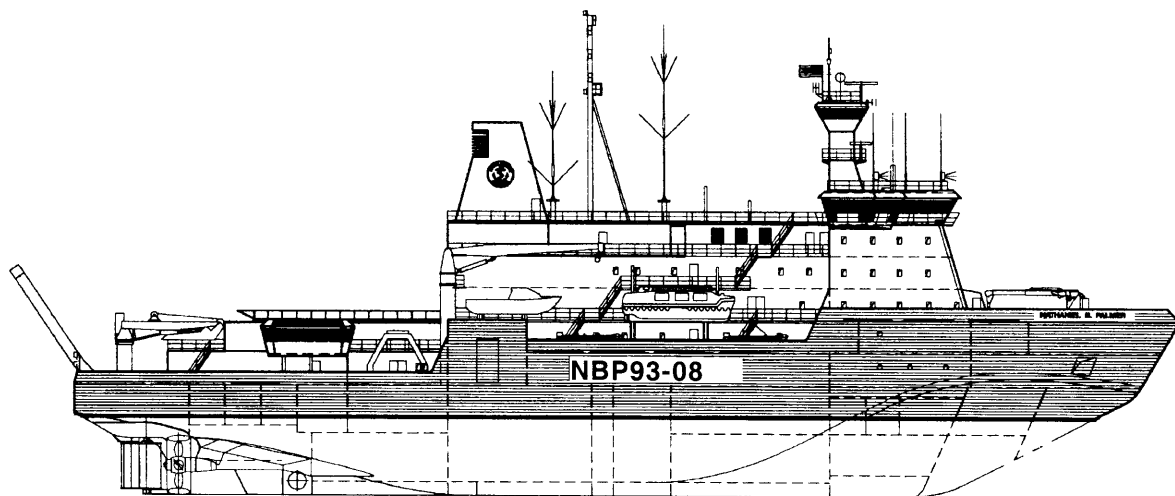


SEDIMENT DESCRIPTIONS
for
R/V *NATHANIEL B. PALMER*
CRUISE 8, 1993



Antarctic Marine Geology Research Facility Contribution No. 3

FLORIDA STATE UNIVERSITY
Tallahassee, Florida

SEDIMENT DESCRIPTIONS
for
R/V NATHANIEL B. PALMER
Cruise 8, 1993

DESCRIPTIONS OF SEDIMENT RECOVERED
BY THE R/V *NATHANIEL B. PALMER*,
UNITED STATES ANTARCTIC PROGRAM
CRUISE 8, 1993

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Antarctic Marine Geology Research Facility
Contribution No. 3
October, 1995

(Formerly known as--The Sedimentological Research Laboratory Contribution Series)

Funding for the Antarctic Marine Geology Research Facility and publication of this volume is provided by the National Science Foundation (OPP-9322647)

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INTRODUCTION

This volume contains the descriptions of sediments recovered by the R/V *Nathaniel B. Palmer* during cruise 8 in 1993 to the eastern and central Ross Sea area (herein referred to as NBP93-8). During December 1993 and January 1994 the R/V *Nathaniel B. Palmer* occupied eighteen coring stations (Table 1 and Figure 1) and collected several thousand kilometers of single- and multi-channel seismic data. A total of 14 piston cores, 10 trigger cores and 2 gravity cores were retrieved during the cruise.

The sediments are curated at the Antarctic Marine Geology Research Facility, Florida State University, Tallahassee, Florida. This facility contains an extensive collection of Antarctic and subantarctic sediments retrieved by coring, dredging, trawling, and grab sampling from a number of research cruises and vessels, and other research initiatives, including: forty-seven cruises of the USNS *Eltanin* (Goodell, 1964, 1965, 1968; Frakes, 1971, 1973; Cassidy et al., 1977a), five cruises of the ARA *Islas Orcadas* (Cassidy et al., 1977b; Kaharoeddin, 1978; Kaharoeddin et al., 1979, 1980, 1982), more than 13 cruises of the USCGC *Glacier* (Goodell et al., 1961; Anderson et al., 1981; Kellogg et al., 1981; Kaharoeddin et al., 1983, 1984, 1988; Bryan, 1992a; 1992b; 1993), nine cruises of the R/V *Polar Duke* (Domack, 1992; Stravers et al., 1993; Bryan and Pospichal, 1993; Hovan and Janecek, 1994a, b, c, and d; Janecek, 1995a), five cruises of the R/V *Nathaniel B. Palmer* (Janecek, 1995b; and unpublished data), the Dry Valley Drilling Project (DVDP) (Dry Valley Drilling Project, 1974, 1975, 1976; McGinnis, 1979; Torii, 1981), the Ross Ice Shelf Project (RISP) (Clough and Hansen, 1979; Webb, 1978, 1979), the Eastern Taylor Valley Project (ETV) (Elston et al., 1981, 1983; Robinson, 1983, 1985; Robinson and Jaegers, 1984; Robinson et al., 1984), the Cenozoic Investigations in the Western Ross Sea Project (CIROS-1, CIROS-2) (Barrett, 1982, 1985, 1987; Barrett et al., 1985; Pyne et al., 1985; Robinson et al., 1987), and collections from miscellaneous vessels operating in the Southern Ocean (*Anton Brun, Robert Conrad, Hero, and Vema*).

This volume includes a summary of the scientific objectives and preliminary results of cruise NBP93-8, a table and map of station locations, a discussion of core recovery and processing, an explanation of laboratory descriptive procedures, lithologic and smear-slide descriptions of piston, trigger, and gravity cores, and several appendices containing information on how to obtain samples from cores stored at the Antarctic Research Facility.

R/V NATHANIEL B. PALMER, CRUISE 8, 1993

The objectives and preliminary results of R/V *Nathaniel B. Palmer* cruise 8, 1993 (NBP93-8) have been summarized by Bartek (1994). A brief outline of that summary is presented here.

High-resolution seismic stratigraphic units have been identified and traced in seismic profiles over extensive portions of the Ross Sea continental margin (Bartek et al., 1991; Alonso et al., 1992; Anderson and Bartek, 1992). These units appear to be bound by glacial-erosional unconformities and contain a variety of seismic facies. Correlation of the seismic stratigraphic units to the sparse Ross Sea drill core data base suggests that the strata of the Ross Sea continental margin contain a record of Cenozoic ice sheet waxing and waning events that correspond to major climatic and eustatic events (Bartek et al., 1991; Anderson and Bartek, 1992). What has been lacking up to this point are data that will facilitate a more accurate determination (higher resolution) of the intervals when the units were deposited and when the unconformities were produced. Acquisition of these data will facilitate correlation of the Ross Sea record of ice-volume fluctuation to global records of climate and eustatic change. The Ross Sea has been, and currently is, a recipient of a significant proportion of antarctic ice-sheet drainage, so the stratigraphic record from the Ross Sea continental margin can serve as a proximal "barometer" of antarctic ice-volume fluctuation.

The goal of this project was to spot core the seismic stratigraphic units that are exposed at the sea floor of the Ross Sea continental margin, so that the age, lithology, and paleoenvironmental significance of these units can be determined. Existing high-resolution seismic data (as well as seismic data acquired as part of this investigation) were utilized to locate areas where individual seismic stratigraphic units and facies outcrop at the sea floor. To further delineate regions of thin overburden, 3.5 kHz acoustic surveys were conducted over areas where the units appear to lie near the surface. Piston cores were collected from the areas targeted with the acoustic surveys. Correlation of the paleontologic and sedimentologic ground control to the seismic units will facilitate extension of age information to stratigraphic units identified and traced in seismic profiles over extensive portions of the Ross Sea continental margin.

During cruise NBP93-08, sediment cores and high- and intermediate-resolution seismic data were collected in the Ross Sea to facilitate correlation of this Ross Sea record of ice-volume fluctuation to global records of climate and eustatic change. The

seismic and subbottom profiler survey covered an extensive area in the central and eastern Ross Sea (Figure 1). During this survey, 1376 km of 210-in³ generator injector (GI) gun multi-channel data, 3018 km of 210-in³ GI single-channel data, 1229 km of 50-in³ GI single-channel data, 1304 km of 15-in³ water gun single-channel and 2378 km of 3.5 kHz profile data were collected. A total of 26 gravity, piston, and trigger cores were recovered (Table 1).

Table 1. NBP93-8 coring statistics

Station ID	Core Type	Latitude (°S)	Longitude (°W)	Depth (m)	Length (cm)	TC length (cm)	Bag sample
NBP93-08-1	Piston	77° 21.91'	174° 38.06'	607	146	43	Yes
NBP93-08-3	Piston	77° 18.88'	175° 21.43'	544	86	Bagged	Yes
NBP93-08-4	Piston	77° 24.70'	176° 00.21'	658	120	54	Yes
NBP93-08-5	Piston	77° 25.54'	176° 20.91'	672	45	77	Yes
NBP93-08-6	Piston	77° 30.22'	176° 50.99'	700	27	77	Yes
NBP93-08-7	Piston	77° 07.84'	175° 40.23'	388	262	NR	Yes
NBP93-08-8	Piston	77° 12.32'	176° 24.00'	478	259	NR	Yes
NBP93-08-9	Piston	77° 16.76'	177° 06.86'	576	121	47	Yes
NBP93-08-10	Piston	77° 17.80'	177° 16.22'	583	92	63	Yes
NBP93-08-11	Piston	77° 18.91'	177° 27.16'	589	41	28	Yes
NBP93-08-13	Piston	77° 22.16'	177° 59.24'	676	217	81	Yes
NBP93-08-14	Piston	77° 32.40'	179° 48.20'	681	70	60	Yes
NBP93-08-15	Gravity	77° 37.91'	179° 12.44'	669	278	n/a	Yes
NBP93-08-16	Gravity	76° 57.61'	163° 31.95'	462	70	n/a	Yes
NBP93-08-17	Piston	76° 58.13'	163° 38.30'	357	39	NR	Yes
NBP93-08-18	Piston	76° 58.30'	163° 42.04'	260	181	NR	Yes

NR = no recovery; n/a = no trigger core used with gravity coring system

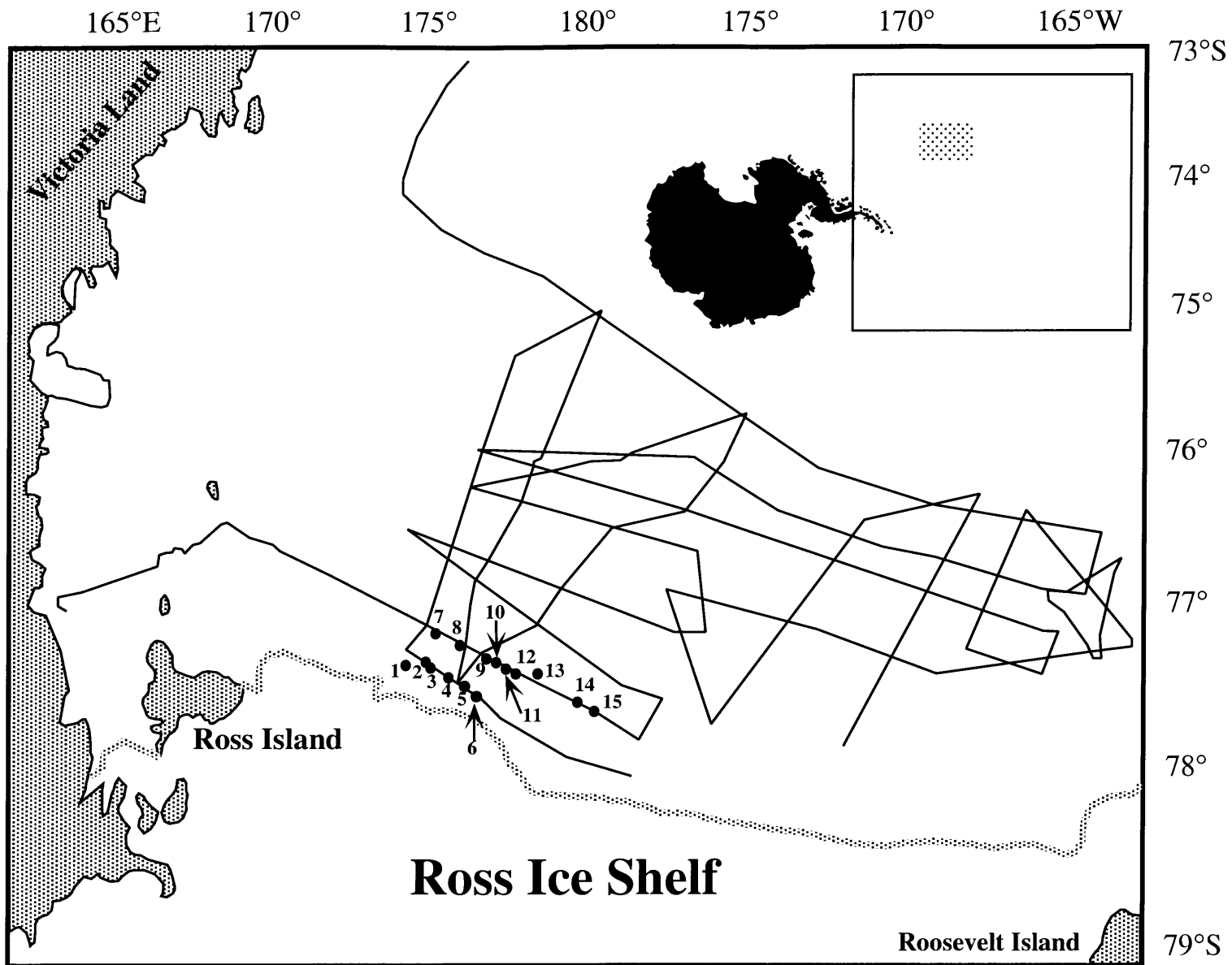


Figure 1. Map of Ross Sea area showing Cruise NBP93-08 seismic tracklines and coring stations. Upper right inset: Location of survey area shown in this figure.

CORE PROCESSING

At the Antarctic Research Facility all cores are cut using an adjustable, track-operated, radial power saw (Cassidy and Devore, 1973). The saw is adjusted to cut only through the thickness of the plastic core liner. Cuts are made on opposite sides of the core liner. Once the liner is cut, the core sediments are split by drawing a wire through the middle of the core. Each half section of core is cleaned of plastic debris (which results from cutting the liners) by scraping the sediment perpendicular to the core axis with a stainless steel spatula. Core halves are then measured, labeled every 20 cm (taking into account any bagged sediments), and heat-sealed within polyethylene sleeving to prevent desiccation. Disturbance of the sediment structures resulting from flow-in or sediment washing are recorded immediately after the core is opened.

All cores are stored in a refrigerated store room ($\sim 2^{\circ}\text{C}$) at the Antarctic Research Facility. Bagged samples are placed in labeled plastic bags and are also kept in refrigerated storage.

CORE DESCRIPTION PROCEDURES

General Description Procedures

Procedures used for describing the cores listed in this volume are, in general, similar to those used in previous studies published by the Antarctic Research Facility (e.g., Kaharoeddin et al., 1988; Bryan, 1992a, b). These procedures are presented below.

The description of each core consists of three types of information:

1. The primary information (latitude, longitude, water depth, core length);
2. The lithologic description (using megascopic and smear-slide observations);
3. Information concerning core conditions that are not inherent to the lithologic character of the sediments (disturbance, missing section, etc.).

Most of the primary information is obtained from the deck-log, or from other information provided by the chief scientist(s) of the cruise. Core conditions not inherent

to the lithologic character of the sediments are recorded from the deck log and from initial observations after cutting the core liner.

Each core description is accompanied by a graphic log illustrating the main lithologic boundaries, inclusions, sedimentary structures, and disturbances of the sedimentary units. The same criteria and format used for describing piston cores are used for describing trigger and gravity cores. The positions of the core section breaks are also indicated on the log in order to inform the investigator as to where samples should not be taken, since the cutting of cores into sections may result in sediment disturbance. Not all information appearing in the written portion of the lithologic description is illustrated in the graphic log.

