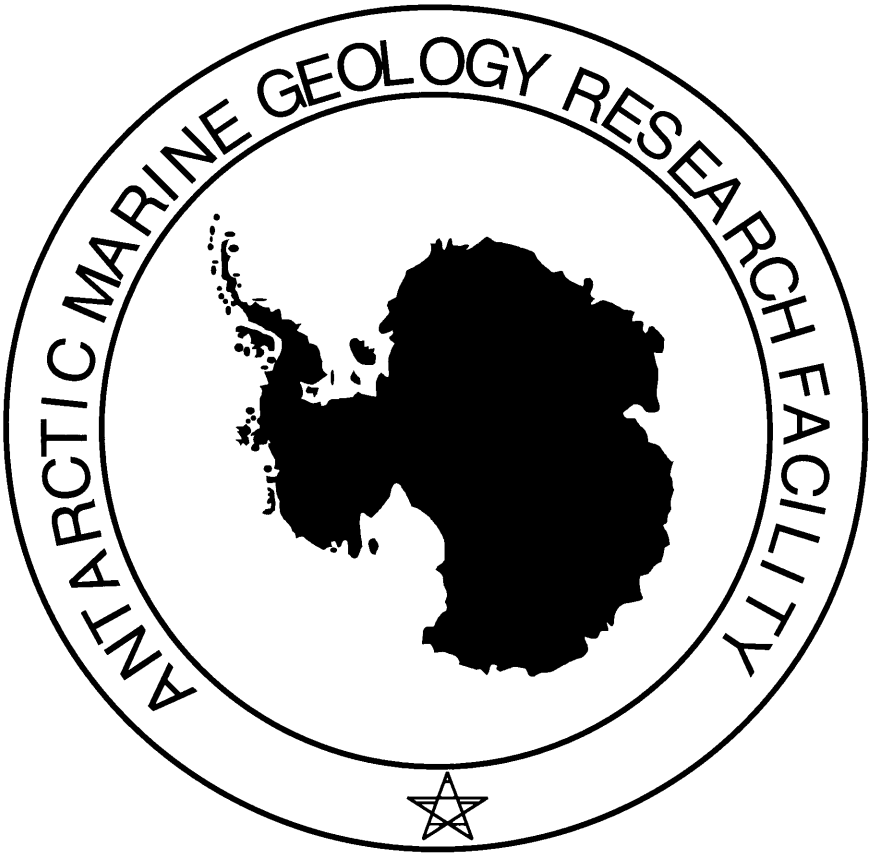

SEDIMENT DESCRIPTIONS
for
R/V *POLAR DUKE*
CRUISE VI, 1988

Antarctic Marine Geology Research Facility Contribution No. 1

FLORIDA STATE UNIVERSITY
Tallahassee, Florida

SEDIMENT DESCRIPTIONS

for

R/V *Polar Duke*

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DESCRIPTIONS OF SEDIMENT RECOVERED BY THE R/V *POLAR DUKE*, UNITED STATES ANTARCTIC PROGRAM CRUISE VI, 1988

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INTRODUCTION

This volume contains the descriptions of sediments recovered by the R/V *Polar Duke* during the sixth cruise of 1988 (herein referred to as PD88-VI). During May, 1988, the R/V *Polar Duke* collected a total of 2480 nautical miles of digitally-recorded single-channel seimic data in the vicinity of the northern Antarctic Peninsula. Seventeen coring stations were occupied, primarily to recover cores for thermal conductivity measurements (Table 1 and Figures 1-3). A total of 10 piston cores, 10 trigger cores and 5 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; Bryan and Pospichal, 1993; Stravers et al., 1993; Hovan and Janecek, 1994a, b, c, and d), five cruises of the R/V*Nathaniel B. Palmer* (Janecek, 1995a, b; unpublished data), the Dry Valley Drilling Project (DVDP) (Dry Valley Drilling Project, 1974, 1975, 1976; McGinnis, 1979; Torii, 1981), the Ross Ice Shelf Project (RISP)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 of criuse PD88-VI, a discussion of core recovery and processing, a table and several maps of station locations, an explanation of laboratory descriptive procedures, lithologic and smear-slide descriptions of piston, trigger, and gravity cores and bag samples, and several appendices containing information and forms for requesting sediment samples.

R/V *POLAR DUKE*, CRUISE VI, 1988

The objectives and preliminary results of cruise PD88-VI have been summarized by Lawver et al. (1988) and Lawver and Villinger (1989). The cruise was initially scheduled to investigate the Powell Basin immediately to the east of the tip of the Antarctic Peninsula and the King George Basin of the Bransfield Strait (Fig. 1). However, multi-year ice coverage in both locations did not allow for any work in the Powell Basin and only coring and limited seismic work in the King George Basin. Instead, the scientific staff took the opportunity to investigate the North Bransfield Basin (Figs. 2 and 3), which may be a junction that connects transform motion along the Shackleton fracture zone and the South Scotia Ridge with extension into the Bransfield Strait. A survey of the Hero Fracture zone was also conducted in order to complete a survey of the region that had been initiated on an earlier R/V *Polar Duke* cruise in 1987.

During cruise PD88-VI to the Antarctic Peninsula (30 April to 29 May, 1987), a total of 2480 nautical miles of digitally-recorded single-channel seismic data and 3151 nautical miles of underway magnetic field measurements were recorded. Seventeen coring stations were occupied during the cruise, primarily to recover sediment for thermal conductivity measurements. Once several technical problems with the coring apparatus were solved, coring operations proceeded smoothly (Lawver el al. 1988). Over two meters of sediment were recovered in each of the first three gravity cores in the North Bransfield Basin (Fig. 2). Most of the material washed out of the fourth gravity core and operations were switched over to the piston coring system at that point as the gravity core barrel did not have a stopper valve. Stations 5-9, in the King George Basin, had excellent recovery, with three cores over 560 cm in length (Fig. 2). Coring in the South Shetland Trench region (Stations 10-17; Fig. 3) was successful but recovery was low owing to the coarse nature of the sediments.

Table 1. PD88-VI coring statistics

Station ID	Core Type	Latitude (°S)	Longitude (°W)	Depth (m)	Length (cm)	TC length (cm)	Bag sample
PD88-VI-1	Gravity	61°35.341’	54°41.640’	2342	266	n/a	1
PD88-VI-2	Gravity	61°30.126’	54°32.941’	1490	221	n/a	1
PD88-VI-3	Gravity	61°29.317’	54°05.029’	956	253	n/a	1
PD88-VI-4	Gravity	61°41.819’	54°54.206’	2161	57	n/a	1
PD88-VI-5	Piston	62°15.638’	57°28.986’	1980	576	49	2
PD88-VI-6	Piston	62°13.04’	57°35.487’	1969	299	63	--
PD88-VI-7	Piston	62°15.623’	57°37.542’	1980	276	87	2
PD88-VI-8	Piston	62°14.893’	57°38.441’	1978	567	84	3
PD88-VI-9	Piston	62°18.664’	57°43.597’	1990	597	74	2
PD88-VI-10	Gravity	62°32.723’	61°53.259’	191	56	n/a	1
PD88-VI-11	Piston	62°32.834’	61°53.868’	175	33	Bag	3
PD88-VI-12	Piston	62°27.080’	61°28.960’	165	25	Bag	5
PD88-VI-13	Gravity	62°19.809’	61°03.798’	152	NR	n/a	1
PD88-VI-14	Piston	62°20.192’	61°06.116’	178	211	Bag	2
PD88-VI-15	Piston	62°14.460’	60°42.121’	439	125	82	4
PD88-VI-16	Piston	62°05.420’	60°10.568’	381	239	77	2
PD88-VI-17	Piston	62°09.261’	59°54.950’	103	NR	NR	1

* NR= No Recovery ; n/a= not applicable; Bag= sediment archived in a bag sample

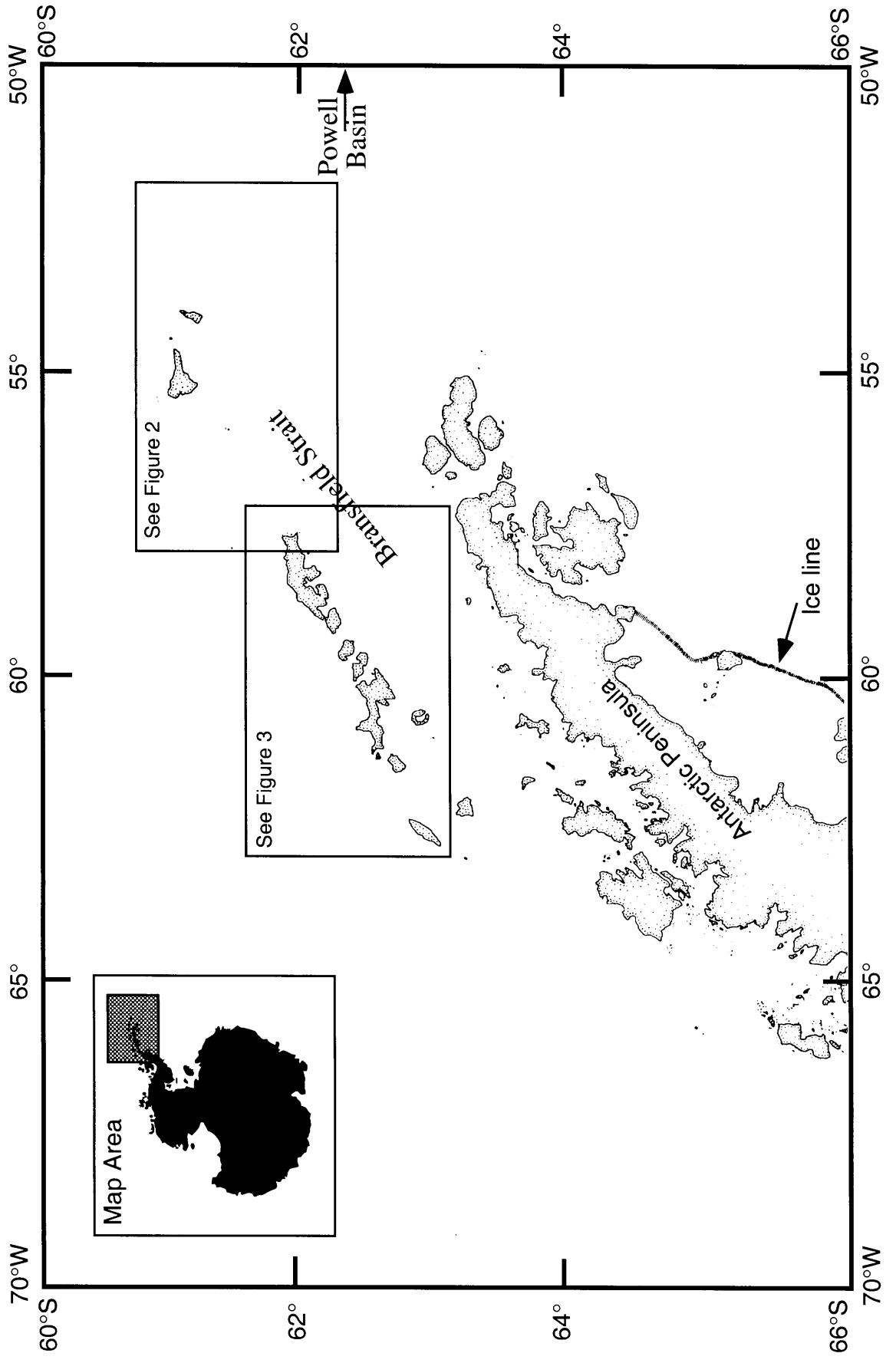


Figure 1. Location of coring areas during Cruise PD88-VI. See Figures 2 and 3 for more detailed maps.

