

978A-01R Entire core given to palentologists.

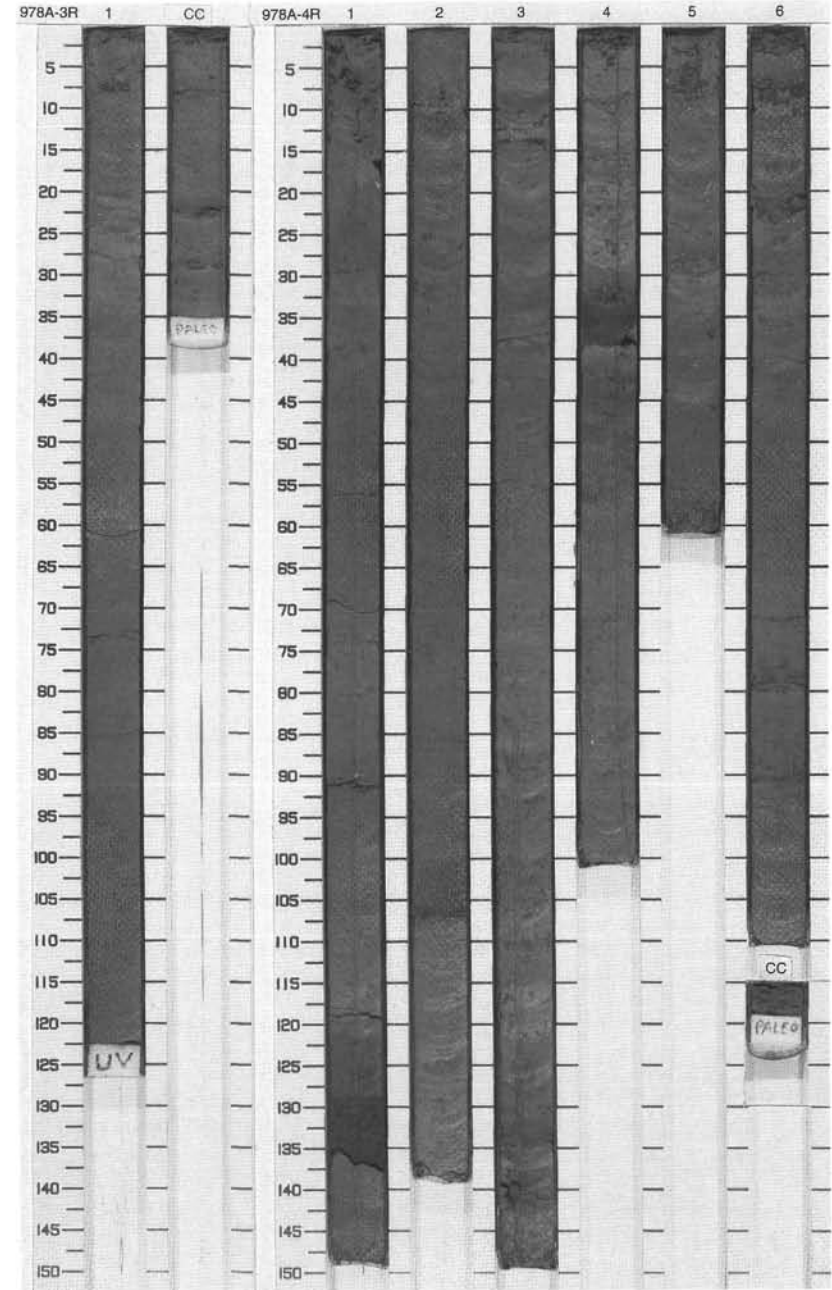
978A-02R Entire core given to palentologists.

SITE 978 HOLE A CORE 3R CORED 213.0 - 222.7 mbsf

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
1		1	Pleistocene	∅		S	5GY 4/1	NANNOFOSSIL CLAY Major Lithology: The major lithology is dark greenish gray (5GY 4/1) NANNOFOSSIL CLAY with scattered shell fragments and pods of grayish black (N2) pyrite(?).
				∅		S		
		CC		∅		M		

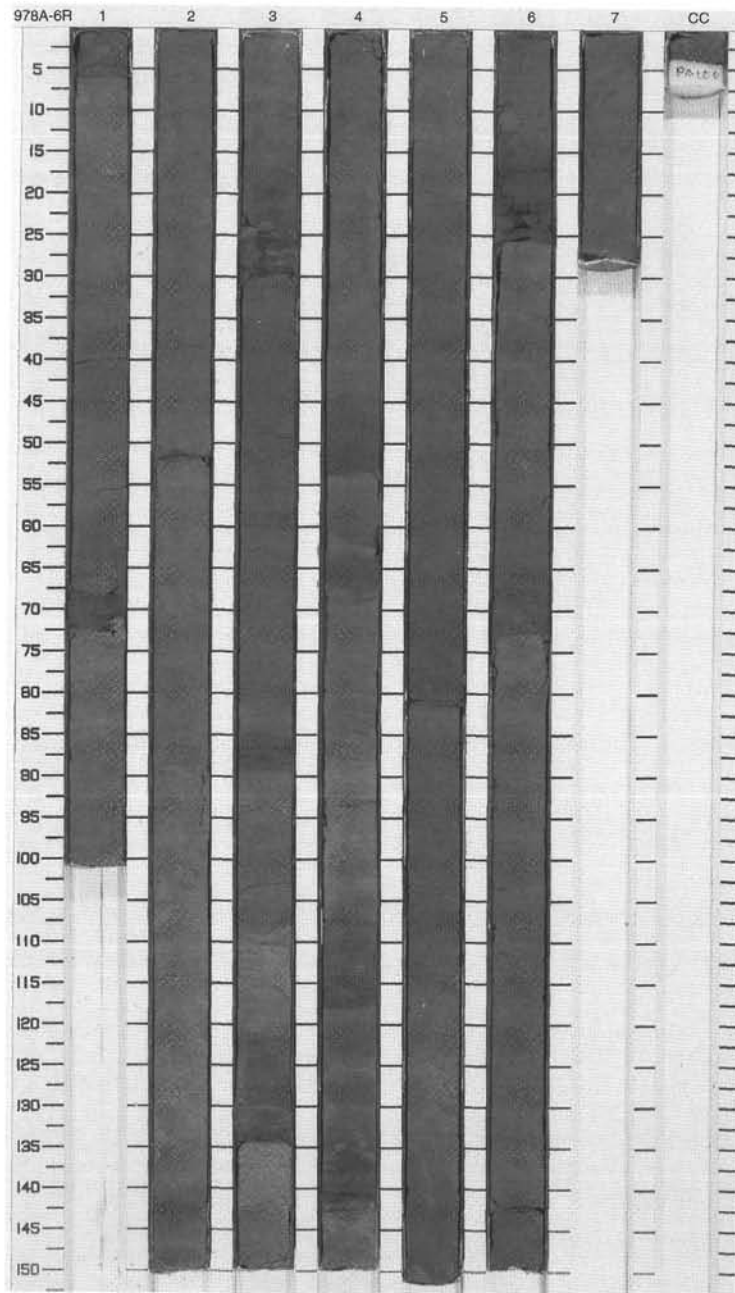
SITE 978 HOLE A CORE 4R CORED 222.7 - 232.3 mbsf

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description	
1		1	late Pliocene	P		S	5Y 4/1	NANNOFOSSIL CLAY TO NANNOFOSSIL-RICH CLAY Major Lithology: The main lithologies are dark greenish gray (5GY 4/1) NANNOFOSSIL CLAY TO NANNOFOSSIL-RICH CLAY with dispersed shell fragments and pyrite(?) rich pods.	
				P ∅					5GY 4/1
				P ∅			S S		5GY 5/1
				P ∅			S S		5Y 4/1
2		2			P ∅	I		Minor Lithologies: Structureless to laminated to normally graded beds of medium dark gray (N4) to olive gray (5Y 4/1) SANDY SILT TO SILTY SAND are present at 127-137 cm in Section 1, at 106-107 cm in Section 2, at 33-38 cm in Section 4, and 78-79 cm in Section 6. Dark gray (N3) laminae of SILT are present at 13-15 cm in Section 1, 134-136 cm in Section 3, and 90-91 cm in Section 6. The sandy and silty intervals grade upward into dark greenish gray (5GY 4/1) CALCAREOUS SILTY CLAY. A bioturbated lamina of dusky yellow (5Y 6/4) NANNOFOSSIL OOZE is present at 90 cm in Section 1. A smear slide of this material indicates it is predominantly composed of Braarudosphaera bigelowii.	
				P ∅					
3		3				S			
4		4			P ∅				
5		5		△	P ∅		5GY 4/1		
6		6			P ∅	S			
				P ∅					
				P ∅					
7		7		P ∅					
		CC				M			



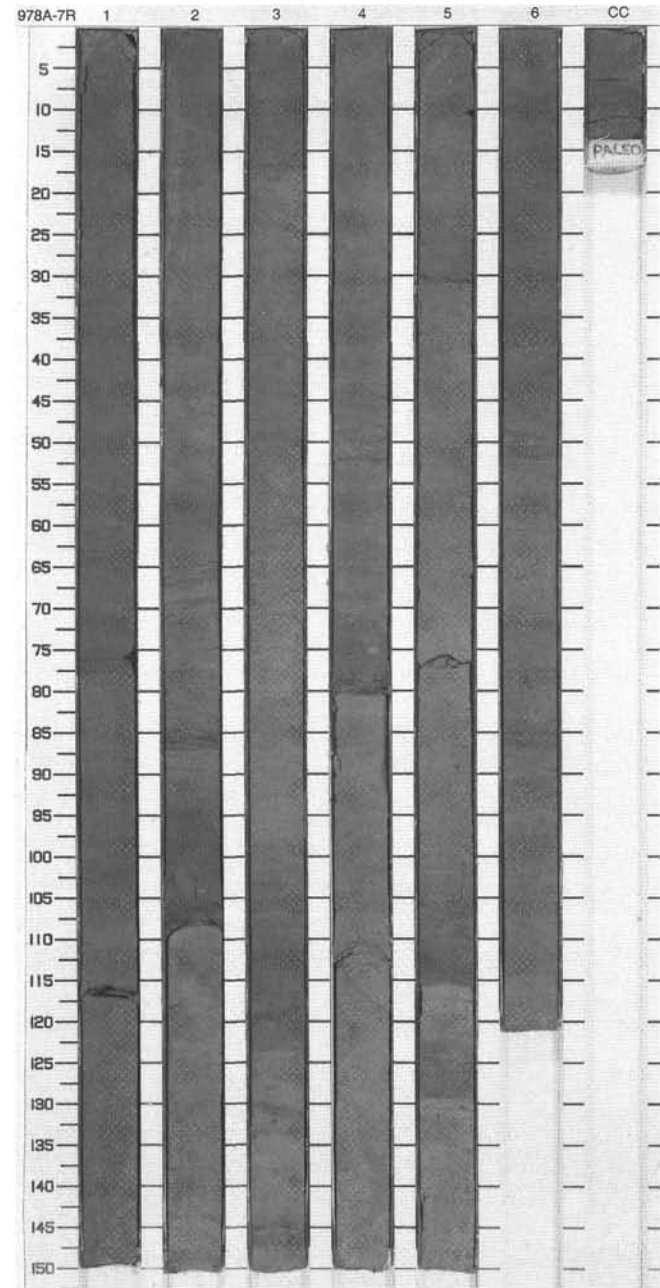
SITE 978

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
1	[Pattern]	1		P	X			<p>NANNOFOSSIL CLAY</p> <p>Major Lithology: The major lithology is NANNOFOSSIL CLAY; layers of this lithology alternate between olive gray (5Y 4/1) and dark greenish gray (5GY4/1) in color.</p> <p>Minor Lithologies: Medium dark gray (N4) SANDY SILT layers with normal grading and parallel lamination are present at 68-73 cm in Section 1, at 25-30 cm and 131-134 cm in Section 3, and at 17-25 cm in Section 6. These exhibit abrupt bases and grade upward into olive gray (5Y 4/1), bioturbated NANNOFOSSIL CLAY. Several finer-grained versions of these darker sequences are present in Section 4, all with abrupt basal contacts, but lacking SANDY SILT bases. Foraminifers are scattered throughout the core, and locally concentrated in pods or laminae of FORAMINIFER SAND.</p> <p>General Description: <i>Chondrites</i>, <i>Planolites</i> and <i>Zoophycos</i> burrows are present throughout the core.</p>
1	[Pattern]			P	X	S	5GY 4/1	
2	[Pattern]	2		P	X	S		
3	[Pattern]	3		P	X	S	5GY 4/1 To 5Y 4/1	
4	[Pattern]	4	late Pliocene	P	X	S	5GY 4/1 To 5Y 4/1	
5	[Pattern]	5		P	X	S	5Y 5/1 To 5GY 5/1	
6	[Pattern]	6		P	X	S	5GY 4/1	
7	[Pattern]	7		P	X	M		

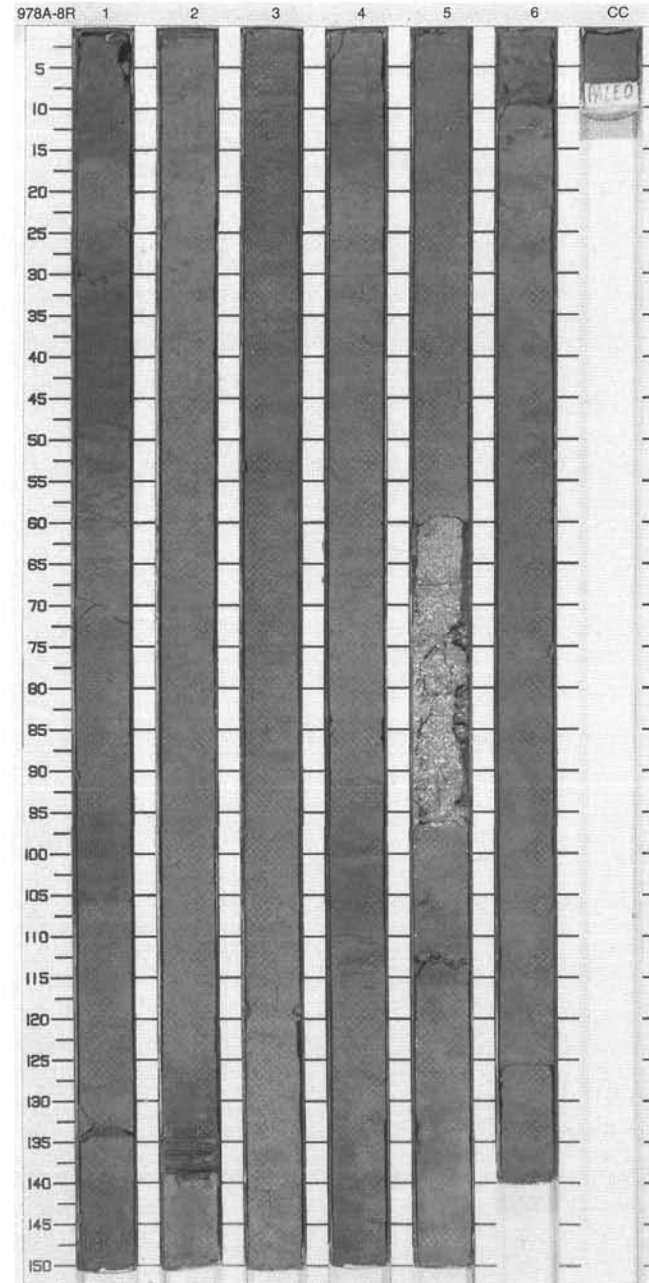


SITE 978 HOLE A CORE 7R CORED 245.9 - 255.5 mbsf

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
1	[Dotted pattern]	1	late Pliocene	[Wavy lines]	S	S	5GY 4/1	NANNOFOSSIL CLAY Major Lithology: The core is composed of alternating olive gray (5Y 4/1; 5Y 5/1) and dark greenish gray (5GY 4/1) layers of NANNOFOSSIL CLAY.
2	[Dotted pattern]	2		[Wavy lines]			5GY 5/1	Minor Lithologies: Dark greenish gray (5GY 4/1) layers of FORAMINIFER SILTY SAND are present at 116–118 cm in Section 1, and at 76–77 cm in Section 5. A layer of medium dark gray (N4) SILT TO SILTY CLAY at 105–110 cm in Section 2 exhibits an abrupt base and passes up into burrowed, olive gray (5Y 4/1) NANNOFOSSIL CLAY. Several finer-grained versions of this dark sequence are present in Section 4 at 70–81 cm, and in Section 5 at 25–35, 102–117 cm, and 116–129 cm; these lack silty bases and exhibit abrupt basal contacts.
3	[Dotted pattern]	3		[Wavy lines]			5Y 4/1	General Description: A fish tooth is present at 112 cm in Section 4. <i>Chondrites</i> burrows are common throughout the core.
4	[Dotted pattern]			[Wavy lines]			5Y 5/1	
5	[Dotted pattern]	4		[Wavy lines]			5Y 4/1	
6	[Dotted pattern]	5		[Wavy lines]				
7	[Dotted pattern]	6	[Wavy lines]	5Y 4/1				
8	[Dotted pattern]		[Wavy lines]	5GY 4/1				
		CC				M		

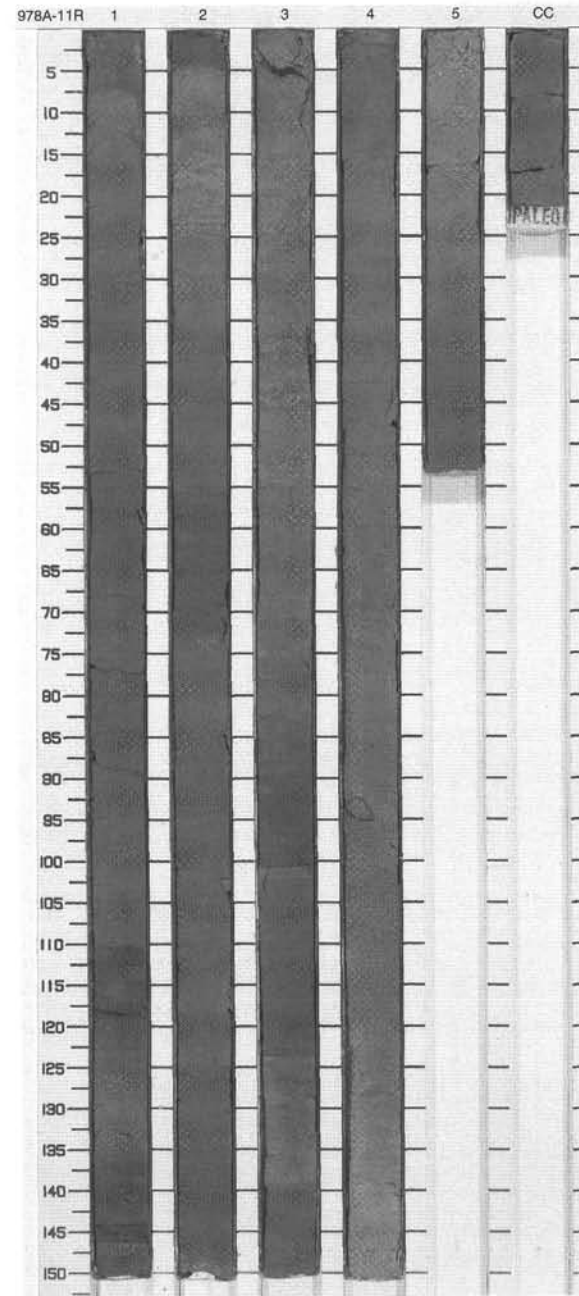


Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
1	[Pattern]	1	late Pliocene	}}		S	5Y 4/1 To 5GY 4/1	<p>NANNOFOSSIL CLAY</p> <p>Major Lithology: The core consists predominantly of alternating olive gray (5Y 4/1) to dark greenish gray (5GY 4/1; 5GY 5/1) layers of NANNOFOSSIL CLAY.</p>
2	[Pattern]	2					5GY 4/1	
3	[Pattern]	3	late Pliocene	}}	P	S	5GY 5/1	<p>Minor Lithologies: Several slightly darker, silty sequences are present in the core (31–49 cm, 94–105 cm, Section 1; 125–140 cm, Section 2; 1–9 cm, Section 6). These exhibit abrupt bases overlain by laminated medium gray (N4) SILT TO SANDY SILT that passes upward into olive gray (5Y 4/1), intensely bioturbated NANNOFOSSIL-RICH SILTY CLAY. A medium dark gray (N4) PACKSTONE layer at 60–97 cm in Section 5 exhibits abrupt contacts and crude upward fining from granule- to sand-sized material. In thin section, fragments of red algae, molluscs, and worm tubes(?) are the main allochems with lesser echinoderm fragments, foraminifers, coral, bryozoan, and siliciclastic debris; the bed has a grain supported fabric with microsparite matrix and minor carbonate cement. One layer of greenish gray (5GY 4/1) FORAMINIFER SAND is present at 133–135 cm in Section 1; this bed exhibits abrupt upper and lower contacts.</p>
4	[Pattern]	4					5GY 4/1	
5	[Pattern]	5	late Pliocene	}}	F	S	N4	<p>General Description: <i>Planolites</i>, <i>Chondrites</i> and <i>Zoophycos</i> burrows occur throughout the core. Larger zoned (<i>Planolites</i> ?) burrows are greater than 2 cm in diameter.</p>
6	[Pattern]	6					5GY 4/1	
7	[Pattern]	7						
8	[Pattern]	8						
		CG				M		

