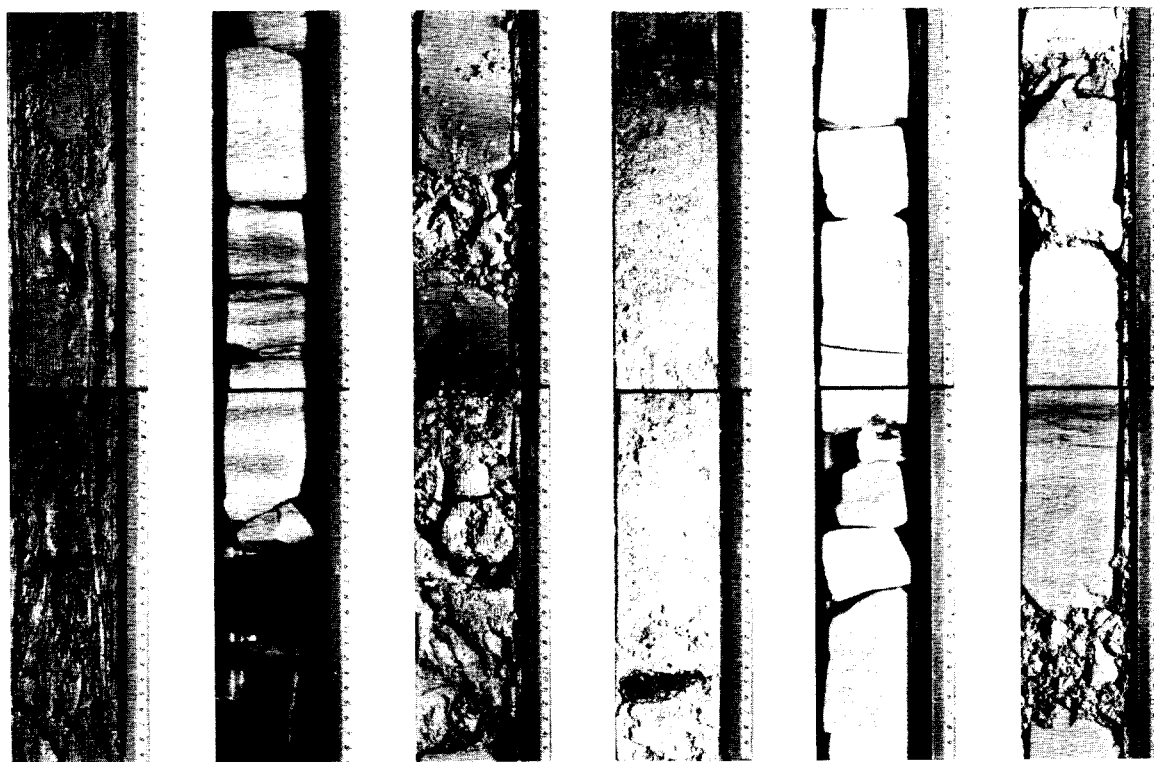


# INITIAL CORE DESCRIPTIONS

DEEP SEA DRILLING PROJECT

LEG 33

LINE ISLANDS, MANIHIKI PLATEAU, TUAMOTUS



Prepared for the  
NATIONAL SCIENCE FOUNDATION  
National Ocean Sediment Coring Program  
Under Contract C-482

By the  
UNIVERSITY OF CALIFORNIA  
Scripps Institution of Oceanography  
Prime Contractor for the Project

# UNIVERSITY OF CALIFORNIA, SAN DIEGO

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SANTA BARBARA · SANTA CRUZ

SCRIPPS INSTITUTION OF OCEANOGRAPHY

POST OFFICE BOX 1529  
LA JOLLA, CALIFORNIA 92037

Dear Colleague:

This document has been printed and distributed by the Deep Sea Drilling Project for the purpose of sample selection by interested earth scientists, sample requests being honored one year after completion of the cruise on which the samples were collected. It is an interim and informal document consisting of site data and sedimentologic and paleontologic data as known six (6) months post-cruise. These data, while completely adequate for almost all sample selection needs, will be subject to possible slight change by the time of issue of the formal cruise report, the corresponding volume of the Initial Reports of the Deep Sea Drilling Project.

The information contained herein is preliminary and privileged, consequently this document is not to be cited or used as the basis of other publications. Data cited or used in a manuscript will be considered a breach of professional ethics.

Thank you for your interest in the Deep Sea Drilling Project.

Sincerely,

A handwritten signature in cursive script that reads "N. Terence Edgar".

N. Terence Edgar  
Chief Scientist  
Deep Sea Drilling Project

NTE:eb

2

**INITIAL CORE DESCRIPTION  
(ICD)  
DEEP SEA DRILLING PROJECT  
LEG 33  
NOV. 2, 1973 – DEC. 17, 1973**

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A Project Planned by and Carried Out With the Advice of the  
JOINT OCEANOGRAPHIC INSTITUTIONS FOR DEEP EARTH SAMPLING (JOIDES)

**MEMBER ORGANIZATIONS**

Lamont-Doherty Geological Observatory, Columbia University  
Rosenstiel School of Marine and Atmospheric Science, University of Miami  
Scripps Institution of Oceanography, University of California  
University of Washington  
Woods Hole Oceanographic Institution  
Institute of Oceanology, Moscow, USSR

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**PARTICIPATING SCIENTISTS**

Everett D. Jackson, Seymour O. Schlanger, Edward L. Winterer,  
Harry E. Cook, Hugh C. Jenkyns, Kerry R. Kelts, Robert E. Boyce,  
Charles L. McNulty, Jr., Ansis G. Kaneps, Erlend Martini, David A. Johnson

## INITIAL CORE DESCRIPTION - LEG 33

### INTRODUCTION

Known also as the "hot spot" leg. Leg 33 was primarily intended to drill the Line Islands and Tuamotus in order to test the recently popular hypothesis that linear island chains are formed by movement of a crustal plate over a fixed melting anomaly in the mantle. The strategy was to drill on the flanks of these island chains and sample the sediments and basalt in order to date the cessation of volcanism at points along the chains. Another objective was to drill the thick carbonate section on the Manihiki Plateau and to compare the history of deposition here with that of previously drilled, relatively shallow rises and plateaus of the Pacific Basin (Shatsky Rise, Magellan Rise, Ontong-Java Plateau). Additionally, the first site drilled, in the Johnston Island Trough at the northern extremity of the Line Islands, was an engineering test site for a new downstring pinger, designed to provide better control over the location of the bit while feeling bottom, and a heave compensator, designed to keep the drill bit in a steady position despite the rise and fall of the ship.

GLOMAR CHALLENGER steamed from Honolulu, Hawaii on November 2, 1973, drilled eight holes at five sites, and docked at Papeete, Tahiti, on December 17. The principal results are summarized in the Site Summary section at the beginning of each site section in the present volume, and reference is made to GEOTIMES of March, 1974 (v. 19, no. 3) for a more detailed account of the scientific results.

The main objective of the present volume is to present the core logs of cores recovered during DSDP Leg 33, for the purpose of guiding selection of samples. Since shorebased investigation of Leg 33 materials by the shipboard sedimentologists and paleontologists is still in progress, the lithological descriptions and biostratigraphy should be regarded as tentative and subject to modification (though probably minor). The sediment classification and nomenclature, and biostratigraphy used are fairly orthodox and require no special comment. A section of explanatory notes on DSDP conventions on the numbering of sites, holes, and cores, sample designation, and some background material on shipboard operations follows.

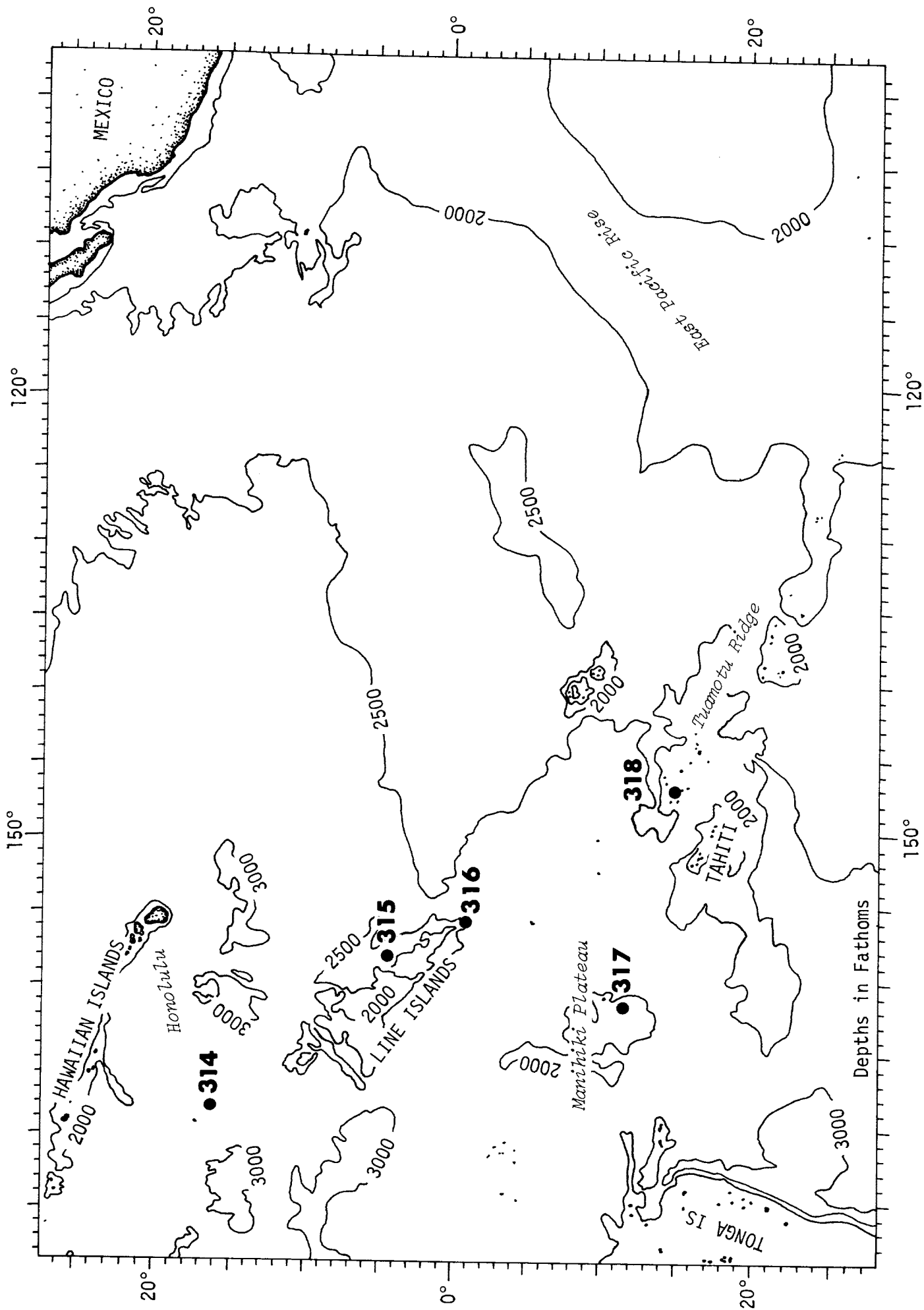


Figure 1. Location of sites drilled during Leg 33.

## EXPLANATORY NOTES

### Introduction

The following material is intended as an aid in understanding the terminology, labeling, and numbering conventions in use on board the GLOMAR CHALLENGER during Leg 33 and at the Deep Sea Drilling Project. It should also facilitate use of the Site Summary and Core Logs of this volume.

### Numbering of Sites, Holes, Cores, Samples

Drill site number run consecutively from the first site drilled by GLOMAR CHALLENGER in 1968. The site number is unique; thus, use of Leg number is optional. A site refers to the hole or holes drilled from one acoustic positioning beacon. Several holes may be drilled at a single locality by pulling the drill string above the sea floor ("mud line") and offsetting the ship some distance (usually 100 meters or more) from the previous hole. For purposes of compiling the stratigraphy of the site, the stratigraphic sections at each of the holes are assumed to be similar or identical (this has not always proved to be the case, as there can sometimes be large lateral variations in the thickness of stratigraphic units).

Holes drilled at a site take the site number, and are distinguished by a letter suffix. The first hole has only the site number; the second has the site number with suffix A; the third has the site number with suffix B; and so forth. It is important, for sampling purposes, to distinguish the holes drilled at a site, since recovered sediments or rocks usually do not come from equivalent positions in the stratigraphic column at different holes. For example, Core 1 of Hole 567A may have

been recovered from a deeper level than Core 57 of Hole 567.

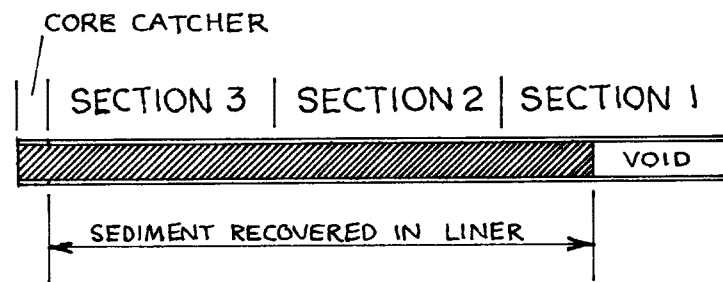
Cores are numbered sequentially from the top down. In the ideal case, they consist of 9 meters of sediment or rock in a plastic liner of 6.6 cm diameter. In addition, a short sample is obtained from the core catcher (a multi-fingered device at the bottom of the core barrel which prevents cored materials from sliding out during core-barrel recovery). This usually amounts to about 20 cm of sediment and is stored separately. It is the sample from each core that represents the lowest stratum recovered in the particular cored interval. It is also generally the first material examined by the shipboard geologists, as several hours may elapse before the core itself is ready for examination. The core catcher sample is designated by CC (e.g., 567A-4-CC = core catcher sample of the fourth core taken in the second hole at Site 567).

The cored interval is the interval in meters below the sea floor, measured from the point at which coring for a particular core was begun to the point at which it was terminated. This interval is generally 9.5 meters (nominal length of a core barrel), but may be shorter if conditions dictate. Cores and cored intervals need not be contiguous. In soft sediments, the drill string can be "washed ahead" without recovering core by applying sufficiently high pump pressure to wash sediment out of the way of the bit and up the annulus between the drill pipe and wall of the hole. In a similar way, in hard rocks a center bit, which fills the opening in the bit face, can replace the core barrel if drilling ahead without coring is necessary (the latter, however, is seldom used). Drilling



or washing ahead are usually imposed by time limitations in the drilling of thick or monotonous lithologies.

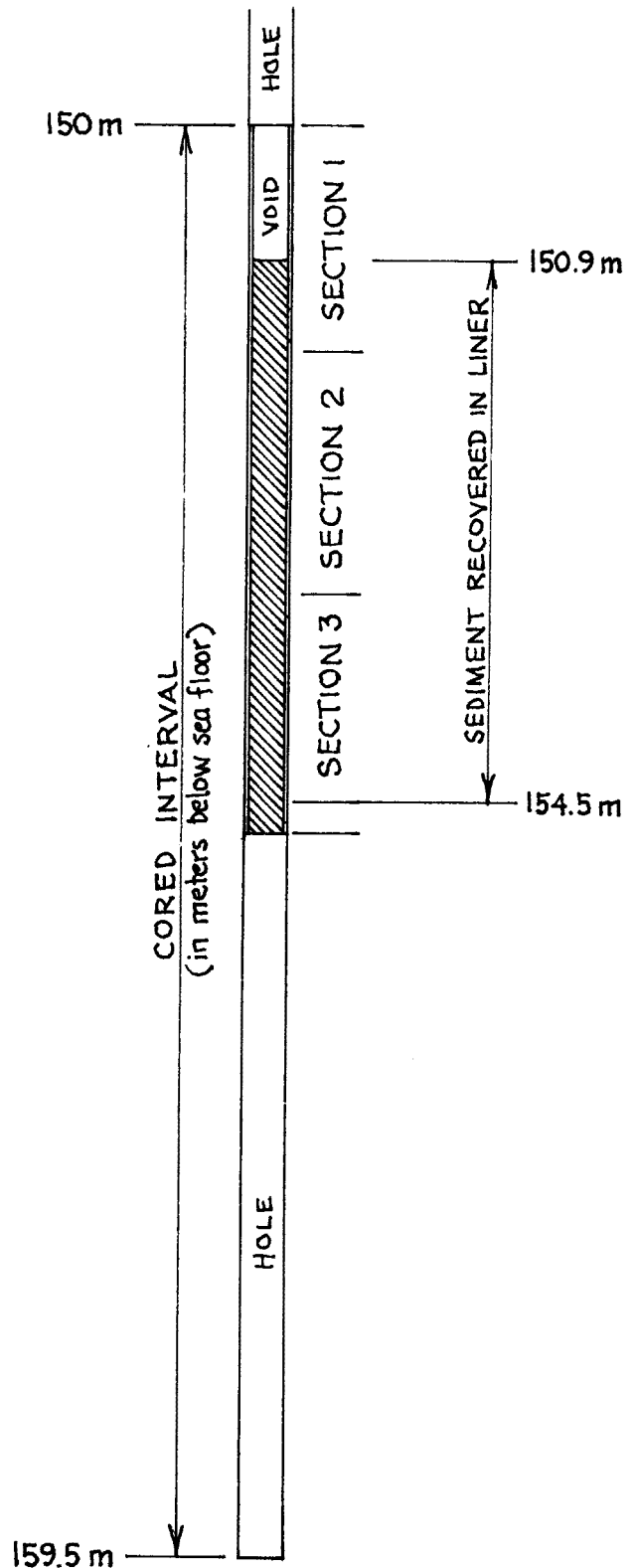
When a core is brought aboard the GLOMAR CHALLENGER it is labeled and the plastic liner and core cut into 1.5-meter sections. A full, 9-meter core would thus consist of six sections, numbered from the top down, 1 to 6. (The discrepancy between the 9-meter core and 9.5-meter cored interval is discussed below.) More often than not, something less than 9 meters is recovered. In this case, the sections are still numbered starting with one at the top, but the number of sections is the number of 1.5-meter intervals needed to accommodate the length of core recovered; this is illustrated below:



Thus, as shown, recovery of 3.6 meters of sediment would result in a core with 3 sections, with a void of 0.9 meters at the top of the first section. By convention, and for convenience in routine data handling at the Deep Sea Drilling Project, if a core contains a length of material less than the length of the cored interval, the recovered material is placed in the top of the cored interval, with the top of Section 1, rather than the top of the sediment, equal to the top of the cored interval. This is shown below for the core in the above example.

Thus, the depth below the sea floor of the top of the sediment of this hypothetical core would lie at 150.9 meters (not 150.0 m) and the bottom at 154.5 meters (the core catcher sample is regarded as being dimensionless).

It was noted above that a discrepancy exists between the usual coring interval of 9.5 meters and the 9-meter length of core recovered. The core liners used are actually 9.28 meters in length, and the core catcher accounts for another 0.2 meters. In cases where the core liner is recovered full to the top, the core is still cut into six 1.5-meter sections, measured from the bottom of the liner, and the extra 0.28-meter section at the top is designated Section 0, or the "zero section". The zero section is ignored in calcu-



10  
lations of depth below the sea floor of cores or levels within cores.

In the core laboratory on the GLOMAR CHALLENGER, after some steps of routine processing, the 1.5-meter sections of core and liner are split in half lengthwise. One half is designated the "archive" half, which is described by the shipboard geologists, and photographed; and the other is the "working" half, which is sampled by the shipboard sedimentologists and paleontologists for further shipboard and shorebased analysis.

Samples taken from core sections are designated by the interval in centimeters from the top of the core section from which the sample was extracted; sample size, in cc, is also given. Thus, a full sample designation would consist of the following information:

Leg (Optional)

Site (Hole, if other than first hole)

Core Number

Section Number

Interval in centimeters from top of section

567A-4-3, 122-124 cm (10cc) designates a 10cc sample taken from Section 3 of Core 4 from the second hole drilled at Site 567. The depth below the sea floor for this sample would then be the depth to the top of the cored interval - 150 meters in the example above - plus 3 meters for Sections 1 and 2, plus 122 cm (depth below the top of Section 3), or 154.2 meters. (Note, however, that sample requests should refer to a specific interval within a core section rather than level below sea floor.)

### Core Disturbance and Representativeness

Needless to say, the rotary drill-coring technique quite often results in a high degree of disturbance of the cored sediments. This is especially true of the softer unconsolidated sediments. Core disturbance has been treated at great length in volumes of the Initial Reports of the Deep Sea Drilling Project, and will not be elaborated upon here. A qualitative estimate of the degree of deformation is given on the core logs.

### Carbon-carbonate Analyses

At this writing, carbon-carbonate analyses have not been completed for Leg 33 samples because of malfunctioning analytical equipment. They will be included in the Leg 33 Initial Reports Volume.

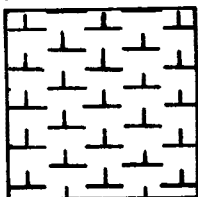
### X-ray Mineralogy

Semiquantitative determinations of the mineral composition of bulk samples are tabulated on the core logs. In each listing the percentage of "amorphous scattering" (noncrystalline, unidentifiable material) is shown along with the crystalline, identified fraction. The percentages of identified minerals sum up to 100 percent. The analytical methods used are described in Volumes 1 and 2 of the Initial Reports of the Deep Sea Drilling Project and in Appendix III of Volume 4.

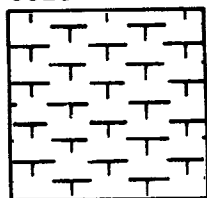
### Grain Size Analyses

The grain size analyses presented on the core logs are performed by standard sieve and pipette techniques, described in detail in Appendix III of Volume 4 of the Initial Reports (p. 745), with modified settling times as in Volume 9.

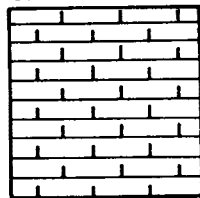
Nannofossil ooze



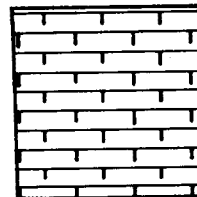
Nanno-foram ooze



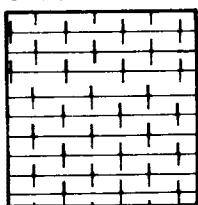
Nanno chalk



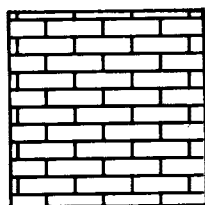
Foram chalk



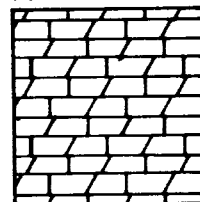
Foram-nanno chalk



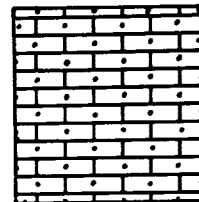
Limestone



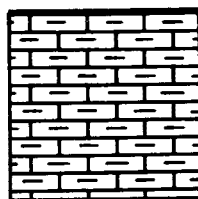
Dolomitic limestone



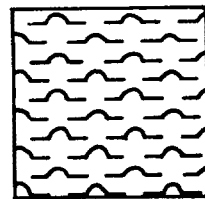
Sandy-graded limestone



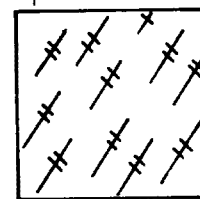
Clayey limestone



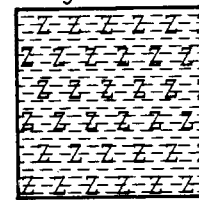
Rad ooze



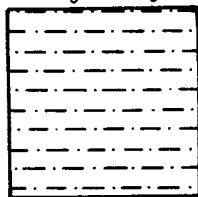
Pyritic-nanno-spicular ooze



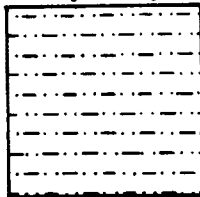
Zeolitic clay



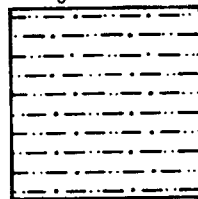
Sandy clay



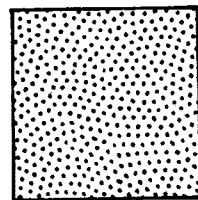
Silty clay



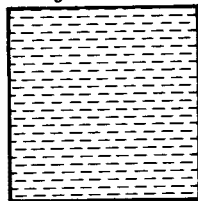
Sandy-silty clay



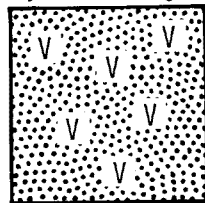
Sand



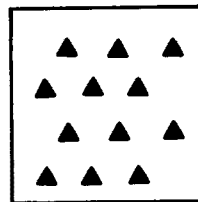
Claystone



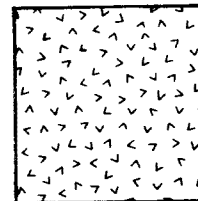
Volcaniclastic sand-, silt-, and claystones



Chert



Basalt



R = Rads  
 D = Diatoms  
 F = Forams  
 Z = Zeolites  
 Fe = Ferruginous  
 V = Volcanic  
 C = Clay

Figure 2. Lithologic symbols used in Volume 33.

