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Texture of the surficial sediments in Fishers Island Sound

by

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ABSTRACT

Grain-size analyses were performed on 217 samples from Fishers Island Sound, located along the southern coast of New England. The relative grain-size frequency distributions and related statistics are reported herein. Descriptions of the benthic character from videotapes of the bottom at these stations and at 29 others are also presented.

Past and present depositional agents have affected the topography and surficial sediment distribution in Fishers Island Sound. Gravelly sediments tend to dominate the central axis of the sound, offshore from points, and on bathymetric highs where tidal currents are the strongest. Sandy sediments surround these gravelly deposits and dominate the remainder of the sound. The finer-grained muddy sediments are confined to harbors and enclosed bathymetric lows.

INTRODUCTION

The data presented in this report were collected as part of a State of Connecticut and U.S. Geological Survey cooperative program intended to further understand the marine geology of Connecticut and Long Island Sound. The purpose of this cooperative program is (1) to resolve sedimentologic and oceanographic problems and data gaps in Long Island Sound, (2) to integrate these findings with terrestrial data and the Pleistocene histories of Long Island and Connecticut, and (3) to initiate investigations of offshore resources that are keyed to the better management of Long Island Sound.

With this in mind, the fundamental objectives of this study were to accurately measure particle sizes of the surficial sediment samples from Fishers Island Sound, to determine their frequency distributions, and to calculate statistical descriptions that adequately characterize these samples. These grain-size data will eventually be used to describe the sedimentary processes active in Fishers Island Sound, and to evaluate near-shore sand and gravel resources. Other potential uses for these textural data include benthic biologic studies that evaluate faunal distributions and relate them to habitats and geochemical studies involving the transport and deposition of pollutants.

STUDY AREA

Fishers Island Sound, which lies between $71^{\circ}51'W$ and $72^{\circ}03'W$, is about 13 km long and 4.6 km wide (Figs. 1, 2). The sound is bordered by Fishers Island, New York on the south, southeastern Connecticut on the north, and southwestern Rhode Island on the northeast. Fishers Island Sound opens into eastern Long Island Sound on the west and into Block Island Sound to the east. Water depths in Fishers Island Sound gradually increase toward the west where the maximum water depth exceeds 30 m.

Crystalline rocks of pre-Mesozoic age probably dominate the bedrock lithology of Fishers Island Sound (Needell and Lewis, 1984). The bedrock is unconformably overlain by glacial deposits composed mainly of glaciolacustrine silt and sand put down as deltaic fans and of glacial drift put down as a series of recessional end moraines (Lewis and Stone, 1991). The Harbor Hill-Roanoke Point-Fishers Island-Charlestown moraine belt, which is of late Wisconsinian age, lies across northern Long Island and makes up Fishers Island and Watch Hill, Rhode Island. Less prominent end moraines control much of the bathymetric relief

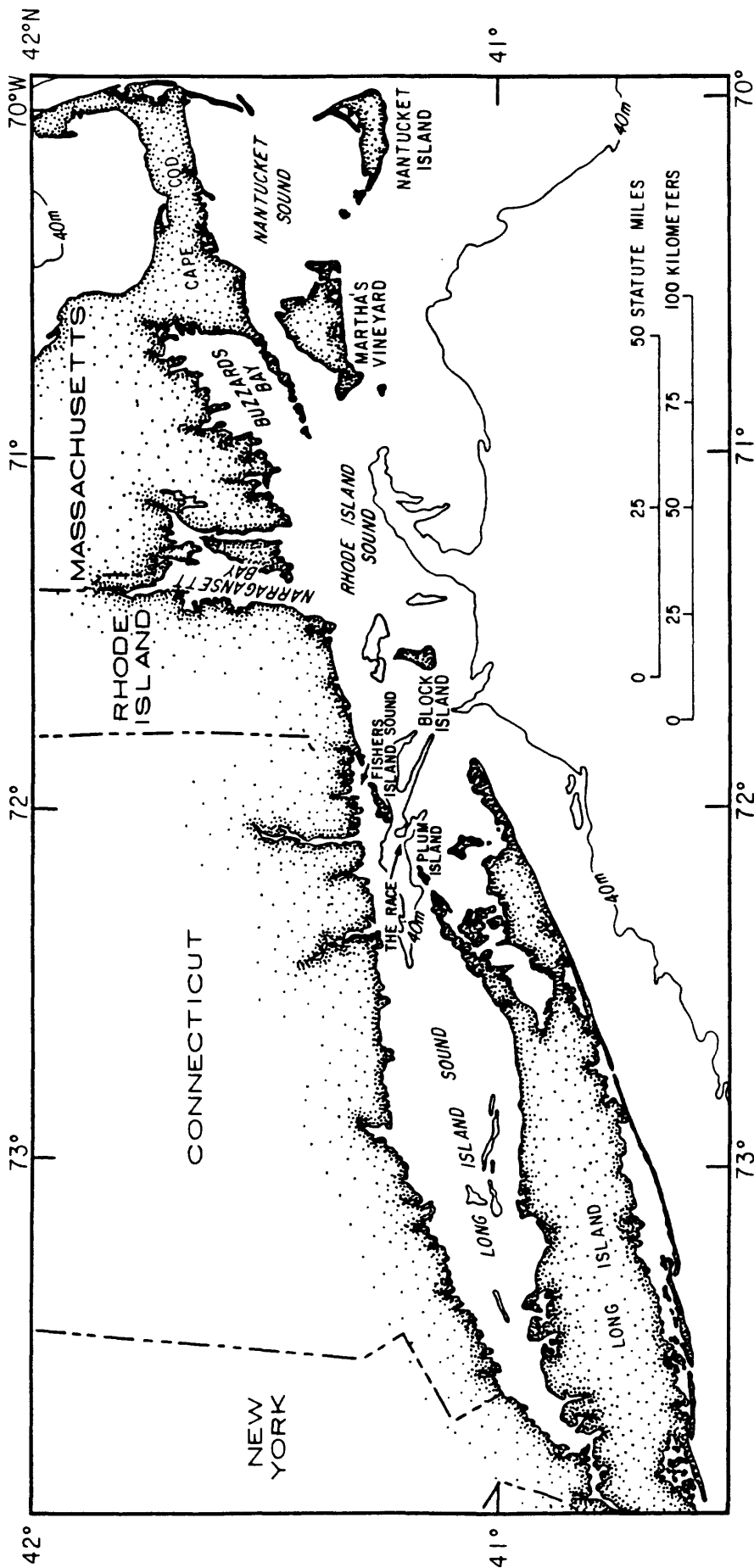


Figure 1. Index map showing the location of Fishers Island Sound along the coast of southern New England. Map also shows the locations of Block Island, Plum Island, the Race, and Long Island Sound.

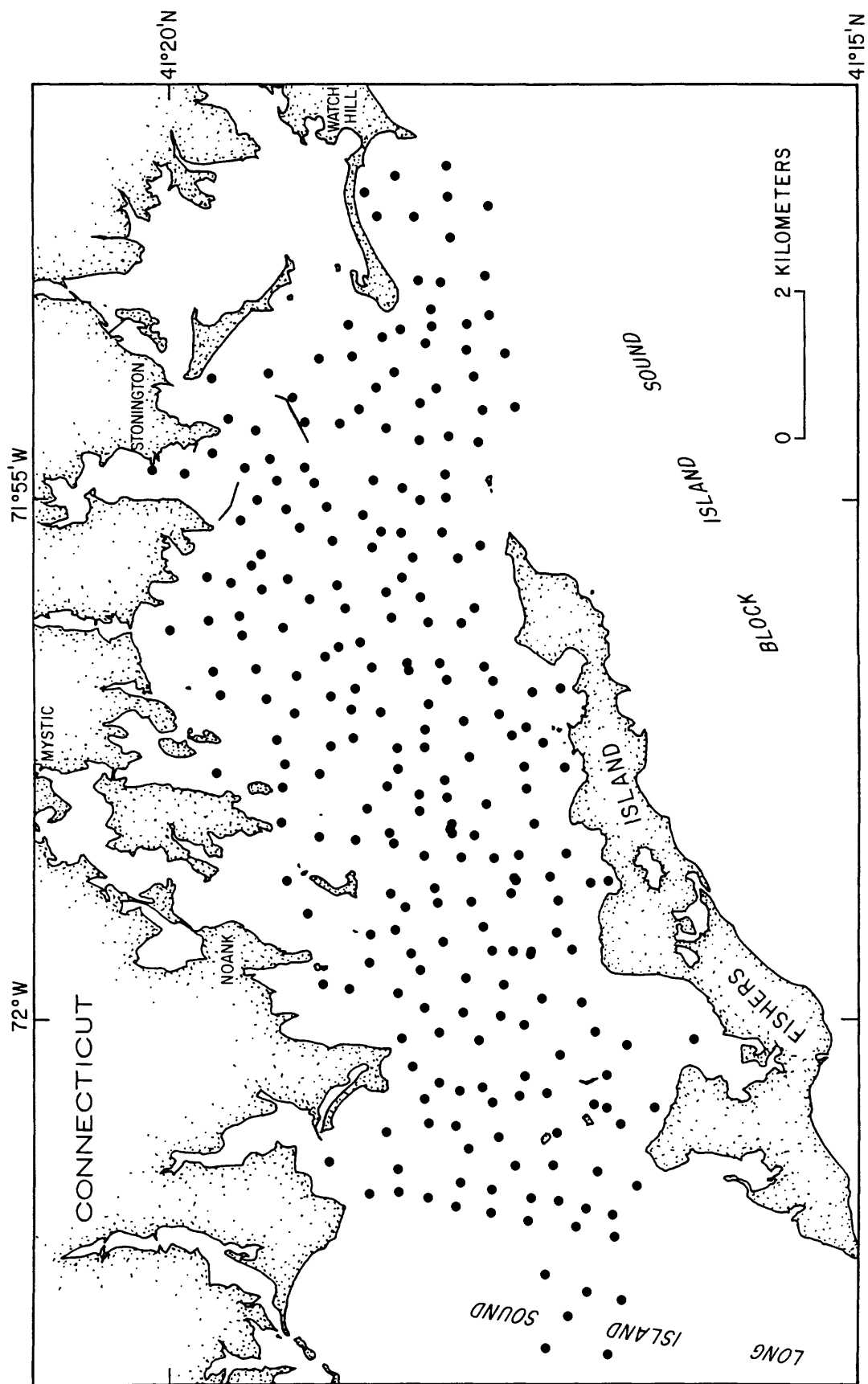


Figure 2. Map of Fishers Island Sound showing the surficial sediment and bottom videotape station locations.

in Fishers Island Sound.

The surficial bottom sediments of the sound are predominantly composed of materials reworked from these glacial deposits during the Holocene by strong tidal currents that range up to 2.0 knots (Eldridge Tide and Pilot Book, 1992). The irregular bottom topography, well developed bedforms, and extensive lag deposits of boulders reflect this scour, transport, and reworking of the glacial and early post-glacial deposits (Lewis and Stone, 1991).

METHODS

Sampling of surficial sediments was attempted at 246 locations during June, 1992 aboard the RV *Asterias* using a Van Veen grab sampler (Fig. 2). The grab sampler was equipped with an Osprey Camera system attached to an 8 mm video cassette recorder. This video system was used to appraise intra-station bottom variability and observe boulder fields and bedrock outcrops where sediment samples could not be collected. Only the 0-2 cm interval was sampled; these samples were frozen and stored for analysis. Navigation was performed using a differential Global Satellite Positioning (GPS) system and LORAN-C.

The samples were thawed and visually inspected in the laboratory. If the sample contained gravel, the entire sample was analyzed. If the sample was composed of only sand, silt, and clay, an approximately 50 gram, representative split was analyzed. The sample to be analyzed was placed in a preweighed 100 ml beaker, weighed, and dried in a convection oven set at 75 °C. When dried, the sample was placed in a desiccator to cool and then weighed. The decrease in weight due to water loss was used to correct for salt; salinity was assumed to be 30 ‰. The weight of the sample and beaker less the weight of the beaker and the salt correction gave the sample weight.

The samples were disaggregated and then wet sieved through a number 230, 62 µm (4 φ) sieve using distilled water to separate the coarse- and fine-fractions. The fine fraction was sealed in a Mason jar and reserved for analysis by Coulter Counter (Shideler, 1976). The coarse fraction was washed in tap water and reintroduced into the preweighed beaker. The coarse fraction was dried in the convection oven at 75 °C and weighed. The weight of the coarse (greater than 62 µm) fraction and beaker less the weight of the beaker is equal to the net coarse weight that is equal to the weight sand plus gravel. The weight fines (silt and clay) can also be calculate by subtracting the coarse weight from the sample weight.

The coarse fraction is dry sieved through a number 10, 2 mm (-1 φ) sieve to separate the sand and gravel. If the weight gravel was distributed over more than one phi class, the size distribution within the gravel fraction was determined by sieving. Because biogenic carbonate commonly form in situ, they are not representative of the depositional environment from a textural standpoint. Therefore, bivalve shells and other biogenic debris greater than 1φ (1.0 mm) were manually removed from the samples and the weights corrected to mitigate this source of error.

If the sand fraction contained more than 16 grams of material (enough to run the analysis twice), a rapid sediment analyzer (Schlee, 1966) was used to determine the sand distribution. If less than 16 grams of sand were available, this fraction was dry sieved using a Ro-Tap.

The fine fraction was analyzed by Coulter Counter; storage in the Mason jars prior to analysis never exceeded five days. One limitation of using the Coulter Counter to perform fine-fraction size analyses is its ability to detect

only those particles for which it has been calibrated. Calibration for this study allowed us to determine the distribution down to $0.62\ \mu\text{m}$ or about two-thirds of the 11ϕ fraction. Because clay particles finer than this diameter and all of the colloidal fraction were not determined, a slight decrease in the 11ϕ fraction is present in the size distributions (Appendix B).

The raw gravel, sand, and fine fraction data were combined and processed by computer to generate the distribution, statistics, and database (Poppe et al., 1985). The textural methods used during this study are similar to those used during an earlier study in northeastern Long Island Sound (Poppe and others, 1992) to facilitate direct comparisons between the data sets.

RESULTS AND DISCUSSION

The navigation, water depths, and comments on the benthic character for each sample station are presented in Appendix A. The grain-size frequency distributions are presented in Appendix B; the sample weights, the percentages of gravel, sand, silt, and clay, the verbal equivalents, and related statistics are given in Appendix C. Size classifications are based on the method proposed by Wentworth (1929); the statistics were calculated using the method of moments (Folk, 1974). The verbal equivalents are based on the nomenclature proposed by Shepard (1954).

Gravels and gravelly sands dominate the surficial sediment texture in the central axis of Fishers Island Sound and on the submerged part of the Fishers Island-Charleston moraine belt where the tidal flow is constricted and the currents are the strongest (Fig. 3A). Gravelly sediments are also prevalent on bathymetric highs and in the shallow areas directly offshore from promontories where episodic storm currents combine with the tidal currents. Examination of the grab samples revealed that the gravels often occur in thin surficial layers, which are underlain by finer-grained sediments. This stratification is caused by strong tidal currents that erode the underlying glacial tills and winnow away the finer-grained materials. Subsequently, thin lag deposits of gravel remain to armor the underlying silts and sands. Sponges, rock crabs, lobsters, starfish, welks, and mussels are commonly observed in the bottom photography of the gravelly areas.

The grain size distributions of the gravelly sediments tend to be poorly to very poorly sorted and bimodal. Three explanations are offered for these distributions. First, till, which by definition is poorly sorted, underlies and is exposed in the study area (Lewis and Stone, 1991). Second, the grab sampler penetrated the lag deposits described above, collecting both the gravel armor and the underlying silt and sand. Third, seaweed-encrusted coarse gravel was occasionally observed being "rafted" by currents across the study area during bottom photography. When the seaweed dies, the gravel is stranded in finer-grained, hydraulically-unequivalent sediments and the sediment becomes a gravelly sand.