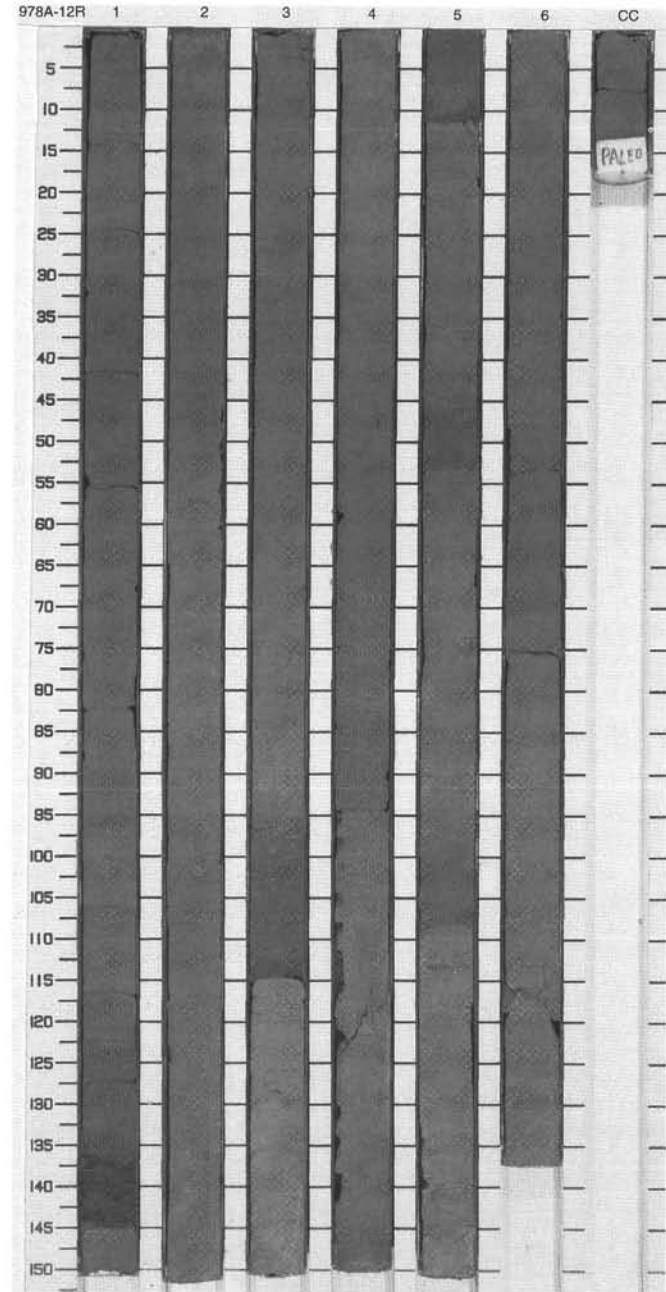


SITE 978 HOLE A CORE 11R CORED 284.3 - 293.9 mbsf

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description		
1		1	late Pliocene	~	W	S S	10Y 4/2 To 5GY 5/2	<p>NANNOFOSSIL CLAY and NANNOFOSSIL-RICH CLAY</p> <p>Major Lithologies: The main sediment types in this core are burrowed NANNOFOSSIL and NANNOFOSSIL-RICH CLAY ranging in color from dusky yellow green (5GY 5/2) and greenish gray (5GY 6/1) to grayish olive (10Y 4/2).</p>		
2		2		~	S		S S		5GY 4/1 To 5GY 5/2	<p>Minor Lithology: Several slightly darker sequences are present in the core (119-110 and 136-146 cm, Section 1; 146 cm in Section 1 to 5 cm in Section 5). These units have abrupt bases and consist of locally laminated grayish olive (10Y 4/2) CALCAREOUS CLAY. In addition to these discrete units, there are a few darker intervals obscured by bioturbation (55-72 cm, Section 2; 88-101 cm, Section 3).</p>
3		3		~	M	5GY 6/1 To 5GY 5/1		<p>General Description: One possible organic rich layer is present in Section 3 from 104-125 cm. This interval is dark greenish gray (5GY 4/1) in color and is intensely burrowed. <i>Chondrites</i> and <i>Planolites</i> burrows are common throughout the core, with some inclined cylindrical traces and a single possible Ophiomorpha.</p>		
4		4		~						
5		5		~	M	5GY 6/1 To 5GY 5/1				
6		CC		~			M		5GY 6/1 To 5GY 5/1	
				M	5GY 6/1 To 5GY 5/1					



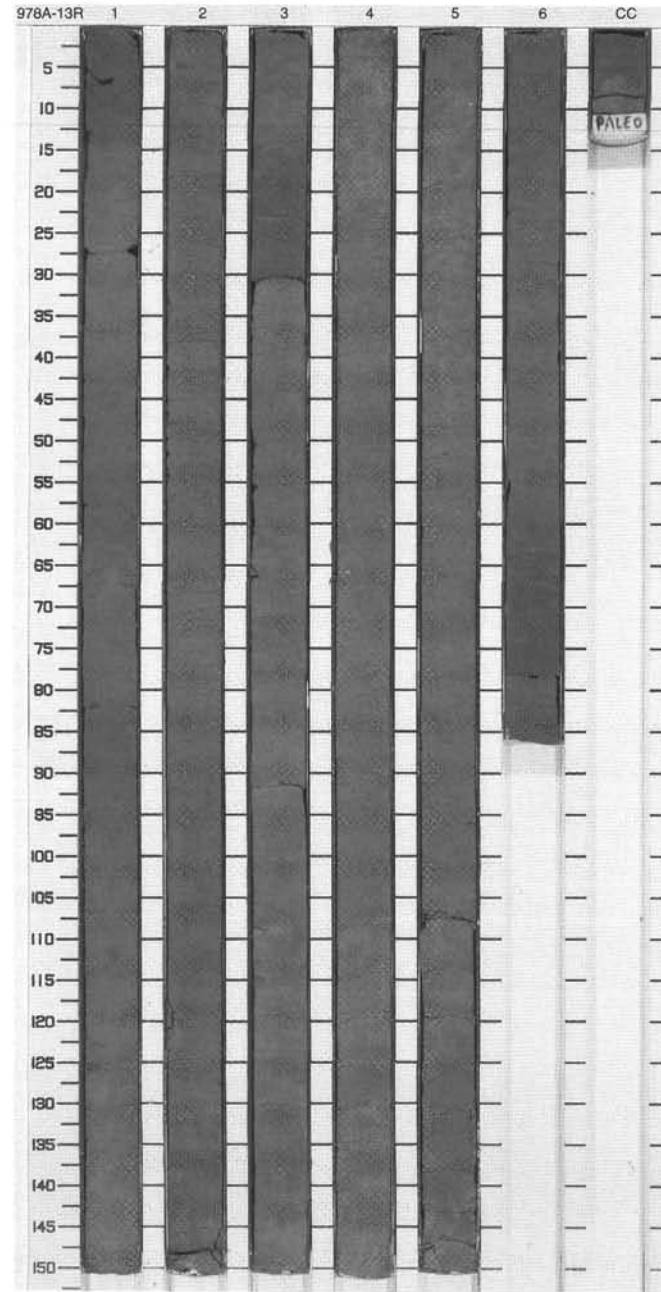
Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
1	[Pattern]	1		~		S	10Y 4/2	<p>NANNOFOSSIL CLAY</p> <p>Major Lithology: The main sediment type is NANNOFOSSIL CLAY that is highly variable in color ranging from grayish olive (10Y 4/2) to dusky yellow green (5GY 5/2) to light olive gray (5Y 5/2) to medium greenish gray (5G 5/1).</p> <p>Minor Lithologies: Several slightly darker silty intervals are present in the core (121–146 cm, Section 1; 96–115 cm, Section 3; and 145 cm in Section 4 to 11 cm in Section 5). These have sharp bases overlain by a few mm to cm of grayish olive (10Y 4/2) structureless to laminated SANDY SILTY CLAY to SILT that passes up into intensely bioturbated, grayish olive (10Y 4/2) CALCAREOUS CLAY. The maximum grain size in these intervals decreases down the core. Rare foraminifer-rich laminae are also present.</p> <p>General Description: Foraminifers are visible throughout, and shell fragments are locally present. Burrowing intensity ranges from slight to heavy. Both <i>Planolites</i> and <i>Chondrites</i> are present. Pyrite blebs are common.</p>
2	[Pattern]	2		~			5GY 5/2	
3	[Pattern]	3		~	(P)	S	5Y 5/2	
4	[Pattern]	4		~	(P)	S	5G 5/1	
5	[Pattern]	4	late Pliocene	~		S	10Y 5/2	
6	[Pattern]	5		~		S	5GY 5/1	
7	[Pattern]	6		~				
8	[Pattern]	6		~				
9	[Pattern]	CC		~		M		



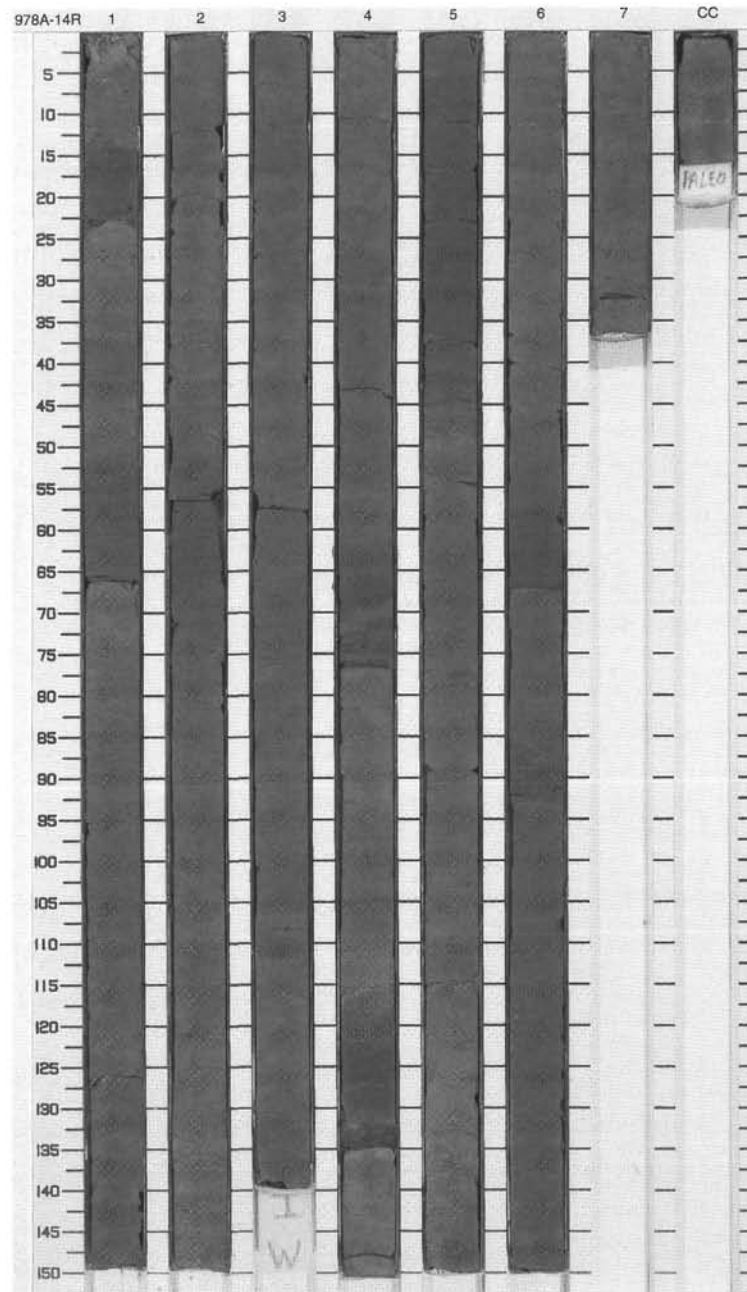
SITE 978 HOLE A CORE 13R

CORED 303.6 - 313.1 mbsf

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
1	[Pattern]	1	late Pliocene	~ (P)	-	S	5GY 5/1	<p>NANNOFOSSIL CLAY and CALCAREOUS CLAY</p> <p>Major Lithologies: The main sediment types in this core are NANNOFOSSIL CLAY and CALCAREOUS CLAY. Carbonate in the latter is dominated by nannofossils, but up to 15% micrite is also present. The two lithologies alternate throughout the core with nannofossil clay being the paler of the two (dusky yellow green (5GY 5/2) and medium greenish gray (5GY 5/1) versus dark greenish gray (5GY 4/1) for calcareous clay).</p> <p>Minor Lithology: Thin SILT laminae are present at the base of slightly darker intervals (148-135 cm, Section 2; 15-30 cm, Section 3; 60-78 cm, Section 6) predominantly composed of intensely bioturbated NANNOFOSSIL CLAY.</p> <p>General Description: Burrowing is common with <i>Planolites</i> and <i>Chondites</i> the main types. Pyrite blebs and foraminifers are visible throughout.</p>
2	[Pattern]	2		~ (P)				
3	[Pattern]	3		~ (P)				
4	[Pattern]	4		~ (P)				
5	[Pattern]	5		~ (P)				
6	[Pattern]	6		~ (P)				
7	[Pattern]	5	~ (P)	S	M	5GY 5/1 To 5GY 4/1		
8	[Pattern]	6	~ (P)					
		CC						

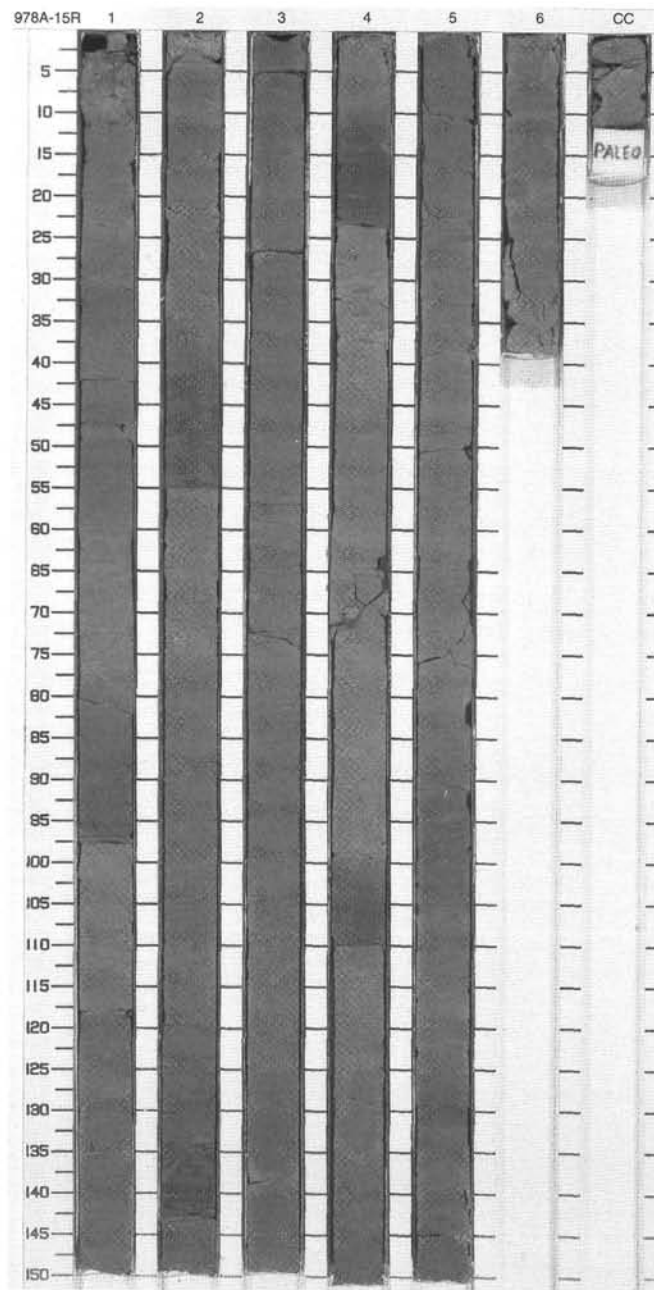


Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
1	[Dotted pattern]	1	late Pliocene	~ ~ ~ ~ ~ ~ ~	-	S	5GY 5/1 To 5GY 4/1	<p>NANNOFOSSIL CLAY</p> <p>Major Lithology: The main lithology is medium greenish gray (5GY 5/1) to dark greenish gray (5GY 4/1) and dusky yellow green (5GY 5/2) NANNOFOSSIL CLAY.</p> <p>Minor Lithology: Several slightly darker, silty intervals are present in the core (15-24 cm and 52-67 cm, Section 1; 50-67 cm, Section 2; 61-76.5 cm and 120-136 cm, Section 4; 58-67 cm and 87-95 cm, Section 6). The base of each sequence consists of weakly laminated, 1 cm-thick SILT layers above an abrupt basal contact. The SILT passes upward into bioturbated dark greenish gray (5GY 4/1) NANNOFOSSIL CLAY. Cemented fine- to medium-grained SAND is present in the Core Catcher from 0-22 cm.</p> <p>General Description: Burrowing is present throughout and ranges from slight to heavy. <i>Chondrites</i> and <i>Planolites</i> are the main forms of classifiable burrows, with less frequent <i>Zoophycos</i>. Foraminifers and shell fragments are present.</p>
2	[Dotted pattern]	2						
3	[Dotted pattern]	3						
4	[Dotted pattern]	4						
5	[Dotted pattern]	5						
6	[Dotted pattern]	6						
7	[Dotted pattern]	7						
8	[Dotted pattern]	CC					10Y 4/2	
9	[Dotted pattern]						5GY 5/2	
								10Y 4/2 To 5GY 5/2
								M

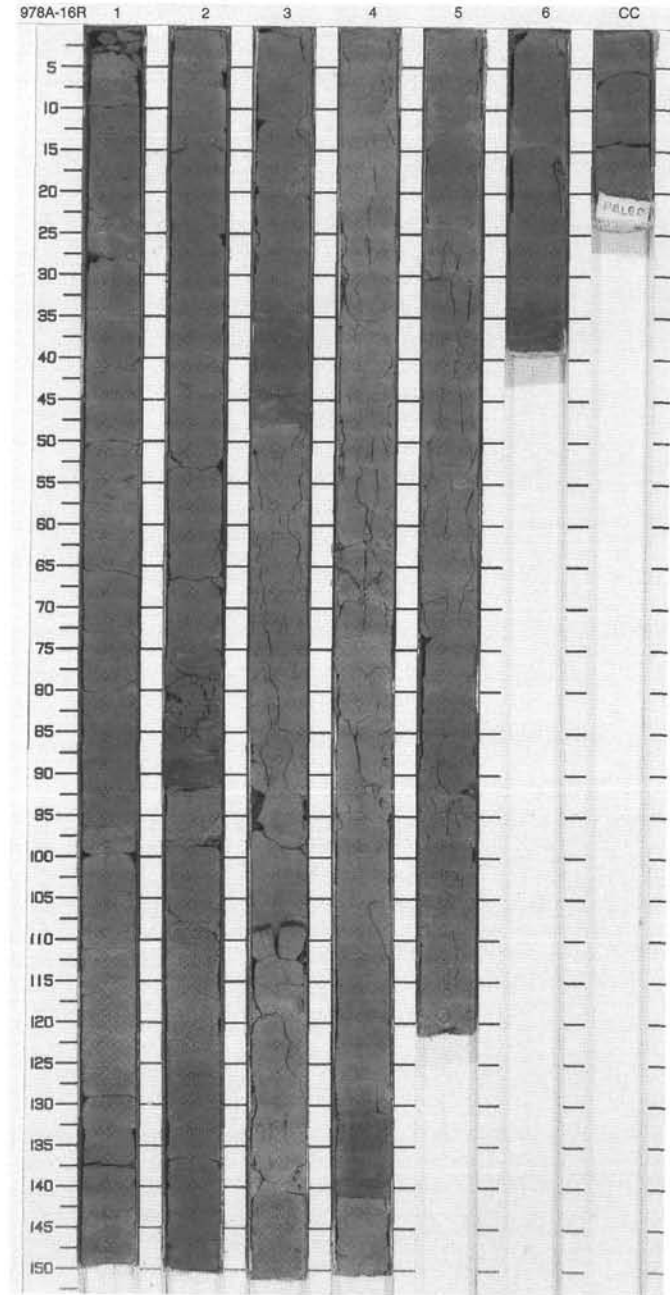


SITE 978 HOLE A CORE 15R CORED 322.8 - 332.5 mbsf

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
1	[Dotted pattern]	1	late Pliocene	[Wavy lines]	[Disturbance symbol]	S	5GY 5/1	<p>NANNOFOSSIL CLAY and CALCAREOUS SILTY CLAY</p> <p>Major Lithologies: The predominant lithologies are NANNOFOSSIL CLAY and CALCAREOUS SILTY CLAY. The major colors include medium olive gray (5GY 5/1), dusky yellow green (5GY 5/2), and grayish olive (10Y 4/2), with bands of dark greenish gray (5GY 4/1) and grayish olive green (5GY 3/2).</p> <p>Minor Lithologies: Several slightly darker sequences are present in the core (70-100 cm, Section 1; 35-55 cm and 134-143 cm, Section 2; 12-24 and 101-110 cm, Section 4; 93-102 and 126-133 cm, Section 5). These typically exhibit sharp bases overlain by a thin (1 cm) interval of faintly laminated bioclastic clayey/sandy silt that passes upward into intensely bioturbated (Planolites and Chondrites) NANNOFOSSIL CLAY. The darker intervals in Section 5 do not have silty bases and are more heavily bioturbated.</p> <p>General Description: Disseminated foraminifers are common throughout. Slightly darker gray mm-sized fecal pellets are dispersed throughout Sections 4 and 5.</p>
2	[Dotted pattern]	2						
3	[Dotted pattern]	3						
4	[Dotted pattern]	4						
5	[Dotted pattern]	5						
6	[Dotted pattern]	6						
7	[Dotted pattern]	5	S	5GY 5/2				
8	[Dotted pattern]	6	M	10Y 4/2				