In addition to the recovery of piston, trigger, and gravity cores, a variety of bagged sediments are normally collected during most cruises. Bagged samples are listed following the graphic core descriptions and are also available for sampling. Bagged sediments include:

1. Sediments representing the total recovery of sediment by the coring attempt (gravity, piston, and trigger cores).
2. Sediments recovered by grab-sampling.
3. Sediment that has come out of the core liner. Most bagged sediments in this category are from core catchers/cutters and the top or bottom of core sections. The bag samples from the core sections usually result from difficult extrusion of the core liner from the core barrel, or from the accidental spilling of sediment from the liner end either during handling or cutting of the liner into shorter sections while at sea.

Megascope Examination and Description

The elements of description of each unit are presented in the following order:

1. The upper and lower boundaries of the unit in centimeters. Lithologic units are recognized on the basis of compositional, textural, and other sedimentological characteristics.
2. Name and Munsell color and color code of the sediment. Gradual changes in texture or color of the unit are described accordingly. The term "graded" can be applied to the

name of the unit (see the following section on sediment classification). Interlayering with other types of sediment is also noted.

3. Observable distribution of volcanic ash, manganese nodules, and staining.
4. Internal structures within the unit: zone, layer, lamina, lense, stringer.
5. Inclusions: Sedimentary clasts, pebbles, lapilli, manganese nodules.
6. Bioturbation.
7. Disturbances due to the coring operation and/or transportation.
8. Nature of the bottom contact of the unit.

Other than coarse volcanoclastics, most of the cores consist of muddy lithologies, and classification is based on smear-slide observations. Sediments larger than 63 μm in size must usually be avoided in smear slide preparations. In the case of sediments with mixed sizes ($>$ and $<$ 63 μm), an estimate of coarse -vs- fine fraction is necessary for sediment classification. If there is an obvious coarse fraction within an otherwise muddy lithology, a small portion of the sediment is wet-sieved (63 μm sieve) and observed under the binocular microscope. A rough visual estimate is then made of the amount of coarse -vs- fine sediment (based on the amount sieved -vs- residual coarse sediment $>$ 63 μm). For example, if a smear slide is a diatomaceous mud, but approximately half of the original lithology is sand, the sediment will be a sandy diatomaceous mud. Thus, estimated values of dominant constituents from smear slide analyses, wet-sieving, and megascopic examination are used in classification.

Glacial marine sediments generally consist of mixed-size classes (such as pebbles in mud). However, no attempt was made to utilize a separate classification for these sediments. Instead, the matrix is classified according to the guidelines outlined herein for fine-grained sediments, and clasts are described separately as inclusions within the lithology.

The size class and sorting of a sand or pebble unit are usually mentioned in the description. Size classes of sand-size fractions were determined by use of the AMSTRAT (American/ Canadian Stratigraphic) size-class comparison card. On this card, each of the five size classes (very coarse, coarse, medium, fine, very fine) of sand-size particles has been divided into two subclasses (very coarse-upper, very coarse lower; coarse-upper,

coarse lower; etc.). The ten subclasses (separated by 0.5 phi intervals) are graphically depicted on the card for comparison with the sediment. Determination of the mean grain size of sand is a matter of matching the size of the most abundant grains to one of the five size classes exhibited on the card.

A unit may exhibit several colors, and color changes within a unit are described as being gradational or sharp (abrupt). Mottling refers to irregular spots of differing color within the sediment, and the color of mottling may be included in the description. The color of the sediment is determined by visual comparison of fresh sediment with the Munsell color chart. If the color of a sediment cannot be matched exactly with the color chart, the closest color is used.

Any variation in the abundance of a major component in a unit, observable either megascopically or through smear-slide analyses, is given in the description. Minor constituents that are scattered within a unit (micro-manganese nodules, lapilli, ash, etc.) may also be identified on smear slides. Their abundance is determined after a thorough examination of the core and described as scattered, common, or abundant. Manganese and ferrous oxides that occur as staining materials can be either in the form of small patches, or spread uniformly within a certain interval. These stainings are described by the terms slightly, moderately, or highly stained.

In describing the internal structures within a sedimentary unit, the stratigraphic position of each structure is noted, and when applicable, the composition and the color are also described. Each structure is defined as follows: *Zones* are defined as small intervals (less than 20 cm) in which a notable change in the abundance of some components or inclusions in the unit can be detected, either through megascopic examination or in the smear slide analysis. *Layers* have a thickness of between 1 to 10 cm and are separated from the main unit by a discrete change in lithology and distinct planes of contact. Layers less than 5 cm thick are usually not included on the graphic lithology column of the core description form but denoted by a symbol in the structure column. *Laminae* are similar to layers, but have a thickness of less than 1 cm. *Stringers* are laminae which are discontinuous and often irregular in form. In the description of a unit, the following sequence is used: zones, layers, laminae, and stringers.

Inclusions within an unit are described in the following order:

1. *Sedimentary clasts* are described in detail including size, composition, color, and position in the core (Example: "sedimentary clasts up to 12 mm composed of

calcareous, ash-bearing mud, diatomaceous mud, and muddy diatomaceous ooze, all olive gray (5Y 4/1), common throughout").

2. *Manganese nodules* are described as to their size and position in the core.
3. *Volcaniclastics* are described as to their textural class and position in the core. Sometimes the rock type (pumice, scoria) is also mentioned.
4. *Pebbles* are described as to their size, roundness, and position in the core (Example: "very fine to fine, subangular to subrounded pebbles common throughout"). Occasionally, their rock type is also given. Coatings, encrustations, and cementation by manganese or ferrous oxides are common on clastics and volcaniclastics; they are mentioned when present.

Bioturbated sediments are described in terms of slightly, moderately, or highly bioturbated. The qualifiers can be approximated as follows:

Slightly: less than 5% bioturbation

Moderately: between 5% to 30% bioturbation

Highly: 30% or more bioturbation

Operational disturbances are disturbances in the sediment usually occurring during the coring operation, transportation, and occasionally during the splitting of the core, resulting in total or partial loss of the primary sedimentary structures and the stratigraphic integrity of the sediment. The degree of the disturbance is described in terms of slightly, moderately, or highly disturbed. *Slightly disturbed* sediments still retain most of their primary sedimentary structures, particularly along the central axis of the core. *Moderately disturbed* sediments have lost almost half of their original structures, and must be sampled carefully if they are to be stratigraphically meaningful. *Highly disturbed* sediments have lost most or all of their primary structures; it is not recommended that these be sampled for stratigraphic study because of mixing of sediment components. Highly mixed sediment that has randomly entered the core by suction during the coring operation is described as *flow-in* and is usually characterized by vertical striations that can be traced from the base of the core.

Water entrapped in the liner can wash sediment along the side of the liner during transport. Sediments disturbed in this manner are described as *slightly or moderately*

washed along the side, and can still be sampled carefully for stratigraphic work. The term, "highly washed along the side", is not used because such sediment is almost always highly disturbed. An uncommon disturbance occurs when the overlying sediment is dragged along the side of the liner. Cores described in this manner can be sampled (carefully) for stratigraphic work.

Smear Slide Analysis

Smear slides are routinely made from regular intervals throughout the core during the description process. Slides are made from each macroscopically visible lithologic unit in the core (as recognized by compositional, textural, and color changes), but if the core is homogeneous in composition (e.g., a diatomaceous ooze), only one or two slides may be made for the entire core.

Smear slides are made as follows: Using a toothpick, a small amount of sediment is obtained from the core. This sample is mixed with a drop of distilled water on a standard 1" x 3" glass slide until the sediment and water are smeared into a very thin film. The slide is then dried on a hot plate (using low temperature). When the slurry is dry, 1 to 3 drops of Norland Optical Adhesive (NOA 61) are put over the dried sediment film and covered with a glass cover slip. The slide is then placed under an ultraviolet lamp for 2 or 3 minutes to cure the adhesive. After curing, the slide is then ready for viewing under a petrographic microscope. Using transmitted light and phase contrast, biogenic sediment components and heavy minerals are readily visible. Polarized light is used to view most clastic components.

For each smear slide, the percentage abundance of the following constituents are estimated using the percentage composition chart of Shvetsov (Terry and Chilingar, 1955) and reported on the core description logs:

1. Minerals: quartz, feldspar, mica, heavy minerals, volcanic glass, glauconite, pyrite, and micromanganese nodules.
2. Biogenic constituents: foraminifera, calcareous nannofossils, unspecified carbonate, diatoms, radiolarians, sponge spicules, silicoflagellates, ebridians, and ostracodes.

On the basis of the dominant sedimentary constituents, the sediment is classified according to the guidelines outlined below. On the core description form a symbol "D"

by the smear slide percentage denotes the dominant lithology, a symbol “m” denotes a minor lithology, zone, layer, laminae, or stringer, and “TR” denotes trace quantity.

SEDIMENT CLASSIFICATION

The system of sediment classification used in this volume modified from Kaharoeddin et al. (1988). This classification is based on abundance estimates of constituent particles (from smear slide observations) and megascopic examination.

The three major groups of sediment are (Figure 2):

- I. Pelagic sediments, consisting of pelagic clay, siliceous ooze, calcareous ooze, or mixtures of siliceous and calcareous ooze;
- II. Transitional sediments consisting of mixtures of biogenic and clastic sediments; and
- III. Terrigenous and volcanic detrital sediments.

Pelagic Sediments

Pelagic Clay

This type of sediment accumulates at a very slow rate and generally has a brown hue. Authigenic components are common (5% or more in estimated abundance), however, they may be present only in small quantities and distributed in such a manner that they are not found on the smear slide. Usually, a careful examination of the core, aided by the smear slide analysis, is necessary to determine whether or not a sediment is a pelagic clay. The primary components of pelagic clay are clay minerals and silt-size quartz particles, and the clay may contain less than 30% biogenic components. A qualifier cannot be added to pelagic clay; hence, pelagic clay containing 25% diatoms is not called diatomaceous pelagic clay.

Pelagic Biogenic Sediments

Included in this group are sediments containing at least 30% biogenic skeletons, but containing less than 30% silt and clay. They are named according to their principle fossil types: diatomaceous ooze, radiolarian ooze, siliceous ooze, foraminiferal ooze, nannofossil ooze, or calcareous ooze. A second (lesser) biogenic component may be used as a qualifier if more than 15%. The following rules apply for naming pelagic biogenic sediments:

1. If both the principal and lesser fossil types are similar in their chemical composition (i.e., calcareous or siliceous), the sediment may be called a siliceous ooze or calcareous ooze, depending on its chemical composition.
2. Calcareous sediment that has unspecified carbonate more than one-third of the total carbonate is called calcareous ooze.
3. If the principal and lesser fossil types differ in chemical composition, then both components are used in the sediment name, joined by a hyphen (e.g., diatomaceous-foraminiferal ooze).

Transitional Biogenic Sediments

Included in this group are sediments containing at least 30% silt and clay. Two subdivisions are recognized: the transitional siliceous sediments having at least 15% diatoms but less than 30% calcareous skeletons, and transitional calcareous sediments having at least 30% calcareous skeletons. The following rules apply for naming transitional biogenic sediments:

1. A transitional siliceous sediment is called muddy diatomaceous ooze if diatoms are more abundant than silt and clay; otherwise, it is called diatomaceous mud.
2. The transitional calcareous sediments are named according to their principal fossil types: marly foraminiferal ooze or marly nannofossil ooze. If the lesser biogenic component exceeds 15%, the sediment is called marly calcareous ooze.

Terrigenous and Volcanic Detrital Sediments

Terrigenous Detrital Sediments

Sediments in this group are classified according to their texture as defined by the standard size classes of sediment according to Friedman and Sanders (1978; Figures 3 and 4). Sand/silt/clay ratios, based upon optical examination of smear slides, are presented in on the core description logs. These ratios are used to assist in classification of terrigenous sediments. The following rules apply for sediments that are primarily composed of mixtures of sand, silt and clay:

1. The sediments are named after their major clastic component (end-member) if that component is greater than or equal to 70% (i.e., sand, silt, clay).

2. Sediments containing a mixture of silt and clay greater than or equal to 70% are called mud.
3. Sediments containing between 30% and 50% sand are named: sandy silt if the silt content is between 50% and 70%; sandy clay if the clay content is between 50% and 70%, or sandy mud if the mud content is less than 70%.
4. Sediments containing between 50% and 70% sand and between 30% and 50% mud are called muddy sand.
5. Sediments containing a minor component between 15% and 30% (e.g., diatoms or pebbles) should have a qualifier (e.g., diatomaceous muddy sand).

Pebbles are seldom encountered as a distinct sedimentary unit in marine sediments except in glacial marine sediments. The following rules apply to the naming of sediments that consist primarily of pebbles:

1. Sediments containing 70% or more pebbles are called pebbles.
2. Sediments containing between 50% and 70% pebbles and between 30% and 50% either mud or sand are called muddy pebbles or sandy pebbles, respectively.

Pebble units often contain finer matrix sediment, some or nearly all of which may be washed away during core retrieval or transportation. Removal of matrix sediment by washing is usually easily identified during core description. If the matrix sediment constitutes more than 10% of a pebble unit, the composition of the matrix is mentioned.

In graded sequences in which the size of the particles ranges from one textural class to another (e.g., silt to sand), the term *graded clastics* is used as the name of the unit. If the size of the particles ranges within one textural class, the unit is named according to its textural class (e.g., "sand, yellow gray (5Y 7/2), graded").

Volcaniclastics

This sediment group is classified according to the classification proposed by Fisher (1961, 1966). The nomenclature and the size limits are as follows:

<i>Fine ash:</i>	less than 63 μm
<i>Coarse ash:</i>	63 μm to 2 mm
<i>Lapilli:</i>	2 mm to 64 mm

As suggested by Fisher (1966), the term "volcanic" is not used as an adjective of ash or lapilli. The term "volcaniclastic" is used only for graded sequences where the particles size grades from ash to lapilli; thus, the name of the unit is graded volcaniclastics. In the case of graded sequences where the size of the particles ranges within one textural class, the unit is named according to its textural class (e.g., "coarse ash, brownish black (5YR 2/1) graded, well sorted").

Volcaniclastics that have biogenic or terrigenous components in excess of 15% will have a qualifier with the term "bearing" added to the qualifier (e.g., "diatom-bearing coarse ash"). The same term is also added to the qualifier of other groups of sediment if the unit contains more than 15% volcaniclastics (e.g., "ash-bearing diatomaceous ooze").

PELAGIC	NON-BIOGENIC	Authigenic components common (>5) < 30% Biogenous <i>Pelagic clay</i>
	BIOGENIC	<p>> 30% Biogenous</p> <p>> 30% Siliceous skeleton (Biogenic-siliceous) > 30% Calcareous skeleton (Biogenic-calcareous)</p> <p><i>Siliceous ooze</i> <i>Diatomaceous-nannofossil ooze</i> <i>Calcareous ooze</i> <i>Radiolarian ooze</i> <i>Foraminiferal-diatomaceous ooze</i> <i>Foraminiferal ooze</i> <i>Diatomaceous ooze</i> <i>Radiolarian-nannofossil ooze</i> <i>Nannofossil ooze</i></p>
TRANSITIONAL	BIOGENIC	<p>< 30% Silt and Clay</p> <p>> 30% Silt and Clay</p> <p>Radiolarian types uncommon</p> <p><i>Muddy Diatomaceous ooze</i></p> <p>Diatoms > Silt and Clay <i>Marly calcareous ooze</i></p> <p>Diatoms < Silt and Clay</p> <p><i>Diatomaceous Mud</i></p> <p>< 30% Calcareous Skeletons > 30% Calcareous Skeletons</p> <p>> 15% Diatoms > 30% Calcareous Skeletons</p>
	TERRIGENOUS and VOLCANIC DETRITAL	<p>< 15% Diatoms or < 30% Calcareous Skeletons</p> <p>Authigenic Components rare</p> <p><i>Clay</i> <i>Ash</i> <i>Mud</i> <i>Lapilli</i> <i>Silt</i> <i>Breccia</i> <i>Sand</i> <i>Pebble</i></p>

Figure 2. Classification scheme used for marine sediments.

