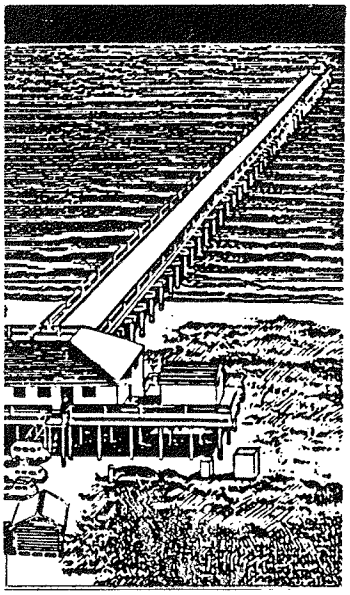
US Army Corps of Engineers



MISCELLANEOUS PAPER CERC-89-18

SUPERDUCK BEACH SEDIMENT SAMPLING EXPERIMENT

Report 1

DATA SUMMARY AND INITIAL OBSERVATIONS

by

Mark R. Byrnes

Coastal Engineering Research Center

DEPARTMENT OF THE ARMY
Waterways Experiment Station, Corps of Engineers
3909 Halls Ferry Road, Vicksburg, Mississippi 39180-6199

December 1989
Report 1 of a Series

Prepared for DEPARTMENT OF THE ARMY
US Army Corps of Engineers
Washington, DC 20314-1000

Under Barrier Island Sedimentation Studies
Work Unit 31665

Destroy this report when no longer needed. Do not return it to the originator.

The findings in this report are not to be construed as an official Department of the Army position unless so designated by other authorized documents.

The contents of this report are not to be used for advertising, publication, or promotional purposes. Citation of trade names does not constitute an official endorsement or approval of the use of such commercial products.

REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

1a. REPORT SECURITY CLASSIFICATION Unclassified	1b. RESTRICTIVE MARKINGS
2a. SECURITY CLASSIFICATION AUTHORITY	3. DISTRIBUTION/AVAILABILITY OF REPORT Approved for public release; distribution unlimited.
2b. DECLASSIFICATION/DOWNGRADING SCHEDULE	
4. PERFORMING ORGANIZATION REPORT NUMBER(S) Miscellaneous Paper CERC-89-18	5. MONITORING ORGANIZATION REPORT NUMBER(S)
6a. NAME OF PERFORMING ORGANIZATION USAEWES, Coastal Engineering Research Center 6b. OFFICE SYMBOL (If applicable)	7a. NAME OF MONITORING ORGANIZATION
6c. ADDRESS (City, State, and ZIP Code) 3909 Halls Ferry Road Vicksburg, MS 39180-6199	7b. ADDRESS (City, State, and ZIP Code)
8a. NAME OF FUNDING/SPONSORING ORGANIZATION US Army Corps of Engineers 8b. OFFICE SYMBOL (If applicable)	9. PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER
8c. ADDRESS (City, State, and ZIP Code) Washington, DC 20314-1000	10. SOURCE OF FUNDING NUMBERS PROGRAM ELEMENT NO. / PROJECT NO. / TASK NO. / WORK UNIT ACCESSION NO.

11. TITLE (Include Security Classification)
SUPERDUCK Beach Sediment Sampling Experiment; Report 1, Data Summary and Initial Experiment

12. PERSONAL AUTHOR(S)
Byrnes, Mark R.

13a. TYPE OF REPORT	13b. TIME COVERED	14. DATE OF REPORT (Year, Month, Day)	15. PAGE COUNT
Report 1 of a series	FROM _____ TO _____	December 1989	56

16. SUPPLEMENTARY NOTATION
Available from National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161.

17. COSATI CODES			18. SUBJECT TERMS (Continue on reverse if necessary and identify by block number)
FIELD	GROUP	SUB-GROUP	See reverse.

19. ABSTRACT (Continue on reverse if necessary and identify by block number)

This report provides a summary of grain size data collected during Phase II (October 1986) of the SUPERDUCK field experiment. The objective of the study was to collect and analyze data on changes in beach sedimentology and morphology associated with a major storm event. Average median grain size provided useful information for identifying trends in sediment texture associated with variations in nearshore wave climate. During storm events, finer-grained sand was removed from the subaerial beach profile, producing a coarser average median grain size. Post-storm recovery involved landward migration of the nearshore bar system and a net decrease in average median grain size.

20. DISTRIBUTION/AVAILABILITY OF ABSTRACT	21. ABSTRACT SECURITY CLASSIFICATION
☒ UNCLASSIFIED/UNLIMITED ☐ SAME AS RPT. ☐ DTIC USERS	Unclassified
22a. NAME OF RESPONSIBLE INDIVIDUAL	22b. TELEPHONE (Include Area Code) / 22c. OFFICE SYMBOL

18. SUBJECT TERMS (Continued).

Beach profile response
Beach sediment samples
Duck, NC
Field Research Facility
Grain size analysis
Storms
SUPERDUCK experiment

PREFACE

This report provides a summary of data collected during a major field experiment at the Coastal Engineering Research Center's (CERC) Field Research Facility (FRF). Data collection was authorized by Headquarters, US Army Corps of Engineers (HQUSACE), under Civil Works Research Work Unit 31665, "Barrier Island Sedimentation Studies." Funds were provided through the US Army Engineer Waterways Experiment Station (WES) Coastal Engineering Research Area under the management of Dr. C. Linwood Vincent, CERC. The reported experiment was designed and directed by Dr. Suzette Kimball, Virginia Institute of Marine Science, formerly CERC. Messrs. John C. Lockhart, Jr., and John G. Housley were the HQUSACE Technical Monitors.

This report was prepared by Dr. Mark R. Byrnes, Research Physical Scientist, Coastal Processes Branch (CPB), Research Division (RD), under the direct supervision of Dr. Steven A. Hughes, former Chief, CPB, and under the general supervision of Mr. H. Lee Butler, Chief, RD, and Dr. James R. Houston, Chief, CERC. Sediment samples were analyzed by Ms. Michelle Poirier. Mr. William A. Birkemeier, Chief, Field Research Facility, provided wave gage and bathymetry data. Mr. Fred J. Anders and Dr. Donald K. Stauble, Coastal Structures and Evaluation Branch, Engineering Division, and Ms. Kathryn J. Gingerich, CPB, reviewed the report.

COL Larry B. Fulton, EN, was Commander and Director of WES during publication of this report. Dr. Robert W. Whalin was Technical Director.

CONTENTS

SUPERDUCK BEACH SEDIMENT SAMPLING EXPERIMENT

DATA SUMMARY AND INITIAL OBSERVATIONS

PART I: INTRODUCTION

Background

1. One of the objectives of the Barrier Island Sedimentation Studies Work Unit, under the Shore Protection and Restoration Program, is to develop a better understanding of beach morphology changes in response to high energy wave conditions. To accomplish this objective, a series of measurements relating nearshore wave and current dynamics, beach profile evolution, and resultant changes in beach sedimentology is necessary during storm events.

2. During September and October, 1986, a period of intense study of nearshore processes was carried out at the US Army Engineer Waterways Experiment Station's Field Research Facility (FRF) at Duck, NC (Figure 1). This study, known as SUPERDUCK, was performed by engineers and scientists from the Coastal Engineering Research Center (CERC), 15 Corps of Engineers District and Division Offices, six other government agencies, and 10 universities. Experiments planned during the second month of SUPERDUCK were designed to evaluate process and response mechanisms associated with extratropical storm events.

3. An extensive short-core sediment sampling scheme was established at six shore-normal transects from 12 to 22 October 1986 to assess three-dimensional changes in beach sedimentology associated with variations in incident wave energy. Wave height and period measurements were collected at 1 to 6 hour intervals during the test period from a pressure sensor located 0.8 km seaward of the study area in 8 m water depth. Subaerial beach profile changes along these transects were monitored in conjunction with sediment sampling activities. Therefore, beach morphologic changes could be compared with sedimentologic variability during the post-storm recovery process.

Report Contents

4. The primary purpose of this report is to present data gathered during the 11-day study period in October 1986. A description of the study

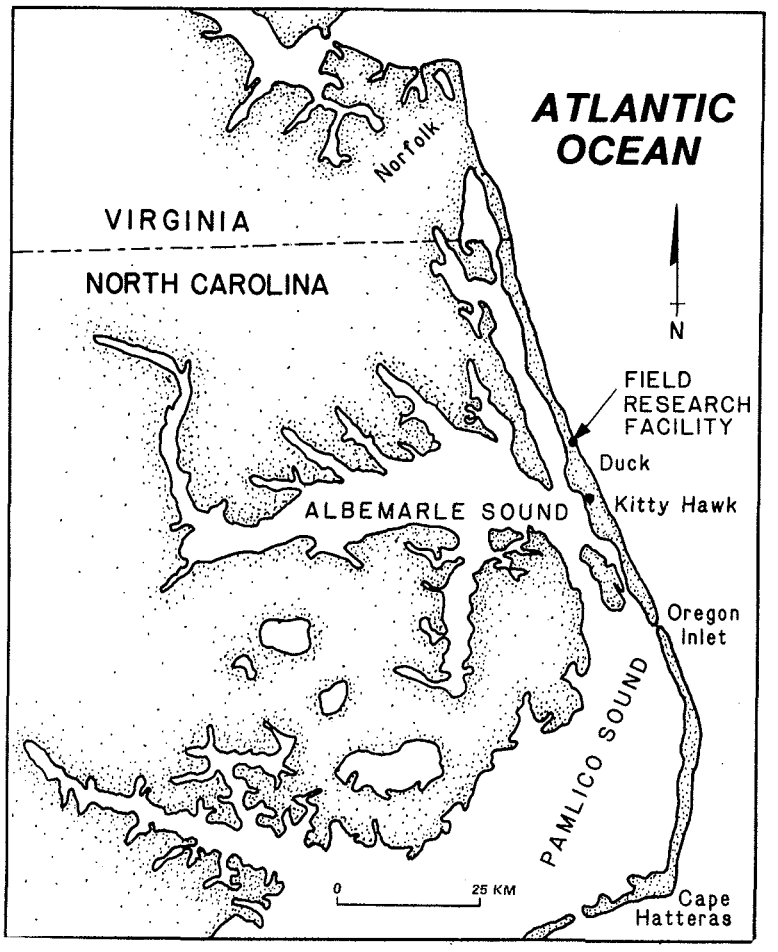


Figure 1. Location map showing Field Research Facility

site and sampling scheme is given in Part II. Parts III and IV describe nearshore wave and bathymetry conditions, respectively. Sediment data characteristics and preliminary observations are presented in Part V, and a summary of results is given in Part VI. Appendix A contains beach profile and core location data, and Appendix B lists grain size statistics for sand samples collected during the study.

5. The second report in the SUPERDUCK Beach Sediment Sampling Experiment presents a detailed description of daily changes in beach profile shape during the 11-day study period (Stauble et al. in prep). In addition, trends in grain size characteristics are correlated with storm wave parameters and adjustments in the nearshore bar system.

PART II: SAMPLING SCHEME

6. The study area was approximately 3000 m^2 and was located about 450 m north of the FRF research pier. Fluctuations in water level due to local meteorological conditions made it difficult to reoccupy exact cross-shore positions along each transect for the 11-day period. Consequently, three beach zones were identified for comparison of spatial and temporal changes in sediment distribution: berm, upper swash, and lower swash. The average positions of transect lines and morphologic zones are presented in Figure 2. Sample locations along the transects were determined using a Zeiss electronic surveying system. Appendix A contains X, Y, and Z coordinates for each surveyed point along the six transects. Elevations are referenced to the National Geodetic Vertical Datum (NGVD) (NGVD = 0.44 m mean low water (MLW)).

7. Short-core data were collected daily in each morphologic zone at the time of predicted low water by manually driving and extracting standard Shelby tubes (7.6 cm diameter stainless steel) at selected positions along each transect. A core catcher and liner were used to retain sediment during the extraction procedure. Core surface elevation ranged from 3.56 to -0.97 m NGVD and core length ranged from 0.05 to 0.59 m (Table 1). Cores were brought to the laboratory and processed by removing the liner and sediment from the stainless steel tube and splitting it in half lengthwise for examination and sampling.

8. Samples were selected from sand units based on changes in sediment texture. A total of 361 sediment samples were extracted from the 127 cores taken along transects 1, 3, 4, and 6 to initially characterize the three-dimensional sedimentologic variability of the beach over the 11-day sampling period. An additional 167 samples, collected from the two remaining transects (65 cores), will be analyzed at a future date. Sand size was classified using an ATM Sonic Sifter and a Satorius microbalance interfaced with an IBM PC-XT for direct data transfer to a grain size analysis software package. Moment measures were used to statistically characterize grain size distributions (Appendix B).

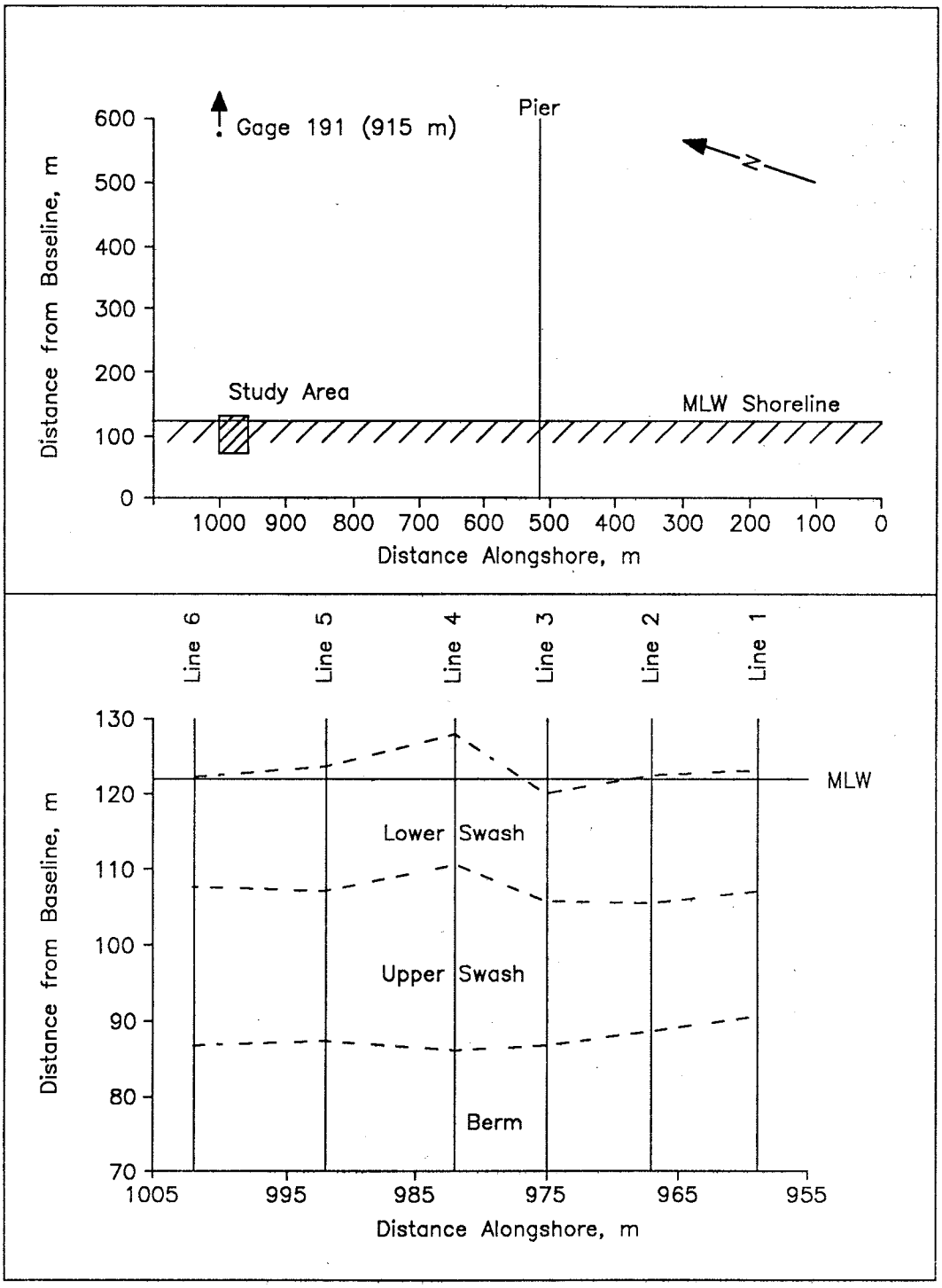


Figure 2. Schematic showing relative positions of transect lines and morphologic zones in the study area

Table 1

Summary of Core Characteristics

Date	No. Cores	No. Sediment Samples	Range in Core Length (m)	Average Core Length (m)
10/12	14	43	0.05 - 0.49	0.34
10/13	18	58	0.12 - 0.54	0.38
10/14	17	42	0.06 - 0.52	0.38
10/15	18	52	0.20 - 0.50	0.35
10/16	17	42	0.26 - 0.53	0.40
10/17	18	58	0.20 - 0.54	0.42
10/18	18	43	0.23 - 0.53	0.41
10/19	18	45	0.25 - 0.50	0.35
10/20	18	43	0.20 - 0.58	0.42
10/21	18	58	0.32 - 0.56	0.44
10/22	18	44	0.25 - 0.59	0.45

PART III: NEARSHORE WAVE CHARACTERISTICS

9. Nearshore and offshore wave data are routinely collected and analyzed by the FRF research program. During SUPERDUCK, additional sensors were installed in support of increased field experiments. Data from wave gage 191, 800 m seaward of the study area in 8 m of water, were used to characterize temporal variations in wave height (H_{mo}) and peak period (T_p). H_{mo} is an energy-based statistic equal to four times the standard deviation of the sea surface elevation. T_p is the wave period associated with maximum energy density in the spectrum.