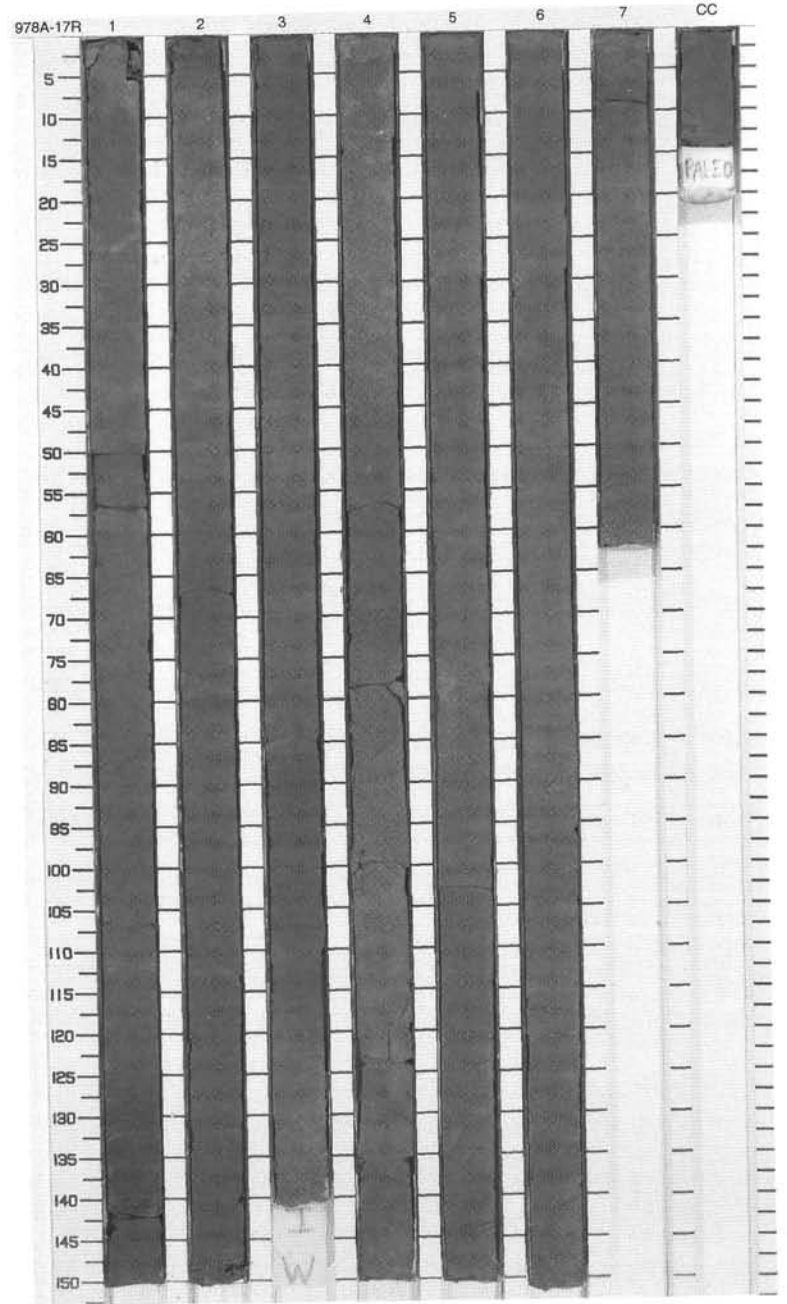
Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
1	[Pattern]	1		}}		S	10Y 4/2	<p>NANNOFOSSIL CLAY and NANNOFOSSIL SILTY CLAY</p> <p>Major Lithologies: The major lithologies are NANNOFOSSIL CLAY and NANNOFOSSIL SILTY CLAY. The NANNOFOSSIL CLAY tends to be darker in color [grayish olive (10Y 4/2) and olive gray (5Y 4/1)] whereas the NANNOFOSSIL SILTY CLAY is lighter in color [medium greenish gray (5GY 5/1) and dusky yellow green (5GY 5/2)].</p> <p>Minor Lithology: Several slightly darker, silty sequences are present: 73–92 cm, Section 2; 35–48 cm, Section 3; 130–142 cm, Section 4; and 32–38 cm, Section 6. These exhibit sharp bases overlain by up to 5 cm of laminated SILT to SAND that passes up into bioturbated silt to clay. These are typically 10–20 cm in thickness. FORAMINIFER SAND, locally semi-lithified, is present in discrete layers up to 2 cm thick (98–99 cm, Section 2; 98–100 cm, Section 3; 78.5–79.5 cm, Section 4; 79–80 cm, Section 5); these have been somewhat disturbed during drilling, but appear to have sharp upper and lower contacts.</p> <p>General Description: Bioturbation includes large horizontal to inclined burrows and abundant <i>Chondrites</i>. Fecal pellets are disseminated throughout the core.</p>
1	[Pattern]	1		}}		S	5GY 5/1	
2	[Pattern]	2		}}		S	10Y 4/2	
2	[Pattern]	2		}}		S	5GY 5/2	
3	[Pattern]	3		}}		S	10Y 4/2	
4	[Pattern]	3	late Pliocene	}}		S	5GY 5/1	
5	[Pattern]	4		}}		S	5Y 4/1	
6	[Pattern]	5		}}		S	5Y 4/1	
7	[Pattern]	6		}}		S	5Y 4/1	
	[Pattern]	CC		}}		M		



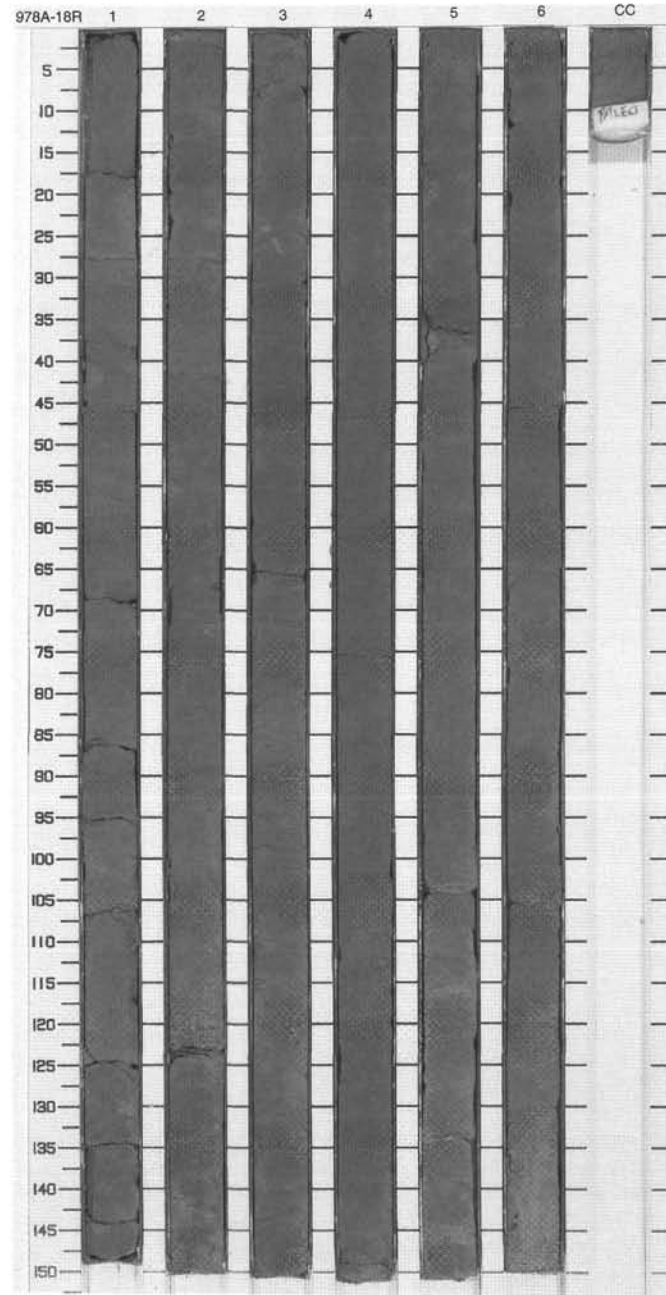
SITE 978 HOLE A CORE 17R

CORED 342.2 - 351.8 mbsf

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
1	[Dotted pattern]	1				S	5GY 5/1	<p>NANNOFOSSIL CLAY</p> <p>Major Lithology: The major lithology is dark greenish gray (5GY 5/1, 5GY 4/1) to olive gray (5Y 4/1) NANNOFOSSIL CLAY.</p> <p>Minor Lithologies: The core is locally enriched in foraminifers, with a concentration of normal graded FORAMINIFER SAND in Section 1, 49-56cm.</p> <p>General Description: Fecal pellets are common and locally concentrated in laminae at 0-52 cm in Section 3. Burrow types include large halo burrows.</p>
2	[Dotted pattern]	2				S	5GY 4/1	
3	[Dotted pattern]	3				S	5Y 4/1	
4	[Dotted pattern]	4	late Pliocene			I	5GY 4/1 To 5GY 5/1	
5	[Dotted pattern]	5						
6	[Dotted pattern]	6					5GY 5/1	
7	[Dotted pattern]	7						
9	[Dotted pattern]	CC				M		

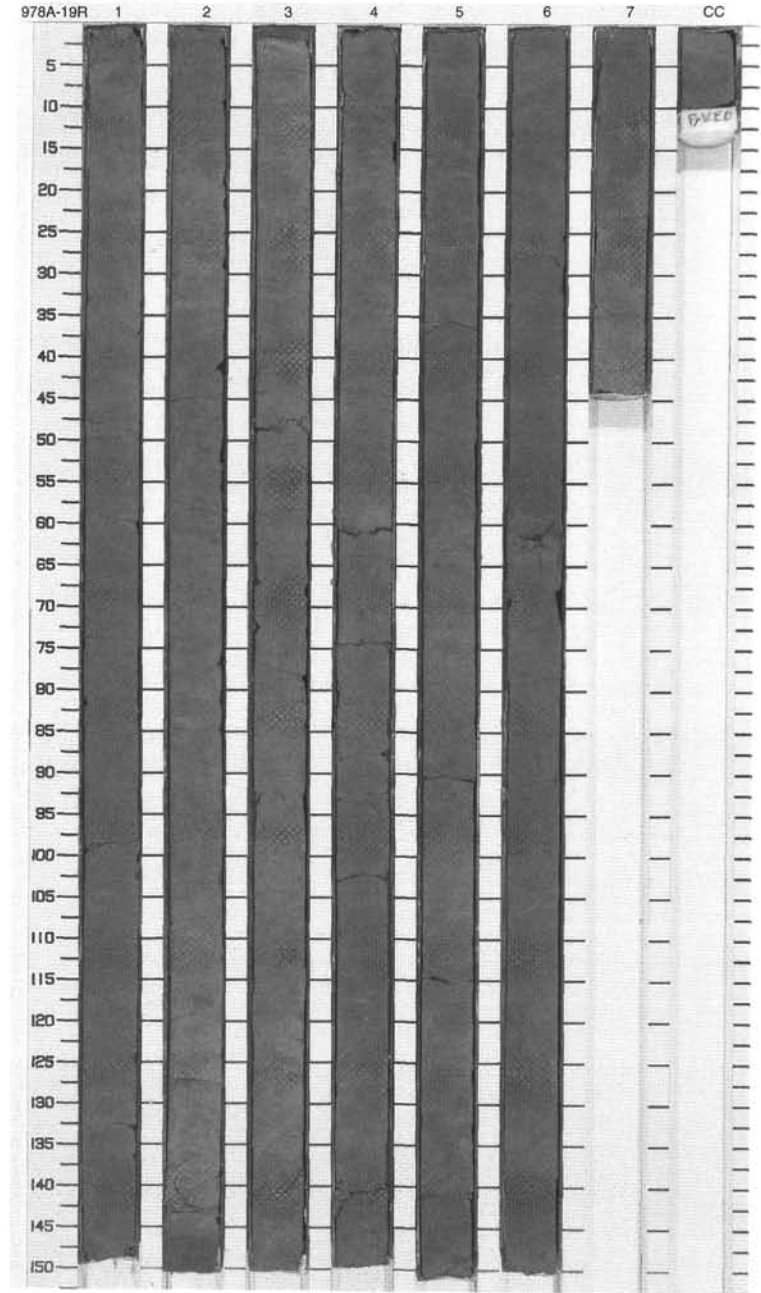


Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
1	[Pattern]	1	late Pliocene	[Wavy]	[Dashed]		5GY 5/1	<p>NANNOFOSSIL CLAY</p> <p>Major Lithology: The main lithology is dark greenish gray (5GY 4/1, 5GY 5/1) bioturbated NANNOFOSSIL CLAY.</p> <p>Minor Lithologies: Foraminifers are present throughout the core and locally concentrated. Foraminifer-rich silty laminated layers are present at 123–124 cm in Section 2 and at 62–65 cm in Section 4. A silty bed in Section 5 at 33–40 cm, shows parallel lamination, an abrupt base, and grades up into bioturbated nannofossil clay.</p> <p>General Description: Fecal pellets are distributed throughout the core.</p>
2	[Pattern]	2						
3	[Pattern]	3						
4	[Pattern]	4						
5	[Pattern]	5						
6	[Pattern]	6						
7	[Pattern]					S		
8	[Pattern]						5GY 5/1 To 5GY 4/1	
9	[Pattern]							M



SITE 978 HOLE A CORE 19R CORED 361.4 - 371.0 mbsf

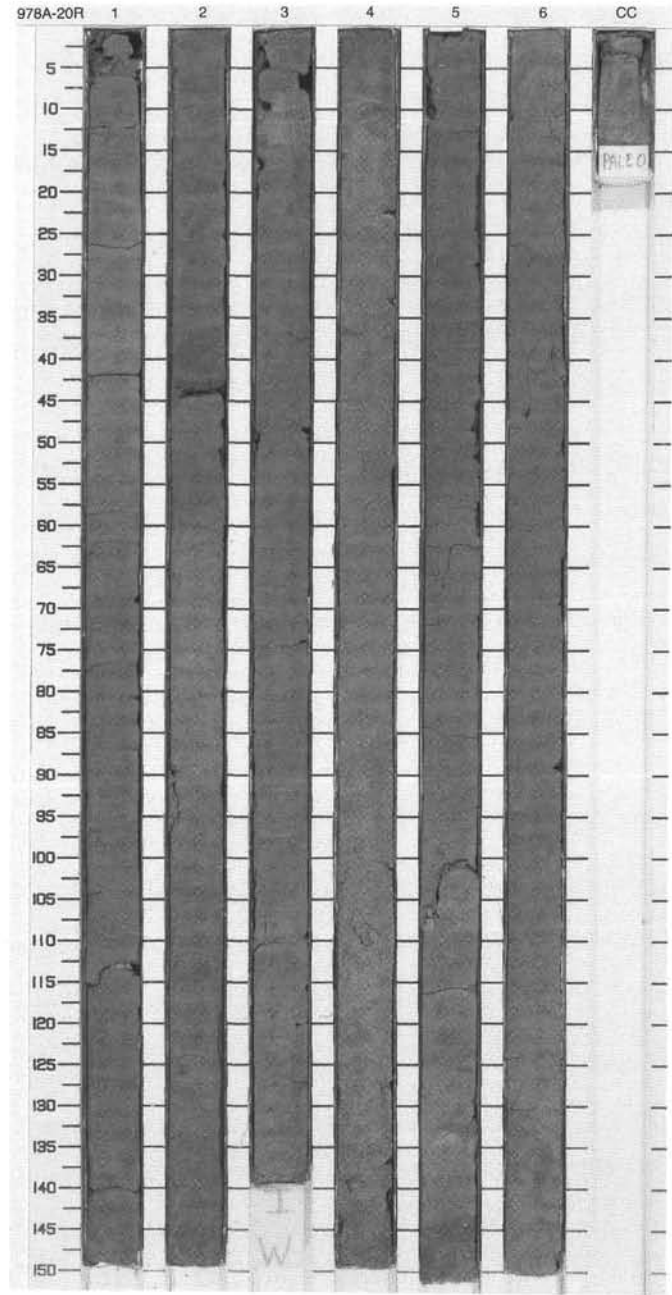
Meter	Graphic Lith.	Section Age	Structure	Disturb	Sample	Color	Description
1	[Pattern]	1				5Y 5/1	<p>NANNOFOSSIL CLAY TO NANNOFOSSIL SILTY CLAY</p> <p>Major Lithology: The main lithology is olive gray (5Y 4/1) to dark greenish gray (5GY 4/1, 5GY 5/1) bioturbated NANNOFOSSIL CLAY TO NANNOFOSSIL SILTY CLAY.</p> <p>Minor Lithologies: The core is locally enriched in foraminifers with lamina of FORAMINIFER SANDY SILT occurring in Section 4, 60-61 cm. Parallel laminated SILT layers with abrupt bases are present and grade up into bioturbated NANNOFOSSIL-RICH SILTY CLAY (in Section 6, 56-63 cm).</p> <p>General Description: Fecal pellets are dispersed throughout the core and locally concentrated. Burrow types include <i>Zoophycos</i>, <i>Planolites</i>, and <i>Chondrites</i>.</p>
2	[Pattern]	2				5Y 5/1 To 5GY 5/1	
3	[Pattern]	3					
4	[Pattern]	4		⊗			
5	[Pattern]	5		⊗			
6	[Pattern]	6					
7	[Pattern]	7		⊗			
8	[Pattern]	8			S	5GY 4/1 To 5GY 5/1	
9	[Pattern]	9			S		
	[Pattern]				M		



SITE 978 HOLE A CORE 20R

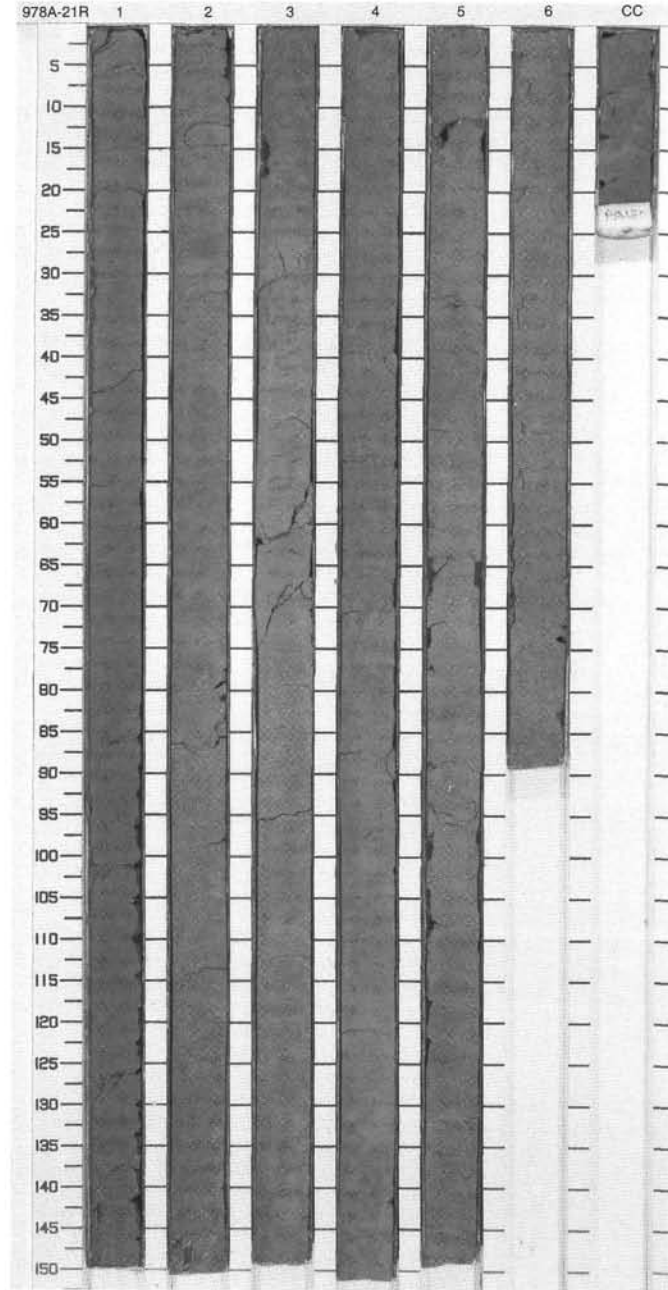
CORED 371.0 - 380.6 mbsf

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
1	[Pattern]	1	late Pliocene	[Symbol]		S	5GY 5/1 To 5GY 4/1	NANNOFOSSIL CLAY Major Lithology: The major lithology is dark greenish gray (5 GY 5/1, 5GY 4/1) NANNOFOSSIL CLAY with scattered fecal pellets.
2	[Pattern]	2		[Symbol]		S	5GY 5/1	Minor Lithologies: Foraminifers are scattered throughout the core and locally concentrated in laminae of FORAMINIFER SILT at 40-115 cm in Section 1, and at 8-112 cm in Section 3. A laminated silty bed is present in Section 2 at 35-44 cm that grades up into bioturbated NANNOFOSSIL CLAY.
3	[Pattern]	3		[Symbol]		I	5GY 4/1 To 5GY 5/1	General Description: Large halo burrows and <i>Chondrites</i> are present.
4	[Pattern]	4		[Symbol]		S		
5	[Pattern]	5		[Symbol]				
6	[Pattern]	6		[Symbol]				
7	[Pattern]	5		[Symbol]			5GY 4/1	
8	[Pattern]	6		[Symbol]				
9	[Pattern]	CC				M	5GY 5/1	