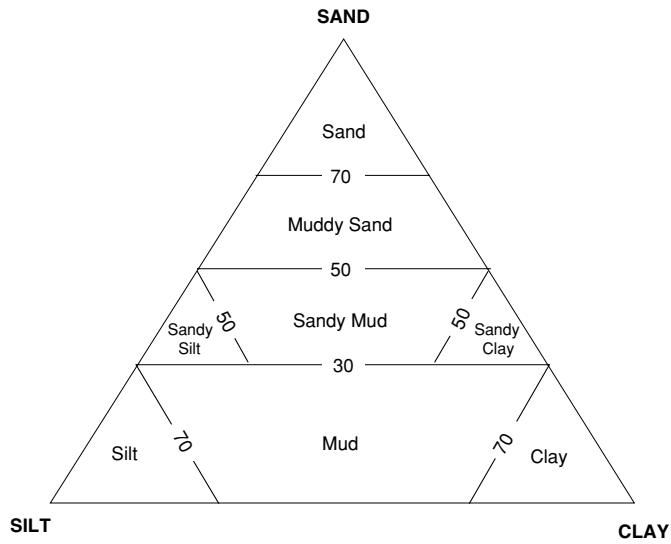


Figure 3. Classification of clastic sediments

















Limiting Size (mm)	SIZE CLASS	
64	Very Coarse Coarse Medium Fine Very Fine	P E B B L E S
32		
16		
8		
4		
2		
1	Very Coarse Coarse Medium Fine Very Fine	S A N D
.5		
.25		
.125		
.062		
.031	Coarse Medium Fine Very Fine	S I L T
.016		
.008		
.004		
	CLAY	

Standard size classes of sediment
(modified after Friedman and Sanders, 1978)

Figure 4. Standard size classes of sediments.

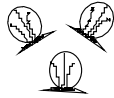
SEDIMENT CORE DESCRIPTIONS
R/V Nathaniel B. Palmer, Cruise 8, 1993

Graphic Lithology Key

	Diatomaceous Ooze		Clay		Sandy Clay or Silty Sand		Missing Section
	Muddy Diatomaceous Ooze		Silt		Pebbles		Calcareous Hash
	Mud		Sand		Ash		Calcareous Ooze
	Diatomaceous Mud		Muddy Sand or Sandy Mud		Diatomaceous Sandy Mud		Foraminifera ooze



Coral



Pelecypods



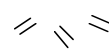
Pebble



Bryozoa



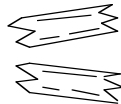
Barnacle Fragments



Common to rare ash



Gastropods



Plant Fragments



Abundant ash



Spicules



Sedimentary clasts



Glaucinite

Graphic Structures Key



Slightly to moderately disturbed



Moderately to Highly Disturbed



Layer



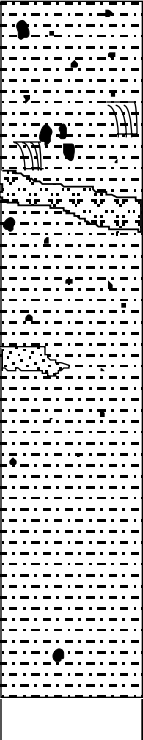
Laminae



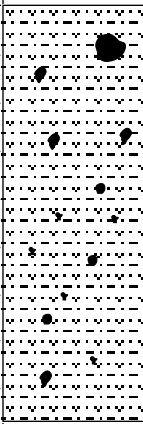

Graded bed

Piston Cores

NBP93-08-01 PC

Length (cm)	Lithology	Structure	Disturbance	Latitude:	77° 21.91' S	Water Depth:	607 m																																								
				Longitude:	174° 38.06' E	Core Length:	146 cm																																								
LITHOLOGIC DESCRIPTION																																															
<div style="display: flex; flex-direction: column; align-items: center;"> <div style="margin-bottom: 20px;">50</div> <div style="margin-bottom: 20px;">100</div> <div>150</div> </div>				<p>0-146 cm: The core consist of olive gray (5Y 4/2) mud. Subrounded, fine to medium, basaltic pebbles are found from 6-7, 28-29, 30-31, 46-46.5, 49-50, and 137-137.5 cm. Subrounded, very fine to fine, basaltic pebbles are scattered throughout a zone from 0-39 and 41-98 cm. A more indurated diatomaceous sandy mud occurs in a layer from 34-41 cm. An olive gray (5Y 4/2) bleb of poorly-sorted subrounded sand occurs from 71-73 cm. Barnacle plates are found at 18 and 28 cm.</p> <p style="padding-left: 40px;">The core is slightly disturbed from 0-20 cm and is cut into sections at 70 cm.</p> <p>Smear slides:</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;"><u>Minerals:</u></th> <th style="text-align: center;"><u>35 cm (m)</u> (layer)</th> <th style="text-align: center;"><u>65 cm (D)</u></th> <th style="text-align: center;"><u>73 cm (m)</u> (bleb)</th> </tr> </thead> <tbody> <tr> <td>Diatoms</td> <td style="text-align: center;">20</td> <td style="text-align: center;">TR</td> <td style="text-align: center;">TR</td> </tr> <tr> <td>Spicules</td> <td style="text-align: center;">1</td> <td style="text-align: center;">TR</td> <td style="text-align: center;">TR</td> </tr> <tr> <td>Quartz</td> <td style="text-align: center;">45</td> <td style="text-align: center;">35</td> <td style="text-align: center;">75</td> </tr> <tr> <td>Clay</td> <td style="text-align: center;">34</td> <td style="text-align: center;">65</td> <td style="text-align: center;">25</td> </tr> <tr> <td>Heavy minerals</td> <td style="text-align: center;">TR</td> <td style="text-align: center;">TR</td> <td style="text-align: center;">TR</td> </tr> <tr> <td>Hornblende</td> <td style="text-align: center;">TR</td> <td style="text-align: center;">TR</td> <td style="text-align: center;">TR</td> </tr> <tr> <td>Sand</td> <td style="text-align: center;">30</td> <td style="text-align: center;">25</td> <td style="text-align: center;">65</td> </tr> <tr> <td>Silt</td> <td style="text-align: center;">30</td> <td style="text-align: center;">10</td> <td style="text-align: center;">10</td> </tr> <tr> <td>Clay</td> <td style="text-align: center;">40</td> <td style="text-align: center;">65</td> <td style="text-align: center;">25</td> </tr> </tbody> </table>				<u>Minerals:</u>	<u>35 cm (m)</u> (layer)	<u>65 cm (D)</u>	<u>73 cm (m)</u> (bleb)	Diatoms	20	TR	TR	Spicules	1	TR	TR	Quartz	45	35	75	Clay	34	65	25	Heavy minerals	TR	TR	TR	Hornblende	TR	TR	TR	Sand	30	25	65	Silt	30	10	10	Clay	40	65	25
<u>Minerals:</u>	<u>35 cm (m)</u> (layer)	<u>65 cm (D)</u>	<u>73 cm (m)</u> (bleb)																																												
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Spicules	1	TR	TR																																												
Quartz	45	35	75																																												
Clay	34	65	25																																												
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Sand	30	25	65																																												
Silt	30	10	10																																												
Clay	40	65	25																																												

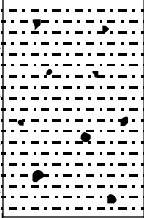

NBP93-08-03 PC

Length (cm)	Lithology	Structure	Disturbance	Latitude:	77° 18.88' S	Water Depth:	544 m																																	
				Longitude:	175° 21.43' E	Core Length:	86 cm																																	
LITHOLOGIC DESCRIPTION																																								
<div style="display: flex; flex-direction: column; align-items: center;"> <div style="margin-bottom: 20px;">50</div> <div style="margin-bottom: 20px;">100</div> </div>			<p>0-86 cm: The core consists of olive gray (5Y 4/2) diatomaceous mud. Subrounded, very fine to fine, basaltic pebbles are common throughout the core. A medium, subrounded, basaltic pebble is found at 7-8 cm. Black (5Y 2.5/1) manganese oxide staining occurs from 4-9 cm.</p> <p>The core is moderately disturbed from 0-5 cm and slightly disturbed from 5-43 cm. The top 10 cm are highly indurated.</p> <p>Smear slides:</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Minerals:</th> <th style="text-align: center;"><u>10 cm (D)</u></th> <th style="text-align: center;"><u>84 cm (D)</u></th> </tr> </thead> <tbody> <tr> <td>Diatoms</td> <td style="text-align: center;">20</td> <td style="text-align: center;">25</td> </tr> <tr> <td>Spicules</td> <td style="text-align: center;">TR</td> <td style="text-align: center;">TR</td> </tr> <tr> <td>Silicaflagellates</td> <td style="text-align: center;">--</td> <td style="text-align: center;">--</td> </tr> <tr> <td>Quartz</td> <td style="text-align: center;">25</td> <td style="text-align: center;">20</td> </tr> <tr> <td>Clay</td> <td style="text-align: center;">55</td> <td style="text-align: center;">55</td> </tr> <tr> <td>Heavy minerals</td> <td style="text-align: center;">TR</td> <td style="text-align: center;">TR</td> </tr> <tr> <td>Hornblende</td> <td style="text-align: center;">TR</td> <td style="text-align: center;">--</td> </tr> <tr> <td>Sand</td> <td style="text-align: center;">5</td> <td style="text-align: center;">5</td> </tr> <tr> <td>Silt</td> <td style="text-align: center;">30</td> <td style="text-align: center;">35</td> </tr> <tr> <td>Clay</td> <td style="text-align: center;">65</td> <td style="text-align: center;">60</td> </tr> </tbody> </table>					Minerals:	<u>10 cm (D)</u>	<u>84 cm (D)</u>	Diatoms	20	25	Spicules	TR	TR	Silicaflagellates	--	--	Quartz	25	20	Clay	55	55	Heavy minerals	TR	TR	Hornblende	TR	--	Sand	5	5	Silt	30	35	Clay	65	60
Minerals:	<u>10 cm (D)</u>	<u>84 cm (D)</u>																																						
Diatoms	20	25																																						
Spicules	TR	TR																																						
Silicaflagellates	--	--																																						
Quartz	25	20																																						
Clay	55	55																																						
Heavy minerals	TR	TR																																						
Hornblende	TR	--																																						
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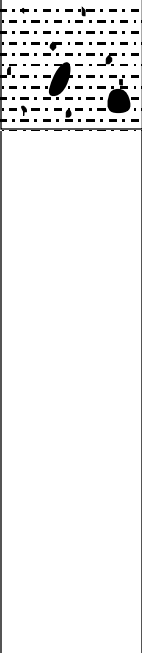

NBP93-08-04 PC

Length (cm)	Lithology	Structure	Disturbance	Latitude: 77° 24.70' S Longitude: 176° 00.21' E	Water Depth: 658 m Core Length: 120 cm																																				
LITHOLOGIC DESCRIPTION																																									
<div style="display: flex; flex-direction: column; align-items: center;"> <div style="margin-bottom: 20px;">50</div> <div style="margin-bottom: 20px;">100</div> <div>150</div> </div>				<p>0-120 cm: The core consists of olive gray (5Y 4/2) diatomaceous mud. Subrounded, medium, basaltic pebbles are found at 14-15, 34-34.5, 71-72, and 117-118 cm. Subrounded, very fine, basaltic pebbles are scattered in a zone from 7-120 cm. No pebbles are found from 0-7 cm. A zone of sandy mud occurs from 6-17 cm. Black (5Y 2.5/1) manganese-oxide staining occurs from 6-33 cm; it is concentrated from 6-17 cm.</p> <p style="padding-left: 40px;">The core is very firm, very sticky, and is slightly disturbed from 0-17 cm.</p> <p>Smear slides:</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;"><u>Minerals:</u></th> <th style="text-align: center;"><u>7 cm (m)</u></th> <th style="text-align: center;"><u>30 cm (D)</u></th> <th style="text-align: center;"><u>118 cm (D)</u></th> </tr> </thead> <tbody> <tr> <td>Diatoms</td> <td style="text-align: center;">1</td> <td style="text-align: center;">15</td> <td style="text-align: center;">20</td> </tr> <tr> <td>Spicules</td> <td style="text-align: center;">TR</td> <td style="text-align: center;">1</td> <td style="text-align: center;">TR</td> </tr> <tr> <td>Quartz</td> <td style="text-align: center;">50</td> <td style="text-align: center;">20</td> <td style="text-align: center;">20</td> </tr> <tr> <td>Clay</td> <td style="text-align: center;">48</td> <td style="text-align: center;">64</td> <td style="text-align: center;">60</td> </tr> <tr> <td>Heavy minerals</td> <td style="text-align: center;">1</td> <td style="text-align: center;">TR</td> <td style="text-align: center;">TR</td> </tr> <tr> <td>Sand</td> <td style="text-align: center;">40</td> <td style="text-align: center;">10</td> <td style="text-align: center;">5</td> </tr> <tr> <td>Silt</td> <td style="text-align: center;">10</td> <td style="text-align: center;">20</td> <td style="text-align: center;">25</td> </tr> <tr> <td>Clay</td> <td style="text-align: center;">50</td> <td style="text-align: center;">70</td> <td style="text-align: center;">70</td> </tr> </tbody> </table>		<u>Minerals:</u>	<u>7 cm (m)</u>	<u>30 cm (D)</u>	<u>118 cm (D)</u>	Diatoms	1	15	20	Spicules	TR	1	TR	Quartz	50	20	20	Clay	48	64	60	Heavy minerals	1	TR	TR	Sand	40	10	5	Silt	10	20	25	Clay	50	70	70
<u>Minerals:</u>	<u>7 cm (m)</u>	<u>30 cm (D)</u>	<u>118 cm (D)</u>																																						
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Heavy minerals	1	TR	TR																																						
Sand	40	10	5																																						
Silt	10	20	25																																						
Clay	50	70	70																																						

NBP93-08-05 PC

Length (cm)	Lithology	Structure	Disturbance	Latitude: 77° 25. 54' S	Water Depth: 672 m																											
				Longitude: 176° 20.91' E	Core Length: 45 cm																											
LITHOLOGIC DESCRIPTION																																
<div style="text-align: center;">50</div> <div style="text-align: center;">100</div>				<p>0-45 cm: The core consists of olive gray (5Y 4/2) diatom-bearing mud. Very fine, rounded, basaltic pebbles are scattered throughout the core. Black (5Y 2.5/1) manganese oxide staining occurs from 7-30 cm, and iron staining occurs from 33-45 cm.</p> <p>The core is moderately disturbed from 0-12 cm and slightly disturbed from 12-23 cm .</p> <p>Smear slides:</p> <p><u>Minerals:</u> <u>8 cm (D)</u> <u>43 cm (D)</u></p> <table style="width: 100%; border: none;"> <tr> <td style="width: 40%;">Diatoms</td> <td style="width: 30%; text-align: center;">15</td> <td style="width: 30%; text-align: center;">10</td> </tr> <tr> <td>Spicules</td> <td style="text-align: center;">TR</td> <td style="text-align: center;">TR</td> </tr> <tr> <td>Quartz</td> <td style="text-align: center;">20</td> <td style="text-align: center;">25</td> </tr> <tr> <td>Clay</td> <td style="text-align: center;">65</td> <td style="text-align: center;">65</td> </tr> <tr> <td>Heavy minerals</td> <td style="text-align: center;">TR</td> <td style="text-align: center;">TR</td> </tr> <tr> <td>Hornblende</td> <td style="text-align: center;">--</td> <td style="text-align: center;">TR</td> </tr> <tr> <td>Sand</td> <td style="text-align: center;">5</td> <td style="text-align: center;">10</td> </tr> <tr> <td>Silt</td> <td style="text-align: center;">25</td> <td style="text-align: center;">20</td> </tr> <tr> <td>Clay</td> <td style="text-align: center;">70</td> <td style="text-align: center;">70</td> </tr> </table>		Diatoms	15	10	Spicules	TR	TR	Quartz	20	25	Clay	65	65	Heavy minerals	TR	TR	Hornblende	--	TR	Sand	5	10	Silt	25	20	Clay	70	70
Diatoms	15	10																														
Spicules	TR	TR																														
Quartz	20	25																														
Clay	65	65																														
Heavy minerals	TR	TR																														
Hornblende	--	TR																														
Sand	5	10																														
Silt	25	20																														
Clay	70	70																														