Site \_\_\_\_\_ Hole \_\_\_\_\_ Core \_\_\_\_\_ Cored Interval: (in meters below the sea floor)

AGE	ZONE	FOSSIL CHARACTER				SECTION METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
	Foraminifer, nannofossil, and radiolarian zones and zonal boundaries.					0			<p>Munsell Color Designation</p> <p>↓</p> <div style="border: 1px dashed black; padding: 10px; width: fit-content; margin: 10px auto;">                     Lithological description                 </div> <p>Hyphenated numbers (e.g., 4-125) refer to section number and depth in section in centimeters.</p> <p>Smear slide description is either referenced to sample depth in LITHO. SAMPLE column, or is a summary of entire core in intervals of uniform lithology.</p> <p>D = dominant A = abundant C = common R = rare TRACE</p> <p>Description of acid-insoluble residue. Symbols, if used, are same as for smear slide description.</p> <p>Grain size determinations are given in % sand, silt, and clay.</p> <p>Bulk X-ray analyses give percentages of amorphous and crystalline fractions, and composition of the crystalline fraction, summed to 100%.</p>	
					0.5		Drilling breccia			
						1				
						1.0				
						2				
						3		Strongly deformed;		HCL = acid-insoluble residue sample
						4		Moderately deformed;		CC = carbon-carbonate sample;
					5		Slightly deformed;	Numbers refer to depth in section of smear slide sample;		
					6					
					Core Catcher					

Figure 3. Sample Core Description.

# sample-distribution policy

**D**istribution of Deep Sea Drilling samples will be undertaken in order to (1) provide supplementary data for inclusion in the appropriate Initial Report to support *Glomar Challenger* scientists in achieving the scientific objectives of their particular cruise, and (2) provide individual investigators with material to conduct detailed studies beyond the scope of the Initial Reports.

The National Science Foundation has established a Sample Distribution Panel to advise on distribution of core material. This panel is chosen in accordance with usual Foundation practices, in a manner that will assure advice in the various disciplines leading to a complete and adequate study of the core and related materials. Funding for the proposed research is handled separately by the investigator, not through the Deep Sea Drilling Project.

## *Distribution of samples for contributions to Initial Reports*

Any investigator who wishes to contribute a paper to a given volume of the Initial Reports may write to the Curator, Deep Sea Drilling Project, Scripps Institution of Oceanography, University of California at San Diego, La Jolla, 92037, requesting samples from a forthcoming cruise. The request should include the nature of the study, and type, size, number of samples, particular sampling techniques or equipment that might be required, and an estimate of the time required to complete the study. The requests will be reviewed by shipboard scientists, and, if they are deemed suitable and pertinent to the objectives of the leg, and shipboard workload permits, the requested samples will be taken during the cruise (provided, of course, material suitable to the investigation is obtained during the drilling). In the case of multiple requests to perform the same investigation, selection of investigator will be made by the shipboard scientific party.

Proposals should be of a scope appropriate to complete the sampling and study in time for publication in the Initial Reports. Studies deemed acceptable will be referred to the Curator who will, with the consent of the NSF Sample Distribution Panel, authorize distribution of the samples. The Sample Distribution Panel and the Deep Sea Drilling Project will strive to ensure a reasonable degree of continuity in the investigations among the various cruises, that the studies are pertinent to goals of the cruise, and that they are consistent with the publication policy for the Initial Reports. Subject to these same provisions, the shipboard scientific party may elect to have special studies of selected core samples of its recently completed cruise made by other investigators.

Investigations not completed in time for inclusion in the Initial Report may not be published in other journals until publication of the Initial Report for

which it was intended.

## *Distribution of samples for publication other than in Initial Reports*

1. Researchers intending to request samples for studies beyond the scope of the Initial Reports should first obtain a sample request form from the Curator. Requests should specify the quantities and intervals of the core required, a statement of the proposed research, the possibility of returning residue to the Curator, the estimated time required to complete and publish the results, and the availability or need of funding and availability of equipment and space foreseen for the research.

In order to ensure that requests for highly desirable but limited samples can all be considered, approval of requests and distribution of samples will not be made prior to 12 months after date of completion of the cruise that collected the cores. Prior to publication of an Initial Report, requests for samples from a cruise can be based on the preliminary shipboard core logs. Copies of these logs will be kept on open file at Scripps and other designated institutions. The only exceptions will be for specific instances involving ephemeral properties.

Requests for samples from researchers in industrial laboratories will be handled in the same manner as those from academic organizations, and there will be the same obligation to publish results promptly. Requests from foreign scientists or organizations will also be considered.

2. The Curator has the responsibility for distributing samples, controlling quality of samples, and preserving core material. He also has the responsibility for maintaining a record of requests for samples that have been processed and filled indicating the investigator and subjects to be studied. This record will be available to investigators.

The distribution of samples will be made directly from the two repositories at Lamont-Doherty Geological Observatory and Scripps by the Curator or his designated representative.

3. (a) Samples up to 10 cc/m of core length can be automatically distributed by the Curator, Deep Sea Drilling Project or his authorized representative to any qualified investigator who requests them. The Curator will refrain from making automatic distribution of any parts of the cores which appear to be in particularly high demand, and any requests for these parts of the cores will be referred to the Sample Distribution Panel for review. Requests for samples from thin layers or important stratigraphic boundaries will generally require Panel review.

(b) All requests for samples in excess of 3(a) above will be referred to the Sample Distribution Panel.

(c) If, in the opinion of scientific investigators, certain properties they wish to study may deteriorate prior to the normal availability of the samples, such investigators may request that the normal waiting period not apply. All such requests

must be approved by the Sample Distribution Panel.

4. Samples will not be provided prior to assurance that funding for sample studies either exists or is not needed. However, neither formal approval of sample requests nor distribution of samples will be made until the appropriate time (Item 1). If a sample request is dependent, either wholly or in part, on proposed funding, the Curator will provide to the organization to whom the funding proposal has been submitted any information on the availability (or potential availability) of samples that it may request.

5. Investigators receiving samples are responsible for:

i) promptly publishing significant results.  
ii) acknowledging, in publications, that samples were supplied through the assistance of the National Science Foundation.

iii) submitting 4 copies of all reprints of published results to the Curator.

iv) notifying the Curator of any work done on the samples that is additional to that stated in the original request for samples.

v) returning, in good condition, the remainders of samples after termination of research, if requested by the Curator.

6. Cores will be made available at repositories for investigators to examine and specify exact samples in such instances as this may be necessary for the scientific purposes of the sampling, subject to the limitations of 3 (a), (b), (c), and 5, above, and with the specific permission of the Curator or his delegate.

7. Cores of igneous and metamorphic rocks will also remain at the repositories where they will be available for observation and description and where selected samples may be taken for thin-section preparation and other work.

8. The Deep Sea Drilling Project routinely processes by computer most of the quantitative data presented in the Initial Reports. Space limits in the Initial Reports preclude detailed presentation of all such data. However, copies of the computer readout are available for those who wish the data for further analysis or as an aid in selecting samples.

Magnetics, seismic-reflection and bathymetric data collected under way by the *Glomar Challenger* will also be available for distribution 12 months after completion of the cruise.

Requests for these data may be made to the Chief Scientific Editor of the Deep Sea Drilling Project, at Scripps.

A charge will be made to recover the expenses of responding to individual requests. Estimated charges can be furnished before the request is processed, if required.

9. This policy has the approval of the National Science Foundation and is designed to help ensure that the greatest possible scientific benefit is gained from the materials obtained, and that samples will be made widely available to interested geologists.

*(Slightly condensed from the official sample distribution policy of the Deep Sea Drilling Project.)*

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DEEP SEA DRILLING PROJECT

LEG 33 SITE 314

SITE SUMMARY SHEET

POSITION: Latitude: 15°54.76'N Longitude: 168°28.07'W

Water depth (from sea level): 5213.8 corrected meters (echo sounding)

Bottom felt at: 5225.5 meters (drill pipe) Penetration: 45 meters

Number of Holes: 1 Number of Cores: 3

Total length of cored section: 17.5 m Total core recovered: <0.1 m

Percentage of core recovery: <1.0%

OLDEST SEDIMENT CORED:

Depth below sea floor: 45 meters Nature: Brown clay above chert  
of unknown thickness

Age: Eocene Measured Velocity: 3.1-3.4 km/sec

BASEMENT:

Depth below sea floor: Not reached

PRINCIPAL RESULTS:

The section consists of approximately 7 meters of soft brown zeolitic clay containing poorly preserved radiolarians of Eocene age, redeposited during Quaternary time. These 7 meters overlie 28 meters of uncored section, probably of brown zeolitic clay. From 35 to 45 meters the section is brown porcellanite and brown clay of middle and late Eocene age. Calcium carbonate is present only in the form of a few coccoliths and poorly preserved foraminifera - none of which are in the porcellanite. The section penetrated is similar to the upper 43 meters drilled at Site 164, 110 miles to the southeast, and the upper 15 meters drilled at Site 68, approximately 270 miles to the east of Site 314.



Site 314 Hole Core 1 Cored Interval: 0.0-7.5 m

AGE	ZONE	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
		FOSSIL	ABUND.						
QUATERNARY(?)		F N R	— — —	Core Catcher	0			WM	Dark yellowish-brown (10YR 4/2) ZEOLITIC CLAY. Smear Slide: CC Clay D Zeolites C Opal. C Fish Remains R Fe-Mn Specks R Traces of heavy minerals.

Site 314, Core 2, 7.5-17.5 m: NO RECOVERY

Site 314 Hole Core 3 Cored Interval: 35.5-45.0 m

AGE	ZONE	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
		FOSSIL	ABUND.						
EOCENE(?)	?	F N R	— — —	Core Catcher	0			WM T-2, T-3	Fragments of several lithologies: 1) Grayish-brown (5YR 5/6) FIRM CLAY Smear Slide: Clay D Fe-Mn Specks R Zeolites R Fish Remains R Volcanic Glass R 2) Grayish-orange (10YR 7/4) PORCELLANITIC CLAYSTONE Smear Slide: Thin section T-1 Clay D Chert C 3) Dark yellowish-brown (10YR 4/2) PORCELLANITE Smear Slide: Opaline Chert D 4) Dark yellowish-brown (10YR 4/2) ZEOLITIC CLAYSTONE Smear Slide: Clay D Fe-Mn Specks C Zeolites C Volcanic Glass R Fish Remains R 5) Pinkish-white (5YR 9/1) PORCELLANITE Smear Slide: Opaline Chert R Fish Remains R

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DEEP SEA DRILLING PROJECT

LEG 33 SITE 315

SITE SUMMARY SHEET

POSITION: Latitude: 4°10.26'N Longitude: 158°31.52'W

Water depth (from sea level): 4152 corrected meters (echo sounding)

Bottom felt at: 4164 meters (drill pipe) Penetration: 85 meters

Number of Holes: 2 Number of Cores: 4

Total length of cored section: 37.5 m Total core recovered: 17.2 m

Percentage of core recovery: 45.9%

OLDEST SEDIMENT CORED:

Depth below sea floor: 65.0 meters Nature: Gray foram nannofossil ooze

Age: Early Pliocene Measured Velocity: 1.55

BASEMENT:

Depth below sea floor: Not reached

PRINCIPAL RESULTS:

Ship excursion over beacon resulted in abandonment of Hole 315, and coring of Hole 315A.

/

DEEP SEA DRILLING PROJECT

LEG 33 HOLE 315A

SITE SUMMARY SHEET

POSITION: Latitude: 4°10.26'N Longitude: 158°31.54'W

Water depth (from sea level): 4152 corrected meters (echo sounding)

Bottom felt at: 4164 meters (drill pipe) Penetration: 1034.5 meters

Number of Holes: 1 Number of Cores: 34

Total length of cored section: 323.0 m Total core recovered: 130.5 m

Percentage of core recovery: 40.4%

OLDEST SEDIMENT CORED:

Depth below sea floor: 996.3 meters Nature: Green siltstone interlayered with brown mudstone

Age: Late Cretaceous (in or below Santonian) Measured Velocity: 2.0

BASEMENT:

Depth below sea floor: 996.3-1034.5 meters Nature: Basalt

Velocity: 4.0

PRINCIPAL RESULTS:

Spudded into late Pleistocene foram-nannofossil oozes, spot cored through late Pliocene to late Paleocene oozes, cherts, limestones, and cherts, into Cretaceous limestones, shales, and volcanogenic sands of Santonian or older age. These sands probably record the growth and erosion of the Fanning edifice. Redeposited shallow-water skeletal debris including large foraminifera, bryozoans, rudistids, and calcareous algae, probably of Late Cretaceous age suggest the growth of reefs or banks on the Fanning edifice following the cessation of volcanism. Drilled and cored 38.2 meters of probably alkalic basalt that represents at least 6 flow units related to the Fanning edifice. The section is much like that encountered at Site 165, Leg 17 (Winterer, Ewing, et al., 1973), except that the Quaternary section is present here, and the Tertiary section is considerably thicker here. The Fanning edifice appears to be the same age as the edifice drilled at Site 165, which is approximately 780 km further north along the Line Island Chain.

References

Winterer, E. L., Ewing, J. I., et al., 1973. Initial Reports of the Deep Sea Drilling Project, v. 17, Washington (U. S. Government Printing Office) p. 47-102.

Site 315 Hole Core 1 Cored Interval: 0.0-9.0 m

AGE	ZONE	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
		ABUND.	PREV.						
		N	A	G	0				
		N	A	G	0.5			85	Some soupy horizons, mostly moderately to light deformed Foraminifera nanofossil ooze with varying siliceous admixtures.
		N	A	G	1.0				Appears to be bedded in cyclic units (10YR 8/2) with shades of pale orange (10YR 8/2) to pale yellow brown (10YR 7/4) in basal portions and moderate-yellow brown (10YR 5/4) in upper part. Upper zones are mottled apparently due to burrowing.
		N	A	G	2			30	FORAMINIFERAL-NANOFOSซิล OOOE
		N	A	G				92	Smear Slide Summary:
		N	A	G				110	Nannos D
		N	A	G				39	Forams R to C
		N	A	G					Rads R to C
		N	A	G					Sp. Spic. R
		N	A	G					Silicof. R
		N	A	G					Further clay R
		N	A	G					Acid-insoluble Residue: D
		N	A	G				145	Clay D
		N	A	G					Siliceous Fossils D
		N	A	G					With rare volcanic glass, palagonite, zeolites, length-slow chaicedony, quartz, micas(?), barite.
		N	A	G				36	GRAIN SIZE
		N	A	G				56	(1-122 cm): 4.3 Sand
		N	A	G				92	20.6 Silt
		N	A	G					75.1 Clay
		N	A	G					(2-24 cm): 3.4 Sand
		N	A	G					33.5 Silt
		N	A	G					63.1 Clay
		N	A	G				38	(2-82 cm): 6.3 Sand
		N	A	G					26.5 Silt
		N	A	G					67.2 Clay
		N	A	G				120	(3-81 cm): 4.3 Sand
		N	A	G					22.6 Silt
		N	A	G					73.1 Clay
		N	A	G					(4-46 cm): 3.3 Sand
		N	A	G					26.2 Silt
		N	A	G					70.5 Clay
		N	A	G				90	(5-23 cm): 6.9 Sand
		N	A	G					26.9 Silt
		N	A	G					66.2 Clay
		N	A	G				133	(6-137 cm): 5.3 Sand
		N	A	G				148	21.9 Silt
		N	A	G					72.8 Clay
		N	A	G				CC	

Explanatory notes in Chapter 1

Site 315 Hole Core 2 Cored Interval: 9.0-18.5 m

AGE	ZONE	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
		ABUND.	PREV.						
		N	A	G	0				NO RECOVERY
		N	A	G					Very small (<1 cc) sample recovered in core catcher.

Site 315 Hole Core 3 Cored Interval: 9.0-18.5 m

AGE	ZONE	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
		ABUND.	PREV.						
		N	A	G	0				NO RECOVERY
		N	A	G					Very small sample recovered in core catcher.

Explanatory notes in Chapter 1

Site 315 Hole A Core 1 Core Interval: 75.5-85.0 m

AGE	ZONE	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION		
		ABUND.	PRES.								
UPPER MIOCENE	NN11 Globotarta pletosumida Sticthocorys peregrina	N A M R A G		0							
				1	0.5					5PB 8/2 SP 7/2 N8	
				2						N8	Slender Slide Summary: Nannos Forams Rads Diatoms Sp. Spic. Some Clay Acid Insoluble Residue: CC Clay Siliceous Microfossils (Sponge Spicules coated with Pyrite) Glass Shards Zeolites, Barite
				3							
				4					VOID	142	5PB 6/2
				5						35	5GY 9/1 SP 4/2 SP 7/2 SP 4/2
				6						145	5PB 7/2
	NN11						CC HCL	5GY 9/1			

Site 315 Hole B Core 4 Core Interval: 56.5-65.0 m

AGE	ZONE	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION	
		ABUND.	PRES.							
LOWER PLIOCENE	NN15 Globotarta tumida	N A G/M N A G/M R A G N A G/M		0					Moderately to highly disturbed pale blue (5B 8/2) to bluish white (5B 9/1) FORAMINIFERAL-NAANFOSSIL firm OOZE. Some faint laminations and mottling (burrows), layering. Minor pale orange (10YR 8/2) to yellow (10Y 7/2) RADIODIOLARIAN NAANFOSSIL OOZE. Slender Slide Summary: D to A Nannos Forams Rads Diatoms Sp. Spic. Some clay, volcanogenic grains, Pyrite(?), silicoflagellates. Acid Residue: 4 to 5 Siliceous Fossils Green Clay R.I.: >1.57 Brown Clay R.I.: <1.57 Rads Sponges Zeolites Oxyhydroxides, Barite	
				1	0.5		VOID			121 123 133 144 149
				2						92
				3						56
				4						40
				5						104
				6						8
				NN14						132
				NN14						NCL 20
				NN14						*
				NN13						
				NN13						
				NN13						
				NN13						
				NN13						
	NN13									

Explanatory notes in Chapter 1

Site 315 Hole A Core 2 Cored Interval: 123.5-133.0 m

AGE	ZONE	FOSSIL CHARACTER		SECTION METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
		ABUND.	PRES.					
UPPER MIOCENE	Globorotalia acostaensis	R	A	1	VOID		70	Very pale purple FORAM-NANNO Ooze with a lens of yellow streaks. Coarse layer at 1-68 to 1-76.  Smear Slide Summary: Nannos D Forams C to C Rads R Diatoms R Sp. Spic. R
	Globorotalia acostaensis	F	R	1.0			101	
	Globorotalia acostaensis	R	A	0.5			104	
	Globorotalia acostaensis	R	A				CC	

Site 315 Hole A Core 3 Cored Interval: 142.0-151.5 m

AGE	ZONE	FOSSIL CHARACTER		SECTION METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
		ABUND.	PRES.					
UPPER MIOCENE	Globorotalia acostaensis	N	A	0				Bluish-white RAD-NANNO, NANNO-FORM unit. Forams NANNO Ooze to top of NANNO-FORM unit. Some fine laminations and streaks. Some fine laminations graded unit. (RAD-NANNO firm Ooze at top to NANNO-FORM Ooze at base) from 5-15 to 6-25.  Smear Slide Summary of major lithology: 1-58, 3-90, 5-15, 6-10, CC Nannos D Forams R to C to A Rads C to A Diatoms R to C Sp. Spic. R to C Some clay, volcanic glass, fish remains.  Smear Slide Summary of coarser lithology: 5-92, 6-24 Nannos A Forams D Rads R to C Diatoms R Sp. Spic. R Some palagonite, fish remains.
	Globorotalia acostaensis	R	A	1			58	
	Globorotalia acostaensis	R	A	1.0			58 9/1	
	Globorotalia acostaensis	N	A	2			58 9/1	
	Globorotalia acostaensis	N	A	3			90	
	Globorotalia acostaensis	N	A	4			58 9/1	
	Globorotalia acostaensis	N	A	5			58 9/1	
	Globorotalia acostaensis	N	A	6			58 9/1	
	Globorotalia acostaensis	F	R				92	
	Globorotalia acostaensis	R	A				24	
	Globorotalia acostaensis	R	A				107	
	Globorotalia acostaensis	R	A				CC	

Site 315 Hole A Core 4 Cored Interval: 256.0-265.5 m

AGE	ZONE	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION	
		FOSSIL	ABUND.							
MIDDLE MIOCENE	NMS Globorotalia foansi robusta Globorotalia foansi NMS Camarotus laticonus	R	A	1	0.5	VOID		83	White, bluish-white and pale purple RAP-NANNO FORAM NANO and NANO FORAM OOZE to firm OOZE and CHALK. Some faint layering. Pyritic zones. Coarse yellow-gray NANO-FORAM OOZE at 2-42 to 46. Light gray NANO-FORAM OOZE with volcanic glass at 2-46 to 48.5. White NANO-FORAM OOZE, graded, at 3-8 <sup>1</sup> / <sub>2</sub> to 124.	
		F	A	1	1.0	VOID		45	Smear Slide Summary of major lithology: 1-83, 3-88 Nannos D Forams C Rads C Diatoms C Sp. Spic. R	
		N	A	2		VOID		47		
		N	A	2					58 9/1	Smear Slide Summary of coarser material: 2-45, 2-47, 3-121 Nannos A Forams D Rads R Diatoms R Sp. Spic. R Silicofl. R
		F	A	3		VOID		88		
		N	A	3					121	GRAIN SIZE (1-12 cm): 28.6 Sand 32.6 Silt 38.8 Clay
		F	A	3					5P 7/2	

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Site 315 Hole A Core 5 Cored Interval: 340.0-379.5 m

AGE	ZONE	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION	
		FOSSIL	ABUND.							
LOWER MIOCENE	Globoigerinoides bisphecus/s. insueta NMS Diatocycletta costata D. alata	R	C	0				15	Pale purple to white FORAM-NANNO CHALK laminations picked out by (<30°) laminations picked out by color differences. Burrows common. Coarse FORAM-RICH layer at 1-0 to 1-20. Layer rich in green palagonitic fragments at 1-57. Black pyritic NANO-SPICULAR SILICEOUS OOZE at 2-125.	
		N	A	1	0.5			57		
		F	A	1	1.0					58 9/1
		N	A	1						5P 6/2
		F	A	1						5P 8/2
		N	A	1						58 9/1
		N	A	2						NR
		F	A	2						5P 6/2
		N	A	2						NR
		F	A	2						5P 7/2
		R	C	6				125	Smear Slide Summary of major lithology: 1-57, 2-48, CC Nannos A to D Forams R Rads R Diatoms R Sp. Spic. R	
		N	A	6						1-15
		F	C	6						
		N	A	6						
		F	C	6						
		N	A	6						
		F	C	6						
		N	A	6						
		F	C	6						
		N	A	6						

Explanatory notes in Chapter 1





Site 315 Hole A Core 10 Cored Interval: 730.5-740.0 m

AGE	ZONE	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
			0				
		N C M	1	0.5		61	Light grayish-green, olive-gray clay with MAMMOSSIC CHALK in sections 1 to 4. Yellowish-gray in basal sections. SPICULE-RAD and SPICULE-MAMMO CLAYSTONES occur locally. Wide-spread burrow mottling "fucoids" with both dark and light compacted burrow infills. FORAM-RICH GRAINSTONES, with green volcanogenic fragments, with abundant sponges, with chert and FORAM-RICH GRAINSTONES.
	NP22	N C M	2	1.0			Smear Slide Summary: Nannos Forams Rads Trams Sponges R to C Clay is abundant to dominant. Some micrite. A little volcanic glass. Acid residue: 2-137 98% Clay, with very rare highly corroded Radiolarian skeletons.
		N C M	3				
		N C M	4				
		N C M	5				
		N C M	6				
		N C M	Core Catcher				
UPPER EOCENE	NP19/20	N C M				131	
		N C M				CC	

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Site 315 Hole A Core 11 Cored Interval: 740.0-749.5 m

AGE	ZONE	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
			0				
			1	0.5	VOID		
				1.0			Yellowish-brown gray, orange-pink and pink CHERT nodules of replacement origin. Some silicified claystone. Some chert fragments laminated, others more gray that partially replace coarse foram layers with green volcaniclastic detritus.
							56 5/2 NB 10YR 5/4 5R 7/4 56 4/1 specks

Site 315 Hole A Core 12 Cored Interval: 749.5-759.0 m

AGE	ZONE	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
			0				
		N					Brownish-black to dusky yellow-brown silicified claystone. Some light gray specks in chert are feebly calcareous.
							5YR 2/1 10YR 2/2 5YR 2/1
							Site 315A, Core 13, 759.0-768.5 m: NO RECOVERY

Site 315 Hole A Core 14 Cored Interval: 768.5-778.0 m

AGE	ZONE	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
			0				
			Core Catcher				One fragment of light gray and moderate reddish-brown replacement CHERT. Some unreplaced calcareous matrix.
							10YR 8/2 N2 10K 6/6

Site 315 Hole A Core 15 Cored Interval: 778.0-787.5 m

AGE	ZONE	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
			0				
	NP9	N C P	1	0.5	VOID		
		N C P		1.0			Olive gray, dusky brown and brownish black CLAYSTONE to CLAYEY MAMMO-CHALK. Numerous "fucoid" burrows. Some zones of silicification. Some dark chert.
		N F P					Brownish-black clay layers are rich in fish remains; these layers are interlaminated with lighter, more calcareous sediments.
		R F P					Level of silicified packstone at 1-104 to 1-112.
		N F P					Smear Slide Summary: Nannos Clay often dominant, often >75%. Fish material common.
UPPER PALEOCENE	NP8	N F P	2				
		N F P					
		N					

Explanatory notes in Chapter 1

Site 315 Hole A Core 16 Cored Interval: 787.5-797.0 m

AGE	ZONE	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
		ABUND.	PRES.						
MIDDLE MASTRICHTIAN	L. quadratus	N	R	0	VOID				Dusky yellowish-brown, brownish-black and dark to light brown CLAYSTONE, inter-laminated with burrowed "fucoidal" grayish-orange clayey limestone.
		R	R	1	0.5				Intervals of pale orange foraminiferal grainstones to packstones, graded and laminated. Locally silticified to reddish-brown chert.
		R	R	2	1.0				Shear Slide of finely laminated foramin-rich grainy bed: Forams Pieces of fish remains, with fragments (c.50µm) of sparry calcite.
		N	R	Core Catcher					

Site 315 Hole A Core 17 Cored Interval: 797.0-806.5 m

AGE	ZONE	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
		ABUND.	PRES.						
MIDDLE MASTRICHTIAN	L. quadratus	N	F	0	0.5			TS 45	Light grayish-brown to dark yellowish-brown CLAYSTONE. Burrowed, with "fucoid" calcite. Numerous brown chert nodules. Numerous intervals (centimeter scale) of white to pale orange graded, laminated calcareous grainstones to packstones.
		N	F	1	1.0				Yellowish graded layer at 2-96 to 2-118 contains additional green fragments of millimeter scale large foraminifera visible on cut surface.
		N	F	2					Shear Slide of a coarse foraminiferal layer: Forams Altered volcanic glass common, rare feldspar crystals and fish remains.
		N	F	Core Catcher				TS	Thin section description: 1-43 to 45 Packstone containing highly recrystallized planktonic forams, with occasional (c100-400µm) feldspar crystals. 2-117 Packstone containing large forams, red algae, bryozoa, echinoderm material, feldspar fragments and pieces of volcanic rock with trachytic texture.