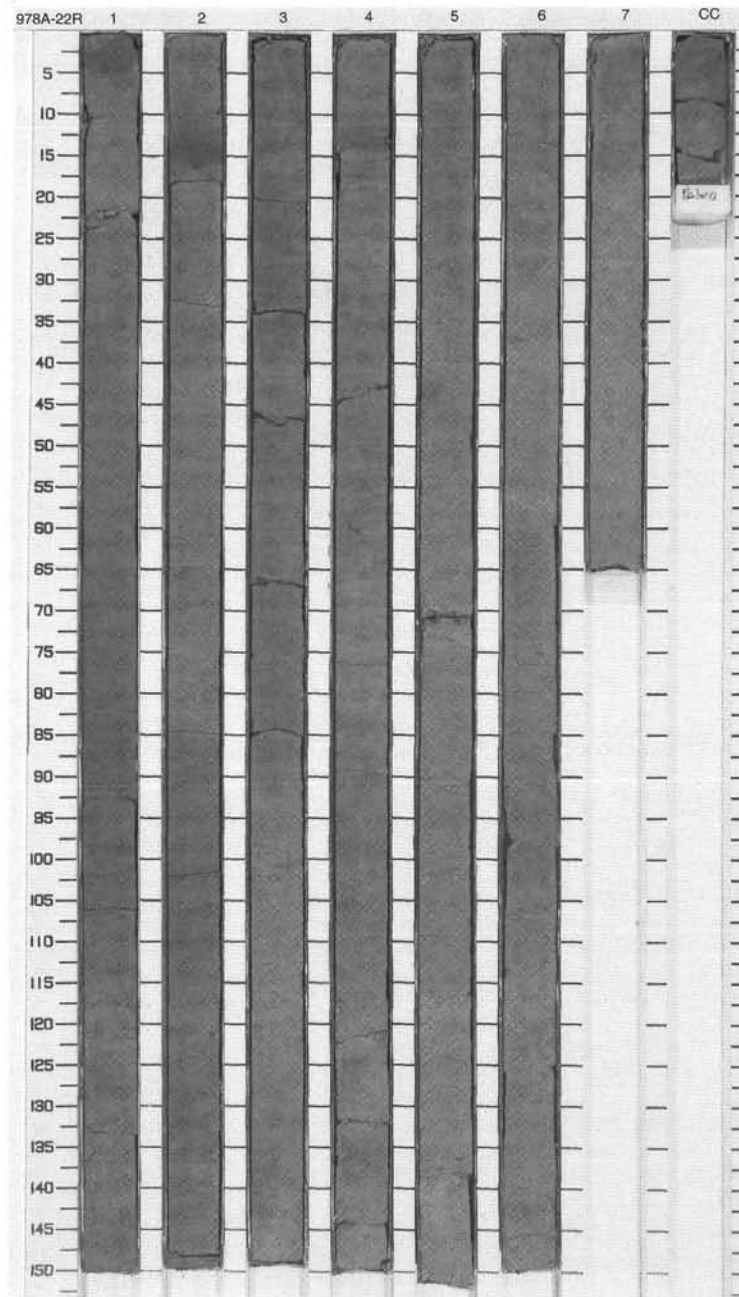


SITE 978 HOLE A CORE 21R CORED 380.6 - 390.2 mbsf

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
1	[Pattern]	1		δ			5GY 5/1	<p>NANNOFOSSIL CLAY</p> <p>Major Lithology: The major lithology is dark greenish gray (5GY 4/1, 5GY 5/1) NANNOFOSSIL CLAY.</p> <p>Minor Lithologies: Foraminifer-rich, silty layer occurs at 30-33 cm in Section 5.</p> <p>General Description: <i>Chondrites</i> and <i>Planolites</i> burrows are present throughout the core.</p>
2	[Pattern]	2		δ				
3	[Pattern]	3					5GY 4/1 To 5GY 5/1	
4	[Pattern]	3	late Pliocene					
5	[Pattern]	4						
6	[Pattern]	4			S			
7	[Pattern]	5		δ			5GY 4/1	
8	[Pattern]	6			S			
		CC						
						M		



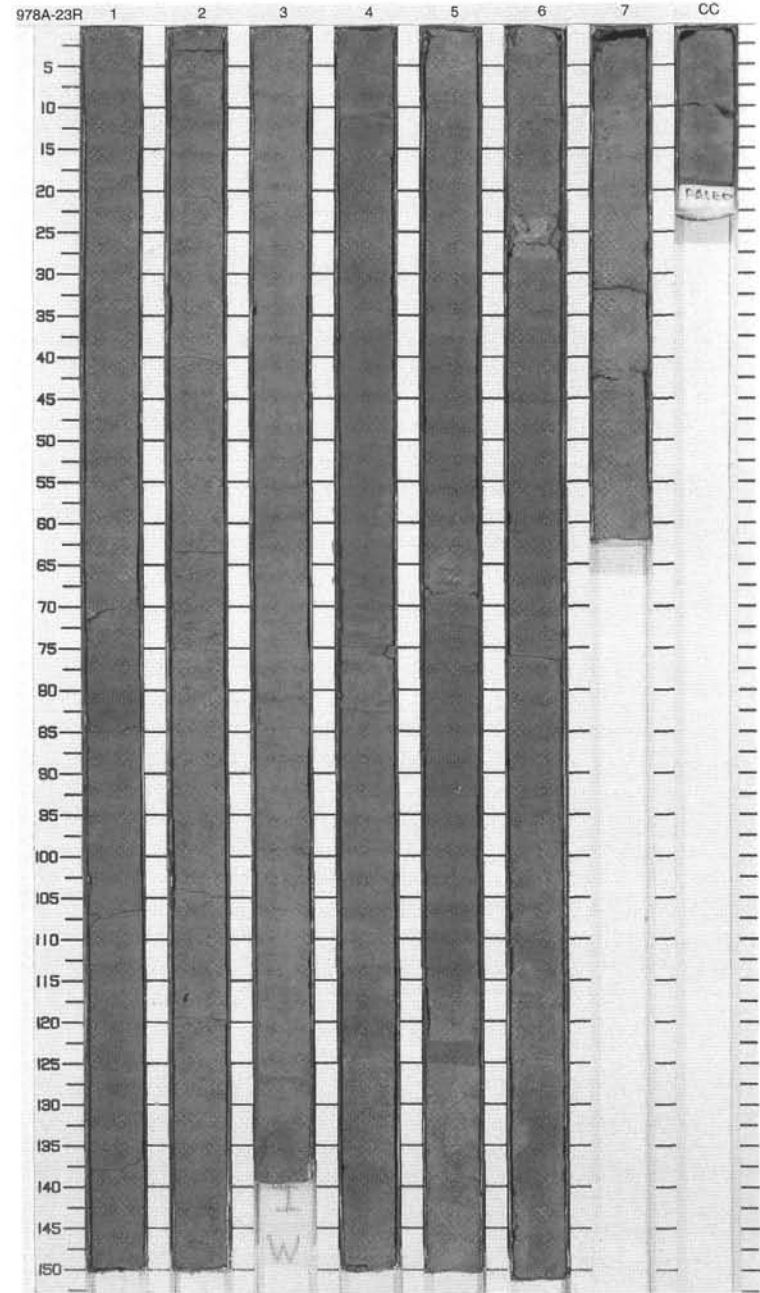
Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
1	[Dotted pattern]	1	late Pliocene	[Wavy lines]	-	S	5GY 4/1 To 5GY 5/1	<p>NANNOFOSSIL CLAY</p> <p>Major Lithology: The major lithology is dark greenish gray (5GY 4/1, 5GY 5/1) NANNOFOSSIL CLAY, with enriched sequences of <i>Chondrites</i>, <i>Planolites</i>, and composite burrows throughout the core.</p> <p>Minor Lithologies: Foraminifers are concentrated at 21–22 cm in Section 1. Medium dark gray (N4) SANDY SILT layer is present at 71 cm in Section 5. A layer of CALCAREOUS SILTY CLAY with large <i>Planolites</i> burrows is present at 13–18 cm in Section 2.</p> <p>General Description: Locally burrows are replaced by grayish black (N2) pyrite (?). Some 15-cm thick bioturbation cycles are present with <i>Chondrites</i> passing up into <i>Planolites</i>. X-ray diffraction data indicate the presence of siderite at 15–17 cm in Section 2.</p>
2	[Dotted pattern]	2						
3	[Dotted pattern]	3						
4	[Dotted pattern]	4						
5	[Dotted pattern]	5						
6	[Dotted pattern]	6						
7	[Dotted pattern]	7						
8	[Dotted pattern]	CC				M		



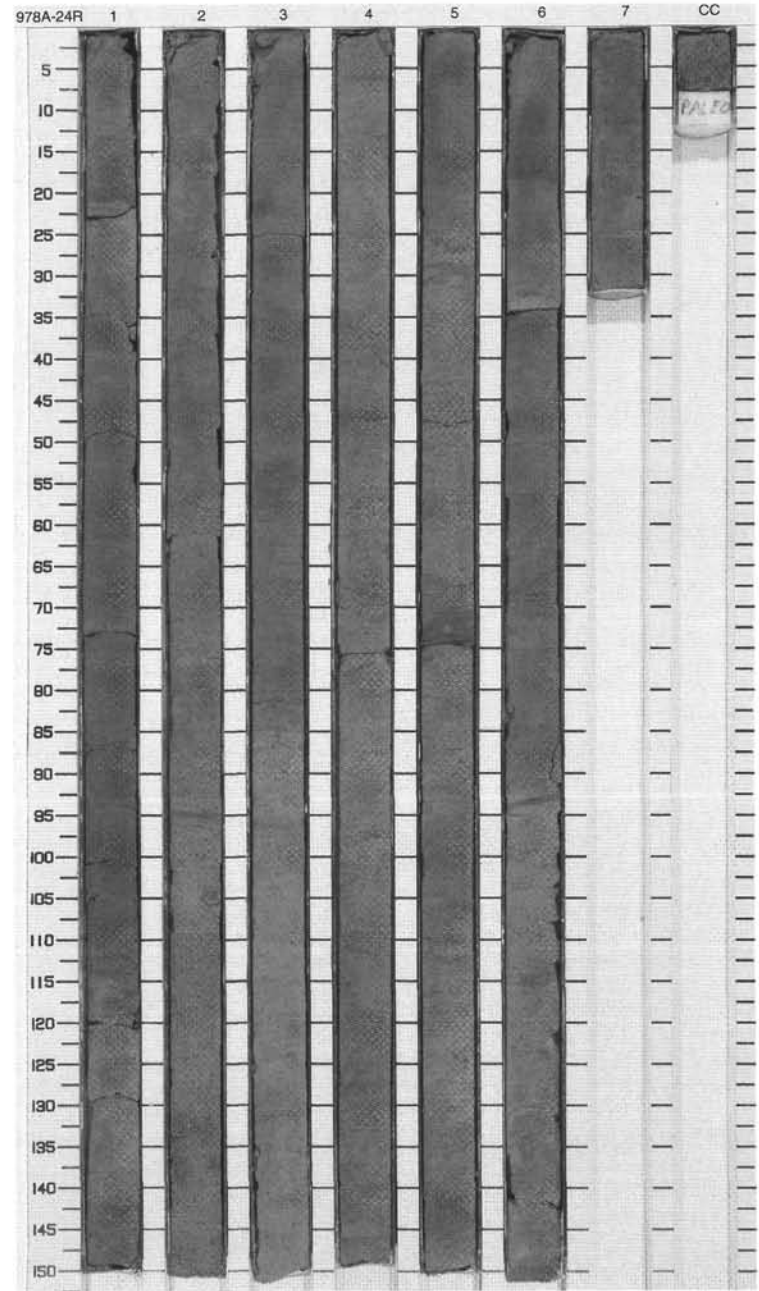
SITE 978 HOLE A CORE 23R

CORED 399.8 - 409.3 mbsf

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
1	[Cross-hatched pattern]	1	late Pliocene	~		S	5GY 4/1	<p>NANNOFOSSIL CLAY</p> <p>Major Lithology: The major lithology is dark greenish gray (5GY 4/1, 5GY 5/1) NANNOFOSSIL CLAY with enriched sequences of <i>Chondrites</i>, <i>Planolites</i> and <i>Zoophycos</i> burrows.</p> <p>Minor Lithology: Olive gray (5Y 5/1) CALCAREOUS SAND TO SANDY SILT layers composed predominantly of foraminifers and shell fragments are present at 67-68 cm in Section 5, at 26-28 cm in Section 6 (with sharp upper and lower contacts), and at 29-33 cm in Section 7 (laminated and upward fining).</p> <p>General Description: A wide variety of burrow types are present, including <i>Zoophycos</i>, Composite, <i>Chondrites</i>, <i>Planolites</i>, and Halo burrows. Large burrows are partly filled with fecal pellets.</p>
2	[Cross-hatched pattern]	2						
3	[Cross-hatched pattern]	3						
4	[Cross-hatched pattern]	4						
5	[Cross-hatched pattern]	5						
6	[Cross-hatched pattern]	6						
7	[Cross-hatched pattern]	7						
8	[Cross-hatched pattern]	6	~		S	5GY 5/1		
9	[Cross-hatched pattern]	5				5GY 4/1		
	[Cross-hatched pattern]	5	~		S	5GY 5/1		
	[Cross-hatched pattern]	6				5GY 4/1		
	[Cross-hatched pattern]	6	~		S	5GY 4/1		
	[Cross-hatched pattern]	7				5GY 5/1		
	[Cross-hatched pattern]	7	~		S	5GY 4/1		
	[Cross-hatched pattern]	CC				5GY 5/1		
	[Cross-hatched pattern]	CC				M		

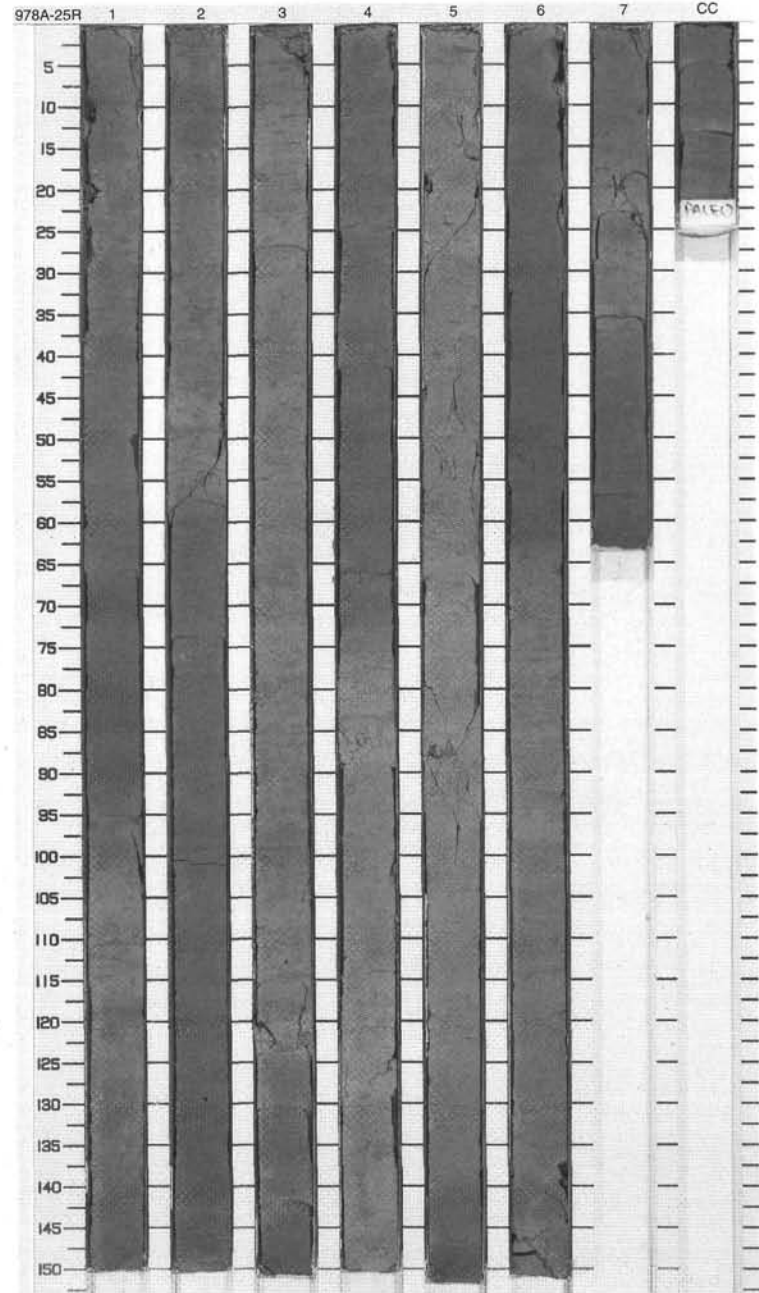


Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
1	[Pattern]	1	late Pliocene	⋘ ⋘	-	S	5GY 4/1	NANNOFOSSIL CLAYSTONE Major Lithology: The major lithology is strongly bioturbated, dark greenish gray (5GY 4/1; 5GY 5/1) NANNOFOSSIL CLAYSTONE, in alternating darker (5GY 4/1) and lighter (5GY 5/1) beds. Minor Lithologies: Dark greenish gray (5GY 5/1) CALCAREOUS SANDY CLAYSTONE laminae with foraminifer concentrations occur at 60-61 cm in Section 2. A thin bed of SANDY SILTSTONE exhibiting parallel lamination is present at 71-74 cm in Section 5. General Description: <i>Zoophycos</i> , <i>Chondrites</i> , and <i>Planolites</i> occur throughout the core.
2	[Pattern]	2					5GY 5/1	
3	[Pattern]	3					5GY 4/1	
4	[Pattern]	4					5GY 5/1	
5	[Pattern]	5					5GY 4/1	
6	[Pattern]	6					5GY 5/1	
7	[Pattern]	7					5GY 4/1	
8	[Pattern]	6	5GY 4/1	M	5GY 5/1			
9	[Pattern]	7	5GY 5/1					

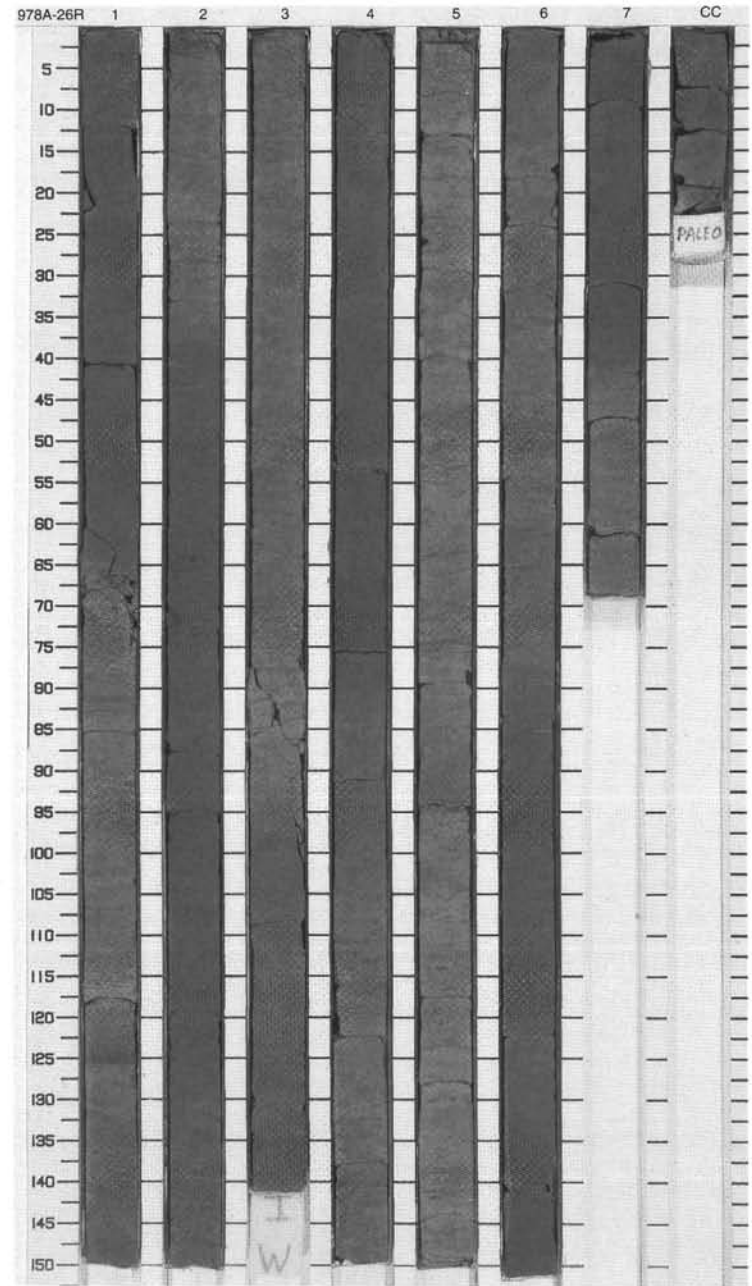


SITE 978 HOLE A CORE 25R CORED 418.9 - 428.5 mbsf

Meter	Graphic Lith.	Section Age	Structure	Disturb	Sample	Color	Description
1	[Pattern]	1	~			5GY 5/1	<p>CALCAREOUS CLAYSTONE and NANNOFOSSIL CLAYSTONE</p> <p>Major Lithologies: The main sediment types are NANNOFOSSIL CLAYSTONE and CALCAREOUS CLAYSTONE. The former ranges in color from grayish olive (10Y 4/2) to dusky yellow green (5GY 5/2) to medium greenish gray (5GY 6/1), whereas the latter is medium greenish gray (5GY 5/1). These lithologies alternate as light and dark layers throughout the core, with the darker intervals of CALCAREOUS CLAYSTONE being less intensely bioturbated.</p> <p>General Description: <i>Chondrites</i> and <i>Planolites</i> are the main burrow types present. Dispersed Foraminifera are locally present.</p>
2	[Pattern]	2	~			5GY 5/1 To 5GY 6/1	
3	[Pattern]	3	~		S	5GY 5/1	
4	[Pattern]	3	~			5GY 5/1 To 5GY 6/1	
5	[Pattern]	4	~			5GY 5/1 To 5GY 6/1	
6	[Pattern]	4	~			5GY 5/1 To 5GY 6/1	
7	[Pattern]	5	~		S	5GY 5/2	
8	[Pattern]	6	~ (P)			10Y 4/2	
9	[Pattern]	6	~			5GY 5/2	
		7	~			5GY 5/1	
		CC			M		