Textural samples were not collected at 31 of the stations because the bottom photography revealed the presence of numerous boulders. The boulders, which would have prevented the collection of texturally representative samples, are often covered by kelp and other nondescript seaweed and variably inhabited by starfish, anemones, and mussels. No bedrock outcrops were observed at any of the sample stations.

Sand dominates in the areas adjacent to the central axis, in bays, behind breakwaters, and all across the western-most part of Fishers Island Sound (Fig.

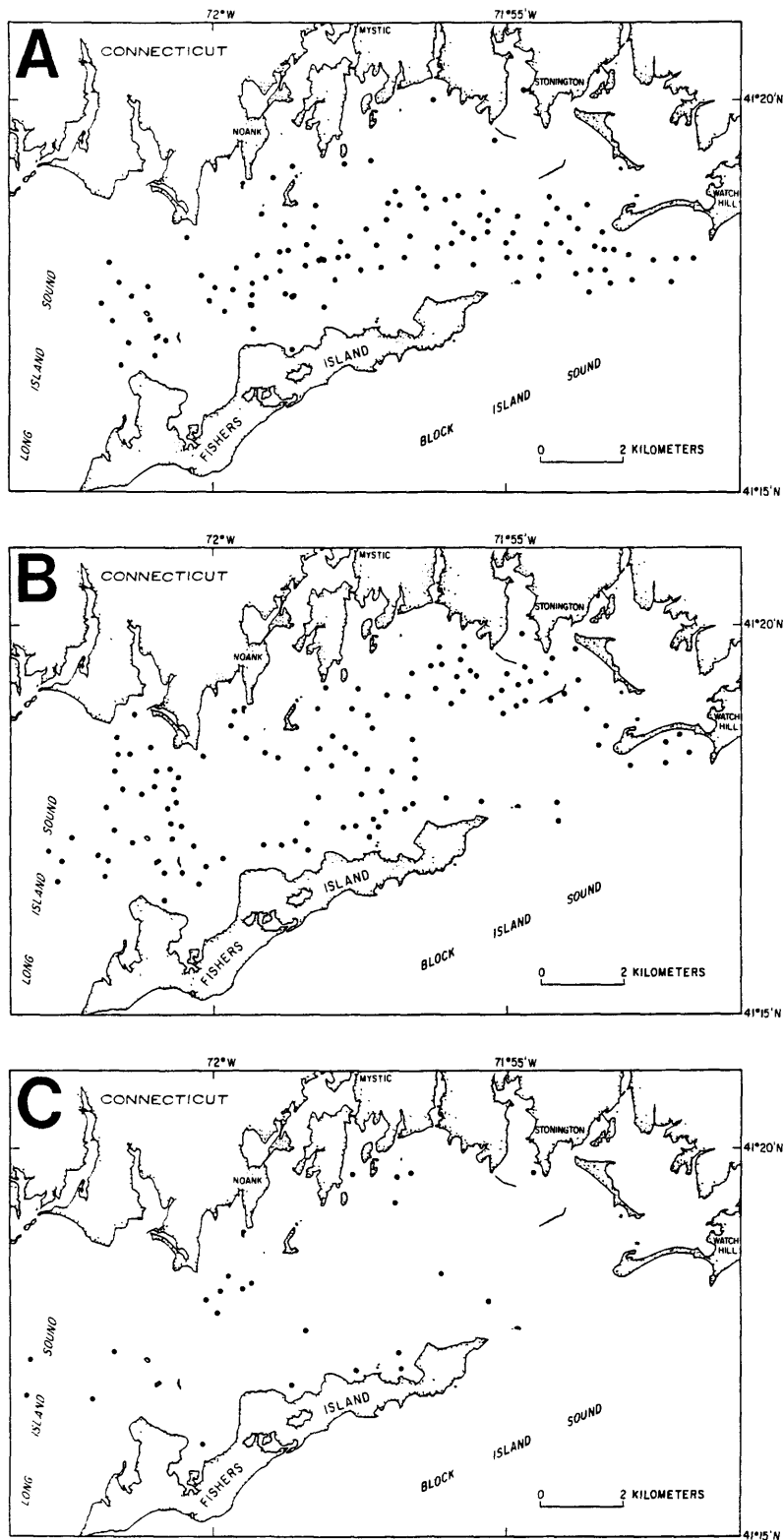


Figure 3. Maps showing textural distributions in Fishers Island Sound. (A) Sample stations with surficial sediments characterized as gravels or gravelly sediments. (B) Sample stations with surficial sediments characterized as sands. (C) Sample stations with surficial sediments characterized as silty sands, sandy silts, or sand-silt-clay.

3B). Bedforms present on the sandy areas include current ripples, oscillation ripples, and, in some places near the gravelly central axis, sand waves. Sandy areas located in between 1-3 m of water are often overgrown by eel grass. Shell hash, hermit crabs, gastropods, skates, flounder, and burrows were observed in the bottom photography from these sandy areas.

The sand in the eastern part of the sound and adjacent to the gravelly areas tends to have moderately to moderately well sorted, unimodal grain size distributions. Sorting in these sands decreases both inshore toward the bays and coves and toward the western part of the sound.

Finer-grained muddy sediments are restricted to enclosed bathymetric depressions, a small area about 1km south-southwest of Noank, and in coves along the north shore of Fishers Island (Fig. 3C). These muddy sediments are usually heavily burrowed by amphipods, polychetes, and bivalves (quahogs and razor clams); spider crabs and blue crabs were commonly observed during the bottom photography.

The present distribution of surficial sediments in Fishers Island Sound is shaped from the deposits left by the last glaciation and reflects the cumulative effect of reworking, transport, and deposition by tidal and, to a lesser degree, by storm currents during and since the Holocene eustatic rise in sea level. The predominantly coarse-grained nature of the sediments and the abundance of bedforms reflects the constant winnowing and transport associated with strong tidal currents. The presence of finer-grained sediments only in enclosed bathymetric depressions and coves suggest that more tranquil conditions, which can permit muddy sediments to accumulate, are present in these environments.

Interested parties can obtain copies of the grain-size analysis data in ASCII format and on 3.5" diskettes by contacting any of the authors. Videotapes showing the bottom character of the station locations can be viewed at the U.S. geological Survey offices in Woods Hole, Massachusetts or at the Long Island Sound Resource Center in Groton Connecticut.

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APPENDIX A

This table contains a list of the sample numbers, navigation (latitudes and longitudes) in decimal degrees, water depths in meters, and comments on the bottom character.

SAMPLE NUMBER	LATITUDE (IN DECIMAL DEGREES)	LONGITUDE	WATER DEPTH	COMMENTS
FIS-1	41.308363	-71.871147	6	CURRENT RIPPLES
FIS-2	41.309873	-71.867360	4	CURRENT RIPPLES, SPARSE BURROWS
FIS-3	41.306092	-71.864562	5	CURRENT RIPPLES, SPARSE BURROWS, FAUNAL TRACKS
FIS-4	41.299863	-71.862952	13	SCATTERED SHELL HASH AND NONDESCRIPT SEAWEED
FIS-5	41.299788	-71.867833	12	SHELL HASH, ROCK CRABS, SPONGES
FIS-6	41.294740	-71.869398	10	ROCK CRABS
FIS-7	41.303808	-71.871235	8	CURRENT RIPPLES, ROCK AND SPIDER CRABS
FIS-8	41.299427	-71.874660	11	SHELL HASH
FIS-9	41.295225	-71.880738	13	SHELL HASH, ROCK CRABS
FIS-10	41.300450	-71.881760	11	BARCAN RIPPLES, SHELL HASH, GRAVELLY PATCHES
FIS-11	41.303277	-71.881395	6	SCATTERED COBBLES AND SEAWEED, SPIDER AND ROCK CRABS, SKATE
FIS-12	41.301697	-71.885815	10	BOULDERS, STARFISH, SEAWEED, NO TEXTURAL SAMPLE
FIS-13	41.294747	-71.886998	15	STARFISH, SPIDER AND ROCK CRABS
FIS-14	41.297392	-71.888552	14	SHELL HASH
FIS-15	41.301695	-71.888732	10	SHELL HASH, SPIDER CRABS, GASTROPODS
FIS-16	41.305413	-71.889282	7	CURRENT RIPPLES
FIS-17	41.311765	-71.888478	4	FAINT CURRENT RIPPLES, BURROWS, FAUNAL TRACKS
FIS-18	41.307543	-71.890498	4	CURRENT RIPPLES, SPIDER CRABS
FIS-19	41.302433	-71.891553	11	SHELL HASH, SPIDER CRABS, SCATTERED NONDESCRIPT SEAWEED
FIS-20	41.297358	-71.892605	20	STARFISH, SPONGES, SEAWEED
FIS-21	41.292813	-71.892995	8	BOULDERS, STARFISH, KELP AND NONDESCRIPT SEAWEED
FIS-22	41.291657	-71.901753	10	SAND WAVES AND CURRENT RIPPLES
FIS-23	41.296590	-71.896802	19	GRAVEL OVER ORGANIC-RICH SILTY SEDIMENT, STARFISH, MUSSELS
FIS-24	41.301047	-71.898542	19	NO VIDEO
FIS-25	41.306088	-71.896208	7	RIPPLES, ABUNDANT MUSSEL SHELLS AND HASH, ROCK CRABS
FIS-26	41.308423	-71.898645	5	CURRENT RIPPLES, SCATTERED SHELL HASH AND SEAWEED, FISH
FIS-27	41.311157	-71.893603	5	CURRENT RIPPLES, COARSER SEDIMENT BETWEEN RIPPLES, SPIDER CRABS
FIS-28	41.315398	-71.893807	4	CURRENT RIPPLES
FIS-29	41.321403	-71.896273	5	FAINT OSCILLATION RIPPLES, BURROWS, CRABS
FIS-29-2	41.328295	-71.896978	2	EEL GRASS BEDS
FIS-30	41.318587	-71.900237	4	OSCILLATION RIPPLES, BURROWS
FIS-31	41.310485	-71.902162	5	CURRENT RIPPLES, SHELL HASH, SPIDER CRABS, SCATTERED SEAWEED
FIS-32	41.303102	-71.901338	18	BOULDERS, STARFISH, SPONGES, CRABS, NO TEXTURAL SAMPLE
FIS-33	41.295500	-71.902203	12	SCATTERED BOULDERS, SAND WAVES AND CURRENT RIPPLES, STARFISH
FIS-34	41.296092	-71.907337	4	BOULDERS, STARFISH, KELP AND SEAWEED, NO TEXTURAL SAMPLE
FIS-35	41.299553	-71.906445	17	BOULDERS, STARFISH, ABUNDANT MUSSELS AND SHELLS
FIS-36	41.303143	-71.907100	17	BOULDERS, STARFISH, SPONGES, ANEMONES, FISH, NO SAMPLE
FIS-37	41.307202	-71.905235	7	CURRENT RIPPLES, SHELL HASH, SCATTERED NONDESCRIPT SEAWEED
FIS-38	41.312743	-71.904415	5	CURRENT RIPPLES, SHELL HASH, SCATTERED NONDESCRIPT SEAWEED
FIS-39	41.317112	-71.904125	5	CURRENT RIPPLES, SCATTERED NONDESCRIPT SEAWEED
FIS-40	41.323087	-71.905463	5	FAINT RIPPLES, BURROWS, SCATTERED SEAWEED
FIS-41	41.326330	-71.903455	4	EEL GRASS BED
FIS-42	41.328218	-71.908977	5	BURROWS, SCATTERED NONDESCRIPT SEAWEED
FIS-42-2	41.331505	-71.912288	5	BURROWS, NONDESCRIPT SEAWEED, JELLYFISH

SAMPLE NUMBER	LATITUDE (IN DECIMAL DEGREES)	LONGITUDE	WATER DEPTH	COMMENTS
FIS-42-3	41.335480	-71.911670	5	BURROWS, DEAD NONDESCRIPT SEAWEED, BEER CAN
FIS-43	41.321408	-71.909998	6	BURROWED, BLUE CRABS
FIS-44	41.317113	-71.911415	7	SCATTERED SHELLS AND NONDESCRIPT SEAWEED, SPIDER CRABS
FIS-45	41.308680	-71.913442	17	ABUNDANT SHELL HASH, CORAL FRAGMENTS, ROCK CRABS
FIS-46	41.305247	-71.914683	25	STARFISH
FIS-47	41.300007	-71.912543	19	CURRENT RIPPLES, STARFISH
FIS-48	41.299815	-71.916248	21	FAINT CURRENT RIPPLES, STARFISH
FIS-49	41.302978	-71.916740	17	SCATTERED COBBLES, FAINT CURRENT RIPPLES
FIS-50	41.305283	-71.921960	14	SCATTERED COBBLES, SHELL HASH, SPONGES
FIS-51	41.309913	-71.919200	16	SCATTERED COBBLES, SPONGES, ROCK CRABS, SOME SHELL HASH
FIS-52	41.315863	-71.913977	10	CURRENT RIPPLES, SPARSE AMPHIPOD BURROWS
FIS-53	41.320475	-71.913542	10	POORLY ORGANIZED RIPPLES, BURROWS
FIS-54	41.324312	-71.911562	6	POORLY ORGANIZED RIPPLES, BURROWS
FIS-55	41.322780	-71.916765	8	AMPHIPOD BURROWS
FIS-56	41.319342	-71.918030	7	FAINT RIPPLES, AMPHIPOD BURROWS
FIS-57	41.314402	-71.917683	6	CURRENT RIPPLES
FIS-58	41.307758	-71.921605	16	SPONGES, STARFISH, ROCK CRABS
FIS-59	41.300325	-71.921745	19	PATCHY MUSSEL BEDS, CLEAN SAND OVER ORGANIC-RICH SEDIMENT
FIS-60	41.295877	-71.923877	8	MUSSEL SHELLS AND HASH
FIS-61	41.298497	-71.925938	10	BOULDERS, SPONGES, ANEMONES, STARFISH, SEAWEED, NO SAMPLE
FIS-62	41.303787	-71.925788	10	RIPPLES, ABUNDANT MUSSEL SHELLS AND HASH, SCATTERED SEAWEED
FIS-62-2	41.305188	-71.929005	7	BOULDERS, SOME SHELL HASH AND KELP
FIS-63	41.308867	-71.924150	14	SPONGES AND STARFISH
FIS-64	41.313672	-71.923177	12	SPONGES, ROCK CRABS, SAND DOLLARS, CLAM SHELLS AND HASH
FIS-65	41.317830	-71.921062	10	FAINT RIPPLES, AMPHIPOD BURROWS
FIS-66	41.324787	-71.919882	4	SCATTERED EEL GRASS AND KELP, RAZOR CLAM SHELLS
FIS-67	41.322457	-71.925228	8	FAINT RIPPLES, AMPHIPOD AND WORM BURROWS, QUOHOGS
FIS-68	41.323547	-71.926928	9	FAINT RIPPLES, AMPHIPOD AND WORM BURROWS, BLUE AND SPIDER CRABS
FIS-68-2	41.328813	-71.928905	5	SCATTERED SEAWEED, ALGAE, QUOHOG AND RAZOR CLAM SHELLS AND HASH
FIS-69	41.319130	-71.929208	5	FAINT RIPPLES, HEAVILY BURROWED BY AMPHIPODS, SCATTERED SHELLS
FIS-70	41.313140	-71.930227	13	SPONGES
FIS-71	41.307135	-71.931292	13	ABUNDANT MUSSEL SHELLS AND HASH, SPONGES
FIS-72	41.302878	-71.932175	12	SHELL HASH, SCATTERED SEAWEED AND SPONGES
FIS-73	41.296475	-71.933817	7	CURRENT RIPPLES
FIS-74	41.297880	-71.936337	20	FAINT RIPPLES, QUOHOG SHELLS AND HASH, SPONGES
FIS-75	41.301993	-71.936140	13	SCATTERED SHELLS, SHELL HASH, AND SPONGES
FIS-76	41.306390	-71.935300	12	ABUNDANT MUSSELS AND SHELLS AND HASH IN PATCHY-ELONGATE BEDS
FIS-77	41.312095	-71.933953	11	ABUNDANT MUSSEL SHELLS AND HASH, SPONGES
FIS-78	41.316510	-71.932473	11	CURRENT RIPPLES AND SCATTERED SHELL HASH
FIS-79	41.322227	-71.930737	10	FAINT RIPPLES, AMPHIPODBURROWS, BLUE AND SPIDER CRABS
FIS-80	41.326097	-71.929785	5	EEL GRASS BED
FIS-81	41.324958	-71.935183	8	FAINT RIPPLES, BURROWS, SPIDER CRABS
FIS-82	41.319655	-71.936947	7	FAINT RIPPLES, AMPHIPOD BURROWS, BLUE CRABS, QUOHOG SHELLS
FIS-83	41.312965	-71.940022	10	SCATTERED MUSSEL SHELLS
FIS-84	41.310265	-71.939367	11	CURRENT RIPPLES, GRAVEL PATCHES, SAND DOLLARS, CRABS, SEAWEED
FIS-85	41.304713	-71.942863	10	SAND WAVES, CURRENT RIPPLES, SOME SHELL HASH
FIS-86	41.300650	-71.942992	9	BOULDERS, KELP, NONDESCRIPT SEAWEED, ABUNDANT MUSSELS
FIS-87	41.295438	-71.943610	18	CURRENT RIPPLES, BLUE CRABS