Site 315 Hole A Core 18 Cored Interval: 806.5-816.0 m

AGE	ZONE	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
		ABUND.	PRES.						
MIDDLE MASTRICHTIAN	A. cymbiformis	N	F	0	0.5	VOID		62	Pale orange, light brown, moderate brown NANNO CLAYSTONE, involved in soft-sediment deformation (placoid conchoidal, conchoidal burrows common). Rare dark brown chert nodules.
		R	R	1	1.0				Intercalations of white, pinkish gray and light greenish gray foraminiferal grainstones to packstones; graded and laminated rich burrows at clay-rich tops. Greenish gray claystone common in basal layers of graded units.
		F	C	2					Shear Slide of claystone: 1-62 Nannos Dominant clay, with rare volcanic glass and fish remains.
		R	R	3					Shear Slides of coarse foraminiferal sandstones: 1-106, 2-8 Nannos Forams Some clay, with fragments of sparry calcite.
		F	N	4					

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Site 315 Hole A Core 20 Cored Interval: 825.5-835.0 m

AGE	ZONE	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
		ABUND.	PRES.					
UPPER CAMPANIAN-LOWER MASTRICHTIAN				0				Light olive gray, pale orange, and grayish orange claystones to CLAYEY NANNOS LIMESTONE. Burrowed and mottled, with phacoid structures. Inclusions of grayish yellow green volcanogenic grains and foraminifera. Units are graded and laminated, with scours at base.
		F R P	P	1	0.5	VOID		
		N C P	R	2	1.0			Smear Slide of clay-rich horizon: 4-91 NANNOS Sp. Spic. - R Mostly micrite with abundant clay.
		F	-					Smear Slide of coarser layer: 4-88 Nannos Forams R C Much micrite, with sparry calcite. Forams highly recrystallized.
		N C P	P	3				
		N F P	P	4				
		F	-					
		N F P	P	5				
		N C P	P					
							88 91	

Explanatory notes in Chapter 1

Site 315 Hole A Core 19 Cored Interval: 816.0-825.5 m

AGE	ZONE	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
		ABUND.	PRES.					
UPPER CAMPANIAN-LOWER MASTRICHTIAN				0				
		N C P	P	1	0.5	VOID		
		F C P	P				106	Pale orange, pale brown, grayish-orange pink, and olive-gray NANNOS and MICRITIC CLAYSTONES interbedded with white and gray FORAMINIFERAL LIMESTONES. The coarser limestone units are of centimeter scale; they contain green volcanogenic grains. Load casts at base.
		F R P	P	2	1.0			The claystones are burrowed and contorted into "phacoids". Smear Slide of claystone: 5-106 Nannos C R Forams Clay dominant; some micrite.
		N C P	P					Smear Slide of coarser unit: 1-106 Nannos Forams A Some clay, and some micrite.
		F R P	P	3				Smear Slide of acid-treated sample: 5-40 95% Clay Ferruginous matter.
		N C P	P	4				
		F	-				HCL 40	
		F C P	P	5			106	
		N C P	P					
		F C P	P	6				
		R	-					
		N C P	P					

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Site 315 Hole A Core 22 Cored Interval: 844.5-854.0 m

AGE	ZONE	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
		FOSSIL	ABUND.						
				0					
		F	-	1	0.5	VOID			Light gray, yellowish gray to greenish-gray CLAYEY MICRITIC LIMESTONE to CLAYSTONE. Some olive black claystone levels. Many burrows. Intervals of greenish gray to dark greenish gray volcaniclastic sandstones, graded, burrowed clay-rich tons. Scours at base. Clay clasts included in sandy units.
		N	F		1.0				5G 6/1 N7 56Y 4/1 5Y 8/1
		F	F	2				22	Smear Slide of Claystone: 2-22 Mainly clay, with admixture of feldspars, mafic minerals, and volcanic glass.
		N	F						N7
		F	F	2					Smear Slide of Volcanic Sandstone: 4-145 Sp. Spic. B Numerous feldspars, altered mafic minerals, including clinopyroxenes, volcanic glass and fragments of sparry calcite.
		F	C	3					5G 6/1
		N	F						5G 4/1
		R	F			VOID			5G 6/1
		N	F	4					
		F	C					145	

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Site 315 Hole A Core 21 Cored Interval: 835.0-844.5 m

AGE	ZONE	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
		FOSSIL	ABUND.						
				0					
		F	-	1	0.5	VOID			Pale brown, pale gray, dark greenish gray and white CLAYEY MICRITIC LIMESTONES and MICRITIC CLAYSTONES. Fucoids. Intersections of olive gray, olive black, greenish gray and white volcaniclastic sandstones, graded, burrowed and laminated. Layers range in thickness from 1 to 2 cm to 15 cm. Scours sometimes present at base.
		N	C		1.0				5YR 5/2
		N	F	2					Smear Slide of fine-grained material: 3-120 Nannos R Much micrite; and much clay. D
		F	F						5YR 8/1 N8
		N	F						Smear Slide of acid-treated sample: 3-118 Mainly clay with palagonite grains and numerous small Feldspar crystals.
		F	F						5YR 5/2 N9
		N	F						N7
		N	F	3					HCL 118 120 5YR 4/1 N8
		N	F						N8
		N	F	4					N5 5Y 2/1 5Y 6/1
		N	F						N8 5Y 6/1
		N	F	5					
		F	-						56Y 6/1 56Y 6/1
		F	R						
		R	-	6					
		N	C						
		N	F						56Y 6/1

Explanatory notes in Chapter 1

Site 315 Hole A Core 24 Cored Interval: 873.0-882.5 m

AGE	ZONE	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION	
		ABUND.	PRES.							
LOWER CAMP.	T. aculeus	N	F	1	0.5	VOID			Greenish white to greenish gray MICRITIC CLAYSTONES to LIMESTONES with localized burrows (fucoids). Red brown chert nodule at 2-19 to 2-25, replacing light gray micritic limestone. Mottled to dark greenish gray volcaniclastic sandstones, graded, parallel- and cross-laminated.  Smear Slide Summary of Claystones: 3-98, 6-143 Nannos from abundant to dominant, with corresponding decrease in micrite from abundant to common.	
		N	F	1	1.0			N6		
		N	F	1						56Y 7/1
		N	F	1						N7
		N	F	2						10R 4/6
		N	F	2						N6
		N	F	3						56Y 7/1
		N	F	3						N7
		N	F	4						N7
		N	F	4						56 4/1
MIDDLE CAMPANIAN										
				Core Catcher						
								143		

Site 315 Hole A Core 23 Cored Interval: 854.0-863.5 m

AGE	ZONE	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION	
		ABUND.	PRES.							
MIDDLE CAMPANIAN	T. gothicus	N	F	1	0.5	VOID			Light gray, olive gray, and greenish gray NANNOS to MICRITIC CLAYSTONES to LIMESTONES, mottled and burrowed. Dark greenish gray to greenish black volcaniclastic sandstones occur as interbeds; calcareous fragments and mud cracks. Tops are parallel or cross-laminated, with burrow traces.  Smear Slide of clay-rich facies: 4-74 Nannos Much clay, with micrite as well as nannos.	
		N	F	1	1.0			56 4/1		
		N	F	1						56 2/1
		N	F	2						N7
		N	F	2						
		N	F	3						56 4/1
		N	F	3						56Y 8/1
		N	F	3						
		N	F	4						56 2/1
		N	F	4						56Y 6/1
								74		

Explanatory notes in Chapter 1

Explanatory notes in Chapter 1

Site 315 Hole A Core 25 Cored Interval: 892.0-901.5 m

AGE	ZONE	FOSSIL CHARACTER			SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
		FOSSIL	ABUND.	PRES.						
					0					
					1	0.5 1.0	VOID			
		N	F	P					N7	Pinkish gray to light brown gray MICRITIC CLAYSTONE to LIMESTONE. Heavily burrowed intercalations of light olive gray and grayish green calcareous and volcanoclastic sandstone. Levels of dusky yellow green to dark greenish gray finely laminated claystone.
					2				5YR 4/1 5YR 8/1	Smear Slide of Claystone: 3-40 Nannos R to C Clay dominant, with micrite common. Feldspars.
		F	R	P					56Y 6/1	Smear Slide of coarser unit: 3-96 Nannos R Clay common, with abundant micrite, fragments of sparry calcite and feldspar.
	LOWER CAMPANIAN	N	R	P					56Y 4/1	
		F	R	P					56Y 6/1	
		N	F	P					40	
		N	C	M					96	
		R	F	P						
										Core Catcher

Site 315 Hole A Core 26 Cored Interval: 911.0-920.5 m

AGE	ZONE	FOSSIL CHARACTER			SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
		FOSSIL	ABUND.	PRES.						
					0					
					1	0.5 1.0	VOID			
		N	F	P					10R 5/4	Pale red to pale brown laminated MICRITIC CLAYSTONES, with burrowed zones. Some coarser bedded zones containing volcanoclastic grains.
		F	R	P					10R 6/2	Smear Slide: 2-77 Nannos R Clay dominant, with micrite common.
		N	F	P					10R 5/4 5YR 6/2 10R 6/2	
	SANTONIAN	N	F	P					77	
		F	R	P						
		N	F	P						Core Catcher

Explanatory notes in Chapter 1

Site 315 Hole A Core 27 Cored Interval: 930.0-939.5 m

AGE	ZONE	FOSSIL CHARACTER			SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
		FOSSIL	ABUND.	PRES.						
					0					
					1	0.5 1.0			72	
		N								Pale reddish brown MICRITIC CLAYSTONE and yellow brown CLAYSTONE fissile, with rare burrows. Intervals of greenish-gray volcanoclastic sand to clay, graded, with bed-parallel and angular laminations.
		F	R	P					56Y 6/1	Smear Slide Summary of Claystone: 1-72, Nannos R to absent Clay dominant, with much iron oxide-hydroxide material. Occasional feldspars.
		F	R	P					10R 5/4	
		N			2				110	Smear Slide Summary of Volcanic Sandstone: 6-102 Abundant plagioclase, with clay fragments, pyroxene and feldspar grains.
					3		VOID			
		F	R	P					5YR 6/2 10YR 5/4 5R 6/2	
	BARREN				4		VOID			
					5					
		N			6					
									102	

Explanatory notes in Chapter 1

Site 315 Hole A Core 28 Cored Interval: 949.0-958.5 m

AGE	ZONE	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
		FOSSIL	ABUND.						
				0		VOID			<p>Gray, grayish green, blue-green to grayish black ferruginous CLAYSTONES with some graded and laminated silty and sandy beds. Greenish black, chert nodules and thin bedded, shaly, argillaceous, thin bedded, radiolarian ferruginous claystones.</p> <p>Smear Slide of green Claystone: 3-72 Rads The Radiolarians are infilled and overgrown with siltite; only two specimens seen.</p> <p>Smear Slide Summary of red Claystone: 3-70, 3-135 R to C Abundant to dominant clay, with much iron oxide-hydroxide matter, patagonite and feldspar grains. Radiolarians are all infilled and overgrown with siltite.</p>
				1	0.5			5Y 6/1	
				2	1.0			5YR 4/1	
								5G 4/1	
								10R 4/6	
								5B 5/2	
								10R 3/4	
								5B 5/2	
								5B 3/2	
				Core Catcher					

Site 315 Hole A Core 30 Cored Interval: 987.0-996.5 m

AGE	ZONE	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
		FOSSIL	ABUND.						
				0		VOID			<p>Grayish red to dark reddish brown ferruginous CLAYSTONE, laminated, fissile. Interbedded with greenish-gray graded volcanic sandstones with bed-parallel and cross-laminated levels. Some ripple bedding.</p> <p>Smear Slide reddish Claystone: 2-130 Predominantly clay, with many feldspars and altered mafic minerals.</p> <p>All basalts below appear to be alkalic. Circled 2-130-150 Basalt is grayish green altered aphyric dense variolitic-interstitial type.</p> <p>Thin section description: TS-CC Plagioclase in variolitic laths, partly altered. Clinopyroxene interstitial glass completely altered to clay minerals. Calcite common as replacement mineral.</p>
				1	0.5			5G 4/1	
				2	1.0			10R 2/2	
								5G 4/1	
								5G 5/2	
								10R 4/6	
								5G 3/2	
								TS-CC	
				Core Catcher					

Site 315 Hole A Core 31 Cored Interval: 996.5-1006.5 m

AGE	ZONE	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
		FOSSIL	ABUND.						
				0		VOID			<p>Grayish green to dark greenish gray altered aphyric dense variolitic-interstitial Basalt.</p>
				1	0.5			5G 5/2	
				Core Catcher				5G 5/2	
								5G 4/1	

Site 315 Hole A Core 29 Cored Interval: 968.0-977.5 m

AGE	ZONE	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
		FOSSIL	ABUND.						
				0					<p>Grayish blue-green and grayish-red ferruginous CLAYSTONE, intercalated with numerous grayish blue-green graded, laminated volcanoclastic silt-sand layers. Chert at 1-27.</p> <p>Smear Slide of grayish blue-green Claystone: 1-36 Predominantly a green clay.</p> <p>Smear Slide Summary of grayish red Claystone: 1-28, 1-139 R to Absent Predominantly clay, with considerable amounts of iron oxide-hydroxide. A little patagonite.</p>
				1	0.5			36	
				2	1.0			10R 4/2	
								5B 3/2	
								5B 5/2	
								NS	
								5B 5/2	
				Core Catcher					

Site 315 Hole A Core 31 Cored Interval: 996.5-1006.5 m

AGE	ZONE	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
		FOSSIL	ABUND.						
				0		VOID			<p>Grayish green to dark greenish gray altered aphyric dense variolitic-interstitial Basalt.</p>
				1	0.5			5G 5/2	
				Core Catcher				5G 5/2	
								5G 4/1	

Explanatory notes in Chapter 1

Site 315 Hole A Core 32 Cored Interval: 1006.5-1015.5 m

AGE	ZONE	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
		ABUND.	PRES.						
				0					
				1	0.5	VOID			
				1	1.0			56 4/1	Dark greenish gray to medium bluish gray basalts with variable textures and vesicularity. All partially to completely altered. Abundant plagioclase in Flow Unit 2, diabasic-trachytic in Flow Units 3 and 4. Chilled margins at 2-123, 3-121. All basalts vesicular to vuggy.
				2				56 4/1	Thin section description: TS-CC Plagioclase in stubby radii, plagioclase rimmed with fine-grained pyroxene. Average grain size 0.4. Plagioclase relatively fresh, clinopyroxenes 75% altered to clay aggregates. Considerable calcite replacement.
				3				58 5/1 56 4/1	
				4				56 5/1	
				Core Catcher				56 5/1	

Site 315 Hole A Core 33 Cored Interval: 1015.5-1025.0 m

AGE	ZONE	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
		ABUND.	PRES.						
				0					
				1	0.5	VOID			
				1	1.0			58 5/1	Flow Unit 5. Medium bluish gray aphyric very fine-grained vesicular altered basalt.
				Core Catcher					

Explanatory notes in Chapter 1

Site 315 Hole A Core 34 Cored Interval: 1025.0-1034.5 m

AGE	ZONE	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
		ABUND.	PRES.						
				0					
				1	0.5	VOID			
				1	1.0			58 5/1 56 4/1	Flow Unit 6 chilled margin at 1025.0 m. Medium bluish gray to dark greenish gray aphyric very fine-grained vesicular altered basalt with diabasic texture.
				Core Catcher					

Explanatory notes in Chapter 1



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DEEP SEA DRILLING PROJECT

LEG 33 SITE 316

SITE SUMMARY SHEET

POSITION: Latitude: 00°05.44'N Longitude: 157°07.71'W

Water depth (from sea level): 4451.0 corrected meters (echo sounding)

Bottom felt at: 4464.5 meters (drill pipe) Penetration: 837.0 meters

Number of Holes: 1 Number of Cores: 30

Total length of cored section: 285.0 m Total core recovered: 102.8 m

Percentage of core recovery: 36.1%

OLDEST SEDIMENT CORED:

Depth below sea floor: 837.0 meters Nature: Tan claystone

Age: Early Campanian Measured Velocity: c/c only - not measured

BASEMENT:

Depth below sea floor: Not reached at 837.0 meters

PRINCIPAL RESULTS:

Like the section at Site 315, the uppermost rocks at Site 316 are Quaternary and Pleistocene nannofossil-foram oozes. The Tertiary section above the Eocene chert is principally foram-nannofossil chalk; it is thinner than the coeval section at Site 315 - about 460 meters subbottom versus 720 meters. The middle to lower Eocene contains abundant white and brown sugary dolomite not encountered at Site 315. The Paleocene section consists principally of cherty chalk that contains scattered dolomite. This section is very thick - 66 meters - as is the entire Cretaceous section cored, the Maastrichtian being on the order of 57 meters, and the Campanian 150 meters. A few very thin volcaniclastic sands are present in middle Maastrichtian strata, but comprise almost all of the middle and lower Campanian section. It seems likely that the thin volcanogenic sands of Maastrichtian age represent very late erosional products of earlier volcanism, but the thick middle and lower Campanian volcanogenic debris appear to represent the nearly simultaneous growth and rapid erosion of nearby Line Islands edifices. It is apparent that the thick section of volcanogenic sands and breccias is coeval at Sites 165, 315, and 316. It also seems apparent that the youngest volcanic basement in what is commonly accepted as the Line Island-seamount chain does not young to the south, at least in the approximately 1270 km distance along the chain between Sites 165 and 316. It is apparent that no simple model of "hot spots" that involves progressive volcanism is applicable to this part of the Line Islands.

Site 316 Hole Core 1 Cored Interval: 0.0-9.5 m

AGE	ZONE	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
		F A M	0				HCL 16	0-2.0 m: Repeated cycles consisting of white (N9) FORAM Ooze, with rare vol- canic ash (5Y 7/2) and very pale yellowish gray (5Y 7/2) and very pale orange (10YR 8/2) FORAM Ooze with slight burrowing.
		N A G	1	0.5			17	10YR 8/2 to N9
		N A G	1	1.0			80	N9 to 10YR 8/2
		N A G	1	1.0			116	5Y 7/2 to 10YR 6/2
		N A G	1	1.0			117	10YR 8/2 to N9
		N A G	2				38	Smear Slides: Forams D to C Nannos D to A Rads R to R Diatoms R Silicofl. R Sp. Spic. R Vol. Sd. R
		N A G	2				67	10YR 8/2
		N A G	2				91	10Y 6/2 to 10Y 4/2
		N A G	2				102	N7
		N A G	2				118	2.0-9.5 m: Varioleated interbedded light gray (N7) white FORAM Ooze, with acrital pal- e gray (5G 8/1) - pale olive (10Y 6/2) and pale purple (5P 6/2) FORAM NANNO OOZE.
		N A G	2				56	Smear Slides: Light gray foram ooze: Forams D Nannos A Rads R Diatoms R Sp. Spic. R Palagonite R Zeolite (sand- sized grains) R
		N A G	3				122	5G 8/1 & N9
		N A G	3				10	5P 6/2 to 5P 2/2
		N A G	3				31	N9 to 5G 8/1
		N A G	3				105	5P 6/2
		N A G	3				132	5P 6/2
		N A G	4				106	5G 6/1, N9, N7, & 5P 6/2
		N A G	4				109	5G 6/1, N9, N7, & 5P 6/2
		N A G	4				132	5G 6/1
		N A G	5				69	Purple coloration from pyrite on rads and forams. Bulk X-ray (0.80 m): Amorph. 15.85 Ident. 84.2% Calc. 97.6% Quar. 0.4% Mica 1.4% Barl. 0.6%
		N A G	6				77	
		N A G	Core Catcher				CC	
		F A M	Core Catcher				CC	

Site 316 Hole Core 2 Cored Interval: 153.0-162.5 m

AGE	ZONE	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
		F A M	0				47	Interlaminated thin (1-10 mm) layers of white (N9) FORAM NANNO firm Ooze and pale purple (5P 6/2), pale blue (5G 8/1), and very pale orange (10YR 8/2), and pale pink (5P 6/2) RADICULARIAN NANNOFOSIL firm Ooze.
		N A M	1	0.5			87	Smear Slides: Forams R to C Nannos D Rads R to C Diatoms R to C Sp. Spic. R to C Pyrite R (coatings on Rads and spicules)
		N A M	1	1.0			103	
		N A M	1	1.0			104	
		N A M	1	1.0			143	
		N A M	1	1.0			140	
		N A M	1	1.0			CC	
		N A M	2				140	
		N A M	2				566 7/7, and N9	
		N A M	2				5B 9/1	
		N A M	2				5P 2/2, 5P 6/2, 566 7/7, and N9	
		N A M	2				CC	
		N A M	Core Catcher				CC	

Site 316 Hole Core 3 Cored Interval: 267.0-276.5 m

AGE	ZONE	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
		F A M	0				116	Light greenish gray (5G 8/1), light blue (5P 6/2) and white (N9) to white (5P 9/1) RADICULARIAN NANNO- FOSSIL CHALK; and white (N9) to bluish white (5G 9/1) FORAM NANNO- FOSSIL CHALK. Moderately burrowed. Thin (1 mm) laminations 123-126 cm. Coarse-grained layer 118-123 cm contains rare grains of palagonite.
		N A M	1	0.5			117	Smear Slides: Forams R to C Nannos A to D Micrite R to C Rads R to C Diatoms R Sp. Spic. R to C
		N A M	1	1.0			122	
		N A M	1	1.0			120	
		N A M	1	1.0			121	
		N A M	1	1.0			123	
		N A M	1	1.0			124	
		N A M	1	1.0			CC	
		N A M	1	1.0			CC	
		N A M	Core Catcher				CC	
		F A M	Core Catcher				CC	

Site 316 Hole Core 4 Cored Interval: 390.5-400.0 m

AGE	ZONE	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
MID. EOCENE	NP22	FOSSIL ABUND. PRES.	0		VOID			
LOWER OLIгоценE	NP22	N A M	1	0.5			80	White (N9), yellowish gray (SY 6/2), and pale brown (10YR 8/1) to reddish brown (10YR 5/4 to 4/6) DOLOMITIC NANNOFOSSIL CHALK, and reddish brown (10YR 5/4 to 4/6) CHERT. Dolomite occurs as 50 to 100um rhombs, scattered on these contacts in chalk. Chert has chalk inclusions.
		N A P	2	1.0			88 HCL 92 112 30	Smear Slides, Rad-Nanno Chalks: Nannos A Micas C Rads C to A Sp. Spic. R
		N A M	Core Catcher					Smear Slides, Nanno-Foram Chalks: Forams A Nannos B Micas C Rads R Sp. Spic. R Palagonite, zeolite sand <sup>a</sup> Lychnocanona elongata <sup>b</sup> Dorcadospirys atcauchus

Site 316 Hole Core 5 Cored Interval: 447.5-457.0 m

AGE	ZONE	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
LOWER OLIгоценE	NP21	FOSSIL ABUND. PRES.	0		VOID			
		N C P	1	0.5			119 140	White (N9), yellowish gray (SY 7/2), and very pale orange (10YR 8/1) RADICULAR NANNOFOSSIL CHALK, with moderate brown (5YR 4/4), pale yellowish brown (10YR 6/2), and grayish orange pink (5YR 7/2) CHERT. Coarser laminae at 11, 55, 75, and 85 cm in section 2 contain rare palagonite grains.
		N C P	2	1.0			40 HCL 54 55	Remnant limestone fragments in chert indicate replacement origin for chert.
		N C P	Core Catcher					Smear Slides: Forams R (in coarse laminae) Nannos A to D Micas C to D Rads C to A Sp. Spic. R Palagonite, glass R (in coarse laminae)

Site 316 Hole Core 6 Cored Interval: 457.0-466.5 m

AGE	ZONE	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
MID. EOCENE	NP16	FOSSIL ABUND. PRES.	0		VOID			
LOWER OLIгоценE	NP16	N C P	Core Catcher				CC	Light brown (5YR 5/6) to dark yellowish brown (10YR 4/2) CHERT, with an irregular lump of partly silicified white (N9) NANNOFOSSIL CHALK.