10. Wave height and period are plotted for the period 9 to 23 October 1986 in Figure 3. H_{mo} exceeded 2.0 m during two storm events. The first was associated with strong northeast winds generated by a Canadian high pressure system that began to affect sea state conditions early on 10 October with the passage of a cold front. Winds reached 15 m/sec from the northeast and were sustained at 10 m/sec for 41 consecutive hours, producing a storm surge of approximately 0.5 m (Field Research Facility 1986). The maximum H_{mo} at gage 191 was recorded at 1200 hours on 11 October as 3.10 m (T_p = 8.83 sec). Wave heights greater than 2.0 m were sustained until 2000 on 12 October.

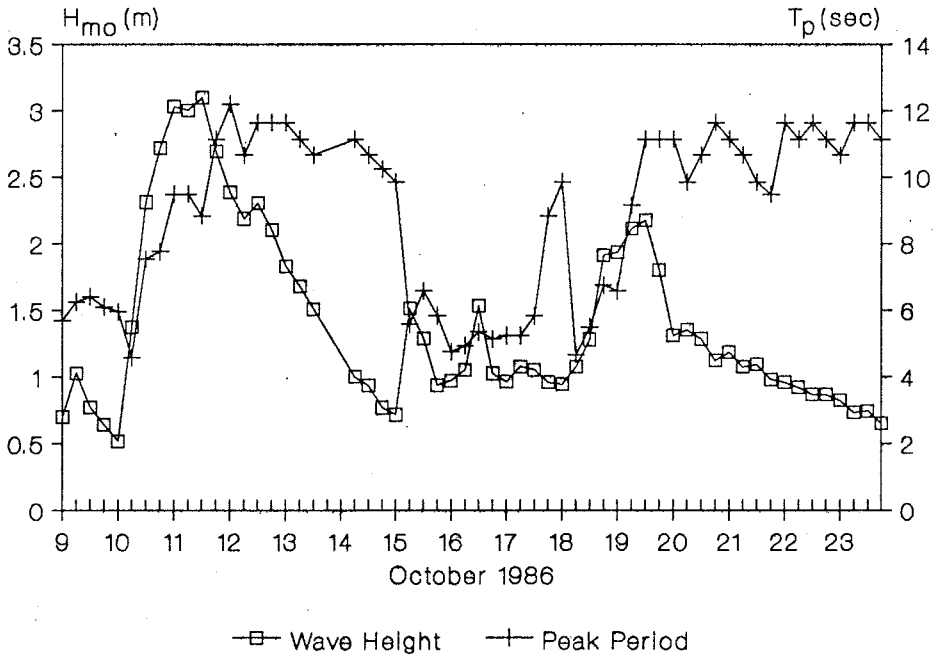


Figure 3. Plot of wave height and period measured at gage 191

11. The second event was much shorter lived and less intense. A weak low pressure system located off New England, in conjunction with a strong high pressure system centered over the Great Lakes, generated strong NNE winds at the FRF on 18 October. Winds peaked near 14 m/sec at 1500 hours and a maximum H_{mo} of 2.28 m (T_p = 11.13 sec) was recorded on 19 October at 1545 hours. Wave heights greater than 2.0 m were sustained for less than 24 hours.

PART IV: NEARSHORE BATHYMETRY

12. Beach and nearshore profile data were collected along 14 to 20 transects in the vicinity of the study area between 9 and 22 October 1986. Positions of surveyed profile lines are shown in Figure 4. Profile data were obtained by FRF staff using the Coastal Research Amphibious Buggy (CRAB) in combination with a self-recording Zeiss Elta-Z electronic surveying instrument. Beach morphology was monitored 10 times during the 14-day time period to document bathymetric response to the storm events.

13. Three-dimensional plots of survey data were constructed to characterize spatial and temporal changes in nearshore bathymetry. Figure 5 illustrates sequential changes in nearshore bar morphology during the beach sediment sampling study. Although the nearshore bar system was poorly developed prior to storm activity on 10 October, a well-defined, linear bar formed by the following day. Once storm intensity decreased, bar morphology became more irregular and subdued. A small depression intersected the bar crest at about the 1000 m longshore reference mark and maintained its form and position until 16 October.

14. Although storm-wave energy on 18 and 19 October was less significant than wave energy on 11 and 12 October, resultant changes in bar morphology were prominent and non-linear (Figure 5). Between the 950 and 1050 m longshore reference positions, the bar crest was encroaching on the lower foreshore (20 October) and appeared to be roughly crescentic. By 22 October, three-dimensional bar morphology was well-developed in a classic crescentic configuration. A similar pattern of nearshore bar development was identified by Mason et al. (1984) for the DUCK82 experiment. Significant quantities of fine-grained nearshore sand had migrated to the lower foreshore, providing a potential source of sand to the subaerial beach profile. This trend is important since the beach sedimentology study area was located between the 950 and 1000 m longshore coordinates, just landward of the region of maximum landward migration of the bar crest.

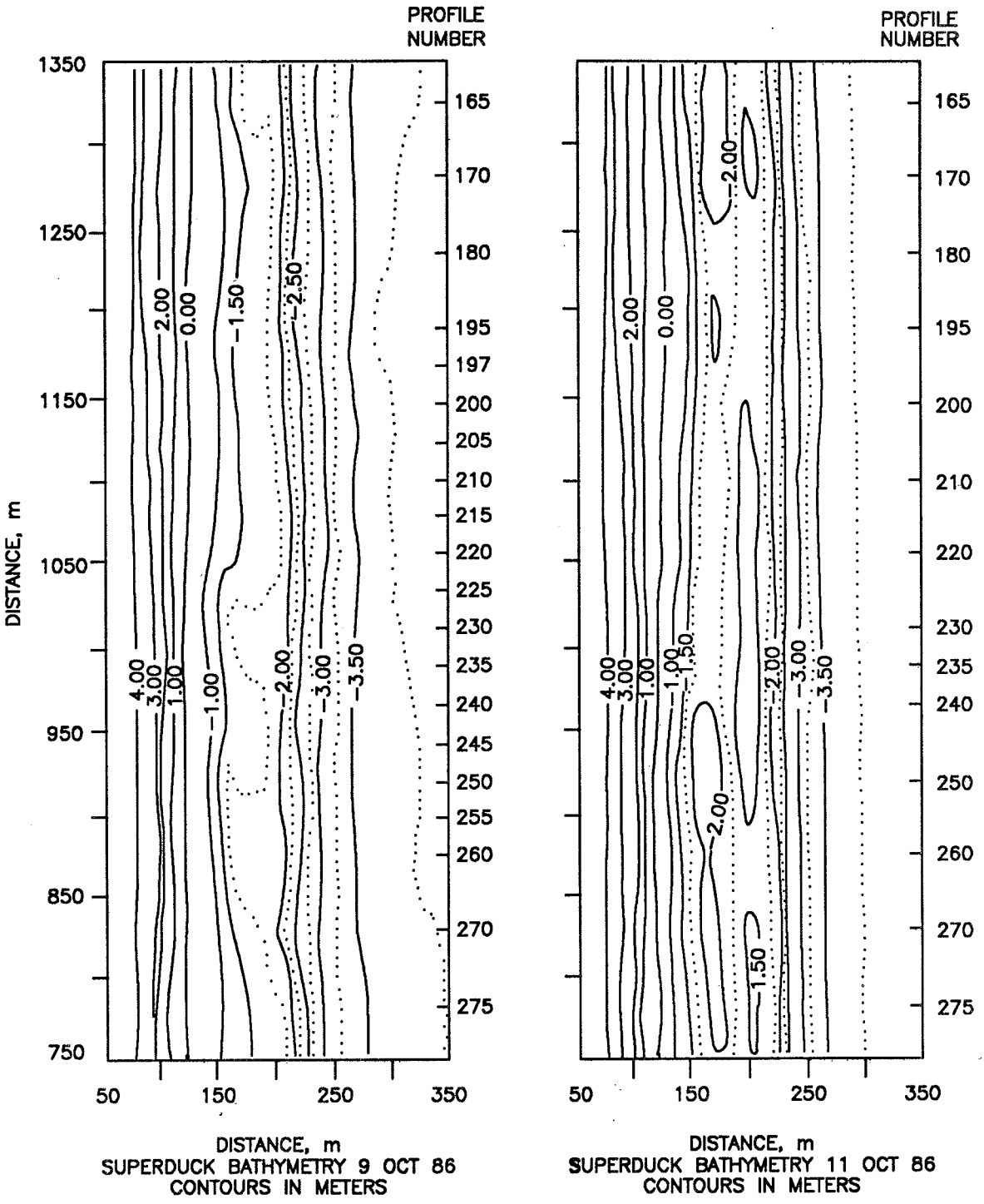


Figure 4. Contour maps of bathymetry for 9 and 11 October 1986 showing the positions of surveyed profile lines

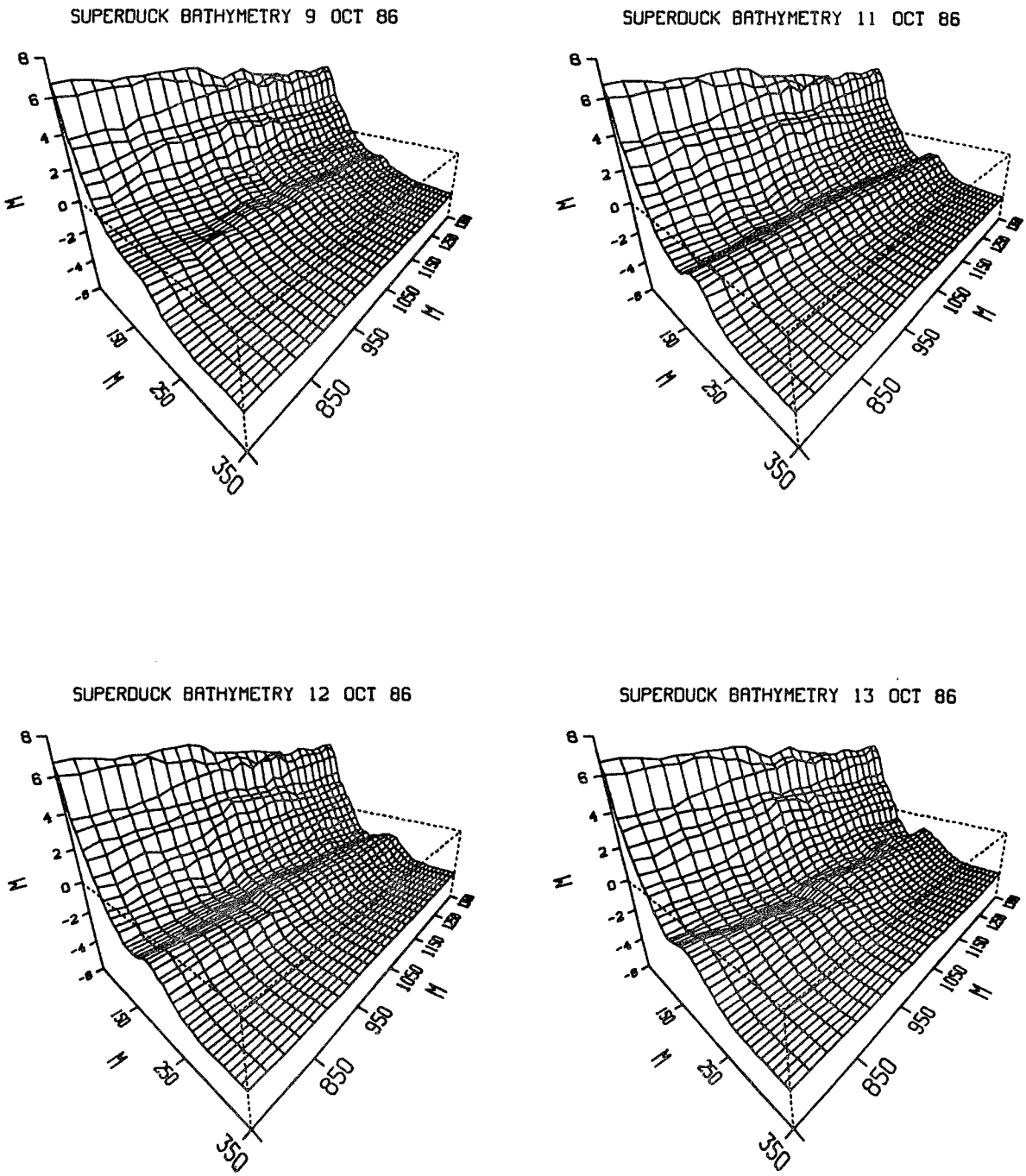


Figure 5. Three-dimensional plots of bathymetric survey data from 9 to 22 October 1986 illustrating the evolution of the nearshore bar system in response to two storm events (Sheet 1 of 3)

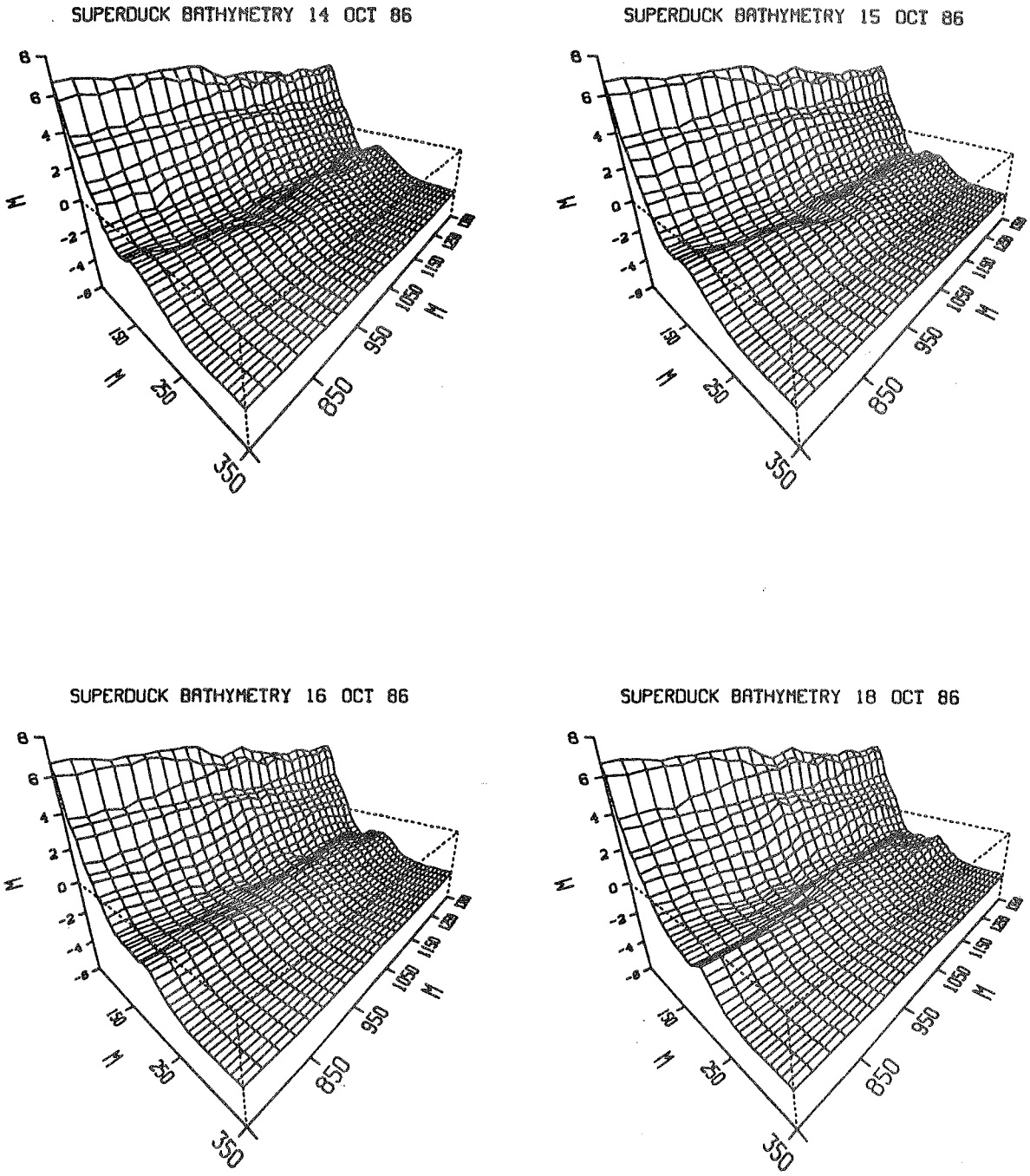


Figure 5. (Sheet 2 of 3)

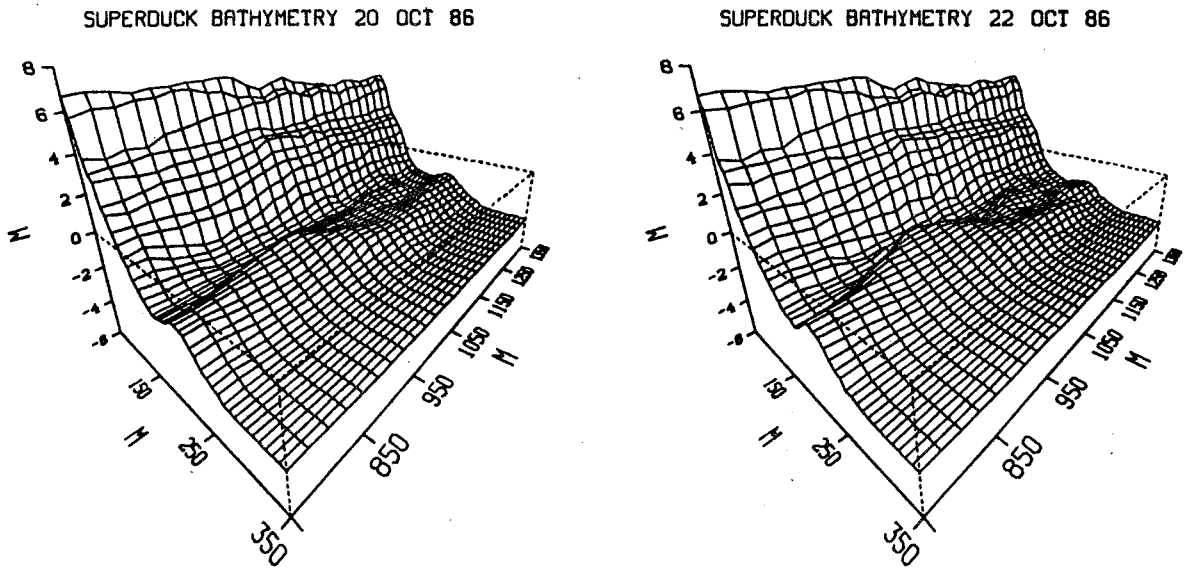


Figure 5. (Sheet 3 of 3)

PART V: TRENDS IN SEDIMENT DATA CHARACTERISTICS

15. Beach profile evolution is a result of prevailing hydraulic conditions and sediment supply. During storm events, sand is typically removed from the foreshore and deposited offshore as a submerged bar. Post-storm recovery often involves shoreward migration of relatively fine-grained sand from the nearshore bar, producing net deposition on the subaerial beach profile (Sonu 1972, Richmond and Sallenger 1984). Temporal variations in mean grain size reflect the magnitude and duration of wave and current forces, while spatial trends may also indicate local variations in beach morphology. The purpose of this study was to examine the sedimentologic response of the beach to storm and post-storm processes.