SAMPLE NUMBER	LATITUDE (IN DECIMAL DEGREES)	LONGITUDE	WATER DEPTH	COMMENTS
FIS-87-2	41.286103	-71.947040	5	AMPHIPOD BURROWS, SPIDER CRABS
FIS-88	41.289512	-71.947550	8	AMPHIPOD BURROWS, SKATE, SCATTERED SEAWEED
FIS-89	41.294293	-71.945720	15	CURRENT RIPPLES, SAND DOLLARS, STARFISH, CRABS
FIS-90	41.299943	-71.945345	11	SAND WAVES, RIPPLES, GRAVEL PATCHES, MUSSEL SHELLS AND HASH
FIS-91	41.304423	-71.944027	9	SAND WAVES, CURRENT RIPPLES, SCATTERED SHELL HASH
FIS-92	41.309022	-71.943455	10	CURRENT RIPPLES, SCATTERED SEAWEED, SHELL HASH
FIS-93	41.314727	-71.941543	11	CURRENT RIPPLES, CLAM SHELLS AND HASH
FIS-94	41.324688	-71.938137	7	FAINT RIPPLES, BURROWS, BLUE AND SPIDER CRABS
FIS-95	41.328602	-71.936025	6	AMPHIPOD BURROWS, SPIDER CRABS, SCATTERED SEAWEED
FIS-95-2	41.333233	-71.937412	5	BURROWS, FISH, SCATTERED SEAWEED, ORGANIC SMELL
FIS-96	41.328103	-71.944010	5	FAINT RIPPLES, AMPHIPOD BURROWS, SCATTERED SHELLS AND SEAWEED
FIS-97	41.323000	-71.943425	6	FAINT RIPPLES, AMPHIPOD AND WORM BURROWS, GASTROPODS
FIS-98	41.318100	-71.944757	9	CURRENT RIPPLES, GASTROPODS
FIS-99	41.311087	-71.946895	4	MUSSEL SHELLS AND HASH, SCATTERED SEAWEED
FIS-100	41.302130	-71.949343	14	CURRENT RIPPLES, SCATTERED SPONGES AND SHELLS
FIS-101	41.293520	-71.951088	12	FAINT RIPPLES, QUOHOG SHELLS AND HASH, SPIDER AND ROCK CRABS
FIS-102	41.290297	-71.953095	12	BURROWS, SCATTERED SHELLS AND SEAWEED
FIS-103	41.288162	-71.955695	9	AMPHIPOD AND WORM BURROWS, SCATTERED SEAWEED
FIS-104	41.292043	-71.954580	12	BURROWS, SPIDER CRABS, QUOHOGS, SHELLS AND HASH
FIS-105	41.297815	-71.952302	12	FAINT RIPPLES, SPONGES, SOME QUOHOG SHELLS AND HASH, ROCK CRABS
FIS-106	41.302682	-71.953552	13	BOULDERS, STARFISH, ABUNDANT MUSSELS AND SHELLS
FIS-107	41.308028	-71.950657	13	MUSSEL SHELLS, QUOHOGS, SPIDER CRABS
FIS-107-2	41.311522	-71.950430	3	EEL GRASS, MUSSELS
FIS-108	41.313940	-71.948128	9	SHELL HASH, SCATTERED SEAWEED
FIS-109	41.321837	-71.948513	7	FAINT RIPPLES, AMPHIPOD BURROWS
FIS-110	41.327173	-71.947855	5	FAINT RIPPLES, AMPHIPOD BURROWS
FIS-111	41.318408	-71.950827	11	FAINT RIPPLES, BURROWS, BLUE CRABS
FIS-112	41.311323	-71.954870	13	FAINT RIPPLES, AMPHIPOD BURROWS
FIS-113	41.306027	-71.956555	13	BOULDERS, SPONGES, STARFISH, ANEMONES, WELK, NO SAMPLE
FIS-114	41.302683	-71.956407	15	FAINT RIPPLES, MUSSEL SHELLS AND HASH
FIS-115	41.297253	-71.958113	11	AMPHIPOD BURROWS, SHELLS, ROCK CRABS
FIS-116	41.290488	-71.959735	12	CURRENT RIPPLES, SPARSE AMPHIPOD BURROWS
FIS-117	41.285660	-71.959797	3	BURROWS, SCATTERED NONDESCRIPT SEAWEED
FIS-118	41.290315	-71.963145	12	FAINT RIPPLES, AMPHIPOD AND WORM BURROWS, ROCK AND HERMIT CRABS
FIS-119	41.300272	-71.961725	11	BOULDERS, NONDESCRIPT SEAWEED, NO TEXTURAL SAMPLE
FIS-120	41.305933	-71.959935	17	ABUNDANT MUSSEL SHELLS AND HASH, STARFISH
FIS-121	41.314008	-71.956125	20	SHELL HASH, SPONGES, AHERATYPIC CORAL, NO VIDEO
FIS-122	41.320673	-71.955082	7	RIPPLES, SOME SHELLS AND HASH, SCATTERED SEAWEED, SPIDER CRABS
FIS-123	41.319623	-71.959007	7	FAINT RIPPLES, BURROWS
FIS-123-2	41.327778	-71.960577	3	EEL GRASS BED
FIS-124	41.315453	-71.960658	8	SHELL HASH, SPIDER CRABS, GASTROPODS
FIS-125	41.307175	-71.962695	15	RIPPLES, ROCK CRABS
FIS-126	41.303278	-71.964082	14	BOULDERS, SPONGES, STARFISH
FIS-127	41.299967	-71.964388	18	BOULDERS, MUSSELS AND SHELL HASH, SPONGES, STARFISH
FIS-128	41.295083	-71.965588	11	SPONGES, STARFISH
FIS-129	41.289232	-71.968647	7	BOULDERS, KELP AND NONDESCRIPT SEAWEED, SPONGES, NO SAMPLE
FIS-130	41.285503	-71.973432	12	AMPHIPOD AND WORM BURROWS, SHELL HASH, SKATE, SOME SEAWEED
FIS-130-2	41.280370	-71.977807	3	BOULDERS, KELP AND NONDESCRIPT SEAWEED, NO TEXTURAL SAMPLE

SAMPLE NUMBER	LATITUDE (IN DECIMAL DEGREES)	LONGITUDE	WATER DEPTH	COMMENTS
FIS-131	41.291177	-71.973808	9	ABUNDANT MUSSEL SHELLS AND HASH, SCATTERED NONDESCRIPT SEAWEED
FIS-132	41.296613	-71.970462	21	SPARSE SHELL HASH
FIS-133	41.299353	-71.968837	24	MUSSELS AND SHELL HASH
FIS-134	41.303347	-71.966648	20	SHELL HASH, STARFISH
FIS-135	41.309778	-71.966320	11	SHADOW DUNES LEEWARD OF OBJECTS, MUSSEL SHELLS, ROCK CRABS
FIS-136	41.319732	-71.962655	8	SPIDER CRABS, SPARSE SHELL HASH
FIS-137	41.319907	-71.968252	5	FAINT RIPPLES, SCATTERED SHELLS, SPIDER AND HERMIT CRABS
FIS-137-2	41.319335	-71.977718	3	SPONGES, HERMIT CRABS
FIS-138	41.315457	-71.970553	5	FAINT RIPPLES, BURROWS, HERMIT CRABS
FIS-139	41.311135	-71.971207	7	FAINT RIPPLES, SPARSE BURROWS, RAZOR CLAM AND QUOHOG SHELLS
FIS-140	41.306513	-71.971705	12	MUSSEL SHELLS AND HASH, STARFISH
FIS-140-2	41.306942	-71.970087	12	RIPPLES, RAZOR CLAM AND QUOHOG SHELLS, WELK, SPIDER CRABS
FIS-141	41.302643	-71.973800	10	BOULDERS, LOBSTER TRAP, STARFISH, SPONGES, ANEMONES, CRABS
FIS-142	41.298205	-71.973800	26	SPONGES, NO VIDEO
FIS-143	41.294223	-71.974165	15	MUSSEL BEDS, SHELLS AND HASH, ROCK CRABS, STARFISH
FIS-144	41.287317	-71.977210	13	FAINT RIPPLES, SPARSE BURROWS, SCATTERED NONDESCRIPT SEAWEED
FIS-145	41.282492	-71.978188	4	EEL GRASS AND NONDESCRIPT SEAWEED
FIS-146	41.286418	-71.981035	12	RAZOR CLAM SHELLS AND HASH, CRABS
FIS-147	41.292102	-71.979830	9	BOULDERS, ANEMONES, NONDESCRIPT SEAWEED, NO TEXTURAL SAMPLE
FIS-148	41.297035	-71.981245	24	SEA URCHINS, NO VIDEO
FIS-149	41.301370	-71.979012	22	NO VIDEO
FIS-150	41.306828	-71.979778	7	BOULDERS, STARFISH, SPONGES, KELP, NO TEXTURAL SAMPLE
FIS-151	41.316910	-71.983088	4	SPARSE SHELL HASH
FIS-152	41.304870	-71.981963	11	RIPPLES, SCATTERED SHELLS AND HASH, ROCK CRABS, ORGANIC SMELL
FIS-153	41.301173	-71.981293	22	SEA URCHINS, SPONGES, STARFISH, SCATTERED SEAWEED
FIS-154	41.295450	-71.985197	22	COARSE LAG OVER SAND, SHELLS AND HASH, SPONGES, ROCK CRABS
FIS-155	41.286607	-71.986128	9	FAINT RIPPLES, AMPHIPOD BURROWS, SPIDER CRABS
FIS-156	41.284650	-71.988957	15	RAZOR CLAM AND QUOHOG SHELL HASH, SEA URCHINS, SPIDER CRABS
FIS-157	41.291933	-71.988985	12	MUSSEL SHELLS AND HASH, SPONGES, STARFISH, ROCK CRABS
FIS-158	41.294472	-71.989038	15	ABUNDANT MUSSEL AND RAZOR CLAM SHELLS AND HASH, SPONGES
FIS-159	41.300453	-71.987493	21	BOULDERS, FISH, STARFISH, MUSSELS, WELK, NO TEXTURAL SAMPLE
FIS-160	41.306277	-71.985655	6	RIPPLES, HERMIT AND ROCK CRABS, SCATTERED SEAWEED AND SHELLS
FIS-161	41.309180	-71.986370	3	BOULDERS, KELP, EELGRASS, NO TEXTURAL SAMPLE
FIS-162	41.309268	-71.990717	4	BOULDERS, RIPPLES, CRABS, SEAWEED-RAFTED ROCKS
FIS-163	41.304373	-71.989463	7	FAINT RIPPLES, BURROWED, SCATTERED NONDESCRIPT SEAWEED
FIS-164	41.303220	-71.992182	8	MUSSEL BED, SHELLS AND HASH, BLUE CRABS, WELK
FIS-165	41.297577	-71.993518	23	SPONGES, ROCK CRABS
FIS-166	41.292902	-71.994612	21	SHELL HASH, SPONGES, STARFISH
FIS-167	41.288367	-71.996712	10	BOULDERS, LOBSTERS, SPONGES, ROCK CRABS, ANEMONES, NO SAMPLE
FIS-168	41.283552	-71.997423	9	SHELLS AND HASH, SPIDER CRABS
FIS-169	41.278063	-72.004135	7	AMPHIPOD AND WORM BURROWS, SCATTERED SHELL HASH AND SEAWEED
FIS-169-2	41.269840	-72.003308	4	HEAVILY BURROWED BY AMPHIPODS
FIS-170	41.281973	-72.001818	9	BURROWS, SCATTERED QUOHOG AND RAZOR CLAM SHELLS AND HASH, CRABS
FIS-171	41.290553	-72.001012	24	ABUNDANT RAZOR CLAM AND QUOHOG SHELLS AND HASH
FIS-171-2	41.293397	-71.999478	26	BOULDERS, SPONGES, NO TEXTURAL SAMPLE
FIS-172	41.298022	-71.998755	16	ABUNDANT MUSSEL SHELLS, ROCK CRABS, FISH, ORGANIC-RICH
FIS-173	41.302618	-71.998022	10	BOULDERS, MUSSELS, SPONGES, CRABS, STARFISH, SKATE, NO SAMPLE
FIS-174	41.305930	-71.995702	6	MUSSELS, SPIDER AND ROCK CRABS, SCATTERED SEAWEED, ORGANIC-RICH