Site 316 Hole Core 7 Cored Interval: 466.5-476.0 m

AGE	ZONE	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
LOW. MID. EOCENE	NP13/14	FOSSIL ABUND. PRES.	0		VOID			
		N C P	1	0.5			105 112 115 122 128 132 142	Brownish (5YR 8/1 to 8/4, 5YR 3/2, 10YR 8/2 to 4/6) and white (N9) DOLOMITIC NANNOFOSSIL CHALK, and reddish brown (10YR 5/4 to 4/6) CHERT. Dolomite occurs as 50 to 100um rhombs, scattered on these contacts in chalk. Chert has chalk inclusions.
		N C P	2	1.0			107 7/4 to 10R 5/4 5YR 3/2 & 5YR 8/4 10R 8/2 10R 5/4 10R 8/2 to 5Y 8/1 10R 4/6 10YR 8/2 to 10YR 6/2 10YR 4/2 & 5YR 8/4	Smear Slides: Nannos A C to A Micas R (at 122 cm only) Dolomite Rhombs C (in darker brown samples, as tiny grains).
		N	Core Catcher				135	Bulk X-ray (469.30um): Amorph. 55.7% Iolo. 48.4% Quar. 0.8% K-Fs 1.3% Plag. 0.9% Mica 3.3% Mont. 3.0% Clin. 5.6% Berl. 1.7%

Site 316 Hole Core 8 Cored Interval: 476.0-485.5 m

AGE	ZONE	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
		FOSSIL ABUND. PRES.	0		VOID			
		N	1	0.5			110 138	Grayish brown (5YR 3/2) DOLOMITIC NANNOFOSSIL CHALK, and dark brown (5YR 2/2) light brown (5YR 3/4), and very pale orange (10YR 8/2) CHERT. Rhombic dolomite crystals average about 100um in diameter. Fragments of partly silicified laminated dolomitic limestone in chert.
		N	Core Catcher					Smear Slides: Dolomite Rhombs A Nannos C Micas C Micrite A

Site 316 Hole Core 9 Cored Interval: 485.5-495.0 m

AGE	ZONE	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
		ABUND.	PRES.						
LOWER EOCENE	NP12	N	C	P	0-0.5	VOID	Core Catcher	7	White (N9) DOLOMITIC, DOLOMITIC NANNOFOSSIL CHALK, and DOLOMITIC and gray (N6), light brown (5YR 6/4), moderate reddish brown (10R 4/6), and pale red (5R 6/2) CHERT, enclosing chalk. Dolomite partly silticified in abundance and size from 50 to 100µm to 20µm from top of core downward. Smear Slides: 7 cm: Dolomite D (100µm) Nannos R 45 cm: Dolomite A (10 to 100, C avg. 50µm) Nannos A Micrite D 126 cm: Dolomite R (20µm) Nannos R Micrite A
		F	C	P	1.0				
		N	C	P	1.0				
		N	C	P	Core Catcher				

Site 316 Hole Core 10 Cored Interval: 495.0-504.5 m

AGE	ZONE	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
		ABUND.	PRES.						
LOWER EOCENE	G. subbotinae (NP1)	N	R	P	0-0.5	VOID	Core Catcher	27	Fragments of moderate reddish brown (10R 4/6), moderate brown (5YR 3/4), and moderate olive brown (5Y 4/4), chert, light brown (5Y 6/4), moderate reddish brown (5Y 8/1) FORAMINIFERAL NANNOFOSSIL CHALK and LIMESTONE, with minor moderate reddish orange (10R 6/6) silticified FORAMINIFERAL NANNOFOSSIL LIMESTONE. Smear Slides (limestone): 63 cm: Nannos R to C 116 cm: Nannos R 134 cm: Sp. Spic. R
		F	C	P	1.0				
		N	C	P	1.0				
		N	C	P	Core Catcher				

Site 316 Hole Core 11 Cored Interval: 514.0-523.5 m

AGE	ZONE	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
		ABUND.	PRES.						
UPPER PALEOCENE	Globorotalia velascensis NP9	N	C	P/M	0-0.5	VOID	Core Catcher	69	Light gray (N7), medium gray (N5) and minor light brown (5YR 5/6) CHERT, and interbedded (5Y 8/1) NANNOFOSSIL CHALK. Rare dolomite rhombs (5-10µm) at 136 cm and in core catcher. Smear Slides (chalk): 136 cm: Nannos D 137 cm: Micrite A 138 cm: Spic. A
		F	C	P	1.0				
		N	C	P/M	1.0				
		N	C	P/M	Core Catcher				

Site 316 Hole Core 12 Cored Interval: 523.5-533.0 m

AGE	ZONE	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
		ABUND.	PRES.						
UPPER PALEOCENE	NP9	N	C	M	0-0.5	VOID	Core Catcher	135	White (N9) with minor thin laminations of greenish gray (5Y 9/1) and gray (5Y 6/4) CHERT, and moderate reddish brown (5YR 4/4) and related color shades of CHERT. Chalk is moderately burrowed. From 140-150 cm, chalk is very pale purple (5P 6/2), and contains very rare dolomite rhombs. Smear Slides (chalk): 146 cm: Forams D 148 cm: Nannos C to A 42 cm: Micrite C to A 84 cm: Palagonite, 1 grain (148 cm) glass, RI > 1.57, 1 grain (cc). 145 cm: CC
		F	C	P	1.0				
		N	C	M	1.0				
		N	C	M	Core Catcher				

Site 316 Hole Core 13 Cored Interval: 533.0-542.5 m

AGE	ZONE	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
		ABUND.	PRES.						
UPPER PALEOCENE	NP9	N	C	P/M	0-0.5	VOID	Core Catcher	10R 4/6	Pinkish gray (5YR 8/1) FORAMINIFERAL NANNOFOSSIL CHALK, and fragments of moderate reddish brown (10R 4/6) CHERT. Delicate, irregular wavy laminations of greenish gray (5Y 9/1) CHERT, and scattered flattened burrows. Smear Slides: 100 cm: Forams C to D Nannos A to D Micrite C 5YR 8/1
		F	C	P	1.0				
		N	C	P/M	1.0				
		N	C	P/M	Core Catcher				

Site 316 Hole Core 14 Cored Interval: 542.5-552.0 m

AGE	ZONE	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
		ABUND.	PRES.						
UPPER PALEOCENE	Globorotalia pseudomediterranea NP8   NP9	N	C	P/M	0-0.5	VOID	Core Catcher	13 HCL	Pinkish gray (5YR 8/1) and white (N9) FORAMINIFERAL NANNOFOSSIL CHALK, and dark reddish brown (10R 3/4) CHERT. Smear Slides: 44 cm: Forams C to A Nannos C to D 107 cm: Palagonite, in HCL resid. at 21 cm, and at 13 cm. 142 cm: CC
		F	C	P/M	1.0				
		N	C	P/M	1.0				
		N	C	P/M	Core Catcher				



Site 316 Hole Core 19 Cored Interval: 609.0-618.5 m

AGE	ZONE	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
		ABUND.	PRES.						
MIDDLE MASTRICHIAN	L. quadratus	N	C	0					0.6-1.15 m: Light gray (N7), yellowish gray (5Y 8/1) and greenish gray (5GY 6/1) NANNO FORAM LIMESTONE. Laminated, burrowed.
		N	C	1	0.5			113	1.15-1.50 m: Graded bed at greenish black and white CLASTIC BRECCIA and SANDSTONE. Greenish gray and slabs of greenish gray (5GY 6/1) CLAYEY NANNO LIMESTONE at 1.35 m.
		N	C	2	1.0			115 125 143	1.50-6.00 m: Sequence of 15 beds, from 5 cm to 100 cm thick, consisting of the beds of white to light gray (N7) NANNO FORAM LIMESTONE with packstone fabrics or cross-laminations with laminations or cross-laminations and containing volcanogenic (palagonite, glass) sand grains. Beds grade upward to light gray (N7) to greenish gray (5GY 6/1) NANNO FORAM LIMESTONE with wackestone fabric and with faint laminations, and, near the top, burrows.
		N	C	3				96	
		N	C	4				87 115	
		N	C	Core Catcher					

Site 316 Hole Core 18 Cored Interval: 590.0-599.5 m

AGE	ZONE	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
		ABUND.	PRES.						
MIDDLE MASTRICHIAN	L. quadratus	N	R	0					Grayish green (5G 6/1), greenish gray (5GY 6/1), yellowish gray (5Y 7/2), and white (N9) FORAM LIMESTONE and NANNO FORAM LIMESTONE. Grayish chert (5GY 2/2) reddish brown (10R 3/4) CHERT at 3.55 m.
		N	R	1	0.5	VOID			Foram-rich light-colored layers at 2.42, 3.05, 3.75, 4.08, 4.18, 6.05, 6.40, 5.95, 5.60, 5.75, 6.00, 6.05, 6.40, 5.95, 5.60, and 5.50 m commonly contain detrital and detrital palagonite grains and show parallel and cross-stratified lamination. These generally grade upward into darker, more nannofossil-rich limestone showing wavy laminations of more clayey layers, and moderate burrowing.
		N	R	2	1.0			92	Smear Slides: Forams: A to D Nannos: C to A Micrite
		N	R	3				97 106	
		N	R	4				100	
		N	R	5				68 73	
		N	C	Core Catcher					









Site 316 Hole Core 26 Cored Interval: 723.0-732.5 m

AGE	ZONE	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
		FOSSIL	ABUND.						
				0					
		F	F P	1	0.5	VOID		97	Thirty-three beds, from 5 to 80 cm thick, all but two of these consists of a basal portion of light gray (NB) brownish gray (5YR 6/1) and pale yellowish brown (10YT 6/2) MANNO FORAM LIMESTONE or dusky brown (5YR 2/2) PALAGONITE FORAM SANDSTONE. Fine laminated grading upward into pale yellowish brown (10YR 6/2) to moderate brown (5YR 6/4) CLAYEY FORAM MANNO LIMESTONE with widely spaced (1-2 cm) fine laminations of moderate brown (5YR 3/4) CLAYEY MANNOFOSFIL LIMESTONE, moderately to intensely burrowed.
				2	1.0	VOID		149	Contact with next overlying bed is sharp, and at one place (at 723.0 m), limestone are transected by the contact, with no source remaining for the burrow fills.
	T. trifidus	F	F M	3					5YR 2/2 5YR 2/2 5YR 2/2
				4					10YR 6/2 to 5YR 6/4 NB to 5YR 6/1
				5				71	HCL
		N C M F F M		Core Catcher				CC	
UPPER CAMPANIAN-LOWER MASTRICHIAN									

Site 316 Hole Core 27 Cored Interval: 742.0-751.5 m

AGE	ZONE	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
		FOSSIL	ABUND.						
				0					
		N	C P	1	0.5	VOID			Thirty-eight beds, from 2 to 70 cm thick, all but two of these consists of a basal portion of light gray (NB) pale yellowish gray (10YR 6/2) MANNO FORAM LIMESTONE, or of dark brown (5YR 4/1) and greenish brown (5Y 4/1) PALAGONITE-RICH FORAM VOLCANIC SANDSTONE, thinly laminated; grading upward to pale yellowish brown (10YR 6/2) to light brown (5YR 6/4) CLAYEY MANNO LIMESTONE with widely spaced fine laminations, which gives way upward to moderate brown (5YR 4/1) to dark brown (5YR 2/2) CLAYEY MANNO LIMESTONE and CALCAREOUS CLAYSTONE. The colors are brownish in the upper part of the core, becoming more green in the lower part, reflecting the increasing proportions of volcanic sandstone and clay.
				2	1.0	VOID			56Y 4/1 to 5YR 4/1
	T. trifidus	N C P F F M		3					At 6.65 m, 3 cm of interbedded very dark red (5R 2/6) and dusky blue green (5BG 3/2) CLAYEY PALAGONITIC fine-grained SILTY SANDSTONE.
				4					At 2.45 to 3.23, and at 3.45 to 3.70 m, graded beds of greenish gray (5G 6/1) to dark greenish gray (5G 4/1) pebbly FORMINIFERAL VOLCANIC SANDSTONE.
		N C P F F P		5				65	5R 2/6 5BG 3/2
		N C P		Core Catcher				CC	5G 8/1
M. CAMP.	T. gothicus								
UPPER CAMPANIAN-LOWER MASTRICHIAN									



DEEP SEA DRILLING PROJECT

LEG 33 SITE 317

## SITE SUMMARY SHEET

POSITION: Latitude: 11°00.09'S Longitude: 162°15.78'WWater depth (from sea level): 2598.0 corrected meters (echo sounding)Bottom felt at: 317-2625.0 meters, Penetration: 943.5 meters  
317A and B-2622.0  
meters (drill pipe)Number of Holes: 3 Number of Cores: 82Total length of cored section: 766.5 m Total core recovered: 490.5 mPercentage of core recovery: 64.0%

## OLDEST SEDIMENT CORED:

Depth below sea floor: 910.0 meters Nature: Green and red volcanogenic siltstone and mudstoneAge: Older than Aptian-Barremian(?) Measured Velocity: 2.0-2.4 cm/sec

## BASEMENT:

Depth below sea floor: 910.0 meters Nature: BasaltVelocity: 4.0-5.7 cm/secPRINCIPAL RESULTS:

We attempted to obtain a continuous core in the central part of the Manihiki Plateau, approximately 80 miles southwest of Manihiki Island Hole 317, an attempted wash-down to Mesozoic rocks, was aborted on 30 November. Hole 317A was re-spudded 1 December, and successfully cored a thick Mesozoic section and, ultimately, into basalt. Hole 317B was spudded on 5 December, and successfully cored Pleistocene through Eocene rocks. The section at Site 317, as reconstructed from all holes at this site, consists of 424.5 meters of late Pleistocene to early Eocene nannofossil and foraminiferal oozes, chalks, and cherts, continuously cored. The uncored gap of 129.5 meters is probably occupied by strata of Paleocene age. From 554.0 to approximately 910 meters, the section consists of very early Tertiary or very Late Cretaceous sediments through Aptian-Barremian(?) chalk, chert, limestone, and siltstone to a depth of 677.5 meters, and a still older, thick, partially mollusk-bearing section of green and red volcanogenic mudstone, siltstone, and reworked breccia that extends to the basalt

LEG 33 SITE 317  
SITE SUMMARY SHEET, con't.

contact at about 910 meters. We then drilled 33.5 meters of basalt to a terminal depth of 943.5 meters, recovering 24.9 meters of basaltic rocks. In this interval, parts of ten basalt flow units occur, three of which are separated by thin beds of red and green volcanogenic siltstone, indicating a history of partially overlapping volcanic flows and volcanogenic debris accumulation. Two flow units appear to contain pigeonite and at least one contains feldspar phenocrysts, indicating that the flows are probably oceanic tholeiites. They are, however, uncommonly vesicular, and contain vesicle tubes up to a cm wide and 5 cm long. A simplified geological history of the Manihiki section as drilled can be summarized as follows:

- 1) Eruption of tholeiitic oceanic basalts in thin flow units, probably in unusually shallow water.
- 2) Possible isostatic uplift of the plateau following eruption of the major part of the volcanic masses.
- 3) Eruption of volcanic edifices that shed ash or erosional debris, or both over the area, partially overlapping the basalts in age, and extending into Aptian-Barremian(?) time; during this period the volcanogenic debris shows evidence of downslope movement and contains mollusks of types that may be indicative of shallow water.
- 4) Subsidence of the Manihiki Plateau, perhaps accompanied by erosion.
- 5) Deposition of a moderately thick section of pelagic sediments at a relatively modest rate, but in steady sequence, over the last 60 m.y.



Site 317 Hole A Core 3 Cored Interval: 563.5-573.0 m

AGE	ZONE	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
UPPER CRETACEOUS	MIDDLE MASTRICHTIAN	L. MAAS. MASTR. N C P	0					Very light gray (N6) white (N9) and pinkish gray NANNOFOSSIL FIRM OOZE. Lightly mottled, some chalky zones. Olive black (5Y 2/1) to brownish black (5YR 2/1) chert, some millimeter-sized pieces scattered throughout the core. Smear Slide Summary: Nannos R to C, Forams R, Micrite R, Clay R Moderately poor preservation of nannos with some overgrowth. Acid Residue: 14 Clay and some fine (<2um) opaques.
			Core Catcher					
			1	0.5	VOID			
			2	1.0			76	
			3				76	
			4		VOID		HCL 14	
			Core Catcher				CC	

Site 317 Hole A Core 4 Cored Interval: 573.0-576.0 m

AGE	ZONE	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
UPPER CRETACEOUS	MIDDLE MASTR. N C P	L. MAAS. MASTR. N C P	0					Fragments of dusty yellowish brown CLAYEY NANNOFOSSIL FIRM OOZE. Friable, mottled, burrowed. Smear Slide Summary: Nannos A to D, Clay C to A, Micrite R, Fe/Mn-Minerals R, Palagonite in acid residue and white (N9) nanofossil chalk. Nannos D
			Core Catcher					

Explanatory notes in Chapter 1

Site 317 Hole A Core 3 Cored Interval: 342.0-351.5 m

AGE	ZONE	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
LATE EOCENE	NP20 (NN1)	Lychocanomia elongata	0					Pinkish gray (5YR 8/1) FORAMINIFERAL-NANNOFOSSIL CHALK with some reddening. Mottles elongate parallel to bedding. Fragments of olive black (5Y 2/1) chert in core catcher. Some chalk with ferruginous patina. Smear Slide Summary: Nannos D, Forams R, Sp. Spic. R, Clay R Some overgrowth on discoasters and coccoliths.
			Core Catcher					
			1	0.5	VOID			
			2	1.0			5YR 8/1	
			3				5Y 2/1	

Site 317 Hole A Core 1 Cored Interval: 402.0-411.5 m

AGE	ZONE	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
MIDDLE EOCENE (LATE MIOC.)	NP15 (NN9)	Hankenia argoensis (G. mendotii)	0					Pale yellowish brown (10YR 6/2) FORAMINIFERAL-NANNOFOSSIL CHALK. Extensively burrowed (fucoids); commonly light infill dark. Some white (N9) foraminiferal nanofossil chalk zones. Grayish black (N2) and reddish brown (10YR 5/4) CHERT nodules. Smear Slide Summary: D Nannos (coccos-thiscos) C, Forams R to C, Clay TRACE, Rads Some overgrowth on discoasters.
			Core Catcher					
			1	0.5	VOID		47	
			2	1.0			122	
			3				CC	

Site 317 Hole A Core 2 Cored Interval: 554.0-563.5 m

AGE	ZONE	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
MID. MASTRICHTIAN	L. quadratus NP17/12		0					Light olive gray (5Y 6/1) CLAYEY NANNOFOSSIL CHALK. Some clay-rich darker layers with more conspicuous burrowing, local solution seams. Black chert. Smear Slide Summary: Nannos D, Forams R to C, Clay R Some overcalcification of discoasters.
			Core Catcher					
			1	0.5			31	
			2	1.0			144	
			3				CC	

Explanatory notes in Chapter 1

Site 317 Hole A Core 7 Cored Interval: 592.0-601.5 m

AGE	ZONE	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
UPPER CRETACEOUS	SANTONIAN	N A P	0				32	1) Mostly interbedded light olive gray (5Y 6/1) to very pale orange (10YR 8/2) CLAYEY MAMMOFOSSIL CHALK.
		N A P	1	0.5	VOID		70 81	Burrowed, some local soft sediment deformation, laminated layers, intrabed brittle failures.
		N A P		1.0			120	Smear Slide Summary: 1-32, 1-120 Nannos Micrite Clay Rads TRACE
	CENOMANIAN-LOM, TURONIAN	N A P	2		VOID			2) And dark yellowish brown (10YR 4/2) to black (N1) MAMMOFOSSIL CLAYSTONE.
		N A P					145	Partially silicified.
		N A P					CC	Smear Slide Summary: 1-81, 2-14, 2-145 Clay Nannos R to C Zeolite Fe/Mn Specks Fish Debris Rads R to C Radiolaria as silica infilled, cha leonid motils. Smear Slide 1-70: clasts of Fe/Mn coated altered igneous material: pinkish, clay (D), palagonite (C), allertine volc. minerals (R), micrite (R).

Site 317 Hole A Core 8 Cored Interval: 601.5-611.0 m

AGE	ZONE	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
LOWER/UPPER CRETACEOUS	UPPER ALBAIN-CENOMANIAN	N A P	0					
		N A P	1	0.5	VOID			
		N A P		1.0			125	Interlayering of partly silicified dark yellowish brown (10YR 4/2) MAMMOFOSSIL CLAYSTONE and black replacement chert layers containing large calcite fragments of INOCERAMMUS shell-prism layers and very pale orange (10YR 8/2) FORAMINIFERAL MAMMOFOSSIL CHALK.
		N A P					CC	Smear Slide Summary: 8-125: Nannos Forams Micrite Clay Amorph. Silica CC Clay Nannos Fe-Material Rads Chert Silica Rads: silica infilled.

Explanatory notes in Chapter 1

Site 317 Hole A Core 5 Cored Interval: 576.0-582.5 m

AGE	ZONE	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
U. CAMP.-L. MAASTR.	T. trifidus	N C P	1	0.5	VOID		107	1) Brownish black (5YR 2/1), olive (5Y 6/1) and pinkish gray (5Y 8/1) CLAYEY MAMMOFOSSIL CHALK.
		N C P		1.0				Clay-rich seam, extensively burrowed, with fucooids and solution seams.
		N A P					CC	2) Core catcher: Light gray (N8) MAMMOFOSSIL CHALK. Smear Slide: 1-107 Nannos Clay Fish Debris Dark Specks R Smear Slide: CC Clay Nannos R to C Nannofossils moderately to poorly preserved.

Site 317 Hole A Core 6 Cored Interval: 582.5-592.0 m

AGE	ZONE	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
MIDDLE CAMPANIAN	T. gothicus	N C P	1	0.5	VOID		146	Pinkish gray (5YR 8/1) to dark yellowish brown (10YR 4/2) CLAYEY MAMMOFOSSIL CHALK
		N C P		1.0			17 34 42	and dusky yellowish brown (10YR 2/2) MAMMOFOSSIL CLAYSTONE to CLAYSTONE.
		N F P	2				HCL	Bioburated, mod. deformed burrows, dark to light infillits. Color change boundary cross cuts primary burrows.
		N F P					CC	Smear Slide Summary: C to D Clay, brown-fer. D R to C TRACE to R Zeolites Fish Debris Iron Ore Minerals R to C Downward decrease of calcite.