NBP93-08-06 PC

Length (cm)	Lithology	Structure	Disturbance	Latitude:	77° 30.22' S	Water Depth:	700 m																																				
				Longitude:	176° 50.99' E	Core Length:	27 cm																																				
LITHOLOGIC DESCRIPTION																																											
<div style="display: flex; flex-direction: column; align-items: center;"> <div style="margin-bottom: 20px;">50</div> <div style="margin-bottom: 20px;">100</div> </div>				<p>0-27 cm: The core consists of mud/clay that grades in color from olive gray (5Y 4/2) at the top to dark gray (5Y 4/1) at the base. The upper portion of the core, particularly the interval from 0-5 cm, has a higher concentration of diatoms than the rest of the core. Coarse, subangular, basaltic pebbles are found from 13-14 and from 22-24.5 cm. Very fine, subangular, pebbles are common throughout the core from 5-27 cm.</p> <p>The core is moderately disturbed from 0-8 cm and slightly disturbed from 8-27 cm.</p> <p>Smear slides:</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;"><u>Minerals:</u></th> <th style="text-align: center;"><u>2 cm (m)</u></th> <th style="text-align: center;"><u>10 cm (D)</u></th> <th style="text-align: center;"><u>25 cm (D)</u></th> </tr> </thead> <tbody> <tr> <td>Diatoms</td> <td style="text-align: center;">10</td> <td style="text-align: center;">TR</td> <td style="text-align: center;">3</td> </tr> <tr> <td>Spicules</td> <td style="text-align: center;">TR</td> <td style="text-align: center;">TR</td> <td style="text-align: center;">TR</td> </tr> <tr> <td>Quartz</td> <td style="text-align: center;">20</td> <td style="text-align: center;">30</td> <td style="text-align: center;">30</td> </tr> <tr> <td>Clay</td> <td style="text-align: center;">70</td> <td style="text-align: center;">70</td> <td style="text-align: center;">67</td> </tr> <tr> <td>Heavy minerals</td> <td style="text-align: center;">TR</td> <td style="text-align: center;">TR</td> <td style="text-align: center;">TR</td> </tr> <tr> <td>Sand</td> <td style="text-align: center;">3</td> <td style="text-align: center;">5</td> <td style="text-align: center;">5</td> </tr> <tr> <td>Silt</td> <td style="text-align: center;">17</td> <td style="text-align: center;">25</td> <td style="text-align: center;">25</td> </tr> <tr> <td>Clay</td> <td style="text-align: center;">80</td> <td style="text-align: center;">70</td> <td style="text-align: center;">70</td> </tr> </tbody> </table>				<u>Minerals:</u>	<u>2 cm (m)</u>	<u>10 cm (D)</u>	<u>25 cm (D)</u>	Diatoms	10	TR	3	Spicules	TR	TR	TR	Quartz	20	30	30	Clay	70	70	67	Heavy minerals	TR	TR	TR	Sand	3	5	5	Silt	17	25	25	Clay	80	70	70
<u>Minerals:</u>	<u>2 cm (m)</u>	<u>10 cm (D)</u>	<u>25 cm (D)</u>																																								
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Spicules	TR	TR	TR																																								
Quartz	20	30	30																																								
Clay	70	70	67																																								
Heavy minerals	TR	TR	TR																																								
Sand	3	5	5																																								
Silt	17	25	25																																								
Clay	80	70	70																																								

NBP93-08-07 PC

Length (cm)	Lithology	Structure	Disturbance	Latitude: 77° 07.84' S	Water Depth: 387.90 m																																																
				Longitude: 175° 40.20' E	Core Length: 262 cm																																																
LITHOLOGIC DESCRIPTION																																																					
<div style="display: flex; flex-direction: column; align-items: center;"> <div style="margin-bottom: 20px;">50</div> <div style="margin-bottom: 20px;">100</div> <div style="margin-bottom: 20px;">150</div> <div style="margin-bottom: 20px;">200</div> <div style="margin-bottom: 20px;">250</div> <div style="margin-bottom: 20px;">300</div> </div>		<p>0-262 cm: The core consists of olive gray (5Y 5/2) mud/clay. Subrounded, medium, basaltic pebbles are found from 11-12, 35.5-36, 51-56, 58-59, 64-65, 71-72, 73.5-74, 194-198, 218-219, 233-234, 242-244, and 250-252 cm. Subrounded fine basaltic pebbles are found from 18-18.5, 49-49.5, 75-75.5, and 79-79.5 cm. Subangular to subrounded, very fine basaltic pebbles are common throughout the core.</p> <p>Zones of sandy mud, with gradational contacts, occur over the intervals from 19-24 and 56-67 cm. The sand in these zones is subrounded, poorly-sorted and fine sized.</p> <p>An articulated bivalve occurs at 2 cm. Zones of coarse bryozoan and barnacle fragments are found from 7-13, 16-18, and 58-67 cm. Coarse bryozoan fragments occur at 81, 88, 98, 104, 110, 115, 137, 144, 146, 154, 167, 172, 182, 192, 196, 224, 242, and 256 cm. Barnacle plates are found at 87, 103, 111, and 208 cm.</p> <p>The core is slightly disturbed from 118-125 cm.</p> <p>Smear slides:</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;"><u>Minerals:</u></th> <th style="text-align: center;"><u>20 cm (m)</u></th> <th style="text-align: center;"><u>70 cm (D)</u></th> <th style="text-align: center;"><u>252 cm (D)</u></th> </tr> </thead> <tbody> <tr> <td>Diatoms</td> <td style="text-align: center;">5</td> <td style="text-align: center;">3</td> <td style="text-align: center;">3</td> </tr> <tr> <td>Spicules</td> <td style="text-align: center;">TR</td> <td style="text-align: center;">TR</td> <td style="text-align: center;">TR</td> </tr> <tr> <td>Silicaflagellates</td> <td style="text-align: center;">--</td> <td style="text-align: center;">--</td> <td style="text-align: center;">TR</td> </tr> <tr> <td>Quartz</td> <td style="text-align: center;">40</td> <td style="text-align: center;">30</td> <td style="text-align: center;">25</td> </tr> <tr> <td>Clay</td> <td style="text-align: center;">55</td> <td style="text-align: center;">67</td> <td style="text-align: center;">72</td> </tr> <tr> <td>Heavy minerals</td> <td style="text-align: center;">--</td> <td style="text-align: center;">--</td> <td style="text-align: center;">TR</td> </tr> <tr> <td>Feldspar</td> <td style="text-align: center;">TR</td> <td style="text-align: center;">--</td> <td style="text-align: center;">--</td> </tr> <tr> <td>Hornblende</td> <td style="text-align: center;">TR</td> <td style="text-align: center;">TR</td> <td style="text-align: center;">TR</td> </tr> <tr> <td>Sand</td> <td style="text-align: center;">35</td> <td style="text-align: center;">15</td> <td style="text-align: center;">10</td> </tr> <tr> <td>Silt</td> <td style="text-align: center;">10</td> <td style="text-align: center;">15</td> <td style="text-align: center;">15</td> </tr> <tr> <td>Clay</td> <td style="text-align: center;">55</td> <td style="text-align: center;">70</td> <td style="text-align: center;">75</td> </tr> </tbody> </table>				<u>Minerals:</u>	<u>20 cm (m)</u>	<u>70 cm (D)</u>	<u>252 cm (D)</u>	Diatoms	5	3	3	Spicules	TR	TR	TR	Silicaflagellates	--	--	TR	Quartz	40	30	25	Clay	55	67	72	Heavy minerals	--	--	TR	Feldspar	TR	--	--	Hornblende	TR	TR	TR	Sand	35	15	10	Silt	10	15	15	Clay	55	70	75
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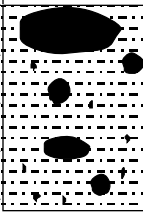
NBP93-08-08 PC

Length (cm)	Lithology	Structure	Disturbance	Latitude: 77° 12.32' S Longitude: 176°24.00' E	Water Depth: 477 m Core Length: 259 cm																																												
LITHOLOGIC DESCRIPTION																																																	
<div style="display: flex; flex-direction: column; align-items: center;"> <div style="margin-bottom: 20px;">50</div> <div style="margin-bottom: 20px;">100</div> <div style="margin-bottom: 20px;">150</div> <div style="margin-bottom: 20px;">200</div> <div style="margin-bottom: 20px;">250</div> <div style="margin-bottom: 20px;">300</div> </div>	(Lithology column with horizontal lines and dots)			<p>0-259 cm: The core consists of olive gray (5Y 4/2) mud. Fine, subrounded, basaltic pebbles are found from 18-18.5, 49-49.5, 75-75.5, and 79-79.5 cm. Black (5Y 2.5/1) staining occurs from 2-8 cm. A zone of diatomaceous mud occurs from 180-200 cm.</p> <p>The top 8 cm of the core is sandier and more indurated than the rest of the core. The concentration of diatom fragments increases down core.</p> <p>Smear slides:</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;"><u>Minerals:</u></th> <th style="text-align: center;"><u>3 cm (D)</u></th> <th style="text-align: center;"><u>160 cm (D)</u></th> <th style="text-align: center;"><u>189 cm (m)</u></th> </tr> </thead> <tbody> <tr> <td>Diatoms</td> <td style="text-align: center;">5</td> <td style="text-align: center;">5</td> <td style="text-align: center;">25</td> </tr> <tr> <td>Spicules</td> <td style="text-align: center;">TR</td> <td style="text-align: center;">1</td> <td style="text-align: center;">1</td> </tr> <tr> <td>Silicaflagellates</td> <td style="text-align: center;">--</td> <td style="text-align: center;">--</td> <td style="text-align: center;">TR</td> </tr> <tr> <td>Quartz</td> <td style="text-align: center;">30</td> <td style="text-align: center;">20</td> <td style="text-align: center;">20</td> </tr> <tr> <td>Clay</td> <td style="text-align: center;">65</td> <td style="text-align: center;">74</td> <td style="text-align: center;">54</td> </tr> <tr> <td>Heavy minerals</td> <td style="text-align: center;">TR</td> <td style="text-align: center;">--</td> <td style="text-align: center;">TR</td> </tr> <tr> <td>Hornblende</td> <td style="text-align: center;">TR</td> <td style="text-align: center;">TR</td> <td style="text-align: center;">--</td> </tr> <tr> <td>Sand</td> <td style="text-align: center;">20</td> <td style="text-align: center;">10</td> <td style="text-align: center;">15</td> </tr> <tr> <td>Silt</td> <td style="text-align: center;">10</td> <td style="text-align: center;">10</td> <td style="text-align: center;">15</td> </tr> <tr> <td>Clay</td> <td style="text-align: center;">70</td> <td style="text-align: center;">80</td> <td style="text-align: center;">70</td> </tr> </tbody> </table>		<u>Minerals:</u>	<u>3 cm (D)</u>	<u>160 cm (D)</u>	<u>189 cm (m)</u>	Diatoms	5	5	25	Spicules	TR	1	1	Silicaflagellates	--	--	TR	Quartz	30	20	20	Clay	65	74	54	Heavy minerals	TR	--	TR	Hornblende	TR	TR	--	Sand	20	10	15	Silt	10	10	15	Clay	70	80	70
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Sand	20	10	15																																														
Silt	10	10	15																																														
Clay	70	80	70																																														

NBP93-08-10 PC

Length (cm)	Lithology	Structure	Disturbance	Latitude:	77° 17.80' S	Water Depth:	583 m																																																																						
				Longitude:	177° 16.22' E	Core Length:	92 cm																																																																						
LITHOLOGIC DESCRIPTION																																																																													
<div style="display: flex; flex-direction: column; align-items: center;"> <div style="margin-bottom: 20px;">50</div> <div style="margin-bottom: 20px;">100</div> <div>150</div> </div>				<p>0-92 cm: The core consists primarily of a dark gray (5Y 4/1) mud. The middle portion of the core (~20-50 cm) is a sandy mud. Coarse, rounded, basaltic pebbles are found from 51-56 and 70-76 cm. Medium, rounded, basaltic pebbles are found from 64-64.5, 65-66, 68-69, 86-87, and 89-90 cm. Olive gray (5Y 4/2) blebs of clay occur between 44-55 cm. The sand fraction in the core is well-sorted, rounded, and fine sized from 0-19 cm and gradually changes downcore to subrounded, poorly-sorted, and coarse. The diatom concentration is higher in the upper 10 cm of the core.</p> <p style="padding-left: 40px;">The core is slightly disturbed from 0-70 cm.</p> <p>Smear slides:</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;"><u>Minerals:</u></th> <th style="text-align: center;"><u>2 cm (D)</u></th> <th style="text-align: center;"><u>43 cm (m)</u></th> <th style="text-align: center;"><u>55 cm (m)</u> Bleb</th> <th style="text-align: center;"><u>90 cm (D)</u></th> </tr> </thead> <tbody> <tr><td>Diatoms</td><td style="text-align: center;">10</td><td style="text-align: center;">3</td><td style="text-align: center;">10</td><td style="text-align: center;">3</td></tr> <tr><td>Spicules</td><td style="text-align: center;">TR</td><td style="text-align: center;">TR</td><td style="text-align: center;">1</td><td style="text-align: center;">TR</td></tr> <tr><td>Silicaflagellates</td><td style="text-align: center;">--</td><td style="text-align: center;">--</td><td style="text-align: center;">TR</td><td style="text-align: center;">--</td></tr> <tr><td>Foraminifera</td><td style="text-align: center;">--</td><td style="text-align: center;">--</td><td style="text-align: center;">TR</td><td style="text-align: center;">--</td></tr> <tr><td>Quartz</td><td style="text-align: center;">30</td><td style="text-align: center;">50</td><td style="text-align: center;">20</td><td style="text-align: center;">30</td></tr> <tr><td>Clay</td><td style="text-align: center;">60</td><td style="text-align: center;">47</td><td style="text-align: center;">69</td><td style="text-align: center;">67</td></tr> <tr><td>Heavy minerals</td><td style="text-align: center;">TR</td><td style="text-align: center;">TR</td><td style="text-align: center;">TR</td><td style="text-align: center;">--</td></tr> <tr><td>Feldspar</td><td style="text-align: center;">TR</td><td style="text-align: center;">TR</td><td style="text-align: center;">--</td><td style="text-align: center;">--</td></tr> <tr><td>Hornblende</td><td style="text-align: center;">TR</td><td style="text-align: center;">TR</td><td style="text-align: center;">TR</td><td style="text-align: center;">--</td></tr> <tr><td>Volcanic glass</td><td style="text-align: center;">--</td><td style="text-align: center;">--</td><td style="text-align: center;">--</td><td style="text-align: center;">TR</td></tr> <tr><td>Sand</td><td style="text-align: center;">20</td><td style="text-align: center;">45</td><td style="text-align: center;">5</td><td style="text-align: center;">20</td></tr> <tr><td>Silt</td><td style="text-align: center;">20</td><td style="text-align: center;">5</td><td style="text-align: center;">15</td><td style="text-align: center;">10</td></tr> <tr><td>Clay</td><td style="text-align: center;">60</td><td style="text-align: center;">50</td><td style="text-align: center;">80</td><td style="text-align: center;">70</td></tr> </tbody> </table>				<u>Minerals:</u>	<u>2 cm (D)</u>	<u>43 cm (m)</u>	<u>55 cm (m)</u> Bleb	<u>90 cm (D)</u>	Diatoms	10	3	10	3	Spicules	TR	TR	1	TR	Silicaflagellates	--	--	TR	--	Foraminifera	--	--	TR	--	Quartz	30	50	20	30	Clay	60	47	69	67	Heavy minerals	TR	TR	TR	--	Feldspar	TR	TR	--	--	Hornblende	TR	TR	TR	--	Volcanic glass	--	--	--	TR	Sand	20	45	5	20	Silt	20	5	15	10	Clay	60	50	80	70
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Silt	20	5	15	10																																																																									
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NBP93-08-11 PC