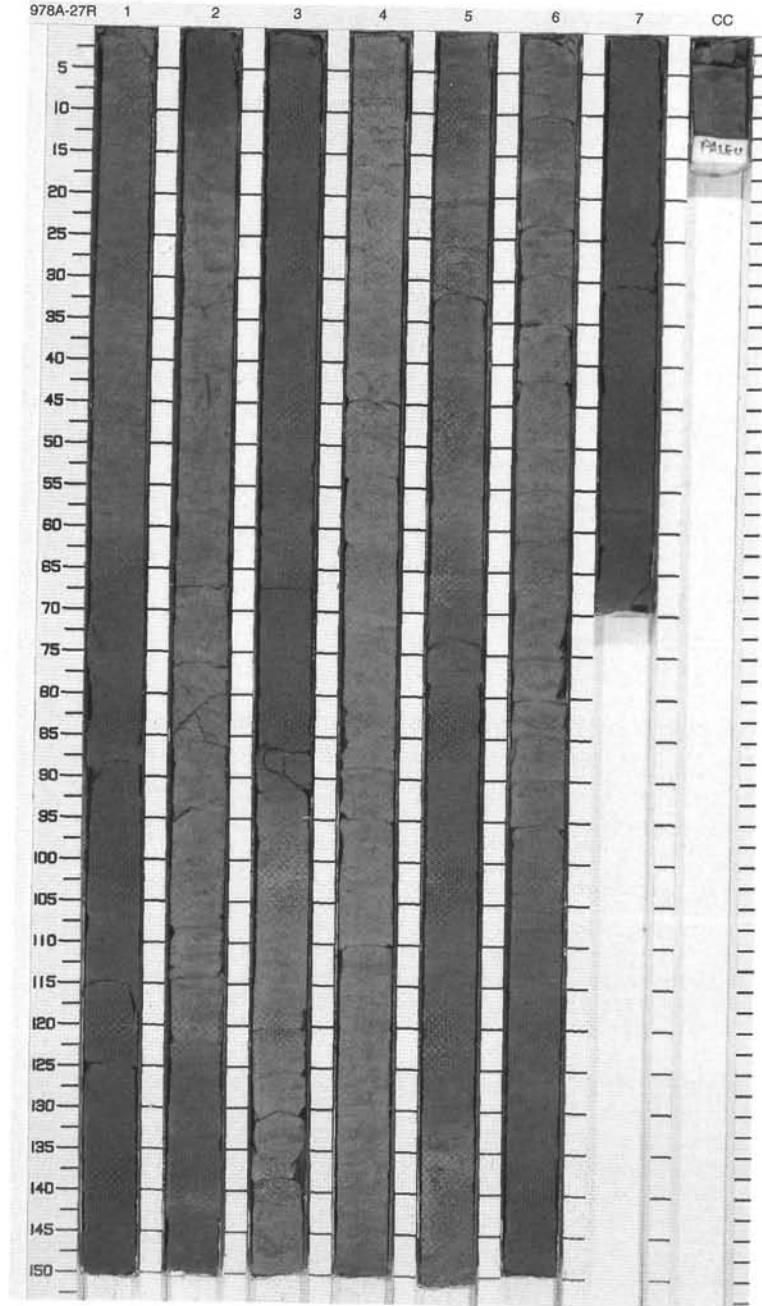
Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
1	[Pattern]	1	late Pliocene	[Symbol]		S	5GY 6/1 To 5GY 5/1	<p>NANNOFOSSIL CLAYSTONE and CALCAREOUS SILTY CLAYSTONE</p> <p>Major Lithologies: The predominant lithologies are NANNOFOSSIL CLAYSTONE and CALCAREOUS SILTY CLAYSTONE. The CALCAREOUS SILTY CLAYSTONE contains roughly 20% micrite and 35% nannofossils. Colors alternate between lighter shades [greenish gray (5GY 6/1) and light olive gray (5Y 6/1)] typical of the CALCAREOUS SILTY CLAYSTONE and darker shades [dark greenish gray (5GY 4/1) and grayish olive (10Y 4/2)] typical of the NANNOFOSSIL CLAYSTONE, with some intervals of intermediate shades [medium greenish gray (5GY 5/1) and dusky yellow green (5GY 5/2)].</p> <p>General Description: Darker nannofossil clay intervals have sharp, gradational or bioturbated bases, but all tend to grade upward into lighter CALCAREOUS SILTY CLAYSTONE. The lighter intervals of CALCAREOUS SILTY CLAYSTONE have abundant <i>Planolites</i> burrows whereas darker NANNOFOSSIL CLAYSTONE intervals are characterized by <i>Chondrites</i> burrows.</p>
2	[Pattern]	2					5GY 4/1 To 5GY 5/1	
3	[Pattern]	3					5GY 6/1 To 5GY 5/1	
4	[Pattern]	4					10Y 4/2	
5	[Pattern]	5					5GY 5/2	
6	[Pattern]	6					5GY 6/1 To 5GY 5/2	
7	[Pattern]	7					10Y 4/2 To 5GY 5/2	
CC	[Pattern]	CC		M				



SITE 978 HOLE A CORE 27R

CORED 438.1 - 447.8 mbsf

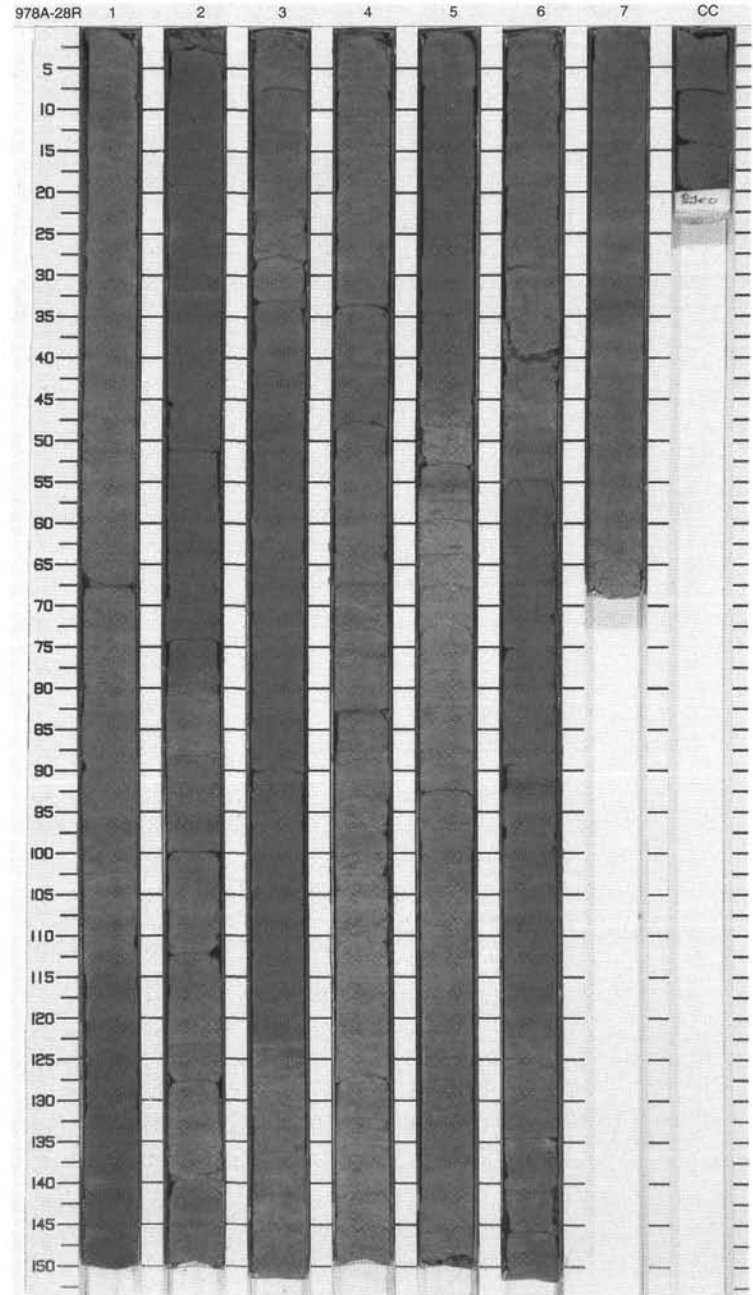
Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
1	[Dotted pattern]	1		}}			5GY 5/2	<p>NANNOFOSSIL CLAYSTONE and CALCAREOUS SILTY CLAYSTONE</p> <p>Major Lithologies: The main sediment types are dusky yellow green (5GY 5/2) NANNOFOSSIL CLAYSTONE and grayish olive (10Y 4/2) CALCAREOUS SILTY CLAYSTONE that alternate throughout the core.</p> <p>Minor Lithology: Layers of FORAMINIFER TO FORAMINIFER-RICH SAND are present at 55-57 and 125 cm in Section 5.</p> <p>General Description: The core is heavily to moderately burrowed; the intensity decreases down the core. <i>Chondrites</i> and <i>Planolites</i> are present. Most of the trace fossils are horizontal varieties, but a few are inclined or vertical. In general, NANNOFOSSIL CLAYSTONE is more intensely bioturbated than CALCAREOUS SILTY CLAYSTONE. Small, dark gray, preferentially lithified, fecal pellets are dispersed throughout the core and locally concentrated.</p>
2	[Dotted pattern]	2		}}			10Y 4/2	
3	[Dotted pattern]	3		}}			5GY 5/2	
4	[Dotted pattern]	4		}}			10Y 4/2	
5	[Dotted pattern]	4	late Pliocene	}}			5GY 5/2	
6	[Dotted pattern]	5		}}			10Y 4/2	
7	[Dotted pattern]	6		}}			5GY 5/2	
8	[Dotted pattern]	7		}}			10Y 4/2	
9	[Dotted pattern]	7		}}			10Y 4/2	
		CC				S		
						M		



SITE 978 HOLE A CORE 28R

CORED 447.8 - 457.5 mbsf

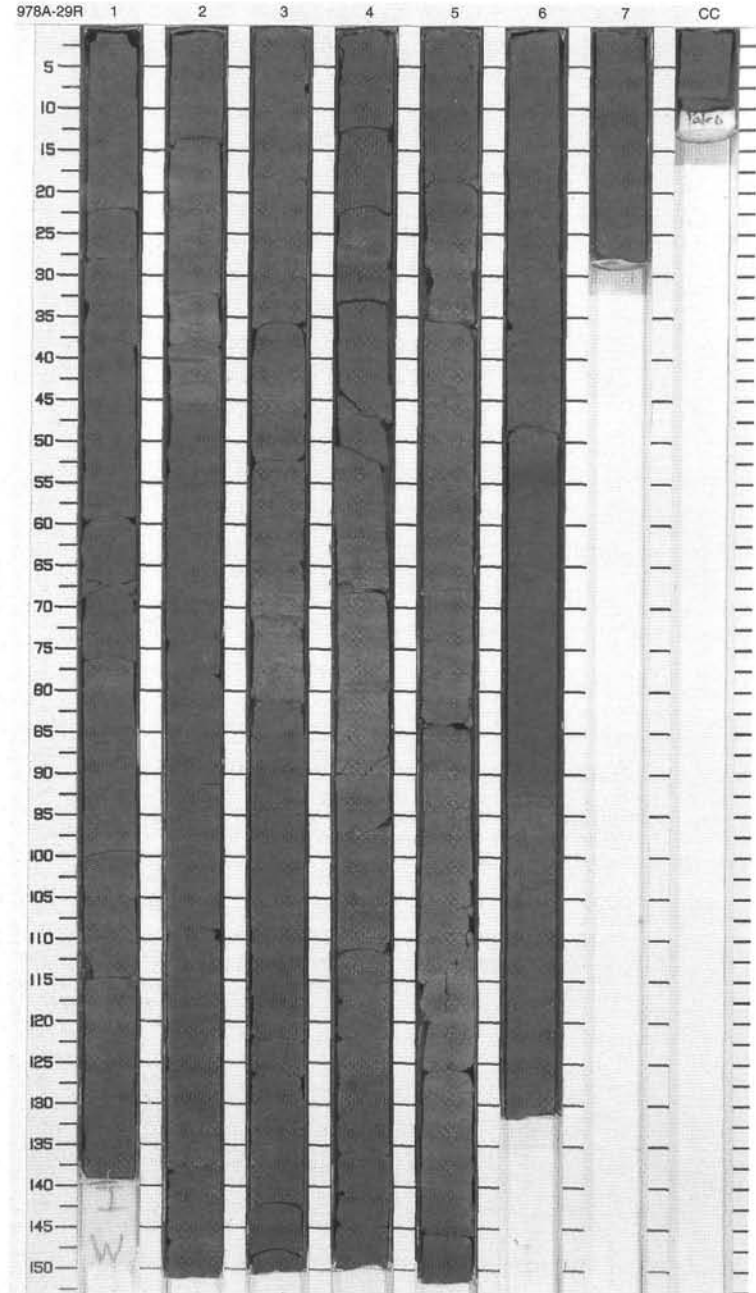
Meter	Graphic Lith.	Section Age	Structure	Disturb	Sample	Color	Description
1	[Pattern]	1	}}			5GY 6/1 To 5GY 5/1	<p>NANNOFOSSIL CLAYSTONE and CALCAREOUS SILTY CLAYSTONE</p> <p>Major Lithologies: The core consists of alternating beds of NANNOFOSSIL CLAYSTONE and CALCAREOUS SILTY CLAYSTONE. The intervals of NANNOFOSSIL CLAYSTONE are lighter in color [greenish gray (5GY 5/1 and 5GY 6/1)] than the intervals of CALCAREOUS SILTY CLAYSTONE [greenish gray (5GY 5/1) to dark greenish gray (5GY 4/1)]. <i>Planolites</i> is the dominant ichnofossil in the NANNOFOSSIL CLAYSTONE, whereas <i>Chondrites</i> is dominant in the CALCAREOUS SILTY CLAYSTONE.</p> <p>General Description: Foraminifers are dispersed and concentrated in pockets throughout the calcareous silty clay intervals (e.g., 39-41 cm in Section 3).</p>
2	[Pattern]	2	}}			5GY 4/1 To 5GY 5/1	
3	[Pattern]	3	}}			5GY 6/1 To 5GY 5/1	
4	[Pattern]	4	}}		S	5GY 4/1	
5	[Pattern]	4	}}			5GY 5/1	
6	[Pattern]	5	}}		S	5GY 4/1	
7	[Pattern]	5	}}			5GY 5/1 To 5GY 6/1	
8	[Pattern]	6	}}			5GY 4/1	
9	[Pattern]	7	}}			5GY 5/1	
CC					M		



SITE 978 HOLE A CORE 29R

CORED 457.5 - 467.1 mbsf

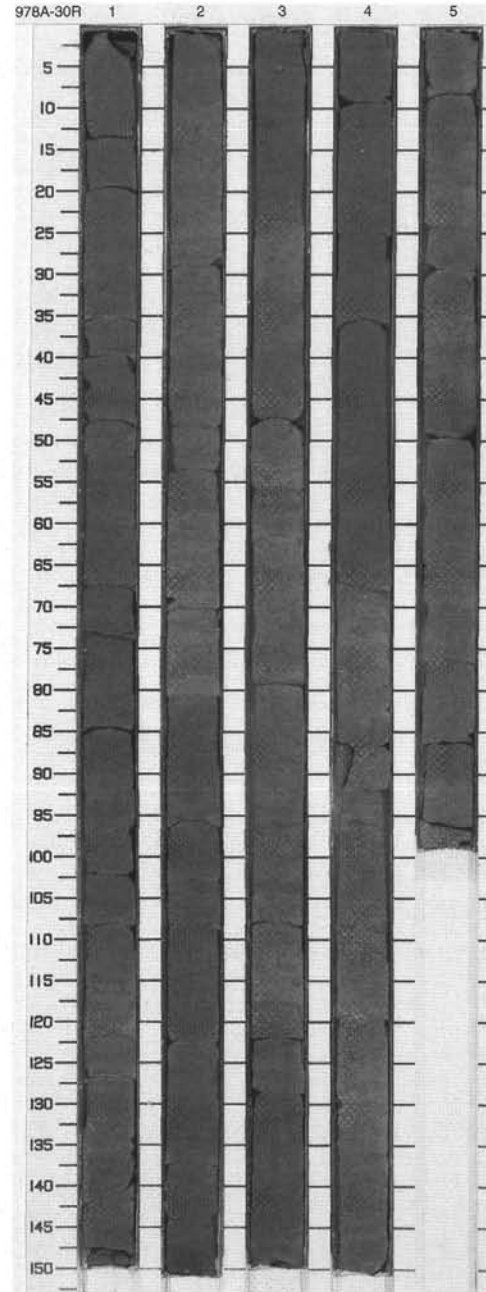
Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
1		1		}}		S	5GY 5/2	NANNOFOSSIL CLAYSTONE Major Lithology: The predominant lithology is NANNOFOSSIL CLAYSTONE. Alternating light [medium greenish gray (5GY 5/1) and light olive gray (5Y 5/2)], intermediate [dusky yellow green (5GY 5/2)], and dark [dark greenish gray (5GY 4/1), olive gray (5Y 4/1), and grayish olive (10Y 4/2)] colors correspond to variations in carbonate content between 40% (dark) and 50% (light).
2		2		}}		I	5Y 4/1	
3		3		}}		S	10Y 4/2 To 5GY 5/2	Minor Lithology: Intervals of fine SANDSTONE with sharp bases, parallel lamination, and gradational to sharp tops are present in Section 5 at 32-34 and 82-83 cm, and in Section 6 at 54-56 cm.
4		4		}}		S	10Y 4/2	General Description: <i>Planolites</i> and <i>Chondrites</i> , as well as large horizontal burrows, are common.
5		5		}}		S	5GY 5/2	
6		6		}}		S	10Y 4/2	
7		7		}}		S	5Y 5/2	
8		8		}}		S	5Y 5/2	
9		9		}}		M	5Y 5/2	



SITE 978 HOLE A CORE 30R

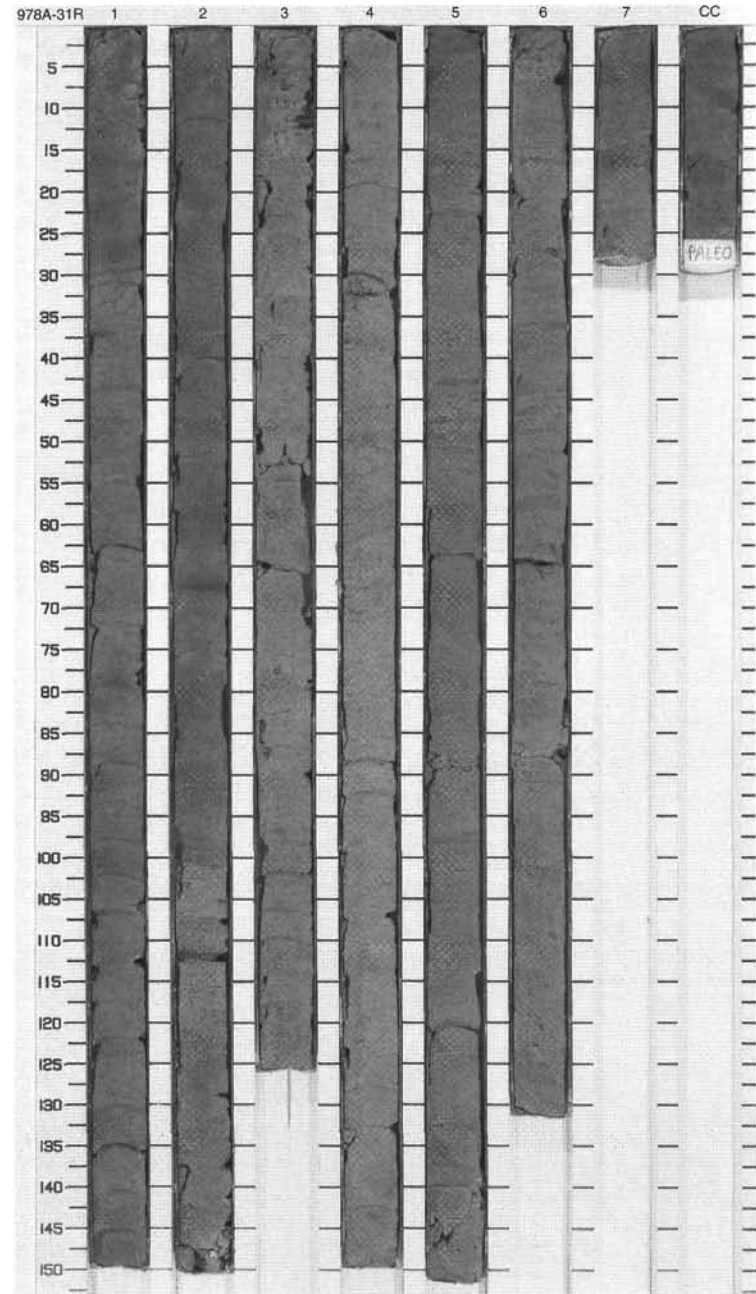
CORED 467.1 - 476.7 mbsf

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
1	[Cross-hatched pattern]	1	early Pliocene	}}	-	S	10Y 4/2	<p>NANNOFOSSIL CLAYSTONE</p> <p>Major Lithology: The main sediment type is NANNOFOSSIL CLAYSTONE in beds alternating between grayish olive (10Y 4/2) and dusky yellow green (5GY 5/2) in color.</p> <p>Minor Lithologies: SANDY SILT is present in Section 1 from 0-4 cm, and FORAMINIFER SANDY SILT in Section 4 from 67 to 68 cm.</p> <p>General Description: Horizontal burrows are the main type present. Foraminifers are present throughout the core. Shell fragments are present in a few places.</p>
2	[Cross-hatched pattern]	2		}}			5GY 5/2	
3	[Cross-hatched pattern]	3		}}			10Y 4/2	
4	[Cross-hatched pattern]	4		}}			5GY 5/2	
5	[Cross-hatched pattern]	5		}}			10Y 4/2	
6	[Cross-hatched pattern]	6	}}	M	5GY 5/1			
7	[Cross-hatched pattern]	7	}}		5GY 5/2			