SAMPLE NUMBER	LATITUDE (IN DECIMAL DEGREES)	LONGITUDE	WATER DEPTH	COMMENTS
FIS-175	41.311622	-71.995133	4	EEL GRASS, WORM TUBES
FIS-175-2	41.314922	-71.994348	3	EEL GRASS AND NONDESCRIPT SEAWEED
FIS-176	41.300877	-72.002162	11	MUSSEL BED, SHELLS AND HASH, SPIDER AND ROCK CRABS
FIS-177	41.296133	-72.003213	10	BOULDERS, MUSSELS, STARFISH, SPONGES, AND ROCK CRABS
FIS-178	41.286155	-72.005782	4	SILTY SAND OVER COARSE SAND, SCATTERED NONDESCRIPT SEAWEED
FIS-179	41.280527	-72.008880	6	BURROWS, SCATTERED SEAWEED AND SHELLS
FIS-180	41.287785	-72.011945	23	FAINT RIPPLES, MUSSEL SHELLS AND HASH
FIS-181	41.290503	-72.009135	23	ABUNDANT MUSSEL SHELLS AND HASH
FIS-182	41.305455	-72.003078	6	RIPPLES, SHELL HASH
FIS-183	41.304192	-72.007482	8	SHELL HASH, SPIDER CRABS
FIS-184	41.300925	-72.009982	16	FAINT RIPPLES, SPONGES, SHELL HASH
FIS-185	41.295610	-72.010922	21	MUSSEL AND RAZOR CLAM SHELLS AND HASH, LOBSTER TRAP
FIS-186	41.291092	-72.012122	23	SHELL HAHS, COAL FRAGMENTS
FIS-187	41.282042	-72.013493	3	EEL GRASS BED
FIS-188	41.280470	-72.014247	5	EEL GRASS BED
FIS-189	41.279012	-72.016648	5	BOULDERS, KELP AND NONDESCRIPT SEAWEED, NO TEXTURAL SAMPLE
FIS-189-2	41.274670	-72.014132	5	BURROWED, SCATTERED NONDESCRIPT SEAWEED
FIS-190	41.286588	-72.018197	4	BOULDERS, ABUNDANT MUSSELS, ROCK CRABS, NO TEXTURAL SAMPLE
FIS-191	41.298350	-72.011350	13	CURRENT RIPPLES, SHELL HASH, SPIDER AND HERMIT CRABS
FIS-192	41.302705	-72.012605	11	FAINTLY RIPPLES, BURROWED, SHELL HASH, HERMIT CRABS, WELK
FIS-193	41.298878	-72.017027	13	CURRENT RIPPLES, SHELL HASH
FIS-194	41.293682	-72.018872	25	SHELL HASH
FIS-194-2	41.294268	-72.013218	23	MUSSEL AND RAZOR CLAM SHELLS AND HASH, FISH
FIS-195	41.281702	-72.024423	16	SHELL HASH, SPONGES, ANEMONES, SEA URCHINS
FIS-196	41.286882	-72.023445	15	AMPHIPOD BURROWS, SHELL HASH, SPIDER CRABS
FIS-197	41.291598	-72.023478	23	BOULDERS, SPONGES, NO TEXTURAL SAMPLE
FIS-198	41.297338	-72.020643	10	CURRENT RIPPLES, SHELLS AND HASH
FIS-198-2	41.302153	-72.016635	11	SHELLS AND HASH, SPIDER CRAB
FIS-199	41.307310	-72.017962	8	FAINT RIPPLES, AMPHIPOD BURROWS, SCATTERED SHELLS AND SEAWEED
FIS-199-2	41.314197	-72.022722	4	BURROWS, QUOHOG AND RAZOR CLAM SHELLS AND HASH, SPIDER CRABS
FIS-200	41.279852	-72.031325	24	AMPHIPOD BURROWS, SCATTERED SHELLS
FIS-201	41.283088	-72.030310	22	SAND LAYER OVER SILT, ABUNDANT AMPHIPOD BURROWS, SOME SHELLS
FIS-201-2	41.286390	-72.029175	21	AMPHIPOD BURROWS, SPIDER CRABS
FIS-202	41.289598	-72.028543	17	AMPHIPOD BURROWS, FISH
FIS-203	41.294468	-72.027280	11	SOME RAZOR CLAM SHELLS AND HASH
FIS-204	41.298353	-72.026090	10	FAINT RIPPLES, SHELLS AND HASH, SPIDER CRABS, SCATTERED SEAWEED
FIS-205	41.305873	-72.023985	11	FAINT RIPPLES, BURROWS, ABUNDANT RAZOR CLAM SHELLS AND HASH
FIS-206	41.309323	-72.027842	8	BURROWS, SHELS AND HASH, SCATTERED NONDESCRIPT SEAWEED
FIS-207	41.305795	-72.027562	10	BURROWS, QUOHOG AND RAZOR CLAM SHELLS AND HASH
FIS-207-2	41.302253	-72.028415	9	SCATTERED COBBLES, SHELL HASH, SPIDER CRABS
FIS-208	41.298798	-72.029913	8	SCATTERED COBBLES, SHELL HASH, HERMIT CRABS, SCATTERED SEAWEED
FIS-209	41.294552	-72.031005	10	BURROWS, SCATTERED QUOHOG SHELLS, HERMIT CRABS
FIS-210	41.290050	-72.032293	14	ABUNDANT SHELL HASH
FIS-211	41.284253	-72.033278	17	AMPHIPOD BURROWS, SCATTERED SHELLS
FIS-212	41.287987	-72.040812	12	AMPHIPOD BURROWS, SHELLS AND HASH, SPIDER CRABS
FIS-213	41.283013	-72.043712	14	BURROWS, SHELLS AND HASH
FIS-214	41.280263	-72.053562	13	HEAVILY BURROWED BY AMPHIPODS, SHELL AND HASH, SEAWEED
FIS-215	41.285232	-72.047488	12	HEAVILY BURROWED BY AMPHIPODS AND WORMS, QUOHOG SHELLS

SAMPLPE NUMBER	LATITUDE (IN DECIMAL DEGREES	LONGITUDE	WATER DEPTH	COMMENTS
FIS-216	41.287867	-72.052450	11	HEAVILY BURROWED BY AMPHIPODS, SPIDER CRABS
FIS-217	41.279550	-72.034888	20	AMPHIPOD BURROWS, SHELLS AND HASH
FIS-218	41.278632	-72.044958	14	HEAVILY BURROWED, BLUE AND SPIDER CRABS
FIS-219	41.276928	-72.026827	11	BOULDERS, SPONGES, FISH, ANEMONES
FIS-220	41.289720	-71.989113	3	EEL GRASS BED, NO TEXTURAL SAMPLE
FIS-220-2	41.289730	-71.989447	3	EEL GRASS BED, NO TEXTURAL SAMPLE
FIS-221	41.291712	-71.977443	2	BOULDERS, GRAVEL, NO TEXTURAL SAMPLE
FIS-221-2	41.291508	-71.977852	3	EEL GRASS BED, NO TEXTURAL SAMPLE
FIS-222	41.299437	-71.969707	24	BOULDERS, GRAVEL, SPONGES, STARFISH, SHELL HASH, NO SAMPLE
FIS-222-2	41.299303	-71.970210	24	GRAVEL, STARFISH, SPONGES, NO TEXTURAL SAMPLE

APPENDIX B

This table contains the relative grain-size frequency distributions by weight in whole phi units for each sample. The -5 ϕ fraction contains all sediment coarser than 32 mm; the 11 ϕ fraction contains sediment with diameters between .001 and .00063 mm.

SAMPLE NUMBER	CLAY				SILT	SAND				GRAVEL								
	11φ	10φ	9φ	8φ		7φ	6φ	5φ	4φ	3φ	2φ	1φ	0φ	-1φ	-2φ	-3φ	-4φ	-5φ
FIS-1	0.07	0.12	0.12	0.11	0.09	0.13	0.15	20.34	27.08	41.57	10.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FIS-2	0.14	0.19	0.23	0.12	0.05	0.09	0.24	42.84	42.05	14.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FIS-3	0.03	0.05	0.07	0.05	0.03	0.05	0.09	7.57	56.09	35.97	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FIS-4	0.10	0.16	0.19	0.24	0.17	0.18	0.12	4.38	19.33	31.92	24.36	1.22	1.79	3.57	8.07	4.20	0.00	0.00
FIS-5	0.11	0.24	0.22	0.24	0.18	0.29	0.26	13.66	20.42	21.58	11.07	1.57	2.88	7.24	11.77	8.27	0.00	0.00
FIS-6	0.02	0.02	0.02	0.04	0.04	0.06	0.05	7.90	31.09	37.28	6.63	2.04	14.59	0.22	0.00	0.00	0.00	0.00
FIS-7	0.02	0.04	0.06	0.05	0.07	0.12	0.23	13.42	35.29	48.71	1.79	0.20	0.00	0.00	0.00	0.00	0.00	0.00
FIS-8	0.18	0.33	0.21	0.23	0.15	0.15	0.13	5.35	18.59	19.87	30.55	10.53	6.66	3.73	3.34	0.00	0.00	0.00
FIS-9	1.41	1.82	1.60	1.06	0.99	0.41	0.27	1.72	4.53	12.44	14.72	8.51	13.76	18.26	16.88	1.62	0.00	0.00
FIS-10	0.14	0.09	0.08	0.07	0.05	0.06	0.03	0.68	21.09	58.46	3.13	1.36	7.96	6.80	0.00	0.00	0.00	0.00
FIS-11	0.06	0.10	0.11	0.13	0.06	0.11	0.20	3.57	7.15	26.29	60.53	1.69	0.00	0.00	0.00	0.00	0.00	0.00
FIS-13	0.25	0.34	0.36	0.43	0.43	0.58	0.49	0.27	0.55	3.44	11.97	11.05	10.83	13.61	17.60	27.80	0.00	0.00
FIS-14	0.15	0.26	0.26	0.17	0.14	0.18	0.12	1.17	1.90	3.80	17.68	9.98	9.95	18.20	28.34	7.70	0.00	0.00
FIS-15	0.08	0.06	0.05	0.07	0.05	0.05	0.04	0.91	1.46	6.56	28.33	8.29	5.80	4.47	20.08	23.70	0.00	0.00
FIS-16	0.00	0.00	0.00	0.00	0.00	0.00	0.01	4.66	19.33	20.73	3.80	5.09	10.08	18.93	16.44	0.93	0.00	0.00
FIS-17	0.06	0.09	0.10	0.09	0.05	0.08	0.08	8.26	44.55	43.56	3.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FIS-18	0.06	0.05	0.04	0.04	0.05	0.08	0.05	0.40	1.99	41.45	55.79	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FIS-19	0.23	0.44	0.48	0.45	0.26	0.29	0.21	3.28	6.79	15.15	24.09	7.24	10.27	10.09	15.40	5.33	0.00	0.00
FIS-20	0.32	0.84	0.86	0.56	0.32	0.32	0.20	4.59	4.16	3.65	0.40	0.05	0.33	0.80	12.76	62.66	7.18	7.18
FIS-21	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	42.56	57.44	57.44
FIS-22	0.11	0.04	0.02	0.03	0.04	0.05	0.04	0.20	1.39	38.20	59.18	0.50	0.20	0.00	0.00	0.00	0.00	0.00
FIS-23	1.62	5.16	5.92	3.65	2.14	2.12	1.37	1.82	2.08	2.81	4.56	4.08	3.42	8.26	19.42	9.91	21.66	21.66
FIS-24	0.60	1.16	1.36	0.98	0.60	0.57	0.27	2.50	3.85	13.34	21.56	10.83	18.31	15.50	8.57	0.00	0.00	0.00
FIS-25	0.15	0.19	0.21	0.21	0.11	0.05	0.03	1.78	10.23	16.63	20.02	12.93	14.88	10.69	10.20	1.69	0.00	0.00
FIS-26	0.16	0.18	0.18	0.13	0.10	0.07	0.06	1.48	17.17	30.29	9.20	6.17	10.44	11.31	13.06	0.00	0.00	0.00
FIS-27	0.06	0.07	0.07	0.06	0.05	0.09	0.07	1.54	3.85	10.26	35.91	33.95	5.60	8.42	0.00	0.00	0.00	0.00
FIS-28	0.08	0.11	0.12	0.05	0.03	0.03	0.04	17.19	63.31	17.49	1.39	0.00	0.16	0.00	0.00	0.00	0.00	0.00
FIS-29	0.09	0.13	0.16	0.07	0.03	0.04	0.04	15.02	59.96	22.47	1.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00

SAMPLE NUMBER	CLAY				SILT	SAND				GRAVEL								
	11φ	10φ	9φ	8φ		7φ	6φ	5φ	4φ	3φ	2φ	1φ	0φ	-1φ	-2φ	-3φ	-4φ	-5φ
FIS-29-2	0.57	1.36	1.26	0.70	0.53	0.84	1.41	52.92	25.40	7.36	4.60	1.75	1.30	0.00	0.00	0.00	0.00	0.00
FIS-30	0.05	0.10	0.10	0.06	0.05	0.07	0.06	14.79	32.14	28.79	22.58	0.29	0.57	0.35	0.00	0.00	0.00	0.00
FIS-31	0.25	0.19	0.22	0.18	0.07	0.07	0.06	0.51	7.16	16.67	10.14	7.93	10.97	13.73	17.70	14.15	0.00	0.00
FIS-33	0.06	0.19	0.07	0.02	0.02	0.03	0.01	1.49	2.79	41.72	50.96	2.38	0.26	0.00	0.00	0.00	0.00	0.00
FIS-35	0.08	0.32	0.59	0.86	0.84	0.80	0.38	1.99	3.60	11.23	5.61	0.96	5.42	9.57	13.08	36.10	8.57	0.00
FIS-37	0.15	1.00	0.34	0.09	0.06	0.07	0.03	0.08	1.92	13.20	32.54	29.02	14.51	6.99	0.00	0.00	0.00	0.00
FIS-38	0.04	0.08	0.10	0.09	0.03	0.04	0.04	1.67	16.44	18.94	10.44	4.70	10.72	11.79	7.73	17.15	0.00	0.00
FIS-39	0.12	0.40	0.17	0.18	0.12	0.00	0.00	11.97	23.32	21.73	3.30	0.73	3.09	6.05	9.61	19.21	0.00	0.00
FIS-40	0.39	0.92	1.02	1.04	1.36	3.36	7.39	66.10	18.17	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FIS-41	0.41	0.90	0.93	0.77	0.87	1.87	3.42	47.95	23.09	13.70	2.64	0.44	2.07	0.94	0.00	0.00	0.00	0.00
FIS-42	0.54	1.07	0.92	0.60	0.88	4.75	18.53	57.37	14.18	1.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FIS-42-2	0.50	0.70	0.67	0.63	0.73	2.05	3.54	20.06	41.87	23.85	2.28	0.09	0.76	2.27	0.00	0.00	0.00	0.00
FIS-42-3	0.34	0.80	1.04	0.87	0.96	2.55	4.62	3.09	6.98	9.35	19.53	15.15	15.20	15.56	3.96	0.00	0.00	0.00
FIS-43	0.57	1.28	1.26	0.88	0.93	2.03	5.09	59.37	26.22	2.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FIS-44	0.13	0.26	0.21	0.23	0.19	0.34	0.46	30.41	42.68	18.87	0.93	0.10	1.11	1.33	2.75	0.00	0.00	0.00
FIS-45	0.85	1.72	1.73	1.05	0.62	0.61	0.39	1.13	3.23	9.62	22.94	8.49	13.49	12.32	10.53	11.28	0.00	0.00
FIS-46	0.18	0.56	0.65	0.44	0.29	0.31	0.23	1.53	4.36	14.34	23.75	12.70	17.20	19.11	4.35	0.00	0.00	0.00
FIS-47	0.75	1.08	0.82	0.51	0.24	0.20	0.11	1.09	17.05	29.71	4.94	1.52	6.21	4.03	7.16	12.04	12.54	0.00
FIS-48	0.14	0.34	0.40	0.34	0.23	0.29	0.26	4.57	17.12	18.43	10.87	1.52	7.08	27.48	10.93	0.00	0.00	0.00
FIS-49	0.73	1.27	0.87	0.66	0.22	0.19	0.08	1.16	17.44	29.12	7.10	3.31	10.48	14.48	8.24	4.65	0.00	0.00
FIS-50	1.22	2.78	2.79	1.96	0.77	0.71	0.38	5.03	28.73	27.16	6.75	1.24	1.74	3.79	7.25	7.70	0.00	0.00
FIS-51	0.35	0.65	0.74	0.55	0.36	0.38	0.29	1.19	3.63	11.47	33.97	12.41	13.11	10.38	7.34	3.18	0.00	0.00
FIS-52	0.15	0.33	0.23	0.19	0.13	0.16	0.12	40.46	55.27	2.96	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FIS-53	1.86	3.48	3.70	2.72	2.42	4.40	4.51	57.14	19.08	0.69	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FIS-54	0.65	1.47	1.48	1.24	1.03	2.61	5.25	68.15	15.70	2.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FIS-55	0.35	0.88	0.73	0.56	0.57	1.16	1.75	67.72	19.92	5.24	0.56	0.10	0.09	0.37	0.00	0.00	0.00	0.00
FIS-56	0.17	0.35	0.32	0.24	0.21	0.32	0.31	46.69	51.19	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FIS-57	0.12	0.21	0.22	0.09	0.05	0.06	0.07	12.18	80.85	5.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FIS-58	0.40	1.04	1.27	1.00	0.60	0.70	0.39	0.58	4.02	9.24	27.68	11.30	8.44	10.41	15.26	7.67	0.00	0.00
FIS-59	3.18	10.84	13.35	10.55	7.21	7.38	6.01	25.14	15.05	1.17	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FIS-60	0.24	0.87	0.51	0.37	0.26	0.19	0.12	1.68	13.78	38.05	37.86	2.34	2.14	1.59	0.00	0.00	0.00	0.00
FIS-62	0.37	0.99	1.04	1.04	0.71	0.63	0.46	3.69	18.73	19.62	16.59	0.84	2.44	8.67	16.47	7.71	0.00	0.00

