U.S. DEPARTMENT OF THE INTERIOR

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LITHOLOGIC DESCRIPTIONS OF LATE QUATERNARY CORE BORINGS FROM THE CORPUS CHRISTI AREA, NUECES COUNTY, TEXAS

by

Gerald L. Shideler

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INTRODUCTION

This report contains the lithologic descriptions of seven continuous core borings obtained from coastal zone environments near the City of Corpus Christi in Nueces County, Texas. The core borings were taken to provide detailed lithostratigraphic information about the local unconsolidated to poorly consolidated deposits that compose the late Pleistocene and Holocene stratigraphic section of the area encompassing southern Mustang Island, northern Laguna Madre, southern Corpus Christi Bay, and the adjacent mainland. The seven core borings (designated A, B, C, D, E, EE, and F) were obtained at five subaerial and two subaqueous sites (Fig. 1). Penetrated depths of individual borings range from a minimum of 10.75 m (C) to a maximum of 62.0 m (D); five of the borings exceed 60 m in depth. The descriptive lithologic data presented in this report have resulted from detailed laboratory analyses of the individual core borings. An integrated stratigraphic analysis of the core data is presently in progress.

METHODS

In the field, the seven core borings were drilled by a truck-mounted Failing 1500 drilling rig; for the subaqueous sites (C, D), a spud barge was used as an operational platform for the drilling-rig truck and support vehicles. Continuous cores were obtained with a rotary-type modified Denison core barrel fitted with an acrylic core liner; the core barrel produced core segments 9.5 cm in diameter, having a maximum length of 1.5 m. Average core recovery for the seven borings was 74 percent, resulting in a total acquisition of 247 m of core. After the completion of coring operations at each site, the borehole was conditioned, and caliper, resistivity, gamma-ray, and density logs were obtained. The accurate field locations of all boring sites were determined by standard surveying techniques.

In the laboratory, the cores were longitudinally split, then stored in capped watertight D-tubing to retain their moisture content. An X-radiograph (1:1) was made of each core to delineate sedimentary structures and bioturbation effects. The cores and X-radiographs were then described megascopically; sediment color was described in a wet state using the standard Geological Society of America rock-color chart based on the Munsell system (Goddard and others, 1948).

After description, the cores were subsampled for textural analyses; textural samples were obtained from each core segment and at each observable change in lithology. The textural samples were oxidized with hydrogen peroxide to remove organic matter, desalinized, and dispersed in a standard sodium hexametaphosphate solution (5 g/l). After dispersion, the samples were fractionated by wet sieving into gravel (>2 mm), sand (2 mm-63 μm), and mud (<63 μm) fractions. The gravel was mainly bioclastic material, primarily molluscan shell fragments; however, terrigenous quartz granules and pebbles also were present in a few of the samples. As the gravel fraction was a very minor component, it was excluded from further size analysis. Grain-size distributions of the sand fractions were determined by means of a Rapid Sediment Analyzer settling tube, using techniques described by Schlee (1966). Grain-size distributions of the mud fractions were determined electronically by Coulter Counter (Model TA), using techniques described by Shideler (1976). Composite size-frequency distributions of the

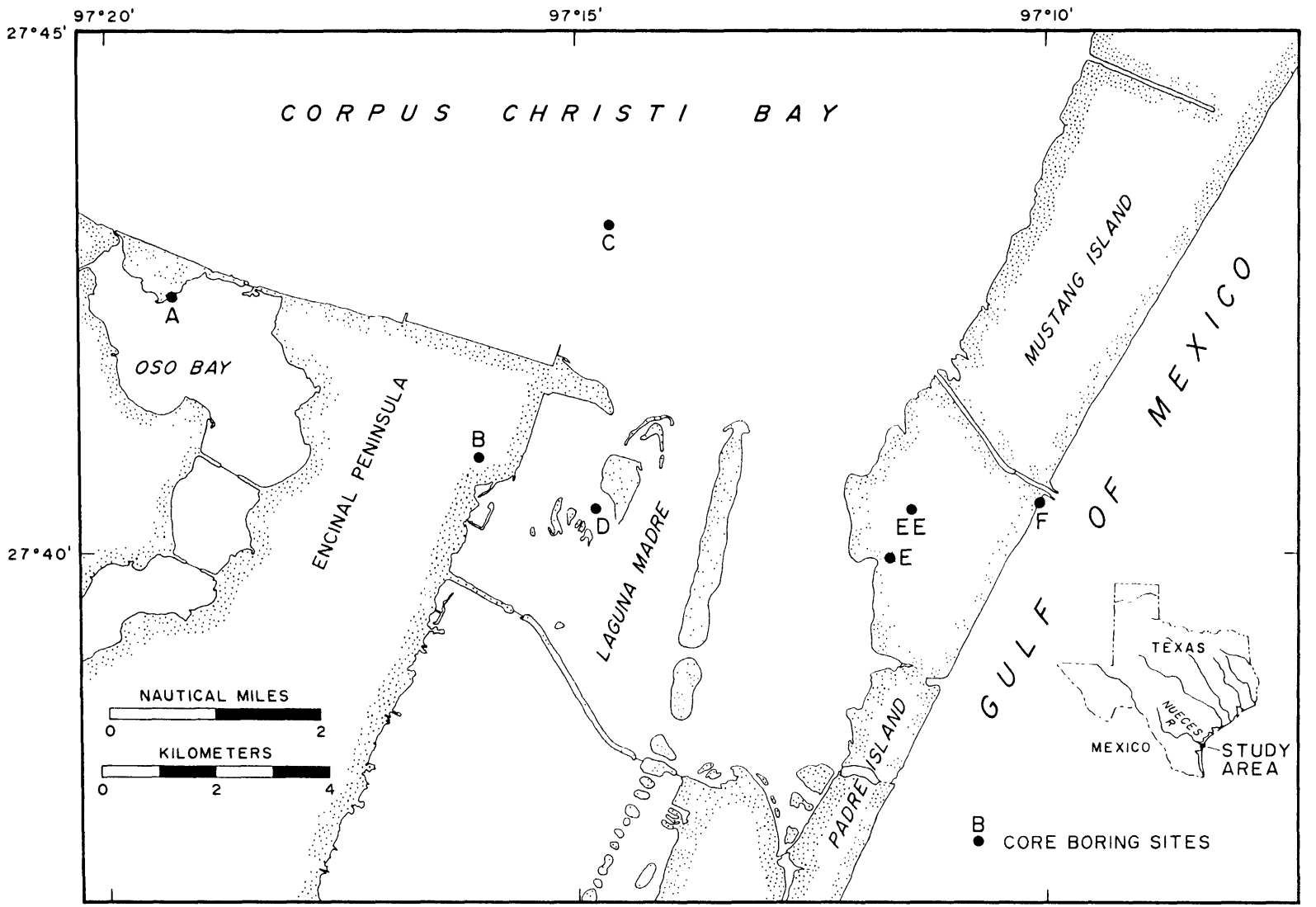

Figure 1. Location map of study area and drilling sites.

total non-gravel fractions of the sediment were determined at a 0.5 ϕ interval ($\phi = -\log_2 D$, where D = diameter in mm), which provided the basis for the computer derivation of statistical grain-size parameters.

