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INNER WEST-CENTRAL FLORIDA CONTINENTAL SHELF: SEDIMENTARY FACIES AND FACIES ASSOCIATIONS

BY:

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INTRODUCTION

Florida exhibits the second longest coastline of any state in the U.S. and contains a large population that relies heavily on its coastal resources from both an economic and recreational perspective. In spite of this, we have a poor understanding of how this coastal system operates. The purpose of this report is to present a three-dimensional view of the sedimentary facies present on the inner west-central Florida shelf, as well as the relationships among facies and with the underlying carbonate platform. Results will aid in our understanding of the geological evolution of the coast and inner continental shelf and can provide a framework for additional studies as well as serve as a basis for more efficient and effective coastal management. This study evolved as a cooperative effort among the USGS, the University of South Florida Marine Science and Geology departments, and the Eckerd College Marine Geology program.

The inner west-central Florida continental shelf (Fig. 1) is part of the vast Florida platform, a southward thickening wedge of carbonates and evaporites that reaches a thickness of at least 5,000 m beneath Florida's southern tip. The west Florida shelf constitutes almost the entire western half of the platform. It is broad and shallow, and extends westward approximately 250 km from the modern barrier island coastline. It consists of an irregular, karst surface that is covered by a thin (<1-3 m), sediment veneer presumed to be Holocene in age (Gould and Stewart, 1955; Ginsburg and James, 1975; Doyle and Sparks, 1980). Periodically, the underlying platform surface crops out to form ledges and hardbottoms that support a diverse biological assemblage (Obrochta, 1997).

Surface sediments on the shelf are indicative of a mixed carbonate/siliciclastic system. Doyle and Sparks (1980) roughly mapped the distribution and reported that surface sediments consist of a nearshore quartz sand band, progressing offshore into carbonate sands and gravels, with the transition occurring rather abruptly at a distance of about 30 km. A more detailed study focusing on the inner shelf indicates that no nearshore quartz sand band exists, but that surface sediments consist of a patchy and discontinuous mixture of quartz and carbonate sands and gravels, occasionally interrupted by outcrops of the underlying platform surface (Brooks, et al., 1998).

The source for the quartz sand input to the inner shelf is unknown. It has been suggested that Tertiary terrace deposits that veneer the Florida mainland, interpreted to represent ancient coastal deposits, may provide a source (Doyle, 1982; Davis, Hine and Belknap, 1985; Brooks and Doyle, 1992), but the extent to which quartz sand is currently being added to the system remains a mystery.

Carbonate sediments are of biogenic origin, consisting dominantly of molluscan shell fragments with subordinate amounts of benthic foraminifera, bryozoa and coralline algae (Brooks and Doyle, 1991). This assemblage is representative of a *Foramol Association*, described by Lees and Buller (1972) as representing cool water conditions.