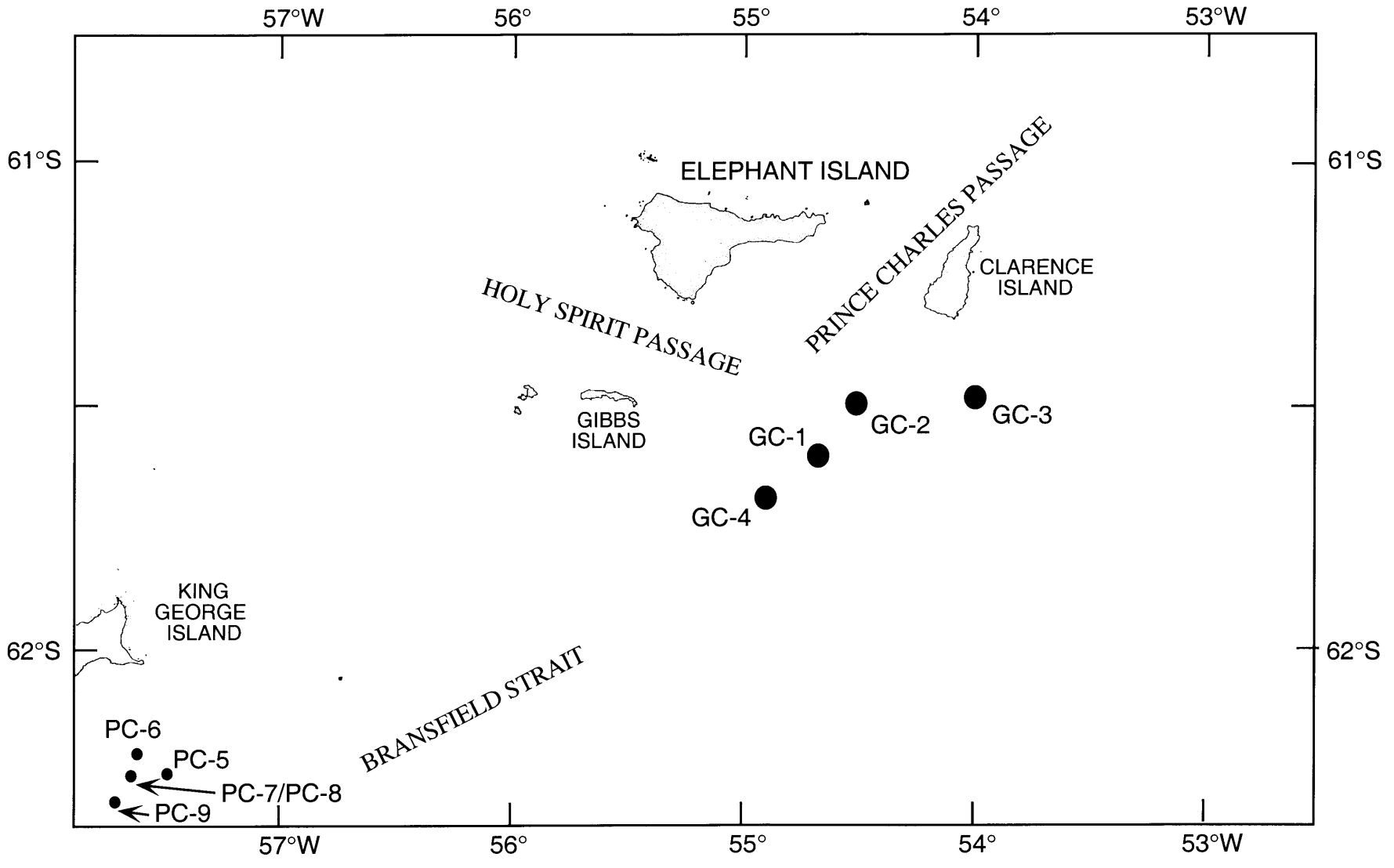


Figure 2. Location of piston and gravity cores collected in the vicinity of North Bransfield Basin (GCs 1-4) and the King George Basin (PCs 5-9). See Figure 1 for location of map area.

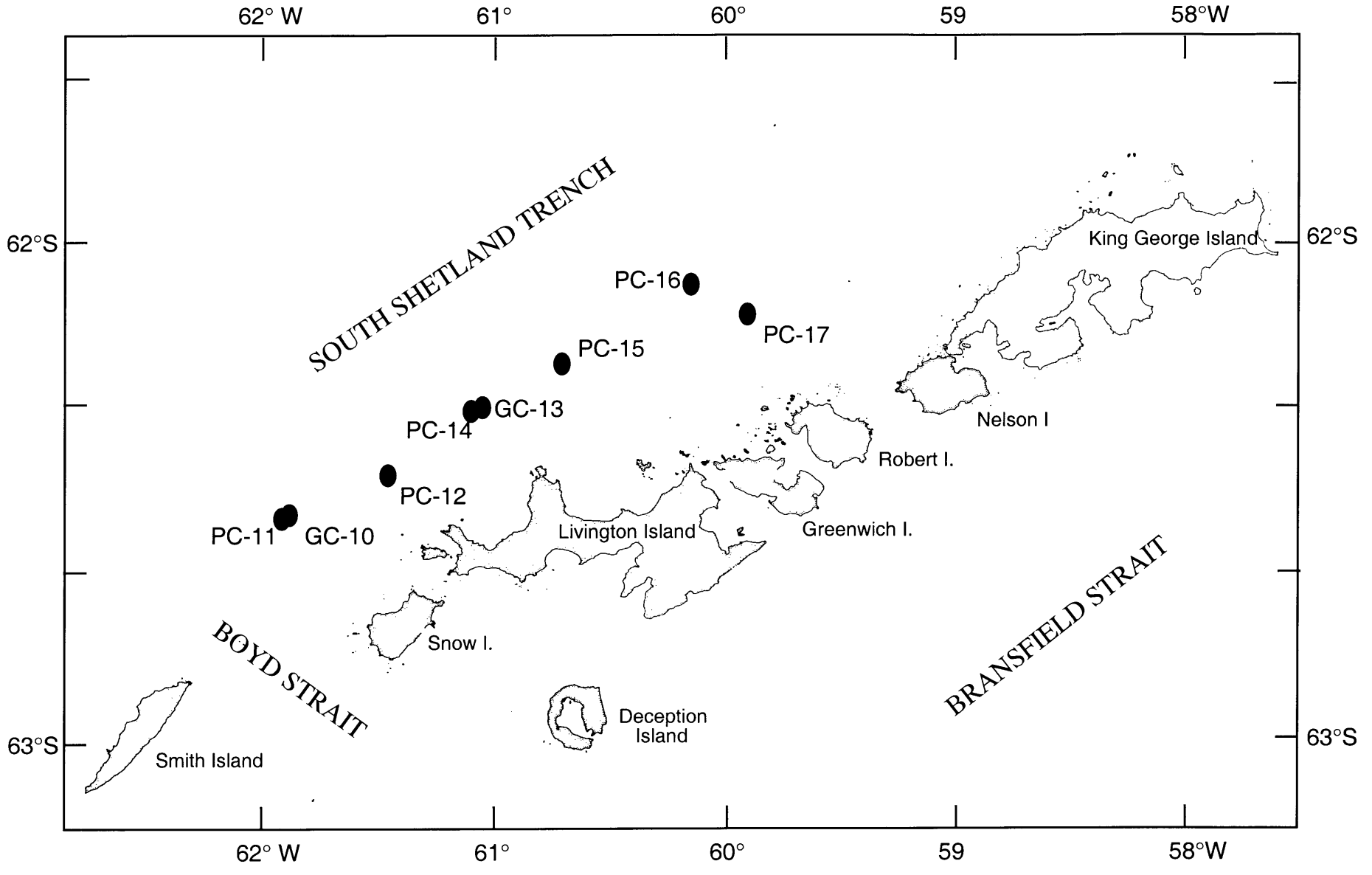


Figure 3. Location of PD88-VI coring stations in the vicinity of the South Shetland Trench. See Figure 1 for location of this map.

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 (~2°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. Note that a different scale was used for cores 5PC, 8PC, and 9PC (600 cm/page instead of 300 cm/page).

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.

Megascopic 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. (For bagged sediments, this interval is replaced by the wet weight of the sediment in grams). 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 volcaniclastics, 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 and 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 4):

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 5 and 6). Sand/silt/clay ratios, based upon optical examination of smear slides, are presented in Table 2 at the end of the core-log description section. 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:

Fine ash:	less than 63 µm
Coarse ash:	63 µm to 2 mm
Lapilli:	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").