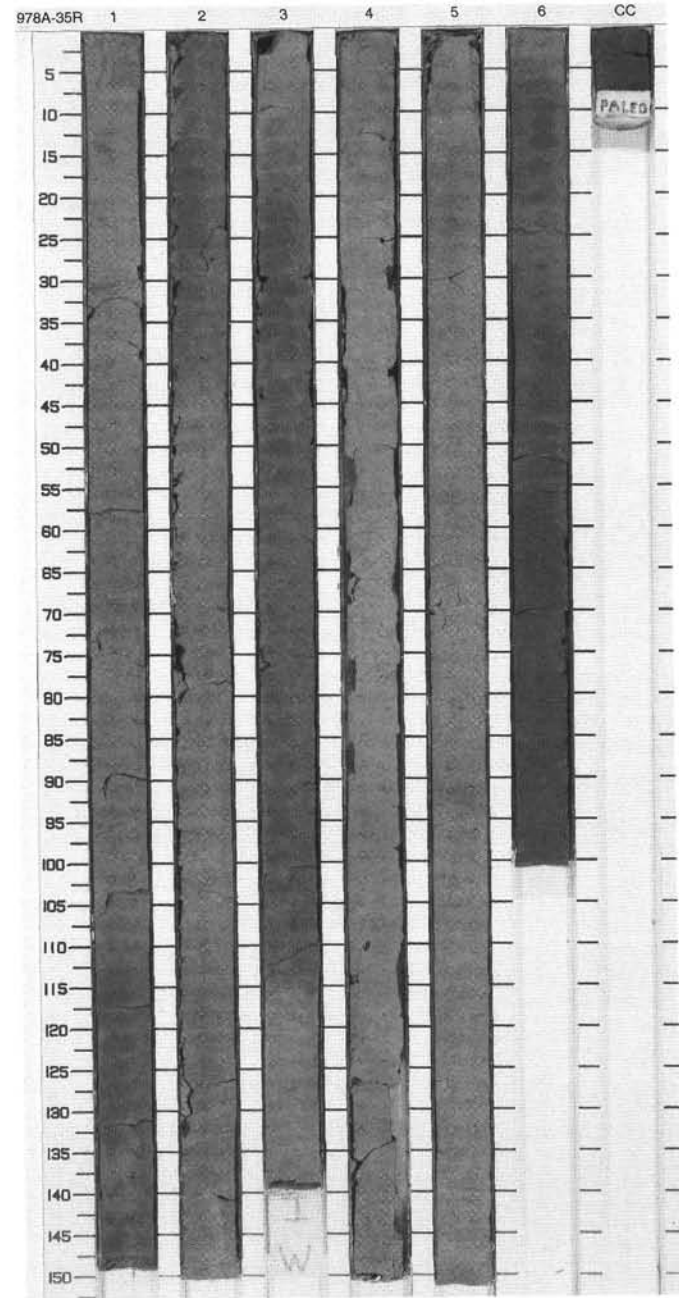
SITE 978 HOLE A CORE 31R CORED 476.7 - 486.3 mbsf

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
1	[Cross-hatched pattern]	1	Pliocene	~>>>	~>>>		5GY 4/1	<p>NANNOFOSSIL CLAYSTONE</p> <p>Major Lithology: The major lithology is olive gray (5Y 4/1; 5Y 5/1) to dark greenish gray (5GY 4/1; 5GY 5/1) NANNOFOSSIL CLAYSTONE with scattered foraminifers and moderate bioturbation. <i>Chondrites</i>, <i>Zoophycos</i>, and <i>Planolites</i> burrows are common with burrows locally replaced by pyrite.</p>
2	[Cross-hatched pattern]	2		~>>>		S		
3	[Cross-hatched pattern]	3		~>>>	~>>>	S		<p>Minor Lithology: Medium dark gray (N4) SANDY SILTY CLAYSTONE layers with foraminifers occur at 111–112.5 cm in Section 2, and 86–89 cm in Section 5.</p>
4	[Cross-hatched pattern]	4		~>>>	~>>>		5Y 5/1	
5	[Cross-hatched pattern]	5		~>>>		S		
6	[Cross-hatched pattern]	6		~>>>	~>>>		5Y 4/1 To 5Y 5/1	
7	[Cross-hatched pattern]	7		~>>>	~>>>	P		
8	[Cross-hatched pattern]	CC	~>>>	~>>>			5GY 5/1	
9	[Cross-hatched pattern]	CC	~>>>	~>>>		M		

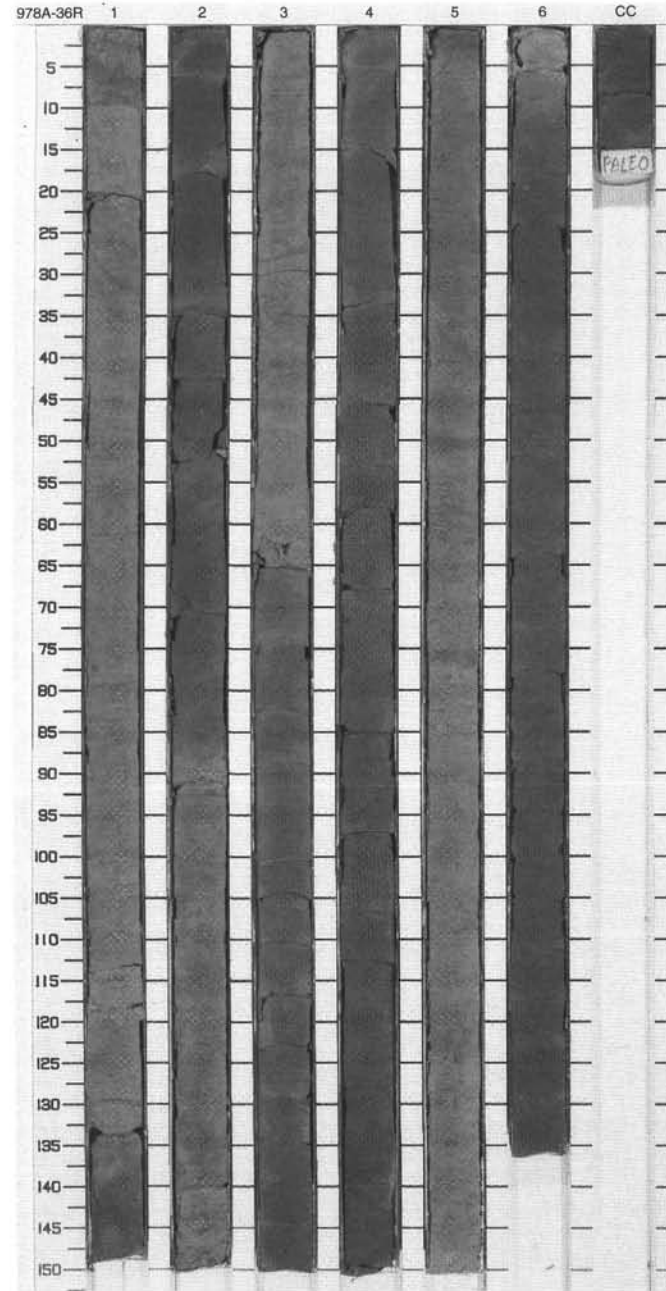


SITE 978 HOLE A CORE 35R CORED 515.2 - 524.9 mbsf

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
1	[Dotted pattern]	1		~ ~ ~ ~ ~	W		5Y 6/1 To 5Y 5/1	<p>NANNOFOSSIL CLAYSTONE and CALCAREOUS CLAYSTONE</p> <p>Major Lithologies: The major lithology is strongly bioturbated, light olive gray, olive gray to dark greenish gray NANNOFOSSIL CLAYSTONE and CALCAREOUS CLAYSTONE with alternations between lighter NANNOFOSSIL CLAYSTONE (5Y 5/1; 5Y 6/1; 5GY 5/1) and darker CALCAREOUS CLAYSTONE (5Y 4/1; 5GY 4/1).</p> <p>General Description: <i>Chondrites, Planolites, and Zoophycos</i> burrows occur throughout the core.</p>
2	[Dotted pattern]	2		~ ~ ~ ~ ~	S		5GY 5/1 To 5Y 4/1	
3	[Dotted pattern]	3		~ ~ ~ ~ ~			5Y 5/1	
4	[Dotted pattern]	3	early Pliocene	~ ~ ~ ~ ~			5GY 4/1	
5	[Dotted pattern]	4		~ ~ ~ ~ ~	I		5GY 5/1 To 5Y 5/1	
6	[Dotted pattern]	5		~ ~ ~ ~ ~			5Y 4/1 To 5GY 4/1	
7	[Dotted pattern]	6		~ ~ ~ ~ ~				
8	[Dotted pattern]	6		~ ~ ~ ~ ~				
		CC				S M		



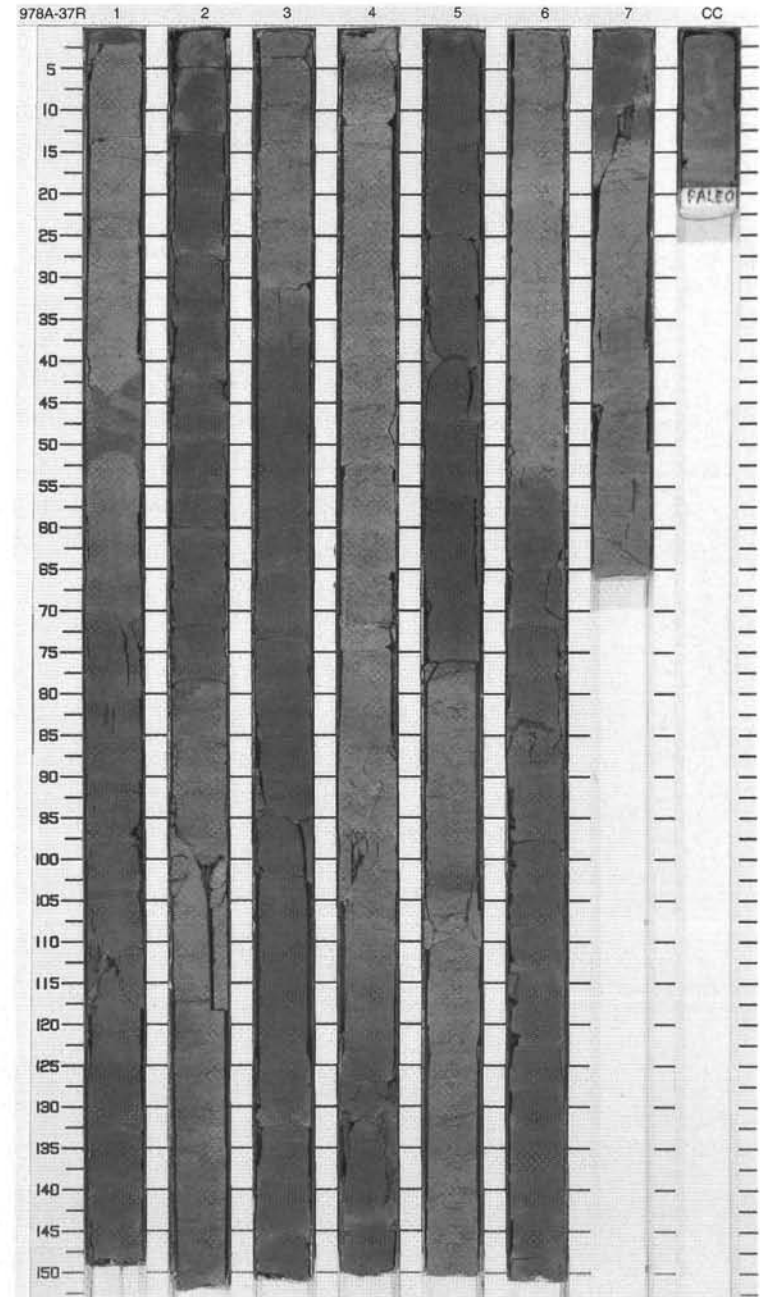
Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
1	[Pattern]	1		~ ~ ~ ~ ~	W		5GY 5/1 To 5Y 5/1	<p>NANNOFOSSIL CLAYSTONE</p> <p>Major Lithology: The major lithology is olive gray (5Y 4/1; 5Y 5/1) to dark greenish gray (5GY 4/1; 5GY 5/1) NANNOFOSSIL CLAYSTONE with alternations between light color (5Y 5/1; 5GY 5/1) and dark color (5Y 4/1; 5GY 4/1) beds.</p> <p>General Description: Chondrites and Planolites burrows occur throughout the core. Trace fossils are less prevalent in darker beds than in lighter beds.</p>
2	[Pattern]	2		~ ~ ~ ~	S		5Y 4/1	
3	[Pattern]	3		~ ~ ~	S		5Y 5/1 To 5GY 5/1	
4	[Pattern]	4	Pliocene	~ ~ ~	I		5Y 4/1	
5	[Pattern]	5		~ ~ ~ ~ ~			5Y 5/1 To 5GY 5/1	
6	[Pattern]	6		~ ~ ~	P		5Y 5/1	
7	[Pattern]			~ ~ ~				
8	[Pattern]	6		~ ~ ~			5Y 4/1	
9	[Pattern]	CC				M		



SITE 978 HOLE A CORE 37R

CORED 534.5 - 544.1 mbsf

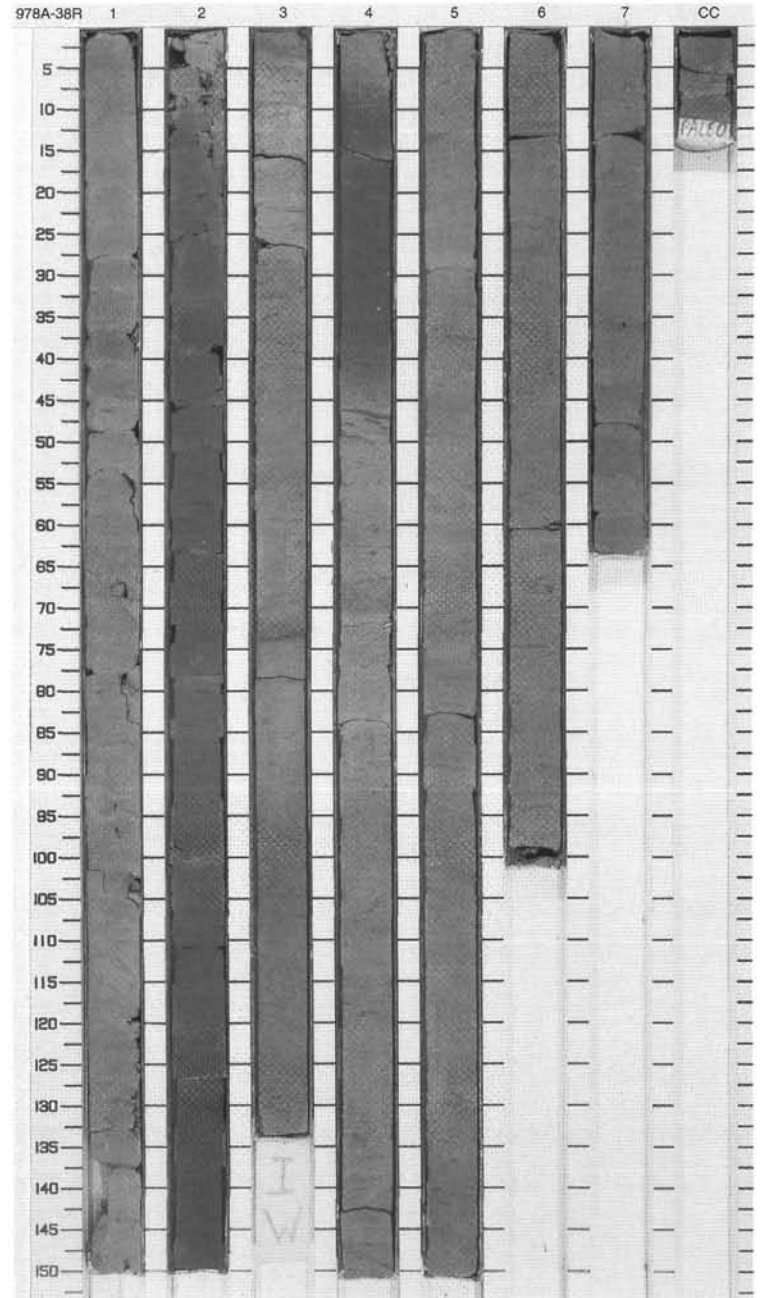
Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
1		1		~			5GY 5/2	<p>NANNOFOSSIL CLAYSTONE and CALCAREOUS CLAYSTONE</p> <p>Major Lithologies: The main sediment types are pale olive (10Y 6/2), light olive gray (5Y 5/2), and dusky yellow green (5GY 5/2) NANNOFOSSIL CLAYSTONE and CALCAREOUS CLAYSTONE. They are present in alternating dark and light intervals up to 1.5 m thick. Minor color banding is present in Section 3. Foraminifers are visible but rare throughout.</p> <p>General Description: The main trace fossils present are <i>Planolites</i> and <i>Chondrites</i>, with some rind burrows. At boundaries between light and dark intervals, the trace fossils immediately below the boundary are infilled by the overlying sediment.</p>
2		2		~		10Y 4/2		
3		3		~		5GY 5/2		
4		4	early Pliocene	~		5Y 5/2		
5		5		~	S	10Y 4/2 To 5GY 5/2		
6		6		~	S	5GY 5/2		
7		7		~	S	10Y 4/2		
8		8		~		10Y 6/2		
9		9		~		5GY 5/2		
		CC		~			10Y 6/2	
				~		M		



SITE 978 HOLE A CORE 38R

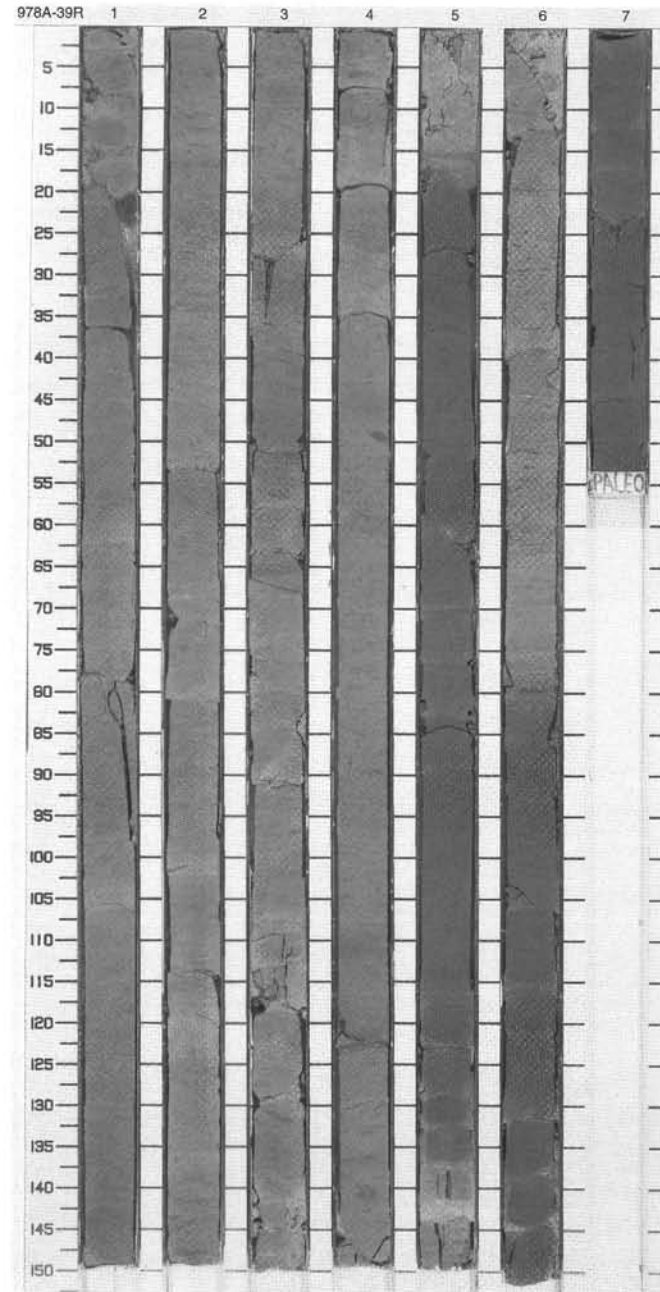
CORED 544.1 - 553.7 mbsf

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
1	[Pattern]	1		}}			5GY 5/2	<p>NANNOFOSSIL CLAYSTONE and CALCAREOUS CLAYSTONE</p> <p>Major Lithologies: The main sediments are alternations of darker (grayish olive, 10Y 4/2; light olive gray, 5Y 5/2) CALCAREOUS CLAYSTONE and lighter (dusky yellow green, 5GY 5/2; greenish gray, 5GY 6/1; light olive gray, 5Y 6/1; pale olive 10Y 6/2) NANNOFOSSIL CLAYSTONE. Burrowing is present throughout, but is more common in the lighter color variant. <i>Zoophycos</i> is the main burrowing type present; <i>Chondrites</i> and <i>Planolites</i> are less common.</p>
2	[Pattern]	2		}}		S	10Y 4/2	
3	[Pattern]	3		}}>>		S	5GY 5/2	
4	[Pattern]	4	early Pliocene	}}		I	10Y 4/2	
5	[Pattern]	5		}}		S	2.5Y 5/2	
6	[Pattern]	6		}}			5GY 6/1	
7	[Pattern]	7		}}			5Y 6/1	
8	[Pattern]	CC		}}		M	5GY 5/2	