Length (cm)	Lithology	Structure	Disturbance	Latitude: 77° 18.91' S	Water Depth: 589 m																						
				Longitude: 177° 27.16' E	Core Length: 41 cm																						
LITHOLOGIC DESCRIPTION																											
<div style="display: flex; flex-direction: column; align-items: center;"> <div style="margin-bottom: 20px;">50</div> <div style="margin-bottom: 20px;">100</div> </div>			<p>0-41 cm: The core consists of mud/clay that grades in color from dark olive gray (5Y 3/2) mud at the top and to olive gray (5Y 3/2) at the base. A rounded, very coarse, granitic pebble is found at 0-7 cm. Rounded, coarse, basaltic pebbles occur at 8.5-10, 14-18 (sample half), 17-19, 29-31, and 36-37 cm. Rounded, very fine to fine, basaltic pebbles are common throughout the core.</p> <p style="padding-left: 40px;">The core is moderately disturbed from 0-8 cm.</p> <p>Smear slides:</p> <p><u>Minerals:</u> <u>8 cm (D)</u></p> <table style="width: 100%; border: none;"> <tr><td>Diatoms</td><td style="text-align: right;">1</td></tr> <tr><td>Spicules</td><td style="text-align: right;">TR</td></tr> <tr><td>Quartz</td><td style="text-align: right;">29</td></tr> <tr><td>Clay</td><td style="text-align: right;">70</td></tr> <tr><td>Heavy minerals</td><td style="text-align: right;">TR</td></tr> <tr><td>Hornblende</td><td style="text-align: right;">TR</td></tr> <tr><td>Mica</td><td style="text-align: right;">TR</td></tr> <tr><td colspan="2"> </td></tr> <tr><td>Sand</td><td style="text-align: right;">20</td></tr> <tr><td>Silt</td><td style="text-align: right;">10</td></tr> <tr><td>Clay</td><td style="text-align: right;">70</td></tr> </table>	Diatoms	1	Spicules	TR	Quartz	29	Clay	70	Heavy minerals	TR	Hornblende	TR	Mica	TR			Sand	20	Silt	10	Clay	70		
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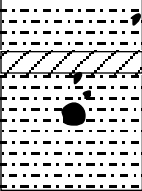

NBP93-08-13 PC

Length (cm)	Lithology	Structure	Disturbance	Latitude:	77° 22.16' S	Water Depth:	676 m																																																				
				Longitude:	177° 59.24' E	Core Length:	217 cm																																																				
LITHOLOGIC DESCRIPTION																																																											
<div style="display: flex; flex-direction: column; align-items: center;"> <div style="margin-bottom: 20px;">50</div> <div style="margin-bottom: 20px;">100</div> <div style="margin-bottom: 20px;">150</div> <div style="margin-bottom: 20px;">200</div> </div>		<p>0-217 cm: The core consists of olive gray (5Y 5/2) diatomaceous mud at the top that grades into an olive gray (5Y 4/2) clay at the base. A layer of sandy mud, with sharp contacts, occurs from 21-27 cm. Very coarse, subrounded, basaltic pebbles are found from 128.5-135 and 190-196 cm. Medium, subrounded, basaltic pebbles occur at: 22-24, 39-40, 47-50 (sample half), 60-61, 72-73, 88-89, 104-105, 107-109, 122-123, 150-151, 164-164, 170-171, 188-189, and 210-217 cm. Subrounded, very fine, basaltic pebbles are common throughout the core from 27-217 cm. Black (5Y 2.5/1) manganese-oxide staining occurs from 0-27 cm.</p> <p>Smear slides:</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;"><u>Minerals:</u></th> <th style="text-align: center;"><u>2 cm (m)</u></th> <th style="text-align: center;"><u>22 cm (m)</u> layer</th> <th style="text-align: center;"><u>105 cm (D)</u></th> </tr> </thead> <tbody> <tr> <td>Diatoms</td> <td style="text-align: center;">20</td> <td style="text-align: center;">TR</td> <td style="text-align: center;">3</td> </tr> <tr> <td>Spicules</td> <td style="text-align: center;">TR</td> <td style="text-align: center;">TR</td> <td style="text-align: center;">TR</td> </tr> <tr> <td>Silicaflagellates</td> <td style="text-align: center;">--</td> <td style="text-align: center;">--</td> <td style="text-align: center;">TR</td> </tr> <tr> <td>Quartz</td> <td style="text-align: center;">10</td> <td style="text-align: center;">40</td> <td style="text-align: center;">20</td> </tr> <tr> <td>Clay</td> <td style="text-align: center;">70</td> <td style="text-align: center;">60</td> <td style="text-align: center;">77</td> </tr> <tr> <td>Heavy minerals</td> <td style="text-align: center;">TR</td> <td style="text-align: center;">--</td> <td style="text-align: center;">TR</td> </tr> <tr> <td>Feldspar</td> <td style="text-align: center;">--</td> <td style="text-align: center;">--</td> <td style="text-align: center;">--</td> </tr> <tr> <td>Hornblende</td> <td style="text-align: center;">TR</td> <td style="text-align: center;">--</td> <td style="text-align: center;">TR</td> </tr> <tr> <td>Mica</td> <td style="text-align: center;">TR</td> <td style="text-align: center;">--</td> <td style="text-align: center;">TR</td> </tr> <tr> <td>Sand</td> <td style="text-align: center;">1</td> <td style="text-align: center;">30</td> <td style="text-align: center;">3</td> </tr> <tr> <td>Silt</td> <td style="text-align: center;">20</td> <td style="text-align: center;">10</td> <td style="text-align: center;">17</td> </tr> <tr> <td>Clay</td> <td style="text-align: center;">69</td> <td style="text-align: center;">70</td> <td style="text-align: center;">80</td> </tr> </tbody> </table>						<u>Minerals:</u>	<u>2 cm (m)</u>	<u>22 cm (m)</u> layer	<u>105 cm (D)</u>	Diatoms	20	TR	3	Spicules	TR	TR	TR	Silicaflagellates	--	--	TR	Quartz	10	40	20	Clay	70	60	77	Heavy minerals	TR	--	TR	Feldspar	--	--	--	Hornblende	TR	--	TR	Mica	TR	--	TR	Sand	1	30	3	Silt	20	10	17	Clay	69	70	80
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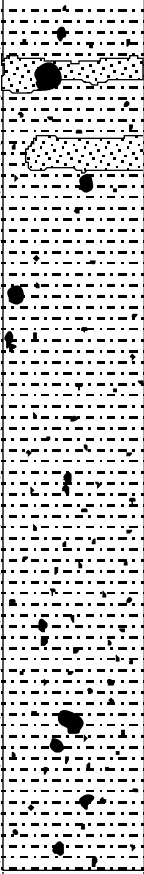
NBP93-08-14 PC

Length (cm)	Lithology	Structure	Disturbance	Latitude:	77° 32.40' S	Water Depth:	680 m																																										
				Longitude:	179° 48.24' E	Core Length:	70 cm																																										
LITHOLOGIC DESCRIPTION																																																	
<div style="text-align: center;">50</div> <div style="text-align: center;">100</div> <div style="text-align: center;">150</div> <div style="text-align: center;">200</div>				<p>0-70 cm: The core consists of clay that grades in color from olive gray (5Y 5/2) at the top to olive gray (5Y 4/2) at the base. Medium, subrounded, basaltic pebbles are found from 46-48, 51-52, and 68-70 cm. Very fine, subrounded, basaltic pebbles are scattered between 0-30 cm and common from 30-70 cm. Olive gray (5Y 4/2) silty layers are found from 10-12, 13-15, and 30-31 cm. Black (5Y 2.5/1) manganese oxide staining occurs from 17-30 and is most concentrated between 25-30 cm.</p> <p>Smear slides:</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Minerals:</th> <th style="text-align: center;"><u>12 cm (m)</u> (layer)</th> <th style="text-align: center;"><u>66 cm (D)</u></th> </tr> </thead> <tbody> <tr><td>Diatoms</td><td style="text-align: center;">1</td><td style="text-align: center;">10</td></tr> <tr><td>Spicules</td><td style="text-align: center;">TR</td><td style="text-align: center;">TR</td></tr> <tr><td>Silicoflagellates</td><td style="text-align: center;">--</td><td style="text-align: center;">--</td></tr> <tr><td>Quartz</td><td style="text-align: center;">25</td><td style="text-align: center;">10</td></tr> <tr><td>Clay</td><td style="text-align: center;">74</td><td style="text-align: center;">77</td></tr> <tr><td>Heavy minerals</td><td style="text-align: center;">TR</td><td style="text-align: center;">3</td></tr> <tr><td>Feldspar</td><td style="text-align: center;">TR</td><td style="text-align: center;">--</td></tr> <tr><td>Hornblende</td><td style="text-align: center;">TR</td><td style="text-align: center;">--</td></tr> <tr><td>Mica</td><td style="text-align: center;">TR</td><td style="text-align: center;">TR</td></tr> <tr><td>Glauconite</td><td style="text-align: center;">--</td><td style="text-align: center;">TR</td></tr> <tr><td>Sand</td><td style="text-align: center;">2</td><td style="text-align: center;">3</td></tr> <tr><td>Silt</td><td style="text-align: center;">23</td><td style="text-align: center;">12</td></tr> <tr><td>Clay</td><td style="text-align: center;">75</td><td style="text-align: center;">85</td></tr> </tbody> </table>				Minerals:	<u>12 cm (m)</u> (layer)	<u>66 cm (D)</u>	Diatoms	1	10	Spicules	TR	TR	Silicoflagellates	--	--	Quartz	25	10	Clay	74	77	Heavy minerals	TR	3	Feldspar	TR	--	Hornblende	TR	--	Mica	TR	TR	Glauconite	--	TR	Sand	2	3	Silt	23	12	Clay	75	85
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Sand	2	3																																															
Silt	23	12																																															
Clay	75	85																																															

NBP93-08-17 PC

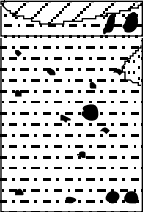

Length (cm)	Lithology	Structure	Disturbance	Latitude: 76° 58.13' S	Water Depth: 357 m																																													
				Longitude: 163° 38.30' E	Core Length: 39 cm																																													
LITHOLOGIC DESCRIPTION																																																		
<div style="display: flex; flex-direction: column; align-items: center;"> <div style="margin-bottom: 20px;">50</div> <div style="margin-bottom: 20px;">100</div> <div>150</div> </div>			<p>0-39 cm: The core consists of dark olive gray (5Y 3/2), diatom-bearing mud. Subrounded, medium, basaltic pebbles are found at 3-4, 13-13.5, and 14.5-15 cm. A subrounded, coarse basaltic pebble occurs at 21-25 cm.</p> <p>The core is slightly disturbed from 0-10 cm and moderately disturbed from 10-39 cm. There is a void at 10-12 cm.</p> <p>Smear slides:</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Minerals:</th> <th style="text-align: center;"><u>2 cm (D)</u></th> <th style="text-align: center;"><u>37 cm (D)</u></th> </tr> </thead> <tbody> <tr><td>Diatoms</td><td style="text-align: center;">10</td><td style="text-align: center;">5</td></tr> <tr><td>Spicules</td><td style="text-align: center;">TR</td><td style="text-align: center;">TR</td></tr> <tr><td>Silicaflagellates</td><td style="text-align: center;">TR</td><td style="text-align: center;">-</td></tr> <tr><td>Quartz</td><td style="text-align: center;">30</td><td style="text-align: center;">30</td></tr> <tr><td>Clay</td><td style="text-align: center;">60</td><td style="text-align: center;">60</td></tr> <tr><td>Heavy minerals</td><td style="text-align: center;">--</td><td style="text-align: center;">4</td></tr> <tr><td>Feldspar</td><td style="text-align: center;">TR</td><td style="text-align: center;">TR</td></tr> <tr><td>Hornblende</td><td style="text-align: center;">TR</td><td style="text-align: center;">TR</td></tr> <tr><td>Phillipsite</td><td style="text-align: center;">--</td><td style="text-align: center;">1</td></tr> <tr><td>Glauconite</td><td style="text-align: center;">TR</td><td style="text-align: center;">TR</td></tr> <tr><td>Volcanic glass</td><td style="text-align: center;">TR</td><td style="text-align: center;">TR</td></tr> <tr><td>Sand</td><td style="text-align: center;">20</td><td style="text-align: center;">25</td></tr> <tr><td>Silt</td><td style="text-align: center;">15</td><td style="text-align: center;">5</td></tr> <tr><td>Clay</td><td style="text-align: center;">65</td><td style="text-align: center;">70</td></tr> </tbody> </table>			Minerals:	<u>2 cm (D)</u>	<u>37 cm (D)</u>	Diatoms	10	5	Spicules	TR	TR	Silicaflagellates	TR	-	Quartz	30	30	Clay	60	60	Heavy minerals	--	4	Feldspar	TR	TR	Hornblende	TR	TR	Phillipsite	--	1	Glauconite	TR	TR	Volcanic glass	TR	TR	Sand	20	25	Silt	15	5	Clay	65	70
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NBP93-08-18 PC

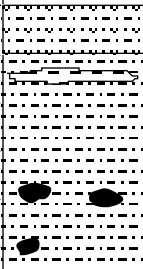
Length (cm)	Lithology	Structure	Disturbance	Latitude: 76° 58.30' S	Water Depth: 260 m																																																												
				Longitude: 163° 42.04' E	Core Length: 181 cm																																																												
LITHOLOGIC DESCRIPTION																																																																	
<div style="display: flex; flex-direction: column; align-items: center;"> <div style="margin-bottom: 50px;">50</div> <div style="margin-bottom: 50px;">100</div> <div style="margin-bottom: 50px;">150</div> <div>200</div> </div>				<p>0-181 cm: The core consists of dark olive gray (5Y 3/2) mud but contains more sand in the uppermost 10 cm. A black (5Y 2.5/1) bleb of poorly sorted, muddy sand, with a coarse, subrounded, basaltic pebble, occurs from 14-18 cm. An olive gray (5Y 4/2) bleb of sandy mud occurs from 29-34 cm.</p> <p>Medium, subrounded, basaltic pebbles are found from 8-9, 46-47, 64-65, 71-72, 73-73.5, 102-102.5, 134-134.5, 137-138, 146-147, 150-153 (sample half), 156-156.5, 164-164.5, and 176-176.5. Very fine, subangular, basaltic pebbles are scattered from 0-80 cm and common from 81-181 cm.</p> <p>Black (5Y 2.5/1) manganese oxide staining occurs from 0-40 cm, with the greatest concentration from 34-40 cm.</p> <p>Smear slides:</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;"><u>Minerals:</u></th> <th style="text-align: center;"><u>15 cm (m)</u> (bleb)</th> <th style="text-align: center;"><u>32 cm (m)</u> (bleb)</th> <th style="text-align: center;"><u>50 cm (D)</u></th> </tr> </thead> <tbody> <tr><td>Diatoms</td><td style="text-align: center;">1</td><td style="text-align: center;">TR</td><td style="text-align: center;">TR</td></tr> <tr><td>Spicules</td><td style="text-align: center;">1</td><td style="text-align: center;">TR</td><td style="text-align: center;">TR</td></tr> <tr><td>Foraminifera</td><td style="text-align: center;">TR</td><td style="text-align: center;">--</td><td style="text-align: center;">--</td></tr> <tr><td>Quartz</td><td style="text-align: center;">60</td><td style="text-align: center;">50</td><td style="text-align: center;">40</td></tr> <tr><td>Clay</td><td style="text-align: center;">30</td><td style="text-align: center;">47</td><td style="text-align: center;">55</td></tr> <tr><td>Heavy minerals</td><td style="text-align: center;">3</td><td style="text-align: center;">3</td><td style="text-align: center;">5</td></tr> <tr><td>Feldspar</td><td style="text-align: center;">TR</td><td style="text-align: center;">TR</td><td style="text-align: center;">TR</td></tr> <tr><td>Hornblende</td><td style="text-align: center;">TR</td><td style="text-align: center;">TR</td><td style="text-align: center;">TR</td></tr> <tr><td>Mica</td><td style="text-align: center;">TR</td><td style="text-align: center;">--</td><td style="text-align: center;">TR</td></tr> <tr><td>Glauconite</td><td style="text-align: center;">TR</td><td style="text-align: center;">--</td><td style="text-align: center;">--</td></tr> <tr><td>Volcanic glass</td><td style="text-align: center;">5</td><td style="text-align: center;">--</td><td style="text-align: center;">TR</td></tr> <tr><td>Sand</td><td style="text-align: center;">50</td><td style="text-align: center;">30</td><td style="text-align: center;">30</td></tr> <tr><td>Silt</td><td style="text-align: center;">10</td><td style="text-align: center;">20</td><td style="text-align: center;">10</td></tr> <tr><td>Clay</td><td style="text-align: center;">40</td><td style="text-align: center;">50</td><td style="text-align: center;">60</td></tr> </tbody> </table>		<u>Minerals:</u>	<u>15 cm (m)</u> (bleb)	<u>32 cm (m)</u> (bleb)	<u>50 cm (D)</u>	Diatoms	1	TR	TR	Spicules	1	TR	TR	Foraminifera	TR	--	--	Quartz	60	50	40	Clay	30	47	55	Heavy minerals	3	3	5	Feldspar	TR	TR	TR	Hornblende	TR	TR	TR	Mica	TR	--	TR	Glauconite	TR	--	--	Volcanic glass	5	--	TR	Sand	50	30	30	Silt	10	20	10	Clay	40	50	60
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Sand	50	30	30																																																														
Silt	10	20	10																																																														
Clay	40	50	60																																																														