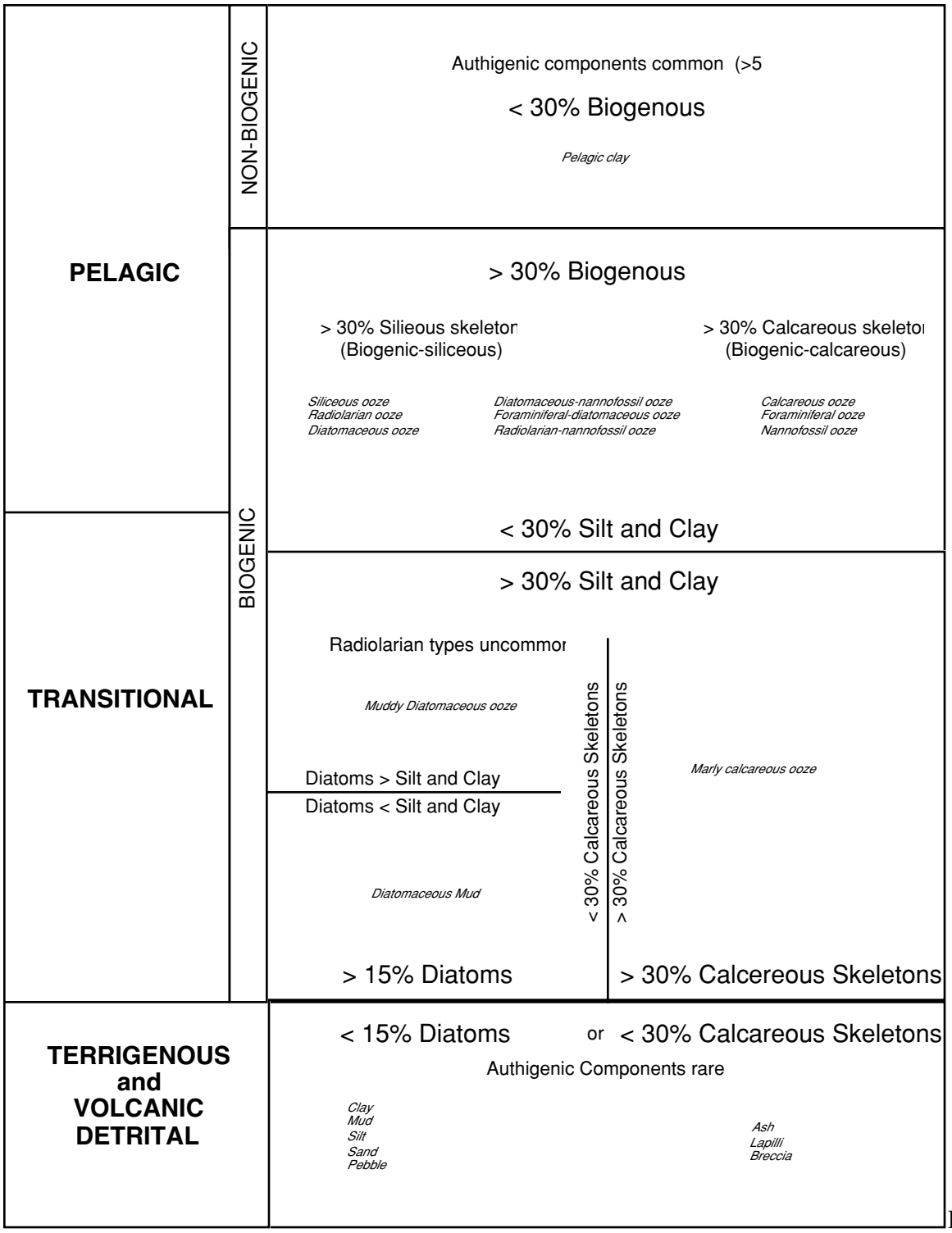


Figure 4. Classification scheme used for marine sediments.

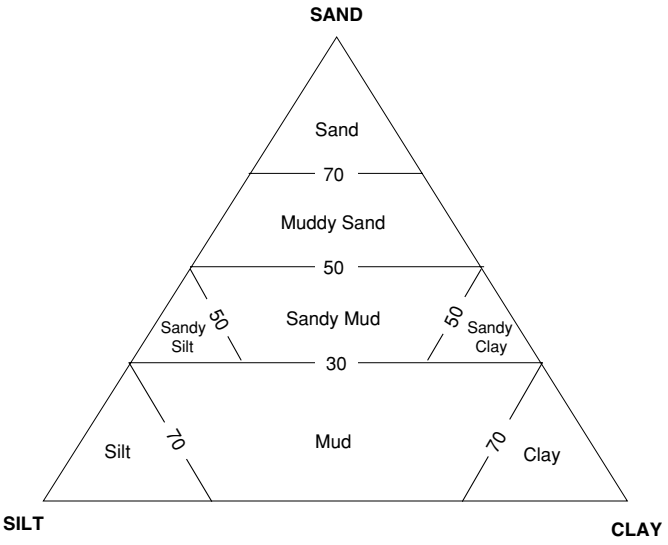


Figure 5. Classification of clastic sediments

Limiting Size (mm)	SIZE CLASS	
64		
	Very Coarse	PEBBLES
32		
	Coarse	
16		
	Medium	
8		
	Fine	
4		
	Very Fine	
2		
	Very Coarse	SAND
1		
	Coarse	
.5		
	Medium	
.25		
	Fine	
.125		
	Very Fine	
.062		
	Coarse	SILT
.031		
	Medium	
.016		
	Fine	
.008		
	Very Fine	
.004		
	CLAY	

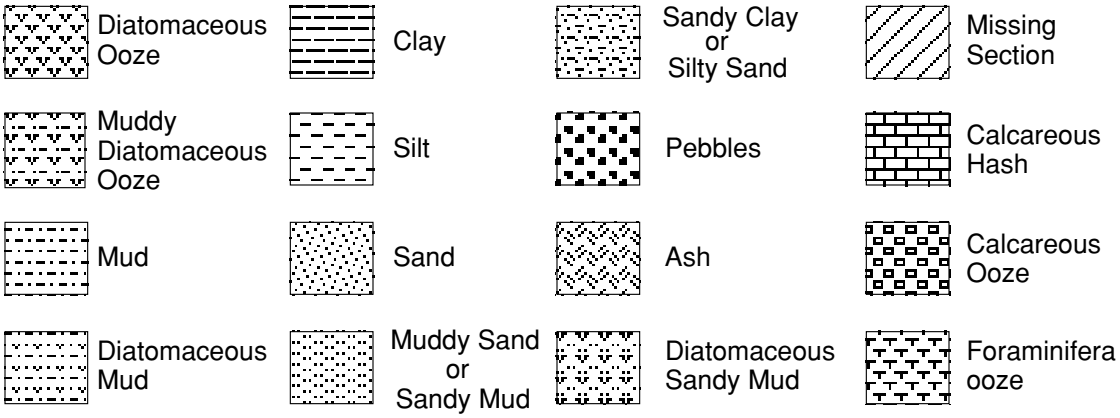
Standard size classes of sediment
(modified after Friedman and Sanders, 1978)

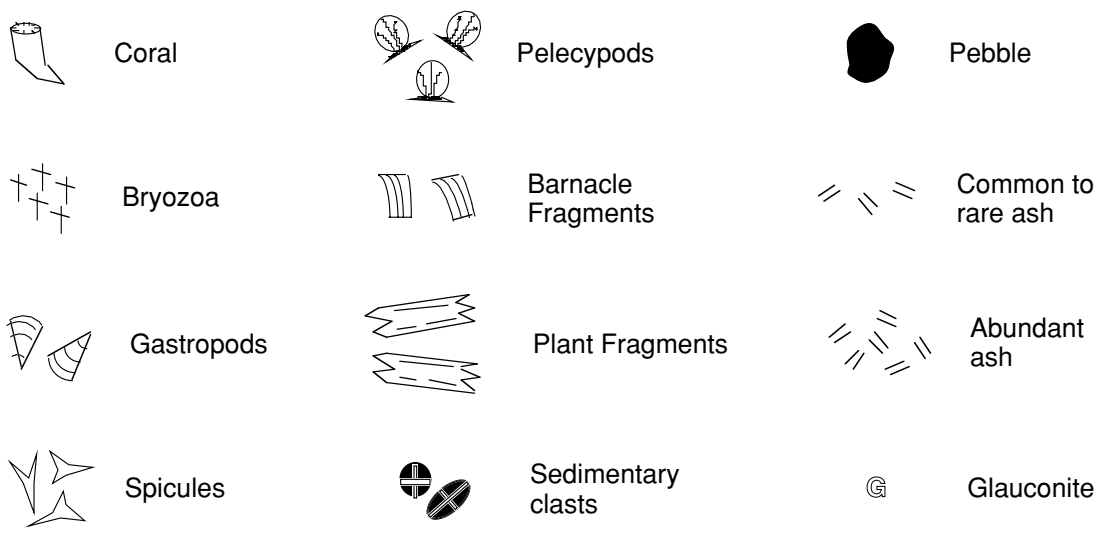
Figure 6. Standard size classes of sediments.

SEDIMENT CORE DESCRIPTIONS

R/V *Polar Duke* , Cruise VI, 1988

Graphic Lithology Key

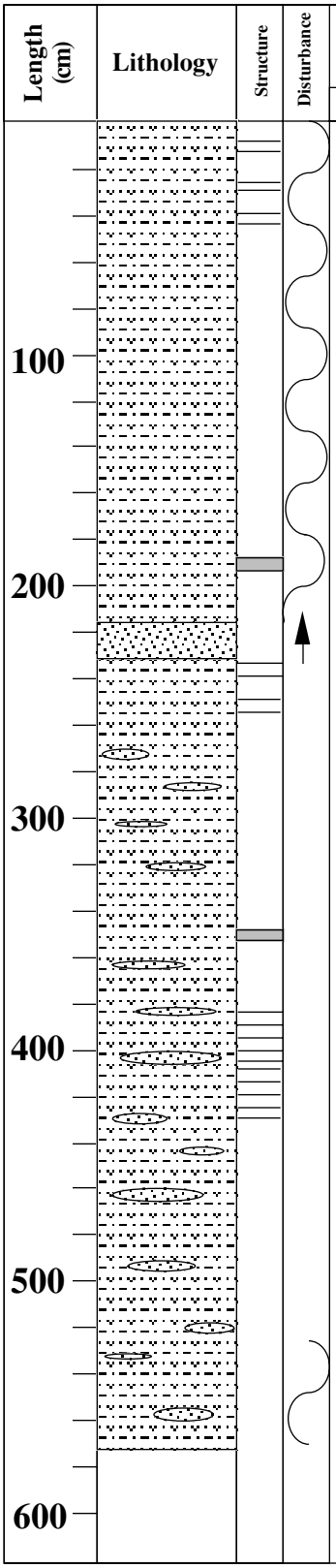




Graphic Structures Key

Piston Cores

PD88-VI-05 PC



Latitude: 62° 15.638' S **Water Depth:** 1980 m
Longitude: 57° 28.986' W **Core Length:** 575 cm

LITHOLOGIC DESCRIPTION

0-575 cm: The core consists diatomaceous mud, grading in color from dark olive gray (5Y 3/2) at the top of the core to olive (5Y 4/3) at the base. It is washed along the sides from 0-18 cm and slightly disturbed from 18-220 cm and 550-575 cm. The core is more indurated in the upper half (0-232 cm) than in the lower portion.