In the core-boring descriptions that follow, the relative proportions of sand, silt, and clay components were used as the basis for differentiating the penetrated sections into discrete lithologic units according to Shepard's (1954) sediment-classification system; further differentiation of the sand units was based on their modal diameters. All size terminology is in accordance with the Udden-Wentworth grade scale. The lithology of non-recovery zones was inferred from adjacent core segments, used in conjunction with the borehole logs. Within multicolored lithologic units, sediment colors are recorded in the order of their relative quantitative importance. The lithologic units composing each cored section are numbered sequentially from oldest to youngest. The Pleistocene/Holocene boundary in each boring was established by a combination of factors which include lithologic differences, supplemental high-resolution seismic profiles, and radiocarbon age dates.

CORE-BORING DESCRIPTIONS

Core A

[The boring site is located at Mean Low Water on the Ward Island wind-tidal flat, latitude 27°42'29"N and longitude 97°19'18"W in Oso Creek NE Quadrangle, Nueces County, Texas]

Holocene Units	Thickness (m)
38. Sand, fine; 10YR6/2, 10YR7/4, 5Y6/1, 5Y8/1; containing mud-filled burrows and a shell layer; horizontal laminations; sharp lower contact	0.25
37. Sand, silty; 5Y8/1, 5Y6/1; containing numerous burrows in the top, scattered shell fragments, and carbonaceous matter; gradational lower contact	1.75
36. Silt, clayey; mottled 5YR5/6, 5GY8/1; containing carbonaceous matter; gradational lower contact	2.25
35. Clay, silty; mottled 10YR7/4, 5GY8/1, 5YR6/4, 5Y6/1; containing carbonaceous matter; sharp lower contact	2.75
Pleistocene Units	
34. Sand-silt-clay; 10YR5/4, 10YR6/2, 5YR5/6, 5Y6/1; containing calcareous nodules as large as 20 mm; horizontally laminated intervals; gradational lower contact	2.75
33. Sand, silty; 10YR5/4; containing calcareous nodules as large as 20 mm; horizontal laminations; sharp lower contact	0.50
32. Silt, sandy; 10YR5/4; containing calcareous nodules as large as 20 mm; horizontal laminations; sharp lower contact	0.75
31. Sand, very fine; 5Y6/1, 10YR5/4, 5Y8/1; containing calcareous nodules as large as 80 mm and abundant in zones, iron stains; horizontally laminated except for base; gradational lower contact	4.00
30. Sand, silty; 5Y6/1; containing calcareous nodules; faint horizontal laminations; sharp lower contact	0.50

Core A--Continued

		Thickness (m)
29.	Sand-silt-clay; mottled 10YR6/6, 5GY6/1; containing calcareous nodules as large as 40 mm, small pelecypod shells and shell fragments and iron stains; faint horizontal laminations at top; gradational lower contact	2.00
28.	Sand, silty; mottled 10YR6/6, 5GY6/1; sharp lower contact	1.50
27.	Silt, sandy; mottled 10YR6/6, 5GY6/1; containing sand-filled burrows; sharp lower contact	1.25
26.	Silt, clayey; mottled 10YR6/6, 5GY6/1, 10YR5/4, 5YR5/6, N5; containing carbonaceous matter, shell fragments, and iron-stained silty calcareous nodules and lenses; horizontally laminated at base; gradational lower contact	5.25
25.	Sand-silt-clay; 5YR5/2, N5, 10YR6/2; containing carbonaceous matter, shell fragments, and silty iron-stained lenses; horizontal laminations; sharp lower contact	0.50
24.	Sand, silty; mottled 10YR6/2, 5Y6/1, 5YR5/6; containing calcareous nodules, iron-stained silty lenses and silty layers; gradational lower contact	0.50
23.	Sand-silt-clay; mottled 5GY6/1, 10YR7/4, 5YR5/6, 5Y6/1, 10YR6/2; containing calcareous nodules as large as 10 mm and sand lenses; faint horizontal laminations; sharp lower contact	1.00
22.	Silt, sandy; 10YR7/4; containing sandy calcareous nodules; horizontal laminations; gradational lower contact	0.25
21.	Sand, silty; mottled 5YR6/4, 5Y6/1, 10YR7/4; containing zones of sandy calcareous nodules as large as 90 mm; horizontal laminations; sharp lower contact	1.50
20.	Sand, fine; 10YR6/2; sharp lower contact	1.75
19.	Clay; mottled 5Y6/1, 5YR5/6; sharp lower contact	0.25

Core A--Continued

		Thickness (m)
18.	Sandstone, fine-grained; 5YR5/6, 10YR6/6; carbonate cement, iron stained; degree of induration increases toward base; sharp lower contact	0.25
17.	Silt, clayey; mottled 5YR4/1, 5YR5/6, 5Y6/1, 10YR4/2, 5GY6/1, 5YR6/4, N4, 10YR6/6; containing calcareous nodules as large as 12 mm, silty lenses, and a few shell fragments; gradational lower contact	4.75
16.	Silt, sandy; mottled 10YR6/2, 5Y6/1, 5YR5/6; containing calcareous nodules as large as 4 mm, sand pods, and iron stains; horizontal laminations; gradational lower contact	1.00
15.	Clay, silty; 5Y6/1, 5YR6/4; iron stains; faint horizontal laminations in middle part; sharp lower contact central section	2.00
14.	Clay; 5Y6/1, 10YR6/2; iron stains; sharp lower contact	0.25
13.	Clay, silty; 5Y6/1; containing iron stains and a small amount of carbonaceous matter; faint horizontal laminations; sharp lower contact	0.50
12.	Silt, clayey; mottled 5Y6/1 and 10YR6/2; containing iron stains and calcareous nodules as large as 3 mm; sharp lower contact	0.75
11.	Clay; 5Y6/1, 5GY6/1; containing iron stains, calcareous nodules as large as 15 mm, and a small amount of carbonaceous matter; faint horizontal laminations; sharp lower contact	2.25
10.	Silt, clayey; 5Y6/1 with streaks of N5; containing carbonaceous matter, shell layers, sand lenses, and iron stains; horizontal laminations; gradational contact	1.75
9.	Clay; 5GY6/1 with streaks of N5; containing carbonaceous matter and calcareous nodules as large as 15 mm; gradational lower contact	2.25
8.	Clay, silty; 5Y6/1; containing calcareous nodules as large as 10 mm; sharp lower contact	0.75