16. For this report, 127 surface sand samples (labeled "a" in Appendix B) were compared spatially and temporally. A more detailed analysis of variations in sediment distribution will be presented in a companion report (Stauble et al. in preparation).

Median Grain Size

17. Since many of the sample distributions are bimodal, median grain size was used to investigate trends. This parameter represents particle size at the mid-point of the frequency distribution. Richmond and Sallenger (1984) suggested using the modal size because it corresponds to the most frequently occurring particle diameter. However, unless the percent occurrence of primary versus secondary modes is constant for samples being compared, a bias is presented in characterizing the frequency distributions. Table 2 summarizes trends in median grain size for surface samples in the study area. In all cases, average median grain size for lower swash sediment is coarsest. However, a longshore increase in the percentage of finer material is apparent by the shift in average median grain size from -0.86ϕ at transect 1 to -0.28ϕ at transect 6. Although this trend is not as consistent for berm and upper swash morphologic zones, temporally averaged median grain size for each transect indicates a net increase in the percentage of finer sand from south (transect 1) to north (transect 6) (Table 3).

Table 2

Median Grain Size (phi units) for Surface Samples in the Study Area

	TRANSECT											
	1			3			4			6		
Date	Berm	US	LS	Berm	US	LS	Berm	US	LS	Berm	US	LS
10/12/86	0.21	1.70	-0.64	-0.28	-0.16	-0.99	0.47	1.36	-1.03	nd	nd	nd
10/13/86	1.46	1.18	-0.50	-0.50	0.42	-0.93	0.65	1.28	-0.04	1.23	0.71	0.39
10/14/86	0.85	1.42	-1.40	-0.20	0.95	-0.33	1.04	1.73	nd	0.38	1.67	-0.29
10/15/86	1.73	-0.34	-0.03	0.87	1.21	-0.41	0.89	-0.34	-0.01	0.74	1.85	-0.25
10/16/86	1.45	-0.28	nd	0.63	-0.13	0.54	0.94	-0.18	0.94	0.49	1.73	0.50
10/17/86	1.53	1.46	-0.56	0.22	0.04	-1.09	0.46	2.02	-0.78	0.14	1.52	-0.95
10/18/86	1.50	1.91	-2.11	1.51	0.88	-1.24	0.66	0.31	0.02	0.98	0.66	-0.59
10/19/86	0.74	-0.62	-1.22	0.25	-0.61	-0.63	0.16	-0.84	-0.97	0.63	0.11	-0.72
10/20/86	-0.62	-1.04	-1.15	-0.10	-0.21	-0.43	0.75	-0.70	-0.88	1.42	0.15	-0.49
10/21/86	1.55	-0.72	-0.75	-0.75	-0.45	-0.29	0.83	-0.17	-1.76	0.73	0.39	-0.66
10/22/86	0.73	-0.74	-0.28	0.30	-0.25	-0.73	0.54	0.27	-0.25	0.81	0.52	0.23
Average	1.01	0.36	-0.86	0.18	0.15	-0.59	0.67	0.43	-0.48	0.76	0.93	-0.28
Std. Dev.	0.72	1.16	0.61	0.65	0.62	0.50	0.26	1.00	0.76	0.38	0.69	0.50

US - upper swash LS - lower swash nd - no data

18. A detailed examination of trends in median grain size for each morphologic zone illustrates considerable variability for berm, upper swash, and lower swash samples (Figure 6). Temporal consistency is greatest for berm samples at transects 4 and 6. In contrast, upper and lower swash samples, associated with the most active portion of the beach, exhibit large variability. At transects 1, 4, and 6, the distribution of median grain size in the upper swash morphologic zone appears to respond to the storm event of 18 to 19

Table 3

Temporal Variations in Average

Median Grain Size and Standard Deviation

Transect	Average Median Grain Size (ϕ)	Average Standard Deviation (ϕ)
1	0.09	1.10
3	-0.09	1.22
4	0.23	1.16
6	0.47	1.15

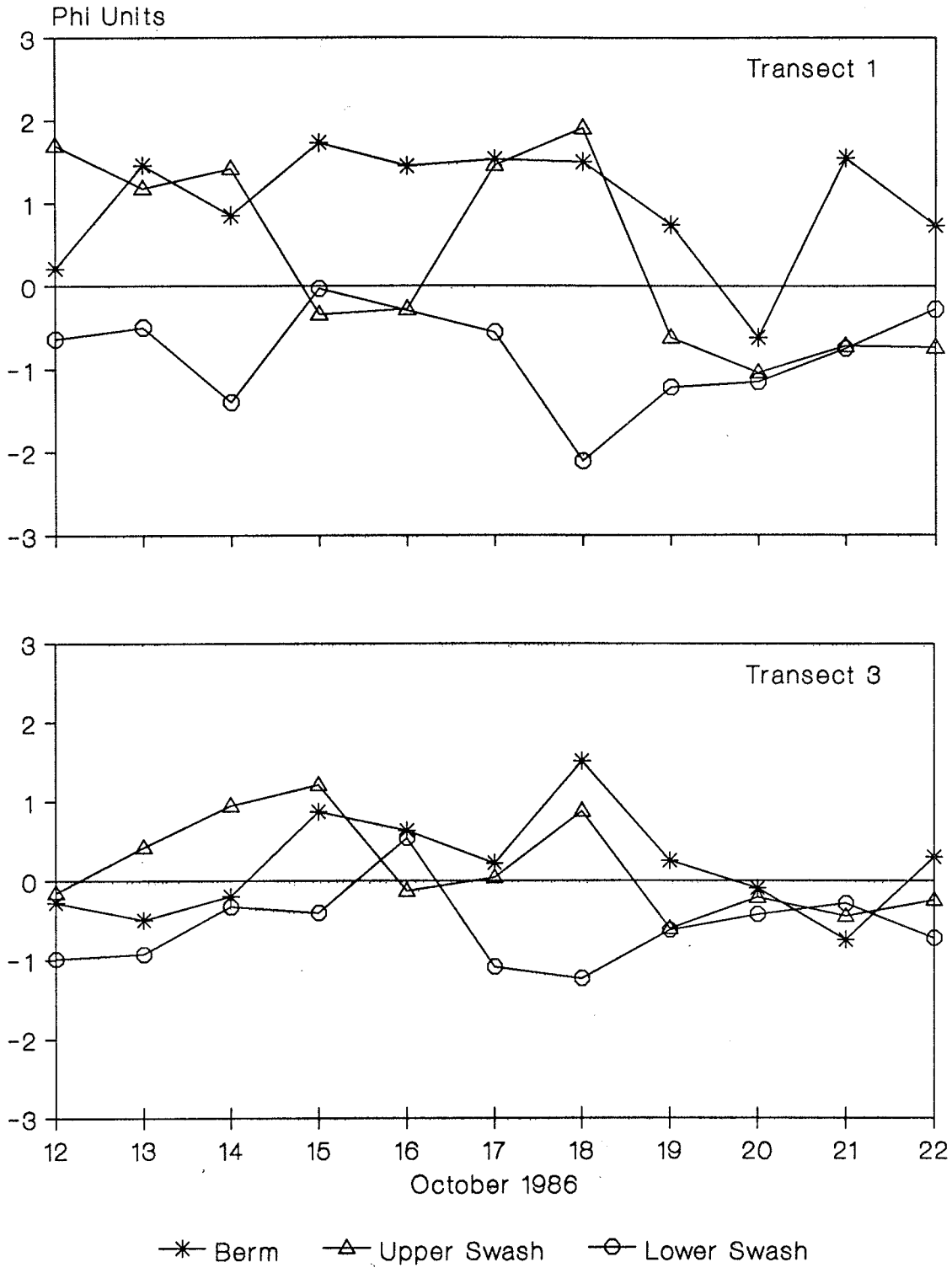


Figure 6. Comparison of trends in median grain size for berm, upper swash, and lower swash morphologic zones (Continued)

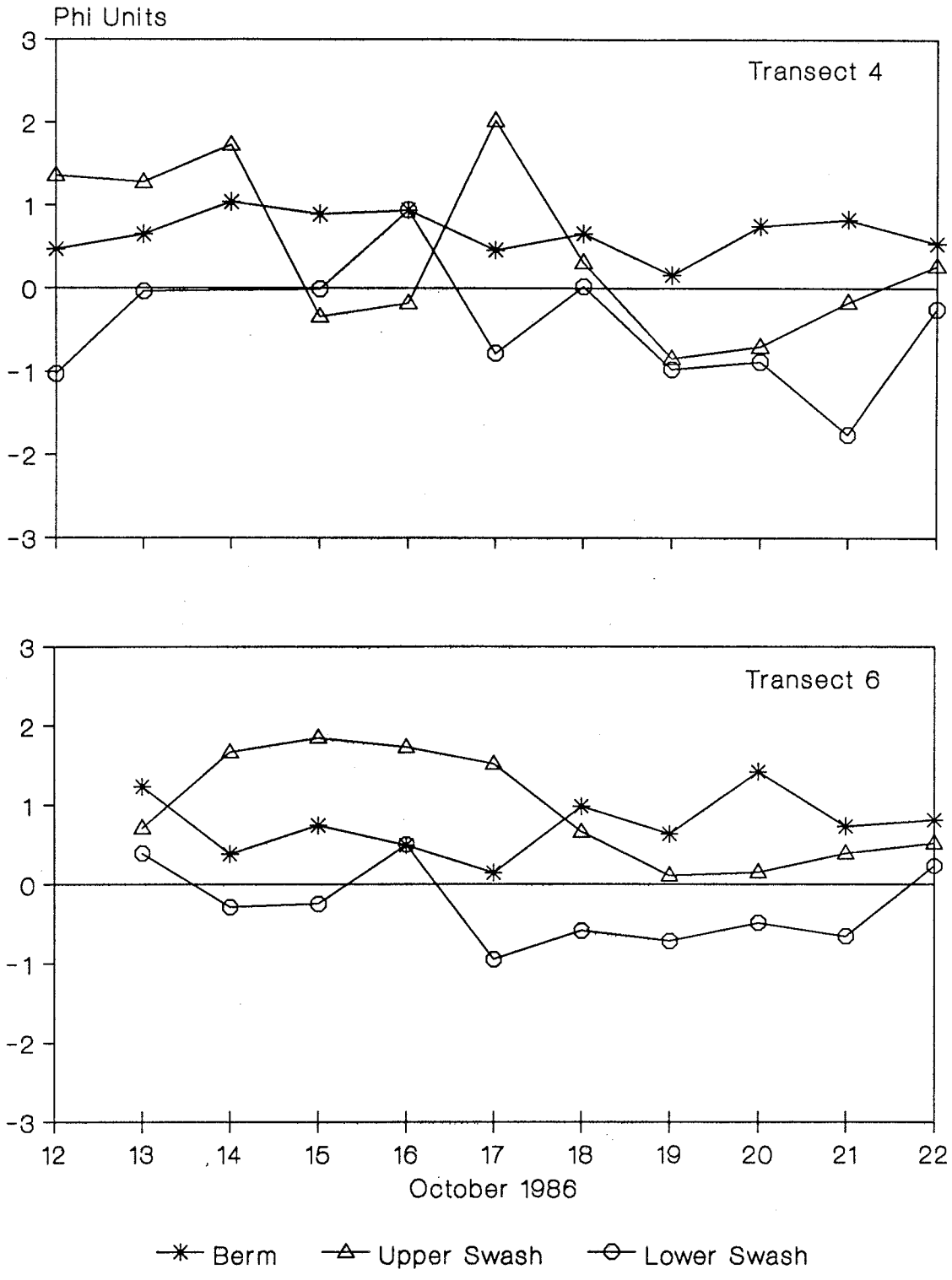


Figure 6. (Concluded)

October by exhibiting a net decrease in sediment size during the storm and a gradual post-storm increase in the percentage of finer-grained sand in response to onshore bar migration (Figure 5; 20 and 22 October 1986). Median grain size is particularly sensitive to variations in wave height at transect 6. Coarser sand size is associated with higher wave heights while finer-grained samples were more persistent during relatively calm conditions.

19. Samples from all four transects were averaged to produce a composite median grain size for each morphologic zone. Table 4 summarizes the spatial

Table 4

Spatial Distribution of Median Grain Size (phi units)

Date	Berm	Upper Swash	Lower Swash
10/12/86	0.13[a]	0.97	-0.89
	0.38[b]	0.99	0.21
10/13/86	0.71	0.90	-0.27
	0.88	0.40	0.57
10/14/86	0.52	1.44	-0.67
	0.55	0.35	0.63
10/15/86	1.06	0.60	-0.18
	0.45	1.11	0.19
10/16/86	0.88	0.29	0.66
	0.43	0.97	0.24
10/17/86	0.59	1.26	-0.85
	0.64	0.85	0.23
10/18/86	1.16	0.94	-0.98
	0.42	0.69	0.91
10/19/86	0.45	-0.49	-0.89
	0.28	0.41	0.27
10/20/86	0.36	-0.53	-0.74
	0.90	0.61	0.34
10/21/86	0.59	-0.24	-0.87
	0.97	0.47	0.63
10/22/86	0.60	-0.05	-0.26
	0.23	0.56	0.39

[a] first row of values for each date represents the average of median grain size for that morphologic zone

[b] second row of values for each date represents the variability of median grain size for that morphologic zone

distribution of average median grain size for berm, upper swash, and lower swash zones between 12 and 22 October 1986. Samples collected from the lower foreshore show no consistent trend when compared with variations in wave height (Figure 7). However, average median grain size increases near the upper limit of swash and on the berm in response to larger wave heights for the 18 to 19 October storm event. A subsequent decrease in median grain size was associated with a post-storm decrease in wave power. Sand from the upper swash morphologic zone appeared most sensitive to changes in coastal hydrodynamics.

Standard Deviation

20. Although median grain size often provides a useful description of the sediment size distribution, it is also the most general information parameter and occasionally masks important characteristics of the size-frequency curve. This is particularly true with bimodal samples. The standard deviation grain size statistic provides an assessment of the spread of the distribution relative to the mean. As the value approaches zero, variability decreases.

21. Table 5 is a summary of standard deviation values for surface samples in the study area. Variability associated with average standard deviation increases toward the base of the foreshore for all transects. However, a comparison of temporally averaged standard deviation shows little variation between transects (Table 3). Therefore, variability between morphologic zones appears more significant than temporal trends within morphologic zones. Figure 8 illustrates this point where large variations in average median grain size are associated with small fluctuations in standard deviation. Consequently, the data indicate that this parameter is not very sensitive to varying wave climate.