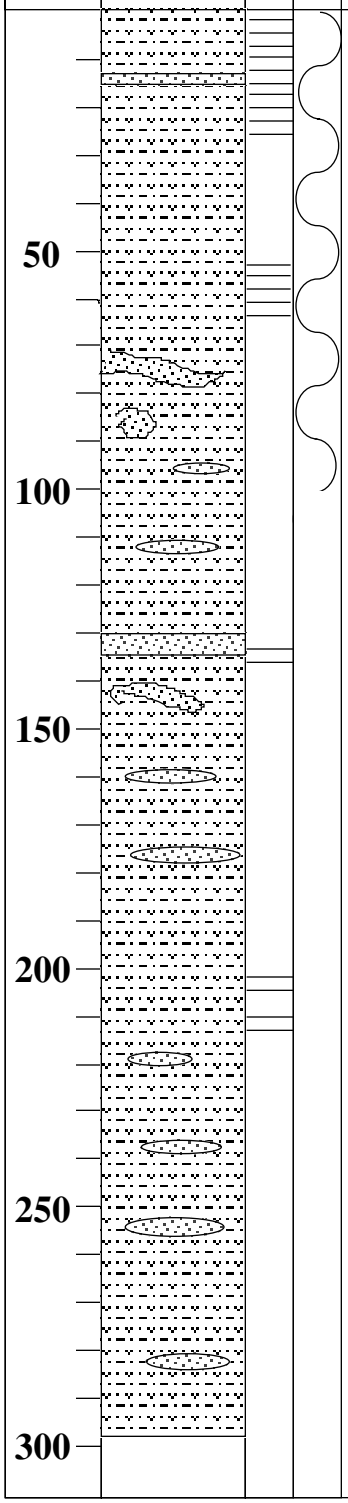
Laminae consisting of dark olive gray (5Y 3/2) fine volcanic glass occur at 8-9 cm, 29-30 cm, 40-45 cm, and 383-413 cm. Dark olive gray (5Y 3/2), subrounded, fine sand layers (196-197 and 353-355 cm) and lenses are present from 196-575 cm. Scattered iron staining is evident throughout the core with the heaviest concentration occurring at 454-458 cm. A graded sequence of dark olive (5Y 3/3), subrounded sand, with a sharp basal contact, is present from 216-227 cm. Several laminae consisting of olive (5Y 4/4), muddy diatomaceous ooze are located at 232-234 cm and 247-248 cm.

Smear slides:

Minerals:	43 cm (m) (laminae)	150 cm (D)
Diatoms	--	15
Spicules	--	TR
Quartz	10	15
Clay	5	69
Volcanic Glass	85	--
Feldspar	TR	TR
Heavy Minerals	--	1

Minerals:	225 cm (m) (layer)	232 cm (m) (laminae)
Diatoms	TR	50
Spicules	TR	--
Quartz	75	10
Clay	23	40
Volcanic Glass	1	--
Feldspar	--	--
Heavy Minerals	1	--

PD88-VI-06 PC



Latitude: 62° 13.26' S **Water Depth:** 1969 m
Longitude: 57° 36.12' W **Core Length:** 299 cm

LITHOLOGIC DESCRIPTION

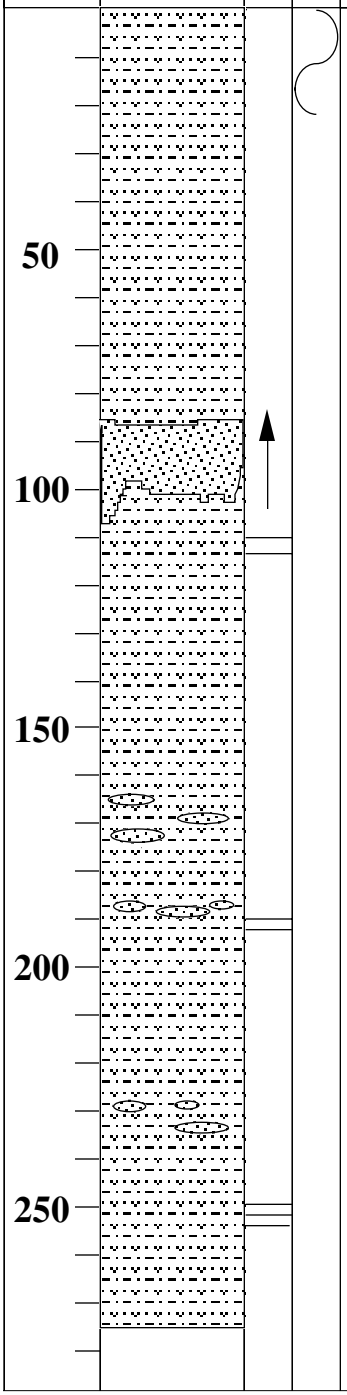
0-299 cm: The core consists of olive (5Y 4/3) diatomaceous mud. The core is washed along the side between 0-100 cm. Dark olive gray (5Y 3/2), subrounded, fine sand laminae, with gradational contacts, occur over the intervals from 0-29 cm and 53-64 cm. A dark olive gray (5Y 3/2), subrounded, fine sand layer, with sharp contacts, is located at 13-15 cm within the upper interval of sand laminae. Scattered blebs, layers, and lenses of dark olive gray (5Y 3/2) subrounded fine sand occur over the interval from 70-299 cm. Dark olive (5Y 3/3) diatomaceous ooze and muddy diatomaceous ooze laminae are present at 134-135 cm, 203-204 cm, and 212-213 cm.

Smear slides:

Minerals	50 cm (D)	73 cm (m)	135 cm (m)
Diatoms	20	--	85
Spicules	TR	--	--
Silicaflagellates	TR	--	TR
Quartz	20	80	5
Clay	60	7	10
Volcanic Glass	TR	1	--
Heavy Minerals	TR	1	--
Feldspar	--	1	--
Hornblende	--	1	--
Glauconite	--	TR	--

Minerals	198 cm (D)	213 cm (m) (laminae)
Diatoms	15	50
Spicules	TR	--
Silicaflagellates	TR	--
Quartz	20	15
Clay	65	35
Volcanic Glass	TR	--
Heavy Minerals	TR	--
Feldspar	TR	--
Hornblende	TR	--
Glauconite	TR	--
Mica	TR	TR

PD88-VI-07 PC



Latitude: 62° 15.623' S **Water Depth:** 1977 m
Longitude: 57° 37.542' W **Core Length:** 275 cm

LITHOLOGIC DESCRIPTION

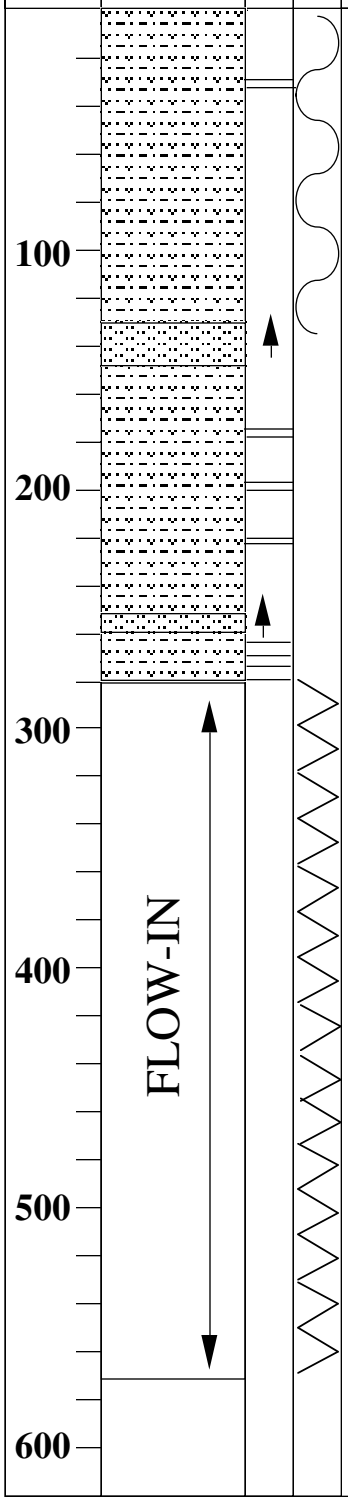
0-225 cm: The core consists of olive (5Y 4/3) diatomaceous mud. It is washed along the sides from 0-80 cm. A graded sequence of dark olive gray (5Y 3/2) fine sand occurs over the interval from 85-107 cm. Lenses of dark olive gray (5Y 3/2) fine sand are scattered throughout intervals from 167-171, 183-186, and 232-245 cm. Dark olive gray (5Y 3/2) diatomaceous mud laminae, with sharp contacts, occur at 110-111 and 186-187 cm. The diatom concentration is much higher in these laminae than in the surrounding matrix. Laminae consisting of olive (5Y 4/3) diatomaceous mud occur from 250-254 cm.

Smear slides:

Minerals:	105 cm (m)	111 cm (m) (laminae)	185 cm (m) (lense)
Diatoms	5	25	--
Spicules	TR	TR	TR
Silicaflagellates	--	TR	--
Quartz	35	20	80
Clay	59	54	15
Volcanic Glass	TR	--	TR
Feldspar	TR	--	TR
Hornblende	TR	--	TR
Heavy Minerals	1	1	5
Mica	TR	TR	--
Glauconite	--	TR	TR

Minerals:	250 cm (m) (laminae)	275 cm (D)
Diatoms	30	15
Spicules	TR	TR
Silicaflagellates	--	TR
Quartz	5	14
Clay	65	70
Volcanic Glass	--	--
Feldspar	--	--
Hornblende	--	--
Heavy Minerals	--	1
Mica	--	TR
Glauconite	TR	--

PD88-VI-08 PC



Latitude: 62° 15.732' S **Water Depth:** 1985m
Longitude: 57° 37.782' W **Core Length:** 566 cm

LITHOLOGIC DESCRIPTION

0-566 cm: The core is highly laminated, olive gray (5Y4/2), diatomaceous mud. The core is moderately disturbed from 0-147 cm, and flow-in occurs from 281 cm to the base of the core. The dark olive gray (5Y 3/3) flow-in material from 281-566 cm consists of the same material as the major lithology in the upper portion of the core.

Two dark olive gray (5Y 3/2) muddy sand graded sequences, with sharp basal contacts, occur in the core; one, between 130-146 cm, has rounded, coarse sand and the other, between 250-261 cm, has rounded, fine sand.

Olive (5Y 3/2) diatomaceous ooze laminae occur at 175-176, 198-199, 213-214, 264-265 and 271-272 cm. Olive gray (5Y 4/2) mud-bearing volcanic ash laminae, with gradational contacts, occur at 29-31.5 cm. Very dark gray (5Y 3/1) mud-bearing volcanic ash lenses are scattered over the interval from 15-18 cm. Whole foraminifera and foraminifera fragments are visable at 146 and 254 cm.