Core A--Continued

	Thickness (m)
7. Sand-silt-clay; mottled 5Y6/1, N6, 10YR8/2, 5Y7/2, 5Y3/2; containing abundant carbonaceous matter and some shell fragments; very pronounced horizontal laminations; sharp lower contact	0.50
6. Sand, silty; mottled 5Y5/1, 5GY6/1, 5Y8/1; containing calcareous nodules as large as as 15 mm, and carbonaceous matter including wood fragments; faint horizontal laminations at top; sharp lower contact	1.00
5. Sand, medium; 5Y7/2; containing calcareous nodules as large as 20 mm, some terrigenous gravel clasts as large as 30 mm, and scattered shell fragments; crossbedding; sharp lower contact	2.00
4. Sand, fine; 5Y7/2; containing calcareous nodules as large as 25 mm and a few terrigenous pebbles; cross-bedding; sharp lower contact	0.75
3. Sand, medium; 5Y7/2; containing calcareous nodules as large as 4 mm and shell fragments; crossbedded top part; gradational lower contact	2.25
2. Sand, silty; 5Y7/2, 5Y6/1, 5GY6/1; containing abundant calcareous nodules as large as 100 mm at base; sharp lower contact	4.50
1. Sand-silt-clay; 5Y7/2, 5Y6/1; containing calcareous nodules as large as 4 mm; horizontal laminations	0.50
TOTAL THICKNESS-----	61.00 m

(Because individual unit thicknesses were recorded to the nearest 0.25 m, the total thickness does not exactly match the sum of the unit thicknesses.)

Core B

[The boring site is located 3 m above Mean low Water on the Corpus Christi Naval Air Station, latitude 27°40'56"N and longitude 97°16'04"W in Oso Creek NE Quadrangle, Nueces County, Texas]

Pleistocene Units	Thickness (m)
57. Sand, fine; mottled 5Y6/1, 10YR6/6, 5YR4/1, 10YR6/2, 5Y2/1; iron stains; horizontal laminations; sharp lower contact	4.25
56. Silt; mottled 5GY6/1, 5YR8/1, 5YR5/6, 10YR7/4; containing sand laminations as thick as 20 mm; horizontal laminations; sharp lower contact	0.75
55. Sand-silt-clay; mottled 5GY6/1, 5YR8/1, 5YR5/6, 10YR7/4; horizontal laminations; sharp lower contact	0.75
54. Sand, silty; 5GY6/1; containing calcareous nodules as large as 20 mm; sharp lower contact	1.25
53. Sand, very fine; 5GY6/1; containing calcareous nodules as large as 5 mm; sharp lower contact	0.50
52. Sand, clayey; 5GY6/1; containing calcareous nodules as large as 40 mm; sharp lower contact	0.50
51. Sand, very fine; 5GY6/1; containing calcareous nodules as large as 7 mm; horizontal laminations; gradational lower contact	0.25
50. Sand, fine, 5Y7/2; containing shell fragments; horizontal laminations; sharp lower contact	1.25
49. Sand-silt-clay; 5Y6/1; containing carbonaceous matter, calcareous nodules as large as 50 mm, and iron stains; sharp lower contact	2.75
48. Sandstone, very coarse; 10YR7/4; containing some shells and carbonate cement; well indurated; sharp lower contact	0.75
47. Silt, sandy; 5Y6/1; containing iron stains and calcareous nodules; sharp lower contact	0.25
46. Coquina; 10YR7/4, 5YR4/4; containing mollusc shells and indurated with carbonate cement; sharp lower contact	0.50

Core B--Continued

		Thickness (m)
45.	Sand, very fine; mottled 5Y6/1, 10YR6/6, 10YR7/4; containing calcareous nodules as large as 30 mm, iron stains, and burrows; horizontal laminations; gradational lower contact	0.50
44.	Sand, fine; mottled 5Y6/1, 10YR6/6, 10YR7/4; containing calcareous nodules as large as 30 mm, iron stains, and burrows; horizontal laminations; sharp lower contact	0.50
43.	Sand, silty; mottled 10YR6/6, 5Y6/1; containing calcareous nodules as large as 12 mm, shell fragments, and iron stains; horizontal laminations; sharp lower contact	1.00
42.	Sand, fine; mottled 10YR6/6, 5Y6/1; horizontal laminations; sharp lower contact	0.25
41.	Sand, silty; mottled 10YR6/6, 5Y6/1; containing calcareous nodules as large as 12 mm and shell fragments; sharp lower contact	0.50
40.	Silt, clayey; mottled 10YR6/6, 5GY6/1; containing sand lenses and calcareous nodules as large as 15 mm; sharp lower contact	0.25
39.	Sand, fine; 5Y6/1; horizontal laminations; sharp lower contact	0.25
38.	Silt, clayey; mottled 10YR6/6, 5GY6/1, 5Y6/1; containing calcareous nodules as large as 10 mm; sharp lower contact	0.50
37.	Sand, very fine; mottled 10YR6/6, 5GY6/1, 5Y6/1; sharp lower contact	0.50
36.	Sand, silty; mottled 10YR6/6, 5Y6/1; containing calcareous nodules as large as 10 mm; gradational lower contact	0.25
35.	Sand, fine; 10YR6/6, 10YR7/4, 5YR7/2, 5Y6/1; containing mud laminations 2 to 3 mm thick and one calcareous lamination; gradational lower contact	0.75