Explanatory notes in Chapter 1



AGE	ZONE	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	LITHO. SAMPLE	DEFORMATION	LITHOLOGIC DESCRIPTION
LOWER CRETACEOUS	APTIAN OR YOUNGER	N A P	0					
		N C P	1	0.5	VOID	137		
		N C P	2	1.0	VOID	31		1) Greenish gray (5Y 6/1), light olive gray (5Y 7/1) to light olive gray (5Y 6/1) and very pale orange (10YR 8/2) CLAYEY MICRITIC CHALK to MICRITIC NANNOFOSSIL MICRITIC LIMESTONE extensively burrowed. Some mottling, lamination. Some levels rich in recrystallized forams. Thin shells occur throughout. Some chevron burrows. Some layers are filled with calcite 'catcl' siltite.
		N C P	3		VOID	148		Smear Slide Summary: Nannos A Micrite A Forams R to C Calc-shell Debris R to C Quartz or Amorph. Silica TRACE Foraminifera overcalcified, infilled with sparry calcite. 2) Moderate brown (5YR 4/1) chert nodules.
		N A P	4					
		N A P	5					
		N A P	Core Catcher					

Explanatory notes in Chapter 1

AGE	ZONE	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	LITHO. SAMPLE	DEFORMATION	LITHOLOGIC DESCRIPTION
LOWER CRETACEOUS	LOWER-MIDDLE ALBIAN	N A P	0					
		N A P	1	0.5	VOID	79		Dark yellowish brown (10YR 4/2) to light olive gray (5Y 6/1) and very pale orange (10YR 8/2) CLAYEY MICRITIC CHALK to MICRITIC NANNOFOSSIL CHALK.
		N A P	2	1.0		68		Fine laminations, some sediment slippage structures. Locally thin-shelled bivalve fragments parallel to bedding and solitary INOCERAMUS PRISMS. Smear Slide Summary: Nannos C to A (badly preserved) Micrite A Clay C Amorph. Silica R to C Coarse Shell R Debris R
		N A P						and grayish orange pink (5YR 7/2) to pinkish gray (5YR 2/2) to black (M) chert beds.

AGE	ZONE	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	LITHO. SAMPLE	DEFORMATION	LITHOLOGIC DESCRIPTION
LOWER CRETACEOUS	BARREMIAN-APTIAN (?)	N A P	0					
		N A P	1	0.5	VOID	125		Light olive gray (5Y 6/1) to pale yellowish brown (10YR 6/2) to pinkish gray (5YR 8/1) MICRITIC NANNOFOSSIL CHALK changing to Mostly clay rich. Some INOCERAMUS fragments. Squashed burrows, tiny black specks. Thin-shelled bivalves.
		N A P	2					And: moderate reddish orange (10R 6/6) to grayish brown (5YR 3/2) CHERT beds replacing grayish pink (5R 8/2) CHALK. Smear Slide Summary: Nannos D Micrite, Shell C to A Mat. R to C Forams R to C Opaliferous Silica R Black Spcks R to C Clay R to C
		N A P	3			142		Forams recrystallized.
		N A P	Core Catcher			63		

Explanatory notes in Chapter 1

Site 317 Hole A Core 13 Cored Interval: 649.0-658.5 m

AGE	ZONE	FOSSIL CHARACTER	SECTIONS	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
LOWER CRETACEOUS	BARDESIAN-APTIAN	FOSSIL ABUND. PRES.	0	0.5	VOID		80	<p>Interbedded</p> <p>1) Greenish gray (5G 6/1) to dark greenish gray (5G 4/1) MANDUFOSSIL MICRITIC LIMESTONE, partly silicified. Forams-rich, rare micritic layers, nodoid burrows. Locally clay-rich.</p> <p>Swear Slide Summary: A to D            Mammals A to D            Micrite A to D            Clay R            Forams (Recryst.) R to C            Volcanic Minerals R</p> <p>Acid Residue:            Clay cemented by amorph-microcrystalline silica.</p> <p>and</p> <p>2) Greenish black (5GY 2/1) to olive gray (R2) volcanogenic sands, locally some graded beds poorly sorted, locally burrowed. Partly calcareous. Angular grains.</p> <p>Swear Slide Summary: D            Palygonite D            Mg and Pyroxene D to R            Calcite R            Zeolite R</p>
			1	1.0			56 6/1-56 4/1	
			2				56 4/1	
							56 7/1	
							56 6/1	
							56 7/1	
							R2	
							56 4/1	
							R2	
			3				48	
							56 6/1	
							56 4/1	
							56 2/1	
			4				56 2/1	
							R3	
							M4	
							56 6/1	
							103	
							56 2/1	

Explanatory notes in Chapter 1

Site 317 Hole A Core 12 Cored Interval: 639.5-649.0 m

AGE	ZONE	FOSSIL CHARACTER	SECTIONS	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
LOWER CRETACEOUS	UPPER APTIAN	FOSSIL ABUND. PRES.	0					<p>1) Mostly greenish gray (5G 6/1), some yellowish brown (10YR 6/2) to light olive gray (5Y 6/1) MANDUFOSSIL MICRITIC LIMESTONE, rucoid type (micrites) burrow shells, black, red and thin-shelled blades. Micritic silicification fronts. INOGERMUS prisms.</p> <p>2) Moderate brown (5YR 4/4) chert nodules. Silicification fronts in limestone.</p> <p>Swear Slide Summary: A            Mammals A            Micrite R to C            Forams R to C            Clay R</p> <p>Acid Residues: (A) Radiolaria, (filled) with nodules, thin aggregates, grains, clay grain aggregates.</p> <p>3) At base: first appearance of greenish black (5G 2/1) volcanogenic sand.</p> <p>Swear Slide: 6-140            Palygonite D            Clay (isolated) C to A            Heavys R            Clear Grains R            (Zeolite) R            Vitric Fragments M &lt;1.5</p>
			1	0.5			100	
			2				74	
							5G 6/1	
							10YR 6/2	
							56 7/2	
							10YR 6/2	
							56 6/1	
							10YR 6/2	
							MCL	
							10YR 6/2	
							5B 9/1	
							5YR 4/4	
							56Y 6/1	
							5B 7/1	
							5Y 6/1	
							5YR 4/4	
							56Y 6/1	
							56 6/1	
							56 2/1	
							56 4/1	
							56 2/1	

Explanatory notes in Chapter 1

Site 317 Hole A Core 15 Core Interval: 668.0-677.5 m

AGE	ZONE	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION	
									FOSSIL ABUND.
EARLY CRETACEOUS	BARREMIAN-APTIAN (?)	N F P	0						
			1	0.5 - 1.0	VOID			Dark gray (N3) to greenish black (56Y 2/1) VOLCANOGENIC SANDSTONE to SILTSTONE. Tops of faintly graded units burrowed, lighter color (56Y 4/1) and calcareous. Poorly sorted, angular grains. Intercalated are rare calcareous layers with shell material.	
			2					Smear Slide Summary: Palagonite A to D Micrite R to A Clay C to A Zeolite R Altered volc. Minerals R Amorph. Silica R	
			3					56Y 2/1 56Y 4/1 56Y 2/1 N3	
			4					56Y 2/1 56Y 2/1 56Y 4/1	
								20	

Explanatory notes in Chapter 1

Site 317 Hole A Core 14 Core Interval: 680.5-688.0 m

AGE	ZONE	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
EARLY CRETACEOUS	BARREMIAN-APTIAN	N R P	0					
			1	0.5 - 1.0	VOID			Interbedded greenish black (56Y 2/1) CLAYEY MICRITIC LIMESTONE, fucoid burrows, mottled, locally foraminiferal or with thin shelled fragments and dark gray (N2-N3) to greenish black volcanogenic sandstone to claystone. Some grading, not conspicuous, poorly sorted. Rarely calcareous. Partly burrowed. Rare current x-laminations.
			2					Smear Slide Summary: 1) Micrite A Forams C to A Nannos R Rads R to C Palagonite R Microcrystalline R (fossils badly preserved) 2) Palagonite A to D Altered Volc. R to C Fe Opaque R Minerals R Zeolites R Crystals Crystalline R to A Silica R
			3					126 131
			4					56Y 2/1 56Y 2/1 56Y 2/1 56 4/1 N3

Explanatory notes in Chapter 1

Site 317 Hole A Core 17 Cored Interval: 687.0-696.5 m

AGE	ZONE	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
			0					
			1	0.5 1.0	VOID			Mostly greenish-black (56 2/1) VOLCANOGENIC SANDSTONE to SILTSTONE. Thin- to thick-bedded, some brecciated zones with 1-5 cm intraclasts locally, matrix altered to grayish red purple (SRP, 4/2). Rare calcareous beds some with small (2mm) spherulites.
			2					Smear Slide Summary: Palagonite 0 to A Zeolites R to A Clay (analcite) C to A Micae NIL to A Nonfossils TRACE Altered Volc. R Min.
			3					56Y 4/1 SRP 4/2 56 2/1 N2 N3
			Core Catcher				125	
								CC

Site 317 Hole A Core 18 Cored Interval: 696.5-706.0 m

AGE	ZONE	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
			0					
			1	0.5 1.0	VOID			Greenish black (56 2/1) VOLCANOGENIC SANDSTONE to SILTSTONE. Several stages of mass movement and brecciation visible: incipient to complete.
			2					Smear Slide: CC Palagonite D Clay C to A Zeolites R Iron ore, Opaques TRACE to R Altered Leucocrats R
			Core Catcher					
								CC

Explanatory notes in Chapter 1

Site 317 Hole A Core 16 Cored Interval: 677.5-687.0 m

AGE	ZONE	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
			0					
			1	0.5 1.0	VOID			Greenish black (56 2/1) to olive gray (56Y 4/1) VOLCANOGENIC SANDSTONE to SILTSTONE. Some beds calcareous, poorly sorted, brecciated with brecciated zones of intraformational material, locally dusky red (5R 2/6) or med 1 um bluish gray (5B 5/1) contorted beds, some burrows with coarse pyrite.
			2					And: bioclastic conifera 2-80 small spherulites (4-30). Smear Slide Summary: Palagonite A to D Zeolite C to A Altered Volc. R Clay, Fe Specks, R to C Ferrug.
			3					56Y 2/1 PYRITE 5YR 2/1
			4					10R 2/2 56Y 2/1 5YR 6/1 5R 4/2 5Y 3/2 56Y 2/1
			5					56 2/1
			Core Catcher					

Explanatory notes in Chapter 1

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Site 317 Hole A Core 20 Cored Interval: 725.0-734.5 m

AGE	ZONE	FOSSIL CHARACTER	FOSSIL ABUND.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
				0					
				1	0.5-1.0	VOID			Greenish-black (56Y 2/1) VOLCANOGENIC SANDSTONE to SILTSTONE. Thin beds, alternating silty to sandy. Some clay. Some grades. These are brecciated in the lowest section into lithoclasts. Coarser layers rich in a variety of sub- to anhedral zeolites.
				2					56Y 2/1 Smear Slide Summary: Palagonite D Plag. (altered) R Pyroxene to Amphibole R Zeolites (anaclitic and others) R to C
				3				50	56Y 2/1
									Core catcher
									CC

Explanatory notes in Chapter 1

Site 317 Hole A Core 19 Cored Interval: 715.5-725.0 m

AGE	ZONE	FOSSIL CHARACTER	FOSSIL ABUND.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
				0					
				1	0.5-1.0	VOID			Greenish black (5G 2/1) VOLCANOGENIC SANDSTONE to SILTSTONE. Zones with various stages of mass movement. Intra-formational little brecciation. Intra-formational little brecciation. Brecciated to grayish-red-purple (SRP 4/2) locally. Some calcareous levels in uppermost section.
				2				148	5G 4/1 Smear Slide Summary: Palagonite D Altered Volc. R to C Chlorite (R.I. 1.57) R Clay (mont.) C Zeolite (anaclitic) R
				3				103	56Y 2/1
				4				78	56Y 2/1
									Core catcher
									CC

Explanatory notes in Chapter 1

Site 317 Hole A Core 21 Cored Interval: 734.5-744.0 m

AGE	ZONE	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
			0					
			1	0.5	VOID			<p>Greenish black (56Y 2/1) VOLCANOGENIC SANDSTONE, SILTSTONE to CLAYSTONE.</p> <p>Locally brecciated zones. Poorly sorted. Rare calcareous horizons.</p> <p>Sneer Slide Summary: D to A Palagonite Altered Volc. Min. Zeolites (analcite and others) R to A</p>
			2	1.0			56Y 2/1	
			3				56Y 2/1	
			4				56Y 2/1	
							45	
							90	
							150	

Explanatory notes in Chapter 1

Site 317 Hole A Core 22 Cored Interval: 753.5-763.0 m

AGE	ZONE	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
			0					
			1	0.5				<p>Greenish black (56Y 2/1) or dark reddish-brown (10R 3/4) VOLCANOGENIC SANDSTONE partly brecciated. Solution alteration. Numerous ferruginous clay-rich seams.</p> <p>Mass-movement features, abnormal dips.</p> <p>Native copper flakes in section 2 to 3 in red ferruginous zone.</p> <p>Rare calcareous level with bivalves.</p> <p>Sneer Slide Summary: Brown Brown Ferrug. Clay Palagonite A Altered Volc. C Min. Zeolites R Flacks of Native Cu R</p>
			2	1.0			56Y 2/1 56Y 2/1 10R 4/2	
			3				10R 3/4 56 4/1 56 2/1	
			4				10R 3/4	
			5				56Y 2/1 10R 3/4 56 2/1 10R 3/4	
							CC	

Explanatory notes in Chapter 1

Site 317 Hole A Core 23 Cored Interval: 763.0-772.5 m

AGE	ZONE	FOSSIL CHARACTER	FOSSIL ABUND.	PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
					0					
					1	0.5	VOID			Interbedded greenish black (56Y 2/1) and orange reddish brown (10YR 3/4) CLAYSTONE SANDSTONE SILTSTONE and BRECCIA.
					1	1.0	VOID			Commonly green interfaced with reddish-brown seams and veins.
					2					Coarse levels rich in zeolite grains. Some graded. Analcite most common. Flcks of native copper.
										Smear Slide Summary: Palagonite Clay or Ferrug. Zeolites (analcite) Iron Minerals
					3					C to D R to A
					4					
									CC	

Explanatory notes in Chapter 1

Site 317 Hole A Core 24 Cored Interval: 772.5-782.0 m

AGE	ZONE	FOSSIL CHARACTER	FOSSIL ABUND.	PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
					0					
					1	0.5	VOID			Interlayered greenish black (56Y 2/1) and orange reddish brown (10YR 3/4) CLAYSTONE with reddish brown (10YR 3/4) clay seams, veins and layers.
					1	1.0	VOID			Coarse beds rich in zeolite grains. Locally intercalated breccia. Slumping, concretion.
					2					Some calcite occurs as grains together with vesicles. Zeolites. Sorting poor. Traces of grading.
										Some native copper flakes.
										Smear Slide Summary: Palagonite D to A
										Altered Volc. C
										Ferrug. Clay C to A
										Zeolites (analcite C to A and others) R to NONE
										Calcite
					3					
					4					
					5					

Explanatory notes in Chapter 1

Site 317 Hole A Core 25 Cored Interval: 791.5-801.0 m

AGE	ZONE	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
		ABUND.	PRESEN.					
				0				
				1	0.5	VOID	90	Greenish black (56Y 2/1) to dusky reddish brown (10R 3/4) VOLCANO-GENIC SANDSTONE, SILTSTONE and FERROUGINOUS CLAY.
				2	1.0		77	Some brecciated inter layers. Sandy beds rich in vesicle calcite. Zeolite suite as detrital grains. Locally graded, deformation structures. Grains of native copper. Smear Slide Summary: Pyrite grains D Clay (ferrous) A to D Zeolite (Most) R to C Calcite R Carbonate R Altered Volc. R Min. R
				3				
				4			32	
				5				
				Core Catcher				

Explanatory notes in Chapter 1

Site 317 Hole A Core 26 Cored Interval: 810.5-820.0 m

AGE	ZONE	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
		ABUND.	PRESEN.					
				0				
				1	0.5	VOID		As above.
				2	1.0		85	Greenish black (56Y 2/1) to dusky reddish brown (10R 3/4) VOLCANO-GENIC SANDSTONE, SILTSTONE and FERROUGINOUS CLAY. Greenish colors more common in sandier beds.
				3				
				4				
				5				
				Core Catcher				

Explanatory notes in Chapter 1



Site 317 Hole A Core 28 Cored Interval: 849.5-958.0 m

AGE	ZONE	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO.SAMPLE	LITHOLOGIC DESCRIPTION
			0					
			1	0.5 1.0			10R 2/2 5G 2/1	Greenish black (56Y 2/1) VOLCANOGENIC SANDSTONE SILTSTONE to CLAYSTONE Feer, reddish layers. More incising veins + seams of dusky red brown (10R 3/4) clay. Many thin graded beds, 1 to 5 cm thick. Burrowed ironspecks, zeolite rich.  Smear Slide Summary: Clay C to A Palagonite C to A Zeolite C Calcite V. R Volc. Minerals C Fe Opaques R
			2				5R 2/2	Native Cu
			3				5G 2/1 10R 4/2	
			4				5G 2/1 10R 3/4 5G 2/1	
			5				10R 3/4 N2 56Y 2/2	
			6				10R 3/4	
		N			Core Catcher		10R 3/4	

Site 317 Hole A Core 27 Cored Interval: 829.5-939.0 m

AGE	ZONE	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO.SAMPLE	LITHOLOGIC DESCRIPTION
			0					
			1	0.5 1.0			10R 4/3 56Y 2/1	As above. Greenish black (56Y 2/1) and dusky red-brown (10R 3/4) VOLCANOGENIC SANDSTONE, SILTSTONE to CLAYSTONE. Locally breccia produced by extensive fracturing of the greenish black SILTSTONE. Sandstone grains angular to subangular.
			2				10R 4/3 5G 2/1 5G 2/1	Smear Slide Summary: 3-98 Clay C to A Palagonite C to A Zeolite C Calcite (white +) C Volc. Minerals V. RARE Fe Opaques C
			3				5G 2/1 5B 5/1 10R 3/4 10R 3/4	
			4				5G 2/1 10R 2/2	
			5				56Y 2/1 10R 3/4	
			6				56Y 2/1 5R 3/4 10R 3/4 56Y 2/1	
		N			Core Catcher			

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Explanatory notes in Chapter 1

Site 317 Hole A Core 30 Cored Interval: 886.5-896.0 m

AGE	ZONE	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
		ABUND.	PRES.						
				0		VOID			As above.
				1	0.5	V		56 2/1 10R 3/4	Greenish-black (56Y 2/1) and dusky red-brown (10R 3/4) VOLCANOGENIC SANDSTONES, SILTSTONES to CLAYSTONES
				2	1.0	V		5R 2/2 10R 3/4	Some graded layers. Local zeolitic sandstone all poorly sorted. Clay seams cutting greenish layers. Rare calcareous zones with zeolites
				3		V		5R 2/2 56Y 2/1 10R 3/4	Smear Slide Summary: 1-132 Palagonite A Clay (ferrug.) A Zeolite (anaclite) A Fe-minerals R to C
				4		VOID		56 2/1 10R 3/4	
				Core Catcher					

Explanatory notes in Chapter 1

Site 317 Hole A Core 29 Cored Interval: 867.5-877.0 m

AGE	ZONE	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
		ABUND.	PRES.						
				0		VOID			As above.
				1	0.5	VOID			Dusky red-brown (10R 3/4) and greenish black (56Y 2/1) VOLCANOGENIC SANDSTONE, SILTSTONE to CLAYSTONE.
				2	1.0	V		10R 2/2 10R 3/4 56 2/1	Some thin graded layers, rare spherulites. Sandy layers contain subhedral zeolites and angular.
				3		V		10R 3/4 Seams 56 2/1 10R 3/4	Smear Slide Summary: Palagonite A to D Clay (ferrug.) R Calcite R Zeolites R to A Volc. Min. R Grains R
				4		V		56Y 2/1 10R 2/2	
				5		V		10R 3/4	
				Core Catcher					

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Site 317 Hole A Core 32 Cored Interval: 915.0-924.5 m

AGE	ZONE	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
		FOSSIL	ABUND.						
				0					See above continued.
				1	0.5				Flow Unit 5 (lower part) 4.5 meters dark greenish-gray (56 4/1) to greenish gray (56 6/1) basaltic glassy to fine grained, pyroxene-filled, vesicular, irregularly rounded locally irregular up to 6 x 10 mm, lined, some zeolite-filled. Five to ten percent pyroxene microphenocrysts and common platy feldspars oriented core axis.
				2					4-82 cm to core catcher) 4.5 m Flow Unit 5 (56 6/1) basaltic glassy, vesicular 1 to 3 mm, up to 10 cm near top contact. Irregular, lined with greenish black (56Y 2/1), vesicles mostly filled. Groundmass glassy at top, texture diabasic to intersertal. Coarsens downward to .2 to .3 mm. Feldspars oriented to core barrel. Veins along fractures. Vesicles mostly zeolite filled, some calcite.
				3					Thin Section: CC Middle Flow Unit 6 Vesicular-vuggy basalt with augite phenocrysts and diabasic to intersertal texture. Vesicles, as 31-CC, zeolite or calcite filled. Microphenocrysts - clinopyroxene (augite) with groundmass - augite and pigeonite opaques with some feldspar, glass altered opaques concentrated near glass.
				4					Vesicles (filled) 9.0% Augite Microphenocrysts 12.5% Groundmass Augite 10.0% Groundmass Pigeonite 40.0% Altered Glass ~12.5% Opaques ~5.0%
				5					
				6					
									Core Catcher

Explanatory notes in Chapter 1

Site 317 Hole A Core 31 Cored Interval: 905.5-915.0 m

AGE	ZONE	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
		FOSSIL	ABUND.						
				0					1-110 to 137 cm: Grayish red (58 4/2) and grayish green VOLCANOGENIC SILTSTONE.
				1	0.5	VOID			BASALT: Basalts are all probable ocean floor tholeiites. Circled numbers are flow units.
				2	1.0				40 cm Flow Unit 1: Dark greenish gray (56 4/1) basaltic glassy, vesicular (15%) some zeolite-filled, fine-grained, altered groundmass. No chilled margins. Vesicles 1.5 to 2.5 mm, irregular, rounded lined. Some filled with green matter.
				3					Flow Units 1 and 2, and 3 separated by grayish brown (58 3/2), grayish blue-green (58 2/2) volcanogenic siltstone. Indurated, baked.
				4					60 cm Flow Unit 2 as 1 above dark greenish gray vesicular basalt. Vesicles (20%) smaller, near top; those near the base partially lined with coarse white zeolites. Pyroxene phenocrysts common. Fine grained near contact.
				5					120 cm Flow Unit 3 as above but phenocrysts rare, evenly dispersed vesicles (20%) lined, most with greenish fillings. Groundmass fine grained, altered. Chalcopyrite?
				6					110 cm Flow Unit 4 as above, finer grained, near contacts, med. bluish gray (58 5/1) aphanitic, vesicular upper contact, 40% near contact.
				7					Flow Unit 5 (upper part), vesicles, (10%) 1 x 1 mm pyroxene microphenocrysts, glassy lighter greenish gray (56 6/1).
									Thin Section: CC Basalt, vesicles, (0.6-4 cm) rounded, filled with zeolites, vesicles filled with green fibrous material. Augite Microphenocrysts Groundmass Augite Groundmass Pigeonite Groundmass Plagioclase Groundmass Glass Opaques Texture diabasic to intersertal
									9.0% 12.5% 15.0% 10.0% 40.0% 12.5% (altered) ~5.0%
									Core Catcher

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Site 317 Hole A Core 33 Cored Interval: 924.5-934.0 m

AGE	ZONE	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
			0					
			1	0.5			56 6/1	0 to 3-110 cm Bottom of Flow Unit 6 greenish gray (56 6/7) basalt vesicular, aphy. C, fine grained similar to core 33. Some light brown stained veins and altered in upper part. Slightly grayer color and finer grained no glassy margin.
			2	1.0			6	3-110 to 4-38 cm Dark red (SR 2/6) volcanogenic siltstone to claystone separating Flow Unit 6 and 7. High iron content. Dark bluish gray (57 7/2) calcareous veins. Irregular bedding.
			3				SR 2/6	4-38 cm to core catcher Upper part Flow Unit 7, dark greenish gray (56 4/7) basalt. Aphyric, vesicular, vesicles irregular, uneven distribution mostly filled, greenish black. Some zeolite. Vesicles spherical to rounded. Groundmass fine to intergranular to intersertal. Glass badly altered. Rare calcite veins.
			4				56 4/1	Thin Section: CC Vesicular basalt, intersertal groundmass. Chilled texture within slide. Vesicles .6-1.75 mm, flattened, dark green fibrous to granular filling, some calcite, fine-coarse.
			Core Catcher				7	Vesicles 5-11% Groundmass Augite 34-35% Groundmass 40-40% Plagioclase 15-20% Groundmass Glass 15-20% Opauques <5-5%