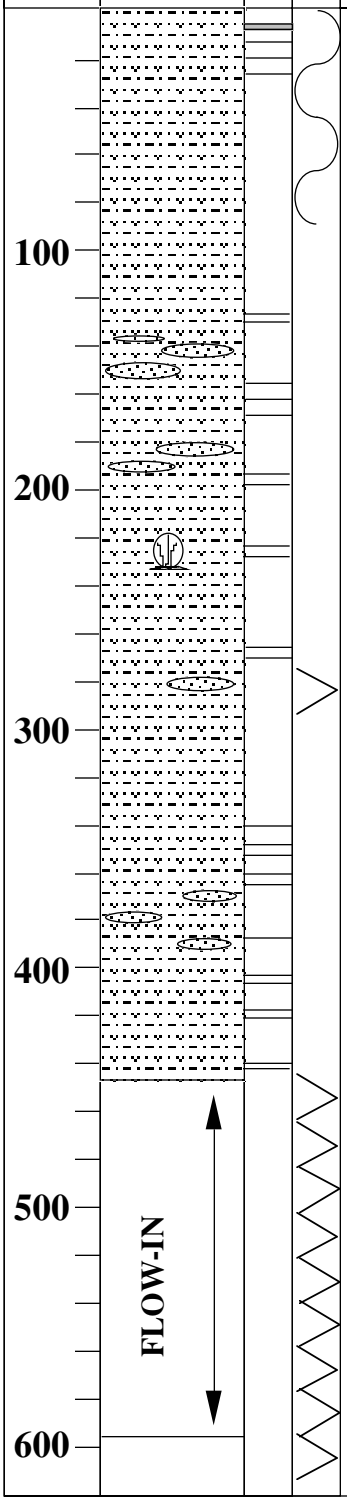
The core is sectioned at 262 cm.

Smear slides:

Minerals:	30 cm (m) (laminae)	103 cm (D)	132 cm (m)
Diatoms	10	20	TR
Spicules	TR	TR	TR
Quartz	15	15	65
Clay	20	64	25
Mica	--	TR	--
Volcanic Glass	55	TR	10
Feldspar	--	--	--
Hornblende	--	--	TR
Heavy Minerals	TR	1	--

Minerals:	176 cm (m) (laminae)	200 cm (D)	250 cm (m)
Diatoms	75	20	10
Spicules	TR	TR	--
Silicaflagellates	--	--	TR
Quartz	10	15	65
Clay	15	65	24
Mica	TR	TR	--
Volcanic Glass	--	TR	--
Feldspar	--	--	--
Hornblende	--	--	TR
Heavy Minerals	TR	--	1

PD88-VI-09 PC



Latitude: 62° 18.664' S **Water Depth:** 1988 m
Longitude: 57° 43.597' W **Core Length:** 597 cm

LITHOLOGIC DESCRIPTION

0-597 cm: The core consists of laminated, olive gray (5Y 4/2), diatomaceous mud. It is slightly washed along the side of core from 17-80 cm and highly disturbed from 285-295 cm. Flow-in occurs from 448-597 cm.

An olive gray (5Y 5/2) mud layer (with rounded fine sand) occurs from 11-12 cm. Lenses of very dark gray (5Y 3/1), rounded, fine sand are scattered over intervals from 136-157, 174-193, and 353-400 cm

Very dark gray (5Y 3/1) laminae, with sharp contacts, composed of medium ash are found at 13-14 and 22-23 cm. Very dark gray (5Y 3/1) ash-bearing, diatomaceous mud laminae occur from 363-364 cm.

Olive gray (5Y 4/2) diatomaceous ooze laminae occur at 8-9, 227-228, 354-355, 405-406, and 421-422 cm, and olive gray (5Y 4/2) diatomaceous mud laminae (with a much greater diatom concentration than the matrix) occur at 134-136, 154-155, 175-176, 197-198, 270-271, 362-363, 376-377 413-414, 441-442, and 470-471 cm.

Scattered black (5Y 2.5/1) manganese-oxide staining occurs from 363-412 cm. A broken, articulated bivavle occurs at 226 cm. Foraminifera are visible at 400 cm.

The core is sectioned at 294 cm.

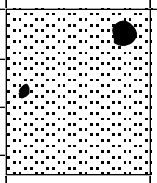
Smear slides:

Minerals:	12 cm (m) layer)	22 cm (m) (laminae)	135 cm (m) (laminae)
Diatoms	10	TR	40
Spicules	TR	TR	TR
Silicaflagellates	--	--	TR
Quartz	35	5	15
Clay	52	10	45
Volcanic Glass	TR	85	--
Heavy Minerals	3	--	TR
Mica	TR	--	TR
Hornblende	TR	--	--
Feldspar	--	--	TR
Glauconite	--	--	TR

Minerals:	173 cm (D)	227 cm (m) (laminae)	363 cm (m) (laminae)
Diatoms	15	60	20
Spicules	TR	TR	TR
Silicaflagellates	TR	TR	--
Quartz	15	10	15
Clay	70	30	50
Volcanic Glass	TR	--	5
Heavy Minerals	--	--	1
Mica	TR	--	TR
Hornblende	TR	--	--
Feldspar	--	--	TR
Glauconite	TR	TR	--

PD88-VI-11 PC

Length (cm)	Lithology	Structure	Disturbance	Latitude: 62° 32.834' S Longitude: 61° 53.868' W Water Depth: 150 m Core Length: 33 cm



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100

LITHOLOGIC DESCRIPTION

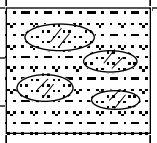
0-33 cm: The core consists of dark olive gray (5Y 3/2) sandy mud. Rounded pebbles (gabbro) are found at 4-5 cm and 15-16 cm. No layers or laminae are present. Foraminifera are seen at 2 cm.

Smear slides:

Minerals:	20 cm (D)
Diatoms	3
Spicules	TR
Silicaflagellates	TR
Quartz	45
Clay	51
Feldspar	TR
Hornblende	TR
Heavy Minerals	1
Mica	TR

PD88-VI-12 PC

Length (cm)	Lithology	Structure	Disturbance	Latitude: 62° 27.080' S Longitude: 61° 28.960' W Water Depth: 165 m Core Length: 25 cm



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100

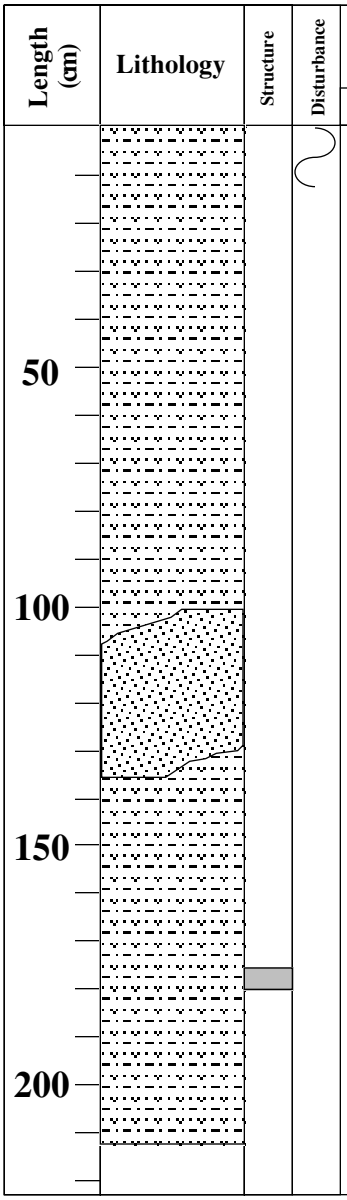
LITHOLOGIC DESCRIPTION

0-25 cm: The core consists of olive (5Y 4/3) diatomaceous mud. Dark olive gray (5Y 3/2) lenses of ash-bearing sandy mud are scattered throughout the core.

Smear slides:

Minerals:	3 cm (m) (lense)	23 cm (D)
Diatoms	0	15
Spicules	TR	TR
Quartz	40	40
Clay	34	45
Volcanic Glass	15	--
Glauconite	TR	TR
Heavy Minerals	1	1
Mica	TR	TR
Feldspar	--	TR

PD88-VI-14 PC



Latitude: 62° 20.192' S **Water Depth:** 178 m
Longitude: 61° 06.116' W **Core Length:** 211 cm

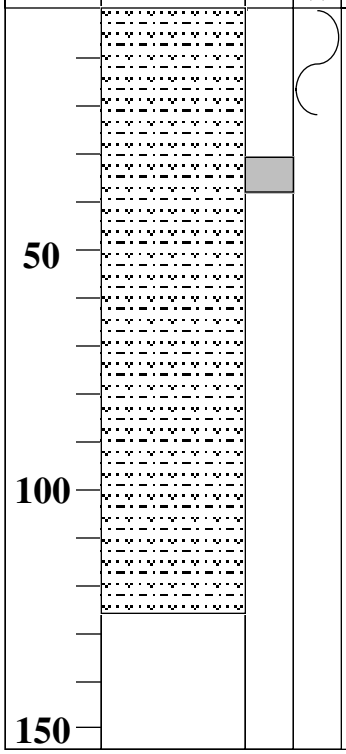
LITHOLOGIC DESCRIPTION

0-211 cm: The core consists of dark olive gray (5Y 3/2) diatomaceous mud. It is slightly disturbed (washed along the sides of the core) from 0-8 cm. A zone of black (5Y 2.5/2), rounded, coarse sand is present from 100-134 cm. A black (5Y 2.5/1), rounded, fine sand layer occurs from 178-180 cm. Black (5Y 2.5/1) manganese-oxide staining is scattered thoughout the core.

Smear slides:

Minerals:	10 cm (D)	130 cm (m) (zone)	179cm (m) (layer)
Diatoms	15	1	TR
Spicules	TR	1	TR
Quartz	30	75	70
Clay	54	22	29
Mica	TR	TR	TR
Feldspar	TR	--	--
Hornblende	TR	TR	TR
Glauconite	TR	TR	TR
Heavy Minerals	1	1	1

PD88-VI-15 PC



Latitude: 62° 14.460' S **Water Depth:** 435 m
Longitude: 60° 42.121' W **Core Length:** 125 cm

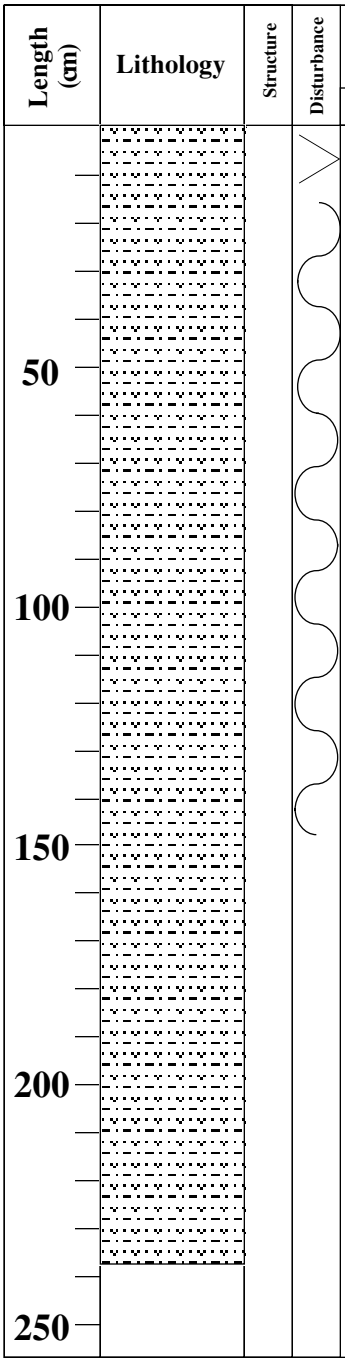
LITHOLOGIC DESCRIPTION

0-125 cm: The core consists homogeneous, olive gray (5Y 4/2), diatomaceous mud. The core is slightly disturbed (washed along the sides of the core) from 0-21 cm. A layer of diatomaceous mud, sandier than the surrounding matrix, occurs from 30-38 cm. The contacts of this layer with the major lithology are gradational and exhibit no obvious color change.