Core B--Continued

		Thickness (m)
34.	Sand, very fine; 5Y7/2; horizontal laminations; gradational lower contact	0.50
33.	Sand, fine; 5YR5/6, 10YR6/6, 10YR8/6, 5Y7/2, 5GY6/1, 5Y6/1; containing some mud laminations; gradational lower contact	0.75
32.	Sand, very fine; 5Y6/1, 5Y7/2; containing some mud laminations 1 to 2 mm thick; gradational lower contact	0.75
31.	Sand, fine; 5Y7/2, 10YR6/2, 10YR6/6, 10YR7/4, N6, 5GY6/1; containing some mud laminations 1 to 5 mm thick and a few shell fragments; horizontal laminations at top and base; sharp lower contact	3.00
30.	Sand, silty; N6, 5GY6/1; containing some mud laminations and shell fragments; faint horizontal laminations; sharp lower contact	0.50
29.	Silt, clayey; 5Y4/1, 5YR6/1, 5GY6/1, 5YR5/2, 5YR4/4; containing shell fragments and carbonaceous matter; sharp lower contact	3.50
28.	Sand, silty; N6, 5Y4/1; containing abundant shells and some mud laminations; sharp lower contact	1.50
27.	Silt, clayey; 5Y4/1; containing some shell laminations; gradational lower contact	1.00
26.	Sand, silty; 5Y4/1, 5YR4/1, 10YR5/4; containing some pelecypod shells as large as 40 mm and carbonaceous matter; sharp lower contact	2.25
25.	Sand-silt-clay; 5Y4/1, 5YR4/1; containing some shell fragments; sharp lower contact	0.25
24.	Sand, silty; 5Y2/1, 5GY6/1, 5YR8/1, N3, 5YR4/4; containing calcareous nodules as large as 40 mm and iron stains; sharp lower contact	0.50
23.	Sand, fine; 5Y6/1; sharp lower contact	0.25
22.	Sand-silt-clay; 5Y4/1; containing shell fragments; sharp lower contact	0.25

Core B--Continued

		Thickness (m)
21.	Sand, fine; 5Y6/1; containing calcareous nodules as large as 4 mm and a calcareous mud lamination; sharp lower contact	0.25
20.	Sandstone, fine-grained; 10YR6/6, 10YR8/2, 5Y8/1, 10YR5/4, 10YR6/2; carbonate cement; gradational lower contact	1.50
19.	Coquina; 10YR6/6, 10YR6/2; containing mollusc shells and indurated with carbonate cement; gradational lower contact	0.50
18.	Sandstone, very fine grained; 5Y8/1; carbonate cement; containing shell fragments; gradational lower contact	0.25
17.	Sand, very fine; gradational lower contact	0.75
16.	Sand, silty; 10YR6/6, 5YR5/6, 5Y6/1; containing silty pods and iron stains; gradational lower contact	1.75
15.	Silt, clayey; 10YR6/6, 5YR5/6, 5Y6/1; containing silty pods, sand laminations, and iron stains; sharp lower contact	0.25
14.	Clay, silty; 5YR4/1, 5YR2/1, 5Y4/1, 5Y6/1, 5GY6/1; containing a few calcareous nodules as large as 5 mm at the top and base; horizontal laminations in upper part; sharp lower contact	3.75
13.	Silt, clayey; 5GY6/1, 5Y6/1, 5YR4/4, 10YR7/4, 10YR8/2; containing calcareous nodules as large as 5 mm and iron stains; sharp lower contact	2.50
12.	Sand, silty; 5Y6/1, 5YR8/1; containing iron stains; sharp lower contact	0.25
11.	Sand, fine; 5Y6/1, 5Y7/2, 10YR7/4, N4, 10YR5/4, 10YR5/6, 10YR6/6; containing iron stains, a 15-mm pelecypod shell, and some shell fragments; horizontal laminations; sharp lower contact	4.50
10.	Sand-silt-clay; 10YR7/4, 5GY6/1, 5YR5/6; containing abundant large shell fragments; gradational lower contact	1.00
9.	Silt, clayey; 10YR7/4, 5GY6/1, 5YR5/6; sharp lower contact	0.75

Core B--Continued

		Thickness (m)
8.	Sand-silt-clay; N7, 5YR5/6; containing shell fragments, 1-to 3-mm silty pods, and iron stains; sharp lower contact	1.50
7.	Silt, clayey; N5, 5YR5/6; containing some carbonaceous matter and iron stains; gradational lower contact	0.75
6.	Sand-silt-clay; N5, 5Y6/1; containing shell fragments, carbonaceous matter, and iron stains; sharp lower contact	0.75
5.	Clay, silty; 5Y6/1, 5Y4/1, 5YR2/1; containing a shell layer in the upper part and abundant carbonaceous matter in the lower part; sharp lower contact	1.00
4.	Silt, sandy; 5GY6/1; containing calcareous nodules as large as 6 mm; sharp lower contact	0.50
3.	Sand, silty; 5GY6/1; containing calcareous nodules as large as 7 mm and carbonaceous matter; sharp lower contact	1.25
2.	Sand, very fine; 5Y6/1; containing mud laminations; gradational lower contact	0.50
1.	Silt, sandy; 5GY6/1; containing calcareous nodules as large as 12 mm; faint horizontal laminations	1.00
	TOTAL THICKNESS----	61.50 m

(Because individual unit thicknesses were recorded to the nearest 0.25 m, the total thickness does not exactly match the sum of the unit thicknesses.)

Core C

[The boring site is located in southeastern Corpus Christi Bay in a water depth of 4 m, latitude 27°43'09"N and longitude 97°14'40"W in Crane Islands NW Quadrangle, Nueces County, Texas]

Holocene Units	Thickness (m)
6. Sand-silt-clay; 5Y4/1; containing molluscan shells and some tar; sharp lower contact	0.75
5. Silt, sandy; 5Y4/1; containing shells, tar, and sand-filled burrows; sharp lower contact	1.75
4. Sand, fine; 5Y4/1, N7, 5GY6/1; containing shells and shell fragments, mud laminations, and mud-filled burrows; horizontal laminations in lower half; sharp lower contact	3.75
3. Sand, silty; N7, 5GY6/1, 5Y4/1, 10YR5/4; containing mud laminations as thick as 7 mm, shell fragments, and iron stains; horizontal laminations; gradational lower contact	1.75
2. Silt, sandy; 5GY6/1, 10YR5/4; containing shell fragments and iron stains; sharp lower contact	0.75
1. Sand-silt-clay; 5Y6/1, 10YR5/4; containing shells and shell fragments, and iron stains	1.50
TOTAL THICKNESS	10.75 m

(Because individual unit thicknesses were recorded to the nearest 0.25 m, the total thickness does not exactly match the sum of the unit thicknesses.)