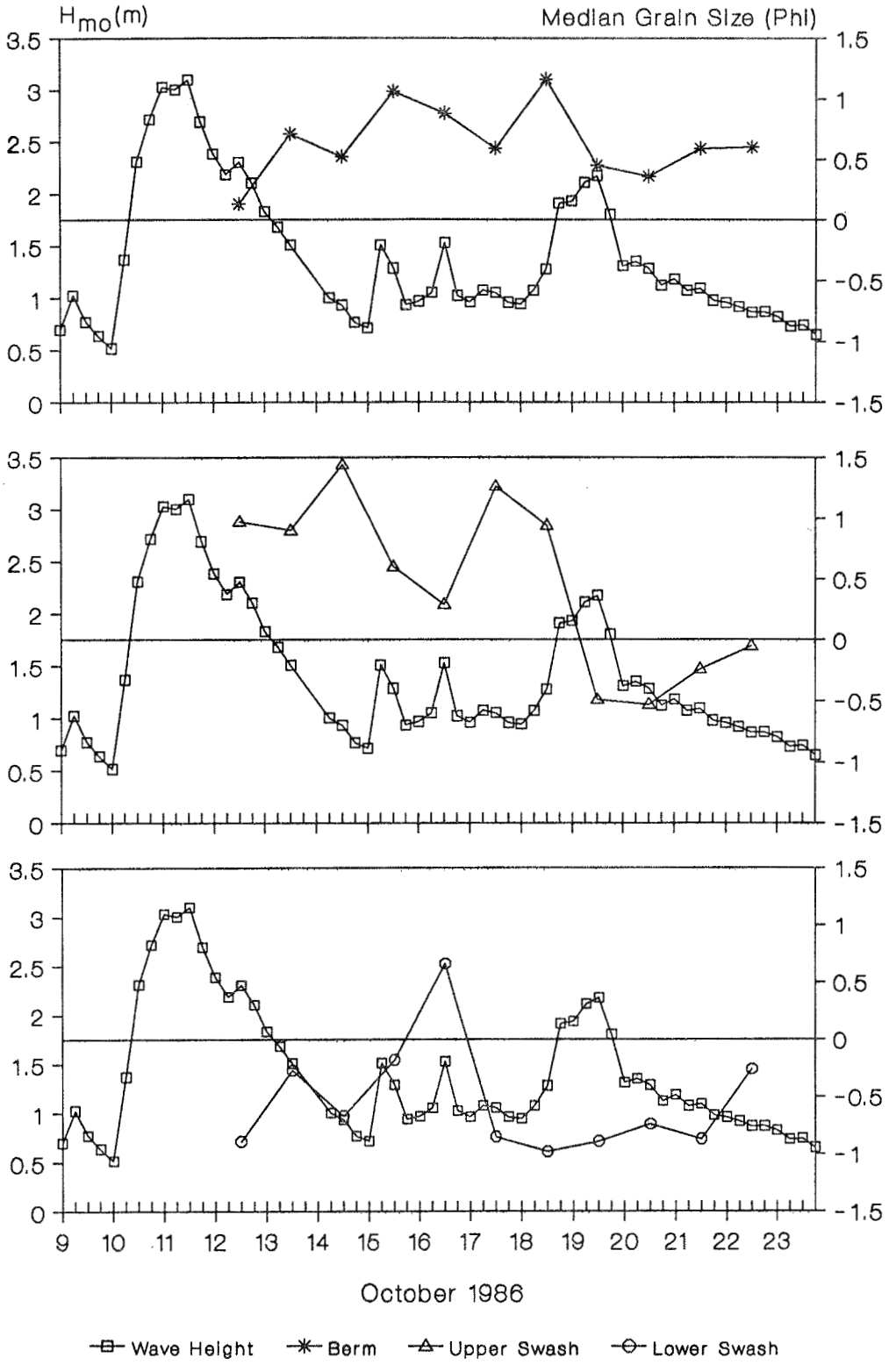


Figure 7. Comparison of trends in median grain size and wave height for berm, upper swash, and lower swash zones

Table 5

Standard Deviation (phi units) for Surface Samples in the Study Area

	TRANSECT											
	1			3			4			6		
Date	Berm	US	LS	Berm	US	LS	Berm	US	LS	Berm	US	LS
10/12/86	1.08	0.90	1.41	1.10	1.34	1.39	0.89	0.99	1.51	nd	nd	nd
10/13/86	0.99	0.97	1.38	1.07	1.14	1.48	0.94	0.80	1.51	0.94	1.14	1.48
10/14/86	0.94	0.98	1.01	1.04	1.05	1.59	0.98	0.87	nd	0.88	1.05	1.53
10/15/86	0.82	1.15	1.41	1.01	1.08	1.47	0.89	1.24	1.25	0.99	0.79	1.44
10/16/86	1.73	1.08	nd	1.09	0.65	1.29	1.00	0.76	1.41	0.93	1.25	0.89
10/17/86	0.87	0.99	0.90	1.02	1.17	1.69	0.91	0.77	1.46	0.94	0.90	1.69
10/18/86	0.70	1.13	1.81	0.94	1.19	1.73	0.93	1.51	1.31	1.05	1.48	1.60
10/19/86	0.99	1.33	1.65	1.03	1.37	1.50	0.55	1.49	1.77	0.92	1.23	1.08
10/20/86	1.39	1.44	0.57	0.99	1.33	1.45	0.90	1.37	1.62	0.77	1.26	1.28
10/21/86	0.80	1.19	0.38	1.08	1.02	1.36	0.88	1.17	1.76	0.96	1.16	1.47
10/22/86	0.87	0.98	1.31	1.02	1.22	1.22	0.71	1.29	1.59	0.92	1.29	1.07
Average	1.02	1.09	1.18	1.04	1.14	1.47	0.87	1.11	1.52	0.93	1.15	1.35
Std. Dev.	0.30	0.18	0.46	0.05	0.20	0.16	0.13	0.29	0.17	0.07	0.20	0.26

US - upper swash LS - lower swash nd - no data

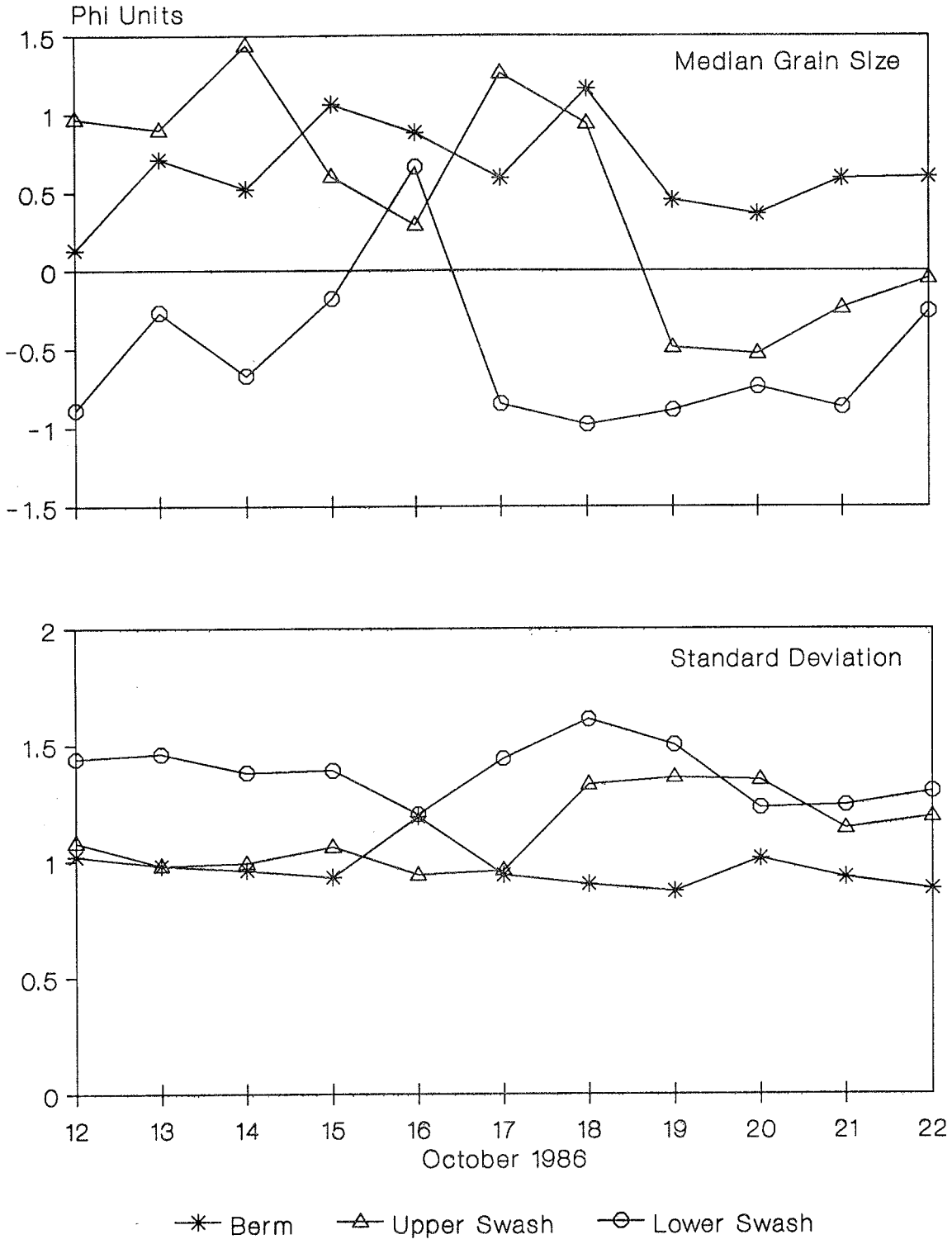


Figure 8. Plot of average median grain size and standard deviation for berm, upper swash, and lower swash zones

PART VI: SUMMARY

22. Surface sand samples from berm, upper swash, and lower swash morphologic zones were used to examine temporal and spatial variations in median grain diameter associated with two storm events. Trends in the distribution of median grain size show a correlation with variations in nearshore wave height for berm and upper swash samples. Contrary to results of Richmond and Sallenger (1984) and Sonu (1972), as wave height peaked with maximum storm intensity, median grain size increased on the foreshore. Likewise, as wave power decreased, median grain size decreased.

23. Figure 9 illustrates trends in average median grain size and standard deviation for surface samples at the study site between 12 and 22 October 1986. Although grain size data were not collected in association with storm development and peak intensity on 10 and 11 October, a decrease in grain size could be associated with post-storm recovery. Furthermore, a rapid increase in median grain size on 18 to 19 October is directly correlated with an increase in wave height associated with a storm event. Post-storm beach profiles show a net decrease in grain size as the nearshore bar migrated landward. Standard deviation values are extremely consistent both spatially and temporally and therefore provide limited insight to process/response dependence.

24. Sonu (1972) presented a model describing variations in beach sediment texture associated with storm and recovery cycles. The time scale of change for adjustments in foreshore sand volume and sediment texture was 2 to 3 months. Results of the present study suggest that near-instantaneous adjustments in average median grain size can be directly related to storm and post-storm nearshore wave processes.

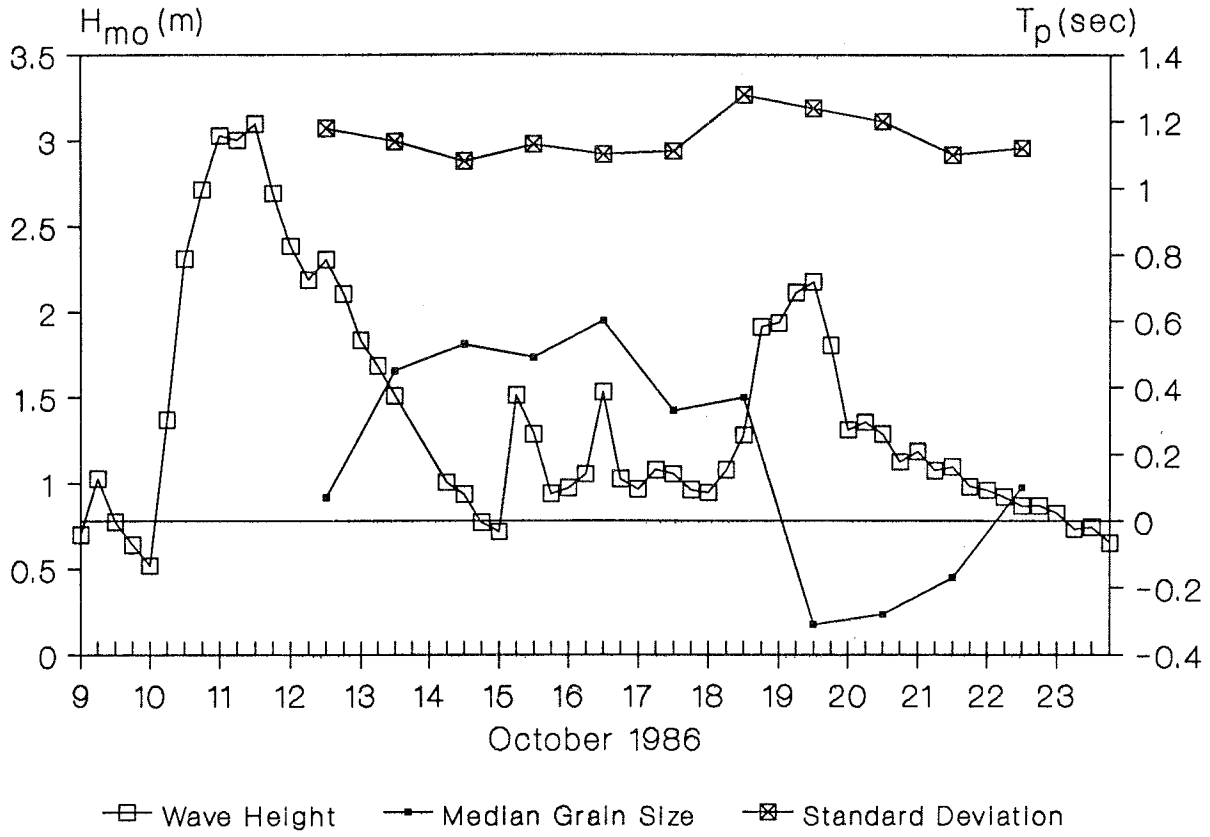


Figure 9. Plot of wave height, average median grain size, and average standard deviation for 9 to 23 October 1986

REFERENCES

Field Research Facility. 1986 (Oct). "Preliminary Data Summary," Monthly Series, Coastal Engineering Research Center, US Army Engineer Waterways Experiment Station, Vicksburg, MS.

Mason, C., Sallenger, A. H., Holman, R. A., and Birkemeier, W. A. 1984. "DUCK82 - A Coastal Storm Processes Experiment," Proceedings of the 19th Coastal Engineering Conference, American Society of Civil Engineers, pp 1913-1928.

Richmond, B. M., and Sallenger, A. H. 1984. "Cross-Shore Transport of Bimodal Sands," Proceedings of the 19th Coastal Engineering Conference, American Society of Civil Engineers, pp 1997-2008.

Sonu, C. J. 1972. "Bimodal Compositions and Cyclic Characteristics of Beach Sediment in Continuously Changing Profiles," Journal of Sedimentary Petrology, Vol 42, pp 852-857.

Stauble, D. K., Holem, G. W., Byrnes, M. R., Anders, F. J., and Meisburger, E. P. "SUPERDUCK Beach Sediment Sampling Experiment, Report 2, Beach Profile Change and Sediment Dynamics," Miscellaneous Paper, in preparation, Coastal Engineering Research Center, US Army Engineer Waterways Experiment Station, Vicksburg, MS.

APPENDIX A: BEACH PROFILE AND CORE LOCATION DATA

Beach Profile and Core Location Data - 12 October 1986

Transect	Alongshore (m)	Cross-shore (m)	Elevation (m)	Core #
1	961.05	73.55	3.49	--
1	959.95	78.89	3.26	4
1	958.72	84.78	2.71	--
1	957.40	94.84	1.99	5
1	956.23	104.89	1.04	6
2	966.69	76.19	3.30	--
2	965.79	81.66	3.16	7
2	964.72	88.80	2.73	--
2	963.80	96.64	2.00	8
2	961.89	103.72	1.25	*
3	976.41	74.66	3.52	--
3	975.96	80.04	3.32	10
3	975.99	84.85	3.13	--
3	975.04	94.99	2.05	11
3	974.18	105.28	1.17	12
4	-------	------	-----	--
4	981.78	78.24	3.46	1
4	981.07	84.43	3.20	--
4	980.14	91.57	2.34	2
4	978.91	102.95	1.37	3
5	992.67	74.76	3.55	--
5	993.55	80.70	3.56	13
5	992.78	86.40	3.38	--
5	991.76	95.63	2.14	14
5	991.32	107.38	1.13	15
6	1004.60	77.70	3.38	--
6	1003.90	81.52	3.38	*
6	1002.93	86.37	3.22	--
6	1000.95	95.61	2.15	*
6	1000.35	109.25	0.96	*

* - no core recovery

Beach Profile and Core Location Data - 13 October 1986

Transect	Alongshore (m)	Cross-shore (m)	Elevation (m)	Core #
1	961.41	74.88	3.36	--
1	960.39	86.27	2.69	4
1	960.02	91.84	-----	--
1	958.81	101.67	1.35	5
1	957.01	116.33	-0.36	6
2	970.70	74.50	3.39	--
2	969.38	84.81	3.11	7
2	968.24	91.92	2.32	--
2	966.98	101.12	1.38	8
2	965.73	119.26	-0.46	9
3	975.18	74.98	3.41	--
3	974.16	84.44	3.18	10
3	972.95	91.46	2.23	--
3	971.99	100.71	1.34	11
3	970.12	119.08	-0.37	12
4	982.89	76.28	3.50	--
4	982.66	86.21	3.13	1
4	982.85	96.32	1.84	--
4	982.15	110.74	0.47	2
4	981.29	122.41	-0.50	3
5	993.60	80.17	3.47	--
5	992.72	84.99	3.36	13
5	991.00	97.36	2.14	--
5	989.73	106.30	1.32	14
5	989.17	121.12	-0.32	15
6	1003.32	79.91	3.31	--
6	1002.46	85.91	3.19	16
6	1001.24	93.51	2.37	--
6	999.34	103.52	1.59	17
6	998.62	121.89	-0.25	18

Beach Profile and Core Location Data - 14 October 1986

Transect	Alongshore (m)	Cross-shore (m)	Elevation (m)	Core #
1	959.42	76.67	3.30	--
1	957.05	90.60	2.45	4
1	956.96	97.21	1.69	--
1	956.04	106.94	0.50	5
1	955.10	123.10	-0.88	6
2	967.30	76.29	3.23	--
2	965.10	86.94	2.56	7
2	964.81	96.56	1.67	--
2	963.41	105.44	0.76	8
2	961.97	122.62	-0.78	9
3	974.28	77.43	3.30	--
3	974.11	86.82	2.87	10
3	972.30	93.38	1.94	--
3	969.35	103.63	0.92	11
3	966.91	120.23	-0.59	12
4	982.24	75.09	3.55	--
4	982.07	83.96	3.23	1
4	981.33	94.60	1.97	--
4	978.87	109.32	0.57	2
4	975.30	128.32	-0.97	*
5	993.86	77.09	3.49	--
5	992.35	85.73	3.39	13
5	990.83	95.56	2.39	--
5	989.02	107.04	0.94	14
5	986.41	123.73	-0.70	15
6	1002.51	80.03	3.30	--
6	1001.83	86.06	3.20	16
6	1000.67	97.02	1.97	--
6	999.10	107.60	0.80	17
6	998.19	122.22	-0.43	18