Explanatory notes in Chapter 1

Site 317 Hole A Core 34 Cored Interval: 934.0-943.5 m

AGE	ZONE	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
			0					
			1	0.5			56Y 6/1	Flow Units 7, 8, 9, 10 Greenish gray (56 6/7) to dark greenish gray (56 4/7) vesicular basalt, some contacts, glassy, some chloritized.
			2	1.0			56Y 4/1	Basalt aphyric, vesicular, large in upper parts (5-10 mm) decreasing downward. Irregular. Mostly filled with greenish black. Some zeolite, more near center. Common reidspar (small reidspar phenocrysts). Light blue green vesicle filling near contacts.
			3				9	Thin Section: CC Vesicular basalt with plagioclase microphenocrysts, glomerophyritic fine intergranular groundmass. Some glass. Vesicles irregular, flattened, fibrous to granular blue green material. Some zeolite or calcite. Vesicles (filled) 7.0% Plagioclase 7.5% Phenocrysts 6.0% Plag-rich Aggregates 3.5% Opauques 35.0% Groundmass 35.0% Pyroxene 3.0% Opauques 3.0%
			4				10	
			Core Catcher					

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Site 317 Hole B Core 2 Cored Interval: 6.5-16.0 m

AGE	ZONE	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
		ABUND.	PRES.					
LATE PLEISTOCENE	NN18	N	A G	0				Very disturbed. Very pale orange (10YR 8/2) to white (N9) NANNOFOSSIL FORAMINIFERAL OOZE.
				1	0.5			N9 10YR 8/2
				2	1.0			N9 N3 specks N9 Smear Slide Summary: Forams D Nannos A Acid Residue: 4-2 TRACE Fe/Mn Specks
	NN17	N	A G	3				10YR 8/2 N9 N6
				4			2 HCL	
				5				
				Core Catcher				

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Site 317 Hole B Core 1 Cored Interval: 0.0-6.5 m

AGE	ZONE	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
		ABUND.	PRES.					
QUATERNARY UNZONED QUATERNARY (RAD.) G. conglomerata	NN20/21	F	A G	0				Highly disturbed. Grayish-orange FORAMINIFERAL-NANNOFOSSIL to NANNOFOSSIL-FORAM OOZE. Smear Slide: Forams A Nannos A Zeolite TRACE Clay R Rads R
				1	0.5			10YR 7/4
				2	1.0		HCL	
				3				
				4				
				5				
				6				
				Core Catcher				
				CC				10YR 7/4

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Site 317 Hole B Core 3 Cored Interval: 16.0-25.5 m

AGE	ZONE	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
		ABUND.	PRES.						
LATE PLIOCENE	NN16 <i>G. altispira</i>	N	A	0					Highly disturbed, homogeneous. White (N9) NANNOFOSSIL FORAMINIFERAL OOZE. Locally, rare black specks. Smear Slide Summary: D Forams A to D Nannos R Rads
		A	G	1	0.5			83	
		F	A	2	1.0			N9	
		F	A	3				Black Specks N9	
		F	A	4					
		F	A	5				N7	
F	A	Core Catcher		Black Specks					

Explanatory notes in Chapter 1

Site 317 Hole B Core 4 Cored Interval: 25.5-35.0 m

AGE	ZONE	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
		ABUND.	PRES.						
LATE PLIOCENE	NN15 <i>G. altispira</i>	N	A	0					Homogeneous, highly disturbed. White (N9) NANNOFOSSIL FORAMINIFERAL OOZE. Smear Slide Summary: 2-35, 4-90 Forams D Nannos A
		A	G	1	0.5			35	
		F	A	2	1.0			N9 N7	
		F	A	3					
		F	A	4				N7 N9	
		F	A	5					
F	A	Core Catcher		VOID					

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Site 317 Hole B Core 5 Cored Interval: 35.0-44.5 m

AGE	ZONE	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
		FOSSIL	ABUND.						
EARLY PLIOCENE	N13/14 G. tumida	N	A M/G	0					Black Specks Homogeneous, white (N9) FORAMINIFERAL NANNOFOSSIL OOZE. Smear Slide Summary: D Nannos Forams (locally ~50%) A
				1	0.5			75	
				2	1.0			75	
				3				75	
				4				75	
				5				75	
				6				75	
									VOID
		N	A M/G						Core Catcher

Explanatory notes in Chapter 1

Site 317 Hole B Core 6 Cored Interval: 44.5-54.0 m

AGE	ZONE	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
		FOSSIL	ABUND.						
EARLY PLIOCENE	N13 G. tumida	N	A M/G	0					Intensely disturbed homogeneous, white (N9) FORAMINIFERAL NANNOFOSSIL OOZE. Smear Slide: D Nannos Forams Rads Some slight overgrowth on nanno-discasters.
				1	0.5			75	
				2	1.0			75	
				3				75	
				4				75	
				5				75	
				6				75	
									Core Catcher

Explanatory notes in Chapter 1

Site 317 Hole B Core 7 Cored Interval: 54.0-63.5 m

AGE	ZONE	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
		ABUND.	PRES.						
LATE MIOCENE Stichocorys peregrina? MN12 G. lundia		N	A	0					Highly disturbed, homogeneous. White (N9) FORAMINIFERAL NANNOFOSSIL OOZE. Shear Slides: 1-75 Nannos Forams D A
				1	0.5			75	
				2	1.0				
				3					
				4					
				5					
		N	A	M					
		F	A	G					
		Core Catcher							

Explanatory notes in Chapter 1

Site 317 Hole B Core 8 Cored Interval: 63.5-73.0 m

AGE	ZONE	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
		ABUND.	PRES.						
LATE MIOCENE Stichocorys peregrina? MN12 Putilentia prima		N	A	0					Highly to moderately disturbed, homogeneous. White (N9) FORAMINIFERAL NANNOFOSSIL OOZE to FIRM OOZE. Shear Slide Summary: Nannos Forams Clay D to A A TRACE Discoasters slight overgrowth.
				1	0.5	VOID			
				2	1.0			75	
				3					
				4					
				5				75	
		N	A	M					
		F	A	G					
		Core Catcher							

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Site 317 Hole B Core 10 Cored Interval: 82.5-92.0 m

AGE	ZONE	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
LATE MIOCENE	<i>Globorotalia acostaensis</i>		0					
	<i>Ommatartus penultimus</i>	N A M F C G	1	0.5			70	Homogeneous. Bluish white (SB 9/1) FORAMINIFERAL MANNOFOSSIL to FIRM OOZE. Smear Slides Summary: A to D Nannos A TRACE Forams R Clay TRACE Rad's R Rad's R Acid Insoluble: Very little. A few plagioclite clumps, rad grain, clay.
			2	1.0				
			3					
			4					
			5					
			6					
			Core Catcher					

Explanatory notes in Chapter 1

Site 317 Hole B Core 9 Cored Interval: 73.0-82.5 m

AGE	ZONE	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
LATE MIOCENE	<i>Globorotalia acostaensis</i>		0					
	<i>Ommatartus penultimus</i>	N A M F C G	1	0.5			75	Homogeneous. Bluish white (SB 9/1) FORAMINIFERAL MANNOFOSSIL OOZE to FIRM OOZE. Smear Slides: D Nannos A R Forams R Rad's TRACE Sp. Spic. Moderate nannofossil preservation.
			2	1.0				
			3					
			4					
			5					
			6					
			Core Catcher					

Explanatory notes in Chapter 1

Site 317 Hole B Core 11 Cored Interval: 92.0-101.5 m

AGE	ZONE	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
		ABUND.	PRES.						
LATE MIOCENE	<i>O. antepenultimus</i> NN11 <i>G. acostansis</i>	N	A	0					<p>Homogeneous.</p> <p>Bluish white (SB 9/1) FORAMINIFERA NANNOFOSSIL OOZE to FIRM OOZE.</p> <p>Smear Slide Summary: Nannos D to A Forams A to D Clay specks TRACE Rads R</p> <p>Moderate to poor preservation, slight overcalcification on discoasters.</p>
				1	0.5				
				2	1.0				
				3					
				Core Catcher				50	

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Site 317 Hole B Core 12 Cored Interval: 101.5-111.0 m

AGE	ZONE	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
		ABUND.	PRES.						
LATE MIOCENE	<i>O. antepenultimus</i> NN10 <i>Globorotalia menardii</i>	N	A	0					<p>Homogeneous.</p> <p>Bluish white (SB 9/1) to white (M9) FORAMINIFERAL NANNOFOSSIL OOZE to FIRM OOZE.</p> <p>Smear Slide Summary: Nannos D to A Forams A to D Rads R Sp. Spic. R</p> <p>Some discoasters moderately overcalcified.</p>
				1	0.5				
				2	1.0				
				3					
				4					
				5					
				6					
				Core Catcher				75	
								75	
									SB 9/1 to M9

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Site 317 Hole B Core 17 Cored Interval: 149.0-158.5 m

AGE	ZONE	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
		ABUND.	PRES.						
MIDDLE MIOCENE	D. alata NMS G. foerst. s. 1.	N A P	N A P	0	0-5 1.0	VOID		90	Homogeneous, very pale orange (10YR 8/2) to yellowish gray (5Y 8/1) FORAMINIFERAL MAMMO-OFFSILL CHALK.  Smear Slide: 1-90 Nannos D Forams C to A Rads R Mucrite R  Notable decrease in forams, while increase in micrite and overcalcification of discoasters.

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Site 317 Hole B Core 16 Cored Interval: 139.5-149.0 m

AGE	ZONE	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
		ABUND.	PRES.						
MIDDLE MIOCENE	Dorsadapsyris alata Gliborotalia foerst. s. 1.	N A P	N A P	0	0-5 1.0			75	Moderately disturbed, homogeneous. Very pale orange (10YR 8/2) FORAMINIFERAL MAMMO-OFFSILL CHALK with blotches and mottles of white (N9) to olive gray (5Y 4/1).  Smear Slide Summary: Nannos D Forams A Mucrite Y. R Rads  Moderate discoaster overcalcification. Nannos becoming less distinct.  Acid Residue: Mostly Radiolarian fragments, spines, clay ss. 1.57 and ferruginous matter.
		N A P	N A P	1					10YR 8/2 HCL
		N A P	N A P	2					N9 10YR 7/4
		N A P	N A P	3					10YR 8/2 N9
		N A P	N A P	4					10YR 8/2 N9
		N A P	N A P	5					N9 N9
		N A P	N A P	6					N9 N9 N9 + 5Y 4/1

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Site 317 Hole B Core 19 Cored Interval: 168.0-177.5 m

AGE	ZONE	FOSSIL CHARACTER	FOSSIL ABUND.	PRES.	SECTION	METERS	LITHOLOGY	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
EARLY MIOCENE					0				
	D. alata?		N A	P	1	0.5			Moderately to lightly disturbed. Very pale orange (10YR 8/2) to grayish orange (10YR 7/4) FOAMINIFERAL-NANNOFOSSIL FIRM ooze with periodic chalk nodules (drilling disturbance?). (N9) mottles and streaks.
			N A	P	2	1.0			Smear Slide Summary: D Nannos Forams Micrite R to C Rads R to C Clay Spic. 0 to R Silticofl. 0 to R
			N A	P	3			120	Discoasters almost totally overcalcified.
			N A	P	4			75	Acid Residue: 2-120 Rads, sponges, fish debris, fine grained heavy mins.
			N A	P	5				
			N A	P	6				
			N A	P	Core Catcher				

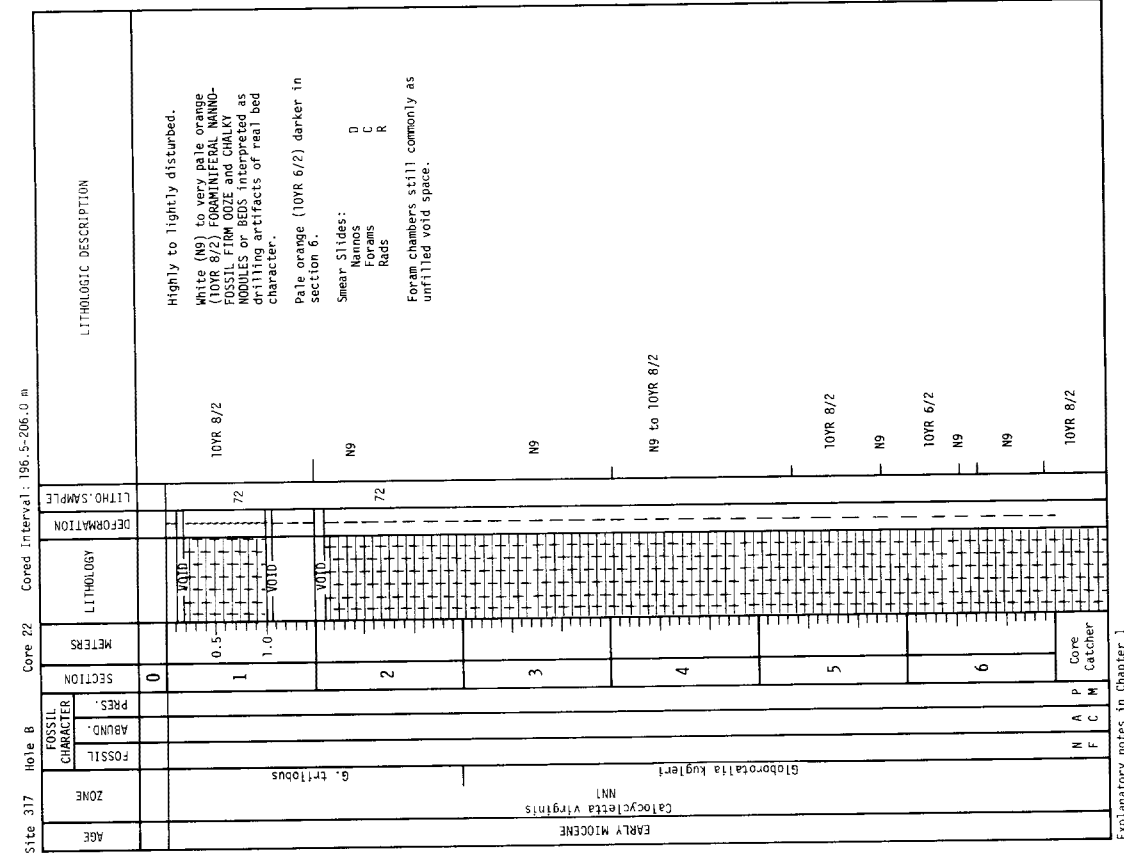
Site 317 Hole B Core 18 Cored Interval: 158.5-168.0 m

AGE	ZONE	FOSSIL CHARACTER	FOSSIL ABUND.	PRES.	SECTION	METERS	LITHOLOGY	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
MIDDLE MIOCENE					0				
	D. alata		N A	P	1	0.5			Highly to moderately disturbed. Light grayish orange (10YR 8/4) to grayish orange (10YR 7/4) FOAMINIFERAL-NANNOFOSSIL FIRM ooze with periodic chalk nodules (drilling disturbance?). Streaks and mottles of gray and white.
			N A	P	2	1.0			Smear Slides: 2-43, 2-75, 2-90 Nannos D C (A) Forams R R Clay Mins. R
			N A	P	3			43	Preservation of nannos slightly improved.
			N A	P	4			75	Smear Slide: 6-100 mod. yellow brown (10YR 5/4) Nannos D Forams C C Fish Debris Micrite R
			N A	P	5			90	
			N A	P	6				
			N A	P	Core Catcher				

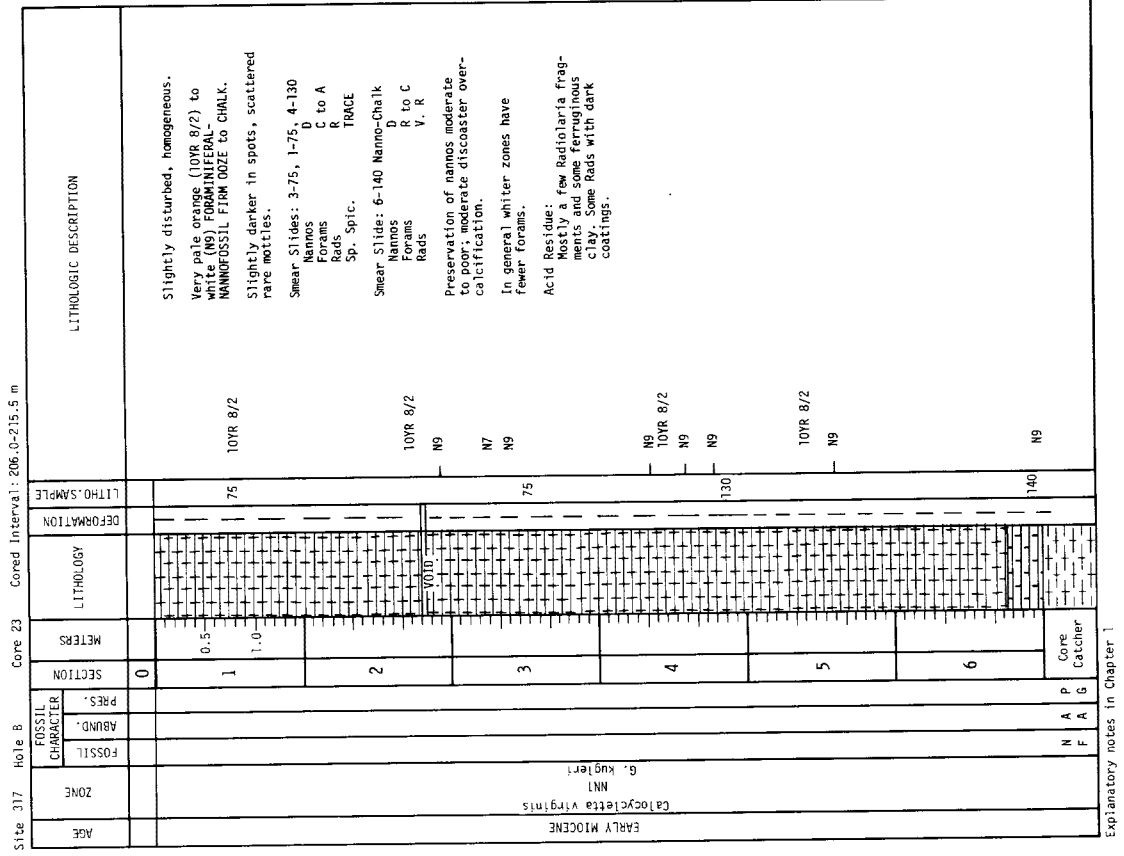
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Site 317 Hole B Core 24 Cored Interval: 215.5-225.0 m

AGE	ZONE	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
		ABUND.	PRES.					
EARLY MIOCENE				0				
L. elongata	N A P F C P			1	0.5			Slightly disturbed, homogeneous. Very pale orange (10YR 8/2) FORAMINIFERAL NANNOFOSSIL to NANNOFOSSIL FIRM OOZE to CHALK. Some chalky biscuits and mottles. Smear Slides: 79 Nannos Forams Rads R to C R
				2	1.0			
g. kugleri	N A P F C P			3				Overgrowth of calcite on discoasters slight to moderate in more brownish horizons.
				4				
Lychocanoma elongata	N A P F C P			5				
				6				

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Site 317 Hole B Core 25 Cored Interval: 225.0-234.5 m

AGE	ZONE	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
		ABUND.	PRES.					
LATE OLIгоценE				0				
L. elongata g. kugleri	N A P F C P			1	0.5			Homogeneous, slightly disturbed. Very pale orange (10YR 8/2) NANNOFOSSIL FIRM OOZE to CHALK (with biscuits). With one grayish orange layer (10YR 6/4). Smear Slides: Nannos Forams Rads R R R Sacc Spic. Stillof. Clay TRACE V. R Mod. overcalcification.
				2	1.0			
N A P F C P				3				
				4				
N A P F C P				5				
				6				

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Site 317 Hole B Core 26 Cored Interval: 234.5-244.0 m

AGE	ZONE	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
LATE OLIгоценE	Dorcadopyrhis atechus NP25	N A M	0				Highly disturbed, homogeneous. White (N9) NANNOFOSSIL OOZE with CHALKY BISCUITS. Smear Slide: Nannos Forams Pterite Rads, Sponge (?) Disceaster overgrowth heavy.
			1	0.5	VOID	75	
			2	1.0			
			3		VOID		
			4				
			5				
			Core Catcher				

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Site 317 Hole B Core 27 Cored Interval: 244.0-253.5 m

AGE	ZONE	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
LATE OLIгоценE	D. atechus NP25	N A M	0				Slight to moderately disturbed homogeneous. White (N9) NANNOFOSSIL FIRM OOZE with regularly spaced chalky biscuits, some mottles. Smear Slides: Nannos Forams Pterite Rads
			1	0.5		75	
			2	1.0			
			3				
			4				
			5				
			6				
			Core Catcher				

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Site 317 Hole B Core 29 Cored Interval: 263.0-272.5 m

AGE	ZONE	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
		ABUND.	PRESENCE						
LATE Oligocene	NP24			0					
				1	0.5				Highly to slightly disturbed, mostly homogeneous.
				2	1.0				Very pale orange (10YR 8/2) to grayish orange (10YR 8/4) MANNIFOSSIL FIRM OOZE to CHALK.
				3					Color change gradual, conspicuous solution of coccoliths and overcalcification of discoasters.
				4					Smear Slides: Nannos D Forams C Clay R
				5					Acid Residue: Very little clay with at least some $>1.5\mu$ , zeolites, L, slow prisms, small $>10\mu$ . Ferruginous matter + Fe/Mn mineral specks.
				6					
				Core Catcher					

Site 317 Hole B Core 28 Cored Interval: 253.5-263.0 m

AGE	ZONE	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
		ABUND.	PRESENCE						
LATE Oligocene	NP25			0					
				1	0.5				Mod-light disturbed, uniform.
				2	1.0				White (N9), gradually darker to very pale orange (10YR 8/2) to grayish orange (10YR 8/4) MANNIFOSSIL FIRM OOZE to CHALK.
				3					Some mottles, locally.
				4					Smear Slides: Nannos D Forams R to C Clay TRACE (in darker)
				5					
				6					
				Core Catcher					

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Site 317 Hole B Core 31 Cored Interval: 282.0-291.5 m

AGE	ZONE	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
		ABUND.	PREV.						
MIDDLE OLIGOCENE	NP3			0					
		N	A	1	0.5				10YR 8/2 N9
		N	A	2	1.0				10YR 8/2
		N	A	3					N7 Smears N9
		N	A	4					10YR 8/2
		N	A	5					N9 10YR 8/4
		N	A	6					N7 10YR 8/4
		N	A						
		F	C						
		M							

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Site 317 Hole B Core 30 Cored Interval: 272.5-282.0 m

AGE	ZONE	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
		ABUND.	PREV.						
MIDDLE OLIGOCENE	NP24 G. optima			0					
		N	A	1	0.5				10YR 8/2
		N	A	2	1.0				N9
		N	A	3					10YR 8/4
		N	A	4					10YR 8/2
		N	A	5					10YR 8/2
		N	A	6					N9
		N	A						
		F	C						
		M							

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Site 317 Hole B Core 32 Cored Interval: 291.5-301.0 m

AGE	ZONE	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
		ABUND.	PRES.						
EARLY OLIGOCENE	NP23	N	A	M/P	0.5		75	10YR 8/2	Moderately disturbed, homogeneous. Very pale orange (10YR 8/2) NANNO-FOSSIL OOZE, rare light mottles. Smear Slide: 2-75 Nannos Forams D R to C Smear Slide: 2-95 gray splotch. (foram nanno ooze) Nannos Forams Rads D C R
		N	A	M/P	1.0				
		N	A	M/P	2				
		N	A	M/P	3				
		N	A	M/P	4				
		N	A	M/P	5				
		N	A	M					Core Catcher

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Site 317 Hole B Core 33 Cored Interval: 301.0-310.5 m

AGE	ZONE	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
		ABUND.	PRES.						
EARLY OLIGOCENE	NP23	N	A	P	0		75	10YR 8/2	Highly disturbed, homogenized. Very pale orange (10YR 8/2) FORAMINIFERAL-NANNOFOSSIL OOZE. Pale yellowish brown (10YR 6/2) to moderate yellowish brown chert fragment, dense, translucent, in core catcher. Smear Slide: Nannos Micrite Forams D C C Moderate overcalcification, many separate nanno-platelets.
		N	A	P	1				
		N	A	P	2				
		N	A	P	3				
		N	A	P	4				
		N	A	P	5				
		N	A	P					Core Catcher

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Site 317 Hole B Core 34 Cored Interval: 310.5-320.0 m