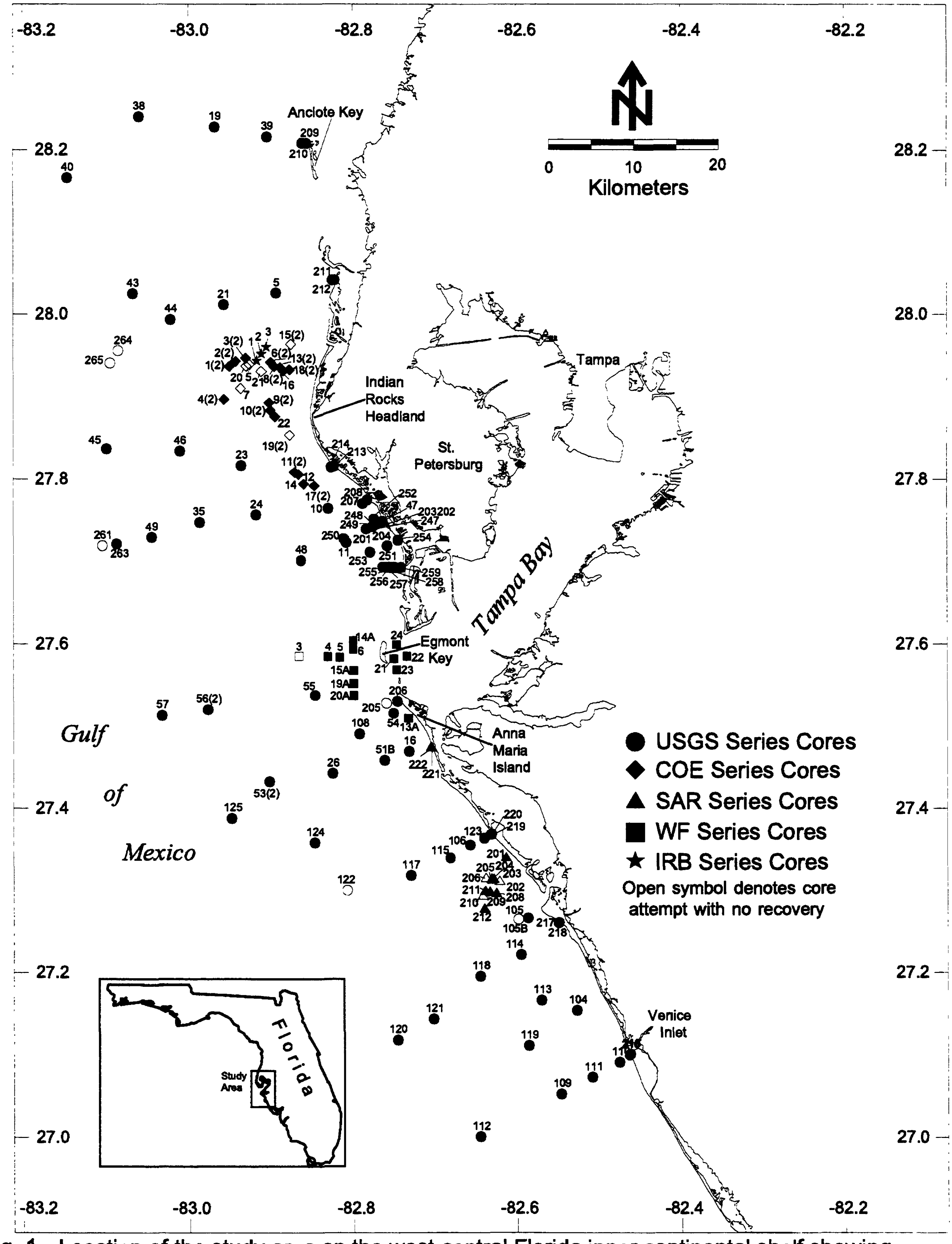

Fig. 1. Location of the study area on the west-central Florida inner continental shelf showing vibracore sample sites. The vibracore database contains cores collected under several individual projects. The above abbreviations correspond to the following project designations: USGS- United States Geological Survey; COE - Army Corp of Engineers; SAR - Sarasota; WF - West Florida; IRB - Indian Rocks Beach.

James (1997) introduced the term *Heterozoan Association* for this carbonate assemblage, and noted that they often dominate on open shelves where conditions are unfavorable for the growth of hermatypic corals and calcareous algae.

Bedforms identified across the entire width of the shelf indicate that sediments are occasionally mobilized, presumably by storm-generated currents (Neurauter, 1980; Holmes, 1981), and transported offshelf into the deep Gulf of Mexico and Straits of Florida (Brooks and Holmes, 1989; 1990).

METHODS

The study area (Fig. 1) extends southward from Anclote Key, the northernmost extent of the barrier island system, to Venice Inlet; and offshore to approximately 30 km. Approximately 140 vibracore sites were occupied and 123 cores were collected and analyzed (Fig. 1). Site selection was based upon high-resolution seismic reflection and side scan sonar data collected during the course of this study by A. C. Hine and S. D. Locker of the University of South Florida, St. Petersburg. Coring targets included bathymetric highs, subbottom depressions, or other features that indicated sufficient sediment thickness for vibracore retrieval.

All cores were collected aboard the R/V G.K. Gilbert between October, 1994 and September, 1997. Navigation was by differential GPS (DGPS). It is estimated that cores were collected within 7 meters of the GPS antennae and that the DGPS system accuracy was within 3 to 5 meters. The vibracoring system consists of a Branford series R5000 flange-mounted vibrating head mounted on an aluminum frame. The vibrator is powered by two 7.5 hp compressors at a pressure of 60 psi with a volume of 45 scfm. Cores were collected in 20 ft (6.1 m) long by 3 in (7.6 cm) diameter aluminum barrels. Brass core catchers were used in all cases to insure maximum recovery. Core penetration was measured both visually and with an electronic penetrometer. Core recovery was determined by measuring the total length of sediment in the core barrel immediately following retrieval, and the percent recovery calculated as follows:

% Recovery = length recovered/length penetrated x 100

All cores were returned to the Eckerd College Sedimentology Laboratory for analysis. Each core was split longitudinally, visually described, photographed and subsampled for further analysis. Subsamples were collected from each lithologic interval, or at regular intervals where no lithologic breaks were identified. A minimum of three samples were collected from each core. A total of 613 samples were analyzed for grain size, calcium carbonate content, and total organic content (TOC). Selected samples were analyzed for mineralogy and age dating using C-14 and/or Sr-isotope techniques.