* - no core recovery

Beach Profile and Core Location Data - 15 October 1986

Transect	Alongshore (m)	Cross-shore (m)	Elevation (m)	Core #
1	961.27	74.22	3.39	--
1	959.96	89.55	2.61	4
1	959.09	95.79	1.64	--
1	958.71	101.19	0.96	5
1	958.18	114.40	-0.14	6
2	968.66	75.23	3.37	--
2	968.46	85.42	3.09	7
2	967.73	92.42	2.09	--
2	966.75	98.30	1.34	8
2	965.35	113.60	-0.05	9
3	975.24	75.59	3.42	--
3	974.86	83.62	3.25	10
3	973.87	91.41	2.22	--
3	972.91	99.18	1.29	11
3	971.34	114.85	-0.12	12
4	982.70	71.60	3.74	--
4	982.15	83.27	3.28	1
4	981.01	92.22	2.20	--
4	980.02	99.69	1.37	2
4	977.52	115.14	-0.08	3
5	994.12	74.81	3.46	--
5	993.37	84.78	3.44	13
5	992.78	94.32	2.54	--
5	992.32	106.20	0.77	14
5	990.41	118.27	-0.24	15
6	1004.10	75.59	3.48	--
6	1003.41	85.88	3.21	16
6	1002.57	95.19	2.07	--
6	1001.77	102.50	1.24	17
6	1000.23	116.22	0.03	18

Beach Profile and Core Location Data - 16 October 1986

Transect	Alongshore (m)	Cross-shore (m)	Elevation (m)	Core #
1	961.09	72.44	3.55	--
1	960.72	89.15	2.65	4
1	960.74	94.24	1.76	--
1	961.01	98.73	1.13	5
1	959.30	110.24	0.11	*
2	968.51	73.74	3.47	--
2	968.24	86.73	2.94	7
2	967.70	92.91	1.99	--
2	967.63	98.18	1.26	8
2	967.75	109.10	0.34	9
3	975.66	74.52	3.46	--
3	974.77	85.09	3.16	10
3	974.51	91.32	2.21	--
3	974.06	97.95	1.31	11
3	973.18	109.11	0.41	12
4	981.44	74.25	3.62	--
4	980.20	83.77	3.23	1
4	979.70	91.72	2.20	--
4	978.43	99.59	1.21	2
4	978.02	111.44	0.18	3
5	993.92	76.07	3.51	--
5	992.42	87.07	3.30	13
5	991.88	94.43	2.45	--
5	991.17	99.43	1.44	14
5	989.74	111.28	0.34	15
6	1002.00	77.61	3.41	--
6	1001.43	86.58	3.21	16
6	1000.82	94.57	2.17	--
6	999.76	104.13	0.90	17
6	999.44	112.41	0.27	18

* - no core recovery

Beach Profile and Core Location Data - 17 October 1986

Transect	Alongshore (m)	Cross-shore (m)	Elevation (m)	Core #
1	958.75	79.05	3.17	--
1	957.81	85.98	2.65	4
1	957.59	90.83	2.38	--
1	956.96	99.47	0.99	5
1	955.12	117.32	-0.50	6
2	966.55	77.77	3.21	--
2	966.15	86.84	2.87	7
2	965.70	95.30	1.64	--
2	964.87	102.66	0.82	8
2	962.90	116.18	-0.42	9
3	975.79	79.07	3.31	--
3	976.19	86.12	2.94	10
3	975.83	94.30	1.75	--
3	975.58	102.40	0.92	11
3	974.45	116.69	-0.52	12
4	983.43	77.50	3.50	--
4	982.86	86.24	2.95	1
4	982.14	94.26	1.82	--
4	982.07	105.17	0.65	2
4	981.13	120.11	-0.74	3
5	993.85	79.32	3.51	--
5	993.28	87.28	3.31	13
5	992.07	94.22	2.49	--
5	991.80	96.67	1.77	14
5	991.16	104.98	0.70	15
5	989.80	118.80	-0.45	--
6	1003.58	81.08	3.30	--
6	1003.47	86.68	3.11	16
6	1002.50	95.75	1.83	--
6	1001.77	106.85	0.65	17
6	998.77	121.22	-0.53	18

Beach Profile and Core Location Data - 18 October 1986

Transect	Alongshore (m)	Cross-shore (m)	Elevation (m)	Core #
1	960.83	68.69	4.01	--
1	961.14	89.05	2.65	4
1	960.93	93.80	1.94	--
1	960.38	100.47	1.12	5
1	960.15	112.19	-0.23	6
2	967.97	69.21	3.83	--
2	967.62	88.52	2.76	7
2	967.74	94.24	1.85	--
2	967.96	99.52	1.20	8
2	966.91	112.83	-0.21	9
3	977.01	71.02	3.76	--
3	977.41	85.11	3.05	10
3	977.78	91.97	2.09	--
3	977.57	102.77	0.88	11
3	977.38	112.10	-0.08	12
4	982.93	79.59	3.42	--
4	983.08	85.96	3.06	1
4	982.67	94.28	1.88	--
4	982.07	102.31	0.99	2
4	982.41	115.21	-0.26	3
5	992.80	71.60	3.66	--
5	992.45	86.94	3.29	13
5	992.12	91.84	2.68	--
5	991.52	100.08	1.31	14
5	989.94	114.95	-0.11	15
6	1008.48	72.98	3.55	--
6	1006.98	84.70	3.18	16
6	1004.68	96.34	1.90	--
6	1002.90	107.02	0.77	17
6	1001.21	115.88	-0.06	18

Beach Profile and Core Location Data - 19 October 1986

Transect	Alongshore (m)	Cross-shore (m)	Elevation (m)	Core #
1	960.80	70.38	3.75	--
1	961.02	84.41	2.86	4
1	960.83	90.80	2.31	--
1	960.19	100.08	1.37	5
1	959.64	113.33	-0.14	6
2	969.22	70.35	3.73	--
2	968.40	86.18	2.99	7
2	968.46	91.06	2.27	--
2	968.09	100.47	1.25	8
2	967.65	113.81	0.02	9
3	977.20	70.20	3.87	--
3	976.80	83.41	3.24	10
3	976.66	92.00	2.18	--
3	976.50	101.10	1.18	11
3	976.61	114.44	0.09	12
4	983.37	71.02	3.77	--
4	982.58	84.17	3.23	1
4	982.48	89.13	2.56	--
4	982.36	98.34	1.65	2
4	980.80	116.94	-0.23	3
5	992.09	72.31	3.62	--
5	961.65	85.78	3.40	13
5	991.69	97.11	2.04	--
5	991.52	103.09	1.34	14
5	991.30	115.09	0.11	15
6	1005.91	72.93	3.55	--
6	1004.84	85.20	3.21	16
6	1003.83	93.70	2.31	--
6	1002.77	102.60	1.44	17
6	1001.05	117.65	-0.12	18

Beach Profile and Core Location Data - 20 October 1986

Transect	Alongshore (m)	Cross-shore (m)	Elevation (m)	Core #
1	960.15	72.44	3.53	--
1	959.84	80.87	3.09	4
1	959.69	91.26	2.24	--
1	959.18	102.27	1.16	5
1	957.79	117.88	-0.41	6
2	968.04	73.84	3.46	--
2	967.55	83.87	3.10	7
2	967.71	91.75	2.27	--
2	967.03	102.22	1.49	8
2	965.25	115.43	-0.07	9
3	976.63	74.28	3.50	--
3	975.49	83.55	3.24	10
3	975.25	93.26	2.04	--
3	975.94	101.75	1.34	11
3	976.06	119.39	-0.26	12
4	983.00	70.47	3.82	--
4	982.71	83.53	3.28	1
4	982.80	89.20	2.54	--
4	982.83	101.69	1.48	2
4	981.83	119.44	-0.23	3
5	992.62	75.34	3.55	--
5	991.88	85.54	3.44	13
5	991.65	94.84	2.36	--
5	990.59	103.53	1.60	14
5	989.38	121.13	-0.47	15
6	1004.26	76.30	3.42	--
6	1003.73	85.43	3.21	16
6	1003.08	93.52	2.32	--
6	1002.67	103.36	1.47	17
6	1001.07	120.80	-0.20	18

Beach Profile and Core Location Data - 21 October 1986

Transect	Alongshore (m)	Cross-shore (m)	Elevation (m)	Core #
1	960.10	72.83	3.52	--
1	959.61	83.41	2.88	4
1	958.49	93.94	1.97	--
1	958.11	102.19	1.27	5
1	956.73	116.34	-0.23	6
2	967.69	70.02	3.78	--
2	967.20	83.83	3.07	7
2	965.59	95.05	2.17	--
2	965.88	103.42	1.25	8
2	965.61	117.41	-0.27	9
3	976.68	70.20	3.85	--
3	975.63	83.43	3.23	10
3	975.27	94.57	2.04	--
3	974.72	101.97	1.45	11
3	974.32	118.04	-0.31	12
4	983.20	71.74	3.74	--
4	982.55	83.25	3.32	1
4	982.46	92.27	2.25	--
4	982.04	102.28	1.53	2
4	981.90	117.33	-0.20	3
5	992.50	72.01	3.59	--
5	992.00	85.41	3.43	13
5	990.79	95.84	2.30	--
5	990.81	104.34	1.29	14
5	990.31	118.70	-0.23	15
6	1005.32	72.59	3.63	--
6	1004.18	85.16	3.21	16
6	1002.69	99.27	1.90	--
6	1002.30	105.12	1.43	17
6	1001.09	119.63	-0.27	18

Beach Profile and Core Location Data - 22 October 1986

Transect	Alongshore (m)	Cross-shore (m)	Elevation (m)	Core #
1	959.99	75.22	3.40	--
1	959.63	83.12	2.88	4
1	959.65	94.09	2.02	--
1	959.17	104.04	1.12	5
1	958.28	119.21	-0.38	6
2	967.47	74.97	3.38	--
2	967.16	82.77	3.09	7
2	967.14	94.60	2.25	--
2	966.63	105.55	1.04	8
2	966.89	119.55	-0.40	9
3	975.74	74.54	3.48	--
3	975.70	83.34	3.27	10
3	975.40	93.68	2.10	--
3	974.53	105.78	0.96	11
3	973.74	119.21	-0.30	12
4	982.89	74.89	3.59	--
4	982.48	83.31	3.26	1
4	982.88	93.92	2.14	--
4	982.05	104.06	1.30	2
4	981.35	119.52	-0.29	3
5	992.15	75.38	3.56	--
5	992.10	85.66	3.43	13
5	991.53	95.37	2.37	--
5	990.97	105.31	1.15	14
5	990.48	120.88	-0.41	15
6	1006.06	73.69	3.52	--
6	1004.77	85.22	3.21	16
6	1003.75	95.95	2.15	--
6	1002.75	105.07	1.26	17
6	1001.09	120.45	-0.33	18

APPENDIX B: GRAIN SIZE STATISTICS

		MOMENT STATISTICS				FOLK INCLUSIVE GRAPHIC STATISTICS					PERCENT COMPOSITION			
SAMPLE	DEPTH (CM)	FIRST (PHI)	SECOND (PHI)	THIRD	FOURTH	MEDIAN (PHI)	MEAN (PHI)	STANDARD DEVIATION (PHI)	SKEWNESS	KURTOSIS	GRAVEL	COARSE SAND	MEDIUM SAND	FINE SAND
120101a	3-7	0.48	1.08	0.40	2.10	0.21	0.51	1.12	0.33	0.74	4.31	64.61	18.69	12.39
120101b	21-25	1.03	0.88	-0.26	2.45	1.03	1.04	0.88	-0.04	0.84	0.77	48.17	37.01	14.05
120101c	31-34	1.26	0.84	-0.64	3.16	1.42	1.30	0.81	-0.25	0.88	0.97	35.15	44.95	18.93
120102a	2-5	1.43	0.90	-0.68	2.71	1.70	1.46	0.90	-0.38	0.90	0.28	29.56	39.10	31.06
120102b	7-9	0.20	1.31	0.46	1.94	-0.19	0.23	1.34	0.39	0.68	18.46	51.54	15.79	14.21
120102c	11-15	1.30	0.93	-0.48	2.38	1.53	1.32	0.93	-0.30	0.82	0.70	34.89	38.14	26.27
120102d	30-34	-0.26	0.72	1.32	5.85	-0.37	-0.34	0.62	0.21	1.47	9.56	84.45	4.24	1.75
120103a	3-7	-0.24	1.41	0.64	2.35	-0.64	-0.12	1.53	0.40	1.01	32.44	45.02	10.71	11.83
120103b	20-24	-0.99	1.39	1.28	3.60	-1.42	-1.09	1.36	0.47	1.31	65.09	21.53	6.42	6.96
120301a	6-10	0.12	1.10	0.84	2.66	-0.28	0.19	1.14	0.52	0.98	8.76	68.39	14.06	8.79
120301b	20-24	-0.74	0.81	2.02	8.23	-0.89	-0.88	0.67	0.25	1.58	41.40	53.35	2.80	2.45
120301c	31-35	-0.09	0.96	0.64	3.25	-0.20	-0.13	0.95	0.17	1.25	15.22	71.84	9.31	3.63
120302a	0-4	0.45	1.34	0.42	1.72	-0.16	0.42	1.33	0.53	0.58	7.58	56.79	13.45	22.18
120302b	5-8	1.20	1.08	-0.48	2.01	1.60	1.23	1.10	-0.43	0.73	1.15	37.09	32.89	28.87
120302c	10-13	-0.06	1.10	1.02	2.98	-0.48	0.00	1.12	0.58	1.15	12.30	68.21	11.65	7.84
120302d	17-20	0.86	1.11	-0.10	1.79	0.93	0.85	1.13	-0.09	0.69	2.25	49.17	30.30	18.28
120302e	33-36	0.00	0.64	1.50	5.81	-0.16	-0.08	0.56	0.37	1.61	0.68	91.41	6.23	1.68
120303a	0-5	-0.56	1.39	1.16	3.23	-0.99	-0.32	1.54	0.55	1.69	48.60	33.63	5.96	11.81
120401a	2-5	0.62	0.89	0.28	2.35	0.47	0.64	0.91	0.22	0.85	1.78	65.64	25.17	7.41
120401b	12-16	0.17	0.51	1.18	6.04	0.09	0.12	0.43	0.18	1.25	0.08	94.40	4.65	0.87
120401c	20-23	-0.15	0.80	0.74	3.99	-0.22	-0.21	0.76	0.15	1.34	11.28	80.40	6.58	1.74
120401d	35-39	0.59	0.73	0.40	2.74	0.46	0.60	0.73	0.25	1.03	0.40	73.46	22.96	3.18
120402a	1-4	1.12	0.99	-0.38	2.08	1.36	1.12	1.00	-0.30	0.75	0.78	39.93	39.11	20.18
120402b	7-10	0.55	1.05	0.36	2.08	0.28	0.56	1.08	0.32	0.74	3.18	63.56	21.24	12.02
120402c	12-15	1.17	0.86	-0.08	2.11	1.22	1.16	0.87	-0.08	0.75	0.08	43.29	37.98	18.65
120402d	26-30	-0.14	0.85	1.54	5.19	-0.40	-0.28	0.71	0.48	1.89	4.64	83.97	7.28	4.11
120403a	2-6	-0.61	1.51	0.84	2.52	-1.03	-0.54	1.63	0.42	0.96	51.04	29.50	9.41	10.05
120403b	19-23	0.27	1.21	0.44	2.05	-0.05	0.30	1.26	0.34	0.75	13.20	57.81	16.86	12.13
130101a	5-8	1.20	0.99	-0.52	2.39	1.46	1.24	0.98	-0.32	0.75	0.98	39.11	34.60	25.31