SAMPLE NUMBER	CLAY					SILT					SAND					GRAVEL				
	11φ	10φ	9φ	8φ	7φ	6φ	5φ	4φ	3φ	2φ	1φ	0φ	-1φ	-2φ	-3φ	-4φ	-5φ			
FIS-62-2	0.23	0.34	0.23	0.19	0.09	0.08	0.04	3.31	30.71	21.49	3.13	1.57	6.62	9.54	8.56	13.87	0.00			
FIS-63	0.28	0.73	0.77	0.61	0.44	0.62	0.36	4.36	6.94	10.25	11.29	4.69	10.62	23.82	18.93	5.29	0.00			
FIS-64	0.32	0.65	0.30	0.22	0.14	0.11	0.13	1.77	19.00	37.85	10.34	1.92	8.05	9.80	3.63	5.77	0.00			
FIS-65	0.14	0.24	0.24	0.18	0.14	0.21	0.21	26.42	63.47	8.67	0.00	0.00	0.08	0.00	0.00	0.00	0.00			
FIS-66	0.50	0.82	0.78	0.72	0.85	1.15	1.03	0.72	0.49	2.44	6.61	6.02	9.08	13.41	32.56	22.82	0.00			
FIS-67	0.22	0.43	0.43	0.38	0.42	0.81	1.38	57.17	33.29	5.47	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
FIS-68	0.27	0.50	0.52	0.46	0.69	2.92	8.83	49.30	21.42	10.00	2.85	0.42	1.82	0.00	0.00	0.00	0.00			
FIS-68-2	0.35	0.69	0.61	0.54	0.74	2.51	6.48	50.79	22.56	6.42	2.24	1.25	2.12	0.74	1.96	0.00	0.00			
FIS-69	0.11	0.25	0.30	0.22	0.20	0.32	0.42	18.56	71.08	8.54	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
FIS-70	0.15	0.34	0.42	0.37	0.29	0.50	0.31	1.54	3.20	13.41	22.14	9.57	12.52	13.62	19.20	2.42	0.00			
FIS-71	0.31	1.10	1.92	1.90	1.24	1.14	0.38	7.83	12.33	15.90	10.82	1.45	7.43	9.57	14.73	11.95	0.00			
FIS-72	0.24	0.56	0.59	0.46	0.36	0.49	0.28	8.31	17.64	14.09	4.22	0.63	3.10	4.95	2.93	0.00	41.15			
FIS-73	0.38	0.65	0.55	0.42	0.47	0.80	0.84	12.45	75.33	7.95	0.00	0.00	0.16	0.00	0.00	0.00	0.00			
FIS-74	0.23	0.57	0.46	0.34	0.23	0.29	0.28	4.12	33.86	39.44	5.57	2.75	5.11	3.59	3.16	0.00	0.00			
FIS-75	0.19	0.47	0.54	0.58	0.41	0.67	0.37	2.76	29.04	30.43	1.80	0.30	1.19	3.08	10.53	17.64	0.00			
FIS-76	1.53	4.71	5.86	4.82	3.24	3.20	1.75	6.72	20.44	29.53	15.10	0.43	2.67	0.00	0.00	0.00	0.00			
FIS-77	0.29	0.68	0.60	0.40	0.30	0.54	0.35	4.34	10.86	23.69	20.16	2.98	9.34	17.22	8.25	0.00	0.00			
FIS-78	0.12	0.23	0.15	0.14	0.06	0.06	0.05	1.18	31.33	50.50	14.53	1.29	0.36	0.00	0.00	0.00	0.00			
FIS-79	0.40	1.03	0.87	0.56	0.45	0.74	1.46	65.40	29.01	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
FIS-80	0.67	1.58	1.59	1.13	1.20	2.49	5.30	40.98	17.84	11.87	3.45	2.45	4.80	4.65	0.00	0.00	0.00			
FIS-81	0.63	1.65	1.60	1.14	0.97	2.10	5.10	64.93	19.62	2.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
FIS-82	0.30	0.63	0.58	0.39	0.30	0.45	0.69	25.81	63.89	6.96	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
FIS-83	0.09	0.20	0.21	0.19	0.11	0.13	0.11	1.11	6.77	25.72	19.95	4.78	16.04	17.92	5.36	1.31	0.00			
FIS-84	0.05	0.14	0.16	0.18	0.17	0.22	0.27	2.88	11.96	47.85	21.89	0.25	4.83	0.93	4.12	4.10	0.00			
FIS-85	0.17	0.33	0.12	0.10	0.06	0.06	0.04	0.85	9.86	38.84	39.70	5.49	4.38	0.00	0.00	0.00	0.00			
FIS-86	0.15	0.43	0.56	0.58	0.49	0.64	0.46	7.70	35.22	42.54	10.78	0.00	0.45	0.00	0.00	0.00	0.00			
FIS-87	0.17	0.41	0.24	0.14	0.09	0.13	0.17	10.65	73.70	14.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
FIS-87-2	1.37	4.25	6.16	5.96	6.29	13.26	30.83	25.34	5.17	1.31	0.06	0.00	0.00	0.00	0.00	0.00	0.00			
FIS-88	1.27	3.45	3.82	2.89	2.02	3.55	8.49	63.56	10.58	0.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
FIS-89	0.20	0.53	0.33	0.23	0.15	0.23	0.21	10.99	65.64	21.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
FIS-90	0.42	1.03	0.87	0.59	0.37	0.61	0.57	5.49	12.66	15.03	23.92	9.14	11.03	16.21	2.06	0.00	0.00			
FIS-91	0.08	0.27	0.10	0.06	0.03	0.05	0.02	0.31	0.92	10.50	32.11	32.79	15.63	7.13	0.00	0.00	0.00			

SAMPLE NUMBER	CLAY					SILT					SAND					GRAVEL				
	11φ	10φ	9φ	8φ	7φ	6φ	5φ	4φ	3φ	2φ	1φ	0φ	-1φ	-2φ	-3φ	-4φ	-5φ			
FIS-92	0.23	0.51	0.37	0.33	0.30	0.47	0.36	8.64	34.15	45.89	6.89	1.46	0.26	0.14	0.00	0.00	0.00			
FIS-93	0.47	1.31	0.64	0.64	0.45	0.58	0.81	1.51	6.61	20.57	29.41	13.81	12.73	8.39	2.07	0.00	0.00			
FIS-94	0.58	1.43	1.48	0.87	0.76	1.13	2.00	45.60	31.38	13.40	1.38	0.00	0.00	0.00	0.00	0.00	0.00			
FIS-95	0.82	2.09	2.06	1.34	1.21	2.90	5.48	45.11	18.33	15.34	4.15	0.00	0.27	0.90	0.00	0.00	0.00			
FIS-95-2	0.33	0.75	0.82	0.90	1.53	5.79	13.54	11.21	22.20	15.07	3.22	1.93	11.49	11.22	0.00	0.00	0.00			
FIS-96	1.43	3.72	3.82	2.82	2.54	5.27	9.27	54.30	12.47	0.27	0.00	0.00	0.00	0.00	4.09	0.00	0.00			
FIS-97	0.91	2.17	2.09	1.14	1.04	1.73	3.87	64.07	22.11	0.87	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
FIS-98	0.02	0.02	0.04	0.03	0.02	0.01	0.02	1.40	14.47	65.40	18.57	0.00	0.00	0.00	0.00	0.00	0.00			
FIS-99	0.84	1.87	1.69	1.04	0.76	0.92	1.07	14.87	19.99	19.66	15.67	9.75	5.09	5.52	1.26	0.00	0.00			
FIS-100	0.28	0.56	0.47	0.24	0.12	0.13	0.09	5.20	48.08	42.97	1.86	0.00	0.00	0.00	0.00	0.00	0.00			
FIS-101	1.15	2.32	1.93	1.32	1.23	1.67	2.19	15.12	46.75	18.80	1.06	0.00	0.00	0.00	6.46	0.00	0.00			
FIS-102	1.92	4.15	3.60	1.98	1.44	2.40	4.42	53.26	26.83	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
FIS-103	1.93	4.45	4.05	1.79	1.20	1.94	3.75	54.14	22.24	3.38	0.65	0.16	0.00	0.32	0.00	0.00	0.00			
FIS-104	0.34	0.73	0.65	0.37	0.32	0.54	1.41	29.94	59.67	6.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
FIS-105	0.13	0.28	0.24	0.15	0.10	0.14	0.19	2.05	22.28	43.01	26.48	3.91	1.04	0.00	0.00	0.00	0.00			
FIS-106	0.58	1.19	1.08	0.62	0.47	0.65	0.74	10.91	33.80	31.10	3.83	1.79	3.64	6.08	3.52	0.00	0.00			
FIS-107	0.28	0.71	0.80	0.78	0.92	1.33	1.16	12.42	42.74	21.17	2.78	0.48	1.34	5.33	7.76	0.00	0.00			
FIS-107-2	1.72	4.45	3.75	1.81	1.33	1.86	2.19	15.77	12.49	13.30	7.30	2.52	5.48	7.91	8.13	9.99	0.00			
FIS-108	0.24	0.48	0.44	0.36	0.22	0.25	0.20	2.42	3.83	18.76	34.64	13.90	11.60	7.08	5.58	0.00	0.00			
FIS-109	0.79	2.20	2.65	2.47	2.23	4.15	8.69	62.99	13.35	0.38	0.00	0.00	0.10	0.00	0.00	0.00	0.00			
FIS-110	0.95	2.24	2.22	1.51	1.82	5.09	13.36	58.25	12.30	1.97	0.29	0.00	0.00	0.00	0.00	0.00	0.00			
FIS-111	0.38	0.75	0.56	0.25	0.29	0.48	0.86	32.40	61.43	2.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
FIS-112	1.71	3.58	2.60	1.15	0.79	1.36	2.06	54.65	31.41	0.69	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
FIS-114	0.32	0.71	0.48	0.32	0.27	0.47	0.83	12.84	33.91	35.17	12.17	2.51	0.00	0.00	0.00	0.00	0.00			
FIS-115	0.68	1.61	1.51	0.73	0.49	0.89	1.31	22.73	48.25	21.24	0.56	0.00	0.00	0.00	0.00	0.00	0.00			
FIS-116	0.39	0.72	0.54	0.27	0.23	0.46	0.63	26.41	67.64	2.71	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
FIS-117	2.54	5.01	3.89	2.41	2.18	4.51	9.02	58.39	12.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
FIS-118	0.10	0.31	0.32	0.23	0.23	0.33	0.38	32.77	64.94	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
FIS-120	0.49	1.10	0.65	0.31	0.24	0.39	0.79	13.16	33.26	27.12	11.03	4.35	3.72	0.51	2.88	0.00	0.00			
FIS-121	0.20	0.56	0.34	0.19	0.18	0.35	0.43	5.86	29.53	35.48	13.37	6.05	4.37	1.40	1.69	0.00	0.00			
FIS-122	1.09	2.40	1.95	1.12	1.11	2.39	4.63	26.20	13.41	15.12	5.79	2.46	5.05	6.07	11.21	0.00	0.00			
FIS-123	0.27	0.72	0.51	0.32	0.30	0.72	2.11	9.92	20.77	34.52	22.92	5.42	1.50	0.00	0.00	0.00	0.00			

SAMPLE NUMBER	CLAY				SILT				SAND				GRAVEL				
	11φ	10φ	9φ	8φ	7φ	6φ	5φ	4φ	3φ	2φ	1φ	0φ	-1φ	-2φ	-3φ	-4φ	-5φ
FIS-123-2	6.50	15.52	10.93	6.93	4.93	7.39	16.11	24.78	4.69	2.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00
FIS-124	0.37	0.86	0.58	0.35	0.39	0.82	1.74	19.38	27.20	25.96	11.11	5.24	3.39	2.61	0.00	0.00	0.00
FIS-125	0.44	0.96	0.73	0.38	0.36	0.78	2.97	25.08	32.52	26.47	7.81	1.02	0.27	0.21	0.00	0.00	0.00
FIS-127	0.47	1.00	0.77	0.45	0.38	0.63	0.79	5.47	8.01	19.66	23.48	7.00	3.09	13.83	14.97	0.00	0.00
FIS-128	0.30	0.63	0.58	0.33	0.22	0.29	0.30	6.12	33.38	22.04	2.04	0.13	0.12	0.46	2.51	30.55	0.00
FIS-130	0.00	0.54	0.59	0.34	0.28	0.54	1.14	12.63	31.90	33.58	11.51	3.93	0.89	0.21	1.92	0.00	0.00
FIS-131	0.00	2.55	3.45	2.73	1.97	2.85	4.41	30.85	34.86	13.13	3.04	0.16	0.00	0.00	0.00	0.00	0.00
FIS-132	0.00	0.48	0.53	0.33	0.16	0.22	0.33	2.73	18.33	51.37	21.83	3.22	0.47	0.00	0.00	0.00	0.00
FIS-133	0.00	0.15	0.15	0.12	0.18	1.07	3.10	4.79	4.16	10.44	22.86	11.03	7.76	6.04	4.99	23.16	0.00
FIS-134	0.00	1.39	1.70	1.34	1.09	1.54	1.56	10.81	26.74	30.68	10.73	4.86	2.49	4.01	1.06	0.00	0.00
FIS-135	0.00	1.66	1.98	1.57	1.14	1.86	2.84	22.75	46.10	17.25	2.39	0.00	0.11	0.35	0.00	0.00	0.00
FIS-136	0.00	0.20	0.38	0.20	0.17	0.36	0.95	3.93	10.05	23.87	26.42	8.52	8.73	9.38	6.84	0.00	0.00
FIS-137	0.00	0.53	0.69	0.51	0.43	1.12	2.67	10.71	27.71	35.84	15.70	2.40	1.32	0.37	0.00	0.00	0.00
FIS-137-2	0.00	0.28	0.28	0.25	0.23	0.43	0.59	1.49	10.26	22.74	9.49	1.27	1.95	5.06	10.66	35.07	0.00
FIS-138	0.00	1.94	2.26	1.64	1.41	3.32	7.31	50.09	28.33	3.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FIS-139	0.13	0.41	0.29	0.13	0.17	0.34	0.74	28.34	59.19	8.61	0.58	0.00	0.10	0.97	0.00	0.00	0.00
FIS-140	0.64	1.66	1.27	0.84	0.66	1.09	1.90	18.22	23.19	9.09	6.28	0.34	3.62	9.75	10.83	10.62	0.00
FIS-140-2	0.32	0.67	0.39	0.24	0.20	0.25	0.23	4.69	35.56	54.42	3.03	0.00	0.00	0.00	0.00	0.00	0.00
FIS-142	0.38	1.07	1.18	0.95	0.59	0.65	0.51	4.05	4.63	9.26	9.75	2.77	5.33	10.72	18.43	29.73	0.00
FIS-143	1.67	5.93	8.29	7.77	7.17	8.39	6.64	33.41	20.46	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FIS-144	0.64	1.64	1.33	0.89	1.23	2.49	4.44	51.88	34.59	0.87	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FIS-145	0.72	1.82	1.51	0.91	1.34	3.57	15.54	63.03	11.04	0.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FIS-146	0.19	0.56	0.31	0.17	0.15	0.33	0.78	18.61	37.59	20.49	13.44	3.85	2.77	0.76	0.00	0.00	0.00
FIS-148	0.29	0.74	0.84	0.80	0.56	0.66	0.56	6.29	8.71	10.25	9.45	2.06	4.17	12.29	20.52	21.81	0.00
FIS-149	0.20	0.52	0.45	0.35	0.36	0.79	1.36	7.08	19.49	22.87	23.83	7.25	2.88	5.96	6.61	0.00	0.00
FIS-151	0.06	0.16	0.11	0.10	0.08	0.14	0.24	1.87	12.36	46.33	22.67	5.69	5.58	4.61	0.00	0.00	0.00
FIS-152	0.09	0.22	0.16	0.09	0.08	0.11	0.21	10.10	62.10	26.34	0.50	0.00	0.00	0.00	0.00	0.00	0.00
FIS-153	0.10	0.27	0.36	0.28	0.26	0.32	0.35	7.07	12.59	27.63	15.74	6.93	6.60	8.29	13.21	0.00	0.00
FIS-154	0.20	0.50	0.26	0.12	0.11	0.16	0.21	3.37	10.42	25.92	25.33	9.89	12.32	7.03	4.16	0.00	0.00
FIS-155	0.21	0.52	0.47	0.26	0.19	0.25	0.53	28.98	58.64	9.46	0.49	0.00	0.00	0.00	0.00	0.00	0.00
FIS-156	0.03	0.12	0.13	0.09	0.10	0.16	0.23	2.90	2.79	2.89	1.69	0.40	0.89	1.41	1.77	84.40	0.00
FIS-157	0.11	0.36	0.48	0.40	0.40	0.42	0.36	2.87	4.22	7.83	8.12	0.25	9.26	17.36	21.55	24.15	0.00

