73	12.73																		
2.5	2.5	2.375	3.33	3.07	3.07	3.07	3.07	3.07																		
2.75	2.75	2.625	0.67	0.62	0.62	0.62	0.62	0.62																		
3	3	2.875	0.53	0.49	0.49	0.49	0.49	0.49																		
3.25	3.25	3.125	0.19	0.18	0.18	0.18	0.18	0.18																		
3.5	3.5	3.375	0.15	0.14	0.14	0.14	0.14	0.14																		
3.75	3.75	3.625	0.06	0.06	0.06	0.06	0.06	0.06																		
4	4	3.875	0.02	0.02	0.02	0.02	0.02	0.02																		
>4.0	>4.0	4.25	0.03	0.03	0.03	0.03	0.03	0.03																		

Limits			Weight % Cum. Wt %			Percentiles			Moment Measures			Graphic Phi Parameters			Folk & Ward 1957		
(phi)	Mid Point (phi)	Weight (gram)															
-4	-4.5	0.00	0.00	0.00	1	-4.125	Mean	0.146	0.146	0.904							
-3	-3.5	5.19	4.73	4.73	5	-3.475	Standard Deviation	1.617	1.617	0.326							
-2	-2.5	12.54	11.42	16.15	16	-2.515	Skewness	-0.821	-0.821								
-1.5	-1.75	3.84	3.50	19.65	25	-1.170	Kurtosis	2.466	2.466								
-1	-1.25	5.28	4.81	24.46	50	0.665	Standard Deviation										
-0.75	-0.875	2.70	2.46	26.92	75	1.260	Deviation from Normal										
-0.5	-0.625	3.73	3.40	30.32	84	1.465											
-0.25	-0.375	3.28	2.99	33.31	95	1.795											
0	-0.125	3.82	3.48	36.78	99	2.115											
0.25	0.125	2.61	2.38	39.16													
0.5	0.375	4.09	3.73	42.89													
0.75	0.625	6.70	6.10	48.99													
1	0.875	6.58	5.99	54.99													
1.25	1.125	15.19	13.84	68.82													
1.5	1.375	12.35	11.25	80.08													
1.75	1.625	12.21	11.12	91.20													
2	1.875	6.13	5.58	96.78													
2.25	2.125	2.52	2.30	99.08													
2.5	2.375	0.60	0.55	99.63					-0.525	-0.525					-0.128		
2.75	2.625	0.12	0.11	99.74					1.990	1.990					1.793		
3	2.875	0.10	0.09	99.83					-0.598	-0.598					-0.585		
3.25	3.125	0.06	0.05	99.88					-0.756	-0.756					0.889		
3.5	3.375	0.07	0.06	99.95					0.324	0.324							
3.75	3.625	0.04	0.04	99.98													
4	3.875	0.01	0.01	99.99													
>4.0	4.25	0.01	0.01	100.00													

Grain Size Distribution



Grain Size Distribution



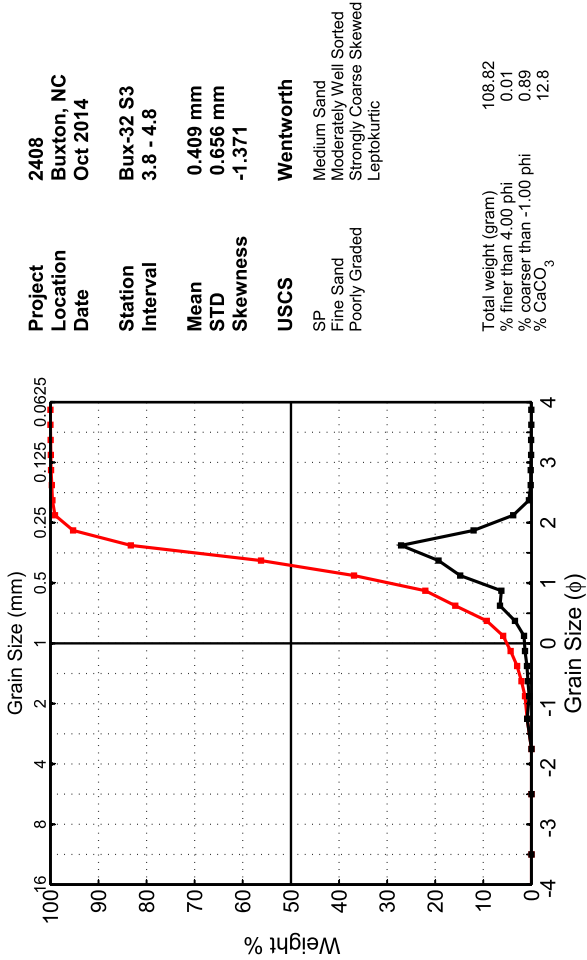
Percentiles			Moment Measures		
Limits (ϕ)	Mid Point (ϕ)	Weight (gram)	Weight % Cumm. Wt %		
-4	-4.5	0.00	0.00	Mean	1.272
-3	-3.5	0.00	0.00	Standard Deviation	0.515
-2	-2.5	0.00	0.00	Skewness	-1.695
-1.5	-1.75	0.00	0.00	Kurtosis	9.371
-1	-1.25	0.00	0.00	Dispersion	
-0.75	-0.875	0.34	0.85	Standard Deviation	
-0.5	-0.625	0.59	0.30	Deviation from Normal	
-0.25	-0.375	0.66	0.52		
0	-0.125	0.95	1.15		
0.25	0.125	0.91	0.85		
0.5	0.375	2.29	3.91		
0.75	0.625	5.13	10.51		
1	0.875	7.56	17.24		
1.25	1.125	25.00	39.48		
1.5	1.375	30.83	66.90		
1.75	1.625	28.55	27.42		
2	1.875	5.79	25.40		
2.25	2.125	1.51	97.45		
2.5	2.375	0.87	1.34		
2.75	2.625	0.22	0.77		
3	2.875	0.14	99.76		
3.25	3.125	0.06	0.12		
3.5	3.375	0.03	99.94		
3.75	3.625	0.02	99.96		
4	3.875	0.01	0.03		
>4.0	4.25	0.01	99.98		
			100.00		

Graphic Phi Parameters			Folk & Ward 1957		
Mean	Standard Deviation	Skewness (1)	Inman 1952		
1.188	0.357	-0.091	0.705		0.720
1.091	-0.594	1.091	0.385		0.441
			-0.117		-0.199
			-0.597		
			1.130		1.256

Percentiles			Moment Measures		
Limits (ϕ)	Mid Point (ϕ)	Weight (gram)	Weight % Cumm. Wt %		
-4	-4.5	0.00	0.00	Mean	0.834
-3	-3.5	0.00	0.00	Standard Deviation	0.595
-2	-2.5	0.00	0.00	Skewness	0.300
-1.5	-1.75	0.00	0.00	Kurtosis	9.207
-1	-1.25	0.00	0.00	Dispersion	
-0.75	-0.875	0.74	0.56	Standard Deviation	
-0.5	-0.625	1.30	0.99	Deviation from Normal	
-0.25	-0.375	1.74	2.94		
0	-0.125	3.29	4.26		
0.25	0.125	3.66	2.51		
0.5	0.375	10.92	2.79		
0.75	0.625	26.28	8.33		
1	0.875	31.87	20.04		
1.25	1.125	33.41	24.30		
1.5	1.375	11.09	25.47		
1.75	1.625	1.72	8.46		
2	1.875	0.23	1.31		
2.25	2.125	0.26	0.19		
2.5	2.375	0.36	0.20		
2.75	2.625	0.32	0.27		
3	2.875	0.68	98.13		
3.25	3.125	0.45	0.52		
3.5	3.375	0.53	0.52		
3.75	3.625	0.20	98.89		
4	3.875	0.12	99.24		
>4.0	4.25	0.15	0.40		
			0.15		
			0.09		
			99.79		
			99.89		
			100.00		

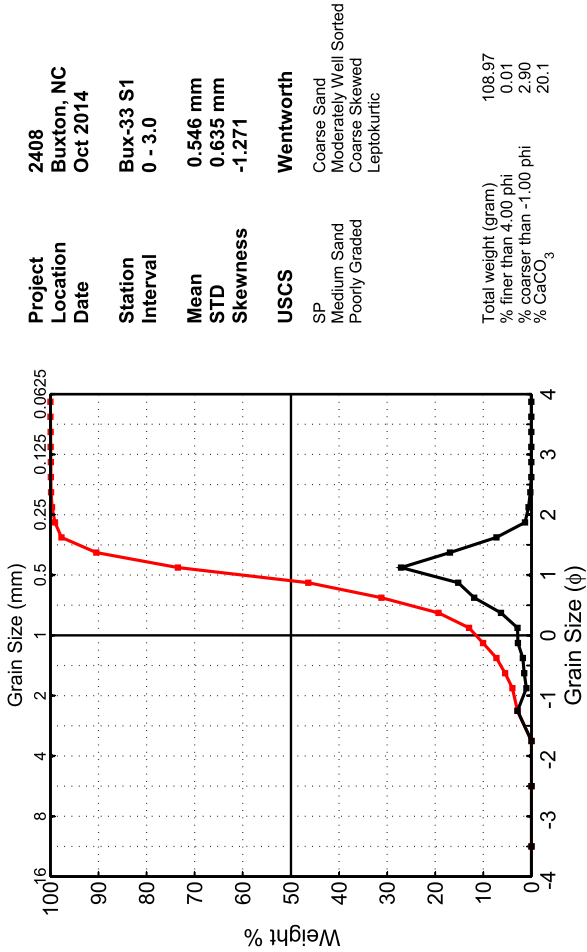
Graphic Phi Parameters			Folk & Ward 1957		
Mean	Standard Deviation	Skewness (1)	Inman 1952		
0.705	0.385	-0.117	0.705		0.720
-0.597	0.441	-0.199	0.385		0.441
1.130	-0.199		-0.117		-0.199
			-0.597		
			1.130		1.256

Grain Size Distribution

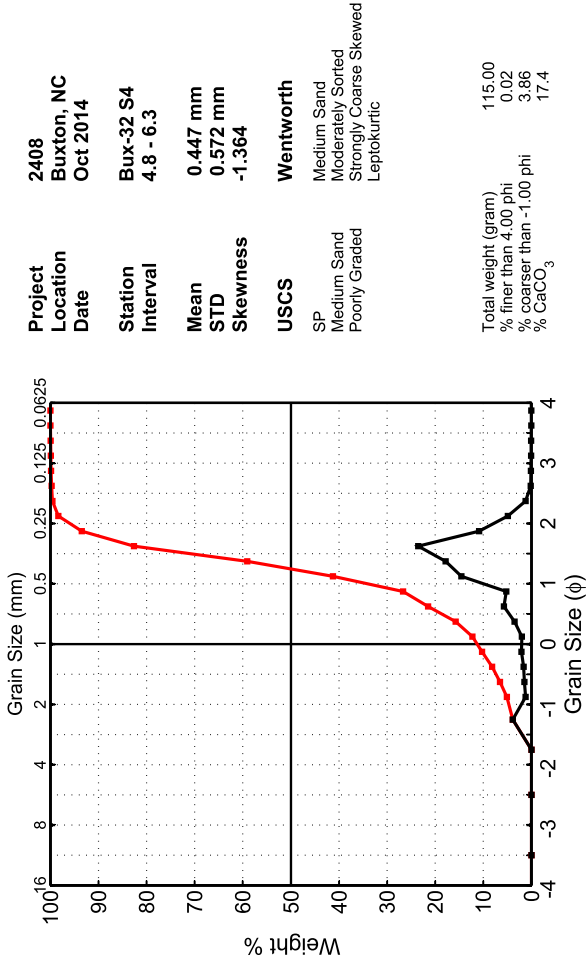


Moment Measures			Percentiles		
Mean	1.288	(phi)	1	-1.160	0.00
Standard Deviation	0.608	(mm)	5	-0.015	0.00
Skewness	-1.371		16	0.630	0.00
Kurtosis	6.242		25	0.925	0.00
Dispersion			50	1.295	0.89
Standard Deviation			75	1.550	1.35
Deviation from Normal			84	1.640	2.07
			95	1.870	2.98
			99	2.120	4.33
					1.35
					5.86
					9.29
					3.41
					6.52
					7.10
					6.24
					22.05
					36.88
					14.82
					16.13
					6.79
					1.875
					1.125
					1.125
					1.375
					21.01
					19.31
					15.18
					56.18
					27.09
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					12.00
					95.28
					3.78
					99.05
					4.11
					2.125
					0.54
					2.375
					0.17
					2.625
					0.16
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					99.55
					0.50
					0.50
					14.82
					16.13
					6.79
					1.875
					1.125
					1.125
					1.375
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					2.375
					0.17
					2.625
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					99.71
					99.55
					0.50
					0.50
					14.82
					16.13
					6.79
					1.875
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					2.625
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					99.55
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					0.50
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					0.17
					2.625
					0.16
					99.71
					99.55
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					0.50
					14.82
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					2.625
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					99.71
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					0.50
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					2.125
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					0.16
					99.71
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					0.50
					0.50
					14.82
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					4.

Grain Size Distribution



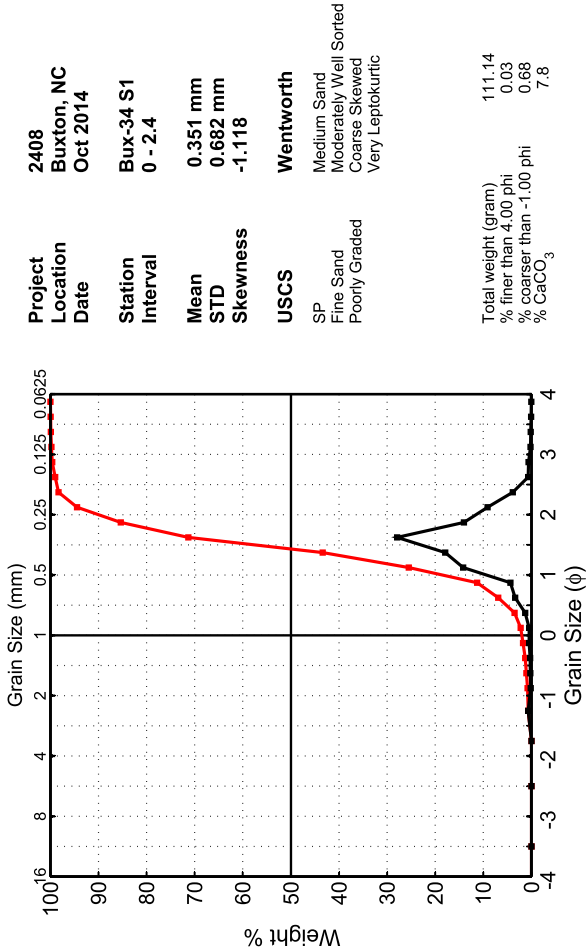
Grain Size Distribution



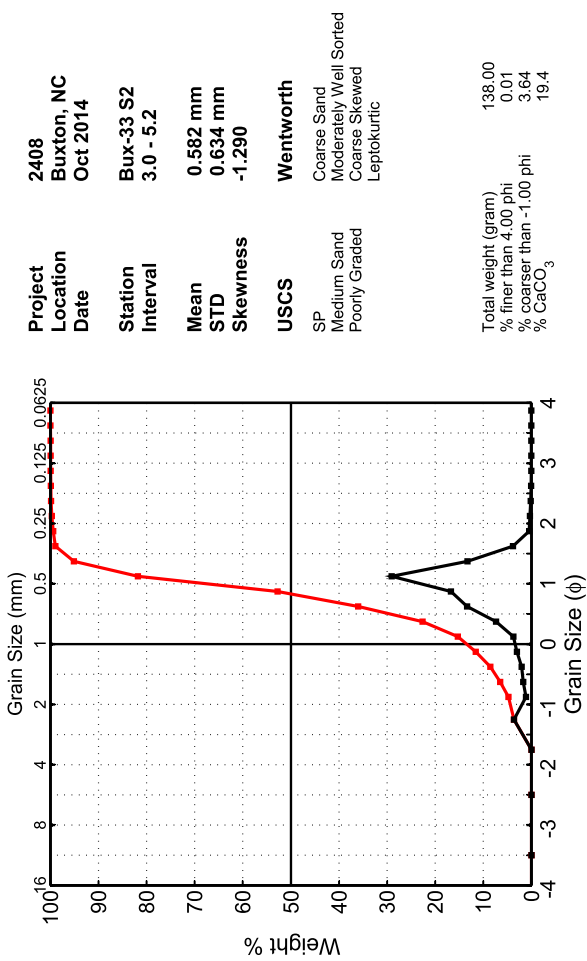
Limits (phi)				Weight % Cum. Wt %				Percentiles				Moment Measures			
-4	-3	-2	-1	-4.5	0.00	0.00	0.00	1	-1.580	Mean	Standard Deviation	Skewness	Kurtosis	(phi)	(mm)
-3	-2	-1	-1	-3.5	0.00	0.00	0.00	5	-0.705	0.873	0.546	0.655	-1.271	0.635	
-2	-1	-1	-1	-2.5	0.00	0.00	0.00	16	0.245	-1.271	0.655	0.635	5.336		
-1.5	-1	-1	-1	-1.75	0.00	0.00	0.00	25	0.495	0.873	0.546	0.635	5.336		
-0.75	-0.5	-0.25	0	-0.875	1.15	1.06	3.96	50	0.910	0.655	0.597	-0.365	1.409		
-0.5	-0.25	0	0	-0.625	1.65	1.51	5.47	75	1.145	-1.271	0.635	5.336			
-0.25	0	0	0	-0.375	1.96	1.80	7.27	84	1.280	0.873	0.546	0.635	5.336		
0	0.25	0.5	0.75	-0.125	3.05	2.89	10.07	95	1.530	0.655	0.597	-0.365	1.409		
0.25	0.5	0.75	1	0.125	3.15	2.89	12.96	99	1.870	0.873	0.546	0.635	5.336		
0.5	0.75	1	1	0.375	6.91	6.34	19.30								
0.75	1	1	1	0.625	12.96	11.89	31.19								
1	1	1	1	0.875	16.56	15.20	46.39								
1.25	1.25	1.25	1.25	1.125	29.53	27.10	73.49								
1.5	1.375	1.375	1.375	1.375	18.46	16.94	90.43								
1.75	1.625	1.625	1.625	1.625	7.92	7.27	97.70								
2	1.875	1.875	1.875	1.875	1.46	1.34	99.04								
2.25	2.125	2.125	2.125	2.125	0.66	0.61	99.64								
2.5	2.375	2.375	2.375	2.375	0.23	0.21	99.85								
2.75	2.625	2.625	2.625	2.625	0.04	0.04	99.89								
3	2.875	2.875	2.875	2.875	0.02	0.02	99.91								
3.25	3.125	3.125	3.125	3.125	0.02	0.02	99.93								
3.5	3.375	3.375	3.375	3.375	0.02	0.02	99.94								
3.75	3.625	3.625	3.625	3.625	0.03	0.03	99.97								
4	3.875	3.875	3.875	3.875	0.02	0.02	99.99								
>4.0	4.25	4.25	4.25	4.25	0.01	0.01	100.00								

Graphic Phi Parameters				Inman		Folk & Ward	
				1952		1957	
Mean				0.762		0.812	
Standard Deviation				0.517		0.597	
Skewness (1)				-0.285		-0.365	
Skewness (2)				-0.961		-0.961	
Kurtosis				1.159		1.409	

Grain Size Distribution



Grain Size Distribution



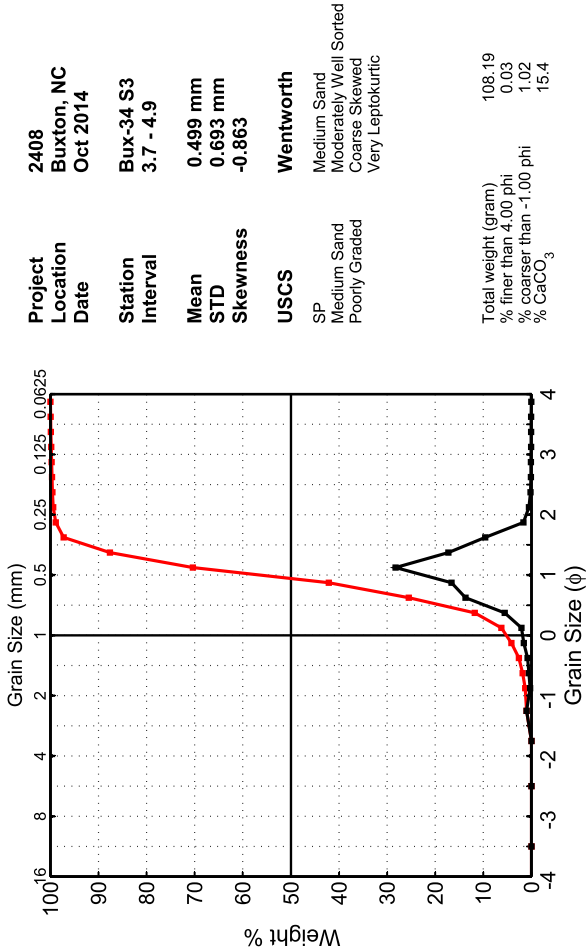
Limits			Percentiles		Moment Measures	
(ϕ)	Mid Point (ϕ)	Weight (gram)	Weight % Cumm. Wt %	(phi)	(mm)	(mm)
-4	-4.5	0.00	0.00	1	-0.675	1.509
-3	-3.5	0.00	0.00	5	0.485	0.552
-2	-2.5	0.00	0.00	16	0.960	-1.118
-1.5	-1.75	0.00	0.00	25	1.115	8.025
-0.75	-0.875	0.15	0.68	50	1.435	
-0.5	-0.625	0.25	0.82	75	1.690	
-0.25	-0.375	0.28	1.04	84	1.850	
0	-0.125	0.51	1.30	95	2.160	
0.25	0.125	0.54	1.75	99	2.625	
0.5	0.375	1.42	2.24			
0.75	0.625	3.77	3.39			
1	0.875	4.86	4.37			
1.25	1.125	15.77	11.28			
1.5	1.375	19.92	25.47			
1.75	1.625	31.02	43.40			
2	1.875	15.60	71.31			
2.25	2.125	10.12	85.34			
2.5	2.375	4.30	94.45			
2.75	2.625	0.76	98.32			
3	2.875	0.66	99.00			
3.25	3.125	0.21	99.60			
3.5	3.375	0.14	99.78			
3.75	3.625	0.05	99.91			
4	3.875	0.02	99.96			
>4.0	4.25	0.03	100.00			

Graphic Phi Parameters		Inman 1952		Folk & Ward 1957	
Mean		1.405		1.415	
Standard Deviation		0.445		0.476	
Skewness (1)		-0.067		-0.101	
Skewness (2)		-0.253			
Kurtosis		0.882		1.194	

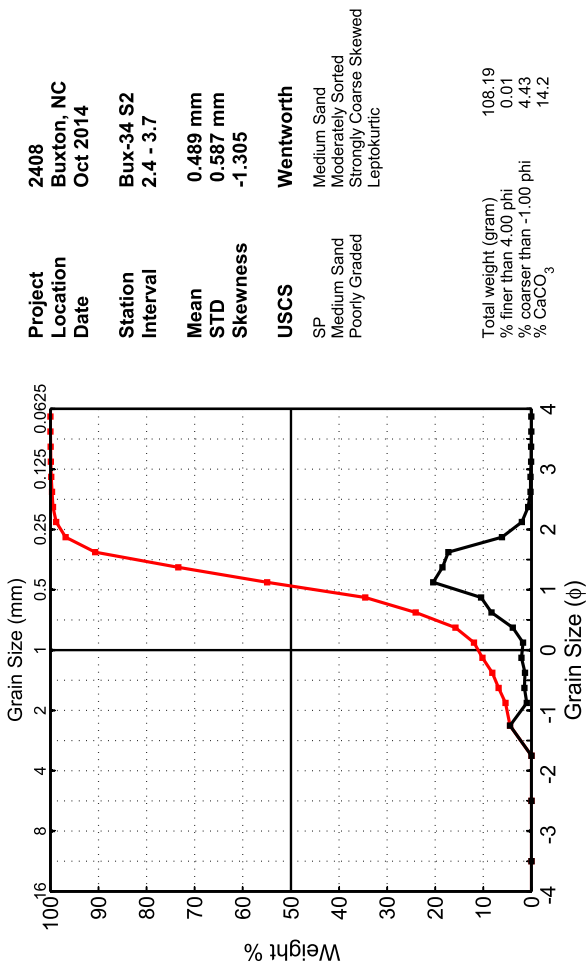
Limits			Percentiles		Moment Measures	
(ϕ)	Mid Point (ϕ)	Weight (gram)	Weight % Cumm. Wt %	(phi)	(mm)	(mm)
-4	-4.5	0.00	0.00	1	-1.615	0.780
-3	-3.5	0.00	0.00	5	-0.845	0.658
-2	-2.5	0.00	0.00	16	0.150	-1.290
-1.5	-1.75	0.00	0.00	25	0.420	5.175
-0.75	-0.875	1.58	3.64	50	0.835	
-0.5	-0.625	2.37	4.78	75	1.065	
-0.25	-0.375	2.81	6.50	84	1.165	
0	-0.125	4.17	8.54	95	1.375	
0.25	0.125	5.16	11.56	99	1.655	
0.5	0.375	10.14	15.30			
0.75	0.625	18.47	22.64			
1	0.875	23.07	36.03			
1.25	1.125	40.11	52.75			
1.5	1.375	18.33	81.81			
1.75	1.625	5.31	95.09			
2	1.875	0.64	98.94			
2.25	2.125	0.41	99.41			
2.5	2.375	0.22	99.70			
2.75	2.625	0.06	99.86			
3	2.875	0.03	99.91			
3.25	3.125	0.02	99.93			
3.5	3.375	0.01	99.94			
3.75	3.625	0.01	99.95			
4	3.875	0.02	99.97			
>4.0	4.25	0.02	99.99			
		0.01	100.00			

Graphic Phi Parameters		Inman 1952		Folk & Ward 1957	
Mean		0.657		0.717	
Standard Deviation		0.508		0.590	
Skewness (1)		-0.350		-0.432	
Skewness (2)		-1.123			
Kurtosis		1.187		1.411	

Grain Size Distribution



Grain Size Distribution



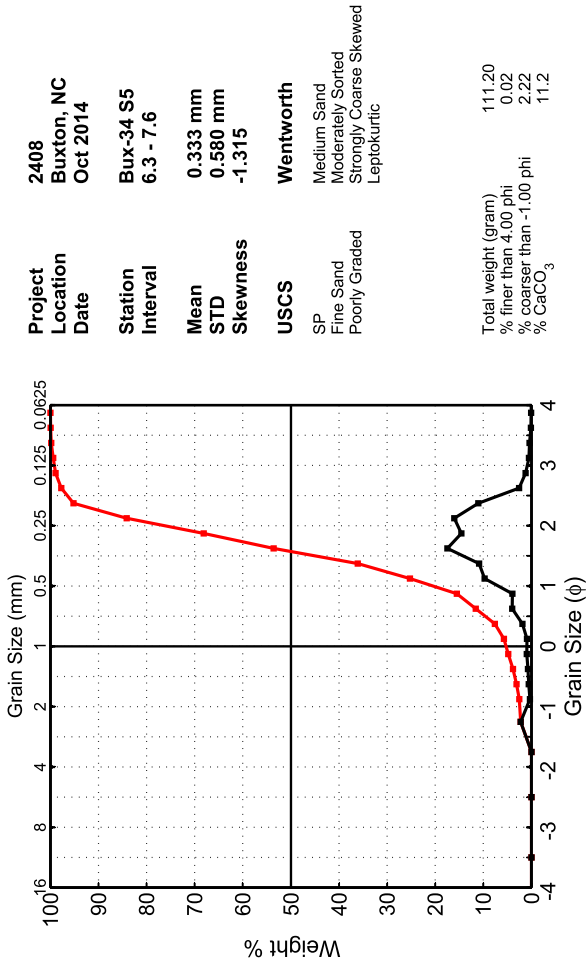
Percentiles			Moment Measures		
Limits (phi)	Mid Point (phi)	Weight (gram)	Weight % Cum. Wt %	Mean	(phi)
-4	-4.5	0.00	0.00	Standard Deviation	(mm)
-3	-3.5	0.00	0.00	Skewness	0.499
-2	-2.5	0.00	0.00	Kurtosis	0.693
-1.5	-1.75	0.00	0.00	Dispersion	-0.863
-0.75	-1.25	0.00	0.00	Standard Deviation	7.463
-0.5	-0.875	0.30	0.28	Deviation from Normal	
-0.25	-0.625	0.57	0.53		
0	-0.375	0.85	0.79		
0.25	-0.125	1.69	1.56		
0.5	0.125	2.23	2.06		
0.75	0.375	6.00	6.23		
1	0.625	14.84	13.72		
1.25	0.875	17.97	16.61		
1.5	1.125	30.57	28.26		
1.75	1.375	18.68	17.27		
2	1.625	10.38	9.59		
2.25	1.875	1.79	1.65		
2.5	2.125	0.56	0.52		
2.75	2.375	0.20	0.18		
3	2.625	0.10	0.09		
3.25	2.875	0.09	0.08		
3.5	3.125	0.07	0.06		
3.75	3.375	0.08	0.07		
4	3.625	0.05	0.05		
>4.0	4.25	0.04	0.04		
		0.03	0.03		
		0.03	0.03		
		100.00	100.00		

Graphic Phi Parameters			Inman 1952			Folk & Ward 1957		
Mean	Standard Deviation	Skewness (1)	Skewness (2)	Kurtosis		Mean	Standard Deviation	Skewness
0.887	0.438	-0.131	-0.400	0.817		0.992	0.715	-0.335
0.907	0.460	-0.176	-0.400	1.133		0.955	0.575	-0.191
0.907	0.460	-0.176	-0.400	1.133		-1.174	-1.452	1.541

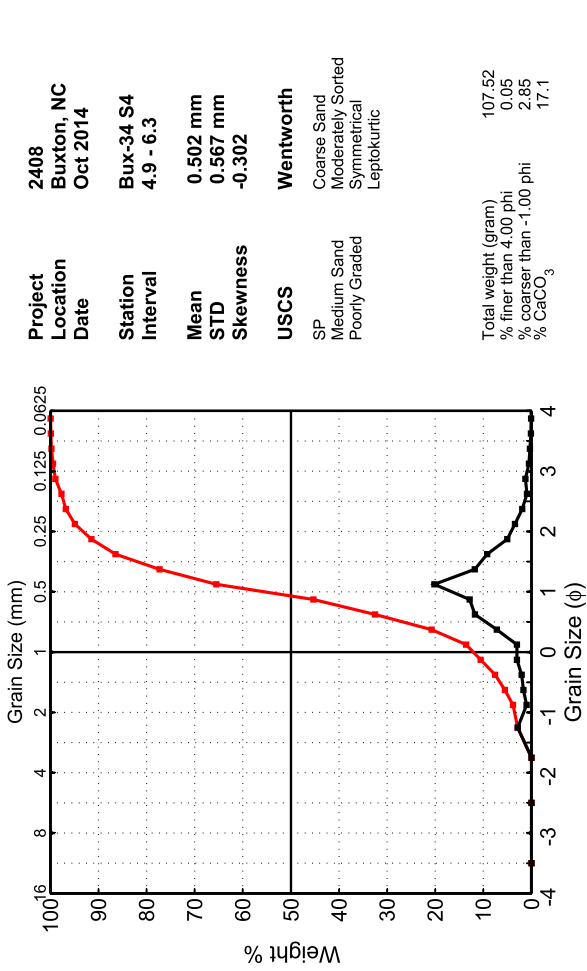
Percentiles			Moment Measures		
Limits (phi)	Mid Point (phi)	Weight (gram)	Weight % Cum. Wt %	Mean	(phi)
-4	-4.5	0.00	0.00	Standard Deviation	(mm)
-3	-3.5	0.00	0.00	Skewness	1.033
-2	-2.5	0.00	0.00	Kurtosis	0.768
-1.5	-1.75	0.00	0.00	Dispersion	-1.305
-0.75	-1.25	4.79	4.43	Standard Deviation	5.025
-0.5	-0.875	1.02	0.94	Deviation from Normal	
-0.25	-0.625	1.56	1.44		
0	-0.375	1.42	1.31		
0.25	-0.125	2.22	2.05		
0.5	0.125	1.89	1.75		
0.75	0.375	4.17	3.85		
1	0.625	8.95	8.27		
1.25	0.875	11.33	10.47		
1.5	1.125	22.09	20.42		
1.75	1.375	19.99	18.48		
2	1.625	18.68	17.27		
2.25	1.875	6.63	6.13		
2.5	2.125	2.13	1.97		
2.75	2.375	0.73	0.69		
3	2.625	0.21	0.19		
3.25	2.875	0.19	0.18		
3.5	3.125	0.07	0.06		
3.75	3.375	0.06	0.06		
4	3.625	0.03	0.03		
>4.0	4.25	0.02	0.02		
		0.01	0.01		
		0.01	0.01		
		100.00	100.00		

Graphic Phi Parameters			Inman 1952			Folk & Ward 1957		
Mean	Standard Deviation	Skewness (1)	Skewness (2)	Kurtosis		Mean	Standard Deviation	Skewness
0.955	0.575	-0.191	-1.174	1.452		0.992	0.715	-0.335
0.955	0.575	-0.191	-1.174	1.452		-1.174	-1.452	1.541

Grain Size Distribution



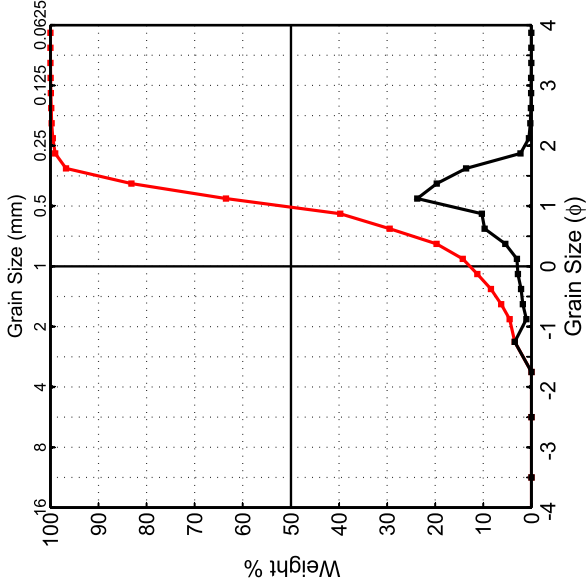
Grain Size Distribution



Limits			Percentiles			Moment Measures		
(phi)	Mid Point (phi)	Weight (gram)	Weight % Cum. Wt %	1	5	Mean	Standard Deviation	(phi)
-4	-4.5	0.00	0.00	-1.525	-3.5	0.00	0.00	1.585
-3	-3.5	0.00	0.00	-0.070	-2.5	0.00	0.00	0.787
-2	-2.5	0.00	0.00	0.890	-1.75	0.00	0.00	-1.315
-1.5	-1.25	0.00	0.00	1.120	-1.25	0.00	0.00	5.831
-0.75	-0.875	0.34	2.22	2.53	-0.625	0.63	0.31	
-0.5	-0.625	0.63	2.22	3.09	-0.375	0.81	0.73	
-0.25	-0.375	0.81	0.97	1.980	-0.125	1.08	0.97	
0	-0.125	1.08	0.97	4.79	0.125	1.04	0.94	
0.25	0.125	1.04	0.94	5.73	0.375	2.07	1.86	
0.5	0.375	2.07	1.86	7.59	0.625	4.43	3.98	
0.75	0.625	4.43	3.98	11.57	0.875	4.38	3.94	
1	0.875	4.38	3.94	15.51	1.125	10.81	9.72	
1.25	1.125	10.81	9.72	25.23	1.375	12.07	10.85	
1.5	1.375	12.07	10.85	36.09	1.625	19.44	17.48	
1.75	1.625	19.44	17.48	53.57	1.875	16.17	14.54	
2	1.875	16.17	14.54	68.11	2.125	17.83	16.03	
2.25	2.125	17.83	16.03	84.15	2.375	12.26	11.03	
2.5	2.375	12.26	11.03	95.17	2.625	2.83	2.54	
2.75	2.625	2.83	2.54	97.72	2.875	1.34	1.21	
3	2.875	1.34	1.21	98.92	3.125	0.56	0.50	
3.25	3.125	0.56	0.40	99.42	3.375	0.45	0.40	
3.5	3.375	0.45	0.40	99.83	3.625	0.12	0.11	
3.75	3.625	0.12	0.11	99.94	3.875	0.05	0.04	
4	3.875	0.05	0.04	99.98	4.125	0.02	0.02	
>4.0	4.25	0.02	0.02	100.00				
Graphic Phi Parameters			Inman 1952			Folk & Ward 1957		
Mean			0.885			0.902		
Standard Deviation			0.675			0.768		
Skewness (1)			-0.074			-0.113		
Skewness (2)			-0.319			1.353		
Kurtosis			1.104					

Limits			Percentiles			Moment Measures		
(phi)	Mid Point (phi)	Weight (gram)	Weight % Cum. Wt %	1	5	Mean	Standard Deviation	(phi)
-4	-4.5	0.00	0.00	-1.575	-3.5	0.995	0.502	0.995
-3	-3.5	0.00	0.00	-0.700	-2.5	0.818	0.567	0.818
-2	-2.5	0.00	0.00	0.210	-1.75	-0.302		-0.302
-1.5	-1.25	0.00	0.00	0.465	-1.25	4.153		4.153
-0.75	-0.875	3.06	2.85	25	-0.625	Dispersion		
-0.5	-0.875	1.07	1.00	50	-0.375	Standard Deviation		
-0.25	-0.375	1.79	1.66	75	-0.125	Deviation from Normal		
0	-0.125	2.19	2.04	84	0.125			
0.25	0.125	3.22	2.99	95	0.375			
0.5	0.375	3.25	3.02	99	0.625			
0.75	0.625	12.63	11.75	2.140	0.875			
1	0.875	13.82	12.85	2.905	1.125			
1.25	1.125	21.68	12.85		1.375			
1.5	1.375	12.67	11.78		1.625			
1.75	1.625	9.87	9.18		1.875			
2	1.875	5.38	5.00		2.125			
2.25	2.125	3.68	3.42		2.375			
2.5	2.375	2.06	1.92		2.625			
2.75	2.625	0.97	0.90		2.875			
3	2.875	1.33	1.24		3.125			
3.25	3.125	0.54	0.50		3.375			
3.5	3.375	0.35	0.33		3.625			
3.75	3.625	0.13	0.12		3.875			
4	3.875	0.07	0.07		4.125			
>4.0	4.25	0.05	0.05					
Graphic Phi Parameters			Inman 1952			Folk & Ward 1957		
Mean			0.885			0.902		
Standard Deviation			0.675			0.768		
Skewness (1)			-0.074			-0.113		
Skewness (2)			-0.319			1.353		
Kurtosis			1.104					

Grain Size Distribution



Project Location Date
2408 Buxton, NC Oct 2014

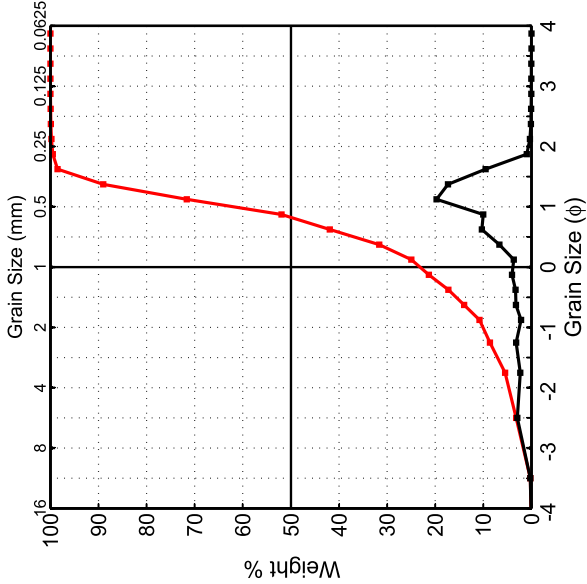
Station Interval
Bux-36 S2 1.8 - 3.7

Mean STD Skewness
0.527 mm
0.609 mm
-1.256

USCS
Wentworth

SP
Coarse Sand
Moderately Sorted
Coarse Skewed
Leptokurtic

Grain Size Distribution



Project Location Date
2408 Buxton, NC Oct 2014

Station Interval
Bux-36 S1 0 - 1.8

Mean STD Skewness
0.656 mm
0.498 mm
-1.446

USCS
Wentworth

SP
Coarse Sand
Poorly Sorted
Strongly Coarse Skewed
Leptokurtic

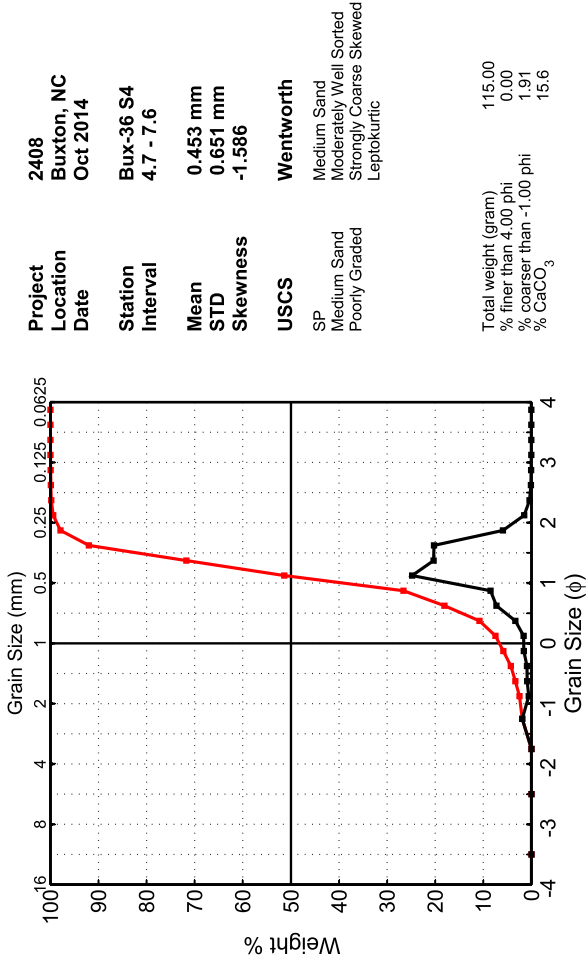
Percentiles			Moment Measures		
Limits (phi)	Mid Point (phi)	Weight (gram)	Weight % Cum. Wt %	Mean	(phi)
-4	-4.5	0.00	0.00	Standard Deviation	(mm)
-3	-3.5	0.00	0.00	Skewness	0.925 0.527
-2	-2.5	0.00	0.00	Kurtosis	0.716 0.609
-1.5	-1.75	0.00	0.00	Dispersion	-1.256 4.732
-1	-1.25	3.93	3.46	Standard Deviation	
-0.75	-0.875	1.20	1.06	Deviation from Normal	
-0.5	-0.625	2.02	1.78		
-0.25	-0.375	2.43	2.14		
0	-0.125	3.21	2.82		
0.25	0.125	3.44	3.03		
0.5	0.375	6.17	5.43		
0.75	0.625	11.08	9.75		
1	0.875	11.72	10.31		
1.25	1.125	27.00	23.75		
1.5	1.375	22.35	19.66		
1.75	1.625	15.43	13.57		
2	1.875	2.58	2.27		
2.25	2.125	0.57	0.50		
2.5	2.375	0.26	0.23		
2.75	2.625	0.10	0.09		
3	2.875	0.08	0.07		
3.25	3.125	0.05	0.04		
3.5	3.375	0.03	0.03		
3.75	3.625	0.02	0.02		
4	3.875	0.01	0.01		
>4.0	4.25	0.01	0.01		

Graphic Phi Parameters			Inman 1952			Folk & Ward 1957		
Mean	Standard Deviation	Skewness (1)	Mean	Standard Deviation	Skewness (1)	Mean	Standard Deviation	Skewness (1)
0.798	0.593	-0.316	0.418	0.887	-0.459	0.553	0.964	-0.523
1.025	-0.996		0.935	-1.135		1.341		

Percentiles			Moment Measures		
Limits (phi)	Mid Point (phi)	Weight (gram)	Weight % Cum. Wt %	Mean	(phi)
-4	-4.5	0.00	0.00	Standard Deviation	(mm)
-3	-3.5	0.26	0.23	Skewness	0.609 0.656
-2	-2.5	3.36	2.93	Kurtosis	1.006 0.498
-1.5	-1.75	2.65	2.31	Dispersion	-1.446 4.838
-1	-1.25	3.63	3.17	Standard Deviation	
-0.75	-0.875	2.48	2.16	Deviation from Normal	
-0.5	-0.625	3.67	3.20		
-0.25	-0.375	3.76	3.28		
0	-0.125	4.62	4.03		
0.25	0.125	4.18	3.65		
0.5	0.375	7.64	6.66		
0.75	0.625	11.81	10.30		
1	0.875	11.50	10.03		
1.25	1.125	22.60	19.71		
1.5	1.375	19.88	17.34		
1.75	1.625	10.92	9.52		
2	1.875	1.11	0.97		
2.25	2.125	0.33	0.29		
2.5	2.375	0.14	0.12		
2.75	2.625	0.06	0.05		
3	2.875	0.03	0.03		
3.25	3.125	0.02	0.02		
3.5	3.375	0.01	0.01		
3.75	3.625	0.00	0.00		
4	3.875	0.00	0.00		
>4.0	4.25	0.00	0.00		

Graphic Phi Parameters			Inman 1952			Folk & Ward 1957		
Mean	Standard Deviation	Skewness (1)	Mean	Standard Deviation	Skewness (1)	Mean	Standard Deviation	Skewness (1)
0.418	0.887	-0.459	0.553	0.964	-0.523	1.341		
0.935	-1.135		0.935	-1.135				

Grain Size Distribution



2408
Buxton, NC
Oct 2014

Bux-36 S4
4.7 - 7.6

0.453 mm
0.651 mm
-1.586

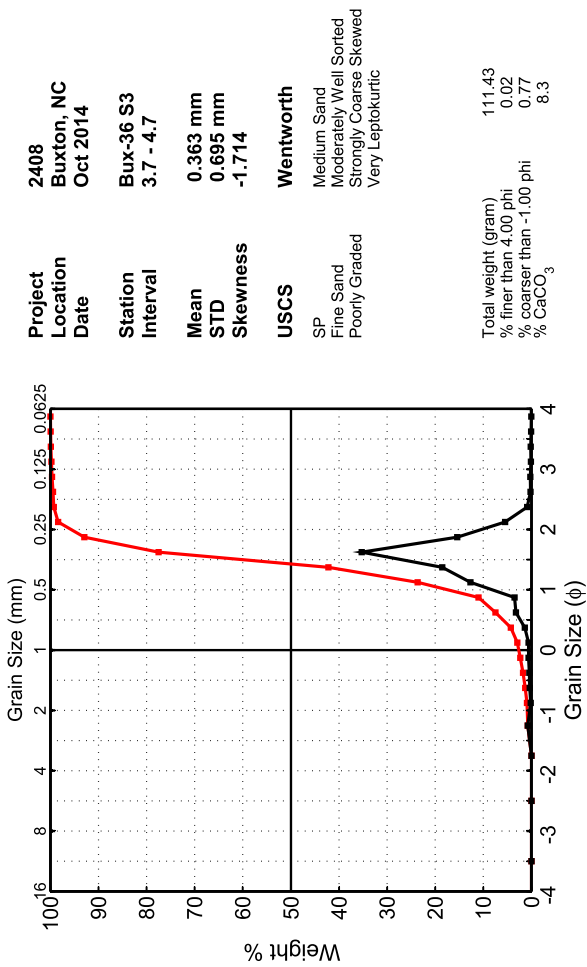
Wentworth

Medium Sand
Moderately Well Sorted
Strongly Coarse Skewed
Leptokurtic

Medium Sand
Poorly Graded

115.00
0.00
1.91
15.6

Grain Size Distribution



2408
Buxton, NC
Oct 2014

Bux-36 S3
3.7 - 4.7

0.363 mm
0.695 mm
-1.714

Wentworth

Medium Sand
Moderately Well Sorted
Strongly Coarse Skewed
Very Leptokurtic

Fine Sand
Poorly Graded

111.43
0.02
0.77
8.3

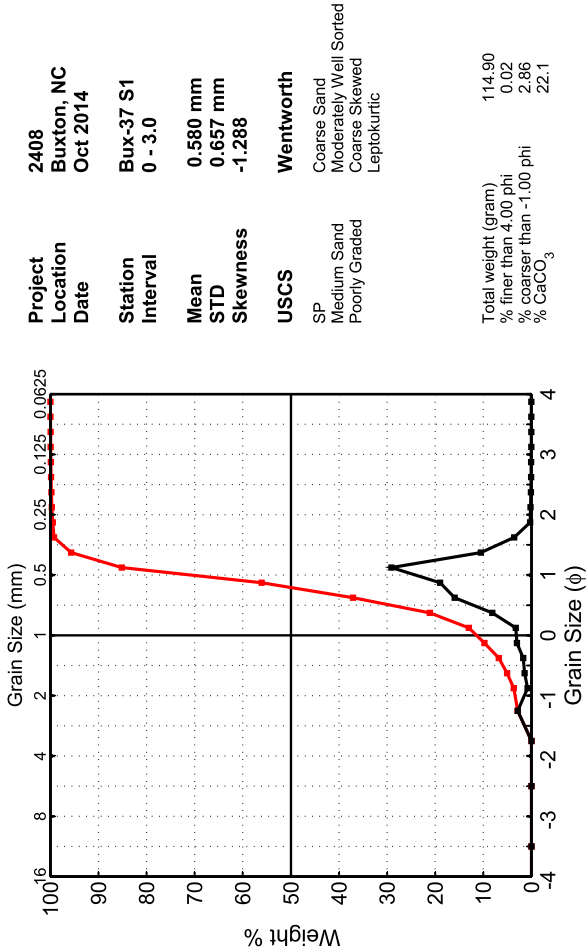
Percentiles				Moment Measures			
1	-1.490	0.00	0.00	Mean	1.141	(phi)	(mm)
5	-0.260	0.00	0.00	Standard Deviation	0.620		0.453
16	0.555	0.00	0.00	Skewness	-1.586		0.651
25	0.830	0.00	0.00	Kurtosis	6.763		
50	1.110	1.91	1.91	Dispersion			
75	1.415	2.46	2.46	Standard Deviation			
84	1.525	3.32	3.32	Deviation from Normal			
95	1.755	4.26	5.83				
99	2.055	1.57	5.83				
Limits (φ)	-4.5	0.00	0.00				
-4	-4.5	0.00	0.00				
-3	-3.5	0.00	0.00				
-2	-2.5	0.00	0.00				
-1.5	-1.75	0.00	0.00				
-1	-1.25	2.20	1.91				
-0.75	-0.875	0.63	0.55				
-0.5	-0.625	0.99	0.86				
-0.25	-0.375	1.08	0.94				
0	-0.125	1.81	1.57				
0.25	0.125	1.88	1.63				
0.5	0.375	3.83	3.33				
0.75	0.625	8.38	7.29				
1	0.875	9.77	8.50				
1.25	1.125	28.51	24.79				
1.5	1.375	23.39	20.34				
1.75	1.625	23.31	20.27				
2	1.875	6.80	5.91				
2.25	2.125	1.74	1.51				
2.5	2.375	0.45	0.39				
2.75	2.625	0.10	0.09				
3	2.875	0.06	0.05				
3.25	3.125	0.03	0.03				
3.5	3.375	0.02	0.02				
3.75	3.625	0.01	0.01				
4	3.875	0.01	0.01				
>4.0	4.25	0.00	0.00				