		MOMENT STATISTICS				FOLK INCLUSIVE GRAPHIC STATISTICS					PERCENT COMPOSITION			
SAMPLE	DEPTH (CM)	FIRST (PHI)	SECOND (PHI)	THIRD	FOURTH	MEDIAN (PHI)	MEAN (PHI)	STANDARD DEVIATION (PHI)	SKEWNESS	KURTOSIS	GRAVEL	COARSE SAND	MEDIUM SAND	FINE SAND
130101b	15-19	0.55	1.00	0.02	1.97	0.54	0.55	1.02	0.02	0.74	4.28	57.92	30.86	6.94
130101c	37-41	0.70	0.68	-0.30	2.97	0.74	0.71	0.67	-0.08	0.97	1.22	62.22	35.14	1.42
130102a	0-4	1.02	0.86	-0.52	2.75	1.18	1.04	0.87	-0.24	0.95	1.40	42.02	44.92	11.66
130102b	7-11	0.25	1.22	0.58	2.30	-0.07	0.30	1.29	0.37	0.90	13.21	60.23	12.65	13.91
130102c	15-18	1.28	1.00	-0.52	2.30	1.55	1.30	1.01	-0.33	0.76	1.08	36.26	33.75	28.91
130102d	22-26	0.47	1.28	0.38	1.70	0.00	0.45	1.27	0.44	0.62	7.98	56.47	15.79	19.76
130102e	39-43	0.78	1.06	0.20	1.78	0.61	0.77	1.06	0.20	0.66	1.13	57.06	24.70	17.11
130103a	2-6	-0.22	1.38	0.60	2.40	-0.50	-0.14	1.50	0.31	1.08	32.19	47.22	8.87	11.72
130103b	20-24	-0.78	1.49	0.92	2.53	-1.38	-0.75	1.52	0.59	0.86	57.27	25.39	9.28	8.06
130301a	3-7	0.50	1.07	0.36	2.15	0.25	0.52	1.09	0.31	0.76	4.22	63.73	20.79	11.26
130301b	19-22	-0.37	0.72	1.14	5.84	-0.43	-0.44	0.61	0.07	1.32	14.73	80.60	3.15	1.52
130301c	23-26	0.22	0.92	0.72	3.07	0.02	0.23	0.92	0.35	1.18	4.71	76.42	13.06	5.81
130301d	32-35	-0.96	0.90	0.94	4.60	-1.03	-1.03	0.84	0.06	1.09	0.00	22.67	2.34	74.99
130301e	42-46	0.41	0.82	0.74	3.12	0.23	0.40	0.79	0.36	1.07	0.70	78.58	15.47	5.27
130302a	2-5	0.62	1.14	0.08	1.96	0.42	0.63	1.15	0.20	0.68	5.29	56.27	22.95	15.49
130302b	12-14	0.20	1.10	0.90	2.56	-0.28	0.29	1.15	0.62	0.95	4.17	71.95	12.10	11.78
130302c	18-22	0.78	1.16	0.04	1.75	0.64	0.76	1.16	0.12	0.64	3.28	52.66	23.85	20.21
130302d	37-41	-0.26	0.90	1.36	4.54	-0.52	-0.32	0.82	0.50	1.76	11.04	77.13	8.31	3.52
130303a	0-4	-0.60	1.48	0.80	2.53	-0.93	-0.52	1.63	0.37	1.03	47.94	33.95	7.82	10.29
130303b	8-11	0.72	1.54	-0.32	1.70	1.05	0.77	1.54	-0.27	0.65	17.67	31.92	18.88	31.53
130401a	4-7	0.78	0.94	0.14	2.23	0.65	0.79	0.94	0.17	0.76	1.12	59.21	28.19	11.48
130401b	13-16	0.01	0.69	1.36	5.26	-0.15	-0.07	0.61	0.35	1.66	1.69	88.99	7.31	2.01
130401c	31-33	0.85	0.69	0.22	2.43	0.76	0.85	0.68	0.17	0.83	0.08	61.27	34.23	4.42
130402a	3-6	1.18	0.80	-0.42	2.75	1.28	1.19	0.79	-0.18	0.85	0.57	38.50	46.97	13.96
130402b	24-27	0.35	0.97	0.78	2.70	0.02	0.40	0.98	0.52	0.92	1.87	73.67	15.85	8.61
130402c	30-32	1.52	0.75	-0.76	3.23	1.70	1.55	0.74	-0.33	1.15	0.00	21.34	51.43	27.23
130402d	33-36	0.87	0.68	0.34	2.78	0.78	0.87	0.67	0.19	0.90	0.09	61.95	32.62	5.34
130402e	38-40	0.32	0.69	1.04	4.10	0.13	0.26	0.64	0.41	1.38	0.29	85.12	11.82	2.77
130403a	5-9	0.18	1.51	0.10	1.79	-0.04	0.20	1.58	0.14	0.69	26.24	39.87	16.39	17.50

		MOMENT STATISTICS				FOLK INCLUSIVE GRAPHIC STATISTICS					PERCENT COMPOSITION			
SAMPLE	DEPTH (CM)	FIRST (PHI)	SECOND (PHI)	THIRD	FOURTH	MEDIAN (PHI)	MEAN (PHI)	STANDARD DEVIATION (PHI)	SKEWNESS	KURTOSIS	GRAVEL	COARSE SAND	MEDIUM SAND	FINE SAND
130403b	18-22	0.61	1.52	-0.12	1.71	0.50	0.60	1.50	0.03	0.64	16.61	37.90	18.08	27.51
130601a	0-4	1.08	0.94	-0.30	2.23	1.23	1.09	0.95	-0.20	0.82	0.60	43.59	38.97	16.84
130601b	13-16	0.30	0.88	0.78	2.82	0.10	0.30	0.90	0.35	0.96	0.98	78.47	15.36	5.19
130601c	38-41	-0.25	0.74	0.36	4.23	-0.26	-0.28	0.68	-0.03	1.24	13.37	82.04	3.68	0.91
130601d	43-46	0.69	0.80	0.30	2.51	0.56	0.71	0.81	0.22	0.88	0.76	67.56	25.51	6.17
130602a	3-7	0.72	1.14	-0.10	1.95	0.71	0.74	1.15	0.01	0.70	5.09	51.82	26.49	16.60
130602b	16-19	1.26	0.95	-0.48	2.18	1.52	1.28	0.98	-0.34	0.76	0.40	36.86	36.14	26.60
130602c	24-28	0.38	1.38	0.42	1.66	-0.19	0.37	1.37	0.48	0.60	13.60	51.38	12.63	22.39
130602d	44-47	0.98	1.12	-0.22	1.85	1.12	1.00	1.11	-0.14	0.66	1.68	46.60	27.99	23.73
130603a	5-9	0.60	1.48	-0.12	1.75	0.39	0.57	1.51	0.06	0.71	15.54	41.53	15.76	27.17
130603b	25-29	-0.47	1.62	0.66	2.01	-0.92	-0.38	1.69	0.43	0.64	48.11	27.37	10.84	13.68
140101a	3-8	0.88	0.94	-0.28	3.11	0.85	0.91	0.91	0.08	0.79	1.83	54.29	30.86	13.02
140101b	19-24	1.10	1.01	-0.36	2.17	1.31	1.14	1.01	-0.24	0.73	1.12	42.71	33.82	22.35
140101c	32-37	1.29	1.02	-0.66	2.43	1.60	1.30	1.04	-0.41	0.84	1.73	32.71	36.50	29.06
140102a	2-7	1.18	0.98	-0.58	2.53	1.42	1.21	0.97	-0.31	0.78	1.92	38.10	36.98	23.00
140102b	17-22	0.23	0.76	1.12	4.23	0.04	0.19	0.71	0.39	1.44	1.21	84.13	10.82	3.84
140102c	31-36	-0.02	0.91	0.48	3.42	-0.10	-0.02	0.91	0.14	1.40	12.02	74.83	10.21	2.94
140103a	0-3	-1.22	1.01	1.88	7.16	-1.40	-1.37	0.88	0.29	1.16	69.32	25.53	2.22	2.93
140103b	7-12	0.55	1.44	0.10	1.50	0.14	0.48	1.42	0.26	0.60	15.06	42.74	15.91	26.29
140103c	19-24	-0.33	1.13	0.80	3.19	-0.49	-0.40	1.13	0.23	1.14	29.91	57.07	7.61	5.41
140301a	3-9	0.09	1.04	0.80	3.10	-0.20	0.12	1.03	0.46	1.17	8.21	72.53	11.62	7.64
140301b	12-17	-0.64	0.79	1.44	5.83	-0.82	-0.72	0.67	0.35	1.44	34.38	60.68	3.66	1.28
140301c	27-32	0.31	0.90	0.76	3.09	0.10	0.31	0.90	0.37	1.21	2.52	77.91	12.67	6.90
140301d	41-46	0.96	1.05	-0.06	1.82	0.91	0.96	1.06	0.03	0.68	1.28	50.60	26.33	21.79
140302a	3-8	0.93	1.05	-0.16	1.99	0.95	0.93	1.05	-0.04	0.70	2.38	48.83	30.09	18.70
140302b	20-25	-0.45	1.06	1.14	4.08	-0.73	-0.45	0.96	0.48	2.44	26.90	60.00	8.81	4.29
140302c	40-45	0.84	0.74	0.52	3.00	0.69	0.83	0.73	0.28	0.93	0.10	64.79	27.44	7.67
140303a	1-6	0.06	1.59	0.32	1.80	-0.33	0.11	1.67	0.29	0.65	31.43	37.52	10.68	20.37
140303b	19-24	-0.27	1.55	0.64	2.15	-0.74	-0.19	1.65	0.40	0.80	39.48	35.50	9.62	15.40

		MOMENT STATISTICS				FOLK INCLUSIVE GRAPHIC STATISTICS					PERCENT COMPOSITION			
SAMPLE	DEPTH (CM)	FIRST (PHI)	SECOND (PHI)	THIRD	FOURTH	MEDIAN (PHI)	MEAN (PHI)	STANDARD DEVIATION (PHI)	SKEWNESS	KURTOSIS	GRAVEL	COARSE SAND	MEDIUM SAND	FINE SAND
140401a	7-12	0.97	0.98	-0.38	2.67	1.04	0.99	0.96	-0.09	0.81	2.50	46.48	36.19	14.83
140401b	35-40	0.84	0.83	0.16	2.40	0.71	0.85	0.83	0.20	0.77	0.76	59.49	30.72	9.03
140402a	3-8	1.49	0.87	-0.70	2.99	1.73	1.51	0.86	-0.38	0.94	0.28	26.35	41.05	32.32
140402b	18-23	0.27	1.50	0.14	1.79	-0.02	0.29	1.53	0.19	0.67	23.32	40.61	17.25	18.82
140402c	32-37	-0.36	0.91	1.36	4.97	-0.56	-0.47	0.81	0.35	1.95	17.24	72.76	6.63	3.37
140601a	2-7	0.56	0.88	0.42	2.53	0.38	0.58	0.90	0.28	0.94	1.66	69.91	21.18	7.25
140601b	30-35	0.10	0.76	0.42	3.60	0.05	0.08	0.75	0.10	1.30	6.37	83.12	8.66	1.85
140602a	2-7	1.31	1.05	-0.76	2.64	1.67	1.34	1.05	-0.45	0.86	2.56	31.20	35.43	30.81
140602b	20-25	0.39	1.20	0.34	1.87	0.02	0.38	1.20	0.37	0.68	8.91	56.84	21.68	12.57
140602c	39-44	-0.12	1.02	0.64	3.04	-0.32	-0.13	1.02	0.29	1.19	17.01	67.40	12.00	3.59
140603a	1-5	-0.05	1.53	0.36	1.93	-0.29	0.00	1.64	0.22	0.75	31.89	41.34	10.51	16.26
140603b	16-20	-0.74	1.77	0.98	2.31	-1.65	-0.58	1.78	0.76	0.76	64.51	11.72	6.74	17.03
150101a	3-6	1.52	0.82	-1.10	4.13	1.73	1.58	0.78	-0.36	1.15	0.77	21.38	48.50	29.35
150101b	27-29	0.49	1.10	0.38	1.94	0.15	0.50	1.13	0.36	0.70	5.27	61.41	20.34	12.98
150101c	32-35	1.46	0.92	-1.08	4.02	1.75	1.49	0.89	-0.44	0.99	1.18	25.46	41.08	32.28
150102a	5-9	0.05	1.15	0.68	2.40	-0.34	0.09	1.18	0.46	0.86	15.23	60.90	16.06	7.81
150102b	20-23	0.99	0.66	-0.06	3.09	0.96	1.00	0.66	0.05	1.05	0.08	53.37	40.46	6.09
150102c	31-36	0.39	0.82	0.40	3.20	0.28	0.37	0.80	0.20	1.14	3.36	76.71	15.48	4.45
150103a	2-5	0.45	1.41	0.32	1.65	-0.03	0.44	1.42	0.37	0.62	14.18	49.46	11.92	24.44
150103b	19-23	-0.77	1.72	0.98	2.31	-1.63	-0.63	1.72	0.75	0.70	65.34	11.44	9.19	14.03
150301a	3-7	0.87	1.01	-0.04	1.93	0.87	0.86	1.02	-0.01	0.72	1.29	51.84	32.18	14.69
150301b	18-20	-0.23	0.80	1.44	5.80	-0.34	-0.32	0.75	0.24	1.65	11.90	80.38	4.52	3.20
150301c	25-28	0.09	0.89	0.98	3.63	-0.13	0.04	0.85	0.36	1.34	5.71	79.39	9.97	4.93
150301d	33-35	-0.76	0.92	1.12	4.50	-0.92	-0.85	0.84	0.25	1.08	46.77	47.99	3.62	1.62
150301e	36-38	-0.10	0.48	1.24	8.22	-0.15	-0.12	0.37	0.10	1.08	1.27	96.88	1.23	0.62
150302a	2-5	1.05	1.08	-0.24	1.85	1.21	1.04	1.10	-0.20	0.69	1.06	44.47	30.81	23.66
150302b	9-13	-0.15	0.79	1.62	5.58	-0.39	-0.28	0.70	0.44	1.77	4.63	85.57	6.50	3.30
150302c	35-38	1.11	0.62	0.16	2.93	1.05	1.11	0.60	0.11	0.96	0.00	46.84	45.72	7.44
150303a	2-5	0.01	1.47	0.40	1.98	-0.41	0.06	1.55	0.33	0.74	26.93	44.47	12.87	15.73

		MOMENT STATISTICS				FOLK INCLUSIVE GRAPHIC STATISTICS					PERCENT COMPOSITION			
SAMPLE	DEPTH (CM)	FIRST (PHI)	SECOND (PHI)	THIRD	FOURTH	MEDIAN (PHI)	MEAN (PHI)	STANDARD DEVIATION (PHI)	SKEWNESS	KURTOSIS	GRAVEL	COARSE SAND	MEDIUM SAND	FINE SAND
150303b	18-22	-0.16	1.70	0.62	1.67	-1.08	-0.10	1.57	0.79	0.51	51.76	16.20	10.18	21.86
150401a	7-10	0.94	0.89	-0.10	2.43	0.89	0.95	0.87	0.08	0.74	1.51	52.15	33.71	12.63
150401b	17-20	0.18	0.70	0.66	4.85	0.08	0.13	0.63	0.22	1.74	2.95	86.77	7.94	2.34
150401c	37-40	1.34	0.97	-0.50	2.29	1.65	1.39	0.96	-0.36	0.72	0.67	36.30	30.48	32.55
150402a	2-6	0.21	1.24	0.58	2.10	-0.34	0.25	1.27	0.55	0.70	11.28	59.72	15.44	13.56
150402b	10-13	0.95	0.93	0.06	1.88	0.91	0.94	0.94	0.05	0.69	0.12	52.24	32.18	15.46
150402c	32-35	0.07	0.87	1.08	3.85	-0.22	0.06	0.81	0.55	1.69	2.95	81.36	11.11	4.58
150403a	2-5	0.30	1.25	0.36	2.27	-0.01	0.38	1.28	0.34	0.84	10.90	60.64	13.79	14.67
150403b	26-30	-0.53	1.62	0.84	2.28	-1.19	-0.44	1.70	0.55	0.87	56.00	20.46	9.20	14.34
150601a	2-5	0.80	0.99	0.10	2.07	0.74	0.81	1.01	0.07	0.80	1.63	57.33	27.53	13.51
150601b	19-23	0.22	0.61	0.48	4.35	0.15	0.20	0.59	0.17	1.32	1.44	89.78	7.86	0.92
150601c	33-37	-0.07	0.75	0.60	4.26	-0.10	-0.09	0.71	0.07	1.45	9.49	83.05	5.95	1.51
150602a	0-3	1.68	0.79	-1.26	4.92	1.85	1.71	0.74	-0.36	1.32	0.61	16.85	43.86	38.68
150602b	7-11	0.21	1.30	0.48	1.88	-0.26	0.21	1.32	0.43	0.68	17.43	51.78	16.81	13.98
150602c	28-32	0.38	0.89	0.84	3.03	0.12	0.39	0.91	0.44	1.08	1.54	76.81	14.41	7.24
150602D	36-40	0.04	0.73	1.40	5.15	-0.09	-0.03	0.67	0.30	1.67	2.24	88.02	6.60	3.14
150603a	2-5	0.32	1.44	0.42	1.73	-0.25	0.33	1.47	0.44	0.64	17.56	49.05	10.04	23.35
150603b	23-26	-1.16	1.63	1.50	3.55	-2.03	-0.90	1.63	0.92	1.98	76.69	6.02	5.42	11.87
160101a	4-8	1.37	0.73	-0.42	2.99	1.45	1.39	0.71	-0.14	0.93	0.27	30.18	49.93	19.62
160101b	24-29	0.54	1.10	0.26	2.02	0.29	0.55	1.13	0.27	0.71	5.08	60.91	20.91	13.10
160101c	37-42	1.00	0.89	-0.22	2.24	0.99	1.00	0.90	-0.03	0.81	0.94	49.48	36.30	13.28
160102a	3-8	0.08	1.08	0.82	2.66	-0.28	0.11	1.11	0.48	0.94	10.71	67.43	14.23	7.63
160102b	13-18	0.86	0.69	0.24	2.76	0.77	0.86	0.67	0.19	0.90	0.31	62.17	32.01	5.51
160102c	33-38	0.12	1.18	0.04	2.45	0.15	0.11	1.24	-0.03	1.05	19.46	58.98	14.98	6.58
160301a	2-6	0.69	1.09	0.02	1.94	0.63	0.70	1.11	0.06	0.71	4.47	54.04	28.00	13.49
160301b	15-20	0.03	0.93	1.06	3.61	-0.22	0.00	0.90	0.41	1.43	7.33	76.93	10.55	5.19
160301c	30-35	-0.53	0.92	0.92	4.33	-0.60	-0.61	0.86	0.11	1.21	32.54	61.08	4.37	2.01
160302a	5-10	0.03	0.65	1.48	5.50	-0.13	-0.05	0.57	0.40	1.69	0.63	90.23	7.34	1.80
160302b	21-25	0.89	0.76	0.12	2.36	0.85	0.89	0.76	0.08	0.83	0.07	56.72	36.00	7.21