Each sample was initially washed with deionized water, dried in an oven at $40^{o}C$, and split into four representative aliquots (10 to 15 grams each) for subsequent analyses. Samples for grain size, calcium carbonate content and total organic content (TOC) were retained at Eckerd College. Samples for mineralogical and sediment constituent analysis were transferred to the University of South Florida Marine Science Laboratory.

Grain size was determined by settling tube and pipette methods. The sample was initially wet sieved through a 63-micron screen; the fine fraction being collected in a 1,000 ml graduated cylinder for the determination of silt and clay. After adding a 10%

calgon solution (to prevent flocculation) each cylinder was stirred for 1 min. After waiting 20 sec, 20 ml was withdrawn at a depth of 20 cm. Based upon Folk (1965) this gives a representative sample of the mud-size fraction in the cylinder. After 1 hr 51 min (from the time of stirring), 20 ml were withdrawn at a depth of 10 cm, giving a representative sample of the clay-size fraction (Folk, 1965). After drying and weighing, each sample was multiplied by a factor of 50 and the calgon weight was subtracted, resulting in the weight of both the mud and clay in the sample. The silt weight was calculated by subtracting the clay weight from the mud weight.

The sand-sized fraction was analyzed by settling tube (Gibbs, 1974). The design of the computerized system was based upon known settling velocities of different-sized sand grains. An 8 in. (20 cm) diameter settling tube was constructed and equipped with a bottom loading balance that is placed over the column. A capture pan with the same diameter as the settling tube was suspended from the balance and through the water column approximately 155 cm below the water surface. The balance was then connected to a computer containing software capable of recording the sediment weights on the capture pan at specific time intervals. These time intervals correlate to grain sizes ranging from -1 phi (ø) (4 mm) to 4ø (63-micron) at 0.5ø intervals. As the sample is introduced into the cylinder and makes contact with the water surface, an electrical circuit is completed back to the computer and the computer begins the capture routine. When the capture routine is completed, the computer records and prints the grain size percentages, weights, and statistics, including mean phi and standard deviation.

Percent by weight of calcium carbonate was determined by the acid leeching method (Milliman, 1974). First, the sample was leeched using a 10% solution of hydrochloric acid, the liquid decanted off, and the residue washed with deionized water. After repeating the washing process two more times, the sample was dried and weighed. Weight difference before and after the acid leeching represents the amount of calcium carbonate present.

Total organic content (TOC) was analyzed by loss on ignition (LOI) (Dean, 1974) using the insoluble residue from the calcium carbonate analysis. Approximately 1 g of sample was weighed to four decimal places in a preweighed crucible, placed in a furnace at 550 ^{o}C for at least 2.5 hours, cooled, then weighed again. Weights were then entered into an equation for calculation of percent TOC.

Percent of blackened grains was determined on 33 samples by the point count method (Carver, 1971). The remainders of the samples were visually examined and the blackened grain content was estimated to within the nearest 5%.

Carbonate mineralogy was determined on 122 samples by X-ray diffraction at the University of South Florida Marine Science Laboratory. Sample selection was based primarily upon lithology and core location in order to maintain adequate coverage of the study area.

A total of 24 samples were age dated using radiocarbon and/or Sr-isotope methods. Radiocarbon ages were determined for 19 samples by Beta Analytic, Inc. of Coral Gables, FL. Both standard and AMS methods were utilized. Sr-isotope ratios were determined for 5 samples by Geochron Laboratories, Cambridge, MA. The $^{87}Sr/^{86}Sr$ ratios were normalized to $^{87}Sr/^{86}Sr$=0.1194 and to Standard Reference Material (SRM) 987=0.710241, and fitted to the regression equations of Hodell, et al. (1991) for age determinations.