Graphic Phi Parameters				Folk & Ward			
Mean	1.040			Mean	1.353		
Standard Deviation	0.485			Standard Deviation	0.377		
Skewness (1)	-0.144			Skewness (1)	-0.205		
Skewness (2)	-0.747			Skewness (2)	-0.609		
Kurtosis	1.077			Kurtosis	1.040		

Percentiles				Moment Measures			
1	-0.815	0.00	0.00	Mean	1.461	(phi)	(mm)
5	0.430	0.00	0.00	Standard Deviation	0.524		0.363
16	0.975	0.00	0.00	Skewness	-1.714		0.695
25	1.145	0.00	0.00	Kurtosis	10.165		
50	1.430	0.77	0.77	Dispersion			
75	1.605	0.14	0.92	Standard Deviation			
84	1.730	0.36	1.27	Deviation from Normal			
95	1.970	0.45	1.72				
99	2.295	0.60	2.32				
Limits (φ)	-4.5	0.00	0.00				
-4	-4.5	0.00	0.00				
-3	-3.5	0.00	0.00				
-2	-2.5	0.00	0.00				
-1.5	-1.75	0.00	0.00				
-1	-1.25	0.86	0.77				
-0.75	-0.875	0.16	0.14				
-0.5	-0.625	0.40	0.36				
-0.25	-0.375	0.50	0.45				
0	-0.125	0.67	0.80				
0.25	0.125	0.68	0.61				
0.5	0.375	1.51	1.36				
0.75	0.625	3.57	3.20				
1	0.875	3.92	3.52				
1.25	1.125	14.10	12.65				
1.5	1.375	20.66	18.54				
1.75	1.625	39.33	35.30				
2	1.875	17.20	15.44				
2.25	2.125	6.08	5.46				
2.5	2.375	0.98	0.88				
2.75	2.625	0.20	0.18				
3	2.875	0.23	0.21				
3.25	3.125	0.12	0.11				
3.5	3.375	0.14	0.13				
3.75	3.625	0.07	0.06				
4	3.875	0.03	0.03				
>4.0	4.25	0.02	0.02				

Graphic Phi Parameters				Folk & Ward			
Mean	1.353			Mean	1.378		
Standard Deviation	0.377			Standard Deviation	0.422		
Skewness (1)	-0.205			Skewness (1)	-0.252		
Skewness (2)	-0.609			Skewness (2)	-0.609		
Kurtosis	1.040			Kurtosis	1.372		

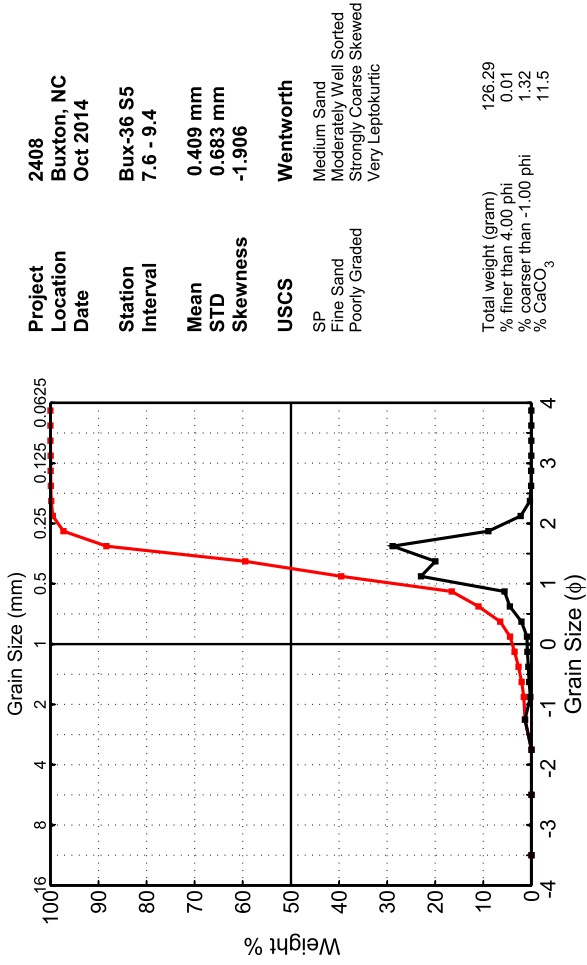
Grain Size Distribution



Percentiles			Moment Measures		
Limits (phi)	Mid Point (phi)	Weight (gram)	Weight % Cumm. Wt %	Mean	(phi)
-4	-4.5	0.00	0.00	Standard Deviation	0.786
-3	-3.5	0.00	0.00	Skewness	0.605
-2	-2.5	0.00	0.00	Kurtosis	-1.288
-1.5	-1.75	0.00	0.00	Dispersion	6.000
-0.75	-0.875	0.93	2.86	Standard Deviation	
-0.5	-0.625	1.61	3.67	Deviation from Normal	
-0.25	-0.375	1.94	5.07		
0	-0.125	3.44	9.76		
0.25	0.125	3.72	12.99		
0.5	0.375	9.34	21.12		
0.75	0.625	18.35	37.09		
1	0.875	21.80	56.07		
1.25	1.125	33.44	85.17		
1.5	1.375	12.06	95.67		
1.75	1.625	4.12	99.25		
2	1.875	0.29	99.50		
2.25	2.125	0.20	99.68		
2.5	2.375	0.12	99.78		
2.75	2.625	0.07	99.84		
3	2.875	0.06	99.90		
3.25	3.125	0.04	99.93		
3.5	3.375	0.03	99.96		
3.75	3.625	0.01	99.97		
4	3.875	0.02	99.98		
>4.0	4.25	0.02	100.00		

Graphic Phi Parameters			Inman 1952			Folk & Ward 1957		
Mean			0.665			0.708		
Standard Deviation			0.450			0.528		
Skewness (1)			-0.289			-0.362		
Skewness (2)			-0.967			1.355		
Kurtosis			1.222					

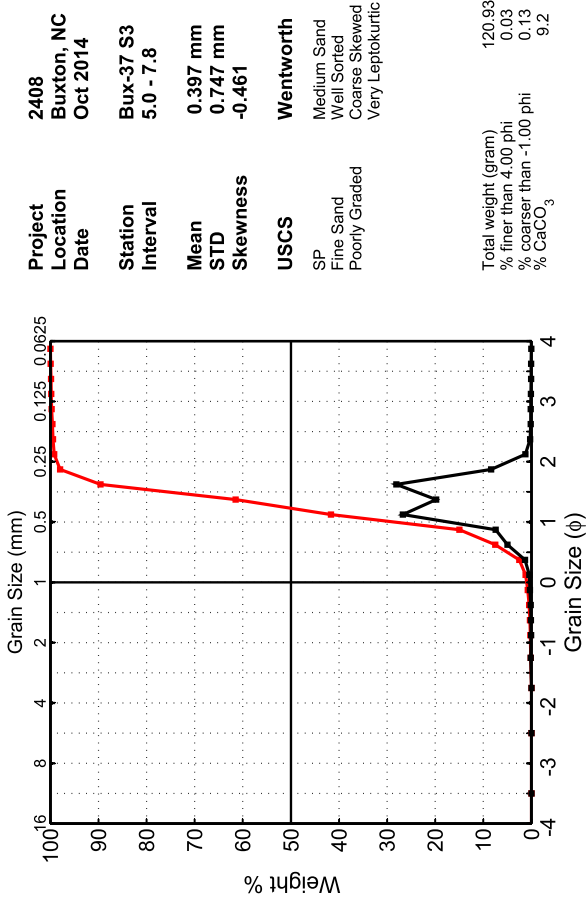
Grain Size Distribution



Percentiles			Moment Measures		
Limits (phi)	Mid Point (phi)	Weight (gram)	Weight % Cumm. Wt %	Mean	(phi)
-4	-4.5	0.00	0.00	Standard Deviation	1.290
-3	-3.5	0.00	0.00	Skewness	0.551
-2	-2.5	0.00	0.00	Kurtosis	-1.906
-1.5	-1.75	0.00	0.00	Dispersion	9.188
-0.75	-0.875	1.67	1.32	Standard Deviation	
-0.5	-0.625	0.30	0.24	Deviation from Normal	
-0.25	-0.375	0.59	0.47		
0	-0.125	0.81	0.64		
0.25	0.125	1.06	0.84		
0.5	0.375	2.59	4.44		
0.75	0.625	5.67	6.49		
1	0.875	7.06	10.98		
1.25	1.125	28.98	16.57		
1.5	1.375	25.20	22.95		
1.75	1.625	36.45	59.47		
2	1.875	11.30	88.34		
2.25	2.125	2.80	97.28		
2.5	2.375	0.39	99.50		
2.75	2.625	0.09	99.81		
3	2.875	0.06	99.88		
3.25	3.125	0.03	99.93		
3.5	3.375	0.02	99.95		
3.75	3.625	0.02	99.97		
4	3.875	0.01	99.98		
>4.0	4.25	0.01	100.00		

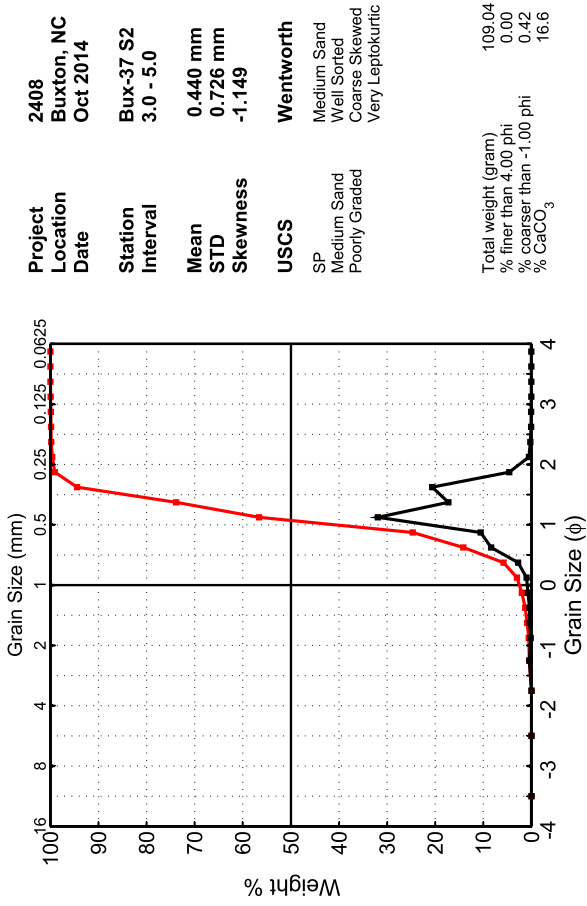
Graphic Phi Parameters			Inman 1952			Folk & Ward 1957		
Mean			1.218			1.230		
Standard Deviation			0.367			0.428		
Skewness (1)			-0.102			-0.207		
Skewness (2)			-0.687			1.214		
Kurtosis			1.197					

Grain Size Distribution



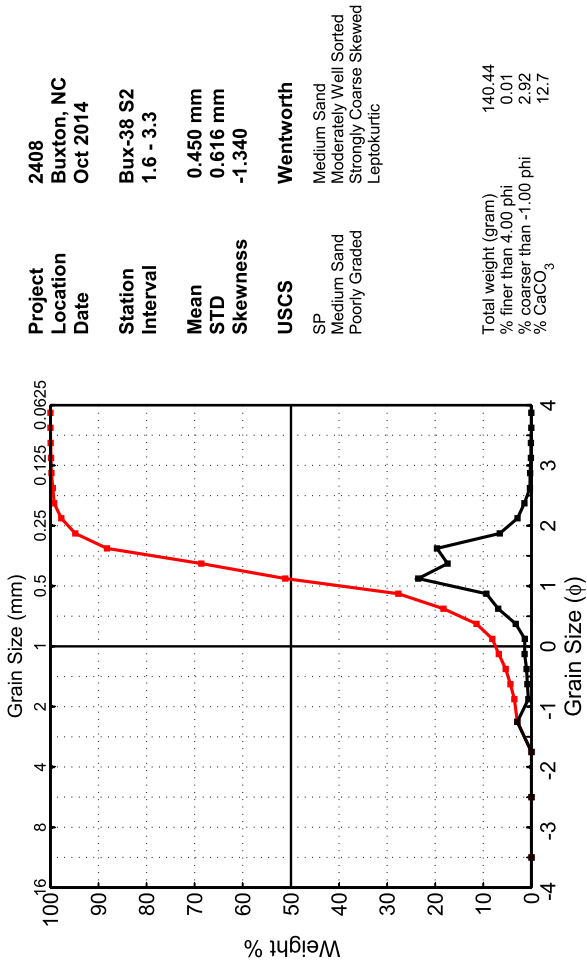
Moment Measures				Folk & Ward			
Percentiles				1952			
Mean	1.334	(phi)	0.397	1.230			
Standard Deviation	0.421		0.747	0.345			
Skewness	-0.461			-0.000			
Kurtosis	8.298			-0.068			
Dispersion							
Standard Deviation							
Deviation from Normal							
Mean	1.230			0.862			
Standard Deviation							
Skewness (1)							
Skewness (2)							
Kurtosis							

Grain Size Distribution

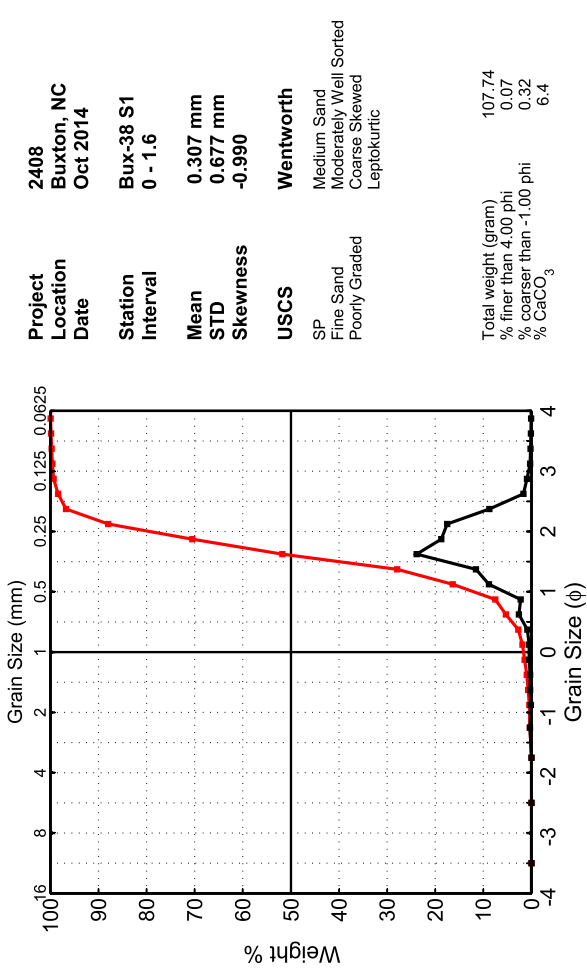


Moment Measures				Folk & Ward			
Percentiles				1952			
Mean	1.185	(phi)	0.440	1.085			
Standard Deviation	0.461		0.726	0.415			
Skewness	-1.149			0.024			
Kurtosis	7.526			-0.229			
Dispersion				0.627			
Standard Deviation							
Deviation from Normal							
Mean	1.085			1.082			
Standard Deviation				0.412			
Skewness (1)				-0.058			
Skewness (2)							
Kurtosis							

Grain Size Distribution



Grain Size Distribution



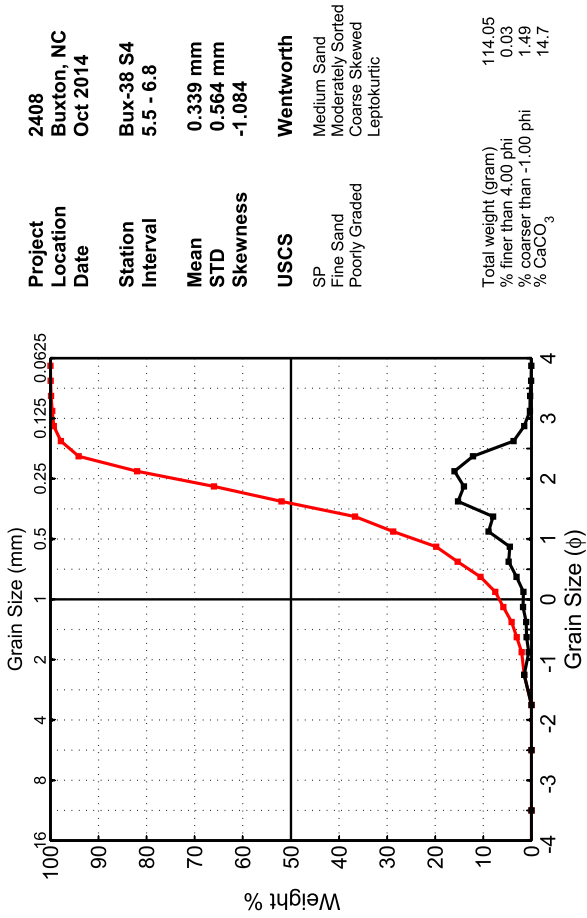
Percentiles			Moment Measures		
Limits (phi)	Mid Point (phi)	Weight (gram)	Weight % Cumm. Wt %	Mean	(phi)
-4	-4.5	0.00	0.00	Standard Deviation	(mm)
-3	-3.5	0.00	0.00	Skewness	1.153 0.450
-2	-2.5	0.00	0.00	Kurtosis	0.700 0.616
-1.5	-1.75	0.00	0.00	Dispersion	-1.340
-0.75	-0.875	0.34	0.32	Standard Deviation	6.162
-0.5	-0.625	0.12	0.11	Deviation from Normal	
-0.25	-0.375	0.27	0.25		
0	-0.125	0.30	0.28		
0.25	0.125	0.49	0.45		
0.5	0.375	0.91	0.84		
0.75	0.625	2.79	2.59		
1	0.875	2.39	2.22		
1.25	1.125	9.52	8.84		
1.5	1.375	12.42	11.53		
1.75	1.625	25.72	23.87		
2	1.875	20.17	18.72		
2.25	2.125	18.86	17.51		
2.5	2.375	9.43	96.74		
2.75	2.625	1.77	1.64		
3	2.875	0.99	0.92		
3.25	3.125	0.28	0.26		
3.5	3.375	0.20	0.19		
3.75	3.625	0.11	0.10		
4	3.875	0.08	0.07		
>4.0	4.25	0.08	0.07		

Graphic Phi Parameters			Folk & Ward 1957		
Mean	Standard Deviation	Skewness (1)	Skewness (2)	Kurtosis	
1.055	0.515	-0.117	-0.782	1.286	
1.075	0.614	-0.229			

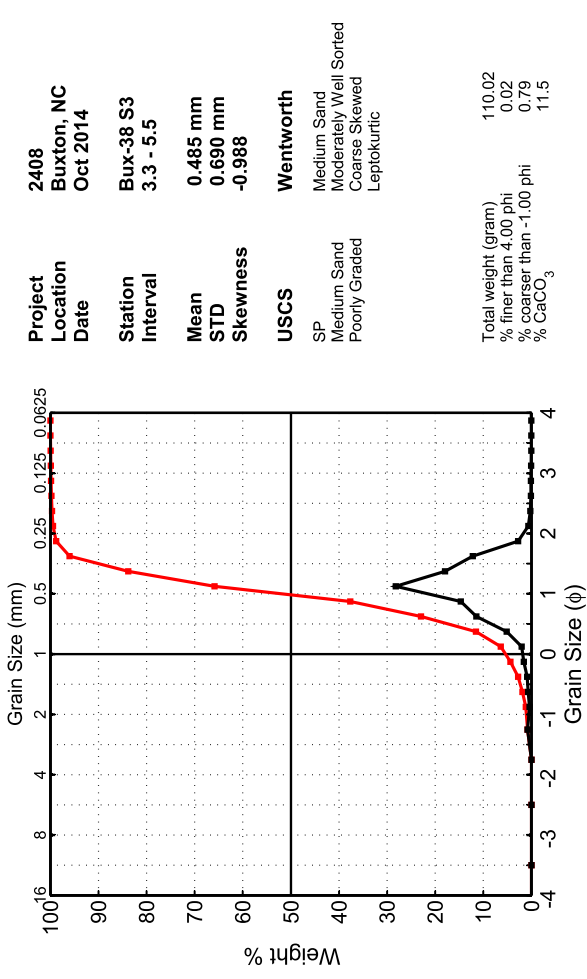
Percentiles			Moment Measures		
Limits (phi)	Mid Point (phi)	Weight (gram)	Weight % Cumm. Wt %	Mean	(phi)
-4	-4.5	0.00	0.00	Standard Deviation	(mm)
-3	-3.5	0.00	0.00	Skewness	1.702 0.307
-2	-2.5	0.00	0.00	Kurtosis	0.562 0.677
-1.5	-1.75	0.00	0.00	Dispersion	-0.990
-0.75	-0.875	0.34	0.32	Standard Deviation	7.158
-0.5	-0.625	0.12	0.11	Deviation from Normal	
-0.25	-0.375	0.27	0.25		
0	-0.125	0.30	0.28		
0.25	0.125	0.49	0.45		
0.5	0.375	0.91	0.84		
0.75	0.625	2.79	2.59		
1	0.875	2.39	2.22		
1.25	1.125	9.52	8.84		
1.5	1.375	12.42	11.53		
1.75	1.625	25.72	23.87		
2	1.875	20.17	18.72		
2.25	2.125	18.86	17.51		
2.5	2.375	9.43	96.74		
2.75	2.625	1.77	1.64		
3	2.875	0.99	0.92		
3.25	3.125	0.28	0.26		
3.5	3.375	0.20	0.19		
3.75	3.625	0.11	0.10		
4	3.875	0.08	0.07		
>4.0	4.25	0.08	0.07		

Graphic Phi Parameters			Folk & Ward 1957		
Mean	Standard Deviation	Skewness (1)	Skewness (2)	Kurtosis	
1.593	0.478	-0.026	-0.304	0.812	
1.597	0.501	-0.097			

Grain Size Distribution



Grain Size Distribution



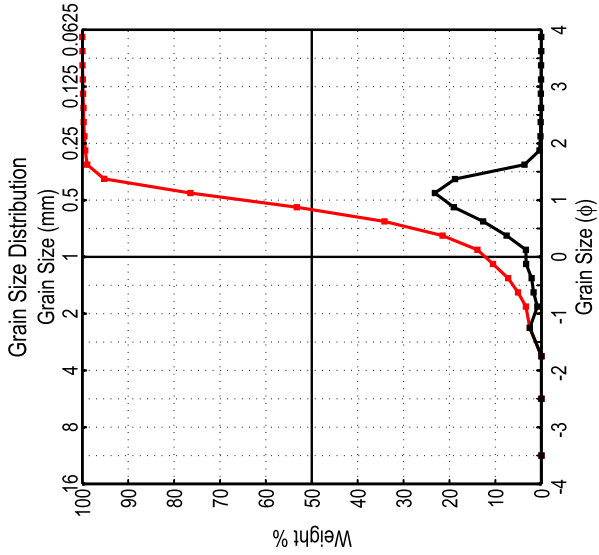
Limits			Weight % Cum. Wt %			Percentiles			Moment Measures			Graphic Phi Parameters			Folk & Ward		
(phi)			Weight (gram)			Mid Point (phi)			1	-1.415	Mean	(phi)	(mm)	1952		1957	
-4	-4.5	0.00	0.00	0.00	0.00	-4.5	0.00	0.00	5	-0.250	Standard Deviation	1.559	0.339				
-3	-3.5	0.00	0.00	0.00	0.00	-3.5	0.00	0.00	16	0.665	Skewness	0.827	0.564				
-2	-2.5	0.00	0.00	0.00	0.00	-2.5	0.00	0.00	25	1.020	Kurtosis	-1.084					
-1.5	-1.75	0.00	0.00	0.00	0.00	-1.75	0.00	0.00	50	1.595	Dispersion	4.416					
-1	-1.25	0.00	0.00	0.00	0.00	-1.25	0.00	0.00	75	2.015	Standard Deviation						
-0.75	-0.875	0.61	0.53	2.03	3.04	-0.875	0.61	0.53	84	2.165	Deviation from Normal						
-0.5	-0.625	1.16	1.02	3.04	4.12	-0.625	1.16	1.02	95	2.435							
-0.25	-0.375	1.23	1.08	4.12		-0.375	1.23	1.08	99	2.825							
0	-0.125	1.97	1.73	5.85		0	-0.125	1.97									
0.25	0.125	1.91	1.67	7.52		0.25	0.125	1.91									
0.5	0.375	3.51	3.08	10.60		0.5	0.375	3.51									
0.75	0.625	5.38	4.72	15.32		0.75	0.625	5.38									
1	0.875	5.10	4.47	19.79		1	0.875	5.10									
1.25	1.125	10.18	8.93	28.72		1.25	1.125	10.18									
1.5	1.375	9.09	7.97	36.69		1.5	1.375	9.09									
1.75	1.625	17.41	15.27	51.95		1.75	1.625	17.41									
2	1.875	15.99	14.02	65.97		2	1.875	15.99									
2.25	2.125	18.25	16.00	81.97		2.25	2.125	18.25									
2.5	2.375	13.84	12.14	94.11		2.5	2.375	13.84									
2.75	2.625	4.21	3.69	97.80		2.75	2.625	4.21									
3	2.875	1.70	1.49	99.29		3	2.875	1.70									
3.25	3.125	0.36	0.32	99.61		3.25	3.125	0.36									
3.5	3.375	0.29	0.25	99.86		3.5	3.375	0.29									
3.75	3.625	0.09	0.08	99.94		3.75	3.625	0.09									
4	3.875	0.04	0.04	99.97		4	3.875	0.04									
>4.0	4.25	0.03	0.03	100.00		>4.0	4.25	0.03									

ATTACHMENT 3B

SAMPLE GRAIN SIZE DISTRIBUTIONS (GSDs)

Composite Core Samples

Upper 4 ft of Section by Core



Project 2403
Location Hatteras NC
Date July 2013

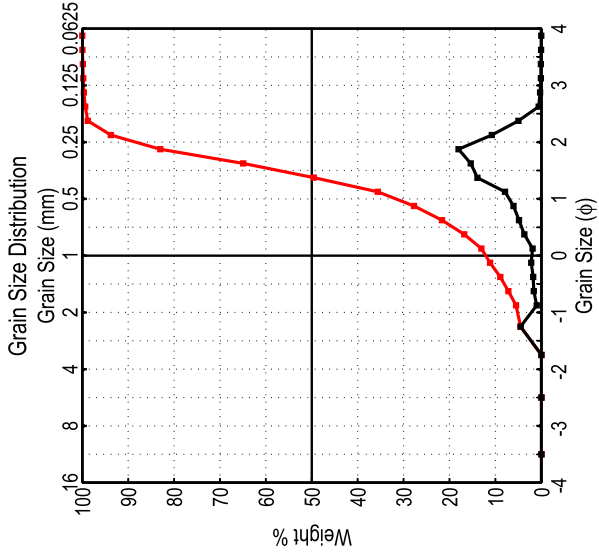
Station Bux-02
Interval Comp 4

Mean 0.566 mm
STD 0.645 mm
Skewness -1.106

USCS Wentworth
SP Coarse Sand
Medium Sand Moderately Well Sorted
Poorly Graded Coarse Skewed
Leptokurtic

Total weight (gram) 119.82
% finer than 4.00 phi 0.02
% coarser than -1.00 phi 2.50
% CaCO₃ 24.4

Percentiles			Moment Measures		
1	-1.550	0.00	Mean	0.822	(mm) 0.566
5	-0.640	0.00	Standard Deviation	0.632	(mm) 0.645
16	0.195	0.00	Skewness	-1.106	
25	0.445	0.00	Kurtosis	5.504	
50	0.830	0.00	Dispersion		
75	1.110	0.00	Standard Deviation		
84	1.225	0.00	Deviation from Normal		
95	1.370	0.00			
99	1.685	0.00			
Graphic Phi Parameters			Folk & Ward 1957		
Mean		0.710	Mean		0.750
Standard Deviation		0.515	Standard Deviation		0.562
Skewness (1)		-0.233	Skewness (1)		-0.348
Skewness (2)		-0.903	Skewness (2)		1.239
Kurtosis		0.951	Kurtosis		



Project 2403
Location Hatteras NC
Date July 2013

Station Bux-01
Interval Comp 4

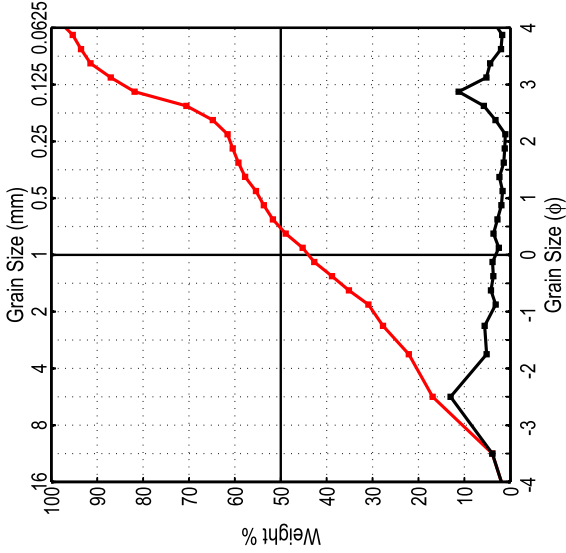
Mean 0.415 mm
STD 0.531 mm
Skewness -1.171

USCS Wentworth
SP Medium Sand
Fine Sand Moderately Sorted
Poorly Graded Coarse Skewed
Leptokurtic

Total weight (gram) 120.13
% finer than 4.00 phi 0.03
% coarser than -1.00 phi 4.51
% CaCO₃ 20.3

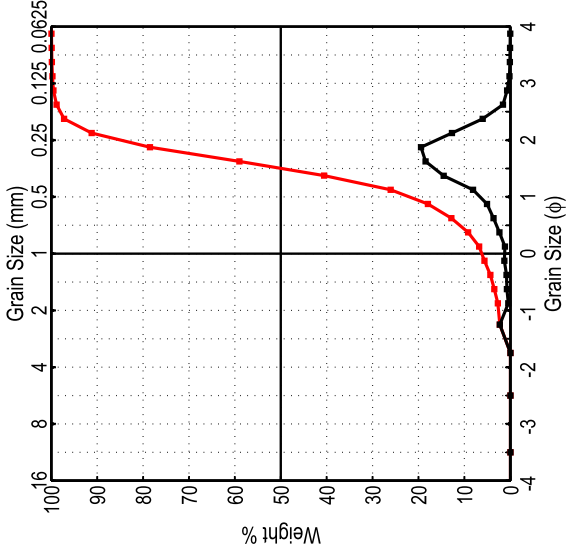
Percentiles			Moment Measures		
1	-1.640	0.00	Mean	1.268	(mm) 0.415
5	-1.065	0.00	Standard Deviation	0.913	(mm) 0.531
16	0.320	0.00	Skewness	-1.171	
25	0.765	0.00	Kurtosis	4.059	
50	1.380	0.00	Dispersion		
75	1.765	0.00	Standard Deviation		
84	1.900	0.00	Deviation from Normal		
95	2.185	0.00			
99	2.475	0.00			
Graphic Phi Parameters			Folk & Ward 1957		
Mean		1.110	Mean		1.200
Standard Deviation		0.790	Standard Deviation		0.887
Skewness (1)		-0.342	Skewness (1)		-0.423
Skewness (2)		-1.038	Skewness (2)		1.332
Kurtosis		1.057	Kurtosis		

Grain Size Distribution



Project 2403
Location Hatteras NC
Date July 2013
Station Bux-06
Interval Comp 4
Mean 0.622 mm
STD 0.204 mm
Skewness -0.152
USCS Wentworth
SP Coarse Sand
Medium Sand
Very Poorly Sorted
Poorly Graded
Symmetrical
Platykurtic
Total weight (gram) 119.76
% finer than 4.00 phi 4.71
% coarser than -1.00 phi 27.71
% CaCO₃ 39.9

Grain Size Distribution

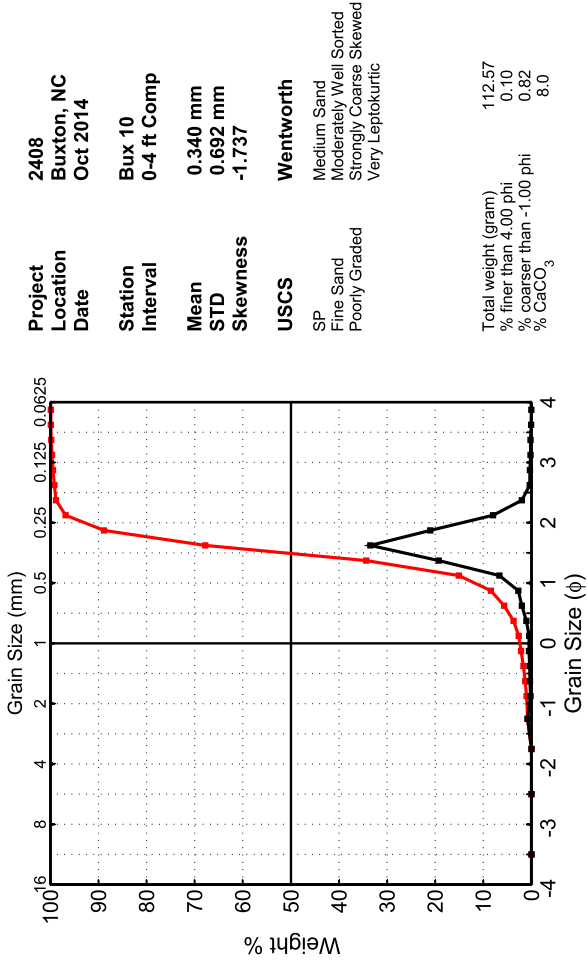


Project 2403
Location Hatteras NC
Date July 2013
Station Bux-05
Interval Comp 4
Mean 0.358 mm
STD 0.587 mm
Skewness -1.406
USCS Wentworth
SP Medium Sand
Fine Sand
Moderately Sorted
Poorly Graded
Strongly Coarse Skewed
Leptokurtic
Total weight (gram) 119.78
% finer than 4.00 phi 0.05
% coarser than -1.00 phi 2.30
% CaCO₃ 9.6

Percentiles				Moment Measures		Graphic Phi Parameters	
Class Limits	Mid Point (phi)	Weight (gram)	Weight %	Mean	Standard Deviation	Inman 1952	Folk & Ward 1957
-4	-4.5	0.00	0.00	0.685	0.622	0.205	0.293
-3	-3.5	3.93	3.93	2.293	0.204	2.775	2.487
-2	-2.5	15.57	13.01	-0.152		-0.095	-0.084
-1.5	-1.75	6.21	5.19	1.712		-0.095	0.705
-1	-1.25	6.69	5.59			0.307	
-0.75	-0.875	3.84	3.20				
-0.5	-0.625	5.06	4.23				
-0.25	-0.375	4.44	3.71				
0	-0.125	4.64	3.87				
0.25	0.125	2.99	2.50				
0.5	0.375	4.42	3.69				
0.75	0.625	3.37	2.81				
1	0.875	2.35	1.96				
1.25	1.125	2.04	1.70				
1.5	1.375	2.85	2.38				
1.75	1.625	1.75	1.46				
2	1.875	1.47	1.23				
2.25	2.125	1.33	1.11				
2.5	2.375	3.88	3.24				
2.75	2.625	6.90	5.76				
3	2.875	13.50	11.27				
3.25	3.125	6.23	5.20				
3.5	3.375	5.28	4.41				
3.75	3.625	2.46	2.05				
4	3.875	2.14	1.79				
>4.0	4.25	5.64	4.71				

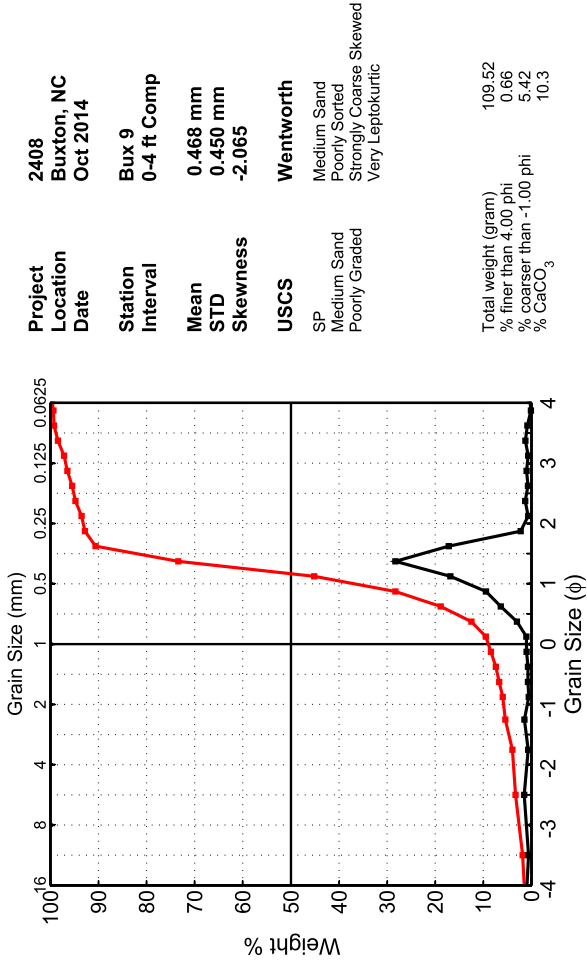
Percentiles				Moment Measures		Graphic Phi Parameters	
Class Limits	Mid Point (phi)	Weight (gram)	Weight %	Mean	Standard Deviation	Inman 1952	Folk & Ward 1957
-4	-4.5	0.00	0.00	1.483	0.358	1.382	1.423
-3	-3.5	0.00	0.00	0.768	0.587	0.603	0.685
-2	-2.5	0.00	0.00	-1.406		-0.203	-0.294
-1.5	-1.75	0.00	0.00	5.955		-0.809	1.414
-1	-1.25	0.00	0.00			1.104	
-0.75	-0.875	0.53	0.44				
-0.5	-0.625	0.92	0.77				
-0.25	-0.375	1.02	0.85				
0	-0.125	1.54	1.29				
0.25	0.125	1.40	1.17				
0.5	0.375	2.84	2.37				
0.75	0.625	4.39	3.67				
1	0.875	6.09	5.08				
1.25	1.125	9.72	8.12				
1.5	1.375	17.37	14.50				
1.75	1.625	22.10	18.45				
2	1.875	23.32	19.47				
2.25	2.125	15.23	12.72				
2.5	2.375	7.21	6.02				
2.75	2.625	1.91	1.59				
3	2.875	0.85	0.71				
3.25	3.125	0.25	0.21				
3.5	3.375	0.15	0.13				
3.75	3.625	0.08	0.07				
4	3.875	0.04	0.04				
>4.0	4.25	0.06	0.05				

Grain Size Distribution



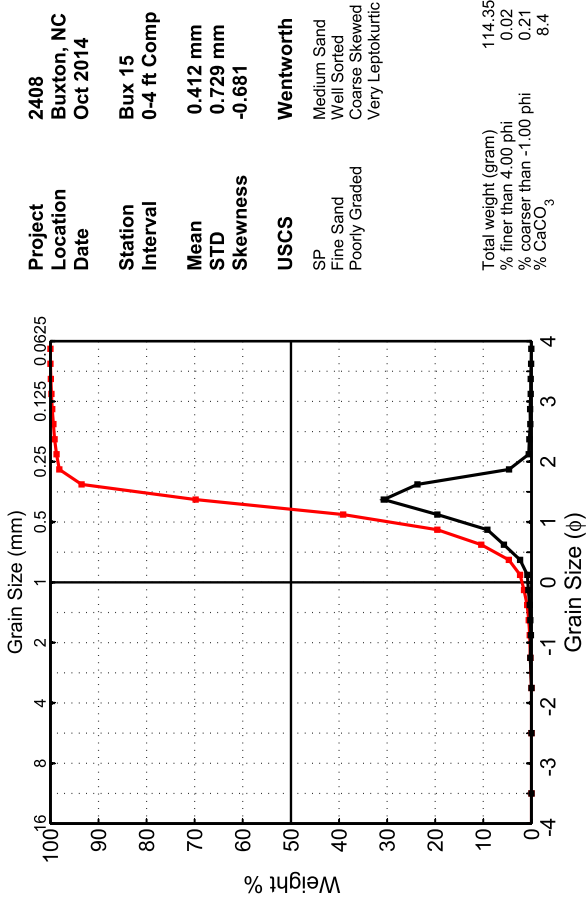
Limits (phi)		Mid Point (phi)		Weight (gram)		Weight % Cummm. Wt %		Percentiles		Moment Measures		Graphic Phi Parameters		Folk & Ward 1957									
-4	-3	-2	-1	-0.75	-0.5	-0.25	0	0.25	1	5	16	25	50	75	84	95	99	Mean	Standard Deviation	Skewness	Kurtosis	Standard Deviation	Deviation from Normal
-4	-3	-2	-1	-0.75	-0.5	-0.25	0	0.25	1	5	16	25	50	75	84	95	99	Mean	Standard Deviation	Skewness	Kurtosis	Standard Deviation	Deviation from Normal
-4	-3	-2	-1	-0.75	-0.5	-0.25	0	0.25	1	5	16	25	50	75	84	95	99	Mean	Standard Deviation	Skewness	Kurtosis	Standard Deviation	Deviation from Normal
-4	-3	-2	-1	-0.75	-0.5	-0.25	0	0.25	1	5	16	25	50	75	84	95	99	Mean	Standard Deviation	Skewness	Kurtosis	Standard Deviation	Deviation from Normal
-4	-3	-2	-1	-0.75	-0.5	-0.25	0	0.25	1	5	16	25	50	75	84	95	99	Mean	Standard Deviation	Skewness	Kurtosis	Standard Deviation	Deviation from Normal
-4	-3	-2	-1	-0.75	-0.5	-0.25	0	0.25	1	5	16	25	50	75	84	95	99	Mean	Standard Deviation	Skewness	Kurtosis	Standard Deviation	Deviation from Normal
-4	-3	-2	-1	-0.75	-0.5	-0.25	0	0.25	1	5	16	25	50	75	84	95	99	Mean	Standard Deviation	Skewness	Kurtosis	Standard Deviation	Deviation from Normal
-4	-3	-2	-1	-0.75	-0.5	-0.25	0	0.25	1	5	16	25	50	75	84	95	99	Mean	Standard Deviation	Skewness	Kurtosis	Standard Deviation	Deviation from Normal
-4	-3	-2	-1	-0.75	-0.5	-0.25	0	0.25	1	5	16	25	50	75	84	95	99	Mean	Standard Deviation	Skewness	Kurtosis	Standard Deviation	Deviation from Normal
-4	-3	-2	-1	-0.75	-0.5	-0.25	0	0.25	1	5	16	25	50	75	84	95	99	Mean	Standard Deviation	Skewness	Kurtosis	Standard Deviation	Deviation from Normal
-4	-3	-2	-1	-0.75	-0.5	-0.25	0	0.25	1	5	16	25	50	75	84	95	99	Mean	Standard Deviation	Skewness	Kurtosis	Standard Deviation	Deviation from Normal
-4	-3	-2	-1	-0.75	-0.5	-0.25	0	0.25	1	5	16	25	50	75	84	95	99	Mean	Standard Deviation	Skewness	Kurtosis	Standard Deviation	Deviation from Normal
-4	-3	-2	-1	-0.75	-0.5	-0.25	0	0.25	1	5	16	25	50	75	84	95	99	Mean	Standard Deviation	Skewness	Kurtosis	Standard Deviation	Deviation from Normal
-4	-3	-2	-1	-0.75	-0.5	-0.25	0	0.25	1	5	16	25	50	75	84	95	99	Mean	Standard Deviation	Skewness	Kurtosis	Standard Deviation	Deviation from Normal
-4	-3	-2	-1	-0.75	-0.5	-0.25	0	0.25	1	5	16	25	50	75	84	95	99	Mean	Standard Deviation	Skewness	Kurtosis	Standard Deviation	Deviation from Normal
-4	-3	-2	-1	-0.75	-0.5	-0.25	0	0.25	1	5	16	25	50	75	84	95	99	Mean	Standard Deviation	Skewness	Kurtosis	Standard Deviation	Deviation from Normal
-4	-3	-2	-1	-0.75	-0.5	-0.25	0	0.25	1	5	16	25	50	75	84	95	99	Mean	Standard Deviation	Skewness	Kurtosis	Standard Deviation	Deviation from Normal
-4	-3	-2	-1	-0.75	-0.5	-0.25	0	0.25	1	5	16	25	50	75	84	95	99	Mean	Standard Deviation	Skewness	Kurtosis	Standard Deviation	Deviation from Normal
-4	-3	-2	-1	-0.75	-0.5	-0.25	0	0.25	1	5	16	25	50	75	84	95	99	Mean	Standard Deviation	Skewness	Kurtosis	Standard Deviation	Deviation from Normal
-4	-3	-2	-1	-0.75	-0.5	-0.25	0	0.25	1	5	16	25	50	75	84	95	99	Mean	Standard Deviation	Skewness	Kurtosis	Standard Deviation	Deviation from Normal
-4	-3	-2	-1	-0.75	-0.5	-0.25	0	0.25	1	5	16	25	50	75	84	95	99	Mean	Standard Deviation	Skewness	Kurtosis	Standard Deviation	Deviation from Normal
-4	-3	-2	-1	-0.75	-0.5	-0.25	0	0.25	1	5	16	25	50	75	84	95	99	Mean	Standard Deviation	Skewness	Kurtosis	Standard Deviation	Deviation from Normal
-4	-3	-2	-1	-0.75	-0.5	-0.25	0	0.25	1	5	16	25	50	75	84	95	99	Mean	Standard Deviation	Skewness	Kurtosis	Standard Deviation	Deviation from Normal
-4	-3	-2	-1	-0.75	-0.5	-0.25	0	0.25	1	5	16	25	50	75	84	95	99	Mean	Standard Deviation	Skewness	Kurtosis	Standard Deviation	Deviation from Normal
-4	-3	-2	-1	-0.75	-0.5	-0.25	0	0.25	1	5	16	25	50	75	84	95	99	Mean	Standard Deviation	Skewness	Kurtosis	Standard Deviation	Deviation from Normal
-4	-3	-2	-1	-0.75	-0.5	-0.25	0	0.25	1	5	16	25	50	75	84	95	99	Mean	Standard Deviation	Skewness	Kurtosis	Standard Deviation	Deviation from Normal
-4	-3	-2	-1	-0.75	-0.5	-0.25	0	0.25	1	5	16	25	50	75	84	95	99	Mean	Standard Deviation	Skewness	Kurtosis	Standard Deviation	Deviation from Normal
-4	-3	-2	-1	-0.75	-0.5	-0.25	0	0.25	1	5	16	25	50	75	84	95	99	Mean	Standard Deviation	Skewness	Kurtosis	Standard Deviation	Deviation from Normal
-4	-3	-2	-1	-0.75	-0.5	-0.25	0	0.25	1	5	16	25	50	75	84	95	99	Mean	Standard Deviation	Skewness	Kurtosis	Standard Deviation	Deviation from Normal
-4	-3	-2	-1	-0.75	-0.5	-0.25	0	0.25	1	5	16	25	50	75	84	95	99	Mean	Standard Deviation	Skewness	Kurtosis	Standard Deviation	Deviation from Normal
-4	-3	-2	-1	-0.75	-0.5	-0.25	0	0.25	1	5	16	25	50	75	84	95	99	Mean	Standard Deviation	Skewness	Kurtosis	Standard Deviation	Deviation from Normal
-4	-3	-2	-1	-0.75	-0.5	-0.25	0	0.25	1	5	16	25	50	75	84	95	99	Mean	Standard Deviation	Skewness	Kurtosis	Standard Deviation	Deviation from Normal
-4	-3	-2	-1	-0.75	-0.5	-0.25	0	0.25	1	5	16	25	50	75	84	95	99	Mean	Standard Deviation	Skewness	Kurtosis	Standard Deviation	Deviation from Normal
-4	-3	-2	-1	-0.75	-0.5	-0.25	0	0.25	1	5	16	25	50	75	84	95	99	Mean	Standard Deviation	Skewness	Kurtosis	Standard Deviation	Deviation from Normal
-4	-3	-2	-1	-0.75	-0.5	-0.25	0	0.25	1	5	16	25	50	75	84	95	99	Mean	Standard Deviation	Skewness	Kurtosis	Standard Deviation	Deviation from Normal
-4	-3	-2	-1	-0.75	-0.5	-0.25	0	0.25	1	5	16	25	50	75	84	95	99	Mean	Standard Deviation	Skewness	Kurtosis	Standard Deviation	Deviation from Normal
-4	-3	-2	-1	-0.75	-0.5	-0.25	0	0.25	1	5	16	25	50	75	84	95	99	Mean	Standard Deviation	Skewness	Kurtosis	Standard Deviation	Deviation from Normal
-4	-3	-2	-1	-0.75	-0.5	-0.25	0	0.25	1	5	16	25	50	75	84	95	99	Mean	Standard Deviation	Skewness	Kurtosis	Standard Deviation	Deviation from Normal
-4	-3	-2	-1	-0.75	-0.5	-0.25	0	0.25	1	5	16	25	50	75	84	95	99	Mean	Standard Deviation	Skewness	Kurtosis	Standard Deviation	Deviation from Normal
-4	-3	-2	-1	-0.75	-0.5	-0.25	0	0.25	1	5	16	25	50	75	84	95	99	Mean	Standard Deviation	Skewness	Kurtosis	Standard Deviation	Deviation from Normal
-4	-3	-2	-1	-0.75	-0.5	-0.25	0	0.25	1	5	16	25	50	75	84	95	99	Mean	Standard Deviation	Skewness	Kurtosis	Standard Deviation	Deviation from Normal
-4	-3	-2	-1	-0.75	-0.5	-0.25	0	0.25	1	5	16	25	50	75	84	95	99	Mean	Standard Deviation	Skewness	Kurtosis	Standard Deviation	Deviation from Normal
-4	-3	-2	-1	-0.75	-0.5	-0.25	0	0.25	1	5	16	25	50	75	84	95	99	Mean	Standard Deviation	Skewness	Kurtosis	Standard Deviation	Deviation from Normal
-4	-3	-2	-1	-0.75	-0.5	-0.25	0	0.25	1	5	16	25	50	75	84	95	99	Mean	Standard Deviation	Skewness	Kurtosis	Standard Deviation	Deviation from Normal
-4	-3	-2	-1	-0.75	-0.5	-0.25	0	0.25	1	5	16	25	50	75	84	95	99	Mean	Standard Deviation	Skewness	Kurtosis	Standard Deviation	Deviation from Normal
-4	-3	-2	-1	-0.75	-0.5	-0.25	0	0.25	1	5	16	25	50	75	84	95	99	Mean	Standard Deviation	Skewness	Kurtosis	Standard Deviation	Deviation from Normal
-4	-3	-2	-1	-0.75	-0.5	-0.25	0	0.25	1	5	16	25	50	75	84	95	99	Mean	Standard Deviation	Skewness	Kurtosis	Standard Deviation	Deviation from Normal
-4	-3	-2	-1	-0.75	-0.5	-0.25	0	0.25	1	5	16	25	50	75	84	95	99	Mean	Standard Deviation	Skewness	Kurtosis	Standard Deviation	Deviation from Normal
-4	-3	-2	-1	-0.75	-0.5	-0.25	0	0.25	1	5	16	25	50	75	84	95	99	Mean	Standard Deviation	Skewness	Kurtosis	Standard Deviation	Deviation from Normal
-4	-3	-2	-1	-0.75	-0.5	-0.25	0	0.25	1	5	16	25	50	75	84	95	99	Mean	Standard Deviation	Skewness	Kurtosis	Standard Deviation	Deviation from Normal
-4	-3	-2	-1	-0.75	-0.5	-0.25	0	0.25	1	5	16	25	50	75	84	95	99	Mean	Standard Deviation	Skewness	Kurtosis	Standard Deviation	Deviation from Normal
-4	-3	-2	-1	-0.75	-0.5	-0.25	0	0.25	1	5	16	25	50	75	84	95	99	Mean	Standard Deviation	Skewness	Kurtosis	Standard Deviation	Deviation from Normal
-4	-3	-2	-1	-0.75	-0.5	-0.25	0	0.25	1	5	16	25	50	75	84	95	99	Mean	Standard Deviation	Skewness	Kurtosis	Standard Deviation	Deviation from Normal
-4	-3	-2	-1	-0.75	-0.5	-0.25	0	0.25	1	5	16	25	50	75	84	95	99	Mean	Standard Deviation	Skewness	Kurtosis	Standard Deviation	Deviation from Normal
-4	-3	-2	-1	-0.75	-0.5	-0.25	0	0.25	1	5	16	25	50	75	84	95	99	Mean	Standard Deviation	Skewness	Kurtosis	Standard Deviation	Deviation from Normal
-4	-3	-2	-1	-0.75	-0.5	-0.25	0	0.25	1	5	16	25	50	75	84	95	99	Mean	Standard Deviation	Skewness	Kurtosis	Standard Deviation	Deviation from Normal
-4	-3	-2	-1	-0.75	-0.5	-0.25	0	0.25	1	5	16	25	50	75	84	95	99	Mean	Standard Deviation	Skewness	Kurtosis	Standard Deviation	Deviation from Normal
-4	-3	-2	-1	-0.75	-0.5	-0.25	0	0.25	1	5	16	25	50	75	84	95	99	Mean	Standard Deviation	Skewness	Kurtosis	Standard Deviation	Deviation from Normal
-4	-3	-2	-1	-0.75	-0.5	-0.25	0	0.25	1	5	16	25	50	75	84	95	99	Mean	Standard Deviation	Skewness	Kurtosis	Standard Deviation	Deviation from Normal
-4	-3	-2	-1	-0.75	-0.5	-0.25	0	0.25	1	5	16	25	50	75	84	95	99	Mean	Standard Deviation	Skewness	Kurtosis	Standard Deviation	Deviation from Normal
-4	-3	-2	-1	-0.75	-0.5	-0.25	0	0.25	1	5	16	25	50	75	84	95	99	Mean	Standard Deviation	Skewness	Kurtosis	Standard Deviation	Deviation from Normal
-4	-3	-2	-1	-0.75	-0.5	-0.25	0	0.25	1	5	16	25	50	75	84	95	99	Mean	Standard Deviation	Skewness	Kurtosis	Standard Deviation	Deviation from Normal
-4	-3	-2	-1	-0.75	-0.5	-0.25	0	0.25	1	5	16	25	50	75	84	95	99	Mean	Standard Deviation	Skewness	Kurtosis	Standard Deviation	Deviation from Normal
-4	-3	-2	-1	-0.75	-0.5	-0.25	0	0.25	1	5	16	25	50	75	84	95	99	Mean	Standard Deviation	Skewness	Kurtosis	Standard Deviation	Deviation from Normal
-4	-3	-2	-1	-0.75	-0.5	-0.25	0	0.25	1	5	16	25	50	75	84	95	99	Mean	Standard Deviation	Skewness	Kurtosis	Standard Deviation	Deviation from Normal
-4	-3	-2	-1	-0.75	-0.5	-0.25	0	0.25	1	5	16	25	50	75	84	95	99	Mean	Standard Deviation	Skewness	Kurtosis	Standard Deviation	Deviation from Normal
-4	-3	-2	-1	-0.75	-0.5	-0.25	0	0.25	1	5	16	25	50	75	84	95	99	Mean	Standard Deviation	Skewness	Kurtosis	Standard Deviation	Deviation from Normal
-4	-3	-2	-1	-0.75	-0.5	-0.25	0	0.25	1	5	16	25	50	75	84	95	99	Mean	Standard Deviation	Skewness	Kurtosis	Standard Deviation	Deviation from Normal
-4	-3	-2	-1	-0.75	-0.5	-0.25	0	0.25	1	5	16	25	50	75	84	95	99	Mean	Standard Deviation	Skewness	Kurtosis	Standard Deviation	Deviation from Normal
-4	-3	-2	-1	-0.75	-0.5	-0.25	0	0.25	1	5	16	25	50	75	84	95	99						