		MOMENT STATISTICS				FOLK INCLUSIVE GRAPHIC STATISTICS					PERCENT COMPOSITION			
SAMPLE	DEPTH (CM)	FIRST (PHI)	SECOND (PHI)	THIRD	FOURTH	MEDIAN (PHI)	MEAN (PHI)	STANDARD DEVIATION (PHI)	SKEWNESS	KURTOSIS	GRAVEL	COARSE SAND	MEDIUM SAND	FINE SAND
160302c	32-37	-0.35	1.40	0.52	2.26	-0.66	-0.30	1.51	0.29	0.92	37.21	41.46	13.80	7.53
160303a	7-12	0.76	1.29	0.04	1.54	0.54	0.73	1.27	0.16	0.59	5.14	49.37	19.27	26.22
160303b	24-29	-0.04	1.16	0.16	2.42	-0.11	-0.02	1.20	0.08	0.97	20.92	58.56	16.56	3.96
160401a	4-9	0.93	1.00	-0.40	2.83	0.94	0.96	0.97	-0.03	0.86	4.13	47.88	33.58	14.41
160401b	31-35	0.62	0.75	0.54	2.76	0.45	0.64	0.76	0.34	1.01	0.39	73.10	21.25	5.26
160402a	10-15	0.10	0.76	1.34	4.27	-0.18	0.05	0.71	0.56	1.57	0.88	85.24	10.66	3.22
160402b	28-33	1.08	0.71	-0.12	2.56	1.10	1.08	0.70	-0.05	0.90	0.07	44.94	46.47	8.52
160403a	1-5	0.75	1.41	-0.22	1.68	0.94	0.77	1.39	-0.17	0.61	13.73	36.92	21.95	27.40
160403b	13-18	-0.55	1.55	0.66	2.19	-0.90	-0.47	1.72	0.34	0.83	47.26	31.65	10.82	10.27
160601a	3-8	0.65	0.93	0.22	2.63	0.49	0.66	0.93	0.24	0.86	1.59	64.93	24.61	8.87
160601b	22-27	0.13	0.67	0.50	4.18	0.08	0.09	0.61	0.10	1.32	3.07	88.44	7.35	1.14
160601c	40-45	0.51	0.71	0.90	3.40	0.30	0.49	0.69	0.42	1.21	0.12	79.58	16.13	4.17
160602a	0-5	1.24	1.25	-0.64	2.25	1.73	1.28	1.26	-0.49	0.76	5.99	30.85	26.02	37.14
160602b	11-16	-0.05	0.94	0.52	3.44	-0.17	-0.07	0.89	0.22	1.31	11.29	75.44	9.93	3.34
160602c	31-36	0.26	0.91	0.48	2.73	0.09	0.27	0.92	0.26	1.00	5.46	73.25	17.35	3.94
160602d	42-47	0.34	1.35	0.00	2.10	0.17	0.38	1.40	0.12	0.78	15.97	50.40	19.36	14.27
160603a	3-8	0.68	0.89	0.38	2.37	0.50	0.69	0.90	0.27	0.83	0.78	65.56	24.86	8.80
160603b	7-12	0.04	1.07	0.28	2.60	-0.04	0.03	1.11	0.09	1.09	16.62	64.44	14.77	4.17
170101a	2-5	1.34	0.87	-0.54	2.69	1.53	1.36	0.86	-0.28	0.86	0.43	33.03	41.78	24.76
170101b	7-10	0.59	1.04	0.30	2.13	0.31	0.61	1.05	0.34	0.72	2.58	63.73	20.81	12.88
170101c	14-17	1.35	0.91	-0.66	2.80	1.60	1.38	0.90	-0.36	0.88	1.03	31.16	40.92	26.89
170101d	29-33	0.44	0.95	0.48	2.47	0.24	0.45	0.97	0.29	0.91	3.13	70.04	19.32	7.51
170101e	37-40	1.09	0.65	0.06	2.77	1.05	1.09	0.63	0.09	0.87	0.15	47.42	44.62	7.81
170102a	5-9	1.24	0.99	-0.80	3.16	1.46	1.27	0.98	-0.32	1.13	2.97	29.73	44.68	22.62
170102b	22-26	-0.25	1.47	0.46	2.04	-0.56	-0.15	1.61	0.29	0.83	37.83	38.22	12.59	11.36
170102c	38-42	0.20	1.11	0.38	2.25	0.10	0.22	1.15	0.16	0.85	14.35	61.58	16.58	7.49
170103a	0-5	-0.49	0.90	1.02	5.34	-0.56	-0.56	0.81	0.11	1.66	24.17	69.69	2.99	3.15
170103b	13-17	-0.03	1.73	0.50	1.65	-0.84	0.00	1.74	0.56	0.57	43.62	23.42	7.78	25.18
170103c	23-28	-1.16	1.47	1.48	3.99	-1.76	-1.35	1.37	0.59	1.34	71.20	15.61	4.72	8.47

		MOMENT STATISTICS				FOLK INCLUSIVE GRAPHIC STATISTICS					PERCENT COMPOSITION			
SAMPLE	DEPTH (CM)	FIRST (PHI)	SECOND (PHI)	THIRD	FOURTH	MEDIAN (PHI)	MEAN (PHI)	STANDARD DEVIATION (PHI)	SKEWNESS	KURTOSIS	GRAVEL	COARSE SAND	MEDIUM SAND	FINE SAND
170301a	2-6	0.51	1.02	0.50	2.22	0.22	0.54	1.05	0.38	0.79	2.18	68.31	17.78	11.73
170301b	20-23	1.23	0.92	-0.24	2.13	1.33	1.25	0.92	-0.13	0.72	0.31	42.13	31.67	25.89
170301c	32-35	-0.02	0.71	1.12	5.43	-0.13	-0.07	0.63	0.25	1.51	3.75	88.36	5.99	1.90
170301d	42-45	-0.61	0.91	1.50	5.61	-0.80	-0.73	0.83	0.32	1.64	36.29	56.50	4.28	2.93
170302a	2-6	0.35	1.17	0.48	2.29	0.04	0.40	1.21	0.36	0.85	8.96	63.22	14.38	13.44
170302b	6-8	1.48	0.99	-0.78	2.76	1.83	1.49	1.00	-0.47	0.90	0.88	27.48	34.05	37.59
170302c	12-15	-0.04	0.98	1.30	2.23	-0.49	-0.04	0.96	0.68	1.87	5.73	77.43	9.88	6.96
170302d	34-38	0.25	0.95	0.38	3.27	0.10	0.26	0.92	0.24	1.22	6.19	74.50	13.98	5.33
170303a	3-7	-0.45	1.69	0.82	2.19	-1.09	-0.27	1.82	0.54	0.81	53.11	22.23	5.46	19.20
170303b	17-21	-0.59	1.87	0.72	1.83	-1.51	-0.54	1.87	0.64	0.52	60.15	11.25	9.41	19.19
170303c	26-29	-0.58	1.24	1.00	3.60	-0.80	-0.68	1.22	0.26	1.48	40.35	47.27	5.57	6.81
170401a	3-7	0.64	0.91	0.38	2.35	0.46	0.66	0.93	0.27	0.83	1.26	66.84	22.73	9.17
170401b	13-16	-0.21	0.74	0.46	4.51	-0.24	-0.24	0.66	0.05	1.36	10.60	83.73	4.66	1.01
170401c	38-41	1.17	0.86	-0.28	2.51	1.22	1.19	0.84	-0.07	0.78	0.67	42.84	37.76	18.73
170402a	0-3	1.86	0.77	-1.90	8.18	2.02	1.94	0.61	-0.29	1.29	1.49	8.48	38.78	51.25
170402b	7-11	-0.21	0.90	1.60	5.19	-0.48	-0.39	0.73	0.42	2.20	8.74	79.72	6.25	5.29
170402c	17-21	0.42	0.88	0.68	2.76	0.16	0.44	0.88	0.43	0.95	1.19	74.63	18.06	6.12
170402d	40-45	-1.25	1.22	1.56	4.90	-1.61	-1.43	1.16	0.44	1.31	71.45	20.45	4.27	3.83
170403a	2-6	-0.39	1.46	0.84	2.60	-0.78	-0.22	1.60	0.44	1.27	42.37	37.77	6.68	13.18
170403b	15-19	-0.33	1.63	0.76	2.18	-0.94	-0.17	1.75	0.51	0.81	46.81	28.23	6.18	18.78
170601a	4-7	0.40	0.94	0.60	2.65	0.14	0.44	0.98	0.38	1.03	3.24	71.91	16.66	8.19
170601b	23-26	0.16	0.65	0.78	4.52	0.09	0.10	0.59	0.17	1.33	1.54	89.61	7.26	1.59
170601c	41-45	0.50	0.71	0.88	3.38	0.29	0.50	0.69	0.46	1.23	0.39	79.47	15.69	4.45
170602a	1-6	1.32	0.90	-0.52	2.63	1.52	1.34	0.90	-0.28	0.83	0.59	34.39	38.95	26.07
170602b	13-18	-0.05	0.73	0.78	4.12	-0.14	-0.10	0.68	0.17	1.29	6.24	85.74	6.64	1.38
170602c	29-34	0.28	0.93	0.36	2.68	0.18	0.28	0.94	0.16	1.00	7.02	71.27	8.38	13.33
170603a	2-5	-0.17	1.69	0.64	1.83	-0.95	-0.08	1.74	0.58	0.61	45.94	24.21	7.18	22.67
170603b	20-24	-0.37	1.79	0.44	1.60	-1.04	-0.44	1.83	0.42	0.54	50.75	17.65	15.13	16.47
180101a	3-8	1.41	0.70	-0.32	2.72	1.50	1.42	0.69	-0.16	0.91	0.00	28.96	51.17	19.87

		MOMENT STATISTICS				FOLK INCLUSIVE GRAPHIC STATISTICS					PERCENT COMPOSITION			
SAMPLE	DEPTH (CM)	FIRST (PHI)	SECOND (PHI)	THIRD	FOURTH	MEDIAN (PHI)	MEAN (PHI)	STANDARD DEVIATION (PHI)	SKEWNESS	KURTOSIS	GRAVEL	COARSE SAND	MEDIUM SAND	FINE SAND
180101b	41-46	1.06	0.83	-0.20	2.61	1.06	1.07	0.82	-0.02	0.86	0.69	46.96	39.82	12.53
180102a	1-5	1.48	1.13	-1.22	3.40	1.91	1.41	1.15	-0.61	1.82	4.82	16.15	38.87	40.16
180102b	28-33	1.00	0.73	0.16	2.66	0.94	0.99	0.71	0.11	0.89	0.18	52.98	38.11	8.73
180102c	43-47	-0.01	1.12	0.18	2.83	-0.07	0.01	1.15	0.08	1.28	16.87	65.40	12.67	5.06
180103a	5-11	-1.11	1.81	1.22	2.80	-2.11	-0.88	1.81	0.87	1.05	71.15	8.31	5.90	14.64
180103b	22-26	-0.09	1.57	0.24	1.84	-0.30	-0.08	1.69	0.16	0.72	33.47	38.06	13.98	14.49
180301a	0-6	1.24	0.94	-0.46	2.25	1.51	1.26	0.94	-0.35	0.75	0.74	36.12	39.98	23.16
180301b	12-17	-0.17	0.61	1.22	7.25	-0.21	-0.22	0.48	0.01	1.35	5.65	90.58	2.46	1.31
180301c	40-44	1.31	0.96	-0.54	2.49	1.57	1.36	0.96	-0.33	0.80	1.05	35.25	34.36	29.34
180302a	0-5	0.83	1.19	-0.16	1.94	0.88	0.80	1.23	-0.08	0.73	5.95	47.00	27.06	19.99
180302b	27-31	0.49	0.86	0.32	2.80	0.40	0.50	0.86	0.17	1.01	2.68	71.43	20.88	5.01
180303a	6-12	-0.60	1.73	0.70	2.00	-1.24	-0.54	1.77	0.51	0.67	54.84	20.63	10.21	14.32
180303b	30-34	-1.27	1.14	1.48	4.88	-1.59	-1.42	1.12	0.41	1.13	69.06	24.63	3.57	2.74
180401a	2-7	0.82	0.93	0.18	2.14	0.66	0.83	0.93	0.22	0.73	1.01	58.88	27.63	12.48
180401b	15-20	0.17	0.79	0.72	3.79	0.06	0.13	0.74	0.22	1.44	4.11	82.93	9.84	3.12
180401c	36-41	0.81	0.92	0.18	2.15	0.64	0.82	0.92	0.22	0.74	0.91	59.75	27.31	12.03
180402a	4-9	0.58	1.51	0.06	1.45	0.31	0.51	1.51	0.16	0.57	20.60	35.74	14.96	28.30
180402b	19-24	-0.06	0.95	1.32	3.85	-0.34	-0.01	0.92	0.55	1.87	5.13	78.41	10.58	5.88
180402c	30-35	0.83	0.79	0.30	2.47	0.74	0.82	0.80	0.15	0.83	0.07	61.14	31.02	7.77
180402d	38-43	0.15	0.87	0.44	3.40	0.05	0.13	0.83	0.18	1.21	6.59	78.52	11.72	3.17
180403a	5-10	0.38	1.31	0.24	1.86	0.02	0.39	1.33	0.31	0.66	12.95	52.83	16.98	17.24
180403b	23-28	-0.14	1.83	0.54	1.58	-1.10	-0.16	1.73	0.63	0.54	52.50	13.65	6.58	27.27
180601a	3-8	0.96	1.05	-0.36	2.72	0.98	0.98	1.02	-0.04	0.85	3.64	46.96	32.03	17.37
180601b	31-36	0.22	0.66	0.86	4.36	0.13	0.16	0.61	0.18	1.41	1.36	88.53	8.06	2.05
180602a	5-10	0.65	1.48	-0.06	1.47	0.66	0.66	1.45	-0.03	0.58	16.11	36.51	18.56	28.82
180602b	26-31	-0.06	0.95	0.86	3.44	-0.27	-0.10	0.93	0.33	1.32	11.80	73.81	10.21	4.18
180603a	5-9	0.05	1.60	0.46	1.76	-0.59	0.11	1.64	0.46	0.65	30.71	37.16	9.33	22.80
180603b	19-24	-0.65	1.82	0.84	2.08	-1.45	-0.53	1.90	0.60	0.59	63.07	10.97	7.13	18.83
190101a	14-19	0.82	0.99	0.02	2.00	0.74	0.82	1.00	0.08	0.73	1.55	55.19	29.58	13.68

		MOMENT STATISTICS				FOLK INCLUSIVE GRAPHIC STATISTICS					PERCENT COMPOSITION			
SAMPLE	DEPTH (CM)	FIRST (PHI)	SECOND (PHI)	THIRD	FOURTH	MEDIAN (PHI)	MEAN (PHI)	STANDARD DEVIATION (PHI)	SKEWNESS	KURTOSIS	GRAVEL	COARSE SAND	MEDIUM SAND	FINE SAND
190101b	38-43	1.17	0.81	-0.18	2.48	1.22	1.17	0.81	-0.09	0.87	0.18	41.30	43.05	15.47
190102a	2-6	0.03	1.33	0.80	2.24	-0.62	0.08	1.37	0.64	0.80	22.90	51.83	9.74	15.53
190102b	14-18	-0.38	1.67	0.92	2.17	-1.24	-0.22	1.66	0.71	0.63	60.41	13.07	4.81	21.71
190102c	26-30	0.82	1.09	0.04	1.84	0.70	0.81	1.09	0.12	0.66	2.21	53.67	25.48	18.64
190102d	37-40	0.33	1.42	0.30	1.63	-0.12	0.28	1.42	0.34	0.59	21.83	41.57	17.53	19.07
190103a	3-8	-0.55	1.65	1.10	2.65	-1.22	-0.31	1.75	0.63	2.22	61.80	15.92	3.12	19.16
190103b	20-25	-1.50	1.14	2.34	8.22	-1.79	-1.72	1.01	0.42	2.04	84.17	9.71	1.50	4.62
190301a	8-13	0.50	1.03	0.30	2.55	0.25	0.54	1.03	0.34	0.84	3.64	66.59	19.50	10.27
190301b	25-29	-0.18	0.75	0.82	5.64	-0.19	-0.25	0.65	-0.03	1.63	11.56	82.82	3.49	2.13
190301c	41-45	0.02	1.27	0.64	2.37	-0.35	0.11	1.34	0.43	0.91	21.93	54.63	11.47	11.97
190302a	1-5	0.14	1.37	0.80	1.98	-0.61	0.22	1.38	0.72	0.58	15.16	55.77	8.36	20.71
190302b	14-19	0.98	1.23	-0.36	1.94	1.24	0.99	1.24	-0.28	0.70	6.15	39.74	27.28	26.83
190302c	24-28	0.29	0.96	0.98	2.83	-0.14	0.34	0.98	0.63	0.94	1.14	75.42	14.99	8.45
190302d	32-36	0.93	0.89	-0.04	2.23	0.93	0.91	0.90	-0.01	0.77	0.53	51.99	35.72	11.76
190303a	3-7	0.08	1.50	0.56	1.78	-0.63	0.12	1.50	0.59	0.61	28.04	40.17	10.62	21.17
190303b	25-29	-0.89	1.99	1.02	2.17	-2.05	-0.74	1.91	0.85	0.53	71.54	1.85	4.28	22.33
190401a	9-14	0.22	0.55	0.82	5.09	0.16	0.17	0.47	0.12	1.27	0.71	92.76	5.64	0.89
190401b	24-29	0.82	0.72	0.16	2.51	0.74	0.84	0.71	0.16	0.86	0.21	61.71	33.13	4.95
190401c	38-43	1.09	0.95	-0.18	2.12	1.12	1.10	0.94	-0.05	0.73	0.54	46.65	32.18	20.63
190402a	4-9	-0.16	1.49	0.88	2.12	-0.84	-0.02	1.50	0.67	0.59	41.49	31.34	8.35	18.82
190402b	18-22	0.35	1.39	0.58	1.64	-0.48	0.29	1.39	0.68	0.57	8.42	57.47	9.94	24.17
190402c	39-44	0.59	0.93	0.62	2.39	0.27	0.61	0.96	0.45	0.83	0.34	70.01	18.95	10.70
190403a	2-7	-0.11	1.77	0.58	1.64	-0.97	-0.10	1.71	0.59	0.55	49.04	17.89	5.78	27.29
190403b	16-21	-1.21	1.68	1.58	3.81	-2.00	-0.90	1.76	0.82	2.43	79.43	3.58	2.59	14.40
190601a	5-10	0.73	0.92	0.14	2.44	0.63	0.73	0.92	0.14	0.82	1.38	61.79	27.53	9.30
190601b	31-36	0.22	0.60	0.74	4.65	0.17	0.18	0.54	0.12	1.37	1.24	90.52	7.05	1.19
190602a	8-12	0.47	1.23	0.30	1.75	0.11	0.45	1.24	0.33	0.62	7.63	56.46	19.34	16.57
190602b	16-19	0.14	1.36	0.64	1.90	-0.48	0.17	1.38	0.57	0.59	20.08	49.97	12.41	17.54
190602c	26-30	0.76	1.43	-0.14	1.48	0.97	0.79	1.41	-0.17	0.57	13.28	36.98	19.30	30.44