Trigger Cores

NBP93-08-01 TC

Length (cm)	Lithology	Structure	Disturbance	Latitude:	77° 21.91' S	Water Depth:	607 m																																																																																
				Longitude:	174° 38.06' E	Core Length:	43 cm																																																																																
LITHOLOGIC DESCRIPTION																																																																																							
50				<p>0-43 cm: The core consists of olive gray (5Y 5/2) diatomaceous mud from 0-8 cm and olive gray (5Y 5/2) mud from 10-43 cm. Medium, subrounded, basaltic pebbles are found from 6-8, 20-21, and 40-41 cm. Very fine, angular, basaltic pebbles are common throughout the core. Dark grayish brown (10YR 4/2) diatomaceous mud laminae occur from 8-10 cm. An olive gray (5Y 4/2) bleb of sandy mud occurs from 9-14 cm. Barnacle plate fragments are found at 7, 23, and 28 cm. A bryozoan fragment occurs at 11 cm.</p> <p>The core is moderately disturbed from 0-4 cm with a void at the top of the core.</p>																																																																																			
100				<p>Smear slides:</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;"><u>Minerals:</u></th> <th style="text-align: center;"><u>5 cm (D)</u></th> <th style="text-align: center;"><u>8 cm (m)</u> (laminae)</th> <th style="text-align: center;"><u>11 cm (m)</u> (bleb)</th> <th style="text-align: center;"><u>42 cm (D)</u></th> </tr> </thead> <tbody> <tr><td>Diatoms</td><td style="text-align: center;">15</td><td style="text-align: center;">15</td><td style="text-align: center;">1</td><td style="text-align: center;">10</td></tr> <tr><td>Spicules</td><td style="text-align: center;">1</td><td style="text-align: center;">1</td><td style="text-align: center;">1</td><td style="text-align: center;">1</td></tr> <tr><td>Silicaflagellates</td><td style="text-align: center;">TR</td><td style="text-align: center;">TR</td><td style="text-align: center;">--</td><td style="text-align: center;">TR</td></tr> <tr><td>Foraminifera</td><td style="text-align: center;">TR</td><td style="text-align: center;">--</td><td style="text-align: center;">--</td><td style="text-align: center;">TR</td></tr> <tr><td>Quartz</td><td style="text-align: center;">30</td><td style="text-align: center;">20</td><td style="text-align: center;">50</td><td style="text-align: center;">25</td></tr> <tr><td>Clay</td><td style="text-align: center;">54</td><td style="text-align: center;">63</td><td style="text-align: center;">48</td><td style="text-align: center;">64</td></tr> <tr><td>Heavy minerals</td><td style="text-align: center;">TR</td><td style="text-align: center;">1</td><td style="text-align: center;">TR</td><td style="text-align: center;">TR</td></tr> <tr><td>Feldspar</td><td style="text-align: center;">--</td><td style="text-align: center;">--</td><td style="text-align: center;">TR</td><td style="text-align: center;">--</td></tr> <tr><td>Hornblende</td><td style="text-align: center;">TR</td><td style="text-align: center;">TR</td><td style="text-align: center;">TR</td><td style="text-align: center;">--</td></tr> <tr><td>Mica</td><td style="text-align: center;">TR</td><td style="text-align: center;">TR</td><td style="text-align: center;">--</td><td style="text-align: center;">--</td></tr> <tr><td>Glauconite</td><td style="text-align: center;">TR</td><td style="text-align: center;">--</td><td style="text-align: center;">--</td><td style="text-align: center;">--</td></tr> <tr><td>Volcanic glass</td><td style="text-align: center;">--</td><td style="text-align: center;">TR</td><td style="text-align: center;">--</td><td style="text-align: center;">--</td></tr> <tr><td>Sand</td><td style="text-align: center;">5</td><td style="text-align: center;">10</td><td style="text-align: center;">40</td><td style="text-align: center;">10</td></tr> <tr><td>Silt</td><td style="text-align: center;">25</td><td style="text-align: center;">20</td><td style="text-align: center;">10</td><td style="text-align: center;">20</td></tr> <tr><td>Clay</td><td style="text-align: center;">70</td><td style="text-align: center;">70</td><td style="text-align: center;">50</td><td style="text-align: center;">70</td></tr> </tbody> </table>				<u>Minerals:</u>	<u>5 cm (D)</u>	<u>8 cm (m)</u> (laminae)	<u>11 cm (m)</u> (bleb)	<u>42 cm (D)</u>	Diatoms	15	15	1	10	Spicules	1	1	1	1	Silicaflagellates	TR	TR	--	TR	Foraminifera	TR	--	--	TR	Quartz	30	20	50	25	Clay	54	63	48	64	Heavy minerals	TR	1	TR	TR	Feldspar	--	--	TR	--	Hornblende	TR	TR	TR	--	Mica	TR	TR	--	--	Glauconite	TR	--	--	--	Volcanic glass	--	TR	--	--	Sand	5	10	40	10	Silt	25	20	10	20	Clay	70	70	50	70
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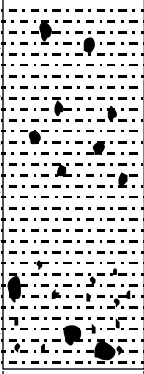
NBP93-08-04 TC

Length (cm)	Lithology	Structure	Disturbance	Latitude: 77° 24.70' S	Water Depth: 658 m																																																												
				Longitude: 176° 00.21' E	Core Length: 53.5 cm																																																												
LITHOLOGIC DESCRIPTION																																																																	
50				<p>0-53.5 cm: The core consists of olive gray (5Y 4/2) diatomaceous mud from 0-10 cm that grades into olive gray (5Y 4/1) diatom-bearing mud. Coarse, subangular, basaltic pebbles are found from 38-40.5 and 48-51 cm. A very dark gray (5Y 5/2) bleb of silt-rich mud occurs from 13-16 cm and a dark gray (5Y 4/1) silt-rich mud layer, with gradational contacts, occurs from 21-24 cm. Olive gray (5Y 4/2) laminae of diatomaceous mud occur at 24-31 cm. Black (5Y 2.5/2) manganese-oxide staining occurs in intervals between 11-16, 20.5-24, and 31.5-53.5 cm.</p>																																																													
100				<p>Smear slides:</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Minerals:</th> <th style="text-align: center;"><u>2 cm (D)</u></th> <th style="text-align: center;"><u>14 cm (m)</u> (bleb)</th> <th style="text-align: center;"><u>22 cm (m)</u> (Dk. bleb)</th> </tr> </thead> <tbody> <tr><td>Diatoms</td><td style="text-align: center;">15</td><td style="text-align: center;">5</td><td style="text-align: center;">3</td></tr> <tr><td>Spicules</td><td style="text-align: center;">TR</td><td style="text-align: center;">TR</td><td style="text-align: center;">TR</td></tr> <tr><td>Silicoflagellates</td><td style="text-align: center;">TR</td><td style="text-align: center;">--</td><td style="text-align: center;">--</td></tr> <tr><td>Foraminifera</td><td style="text-align: center;">--</td><td style="text-align: center;">--</td><td style="text-align: center;">--</td></tr> <tr><td>Quartz</td><td style="text-align: center;">20</td><td style="text-align: center;">50</td><td style="text-align: center;">50</td></tr> <tr><td>Clay</td><td style="text-align: center;">64</td><td style="text-align: center;">42</td><td style="text-align: center;">46</td></tr> <tr><td>Heavy minerals</td><td style="text-align: center;">1</td><td style="text-align: center;">3</td><td style="text-align: center;">1</td></tr> <tr><td>Feldspar</td><td style="text-align: center;">--</td><td style="text-align: center;">--</td><td style="text-align: center;">--</td></tr> <tr><td>Hornblende</td><td style="text-align: center;">TR</td><td style="text-align: center;">--</td><td style="text-align: center;">TR</td></tr> <tr><td>Mica</td><td style="text-align: center;">--</td><td style="text-align: center;">--</td><td style="text-align: center;">TR</td></tr> <tr><td>Glauconite</td><td style="text-align: center;">--</td><td style="text-align: center;">--</td><td style="text-align: center;">--</td></tr> <tr><td>Sand</td><td style="text-align: center;">5</td><td style="text-align: center;">15</td><td style="text-align: center;">5</td></tr> <tr><td>Silt</td><td style="text-align: center;">25</td><td style="text-align: center;">35</td><td style="text-align: center;">45</td></tr> <tr><td>Clay</td><td style="text-align: center;">70</td><td style="text-align: center;">50</td><td style="text-align: center;">50</td></tr> </tbody> </table>		Minerals:	<u>2 cm (D)</u>	<u>14 cm (m)</u> (bleb)	<u>22 cm (m)</u> (Dk. bleb)	Diatoms	15	5	3	Spicules	TR	TR	TR	Silicoflagellates	TR	--	--	Foraminifera	--	--	--	Quartz	20	50	50	Clay	64	42	46	Heavy minerals	1	3	1	Feldspar	--	--	--	Hornblende	TR	--	TR	Mica	--	--	TR	Glauconite	--	--	--	Sand	5	15	5	Silt	25	35	45	Clay	70	50	50
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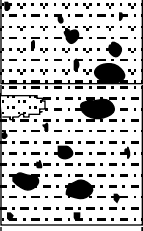
NBP93-08-05 TC

Length (cm)	Lithology	Structure	Disturbance	Latitude:	77° 25.54' S	Water Depth:	672 m																																													
				Longitude:	176° 20.91' E	Core Length:	77 cm																																													
LITHOLOGIC DESCRIPTION																																																				
<div style="text-align: center;">50</div> <div style="text-align: center;">100</div> <div style="text-align: center;">150</div>				<p>0-77 cm: The core consists of olive gray (5Y 4/2) diatom-bearing mud. Fine, subrounded, basaltic pebbles are found from 5-6, 7.5-8.5, 39.5-40, and 45-45.5 cm. Dark gray (5Y 4/1) layers of silt-rich mud, with gradational contacts, occur from 8-11, 17-23, and 25-27 cm. A very dark grayish brown (2.5Y 3/2) mottled zone occurs from 40-50 cm. Black (5Y 2.5/1) manganese-oxide staining is found from 23-27, 36-39, and 45-50 cm.</p> <p>Smear slides:</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;"><u>Minerals:</u></th> <th style="text-align: center;"><u>2 cm (D)</u></th> <th style="text-align: center;"><u>20 cm (m)</u> (Dk. layer)</th> </tr> </thead> <tbody> <tr><td>Diatoms</td><td style="text-align: center;">10</td><td style="text-align: center;">7</td></tr> <tr><td>Spicules</td><td style="text-align: center;">TR</td><td style="text-align: center;">TR</td></tr> <tr><td>Silicaflagellates</td><td style="text-align: center;">TR</td><td style="text-align: center;">-</td></tr> <tr><td>Foraminifera</td><td style="text-align: center;">TR</td><td style="text-align: center;">-</td></tr> <tr><td>Quartz</td><td style="text-align: center;">25</td><td style="text-align: center;">30</td></tr> <tr><td>Clay</td><td style="text-align: center;">65</td><td style="text-align: center;">62</td></tr> <tr><td>Heavy minerals</td><td style="text-align: center;">TR</td><td style="text-align: center;">1</td></tr> <tr><td>Feldspar</td><td style="text-align: center;">--</td><td style="text-align: center;">-</td></tr> <tr><td>Hornblende</td><td style="text-align: center;">TR</td><td style="text-align: center;">-</td></tr> <tr><td>Mica</td><td style="text-align: center;">TR</td><td style="text-align: center;">TR</td></tr> <tr><td>Glauconite</td><td style="text-align: center;">TR</td><td style="text-align: center;">-</td></tr> <tr><td>Sand</td><td style="text-align: center;">5</td><td style="text-align: center;">10</td></tr> <tr><td>Silt</td><td style="text-align: center;">25</td><td style="text-align: center;">25</td></tr> <tr><td>Clay</td><td style="text-align: center;">70</td><td style="text-align: center;">65</td></tr> </tbody> </table>				<u>Minerals:</u>	<u>2 cm (D)</u>	<u>20 cm (m)</u> (Dk. layer)	Diatoms	10	7	Spicules	TR	TR	Silicaflagellates	TR	-	Foraminifera	TR	-	Quartz	25	30	Clay	65	62	Heavy minerals	TR	1	Feldspar	--	-	Hornblende	TR	-	Mica	TR	TR	Glauconite	TR	-	Sand	5	10	Silt	25	25	Clay	70	65
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Clay	70	65																																																		