Grain Size Distribution

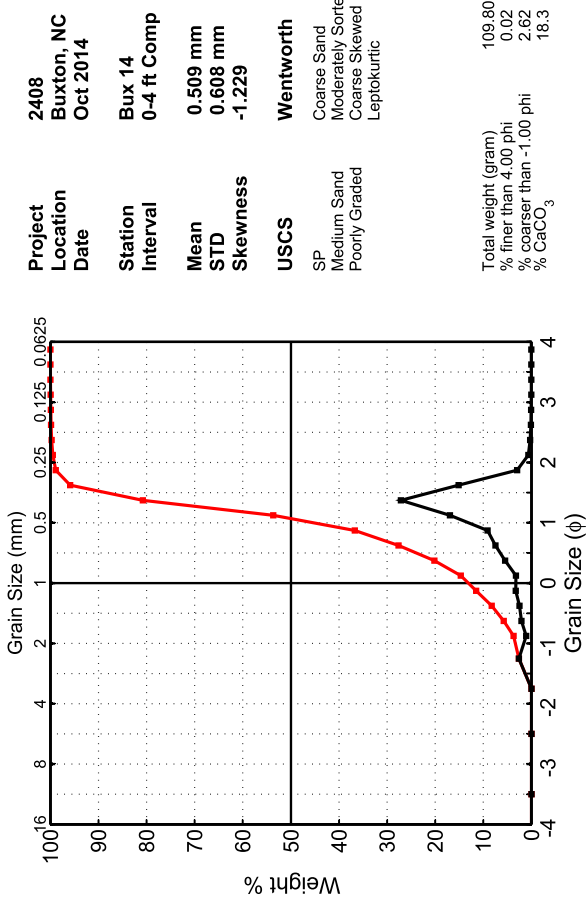


Limits (phi)		Mid Point (phi)		Weight (gram)		Weight % Cummm. Wt %		Percentiles		Moment Measures		Graphic Phi Parameters		Folk & Ward 1957	
-4	-4.5	1.33	1.21	1.21	1.21	1.21	1.21	1	-4.125	Mean	1.096	1.072	Mean	1.023	1.072
-3	-3.5	0.66	0.60	0.60	0.60	0.60	0.60	5	-1.395	Standard Deviation	1.153	0.837	Standard Deviation	0.507	0.837
-2	-2.5	1.62	1.48	1.48	1.48	1.48	1.48	16	0.515	Skewness	-2.065	-0.312	Skewness (1)	-0.291	-0.312
-1.5	-1.75	0.73	0.66	0.66	0.66	0.66	0.66	25	0.790	Kurtosis	11.241	-1.261	Skewness (2)	-1.261	-1.261
-1	-1.25	1.59	1.45	1.45	1.45	1.45	1.45	50	1.170	Dispersion		2.587	Kurtosis	2.793	2.587
-0.75	-0.875	0.60	0.55	0.55	0.55	0.55	0.55	75	1.400	Standard Deviation					
-0.5	-0.625	0.79	0.72	0.72	0.72	0.72	0.72	84	1.530	Deviation from Normal					
-0.25	-0.375	0.78	0.71	0.71	0.71	0.71	0.71	95	2.455						
0	-0.125	1.11	1.02	1.02	1.02	1.02	1.02								
0.25	0.125	1.16	1.06	1.06	1.06	1.06	1.06								
0.5	0.375	3.30	3.01	3.01	3.01	3.01	3.01								
0.75	0.625	6.96	6.36	6.36	6.36	6.36	6.36								
1	0.875	10.36	9.46	9.46	9.46	9.46	9.46								
1.25	1.125	18.46	16.85	16.85	16.85	16.85	16.85								
1.5	1.375	30.97	28.28	28.28	28.28	28.28	28.28								
1.75	1.625	18.80	17.16	17.16	17.16	17.16	17.16								
2	1.875	2.45	2.23	2.23	2.23	2.23	2.23								
2.25	2.125	0.73	0.67	0.67	0.67	0.67	0.67								
2.5	2.375	1.41	1.29	1.29	1.29	1.29	1.29								
2.75	2.625	0.76	0.70	0.70	0.70	0.70	0.70								
3	2.875	1.10	1.00	1.00	1.00	1.00	1.00								
3.25	3.125	0.76	0.69	0.69	0.69	0.69	0.69								
3.5	3.375	1.36	1.25	1.25	1.25	1.25	1.25								
3.75	3.625	0.92	0.84	0.84	0.84	0.84	0.84								
4	3.875	0.10	0.09	0.09	0.09	0.09	0.09								
>4.0	4.25	0.72	0.66	0.66	0.66	0.66	0.66								

Grain Size Distribution



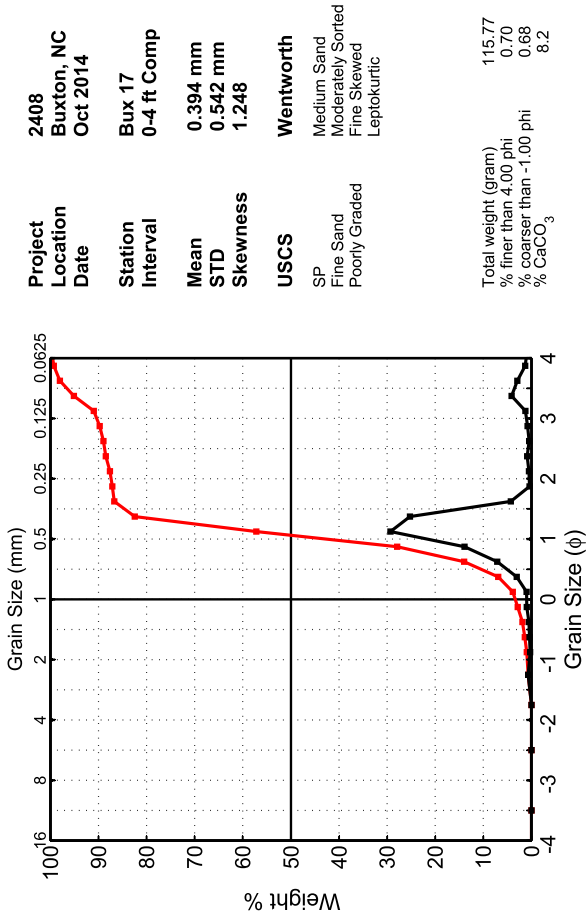
Grain Size Distribution



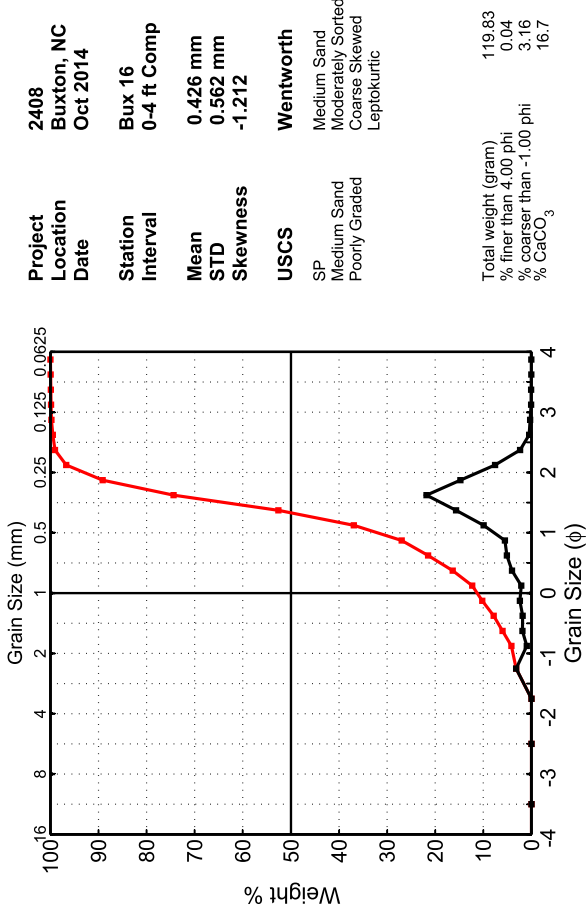
Percentiles			Moment Measures		
Limits (phi)	Mid Point (phi)	Weight (gram)	Weight % Cum. Wt %	Mean	(phi)
-4	-4.5	0.00	0.00	Standard Deviation	(mm)
-3	-3.5	0.00	0.00	Skewness	0.1281 0.412
-2	-2.5	0.00	0.00	Kurtosis	0.456 0.729
-1.5	-1.75	0.00	0.00	Dispersion	-0.681 8.381
-0.75	-1.25	0.24	0.21	Standard Deviation	
-0.5	-0.875	0.14	0.33	Deviation from Normal	
-0.25	-0.625	0.27	0.24		
0	-0.375	0.38	0.33		
0.25	-0.125	0.71	0.62		
0.5	0.125	0.97	0.85		
0.75	0.375	2.67	2.34		
1	0.625	6.54	5.72		
1.25	0.875	10.45	9.14		
1.5	1.125	22.38	19.57		
1.75	1.375	35.09	30.69		
2	1.625	27.07	23.68		
2.25	1.875	5.32	4.66		
2.5	2.125	0.62	0.54		
2.75	2.375	0.48	0.42		
3	2.625	0.27	0.23		
3.25	2.875	0.31	0.27		
3.5	3.125	0.16	0.14		
3.75	3.375	0.17	0.15		
4	3.625	0.07	0.06		
>4.0	4.25	0.03	0.02		
		0.02	0.02		
Graphic Phi Parameters			Inman 1952		
			Folk & Ward 1957		
Mean			Mean		
Standard Deviation			Standard Deviation		
Skewness (1)			Skewness (1)		
Skewness (2)			Skewness (2)		
Kurtosis			Kurtosis		

Percentiles			Moment Measures		
Limits (phi)	Mid Point (phi)	Weight (gram)	Weight % Cum. Wt %	Mean	(phi)
-4	-4.5	0.00	0.00	Standard Deviation	(mm)
-3	-3.5	0.00	0.00	Skewness	0.974 0.509
-2	-2.5	0.00	0.00	Kurtosis	0.719 0.608
-1.5	-1.75	0.00	0.00	Dispersion	-1.229 4.478
-0.75	-1.25	2.88	2.62	Standard Deviation	
-0.5	-0.875	1.20	1.09	Deviation from Normal	
-0.25	-0.625	2.26	2.06		
0	-0.375	2.71	2.47		
0.25	-0.125	3.57	3.25		
0.5	0.125	3.53	3.21		
0.75	0.375	5.98	5.45		
1	0.625	8.19	7.46		
1.25	0.875	9.99	9.10		
1.5	1.125	18.60	16.94		
1.75	1.375	29.78	27.12		
2	1.625	16.61	15.13		
2.25	1.875	3.25	2.96		
2.5	2.125	0.68	0.62		
2.75	2.375	0.29	0.26		
3	2.625	0.10	0.09		
3.25	2.875	0.08	0.07		
3.5	3.125	0.03	0.03		
3.75	3.375	0.02	0.02		
4	3.625	0.01	0.01		
>4.0	4.25	0.02	0.02		
Graphic Phi Parameters			Inman 1952		
			Folk & Ward 1957		
Mean			Mean		
Standard Deviation			Standard Deviation		
Skewness (1)			Skewness (1)		
Skewness (2)			Skewness (2)		
Kurtosis			Kurtosis		

Grain Size Distribution

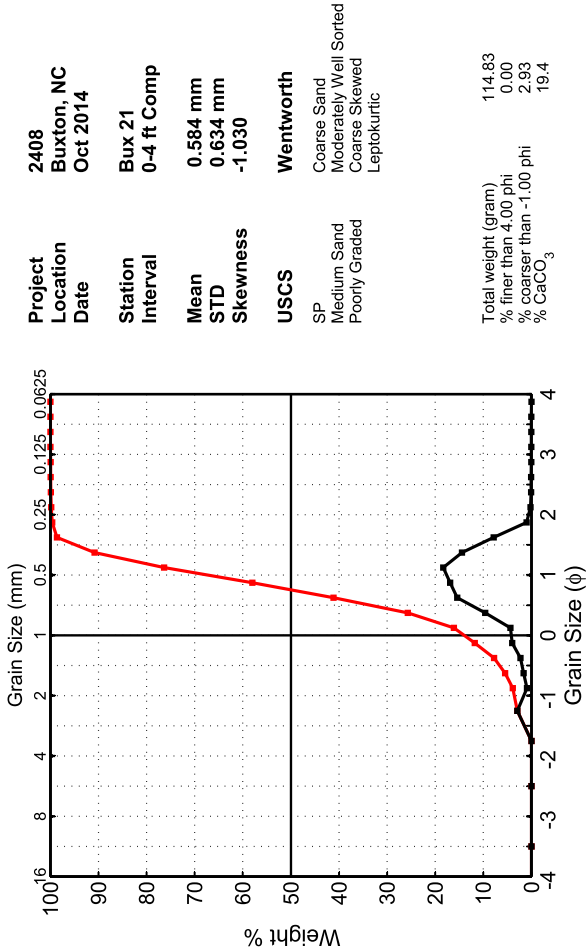


Grain Size Distribution

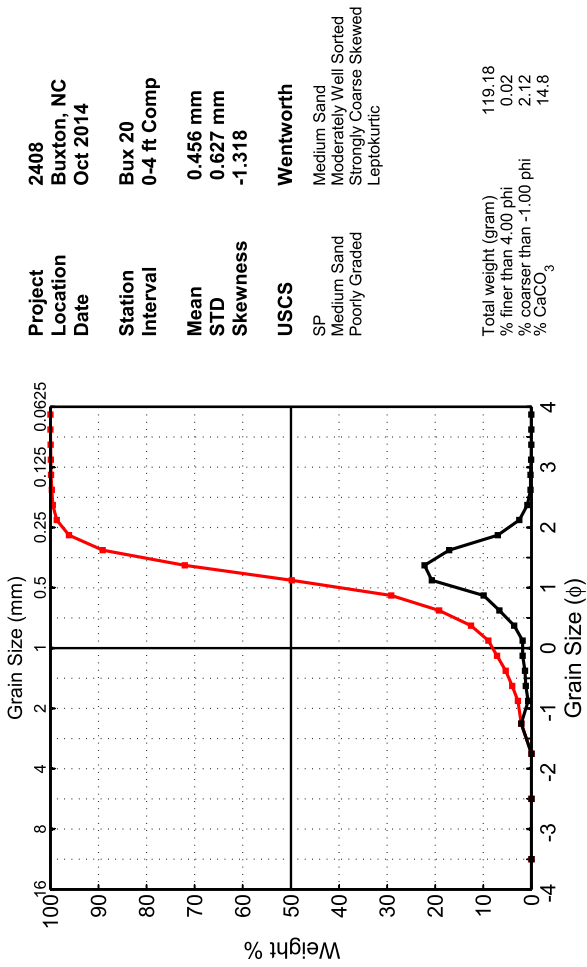


Limits (phi)			Mid Point (phi)			Weight (gram)			Weight % Cum. Wt %			Percentiles			Moment Measures			Graphic Phi Parameters			Inman 1952			Folk & Ward 1957																																
-4	-3	-2	-4.5	0.00	0.00	0.00	0.00	0.00	1	-0.855	Mean	1.345	0.394	5	0.220	Standard Deviation	0.884	0.542	16	0.660	Kurtosis	1.248	5.411	25	0.825	Dispersion	1.814	2.718	50	1.065	Standard Deviation	0.402	0.679	75	1.300	Deviation from Normal	-0.006	0.229	84	1.465	Skewness (2)	1.063	0.229	95	3.370	Kurtosis	2.913	2.718	99	3.815						
-4	-3	-2	-4.5	0.00	0.00	0.00	0.00	0.00	1	-0.855	Mean	1.345	0.394	5	0.220	Standard Deviation	0.884	0.542	16	0.660	Kurtosis	1.248	5.411	25	0.825	Dispersion	1.814	2.718	50	1.065	Standard Deviation	0.402	0.679	75	1.300	Deviation from Normal	-0.006	0.229	84	1.465	Skewness (2)	1.063	0.229	95	3.370	Kurtosis	2.913	2.718	99	3.815						
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-4	-3	-2	-4.5	0.00	0.00	0.00	0.00	0.00	1	-0.855	Mean	1.345	0.394	5	0.220	Standard Deviation	0.884	0.542	16	0.660	Kurtosis	1.248	5.411	25	0.825	Dispersion	1.814	2.718	50	1.065	Standard Deviation	0.402	0.679	75	1.300	Deviation from Normal	-0.006	0.229	84	1.465	Skewness (2)	1.063	0.229	95	3.370	Kurtosis	2.913	2.718	99	3.815						
-4	-3	-2	-4.5	0.00	0.00	0.00	0.00	0.00	1	-0.855	Mean	1.345	0.394	5	0.220	Standard Deviation	0.884	0.542	16	0.660	Kurtosis	1.248	5.411	25	0.825	Dispersion	1.814	2.718	50	1.065	Standard Deviation	0.402	0.679	75	1.300	Deviation from Normal	-0.006	0.229	84	1.465	Skewness (2)	1.063	0.229	95	3.370	Kurtosis	2.913	2.718	99	3.815						
-4	-3	-2	-4.5	0.00	0.00	0.00	0.00	0.00	1	-0.855	Mean	1.345	0.394	5	0.220	Standard Deviation	0.884	0.542	16	0.660	Kurtosis	1.248	5.411	25	0.825	Dispersion	1.814	2.718	50	1.065	Standard Deviation	0.402	0.679	75	1.300	Deviation from Normal	-0.006	0.229	84	1.465	Skewness (2)	1.063	0.229	95	3.370	Kurtosis	2.913	2.718	99	3.815						
-4	-3	-2	-4.5	0.00	0.00	0.00	0.00	0.00	1	-0.855	Mean	1.345	0.394	5	0.220	Standard Deviation	0.884	0.542	16	0.660	Kurtosis	1.248	5.411	25	0.825	Dispersion	1.814	2.718	50	1.065	Standard Deviation	0.402	0.679	75	1.300	Deviation from Normal	-0.006	0.229	84	1.465	Skewness (2)	1.063	0.229	95	3.370	Kurtosis	2.913	2.718	99	3.815						
-4	-3	-2	-4.5	0.00	0.00	0.00	0.00	0.00	1	-0.855	Mean	1.345	0.394	5	0.220	Standard Deviation	0.884	0.542	16	0.660	Kurtosis	1.248	5.411	25	0.825	Dispersion	1.814	2.718	50	1.065	Standard Deviation	0.402	0.679	75	1.300	Deviation from Normal	-0.006	0.229	84	1.465	Skewness (2)	1.063	0.229	95	3.370	Kurtosis	2.913	2.718	99	3.815						
-4	-3	-2	-4.5	0.00	0.00	0.00	0.00	0.00	1	-0.855	Mean	1.345	0.394	5	0.220	Standard Deviation	0.884	0.542	16	0.660	Kurtosis	1.248	5.411	25	0.825	Dispersion	1.814	2.718	50	1.065	Standard Deviation	0.402	0.679	75	1.300	Deviation from Normal	-0.006	0.229	84	1.465	Skewness (2)	1.063	0.229	95	3.370	Kurtosis	2.913	2.718	99	3.815						
-4	-3	-2	-4.5	0.00	0.00	0.00	0.00	0.00	1	-0.855	Mean	1.345	0.394	5	0.220	Standard Deviation	0.884	0.542	16	0.660	Kurtosis	1.248	5.411	25	0.825	Dispersion	1.814	2.718	50	1.065	Standard Deviation	0.402	0.679	75	1.300	Deviation from Normal	-0.006	0.229	84	1.465	Skewness (2)	1.063	0.229	95	3.370	Kurtosis	2.913	2.718	99	3.815						
-4	-3	-2	-4.5	0.00	0.00	0.00	0.00	0.00	1	-0.855	Mean	1.345	0.394	5	0.220	Standard Deviation	0.884	0.542	16	0.660	Kurtosis	1.248	5.411	25	0.825	Dispersion	1.814	2.718	50	1.065	Standard Deviation	0.402	0.679	75	1.300	Deviation from Normal	-0.006	0.229	84	1.465	Skewness (2)	1.063	0.229	95	3.370	Kurtosis	2.913	2.718	99	3.815						
-4	-3	-2	-4.5	0.00	0.00	0.00	0.00	0.00	1	-0.855	Mean	1.345	0.394	5	0.220	Standard Deviation	0.884	0.542	16	0.660	Kurtosis	1.248	5.411	25	0.825	Dispersion	1.814	2.718	50	1.065	Standard Deviation	0.402	0.679	75	1.300	Deviation from Normal	-0.006	0.229	84	1.465	Skewness (2)	1.063	0.229	95	3.370	Kurtosis	2.913	2.718	99	3.815						
-4	-3	-2	-4.5	0.00	0.00	0.00	0.00	0.00	1	-0.855	Mean	1.345	0.394	5	0.220	Standard Deviation	0.884	0.542	16	0.660	Kurtosis	1.248	5.411	25	0.825	Dispersion	1.814	2.718	50	1.065	Standard Deviation	0.402	0.679	75	1.300	Deviation from Normal	-0.006	0.229	84	1.465	Skewness (2)	1.063	0.229	95	3.370	Kurtosis	2.913	2.718	99	3.815						
-4	-3	-2	-4.5	0.00	0.00	0.00	0.00	0.00	1	-0.855	Mean	1.345	0.394	5	0.220	Standard Deviation	0.884	0.542	16	0.660	Kurtosis	1.248	5.411	25	0.825	Dispersion	1.814	2.718	50	1.065	Standard Deviation	0.402	0.679	75	1.300	Deviation from Normal	-0.006	0.229	84	1.465	Skewness (2)	1.063	0.229	95	3.370	Kurtosis	2.913	2.718	99	3.815						
-4	-3	-2	-4.5	0.00	0.00	0.00	0.00	0.00	1	-0.855	Mean	1.345	0.394	5	0.220	Standard Deviation	0.884	0.542	16	0.660	Kurtosis	1.248	5.411	25	0.825	Dispersion	1.814	2.718	50	1.065	Standard Deviation	0.402	0.679	75	1.300	Deviation from Normal	-0.006	0.229	84	1.465	Skewness (2)	1.063	0.229	95	3.370	Kurtosis	2.913	2.718	99	3.815						
-4	-3	-2	-4.5	0.00	0.00	0.00	0.00	0.00	1	-0.855	Mean	1.345	0.394	5	0.220	Standard Deviation	0.884	0.542	16	0.660	Kurtosis	1.248	5.411	25	0.825	Dispersion	1.814	2.718	50	1.065	Standard Deviation	0.402	0.679	75	1.300	Deviation from Normal	-0.006	0.229	84	1.465	Skewness (2)	1.063	0.229	95	3.370	Kurtosis	2.913	2.718	99	3.815						
-4	-3	-2	-4.5	0.00	0.00	0.00	0.00	0.00	1	-0.855	Mean	1.345	0.394	5	0.220	Standard Deviation	0.884	0.542	16	0.660	Kurtosis	1.248	5.411	25	0.825	Dispersion	1.814	2.718	50	1.065	Standard Deviation	0.402	0.679	75	1.300	Deviation from Normal	-0.006	0.229	84	1.465	Skewness (2)	1.063	0.229	95	3.370	Kurtosis	2.913	2.718	99	3.815						
-4	-3	-2	-4.5	0.00	0.00	0.00	0.00	0.00	1	-0.855	Mean	1.345	0.394	5	0.220	Standard Deviation	0.884	0.542	16	0.660	Kurtosis	1.248	5.411	25	0.825	Dispersion	1.814	2.718	50	1.065	Standard Deviation	0.402	0.679	75	1.300	Deviation from Normal	-0.006	0.229	84	1.465	Skewness (2)	1.063	0.229	95	3.370	Kurtosis	2.913	2.718	99	3.815						
-4	-3	-2	-4.5	0.00	0.00	0.00	0.00	0.00	1	-0.855	Mean	1.345	0.394	5	0.220	Standard Deviation	0.884	0.542	16	0.660	Kurtosis	1.248	5.411	25	0.825	Dispersion	1.814	2.718	50	1.065	Standard Deviation	0.402	0.679	75	1.300	Deviation from Normal	-0.006	0.229	84	1.465	Skewness (2)	1.063	0.229	95	3.370	Kurtosis	2.913	2.718	99	3.815						
-4	-3	-2	-4.5	0.00	0.00	0.00	0.00	0.00	1	-0.855	Mean	1.345	0.394	5	0.220	Standard Deviation	0.884	0.542	16	0.660	Kurtosis	1.248	5.411	25	0.825	Dispersion	1.814	2.718	50	1.065	Standard Deviation	0.402	0.679	75	1.300	Deviation from Normal	-0.006	0.229	84	1.465	Skewness (2)	1.063	0.229	95	3.370	Kurtosis	2.913	2.718	99	3.815						
-4	-3	-2	-4.5	0.00	0.00	0.00	0.00	0.00	1	-0.855	Mean	1.345	0.394	5	0.220	Standard Deviation	0.884	0.542	16	0.660	Kurtosis	1.248	5.411	25	0.825	Dispersion	1.814	2.718	50	1.065	Standard Deviation	0.402	0.679	75	1.300	Deviation from Normal	-0.006	0.229	84	1.465	Skewness (2)	1.063	0.229	95	3.370	Kurtosis	2.913	2.718	99	3.815					</	

Grain Size Distribution

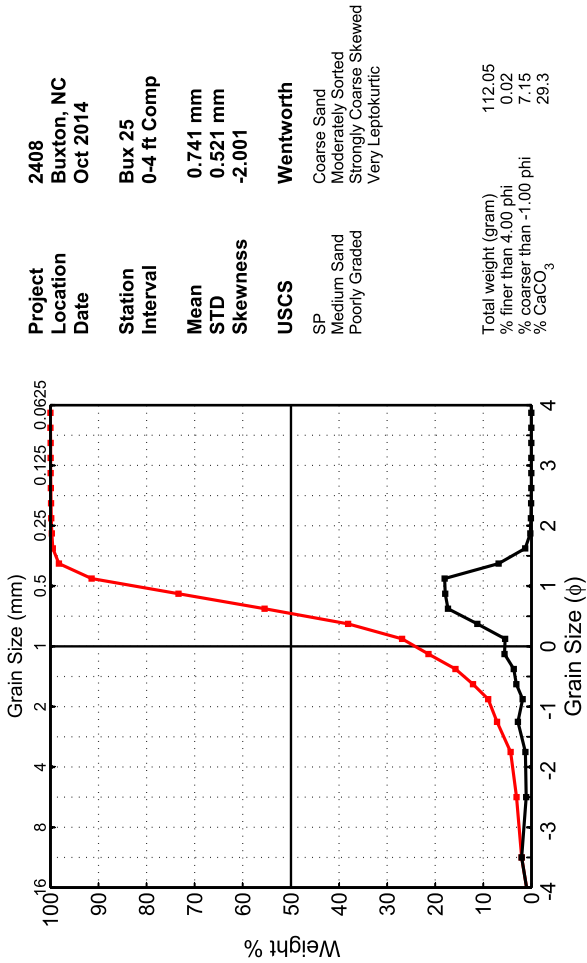


Grain Size Distribution

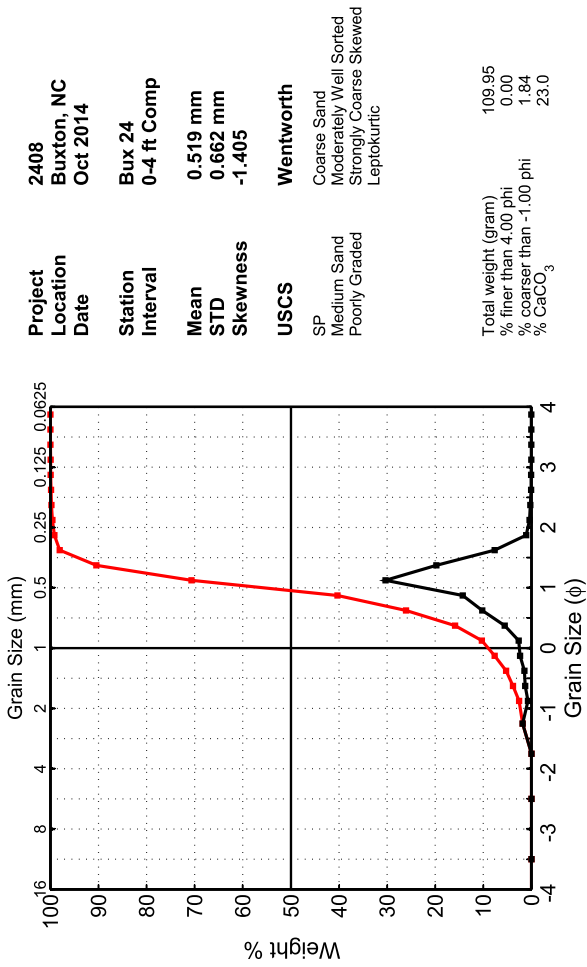


Limits (phi)				Mid Point (phi)				Weight (gram)				Weight % Cum. Wt %				Percentiles				Moment Measures				Graphic Phi Parameters				Folk & Ward 1957								
-4	-3	-2	-1	-0.5	-0.25	0	0.25	0.5	0.75	1.0	1.25	1.5	1.75	2	2.25	2.5	2.75	3	3.25	3.5	3.75	4	>4.0	Mean	Standard Deviation	Skewness	Kurtosis	Mean	Standard Deviation	Skewness (1)	Skewness (2)	Kurtosis				
-4.5	-3.5	-2.5	-1.75	-1.25	-0.875	-0.625	-0.375	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
0.25	0.5	0.75	1.0	1.25	1.5	1.75	2.0	2.25	2.5	2.75	3.0	3.25	3.5	3.75	4.0	4.25	4.5	4.75	5.0	5.25	5.5	5.75	6.0	6.25	6.5	6.75	7.0	7.25	7.5	7.75	8.0	8.25	8.5	8.75	9.0	
6.0	6.25	6.5	6.75	7.0	7.25	7.5	7.75	8.0	8.25	8.5	8.75	9.0	9.25	9.5	9.75	10.0	10.25	10.5	10.75	11.0	11.25	11.5	11.75	12.0	12.25	12.5	12.75	13.0	13.25	13.5	13.75	14.0	14.25	14.5	14.75	
15.0	15.25	15.5	15.75	16.0	16.25	16.5	16.75	17.0	17.25	17.5	17.75	18.0	18.25	18.5	18.75	19.0	19.25	19.5	19.75	20.0	20.25	20.5	20.75	21.0	21.25	21.5	21.75	22.0	22.25	22.5	22.75	23.0	23.25	23.5	23.75	24.0
25.0	25.25	25.5	25.75	26.0	26.25	26.5	26.75	27.0	27.25	27.5	27.75	28.0	28.25	28.5	28.75	29.0	29.25	29.5	29.75	30.0	30.25	30.5	30.75	31.0	31.25	31.5	31.75	32.0	32.25	32.5	32.75	33.0	33.25	33.5	33.75	34.0
35.0	35.25	35.5	35.75	36.0	36.25	36.5	36.75	37.0	37.25	37.5	37.75	38.0	38.25	38.5	38.75	39.0	39.25	39.5	39.75	40.0	40.25	40.5	40.75	41.0	41.25	41.5	41.75	42.0	42.25	42.5	42.75	43.0	43.25	43.5	43.75	44.0
45.0	45.25	45.5	45.75	46.0	46.25	46.5	46.75	47.0	47.25	47.5	47.75	48.0	48.25	48.5	48.75	49.0	49.25	49.5	49.75	50.0	50.25	50.5	50.75	51.0	51.25	51.5	51.75	52.0	52.25	52.5	52.75	53.0	53.25	53.5	53.75	54.0
55.0	55.25	55.5	55.75	56.0	56.25	56.5	56.75	57.0	57.25	57.5	57.75	58.0	58.25	58.5	58.75	59.0	59.25	59.5	59.75	60.0	60.25	60.5	60.75	61.0	61.25	61.5	61.75	62.0	62.25	62.5	62.75	63.0	63.25	63.5	63.75	64.0
65.0	65.25	65.5	65.75	66.0	66.25	66.5	66.75	67.0	67.25	67.5	67.75	68.0	68.25	68.5	68.75	69.0	69.25	69.5	69.75	70.0	70.25	70.5	70.75	71.0	71.25	71.5	71.75	72.0	72.25	72.5	72.75	73.0	73.25	73.5	73.75	74.0
75.0	75.25	75.5	75.75	76.0	76.25	76.5	76.75	77.0	77.25	77.5	77.75	78.0	78.25	78.5	78.75	79.0	79.25	79.5	79.75	80.0	80.25	80.5	80.75	81.0	81.25	81.5	81.75	82.0	82.25	82.5	82.75	83.0	83.25	83.5	83.75	84.0
85.0	85.25	85.5	85.75	86.0	86.25	86.5	86.75	87.0	87.25	87.5	87.75	88.0	88.25	88.5	88.75	89.0	89.25	89.5	89.75	90.0	90.25	90.5	90.75	91.0	91.25	91.5	91.75	92.0	92.25	92.5	92.75	93.0	93.25	93.5	93.75	94.0
95.0	95.25	95.5	95.75	96.0	96.25	96.5	96.75	97.0	97.25	97.5	97.75	98.0	98.25	98.5	98.75	99.0	99.25	99.5	99.75	100.0	100.25	100.5	100.75	101.0	101.25	101.5	101.75	102.0	102.25	102.5	102.75	103.0	103.25	103.5	103.75	104.0
105.0	105.25	105.5	105.75	106.0	106.25	106.5	106.75	107.0	107.25	107.5	107.75	108.0	108.25	108.5	108.75	109.0	109.25	109.5	109.75	110.0	110.25	110.5	110.75	111.0	111.25	111.5	111.75	112.0	112.25	112.5	112.75	113.0	113.25	113.5	113.75	114.0
115.0	115.25	115.5	115.75	116.0	116.25	116.5	116.75	117.0	117.25	117.5	117.75	118.0	118.25	118.5	118.75	119.0	119.25	119.5	119.75	120.0	120.25	120.5	120.75	121.0	121.25	121.5	121.75	122.0	122.25	122.5	122.75	123.0	123.25	123.5	123.75	124.0
125.0	125.25	125.5	125.75	126.0	126.25	126.5	126.75	127.0	127.25	127.5	127.75	128.0	128.25	128.5	128.75	129.0	129.25	129.5	129.75	130.0	130.25	130.5	130.75	131.0	131.25	131.5	131.75	132.0	132.25	132.5	132.75	133.0	133.25	133.5	133.75	134.0
135.0	135.25	135.5	135.75	136.0	136.25	136.5	136.75	137.0	137.25	137.5	137.75	138.0	138.25	138.5	138.75	139.0	139.25	139.5	139.75	140.0	140.25	140.5	140.75	141.0	141.25	141.5	141.75	142.0	142.25	142.5	142.75	143.0	143.25	143.5	143.75	144.0
145.0	145.25	145.5	145.75	146.0	146.25	146.5	146.75	147.0	147.25	147.5	147.75	148.0	148.25	148.5	148.75	149.0	149.25	149.5	149.75	150.0	150.25	150.5	150.75	151.0	151.25	151.5	151.75	152.0	152.25	152.5	152.75	153.0	153.25	153.5	153.75	154.0
155.0	155.25	155.5	155.75	156.0	156.25	156.5	156.75	157.0	157.25	157.5	157.75	158.0	158.25	158.5	158.75	159.0	159.25	159.5	159.75	160.0	160.25	160.5	160.75	161.0	161.25	161.5	161.75	162.0	162.25	162.5	162.75	163.0	163.25	163.5	163.75	164.0
165.0	165.25	165.5	165.75	166.0	166.25	166.5	166.75	167.0	167.25	167.5	167.75	168.0	168.25	168.5	168.75	169.0	169.25	169.5	169.75	170.0	170.25	170.5	170.75	171.0	171.25	171.5	171.75	172.0	172.25	172.5	172.75	173.0	173.25	173.5	173.75	174.0
175.0	175.25	175.5	175.75	176.0	176.25	176.5	176.75	177.0	177.25	177.5	177.75	178.0	178.25	178.5	178.75	179.0	179.25	179.5	179.75	180.0	180.25	180.5	180.75	181.0	181.25	181.5	181.75	182.0	182.25	182.5	182.75	183.0	183.25	183.5	183.75	184.0
185.0	185.25	185.5	185.75	186.0	186.25	186.5	186.75	187.0	187.25	187.5	187.75	188.0	188.25	188.5	188.75	189.0	189.25	189.5	189.75	190.0	190.25	190.5	190.75	191.0	191.25	191.5	191.75	192.0	192.25	192.5	192.75	193.0	193.25	193.5	193.75	194.0
195.0	195.25	195.5	195.75	196.0	196.25	196.5	196.75	197.0	197.25	197.5	197.75	198.0	198.25	198.5	198.75	199.0	199.25	199.5	199.75	200.0	200.25	200.5	200.75	201.0	201.25	201.5	201.75	202.0	202.25	202.5	202.75	203.0	203.25	203.5	203.75	204.0
205.0	205.25	205.5	205.75	206.0	206.25	206.5	206.75	207.0	207.25	207.5	207.75	208.0	208.25	208.5	208.75	209.0	209.25	209.5	209.75	210.0	210.25	210.5	210.75	211.0	211.25	211.5	211.75	212.0	212.25	212.5	212.75	213.0	213.25	213.5	213.75	214.0
215.0	215.25	215.5	215.75	216.0	216.25	216.5	216.75	217.0	217.25	217.5	217.75	218.0	218.25	218.5	218.75	219.0	219.25	219.5	219.75	220.0	220.25	220.5	220.75	221.0	221.25	221.5	221.75	222.0	222.25	222.5	222.75	223.0	223.25	223.5	223.75	224.0
225.0	225.25	225.5	225.75	226.0	226.25	226.5	226.75	227.0	227.25	227.5	227.75	228.0	228.25	228.5	228.75	229.0	229.25	229.5	229.75	230.0	230.25	230.5	230.75	231.0	231.25	231.5	231.75	232.0	232.25	232.5	232.75	233.0	233.25	233.5	233.75	234.0
235.0	235.25	235.5	235.75	236.0	236.25	236.5	236.75	237.0	237.25	237.5	237.75	238.0	238.25	238.5	238.75	239.0	239.25	239.5	239.75	240.0	240.25	240.5	240.75	241.0	241.25	241.5	241.75	242.0	242.25	242.5	242.75	243.0	243.25	243.5	243.75	244.0
245.0	245.25	245.5	245.75	246.0	246.25	246.5	246.75	247.0	247.25	247.5	247.75	248.0	248.25	248.5	248.75	249.0	249.25	249.5	249.75	250.0	250.25	250.5	250.75	251.0	251.25	251.5	251.75	252.0	252.25	252.5	252.75	253.0	253.25	253.5	253.75	254.0
255.0	255.25	255.5	255.75	256.0	256.25	256.5	256.75	257.0	257.25	257.5	257.75	258.0	258.25	258.5	258.75	259.0	259.25	259.5	259.75	260.0	260.25	260.5	260.75	261.0	261.25	261.5	261.75	262.0	262.25	262.5	262.75	263.0	263.25	263.5	263.75	264.0
265.0	265.25	265.5	265.75	266.0	266.25	266.5	266.75	267.0	267.25	267.5	267.75	268.0	268.25	268.5	268.75	269.0	269.25	269.5	269.75	270.0	270.25	270.5	270.75	271.0	271.25	271.5	271.75	272.0	272.25	272.5	272.75	273.0	273.25	273.5	273.75	274.0
275.0	275.25	275.5	275.75	276.0	276.25	276.5	276.75	277.0	277.25	277.5	277.75	278.0	278.25	278.5	278.75	279.0	279.25	279.5	279.75	280.0	280.25	280.5	280.75	281.0	281.25	281.5	281.75	282.0	282.25	282.5	282.75	283.0	283.25	283.5	283.75	284.0
285.0	285.25	285.5	285.75	286.0	286.25	286.5	286.75	287.0	287.25	287.5	287.75	288.0	288.25	288.5	288.75	289.0	289.25	289.5	289.75	290.0	290.25	290.5	290.75	291.0	291.25	291.5	291.75	292.0	292.25	292.5	292.75	293.0	293.25	293.5	293.75	294.0
295.0	295.25	295.5	295.75	296.0	296.25	296.5	296.75	297.0	297.25	297.5	297.75	298.0	298.25	298.5	298.75	299.0	299.25	299.5	299.75	300.0	300.25	300.5	300.75	301.0	301.25	301.5	301.75	302.0	302.25	302.5	302.75	303.0	303.25	303.5	303.75	304.0
305																																				

Grain Size Distribution



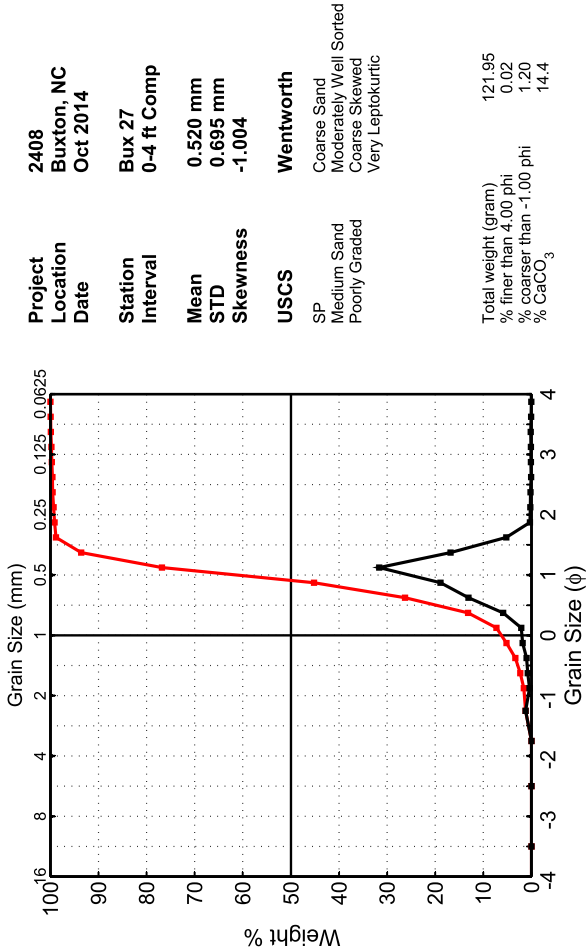
Grain Size Distribution



Percentiles			Moment Measures		
1	-4.005	0.00	Mean	0.433	(phi)
5	-1.630	2.01	Standard Deviation	0.940	(mm)
16	-0.365	3.10	Skewness	-2.001	
25	0.040	4.33	Kurtosis	8.316	
50	0.545	7.15	Dispersion		
75	0.895	8.98	Standard Deviation		
84	1.020	12.13	Deviation from Normal		
95	1.255	15.80			
99	1.530	21.41			
Graphic Phi Parameters			Inman 1952		
Limits (phi)			Folk & Ward 1957		
-4	-4.5	0.00	Mean	0.328	
-3	-3.5	2.25	Standard Deviation	0.692	
-2	-2.5	1.22	Skewness (1)	-0.314	
-1.5	-1.75	1.38	Skewness (2)	-1.058	
-1	-1.25	3.16	Kurtosis	1.083	
-0.75	-0.875	2.05			
-0.5	-0.625	3.53			
-0.25	-0.375	4.12			
0	-0.125	6.28			
0.25	0.125	6.14			
0.5	0.375	12.59			
0.75	0.625	19.43			
1	0.875	20.09			
1.25	1.125	20.19			
1.5	1.375	7.63			
1.75	1.625	1.43			
2	1.875	0.24			
2.25	2.125	0.12			
2.5	2.375	0.07			
2.75	2.625	0.03			
3	2.875	0.03			
3.25	3.125	0.03			
3.5	3.375	0.02			
3.75	3.625	0.02			
4	3.875	0.01			
>4.0	4.25	0.02			