Smear slides:

Minerals:	30 cm (m) (layer)	65 cm (D)
Diatoms	25	30
Spicules	1	TR
Silicaflagellates	TR	–
Quartz	30	20
Clay	43	49
Mica	TR	TR
Heavy Minerals	1	1
Glauconite	TR	TR

PD88-VI-16 PC



Latitude: 62° 05.420' S
Longitude: 60° 10.568' W
Water Depth: 381 m
Core Length: 239 cm

LITHOLOGIC DESCRIPTION

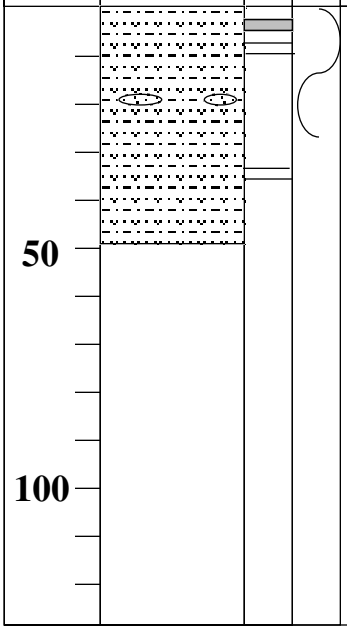
0-239 cm: The core grades from homogeneous, olive gray (5Y 4/2), diatomaceous mud at the top to dark olive gray (5Y 3/2) diatomaceous mud at the base. It is more indurated at the top. The core is highly disturbed from 0-16 cm, moderately disturbed from 16-60 cm, and slightly disturbed from 60-150 cm.

Smear slides:

Minerals:	10 cm (D)
Diatoms	30
Spicules	TR
Quartz	15
Clay	54
Heavy Minerals	1
Hornblende	TR
Glauconite	TR

Trigger Cores

PD88-VI-05 TC



Latitude: 62° 15.638' S **Water Depth:** 1980 m
Longitude: 57° 28.986' W **Core Length:** 49 cm

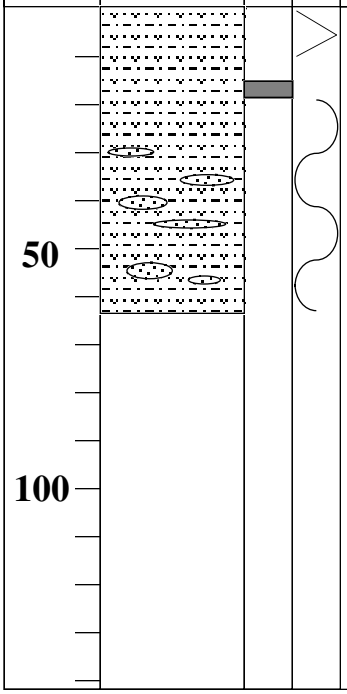
LITHOLOGIC DESCRIPTION

0-49 cm: The core consists of diatomaceous mud that grades in color from dark olive gray (5Y 3/2) at the top to an olive gray (5Y 4/2) towards the base. The core is slightly disturbed by washing from 0-28 cm. A dark olive gray (5Y 3/2) diatomaceous ooze layer occurs at 2-5 cm. Black (5Y 2.5/2), rounded, fine sand laminae are present from 8-9 cm and 33-34 cm and lenses of the same lithology occur from 18-20 cm.

Smear slides:

Minerals:	9 cm (m) (laminae)	46 cm (D)
Diatoms	5	15
Spicules	TR	TR
Quartz	80	20
Clay	15	65
Mica	TR	TR
Heavy Minerals	TR	TR

PD88-VI-06 TC



Latitude: 62° 13.043' S **Water Depth:** 1969 m
Longitude: 57° 35.487' W **Core Length:** 62 cm

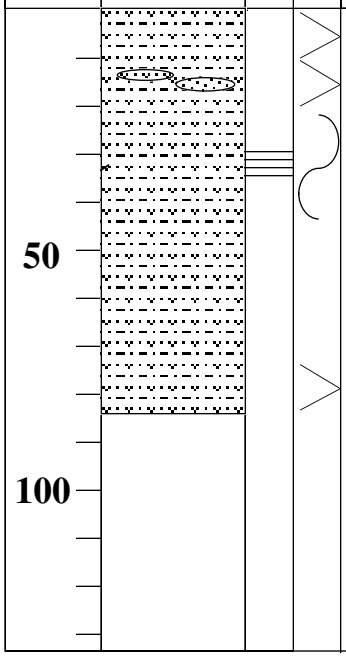
LITHOLOGIC DESCRIPTION

0-62 cm: The core consists of olive (5Y 4/3) diatomaceous mud. It is highly disturbed from 0-18 cm and slightly disturbed from 18-62 cm. A layer of dark olive gray (5Y 3/2), rounded, fine sand is present from 17-18 cm. The upper contact of this layer is gradational, and the basal contact is sharp. Many lenses of dark olive gray (5Y 3/2), rounded, fine sand occur over the interval from 27-47 cm.

Smear Slides:

Minerals:	17 cm (m) (layer)	60 cm (D)
Diatoms	--	25
Spicules	--	TR
Silicaflagellates	--	TR
Quartz	85	7
Clay	14	68
Mica	--	TR
Volcanic Glass	TR	--
Feldspar	TR	--
Heavy Minerals	1	1
Glauconite	TR	TR

PD88-VI-07 TC



Latitude: **62° 15.623' S** **Water Depth:** **1977 m**
Longitude: **57° 37.542' W** **Core Length:** **86 cm**

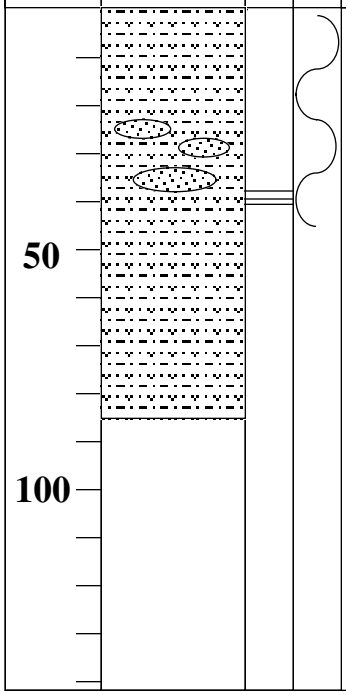
LITHOLOGIC DESCRIPTION

0-86 cm: The core consists of olive gray (5Y 4/3) diatomaceous mud. It is highly disturbed from 0-20 cm and 74-86 cm and slightly disturbed from 20-40 cm. Olive gray (5Y 4/2) sandy mud laminae, with gradational contacts, occur from 29-32 cm. The sand in the laminae is rounded and fine sized. Lenses of very dark gray (5Y 3/1), rounded, fine sand occur over the interval from 15-18 cm.

Smear Slides:

Minerals:	5 cm (D)	30 cm (m)
Diatoms	30	8
Spicules	TR	1
Silicaflagellates	TR	–
Quartz	15	40
Clay	55	50
Mica	--	TR
Volcanic Glass	--	TR
Feldspar	TR	--
Hornblende	TR	TR
Heavy Minerals	TR	1

PD88-VI-08 TC



Latitude: **62° 14.893' S** **Water Depth:** **1985 m**
Longitude: **57° 38.441' W** **Core Length:** **84 cm**

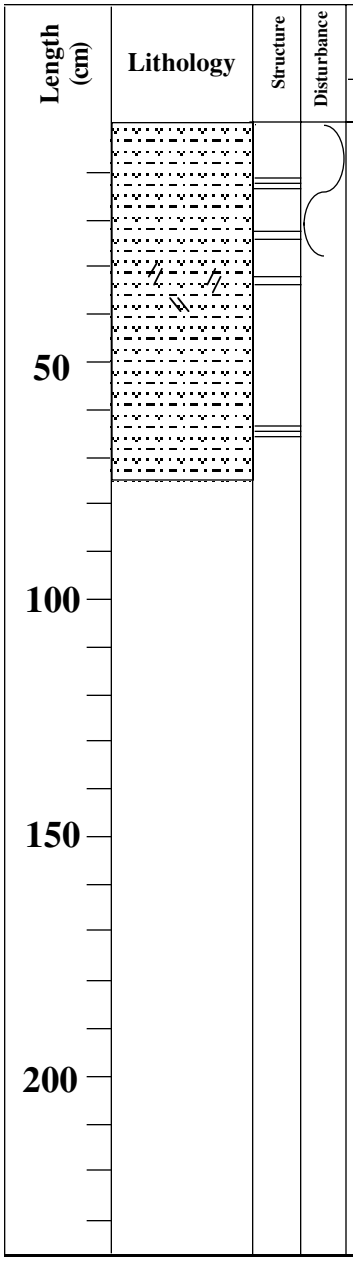
LITHOLOGIC DESCRIPTION

0-84 cm: The core consists of olive gray (5Y 4/2) diatomaceous mud. It is slightly disturbed by washing from 0-40 cm and well bioturbated from 40-84 cm. Dark olive gray (5Y 3/2), rounded, fine sand-bearing ash lenses are scattered over the interval from 20-37 cm. Dark olive gray (5Y 3/2), rounded, fine sand-bearing ash laminae, with gradational contacts, are found from 37-39 cm.