NBP93-08-06 TC

Length (cm)	Lithology	Structure	Disturbance	Latitude:	77° 30.22' S	Water Depth:	700 m																																													
				Longitude:	176° 50.99' E	Core Length:	77 cm																																													
LITHOLOGIC DESCRIPTION																																																				
50				<p>0-77 cm: The core consists of mud that grades in color from olive gray (5Y 5/2) at the top to dark gray (5Y 4/1) at the base. Fine to medium, subrounded, basaltic pebbles occur at from 6-7, 9-10, 58-61, 69.5-70, and 75.5-76 cm. A dark gray (5Y 4/1) zone, with gradational contacts, consisting of fine to medium, subrounded, basaltic pebbles and silt-rich mud occurs from 13-38 cm. Very fine to fine, subrounded, basaltic pebbles are common in a zone from 55-77 cm. Black (5Y 2.5/1) manganese-oxide staining occurs from 2-13 and 53-58 cm. A zone of dark grayish brown (2.5Y 4/2) mottling occurs from 13-38 cm.</p> <p>Smear slides:</p> <table style="width: 100%; border: none;"> <thead> <tr> <th style="text-align: left;"><u>Minerals:</u></th> <th style="text-align: center;"><u>13 cm (D)</u></th> <th style="text-align: center;"><u>50 cm (D)</u></th> </tr> </thead> <tbody> <tr><td>Diatoms</td><td style="text-align: center;">5</td><td style="text-align: center;">10</td></tr> <tr><td>Spicules</td><td style="text-align: center;">TR</td><td style="text-align: center;">TR</td></tr> <tr><td>Silicaflagellates</td><td style="text-align: center;">--</td><td style="text-align: center;">TR</td></tr> <tr><td>Foraminifera</td><td style="text-align: center;">TR</td><td style="text-align: center;">TR</td></tr> <tr><td>Quartz</td><td style="text-align: center;">35</td><td style="text-align: center;">25</td></tr> <tr><td>Clay</td><td style="text-align: center;">59</td><td style="text-align: center;">65</td></tr> <tr><td>Heavy minerals</td><td style="text-align: center;">1</td><td style="text-align: center;">TR</td></tr> <tr><td>Feldspar</td><td style="text-align: center;">--</td><td style="text-align: center;">--</td></tr> <tr><td>Hornblende</td><td style="text-align: center;">--</td><td style="text-align: center;">--</td></tr> <tr><td>Mica</td><td style="text-align: center;">TR</td><td style="text-align: center;">TR</td></tr> <tr><td>Glauconite</td><td style="text-align: center;">TR</td><td style="text-align: center;">TR</td></tr> <tr><td>Sand</td><td style="text-align: center;">5</td><td style="text-align: center;">5</td></tr> <tr><td>Silt</td><td style="text-align: center;">30</td><td style="text-align: center;">25</td></tr> <tr><td>Clay</td><td style="text-align: center;">65</td><td style="text-align: center;">70</td></tr> </tbody> </table>				<u>Minerals:</u>	<u>13 cm (D)</u>	<u>50 cm (D)</u>	Diatoms	5	10	Spicules	TR	TR	Silicaflagellates	--	TR	Foraminifera	TR	TR	Quartz	35	25	Clay	59	65	Heavy minerals	1	TR	Feldspar	--	--	Hornblende	--	--	Mica	TR	TR	Glauconite	TR	TR	Sand	5	5	Silt	30	25	Clay	65	70
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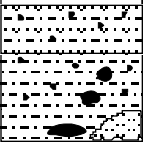

NBP93-08-09 TC

Length (cm)	Lithology	Structure	Disturbance	Latitude:	77° 16.76' S	Water Depth:	576 m																																																												
				Longitude:	177° 06.86' E	Core Length:	47 cm																																																												
LITHOLOGIC DESCRIPTION																																																																			
<div style="text-align: center;">50</div> <div style="text-align: center;">100</div> <div style="text-align: center;">150</div>				<p>0-47 cm: The core consists of olive gray (5Y 5/2) diatomaceous mud at the top that grades to olive gray (5Y 4/2) mud at the base. Fine to medium, subrounded, basaltic pebbles occur at 8-8.5, 13-13.5, 16-19, 21-23, 32-33, and 38-41 cm. Very fine, subrounded, basaltic pebbles are scattered throughout the core. A bleb of sandy mud (with well-sorted subrounded sand) occurs from 20-23 cm.</p> <p style="padding-left: 40px;">The core is slightly disturbed from 16-27 cm.</p> <p>Smear slides:</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;"><u>Minerals:</u></th> <th style="text-align: center;"><u>2 cm (D)</u></th> <th style="text-align: center;"><u>20 cm (m)</u> (bleb)</th> <th style="text-align: center;"><u>45 cm (D)</u></th> </tr> </thead> <tbody> <tr><td>Diatoms</td><td style="text-align: center;">15</td><td style="text-align: center;">3</td><td style="text-align: center;">5</td></tr> <tr><td>Spicules</td><td style="text-align: center;">TR</td><td style="text-align: center;">TR</td><td style="text-align: center;">TR</td></tr> <tr><td>Silicaflagellates</td><td style="text-align: center;">TR</td><td style="text-align: center;">--</td><td style="text-align: center;">--</td></tr> <tr><td>Foraminifera</td><td style="text-align: center;">TR</td><td style="text-align: center;">--</td><td style="text-align: center;">--</td></tr> <tr><td>Quartz</td><td style="text-align: center;">25</td><td style="text-align: center;">40</td><td style="text-align: center;">25</td></tr> <tr><td>Clay</td><td style="text-align: center;">60</td><td style="text-align: center;">57</td><td style="text-align: center;">70</td></tr> <tr><td>Heavy minerals</td><td style="text-align: center;">TR</td><td style="text-align: center;">TR</td><td style="text-align: center;">TR</td></tr> <tr><td>Feldspar</td><td style="text-align: center;">--</td><td style="text-align: center;">--</td><td style="text-align: center;">TR</td></tr> <tr><td>Hornblende</td><td style="text-align: center;">TR</td><td style="text-align: center;">TR</td><td style="text-align: center;">TR</td></tr> <tr><td>Mica</td><td style="text-align: center;">TR</td><td style="text-align: center;">TR</td><td style="text-align: center;">TR</td></tr> <tr><td>Glauconite</td><td style="text-align: center;">--</td><td style="text-align: center;">TR</td><td style="text-align: center;">TR</td></tr> <tr><td>Sand</td><td style="text-align: center;">10</td><td style="text-align: center;">30</td><td style="text-align: center;">5</td></tr> <tr><td>Silt</td><td style="text-align: center;">25</td><td style="text-align: center;">10</td><td style="text-align: center;">25</td></tr> <tr><td>Clay</td><td style="text-align: center;">65</td><td style="text-align: center;">60</td><td style="text-align: center;">70</td></tr> </tbody> </table>				<u>Minerals:</u>	<u>2 cm (D)</u>	<u>20 cm (m)</u> (bleb)	<u>45 cm (D)</u>	Diatoms	15	3	5	Spicules	TR	TR	TR	Silicaflagellates	TR	--	--	Foraminifera	TR	--	--	Quartz	25	40	25	Clay	60	57	70	Heavy minerals	TR	TR	TR	Feldspar	--	--	TR	Hornblende	TR	TR	TR	Mica	TR	TR	TR	Glauconite	--	TR	TR	Sand	10	30	5	Silt	25	10	25	Clay	65	60	70
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Sand	10	30	5																																																																
Silt	25	10	25																																																																
Clay	65	60	70																																																																

NBP93-08-10 TC

Length (cm)	Lithology	Structure	Disturbance	Latitude:	77° 17.81' S	Water Depth:	583 m																																																																
				Longitude:	177° 16.22' E	Core Length:	63 cm																																																																
LITHOLOGIC DESCRIPTION																																																																							
<div style="text-align: center;"> </div>	<p>0-63 cm: The core consists of olive gray (5Y 5/2) diatomaceous mud at the top that grades into olive gray (5Y 4/2) mud at the base. Fine to medium, subangular, basaltic pebbles are found from 9-13, 36-36.5, and 45-45.5 cm. Very fine, basaltic pebbles are common from 5-62 cm. Olive gray (5Y 4/2) blebs of sandy mud occur from 28-32 and 36-37 cm.</p> <p style="padding-left: 40px;">The core is slightly disturbed from 0-18 cm.</p> <p>Smear slides:</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Minerals:</th> <th style="text-align: center;"><u>2 cm (D)</u></th> <th style="text-align: center;"><u>37 cm (m)</u> (bleb)</th> <th style="text-align: center;"><u>60 cm (D)</u></th> </tr> </thead> <tbody> <tr><td>Diatoms</td><td style="text-align: center;">15</td><td style="text-align: center;">1</td><td style="text-align: center;">5</td></tr> <tr><td>Spicules</td><td style="text-align: center;">TR</td><td style="text-align: center;">3</td><td style="text-align: center;">TR</td></tr> <tr><td>Silicaflagellates</td><td style="text-align: center;">TR</td><td style="text-align: center;">TR</td><td style="text-align: center;">--</td></tr> <tr><td>Foraminifera</td><td style="text-align: center;">--</td><td style="text-align: center;">TR</td><td style="text-align: center;">--</td></tr> <tr><td>Quartz</td><td style="text-align: center;">20</td><td style="text-align: center;">35</td><td style="text-align: center;">25</td></tr> <tr><td>Clay</td><td style="text-align: center;">65</td><td style="text-align: center;">61</td><td style="text-align: center;">70</td></tr> <tr><td>Heavy minerals</td><td style="text-align: center;">TR</td><td style="text-align: center;">TR</td><td style="text-align: center;">TR</td></tr> <tr><td>Feldspar</td><td style="text-align: center;">--</td><td style="text-align: center;">--</td><td style="text-align: center;">-</td></tr> <tr><td>Hornblende</td><td style="text-align: center;">--</td><td style="text-align: center;">TR</td><td style="text-align: center;">TR</td></tr> <tr><td>Mica</td><td style="text-align: center;">TR</td><td style="text-align: center;">TR</td><td style="text-align: center;">TR</td></tr> <tr><td>Glauconite</td><td style="text-align: center;">--</td><td style="text-align: center;">TR</td><td style="text-align: center;">--</td></tr> <tr><td>Volcanic glass</td><td style="text-align: center;">--</td><td style="text-align: center;">TR</td><td style="text-align: center;">--</td></tr> <tr><td>Sand</td><td style="text-align: center;">5</td><td style="text-align: center;">30</td><td style="text-align: center;">10</td></tr> <tr><td>Silt</td><td style="text-align: center;">25</td><td style="text-align: center;">5</td><td style="text-align: center;">20</td></tr> <tr><td>Clay</td><td style="text-align: center;">70</td><td style="text-align: center;">65</td><td style="text-align: center;">70</td></tr> </tbody> </table>							Minerals:	<u>2 cm (D)</u>	<u>37 cm (m)</u> (bleb)	<u>60 cm (D)</u>	Diatoms	15	1	5	Spicules	TR	3	TR	Silicaflagellates	TR	TR	--	Foraminifera	--	TR	--	Quartz	20	35	25	Clay	65	61	70	Heavy minerals	TR	TR	TR	Feldspar	--	--	-	Hornblende	--	TR	TR	Mica	TR	TR	TR	Glauconite	--	TR	--	Volcanic glass	--	TR	--	Sand	5	30	10	Silt	25	5	20	Clay	70	65	70
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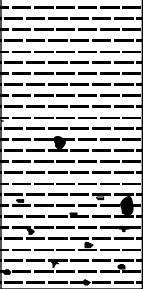
NBP93-08-11 TC

Length (cm)	Lithology	Structure	Disturbance	Latitude:	77° 18.91' S	Water Depth:	589 m																																																												
				Longitude:	177° 27.16' E	Core Length:	28 cm																																																												
LITHOLOGIC DESCRIPTION																																																																			
<div style="text-align: center;">50</div> <div style="text-align: center;">100</div> <div style="text-align: center;">150</div>				<p>0-28 cm: The core consists of olive gray (5Y 5/2) diatomaceous mud at the top that grades to a gray (5Y 5/1) mud at the base. Medium, rounded, basaltic pebbles are found from 16.5-17, 22-23, 25-28 cm. Very fine, subrounded, basaltic pebbles are scattered from 0-22 cm. A bleb of sandy mud (with poorly-sorted sand) occurs at 22-28 cm.</p> <p style="padding-left: 40px;">The core is slightly disturbed from 0-11 cm.</p> <p>Smear slides:</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;"><u>Minerals:</u></th> <th style="text-align: center;"><u>2 cm (D)</u></th> <th style="text-align: center;"><u>25 cm (D)</u></th> <th style="text-align: center;"><u>28 cm (bleb)</u></th> </tr> </thead> <tbody> <tr><td>Diatoms</td><td style="text-align: center;">15</td><td style="text-align: center;">10</td><td style="text-align: center;">--</td></tr> <tr><td>Spicules</td><td style="text-align: center;">1</td><td style="text-align: center;">TR</td><td style="text-align: center;">TR</td></tr> <tr><td>Silicaflagellates</td><td style="text-align: center;">TR</td><td style="text-align: center;">TR</td><td style="text-align: center;">--</td></tr> <tr><td>Foraminifera</td><td style="text-align: center;">--</td><td style="text-align: center;">--</td><td style="text-align: center;">--</td></tr> <tr><td>Quartz</td><td style="text-align: center;">20</td><td style="text-align: center;">25</td><td style="text-align: center;">45</td></tr> <tr><td>Clay</td><td style="text-align: center;">64</td><td style="text-align: center;">65</td><td style="text-align: center;">54</td></tr> <tr><td>Heavy minerals</td><td style="text-align: center;">TR</td><td style="text-align: center;">TR</td><td style="text-align: center;">1</td></tr> <tr><td>Feldspar</td><td style="text-align: center;">--</td><td style="text-align: center;">--</td><td style="text-align: center;">--</td></tr> <tr><td>Hornblende</td><td style="text-align: center;">TR</td><td style="text-align: center;">--</td><td style="text-align: center;">TR</td></tr> <tr><td>Mica</td><td style="text-align: center;">TR</td><td style="text-align: center;">TR</td><td style="text-align: center;">--</td></tr> <tr><td>Glauconite</td><td style="text-align: center;">TR</td><td style="text-align: center;">TR</td><td style="text-align: center;">--</td></tr> <tr><td>Sand</td><td style="text-align: center;">15</td><td style="text-align: center;">10</td><td style="text-align: center;">30</td></tr> <tr><td>Silt</td><td style="text-align: center;">15</td><td style="text-align: center;">20</td><td style="text-align: center;">15</td></tr> <tr><td>Clay</td><td style="text-align: center;">70</td><td style="text-align: center;">70</td><td style="text-align: center;">55</td></tr> </tbody> </table>				<u>Minerals:</u>	<u>2 cm (D)</u>	<u>25 cm (D)</u>	<u>28 cm (bleb)</u>	Diatoms	15	10	--	Spicules	1	TR	TR	Silicaflagellates	TR	TR	--	Foraminifera	--	--	--	Quartz	20	25	45	Clay	64	65	54	Heavy minerals	TR	TR	1	Feldspar	--	--	--	Hornblende	TR	--	TR	Mica	TR	TR	--	Glauconite	TR	TR	--	Sand	15	10	30	Silt	15	20	15	Clay	70	70	55
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Silt	15	20	15																																																																
Clay	70	70	55																																																																