Core D

[The boring site is located in northern Laguna Madre in a water depth of 1 m, latitude 27°40'27"N and longitude 97°14'49"W in Crane Islands NW Quadrangle, Nueces County, Texas]

Holocene Units	Thickness (m)
63. Sand, very fine; 5Y4/1; containing plant fibers, a 50-mm oyster shell, and burrows; gradational lower contact	1.50
62. Sand, fine; 5Y6/1; gradational lower contact	0.75
61. Sand, silty; 5Y6/1, 5Y4/1; containing mud laminations 2-25 mm thick and shell fragments; horizontal laminations; gradational lower contact	1.75
60. Sand, very fine; 5Y6/1; gradational lower contact	0.50
59. Sand, silty; 5Y4/1; containing shells; horizontal laminations; sharp lower contact	0.50
58. Sand, very fine; N8; sharp lower contact	0.75
57. Sand, silty; mottled N5, 5Y8/1; containing shells; sharp lower contact	0.50
56. Sand, very fine; 5Y8/1, 10Y6/2, 5Y3/2, 10R4/6, 5Y6/4; containing iron stains; gradational lower contact	1.00
55. Sand, fine; 5Y6/4; horizontal laminations; gradational lower contact	1.00
54. Sand, very fine; 10YR6/6, 5Y7/2, 10YR4/6, 10YR6/2, 10YR7/4; containing iron stains, small shells, and shell fragments; horizontal laminations at base; sharp lower contact	2.75
Pleistocene Units	
53. Sand, silty; 5Y6/1, 10YR6/6, 10YR7/4; containing shells, shell fragments, iron stains, and calcareous nodules as large as 20 mm; gradational lower contact	0.75
52. Silt, sandy; 5Y6/1, 10YR6/6, 10YR7/4; containing shells and shell fragments, iron stains, and calcareous nodules as large as 20 mm; sharp lower contact	1.25

Core D--Continued

		Thickness (m)
51.	Sand-silt-clay; 10Y6/2, 10YR6/6, 10YR5/4; containing calcareous nodules as large as 40 mm, shell fragments, and iron stains; sharp lower contact	0.50
50.	Clay, silty; 10Y6/2, 10YR6/6; containing calcareous nodules as large as 5 mm and iron stains; gradational lower contact	0.75
49.	Sand, very fine; 5Y7/2, 10YR6/6, 5YR8/1; containing iron stains; horizontal laminations in top part; gradational lower contact	1.00
48.	Sand, fine; 5Y8/1; gradational lower contact	1.00
47.	Sand, very fine; 5Y8/1, 5GY6/1, 5YR8/1, 5Y6/4; containing calcareous nodules as large as 35 mm; sharp lower contact	1.50
46.	Sand, silty; 5Y8/1; containing calcareous nodules; gradational lower contact	0.25
45.	Sand, very fine; 5Y6/4, 10YR6/6, 10YR7/4, 5Y7/2; containing iron stains and calcareous nodules as large as 15 mm; horizontal laminations; sharp lower contact	0.75
44.	Silt, clayey; 5GY6/1, 10YR5/4; containing calcareous nodules as large as 10 mm; horizontal laminations; sharp lower contact	0.25
43.	Sand, very fine; 5Y7/2, 5Y6/4, 10YR6/6; containing iron stains, calcareous nodules, and some mollusc and echinoderm shell fragments; horizontal laminations; gradational lower contact	1.00
42.	Sandstone; N8; containing calcareous nodules and carbonate cement; gradational lower contact	0.25
41.	Sand, very fine; 5Y6/4, 10YR6/6; containing calcareous nodules, a calcified layer, and iron stains; horizontal laminations; gradational lower contact	0.25
40.	Sandstone; 5Y8/1; carbonate cement; containing small pelecypod shells; horizontal laminations; gradational lower contact	0.25

Core D--Continued

		Thickness (m)
39.	Sand, silty; 10YR7/4, 5GY6/1, 10YR6/6; containing calcareous nodules, shell fragments, mud laminations as thick as 10 mm, and iron stains; faint horizontal laminations; sharp lower contact	0.25
38.	Silt, clayey; 5Y6/4; containing some terrigenous gravel clasts; gradational lower contact	0.50
37.	Sand, fine; 5Y7/2, 10YR6/6; containing mud laminations, calcareous nodules as large as 2 mm, iron stains, and shell fragments; cross-bedded with horizontal laminations at base; sharp lower contact	2.00
36.	Silt, clayey; N6, 5YR3/4, 5YR5/6, 5YR6/4, 5YR4/4, 10YR5/4; containing silty pods, iron stains, and a few shells; horizontal laminations in top part; gradational lower contact	4.00
35.	Sand-silt-clay; 5Y4/1; containing oyster-shell layers; gradational lower contact	1.00
34.	Silt, clayey; 5Y4/1; containing oyster-shell layers; gradational lower contact	1.25
33.	Sand-silt-clay; 5Y4/1; containing oyster-shell layers; sharp lower contact	0.50
32.	Silt, clayey; 5Y4/1, containing oyster-shell layers; sharp lower contact	0.25
31.	Sand-silt-clay; 5Y4/1, 5Y2/1; containing oyster shells and shell fragments, sand pods, iron stains, and carbonaceous matter; sharp lower contact	1.25
30.	Sand, fine; 5Y6/1, 10YR8/6, 10YR6/6, 5Y4/1, 5Y2/1; containing iron stains and mud laminations; horizontal laminations; gradational lower contact	0.25
29.	Sand, silty; 5Y2/1; containing sand pods; gradational lower contact	0.50
28.	Sand, fine; 5GY6/1, 5YR5/6; containing iron stains; sharp lower contact	0.75
27.	Sand-silt-clay; 5YR5/2; containing sand pods; sharp lower contact	0.25