AGE	ZONE	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION		
		ABUND.	PRES.								
EARLY OLIгоценE	NP21	N	A	P	0				Mixture of various stages of disturbance, uniform. Pale grayish orange pink (5YR 8/2) - grayish orange (10YR 7/4) to very pale orange (10YR 8/2) FORAMINIFERAL NANNOFOSSIL OOZE to NANNOFOSSIL FIRM OOZE with chalky biscuits. Smear Slide: Nannos D Forams R Rads V. R Micrite C Moderate to poor nannofossil preservation. Forams more abundant in darker zones.		
		N	A	P	1	0.5		N9			
		N	A	P	2	1.0		75		5YR 8/2	
		N	A	P	3					N9	
		N	A	P	4					N7	10YR 7/4 to 10YR 8/2
		N	A	P	5					10YR 8/2	
		N	A	P	6			N7			
		N	A	M/P	Core Catcher						

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Site 317 Hole B Core 35 Cored Interval: 320.0-329.5 m

AGE	ZONE	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION		
		ABUND.	PRES.								
LATE EOCENE AND EARLY OLIгоценE	NP20	N	A	M/P	0				Highly to moderately disturbed, homogeneous. Very pale orange (10YR 8/2) NANNOFOSSIL OOZE to FIRM OOZE with chalky biscuits. Smear Slide: Nannos D Forams R Rads V. R Dark Specks V. R Preservation of nannos very poor due to overcalcification and solution.		
		N	A	M/P	1	0.5					
		N	A	M/P	2	1.0				10YR 8/2	
		N	A	M/P	3					75	10YR 8/2 to 10YR 8/4
		N	A	M/T	4						10YR 8/2
		N	A	M/P	5						N9 N7
		N	A	M/P	6						
		N	A	M/P	Core Catcher						

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Site 317 Hole B Core 37 Cored Interval: 339.0-348.5 m

AGE	ZONE	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
		FOSSIL	ABUND.						
LATE EOCENE	NP19/20	N	A	0					Intensely to moderately disturbed. Mostly very pale orange (10YR 8/2) to very pale yellowish brown (10YR 7/2) NANFOSSIL OOZE, some light mottling. Dusky yellow brown (10YR 2/2) and moderate yellowish brown (10YR 5/4) chert fragments. Laminated, white (N9) <1 m, some translucent. Many small chert chips suggest drilling breccia. Smear Slide Summary: Nanos Micrite Clay
		F	R	1	0.5	VOID		75	
				2	1.0				
				3					
				4					
				5					
				6				75	
									NP17/18 Globigerinids mexicana Core Catcher

Site 317 Hole B Core 36 Cored Interval: 329.5-339.0 m

AGE	ZONE	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
		FOSSIL	ABUND.						
LATE EOCENE	NP19/20	N	A	0					Slight to moderately disturbed. Very pale orange (10YR 8/2) to very pale yellowish brown (10YR 7/2) to pale yellowish brown (10YR 6/2) NANFOSSIL OOZE to FIRM OOZE with some chalky zones. Patches and streaks of white (N9) (pure nanofossil ooze), yellowish brown (10YR 4/2). Smear Slide Summary: Nanos Micrite Clay (in brown zones) R to C C
		F	R	1	0.5			75	
				2	1.0				
				3					
				4					
				5					
				6					
									NP19/20 G. cerraazulensis Core Catcher

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Site 317 Hole B Core 39 Cored Interval: 358.0-367.5 m

AGE	ZONE	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHOLOGIC DESCRIPTION
		ABUND.	PRES.					
MIDDLE EOCENE	NP16 Globorotalia lehneri	N	A	M/P	0.5		20	Moderate to highly disturbed. Pale yellowish brown (10YR 6/2) changing to very pale yellowish brown (10YR 7/2) NANNOFOSSIL OOZE to CHALK. Some motcles and streaks with scattered broken chips of mod. to blk. chert. (10YR 2/1) chert; brownish black (5YR 2/1) chert. Vitreous, millimeter thick chalky, white (N9) patina. Smear Slide: Nannos Clay R. R Fe-Specks Zeolites TRACE Discasters only mod-slight overcalcification.
		N	A	M/P	1.0			
		N	A	M/P	2			
		N	A	M/P	3			
		N	A	M/P	4			
		N	A	M/P	5			
		N	A	M/P	6	Core Catcher		
		N	A	M/P				10YR 6/2
		N	A	M/P				10YR 7/2
								10YR 7/2
								10YR 7/2
								10YR 4/2
								10YR 3/2
								10YR 8/2

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Site 317 Hole B Core 38 Cored Interval: 348.5-358.0 m

AGE	ZONE	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHOLOGIC DESCRIPTION
		ABUND.	PRES.					
LATE EOCENE	NP17/18 G. mexicana	N	A	M/P	0.5		75	Highly disturbed. Very pale orange (10YR 8/2) 1) NANNOFOSSIL OOZE with much finely ground-up chert chips. Brownish black (5YR 2/1) 2) CHERT NODULE with CHALK PATINA, splashes of light gray (N7). Smear Slide Summary: Nannos Micrite Forams Rads R to C TRACE Scattered sand-size calcite grains.
		N	A	M/P	1.0			
		N	A	M/P	2			
		N	A	M/P	3			
		N	A	M/P	4			
		N	A	M/P	5			
		N	A	M/P		Core Catcher		
								10YR 8/2
								5YR 2/1
								10YR 2/2 Streak

Explanatory notes in Chapter 1

Site 317 Hole B Core 41 Cored Interval: 377.0-386.5 m

AGE	ZONE	FOSSIL CHARACTER			SECTION	METERS	LITHOLOGY	DEFORMATION	LITHOLOGIC DESCRIPTION
		ABUND.	PRESENCE	FOSSIL					
MIDDLE EOCENE	NP15	N	A	P	0				Dusky brown (5YR 2/2) to dark yellowish brown (10YR 4/2) CHERT fragments, up to 5 cm, with (10YR 8/6) and med. reddish brown (10R 4/6). In contact with silicified very pale orange (10YR 8/2) NANNOFOSSIL CHALK.
		F	C	G	Core Catcher				

Site 317 Hole B Core 42 Cored Interval: 386.5-396.0 m

AGE	ZONE	FOSSIL CHARACTER			SECTION	METERS	LITHOLOGY	DEFORMATION	LITHOLOGIC DESCRIPTION
		ABUND.	PRESENCE	FOSSIL					
MIDDLE EOCENE	NP15	N	A	P	0				Drilling breccia + highly disturbed. 0-3 m: Slush of very pale orange (10YR 8/2) NANNOFOSSIL OOZE and grayish brown (5YR 3/2) to dusky brown (10YR 2/2) CHERT. 3-4.5 m: Highly disturbed pale yellowish brown NANNOFOSSIL OOZE + CHALK, some hand specimen sized chunks of dusky brown (10YR 2/2) CHERT with silicified pale orange (10YR 8/2) CHALK remnants. Core catcher: Three pieces of brownish black (5YR 2/1) CHERT with pods and lenses of very pale orange (10YR 8/2) CHALK and SILICIFIED CHALK. Some zones of olive gray (5Y 4/1) SILICIFIED CHALK.
		N	A	P	1	0.5			
		N	A	P	2	1.0			
		N	A	P	3				
		N	A	P	Core Catcher				

Site 317 Hole B Core 43 Cored Interval: 396.0-405.5 m

AGE	ZONE	FOSSIL CHARACTER			SECTION	METERS	LITHOLOGY	DEFORMATION	LITHOLOGIC DESCRIPTION
		ABUND.	PRESENCE	FOSSIL					
MIDDLE EOCENE	NP14	N	C	P	0				Dusky yellowish brown (10YR 2/2) CHERT nodules with med. to fine grained (10YR 8/6) to (10YR 4/6) CHALK. Parting of very light gray (M6) CHALK.
		N	C	P	Core Catcher				

Site 317 Hole B Core 40 Cored Interval: 367.5-377.0 m

AGE	ZONE	FOSSIL CHARACTER			SECTION	METERS	LITHOLOGY	DEFORMATION	LITHOLOGIC DESCRIPTION
		ABUND.	PRESENCE	FOSSIL					
MIDDLE EOCENE	NP15	N	A	P	0				Highly disturbed. Very pale yellowish brown (10YR 7/2) to grayish orange (10YR 7/4) to light grayish orange (10YR 8/4) NANNOFOSSIL OOZE to CHALK. Some sections are a wash of dusky brown (10YR 2/2) to brownish black (5YR 2/1) crushed chert chips. Snear Slide Summary: Nannos (poorly preserved) D Forams (poorly preserved) R Small size calcite grains R to C Micrite Clay Acid Residue: Only chert chips and a little ferruginous clay.
		N	A	P	1	0.5			
		N	A	P	2	1.0			
		N	A	P	3				
		N	A	P	4				
		N	A	P	5				
		N	A	P	6				
		N	A	P	Core Catcher				

Explanatory notes in Chapter 1

Explanatory notes in Chapter 1



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Site 317 Hole B Core 44 Cored Interval: 405.5-415.0 m

AGE	EARLY EOCENE	ZONE	NP13	FOSSIL CHARACTER	ABUND.	PRESENCE	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
							0	0.5 1 1.0	VOID			Three pieces. 1) Dusky yellowish brown (10YR 2/2) CHERT with moderate orange pink (5YR 8/4) chalky zones and a light gray (N6) chalk patina. 2) Light olive gray (5Y 6/1) CHALK with olive black chert layers (5Y 2/1) at the base. 3) Moderate brown (5YR 4/4) to dark yellowish brown (10YR 4/2) CHERT.
				N C P			Core Catcher					10YR 2/2

Site 317 Hole B Core 45 Cored Interval: 415.0-424.5 m

AGE	E. EOCENE	ZONE	NP11/12	FOSSIL CHARACTER	ABUND.	PRESENCE	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
							0					A few brown chert chips retrieved from the catcher.
				N C P			Core Catcher					

Explanatory notes in Chapter 1

DEEP SEA DRILLING PROJECT

LEG 33 SITE 318

SITE SUMMARY SHEET

POSITION: Latitude: 15°59.63'S Longitude: 146°51.51'W

Water depth (from sea level): 2641.0 corrected meters (echo sounding)

Bottom felt at: 2659.0 meters Penetration: 745.0 meters

Number of Holes: 1 Number of Cores: 32

Total length of cored section: 298.5 m Total core recovered: 147.1 m

Percentage of core recovery: 49.3%

OLDEST SEDIMENT CORED:

Depth below sea floor: 745.0 meters Nature: Foraminiferal volcano-genic sandstone

Age: Early Eocene Measured Velocity: 2.2

BASEMENT:

Depth below sea floor: Not reached

PRINCIPAL RESULTS:

The site was drilled in order to determine if the northwest part of the Tuamotu Chain is coeval with the Hawaiian-Emporor bend, and to study the history of reefal growth and erosion in this area. A simplified geological history at the site may be given as follows:

- 1) Eruption of basaltic edifices on older oceanic sea floor at some time prior to 46 m.y.BP.
- 2) Deposition of volcanoclastic sandstones and siltstones of shallow-water origin at rates averaging about 70 m/m.y. as these edifices eroded.
- 3) Foramation of reefs, at least as old as 49-50 m.y.BP.
- 4) Pelagic sedimentation from early Eocene time to the present, with at least three hiatuses present. Floods of reefal debris entered the basin as turbidite units during middle Eocene and early Miocene time.

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LEG 33 SITE 318  
SITE SUMMARY SHEET, con't.

Inasmuch as basaltic basement rocks were not drilled, we can give only minimum ages of edifice construction. Nevertheless, even minimum ages of 49-50 m.y.BP are slightly older than recent estimates of the age of the Hawaiian-Emperor bend. Comparison with other ages in the Tuamotu Chain suggests that volcanism has been episodic, like that of the Hawaiian Chain.

Site 318 Hole Core 1 Cored Interval: 0.0-7.5 m

AGE	ZONE	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
QUATERNARY	(FORMS: MIXED U. PLIO. - QUAT.)		0					
		N A G	1	0.5			90	Very pale orange (10YR 8/2 to 10YR 8/4) NANNOFOSSIL FORAM OOZE. Has texture of firmly packed sand. Darker (10YR 8/4) NANNOFOSSIL FORAM OOZE (10YR 8/4) NANNOFOSSIL FORAM OOZE at 2.16 and 2.90 m and a layer of dark yellowish orange (10YR 6/4) NANNO FORAM OOZE, from 3.23 to 4.05 m.
			2	1.0			140	A graded foram sand unit has its base at 3.23 m, possibly extending through section 2. It is medium to fine grained and probably extends through the dark-colored layer to 3.23 m. Another contact between coarser foram sand above and finer sand below occurs at 6.44 m.
			3				79	<p>Smear Slides:</p> <ul style="list-style-type: none"> <li>Forams D</li> <li>Nannos C</li> <li>Bryozoans R</li> <li>Mollusks R</li> <li>Zeolites R</li> <li>Fe-Specks R 2-10µm</li> <li>Radiolarian V. Rare</li> <li>Fragments V. Rare</li> <li>Volc. Glass</li> <li>Fragments R. I. &gt; 1.57</li> </ul> <p>Coarse Fraction &gt;177µm:</p> <ul style="list-style-type: none"> <li>Forams D</li> </ul> <p>Other constituents include bryozoans, mollusks, zeolite prisms, olivine (ore grain); possible milky white chert fragments; interior walls of foram tests; the foram test perforations, sometimes filled with pyrite(?).</p>
		N A G	4					GRAIN SIZE: 75.1 Sand (3-0 cm); 16.9 Silt; 8.1 Clay
			5					(3-21 cm): 79.7 Sand; 12.9 Silt; 7.4 Clay
		R - N A G					CC	
		F A G					CF	

Explanatory notes in Chapter 1

Site 318 Hole Core 2 Cored Interval: 26.0-35.5 m

AGE	ZONE	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
UPPER PLIOENE		R						
QUATERNARY		N A G	1	0.5	VOID			Very pale orange (10YR 8/2) NANNO FORAM OOZE and SHELLY FORAM OOZE, consisting of graded layers containing abundant granule-sized skeletal debris of forams, bryozoa, calcareous algae, echinoids, and mollusks. Small pebbles of nanno-bearing zeolitic claystone of Eocene age at 2.36 and 2.49 m.
		N A G	2	1.0			67	Interbedded with white (N9) and grayish orange (10YR 7/3) nanno foram soft chalk and firm ooze, preserved as "biscuits" fragmented during drilling.
		N A G					82	Smear Slides: (2-82 cm) sample of zeolitic-claystone; also present are altered volcanic sand-stone; also present are:
		F A G						Forams R
		N A G						Nannos R
		F A G						Fe-Specks R
		N A G						Zeolite A
		F A G						Clay A
								(2-67 cm):
								Forams A
								Nannos D
								Micrite C
								Fe-Specks R
								Core catcher >420µm:
								Fragments of:
								Large forams
								Bryozoans
								Probable Coral
								Halimeda (?)
								Mollusks (pink and white)
								Echinoid Spines (pink)

Explanatory notes in Chapter 1

Site 318 Hole Core 3 Cored Interval: 64.5-74.0 m

AGE	ZONE	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
		ABUND.	PRES.						
LOWER PLEISTOCENE	G. altispira NN15	N A G	A G	0	Core Catcher	[Lithology pattern]	[Deformation pattern]	60 67 125 CC	<p>White (N9) FORAM MANNO FIRM OOZE to SOFT CHALK.</p> <p>65-69 cm: Yellowish gray (5Y 8/2) layer of ooze, with rare dark-colored volcanic sand grains.</p> <p>Medium gray (N3, N5) mottles (pyritic?) at 116 and 125 cm.</p> <p>Smear Slides: (1-60 cm):                      Forams                      Nannos                      Green Amphibole or Pyroxenes                      R</p> <p>(1-67 cm):                      Forams                      Nannos                      Green Volcanic Fragments                      altered to Clay                      R                      Sp. Splic.</p>
				1					
				2					
				3					

Explanatory notes in Chapter 1

Site 318 Hole Core 4 Cored Interval: 93.0-102.5 m

AGE	ZONE	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
		ABUND.	PRES.						
LOWER PLEISTOCENE	Globorotalia tumida NN13	N A G	A G	0	Core Catcher	[Lithology pattern]	[Deformation pattern]	45 64 129 80 85 CC	<p>White (N9), bluish white (5B 9/1) medium gray (N5) FORAM MANNO FIRM OOZE with thin bands of light greenish gray (5GY 8/1) and medium gray (N5) FORAM MANNO FIRM OOZE.</p> <p>Smear Slides: (1-45 cm):                      Nannos                      Forams                      Sp. Splic.                      A to D                      C to A                      R</p> <p>(1-64 cm):                      Nannos                      Forams                      Rads                      A to D                      C to A                      R</p> <p>(1-129 cm):                      Nannos                      Forams                      Sp. Splic.                      Forams                      Sp. Splic.                      Forams size appears to be larger in 1-129 cm than in 1-64 cm or 1-45 cm.</p> <p>(4-80 cm):                      Nannos                      Forams                      Sp. Splic.                      Red Fe-Specks                      Discoasters may be slightly overcalcified.</p>
				1					
				2					
				3					
				4					
				5					
6									

Explanatory notes in Chapter 1

Site 318 Hole Core 5 Cored Interval: 121.5-131.0 m

AGE	ZONE	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
		ABUND.	PRES.					
LOWER Pliocene	Pullentina priantia NN12	N	A G/M	0	0.5			White (N9) FORAM NANNO-FORM OOZE with occasional beds of medium gray (N4 to N6) NANNO FORAM and FORAM OOZE. Coarser-grained foram-rich layers are commonly edged by darker (N6) streaks, and contain traces of grayish yellow (SY 8/2) color.
		N	A G/M	1	1.0		71	(1-71 cm): Forams Nannos Echinoid Spines Pyrite (?) Blocky Calcite A to D A R 100 x 300µm R R
		N	A G/M	2			145	
		N	A G/M	3			75	(4-121 cm): Forams Nannos Echinoid Spines Rads Sponges Sp. Spic. Reddish-brown Vesicular Glass Green Clay Fragments A to D A to D R R R R R R R
		N	A G/M	4			115	
		N	A G/M	5			38	
		N	A G/M	6			50	
		N	A G/M				121	
		N	A G/M				45	
		N	A G/M					

Explanatory notes in Chapter 1

Site 318 Hole Core 6 Cored Interval: 150.0-159.5 m

AGE	ZONE	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
		ABUND.	PRES.					
UPPER MIOCENE	Globorotalia accaensis NN11 Gomartus penultimus	N	A M	0				White (N9), and greenish white (SY 9/1) FORAM NANNO-FORM OOZE and CHALK, with a graded layer of NANNO-FORM OOZE (SY 9/1) at its base at 0.91 m, and its top near 0.70 m.
		N	A M	1	1.0		75	Streaks and thin laminae of medium (N6) to light gray (N7) throughout white ooze and chalk.
		N	A M	2			91	Thin laminae of very pale green (106 8/2) at 6.91-6.97 and 7.21 m.
		N	A M	3			80	Smear Slides: Forams C Nannos D Rads R Sponges R Echinoid Spines R Fish Debris R
		N	A M	4				In graded bed: Forams D Nannos C to A Volc. Glass R Micrite C
		N	A M	5			80	
		N	A M	6			148	

Explanatory notes in Chapter 1

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Site 318 Hole Core 8 Cored Interval: 207.0-216.5 m

AGE	ZONE	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
UPPER MIOCENE			0					
			1	0.5-1.0			58	White (N9) and bluish white (5B 9/1) FORAM NANNO FIRM OOZE to CHALK. A few mm laminae of light gray (N7) color. Smear Slides: Forams Nannos Rads Sponges C to A D R R
			2		VOID			
			3				148	
							88	
							CC	

Site 318 Hole Core 9 Cored Interval: 235.5-245.0 m

AGE	ZONE	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
MIDDLE MIOCENE			0					
			1	0.5-1.0	VOID		96	White (N9) FORAM NANNO CHALK with a few mm-scale laminations. Rare (1X) sand-sized grains of dark volcanogenic material throughout. At 2.30 m: a pebble of very dusky green (5G 2/2) palaeogentic clay, about 1 cm in diameter. Smear Slides: Forams Nannos Micrite Rads Sponges C to A R to A R R to C
			2				80	
							CC	

Explanatory notes in Chapter 1

Site 318 Hole Core 7 Cored Interval: 178.5-188.0 m

AGE	ZONE	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
UPPER MIOCENE			0					
			1	0.5-1.0			40	White (N9), greenish white (5G 9/1) and bluish white (5B 9/1) FORAM NANNO FIRM OOZE and CHALK nodules, (N7) and medium gray (N5) FORAM NANNO FIRM OOZE throughout, except in graded layer of yellowish white (5Y 9/1) to pale grayish yellow (5Y 8/1) NANNO FORAM to FORAM FIRM OOZE, from 5.58 to 3.66 m. Forams to 500 microns, and -12 volcanic sand grains in basal part of this graded layer. Smear Slides: (1-40 cm): Forams Nannos Rads Sp. Spic. D C R R (3-65 cm): Forams Nannos Rads Sp. Spic. D C R R (3-149 cm): Forams Nannos Rads Sp. Spic. D C R R (4-2 cm): Dolomite (?) Rhombs Forams Nannos Rads Sp. Spic. D R to C R R (4-108 cm): Forams Micrite Nannos Rads and Sp. Spic. D C R to C R
			2				15	
			3				65	
							149	
							2	
			4				108	
							10	
			5					
			6					

Explanatory notes in Chapter 1

Site 318 Hole Core 11 Cored Interval: 292.5-302.0 m

AGE	ZONE	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION			
		ABUND.	PRES.									
LOWER MIOCENE	Globovalva kugleri Calocyclus virginis	N A M	N A M	0				25	Pale yellowish gray (SY 8/1) FORAM NANNO CHALK, mottled sparsely with pale gray (N6) and light olive gray (SY 5/1) small (1-5 mm) burrows.  At 2.8 m, a 5-cm layer of white (N9) FORAM NANNO CHALK, with light gray (N6) mottles. Darker material concentrated at upper and lower contacts.  At 3.2 m, a 5-cm layer of yellowish white (SY 9/1) NANNO FORAM CHALK, with dark-colored (volcanic) grains making up <1% of the rock.  At 8.7 to 8.8 m, dark-colored volcanic sand grains constitute ~1% of chalk.  Chalk present as "biscuits", internally fractured by the coring process, and separated by a drilling paste.  Smear Slides: (1-25 cm): Nannos D Forams R to C Rads R Sp. Spic. R Stitcodf. R  (core catcher): Nannos A to D Forams C to A Rads R Sp. Spic. R			
				1	0.5							
				2	1.0							
				3								
				4								
				5								
				6								
				Core Catcher								
				CC								

Site 318 Hole Core 10 Cored Interval: 264.0-273.5 m

AGE	ZONE	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION			
		ABUND.	PRES.									
LOWER MIOCENE	Globovalva kugleri Calocyclus virginis	N A M	N A M	0					Yellowish gray (SY 7/2) FORAM NANNO CHALK, preserved as "biscuits" separated by intervals of drilling paste. The chalk "biscuits" are shattered by fractures induced by the coring process.  From 1.1 to 1.5 m are pieces of: A. BRECCIA, consisting of angular ROCKS to 1 cm diam., mainly in shades of very dusky red (SR 2/4, TOR 2/2, etc.), vesicular, altered; SHELLY FORAM LIMESTONE, in shades of yellowish gray (SY 7/2) and dusky yellow (SY 6/4); and SKELETAL parts of bivalves, brachiopods, trilobite, and other fossils. B. BASALT, as rounded cm-size pebbles. In all sections of 2 of these as follows: 1. Plagioclase augite phytic, fine-grained, sparsely vesicular basalt with fine, ilmenite-rich, glassy groundmass; intersertal texture. Est. mode: vesicles (partly filled), 5%; plagioclase phenocrysts, 15%; augite pieces, 15%; glass, 25%; ilmenite, 25%; groundmass augite, 20%; groundmass glass (altered), 25%; groundmass ilmenite, 5%. 2. Vesicular vitrophyric basalt. Est. mode: vesicles (<2 mm), partly filled, 30%; groundmass plagioclase, 25%; groundmass ilmenite, 15%; groundmass glass (altered), 25%; groundmass ilmenite, 5%.			
				1	0.5							
				2	1.0							
				3								
				4								
				Core Catcher								
				CC								

Explanatory notes in Chapter 1

Explanatory notes in Chapter 1



Site 318 Hole Core 14 Cored Interval: 378.0-387.5 m

AGE	ZONE	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
		FOSSIL	ABUND.						
UPPER OLIGOCENE	NP25	N	A	0	VOID			20	0.1-1.5 m: White (N9) and very light gray (N8) FORAM NANNO FORAM CHALK, with occasional laminae of light gray (N7), and faint white (N9) mottles. Rare dark-colored volcanic sand grains in foramin-rich layers.
		N	A	1	VOID				1.5 m: Yellowish gray (5Y 8/1) and olive gray (5Y 5/1) CHERT, in a 5-cm chunk.
		N	A	2					1.5-2.5 m: Pinkish white to very light gray (N8) FORAM NANNO CHALK, mainly fractured by coring process.
UPPER OLIGOCENE	NP25	N	A	3				123	2.5-4.5 m: A single graded unit, consisting of pinkish white (10R 9/1) NANNO CHALK grading down into white (N9) FORAM NANNO CHALK, grading into very pale grayish orange (10YR 8/4) to grayish orange (10YR 7/4) to yellowish orange (10YR 6/4) NANNO FORAM CHALK, with dark-colored volcanic grains increasingly abundant towards the base.
		N	A					23	
		N	A					140	
		F	C	Core Catcher					Smear Slides: (1-20) Nannos D Micrite C Forams R Rads R Sp. Spic.  (3-140 cm): Nannos A Forams R Micrite A Fe-Specks R to C

Explanatory notes in Chapter 1

Site 318 Hole Core 12 Cored Interval: 321.0-330.5 m

AGE	ZONE	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
		FOSSIL	ABUND.						
LOWER MIOCENE	Globeratina kugleri NNT Lychneanoma elongata	F	C	0					White (N9) and pale yellowish gray (5Y 8/1) FORAM NANNO CHALK, with a few sandy foramin-rich laminae, with 1% dark-colored volcanic grains.
		N	A	1	VOID			35	Smear Slides: (1-35 to 40 cm): Nannos C to A Forams R to C Micrite C Volc. Glass R
		N	A	2				108	(2-108 cm): Nannos D Forams R Rads R Sp. Spic.