Percentiles			Moment Measures		
1	-1.480	0.00	Mean	0.945	(phi)
5	-0.420	0.00	Standard Deviation	0.594	(mm)
16	0.380	0.00	Skewness	-1.405	
25	0.600	0.00	Kurtosis	6.161	
50	0.955	0.71	Dispersion		
75	1.180	3.83	Standard Deviation		
84	1.295	5.27	Deviation from Normal		
95	1.525	7.65			
99	1.835	10.30			
Graphic Phi Parameters			Inman 1952		
Limits (phi)			Folk & Ward 1957		
-4	-4.5	0.00	Mean	0.837	
-3	-3.5	0.00	Standard Deviation	0.458	
-2	-2.5	0.00	Skewness (1)	-0.257	
-1.5	-1.75	0.00	Skewness (2)	-0.880	
-1	-1.25	0.00	Kurtosis	1.126	
-0.75	-0.875	0.78			
-0.5	-0.625	1.40			
-0.25	-0.375	1.59			
0	-0.125	2.61			
0.25	0.125	2.91			
0.5	0.375	6.12			
0.75	0.625	11.21			
1	0.875	15.69			
1.25	1.125	30.32			
1.5	1.375	21.74			
1.75	1.625	8.39			
2	1.875	1.21			
2.25	2.125	0.44			
2.5	2.375	0.24			
2.75	2.625	0.09			
3	2.875	0.06			
3.25	3.125	0.04			
3.5	3.375	0.02			
3.75	3.625	0.01			
4	3.875	0.01			
>4.0	4.25	0.00			

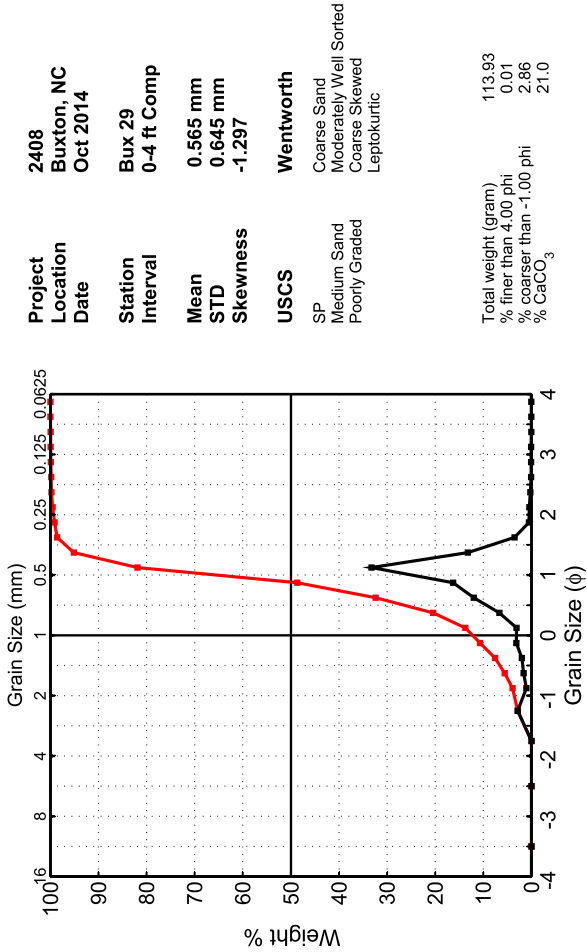
Grain Size Distribution



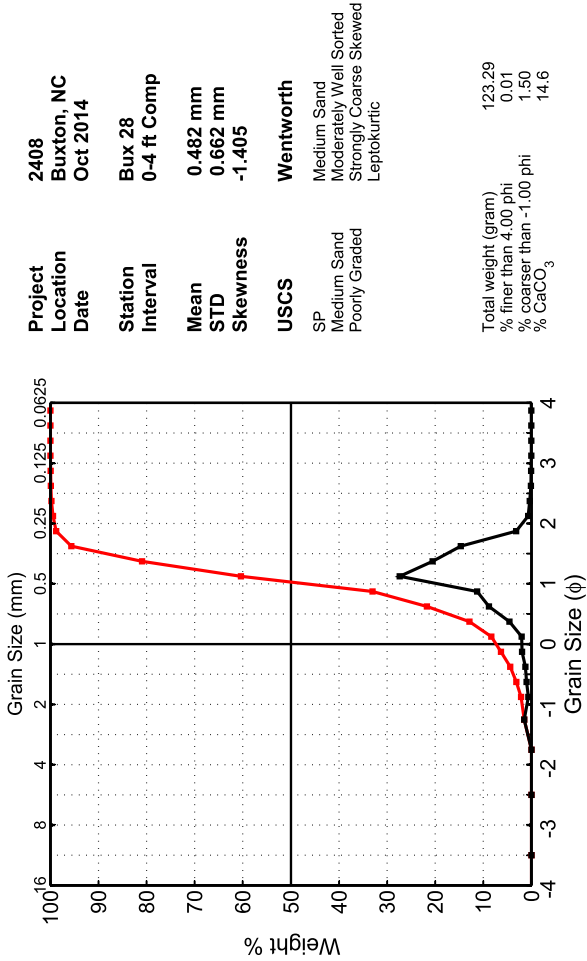
Limits (ϕ)			Mid Point (ϕ)			Weight (gram)			Weight % Cumm. Wt %		
-4	-3	-2	-4.5	0.00	0.00	0.00	0.00	0.00	1	-1.330	
-3	-2	-1.5	-3.5	0.00	0.00	0.00	0.00	0.00	5	-0.150	Mean
-2	-1.5	-1	-2.5	0.00	0.00	0.00	0.00	0.00	16	0.430	Standard Deviation
-1.5	-1	-0.75	-1.75	0.00	0.00	0.00	0.00	0.00	25	0.600	Skewness
-1	-0.75	-0.5	-1.25	1.46	1.20	1.20	1.20	1.20	50	0.915	Kurtosis
-0.75	-0.5	-0.25	-0.875	0.46	0.38	0.38	0.38	0.38	75	1.110	Dispersion
-0.5	-0.25	0	-0.625	0.92	0.76	0.76	0.76	0.76	84	1.230	Standard Deviation
-0.25	0	0.25	-0.375	1.24	1.01	1.01	1.01	1.01	95	1.440	Deviation from Normal
0	0.25	0.5	-0.125	2.23	1.83	1.83	1.83	1.83	99	1.770	
0.25	0.5	0.75	0.125	2.56	2.10	2.10	2.10	2.10			
0.5	0.75		0.375	7.18	5.89	5.89	5.89	5.89			
0.75			0.625	15.98	13.10	13.10	13.10	13.10			
1			0.875	23.05	18.90	18.90	18.90	18.90			
1.25			1.125	38.56	31.62	31.62	31.62	31.62			
1.5			1.375	20.50	16.81	16.81	16.81	16.81			
1.75			1.625	6.39	5.24	5.24	5.24	5.24			
2			1.875	0.35	0.29	0.29	0.29	0.29			
2.25			2.125	0.27	0.22	0.22	0.22	0.22			
2.5			2.375	0.21	0.17	0.17	0.17	0.17			
2.75			2.625	0.09	0.08	0.08	0.08	0.08			
3			2.875	0.11	0.09	0.09	0.09	0.09			
3.25			3.125	0.11	0.09	0.09	0.09	0.09			
3.5			3.375	0.15	0.12	0.12	0.12	0.12			
3.75			3.625	0.07	0.06	0.06	0.06	0.06			
4			3.875	0.03	0.02	0.02	0.02	0.02			
>4.0			4.25	0.03	0.02	0.02	0.02	0.02			

Graphic Phi Parameters			Inman 1952		Folk & Ward 1957	
Mean			0.830	0.858		
Standard Deviation			0.400	0.441		
Skewness (1)			-0.213	-0.276		
Skewness (2)			-0.675			
Kurtosis			0.987	1.278		

Grain Size Distribution

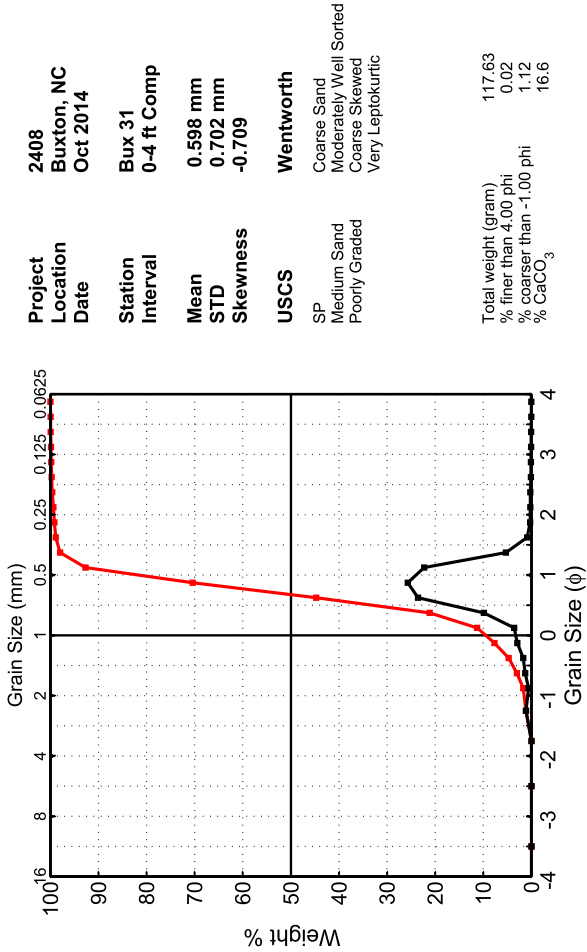


Grain Size Distribution

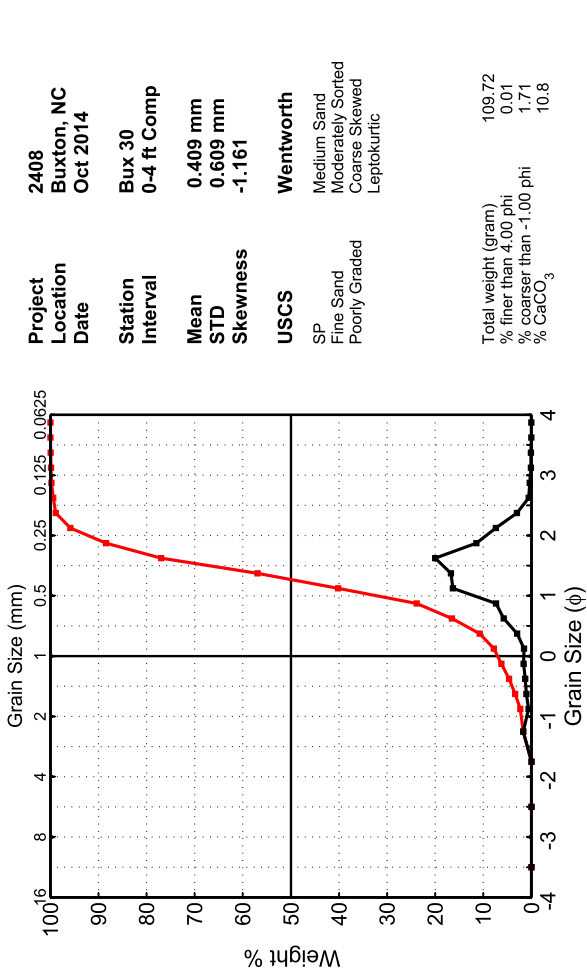


Limits (phi)			Mid Point (phi)			Weight (gram)			Weight % Cum. Wt %			Percentiles			Moment Measures			Graphic Phi Parameters			Folk & Ward 1957		
-4	-3	-2	-4.5	-3.5	-2.5	0.00	0.00	0.00	0.00	0.00	0.00	1	-1.575	Mean	0.823	(phi)	0.565	2	1.875	0.688	0.753		
-3	-2	-1	-3.5	-2.5	-1.5	0.00	0.00	0.00	0.00	0.00	0.00	5	-0.705	Standard Deviation	0.634		0.554	2.5	2.125	0.478	0.554		
-2	-1	0	-2.5	-1.5	-0.5	0.00	0.00	0.00	0.00	0.00	0.00	16	0.210	Skewness	-1.297		-0.471	3	2.375	-0.414	-0.471		
-1	0	1	-1.25	-0.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	25	0.470	Kurtosis	5.614			4	2.625	0.998	0.529		
-0.75	-0.5	-0.25	-0.875	-0.625	-0.375	0.00	0.00	0.00	0.00	0.00	0.00	50	0.885	Dispersion				5	2.875	-0.177	-0.282		
-0.5	-0.25	0	-0.625	-0.375	-0.125	0.00	0.00	0.00	0.00	0.00	0.00	75	1.075	Standard Deviation				75	3.125	-0.771	1.294		
0	0.25	0.5	-0.125	0.125	0.375	0.00	0.00	0.00	0.00	0.00	0.00	84	1.165	Deviation from Normal				99	3.375	0.990			
0.25	0.5	0.75	0.125	0.375	0.625	0.00	0.00	0.00	0.00	0.00	0.00	95	1.375										
0.5	0.75	1	0.375	0.625	0.875	0.00	0.00	0.00	0.00	0.00	0.00	99	1.815										
0.75	1	1.25	0.625	0.875	1.125	0.00	0.00	0.00	0.00	0.00	0.00												
1	1.25	1.5	0.875	1.125	1.375	0.00	0.00	0.00	0.00	0.00	0.00												
1.25	1.5	1.75	1.125	1.375	1.625	0.00	0.00	0.00	0.00	0.00	0.00												
1.5	1.75	2	1.375	1.625	1.875	0.00	0.00	0.00	0.00	0.00	0.00												
1.75	2	2.25	1.625	1.875	2.125	0.00	0.00	0.00	0.00	0.00	0.00												
2	2.25	2.5	1.875	2.125	2.375	0.00	0.00	0.00	0.00	0.00	0.00												
2.25	2.5	2.75	2.125	2.375	2.625	0.00	0.00	0.00	0.00	0.00	0.00												
2.5	2.75	3	2.375	2.625	2.875	0.00	0.00	0.00	0.00	0.00	0.00												
2.75	3	3.25	2.625	2.875	3.125	0.00	0.00	0.00	0.00	0.00	0.00												
3	3.25	3.5	2.875	3.125	3.375	0.00	0.00	0.00	0.00	0.00	0.00												
3.25	3.5	3.75	3.125	3.375	3.625	0.00	0.00	0.00	0.00	0.00	0.00												
3.5	3.75	4	3.375	3.625	3.875	0.00	0.00	0.00	0.00	0.00	0.00												
3.75	4	>4.0	3.625	3.875	4.25	0.00	0.00	0.00	0.00	0.00	0.00												
>4.0			3.875	4.25		0.00	0.00	0.00	0.00	0.00	0.00												
			4.25			0.01	0.01	0.01	0.01	0.01	0.01												

Grain Size Distribution



Grain Size Distribution



Moment Measures			Percentiles		
Mean	0.742	(phi)	1	-1.305	0.00
Standard Deviation	0.510	(mm)	5	-0.350	0.00
Skewness	-0.709		16	0.245	0.00
Kurtosis	7.556		25	0.415	0.00
Dispersion			50	0.675	1.12
Standard Deviation			75	0.925	1.72
Deviation from Normal			84	1.025	2.02
			95	1.235	2.94
			99	1.745	3.46
Graphic Phi Parameters			Weight % Cum. Wt %		
Mean	0.635		Limits (phi)	Mid Point (phi)	Weight (gram)
Standard Deviation	0.390		-4	-4.5	0.00
Skewness (1)	-0.103		-3	-3.5	0.00
Skewness (2)	-0.596		-2	-2.5	0.00
Kurtosis	1.032		-1.5	-1.75	0.00
			-1	-1.25	0.00
			-0.75	-0.875	0.00
			-0.5	-0.625	0.00
			-0.25	-0.375	0.00
			0	-0.125	0.00
			0.25	0.125	0.00
			0.5	0.375	0.00
			0.75	0.625	0.00
			1	0.875	0.00
			1.25	1.125	0.00
			1.5	1.375	0.00
			1.75	1.625	0.00
			2	1.875	0.00
			2.25	2.125	0.00
			2.5	2.375	0.00
			2.75	2.625	0.00
			3	2.875	0.00
			3.25	3.125	0.00
			3.5	3.375	0.00
			3.75	3.625	0.00
			4	3.875	0.00
			>4.0	4.25	0.00

Moment Measures			Percentiles		
Mean	1.289	(phi)	1	-1.460	0.00
Standard Deviation	0.716	(mm)	5	-0.320	0.00
Skewness	-1.161		16	0.600	0.00
Kurtosis	5.310		25	0.890	0.00
Dispersion			50	1.270	0.00
Standard Deviation			75	1.600	0.00
Deviation from Normal			84	1.780	0.00
			95	2.095	0.00
			99	2.440	0.00
Graphic Phi Parameters			Weight % Cum. Wt %		
Mean	1.190		Limits (phi)	Mid Point (phi)	Weight (gram)
Standard Deviation	0.590		-4	-4.5	0.00
Skewness (1)	-0.136		-3	-3.5	0.00
Skewness (2)	-0.648		-2	-2.5	0.00
Kurtosis	1.047		-1.5	-1.75	0.00
			-1	-1.25	0.00
			-0.75	-0.875	0.00
			-0.5	-0.625	0.00
			-0.25	-0.375	0.00
			0	-0.125	0.00
			0.25	0.125	0.00
			0.5	0.375	0.00
			0.75	0.625	0.00
			1	0.875	0.00
			1.25	1.125	0.00
			1.5	1.375	0.00
			1.75	1.625	0.00
			2	1.875	0.00
			2.25	2.125	0.00
			2.5	2.375	0.00
			2.75	2.625	0.00
			3	2.875	0.00
			3.25	3.125	0.00
			3.5	3.375	0.00
			3.75	3.625	0.00
			4	3.875	0.00
			>4.0	4.25	0.00

Moment Measures			Percentiles		
Mean	1.289	(phi)	1	-1.460	0.00
Standard Deviation	0.716	(mm)	5	-0.320	0.00
Skewness	-1.161		16	0.600	0.00
Kurtosis	5.310		25	0.890	0.00
Dispersion			50	1.270	0.00
Standard Deviation			75	1.600	0.00
Deviation from Normal			84	1.780	0.00
			95	2.095	0.00
			99	2.440	0.00
Graphic Phi Parameters			Weight % Cum. Wt %		
Mean	1.190		Limits (phi)	Mid Point (phi)	Weight (gram)
Standard Deviation	0.590		-4	-4.5	0.00
Skewness (1)	-0.136		-3	-3.5	0.00
Skewness (2)	-0.648		-2	-2.5	0.00
Kurtosis	1.047		-1.5	-1.75	0.00
			-1	-1.25	0.00
			-0.75	-0.875	0.00
			-0.5	-0.625	0.00
			-0.25	-0.375	0.00
			0	-0.125	0.00
			0.25	0.125	0.00
			0.5	0.375	0.00
			0.75	0.625	0.00
			1	0.875	0.00
			1.25	1.125	0.00
			1.5	1.375	0.00
			1.75	1.625	0.00
			2	1.875	0.00
			2.25	2.125	0.00
			2.5	2.375	0.00
			2.75	2.625	0.00
			3	2.875	0.00
			3.25	3.125	0.00
			3.5	3.375	0.00
			3.75	3.625	0.00
			4	3.875	0.00
			>4.0	4.25	0.00

Moment Measures			Percentiles		
Mean	1.289	(phi)	1	-1.460	0.00
Standard Deviation	0.716	(mm)	5	-0.320	0.00
Skewness	-1.161		16	0.600	0.00
Kurtosis	5.310		25	0.890	0.00
Dispersion			50	1.270	0.00
Standard Deviation			75	1.600	0.00
Deviation from Normal			84	1.780	0.00
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			99	2.440	0.00
Graphic Phi Parameters			Weight % Cum. Wt %		
Mean	1.190		Limits (phi)	Mid Point (phi)	Weight (gram)
Standard Deviation	0.590		-4	-4.5	0.00
Skewness (1)	-0.136		-3	-3.5	0.00
Skewness (2)	-0.648		-2	-2.5	0.00
Kurtosis	1.047		-1.5	-1.75	0.00
			-1	-1.25	0.00
			-0.75	-0.875	0.00
			-0.5	-0.625	0.00
			-0.25	-0.375	0.00
			0	-0.125	0.00
			0.25	0.125	0.00
			0.5	0.375	0.00
			0.75	0.625	0.00
			1	0.875	0.00
			1.25	1.125	0.00
			1.5	1.375	0.00
			1.75	1.625	0.00
			2	1.875	0.00
			2.25	2.125	0.00
			2.5	2.375	0.00
			2.75	2.625	0.00
			3	2.875	0.00
			3.25	3.125	0.00
			3.5	3.375	0.00
			3.75	3.625	0.00
			4	3.875	0.00
			>4.0	4.25	0.00

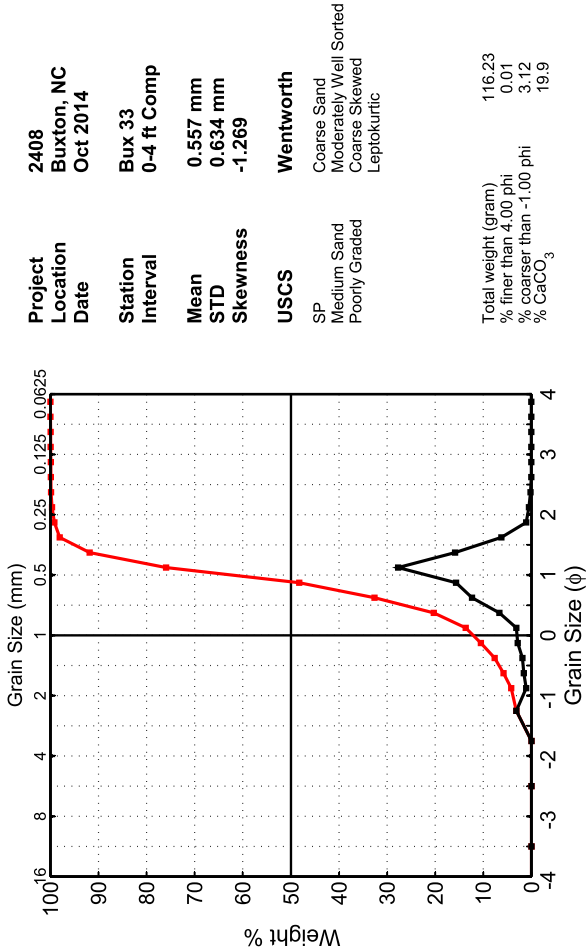
Moment Measures			Percentiles		
Mean	1.289	(phi)	1	-1.460	0.00
Standard Deviation	0.716	(mm)	5	-0.320	0.00
Skewness	-1.161		16	0.600	0.00
Kurtosis	5.310		25	0.890	0.00
Dispersion			50	1.270	0.00
Standard Deviation			75	1.600	0.00
Deviation from Normal			84	1.780	0.00
			95	2.095	0.00
			99	2.440	0.00
Graphic Phi Parameters			Weight % Cum. Wt %		
Mean	1.190		Limits (phi)	Mid Point (phi)	Weight (gram)
Standard Deviation	0.590		-4	-4.5	0.00
Skewness (1)	-0.136		-3	-3.5	0.00
Skewness (2)	-0.648		-2	-2.5	0.00
Kurtosis	1.047		-1.5	-1.75	0.00
			-1	-1.25	0.00
			-0.75	-0.875	0.00
			-0.5	-0.625	0.00
			-0.25	-0.375	0.00
			0	-0.125	0.00
			0.25	0.125	0.00
			0.5	0.375	0.00
			0.75	0.625	0.00
			1	0.875	0.00
			1.25	1.125	0.00
			1.5	1.375	0.00
			1.75	1.625	0.00
			2	1.875	0.00
			2.25	2.125	0.00
			2.5	2.375	0.00
			2.75	2.625	0.00
			3	2.875	0.00
			3.25	3.125	0.00
			3.5	3.375	0.00
			3.75	3.625	0.00
			4	3.875	0.00
			>4.0	4.25	0.00

Moment Measures			Percentiles		
Mean	1.289	(phi)	1	-1.460	0.00
Standard Deviation	0.716	(mm)	5	-0.320	0.00
Skewness	-1.161		16	0.600	0.00
Kurtosis	5.310		25	0.890	0.00
Dispersion			50	1.270	0.00
Standard Deviation			75	1.600	0.00
Deviation from Normal			84	1.780	0.00
			95	2.095	0.00
			99	2.440	0.00
Graphic Phi Parameters			Weight % Cum. Wt %		
Mean	1.190		Limits (phi)	Mid Point (phi)	Weight (gram)
Standard Deviation	0.590		-4	-4.5	0.00
Skewness (1)	-0.136		-3	-3.5	0.00
Skewness (2)	-0.648		-2	-2.5	0.00
Kurtosis	1.047		-1.5	-1.75	0.00
			-1	-1.25	0.00
			-0.75	-0.875	0.00
			-0.5	-0.625	0.00
			-0.25	-0.375	0.00
			0	-0.125	0.00
			0.25	0.125	0.00
			0.5	0.375	0.00
			0.75	0.625	0.00
			1	0.875	0.00
			1.25	1.125	0.00
			1.5	1.375	0.00
			1.75	1.625	0.00
			2	1.875	0.00
			2.25	2.125	0.00
			2.5	2.375	0.00
			2.75	2.625	0.00
			3	2.875	0.00
			3.25	3.125	0.00
			3.5	3.375	0.00
			3.75	3.625	0.00
			4	3.875	0.00
			>4.0	4.25	0.00

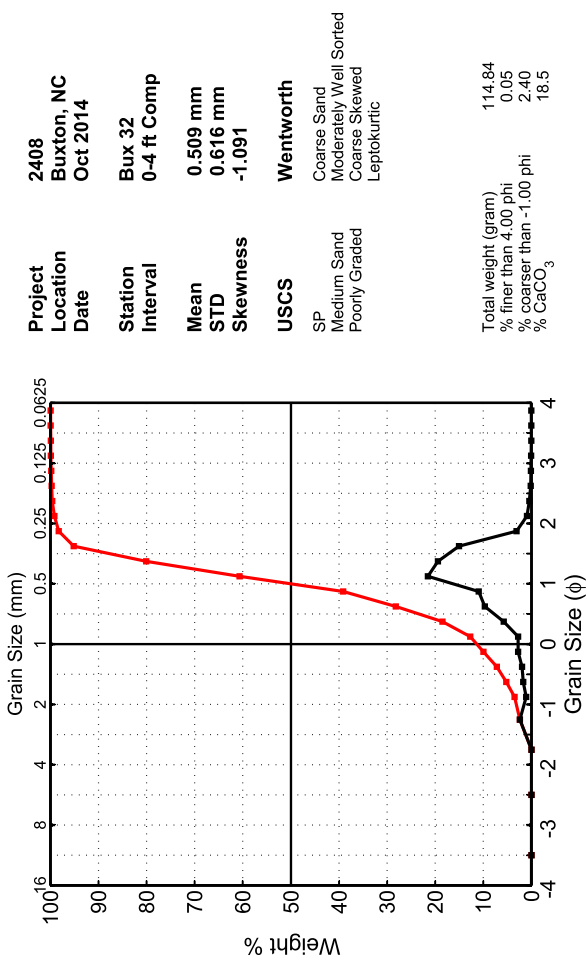
Percentiles		Moment Measures	
1	-1.460	Mean	(phi) (mm)
5	-0.320	Standard Deviation	1.289 0.409
16	0.600	Skewness	0.716 0.609
25	0.890	Kurtosis	-1.161
50	1.270	Dispersion	5.310
75	1.600	Standard Deviation	
84	1.780	Deviation from Normal	
95	2.095		
99	2.440		

Graphic Phi Parameters		Inman 1952		Folk & Ward 1957	
Mean		1.190		1.217	
Standard Deviation		0.590		0.661	
Skewness (1)		-0.136		-0.226	
Skewness (2)		-0.648			
Kurtosis		1.047		1.394	

Grain Size Distribution

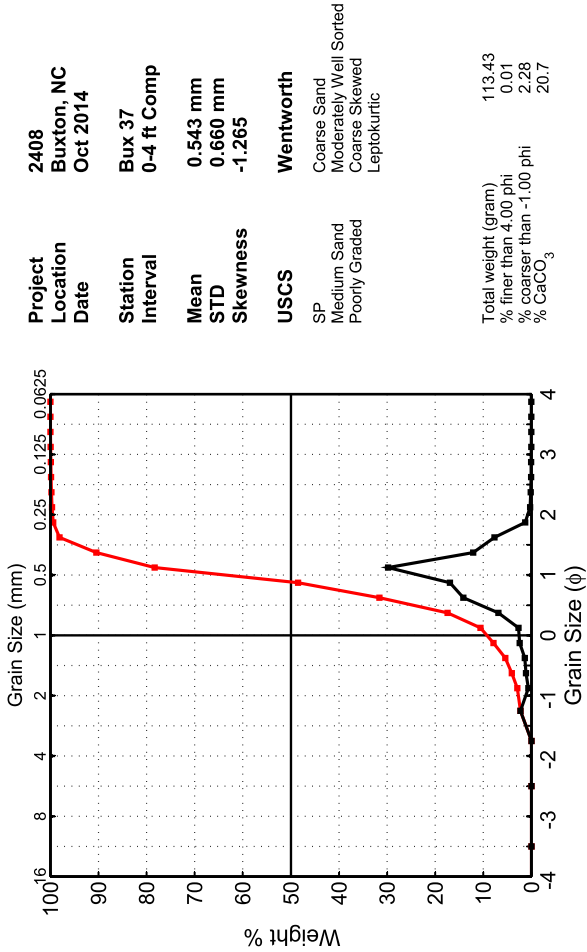


Grain Size Distribution

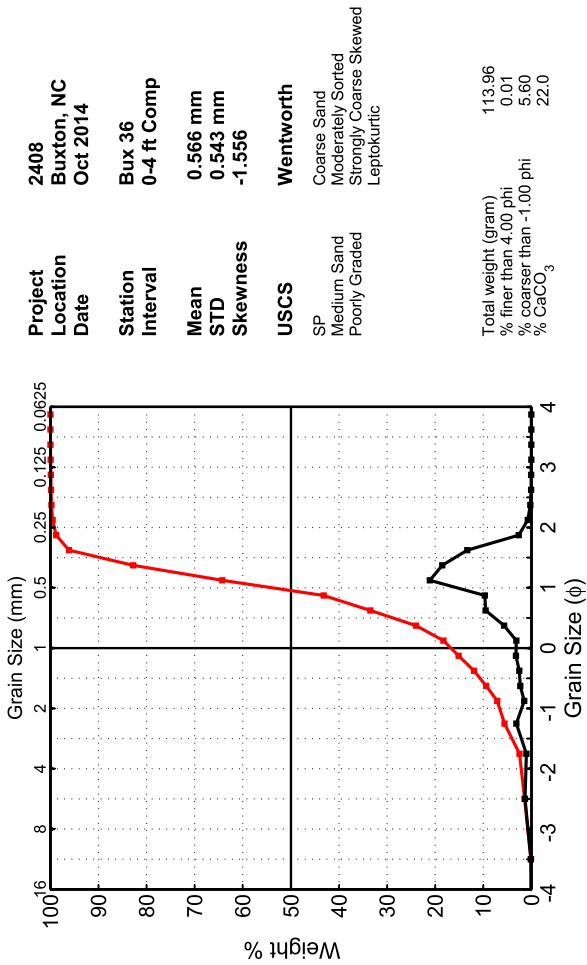


Limits (phi)			Mid Point (phi)			Weight (gram)			Weight % Cum. Wt %			Percentiles			Moment Measures			Graphic Phi Parameters			Inman 1952			Folk & Ward 1957		
-4	-3	-2	-4.5	0.00	0.00	0.00	0.00	0.00	1	-1.590	Mean	Standard Deviation	Skewness	0.846	0.557	0.634	0.657	-1.269	5.272	0.732	0.518	0.600	0.785	0.600	-0.381	
-1.5	-1	-0.5	-1.75	0.00	0.00	0.00	0.00	0.00	5	-0.750	Kurtosis										-0.304	-0.995	1.430	1.174		
-0.75	-0.25	0	-1.25	3.62	3.12	3.12	3.12	3.12	16	0.215	Dispersion															
-0.5	-0.25	0	-0.625	1.83	1.57	1.57	1.57	1.57	25	0.470	Standard Deviation															
-0.25	0	0.25	-0.375	2.17	1.87	1.87	1.87	1.87	50	0.890	Deviation from Normal															
0	0.25	0.5	-0.125	3.33	2.87	2.87	2.87	2.87	75	1.115																
0.25	0.5	0.75	0.125	3.65	3.14	3.14	3.14	3.14	84	1.250																
0.5	0.75	1	0.375	7.72	6.64	6.64	6.64	6.64	95	1.500																
0.75	1	1.25	0.625	14.34	12.34	12.34	12.34	12.34	99	1.840																
1	1.25	1.5	0.875	18.19	15.65	15.65	15.65	15.65																		
1.25	1.5	1.75	1.125	32.17	27.68	27.68	27.68	27.68																		
1.5	1.75	2	1.375	18.43	15.81	15.81	15.81	15.81																		
1.75	2	2.25	1.625	7.27	6.25	6.25	6.25	6.25																		
2	2.25	2.5	1.875	1.25	1.08	1.08	1.08	1.08																		
2.25	2.5	2.75	2.125	0.60	0.51	0.51	0.51	0.51																		
2.5	2.75	3	2.375	0.23	0.20	0.20	0.20	0.20																		
2.75	3	3.25	2.625	0.04	0.04	0.04	0.04	0.04																		
3	3.25	3.5	2.875	0.02	0.02	0.02	0.02	0.02																		
3.25	3.5	3.75	3.125	0.02	0.02	0.02	0.02	0.02																		
3.5	3.75	4	3.375	0.02	0.02	0.02	0.02	0.02																		
3.75	4	>4.0	3.625	0.03	0.03	0.03	0.03	0.03																		
4	>4.0		3.875	0.02	0.02	0.02	0.02	0.02																		
>4.0			4.25	0.01	0.01	0.01	0.01	0.01																		

Grain Size Distribution



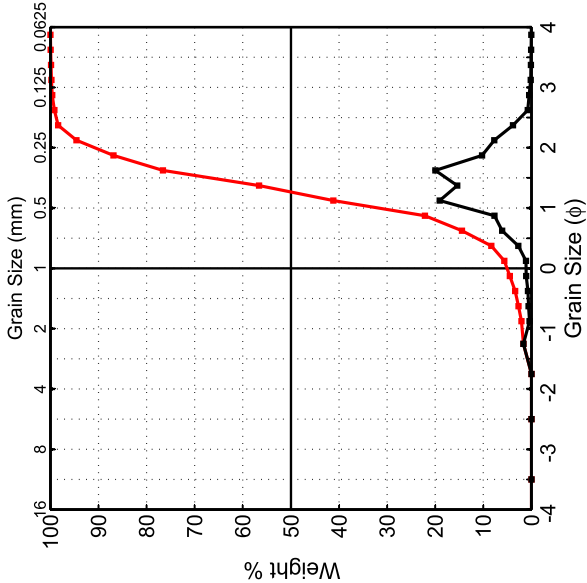
Grain Size Distribution



Percentiles				Moment Measures			
1	-1.530	0.00	0.00	Mean	0.882	(phi)	(mm)
5	-0.455	0.00	0.00	Standard Deviation	0.599		0.543
16	0.325	0.00	0.00	Skewness	-1.265		0.660
25	0.510	0.00	0.00	Kurtosis	6.144		
50	0.885	2.28	2.28	Dispersion			
75	1.095	0.65	2.92	Standard Deviation			
84	1.245	1.14	4.07	Deviation from Normal			
95	1.525	1.38	5.45				
99	1.795	2.77	7.89				
Limits	(phi)	Mid Point (phi)	Weight (gram)	Weight % Cum. Wt %	Graphic Phi Parameters		
-4	-4.5	0.00	0.00	0.00	Inman 1952		
-3	-3.5	0.00	0.00	0.00	Folk & Ward 1957		
-2	-2.5	0.00	0.00	0.00	Mean		
-1.5	-1.75	0.00	0.00	0.00	Standard Deviation		
-1	-1.25	0.00	0.00	0.00	Skewness (1)		
-0.75	-0.875	0.74	2.58	2.28	Skewness (2)		
-0.5	-0.625	1.30	1.14	4.07	Kurtosis		
-0.25	-0.375	1.56	1.38	5.45			
0	-0.125	2.77	2.45	7.89			
0.25	0.125	3.06	2.70	10.59			
0.5	0.375	7.76	6.84	17.44			
0.75	0.625	16.05	14.15	31.58			
1	0.875	19.22	16.94	48.53			
1.25	1.125	33.78	29.78	78.30			
1.5	1.375	13.75	12.12	90.42			
1.75	1.625	8.71	7.68	98.10			
2	1.875	1.48	1.30	99.40			
2.25	2.125	0.29	0.25	99.66			
2.5	2.375	0.15	0.13	99.79			
2.75	2.625	0.07	0.06	99.85			
3	2.875	0.06	0.05	99.90			
3.25	3.125	0.04	0.03	99.93			
3.5	3.375	0.03	0.03	99.96			
3.75	3.625	0.01	0.01	99.97			
4	3.875	0.02	0.02	99.99			
>4.0	4.25	0.02	0.02	100.00			

Percentiles				Moment Measures			
1	-2.825	0.00	0.00	Mean	0.821	(phi)	(mm)
5	-1.345	0.10	0.10	Standard Deviation	0.881		0.566
16	-0.055	1.43	1.43	Skewness	-1.556		0.543
25	0.400	1.05	1.05	Kurtosis	5.834		
50	0.955	3.13	3.13	Dispersion			
75	1.270	2.32	2.32	Standard Deviation			
84	1.400	2.53	2.53	Deviation from Normal			
95	1.605	3.21	3.21				
99	1.945	3.13	3.13				
Limits	(phi)	Mid Point (phi)	Weight (gram)	Weight % Cum. Wt %	Graphic Phi Parameters		
-4	-4.5	0.00	0.00	0.00	Inman 1952		
-3	-3.5	0.12	0.10	0.10	Folk & Ward 1957		
-2	-2.5	1.51	1.33	1.43	Mean		
-1.5	-1.75	1.19	1.05	2.48	Standard Deviation		
-1	-1.25	3.56	3.13	5.60	Skewness (1)		
-0.75	-0.875	1.70	1.49	7.09	Skewness (2)		
-0.5	-0.625	2.64	2.32	9.41	Kurtosis		
-0.25	-0.375	2.88	2.53	11.94			
0	-0.125	3.65	3.21	15.15			
0.25	0.125	3.57	3.13	18.28			
0.5	0.375	6.48	5.69	23.97			
0.75	0.625	10.85	9.52	33.48			
1	0.875	11.04	9.68	43.17			
1.25	1.125	24.05	21.11	64.27			
1.5	1.375	21.11	18.53	82.80			
1.75	1.625	15.19	13.33	96.13			
2	1.875	3.01	2.65	98.78			
2.25	2.125	0.88	0.77	99.55			
2.5	2.375	0.26	0.23	99.77			
2.75	2.625	0.09	0.08	99.85			
3	2.875	0.07	0.06	99.91			
3.25	3.125	0.04	0.04	99.95			
3.5	3.375	0.03	0.03	99.98			
3.75	3.625	0.01	0.01	99.99			
4	3.875	0.01	0.01	99.99			
>4.0	4.25	0.01	0.01	100.00			

Grain Size Distribution



Project
Location
Date

Station
Interval

Mean
STD
Skewness

USCS

SP
Fine Sand
Poorly Graded

Medium Sand
Moderately Well Sorted
Coarse Skewed
Leptokurtic

Total weight (gram)
% finer than 4.00 phi
% coarser than -1.00 phi
% CaCO_3

Moment Measures			
Mean	Standard Deviation	Skewness	Kurtosis
Dispersion	Standard Deviation	Deviation from Normal	
1	5	16	25
50	75	84	95
99			
Graphic Phi Parameters			
Mean	Standard Deviation	Skewness (1)	Skewness (2)
Kurtosis			

Limits	Mid Point	Weight	Weight % Cum. Wt %
(ϕ)	(ϕ)	(gram)	
-4	-4.5	0.00	0.00
-3	-3.5	0.00	0.00
-2	-2.5	0.00	0.00
-1.5	-1.75	0.00	0.00
-1	-1.25	2.03	1.66
-0.75	-0.875	0.50	0.41
-0.5	-0.625	0.73	0.60
-0.25	-0.375	0.88	0.72
0	-0.125	1.34	1.10
0.25	0.125	1.40	1.14
0.5	0.375	3.30	2.70
0.75	0.625	7.44	6.10
1	0.875	9.37	7.68
1.25	1.125	23.28	19.07
1.5	1.375	18.83	15.43
1.75	1.625	24.37	19.97
2	1.875	12.53	10.27
2.25	2.125	9.40	7.71
2.5	2.375	4.69	3.84
2.75	2.625	0.91	0.74
3	2.875	0.58	0.47
3.25	3.125	0.18	0.14
3.5	3.375	0.14	0.11
3.75	3.625	0.07	0.05
4	3.875	0.04	0.04
>4.0	4.25	0.04	100.00

Moment Measures		Percentiles	
Mean	(mm)	1	-1.450
Standard Deviation	(mm)	5	-0.015
Skewness	(mm)	16	0.675
Kurtosis	(mm)	25	0.915
Dispersion	(mm)	50	1.270
Standard Deviation	(mm)	75	1.605
Deviation from Normal	(mm)	84	1.805
	(mm)	95	2.155
	(mm)	99	2.575

Graphic Phi Parameters		Moment Measures	
Mean	(mm)	Mean	(mm)
Standard Deviation	(mm)	Standard Deviation	(mm)
Skewness (1)	(mm)	Skewness	(mm)
Skewness (2)	(mm)	Kurtosis	(mm)
Kurtosis	(mm)	Dispersion	(mm)

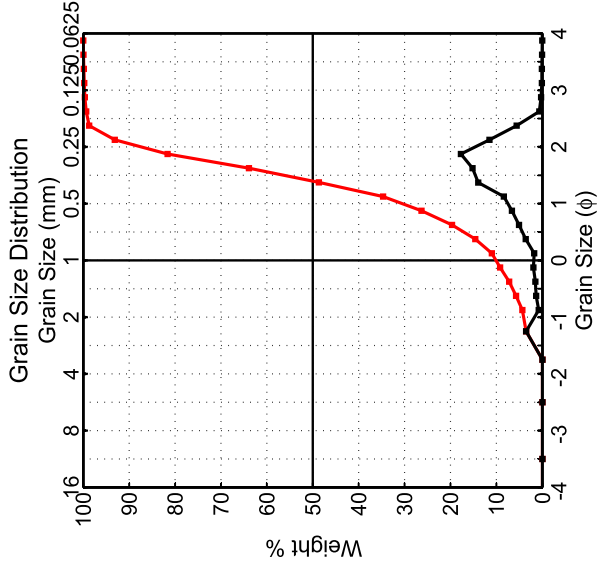
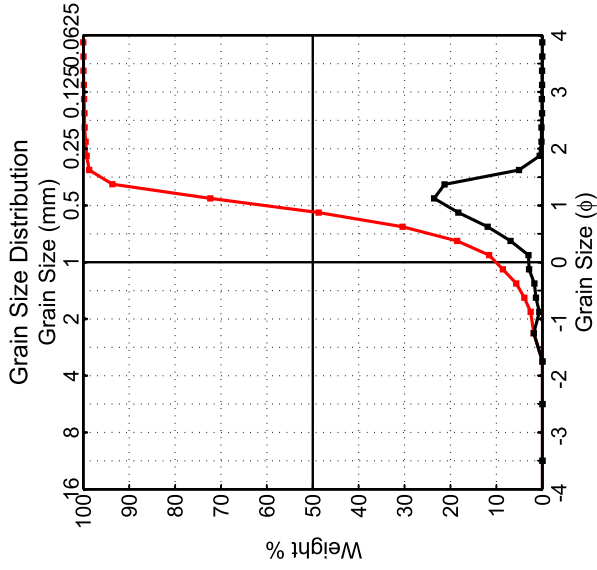
Inman		Folk & Ward	
1952	1957	1952	1957
Mean	1.240	Mean	1.250
Standard Deviation	0.565	Standard Deviation	0.611
Skewness (1)	-0.053	Skewness (1)	-0.119
Skewness (2)	-0.354	Skewness (2)	-0.354
Kurtosis	0.920	Kurtosis	1.289

ATTACHMENT 3C

SAMPLE GRAIN SIZE DISTRIBUTIONS (GSDs)

Composite Core Samples

Upper 6 ft of Section by Core



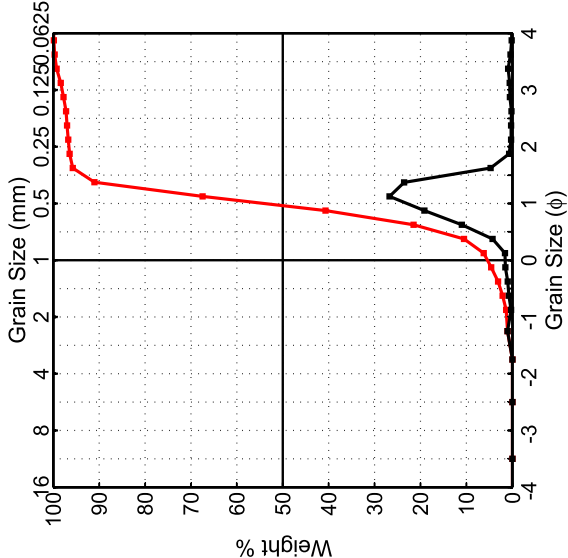
Class Limit	Weight (g)	Weight %	Cumm. Wt %	Percentiles	Moment Measures (phi) (mm)
-4	-4.5	0.00	0.00	1 -1.480	Mean 0.887 0.541
-3	-3.5	0.00	0.00	5 -0.475	Standard Deviation 0.603 0.659
-2	-2.5	0.00	0.00	16 0.285	Skewness -1.120
-1.5	-1.75	0.00	0.00	25 0.510	Kurtosis 5.990
-1	-1.25	2.22	1.85	50 0.890	Dispersion
-0.75	-0.875	0.82	0.68	75 1.155	Standard Deviation
-0.5	-0.625	1.69	1.41	84 1.260	Deviation from Normal
-0.25	-0.375	2.10	1.75	95 1.445	
0	-0.125	3.48	2.90	99 1.755	
0.25	0.125	3.60	3.00		
0.5	0.375	8.31	6.93		
0.75	0.625	14.27	11.91		
1	1.125	18.28	48.72		
1.25	1.875	28.27	72.31		
1.5	1.375	25.53	21.30		
1.75	1.625	6.11	5.10		
2	1.875	0.68	0.57		
2.25	2.125	0.24	0.20		
2.5	2.375	0.22	0.18		
2.75	2.625	0.07	0.06		
3	2.875	0.11	0.09		
3.25	3.125	0.06	0.05		
3.5	3.375	0.07	0.06		
3.75	3.625	0.04	0.03		
4	3.875	0.03	0.03		
>4.0	4.25	0.03	0.03		

Class Limit	Mid Point (ϕ)	Weight (gram)	Weight %	Cumm. Wt %
-4	-4.5	0.00	0.00	0.00
-3	-3.5	0.00	0.00	0.00
-2	-2.5	0.00	0.00	0.00
-1.5	-1.75	0.00	0.00	0.00
-1	-1.25	4.27	3.56	3.56
-0.75	-0.875	0.97	0.81	4.37
-0.5	-0.625	1.62	1.35	5.72
-0.25	-0.375	1.83	1.53	7.24
0	0	2.36	1.97	9.21
0.25	0.125	2.13	1.78	10.99
0.5	0.375	4.32	3.60	14.59
0.75	0.625	6.12	5.10	19.69
1	0.875	7.95	6.62	26.32
1.25	1.125	10.06	8.39	34.70
1.5	1.375	16.77	13.98	48.68
1.75	1.625	18.24	15.20	63.88
2	1.875	21.26	17.72	81.61
2.25	2.125	13.80	11.50	93.11
2.5	2.375	6.69	5.58	98.69
2.75	2.625	0.78	0.65	99.34
3	2.875	0.34	0.29	99.62
3.25	3.125	0.15	0.12	99.74
3.5	3.375	0.15	0.12	99.87
3.75	3.625	0.08	0.07	99.94
4	3.875	0.04	0.03	99.97
>4.0	4.25	0.04	0.03	100.00

Percentiles		Moment Measures (phi) (mm)	
1	-1.610	Mean	1.319 0.401
5	-0.760	Standard Deviation	0.866 0.549
16	0.445	Skewness	-1.199
25	0.825	Kurtosis	4.416
50	1.395	Dispersion	
75	1.780	Standard Deviation	
84	1.925	Deviation from Normal	
95	2.210		
99	2.495		

Graphic Phi Parameters		Folk & Ward	
1952	1957	1952	1957
Mean	1.185	Mean	1.255
Standard Deviation	0.740	Standard Deviation	0.820
Skewness (1)	-0.284	Skewness (1)	-0.367
Skewness (2)	-0.905	Skewness (2)	
Kurtosis	1.007	Kurtosis	1.275

Grain Size Distribution



Project 2403
Location Buxton, NC
Date July 2013

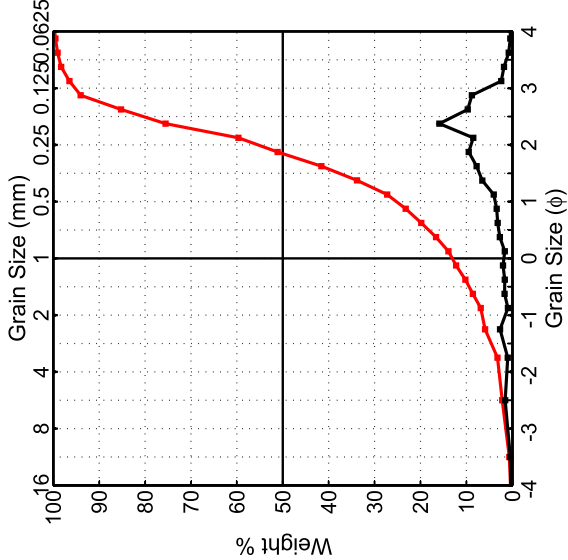
Station Bux 04
Interval Comp 6

Mean 0.481 mm
STD 0.646 mm
Skewness 0.474

USCS Wentworth
SP Medium Sand
Fine Sand Moderately Well Sorted
Poorly Graded Fine Skewed
Very Leptokurtic