Core D--Continued

		Thickness (m)
26.	Sand, fine; 5Y6/1, 5Y7/2, 10YR7/4, 5GY6/1; containing mud laminations, heavy-mineral laminations, calcareous nodules as large as 10 mm, and burrows; transition from horizontal laminations in top part to crossbeds in bottom part; sharp lower contact	3.00
25.	Sand, silty; 10YR7/4, 5YR5/2; containing calcareous nodules as large as 10 mm, mud laminations, and shell fragments; sharp lower contact	0.25
24.	Sand, fine; 5Y5/6; containing calcareous nodules as large as 3 mm; gradational lower contact	0.50
23.	Sand, very fine; 5Y7/2, 10YR5/4, 10YR6/6; containing iron stains and calcareous nodules as large as 3 mm; crossbedding in basal part; sharp lower contact	1.25
22.	Sandstone; 10YR7/4; carbonate cement; containing abundant shells; sharp lower contact	0.50
21.	Silt, sandy; 5GY6/1, 5YR5/6; containing mud laminations and iron stains; horizontal laminations; sharp lower contact	0.25
20.	Silt, clayey; 5GY6/1, N4, 5Y4/1, 5YR5/6, 5YR4/4; containing pelecypod shells as large as 50 mm, shell fragments, iron stains, and a small amount of carbonaceous matter; horizontal laminations; gradational lower contact	3.00
19.	Sand, silty; 5Y6/1; containing carbonaceous matter; horizontal laminations; sharp lower contact	0.25
18.	Clay, silty; N5, N4, 5Y6/1; containing abundant carbonaceous matter, shell fragments, and calcareous nodules as large as 2 mm; horizontal laminations; gradational lower contact	1.00
17.	Sand, silty; 5Y6/1; containing calcareous nodules as large as 10 mm and a small amount of carbonaceous matter; gradational lower contact	0.50

Core D--Continued

		Thickness (m)
16.	Silt, clayey; 5GY6/1; containing calcareous nodules as large as 10 mm and a small amount of carbonaceous matter; sharp lower contact	0.75
15.	Sand, very fine; 5Y7/2, 10YR6/2, 10YR6/6; containing mud laminations and iron stains; sharp lower contact	0.25
14.	Silt, clayey; 5Y6/1; containing calcareous nodules as large as 8 mm; gradational lower contact	0.25
13.	Sand, silty; 5Y6/1; containing calcareous nodules as large as 5 mm and mud laminations as thick as 40 mm; horizontal laminations; gradational lower contact	1.00
12.	Sand, fine; 5Y6/1; containing mud laminations as thick as 25 mm and a few shell fragments; top third is crossbedded and has a downward transition to horizontal laminations; bottom two-thirds is crossbedded; gradational lower contact	5.50
11.	Sand, medium; 5Y6/1; containing shell fragments; crossbedding; sharp lower contact	0.25
10.	Sand, fine; 5GY6/1, 5Y8/1, 5Y7/2, 10YR6/2; containing mud laminations; horizontal laminations in top part; sharp lower contact	1.00
9.	Sand-silt-clay; 5G4/1, 5YR4/4, 5Y7/2, 10Y6/2, 5GY4/1, 10YR6/2; containing calcareous nodules as large as 20 mm; horizontal laminations in top part; gradational lower contact	0.50
8.	Sand, silty; 10Y6/2, 5GY4/1, 10YR6/2; containing a few shell fragments and calcareous nodules as large as 3 mm; gradational lower contact	0.25
7.	Sand, fine; 5Y7/2; sharp lower contact	0.25
6.	Sand-silt-clay; 5GY7/2, 10YR7/4; containing iron stains; sharp lower contact	0.25

Core D--Continued

	Thickness (m)
5. Sand, fine; 10Y6/2, 5YR8/1, 5YR3/4, 5YR5/6; containing iron stains; gradational lower contact	1.50
4. Sand, silty; 10Y6/2, 5YR8/1, 5YR5/6; containing iron stains; gradational lower contact	0.50
3. Sand, clayey; 5YR5/6, 5GY8/1; containing iron stains; gradational lower contact	0.50
2. Sand-silt-clay; 5YR5/6, 5GY8/1; containing iron stains; gradational lower contact	1.00
1. Silt, clayey; 5YR5/6, 5GY8/1; containing iron stains	1.00
TOTAL THICKNESS----	62.00 m

(Because individual unit thicknesses were recorded to the nearest 0.25 m, the total thickness does not exactly match the sum of the unit thicknesses.)

Core E

[The boring site is located 0.6 m above Mean Low Water on the wind-tidal flat of southern Mustang Island, latitude 27°39'58"N and longitude 97°11'42"W in Crane Islands NW Quadrangle, Nueces County, Texas]

Holocene Units	Thickness (m)
14. Sand, fine; 5Y4/1; containing mollusc shells and shell fragments; horizontal laminations in basal part; gradational lower contact	5.50
13. Sand, silty; 5Y4/1; containing small pelecypod shells and shell fragments, and burrows; horizontal laminations; sharp lower contact	1.00
12. Sand-silt-clay; 5Y4/1; horizontal laminations; sharp lower contact	0.50
11. Sand, silty; 5Y4/1; containing a single pelecypod shell; horizontal laminations in upper part; sharp lower contact	0.50
10. Sand, fine; 5Y6/1; containing mud-filled burrows; horizontal laminations; gradational lower contact	0.50
9. Sand, very fine; N7; horizontal laminations; gradational lower contact	0.75
8. Sand, fine; N6; containing articulate mollusc shells; horizontal laminations; gradational lower contact	0.50
7. Sand, very fine; N7; containing some carbonaceous matter; horizontal laminations; sharp lower contact	0.50
6. Sand-silt-clay; 5Y4/1; containing a few shells; sharp lower contact	0.50
5. Sand, very fine; 5Y6/1; containing a few mud-filled burrows; horizontal laminations; gradational lower contact	0.25
4. Sand, fine; 5Y6/1; containing abundant shells; horizontal laminations; sharp lower contact	0.75
3. Sand, medium; N6, N7; containing abundant shells; horizontal laminations; sharp lower contact	0.25

Core E--Continued

	Thickness (m)
2. Sand, fine; 5Y6/1, N6, N5, N7; containing abundant shells and shell fragments, and mud-filled burrows; intervals of horizontal laminations alternating with crossbedding; sharp lower contact	4.50

Pleistocene Unit

1. Silt, clayey; mottled 10Y6/2, 10YR5/4, 5GY6/1, 5Y6/1, 10YR6/6; containing a few shell fragments; horizontal laminations in upper part	2.00
TOTAL THICKNESS----	19.50 m

(Because individual unit thicknesses were recorded to the nearest 0.25 m, the total thickness does not exactly match the sum of the unit thicknesses.)