RESULTS

Core penetration ranged from 0 - 19.25 ft (5.9 m) and recovery ranged from 0 - 16.0 ft (4.9 m). The percent recovery ranged from 0 - 100%. For the majority of cores, especially where penetration exceeded 1 m, recoveries in excess of 60% were consistently recorded. Based on the number of core barrels that exhibited severely damaged bases and/or contained remnants of the underlying platform surface, it is estimated that approximately 50% of the cores penetrated the entire thickness of the unconsolidated sediment veneer. The lack of recovery at 17 sites (Fig. 1) is attributed to the paucity of sedimentary cover in these areas. Twelve of these sites are in water depths exceeding 7 meters.

A description for each vibracore is shown in Appendix 1. Included is a graphic representation of each sediment type, mean grain size, percent gravel/sand/mud, percent calcium carbonate, percent of each carbonate mineral species, percent TOC, percent blackened grains, percent burrowing and specific comments including results of dating analysis, if applicable. Also included is the representative lithofacies for each sediment type. Additional data include latitude and longitude, and water depth for each core site.

Although surface sediments in the study area consist predominantly of a mixture of carbonate and siliciclastic sands (Brooks, et al, 1998), vibracore sediments exhibit a variety of sedimentary facies represented by a broad range of textures and compositions. With the aid of Q-mode cluster analysis, nine sedimentary facies have been identified, ranging from mid Miocene to Holocene in age (Table 1). Criteria used to identify facies (clusters) include grain size, percent calcium carbonate, percent TOC, carbonate mineralogies, percent blackened grains, and percent burrowing. The nine sedimentary facies and associated distinguishing characteristics are shown in Table 2.

All nine facies have not been found together in the same core, but a general stratigraphic relationship can be inferred. This idealized facies succession is shown in Figure 2. The base of the succession is represented by the **carbonate lithoclast facies**, which consists of limestone rock fragments interpreted to represent the underlying platform surface. Strontium isotope ratios indicate this facies to be Miocene in age and petrographic properties are consistent with those of the dolomitic limestones of the Arcadia Formation (Obrochta, 1997); a component of the Hawthorn Group (Oligocene to Pliocene) that crops out regularly along coastal portions of west-central Florida (Davis, 1997). Overlying the carbonate lithoclast facies is the **blue-gray clay facies** consisting of a highly compacted layer of fine-grained sediments composed dominantly of palygorskite (a chain-lattice clay mineral), a calcite-rich carbonate mud, and quartz sands (Table 2). Palygorskite is also a common component of Arcadia deposits (Scott, 1988). The basal sections of this unit often contain fragments of limestone, presumably from the underlying surface. Age dates are inconsistent, ranging from mid Miocene to late Pleistocene (Table 1). The blue-gray clay facies is interpreted to be a weathering residuum of the underlying limestone mixed with carbonate muds and quartz sands from overlying (younger) deposits. Overlying the blue-gray clay is the **lime mud facies**. The contact between the two is generally sharp and well defined, but may occasionally be indistinct. The lime mud facies consists of a white to tan fluidized mud frequently containing unfragmented mollusc shells, many of which are articulated and pristine. The dominant species is *Chione cancellata,* a shallow-marine to lagoonal bivalve commonly found in Neogene and Quaternary coastal deposits of the Gulf of Mexico and Caribbean Sea (Parker, 1960). The depositional environment is still in question but both C-14 and strontium isotope age data indicate that deposition occurred during the mid to late Pleistocene (Table 1).

Stratigraphically, but unconformably overlying the lime mud facies are units deposited during the Holocene rise in sea level. Based upon sedimentary characteristics, these transgressive facies have been interpreted as representing paralic and open marine environments. Paralic units consist of the **olive-gray mud facies,** the **organic-rich sand facies,** and the **burrowed sand facies.** All contain at least 20% mud-sized material and, in addition to other characteristics (Table 2), are interpreted to have been deposited in low-energy environments. Frequently overlying these units is a distinct contact interpreted as a ravinement surface that was formed by shoreface erosion during the landward migration of the coastline. Although this ravinement surface is not always present, underlying paralic units may be interpreted as back barrier deposits. The organic-rich sand and burrowed sand facies are sedimentologically similar to many deposits of modern back barrier environments. The olive-gray mud facies, while similar to some back barrier deposits, exhibits a texture and general appearance similar to that of some modern Tampa Bay sediments (Brooks and Doyle, 1998), and therefore, could represent ancient estuarine deposits. Preliminary results of micropaleontological analyses show foraminiferal populations dominated by Miliolids, *Elphidium,* and *Archaias* (Hill, In Prep.). The Miliolids and *Elphidium* are diagnostic of coastal lagoons, bays and estuaries. *Archaias* is not restricted to these environments, but can be found in shallow, low energy, open marine settings as well (Poag, 1981).