Total weight (gram) 119.99
% finer than 4.00 phi 0.15
% coarser than -1.00 phi 1.06
% CaCO₃ 14.3

Grain Size Distribution



Project 2403
Location Buxton, NC
Date July 2013

Station Bux 03
Interval Comp 6

Mean 0.323 mm
STD 0.398 mm
Skewness -1.376

USCS Wentworth
SP Medium Sand
Fine Sand Poorly Sorted
Poorly Graded Strongly Coarse Skew
Leptokurtic

Total weight (gram) 119.64
% finer than 4.00 phi 0.50
% coarser than -1.00 phi 5.93
% CaCO₃ 13.8

Class Limit			Weight %Cum. Wt %			Percentiles			Moment Measures (phi) (mm)		
(phi)	(phi)	(gram)	(phi)	(phi)	(gram)	1	5	16	Mean	Standard Deviation	Skewness
-4	-4.5	0.00	0.00	0.00	0.00	-1.280	-3	0.00	1.055	0.481	0.646
-3	-3.5	0.00	0.00	0.00	0.00	-0.065	-2	0.00	0.631	0.474	8.887
-2	-2.5	0.00	0.00	0.00	0.00	0.500	-1.5	0.00	0.474	8.887	
-1.5	-1.75	0.00	0.00	0.00	0.00	0.670	-1	1.06	0.670		
-1	-1.25	1.28	1.06	1.06	1.06	0.960	-0.75	0.36	0.960		
-0.75	-0.875	0.36	0.30	1.36	1.36	1.205	-0.5	0.89	1.205		
-0.5	-0.625	0.89	0.74	2.10	2.10	1.300	-0.25	1.20	1.300		
0	-0.375	1.20	1.00	3.10	3.10	1.585	0	1.82	1.585		
0.25	-0.125	1.82	1.52	4.62	4.62	3.305	0.5	3.75	3.305		
0.5	0.375	5.18	4.31	10.54	10.54		1	8.75	8.75		
0.75	0.625	13.20	11.00	21.54	21.54		1.25	1.125	1.125		
1	0.875	23.00	19.17	40.70	40.70		1.5	1.375	1.375		
1.25	1.125	32.09	26.75	67.45	67.45		1.75	1.625	1.625		
1.5	1.375	28.27	23.56	91.01	91.01		2	1.875	1.875		
1.75	1.625	5.67	4.73	95.74	95.74		2.25	2.125	2.125		
2	1.875	0.83	0.69	96.43	96.43		2.5	2.375	2.375		
2.25	2.125	0.36	0.30	96.73	96.73		2.75	2.625	2.625		
2.5	2.375	0.31	0.26	96.99	96.99		3	2.875	2.875		
2.75	2.625	0.25	0.21	97.20	97.20		3.25	3.125	3.125		
3	2.875	0.64	0.53	97.73	97.73		3.5	3.375	3.375		
3.25	3.125	0.72	0.60	98.33	98.33		3.75	3.625	3.625		
3.5	3.375	1.13	0.94	99.27	99.27		4	3.875	3.875		
3.75	3.625	0.51	0.43	99.70	99.70		>4.0	4.25	4.25		
4	3.875	0.19	0.16	99.85	99.85						
>4.0		0.18	0.15	100.00	100.00						

Graphic Phi Parameters

1952 1.063
1957 1.264

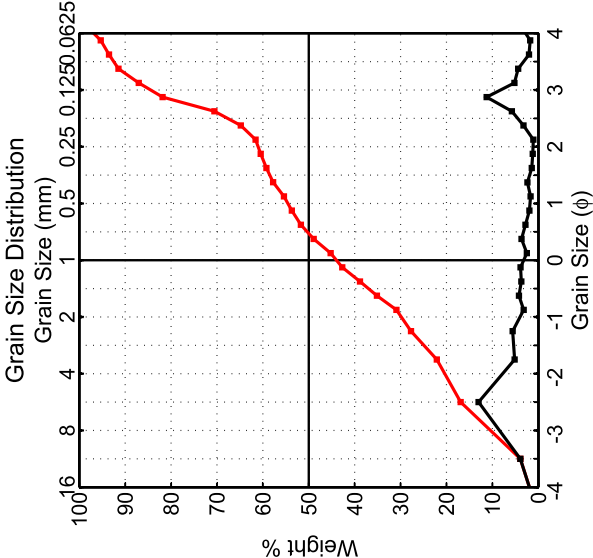
Mean 0.900
Standard Deviation 0.400
Skewness (1) -0.150
Skewness (2) -0.500
Kurtosis 1.063

Class Limit			Weight %Cum. Wt %			Percentiles			Moment Measures (phi) (mm)		
(phi)	(phi)	(gram)	(phi)	(phi)	(gram)	1	5	16	Mean	Standard Deviation	Skewness
-4	-4.5	0.23	0.19	0.19	0.19	-3.280	-3	0.19	1.629	0.323	0.398
-3	-3.5	0.56	0.46	0.66	0.66	-1.425	-2	0.23	1.330	-1.376	5.201
-2	-2.5	1.88	1.57	2.23	2.23	0.315	-1.5	1.02	1.330	-1.376	5.201
-1.5	-1.75	1.22	1.02	3.25	3.25	0.985	-1	2.68	1.330	-1.376	5.201
-1	-1.25	3.20	2.68	5.93	5.93	1.845	-0.75	8.60	1.330	-1.376	5.201
-0.75	-0.875	1.14	0.96	6.88	6.88	2.365	-0.5	10.24	1.330	-1.376	5.201
-0.5	-0.625	2.05	1.71	8.60	8.60	2.975	-0.25	12.27	1.330	-1.376	5.201
-0.25	-0.375	1.96	1.64	10.24	10.24		0	13.92	1.330	-1.376	5.201
0	-0.125	2.43	2.03	12.27	12.27		0.25	16.63	1.330	-1.376	5.201
0.25	0.125	1.98	1.65	13.92	13.92		0.5	19.84	1.330	-1.376	5.201
0.5	0.375	3.24	2.71	16.63	16.63		0.75	23.23	1.330	-1.376	5.201
0.75	0.625	3.84	3.21	19.84	19.84		1	27.27	1.330	-1.376	5.201
1	0.875	4.05	3.39	23.23	23.23		1.25	33.82	1.330	-1.376	5.201
1.25	1.125	4.84	4.04	27.27	27.27		1.5	41.61	1.330	-1.376	5.201
1.5	1.375	7.84	6.55	33.82	33.82		1.75	51.13	1.330	-1.376	5.201
1.75	1.625	9.31	7.79	41.61	41.61		2	59.63	1.330	-1.376	5.201
2	1.875	11.38	9.52	51.13	51.13		2.25	75.52	1.330	-1.376	5.201
2.25	2.125	10.18	8.51	59.63	59.63		2.5	85.22	1.330	-1.376	5.201
2.5	2.375	19.00	15.88	75.52	75.52		2.75	94.03	1.330	-1.376	5.201
2.75	2.625	11.61	9.71	85.22	85.22		3	96.44	1.330	-1.376	5.201
3	2.875	10.54	8.81	94.03	94.03		3.25	98.28	1.330	-1.376	5.201
3.25	3.125	2.89	2.41	96.44	96.44		3.5	99.05	1.330	-1.376	5.201
3.5	3.375	2.20	1.84	98.28	98.28		3.75	99.50	1.330	-1.376	5.201
3.75	3.625	0.93	0.77	99.05	99.05		4	100.00	1.330	-1.376	5.201
4	3.875	0.54	0.45	99.50	99.50		>4.0		1.330	-1.376	5.201
>4.0	4.25	0.60	0.50	100.00	100.00						

Graphic Phi Parameters

1952 0.930
1957 1.307

Mean 1.455
Standard Deviation 1.140
Skewness (1) -0.342
Skewness (2) -0.939
Kurtosis 0.930



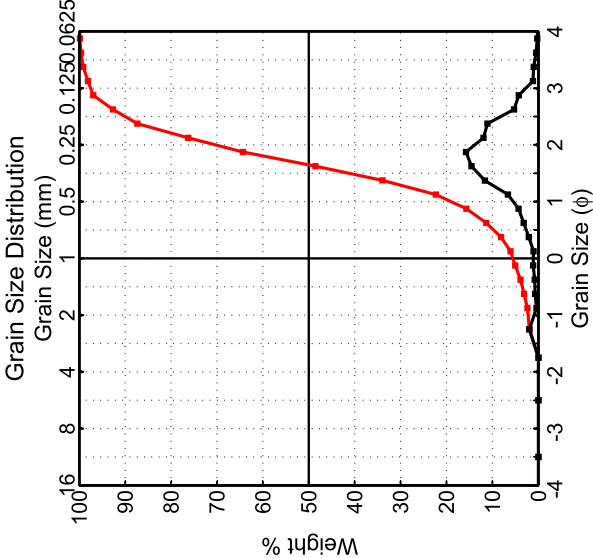
Project 2403
Location Buxton, NC
Date July 2013

Station Bux 06
Interval Comp 6

Mean 0.622 mm
STD 0.204 mm
Skewness -0.152

USCS Wentworth
SP Coarse Sand
Fine Sand Very Poorly Sorted
Poorly Graded Symmetrical
Leptokurtic

Total weight (gram) 119.76
% finer than 4.00 phi 4.71
% coarser than -1.00 phi 27.71
% CaCO₃ 39.9



Project 2403
Location Buxton, NC
Date July 2013

Station Bux 05
Interval Comp 6

Mean 0.312 mm
STD 0.550 mm
Skewness -0.948

USCS Wentworth
SP Medium Sand
Fine Sand Moderately Sorted
Poorly Graded Coarse Skewed
Leptokurtic

Total weight (gram) 119.79
% finer than 4.00 phi 0.15
% coarser than -1.00 phi 1.97
% CaCO₃ 15.5

Class Limit			Weight %			Weight %			Cumulative %		
Point (phi)			(phi)			(gram)			Wt %		
-4	-4.5	0.00	1	-4.125	0.00	0.00	0.00	0.00	1	-1.495	0.00
-3	-3.5	4.71	5	-3.420	3.93	3.93	3.93	3.93	5	-0.130	0.00
-2	-2.5	15.57	16	-2.570	13.01	16.94	16.94	16.94	16	0.890	0.00
-1.5	-1.75	6.21	25	-1.495	5.19	22.13	22.13	22.13	25	1.185	0.00
-1	-1.25	6.69	50	0.470	5.59	27.71	27.71	27.71	50	1.650	1.97
-0.75	-0.875	3.84	75	2.725	3.20	30.92	35.15	30.92	75	2.100	2.38
-0.5	-0.625	5.06	84	2.980	4.23	35.15	38.86	35.15	84	2.300	3.09
-0.25	-0.375	4.44	95	3.835	3.71	38.86	42.73	38.86	95	2.765	3.87
0	-0.125	4.64	99	4.000	3.87	42.73	45.23	42.73	99	3.345	5.02
0.25	0.125	2.99			3.50	45.23	48.91	45.23			6.06
0.5	0.375	4.42			3.69	48.91	51.72	48.91			8.14
0.75	0.625	3.37			2.81	51.72	53.69	51.72			8.14
1	0.875	2.35			1.96	53.69	55.39	53.69			11.34
1.25	1.125	2.04			1.70	55.39	57.77	55.39			15.66
1.5	1.375	2.85			2.38	57.77	59.23	57.77			22.31
1.75	1.625	1.75			1.46	59.23	60.46	59.23			22.31
2	1.875	1.47			1.23	60.46	61.57	60.46			33.98
2.25	2.125	1.33			1.11	61.57	62.75	61.57			48.53
2.5	2.375	3.88			3.24	64.81	65.77	64.81			64.31
2.75	2.625	6.90			5.76	70.57	70.57	70.57			76.24
3	2.875	13.50			11.27	81.84	81.84	81.84			87.34
3.25	3.125	6.23			5.20	87.04	87.04	87.04			92.65
3.5	3.375	5.28			4.41	91.45	91.45	91.45			96.91
3.75	3.625	2.46			2.05	93.50	93.50	93.50			98.10
4	3.875	2.14			1.79	95.29	95.29	95.29			99.12
>4.0	4.25	5.64			4.71	100.00	100.00	100.00			99.61

Moment Measures (phi) (mm)

Mean 0.685 0.622
Standard Deviation 2.293 0.204
Skewness -0.152
Kurtosis 1.712
Dispersion
Standard Deviation
Deviation from Normal

Graphic Phi Parameters

Mean 0.205 0.293
Standard Deviation 2.775 2.487
Skewness (1) -0.095 -0.084
Skewness (2) -0.095
Kurtosis 0.307 0.705

Moment Measures (phi) (mm)

Mean 1.682 0.312
Standard Deviation 0.864 0.550
Skewness -0.948
Kurtosis 4.976
Dispersion
Standard Deviation
Deviation from Normal

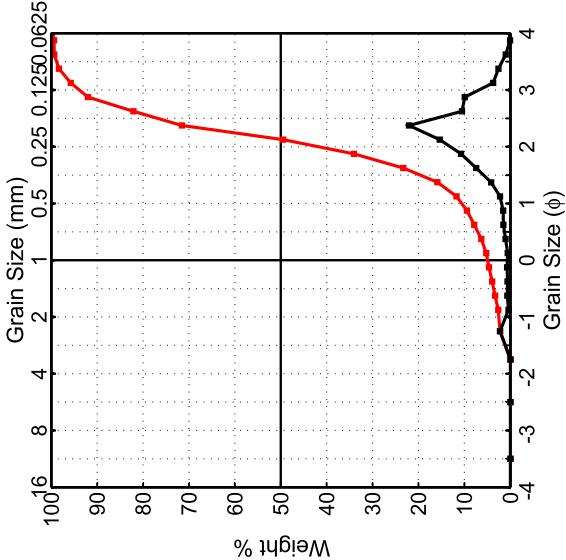
Graphic Phi Parameters

Mean 1.595 1.613
Standard Deviation 0.705 0.791
Skewness (1) -0.078 -0.154
Skewness (2) -0.472
Kurtosis 1.053 1.297

Folk & Ward

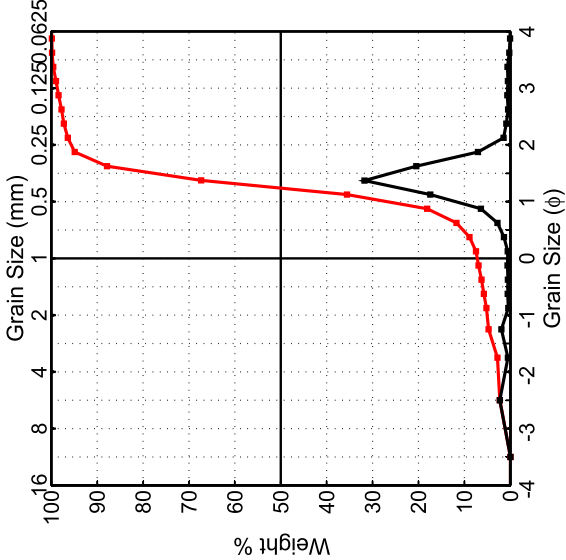
1952 1957

Grain Size Distribution



Project	2403	Location	Buxton, NC
Date	October 2014	Station	Bux 08
Interval	0-6 ft Comp	Mean	0.237 mm
STD	0.532 mm	STD	0.532 mm
Skewness	-1.543	Skewness	-1.543
USCS	Wentworth	SP	Fine Sand
			Fine Sand
			Moderately Sorted
			Poorly Graded
			Strongly Coarse Skew
			Leptokurtic
Total weight (gram)	111.84	% finer than 4.00 phi	0.63
% finer than -1.00 phi	2.23	% CaCO ₃	7.5

Grain Size Distribution



Project	2403	Location	Buxton, NC
Date	October 2014	Station	Bux 07
Interval	0-6 ft Comp	Mean	0.430 mm
STD	0.541 mm	STD	0.541 mm
Skewness	-2.084	Skewness	-2.084
USCS	Wentworth	SP	Medium Sand
			Moderately Sorted
			Poorly Graded
			Strongly Coarse Skew
			Very Leptokurtic
Total weight (gram)	106.83	% finer than 4.00 phi	0.16
% finer than -1.00 phi	4.75	% CaCO ₃	11.4

Class Limit			Point Weight			Weight %Cum. Wt %			Percentiles			Moment Measures (phi) (mm)		
(phi)	(phi)	(gram)	(phi)	(phi)	(gram)	(phi)	(phi)	(gram)	1	5	16	Mean	Standard Deviation	Skewness
-4	-4.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1	5	16	2.076	0.237	0.532
-3	-3.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5	16	25	0.911	0.532	-1.543
-2	-2.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	16	25	50	6.520		
-1.5	-1.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	25	50	75			
-1	-1.25	2.50	2.23	0.42	2.65	2.23	2.23	2.23	50	75	84			
-0.75	-0.875	0.47	0.69	0.69	3.34	3.34	3.34	3.34	75	84	95			
-0.5	-0.625	0.77	0.63	0.63	3.96	3.96	3.96	3.96	84	95	99			
-0.25	-0.375	0.70	0.71	0.71	4.68	4.68	4.68	4.68	95	99				
0	-0.125	0.80	0.60	0.60	5.27	5.27	5.27	5.27						
0.25	0.125	0.67	1.07	1.07	6.34	6.34	6.34	6.34						
0.5	0.375	1.20	1.52	1.52	7.54	7.54	7.54	7.54						
0.75	0.625	1.70	1.58	1.58	9.44	9.44	9.44	9.44						
1	0.875	1.77	2.27	2.27	11.72	11.72	11.72	11.72						
1.25	1.125	2.54	4.16	4.16	15.88	15.88	15.88	15.88						
1.5	1.375	4.66	7.46	7.46	23.34	23.34	23.34	23.34						
1.75	1.625	8.34	10.76	10.76	34.09	34.09	34.09	34.09						
2	1.875	12.03	15.38	15.38	49.47	49.47	49.47	49.47						
2.25	2.125	17.20	22.08	22.08	71.54	71.54	71.54	71.54						
2.5	2.375	24.69	28.08	28.08	82.08	82.08	82.08	82.08						
2.75	2.625	31.78	91.99	91.99	91.99	91.99	91.99	91.99						
3	2.875	31.25	98.31	98.31	98.31	98.31	98.31	98.31						
3.25	3.125	4.18	2.58	2.58	98.31	98.31	98.31	98.31						
3.5	3.375	2.88	1.00	1.00	99.31	99.31	99.31	99.31						
3.75	3.625	1.12	0.06	0.06	99.37	99.37	99.37	99.37						
4	3.875	0.07	0.63	0.63	100.00	100.00	100.00	100.00						
>4.0	4.25	0.70												

Graphic Phi Parameters

1952	1957
Mean	2.027
Standard Deviation	0.647
Skewness (1)	-0.158
Skewness (2)	-0.907
Kurtosis	1.367

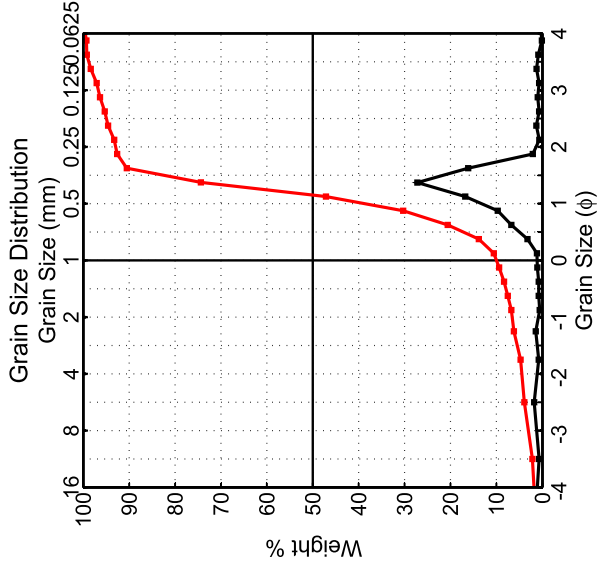
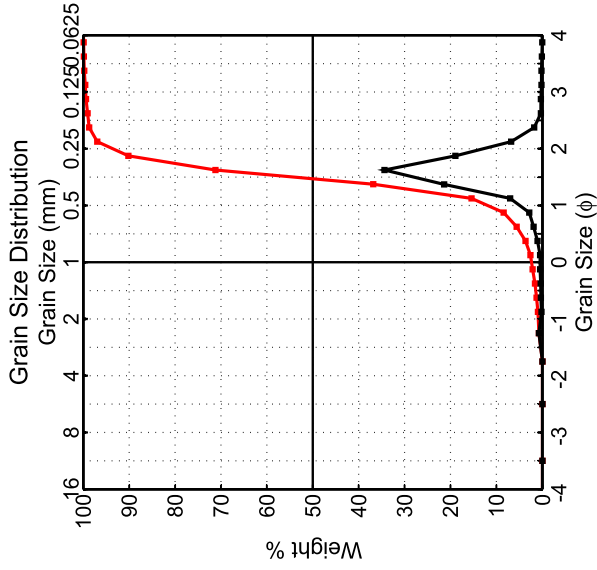
Graphic Phi Parameters

1952	1957
Mean	1.185
Standard Deviation	0.395
Skewness (1)	-0.139
Skewness (2)	-2.063
Kurtosis	2.722

Class Limit			Point Weight			Weight %Cum. Wt %			Percentiles			Moment Measures (phi) (mm)		
(phi)	(phi)	(gram)	(phi)	(phi)	(gram)	(phi)	(phi)	(gram)	1	5	16	Mean	Standard Deviation	Skewness
-4	-4.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1	5	16	1.216	0.430	0.541
-3	-3.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5	16	25	0.885	0.541	-2.084
-2	-2.5	2.43	2.27	2.27	2.27	2.27	2.27	2.27	16	25	50	10.187		
-1.5	-1.75	0.57	1.95	1.95	4.75	4.75	4.75	4.75	25	50	75			
-1	-1.25	2.08	1.95	1.95	5.20	5.20	5.20	5.20	50	75	84			
-0.75	-0.875	0.47	0.58	0.58	5.78	5.78	5.78	5.78	75	84	95			
-0.5	-0.625	0.62	0.52	0.52	6.30	6.30	6.30	6.30						
-0.25	-0.375	0.56	0.61	0.61	6.91	6.91	6.91	6.91						
0	-0.125	0.65	0.60	0.60	7.51	7.51	7.51	7.51						
0.25	0.125	0.64	0.60	0.60	8.15	8.15	8.15	8.15						
0.5	0.375	1.51	1.41	1.41	8.92	8.92	8.92	8.92						
0.75	0.625	3.00	2.81	2.81	11.73	11.73	11.73	11.73						
1	0.875	6.83	6.39	6.39	18.13	18.13	18.13	18.13						
1.25	1.125	18.65	17.45	17.45	35.58	35.58	35.58	35.58						
1.5	1.375	33.92	31.75	31.75	67.33	67.33	67.33	67.33						
1.75	1.625	21.90	20.49	20.49	87.83	87.83	87.83	87.83						
2	1.875	7.54	7.05	7.05	94.88	94.88	94.88	94.88						
2.25	2.125	1.59	1.49	1.49	96.37	96.37	96.37	96.37						
2.5	2.375	0.94	0.88	0.88	97.25	97.25	97.25	97.25						
2.75	2.625	0.53	0.50	0.50	97.74	97.74	97.74	97.74						
3	2.875	0.71	0.66	0.66	98.41	98.41	98.41	98.41						
3.25	3.125	0.56	0.52	0.52	98.93	98.93	98.93	98.93						
3.5	3.375	0.67	0.62	0.62	99.55	99.55	99.55	99.55						
3.75	3.625	0.26	0.24	0.24	99.79	99.79	99.79	99.79						
4	3.875	0.05	0.05	0.05	99.84	99.84	99.84	99.84						
>4.0	4.25	0.17	0.16	0.16	100.00	100.00	100.00	100.00						

Graphic Phi Parameters

1952	1957
Mean	1.185
Standard Deviation	0.395
Skewness (1)	-0.139
Skewness (2)	-2.063
Kurtosis	2.722



Class Limit	Mid Point (ϕ)	Weight (gram)	Weight %Cumm.	Wt %Cumm.	Percentiles	Moment Measures (phi) (mm)
-4	-4.5	0.00	0.00	0.00	1 -0.835	Mean 1.540 0.344
-3	-3.5	0.00	0.00	0.00	5 0.550	Standard Deviation 0.527 0.694
-2	-2.5	0.00	0.00	0.00	16 1.130	Skewness -1.578
-1	-1.75	0.00	0.00	0.00	25 1.235	Kurtosis 11.684
-1	-1.25	0.86	0.75	0.75	50 1.470	Dispersion
-0.75	-0.875	0.24	0.21	0.95	75 1.675	Standard Deviation
-0.5	-0.625	0.36	0.31	1.26	84 1.795	Deviation from Normal
-0.25	-0.375	0.42	0.36	1.62	95 2.055	
0	-0.125	0.57	0.49	2.11	99 2.595	
0.25	0.125	0.56	0.49	2.60		
0.5	0.375	1.22	1.06	3.67		
0.75	0.625	2.21	1.91	5.58		
1	0.875	3.27	2.84	8.42		
1.25	1.125	8.09	7.02	15.44		
1.5	1.375	24.63	21.38	36.82		
1.75	1.625	39.61	34.37	71.19		
2	1.875	21.84	18.95	90.14		
2.25	2.125	7.85	6.81	96.95		
2.5	2.375	2.03	1.76	98.71		
2.75	2.625	0.38	0.33	99.04		
3	2.875	0.38	0.33	99.37		
3.25	3.125	0.21	0.18	99.55		
3.5	3.375	0.24	0.21	99.76		
3.75	3.625	0.10	0.09	99.85		
4	3.875	0.02	0.02	99.87		
>4.0	4.25	0.15	0.13	100.00		

Graphic Phi Parametrdman			Folk & Ward		
1952			1957		
Mean	1.462	1.465			
Standard Deviation	0.333	0.394			
Skewness (1)	-0.023	-0.123			
Skewness (2)	-0.504				
Kurtosis	1.263	1.402			

Class Limit	Mid Point (ϕ)	Weight (gram)	Weight % Cumm. Wt %	Percentiles	Moment Measures (ϕ) (mm)
-4	-4.5	1.60	1.44	1	-4.125
-3	-3.5	0.80	0.72	5	-1.655
-2	-2.5	1.96	1.77	16	0.455
-1.5	-1.75	0.88	0.79	25	0.740
-1	-1.25	1.61	1.45	50	1.150
-0.75	-0.875	0.66	0.59	67.7	
-0.5	-0.625	0.86	0.78	75	1.385
-0.25	-0.375	0.87	0.78	84	1.525
0	-0.125	1.22	1.10	95	2.515
0.25	0.125	1.29	1.16	98	
0.5	0.375	3.60	3.25	99	3.565
0.75	0.625	7.49	6.75		
1	0.875	10.77	9.72		
1.25	1.125	18.64	16.81		
1.5	1.375	30.17	27.22		
1.75	1.625	17.89	16.14		
2	1.875	2.32	2.10		
2.25	2.125	0.75	0.68		
2.5	2.375	1.47	1.32		
2.75	2.625	0.81	0.73		
3	2.875	1.14	1.02		
3.25	3.125	0.79	0.71		
3.5	3.375	1.42	1.29		
3.75	3.625	0.98	0.88		
4	3.875	0.10	0.09		
>4.0	4.25	0.76	0.69		
			100.00		

Graphic Phi Parameters

1952

Mean 0.990

Standard Deviation 0.535

Skewness (1) -0.299

Skewness (2) -1.346

Kurtosis 2.897

Folk & Ward

1957

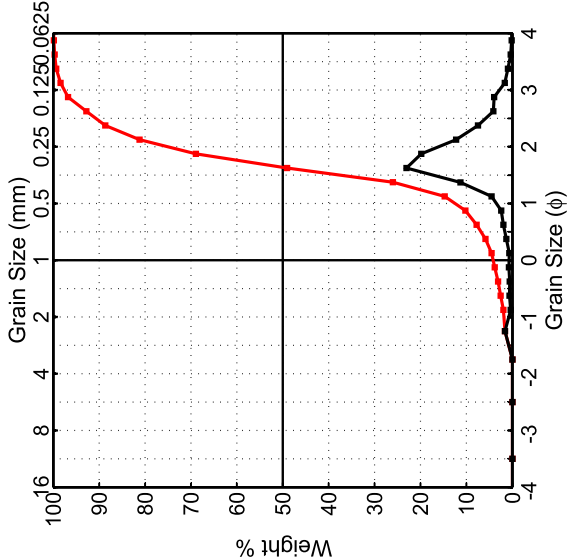
Mean 1.043

Standard Deviation 0.899

Skewness -0.322

Kurtosis 2.650

Grain Size Distribution



Project 2403
Location Buxton, NC
Date October 2014

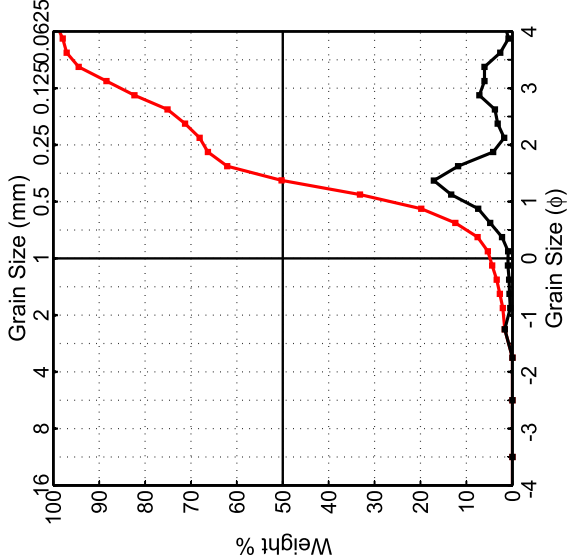
Station Bux 12
Interval 0-6 ft Comp

Mean 0.301 mm
STD 0.586 mm
Skewness -1.122

USCS Wentworth
SP Medium Sand
Fine Sand Moderately Sorted
Poorly Graded Coarse Skewed
Leptokurtic

Total weight (gram) 115.38
% finer than 4.00 phi 0.17
% coarser than -1.00 phi 1.59
% CaCO₃ 8.5

Grain Size Distribution



Project 2403
Location Buxton, NC
Date October 2014

Station Bux 11
Interval 0-6 ft Comp

Mean 0.295 mm
STD 0.466 mm
Skewness 0.072

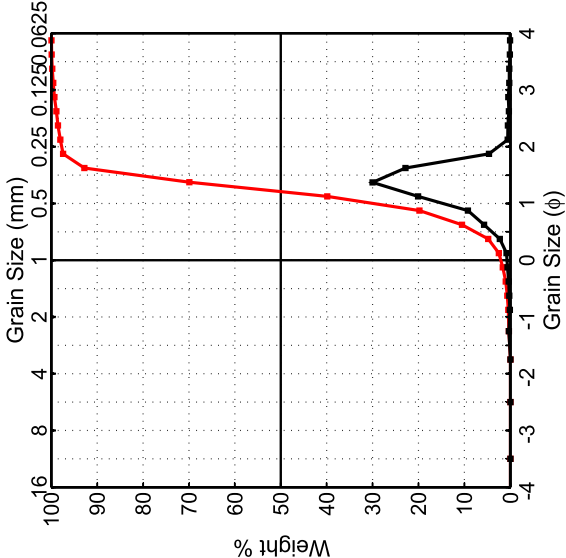
USCS Wentworth
SP Medium Sand
Fine Sand Poorly Sorted
Poorly Graded Symmetrical
Mesokurtic

Total weight (gram) 113.19
% finer than 4.00 phi 2.08
% coarser than -1.00 phi 1.63
% CaCO₃ 9.7

Class Limit			Percentiles			Moment Measures (phi) (mm)		
(phi)	(phi)	Weight (gram)	Weight %	Cumm. Wt %		Mean	Standard Deviation	Skewness
-4	-4.5	0.00	0.00	0.00	1	-1.435	0.215	1.731
-3	-3.5	0.00	0.00	0.00	5	0.215	0.00	0.301
-2	-2.5	0.00	0.00	0.00	16	1.155	0.00	0.586
-1.5	-1.75	0.00	0.00	0.00	25	1.350	1.59	-1.122
-1	-1.25	1.84	1.59	1.59	50	1.635	0.35	6.630
-0.5	-0.875	0.40	0.35	1.94	75	2.000	0.62	
-0.25	-0.625	0.71	0.62	2.55	84	2.220	0.73	
0	-0.375	0.66	0.57	3.12	95	2.765	0.67	
0.25	-0.125	0.77	0.67	4.52	99	3.290	1.33	
0.5	0.375	1.53	1.33	5.85			1.95	
0.75	0.625	2.24	1.95	7.80			2.43	
1	0.875	2.81	2.43	10.23			2.81	
1.25	1.125	5.20	4.51	14.74			13.02	
1.5	1.375	13.02	11.29	26.03			16.25	
1.75	1.625	26.59	23.05	49.08			18.75	
2	1.875	22.90	19.85	68.92			2.125	
2.25	2.125	14.14	12.25	81.18			2.375	
2.5	2.375	8.62	7.47	88.65			2.625	
2.75	2.625	4.77	4.13	92.78			2.875	
3	2.875	4.57	3.96	96.75			3.125	
3.25	3.125	1.89	1.64	98.38			3.375	
3.5	3.375	1.09	0.95	99.33			3.625	
3.75	3.625	0.40	0.35	99.68			3.875	
4	3.875	0.17	0.15	99.83			4.25	
>4.0	4.25	0.20	0.17	100.00				

Graphic Phi Paramet			Folk & Ward		
1952			1957		
Mean	1.687	1.670			
Standard Deviation	0.532	0.653			
Skewness (1)	0.099	-0.008			
Skewness (2)	-0.272				
Kurtosis	1.394	1.608			

Grain Size Distribution



Project 2403
Location Buxton, NC
Date October 2014

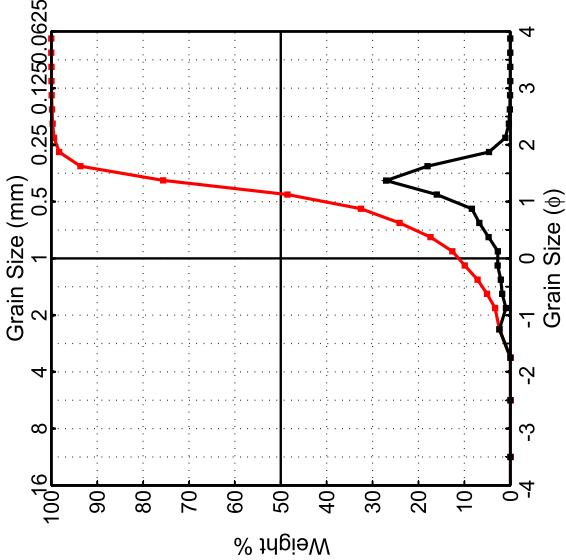
Station Bux 15
Interval 0-6 ft Comp

Mean 0.410 mm
STD 0.713 mm
Skewness -0.318

USCS Wentworth
SP Medium Sand
Fine Sand Well Sorted
Poorly Graded Symmetrical
Very Leptokurtic

Total weight (gram) 115.45
% finer than 4.00 phi 0.06
% coarser than -1.00 phi 0.30
% CaCO₃ 8.7

Grain Size Distribution



Project 2403
Location Buxton, NC
Date October 2014

Station Bux 14
Interval 0-6 ft Comp

Mean 0.483 mm
STD 0.612 mm
Skewness -1.307

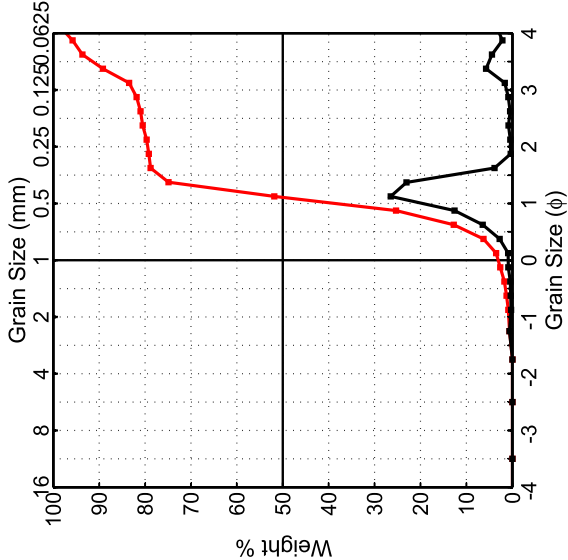
USCS Wentworth
SP Medium Sand
Moderately Sorted
Poorly Graded Strongly Coarse Skew
Leptokurtic

Total weight (gram) 113.58
% finer than 4.00 phi 0.02
% coarser than -1.00 phi 2.36
% CaCO₃ 16.6

Class Limit	Point (phi)	Weight (gram)	Weight %	Cumm. Wt %	Moment Measures (phi)		Percentiles		Graphic Phi Parameters	
					Mean	(mm)	1	5	1952	1957
-4	-4.5	0.00	0.00	0.00	1.286	0.410	-0.395	0.385	1.150	1.170
-3	-3.5	0.00	0.00	0.00	0.489	0.713	0.385	0.770	0.380	0.396
-2	-2.5	0.00	0.00	0.00	-0.318		-0.770	0.940	-0.158	-0.186
-1.5	-1.75	0.00	0.00	0.00	9.072		0.940	0.940	-0.382	
-1	-1.25	0.35	0.30	0.30			1.210	1.430	0.789	1.138
-0.75	-0.875	0.15	0.13	0.43			1.430	1.530		
-0.5	-0.625	0.29	0.25	0.68			1.530	1.745		
-0.25	-0.375	0.40	0.35	1.03			1.745	2.710		
0	-0.125	0.73	0.63	1.66			2.710			
0.25	0.125	0.96	0.83	2.49						
0.5	0.375	2.67	2.31	4.81						
0.75	0.625	6.62	5.74	10.54						
1	0.875	10.69	9.26	19.80						
1.25	1.125	23.19	20.09	39.89						
1.5	1.375	34.64	30.00	69.89						
1.75	1.625	26.39	22.86	92.75						
2	1.875	5.38	4.66	97.41						
2.25	2.125	0.67	0.58	98.00						
2.5	2.375	0.61	0.52	98.52						
2.75	2.625	0.39	0.34	98.86						
3	2.875	0.50	0.43	99.29						
3.25	3.125	0.28	0.24	99.53						
3.5	3.375	0.29	0.25	99.78						
3.75	3.625	0.13	0.11	99.89						
4	3.875	0.06	0.06	99.94						
>4.0	4.25	0.07	0.06	100.00						

Class Limit	Point (phi)	Weight (gram)	Weight %	Cumm. Wt %	Moment Measures (phi)		Percentiles		Graphic Phi Parameters	
					Mean	(mm)	1	5	1952	1957
-4	-4.5	0.00	0.00	0.00	1.049	0.483	-1.540	-0.635	0.895	0.977
-3	-3.5	0.00	0.00	0.00	0.708	0.612	-0.635	0.300	0.595	0.651
-2	-2.5	0.00	0.00	0.00	-1.307		0.300	0.650	-0.412	-0.466
-1.5	-1.75	0.00	0.00	0.00	4.913		0.650		-1.021	
-1	-1.25	2.68	2.36	2.36			1.140	1.370	0.962	1.329
-0.75	-0.875	1.08	0.95	3.31			1.370	1.490		
-0.5	-0.625	2.01	1.77	5.08			1.490	1.700		
-0.25	-0.375	2.34	2.06	7.14			1.700			
0	-0.125	3.15	2.78	9.92						
0.25	0.125	3.08	2.71	12.63						
0.5	0.375	5.39	4.75	17.38						
0.75	0.625	7.68	6.76	24.14						
1	0.875	9.52	8.38	32.52						
1.25	1.125	18.22	16.04	48.56						
1.5	1.375	30.73	27.05	75.61						
1.75	1.625	20.47	18.02	93.63						
2	1.875	5.26	4.64	98.27						
2.25	2.125	1.26	1.11	99.38						
2.5	2.375	0.35	0.31	99.69						
2.75	2.625	0.12	0.10	99.79						
3	2.875	0.10	0.08	99.88						
3.25	3.125	0.05	0.04	99.92						
3.5	3.375	0.04	0.04	99.95						
3.75	3.625	0.02	0.02	99.97						
4	3.875	0.01	0.01	99.98						
>4.0	4.25	0.02	0.02	100.00						

Grain Size Distribution



Project 2403
Location Buxton, NC
Date October 2014

Station Bux 17
Interval 0-6 ft Comp

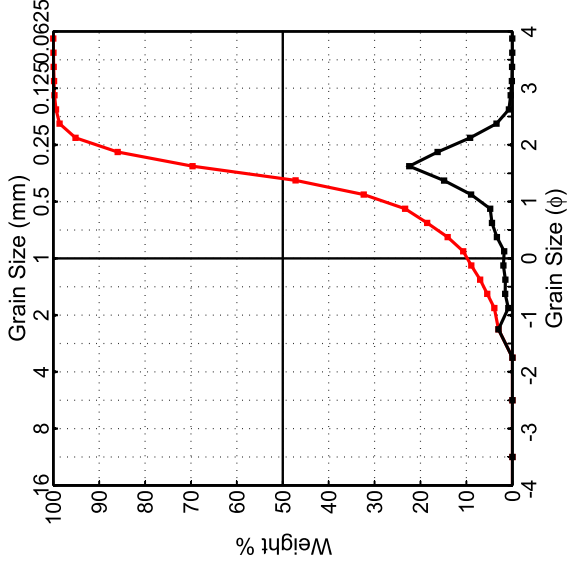
Mean 0.337 mm
STD 0.465 mm
Skewness 1.038

USCS Wentworth

SP Medium Sand
Fine Sand Poorly Sorted
Poorly Graded Fine Skewed
Mesokurtic

Total weight (gram) 105.01
% finer than 4.00 phi 4.21
% coarser than -1.00 phi 0.63
% CaCO₃ 9.1

Grain Size Distribution



Project 2403
Location Buxton, NC
Date October 2014

Station Bux 16
Interval 0-6 ft Comp

Mean 0.402 mm
STD 0.564 mm
Skewness -1.317

USCS Wentworth

SP Medium Sand
Fine Sand Moderately Sorted
Poorly Graded Strongly Coarse Skew
Leptokurtic

Total weight (gram) 118.39
% finer than 4.00 phi 0.04
% coarser than -1.00 phi 3.03
% CaCO₃ 14.9

Class Limit			Weight %Cum. Wt %			Percentiles			Moment Measures (phi) (mm)		
(ϕ)	(ϕ)	Weight (gram)	(ϕ)	(gram)	(mm)	1	-0.800	Mean	Standard Deviation	1.568	0.337
-4	-4.5	0.00	0.00	0.00	5	0.260	0.00	1.106	0.465		
-3	-3.5	0.00	0.00	0.00	16	0.690	0.00	1.038			
-2	-2.5	0.00	0.00	0.00	25	0.870	0.00	3.496			
-1.5	-1.75	0.00	0.00	0.00	50	1.110	0.63				
-1	-1.25	0.66	0.63	0.63	75	1.380	0.89				
-0.75	-0.875	0.27	0.26	0.26	84	3.150	1.26				
-0.5	-0.625	0.39	0.37	0.37	95	3.785	1.73				
-0.25	-0.375	0.48	0.46	0.46			0.89				
0	-0.125	0.94	0.89	0.89			3.54				
0.25	0.125	0.96	0.92	0.92			2.76				
0.5	0.375	2.90	2.76	2.76			6.30				
0.75	0.625	6.78	6.46	6.46			12.75				
1	0.875	13.21	12.58	12.58			25.34				
1.25	1.125	27.82	26.49	26.49			51.83				
1.5	1.375	24.23	23.07	23.07			74.90				
1.75	1.625	4.08	3.88	3.88			78.78				
2	1.875	0.40	0.38	0.38			79.16				
2.25	2.125	0.50	0.47	0.47			79.63				
2.5	2.375	0.89	0.85	0.85			80.49				
2.75	2.625	0.50	0.48	0.48			80.97				
3	2.875	0.92	0.87	0.87			81.84				
3.25	3.125	1.72	1.64	1.64			83.47				
3.5	3.375	6.00	5.71	5.71			89.19				
3.75	3.625	4.68	4.45	4.45			93.64				
4	3.875	2.26	2.15	2.15			95.79				
>4.0	4.25	4.42	4.21	4.21			100.00				

Graphic Phi Parametrdman			Folk & Ward		
1952			1957		
Mean	1.920	1.650			
Standard Deviation	1.230	1.149			
Skewness (1)	0.659	0.588			
Skewness (2)	0.742				
Kurtosis	0.433	2.833			

Class Limit			Weight %Cum. Wt %			Percentiles			Moment Measures (phi) (mm)		
(ϕ)	(ϕ)	Weight (gram)	(ϕ)	(gram)	(mm)	1	-1.585	0.00	Mean	1.314	0.402
-4	-4.5	0.00	0.00	0.00	0.825	5	-0.705	0.00	Standard Deviation	0.825	0.564
-3	-3.5	0.00	0.00	0.00	0.00	16	0.480	0.00	Skewness	-1.317	
-2	-2.5	0.00	0.00	0.00	0.00	25	0.920	0.00	Kurtosis	4.823	
-1.5	-1.75	0.00	0.00	0.00	3.03	50	1.405	3.03	Dispersion		
-1	-1.25	3.59	3.03	3.03	5.49	75	1.705	5.49	Standard Deviation		
-0.75	-0.875	1.06	0.90	0.90	8.95	84	1.845	8.95	Deviation from Normal		
-0.5	-0.625	1.85	1.56	1.56	10.72	95	2.120	10.72			
-0.25	-0.375	1.80	1.52	1.52	14.09	99	2.505	14.09			
0	-0.125	2.29	1.94	1.94	18.54			18.54			
0.25	0.125	2.09	1.77	1.77	23.38			23.38			
0.5	0.375	3.99	3.37	3.37	32.38			32.38			
0.75	0.625	5.26	4.45	4.45	47.23			47.23			
1	0.875	5.73	4.84	4.84	69.67			69.67			
1.25	1.125	10.66	9.00	9.00	85.95			85.95			
1.5	1.375	17.59	14.85	14.85	95.14			95.14			
1.75	1.625	26.56	22.44	22.44	98.61			98.61			
2	1.875	19.27	16.28	16.28	99.36			99.36			
2.25	2.125	10.88	9.19	9.19	99.73			99.73			
2.5	2.375	4.11	3.47	3.47	1.00			1.00			
2.75	2.625	0.90	0.76	0.76							
3	2.875	0.44	0.37	0.37							
3.25	3.125	0.11	0.09	0.09							
3.5	3.375	0.09	0.07	0.07							
3.75	3.625	0.05	0.04	0.04							
4	3.875	0.03	0.02	0.02							
>4.0	4.25	0.04	0.04	0.04							

Graphic Phi Paramet

1952

1.162

0.682

-0.355

-1.022

1.070

1.243

0.769

-0.425

1.475

Mean

Standard Deviation

Skewness (1)

Skewness (2)

Kurtosis

Folk & Ward

1957

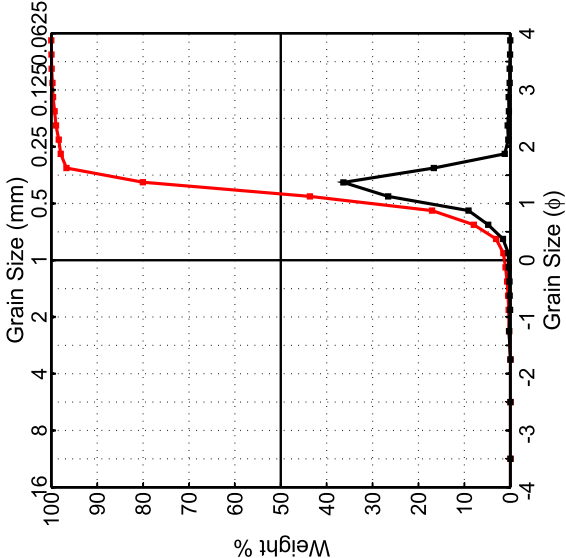
Graphic Phi Parameters

1952	1957
Mean	1.162
Standard Deviation	0.682
Skewness (1)	-0.355
Skewness (2)	-1.022
Kurtosis	1.070

Graphic Phi Parameters

1952	1957
Mean	1.920
Standard Deviation	1.230
Skewness (1)	0.659
Skewness (2)	0.742
Kurtosis	2.833

Grain Size Distribution



Project 2403
Location Buxton, NC
Date October 2014

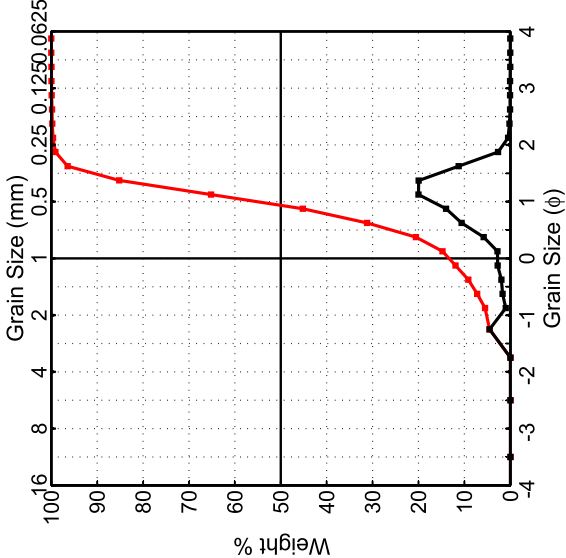
Station Bux 19
Interval 0-6 ft Comp

Mean 0.418 mm
STD 0.750 mm
Skewness -0.353

USCS Wentworth
SP Fine Sand
Well Sorted
Poorly Graded
Symmetrical
Very Leptokurtic

Total weight (gram) 109.00
% finer than 4.00 phi 0.04
% coarser than -1.00 phi 0.29
% CaCO₃ 8.4