Core EE

[The boring site is located 0.6 m above Mean Low Water on the wind-tidal flat of southern Mustang Island, latitude 27°40'26"N and longitude 97°11'28"W in Crane Islands NW Quadrangle, Nueces County, Texas]

Holocene Units	Thickness (m)
43. Sand, fine; 10YR8/2, N7, N5; containing rootlets at top, shells, and shell fragments; horizontal laminations in upper part; sharp lower contact	4.00
42. Sand, clayey; 5Y8/1; containing abundant shells; sharp lower contact	0.25
41. Sand, fine; N7; containing mud laminations as thick as 5 mm and shell fragments; gradational lower contact	1.00
40. Sand, very fine; N7; containing some mud laminations and shell fragments; gradational lower contact	2.75
39. Sand, fine; N7; containing a few mud laminations; gradational lower contact	3.50
38. Sand, silty; 5Y4/1; containing shells; gradational lower contact	0.50
37. Sand, fine; N7, 5Y4/1, 5Y7/2, 5Y6/1, 10YR8/2, N6; containing shell layers, dispersed shells and shell fragments, and a few mud laminations; horizontal laminations in central part; gradational lower contact	6.00
36. Sand, very fine; N7; containing shell fragments and small mud pods; gradational lower contact	0.75
35. Sand, fine; N7, 5Y6/1; containing shell fragments and mud pods; gradational lower contact	1.75
34. Sand, very fine; 5Y6/1, N7, 5GY6/1, 5Y4/1; containing iron stains and shell fragments; gradational lower contact	0.75
33. Sand, silty; 5Y6/1, N7, 5GY6/1, 5Y4/1; containing iron stains and shell fragments; horizontal laminations; gradational lower contact	0.75

Core EE--Continued

		Thickness (m)
Pleistocene Units		
32.	Clay, silty; 5GY6/1, 10YR6/6, 5YR5/6; containing iron stains, shell fragments, and sand laminations as thick as 2 mm; horizontal laminations in top part; gradational lower contact	0.75
31.	Silt, sandy; 5GY6/1, 5Y6/1, 5YR5/6; containing iron stains; crossbedding in basal part; sharp lower contact	1.25
30.	Sand, very fine; 5Y7/2, 10YR6/6; containing iron stains; crossbedding in upper part; gradational lower contact	1.00
29.	Clay, silty; mottled 5YR6/4, 10YR5/4, 5Y6/1, 5GY6/1, 10YR7/4, 5YR5/6, 10YR6/2, 10YR6/6, N3; containing a few sand laminations as thick as 3 mm, small amount of carbonaceous matter, and iron stains; horizontal laminations in lower two-thirds of unit; sharp lower contact	6.00
28.	Sand, clayey; 5GY4/1, 5GY6/1; containing shell fragments; gradational lower contact	0.25
27.	Sand, fine; N6; containing shell fragments; gradational lower contact	0.25
26.	Sand, silty; 5Y4/1, 5YR4/4, 5GY6/1, 5Y6/1; containing shell fragments and iron stains; gradational lower contact	0.75
25.	Sand-silt-clay; 5GY6/1; containing a few calcareous nodules; gradational lower contact	0.50
24.	Silt, clayey; 5GY6/1, 10YR6/6, 5YR5/6, 10YR5/4; containing iron stains; gradational lower contact	0.50
23.	Sand-silt-clay; 5GY6/1, 5YR4/4, 10YR6/6, 5YR5/6; containing sand pods and iron stains; gradational lower contact	0.50
22.	Clay, silty; 5GY6/1, 10YR5/4, 5YR4/4, 10YR6/6, 5YR5/6; containing sand pods and iron stains; gradational lower contact	1.00

Core EE--Continued

		Thickness (m)
21.	Silt, clayey; 10YR5/4, 10YR6/2, 5YR4/4, 5GY6/1, N7, 5YR5/6; containing sand pods and iron stains; gradational lower contact	1.50
20.	Clay, silty; 5GY6/1, 5YR5/6, 10YR5/4; containing a few shell fragments, iron stains, and sand pods; gradational lower contact	0.50
19.	Silt, clayey; 5GY6/1, 5YR5/6, 10YR5/4; containing a few shell fragments, iron stains, and sand pods; gradational lower contact	0.50
18.	Clay, silty; N5, 10YR5/4, 5YR5/6; containing small pelecypod shells and iron stains; gradational lower contact	1.50
17.	Silt, clayey; N5; containing small pelecypod shells; gradational lower contact	1.25
16.	Clay, silty; 5Y4/1, 5YR4/4; containing small pelecypod shells and iron stains; gradational lower contact	0.50
15.	Silt, clayey; 5Y4/1, 5YR4/4; containing small pelecypod shells, sand pods, and iron stains; gradational lower contact	0.50
14.	Clay, silty; 5Y4/1, 10YR4/6; containing large pelecypod shells, sand pods, and iron stains; sharp lower contact	1.25
13.	Sand, fine; N8; sharp lower contact	0.25
12.	Clay, silty; 5Y4/1, 5Y6/1, N3, N2, N1; containing abundant carbonaceous matter in stringers and small pods, and some shells in upper part; horizontal laminations in lower two-thirds of unit; gradational lower contact	2.75
11.	Clay; 5Y4/1, 5Y6/1, N3, N2, N1; containing abundant carbonaceous matter in stringers and small pods; horizontal laminations; gradational lower contact	0.50

Core EE--Continued

		Thickness (m)
10.	Clay, silty; 5Y4/1, 5Y6/1, 5GY6/1, N3, N2, N1, 10YR4/6; containing abundant carbonaceous matter in stringers and pods in the upper part, and calcareous nodules as large as 2 mm in lower part; horizontal laminations in the upper part; gradational lower contact ----------	3.50
9.	Sand-silt-clay; 5GY6/1; containing calcareous nodules as large as 8 mm; gradational lower contact ----------	1.25
8.	Sand, silty; 5Y6/1, 5GY6/1; containing several mud laminations; horizontal laminations; gradational lower contact ----------	1.25
7.	Sand, very fine; 5Y6/1, N9; containing some mud laminations and carbonaceous matter; crossbedded; gradational lower contact ----------	1.25
6.	Sand, fine; N9, 5Y7/2; crossbedded at top; gradational lower contact ----------	0.50
5.	Sand, medium; 5Y7/2; containing a few shell fragments and a few mud laminations as thick as 2 mm; gradational lower contact ----------	0.75
4.	Sand, fine; 5Y7/2; containing a few shell fragments and mud laminations; crossbedded in central part; gradational lower contact ----------	0.75
3.	Sand, medium; 5Y7/2; containing a few shell fragments and mud laminations; crossbedded at top and bottom, gradational lower contact ----------	2.00
2.	Sand, clayey; 5Y7/2; containing some terrigenous gravel clasts, shells and shell fragments, and mud laminations as thick as 1 mm; horizontal laminations; gradational lower contact ----------	0.25
1.	Sand, medium; 5Y7/2; containing some terrigenous gravel clasts, shell fragments, and mud laminations as thick as 1 mm; horizontal laminations ----------	0.25
	TOTAL THICKNESS----	61.00 m

(Because individual unit thicknesses were recorded to the nearest 0.25 m, the total thickness does not exactly match the sum of the unit thicknesses.)