SAMPLE NUMBER	CLAY				SILT			SAND				GRAVEL					
	11φ	10φ	9φ	8φ	7φ	6φ	5φ	4φ	3φ	2φ	1φ	0φ	-1φ	-2φ	-3φ	-4φ	-5φ
FIS-158	0.19	0.61	0.61	0.60	0.56	0.47	0.20	1.65	7.20	15.58	20.00	6.99	5.89	10.02	13.88	15.55	0.00
FIS-160	0.14	0.38	0.41	0.33	0.25	0.36	0.63	3.12	11.61	73.41	9.07	0.29	0.00	0.00	0.00	0.00	0.00
FIS-162	0.29	0.76	0.89	0.70	0.70	1.24	1.79	11.20	38.91	26.11	10.85	1.15	1.04	4.37	0.00	0.00	0.00
FIS-163	1.79	6.64	10.90	10.33	9.86	12.83	12.79	20.85	12.92	0.76	0.28	0.00	0.05	0.00	0.00	0.00	0.00
FIS-164	1.01	3.40	5.13	5.14	5.36	6.30	5.11	40.37	25.44	2.19	0.55	0.00	0.00	0.00	0.00	0.00	0.00
FIS-165	0.10	0.29	0.39	0.38	0.50	0.56	0.34	5.27	10.47	25.32	20.73	6.64	10.09	5.98	3.60	9.34	0.00
FIS-166	0.25	0.73	0.95	0.79	0.71	0.85	0.81	7.80	28.07	32.63	9.07	1.26	1.11	2.56	4.48	7.93	0.00
FIS-168	0.41	1.05	1.15	0.77	0.72	1.23	4.42	31.58	29.14	18.40	7.59	0.53	1.71	1.30	0.00	0.00	0.00
FIS-169	0.51	1.50	1.84	1.52	1.62	4.05	8.60	53.72	25.19	0.80	0.00	0.00	0.02	0.63	0.00	0.00	0.00
FIS-169-2	1.39	3.73	4.04	2.83	2.89	6.21	16.65	52.86	7.16	0.87	1.37	0.00	0.00	0.00	0.00	0.00	0.00
FIS-170	0.96	2.22	2.13	1.43	1.32	2.33	3.23	35.48	31.11	16.72	2.40	0.00	0.33	0.34	0.00	0.00	0.00
FIS-171	0.48	1.38	1.67	1.22	0.98	1.58	1.87	11.28	33.69	24.83	3.45	0.00	1.03	2.29	6.15	8.10	0.00
FIS-172	2.17	7.47	8.76	5.27	3.51	8.65	17.26	29.08	13.98	3.57	0.28	0.00	0.00	0.00	0.00	0.00	0.00
FIS-174	1.97	7.53	10.95	9.38	7.77	9.13	8.26	23.62	9.00	9.43	1.62	0.00	0.44	0.90	0.00	0.00	0.00
FIS-175	0.45	1.00	0.93	0.75	0.75	1.86	6.22	27.20	38.04	21.66	1.14	0.00	0.00	0.00	0.00	0.00	0.00
FIS-175-2	0.30	0.69	0.75	0.88	1.24	2.58	4.39	49.31	38.52	1.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FIS-176	2.37	7.17	9.97	8.11	5.88	6.57	5.34	32.42	17.20	4.70	0.27	0.00	0.00	0.00	0.00	0.00	0.00
FIS-178	0.76	1.97	2.06	1.42	1.25	1.93	2.25	15.29	9.75	11.97	30.43	11.81	7.32	1.79	0.00	0.00	0.00
FIS-179	0.59	1.64	1.94	1.67	1.50	2.17	3.16	55.11	30.65	1.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FIS-180	0.22	0.46	0.38	0.27	0.18	0.17	0.18	1.65	11.87	42.02	30.90	5.52	5.38	0.80	0.00	0.00	0.00
FIS-181	0.24	0.62	0.67	0.48	0.40	0.49	0.46	6.28	20.85	33.43	27.41	3.09	3.63	1.95	0.00	0.00	0.00
FIS-182	0.05	0.14	0.10	0.07	0.04	0.04	0.08	2.87	48.40	30.12	12.94	4.45	0.70	0.00	0.00	0.00	0.00
FIS-183	0.04	0.14	0.11	0.08	0.07	0.08	0.09	1.33	5.34	17.17	22.67	4.76	4.91	6.98	10.54	25.69	0.00
FIS-184	0.38	0.89	0.83	0.46	0.41	0.89	2.52	13.47	53.23	23.16	2.40	0.00	0.17	1.19	0.00	0.00	0.00
FIS-185	0.41	0.92	0.88	0.57	0.38	0.70	2.17	14.07	22.57	32.43	20.10	2.19	1.85	0.76	0.00	0.00	0.00
FIS-186	0.49	0.98	0.75	0.41	0.21	0.20	0.19	2.32	29.58	45.45	14.56	0.83	1.71	2.32	0.00	0.00	0.00
FIS-187	2.48	5.40	4.67	3.14	2.79	5.50	11.10	9.29	14.10	13.77	4.27	0.04	1.99	4.76	16.70	0.00	0.00
FIS-188	0.28	0.78	0.74	0.52	0.51	1.09	2.92	16.76	13.76	35.10	21.88	0.70	1.63	1.86	1.47	0.00	0.00
FIS-189-2	1.02	2.46	2.59	2.03	1.97	4.07	8.57	57.74	18.93	0.62	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FIS-191	0.32	0.66	0.50	0.33	0.24	0.39	0.71	29.35	59.56	7.94	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FIS-192	0.14	0.27	0.23	0.14	0.16	0.25	0.49	4.28	31.70	37.84	15.90	3.25	5.35	0.00	0.00	0.00	0.00
FIS-193	0.15	0.32	0.23	0.16	0.11	0.13	0.18	3.45	52.30	42.53	0.40	0.00	0.04	0.00	0.00	0.00	0.00

SAMPLE NUMBER	CLAY					SILT					SAND					GRAVEL				
	11φ	10φ	9φ	8φ	7φ	6φ	5φ	4φ	3φ	2φ	1φ	0φ	-1φ	-2φ	-3φ	-4φ	-5φ			
FIS-194	0.21	0.68	1.22	0.76	0.46	0.61	0.46	9.56	30.44	25.42	2.37	0.00	0.70	1.27	12.82	13.02	0.00			
FIS-194-2	0.49	1.22	1.25	0.78	0.60	0.93	1.00	13.24	31.33	38.85	3.12	0.00	2.03	2.36	2.80	0.00	0.00			
FIS-195	0.86	0.98	0.34	0.43	0.55	0.68	0.90	5.35	23.53	32.84	6.87	0.83	1.68	2.74	2.84	18.58	0.00			
FIS-196	1.47	1.82	0.84	1.69	2.29	2.66	3.23	42.28	42.79	0.68	0.00	0.00	0.25	0.00	0.00	0.00	0.00			
FIS-198	0.42	0.45	0.19	0.23	0.25	0.31	0.40	26.39	61.98	8.40	0.98	0.00	0.00	0.00	0.00	0.00	0.00			
FIS-198-2	1.02	1.00	0.22	0.24	0.32	0.39	0.58	13.40	44.40	30.90	6.13	0.86	0.54	0.00	0.00	0.00	0.00			
FIS-199	0.61	0.75	0.30	0.46	0.67	1.57	4.19	26.17	25.28	20.49	14.90	1.87	0.91	1.83	0.00	0.00	0.00			
FIS-199-2	0.68	0.88	0.46	0.60	0.78	2.08	5.61	23.02	26.65	16.93	14.30	3.72	2.43	1.86	0.00	0.00	0.00			
FIS-200	1.24	1.51	0.49	0.67	0.87	1.42	2.96	24.46	46.85	18.12	1.18	0.00	0.23	0.00	0.00	0.00	0.00			
FIS-201	0.75	1.16	1.19	2.12	2.47	3.45	3.98	32.23	47.64	2.13	0.00	0.00	0.09	2.79	0.00	0.00	0.00			
FIS-201-2	0.96	1.12	0.50	0.99	1.38	1.98	1.75	4.73	8.95	20.06	11.07	2.51	6.86	13.78	23.36	0.00	0.00			
FIS-202	1.93	3.23	2.79	4.39	6.55	9.34	8.90	24.77	25.70	10.67	1.19	0.06	0.16	0.32	0.00	0.00	0.00			
FIS-203	0.18	0.32	0.11	0.24	0.32	0.50	0.88	8.95	27.35	32.66	13.01	0.91	7.61	6.96	0.00	0.00	0.00			
FIS-204	0.28	0.46	0.17	0.27	0.46	0.89	1.46	26.22	32.52	13.54	11.89	3.23	4.66	3.95	0.00	0.00	0.00			
FIS-205	3.25	4.23	0.98	0.64	0.92	1.63	5.02	47.23	23.82	8.98	2.06	0.33	0.20	0.71	0.00	0.00	0.00			
FIS-206	2.03	2.60	0.79	0.44	0.66	1.54	5.98	11.24	6.60	23.02	32.61	5.11	3.97	3.41	0.00	0.00	0.00			
FIS-207	0.42	0.98	1.00	1.00	0.94	2.52	7.69	54.43	23.59	6.23	1.20	0.00	0.00	0.00	0.00	0.00	0.00			
FIS-207-2	0.58	0.92	0.32	0.32	0.38	0.60	1.43	17.12	12.19	22.05	38.14	3.54	1.51	0.90	0.00	0.00	0.00			
FIS-208	0.51	0.72	0.37	0.64	0.69	1.22	1.99	18.99	15.19	19.13	18.17	2.98	5.35	9.66	4.39	0.00	0.00			
FIS-209	0.18	0.45	0.15	0.16	0.30	0.55	0.79	6.85	3.77	8.97	62.62	14.28	0.59	0.34	0.00	0.00	0.00			
FIS-210	0.62	0.80	0.21	0.26	0.38	0.52	0.65	6.05	26.86	35.68	12.42	0.65	2.98	4.16	7.76	0.00	0.00			
FIS-211	1.99	2.91	0.92	1.20	1.11	1.28	1.38	29.50	50.73	8.91	0.00	0.00	0.07	0.00	0.00	0.00	0.00			
FIS-212	1.65	1.72	0.42	0.34	0.79	1.07	1.31	20.03	39.21	32.53	0.93	0.00	0.00	0.00	0.00	0.00	0.00			
FIS-213	0.57	0.89	0.46	0.68	0.92	1.60	2.77	16.61	43.12	22.94	6.34	0.27	0.30	2.53	0.00	0.00	0.00			
FIS-214	3.39	5.05	3.18	4.51	5.99	8.03	7.74	48.83	12.58	0.56	0.00	0.00	0.14	0.00	0.00	0.00	0.00			
FIS-215	2.15	2.47	1.28	2.28	2.43	7.79	48.06	31.91	1.63	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
FIS-216	4.72	5.90	1.88	2.49	3.14	5.54	7.40	52.66	13.03	2.96	0.28	0.00	0.00	0.00	0.00	0.00	0.00			
FIS-217	1.52	1.79	1.11	1.73	3.05	7.84	25.67	24.12	24.86	7.21	0.17	0.00	0.30	0.63	0.00	0.00	0.00			
FIS-218	2.26	2.65	1.22	1.83	2.30	2.82	6.01	34.95	39.33	6.63	0.00	0.00	0.00	0.00	0.00	0.00	0.00			

APPENDIX C

This table contains the sample weight, percent gravel (>2.0 mm), percent sand (2.0 mm>x>0.062 mm), percent silt (0.063 mm>x>0.004 mm), percent clay (<0.004 mm), the verbal-equivalent sediment classification (Shepard, 1954), and the related method of moments statistics for each sample. Modes are given in the middle of whole phi intervals.

SAMPLE NUMBER	WEIGHT (GRAMS)	PERCENT GRAVEL	PERCENT SAND	PERCENT SILT	PERCENT CLAY	SEDIMENT CLASS	MEDIAN (ϕ)	MEAN (ϕ)	STANDARD DEVIATION	SKENNESS	KURTOSIS	MODE 1 (ϕ)	MODE 2 (ϕ)	MODE 3 (ϕ)
FIS-1	78.7262	0.00	99.21	0.48	0.31	SAND	1.96	2.12	1.00	0.76	8.28	1.5	0	0
FIS-2	52.4296	0.00	98.94	0.50	0.56	SAND	2.85	2.84	0.83	1.34	21.74	3.5	0	0
FIS-3	69.2542	0.00	99.63	0.22	0.15	SAND	2.25	2.23	0.61	1.48	29.13	2.5	0	0
FIS-4	577.2000	17.63	81.21	0.70	0.45	GRAVELLY SAND	1.21	0.73	2.17	-0.35	1.43	1.5	-3.5	0
FIS-5	96.2872	30.16	68.30	0.97	0.57	GRAVELLY SAND	1.33	0.46	2.77	-0.19	-0.54	1.5	-3.5	0
FIS-6	87.4267	14.81	84.94	0.18	0.06	GRAVELLY SAND	1.71	1.43	1.45	-0.39	0.59	1.5	-1.5	0
FIS-7	83.3572	0.00	99.41	0.48	0.12	SAND	1.99	2.13	0.77	0.87	10.18	1.5	0	0
FIS-8	68.6523	13.73	84.89	0.67	0.72	GRAVELLY SAND	0.84	0.85	1.81	0.21	3.54	0.5	0	0
FIS-9	818.2400	50.52	41.92	2.73	4.83	GRAVEL	-1.04	-0.30	3.17	0.77	2.47	-2.5	0.5	0
FIS-10	57.1230	14.76	84.72	0.21	0.31	GRAVELLY SAND	1.53	1.19	1.49	-0.33	4.27	1.5	-1.5	0
FIS-11	69.8835	0.00	99.23	0.50	0.27	SAND	0.80	1.05	0.93	1.75	21.42	0.5	0	0
FIS-13	960.2200	69.84	27.27	1.93	0.95	GRAVEL	-2.66	-2.09	2.49	0.84	4.37	-4.5	0.5	0
FIS-14	884.2400	64.19	34.53	0.61	0.67	GRAVEL	-2.23	-1.66	2.19	0.69	3.66	-3.5	0.5	0
FIS-15	911.4900	54.05	45.55	0.21	0.19	GRAVEL	-1.70	-1.67	2.35	0.18	-0.37	0.5	-4.5	0
FIS-16	732.9400	46.43	53.56	0.01	0.01	GRAVELLY SAND	-0.30	-0.29	2.39	-0.01	-1.58	1.5	-2.5	0
FIS-17	52.0992	0.00	99.45	0.28	0.27	SAND	2.08	2.11	0.76	1.44	24.18	2.5	0	0
FIS-18	53.9643	0.00	99.63	0.22	0.15	SAND	0.90	0.99	0.63	2.80	63.44	0.5	0	0
FIS-19	580.7700	41.09	56.55	1.21	1.15	GRAVELLY SAND	0.07	-0.41	2.51	0.32	1.42	0.5	-3.5	-1.5
FIS-20	674.0800	83.73	12.85	1.40	2.02	GRAVEL	-4.32	-3.09	3.18	1.12	4.29	-4.5	0	0
FIS-21	76.5191	100.00	0.00	0.00	0.00	GRAVEL	-5.13	-5.07	0.40	0.28	-4.07	-5.5	0	0
FIS-22	70.2509	0.20	99.47	0.16	0.17	SAND	0.83	0.93	0.63	3.10	79.01	0.5	0	0
FIS-23	382.5800	62.67	15.36	9.28	12.70	GRAVEL	-3.05	-0.66	5.10	0.47	-0.60	-5.5	-3.5	8.5
FIS-24	615.9800	42.38	52.08	2.42	3.12	GRAVELLY SAND	-0.30	-0.08	2.64	0.79	3.50	0.5	-1.5	0
FIS-25	630.0700	37.46	61.60	0.40	0.55	GRAVELLY SAND	-0.03	-0.24	2.11	0.22	1.48	0.5	-1.5	0
FIS-26	9.0552	34.81	64.31	0.36	0.52	GRAVELLY SAND	0.98	0.13	2.24	0.01	0.23	1.5	-3.5	0
FIS-27	67.3684	14.02	85.52	0.27	0.20	GRAVELLY SAND	0.06	0.05	1.29	0.49	6.57	0.5	-2.5	0
FIS-28	60.2672	0.16	99.38	0.15	0.31	SAND	2.49	2.49	0.72	1.26	29.32	2.5	0	0
FIS-29	68.1837	0.00	99.44	0.18	0.38	SAND	2.43	2.42	0.75	1.50	28.41	2.5	0	0