NBP93-08-13 TC

Length (cm)	Lithology	Structure	Disturbance	Latitude: 77° 119.16' S	Water Depth: 675 m																																																										
				Longitude: 177° 59.24' E	Core Length: 81 cm																																																										
LITHOLOGIC DESCRIPTION																																																															
<div style="display: flex; flex-direction: column; align-items: center;"> <div style="margin-bottom: 20px;">50</div> <div style="margin-bottom: 20px;">100</div> <div style="margin-bottom: 20px;">150</div> <div style="margin-bottom: 20px;">200</div> </div>			<p>0-51 cm: This interval consists of olive gray (5Y 5/2), diatom-rich mud. Olive (5Y 5/3) mottling occurs over the interval from 23-31 cm. A sharp color and lithologic change occurs at 51 cm.</p> <p>51-81 cm: This interval consists of olive gray (5Y 3/2) clay. Fine to medium, subrounded, basaltic pebbles are found from 53-56 and 72-72.5, and very fine, subrounded, basaltic pebbles are common from 55-81 cm. A bleb of sand-bearing mud (with poorly-sorted, subangular sand) occurs from 51-53 cm.</p> <p style="text-align: center;">The core is slightly disturbed from 0-40 cm.</p> <p>Smear slides:</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;"><u>Minerals:</u></th> <th style="text-align: center;"><u>2 cm (D)</u></th> <th style="text-align: center;"><u>52 cm (m)</u> (bleb)</th> <th style="text-align: center;"><u>78 cm (D)</u></th> </tr> </thead> <tbody> <tr><td>Diatoms</td><td style="text-align: center;">10</td><td style="text-align: center;">TR</td><td style="text-align: center;">1</td></tr> <tr><td>Spicules</td><td style="text-align: center;">TR</td><td style="text-align: center;">TR</td><td style="text-align: center;">TR</td></tr> <tr><td>Silicaflagellates</td><td style="text-align: center;">--</td><td style="text-align: center;">--</td><td style="text-align: center;">--</td></tr> <tr><td>Foraminifera</td><td style="text-align: center;">--</td><td style="text-align: center;">--</td><td style="text-align: center;">--</td></tr> <tr><td>Quartz</td><td style="text-align: center;">20</td><td style="text-align: center;">35</td><td style="text-align: center;">15</td></tr> <tr><td>Clay</td><td style="text-align: center;">70</td><td style="text-align: center;">65</td><td style="text-align: center;">84</td></tr> <tr><td>Heavy minerals</td><td style="text-align: center;">TR</td><td style="text-align: center;">TR</td><td style="text-align: center;">TR</td></tr> <tr><td>Feldspar</td><td style="text-align: center;">--</td><td style="text-align: center;">--</td><td style="text-align: center;">--</td></tr> <tr><td>Hornblende</td><td style="text-align: center;">TR</td><td style="text-align: center;">TR</td><td style="text-align: center;">--</td></tr> <tr><td>Mica</td><td style="text-align: center;">TR</td><td style="text-align: center;">--</td><td style="text-align: center;">--</td></tr> <tr><td>Glauconite</td><td style="text-align: center;">--</td><td style="text-align: center;">--</td><td style="text-align: center;">--</td></tr> <tr><td>Sand</td><td style="text-align: center;">10</td><td style="text-align: center;">10</td><td style="text-align: center;">TR</td></tr> <tr><td>Silt</td><td style="text-align: center;">20</td><td style="text-align: center;">25</td><td style="text-align: center;">15</td></tr> <tr><td>Clay</td><td style="text-align: center;">70</td><td style="text-align: center;">65</td><td style="text-align: center;">85</td></tr> </tbody> </table>	<u>Minerals:</u>	<u>2 cm (D)</u>	<u>52 cm (m)</u> (bleb)	<u>78 cm (D)</u>	Diatoms	10	TR	1	Spicules	TR	TR	TR	Silicaflagellates	--	--	--	Foraminifera	--	--	--	Quartz	20	35	15	Clay	70	65	84	Heavy minerals	TR	TR	TR	Feldspar	--	--	--	Hornblende	TR	TR	--	Mica	TR	--	--	Glauconite	--	--	--	Sand	10	10	TR	Silt	20	25	15	Clay	70	65	85
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NBP93-08-14 TC

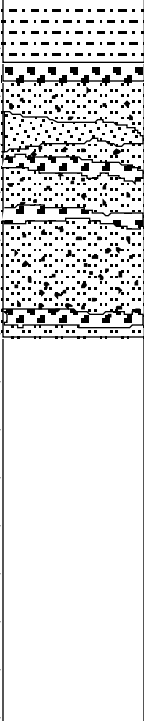
Length (cm)	Lithology	Structure	Disturbance	Latitude:	77° 32.40' S	Water Depth:	680 m																																										
				Longitude:	179° 48.20' E	Core Length:	60 cm																																										
LITHOLOGIC DESCRIPTION																																																	
<div style="text-align: center;">50</div> <div style="text-align: center;">100</div> <div style="text-align: center;">150</div>				<p>0-60 cm: The core consists of olive gray (5Y 5/2), diatom-bearing clay at the top that grades into an olive gray (5Y 4/2) silt-rich clay at the base. Grayish brown (2.5Y 5/2) mottling occurs over the interval from 27-34 cm. Medium, subrounded, basaltic pebbles are found from 31-32 and 43-45.5 cm. Very fine basaltic pebbles are scattered from 40-60 cm. Black (5Y 2.5/1) oxide staining occurs from 40-60 cm.</p> <p>Smear slides:</p> <p><u>Minerals:</u> <u>2 cm (D)</u> <u>36 cm (D)</u></p> <table style="width: 100%; border: none;"> <tr> <td style="width: 40%;">Diatoms</td> <td style="width: 20%; text-align: center;">5</td> <td style="width: 20%; text-align: center;">1</td> </tr> <tr> <td>Spicules</td> <td style="text-align: center;">TR</td> <td style="text-align: center;">TR</td> </tr> <tr> <td>Siliciflagellates</td> <td style="text-align: center;">TR</td> <td style="text-align: center;">-</td> </tr> <tr> <td>Foraminifera</td> <td style="text-align: center;">TR</td> <td style="text-align: center;">-</td> </tr> <tr> <td>Quartz</td> <td style="text-align: center;">15</td> <td style="text-align: center;">30</td> </tr> <tr> <td>Clay</td> <td style="text-align: center;">80</td> <td style="text-align: center;">68</td> </tr> <tr> <td>Heavy minerals</td> <td style="text-align: center;">TR</td> <td style="text-align: center;">1</td> </tr> <tr> <td>Feldspar</td> <td style="text-align: center;">--</td> <td style="text-align: center;">--</td> </tr> <tr> <td>Hornblende</td> <td style="text-align: center;">TR</td> <td style="text-align: center;">-</td> </tr> <tr> <td>Mica</td> <td style="text-align: center;">TR</td> <td style="text-align: center;">TR</td> </tr> <tr> <td colspan="3"> </td> </tr> <tr> <td>Sand</td> <td style="text-align: center;">5</td> <td style="text-align: center;">3</td> </tr> <tr> <td>Silt</td> <td style="text-align: center;">10</td> <td style="text-align: center;">27</td> </tr> <tr> <td>Clay</td> <td style="text-align: center;">85</td> <td style="text-align: center;">70</td> </tr> </table>				Diatoms	5	1	Spicules	TR	TR	Siliciflagellates	TR	-	Foraminifera	TR	-	Quartz	15	30	Clay	80	68	Heavy minerals	TR	1	Feldspar	--	--	Hornblende	TR	-	Mica	TR	TR				Sand	5	3	Silt	10	27	Clay	85	70
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Sand	5	3																																															
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Clay	85	70																																															

Gravity Cores

NBP93-08-15 GC

Length (cm)	Lithology	Structure	Disturbance	Latitude:	77° 37.913' S	Water Depth:	669 m																																							
				Longitude:	179° 12.44' W	Core Length:	278 cm																																							
LITHOLOGIC DESCRIPTION																																														
<div style="display: flex; flex-direction: column; align-items: center;"> <div style="margin-bottom: 50px;">50</div> <div style="margin-bottom: 50px;">100</div> <div style="margin-bottom: 50px;">150</div> <div style="margin-bottom: 50px;">200</div> <div style="margin-bottom: 50px;">250</div> </div>				<p>0-278 cm: The core consists of diatom-bearing mud/clay that grades in color from olive gray (5Y 5/2) at the top to olive gray (5Y 4/2) at the base. The core has olive gray (5Y4/2) mottling from 0-51 cm, with the greatest concentration from 10-22 cm. The top of the core has a slightly higher concentration of siliceous material than the base. Sandier mud layers, with gradational contacts, are present over the intervals from 49-54, 55-57, and 60-62 cm. A very coarse, rounded, basaltic pebble is found from 209.5-215.5 cm. Coarse, subrounded, basaltic pebbles are found at 35-38, 111-112, 122-123, 144.5-145, 170-172, 192.5-193, 203-203.5, and 241-242 cm. Very fine to fine, subrounded, basaltic pebbles are scattered from 0-54 cm and common from 54-278 cm.</p> <p>Smear slides:</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Minerals:</th> <th style="text-align: center;"><u>2 cm (D)</u></th> <th style="text-align: center;"><u>61 cm (m)</u> (layer)</th> </tr> </thead> <tbody> <tr><td>Diatoms</td><td style="text-align: center;">10</td><td style="text-align: center;">TR</td></tr> <tr><td>Spicules</td><td style="text-align: center;">TR</td><td style="text-align: center;">TR</td></tr> <tr><td>Silicaflagellates</td><td style="text-align: center;">TR</td><td style="text-align: center;">-</td></tr> <tr><td>Quartz</td><td style="text-align: center;">25</td><td style="text-align: center;">35</td></tr> <tr><td>Clay</td><td style="text-align: center;">65</td><td style="text-align: center;">65</td></tr> <tr><td>Heavy minerals</td><td style="text-align: center;">--</td><td style="text-align: center;">TR</td></tr> <tr><td>Feldspar</td><td style="text-align: center;">--</td><td style="text-align: center;">--</td></tr> <tr><td>Hornblende</td><td style="text-align: center;">TR</td><td style="text-align: center;">--</td></tr> <tr><td>Mica</td><td style="text-align: center;">TR</td><td style="text-align: center;">--</td></tr> <tr><td>Sand</td><td style="text-align: center;">15</td><td style="text-align: center;">25</td></tr> <tr><td>Silt</td><td style="text-align: center;">10</td><td style="text-align: center;">5</td></tr> <tr><td>Clay</td><td style="text-align: center;">75</td><td style="text-align: center;">70</td></tr> </tbody> </table>				Minerals:	<u>2 cm (D)</u>	<u>61 cm (m)</u> (layer)	Diatoms	10	TR	Spicules	TR	TR	Silicaflagellates	TR	-	Quartz	25	35	Clay	65	65	Heavy minerals	--	TR	Feldspar	--	--	Hornblende	TR	--	Mica	TR	--	Sand	15	25	Silt	10	5	Clay	75	70
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Sand	15	25																																												
Silt	10	5																																												
Clay	75	70																																												

NBP93-08-16 GC

Length (cm)	Lithology	Structure	Disturbance	Latitude: 76° 57.61' S	Water Depth: 462 m																																																
				Longitude: 163° 31.95' E	Core Length: 70 cm																																																
LITHOLOGIC DESCRIPTION																																																					
<div style="display: flex; flex-direction: column; align-items: center;"> <div style="margin-bottom: 20px;">50</div> <div style="margin-bottom: 20px;">100</div> </div>				<p>0-70 cm: The core grades from olive gray (5Y 4/2) mud at the top to dark gray (5Y 4/1) sandy mud towards the base. A very dark gray (5Y 3/1) stringer of subrounded, fine sand/coarse silt and very fine to fine, subrounded, basaltic pebbles occurs at 24-31.5 cm. Layers of fine to medium, subrounded, basaltic pebbles are found from 12-14, 32-34, 44-46, and 66-68 cm.</p> <p>Smear slides:</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;"><u>Minerals:</u></th> <th style="text-align: center;"><u>2 cm (D)</u></th> <th style="text-align: center;"><u>26 cm (m)</u> (stringer)</th> <th style="text-align: center;"><u>40 cm (D)</u></th> </tr> </thead> <tbody> <tr><td>Diatoms</td><td style="text-align: center;">TR</td><td style="text-align: center;">--</td><td style="text-align: center;">--</td></tr> <tr><td>Spicules</td><td style="text-align: center;">TR</td><td style="text-align: center;">TR</td><td style="text-align: center;">--</td></tr> <tr><td>Quartz</td><td style="text-align: center;">30</td><td style="text-align: center;">40</td><td style="text-align: center;">40</td></tr> <tr><td>Clay</td><td style="text-align: center;">70</td><td style="text-align: center;">59</td><td style="text-align: center;">40</td></tr> <tr><td>Heavy minerals</td><td style="text-align: center;">TR</td><td style="text-align: center;">1</td><td style="text-align: center;">--</td></tr> <tr><td>Feldspar</td><td style="text-align: center;">TR</td><td style="text-align: center;">TR</td><td style="text-align: center;">--</td></tr> <tr><td>Hornblende</td><td style="text-align: center;">TR</td><td style="text-align: center;">TR</td><td style="text-align: center;">TR</td></tr> <tr><td>Unsp. Carbonate</td><td style="text-align: center;">--</td><td style="text-align: center;">--</td><td style="text-align: center;">20</td></tr> <tr><td>Sand</td><td style="text-align: center;">25</td><td style="text-align: center;">20</td><td style="text-align: center;">35</td></tr> <tr><td>Silt</td><td style="text-align: center;">5</td><td style="text-align: center;">20</td><td style="text-align: center;">15</td></tr> <tr><td>Clay</td><td style="text-align: center;">70</td><td style="text-align: center;">60</td><td style="text-align: center;">50</td></tr> </tbody> </table>		<u>Minerals:</u>	<u>2 cm (D)</u>	<u>26 cm (m)</u> (stringer)	<u>40 cm (D)</u>	Diatoms	TR	--	--	Spicules	TR	TR	--	Quartz	30	40	40	Clay	70	59	40	Heavy minerals	TR	1	--	Feldspar	TR	TR	--	Hornblende	TR	TR	TR	Unsp. Carbonate	--	--	20	Sand	25	20	35	Silt	5	20	15	Clay	70	60	50
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Bag Samples

The following bagged samples from cruise NBP93-08 are stored at the Antarctic Research Facility and are available for sampling.

Piston/Gravity Core Bag Samples

NBP93-08 PC-1	Cutter, Outside of barrel
NBP93-08 PC-2	Bottom of Cutter, Bottom of core
NBP93-08 PC-3	Cutter, Bottom of core
NBP93-08 PC-4	Cutter, Bottom of core
NBP93-08 PC-5	Bottom of core
NBP93-08 PC-6	Cutter, Catcher
NBP93-08 PC-7	Cutter, Catcher
NBP93-08 PC-8	Cutter, Bottom of core, top of core
NBP93-08 PC-9	Cutter, Catcher
NBP93-08 PC-10	Cutter
NBP93-08 PC-11	Catcher
NBP93-08 PC-13	Cutter
NBP93-08 PC-14	Cutter
NBP93-08 GC-15	Cutter, Catcher
NBP93-08 GC-16	Catcher, Top of core
NBP93-08 PC-18	Cutter, Catcher, Top of core

Trigger Core Bag Samples

NBP93-08 TC-1	Cutter, Top of core
NBP93-08 TC-2	Catcher, Bottom of core
NBP93-08 TC-3	Catcher
NBP93-08 TC-4	Cutter
NBP93-08 TC-5	Cutter (2 bags)
NBP93-08 TC-6	Cutter
NBP93-08 TC-8	Cutter
NBP93-08 TC-9	Cutter
NBP93-08 TC-10	Cutter
NBP93-08 TC-11	Cutter
NBP93-08 TC-13	Cutter
NBP93-08 TC-14	Cutter
NBP93-08 TC-18	Cutter

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SAMPLE DISTRIBUTION POLICY

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The Antarctic Research Facility (ARF) at Florida State University is funded by the Division of Polar Programs, National Science Foundation, and is a national depository for antarctic and subantarctic marine geological materials recovered by U.S. research vessels. The ARF also houses a variety of drill cores and other materials pertaining to polar geology. The collection includes piston, trigger, and Phleger cores, grab and trawl samples, and various other materials recovered from the following expeditions:

USNS *Eltanin* / ARA *Islas Orcadas* Circumpolar Survey
Deep Freeze (*Glacier*) cruises 76, 78, 79, 80, 81, 82, 83, 85, 86, 87
International Weddell Sea Oceanographic Expeditions (IWSOE)
Dry Valley Drilling Project (DVDP)
Eastern Taylor Valley (ETV) Project
Cenozoic Investigations of the western Ross Sea (CIROS 1&2)
Ross Ice Shelf Project
R/V *Polar Duke* Expeditions (cruises 86, 88, 89, 90, 91, 92)
R/V *Nathaniel B. Palmer* (cruises 93, 94, 95)
Assorted grab, trawl, and dredge rock specimens obtained by the USNS *Eltanin* (appx. 4200 kg) and several hundred specimens recovered by the research vessels *Anton Brun*, *Robert Conrad*, *Hero*, and *Vema*

Published descriptions are available for most of this material and are sent to perspective ARF users and libraries upon request to the curator. Additional core description volumes are being prepared by the ARF staff. These publications are generally used as a guide to detailed sampling.

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Investigator(s):

Project Title:

Funding for project (indicate source and grant number):

Summary of proposed research:

Sample Request: Indicate **cruise, core, type, interval, and volume** (please use attached form). We will adhere to this request as best as possible but actual sample distribution may differ due to availability and/or core condition.

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