Grain Size Distribution



Project 2403
Location Buxton, NC
Date October 2014

Station Bux 18
Interval 0-6 ft Comp

Mean 0.542 mm
STD 0.599 mm
Skewness -1.227

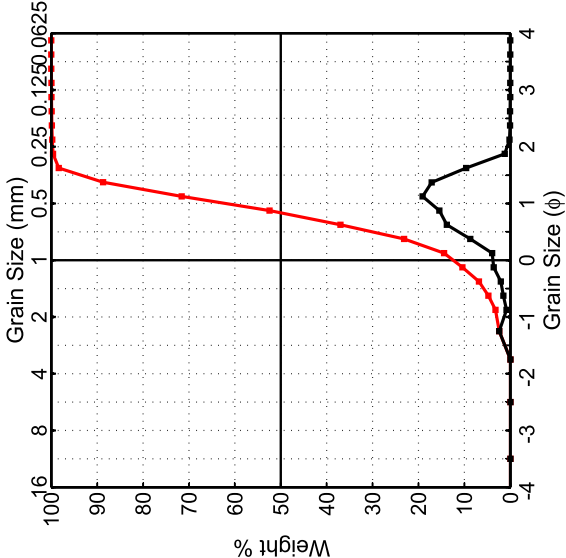
USCS Wentworth
SP Coarse Sand
Moderately Sorted
Poorly Graded
Coarse Skewed
Leptokurtic

Total weight (gram) 114.52
% finer than 4.00 phi 0.01
% coarser than -1.00 phi 4.51
% CaCO₃ 18.7

Class Limit			Weight %Cum. Wt %			Percentiles			Moment Measures (phi) (mm)		
(phi)	(phi)	Weight (gram)	(phi)	(phi)	(gram)	1	5	16	Mean	Standard Deviation	Skewness
-4	-4.5	0.00	0.00	0.00	0.00	-0.165	0.470	0.845	1.259	0.418	0.750
-3	-3.5	0.00	0.00	0.00	0.00	0.470	0.415	0.353	0.415	0.750	-0.353
-2	-2.5	0.00	0.00	0.00	0.00	0.845	0.353	12.215	0.353	12.215	12.215
-1.5	-1.75	0.00	0.00	0.00	0.00	0.950	0.950	0.950	0.950	0.950	0.950
-1	-1.25	0.32	0.29	0.29	0.29	1.170	1.170	1.170	1.170	1.170	1.170
-0.75	-0.875	0.08	0.07	0.37	0.37	1.340	1.340	1.340	1.340	1.340	1.340
-0.5	-0.625	0.14	0.13	0.50	0.50	1.435	1.435	1.435	1.435	1.435	1.435
-0.25	-0.375	0.22	0.20	0.70	0.70	1.600	1.600	1.600	1.600	1.600	1.600
0	-0.125	0.40	0.36	1.06	1.06	2.430	2.430	2.430	2.430	2.430	2.430
0.25	0.125	0.48	0.44	1.50	1.50						
0.5	0.375	1.75	1.61	3.11	3.11						
0.75	0.625	5.28	4.84	7.96	7.96						
1	0.875	9.92	9.11	17.06	17.06						
1.25	1.125	29.00	26.60	43.66	43.66						
1.5	1.375	39.63	36.36	80.02	80.02						
1.75	1.625	18.16	16.66	96.68	96.68						
2	1.875	1.35	1.23	97.91	97.91						
2.25	2.125	0.47	0.44	98.35	98.35						
2.5	2.375	0.64	0.58	98.93	98.93						
2.75	2.625	0.34	0.31	99.24	99.24						
3	2.875	0.38	0.34	99.59	99.59						
3.25	3.125	0.16	0.14	99.73	99.73						
3.5	3.375	0.16	0.14	99.87	99.87						
3.75	3.625	0.07	0.06	99.94	99.94						
4	3.875	0.03	0.03	99.96	99.96						
>4.0	4.25	0.04	0.04	100.00	100.00						

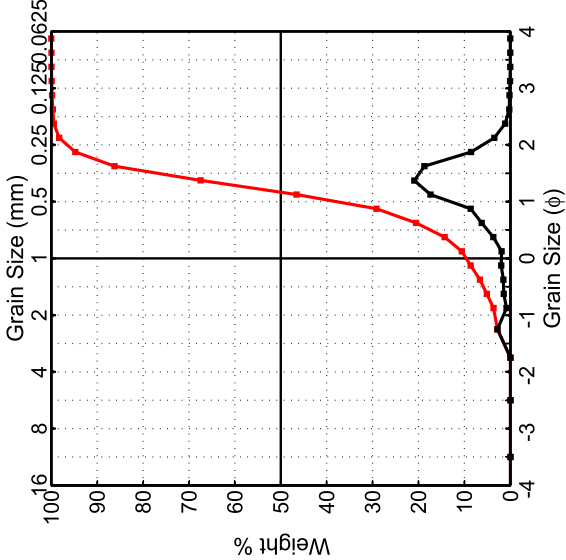
Graphic Phi Parameters			Folk & Ward 1957		
Mean	1.140	1.150			
Standard Deviation	0.295	0.319			
Skewness (1)	-0.102	-0.170			
Skewness (2)	-0.458				
Kurtosis	0.915	1.187			

Grain Size Distribution



Project 2403
Location Buxton, NC
Date October 2014
Station Bux 21
Interval 0-6 ft Comp
Mean 0.558 mm
STD 0.637 mm
Skewness -1.049
USCS Wentworth
SP Coarse Sand
Medium Sand Moderately Well Sorted
Poorly Graded Coarse Skewed
Leptokurtic
Total weight (gram) 113.70
% finer than 4.00 phi 0.01
% coarser than -1.00 phi 2.41
% CaCO₃ 18.2

Grain Size Distribution

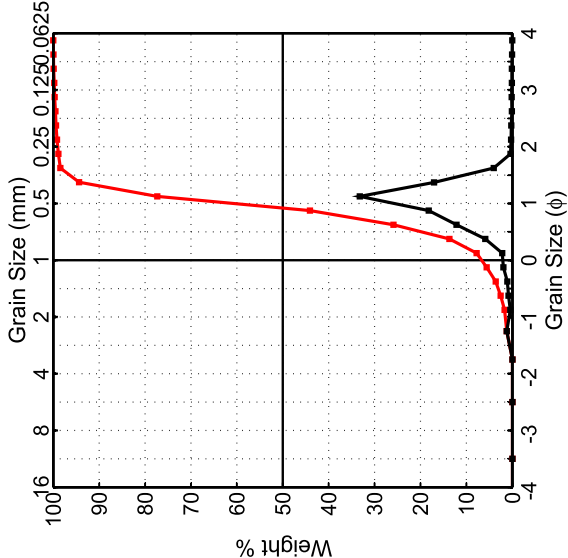


Project 2403
Location Buxton, NC
Date October 2014
Station Bux 20
Interval 0-6 ft Comp
Mean 0.454 mm
STD 0.599 mm
Skewness -1.278
USCS Wentworth
SP Medium Sand
Medium Sand Moderately Sorted
Poorly Graded Coarse Skewed
Leptokurtic
Total weight (gram) 120.55
% finer than 4.00 phi 0.03
% coarser than -1.00 phi 2.83
% CaCO₃ 16.7

Class Limit			Weight % Cumm. Wt %			Percentiles			Moment Measures (phi) (mm)		
(g)	(g)	Weight (gram)	Weight %	Cumm. Wt %		1	-1.540	Mean	Standard Deviation	Skewness	Kurtosis
-4	-4.5	0.00	0.00	0.00	5	-0.595	0.841	0.558		0.650	0.637
-3	-3.5	0.00	0.00	0.00	16	0.170	-1.049			-1.049	
-2	-2.5	0.00	0.00	0.00	25	0.410	4.595				
-1.5	-1.75	0.00	0.00	0.00	50	0.835					
-1	-1.25	2.74	2.41	2.41	75	1.175					
-0.5	-0.875	0.97	0.85	3.26	84	1.305					
-0.25	-0.625	1.71	1.51	4.77	95	1.540					
0	-0.375	2.36	2.08	6.84	99	1.760					
0.25	-0.125	4.11	3.62	10.46							
0.5	0.125	4.51	3.97	14.43							
0.75	0.375	9.92	8.73	23.15							
1	0.625	15.73	13.83	36.99							
1.25	0.875	17.58	15.46	52.45							
1.5	1.125	21.73	19.11	71.56							
1.75	1.375	19.49	17.14	88.71							
2	1.625	10.96	9.64	98.34							
2.25	1.875	1.40	1.23	99.58							
2.5	2.125	0.22	0.19	99.77				0.738	0.568	0.607	
2.75	2.375	0.09	0.08	99.85				-0.172	-0.172	-0.256	
3	2.625	0.05	0.04	99.89				-0.639	-0.639		
3.25	2.875	0.04	0.03	99.92				0.881	0.881	1.144	
3.5	3.125	0.03	0.03	99.95							
3.75	3.375	0.02	0.02	99.97							
4	3.625	0.02	0.02	99.99							
>4.0	3.875	0.01	0.01	99.99							
	4.25	0.01	0.01	100.00							

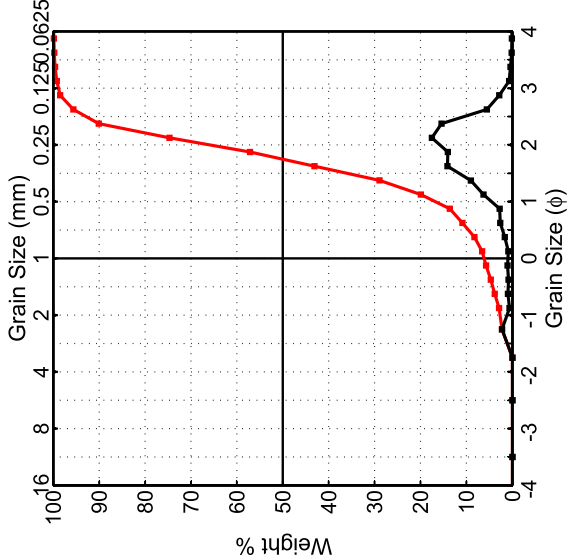
Graphic Phi Parameters			Folk & Ward		
1952			1957		
Mean	0.738	0.770			
Standard Deviation	0.568	0.607			
Skewness (1)	-0.172	-0.256			
Skewness (2)	-0.639				
Kurtosis	0.881	1.144			

Grain Size Distribution



Project	2403	Project	2403
Location	Buxton, NC	Location	Buxton, NC
Date	October 2014	Date	October 2014
Station	Bux 23	Station	Bux 23
Interval	0-6 ft Comp	Interval	0-6 ft Comp
Mean	0.520 mm	Mean	0.520 mm
STD	0.689 mm	STD	0.689 mm
Skewness	-0.982	Skewness	-0.982
USCS	Wentworth	USCS	Wentworth
SP	Coarse Sand	SP	Coarse Sand
	Medium Sand		Medium Sand
	Poorly Graded		Poorly Graded
	Coarse Skewed		Coarse Skewed
	Very Leptokurtic		Very Leptokurtic
Total weight (gram)	114.86	Total weight (gram)	114.86
% finer than 4.00 phi	0.02	% finer than 4.00 phi	0.02
% coarser than -1.00 phi	1.23	% coarser than -1.00 phi	1.23
% CaCO ₃	8.5	% CaCO ₃	8.5

Grain Size Distribution



Project	2403	Project	2403
Location	Buxton, NC	Location	Buxton, NC
Date	October 2014	Date	October 2014
Station	Bux 22	Station	Bux 22
Interval	0-6 ft Comp	Interval	0-6 ft Comp
Mean	0.306 mm	Mean	0.306 mm
STD	0.553 mm	STD	0.553 mm
Skewness	-1.387	Skewness	-1.387
USCS	Wentworth	USCS	Wentworth
SP	Medium Sand	SP	Medium Sand
	Fine Sand		Fine Sand
	Moderately Sorted		Moderately Sorted
	Poorly Graded		Poorly Graded
	Strongly Coarse Skew		Strongly Coarse Skew
	Leptokurtic		Leptokurtic
Total weight (gram)	110.55	Total weight (gram)	110.55
% finer than 4.00 phi	0.14	% finer than 4.00 phi	0.14
% coarser than -1.00 phi	2.26	% coarser than -1.00 phi	2.26
% CaCO ₃	10.2	% CaCO ₃	10.2

Class Limit	Point (phi)	Weight (gram)	Weight %	Cumulative Weight %	Moment Measures (phi)		Moment Measures (mm)	
					Percentiles			
-4	-4.5	0.00	0.00	0.00	1	-1.345	0.942	0.520
-3	-3.5	0.00	0.00	0.00	5	-0.200	0.537	0.689
-2	-2.5	0.00	0.00	0.00	16	0.420	-0.982	
-1.5	-1.75	0.00	0.00	0.00	25	0.605	8.040	
-1	-1.25	1.41	1.23	1.23	50	0.920		
-0.75	-0.875	0.54	0.47	1.70	75	1.110		
-0.5	-0.625	0.97	0.84	2.54	84	1.225		
-0.25	-0.375	1.25	1.09	3.63	95	1.415		
0	-0.125	2.25	1.96	5.59	99	2.000		
0.25	0.125	2.53	2.20	7.80				
0.5	0.375	6.77	5.90	13.70				
0.75	0.625	13.99	12.18	25.86				
1	0.875	20.90	18.20	44.06				
1.25	1.125	38.17	33.23	77.31				
1.5	1.375	19.60	17.07	94.38				
1.75	1.625	4.67	4.07	98.44				
2	1.875	0.47	0.41	98.85				
2.25	2.125	0.34	0.30	99.15				
2.5	2.375	0.28	0.25	99.40				
2.75	2.625	0.14	0.13	99.52				
3	2.875	0.18	0.16	99.68				
3.25	3.125	0.12	0.10	99.78				
3.5	3.375	0.13	0.11	99.90				
3.75	3.625	0.06	0.05	99.95				
4	3.875	0.03	0.03	99.98				
>4.0	4.25	0.03	0.02	100.00				

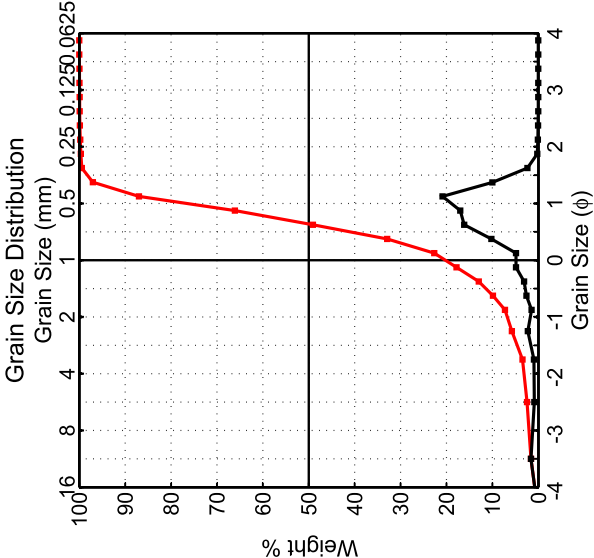
Moment Measures (phi)		Moment Measures (mm)	
Mean	0.942	Mean	0.942
Standard Deviation	0.537	Standard Deviation	0.537
Skewness	-0.982	Skewness	-0.982
Kurtosis	8.040	Kurtosis	8.040
Dispersion		Dispersion	
Standard Deviation		Standard Deviation	
Deviation from Normal		Deviation from Normal	

Graphic Phi Parameters		Folk & Ward	
1952	1957	1952	1957
Mean	0.823	Mean	0.855
Standard Deviation	0.403	Standard Deviation	0.446
Skewness (1)	-0.242	Skewness (1)	-0.315
Skewness (2)	-0.776	Skewness (2)	
Kurtosis	1.311	Kurtosis	1.311

Class Limit	Point (phi)	Weight (gram)	Weight %	Cumulative Weight %	Moment Measures (phi)		Moment Measures (mm)	
					Percentiles			
-4	-4.5	0.00	0.00	0.00	1	-1.530	1.710	0.306
-3	-3.5	0.00	0.00	0.00	5	-0.295	0.855	0.553
-2	-2.5	0.00	0.00	0.00	16	0.970	-1.387	
-1.5	-1.75	0.00	0.00	0.00	25	1.265	5.680	
-1	-1.25	2.50	2.26	2.26	50	1.750		
-0.75	-0.875	0.70	0.63	2.89	75	2.130		
-0.5	-0.625	1.05	0.95	3.84	84	2.275		
-0.25	-0.375	0.93	0.84	4.68	95	2.595		
0	-0.125	1.14	1.03	5.71	99	3.060		
0.25	0.125	0.97	0.88	6.58				
0.5	0.375	1.85	1.67	8.25				
0.75	0.625	2.90	2.62	10.87				
1	0.875	3.06	2.76	13.64				
1.25	1.125	6.95	6.28	19.92				
1.5	1.375	9.97	9.02	28.94				
1.75	1.625	15.63	14.14	43.07				
2	1.875	15.51	14.03	57.11				
2.25	2.125	19.39	17.54	74.65				
2.5	2.375	17.04	15.42	90.07				
2.75	2.625	6.14	5.55	95.62				
3	2.875	3.16	2.86	98.48				
3.25	3.125	0.78	0.71	99.19				
3.5	3.375	0.46	0.42	99.60				
3.75	3.625	0.18	0.16	99.76				
4	3.875	0.10	0.09	99.86				
>4.0	4.25	0.16	0.14	100.00				

Moment Measures (phi)		Moment Measures (mm)	
Mean	1.710	Mean	1.710
Standard Deviation	0.855	Standard Deviation	0.855
Skewness	-1.387	Skewness	-1.387
Kurtosis	5.680	Kurtosis	5.680
Dispersion		Dispersion	
Standard Deviation		Standard Deviation	
Deviation from Normal		Deviation from Normal	

Graphic Phi Parameters		Folk & Ward	
1952	1957	1952	1957
Mean	1.622	Mean	1.665
Standard Deviation	0.653	Standard Deviation	0.764
Skewness (1)	-0.195	Skewness (1)	-0.305
Skewness (2)	-0.920	Skewness (2)	
Kurtosis	1.215	Kurtosis	1.369



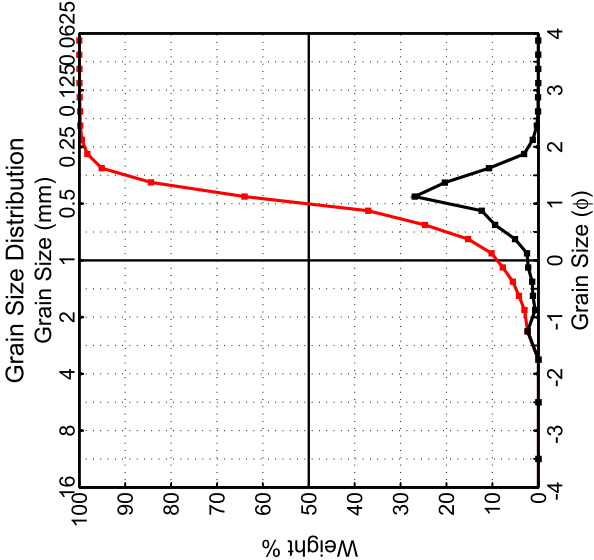
Project 2403
Location Buxton, NC
Date October 2014

Station Bux 25
Interval 0-6 ft Comp

Mean 0.684 mm
STD 0.537 mm
Skewness -2.103

USCS Wentworth
SP Coarse Sand
Medium Sand Moderately Sorted
Poorly Graded Strongly Coarse Skew
Very Leptokurtic

Total weight (gram) 112.18
% finer than 4.00 phi 0.02
% coarser than -1.00 phi 5.77
% CaCO_3 26.8



Project 2403
Location Buxton, NC
Date October 2014

Station Bux 24
Interval 0-6 ft Comp

Mean 0.501 mm
STD 0.641 mm
Skewness -1.301

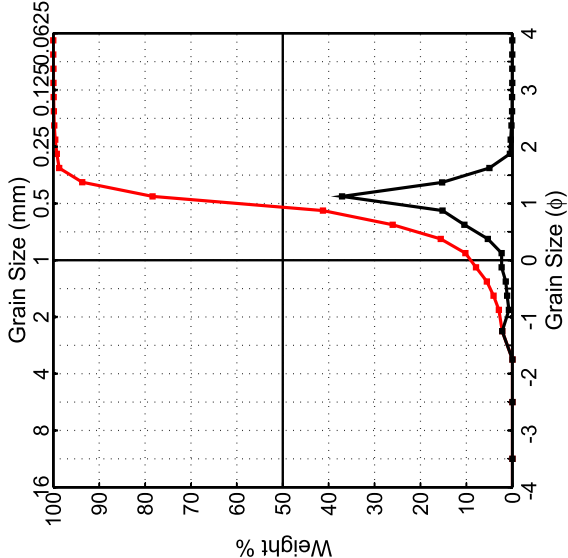
USCS Wentworth
SP Coarse Sand
Medium Sand Moderately Well Sorte
Poorly Graded Strongly Coarse Skew
Leptokurtic

Total weight (gram) 111.43
% finer than 4.00 phi 0.02
% coarser than -1.00 phi 2.33
% CaCO_3 23.2

Class Limit			Weight %Cum. Wt %			Percentiles			Moment Measures (phi) (mm)					
(ϕ)	(ϕ)	Weight (gram)				1	5	16	25	50	75	84	95	99
-4	-4.5	0.00	0.00	0.00	0.00	-3.880	-1.415	-0.220	0.180	0.640	0.980	1.090	1.325	1.580
-3	-3.5	1.80	1.61	1.61	1.61	-1.415	-2.200							
-2	-2.5	0.97	0.87	2.47	2.47	-0.220								
-1.5	-1.75	1.10	0.98	3.46	3.46									
-1	-1.25	2.59	2.31	5.77	5.77									
-0.75	-0.875	1.67	1.49	7.26	7.26									
-0.5	-0.625	2.93	2.62	9.87	9.87									
-0.25	-0.375	3.49	3.11	12.98	12.98									
0	-0.125	5.46	4.86	17.84	17.84									
0.25	0.125	5.44	4.85	22.69	22.69									
0.5	0.375	11.49	10.24	32.93	32.93									
0.75	0.625	18.12	16.15	49.09	49.09									
1	0.875	19.09	17.02	66.11	66.11									
1.25	1.125	23.42	20.88	86.99	86.99									
1.5	1.375	11.26	10.04	97.02	97.02									
1.75	1.625	2.69	2.40	99.42	99.42									
2	1.875	0.26	0.23	99.65	99.65									
2.25	2.125	0.12	0.11	99.76	99.76									
2.5	2.375	0.08	0.07	99.84	99.84									
2.75	2.625	0.05	0.04	99.88	99.88									
3	2.875	0.03	0.03	99.91	99.91									
3.25	3.125	0.03	0.03	99.94	99.94									
3.5	3.375	0.02	0.02	99.95	99.95									
3.75	3.625	0.02	0.02	99.97	99.97									
4	3.875	0.02	0.01	99.98	99.98									
>4.0	4.25	0.02	0.02	100.00	100.00									

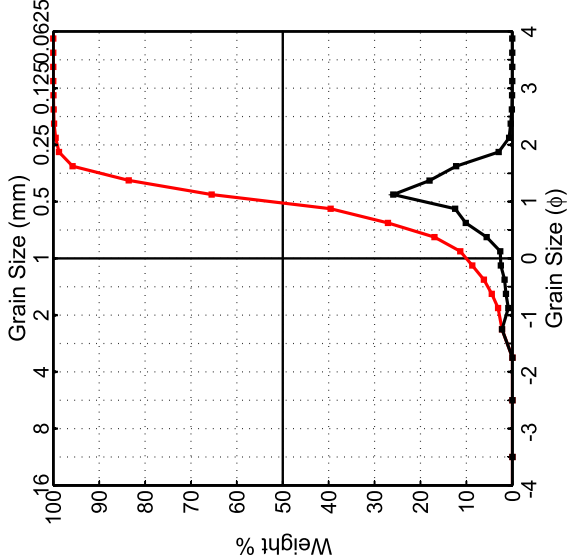
Graphic Phi Parameters			Folk & Ward		
1952			1957		
Mean	0.435	0.503			
Standard Deviation	0.655	0.743			
Skewness (1)	-0.313	-0.406			
Skewness (2)	-1.046				
Kurtosis	1.092	1.404			

Grain Size Distribution



Project 2403
Location Buxton, NC
Date October 2014
Station Bux 29
Interval 0-6 ft Comp
Mean 0.532 mm
STD 0.666 mm
Skewness -1.499
USCS Wentworth
SP Coarse Sand
Medium Sand Moderately Well Sort
Poorly Graded Strongly Coarse Skew
Leptokurtic
Total weight (gram) 113.13
% finer than 4.00 phi 0.01
% coarser than -1.00 phi 2.21
% CaCO₃ 18.2

Grain Size Distribution

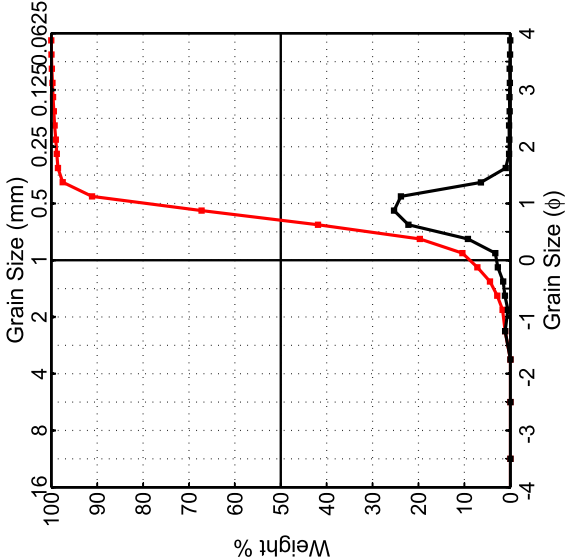


Project 2403
Location Buxton, NC
Date October 2014
Station Bux 28
Interval 0-6 ft Comp
Mean 0.512 mm
STD 0.637 mm
Skewness -1.270
USCS Wentworth
SP Coarse Sand
Medium Sand Moderately Well Sort
Poorly Graded Coarse Skewed
Leptokurtic
Total weight (gram) 121.89
% finer than 4.00 phi 0.00
% coarser than -1.00 phi 2.24
% CaCO₃ 17.3

Class Limit			Weight %Cum. Wt %			Moment Measures (phi) (mm)		
(phi)	(phi)	(gram)				Percentiles		
-4	-4.5	0.00	0.00	0.00	0.00	1	-1.525	
-3	-3.5	0.00	0.00	0.00	0.00	5	-0.470	
-2	-2.5	0.00	0.00	0.00	0.00	16	0.385	
-1.5	-1.75	0.00	0.00	0.00	0.00	25	0.600	
-1	-1.25	2.50	2.21	2.21	2.21	50	0.935	
-0.75	-0.875	0.83	0.74	2.95	4.11	75	1.100	
-0.5	-0.625	1.30	1.15	4.11	5.56	84	1.215	
-0.25	-0.375	1.65	1.45	5.56	7.91	95	1.440	
0	-0.125	2.66	2.35	7.91	10.25	99	1.785	
0.25	0.125	2.65	2.34	10.25	15.60	Graphic Phi Parameters Folk & Ward 1952 1957 Mean 0.800 0.845 Standard Deviation 0.415 0.497 Skewness (1) -0.325 -0.398 Skewness (2) -1.084 1.566 Kurtosis 1.301		
0.5	0.375	6.05	5.35	15.60	26.06			
0.75	0.625	11.83	10.46	26.06	41.26			
1	0.875	17.20	15.20	41.26	58.36			
1.25	1.125	41.96	37.09	78.36	83.66			
1.5	1.375	17.31	15.30	93.66	98.67			
1.75	1.625	5.67	5.02	98.67	99.19			
2	1.875	0.58	0.52	99.19	99.56			
2.25	2.125	0.41	0.37	99.56	99.76			
2.5	2.375	0.23	0.20	99.76	99.83			
2.75	2.625	0.08	0.07	99.83	99.89			
3	2.875	0.06	0.05	99.89	99.92			
3.25	3.125	0.04	0.04	99.92	99.95			
3.5	3.375	0.03	0.03	99.95	99.97			
3.75	3.625	0.01	0.01	99.97	99.99			
4	3.875	0.01	0.01	99.99	100.00			
>4.0	4.25	0.01	0.01	100.00				

Class Limit			Weight %Cum. Wt %			Moment Measures (phi) (mm)		
(phi)	(phi)	(gram)				Percentiles		
-4	-4.5	0.00	0.00	0.00	0.00	1	-1.525	
-3	-3.5	0.00	0.00	0.00	0.00	5	-0.550	
-2	-2.5	0.00	0.00	0.00	0.00	16	0.335	
-1.5	-1.75	0.00	0.00	0.00	0.00	25	0.575	
-1	-1.25	2.73	2.24	2.24	2.24	50	0.975	
-0.75	-0.875	1.05	0.87	3.10	4.49	75	1.255	
-0.5	-0.625	1.70	1.39	4.49	6.19	84	1.385	
-0.25	-0.375	2.07	1.70	6.19	8.72	95	1.610	
0	-0.125	3.09	2.53	8.72	11.35	99	1.965	
0.25	0.125	3.20	2.63	11.35	16.95	Graphic Phi Parameters Folk & Ward 1952 1957 Mean 0.860 0.898 Standard Deviation 0.525 0.590 Skewness (1) -0.219 -0.316 Skewness (2) -0.848 1.302 Kurtosis 1.057		
0.5	0.375	6.83	5.60	16.95	27.08			
0.75	0.625	12.34	10.13	27.08	39.56			
1	0.875	15.21	12.48	39.56	65.49			
1.25	1.125	31.61	25.94	65.49	83.53			
1.5	1.375	21.99	18.04	83.53	95.76			
1.75	1.625	14.90	12.23	95.76	98.74			
2	1.875	3.63	2.98	98.74	99.46			
2.25	2.125	0.88	0.72	99.46	99.81			
2.5	2.375	0.42	0.34	99.81	99.90			
2.75	2.625	0.11	0.09	99.90	99.94			
3	2.875	0.06	0.05	99.94	99.97			
3.25	3.125	0.03	0.02	99.97	99.98			
3.5	3.375	0.01	0.01	99.98	99.99			
3.75	3.625	0.01	0.01	99.99	100.00			
4	3.875	0.01	0.00	100.00				
>4.0	4.25	0.01	0.00					

Grain Size Distribution

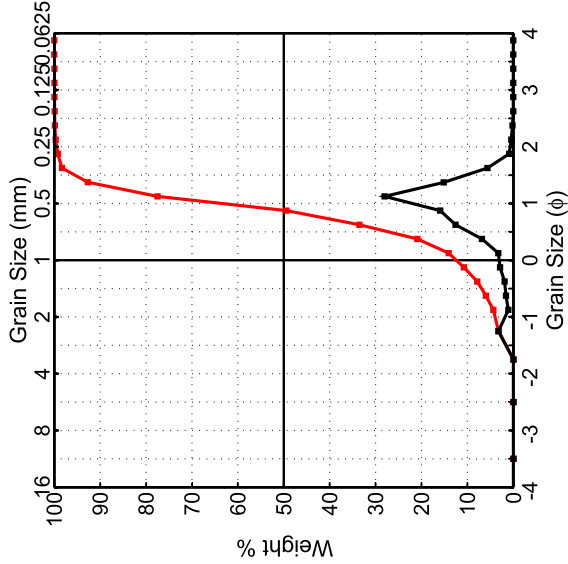


Project 2403
Location Buxton, NC
Date October 2014
Station Bux 31
Interval 0-6 ft Comp
Mean 0.584 mm
STD 0.693 mm
Skewness -0.347
USCS Wentworth
SP Coarse Sand
Medium Sand Moderately Well Sorted
Poorly Graded Symmetrical
Very Leptokurtic
Total weight (gram) 119.41
% finer than 4.00 phi 0.04
% coarser than -1.00 phi 1.13
% CaCO₃ 16.3

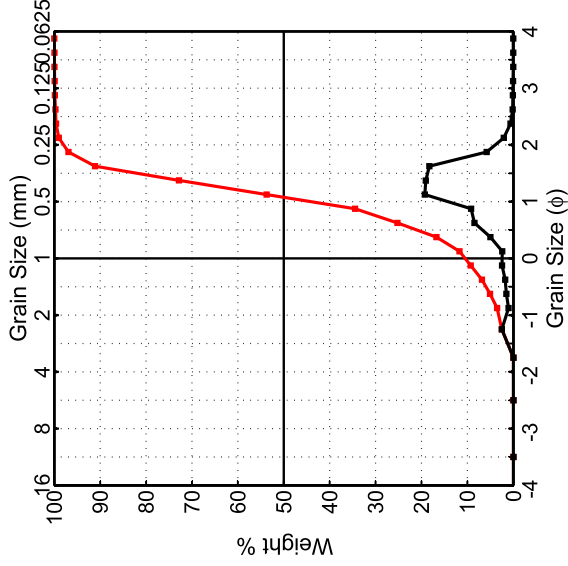
Class Limit			Weight %Cum. Wt %			Percentiles			Moment Measures (phi) (mm)		
(phi)	(phi)	Weight (gram)	(phi)	(phi)	Weight %Cum. Wt %	1	5	16	Mean	Standard Deviation	Skewness
-4	-4.5	0.00	0.00	0.00	0.00	-1.310	-0.325	0.00	0.776	0.584	-0.347
-3	-3.5	0.00	0.00	0.00	0.00	0.275	0.00	0.00	0.529	0.693	8.452
-2	-2.5	0.00	0.00	0.00	0.00	0.435	0.00	0.00			
-1.5	-1.75	0.00	0.00	0.00	0.00	0.705	1.13	1.13			
-1	-1.25	1.35	1.13	1.13	1.13	0.955	1.17	2.86			
-0.75	-0.875	0.67	0.56	1.69	1.69		1.57	4.43			
-0.5	-0.625	1.40	1.17	2.86	4.43		2.74	7.17			
-0.25	-0.375	1.87	1.57	4.43	7.17		3.28	10.45			
0	-0.125	3.27	2.74	7.17	10.45		9.26	19.71			
0.25	0.125	3.92	3.28	10.45	19.71		22.20	41.91			
0.5	0.375	11.06	9.26	19.71	22.20		25.32	67.23			
0.75	0.625	26.51	22.20	41.91	67.23		23.85	91.08			
1	0.875	30.24	25.32	67.23	91.08		6.41	97.49			
1.25	1.125	28.48	23.85	91.08	97.49		1.01	98.50			
1.5	1.375	7.66	6.41	97.49	98.50		0.26	98.76			
1.75	1.625	1.21	1.01	98.50	98.76		0.23	99.00			
2	1.875	0.32	0.26	98.76	99.00		0.26	99.26			
2.25	2.125	0.28	0.23	99.00	99.26		0.15	99.41			
2.5	2.375	0.32	0.26	99.26	99.41		0.12	99.61			
2.75	2.625	0.18	0.15	99.41	99.61		0.20	99.61			
3	2.875	0.24	0.20	99.61	99.61		0.12	99.73			
3.25	3.125	0.14	0.12	99.73	99.73		0.13	99.86			
3.5	3.375	0.16	0.13	99.86	99.86		0.04	99.92			
3.75	3.625	0.08	0.06	99.92	99.92		0.04	99.96			
4	3.875	0.05	0.04	99.96	99.96						
>4.0	4.25	0.05	0.04	99.96	100.00						

Graphic Phi Parameternan			Folk & Ward		
1952			1957		
Mean	0.662	0.677			
Standard Deviation	0.387	0.437			
Skewness (1)	-0.110	-0.197			
Skewness (2)	-0.587				
Kurtosis	1.071	1.265			

Grain Size Distribution



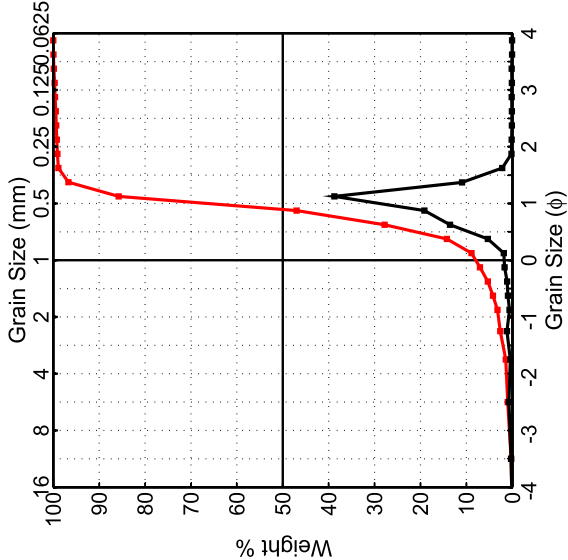
Grain Size Distribution



Class Limit			Weight %Cum. Wt %			Percentiles			Moment Measures (phi) (mm)														
(ϕ)	(ϕ)	(gram)	(ϕ)	(gram)	(ϕ)	1	-1.595	5	-0.775	16	0.195	25	0.455	50	0.880	75	1.105	84	1.230	95	1.480	99	1.815
-4	-4.5	0.00	0.00	0.00	0.00	1	-1.595	5	-0.775	16	0.195	25	0.455	50	0.880	75	1.105	84	1.230	95	1.480	99	1.815
-3	-3.5	0.00	0.00	0.00	0.00	5	-0.775	16	0.195	25	0.455	50	0.880	75	1.105	84	1.230	95	1.480	99	1.815		
-2	-2.5	0.00	0.00	0.00	0.00	16	0.195	25	0.455	50	0.880	75	1.105	84	1.230	95	1.480	99	1.815				
-1.5	-1.75	0.00	0.00	0.00	0.00	25	0.455	50	0.880	75	1.105	84	1.230	95	1.480	99	1.815						
-1	-1.25	3.95	3.26	3.26	3.26	50	0.880	75	1.105	84	1.230	95	1.480	99	1.815								
-0.75	-0.875	1.33	1.10	4.35	1.61	75	1.105	84	1.230	95	1.480	99	1.815										
-0.5	-0.625	1.95	1.61	5.97	1.91	84	1.230	95	1.480	99	1.815												
-0.25	-0.375	2.32	2.91	7.88	2.91	95	1.480	99	1.815														
0	-0.125	3.52	2.91	10.78	10.78																		
0.25	0.125	4.00	3.30	14.08	14.08																		
0.5	0.375	8.28	6.83	20.91	20.91																		
0.75	0.625	15.29	12.61	33.52	33.52																		
1	0.875	19.31	15.93	49.45	49.45																		
1.25	1.125	34.01	28.05	77.50	77.50																		
1.5	1.375	18.40	15.18	92.68	92.68																		
1.75	1.625	6.82	5.62	98.30	98.30																		
2	1.875	1.11	0.92	99.21	99.21																		
2.25	2.125	0.55	0.46	99.67	99.67																		
2.5	2.375	0.23	0.19	99.86	99.86																		
2.75	2.625	0.05	0.04	99.90	99.90																		
3	2.875	0.02	0.02	99.92	99.92																		
3.25	3.125	0.02	0.02	99.93	99.93																		
3.5	3.375	0.02	0.01	99.95	99.95																		
3.75	3.625	0.03	0.02	99.97	99.97																		
4	3.875	0.02	0.02	99.99	99.99																		
>4.0	4.25	0.01	0.01	100.00	100.00																		

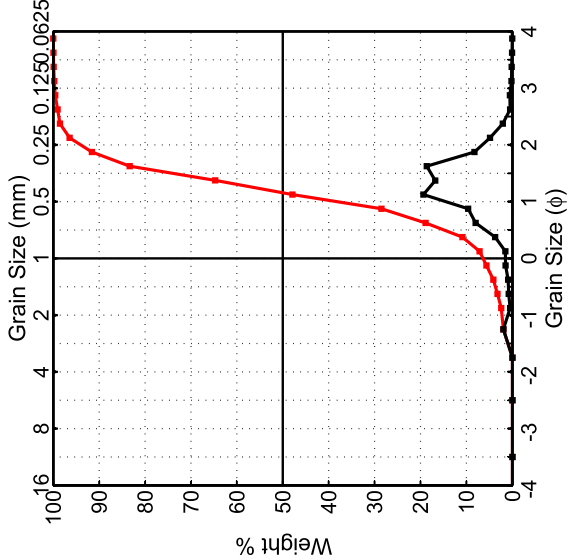
Graphic Phi Parameters			Folk & Ward		
1952			1957		
Mean	0.712	0.768			
Standard Deviation	0.518	0.600			
Skewness (1)	-0.324	-0.396			
Skewness (2)	-1.019				
Kurtosis	1.179	1.422			

Grain Size Distribution



Project 2403
Location Buxton, NC
Date October 2014
Station Bux 35
Interval 0-6 ft Comp
Mean 0.551 mm
STD 0.633 mm
Skewness -2.347
USCS Wentworth
SP Coarse Sand
Medium Sand Moderately Well Sort
Poorly Graded Strongly Coarse Skew
Very Leptokurtic
Total weight (gram) 129.45
% finer than 4.00 phi 0.03
% coarser than -1.00 phi 2.63
% CaCO₃ 15.6

Grain Size Distribution

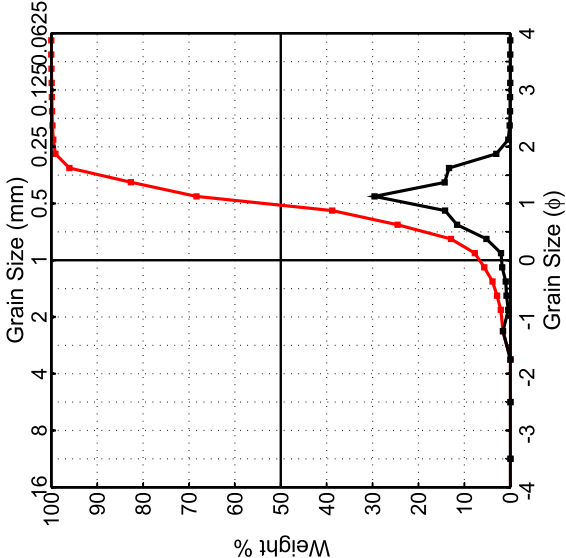


Project 2403
Location Buxton, NC
Date October 2014
Station Bux 34
Interval 0-6 ft Comp
Mean 0.431 mm
STD 0.617 mm
Skewness -0.960
USCS Wentworth
SP Medium Sand
Medium Sand Moderately Well Sort
Poorly Graded Coarse Skewed
Leptokurtic
Total weight (gram) 109.25
% finer than 4.00 phi 0.03
% coarser than -1.00 phi 1.94
% CaCO₃ 12.4

Class Limit			Weight % Cumm. Wt %			Percentiles			Moment Measures (phi) (mm)		
(phi)	(phi)	Weight (gram)									
-4	-4.5	0.00	0.00	0.00	1	-2.520	0.860	0.551			
-3	-3.5	0.34	0.27	0.27	5	-0.450	0.660	0.633			
-2	-2.5	0.97	0.75	1.02	16	0.405	-2.347				
-1.5	-1.75	0.56	0.44	1.45	25	0.575	14.678				
-1	-1.25	1.53	1.18	2.63	50	0.895					
-0.75	-0.875	0.79	0.61	3.24	75	1.055					
-0.5	-0.625	1.26	0.98	4.22	84	1.115					
-0.25	-0.375	1.46	1.13	5.35	95	1.335					
0	-0.125	2.20	1.70	7.05	99	1.780					
0.25	0.125	2.39	1.85	8.89							
0.5	0.375	6.93	5.35	14.25							
0.75	0.625	17.56	13.56	27.81							
1	0.875	24.82	19.17	46.98							
1.25	1.125	50.15	38.74	85.72							
1.5	1.375	14.16	10.94	96.67							
1.75	1.625	2.87	2.22	98.88							
2	1.875	0.25	0.19	99.07							
2.25	2.125	0.20	0.15	99.23							
2.5	2.375	0.15	0.12	99.34							
2.75	2.625	0.11	0.09	99.43							
3	2.875	0.19	0.15	99.58							
3.25	3.125	0.14	0.11	99.68							
3.5	3.375	0.22	0.17	99.85							
3.75	3.625	0.10	0.08	99.93							
4	3.875	0.06	0.04	99.97							
>4.0	4.25	0.03	0.03	100.00							

Graphic Phi Parameters			Folk & Ward		
1952			1957		
Mean	0.760	0.805			
Standard Deviation	0.355	0.448			
Skewness (1)	-0.380	-0.444			
Skewness (2)	-1.275				
Kurtosis	1.514	1.524			

Grain Size Distribution



Project 2403
Location Buxton, NC
Date October 2014

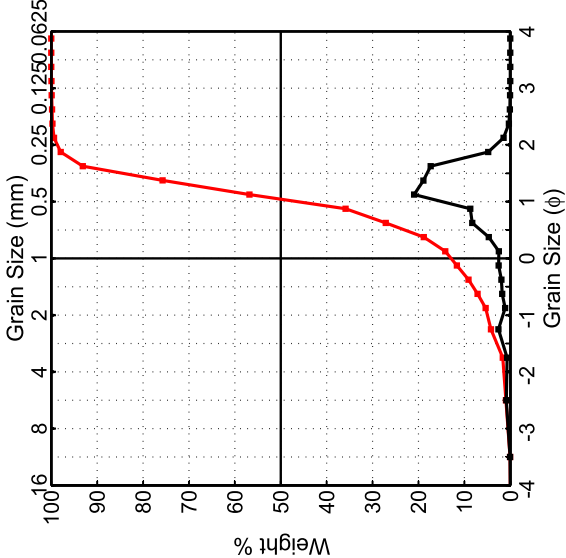
Station Bux 37
Interval 0-6 ft Comp

Mean 0.496 mm
STD 0.669 mm
Skewness -1.236

USCS Wentworth
SP Medium Sand
Moderately Well Sorted
Poorly Graded
Coarse Skewed
Leptokurtic

Total weight (gram) 113.95
% finer than 4.00 phi 0.01
% coarser than -1.00 phi 1.60
% CaCO₃ 18.1

Grain Size Distribution



Project 2403
Location Buxton, NC
Date October 2014

Station Bux 36
Interval 0-6 ft Comp

Mean 0.513 mm
STD 0.564 mm
Skewness -1.667

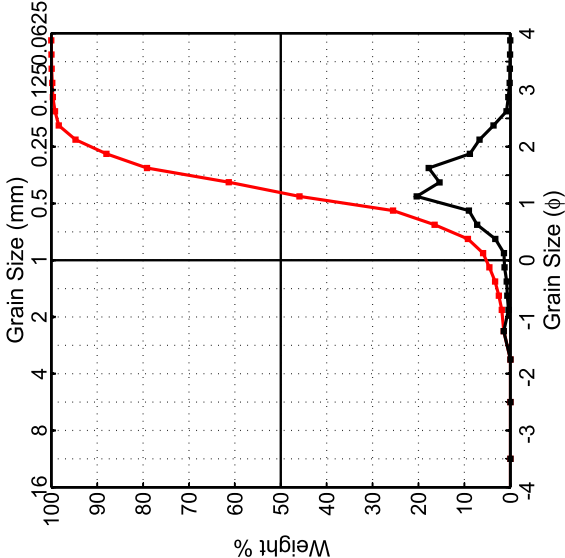
USCS Wentworth
SP Coarse Sand
Moderately Sorted
Poorly Graded
Strongly Coarse Skew
Leptokurtic

Total weight (gram) 113.89
% finer than 4.00 phi 0.01
% coarser than -1.00 phi 4.24
% CaCO₃ 19.0

Class Limit			Weight %Cum. Wt %			Percentiles			Moment Measures (phi) (mm)		
(phi)	(phi)	(gram)	(phi)	(phi)	(gram)	1	-1.440	0.00	Mean	1.010	0.496
-4	-4.5	0.00	0.00	0.00	0.00	5	-0.220	0.00	Standard Deviation	0.581	0.669
-3	-3.5	0.00	0.00	0.00	0.00	16	0.440	0.00	Skewness	-1.236	
-2	-2.5	0.00	0.00	0.00	0.00	25	0.635	0.00	Kurtosis	6.568	
-1.5	-1.75	0.00	0.00	0.00	0.00	50	0.970	1.60	Dispersion		
-1	-1.25	1.83	1.60	1.60	1.60	75	1.240	2.07	Standard Deviation		
-0.75	-0.875	0.53	0.47	0.83	2.90	84	1.400	2.90	Deviation from Normal		
-0.5	-0.625	0.95	0.83	2.90	3.90	95	1.605	5.69			
-0.25	-0.375	1.14	1.00	3.90	5.69	99	1.865	12.94			
0	-0.125	2.04	1.79	5.69	12.94			24.95			
0.25	0.125	2.32	2.03	7.73	11.61			38.79			
0.5	0.375	5.94	5.22	12.94	14.24			68.36			
0.75	0.625	13.23	11.61	24.95	29.58			82.66			
1	0.875	16.22	14.24	38.79	33.70			96.01			
1.25	1.125	33.70	29.58	68.36	14.29			99.01			
1.5	1.375	16.29	14.29	82.66	13.36			99.57			
1.75	1.625	15.22	13.36	96.01	3.09			99.73			
2	1.875	3.52	3.09	99.01	0.47			99.81			
2.25	2.125	0.53	0.47	99.57	0.17			99.87			
2.5	2.375	0.19	0.17	99.73	0.07			99.91			
2.75	2.625	0.08	0.07	99.81	0.06			99.95			
3	2.875	0.07	0.06	99.87	0.04			99.97			
3.25	3.125	0.05	0.04	99.91	0.04			99.97			
3.5	3.375	0.04	0.04	99.95	0.02			99.99			
3.75	3.625	0.02	0.02	99.97	0.02			100.00			
4	3.875	0.02	0.02	99.99	0.01						
>4.0	4.25	0.02	0.01	100.00							
Graphic Phi Parameters											
1952						Folk & Ward 1957					
Mean						Mean					
Standard Deviation						Standard Deviation					
Skewness (1)						Skewness (1)					
Skewness (2)						Skewness (2)					
Kurtosis						Kurtosis					