SITE 978 HOLE A CORE 39R CORED 553.7 - 563.3 mbsf

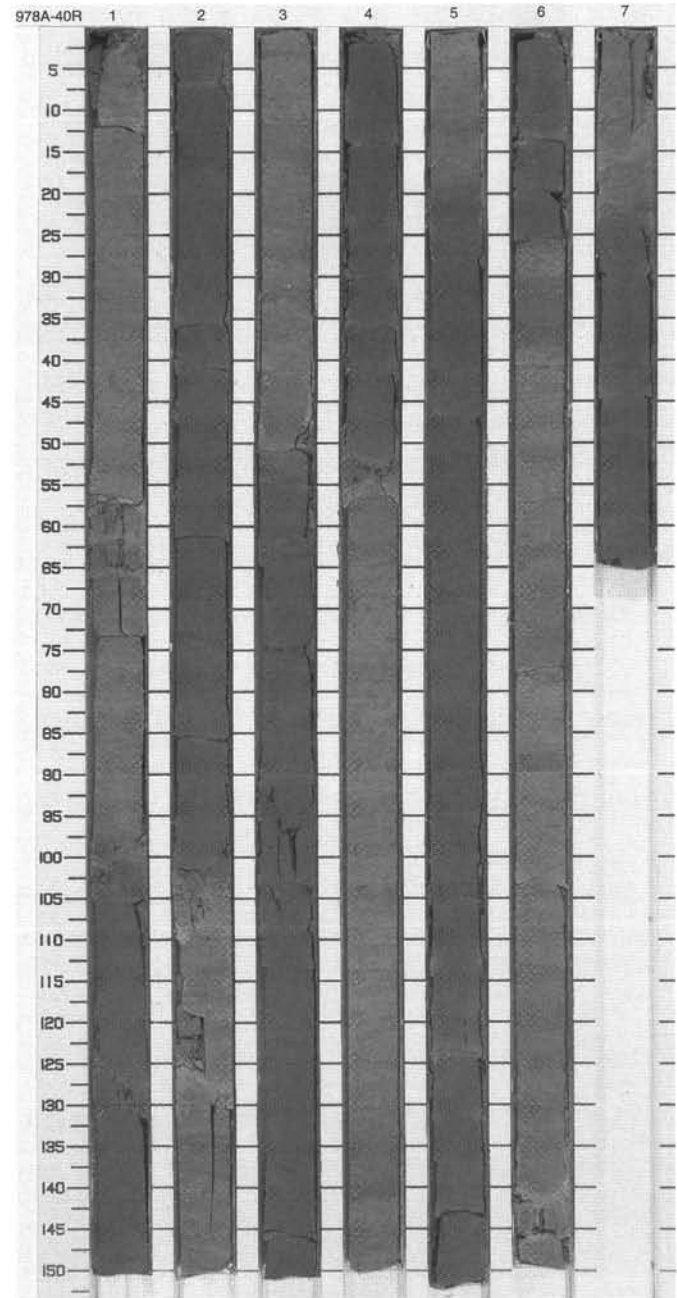
Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
1	[Pattern]	1		}}			5GY 5/2	<p>NANNOFOSSIL CLAYSTONE and CALCAREOUS CLAYSTONE</p> <p>Major Lithologies: The main sediment types are NANNOFOSSIL CLAYSTONE and CALCAREOUS CLAYSTONE. They are commonly dusky yellow green (5GY 5/2) to grayish olive (10Y 4/2) and less commonly light olive gray (5Y 5/2) and pale olive (10Y 6/2) in color.</p> <p>General Description: Sediment is moderately burrowed throughout with horizontal traces dominant, and a few large halo burrows. Foraminifers are dispersed throughout.</p>
2	[Pattern]	2		}}			5Y 5/2 To 10Y 6/2	
3	[Pattern]	3		}}		S	5Y 5/2	
4	[Pattern]	4	early Pliocene	}}			5GY 5/2	
5	[Pattern]	5		}}			10Y 4/2	
6	[Pattern]	6		}}			5Y 5/2	
7	[Pattern]	7		}}		M	10Y 4/2	
8	[Pattern]			}}			5GY 5/2	
9	[Pattern]			}}				



SITE 978 HOLE A CORE 40R

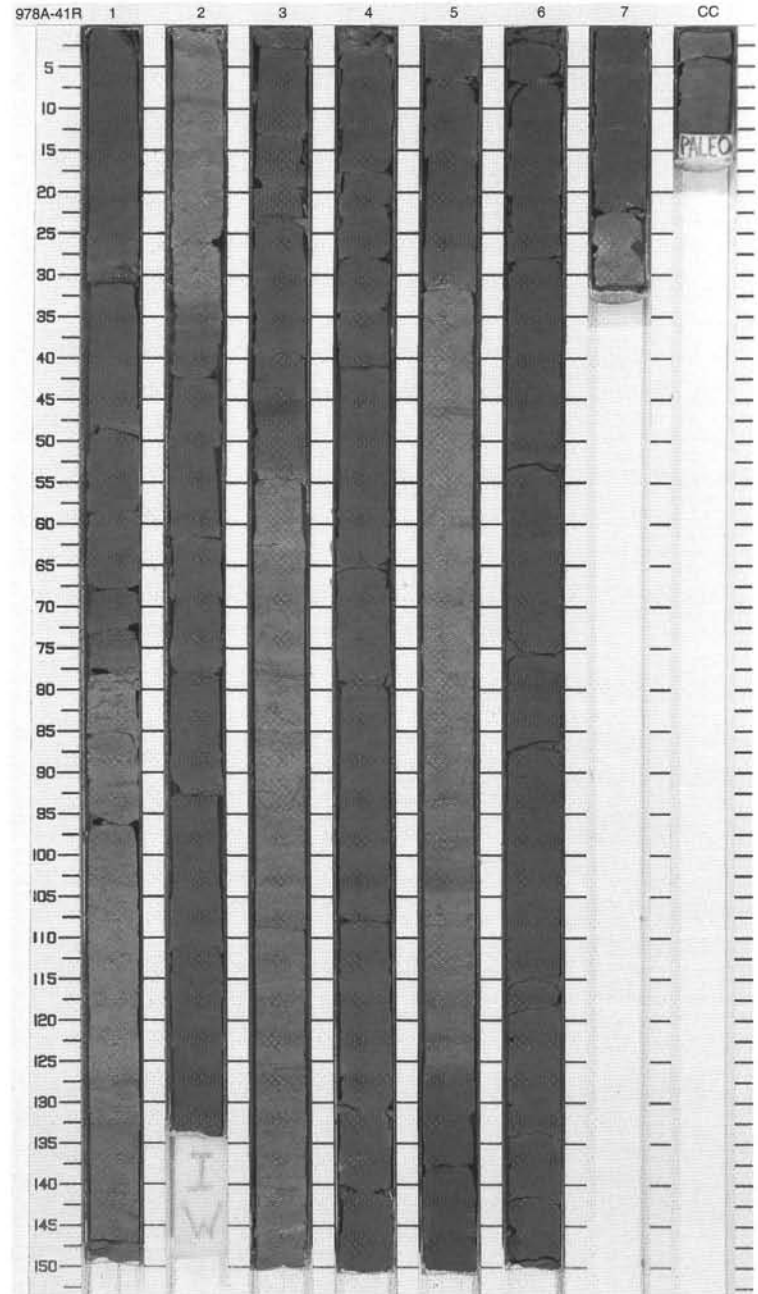
CORED 563.3 - 572.8 mbsf

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
1	[Cross-hatched pattern]	1	early Pliocene	~	-		5GY 6/1	<p>NANNOFOSSIL CLAYSTONE</p> <p>Major Lithology: The main lithologies are alternations of medium greenish gray (5GY 5/1) and dark greenish gray (5GY 4/1) NANNOFOSSIL CLAYSTONE. The former color is more intensely burrowed than the latter. <i>Zoophycos</i> burrows and dispersed foraminifers are present.</p>
2	[Dotted pattern]	2					5GY 4/1	
3	[Cross-hatched pattern]	3					S 5GY 6/1	
4	[Dotted pattern]	3					S 5GY 4/1	
5	[Cross-hatched pattern]	4					5GY 6/1	
6	[Dotted pattern]	5					5GY 4/1	
7	[Cross-hatched pattern]	6					5GY 6/1	
8	[Dotted pattern]	7	5GY 4/1					
9	[Cross-hatched pattern]	8				M	5GY 4/1	



SITE 978 HOLE A CORE 41R CORED 572.8 - 582.5 mbsf

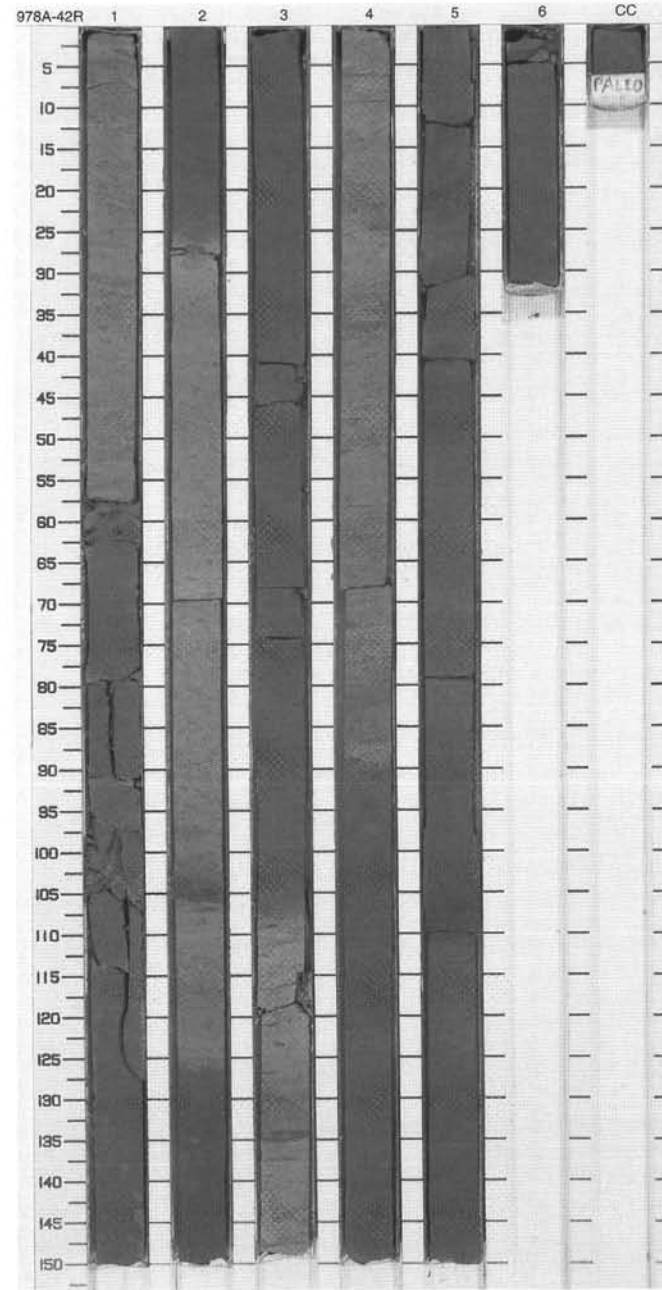
Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
1	[Cross-hatched pattern]	1	early Pliocene	~	-	S	10Y 4/2	<p>NANNOFOSSIL CLAYSTONE</p> <p>Major Lithology: The main sediment type is NANNOFOSSIL CLAYSTONE in alternations of greenish gray (5Y 6/1), dusky yellow green (5GY 5/2), and pale olive (10Y 6/2) colors. More calcareous NANNOFOSSIL CLAYSTONE is grayish olive (10Y 4/2) in color. Both darker and lighter types are pervasively burrowed, however, bioturbation is more intense in darker intervals. Horizontal burrows dominate, but <i>Chondrites</i> is also present. Foraminifers range from sparse to moderate in distribution.</p>
2	[Cross-hatched pattern]	2					10Y 6/2 To 5GY 6/1	
3	[Cross-hatched pattern]	3					10Y 4/2	
4	[Cross-hatched pattern]	4				I	5GY 5/2	
5	[Cross-hatched pattern]	5					10Y 4/2	
6	[Cross-hatched pattern]	6					10Y 6/2 To 5GY 5/2	
7	[Cross-hatched pattern]	7				S	10Y 4/2	
8	[Cross-hatched pattern]	8	10Y 4/2					
9	[Cross-hatched pattern]	9	M	10Y 6/2				
	[Cross-hatched pattern]	CC		10Y 6/2				



SITE 978 HOLE A CORE 42R

CORED 582.5 - 592.1 mbsf

Meter	Graphic Lith.	Section Age	Structure	Disturb	Sample	Color	Description
1	[Graphical lithology pattern]	1	[Wavy structure]	[Dashed line]	S	10Y 6/2	<p>NANNOFOSSIL CLAYSTONE</p> <p>Major Lithology: Alternations of light (pale olive, 10Y 6/2; dusky yellow green, 5GY 5/2) moderately to intensely bioturbated and dark (grayish olive, 10Y 4/2 and dark greenish gray, 5GY 4/1) slightly bioturbated NANNOFOSSIL CLAYSTONE with dispersed foraminifers makes up the core.</p> <p>Minor Lithology: NANNOFOSSIL-RICH CLAYSTONE is present at 106–111 cm in Section 5.</p> <p>General Description: Burrows include <i>Chondrites</i>, horizontal <i>Zoophycos</i> with obvious spreite and a tree-like branching trace fossil that is tentatively also identified as <i>Zoophycos</i>. Overall sediment is very stiff, but two intervals of softer nannofossil-rich clay are present in Section 5 from 40–41 cm and 106–111 cm.</p>
2		2				10Y 4/2	
3		3				5GY 5/2	
4		4				10Y 4/2	
5		5				10Y 6/2	
6		6				10Y 4/2 To 5GY 4/1	
7			S				
							M



SITE 978 HOLE A CORE 44R

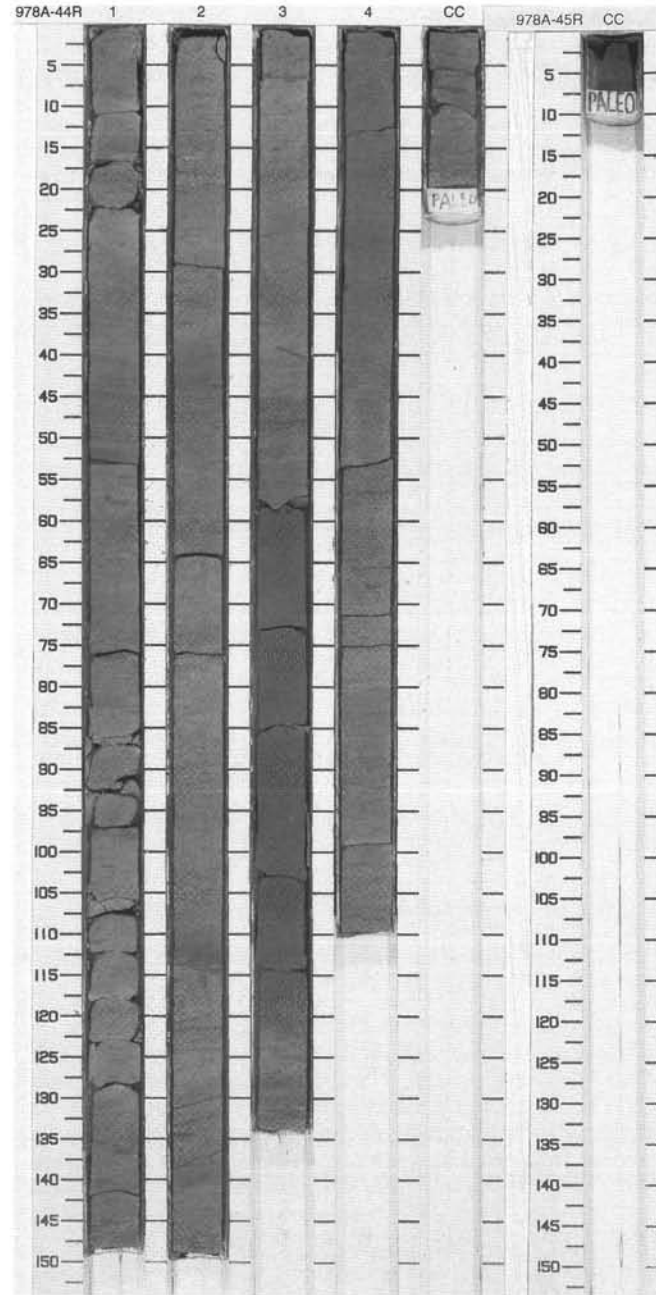
CORED 601.7 - 611.3 mbsf

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
1	[Pattern]	1	early Pliocene	}		S S S	5Y 6/1	<p>NANNOFOSSIL CHALK</p> <p>Major Lithology: The major lithology is greenish gray (5GY 6/1), dark greenish gray (5GY 4/1; 5GY 5/1) to olive gray (5Y 5/1) NANNOFOSSIL CHALK, locally laminated.</p> <p>Minor Lithologies: A thinly laminated, light olive gray (5Y 6/1) CALCAREOUS CHALK layer with foraminifer-rich, medium light gray (N6) CALCAREOUS SANDY SILTY CLAYSTONE in the basal part occurring at 28-50 cm in Section 1.</p> <p>General Description: <i>Zoophycos</i>, <i>Chondrites</i>, and <i>Planolites</i> burrows occur throughout the core. Typical features of <i>Zoophycos</i> are present at 115-118 cm in Section 2 and at 28-31 cm in Section 3.</p>
2	[Pattern]	2					5GY 5/1 To 5GY 6/1	
3	[Pattern]	3					5Y 5/1	
4	[Pattern]	4					5GY 4/1	
5	[Pattern]	CC					5Y 5/1	
								S M

SITE 978 HOLE A CORE 45R

CORED 611.3 - 620.9 mbsf

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
		CC						<p>NANNOFOSSIL SILTY CLAYSTONE and CALCAREOUS CHALK</p> <p>Major Lithologies: The major lithologies are dark greenish gray (5GY 4/1) NANNOFOSSIL SILTY CLAYSTONE with <i>Chondrites</i> burrows in the upper part and greenish gray (5GY 6/1) CALCAREOUS CHALK in the lower part.</p> <p>General Description: Wispy concentration of grayish black (N2) pyrite(?) marks the sedimentary contact between the two lithologies. Of the 9 cm of recovery, 3 cm was given to paleo.</p>

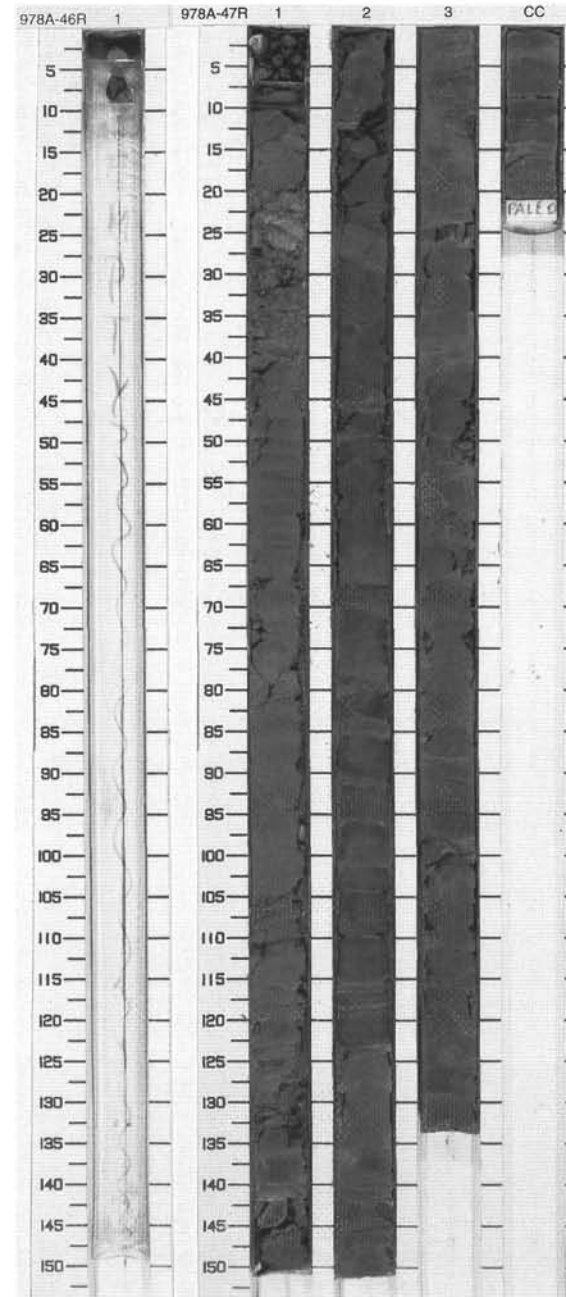


SITE 978 HOLE A CORE 46R CORED 620.9 - 630.6 mbsf

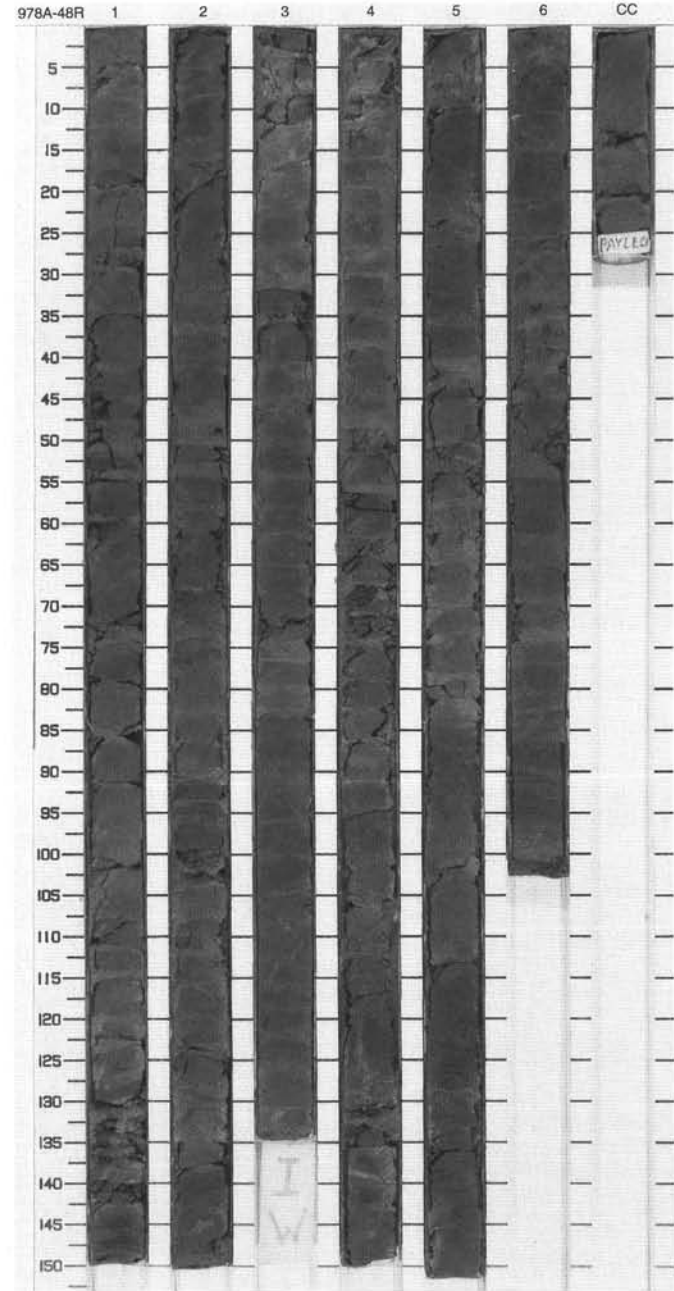
Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
GRAVEL								
Major Lithology: Three rounded to subangular pebbles of volcanic rock.								