Core F

[The boring site is located 1 m above Mean Low Water on the beach berm of southern Mustang Island, latitude 27°40'30"N and longitude 97°10'05"W in Crane Islands NW Quadrangle, Nueces County, Texas]

Holocene Units	Thickness (m)
42. Sand, fine; 10YR8/2; containing small dispersed mollusc shells, shell fragments, and shell laminations; horizontal laminations; gradational lower contact	3.25
41. Sand, very fine; N7; containing shells and shell fragments; gradational lower contact	1.00
40. Sand, fine; N7; containing shells and shell fragments; gradational lower contact	1.00
39. Sand, very fine; N7; containing shells, shell fragments, and a few burrows; gradational lower contact	3.00
38. Sand, fine; N7, N6, 5Y8/1; containing dispersed shells and shell fragments, shell layers, a few stringers of carbonaceous matter, and a few mud laminations; alternating intervals of horizontally laminated, cross-bedded, and structureless sediments; gradational lower contact	14.25
37. Sand, silty; 5Y4/1; gradational lower contact	0.50
36. Sand, fine; N7, 5Y4/1; containing mud laminations as thick as 5 mm, mud-filled burrows, and a few shell fragments; gradational lower contact	0.50
35. Sand, very fine; N7, 5Y4/1; containing mud laminations as thick as 3 mm; gradational lower contact	1.25
34. Sand, fine; N7, 5Y4/1, 5Y6/1; containing mud laminations as thick as 4 mm, small shells and shell fragments, and iron stains; gradational lower contact	3.75
33. Sand, silty; 5Y4/1; containing iron stains; gradational lower contact	0.25
32. Sand-silt-clay; 5Y4/1; containing sand layers, sand pods, and shell fragments; horizontal laminations; gradational lower contact	0.75

Core F--Continued

	Thickness (m)
31. Silt, clayey; 5Y4/1; containing sand pods and shell fragments; horizontal laminations; sharp lower contact	0.50
30. Sand-silt-clay; 5Y4/1; containing sand pods and small shells; gradational lower contact	1.50
29. Silt, clayey; 5Y4/1; containing sand pods, shells, and shell fragments; horizontal laminations at top and bottom; gradational lower contact	2.25
28. Silt; 5Y4/1; containing a few shells and sand pods; horizontal laminations; gradational lower contact	0.75
27. Silt, clayey; 5Y4/1 and mottled 5Y8/1 and N5; containing sand pods, sand laminations, and shell fragments; horizontal laminations; sharp lower contact	1.25
26. Sand, fine; 5Y5/2; sharp lower contact	0.25

Pleistocene Units

25. Silt, clayey; 10Y6/2; containing calcareous nodules as large as 10 mm and a small amount of carbonaceous matter; gradational lower contact	0.50
24. Sand, silty; 5Y7/2, 10Y6/2; containing calcareous nodules as large as 5 mm; horizontal laminations; gradational lower contact	1.25
23. Silt; 10Y6/2; containing calcareous nodules as large as 10 mm; gradational lower contact	0.25
22. Silt, sandy; 5Y6/4; containing sand and mud laminations; horizontal laminations; sharp lower contact	0.25
21. Sand, medium; 5Y7/2; containing a few terrigenous gravel clasts and shell fragments; sharp lower contact	1.25
20. Silt, sandy; 5Y4/1; sharp lower contact	0.25

Core F--Continued

		Thickness (m)
19.	Sand, fine; 10YR8/2; sharp lower contact	0.25
18.	Sand-silt-clay; 5Y4/1; sharp lower contact	0.25
17.	Sand, medium; 5Y7/2; containing terrigenous gravel clasts and shell fragments; gradational lower contact	0.50
16.	Sand, fine; 5Y7/2; containing terrigenous gravel clasts and shell fragments; crossbedding; gradational lower contact	1.25
15.	Sand, medium; 5Y7/2; containing terrigenous gravel clasts; crossbedding; gradational lower contact	0.50
14.	Sand, fine; 5Y7/2; containing terrigenous gravel clasts; crossbedded in upper part; gradational lower contact	1.00
13.	Silt, sandy; 5Y7/2; containing some sand laminations; gradational lower contact	0.25
12.	Sand, medium; 5Y7/2; containing a few terrigenous gravel clasts and shell fragments; bottom half is crossbedded; sharp lower contact	2.50
11.	Silt, clayey; 5Y6/1, N4, N2; containing abundant carbonaceous matter in stringers and a few small pods, one 50-mm sandy nodule, and a few shell fragments; horizontal laminations; gradational lower contact	0.50
10.	Clay, silty; 5Y6/1, 5GY6/1, N4, N3, N2; containing carbonaceous matter in stringers and pods; horizontal laminations in upper part; sharp lower contact	3.50
9.	Sand, fine; N7, N1, 10YR6/6, 10YR5/4; containing small amounts of carbonaceous matter including a 150-mm carbonized branch, and iron stains; gradational lower contact	1.50
8.	Sand, silty; N7, 5Y6/1, 5GY6/1; gradational lower contact	0.50
7.	Sand, fine; 5Y6/1; gradational lower contact	0.25

Core F--Continued

	Thickness (m)
6. Sand, medium; 5Y6/1, 5Y8/1; containing a few mud laminations as thick as 10 mm; horizontal laminations; gradational lower contact	0.75
5. Sand, silty; N7, 5Y8/1; containing mud laminations; horizontal laminations; gradational lower contact	0.25
4. Sand, fine; 5Y6/1, 5Y8/1; containing mud laminations as thick as 5 mm and a few shell fragments; some crossbedding; gradational lower contact	4.25
3. Silt, sandy; 5Y4/1, 5YR4/4, 5YR3/4; containing several small sand pods and iron stains; gradational lower contact	1.25
2. Sand, silty; 5Y4/1, 5YR4/4, 5YR3/4; containing iron stains; gradational lower contact	0.50
1. Sand, fine; N5; containing a few shell fragments	0.25
TOTAL THICKNESS----	61.25 m

(Because individual unit thicknesses were recorded to the nearest 0.25 m, the total thickness does not exactly match the sum of the unit thicknesses.)

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