SAMPLE NUMBER	WEIGHT (GRAMS)	PERCENT GRAVEL	PERCENT SAND	PERCENT SILT	PERCENT CLAY	SEDIMENT CLASS	MEDIAN (ϕ)	MEAN (ϕ)	STANDARD DEVIATION	SKEWNESS	KURTOSIS	MODE 1 (ϕ)	MODE 2 (ϕ)	MODE 3 (ϕ)
FIS-29-2	56.5901	1.30	92.03	3.48	3.19	SAND	3.18	3.09	1.61	0.68	6.55	3.5	0	0
FIS-30	79.4049	0.92	98.59	0.24	0.25	SAND	1.91	1.88	1.11	0.28	5.17	2.5	0	0
FIS-31	470.3600	56.55	42.42	0.38	0.66	GRAVEL	-1.60	-1.22	2.50	0.35	0.85	-3.5	1.5	0
FIS-33	64.8334	0.26	99.34	0.08	0.32	SAND	0.93	1.02	0.79	2.28	43.60	0.5	0	0
FIS-35	583.8500	72.74	23.39	2.88	0.99	GRAVEL	-3.59	-2.25	3.12	0.66	1.25	-4.5	1.5	0
FIS-37	80.9313	21.50	76.76	0.25	1.49	GRAVELLY SAND	-0.02	0.03	1.64	1.38	14.38	0.5	0	0
FIS-38	714.6700	47.39	52.19	0.20	0.22	GRAVELLY SAND	-0.44	-0.68	2.61	-0.01	-0.99	1.5	-4.5	-2.5
FIS-39	154.2171	37.96	61.05	0.30	0.69	GRAVELLY SAND	1.37	0.03	3.10	-0.12	-1.01	2.5	-4.5	0
FIS-40	59.3944	0.00	84.52	13.15	2.33	SAND	3.48	3.67	1.16	1.60	12.21	3.5	0	0
FIS-41	67.5645	3.01	87.82	6.93	2.24	SAND	3.15	3.00	1.63	0.32	5.55	3.5	0	0
FIS-42	57.8905	0.00	72.71	24.76	2.53	SILTY SAND	3.60	3.81	1.20	1.39	10.78	3.5	0	0
FIS-42-2	66.0699	3.03	87.97	6.95	2.05	SAND	2.50	2.61	1.64	0.51	6.67	2.5	0	0
FIS-42-3	54.8559	34.72	54.09	9.00	2.18	GRAVELLY SAND	0.01	0.37	2.67	0.58	1.44	0.5	-2.5	0
FIS-43	50.6359	0.00	87.96	8.93	3.11	SAND	3.36	3.52	1.30	1.54	11.31	3.5	0	0
FIS-44	65.5366	5.19	92.98	1.23	0.60	SAND	2.58	2.40	1.54	-0.69	7.89	2.5	0	0
FIS-45	488.0900	47.62	45.42	2.67	4.30	GRAVEL	-0.72	-0.48	3.13	0.67	2.35	0.5	-1.5	-4.5
FIS-46	729.5300	40.66	56.68	1.27	1.39	GRAVELLY SAND	-0.26	-0.25	2.13	0.73	4.51	0.5	-2.5	0
FIS-47	623.5500	41.98	54.31	1.06	2.65	GRAVELLY SAND	1.05	-0.43	3.46	0.12	-0.01	1.5	-5.5	-1.5
FIS-48	442.2600	45.49	52.52	1.12	0.88	GRAVELLY SAND	0.28	-0.12	2.52	0.25	0.10	-2.5	1.5	0
FIS-49	639.3500	37.85	58.13	1.14	2.87	GRAVELLY SAND	1.06	0.26	2.82	0.35	1.54	1.5	-2.5	0
FIS-50	433.6100	20.48	68.91	3.81	6.79	GRAVELLY SAND	1.79	1.49	3.32	0.15	0.65	2.5	-4.5	0
FIS-51	534.0400	34.01	62.67	1.58	1.74	GRAVELLY SAND	0.11	-0.18	2.29	0.61	4.32	0.5	-1.5	0
FIS-52	74.3716	0.00	98.69	0.60	0.71	SAND	2.85	2.95	0.76	2.45	38.99	2.5	0	0
FIS-53	52.9119	0.00	76.91	14.05	9.04	MUDDY SAND	3.53	4.13	1.92	0.96	2.65	3.5	0	0
FIS-54	58.7262	0.00	86.27	10.13	3.60	SAND	3.47	3.69	1.34	1.48	10.03	3.5	0	0
FIS-55	64.6500	0.46	93.54	4.04	1.96	SAND	3.35	3.35	1.18	1.12	15.10	3.5	0	0
FIS-56	76.8103	0.00	98.08	1.09	0.84	SAND	2.97	3.06	0.78	2.61	38.54	2.5	0	0
FIS-57	69.6579	0.22	98.96	0.27	0.55	SAND	2.54	2.60	0.65	3.21	72.59	2.5	0	0
FIS-58	835.2700	41.78	52.82	2.69	2.71	GRAVELLY SAND	-0.27	-0.51	2.82	0.60	2.53	0.5	-3.5	0
FIS-59	33.7590	0.00	41.48	31.15	27.37	SAND-SILT-CLAY	5.34	5.71	2.60	0.12	-1.42	3.5	8.5	5.5
FIS-60	54.1606	3.73	93.71	0.93	1.62	SAND	1.16	1.29	1.50	1.32	13.62	1.5	0	0
FIS-62	576.1400	35.29	59.47	2.84	2.40	GRAVELLY SAND	0.84	0.19	3.06	0.19	0.31	1.5	-3.5	0

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FIS-62-2	595.0900	38.59	60.20	0.40	0.80	GRAVELLY SAND	1.31	0.05	2.87	-0.09	-0.58	2.5	-4.5	-2.5
FIS-63	131.4342	58.66	37.53	2.04	1.78	GRAVEL	-1.82	-0.85	2.80	0.60	1.68	-2.5	0.5	0
FIS-64	112.4664	27.25	70.88	0.60	1.27	GRAVELLY SAND	1.28	0.55	2.39	-0.02	1.66	1.5	-2.5	-4.5
FIS-65	59.2283	0.08	98.56	0.75	0.62	SAND	2.65	2.74	0.78	2.16	35.30	2.5	0	0
FIS-66	481.0100	77.87	16.27	3.75	2.10	GRAVEL	-3.17	-2.15	2.89	1.11	5.18	-3.5	0.5	0
FIS-67	59.8756	0.00	95.93	2.99	1.08	SAND	3.20	3.18	0.94	1.73	21.30	3.5	0	0
FIS-68	64.2595	1.82	84.00	12.90	1.29	SAND	3.27	3.15	1.40	0.24	5.84	3.5	0	0
FIS-68-2	62.2714	4.82	83.26	10.27	1.65	SAND	3.25	3.00	1.79	-0.33	5.38	3.5	0	0
FIS-69	54.0766	0.00	98.18	1.17	0.66	SAND	2.58	2.68	0.77	2.57	39.55	2.5	0	0
FIS-70	582.1400	47.76	49.86	1.47	0.91	GRAVELLY SAND	-0.77	-0.74	2.33	0.47	2.20	0.5	-3.5	0
FIS-71	633.1500	43.68	48.33	4.67	3.33	GRAVELLY SAND	0.45	0.07	3.43	0.28	-0.09	1.5	-3.5	0
FIS-72	457.6600	52.13	44.88	1.60	1.39	GRAVEL	-1.69	-1.35	3.94	0.14	-1.16	-5.5	2.5	0
FIS-73	66.8357	0.16	95.72	2.54	1.58	SAND	2.56	2.73	1.07	2.28	25.83	2.5	0	0
FIS-74	80.3537	11.86	85.74	1.14	1.26	GRAVELLY SAND	1.76	1.51	1.85	0.01	4.54	1.5	-1.5	0
FIS-75	448.5500	32.44	64.34	2.03	1.20	GRAVELLY SAND	1.52	0.27	3.10	-0.13	-0.51	1.5	-4.5	0
FIS-76	39.8003	2.67	72.22	13.01	12.10	MUDDY SAND	2.11	3.16	2.90	0.52	-0.03	1.5	8.5	0
FIS-77	91.6068	34.81	62.02	1.59	1.57	GRAVELLY SAND	0.61	0.25	2.43	0.35	1.67	1.5	-2.5	0
FIS-78	75.3010	0.36	98.83	0.30	0.50	SAND	1.67	1.71	0.93	1.54	26.34	1.5	0	0
FIS-79	65.1219	0.00	94.49	3.21	2.30	SAND	3.32	3.41	1.08	2.12	20.82	3.5	0	0
FIS-80	68.4201	9.45	76.59	10.12	3.84	SAND	3.12	2.77	2.31	0.07	1.78	3.5	0	0
FIS-81	52.6051	0.00	86.81	9.31	3.88	SAND	3.43	3.65	1.37	1.48	9.72	3.5	0	0
FIS-82	64.0482	0.00	96.66	1.82	1.51	SAND	2.67	2.85	1.02	2.23	25.26	2.5	0	0
FIS-83	471.9200	40.63	58.32	0.55	0.50	GRAVELLY SAND	0.23	-0.19	2.03	0.20	1.34	1.5	-2.5	0
FIS-84	415.0400	13.98	84.83	0.84	0.35	GRAVELLY SAND	1.29	0.88	1.86	-0.51	3.41	1.5	0	0
FIS-85	62.7202	4.38	94.74	0.27	0.62	SAND	1.01	1.04	1.15	1.28	19.46	0.5	0	0
FIS-86	221.9400	0.45	96.24	2.17	1.14	SAND	1.91	2.07	1.24	1.40	13.42	1.5	0	0
FIS-87	63.3883	0.00	98.65	0.53	0.82	SAND	2.48	2.54	0.79	2.97	49.21	2.5	0	0
FIS-87-2	45.1731	0.00	31.88	56.34	11.78	SANDY SILT	4.59	5.08	1.91	0.49	0.28	4.5	8.5	0
FIS-88	58.1100	0.00	74.51	16.95	8.54	MUDDY SAND	3.61	4.21	1.80	1.02	3.11	3.5	0	0
FIS-89	64.0251	0.00	98.12	0.82	1.06	SAND	2.43	2.50	0.93	2.47	33.89	2.5	0	0
FIS-90	73.7564	29.30	66.24	2.14	2.32	GRAVELLY SAND	0.48	0.51	2.42	0.56	2.60	0.5	-2.5	0
FIS-91	77.0928	22.76	76.63	0.17	0.45	GRAVELLY SAND	-0.17	-0.17	1.28	0.99	14.09	-0.5	0	0

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FIS-92	72.1907	0.40	97.02	1.47	1.11	SAND	1.90	2.05	1.21	1.40	15.81	1.5	0	0
FIS-93	87.6303	23.19	71.91	2.48	2.42	GRAVELLY SAND	0.44	0.51	2.22	0.83	5.17	0.5	0	0
FIS-94	46.9200	0.00	91.76	4.75	3.49	SAND	3.08	3.18	1.49	1.25	8.38	3.5	0	0
FIS-95	62.3385	1.17	82.93	10.93	4.97	SAND	3.24	3.31	1.90	0.64	3.78	3.5	0	0
FIS-95-2	53.8642	22.70	53.63	21.76	1.91	GRAVELLY SAND	2.32	2.00	2.70	0.00	-0.26	2.5	4.5	-1.5
FIS-96	51.6223	4.09	67.04	19.90	8.97	SILTY SAND	3.61	3.99	2.41	-0.08	3.18	3.5	0	0
FIS-97	59.7779	0.00	87.05	7.78	5.17	SAND	3.42	3.71	1.50	1.44	8.23	3.5	0	0
FIS-98	60.9879	0.00	99.84	0.08	0.08	SAND	1.48	1.50	0.61	1.23	25.78	1.5	0	0
FIS-99	56.3732	11.87	79.95	3.79	4.40	GRAVELLY SAND	1.65	1.72	2.53	0.47	2.05	2.5	-2.5	0
FIS-100	72.6070	0.00	98.11	0.58	1.31	SAND	2.11	2.20	1.05	2.33	29.27	2.5	0	0
FIS-101	54.5900	6.46	81.73	6.41	5.40	SAND	2.51	2.63	2.44	0.16	3.21	2.5	-3.5	0
FIS-102	60.7410	0.00	80.09	10.24	9.67	SAND	3.44	4.01	1.96	1.03	3.05	3.5	0	0
FIS-103	59.5688	0.32	80.57	8.68	10.43	SAND	3.43	3.95	2.08	0.85	2.61	3.5	0	0
FIS-104	67.5275	0.00	95.64	2.65	1.72	SAND	2.74	2.93	1.07	2.09	22.13	2.5	0	0
FIS-105	97.8769	1.04	97.74	0.58	0.65	SAND	1.43	1.47	1.12	1.23	16.66	1.5	0	0
FIS-106	72.3797	13.24	81.43	2.48	2.85	GRAVELLY SAND	2.00	1.79	2.27	0.16	2.96	2.5	-2.5	0
FIS-107	80.9119	14.43	79.59	4.19	1.79	GRAVELLY SAND	2.26	1.82	2.37	-0.19	1.87	2.5	-3.5	0
FIS-107-2	57.7251	31.51	51.38	7.18	9.92	GRAVELLY SAND	1.65	1.42	3.97	0.18	-0.47	3.5	1.5	-4.5
FIS-108	72.8393	24.26	73.56	1.03	1.16	GRAVELLY SAND	0.34	0.19	1.94	0.58	5.31	0.5	0	0
FIS-109	58.1369	0.10	76.72	17.54	5.64	SAND	3.57	4.01	1.59	1.12	4.88	3.5	0	0
FIS-110	58.7466	0.00	72.81	21.78	5.41	SILTY SAND	3.61	3.99	1.57	1.11	5.30	3.5	0	0
FIS-111	62.4796	0.00	96.43	1.88	1.69	SAND	2.77	2.97	1.02	2.36	26.77	2.5	0	0
FIS-112	53.1478	0.00	86.75	5.36	7.89	SAND	3.33	3.75	1.82	1.25	5.24	3.5	0	0
FIS-114	66.3208	0.00	96.60	1.88	1.51	SAND	2.00	2.12	1.37	1.21	11.27	1.5	0	0
FIS-115	63.5161	0.00	92.78	3.41	3.80	SAND	2.58	2.87	1.55	1.48	9.78	2.5	0	0
FIS-116	55.7568	0.00	96.76	1.59	1.65	SAND	2.70	2.90	1.01	2.51	29.46	2.5	0	0
FIS-117	49.1951	0.00	70.44	18.12	11.44	SILTY SAND	3.65	4.39	2.03	0.89	1.91	3.5	9.5	0
FIS-118	62.1078	0.00	98.10	1.18	0.73	SAND	2.76	2.91	0.74	2.81	42.10	2.5	0	0
FIS-120	64.1252	7.11	88.93	1.73	2.24	SAND	2.01	1.87	1.94	0.31	4.94	2.5	0	0
FIS-121	65.2680	7.46	90.29	1.15	1.10	SAND	1.65	1.52	1.66	0.25	5.89	1.5	0	0
FIS-122	58.7171	22.33	62.98	9.25	5.44	GRAVELLY SAND	2.32	1.88	3.19	0.07	0.10	3.5	1.5	-3.5
FIS-123	79.8492	1.50	93.55	3.45	1.50	SAND	1.58	1.77	1.57	0.96	7.44	1.5	0	0