Class Limit			Weight %Cum. Wt %			Percentiles			Moment Measures (phi) (mm)		
(phi)	(phi)	(gram)	(phi)	(phi)	(gram)	1	-2.450	0.00	Mean	0.964	0.513
-4	-4.5	0.00	0.00	0.00	0.00	5	-1.000	0.07	Standard Deviation	0.826	0.564
-3	-3.5	0.08	0.07	0.07	0.07	16	0.225	0.95	Skewness	-1.667	
-2	-2.5	1.01	0.89	0.89	0.89	25	0.560	1.65	Kurtosis	6.615	
-1.5	-1.75	0.80	0.70	1.65	4.24	50	1.045	2.59	Dispersion		
-1	-1.25	2.95	2.59	1.78	5.38	75	1.365	7.15	Standard Deviation		
-0.75	-0.875	1.29	1.13	9.10	7.15	84	1.495	11.65	Deviation from Normal		
-0.5	-0.625	2.02	1.78	9.10	9.10	95	1.725	14.16			
-0.25	-0.375	2.21	1.94	11.65	11.65	99	2.060	18.84			
0	-0.125	2.91	2.55	14.16	14.16			27.15			
0.25	0.125	2.86	2.51	14.16	14.16			35.87			
0.5	0.375	5.33	4.68	18.84	18.84			56.82			
0.75	0.625	9.46	8.31	27.15	27.15			75.74			
1	0.875	9.93	8.72	35.87	35.87			93.10			
1.25	1.125	23.86	20.95	56.82	56.82			97.92			
1.5	1.375	21.55	18.92	75.74	75.74			99.38			
1.75	1.625	19.77	17.36	93.10	93.10			99.72			
2	1.875	5.49	4.82	97.92	97.92			99.81			
2.25	2.125	1.67	1.47	99.38	99.38			99.87			
2.5	2.375	0.39	0.34	99.72	99.72			99.91			
2.75	2.625	0.10	0.09	99.81	99.81			99.93			
3	2.875	0.09	0.08	99.89	99.89			99.93			
3.25	3.125	0.05	0.04	99.93	99.93			99.97			
3.5	3.375	0.04	0.04	99.97	99.97			99.99			
3.75	3.625	0.02	0.02	99.99	99.99			100.00			
4	3.875	0.01	0.01	99.99	99.99						
>4.0	4.25	0.01	0.01	100.00							
Graphic Phi Parameters											
1952						Folk & Ward 1957					
Mean						Mean					
Standard Deviation						Standard Deviation					
Skewness (1)						Skewness (1)					
Skewness (2)						Skewness (2)					
Kurtosis						Kurtosis					

Grain Size Distribution



Project	2403
Location	Buxton, NC
Date	October 2014
Station	Bux 38
Interval	0-6 ft Comp
Mean	0.411 mm
STD	0.622 mm
Skewness	-0.857
USCS	Wentworth
SP	Medium Sand
Fine Sand	Moderately Well Sorted
Poorly Graded	Coarse Skewed
Leptokurtic	
Total weight (gram)	118.37
% finer than 4.00 phi	0.03
% coarser than -1.00 phi	1.45
% CaCO ₃	10.8

Class Limit (phi)	Mid Point (phi)	Weight (gram)	Weight %	Cum. Wt %	Percentiles		Moment Measures (phi) (mm)	
					1	5	Mean	Standard Deviation
-4	-4.5	0.00	0.00	0.00	-1.405	-0.050	1.281	0.411
-3	-3.5	0.00	0.00	0.00	0.610	0.610	0.684	0.622
-2	-2.5	0.00	0.00	0.00	0.860	0.860	-0.857	
-1.5	-1.75	0.00	0.00	0.00	1.190	1.190	5.425	
-1	-1.25	1.71	1.45	1.45	1.565	1.565		
-0.75	-0.875	0.49	0.41	1.86	1.765	1.765		
-0.5	-0.625	0.78	0.66	2.52	2.145	2.145		
-0.25	-0.375	0.94	0.79	3.31				
0	0.0	1.50	1.27	4.57				
0.25	0.125	1.64	1.39	5.96				
0.5	0.375	3.91	3.30	9.26				
0.75	0.625	8.56	7.23	16.49				
1	0.875	10.71	9.05	25.54				
1.25	1.125	24.12	20.38	45.92				
1.5	1.375	18.25	15.42	61.34				
1.75	1.625	21.05	17.78	79.12				
2	1.875	10.45	8.83	87.95				
2.25	2.125	7.97	6.73	94.68				
2.5	2.375	4.34	3.67	98.35				
2.75	2.625	0.98	0.83	99.18				
3	2.875	0.55	0.46	99.65				
3.25	3.125	0.16	0.14	99.78				
3.5	3.375	0.13	0.11	99.89				
3.75	3.625	0.06	0.05	99.94				
4	3.875	0.04	0.03	99.97				
>4.0	4.25	0.04	0.03	100.00				

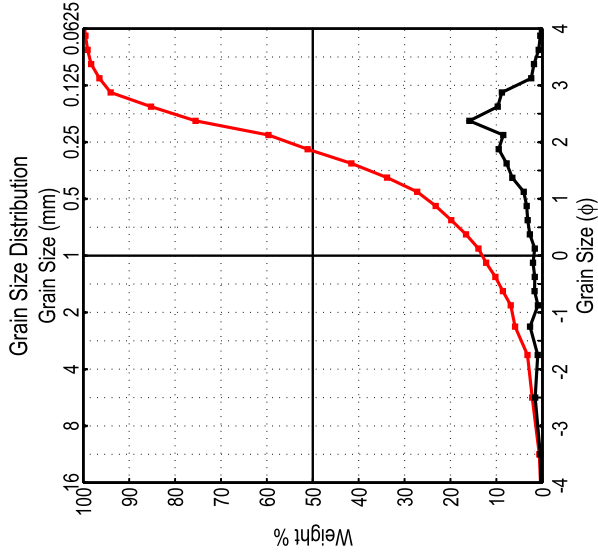
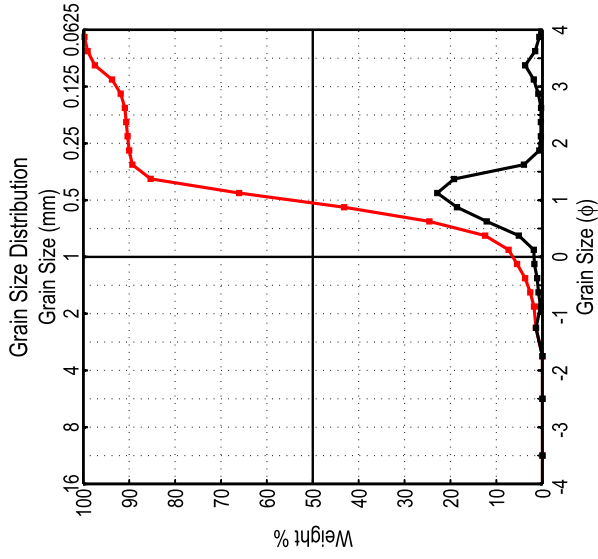
Graphic Phi Parameters			
1952	1957	1957	1957
Mean	1.188	1.188	1.188
Standard Deviation	0.578	0.578	0.621
Skewness (1)	-0.004	-0.004	-0.067
Skewness (2)	-0.247	-0.247	
Kurtosis	0.900	0.900	1.276

ATTACHMENT 3D

SAMPLE GRAIN SIZE DISTRIBUTIONS (GSDs)

Composite Core Samples

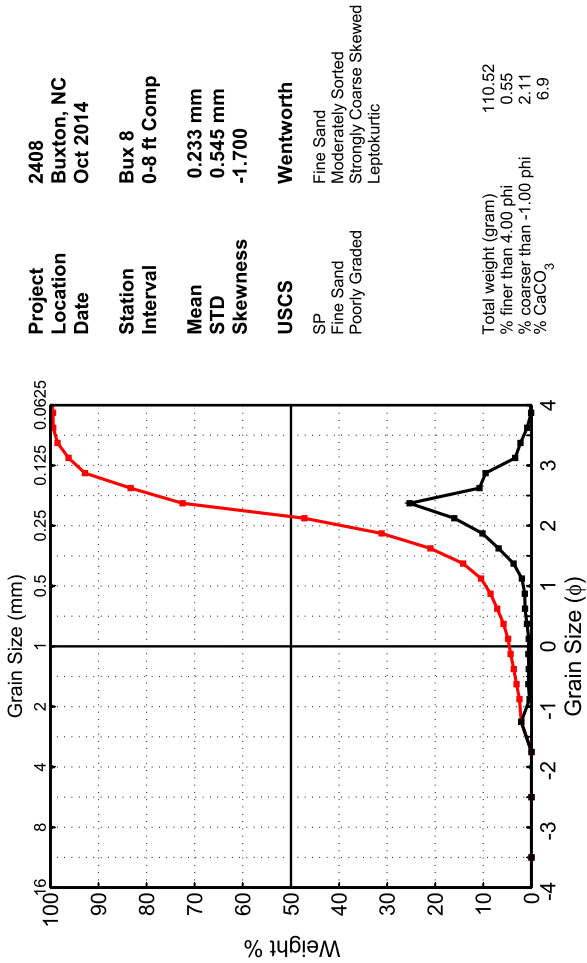
Upper 8 ft of Section by Core



Class Limits	Mid Point (ϕ)	Weight (gram)	Weight %	Cumm. Wt %	Percentiles	Moment Measures	(phi)	(mm)
-4	-4.5	0.00	0.00	0.00	1	-1.395	Mean	1.156
-3	-3.5	0.00	0.00	0.00	5	-0.195	Standard Deviation	0.449
-2	-2.5	0.00	0.00	0.00	16	0.450	Skewness	0.976
-1.5	-1.75	0.00	0.00	0.00	25	0.630	Kurtosis	5.521
-1	-1.25	1.68	1.40	1.40	50	0.950	Dispersion	
-0.75	-0.875	0.48	0.40	1.80	75	1.240	Standard Deviation	
-0.5	-0.625	1.01	0.84	2.65	84	1.360	Deviation from Normal	
-0.25	-0.375	1.35	1.13	3.77	95	3.210		
0	-0.125	2.07	1.73	5.50	99	3.620		
0.25	0.125	2.22	1.85	7.35				
0.5	0.375	6.14	5.12	12.47				
0.75	0.625	14.53	12.11	24.59				
1	0.875	22.28	18.58	43.16				
1.25	1.125	27.46	22.90	66.06				
1.5	1.375	23.09	19.26	85.31				
1.75	1.625	4.79	3.99	89.31				
2	1.875	0.92	0.68	89.99				
2.25	2.125	0.39	0.32	90.32				
2.5	2.375	0.39	0.32	90.64				
2.75	2.625	0.33	0.28	90.92				
3	2.875	1.08	0.90	91.82				
3.25	3.125	2.26	1.86	93.70				
3.5	3.375	4.51	3.76	97.46				
3.75	3.625	1.90	1.58	99.05				
4	3.875	0.81	0.68	99.72				
>4.0	4.25	0.33	0.28	100.00				
					Folk & Ward			
					Graphic Phi Parameters	Inman	1952	1957
					Mean		0.905	0.920
					Standard Deviation		0.455	0.743
					Skewness (1)		-0.099	0.114
					Skewness (2)		1.225	
					Kurtosis		2.742	2.288

Class Limits		Mid Point	Weight	Weight %	Cumm. Wt %	Percentiles		Moment Measures		(phi)	(mm)
(ø)	(ø)	(ø)	(gram)			1	-3.280	Mean		1.629	0.323
-4	-4.5	0.23	0.23	0.19	0.19	5	-1.425	Standard Deviation		1.330	0.398
-3	-3.5	0.56	0.56	0.46	0.66	16	0.315	Skewness		-1.376	
-2	-2.5	1.88	1.88	1.57	2.23	25	0.985	Kurtosis		5.201	
-1.5	-1.75	1.22	1.22	1.02	3.25	50	1.845	Dispersion			
-1	-1.25	3.20	3.20	2.68	5.93	75	2.365	Standard Deviation			
-0.75	-0.875	1.14	1.14	0.96	6.88	84	2.595	Deviation from Normal			
-0.5	-0.625	2.05	2.05	1.71	8.60	95	2.975				
-0.25	-0.375	1.96	1.96	1.64	10.24	99	3.610				
0	-0.125	2.43	2.43	2.03	12.27						
0.25	0.125	1.98	1.98	1.65	13.92						
0.5	0.375	3.24	2.71	1.663	16.63						
0.75	0.625	3.84	3.21	19.84	36.47						
1	0.875	4.05	3.39	23.23	60.00						
1.25	1.125	4.84	4.04	27.27	87.27						
1.5	1.375	7.84	6.55	33.82	100.00						
1.75	1.625	9.31	7.79	41.61							
2	1.875	11.38	9.52	51.13							
2.25	2.125	10.18	8.51	59.63							
2.5	2.375	19.00	15.88	75.52							
2.75	2.625	11.61	9.71	85.22							
3	2.875	10.54	8.81	94.03							
3.25	3.125	2.89	2.41	96.44							
3.5	3.375	2.20	1.84	98.28							
3.75	3.625	0.93	0.77	99.05							
4	3.875	0.54	0.45	99.50							
>4.0	4.25	0.60	0.50	100.00							

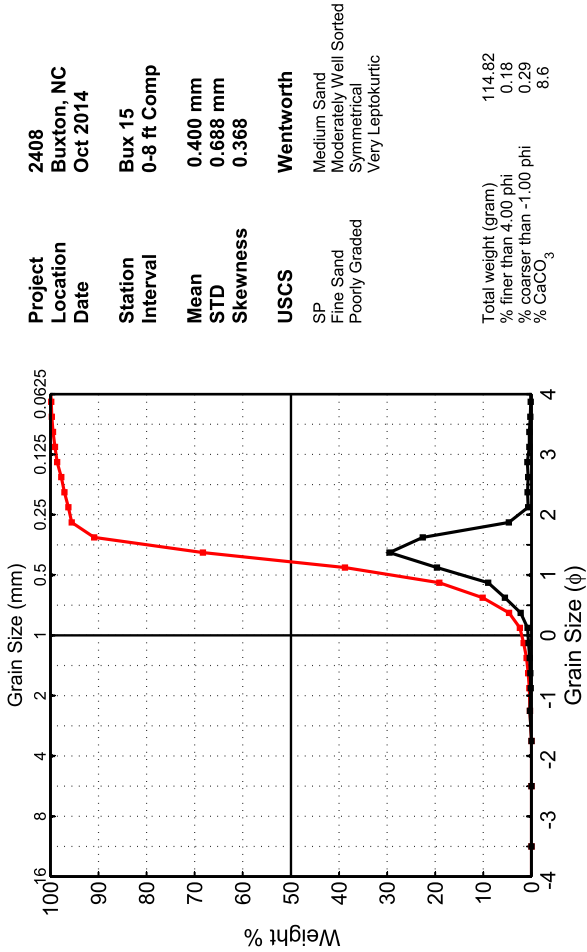
Grain Size Distribution



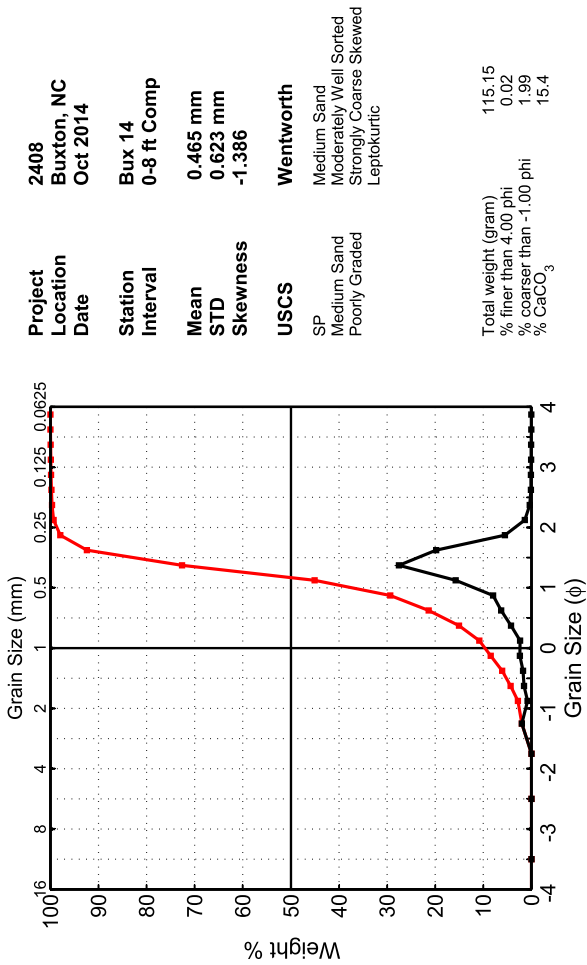
Limits			Weight % Cum. Wt %			Moment Measures		
(phi)	Mid Point (phi)	Weight (gram)						(phi)
-4	-4.5	0.00	0.00	0.00	1	-1.515	Mean	2.103
-3	-3.5	0.00	0.00	0.00	5	0.165	Standard Deviation	0.233
-2	-2.5	0.00	0.00	0.00	16	1.440	Skewness	0.875
-1.5	-1.75	0.00	0.00	0.00			Kurtosis	-1.700
-1	-1.25	2.33	2.11	2.11	25	1.725	Dispersion	7.287
-0.75	-0.875	0.42	0.38	2.49	50	2.155	Standard Deviation	
-0.5	-0.625	0.68	0.61	3.10	75	2.435	Deviation from Normal	
-0.25	-0.375	0.63	0.57	3.67				
0	-0.125	0.70	0.64	4.30	84	2.645		
0.25	0.125	0.59	0.54	4.84	95	3.035		
0.5	0.375	1.03	0.93	5.77	99	3.515		
0.75	0.625	1.47	1.33	7.11				
1	0.875	1.53	1.38	8.49				
1.25	1.125	2.19	1.98	10.47				
1.5	1.375	4.09	3.70	14.17				
1.75	1.625	7.51	6.80	20.97				
2	1.875	11.26	10.19	31.16				
2.25	2.125	17.71	16.02	47.18				
2.5	2.375	28.00	25.33	72.51				
2.75	2.625	11.92	10.78	83.29				
3	2.875	10.54	9.54	92.83				
3.25	3.125	3.74	3.38	96.22				
3.5	3.375	2.53	2.29	98.50				
3.75	3.625	0.99	0.89	99.40				
4	3.875	0.07	0.06	99.45				
>4.0	4.25	0.60	0.55	100.00				

Graphic Phi Parameters			Inman 1952		Folk & Ward 1957	
Mean			2.043	2.080		
Standard Deviation			0.603	0.736		
Skewness (1)			-0.187	-0.287		
Kurtosis (2)			-0.921	1.657		

Grain Size Distribution

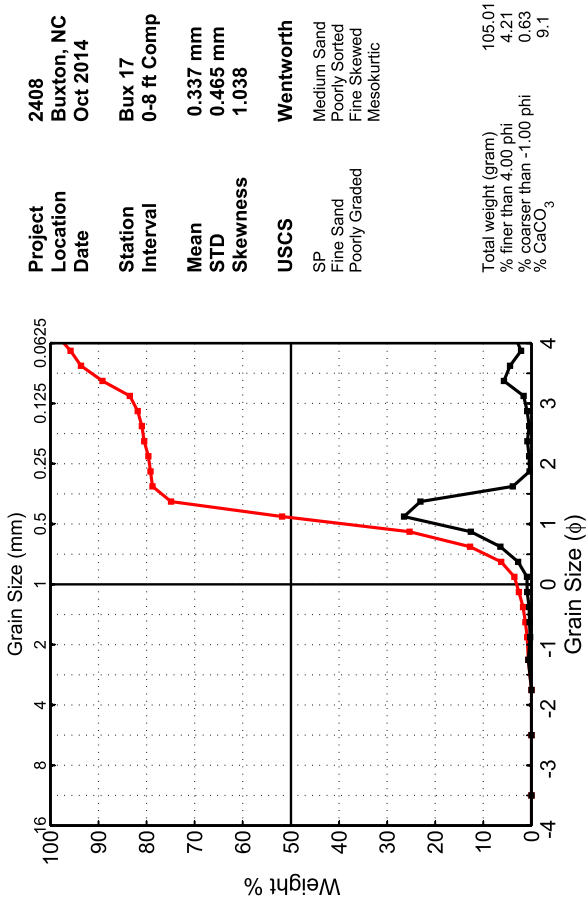


Grain Size Distribution

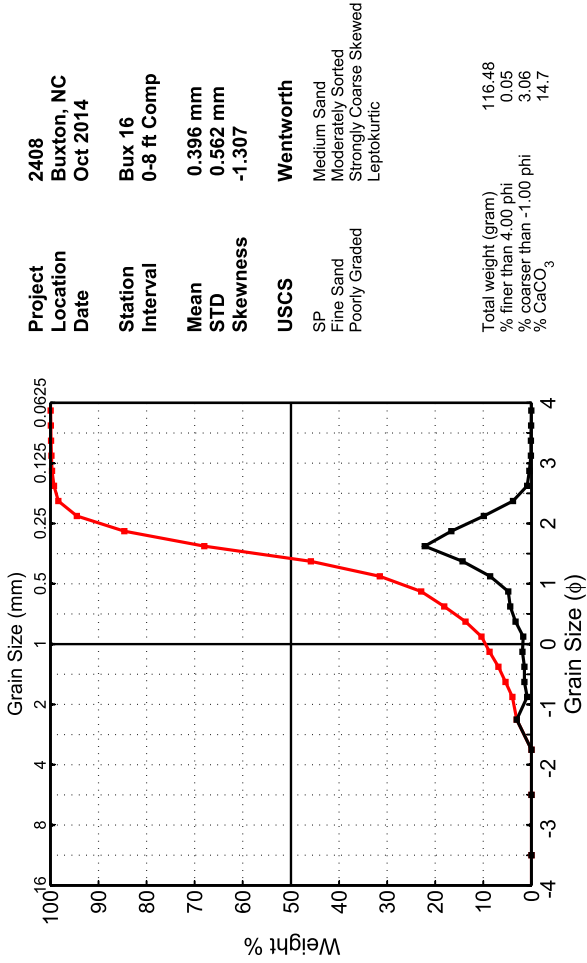


Limits			Weight % Cum. Wt %			Percentiles			Moment Measures			Graphic Phi Parameters			Folk & Ward		
(ϕ)	Mid Point (ϕ)	Weight (gram)															
-4	-4.5	0.00	0.00	0.00	0.00	1	-0.370	5	0.390	16	0.790	Mean	1.321	1.187	1.321	0.400	
-3	-3.5	0.00	0.00	0.00	0.00	5	0.390	16	0.790	25	0.950	Standard Deviation	0.539	0.410	0.539	0.688	
-2	-2.5	0.00	0.00	0.00	0.00	16	0.790	25	0.950	50	1.220	Skewness	0.368	-0.136	0.368		
-1.5	-1.75	0.00	0.00	0.00	0.00	25	0.950	50	1.220	84	1.550	Kurtosis	9.030	0.914	9.030		
-1	-1.25	0.33	0.29	0.29	0.29	50	1.220	84	1.550	95	1.845	Standard Deviation					
-0.75	-0.875	0.14	0.12	0.12	0.41	84	1.550	95	1.845	99	3.115	Deviation from Normal					
-0.5	-0.625	0.28	0.24	0.66	0.66	95	1.845										
-0.25	-0.375	0.38	0.33	0.99	0.99												
0	-0.125	0.70	0.61	1.60	1.60												
0.25	0.125	0.92	0.80	2.40	2.40												
0.5	0.375	2.55	2.22	4.63	4.63												
0.75	0.625	6.33	5.51	10.14	10.14												
1	0.875	10.32	8.99	19.13	19.13												
1.25	1.125	22.55	19.64	38.77	38.77												
1.5	1.375	33.88	29.51	68.28	68.28												
1.75	1.625	25.95	22.60	90.88	90.88												
2	1.875	5.39	4.69	95.58	95.58												
2.25	2.125	0.78	0.68	96.26	96.26												
2.5	2.375	0.93	0.81	97.07	97.07												
2.75	2.625	0.77	0.67	97.74	97.74												
3	2.875	0.96	0.83	98.57	98.57												
3.25	3.125	0.51	0.45	99.02	99.02												
3.5	3.375	0.50	0.43	99.45	99.45												
3.75	3.625	0.27	0.23	99.69	99.69												
4	3.875	0.15	0.13	99.82	99.82												
>4.0	4.25	0.21	0.18	100.00	100.00												

Grain Size Distribution

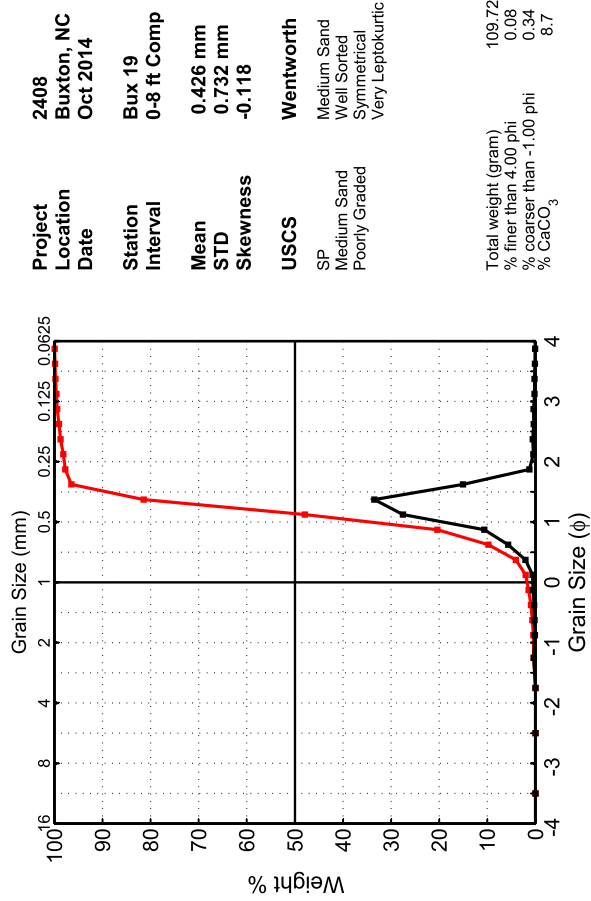


Grain Size Distribution

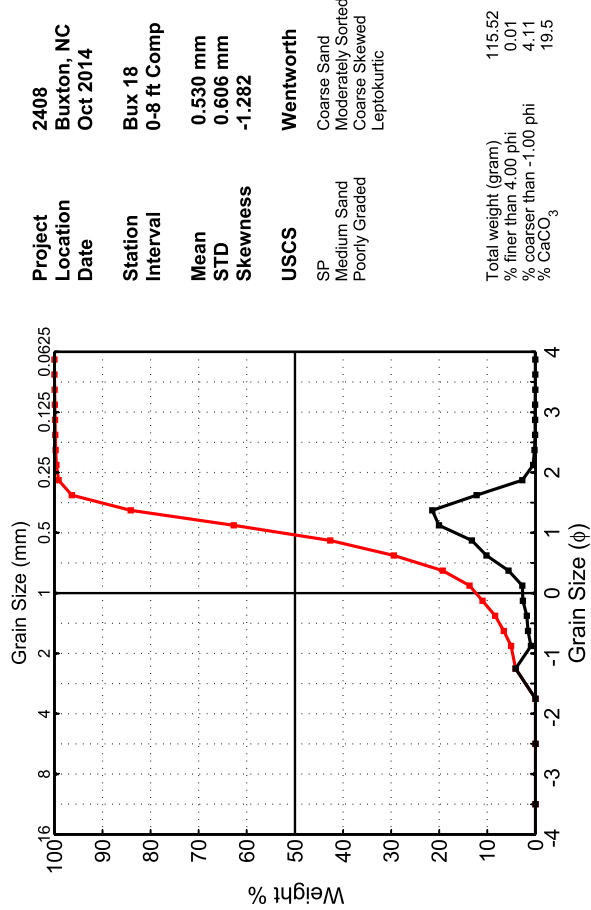


Limits			Weight % Cumm. Wt %			Percentiles			Moment Measures			Graphic Phi Parameters			Folk & Ward		
(phi)	Mid Point (phi)	Weight (gram)															
-4	-4.5	0.00	0.00	0.00	0.00	1	-0.800	Mean	1.568	0.337	1957	1.650	1.920	1.230	1.149	0.588	2.833
-3	-3.5	0.00	0.00	0.00	5	0.260	Standard Deviation	1.106	0.465								
-2	-2.5	0.00	0.00	0.00	16	0.690	Skewness	1.038									
-1.5	-1.75	0.00	0.00	0.00	25	0.870	Kurtosis	3.496									
-1	-1.25	0.66	0.63	0.63	50	1.110	Standard Deviation										
-0.75	-0.875	0.27	0.26	0.89	75	1.380	Deviation from Normal										
-0.5	-0.625	0.39	0.37	1.26	84	3.150											
-0.25	-0.375	0.48	0.46	1.73	95	3.785											
0	-0.125	0.94	0.89	2.62	99	4.000											
0.25	0.125	0.96	0.92	3.54													
0.5	0.375	2.90	2.76	6.30													
0.75	0.625	6.78	6.46	12.75													
1	0.875	13.21	12.58	25.34													
1.25	1.125	27.82	26.49	51.83													
1.5	1.375	24.23	23.07	74.90													
1.75	1.625	4.08	3.88	78.78													
2	1.875	0.40	0.38	79.16													
2.25	2.125	0.50	0.47	79.63													
2.5	2.375	0.89	0.85	80.49													
2.75	2.625	0.50	0.48	80.97													
3	2.875	0.92	0.87	81.84													
3.25	3.125	1.72	1.64	83.47													
3.5	3.375	6.00	5.71	89.19													
3.75	3.625	4.68	4.45	93.64													
4	3.875	2.26	2.15	95.79													
>4.0	4.25	4.42	4.21	100.00													

Grain Size Distribution



Grain Size Distribution



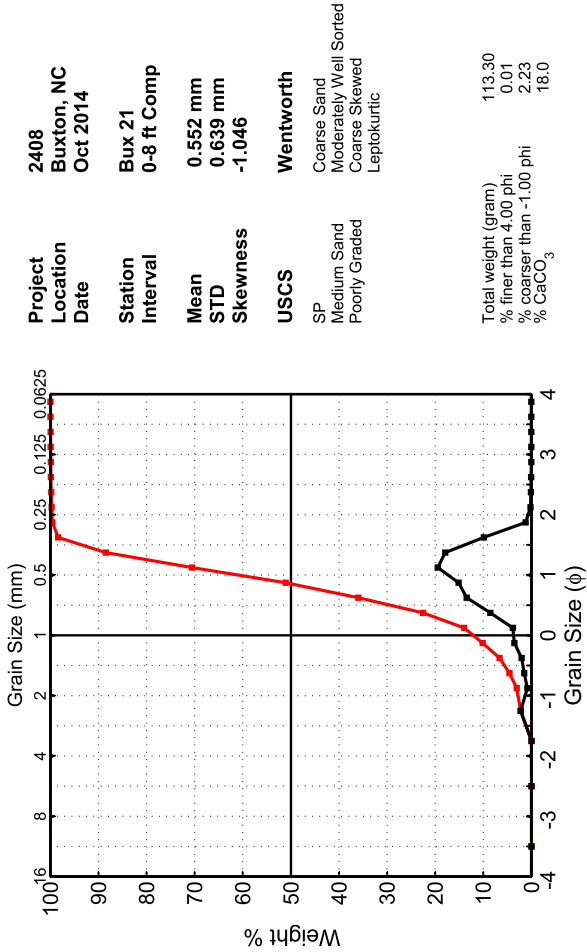
Percentiles			Moment Measures		
Limits (phi)	Mid Point (phi)	Weight (gram)	Weight % Cum. Wt %	Mean	(phi)
-4	-4.5	0.00	0.00	Standard Deviation	(mm)
-3	-3.5	0.00	0.00	Skewness	0.426
-2	-2.5	0.00	0.00	Kurtosis	0.450
-1.5	-1.75	0.00	0.00	Dispersion	-0.118
-1	-1.25	0.00	0.00	Standard Deviation	11.644
-0.75	-0.875	0.12	0.34	Deviation from Normal	
-0.5	-0.625	0.37	0.44		
-0.25	-0.375	0.21	0.19		
0	-0.125	0.30	0.28		
0.25	0.125	0.67	0.53		
0.5	0.375	2.25	2.04		
0.75	0.625	6.21	5.66		
1	0.875	11.67	10.63		
1.25	1.125	30.22	47.93		
1.5	1.375	36.74	81.42		
1.75	1.625	16.52	15.05		
2	1.875	1.37	1.25		
2.25	2.125	0.45	0.41		
2.5	2.375	0.61	0.56		
2.75	2.625	0.36	0.33		
3	2.875	0.41	0.37		
3.25	3.125	0.19	0.18		
3.5	3.375	0.22	0.20		
3.75	3.625	0.10	0.09		
4	3.875	0.06	0.05		
>4.0	4.25	0.08	0.08		

Graphic Phi Parameters			Folk & Ward 1957		
Mean	Standard Deviation	Skewness (1)	Mean	Standard Deviation	Skewness (1)
1.095	0.325	-0.138	0.802	0.573	-0.284
0.823	-0.408	0.823	-1.070	-1.070	-1.070
			1.170	1.170	1.170

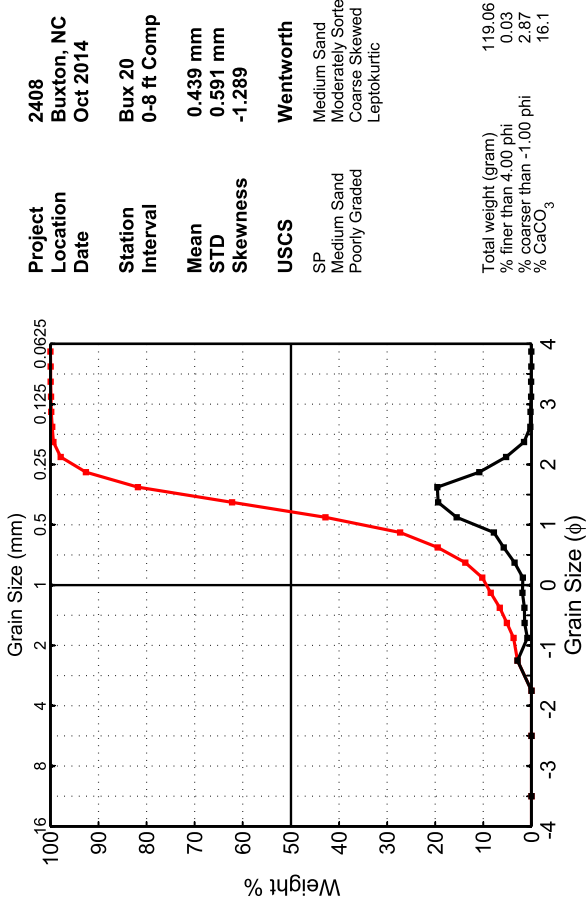
Percentiles			Moment Measures		
Limits (phi)	Mid Point (phi)	Weight (gram)	Weight % Cum. Wt %	Mean	(phi)
-4	-4.5	0.00	0.00	Standard Deviation	(mm)
-3	-3.5	0.00	0.00	Skewness	0.917
-2	-2.5	0.00	0.00	Kurtosis	0.724
-1.5	-1.75	0.00	0.00	Dispersion	-1.282
-1	-1.25	4.74	4.11	Standard Deviation	4.908
-0.75	-0.875	1.08	0.94	Deviation from Normal	
-0.5	-0.625	1.79	1.55		
-0.25	-0.375	2.06	1.78		
0	-0.125	3.01	2.61		
0.25	0.125	3.13	2.71		
0.5	0.375	6.44	5.58		
0.75	0.625	11.74	10.17		
1	0.875	15.28	13.23		
1.25	1.125	23.15	20.04		
1.5	1.375	24.75	21.43		
1.75	1.625	14.13	12.23		
2	1.875	3.16	2.74		
2.25	2.125	0.54	0.46		
2.5	2.375	0.20	0.17		
2.75	2.625	0.08	0.07		
3	2.875	0.07	0.06		
3.25	3.125	0.05	0.04		
3.5	3.375	0.05	0.04		
3.75	3.625	0.03	0.02		
4	3.875	0.02	0.01		
>4.0	4.25	0.02	0.01		

Graphic Phi Parameters			Folk & Ward 1957		
Mean	Standard Deviation	Skewness (1)	Mean	Standard Deviation	Skewness (1)
1.630	0.890	0.230	0.802	0.573	-0.284
5	0.515	0.965	-0.284	-0.284	-0.284
16	1.270	1.375	1.170	1.170	1.170

Grain Size Distribution



Grain Size Distribution



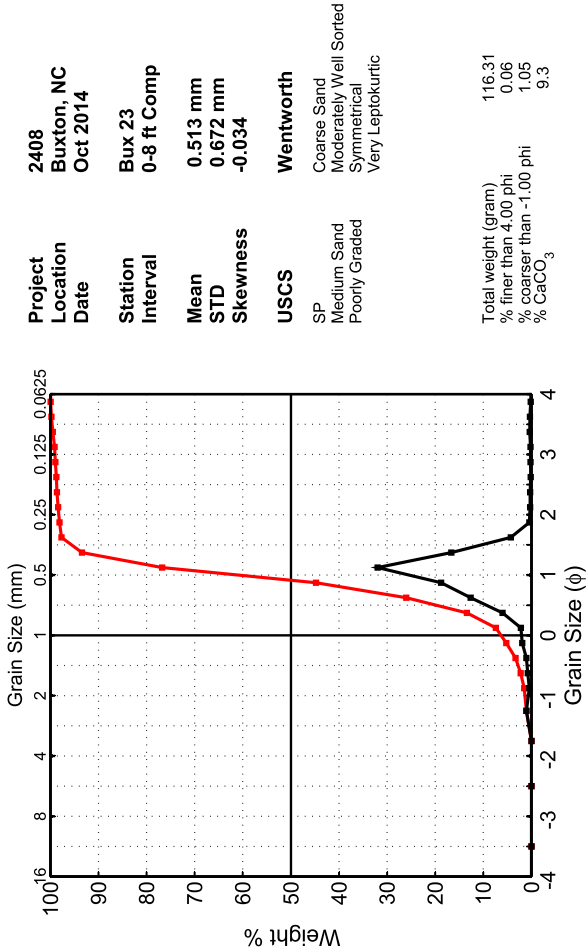
Limits			Percentiles			Moment Measures		
(phi)	Mid Point (phi)	Weight (gram)	Weight % Cum. Wt %	1	5	Mean	Standard Deviation	(phi)
-4	-4.5	0.00	0.00	-1.525	-0.570	0.856	0.552	(mm)
-3	-3.5	0.00	0.00			0.646	0.639	
-2	-2.5	0.00	0.00	16	0.185	Skewness	-1.046	
-1.5	-1.75	0.00	0.00	25	0.420	Kurtosis	4.687	
-1	-1.25	2.52	2.23	50	0.855	Dispersion		
-0.75	-0.875	0.95	0.84	75	1.185	Standard Deviation		
-0.5	-0.625	1.69	1.49			Deviation from Normal		
-0.25	-0.375	2.31	2.04	84	1.315			
0	-0.125	3.99	3.52	95	1.540			
0.25	0.125	4.39	3.87	99	1.760			
0.5	0.375	9.66	8.52					
0.75	0.625	15.23	13.44					
1	0.875	17.15	15.13					
1.25	1.125	22.04	19.46					
1.5	1.375	20.30	17.92					
1.75	1.625	11.22	9.90					
2	1.875	1.35	0.90					
2.25	2.125	0.21	0.19					
2.5	2.375	0.10	0.08					
2.75	2.625	0.05	0.05					
3	2.875	0.04	0.03					
3.25	3.125	0.03	0.03					
3.5	3.375	0.02	0.02					
3.75	3.625	0.02	0.02					
4	3.875	0.01	0.01					
>4.0	4.25	0.01	0.01					

Graphic Phi Parameters			Inman 1952			Folk & Ward 1957		
Mean	Standard Deviation	Skewness (1)	1.075	0.600	1.123	1.188	0.439	
Skewness (2)	Kurtosis		-0.242	-0.912	-0.329	0.758	0.591	
			1.196		1.459	-1.289	5.167	

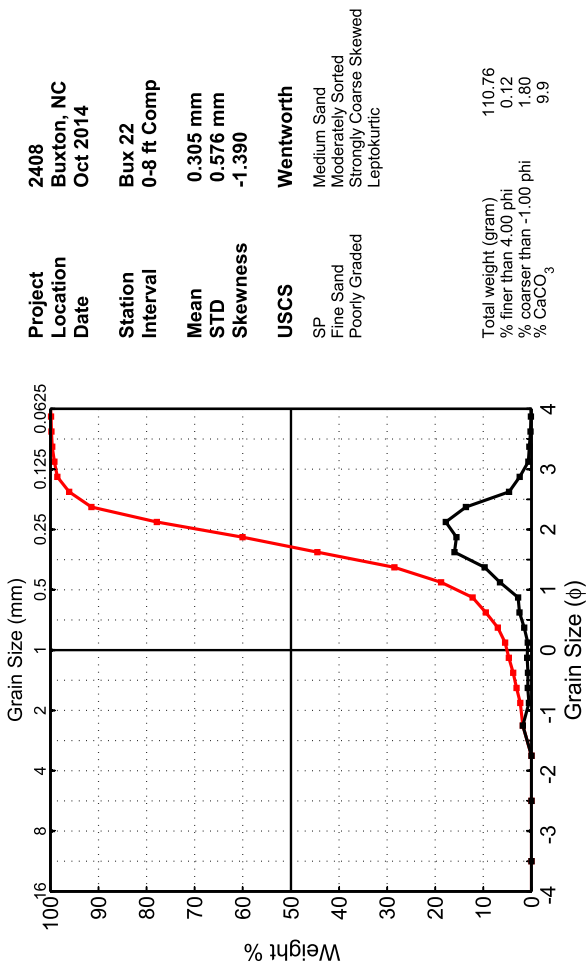
Limits			Percentiles			Moment Measures		
(phi)	Mid Point (phi)	Weight (gram)	Weight % Cum. Wt %	1	5	Mean	Standard Deviation	(phi)
-4	-4.5	0.00	0.00	-1.575	-0.645	0.856	0.552	(mm)
-3	-3.5	0.00	0.00			0.646	0.639	
-2	-2.5	0.00	0.00	16	0.475	Skewness	-1.046	
-1.5	-1.75	0.00	0.00	25	0.800	Kurtosis	4.687	
-1	-1.25	3.42	2.87	50	1.220	Dispersion		
-0.75	-0.875	1.01	0.85	75	1.540	Standard Deviation		
-0.5	-0.625	1.66	1.39			Deviation from Normal		
-0.25	-0.375	1.73	1.45	84	1.675			
0	-0.125	2.23	1.87	95	1.990			
0.25	0.125	2.14	1.80	99	2.310			
0.5	0.375	4.15	3.72					
0.75	0.625	6.84	5.75					
1	0.875	9.31	7.82					
1.25	1.125	18.49	15.53					
1.5	1.375	23.10	19.40					
1.75	1.625	23.29	19.56					
2	1.875	12.68	10.82					
2.25	2.125	6.26	5.82					
2.5	2.375	1.81	1.52					
2.75	2.625	0.28	0.24					
3	2.875	0.22	0.18					
3.25	3.125	0.08	0.06					
3.5	3.375	0.06	0.05					
3.75	3.625	0.04	0.03					
4	3.875	0.02	0.02					
>4.0	4.25	0.04	0.03					

Graphic Phi Parameters			Inman 1952			Folk & Ward 1957		
Mean	Standard Deviation	Skewness (1)	1.075	0.600	1.123	1.188	0.439	
Skewness (2)	Kurtosis		-0.242	-0.912	-0.329	0.758	0.591	
			1.196		1.459	-1.289	5.167	

Grain Size Distribution



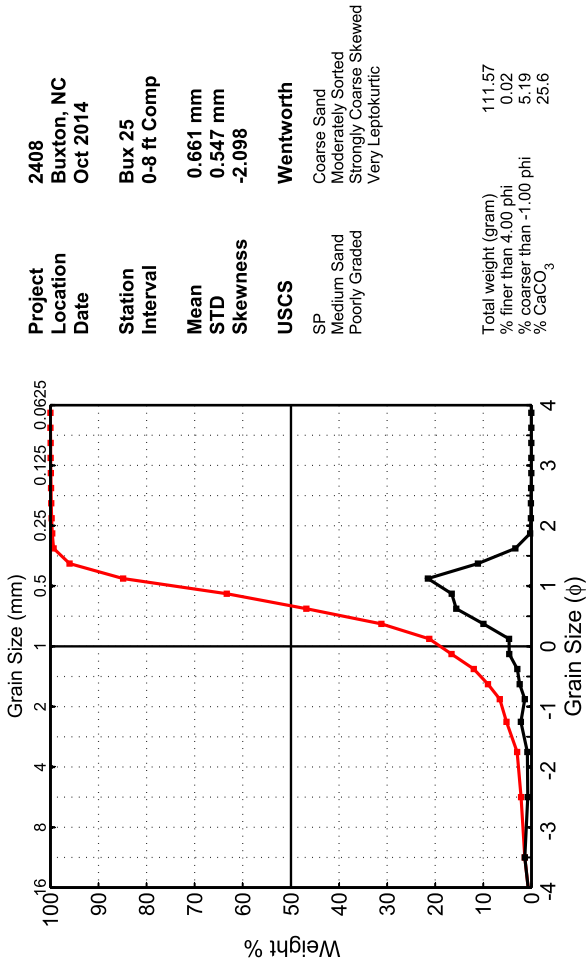
Grain Size Distribution



Limits (phi)			Percentiles			Moment Measures		
-4	-3	-2	1	5	16	Mean	Standard Deviation	Skewness
-1.5	-1.75	-2.5	25	50	75	Kurtosis	Dispersion	Standard Deviation
-0.75	-0.875	-1.25	84	95	99	Deviation from Normal		
-0.5	-0.625	-0.90						
-0.25	-0.375	-0.77						
0	-0.125	-0.23						
0.25	0.125	0.26						
0.5	0.375	0.69						
0.75	0.625	1.05						
1	0.875	1.23						
1.25	1.125	1.48						
1.5	1.375	1.77						
1.75	1.625	2.03						
2	1.875	2.29						
2.25	2.125	2.55						
2.5	2.375	2.81						
2.75	2.625	3.07						
3	2.875	3.33						
3.25	3.125	3.59						
3.5	3.375	3.85						
3.75	3.625	4.11						
4	3.875	4.37						
>4.0								

Limits (phi)			Percentiles			Moment Measures		
-4	-3	-2	1	5	16	Mean	Standard Deviation	Skewness
-1.5	-1.75	-2.5	25	50	75	Kurtosis	Dispersion	Standard Deviation
-0.75	-0.875	-1.25	84	95	99	Deviation from Normal		
-0.5	-0.625	-0.90						
-0.25	-0.375	-0.77						
0	-0.125	-0.23						
0.25	0.125	0.26						
0.5	0.375	0.69						
0.75	0.625	1.05						
1	0.875	1.23						
1.25	1.125	1.48						
1.5	1.375	1.77						
1.75	1.625	2.03						
2	1.875	2.29						
2.25	2.125	2.55						
2.5	2.375	2.81						
2.75	2.625	3.07						
3	2.875	3.33						
3.25	3.125	3.59						
3.5	3.375	3.85						
3.75	3.625	4.11						
4	3.875	4.37						
>4.0								

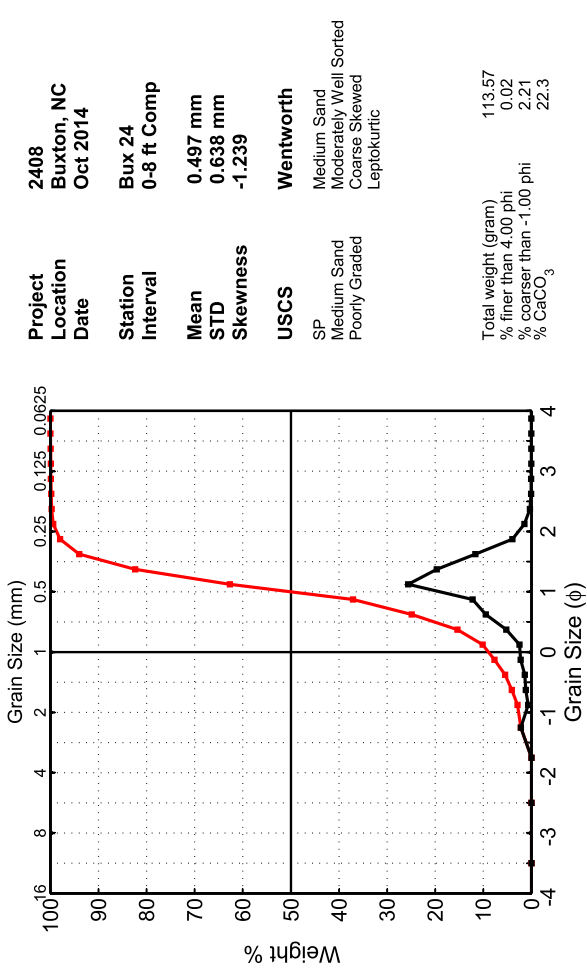
Grain Size Distribution



Percentiles			Moment Measures		
Limits (phi)	Mid Point (phi)	Weight (gram)	Weight % Cum. Wt %	Mean	(phi) (mm)
-4	-4.5	0.00	0.00	Standard Deviation	0.597 0.661
-3	-3.5	1.55	1.39	Skewness	0.871 0.547
-2	-2.5	0.83	0.75	Kurtosis	-2.098 9.540
-1.5	-1.75	0.95	0.85	Dispersion	
-1	-1.25	2.46	2.21	Standard Deviation	
-0.75	-0.875	1.54	1.38	Deviation from Normal	
-0.5	-0.625	2.74	2.45		
-0.25	-0.375	3.29	2.95		
0	-0.125	5.16	4.62		
0.25	0.125	5.17	4.63		
0.5	0.375	11.11	9.96		
0.75	0.625	17.42	15.61		
1	0.875	18.47	16.55		
1.25	1.125	24.02	21.52		
1.5	1.375	12.42	11.13		
1.75	1.625	3.71	3.32		
2	1.875	0.32	0.29		
2.25	2.125	0.13	0.12		
2.5	2.375	0.10	0.09		
2.75	2.625	0.05	0.05		
3	2.875	0.04	0.04		
3.25	3.125	0.03	0.03		
3.5	3.375	0.02	0.02		
3.75	3.625	0.02	0.02		
4	3.875	0.02	0.01		
>4.0	4.25	0.02	0.02		