Smear slides:

Minerals:	37 cm (m) (lense)	79 cm (D)
Diatoms	TR	35
Spicules	TR	1
Silicaflagellates	--	TR
Quartz	15	15
Clay	15	49
Volcanic Glass	70	--
Heavy Minerals	--	--
Hornblende	TR	--

PD88-VI-09 TC



Latitude: 62° 18.664' S **Water Depth:** 1988 m
Longitude: 57° 43.597' W **Core Length:** 74 cm

LITHOLOGIC DESCRIPTION

0-74 cm: The core consists of olive gray (5Y 4/2) diatomaceous mud. It is slightly disturbed from 0-30 cm. Olive (5Y 4/3) diatomaceous ooze laminae, with gradational contacts, occur at 12-13 cm. Dark olive gray (5Y 3/2) diatomaceous mud laminae (with a greater diatom concentration than the major lithology) occur at 22-24, 32-34, and 64-65 cm. Dark olive gray (5Y 3/2) fine volcanic ash lenses are scattered over the interval from 30-42 cm.

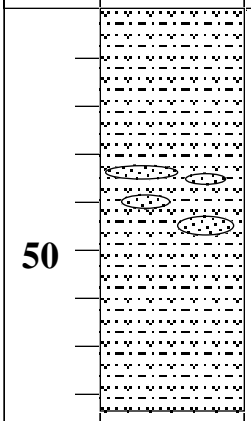
Smear slides:

Minerals:	13 cm (m) (laminae)	23 cm (m) (laminae)
Diatoms	72	40
Spicules	TR	TR
Silicaflagellates	TR	TR
Quartz	3	10
Clay	25	50
Mica	--	TR
Volcanic Glass	--	--
Feldspar	--	--
Heavy Minerals	--	--
Glauconite	--	--

Minerals:	42 cm (m) (lense)	70 cm (D)
Diatoms	1	15
Spicules	TR	TR
Silicaflagellates	--	TR
Quartz	7	15
Clay	2	69
Mica	TR	TR
Volcanic Glass	50	1
Feldspar	--	--
Heavy Minerals	--	TR
Glauconite	1	TR

PD88-VI-15 TC

Length (cm)	Lithology	Structure	Disturbance	Latitude: 62° 14.460' S Longitude: 61° 42.121' W Water Depth: 435 m Core Length: 82 cm
				LITHOLOGIC DESCRIPTION



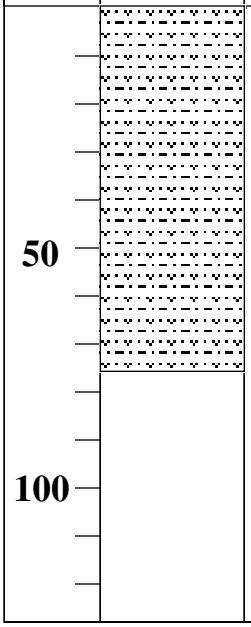
0-82 cm: The core consists olive gray (5Y 4/2) diatomaceous mud. Lenses of dark olive gray (5Y 3/2) mud, with a higher concentration of sand than the surrounding matrix, occur from 30-45 cm.

Smear Slides:

Minerals:	36 cm (m) (lense)	79 cm (D)
Diatoms	10	15
Spicules	--	TR
Silicaflagellates	TR	–
Foraminifera	TR	–
Quartz	25	15
Mica	--	TR
Heavy Minerals	TR	3
Clay	69	67
Volcanic Glass	1	–
Glauconite	TR	TR

PD88-VI-16 TC

Length (cm)	Lithology	Structure	Disturbance	Latitude: 62° 05.420' S Longitude: 60° 10.568' W Water Depth: 381 m Core Length: 77 cm
				LITHOLOGIC DESCRIPTION



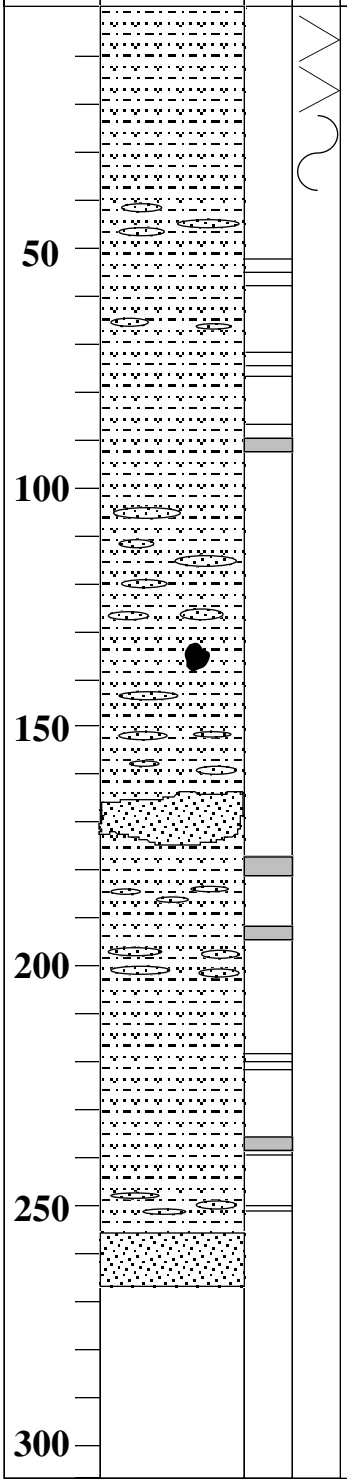
0-77 cm: The core consists of homogeneous diatomaceous mud that grades in color from dark gray (5Y 4/1) at the top to a dark olive gray (5Y 4/2) at the base.

Smear Slide:

Minerals:	70 cm (D)
Diatoms	20
Spicules	TR
Quartz	30
Mica	TR
Heavy Minerals	TR
Clay	50
Glauconite	TR

Gravity Cores

PD88-VI-01 GC



Latitude 61° 35.341' S **Water Depth:** 2342 m
Longitude: 54° 41.640' W **Core Length:** 265 cm

LITHOLOGIC DESCRIPTION

0-254 cm: The core consists of olive gray (5Y 4/3) diatomaceous mud. It is highly disturbed from 0-20 cm and moderately disturbed from 20-35 cm.

Olive (5Y 4/4), subrounded, fine sand laminae are found at 52-57 cm and 71-77 cm. Layers of black (5Y 2.5/2) ash-bearing, fine sand, with sharp contacts, occur at 167-171, 176-179, and 190-191 cm. Black (5Y 2.5/2) ash-bearing, subrounded, medium-sand laminae occur from 251-252 cm.

Olive (5Y 4/3) diatomaceous ooze layers and laminae occur from 86-91 cm. The laminae exhibit sharp upper and basal contacts.

Olive (5Y 4/3) volcanic ash laminae occur from 237-238 and 240-241 cm. Black (5Y 2.5/2) fine ash laminae (with sharp contacts) occur at 238.5-239 cm.

Lenses of black (5Y 2.5/2) manganese oxide are scattered throughout the intervals from 100-202 cm and 241-251 cm. An angular granitic pebble is present at 135 cm. Foraminifera are visable at 56, 170, and 260 cm.

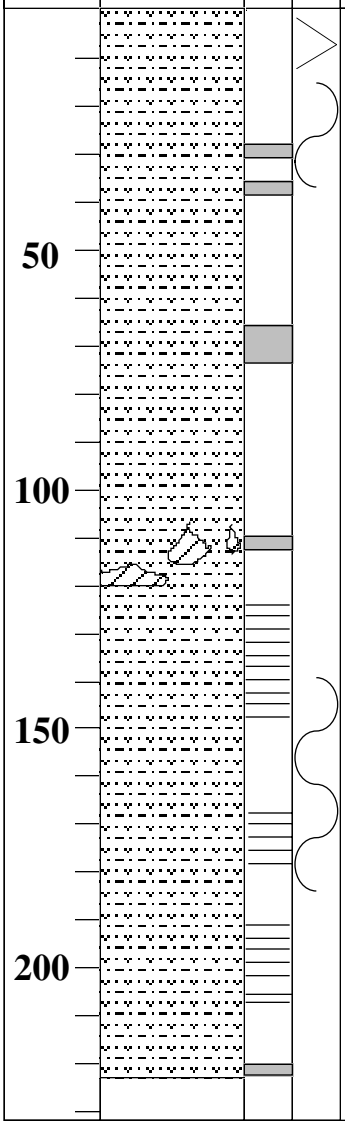
254-264 cm: The lithology changes to a dark olive (5Y 3/2), ash-bearing, muddy sand at 254 cm that continues to the base of the core.

Smear Slides:

Minerals:	50 cm (D)	52 cm (m)	57 cm (m)	86 cm (m)
Diatoms	20	15	TR	92
Spicules	1	TR	TR	TR
Quartz	30	75	89	3
Clay	48	10	10	5
Mica	TR	TR	TR	--
Volcanic Glass	--	--	TR	--
Hornblende	TR	TR	TR	--
Heavy Minerals	--	TR	1	TR
Glauconite	TR	TR	--	--

Minerals:	170 cm (m)	238 cm (m)	263 cm (D)
Diatoms	TR	10	5
Spicules	TR	TR	TR
Quartz	80	3	60
Clay	15	20	19
Volcanic Glass	5	77	15
Feldspar	--	--	--
Hornblende	--	--	TR
Heavy Minerals	TR	TR	1

PD88-VI-02 GC



Latitude: 61° 30.126' S **Water Depth:** 1490 m
Longitude: 54° 32.941' W **Core Length:** 221 cm

LITHOLOGIC DESCRIPTION

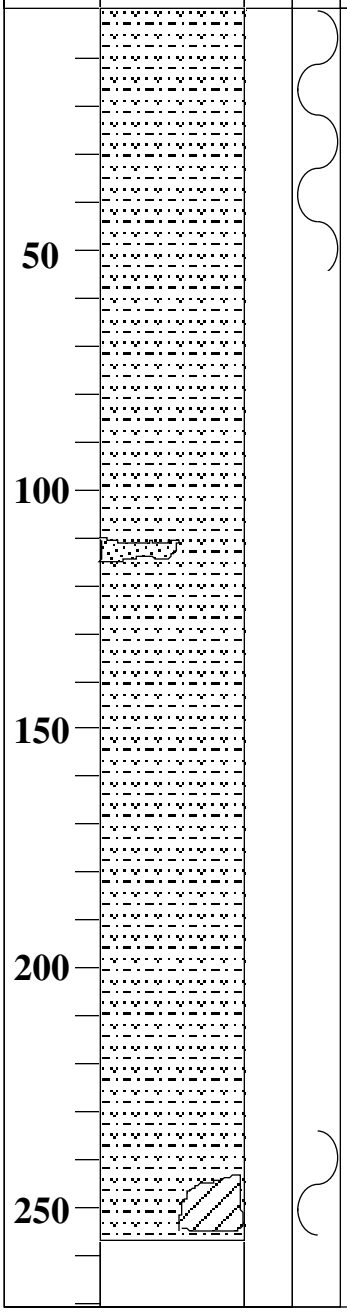
0-221 cm: The core consists of highly-laminated, olive (5Y 4/3), diatomaceous mud. It is highly disturbed from 0-15 cm, moderately disturbed from 15-35 cm, and slightly disturbed from 144-184 cm. Small vugs are present at 111-112 and 117-120 cm. Many olive (5Y 4/4) diatomaceous ooze laminae are present from 121-150 cm, 165-177 cm, and 190-207 cm. Olive (5Y 4/4) diatomaceous ooze layers, with gradational contacts, are present at the following intervals: 27-29, 33-36, 67-73, 111-112, and 220-221 cm. Manganese and iron staining occur at 127 and 194 cm.