SITE 978 HOLE A CORE 47R CORED 630.6 - 640.3 mbsf

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
1		1	late Miocene		W	S	5Y 4/1 To 5GY 4/1	CALCAREOUS SILTSTONE, CALCAREOUS SILTY CLAYSTONE, SANDY SILTSTONE and CLAYEY SILTSTONE TO SILTY CLAYSTONE Major Lithologies: The core consists of interbedded to interlaminated olive gray (5Y 4/1) CALCAREOUS SILTSTONE to CALCAREOUS SILTY CLAYSTONE, CLAYEY SILTSTONE TO SILTY CLAYSTONE, and dark greenish gray (5GY 4/1) SANDY SILTYSTONE. Sandy silty layers exhibit cross lamination, parallel lamination, normal grading and inverse grading. One sequence in Section 1 begins at 30 cm with a massive basal sandstone, that passes up into cross-laminated sandy silty claystone, then into parallel-laminated sandy silty claystone, and then into massive clayey siltstone at 124. Minor Lithology: GRAVEL at top of core consists of pebbles of igneous and sedimentary rocks. General Description: Sedimentary units are locally brecciated at 23-44 cm in Section 1 and at 50-95 cm in Section 3.
2		2		S				
3		3		S				
4		CC		S				
M								

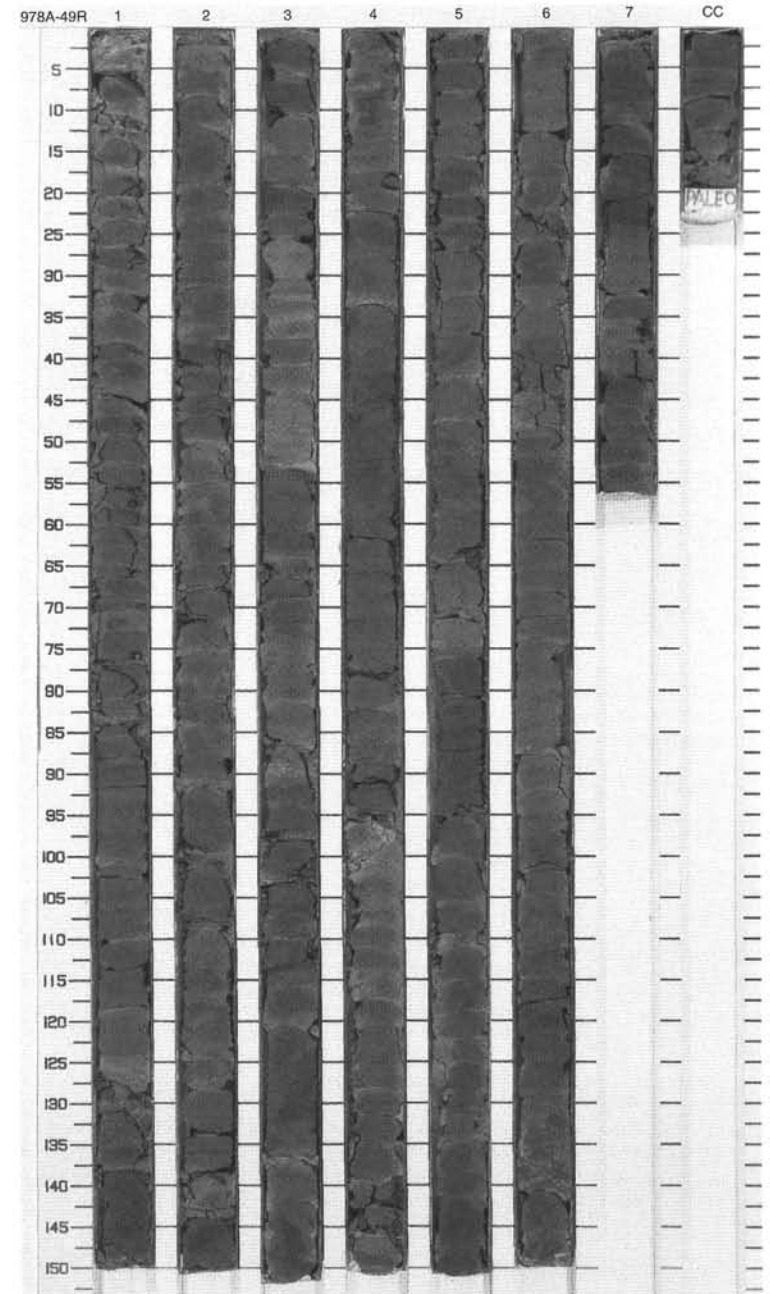


Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
0-1	[Dotted pattern]	1		△		S	5Y 3/2 To 5Y 4/1	<p>CALCAREOUS SILTY SANDSTONE and NANNOFOSSIL-RICH CLAYSTONE</p> <p>Major Lithologies: The major interbedded lithologies are olive gray (5Y 4/1) CALCAREOUS SILTY SANDSTONE with thin parallel- and cross-lamination, olive gray (5Y 3/2) NANNOFOSSIL-RICH CLAYSTONE, and dark greenish gray (5GY 4/1) SILTY CLAYSTONE with rare <i>Planolites</i>(?) burrows. Micaceous and bioclastic CALCAREOUS SILTY SANDSTONE layers exhibit inversely graded bases, that pass up into normally graded intervals.</p>
1-2	[Dotted pattern]	2		△		S		
2-3	[Dotted pattern]	3	late Miocene	△		S		<p>Minor Lithologies: A dark greenish gray (5GY 4/1), inversely graded CALCAREOUS SILTY CLAYSTONE to SANDY SILTSTONE layer with a sharp base is present at 78-84 cm in Section 5. A thin parallel laminated, light olive gray (5Y 6/1) to dark greenish gray (5GY 4/1) CLAYEY SILTSTONE layer occur at 140-142 cm in Section 4. Olive gray (5Y 3/2) to dark greenish gray (5GY 4/1) CLAYSTONE with thin parallel lamination is also present.</p>
3-4	[Dotted pattern]	4			△		S	
4-5	[Dotted pattern]	5		△		S S		
5-6	[Dotted pattern]	6		△		S		
6-7	[Dotted pattern]	7		△		S S		
7-8	[Dotted pattern]	8		△		S		
8-9	[Dotted pattern]	CC		△		M		



SITE 978 HOLE A CORE 49R CORED 649.9 - 659.6 mbsf

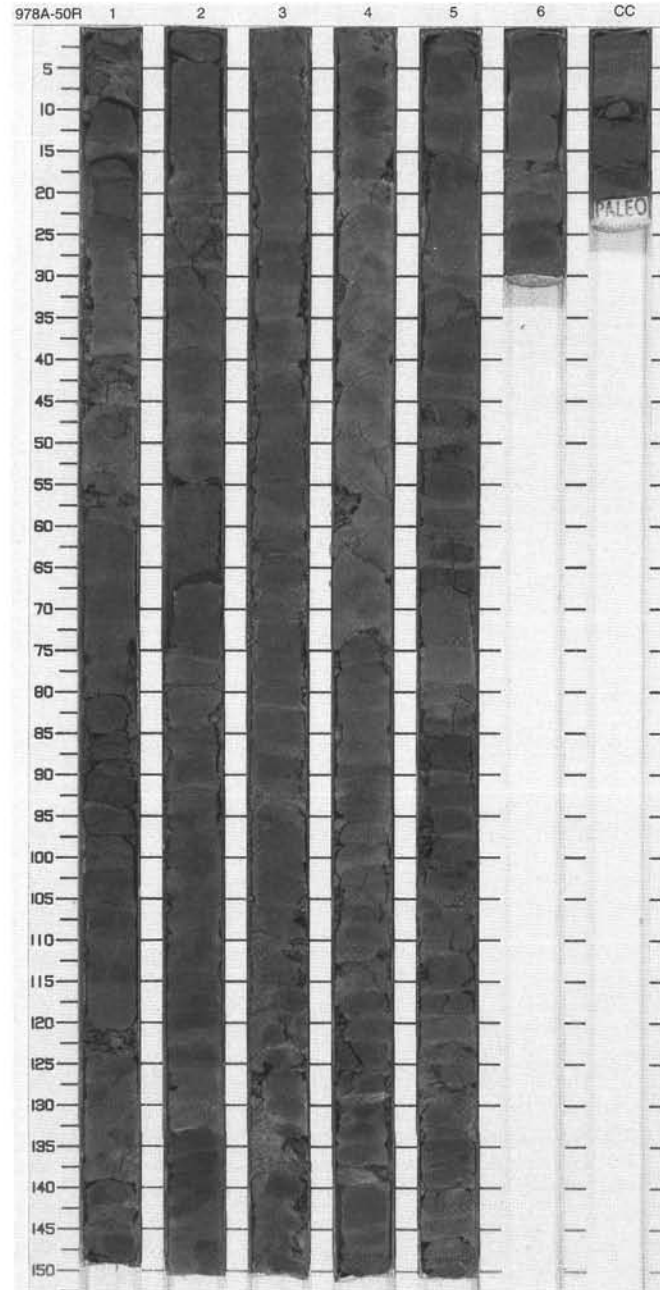
Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
1	[Pattern]	1				S	10Y 4/2 To 5Y 4/2	<p>CLAYSTONE, SILTY CLAYSTONE, NANNOFOSSIL-RICH CLAYSTONE and SILTY CLAYSTONE</p> <p>Major Lithologies: The main sediments present in this core are CLAYSTONE, NANNOFOSSIL-RICH CLAYSTONE, and SILTY CLAYSTONE ranging in color from grayish olive (10Y 4/2) to moderate olive brown (5Y 4/4) to dusky yellow green (5GY 5/2) to olive gray (5Y 3/2) to dark greenish gray (5GY 4/1).</p> <p>Minor Lithologies: SILT is present in thin layers that are laminated to cross laminated in their upper parts, and have sharp bases and gradational tops where undeformed by drilling. Other minor lithologies include CALCAREOUS CLAYEY SILTY SANDSTONE and CLAYEY SILT. In situ BRECCIA comprised of boudinaged laminae and thin beds of the main sediment types is present in three discrete intervals. Clastic dikes are common in and adjacent to the brecciated zones.</p>
2	[Pattern]	2				SS	10Y 4/2 To 5Y 4/4	
3	[Pattern]	3				S	10Y 4/2 To 5GY 5/2	
4	[Pattern]	4				S	5Y 4/4 To 5GY 4/4	
5	[Pattern]	5				S	10Y 4/2 To 5GY 4/4	
6	[Pattern]	6				S	5Y 4/4	
7	[Pattern]	7				S	5Y 3/2 To 5GY 4/1	
8	[Pattern]	8				S		
9	[Pattern]	9				S		
CC	[Pattern]	CC				M		



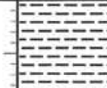

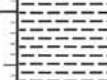


SITE 978 HOLE A CORE 50R

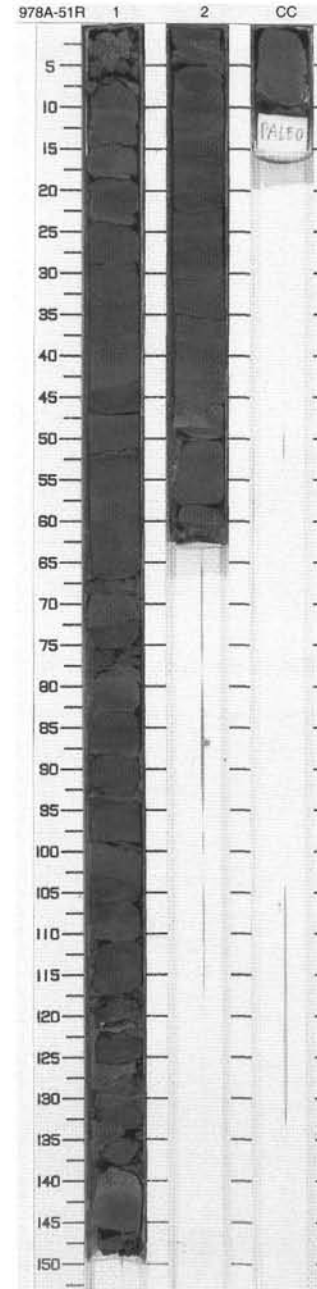
CORED 659.6 - 669.2 mbsf

Meter	Graphic Lith.	Section Age	Structure	Disturb	Sample	Color	Description
1		1			S	5GY 5/2 To 10Y 4/2	CLAYEY SILTY SANDSTONE, SILTY CLAYSTONE, CALCAREOUS SILTY CLAYSTONE and CLAYEY SANDSTONE Major Lithologies: The main sediment types present in this core are CLAYEY SILTY SANDSTONE, SILTY CLAYSTONE, and CALCAREOUS SILTY CLAYSTONE. The main colors are grayish olive (10Y 4/2) and dusky yellow green (5GY 5/2).
2		2			S	5GY 4/1 To 5Y 4/1	Minor Lithologies: Rare CLAYEY SILTY SANDSTONE is present at the base of fining upwards cycles. In situ BRECCIA comprised of boudined laminae and thin beds of the main interstratified sediment types is present at the top of Section 2. SILTSTONE is present in thin layers that are laminated to cross laminated, have sharp bases and sharp to gradational tops.
3		3			S	10Y 4/2 To 5GY 5/2	General Description: Clastic dikes are common throughout the core.
4		4			S		
5		5			S		
6		6			S		
7		7			S		
8		8			MS		

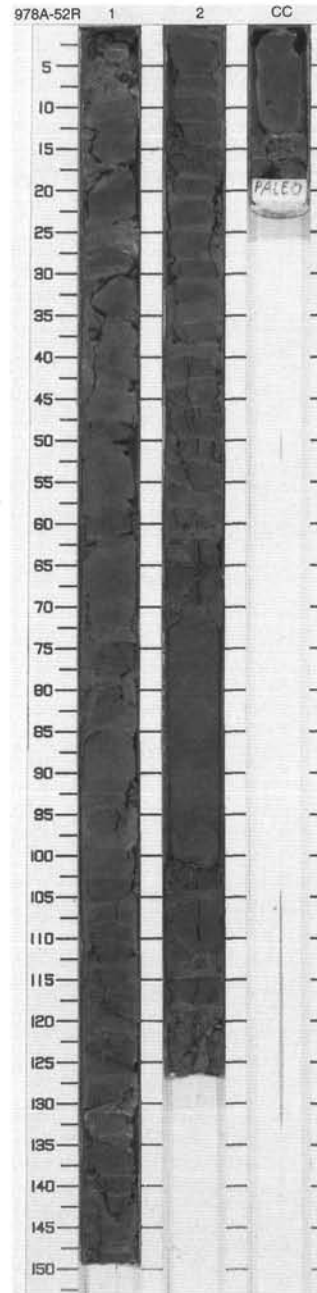


SITE 978 HOLE A CORE 51R CORED 669.2 - 678.0 mbsf

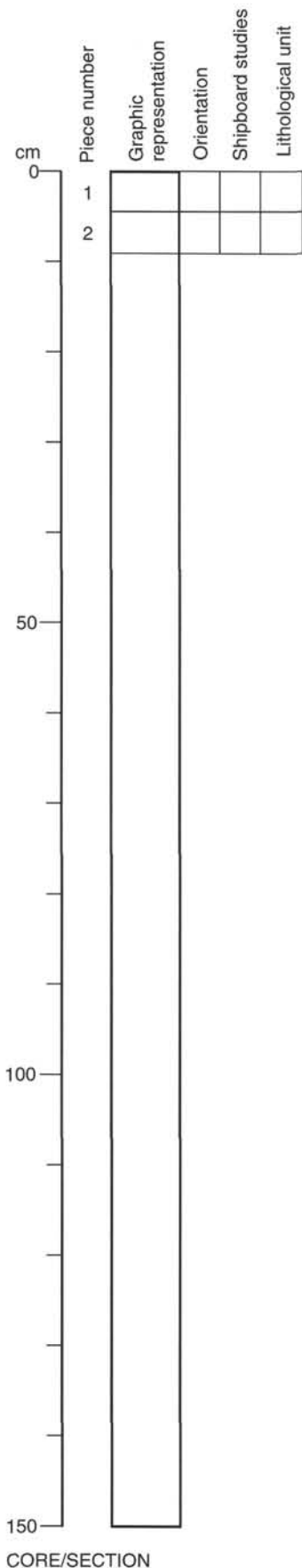
Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
1		1	late Miocene				5GY 4/1 To 10Y 4/2	<p>SILTY CLAYSTONE and SILTY SANDSTONE</p> <p>Major Lithologies: The main lithologies are structureless to burrowed dark greenish gray (5GY 4/1) SILTY CLAYSTONE with common mm-scale sand laminae, locally interbedded with SILTY SANDSTONE.</p>
2		2				S		
		CC				M		<p>Minor Lithology: The minor lithology in this core consists of CALCAREOUS SANDSTONE that is grayish olive (10Y 4/2) in color.</p> <p>General Description: A few burrows are present. Cyclic silty sand and silty clay intercalations show slight upward fining and have sharp tops and bases. The upper parts of some sand units are laminated to ripple cross laminated.</p>



Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
1	[Graphic Lithology: Dotted pattern for sandstone, horizontal lines for siltstone]	1	late Miocene	[Structure: Parallel and cross-lamination symbols]	-	S	5GY 4/1 To 5Y 3/2	<p>SANDSTONE and SILTSTONE</p> <p>Major Lithologies: The major lithologies are olive gray (5Y 4/1), moderate olive brown (5Y 4/4), and dark greenish gray (5GY 4/1) SANDSTONE with parallel- and cross-lamination, and moderate olive brown (5Y 4/4) SILTSTONE with normal and inverse grading.</p> <p>Minor Lithology: Several parallel-laminated, SILTY CLAYSTONE layers are present: one moderate olive brown (5Y 4/4) layer at 97–100 cm in Section 2; and one olive gray (5Y 3/2) layer at 74–84.5 cm in Section 1.</p> <p>General Description: A <i>Planolites</i>-like burrow is present in a cross-laminated SANDSTONE layer at 137–138 cm in Section 1.</p>
2		2				S	5Y 4/4	
		CC				M	5GY 4/1	



161-978A-46R-1



Piece 1

ROCK TYPE: ANDESITIC BASALT(?)

CONTACTS: None.

PHENOCRYSTS:

- Plagioclase(?)
- Olivine - 2%; <1 mm
- Pyroxene - 30%; <1 mm
- Iron-oxide - 1%; <1 mm

GROUNDMASS: Fine-grained, hypohyaline.

VESICLES: None.

COLOR: Brownish ocher.

SIZE: 30x24x22 mm.

SHAPE: Rounded to angular.1111



Pieces 2A-2C

ROCK TYPE: ANDESITIC BASALT(?) TO ANDESITE(?)

CONTACTS: None.

PHENOCRYSTS:

- Plagioclase - 20%; <2; inequigranular
- Pyroxene - 40%; <1
- Biotite - <3%; <1

GROUNDMASS: Fine-grained, hypocrySTALLINE.

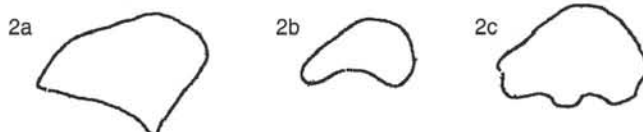
VESICLES: 10%; <5 mm; elongated; irregular; partly filled with smectite and sediments.

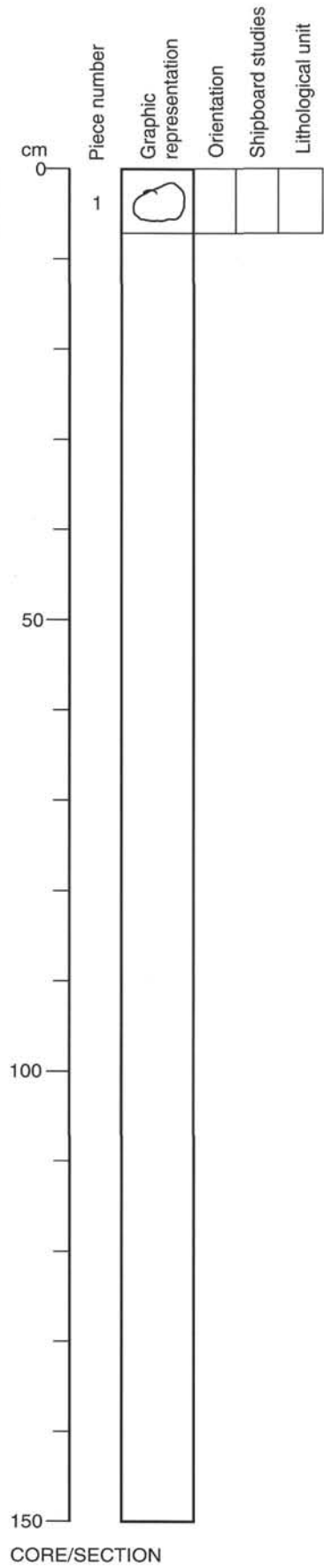
COLOR: Dark gray.

SIZE: 52x39x28 mm, 27x20x18 mm, 33x22x16 mm.

SHAPE: Subrounded to subangular.

ADDITIONAL COMMENTS: Clast coated with sediments, smectite, zeolite.





Piece 1

ROCK TYPE: TRACHYTE(?)
CONTACTS: None.
PHENOCRYSTS: Aphanitic.
 Pyroxene - 10%; <1 mm
 Olivine - 5%; <1 mm
GROUNDMASS: Fine-grained; hypocrySTALLINE.
VESICLES: None.
COLOR: Olive gray.
SIZE: 17x12x10 mm.
SHAPE: Subangular to subrounded.
ALTERATION: Smectite, zeolite.

CORE/SECTION