Site 318 Hole Core 13 Cored Interval: 349.5-359.0 m

AGE	ZONE	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
		FOSSIL	ABUND.						
UPPER OLIGOCENE	NP25 Dorcadospyrta atechus	N	A	0					Very pale orange (10YR 8/1), pinkish white (8R 9/1), and white (N9) FORAM NANNO CHALK, with a few sandy foramin-rich laminae of medium to light gray (N8 to N7).
		N	A	1	VOID			5YR 9/1 5YR 8/1 N9	At 1.3 m, a 3-cm layer of pale yellowish gray (5Y 8/1) NANNO FORAM CHALK, with 1% dark-colored volcanic sand grains.
		N	A	2				10YR 8/1	
		F	C	Core Catcher					

Explanatory notes in Chapter 1

Site 318 Hole Core 16 Cored Interval: 435.0-444.5 m

AGE	ZONE	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION	
LOWER OLILOCENE	NP21	N A M	0	0.5	VOID		93	0.9-2.1 m: Pale yellowish gray (5Y 8/1) NANNO-FOSSIL and FORAM NANNO LIMESTONE, with Fe-Specks and silted by light olive gray (5Y 5/2).	
			1	1.0			107	2.1-3.2 m: Thinly laminated white (N9) and gray (N8, N7, N6, N5) NANNO LIMESTONE. Tiny normal faults displace laminae, and at 2.6 to 2.7 m is a recumbent fold, with minor shear folds on the limbs.	
UPPER EOCENE	NP19/20	N A M	2				83	3.2-4.5 m: Yellowish gray (5Y 8/1), gray (N7, N8), white (N6), greenish white (5G 9/1), and pale yellowish green (10GY 8/1) NANNO LIMESTONE, with darker gray (M5, M6) and grayish green (10GY 5/2) thin laminae.	
			3					At 2.3 m: Two small pebbles of deeply altered volcanic material.	
									In core catcher: A 5-cm chunk of dark yellowish brown (10YR 4/2) CHERT.
									Smear Slides: (2-83 cm): Nannos Forams Fe-Specks
									(1-93 cm) white burrowed area: Nannos Forams Fe-Specks
							(1-107 cm) brownish nonburrowed area: Nannos Forams Fe-Specks		

Explanatory notes in Chapter 1

Site 318 Hole Core 15 Cored Interval: 406.5-416.0 m

AGE	ZONE	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION	
MIDDLE OLILOCENE	NP24	N A M	0	0.5	VOID		55	5Y 8/1 and 5Y 6/2 Pale yellowish gray (5Y 8/1, 5Y 8/2) FORAM HIND HARD CHALK, with mm-scale laminae of gray (5Y 8/1, 5Y 5/2), and laminae of light olive gray (5Y 6/2).	
			1	1.0					0.4-0.6 m: White (N9) NANNO FORAM CHALK, with laminae of pale orange (10YR 8/3) FORAM CHALK, with rare volcanic sand grains.
		N A M	2				10YR 5/4	At 2.2 m: A 3-cm chunk of moderate yellowish brown (10YR 5/4) CHERT.	
									Smear Slides: (1-55 cm): Nannos Mierite Foram perforations filled with red Fe-specks.
									(2-137 cm): Nannos Fe-Specks Forams
								D to C R	

Explanatory notes in Chapter 1

Site 318 Hole Core 17 Cored Interval: 463.5-473.0 m

AGE	ZONE	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
UPPER EOCENE	NP19/20	N A M	0		VOID			Greenish white (10G 9/1), very pale green (10G 9/2) to light greenish gray (5G 9/1) to pale green (10G 7/2) MAMMO LIMESTONE. Colors become gradually darker toward base of core. Darker colored wisps and laminae of pale green (10G 6/2) to grayish green (10G 4/2). A few foraminiferal layers with rare volcanic sand grains.
			1	0.5			120	
			2	1.0			30	CHERT at: 1.05-1.08 m: pale yellowish brown (10VR 6/2) 1.41-1.43 m: light olive gray (5Y 4/2) 1.55-1.60 m: light gray (M7) 1.95-2.10 m: medium dark (M4) to medium light (M6) gray... Chert medium light gray... 0.5 cm spots of unsilicified carbonate within.
		F C G N A M	Core Catcher					Smear Slides: (1-120 cm; 2-30 cm): Nannos Forams

Site 318 Hole Core 18 Cored Interval: 492.0-501.5 m

AGE	ZONE	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
UPPER EOCENE	NP19/20	N A M	0		VOID			Pale green (10G 8/2) MAMMO LIMESTONE, with darker (10G 6/2) wisps and laminae, and lighter (10G 9/1) burrow mottles. A few pale purple (5P 6/2 to 5P 4/2) laminae and thin volcanic foam sandstone layers (sandy bases, burrowed middle, laminated and burrowed top) common. Medium gray (M5) and light olive gray (5Y 6/1) chert chunks at 1.0-1.1 m, 2.1, 2.7, and 2.85 m.
			1	0.5			90	
			2	1.0			140	
		F C G N A M	Core Catcher					Smear Slides: (1-90 cm): Nannos Forams (2-30 cm): Nannos Forams Micrite (1-140 cm, 2-52 cm): Discoidal Forams Nannos Volcanic Fragments R

Explanatory notes in Chapter 1

Site 318 Hole Core 19 Cored Interval: 520.5-530.0 m

AGE	ZONE	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
UPPER EOCENE	NP17/18	F C G N C P	0		VOID			An artificially graded sequence of granule- to fine-grained sand, consisting of volcanogenic (pale greenish gray, cherty grains, agglutinated, and volcanic) and planktonic and large benthonic forams, bryozoans, algae, and molluscan fragments.
			1	0.5				Core catcher: Light olive gray (5Y 5/1) chert, medium green (10G 8/1) MAMMO LIMESTONE with thin purpleish gray (5P 5/2) laminae.
			2	1.0	artificial drilling breccia		140	Smear Slides: (2-140 cm) coarse fraction > 1 mm abraded and rounded alloclasts of: Halimeda Bryozoans Coral (?) Molluscs Gastropods Large Forams - asterocyclinids
		N C P F C G N C P	Core Catcher					

Explanatory notes in Chapter 1

Site 318 Hole Core 21 Cored Interval: 577.5-587.0 m

AGE	ZONE	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
		ABUND.	PRES.						
MIDDLE EOCENE	NP16	N	C	1	1.0	VOID		126	Interbedded and interlaminated pale green (106 8/2) and greenish gray (5G 7/2) MANG. LIMESTONE, and beds and laminae of olive gray (5Y 7/2) and olive gray (5Y 8/2), SANDSTONE, rich in forams, and laminae of grayish purple (5P 4/2).  Grayish black (M2) CHERT at 2.6 and (5YR 2/1) CHERT at 3.4, 3.55, 3.8, 4.0, 4.35 m.  Many graded layers, silty or sandy at base, and extensively burrowed near the top.  Smear Slides: (1-10 cm): Micrite C Nannos R Forams D Nannos C Forams R (2-30 cm) dark grainy bed: Nannos C Micrite D Organic Clay R Fragments R
		N	C	2				30	
		N	C	3				53	
		N	C	3				83	
		N	C	3				89	
		F	C	P	Core Catcher				
		N	F	P					
		F	C	P					
		N	F	P					
		F	C	P					

Explanatory notes in Chapter 1

Site 318 Hole Core 20 Cored Interval: 549.0-558.5 m

AGE	ZONE	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
		ABUND.	PRES.						
MIDDLE EOCENE	NP16	N	F	0		VOID			Pale yellowish green (10GY 8/2), pale green (10G 6/2), greenish white (10G 9/1), and light greenish gray (5G 8/1) MANG. LIMESTONE with abundant burrows (of light material in darker).  From 2.7-5.5 m, thinly laminated, on mm-scale, with many low-angle faults and deformed phacoids (burrows), suggesting small-scale slumping.  A few graded layers, most notably at 6.25 to 6.45 m.  CHERT at 1.1 and 1.5 m (moderate yellowish brown, 10YR 5/4), and at 2.1-2.2 m (pale yellowish brown (10YR 6/2). Chert has ~0.5 cm spots of partly silicified limestone within.  Smear Slides: (1-80 cm, 3-30 cm, 4-148 cm): Nannos A Micrite A Forams R Fe-Specks R Volcanic Fragments R to C
		N	F	1	0.5			80	
		N	C	2					
		N	C	2					
		N	C	2					
		N	C	3				130	
		N	C	3					
		N	C	3					
		N	C	3					
		N	C	3					

Explanatory notes in Chapter 1

Site 318 Hole Core 23 Cored Interval: 606.0-615.5 m

AGE	ZONE	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
		ABUND.	PRES.					
MIDDLE EOCENE	Globoigerapsis Kugleri NP15	N F P F C P	Core Catcher	0	0.5	VOID	139	Graded beds, generally consisting of light greenish gray (5G 8/1) MANNOS LIMESTONE or CLAYEY MANNOS LIMESTONE, commonly with darker-colored olive green (5G 10/2) and grayish olive green (5G 13/2) sandstone and CLAYEY MANNOS LIMESTONE. A few layers of olive black (5Y 2/1) or greenish black (5G 2/1) VOLCANIC SANDSTONE and SILTSTONE. Prevalent burrowing, of lighter material darker, and scattered taninae burrows in some layers internally deformed by post-depositional shear. Recumbent fold at 5.67-5.87 m. Graded sequences common. At 3.65 m, medium gray (N6) CHERT in pale green limestone. Chert, blebs at 4.50-4.56, and 5.87-6.0 m. Smear Slides: (2-77 cm): Volcanic ash altering to green clay Nannos R Micrite (1-147 cm): Nannos D Volcanic Glass R R Sp. Spic. R (2-90 cm): Micrite A Volcanic Glass C Feldspar R Green Clay R (2-147 cm): Micrite C Fe-Specks C Feldspar R Volcanic Glass R to C (3-116 cm): Micrite A Forams C Nannos C Feldspar R Volcanic Glass R Green Clay R
				1	1.0	VOID	147	
				2			90	
				3			147	

Explanatory notes in Chapter 1

Site 318 Hole Core 22 Cored Interval: 596.5-606.0 m

AGE	ZONE	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
		ABUND.	PRES.					
MIDDLE EOCENE	Globoigerapsis Kugleri NP15	F C P N C P	Core Catcher	0	0.5	VOID	120	Alternating pale yellowish green (10G 7/2), pale green (10G 6/2), grayish green (10G 5/2), grayish olive green (5G 10/2) and grayish olive green (5G 13/2) sandstone and CLAYEY MANNOS LIMESTONE. A few layers of olive black (5Y 2/1) or greenish black (5G 2/1) VOLCANIC SANDSTONE and SILTSTONE. Prevalent burrowing, of lighter material darker, and scattered taninae burrows in some layers internally deformed by post-depositional shear. Recumbent fold at 5.67-5.87 m. Graded sequences common. At 3.65 m, medium gray (N6) CHERT in pale green limestone. Chert, blebs at 4.50-4.56, and 5.87-6.0 m. Smear Slides: (2-77 cm): Volcanic ash altering to green clay Nannos R Micrite (1-120 cm): Nannos A to D Forams C C Micrite C
				1	1.0	VOID	77	
				2				
				3				

Explanatory notes in Chapter 1

Site 318 Hole Core 25 Cored Interval: 625.0-634.5 m

AGE	ZONE	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHOLOGIC DESCRIPTION	
		FOSSIL	ABUND.						
MIDDLE EOCENE	NP15			0				<p>Graded beds, from 1-40 cm thick, averaging about 10 cm, generally consisting of grayish to dark gray CLAYEY LIMESTONE and CLAYEY LIMESTONE, commonly with darker-colored olive gray (5Y 4/1, 5Y 3/1) SILTSTONE or FINE-GRAINED FORAM VOLCANIC SANDSTONE at the base, generally laminated or even cross-stratified, with an abrupt contact with the underlying coarse-grained argillite-sandstone. Middle and upper parts of beds burrowed, with light material in darker host. Burrowing increase in intensity towards top of beds.</p> <p>Grayish purple (5P 4/2) laminae and wisps near tops of some beds.</p> <p>Grayish brown (5YR 3/2) and dark greenish gray (5G 4/1) CHERT blebs at 3.75 and 3.80 m, and a very dusky purple (5P 2/2) CHERT splotch at 4.20 m.</p> <p>Limestone in this core, especially the thin bedded intervals and the grayish bands, are very hard and siliceous.</p> <p>Smear Slides: (2-62 cm): Micrite A Chert R Nammos R to C</p> <p>(3-50 cm ICL insolubles): (1) spheroidal blebs ~100um diam, coarse chert replacing forams and/or rads. (2) green clay (1) + (2) = about 10-20% of rock.</p>	
				1	0.5	VOID			
				2	1.0				108
				3					121
				4					130
							removed		

Explanatory notes in Chapter 1

Site 318 Hole Core 24 Cored Interval: 615.5-625.0 m

AGE	ZONE	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	DEFORMATION	LITHOLOGIC DESCRIPTION	
		FOSSIL	ABUND.						
MIDDLE EOCENE	NP15			0				<p>Graded beds, from 1-40 cm thick, averaging about 10 cm, generally consisting of grayish to dark gray CLAYEY LIMESTONE and CLAYEY LIMESTONE, commonly with darker-colored olive gray (5Y 4/1, 5Y 3/1) SILTSTONE or FINE-GRAINED FORAM VOLCANIC SANDSTONE at the base, generally laminated or even cross-stratified, with an abrupt contact with the underlying coarse-grained argillite-sandstone. Middle and upper parts of beds burrowed, with light material in darker host. Burrowing increase in intensity towards top of beds.</p> <p>Grayish purple (5P 4/2) laminae and wisps near tops of some beds.</p> <p>Grayish brown (5YR 3/2) and dark greenish gray (5G 4/1) CHERT blebs at 3.75 and 3.80 m, and a very dusky purple (5P 2/2) CHERT splotch at 4.20 m.</p> <p>Limestone in this core, especially the thin bedded intervals and the grayish bands, are very hard and siliceous.</p> <p>Smear Slides: (2-62 cm): Micrite A Chert R Nammos R to C</p> <p>(3-50 cm ICL insolubles): (1) spheroidal blebs ~100um diam, coarse chert replacing forams and/or rads. (2) green clay (1) + (2) = about 10-20% of rock.</p>	
				1	0.5		13		
				2	1.0				148
				3					50 ICL
				4					

Explanatory notes in Chapter 1

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Site 318 Hole Core 27 Cored Interval: 644.0-663.5 m

AGE	ZONE	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
		ABUND.	PRES.					
MIDDLE EOCENE	NP14			0				<p>Graded beds, from 1-30 cm thick, averaging about 10 cm, each bed generally consisting of greenish gray (5G 5/1) LIMESTONE or CLAYEY LIMESTONE, commonly with a laminated or cross-stratified basal part of olive gray (5Y 4/1, 5Y 2/1) SILTSTONE or greenish gray (5G 4/1) to greenish black (5G 2/1) "salt-and-pepper" FORAM-VOLCANIC SANDSTONE generally fine-grained, but with a few coarse-grained to granule-bearing units.</p> <p>Burrowing intense near tops of graded beds, decreasing downwards.</p> <p>Shear Slides: (2-142 cm): Micrite D Clay R Nannos C</p> <p>(2-145 cm HCL insoluble residue): 1) &gt;100µm 2) Chert blebs C 1) + 2) = 10% of rock</p>
				1	0.5	VOID		
				2	1.0	VOID		
				Core Catcher		VOID	142 HCL	

Site 318 Hole Core 28 Cored Interval: 663.0-672.5 m

AGE	ZONE	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
		ABUND.	PRES.					
MIDDLE EOCENE	NP14			0				<p>Graded bes., from 0.5-15 cm thick, averaging about 10 cm, each bed generally consisting of greenish gray (5G 6/2, 5G 5/1) LIMESTONE or CLAYEY LIMESTONE, commonly with a basal part of laminated or cross-stratified olive gray (5Y 4/1 to 5Y 2/1) SILTSTONE or greenish black (5G 4/1) to greenish gray (5G 2/1) "salt-and-pepper" FORAM-BEARING VOLCANIC SANDSTONE, generally fine-grained, but coarse-grained granule-bearing in a few beds. Burrowing intense near tops of graded units, decreasing below.</p> <p>Mackstone textures in some graded units, with volcanic grains and forams suspended in clayey limestone matrix.</p> <p>From 2.1-2.15 m - laminated grayish blue green (5G 5/2) CLAYEY LIMESTONE.</p> <p>Shear Slides: (1-110 cm): Micrite A Forams C</p> <p>(3-115 cm): Micrite A Nannos C Volcanic Glass A to D Green Pyroboles R Fe-Specks C</p>
				1	0.5	VOID	110	
				2	1.0	VOID	115	
				3			15	

Explanatory notes in Chapter 1

Site 318 Hole Core 26 Cored Interval: 634.5-644.0 m

AGE	ZONE	FOSSIL CHARACTER		SECTION	METERS	LITHOLOGY	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
		ABUND.	PRES.					
MIDDLE EOCENE	NP15			0				<p>Graded beds, from 1-70 cm thick, averaging about 10 cm, each bed generally consisting of greenish gray (5G 6/2, 5G 5/1) LIMESTONE or CLAYEY LIMESTONE, commonly with a laminated or cross-stratified basal unit of greenish black (5G 2/1) FORAM-RICH VOLCANIC SANDSTONE (salt and pepper colors), SILTSTONE gray (5Y 4/1 to 5Y 2/1) or greenish gray (5G 4/1) to greenish black (5G 2/1) "salt-and-pepper" FORAM-BEARING VOLCANIC SANDSTONE generally fine-grained, but coarse-grained or even granule-size grains occur at a few levels.</p> <p>Burrowing intense in upper parts of graded beds, decreasing downwards; rarely do burrows cut base of a bed.</p> <p>Minor low-angle faults and shear folding, and deformed burrows, especially at ~3.0 m.</p> <p>At 6.3-7.0 m, a single graded bed, with medium-grained foram-volcanic sandstone at its base, laminated cross-stratified bed, and greenish black (5G 2/1) at top, dark greenish gray (5G 4/1) in middle, greenish gray (5G 6/2) at base.</p> <p>A pyritized "chevron" burrow at 6.65 m - within graded bed.</p> <p>Shear Slides: (1-140 cm): Forams D Nannos R to C</p> <p>(5-95 cm): Volcanic Glass D Micrite C</p>
				1	0.5	VOID	140	
				2	1.0		24	
				3				
				4			70	
				5			95	

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Site 318 Hole Core 29 Cored Interval: 682.0-691.5 m

AGE	ZONE	FOSSIL CHARACTER	FOSSIL ABUND.	FOSSIL PRES.	SECTION	METERS	LITHOLOGY	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
Eocene					0				<p>Graded beds, from 0.5 to 20 cm thick, averaging about 5 cm, each bed generally consisting of greenish gray (56Y 5/1, 56Y 5/1) and dark greenish gray (56Y 4/1 to 56Y 2/1) LIMESTONE and CLAYEY LIMESTONE, commonly with a basal unit of light gray (5Y 4/1) SILTSTONE or greenish black (5G 2/1) SILTSTONE or greenish black BEARING VOLCANIC SANDSTONE.</p> <p>A few bands of grayish to dusky blue green (58G 5/2 to 58G 3/2) CLAYEY LIMESTONE.</p> <p>Burrowing intense in upper parts of many graded units, decreasing below.</p> <p>Shear Slides: (1-35 cm):                      Volcanic Glass D                      Clay A                      Feldspar C                      Nannos R</p>
					1	0.5	VOID	135	
					2	1.0	VOID		
					Core Catcher				

Site 318 Hole Core 31 Cored Interval: 720.0-729.5 m

AGE	ZONE	FOSSIL CHARACTER	FOSSIL ABUND.	FOSSIL PRES.	SECTION	METERS	LITHOLOGY	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
LOWER Eocene	NP13				0				<p>Graded beds, from 0.5-15 cm thick, averaging about 3 cm, each bed generally consisting of greenish gray (56Y 4/1) and grayish blue green (58G 5/2) to dusky blue green (58G 3/2) CLAYEY LIMESTONE, commonly with a basal part of darker-colored to greenish black (56 2/1) SILTSTONE to SANDSTONE, with forams and volcanic grains. Sandy parts generally laminated, with an abrupt, erosional or low-cast base.</p> <p>Burrowing common in upper parts of graded layers.</p> <p>Shear Slides: (1-138 cm) base of coarse-grained graded bed:                      Volcanic Glass A                      Clay C                      Micrite A                      (1-136 cm) top of graded bed:                      Micrite A                      Nannos A                      Forams R</p>
					1	0.5	VOID	36	
					2	1.0	VOID	138	
					Core Catcher				

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Site 318 Hole Core 30 Cored Interval: 701.0-710.5 m

AGE	ZONE	FOSSIL CHARACTER	FOSSIL ABUND.	FOSSIL PRES.	SECTION	METERS	LITHOLOGY	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
MIDDLE Eocene	Acartina densa NP13				0				<p>Graded beds, from 0.5 to 40 cm thick, averaging about 8 cm, each bed generally consisting of greenish gray (56 6/1) to dark greenish gray (56Y 4/1) LIMESTONE or CLAYEY LIMESTONE, commonly with a basal unit of olive gray (5Y 6/1 to 5Y 2/1) SILTSTONE, or greenish black (5G 2/1) SILTSTONE, commonly laminated or cross-stratified.</p> <p>A few layers of dusky blue green (58G 3/2) CLAYEY LIMESTONE.</p> <p>Burrowing commonly moderate to intense in upper parts of graded beds.</p> <p>Medium- to coarse-grained sandstone common at bases of beds.</p> <p>Shear Slides: (1-40 cm):                      Spic. Volcanic Glass C                      Diatoms R                      Rads R</p> <p>(2-19 cm) base of graded bed:                      Volcanic Glass A                      Feldspar A                      Clay C</p> <p>(2-134 cm) burrowed green limestone:                      Micrite D to A                      Nannos C to A                      Clay C                      Fe-Specks R</p>
					1	0.5	VOID	40	
					2	1.0	VOID	19	
					Core Catcher				

Explanatory notes in Chapter 1



Site 318		Hole		Core 32		Cored Interval: 739.0-745.0 m		LITHOLOGIC DESCRIPTION
AGE	ZONE	FOSSIL CHARACTER	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	
		FOSSIL ABUND. PRES.	0					<p>Graded beds, from 1-250 cm thick, typically 10-15 cm, each bed consisting of greenish gray (56 8/1) to 56 4/1) CLAYEY LIMESTONE (56 4/1) to 56 2/1) SILTSTONE or greenish black (56 2/1) "salt-and-pepper" SANDSTONE, commonly laminated or cross-stratified.</p> <p>Burrowing commonly intense in upper parts of graded units; some burrows deformed by shearing.</p> <p>At 0.8-0.95 m: A coarse-grained bearing bed with reverse (?) grading.</p> <p>At 1.9-2.4 m: One graded bed, with coarse-grained sandstone at base.</p> <p>At 3.45-5.0 m: Graded bed, with granules (including large benthonic forams) in basal 50 cm, crs. to med. grained next 50 cm, wackestone textures next 50 cm, laminated and cross-stratified next 50 cm, claystone top, with burrows in upper 10 cm only. Base not seen.</p> <p>Smear Slides: (1-100 cm): Volcanic Glass A Feldspar C Clay A Micrite R Nannos R</p>
			1	0.5	VOID			
			2	1.0	VOID			
	LOWER EOCENE		3					
	Acarina densa (?) NP13?		4					

Explanatory notes in Chapter 1

Core Catcher  
W F P  
F R P