		MOMENT STATISTICS				FOLK INCLUSIVE GRAPHIC STATISTICS					PERCENT COMPOSITION			
SAMPLE	DEPTH (CM)	FIRST (PHI)	SECOND (PHI)	THIRD	FOURTH	MEDIAN (PHI)	MEAN (PHI)	STANDARD DEVIATION (PHI)	SKEWNESS	KURTOSIS	GRAVEL	COARSE SAND	MEDIUM SAND	FINE SAND
190603a	2-6	-0.47	1.08	1.22	4.20	-0.72	-0.59	0.98	0.35	1.96	29.22	58.86	6.16	5.76
190603b	20-24	-1.39	1.21	1.98	6.46	-1.80	-1.62	1.12	0.51	1.57	77.06	15.48	2.15	5.31
200101a	5-10	-0.13	1.39	0.58	1.99	-0.62	-0.08	1.42	0.49	0.66	38.94	34.62	15.81	10.63
200101b	17-22	-0.91	1.41	1.50	4.29	-1.27	-1.19	1.22	0.33	1.80	62.15	24.71	2.34	10.80
200101c	40-45	1.12	0.61	0.14	2.75	1.07	1.12	0.58	0.10	0.92	0.01	45.70	47.12	7.17
200102a	2-7	-0.45	1.44	1.38	3.39	-1.04	-0.11	1.54	0.75	2.58	52.88	28.29	2.31	16.52
200102b	17-22	0.02	1.66	0.62	1.70	-0.80	0.05	1.55	0.64	0.53	40.77	26.10	6.23	26.90
200102c	33-38	0.85	1.13	0.12	1.78	0.68	0.83	1.12	0.15	0.63	2.00	53.28	23.01	21.71
200103a	12-17	-1.17	0.57	1.72	14.00	-1.15	-1.22	0.43	-0.26	1.14	63.77	35.40	0.16	0.67
200301a	10-15	0.19	0.99	0.88	3.02	-0.10	0.23	1.01	0.46	1.16	4.91	74.69	12.88	7.52
200301b	35-40	-0.07	0.68	1.18	6.12	-0.16	-0.11	0.58	0.22	1.52	4.57	89.25	4.24	1.94
200302a	3-7	0.35	1.33	0.68	1.90	-0.21	0.46	1.36	0.59	0.62	6.69	62.10	7.84	23.10
200302b	29-33	0.04	1.36	1.00	2.33	-0.72	0.21	1.40	0.79	0.63	14.71	59.53	5.62	20.14
200303a	2-7	0.23	1.45	0.62	1.81	-0.43	0.32	1.46	0.60	0.58	16.96	51.50	7.53	24.01
200303b	20-25	-0.76	1.19	1.72	5.56	-0.99	-0.97	1.01	0.26	2.35	48.68	41.00	1.79	8.53
200401a	3-8	0.86	0.90	0.10	2.23	0.75	0.87	0.89	0.15	0.75	0.80	57.17	30.43	11.60
200401b	17-22	0.19	0.82	0.56	3.49	0.08	0.17	0.78	0.22	1.38	4.94	80.45	11.36	3.25
200401c	49-54	1.24	0.90	-0.64	3.76	1.38	1.28	0.83	-0.17	0.75	1.09	38.76	38.57	21.58
200402a	20-25	-0.13	1.37	1.12	2.65	-0.70	0.10	1.42	0.69	1.38	27.82	49.10	5.38	17.70
200402b	40-45	0.67	1.32	0.24	1.50	0.08	0.58	1.27	0.46	0.55	3.26	54.45	15.50	26.79
200403a	2-7	-0.12	1.62	0.72	1.92	-0.88	-0.06	1.62	0.60	0.59	40.20	30.90	5.38	23.52
200403b	20-25	1.02	0.87	-0.30	2.77	1.03	1.04	0.85	-0.03	0.82	1.44	47.66	38.34	12.56
200601a	8-13	1.32	0.77	-0.38	2.72	1.42	1.33	0.76	-0.18	0.94	0.00	33.16	48.44	18.40
200601b	25-30	0.18	0.62	0.62	4.26	0.13	0.15	0.56	0.14	1.29	1.70	89.86	7.51	0.93
200601c	44-48	0.52	0.77	0.58	2.88	0.36	0.53	0.78	0.31	1.09	0.46	75.95	19.05	4.54
200602a	10-15	0.63	1.26	0.32	1.56	0.15	0.58	1.26	0.41	0.60	3.05	57.61	16.07	23.27
200602b	25-30	0.74	1.28	-0.04	1.58	0.74	0.72	1.28	-0.01	0.59	6.27	47.31	23.18	23.24
200602c	40-45	0.91	1.41	-0.22	1.48	1.49	1.01	1.38	-0.43	0.55	9.01	36.86	19.61	34.52
200603a	6-11	-0.04	1.28	0.94	2.68	-0.49	0.10	1.36	0.53	1.47	18.63	59.75	6.86	14.76

		MOMENT STATISTICS				FOLK INCLUSIVE GRAPHIC STATISTICS					PERCENT COMPOSITION			
SAMPLE	DEPTH (CM)	FIRST (PHI)	SECOND (PHI)	THIRD	FOURTH	MEDIAN (PHI)	MEAN (PHI)	STANDARD DEVIATION (PHI)	SKEWNESS	KURTOSIS	GRAVEL	COARSE SAND	MEDIUM SAND	FINE SAND
200603b	23-28	0.23	1.66	0.24	1.57	-0.35	0.23	1.70	0.35	0.61	27.07	35.81	9.01	28.11
210101a	8-12	1.36	0.80	-0.46	2.54	1.55	1.38	0.79	-0.29	0.82	0.16	33.05	44.04	22.75
210101b	31-35	1.03	0.83	-0.18	2.34	1.03	1.03	0.83	-0.03	0.81	0.45	48.35	39.03	12.17
210102a	1-5	-0.16	1.19	1.58	3.98	-0.72	0.00	1.20	0.82	2.09	8.14	74.53	3.17	14.16
210102b	19-23	0.15	1.70	0.28	1.57	-0.48	0.13	1.73	0.37	0.59	31.64	31.98	9.13	27.25
210102c	33-36	-0.08	1.18	1.30	3.39	-0.58	0.05	1.21	0.71	1.70	10.27	70.74	5.75	13.24
210102d	39-43	1.08	1.08	-0.30	1.90	1.33	1.10	1.09	-0.28	0.70	1.40	42.43	31.67	24.50
210103a	1-5	-0.81	0.38	-0.88	5.13	-0.75	-0.78	0.31	-0.23	1.16	22.52	77.48	0.00	0.00
210103b	9-13	-0.70	1.47	1.56	3.98	-1.23	-0.45	1.52	0.70	2.25	63.71	19.92	1.48	14.89
210103c	25-29	-0.96	1.36	1.82	5.22	-1.35	-1.28	1.06	0.38	2.61	72.29	15.17	1.80	10.74
210103d	34-38	-1.42	1.08	2.66	10.32	-1.59	-1.63	0.98	0.26	2.34	86.13	8.08	0.61	5.18
210301a	2-6	0.57	1.08	0.32	1.99	0.29	0.57	1.09	0.32	0.69	3.16	61.32	23.03	12.49
210301b	17-21	-0.14	0.85	0.92	4.50	-0.22	-0.21	0.79	0.14	1.55	11.64	79.60	5.68	3.08
210301c	28-32	-0.40	0.80	0.82	4.81	-0.41	-0.47	0.70	-0.01	1.27	20.38	74.59	3.39	1.64
210301d	38-42	0.22	0.61	1.22	5.27	0.10	0.15	0.54	0.29	1.55	0.37	89.39	7.17	3.07
210302a	2-5	-0.01	1.02	1.44	4.03	-0.45	-0.08	0.94	0.68	2.01	4.49	79.64	5.33	10.54
210302b	16-20	0.27	1.26	0.96	2.29	-0.26	0.40	1.24	0.66	0.67	2.82	70.50	5.71	20.97
210302c	28-32	-0.43	1.08	1.94	5.70	-0.89	-0.76	0.77	0.62	2.84	24.94	63.15	2.44	9.47
210302d	36-40	1.10	1.20	-0.40	1.74	1.64	1.17	1.19	-0.49	0.60	2.17	38.90	26.99	31.94
210303a	1-5	0.29	1.36	0.64	1.84	-0.29	0.37	1.37	0.56	0.60	10.72	57.84	9.17	22.27
210303b	11-15	-0.76	1.00	2.12	7.53	-0.94	-0.94	0.83	0.34	2.17	44.17	48.05	1.57	6.21
210303c	21-25	-0.77	1.64	1.20	3.04	-1.29	-0.42	1.88	0.57	1.73	62.44	18.48	2.02	17.06
210303d	32-36	-1.28	1.35	2.02	6.07	-1.60	-1.57	1.09	0.35	2.18	81.65	7.83	1.51	9.01
210401a	3-6	0.91	0.88	0.00	2.41	0.83	0.92	0.87	0.12	0.74	0.91	54.68	32.46	11.95
210401b	11-15	0.37	0.67	1.08	4.26	0.23	0.31	0.62	0.31	1.31	0.00	85.73	11.15	3.12
210401c	41-44	0.90	0.94	0.04	2.11	0.80	0.91	0.94	0.12	0.75	0.91	56.32	28.78	14.99
210402a	10-14	0.38	1.17	0.74	2.18	-0.17	0.43	1.19	0.61	0.67	3.71	68.09	10.84	17.36
210402b	33-37	-0.27	1.28	1.42	3.47	-0.75	-0.02	1.33	0.71	2.29	27.26	53.91	3.88	14.95
210403a	6-10	-0.98	1.76	1.24	2.86	-1.76	-0.64	1.88	0.74	1.38	71.49	7.86	3.48	17.17

		MOMENT STATISTICS				FOLK INCLUSIVE GRAPHIC STATISTICS					PERCENT COMPOSITION			
SAMPLE	DEPTH (CM)	FIRST (PHI)	SECOND (PHI)	THIRD	FOURTH	MEDIAN (PHI)	MEAN (PHI)	STANDARD DEVIATION (PHI)	SKEWNESS	KURTOSIS	GRAVEL	COARSE SAND	MEDIUM SAND	FINE SAND
210403b	23-27	-0.61	1.93	0.82	4.09	-1.51	-0.53	1.90	0.64	0.52	65.67	5.61	4.92	23.80
210601a	2-5	0.83	0.96	0.12	2.11	0.73	0.83	0.97	0.12	0.76	0.91	57.00	29.09	13.00
210601b	9-12	0.28	0.97	0.62	2.70	0.06	0.32	1.00	0.34	1.02	5.16	72.35	15.87	6.62
210601c	27-31	0.22	0.58	0.90	4.83	0.15	0.16	0.53	0.14	1.36	0.52	91.55	6.71	1.22
210601d	41-45	0.52	0.80	0.48	2.89	0.35	0.55	0.81	0.32	1.09	1.02	74.99	18.76	5.23
210602a	9-12	0.71	1.16	0.18	1.73	0.39	0.69	1.16	0.29	0.62	3.15	56.65	19.96	20.24
210602b	23-27	0.40	1.32	0.54	1.68	-0.32	0.35	1.33	0.63	0.53	4.94	60.82	12.16	22.08
210602c	39-42	0.58	1.24	0.14	1.70	0.37	0.55	1.24	0.18	0.59	6.62	53.10	22.36	17.92
210603a	2-5	0.09	1.47	0.66	1.87	-0.66	0.15	1.48	0.64	0.60	25.22	44.42	8.84	21.52
210603b	8-12	-0.46	1.65	0.90	2.41	-0.99	-0.31	1.80	0.47	1.35	46.59	30.41	3.47	19.53
210603c	37-41	-1.15	1.27	1.78	5.55	-1.45	-1.45	1.08	0.29	1.78	69.94	20.31	2.39	7.36
220101a	10-15	0.86	0.87	0.12	2.40	0.73	0.88	0.87	0.19	0.82	1.27	58.35	29.17	11.21
220101b	21-26	0.71	0.96	0.24	2.13	0.53	0.71	0.98	0.21	0.77	1.28	61.75	25.89	11.08
220101c	40-45	1.09	0.65	-0.16	3.25	1.06	1.11	0.62	0.08	0.93	0.35	46.14	45.99	7.52
220102a	2-7	-0.37	0.98	2.36	7.69	-0.74	-0.60	0.74	0.65	2.89	7.91	82.01	2.20	7.88
220102b	10-15	0.62	1.34	0.42	1.53	-0.17	0.53	1.30	0.64	0.55	2.35	58.89	11.10	27.66
220102c	29-34	-0.92	1.69	1.30	3.11	-1.62	-0.62	1.81	0.69	1.88	73.49	6.84	3.64	16.03
220102d	39-43	0.23	1.35	0.76	2.14	-0.40	0.30	1.37	0.61	0.62	12.43	59.28	8.36	19.93
220103a	1-7	0.16	1.31	0.58	2.00	-0.28	0.21	1.35	0.45	0.67	19.15	52.30	13.87	14.68
220103b	27-33	-1.12	0.73	3.50	18.22	-1.23	-1.20	0.35	0.07	0.95	72.97	23.94	0.53	2.56
220301a	4-9	0.58	1.02	0.40	2.10	0.30	0.59	1.04	0.34	0.72	1.80	64.80	21.68	11.72
220301b	20-25	0.13	0.95	0.62	3.22	-0.02	0.11	0.94	0.23	1.30	8.72	74.78	11.10	5.40
220301c	34-39	0.23	0.76	0.72	3.95	0.09	0.21	0.71	0.28	1.46	3.49	82.48	10.95	3.08
220302a	3-8	0.48	1.22	0.70	1.91	-0.25	0.50	1.23	0.73	0.63	1.01	67.49	9.28	22.22
220302b	20-25	0.52	1.42	0.38	1.46	-0.16	0.48	1.38	0.54	0.52	6.91	54.11	9.91	29.07
220302c	36-41	0.67	1.28	0.18	1.70	0.32	0.62	1.25	0.28	0.59	4.83	53.78	18.27	23.12
220303a	2-7	-0.32	1.22	1.12	3.31	-0.73	-0.26	1.25	0.54	1.55	32.72	47.44	7.54	12.30
220303b	27-32	-0.99	0.81	1.66	8.48	-1.07	-1.05	0.63	0.03	1.05	54.58	42.72	0.85	1.85
220401a	27-32	0.67	0.71	0.44	2.84	0.54	0.69	0.71	0.27	0.98	0.27	71.16	24.61	3.96

		MOMENT STATISTICS				FOLK INCLUSIVE GRAPHIC STATISTICS					PERCENT COMPOSITION			
SAMPLE	DEPTH (CM)	FIRST (PHI)	SECOND (PHI)	THIRD	FOURTH	MEDIAN (PHI)	MEAN (PHI)	STANDARD DEVIATION (PHI)	SKEWNESS	KURTOSIS	GRAVEL	COARSE SAND	MEDIUM SAND	FINE SAND
220402a	3-8	0.80	1.29	0.14	1.44	0.27	0.71	1.26	0.39	0.55	2.72	52.99	14.13	30.16
220402b	27-32	0.00	1.40	1.00	2.31	-0.64	0.21	1.43	0.71	0.63	20.20	53.75	5.80	20.25
220403a	3-8	0.26	1.59	0.28	1.56	-0.25	0.24	1.60	0.36	0.56	30.50	32.71	11.50	25.29
220403b	15-20	-0.83	0.89	2.08	8.91	-0.97	-0.93	0.70	0.23	1.61	47.51	47.53	1.19	3.77
220403c	33-38	-0.06	1.62	0.62	1.95	-0.70	0.01	1.65	0.49	0.65	35.12	36.03	6.02	22.83
220601a	4-9	0.89	0.92	0.10	2.24	0.81	0.89	0.92	0.11	0.79	0.65	55.39	31.28	12.68
220601b	25-30	0.21	0.56	0.74	4.87	0.15	0.17	0.50	0.17	1.32	0.69	91.73	6.75	0.83
220601c	41-46	0.78	0.82	0.08	2.47	0.68	0.81	0.82	0.17	0.82	1.08	61.12	30.60	7.20
220602a	4-9	0.84	1.26	0.08	1.50	0.52	0.78	1.24	0.24	0.59	2.65	51.46	17.80	28.09
220602b	21-26	0.34	1.31	0.42	1.69	-0.14	0.31	1.31	0.43	0.58	13.09	52.19	17.88	16.84
220602c	37-42	0.46	1.43	0.24	1.48	-0.07	0.39	1.40	0.38	0.57	16.33	43.12	17.30	23.25
220603a	3-8	0.55	1.07	0.38	2.06	0.23	0.56	1.10	0.36	0.73	3.66	63.45	19.50	13.39
220603b	13-18	-0.46	1.03	1.28	4.69	-0.67	-0.60	0.92	0.29	1.75	28.69	61.28	4.83	5.20
220603c	22-27	-0.79	0.77	1.40	7.11	-0.88	-0.85	0.63	0.10	1.16	40.84	56.11	1.56	1.49