Overlying the ravinement surface is a coarse shell hash interpreted to represent initial shoreface deposition following erosion. This coarse shell layer is generally no more than a few 10's of cm thick. It fines and grades upward into open-marine sediments interpreted to have been deposited under modern conditions.

Open marine deposits consist of relatively clean quartz sands (quartz sand facies), shelly sands dominated by a molluscan shell hash (shelly sand facies), or black sands (black sand facies) consisting of phosphorite particles with blackened carbonate and quartz grains. The **quartz sand facies** contains relatively clean, well-sorted, quartz sands with carbonate contents ranging from less than 5% to 40%. When present, the quartz sand facies occupies the surficial portion of deposits, and is commonly concentrated in shore-oblique or shore-normal sand ridges (Harrison, 1996; Gelfenbaum and Brooks, 1997; Edwards, et al, 1998). The **shelly sand facies**

Table 1. Age dates for selected core samples.

Core	Depth down Core (cm)	Depth Below Present Sea Level (m)	Facies	Material Dated	Dating Technique	Date (ybp) *
WF-93-13	157 - 184	5.98 - 6.25	Organic Rich Sand	Bulk sediment	C^{14} Standard	> 34,920
COE-94-6(2)	380	9.59	Organic Rich Sand	Bulk sediment	C^{14} Standard	7790 +/- 90
COE-94-16	205 - 229	6.93 - 7.17	Organic Rich Sand	Bulk sediment	C^{14} Standard	5930 +/- 90
COE-94-18(2)	254	8.26	Lime Mud	*Chione cancellata*	C^{14} AMS	44210 +/- 1100
COE-94-18(2)	266 - 272	7.23 - 7.29	Lime Mud	Bulk sediment	C^{14} Standard	27350 +/- 350
COE-94-18(2)	266 - 272	7.23 - 7.29	Lime Mud	Bulk sediment	Strontium Isotope	1 mil (0.709126 $Sr^{87}/_{86}$ ratio)
IRB-95-2	280 - 300	8.29 - 8.49	Organic Rich Sand	Bulk sediment	C^{14} Standard	5900 +/- 150
USGS-95-19	240 - 245	10.02 - 10.07	Blue-Gray Clay	Bulk sediment	C^{14} Standard	19150 +/- 420
USGS-95-19	240 - 245	10.02 - 10.07	Blue-Gray Clay	Bulk sediment	Strontium Isotope	12.2 mil (0.708833 $Sr^{87}/_{86}$ ratio)
USGS-95-24	220 - 260	11.65 - 12.05	Olive-Gray Mud	Bulk sediment	C^{14} Standard	6970 +/- 60
USGS-95-24	234 - 260	11.79 - 12.05	Olive-Gray Mud	Bulk sediment	C^{14} Standard	7050 +/- 60
USGS-95-38	225	12.92	Burrowed Sand	*Acteocina bidentata*	C^{14} AMS	5330 +/- 60
USGS-95-39	240 - 245	7.58 - 7.63	Blue-Gray Clay	Bulk sediment	C^{14} AMS	12170 +/- 60
USGS-95-39	240 - 245	7.58 - 7.63	Blue-Gray Clay	Bulk sediment	Strontium Isotope	Modern (0.709204 $Sr^{87}/_{86}$ ratio)
USGS-95-43	222	15.94	Burrowed Sand	Mollusk shell(s)	C^{14} Standard	8300 +/- 90
USGS-95-47	274	6.4	Lime Mud	*Acteocina bidentata*	C^{14} AMS	36440 +/- 410
USGS-95-47	309 - 417	6.75 - 7.83	Lime Mud	Bulk sediment	C^{14} Standard	30090 +/- 610
USGS-95-47	230	5.98	Burrowed Sand	Bulk sediment	C^{14} Standard	5800 +/- 120
USGS-95-47	309 - 314	6.75 - 6.60	Lime Mud	Bulk sediment	Strontium Isotope	1.1 mil (0.709116 $Sr^{87}/_{86}$ ratio)
USGS-95-47	331	6.97	Lime Mud	Bulk sediment	Strontium Isotope	1 mil (0.709129 $Sr^{87}/_{86}$ ratio)
USGS-95-48	355	13.3	Olive-Gray Mud	*Chione cancellata*	C^{14} AMS	7050 +/- 80
USGS-95-48	330 - 390	13.05 - 13.65	Olive-Gray Mud	Bulk sediment	C^{14} Standard	7250 +/- 80
USGS-95-49	128	15.61	Black Sand	Mollusk shell(s)	C^{14} Standard	640 +/- 60
USGS-95-106	86	9.7	Lime Mud	*Oliva sayana*	C^{14} AMS	36920 +/- 490