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FIS-123-2	76.0278	0.00	31.69	35.36	32.95	SAND SILT CLAY	5.30	6.07	2.64	0.12	-1.40	3.5	9.5	0
FIS-124	69.1942	6.00	88.89	3.30	1.81	SAND	2.06	2.01	1.84	0.37	4.04	2.5	0	0
FIS-125	72.9115	0.48	92.90	4.49	2.13	SAND	2.44	2.54	1.51	0.96	7.96	2.5	0	0
FIS-127	82.5928	31.89	63.62	2.24	2.24	GRAVELLY SAND	0.47	0.19	2.66	0.40	1.64	0.5	-3.5	0
FIS-128	462.1100	33.64	63.71	1.14	1.51	GRAVELLY SAND	1.64	0.12	3.39	-0.12	-0.84	2.5	-4.5	0
FIS-130	84.8170	3.02	93.55	2.30	1.13	SAND	1.94	1.92	1.56	0.18	6.16	1.5	0	0
FIS-131	53.2700	0.00	82.04	11.96	6.00	SAND	2.97	3.39	1.91	0.82	2.47	2.5	0	0
FIS-132	84.5882	0.47	97.48	1.04	1.01	SAND	1.48	1.56	1.18	1.52	16.94	1.5	0	0
FIS-133	80.1048	41.95	53.28	4.47	0.30	GRAVELLY SAND	-0.27	-0.75	2.78	0.10	-0.53	-4.5	0.5	0
FIS-134	81.2699	7.56	83.82	5.53	3.09	SAND	1.88	1.96	2.17	0.39	2.69	1.5	0	0
FIS-135	44.3006	0.46	88.49	7.41	3.64	SAND	2.65	2.96	1.64	1.00	5.62	2.5	0	0
FIS-136	79.6967	24.95	72.79	1.68	0.58	GRAVELLY SAND	0.63	0.37	2.02	0.09	1.24	0.5	-2.5	0
FIS-137	68.7596	1.69	92.36	4.73	1.22	SAND	1.84	2.00	1.48	0.74	5.95	1.5	0	0
FIS-137-2	721.5200	52.74	45.20	1.50	0.56	GRAVEL	-2.16	-1.28	3.06	0.19	-0.93	-4.5	1.5	0
FIS-138	47.0513	0.00	82.12	13.69	4.20	SAND	3.36	3.62	1.48	1.14	5.59	3.5	0	0
FIS-139	55.2131	1.07	96.72	1.38	0.83	SAND	2.67	2.73	1.01	0.59	21.14	2.5	0	0
FIS-140	67.4865	34.82	57.12	4.49	3.57	GRAVELLY SAND	1.94	0.81	3.45	0.05	-0.41	2.5	-3.5	0
FIS-140-2	56.9733	0.00	97.70	0.91	1.38	SAND	1.86	2.07	1.11	2.29	27.05	1.5	0	0
FIS-142	639.2900	64.21	30.45	2.70	2.63	GRAVEL	-2.83	-1.49	3.33	0.64	1.28	-4.5	0.5	0
FIS-143	38.4447	0.00	54.14	29.97	15.89	SILTY SAND	3.88	4.94	2.32	0.39	-0.75	3.5	5.5	8.5
FIS-144	50.0622	0.00	87.34	9.05	3.61	SAND	3.28	3.51	1.39	1.50	9.80	3.5	0	0
FIS-145	42.5654	0.00	74.59	21.37	4.05	SILTY SAND	3.61	3.92	1.35	1.43	9.00	3.5	0	0
FIS-146	72.2506	3.53	93.98	1.43	1.06	SAND	2.23	2.06	1.51	0.34	5.70	2.5	0	0
FIS-148	698.1300	58.79	36.75	2.58	1.87	GRAVEL	-2.38	-1.11	3.26	0.46	0.34	-4.5	1.5	0
FIS-149	89.3244	15.45	80.53	2.85	1.17	GRAVELLY SAND	1.15	1.00	2.17	0.11	2.01	0.5	-3.5	0
FIS-151	80.2975	10.19	88.92	0.56	0.33	GRAVELLY SAND	1.25	1.02	1.37	0.04	5.49	1.5	0	0
FIS-152	56.8728	0.00	99.04	0.49	0.47	SAND	2.37	2.38	0.75	2.15	37.86	2.5	0	0
FIS-153	80.0266	28.10	69.95	1.22	0.73	GRAVELLY SAND	0.95	0.39	2.33	0.03	0.47	1.5	-3.5	0
FIS-154	66.4078	23.51	74.93	0.60	0.96	GRAVELLY SAND	0.66	0.46	1.93	0.33	3.56	1.5	-1.5	0
FIS-155	57.6545	0.00	97.57	1.24	1.20	SAND	2.68	2.81	0.96	2.04	25.74	2.5	0	0
FIS-156	280.2600	88.47	10.68	0.58	0.28	GRAVEL	-4.41	-3.63	2.28	1.37	6.64	-4.5	0	0
FIS-157	396.5700	72.32	25.16	1.58	0.95	GRAVEL	-2.75	-1.91	2.74	0.70	1.96	-4.5	0.5	0

SAMPLE NUMBER	WEIGHT (GRAMS)	PERCENT GRAVEL	PERCENT SAND	PERCENT SILT	PERCENT CLAY	SEDIMENT CLASS	MEDIAN (ϕ)	MEAN (ϕ)	STANDARD DEVIATION	SKEWNESS	KURTOSIS	MODE 1 (ϕ)	MODE 2 (ϕ)	MODE 3 (ϕ)
FIS-158	360.0800	45.34	51.42	1.83	1.41	GRAVELLY SAND	-0.33	-0.74	2.83	0.33	0.87	0.5	-4.5	0
FIS-160	60.5109	0.00	97.50	1.58	0.93	SAND	1.55	1.72	1.03	2.40	29.72	1.5	0	0
FIS-162	64.7083	5.41	88.22	4.43	1.94	SAND	2.17	2.10	1.81	0.37	4.83	2.5	0	0
FIS-163	37.0850	0.05	34.82	45.80	19.33	SANDY SILT	5.18	5.51	2.29	0.16	-1.02	3.5	5.5	8.5
FIS-164	31.8802	0.00	68.55	21.90	9.54	SILTY SAND	3.54	4.26	2.08	0.63	0.58	3.5	5.5	0
FIS-165	546.9500	29.01	68.43	1.78	0.78	GRAVELLY SAND	0.69	0.23	2.46	-0.02	0.79	1.5	-1.5	-4.5
FIS-166	282.7700	16.08	78.83	3.16	1.93	GRAVELLY SAND	1.72	1.27	2.62	-0.19	1.52	1.5	-4.5	0
FIS-168	54.7137	3.01	87.23	7.15	2.61	SAND	2.70	2.70	1.76	0.46	4.59	3.5	0	0
FIS-169	62.7418	0.65	79.71	15.79	3.85	SAND	3.43	3.69	1.51	0.88	6.89	3.5	0	0
FIS-169-2	55.9351	0.00	62.26	28.58	9.16	SILTY SAND	3.77	4.38	1.88	0.78	2.07	3.5	0	0
FIS-170	62.0109	0.67	85.71	8.31	5.31	SAND	2.97	3.23	1.88	0.89	4.36	3.5	0	0
FIS-171	306.3600	17.57	73.25	5.65	3.53	GRAVELLY SAND	2.12	1.62	2.97	-0.14	0.93	2.5	-4.5	0
FIS-172	35.5003	0.00	46.91	34.69	18.40	SILTY SAND	4.18	4.98	2.38	0.39	-0.58	3.5	8.5	0
FIS-174	38.7816	1.34	43.67	34.53	20.45	SAND SILT CLAY	4.60	5.11	2.73	0.03	-0.72	3.5	1.5	5.5
FIS-175	49.0604	0.00	88.04	9.57	2.38	SAND	2.72	2.94	1.45	1.18	7.97	2.5	0	0
FIS-175-2	52.4362	0.00	89.17	9.09	1.74	SAND	3.21	3.36	1.15	1.56	12.60	3.5	0	0
FIS-176	31.1317	0.00	54.59	25.89	19.51	SILTY SAND	3.86	5.01	2.53	0.31	-0.99	3.5	8.5	5.5
FIS-178	75.9907	9.11	79.25	6.85	4.79	SAND	0.96	1.73	2.55	0.65	1.78	0.5	3.5	0
FIS-179	63.3897	0.00	87.33	8.50	4.17	SAND	3.32	3.59	1.47	1.36	7.64	3.5	0	0
FIS-180	71.9671	6.18	91.96	0.80	1.06	SAND	1.18	1.16	1.40	1.07	12.75	1.5	0	0
FIS-181	75.4116	5.58	91.07	1.83	1.53	SAND	1.42	1.51	1.65	0.79	7.21	1.5	0	0
FIS-182	73.2489	0.70	98.77	0.23	0.29	SAND	2.04	1.84	1.00	0.29	10.03	2.5	0	0
FIS-183	662.9300	48.12	51.28	0.32	0.29	GRAVELLY SAND	-0.60	-1.20	2.61	0.07	-0.80	-4.5	0.5	0
FIS-184	62.5538	1.36	92.26	4.28	2.10	SAND	2.43	2.55	1.43	1.01	11.21	2.5	0	0
FIS-185	71.0905	2.61	91.36	3.82	2.21	SAND	1.77	1.99	1.73	0.84	6.13	1.5	0	0
FIS-186	46.0982	4.03	92.74	1.01	2.22	SAND	1.67	1.76	1.61	1.05	11.15	1.5	0	0
FIS-187	34.3097	23.45	41.47	22.54	12.55	GRAVEL	2.60	2.56	3.99	0.02	-0.76	-3.5	2.5	4.5
FIS-188	86.2172	4.96	88.20	5.04	1.80	SAND	1.64	1.87	1.87	0.42	4.29	1.5	3.5	0
FIS-189-2	53.0567	0.00	77.29	16.64	6.07	SAND	3.53	3.95	1.65	1.14	4.78	3.5	0	0
FIS-191	56.9528	0.00	96.85	1.67	1.48	SAND	2.71	2.87	1.02	2.16	24.97	2.5	0	0
FIS-192	69.6754	5.35	92.97	1.04	0.64	SAND	1.67	1.61	1.32	0.48	8.15	1.5	-1.5	0
FIS-193	62.4449	0.04	98.68	0.57	0.70	SAND	2.13	2.17	0.84	2.60	41.84	2.5	0	0

SAMPLE NUMBER	WEIGHT (GRAMS)	PERCENT GRAVEL	PERCENT SAND	PERCENT SILT	PERCENT CLAY	SEDIMENT CLASS	MEDIAN (ϕ)	MEAN (ϕ)	STANDARD DEVIATION	SKENNESS	KURTOSIS	MODE 1 (ϕ)	MODE 2 (ϕ)	MODE 3 (ϕ)
FIS-194	489.2500	27.81	67.79	2.29	2.11	GRAVELLY SAND	1.78	0.74	3.15	-0.14	-0.24	2.5	-4.5	0
FIS-194-2	61.0782	7.19	86.54	3.31	2.96	SAND	2.03	2.12	2.03	0.30	4.78	1.5	0	0
FIS-195	275.1200	25.84	69.42	2.55	2.18	GRAVELLY SAND	1.50	0.63	3.11	-0.07	0.41	1.5	-4.5	0
FIS-196	52.2800	0.25	85.75	9.88	4.13	SAND	3.15	3.52	1.62	1.29	7.17	2.5	0	0
FIS-198	51.1800	0.00	97.75	1.18	1.06	SAND	2.66	2.78	0.96	2.19	29.70	2.5	0	0
FIS-198-2	56.1644	0.54	95.69	1.53	2.24	SAND	2.26	2.37	1.46	1.50	14.11	2.5	0	0
FIS-199	81.8769	2.74	88.70	6.89	1.66	SAND	2.40	2.37	1.77	0.43	4.35	3.5	0	0
FIS-199-2	83.7052	4.29	84.62	9.07	2.02	SAND	2.40	2.35	1.94	0.37	3.15	2.5	0	0
FIS-200	75.3028	0.23	90.61	5.92	3.24	SAND	2.65	2.94	1.58	1.39	9.69	2.5	0	0
FIS-201	56.1263	2.88	82.00	12.02	3.10	SAND	2.94	3.26	1.81	0.39	5.20	2.5	0	0
FIS-201-2	106.3400	44.00	47.32	6.10	2.58	GRAVEL	0.32	0.07	3.15	0.42	0.60	-3.5	1.5	0
FIS-202	59.1209	0.48	62.40	29.18	7.95	SILTY SAND	3.48	4.08	2.26	0.47	0.60	2.5	5.5	0
FIS-203	75.4567	14.57	82.89	1.94	0.61	GRAVELLY SAND	1.66	1.42	1.80	-0.01	2.61	1.5	-1.5	0
FIS-204	56.6493	8.61	87.40	3.08	0.91	SAND	2.39	2.06	1.83	-0.05	2.58	2.5	0	0
FIS-205	44.5850	0.91	82.43	8.21	8.46	SAND	3.29	3.62	2.17	0.84	3.56	3.5	0	0
FIS-206	65.4757	7.38	78.58	8.62	5.42	SAND	1.21	1.85	2.56	0.75	2.80	0.5	3.5	0
FIS-207	46.8216	0.00	85.45	12.15	2.40	SAND	3.35	3.44	1.32	1.15	8.74	3.5	0	0
FIS-207-2	75.1194	2.41	93.03	2.74	1.82	SAND	1.27	1.68	1.77	0.90	6.15	0.5	3.5	0
FIS-208	72.3655	19.40	74.45	4.55	1.60	GRAVELLY SAND	1.49	1.33	2.46	0.11	1.02	1.5	3.5	-2.5
FIS-209	74.6935	0.93	96.49	1.80	0.78	SAND	0.56	0.86	1.39	1.48	12.99	0.5	3.5	0
FIS-210	67.2791	14.90	81.66	1.82	1.63	GRAVELLY SAND	1.62	1.32	2.21	0.05	3.18	1.5	-3.5	0
FIS-211	47.3949	0.07	89.15	4.96	5.82	SAND	2.81	3.29	1.83	1.32	6.62	2.5	0	0
FIS-212	59.1296	0.00	92.70	3.52	3.79	SAND	2.42	2.74	1.68	1.50	9.98	2.5	0	0
FIS-213	63.8332	2.83	89.28	5.97	1.92	SAND	2.41	2.47	1.68	0.56	6.68	2.5	0	0
FIS-214	50.8341	0.14	61.96	26.27	11.62	SILTY SAND	3.75	4.65	2.17	0.65	0.70	3.5	5.5	9.5
FIS-215	51.4073	0.00	81.60	12.50	0.00	SAND	3.34	3.79	1.80	1.14	4.74	3.5	0	0
FIS-216	46.8327	0.00	68.93	18.57	12.50	SILTY SAND	3.64	4.46	2.27	0.76	1.20	3.5	9.5	0
FIS-217	55.8657	0.93	56.36	38.29	4.42	SILTY SAND	3.70	3.89	1.84	0.52	3.16	4.5	2.5	0
FIS-218	47.5492	0.00	80.91	12.96	6.13	SAND	3.12	3.61	1.90	1.09	4.40	2.5	0	0