Smear Slides:

Minerals:	28 cm (m) (layer)	175 cm (m) (laminae)
Diatoms	90	80
Spicules	--	--
Quartz	5	5
Clay	5	15
Glauconite	TR	–
Heavy Minerals	TR	TR

Minerals:	110 cm (D)	210 cm (D)
Diatoms	20	35
Spicules	3	TR
Quartz	15	5
Clay	62	60
Heavy Minerals	TR	TR
Volcanic Glass	--	TR
Glauconite	TR	–
Feldspar	TR	--
Mica	TR	--

PD88-VI-03 GC



Latitude: 61° 29.317' S **Water Depth:** 1040 m
Longitude: 54° 05. 029' W **Core Length:** 253 cm

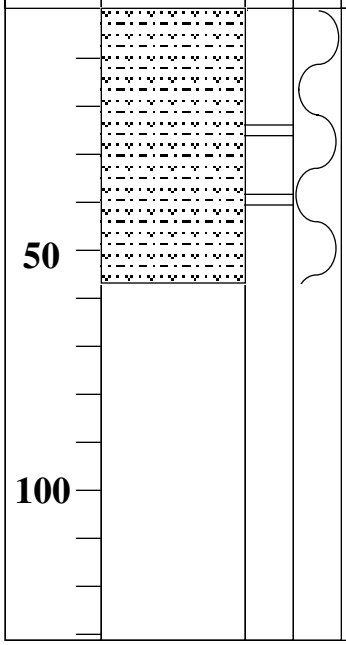
LITHOLOGIC DESCRIPTION

0-253 cm: The core consists of olive gray (5Y 4/2) diatomaceous mud. It is sightly disturbed by washing along the sides of the liner from 0-53 cm and 248-252 cm. A large bleb of black (5Y 2.5/2), rounded, fine sand occurs at 109-112 cm. A partial void in the sediment is located at 247-253 cm.

Smear Slides:

Minerals:	215 cm (D)	110 cm (m) (bleb)
Diatoms	15	TR
Spicules	TR	TR
Quartz	20	75
Clay	60	20
Feldspar	TR	TR
Heavy Minerals	TR	3
Volcanic Glass	5	2
Hornblende	TR	TR
Glauconite	TR	–

PD88-VI-04 GC



Latitude: 61° 41.819' S **Water Depth:** 2138 m
Longitude: 54° 54.206' W **Core Length:** 57 cm

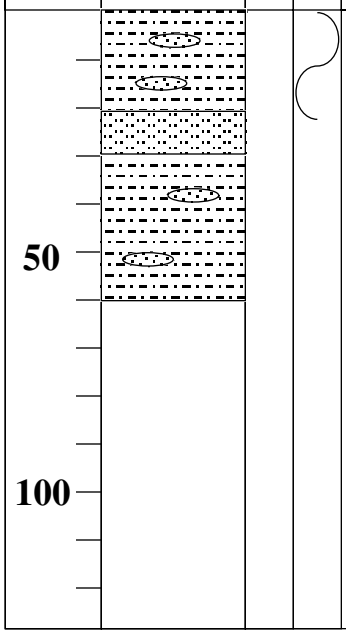
LITHOLOGIC DESCRIPTION

0-57 cm: The core consists of olive gray (5Y 4/2) diatomaceous mud. Laminae of dark olive gray (5Y 3/2) material of nearly the same lithology as the surrounding matrix (but slightly sandier with fewer diatoms) occur from 26-27 and 37-39 cm. The core is slightly disturbed by washing along the liner fom 0-57 cm.

Smear Slides:

Minerals:	27 cm (m) (laminae)	53 cm (D)
Diatoms	10	15
Spicules	1	TR
Quartz	25	15
Clay	60	69
Mica	TR	--
Volcanic Glass	3	--
Feldspar	TR	--
Hornblende	TR	--
Heavy Minerals	1	1

PD88-VI-10 GC



Latitude: 62° 32. 723' S **Water Depth:** 191 m
Longitude: 61° 53. 259' W **Core Length:** 55 cm

LITHOLOGIC DESCRIPTION

0-55 cm: The core consists of dark olive gray (5Y 3/2) mud with lenses of rounded, fine sand scattered thoughout. It is slightly disturbed by washing along the liner from 0-18 and 14-28 cm. A layer of sandy mud occurs between 20-28 cm. The upper contact is gradational while the lower contact is sharp. No upward fining of sediment is evident within this layer.

Minerals:	20 cm (m) (lense)	53 cm (D)
Diatoms	10	10
Spicules	--	TR
Quartz	50	25
Clay	39	64
Mica	TR	TR
Glauconite	TR	TR
Heavy Minerals	1	1
Feldspar	TR	--
Hornblende	TR	TR

Table 2. Estimated sand/silt/clay percentages from examination of smear slides

CORE	INTERVAL (cm)	SAND (%)	SILT (%)	CLAY (%)
PD88-VI-05 PC	43	40	40	30
	150	TR	30	70
	225	75	5	20
	232	TR	25	75
PD88-VI-06 PC	50	10	20	70
	73	80	15	5
	135	TR	30	70
	198	2	23	75
	213	5	25	70
PD88-VI-07 PC	105	35	10	55
	111	10	30	60
	185	80	5	15
	250	1	29	79
	275	TR	25	75
PD88-VI-08 PC	30	1	70	29
	176	10	30	60
	200	TR	25	75
	250	65	20	15
PD88-VI-09 PC	12	25	25	50
	22	85	5	10
	135	10	20	70
	173	5	65	30
	227	3	25	72
	363	1	40	59
PD88-VI-11 PC	20	35	25	40
PD88-VI-12 PC	3	35	25	40
	23	25	25	50
PD88-VI-14 PC	10	10	50	40
	130	70	15	15
	179	75	15	10
PD88-VI-15 PC	30	20	30	50
	65	10	30	60
PD88-VI-16 PC	10	5	30	65
PD88-VI-05 TC	9	10	65	25
	46	1	25	74
PD88-VI-06 TC	7	85	5	10
	60	TR	40	60
PD88-VI-07 TC	5	3	30	67
	30	35	25	40
PD88-VI-08 TC	37	70	15	15
	79	TR	40	60
PD88-VI-09 TC	13	TR	20	80
	23	TR	30	70
	42	55	30	15
	70	1	34	65
PD88-VI-15 TC	36	20	15	65
	79	5	30	65
PD88-VI-16 TC	70	25	25	50

Table 2. (Continued)

CORE	INTERVAL (cm)	SAND (%)	SILT (%)	CLAY (%)
PD88-VI-01 GC	50	2	40	58
	52	70	20	10
	57	80	10	10
	86	TR	23	77
	170	80	5	15
	238	1	89	10
PD88-VI-02 GC	28	TR	50	50
	110	2	30	70
	175	TR	40	60
	210	TR	40	60
PD88-VI-03 GC	110	70	20	10
	215	5	25	70
PD88-VI-04 GC	27	5	50	45
	53	10	20	70
PD88-VI-10 GC	20	35	35	30
	53	10	30	60

Bag Samples

The following bagged samples from cruise PD88-VI are stored at Antarctic Research Facility.

PD88-VI GC/PC samples:

PD88-01: Gravity core (306 grams)
PD88-02: Gravity core (199 grams
PD88-03: Gravity core (110 grams)
PD88-04: Gravity core (341 grams)
PD88-05: Piston core cutter (250 grams)
PD88-07: Piston core cutter (248 grams)
PD88-08: Piston core cutter (112 grams)
PD88-09: Piston core cutter (140 grams)
PD88-10: Gravity core (276 grams)
PD88-11: Piston core catcher (45 grams)
PD88-12: Piston core bottom sample (610 grams)
PD88-13: Gravity core (67 grams)
PD88-14: Piston core (385 grams)
PD88-15: Piston core cutter (229 grams)
PD88-16: Piston core cutter (187 grams)
PD88-17: Piston core cutter (560 grams)

PD88-VI Trigger core bag samples:

PD88-07: Core cutter (223 grams)
PD88-08: Core cutter (88 grams)
PD88-08: Top of the trigger core (145 grams)
PD88-09: Core cutter (325 grams)
PD88-11: Two bags (550 grams, 261 grams)
PD88-12: Four bags (206 grams, 577 grams, 456 grams, 102 grams)
PD88-14: Core cutter(121 grams)
PD88-15: Two bags of core cutter (410 grams, 39 grams), one bag of trigger core top sample (155 grams)
PD88-16: Core cutter (362 grams)

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APPENDIX A. Sample Distribution Policy

Antarctic Marine Geolgy Research Facility
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URL: http://geomag.gly.fsu.edu/~curator/index.html

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, 93)
R/V *Nathanial 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.

Investigators are invited to visit the ARF or to write the curator for sample requests. Samples requested by NSF funded investigators are automatically approved. Samples are released to non-NSF funded scientists upon approval by a small panel of antarctic marine geoscientists appointed by the curator. Approval is based on the merit of the project and the demonstration that funds exist to complete the research.

Investigators using ARF material are responsible for the following:

(1) prompt publication of significant results with acknowledgment of the Antarctic Research Facility as the source of materials
(2) submittal of reprints of published works to the curator for the ARF library
(3) notification to the curator of any proposed changes in the research stated in the original request

All inquiries should be sent to the Curator at the above address.

Appendix B. Research Proposal and Sample Request Form

Antarctic Marine Geology Research Facility
Department of Geology
Florida State University
Tallahassee, FL 32306
(904) 644-2407 / (904) 644-4214 fax
email: curator@geomag.gly.fsu.edu
URL: http://geomag.gly.fsu.edu/~curator/index.html

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.

Signature_____ **Date** _____

Title _____ **phone** _____

Fax_____ **Email Address**_____

Mailing Address_____

_____

Appendix C. Sample Request Inventory

Name	*Page* *of*
Date of Request	*Number of Samples Requested*

CRUISE/PROJECT (e.g) Eltanin 55	CORE or SAMPLE ID (eg. DF79-08)	TYPE	INTERVAL (cm) top	bottom	VOLUME (cc)	COMMENTS

FOR ARF USE ONLY

technician	date sampled	total	shipped via

NSF Grant Number or ARF Review Panel	Request ID Number