Graphic Phi Parameters			Inman 1952			Folk & Ward 1957		
Mean	Standard Deviation	Skewness (1)	Skewness (2)	Kurtosis		Mean	Standard Deviation	Skewness (1)
0.480	0.635	-0.307	-1.020	1.083		0.900	0.510	-0.196
0.545	0.718	-0.398				-0.760	1.103	1.352

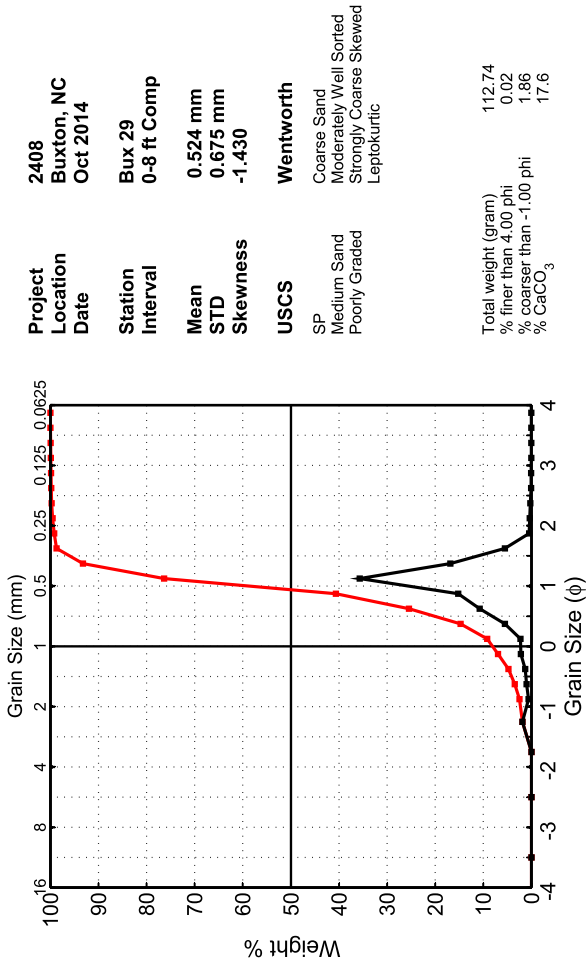
Grain Size Distribution



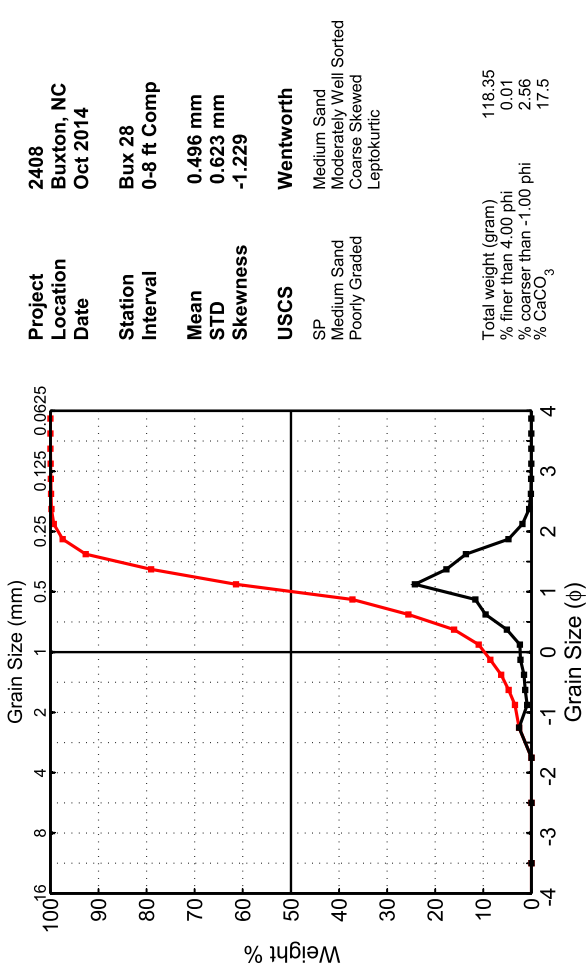
Percentiles			Moment Measures		
Limits (phi)	Mid Point (phi)	Weight (gram)	Weight % Cum. Wt %	Mean	(phi) (mm)
-4	-4.5	0.00	0.00	Standard Deviation	1.009 0.497
-3	-3.5	0.00	0.00	Skewness	0.648 0.638
-2	-2.5	0.00	0.00	Kurtosis	-1.239 5.706
-1.5	-1.75	0.00	0.00	Dispersion	
-1	-1.25	2.51	2.21	Standard Deviation	
-0.75	-0.875	0.78	0.69	Deviation from Normal	
-0.5	-0.625	1.35	1.19		
-0.25	-0.375	1.55	1.37		
0	-0.125	2.53	2.23		
0.25	0.125	2.80	2.46		
0.5	0.375	5.93	5.22		
0.75	0.625	10.78	9.49		
1	0.875	13.86	12.21		
1.25	1.125	29.08	25.61		
1.5	1.375	22.35	19.68		
1.75	1.625	13.24	11.65		
2	1.875	4.48	3.94		
2.25	2.125	1.66	1.46		
2.5	2.375	0.37	0.32		
2.75	2.625	0.09	0.08		
3	2.875	0.06	0.06		
3.25	3.125	0.04	0.04		
3.5	3.375	0.03	0.03		
3.75	3.625	0.02	0.02		
4	3.875	0.01	0.01		
>4.0	4.25	0.03	0.02		

Graphic Phi Parameters			Inman 1952			Folk & Ward 1957		
Mean	Standard Deviation	Skewness (1)	Skewness (2)	Kurtosis		Mean	Standard Deviation	Skewness (1)
0.900	0.510	-0.196	-0.760	1.103		0.933	0.580	-0.279
0.497	0.638	-1.239				1.352		

Grain Size Distribution



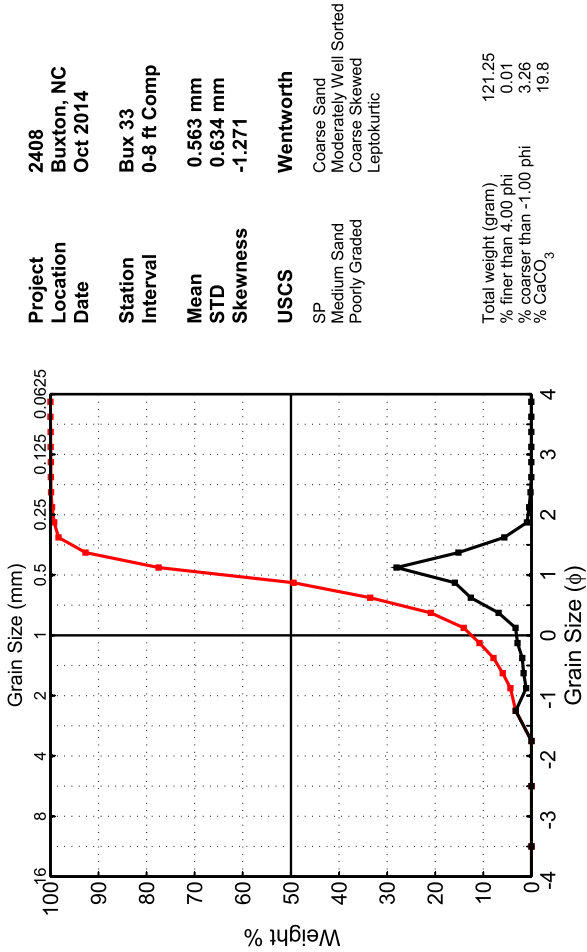
Grain Size Distribution



Limits			Weight % Cum. Wt %			Percentiles			Moment Measures				
(phi)		Mid Point (phi)	Weight (gram)			1	5	16	25	50	75	(phi)	(mm)
-4	-4	-4.5	0.00	0.00	0.00	-1.480	-0.350	0.405	0.615	0.940	1.115	0.934	0.524
-3	-3	-3.5	0.00	0.00	0.00							0.567	0.675
-2	-2	-2.5	0.00	0.00	0.00							-1.430	
-1.5	-1.5	-1.75	0.00	0.00	0.00							7.317	
-1	-1	-1.25	2.10	1.86	1.86								
-0.75	-0.75	-0.875	0.68	0.60	0.60								
-0.5	-0.5	-0.625	1.13	1.01	1.01								
-0.25	-0.25	-0.375	1.45	1.29	1.29								
0	0	-0.125	2.46	2.18	2.18								
0.25	0.25	0.125	2.55	2.26	2.26								
0.5	0.5	0.375	6.20	5.50	14.70								
0.75	0.75	0.625	12.11	10.74	25.45								
1	1	0.875	17.16	15.22	40.66								
1.25	1.25	1.125	40.25	35.70	76.36								
1.5	1.5	1.375	19.00	16.85	93.21								
1.75	1.75	1.625	6.21	5.50	98.72								
2	2	1.875	0.53	0.47	99.19								
2.25	2.25	2.125	0.37	0.33	99.51								
2.5	2.5	2.375	0.23	0.21	99.72								
2.75	2.75	2.625	0.09	0.08	99.80								
3	3	2.875	0.07	0.06	99.86								
3.25	3.25	3.125	0.04	0.04	99.90								
3.5	3.5	3.375	0.04	0.03	99.93								
3.75	3.75	3.625	0.03	0.03	99.96								
4	4	3.875	0.02	0.02	99.98								
>4.0	>4.0	4.25	0.03	0.02	100.00								

Graphic Phi Parameters			Inman 1952		Folk & Ward 1957	
			Mean	0.822	0.862	
			Standard Deviation	0.417	0.482	
			Skewness (1)	-0.281	-0.355	
			Kurtosis (2)	-0.928		
				1.162	1.480	

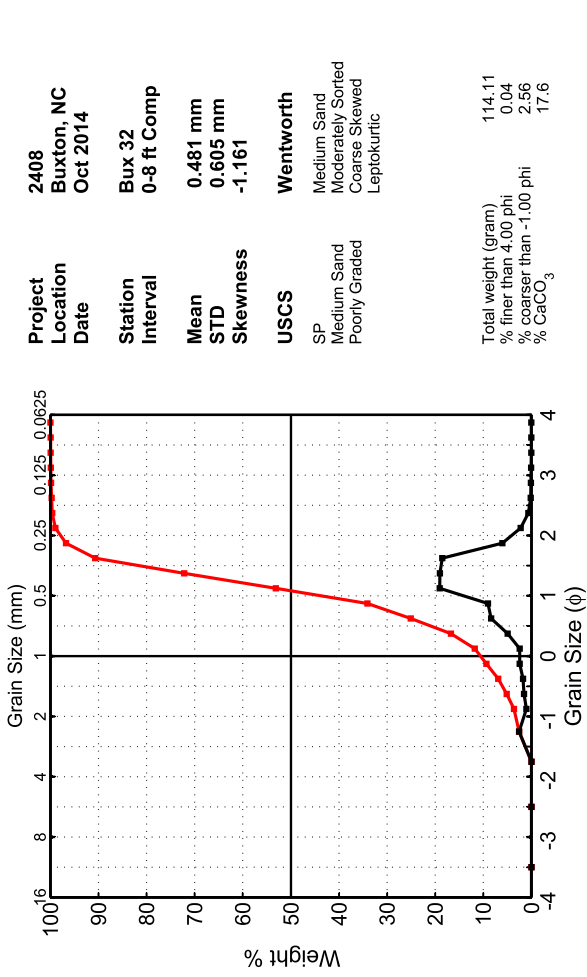
Grain Size Distribution



Percentiles			Moment Measures		
Limits (phi)	Mid Point (phi)	Weight (gram)	Weight % Cum. Wt %	Mean	(phi) (mm)
-4	-4.5	0.00	0.00	Standard Deviation	0.828 0.563
-3	-3.5	0.00	0.00	Skewness	0.658 0.634
-2	-2.5	0.00	0.00	Kurtosis	-1.271 5.240
-1.5	-1.75	0.00	0.00	Dispersion	
-0.75	-1.25	3.95	3.26	Standard Deviation	
-0.5	-0.875	1.33	1.10	Deviation from Normal	
-0.25	-0.625	1.95	1.61		
0	-0.375	2.32	1.91		
0.25	-0.125	3.52	2.91		
0.5	0.125	4.00	3.30		
0.75	0.375	8.28	6.83		
1	0.625	15.29	12.61		
1.25	0.875	19.31	15.93		
1.5	1.125	34.01	28.05		
1.75	1.375	18.40	15.18		
2	1.625	6.82	5.62		
2.25	1.875	1.11	0.92		
2.5	2.125	0.55	0.46		
2.75	2.375	0.23	0.19		
3	2.625	0.05	0.04		
3.25	2.875	0.02	0.02		
3.5	3.125	0.02	0.01		
3.75	3.375	0.03	0.02		
4	3.625	0.02	0.02		
>4.0	4.25	0.01	0.01		

Graphic Phi Parameters			Inman 1952			Folk & Ward 1957		
Mean			0.712			0.768		
Standard Deviation			0.518			0.600		
Skewness (1)			-0.324			-0.396		
Skewness (2)			-1.019					
Kurtosis			1.179			1.422		

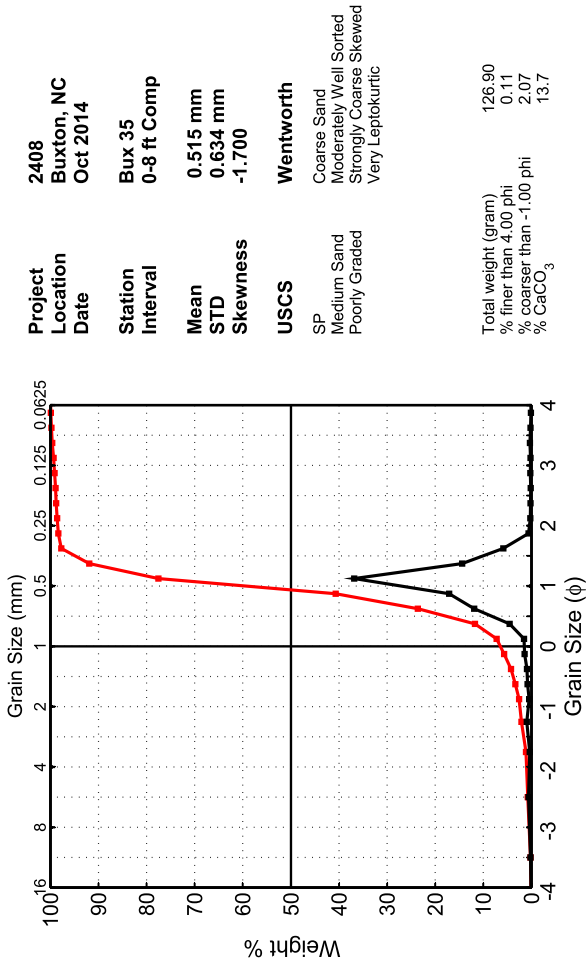
Grain Size Distribution



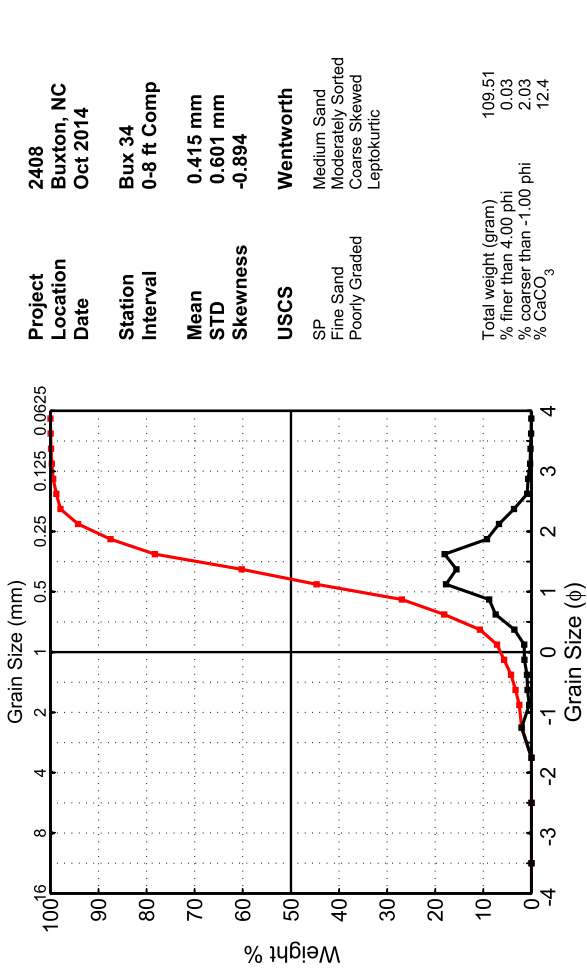
Percentiles			Moment Measures		
Limits (phi)	Mid Point (phi)	Weight (gram)	Weight % Cum. Wt %	Mean	(phi) (mm)
-4	-4.5	0.00	0.00	Standard Deviation	1.057 0.481
-3	-3.5	0.00	0.00	Skewness	0.725 0.605
-2	-2.5	0.00	0.00	Kurtosis	-1.161 4.859
-1.5	-1.75	0.00	0.00	Dispersion	
-0.75	-1.25	2.93	2.56	Standard Deviation	
-0.5	-0.875	1.20	1.05	Deviation from Normal	
-0.25	-0.625	1.75	1.53		
0	-0.375	2.00	1.76		
0.25	-0.125	2.78	2.44		
0.5	0.125	2.77	2.42		
0.75	0.375	5.64	4.94		
1	0.625	9.54	8.36		
1.25	0.875	10.29	9.01		
1.5	1.125	21.74	19.05		
1.75	1.375	21.70	19.02		
2	1.625	21.15	18.53		
2.25	1.875	6.90	6.04		
2.5	2.125	2.53	2.21		
2.75	2.375	0.73	0.84		
3	2.625	0.16	0.14		
3.25	2.875	0.12	0.11		
3.5	3.125	0.06	0.05		
3.75	3.375	0.04	0.04		
4	3.625	0.03	0.02		
>4.0	4.25	0.02	0.02		

Graphic Phi Parameters			Inman 1952			Folk & Ward 1957		
Mean			0.938			0.987		
Standard Deviation			0.598			0.671		
Skewness (1)			-0.247			-0.330		
Skewness (2)			-0.849					
Kurtosis			1.054			1.274		

Grain Size Distribution



Grain Size Distribution



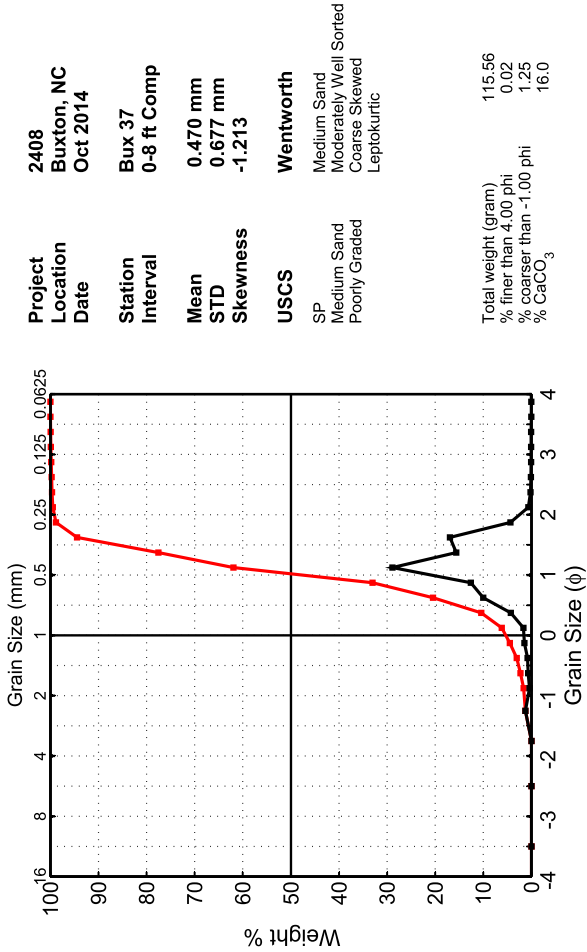
Percentiles			Moment Measures		
Limits (phi)	Mid Point (phi)	Weight (gram)	Weight % Cum. Wt %	Mean	(phi)
-4	-4.5	0.00	0.00	Standard Deviation	(mm)
-3	-3.5	0.26	0.20	Skewness	0.957 0.515
-2	-2.5	0.73	0.57	Kurtosis	0.658 0.634
-1.5	-1.75	0.42	0.33	Dispersion	-1.700
-1	-1.25	1.22	0.96	Standard Deviation	14.388
-0.75	-0.875	0.61	0.48	Deviation from Normal	
-0.5	-0.625	0.99	0.78		
-0.25	-0.375	1.17	0.92		
0	-0.125	1.79	1.41		
0.25	0.125	1.95	1.54		
0.5	0.375	5.73	4.52		
0.75	0.625	15.08	11.89		
1	0.875	21.67	17.08		
1.25	1.125	46.76	36.85		
1.5	1.375	18.25	14.38		
1.75	1.625	7.39	5.82		
2	1.875	0.77	0.61		
2.25	2.125	0.31	0.24		
2.5	2.375	0.25	0.20		
2.75	2.625	0.16	0.12		
3	2.875	0.27	0.21		
3.25	3.125	0.24	0.19		
3.5	3.375	0.37	0.29		
3.75	3.625	0.22	0.17		
4	3.875	0.13	0.10		
>4.0	4.25	0.14	0.11		

Graphic Phi Parameters			Inman 1952			Folk & Ward 1957		
Mean	Standard Deviation	Skewness (1)	1.167	0.613	-0.069	1.182	0.672	-0.135
Standard Deviation	Skewness (2)	Kurtosis	0.971	-0.396	1.302	1.302	0.971	1.302

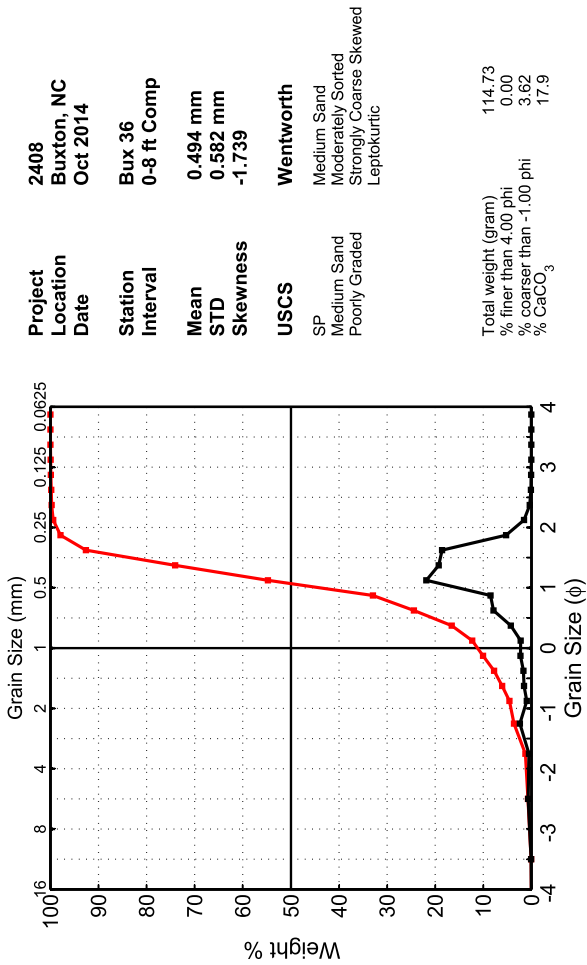
Percentiles			Moment Measures		
Limits (phi)	Mid Point (phi)	Weight (gram)	Weight % Cum. Wt %	Mean	(phi)
-4	-4.5	0.00	0.00	Standard Deviation	(mm)
-3	-3.5	0.00	0.00	Skewness	1.270 0.415
-2	-2.5	0.00	0.00	Kurtosis	0.734 0.601
-1.5	-1.75	0.00	0.00	Dispersion	-0.894
-1	-1.25	2.22	2.03	Standard Deviation	5.191
-0.75	-0.875	0.52	0.48	Deviation from Normal	
-0.5	-0.625	0.87	0.80		
-0.25	-0.375	1.01	0.92		
0	-0.125	1.59	1.45		
0.25	0.125	1.62	1.48		
0.5	0.375	3.88	3.55		
0.75	0.625	8.15	7.44		
1	0.875	9.61	8.77		
1.25	1.125	19.43	17.74		
1.5	1.375	17.06	15.58		
1.75	1.625	19.77	18.06		
2	1.875	10.10	9.22		
2.25	2.125	7.38	6.74		
2.5	2.375	3.99	3.64		
2.75	2.625	0.95	0.87		
3	2.875	0.73	0.67		
3.25	3.125	0.28	0.26		
3.5	3.375	0.21	0.19		
3.75	3.625	0.07	0.07		
4	3.875	0.04	0.03		
>4.0	4.25	0.03	0.03		

Graphic Phi Parameters			Inman 1952			Folk & Ward 1957		
Mean	Standard Deviation	Skewness (1)	1.167	0.613	-0.069	1.182	0.672	-0.135
Standard Deviation	Skewness (2)	Kurtosis	0.971	-0.396	1.302	1.302	0.971	1.302

Grain Size Distribution



Grain Size Distribution



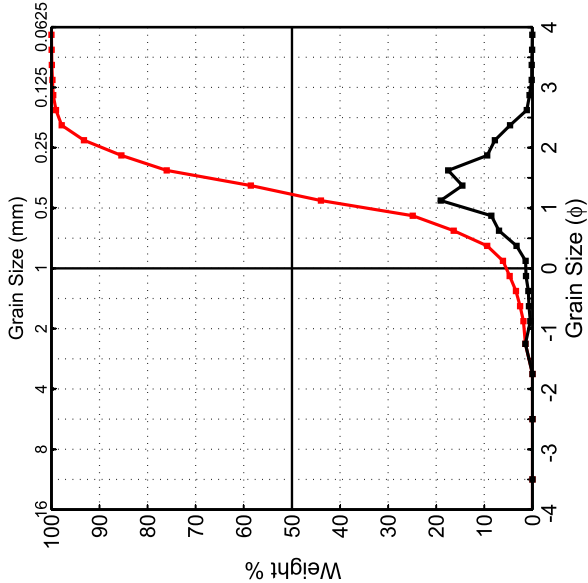
Percentiles			Moment Measures		
Limits (ϕ)	Mid Point (ϕ)	Weight (gram)	Weight % Cum. Wt %	Mean	(ϕ) (mm)
-4	-4.5	0.00	0.00	Standard Deviation	1.088 0.470
-3	-3.5	0.00	0.00	Skewness	0.564 0.677
-2	-2.5	0.00	0.00	Kurtosis	-1.213 6.978
-1.5	-1.75	0.00	0.00	Dispersion	
-0.75	-1.25	1.44	1.25	Standard Deviation	
-0.5	-0.875	0.76	0.66	Deviation from Normal	
-0.25	-0.375	0.91	0.79		
0	-0.125	1.66	1.44		
0.25	0.125	1.91	1.65		
0.5	0.375	4.94	6.13		
0.75	0.625	11.57	10.01		
1	0.875	14.56	33.04		
1.25	1.125	33.38	28.89		
1.5	1.375	18.05	15.62		
1.75	1.625	19.55	16.91		
2	1.875	5.05	4.37		
2.25	2.125	0.75	0.65		
2.5	2.375	0.22	0.19		
2.75	2.625	0.10	0.09		
3	2.875	0.09	0.08		
3.25	3.125	0.06	0.05		
3.5	3.375	0.05	0.04		
3.75	3.625	0.03	0.03		
4	3.875	0.02	0.02		
>4.0	4.25	0.02	0.02		

Graphic Phi Parameters			Inman 1952			Folk & Ward 1957		
Mean			0.992			1.002		
Standard Deviation			0.477			0.497		
Skewness (1)			-0.058			-0.156		
Skewness (2)			-0.455					
Kurtosis			0.785			1.127		

Percentiles			Moment Measures		
Limits (ϕ)	Mid Point (ϕ)	Weight (gram)	Weight % Cum. Wt %	Mean	(ϕ) (mm)
-4	-4.5	0.00	0.00	Standard Deviation	1.018 0.494
-3	-3.5	0.06	0.05	Skewness	0.782 0.582
-2	-2.5	0.76	0.66	Kurtosis	-1.739 7.114
-1.5	-1.75	0.60	0.52	Dispersion	
-0.75	-1.25	2.74	2.39	Standard Deviation	
-0.5	-0.875	1.11	0.96	Deviation from Normal	
-0.25	-0.375	1.74	1.52		
0	-0.125	2.59	1.67		
0.25	0.125	2.58	2.26		
0.5	0.375	4.89	4.26		
0.75	0.625	9.06	7.89		
1	0.875	9.76	8.50		
1.25	1.125	25.04	21.83		
1.5	1.375	22.10	19.26		
1.75	1.625	21.31	18.57		
2	1.875	6.04	5.27		
2.25	2.125	1.74	1.52		
2.5	2.375	0.40	0.35		
2.75	2.625	0.10	0.09		
3	2.875	0.08	0.07		
3.25	3.125	0.04	0.04		
3.5	3.375	0.04	0.03		
3.75	3.625	0.02	0.02		
4	3.875	0.01	0.01		
>4.0	4.25	0.01	0.00		

Graphic Phi Parameters			Inman 1952			Folk & Ward 1957		
Mean			0.927			0.975		
Standard Deviation			0.583			0.677		
Skewness (1)			-0.245			-0.359		
Skewness (2)			-1.034					
Kurtosis			1.185			1.391		

Grain Size Distribution



Project Location Date 2408 Buxton, NC Oct 2014

Station Interval Bux 38 0-8 ft Comp

Mean STD Skewness 0.402 mm 0.612 mm -0.828

USCS Wentworth

SP Medium Sand
Fine Sand Moderately Sorted
Poorly Graded Coarse Skewed
Leptokurtic

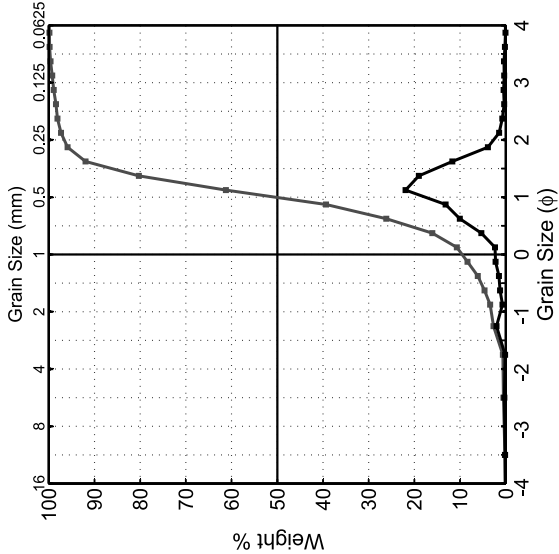
Total weight (gram) 117.86
% finer than 4.00 phi 0.03
% coarser than -1.00 phi 1.45
% CaCO₃ 11.2

Moment Measures			Percentiles		
Mean	(phi)	(mm)	1	-1.405	
Standard Deviation	(phi)	(mm)	5	-0.075	
Skewness			16	0.610	
Kurtosis			25	0.875	
Dispersion			50	1.230	
Standard Deviation			75	1.610	
Deviation from Normal			84	1.835	
			95	2.220	
			99	2.620	
Graphic Phi Parameters			Folk & Ward		
Mean			1952	1957	
Standard Deviation			1.222	1.225	
Skewness (1)			0.613	0.654	
Skewness (2)			-0.012	-0.075	
Kurtosis			-0.257	1.280	
			0.873		

ATTACHMENT 3E

Composite GSDs for Groups of Cores

Grain Size Distribution



Project
Location
Date

Station
Interval

Mean
STD
Skewness

USCS

SP

Total weight (gram)
% finer than 4.00 phi
% coarser than -1.00 phi

2408
Buxton, NC
Oct 2014

BorCompSelect
0-4 ft Comp

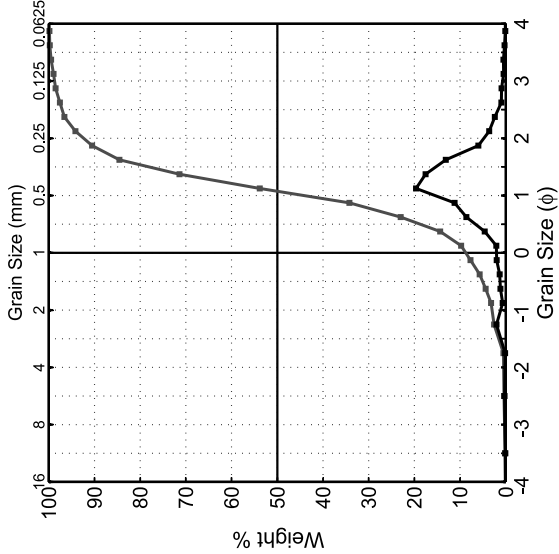
0.494 mm
0.585 mm
-1.111

Wentworth

Medium Sand
Moderately Sorted
Coarse Skewed
Very Leptokurtic

2523.68
0.15
2.68

Grain Size Distribution



Project
Location
Date

Station
Interval

Mean
STD
Skewness

USCS

SP

Total weight (gram)
% finer than 4.00 phi
% coarser than -1.00 phi

2408
Buxton, NC
Oct 2014

BorCompAll
0-4 ft Comp

0.454 mm
0.566 mm
-0.803

Wentworth

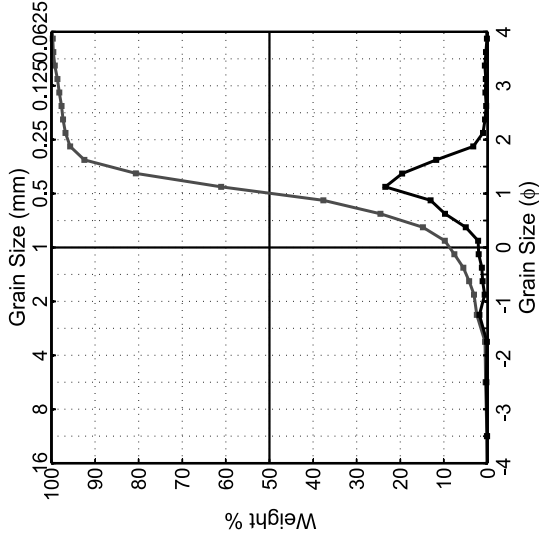
Medium Sand
Moderately Sorted
Coarse Skewed
Leptokurtic

3780.68
0.16
2.54

Percentiles			Moment Measures		
Limits (ϕ)	Mid Point (ϕ)	Weight (gram)	Weight % Cumm. Wt %	(phi)	(mm)
-4	-4.5	1.33	0.05	1	-1.665
-3	-3.5	3.43	0.19	5	-0.565
-2	-2.5	7.94	0.31	16	0.370
-1.5	-1.75	3.81	0.15	25	0.595
-1	-1.25	51.08	2.02	50	0.995
-0.75	-0.875	18.44	0.73	75	1.305
-0.5	-0.625	31.23	1.24	84	1.455
-0.25	-0.375	37.21	1.47	95	1.820
0	-0.125	56.77	2.25	99	2.950
0.25	0.125	59.42	2.35		
0.5	0.375	134.85	5.34		
0.75	0.625	254.10	10.07		
1	0.875	332.67	13.18		
1.25	1.125	553.38	21.93		
1.5	1.375	480.47	19.04		
1.75	1.625	294.82	11.68		
2	1.875	98.39	3.90		
2.25	2.125	37.07	1.47		
2.5	2.375	19.40	0.77		
2.75	2.625	8.31	0.33		
3	2.875	11.77	0.47		
3.25	3.125	8.74	0.35		
3.5	3.375	9.40	0.37		
3.75	3.625	4.62	0.18		
4	3.875	1.20	0.05		
>4.0	4.25	3.83	0.15		
Graphic Phi Parameters			Folk & Ward 1957		
Mean	Standard Deviation	Skewness (1)	Mean	Standard Deviation	Skewness (1)
1.017	0.542	-0.152	1.017	0.597	0.711
0.913	-0.162	-0.677	0.822	-0.803	-0.131
1.198	1.377		6.858		1.438

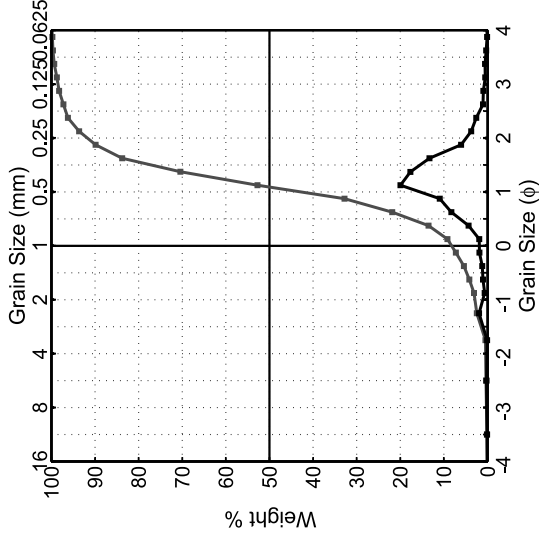
Percentiles			Moment Measures		
Limits (ϕ)	Mid Point (ϕ)	Weight (gram)	Weight % Cumm. Wt %	(phi)	(mm)
-4	-4.5	1.33	0.04	1	-1.630
-3	-3.5	3.55	0.09	5	-0.510
-2	-2.5	9.45	0.25	16	0.420
-1.5	-1.75	5.00	0.13	25	0.670
-1	-1.25	76.71	2.03	50	1.075
-0.75	-0.875	26.08	0.69	75	1.445
-0.5	-0.625	43.97	1.16	84	1.615
-0.25	-0.375	50.62	1.34	95	2.210
0	-0.125	75.50	2.00	99	3.135
0.25	0.125	77.44	2.05		
0.5	0.375	173.48	4.59		
0.75	0.625	326.51	8.64		
1	0.875	423.20	11.19		
1.25	1.125	742.73	19.65		
1.5	1.375	663.71	17.56		
1.75	1.625	496.39	13.13		
2	1.875	227.10	6.01		
2.25	2.125	137.51	3.64		
2.5	2.375	90.45	2.39		
2.75	2.625	37.13	0.98		
3	2.875	35.59	0.94		
3.25	3.125	18.45	0.49		
3.5	3.375	19.57	0.52		
3.75	3.625	10.08	0.27		
4	3.875	3.13	0.08		
>4.0	4.25	6.00	0.16		
Graphic Phi Parameters			Folk & Ward 1957		
Mean	Standard Deviation	Skewness (1)	Mean	Standard Deviation	Skewness (1)
1.017	0.597	-0.096	1.017	0.597	0.711
0.937	-0.377	1.276	-0.803	-0.377	-0.131
1.438			6.858		1.438

Grain Size Distribution



Project 2403
Location Buxton, NC
Date October 2014
Station BorCompSelect
Interval 0-6 ft Comp
Mean 0.484 mm
STD 0.583 mm
Skewness -0.773
USCS Wentworth
 SP Medium Sand
 Moderately Sorted
 Poorly Graded
 Coarse Skewed
 Very Leptokurtic
 Total weight (gram) 2771.52
 % finer than 4.00 phi 0.30
 % coarser than -1.00 phi 2.45
 % CaCO₃ 15.6

Grain Size Distribution



Project 2403
Location Buxton, NC
Date October 2014
Station BorCompAll
Interval 0-6 ft Comp
Mean 0.445 mm
STD 0.563 mm
Skewness -0.747
USCS Wentworth
 SP Medium Sand
 Moderately Sorted
 Poorly Graded
 Coarse Skewed
 Leptokurtic
 Total weight (gram) 3799.92
 % finer than 4.00 phi 0.25
 % coarser than -1.00 phi 2.46
 % CaCO₃ 14.5

Class Limit			Percentiles		Moment Measures (phi)		Moment Measures (phi)	
(phi)	(phi)	(gram)	Weight	%Cumm. Wt %	Mean	Standard Deviation	Mean	Standard Deviation
-4	-4.5	1.60	0.06	0.06	1.047	0.484	1.167	0.445
-3	-3.5	3.02	0.11	0.17	0.779	0.583	0.828	0.563
-2	-2.5	7.34	0.26	0.43	-0.773		-0.747	
-1.5	-1.75	3.91	0.14	0.57	8.994		7.144	
-1	-1.25	52.16	1.88	2.45				
-0.75	-0.875	18.60	0.67	3.13				
-0.5	-0.625	30.98	1.12	4.24				
-0.25	-0.375	36.86	1.33	5.57				
0	-0.125	56.94	2.05	7.63				
0.25	0.125	60.29	2.18	9.80				
0.5	0.375	138.77	5.01	14.81				
0.75	0.625	270.57	9.76	24.57				
1	0.875	361.74	13.05	37.63				
1.25	1.125	650.00	23.45	61.08				
1.5	1.375	542.45	19.57	80.65				
1.75	1.625	326.82	11.79	92.44				
2	1.875	90.37	3.26	95.70				
2.25	2.125	29.35	1.06	96.76				
2.5	2.375	15.97	0.58	97.34				
2.75	2.625	9.13	0.33	97.67				
3	2.875	13.98	0.50	98.17				
3.25	3.125	11.74	0.42	98.60				
3.5	3.375	16.82	0.61	99.20				
3.75	3.625	9.84	0.35	99.56				
4	3.875	3.87	0.14	99.70				
>4.0	4.25	8.38	0.30	100.00				

Graphic Phi Parameters

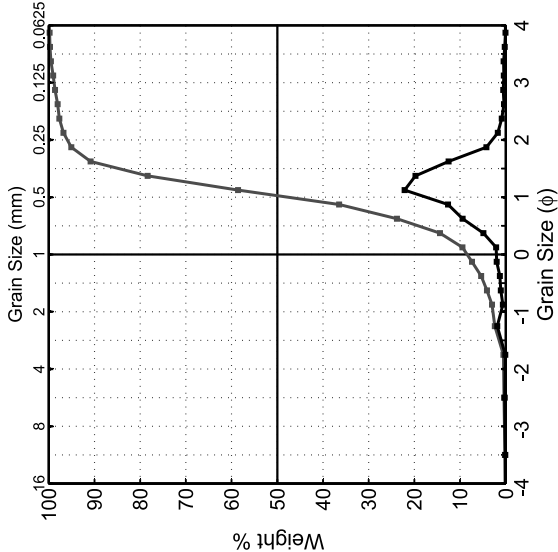
1952
 Mean 0.925
 Standard Deviation 0.520
 Skewness (1) -0.154
 Skewness (2) -0.649
 Kurtosis 1.216

Graphic Phi Parameters

1957
 Mean 1.042
 Standard Deviation 0.593
 Skewness (1) -0.080
 Skewness (2) -0.321
 Kurtosis 1.457

Class Limit			Percentiles		Moment Measures (phi)		Moment Measures (phi)	
(phi)	(phi)	(gram)	Weight	%Cumm. Wt %	Mean	Standard Deviation	Mean	Standard Deviation
-4	-4.5	1.60	0.04	0.04	1.047	0.484	1.167	0.445
-3	-3.5	3.80	0.10	0.14	0.779	0.583	0.828	0.563
-2	-2.5	9.22	0.24	0.38	-0.773		-0.747	
-1.5	-1.75	4.49	0.12	0.50	8.994		7.144	
-1	-1.25	74.45	1.96	2.46				
-0.75	-0.875	24.58	0.65	3.11				
-0.5	-0.625	40.71	1.07	4.18				
-0.25	-0.375	46.90	1.23	5.41				
0	-0.125	70.36	1.85	7.27				
0.25	0.125	72.82	1.92	9.18				
0.5	0.375	164.76	4.34	13.52				
0.75	0.625	316.08	8.32	21.84				
1	0.875	415.81	10.94	32.78				
1.25	1.125	758.69	19.97	52.75				
1.5	1.375	672.38	17.69	70.44				
1.75	1.625	506.77	13.34	83.78				
2	1.875	231.07	6.08	89.86				
2.25	2.125	142.54	3.75	93.61				
2.5	2.375	98.32	2.59	96.20				
2.75	2.625	39.35	1.04	97.23				
3	2.875	37.23	0.96	98.21				
3.25	3.125	19.91	0.52	98.74				
3.5	3.375	22.12	0.58	99.32				
3.75	3.625	11.91	0.31	99.63				
4	3.875	4.39	0.12	99.75				
>4.0	4.25	9.63	0.25	100.00				

Grain Size Distribution



Project
2408
Buxton, NC
Oct 2014

Station
Interval
BorCompSelect
0-8 ft Comp

Mean
STD
Skewness
0.477 mm
0.589 mm
-0.980

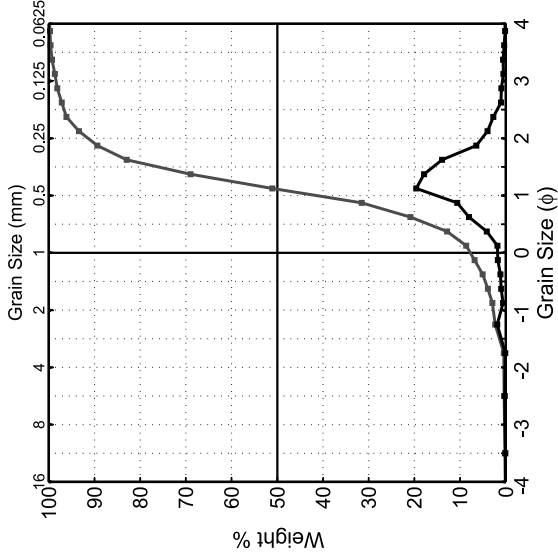
USCS
SP
Medium Sand
Poorly Graded

Wentworth
Medium Sand
Moderately Sorted
Coarse Skewed
Very Leptokurtic

Total weight (gram)
% finer than 4.00 phi
% coarser than -1.00 phi
2556.37
0.17
2.38

Limits			Percentiles		Moment Measures		Graphic Phi Parameters		Inman 1952		Folk & Ward 1957	
(ϕ)												
-4	-4.5	1.60	1	-1.615	0.06	0.06	Mean	1.068	0.477			
-3	-3.5	2.60	5	-0.450	0.16	0.16	Standard Deviation	0.765	0.589			
-2	-2.5	5.83	16	0.420	0.39	0.39	Skewness	-0.980				
-1.5	-1.75	2.79	25	0.650	0.11	0.50	Kurtosis	8.864				
-1	-1.25	48.08	25	0.650	1.88	2.38	Dispersion					
-0.75	-0.875	16.48	50	1.030	0.64	3.03	Standard Deviation					
-0.5	-0.625	27.50	75	1.335	1.08	4.10	Deviation from Normal					
-0.25	-0.375	32.86	1	0.875	1.29	5.39						
0	-0.125	50.91	1	1.125	1.99	7.38						
0.25	0.125	54.06	25	0.650	2.11	9.49						
0.5	0.375	125.24	50	1.030	4.90	14.39						
0.75	0.625	240.95	75	1.335	9.43	23.82						
1	0.875	322.81	84	1.490	12.63	36.45						
1.25	1.125	565.85	95	1.870	22.14	58.58						
1.5	1.375	505.42	99	3.100	19.77	78.35						
1.75	1.625	319.38			12.49	90.85						
2	1.875	107.86			4.22	95.06						
2.25	2.125	44.06			1.72	96.79						
2.5	2.375	22.57			0.88	97.67						
2.75	2.625	9.98			0.39	98.06						
3	2.875	14.27			0.56	98.62						
3.25	3.125	10.82			0.42	99.04						
3.5	3.375	12.01			0.47	99.51						
3.75	3.625	6.01			0.24	99.75						
4	3.875	2.03			0.08	99.83						
>4.0	4.25	4.42			0.17	100.00						
			Graphic Phi Parameters		Inman 1952		Folk & Ward 1957					
			Mean		1.068		0.477					
			Standard Deviation		0.765		0.589					
			Skewness (1)		-0.980							
			Skewness (2)		8.864							
			Kurtosis									

Grain Size Distribution



Project
2408
Buxton, NC
Oct 2014

Station
Interval
BorCompAll
0-8 ft Comp

Mean
STD
Skewness
0.438 mm
0.567 mm
-0.717

USCS
SP
Medium Sand
Poorly Graded

Wentworth
Medium Sand
Moderately Sorted
Coarse Skewed
Leptokurtic

Total weight (gram)
% finer than 4.00 phi
% coarser than -1.00 phi
3796.71
0.26
2.31

Limits			Percentiles		Moment Measures		Graphic Phi Parameters		Inman 1952		Folk & Ward 1957	
(ϕ)												
-4	-4.5	1.60	1	-1.600	0.04	0.04	Mean	1.193	0.438			
-3	-3.5	3.25	5	-0.390	0.09	0.13	Standard Deviation	0.820	0.567			
-2	-2.5	8.00	16	0.475	0.21	0.34	Skewness	-0.717				
-1.5	-1.75	3.82	25	0.720	0.10	0.44	Kurtosis	7.163				
-1	-1.25	70.88	25	0.720	1.87	2.31	Dispersion					
-0.75	-0.875	23.04	50	1.110	0.61	2.91	Standard Deviation					
-0.5	-0.625	36.04	75	1.485	1.00	3.91	Deviation from Normal					
-0.25	-0.375	43.96	1	0.875	1.16	5.07						
0	-0.125	66.57	1	1.375	1.75	6.83						
0.25	0.125	69.36	25	0.650	1.83	8.65						
0.5	0.375	158.47	50	1.030	4.17	12.83						
0.75	0.625	305.32	75	1.335	8.04	20.87						
1	0.875	403.41	84	1.490	10.63	31.49						
1.25	1.125	744.51	95	1.870	19.61	51.10						
1.5	1.375	679.36	99	3.260	17.89	69.00						
1.75	1.625	529.14			13.94	82.93						
2	1.875	244.56			6.44	89.37						
2.25	2.125	152.30			4.01	93.39						
2.5	2.375	103.81			2.73	96.12						
2.75	2.625	39.67			1.04	97.17						
3	2.875	37.09			0.98	98.14						
3.25	3.125	20.10			0.53	98.67						
3.5	3.375	22.98			0.61	99.28						
3.75	3.625	12.63			0.33	99.61						
4	3.875	4.83			0.13	99.74						
>4.0	4.25	10.01			0.26	100.00						
			Graphic Phi Parameters		Inman 1952		Folk & Ward 1957					
			Mean		1.070		1.083					
			Standard Deviation		0.595		0.701					
			Skewness (1)		-0.067		-0.096					
			Skewness (2)		1.239		1.428					
			Kurtosis									