* C^{14} dates are reported as radio carbon years before present. Although some of the younger samples could be corrected to calendar years, conversions have not been made in order to maintain consistency. Reservoir corrections have also not been applied. This may result in errors of several hundred years, which is considered irrelevant to this study.

Table 2. Sedimentological data and distinguishing characteristics of the nine sedimentary facies on the west-central Florida inner continental shelf.

Facies	% $CaCO_3$	% TOC	% Arag	% Calcite	% HMC	% Gravel	% Sand	% Mud	% Black	% Burrow	Distinguishing Characteristics
Quartz Sand											Tan color; generally <30% CO_3, >80% sand,
Average	27	1	72	23	5	3	87	10	2	3	<5% black grains.
Range	1 - 91	0 - 12	0 - 83	7 - 100	0 - 67	0 - 54	32 - 100	0 - 28	0 - 60	0 - 20	
Shelly Sand											Tan to gray color; generally >50% CO_3, >45% arag,
Average	51	2	48	41	11	22	67	12	15	3	>20% grav, <15% black grains.
Range	1 - 92	0 - 8	2 - 87	11 - 94	0 - 35	0 - 60	3 - 97	0 - 88	1 - 60	0 - 30	
Black Sand											Dark gray color, generally >20% black grains,
Average	48	2	60	20	20	7	82	11	24	6	>60% sand, <50% CO_3.
Range	10 - 82	0 - 7	28 - 91	3 - 57	3 - 37	0 - 52	0 - 99	1 - 100	15 - 60	0 - 25	
Burrowed Sand											Relatively clean quartz sand with mud -
Average	19	2	61	30	9	5	79	17	2	27	filled burrows; generally >25% burrows,
Range	1 - 83	0 - 8	0 - 100	0 - 100	0 - 27	0 - 45	41 - 99	3 - 55	1 - 20	0 - 75	>15% mud, >2% TOC; Holocene in age.
Organic Sand											Dark brown-black color; generally >5% TOC,
Average	12	6	55	19	26	1	76	23	1	0	>20% mud.
Range	2 - 67	.1 - 20	0 - 55	19 - 95	0 - 50	0 - 21	20 - 92	2 - 80	1	0	
Olive Gray Mud											Dark green to gray in color; generally >50% HMC,
Average	40	5	13	2	85	2	43	55	1	12	>50% mud; Holocene in age.
Range	13 - 71	1 - 11	0 - 39	0 - 6	55 - 100	0 - 19	1 - 91	6 - 99	0 - 2	0 - 35	
Lime Mud											White fluidized mud, commonly contains unfrag. shells
Average	62	2	50	48	2	30	53	17	1	6	of the mollusk *Chione cancellata; generally* > 45%
Range	43 - 79	0 - 4	0 - 84	16 - 100	0 - 19	9 - 64	23 - 77	6 - 47	1 - 5	0 - 30	calcite, >60% CO_3, >15% mud; Pleistocene in age.
Blue Gray Clay											Blue-gray color, highly compacted, often contains
Average	32	3	4	92	4	6	49	45	1	17	CO_3 clasts in basal portion; generally >90% calcite,
Range	8 - 68	1 - 8	0 - 48	44 - 100	0 - 57	0 - 32	16 - 85	12 - 67	1 - 3	0 - 50	>40% mud; Miocene in age.
Carbonate Lithoclasts											Gravel-sized limestone fragments with minor
Average	----	----	----	----	----	N/A	----	----	----	----	amount of blue-gray clay and/or black grains;
Range	----	----	----	----	----	N/A	----	----	----	----	Miocene in age.

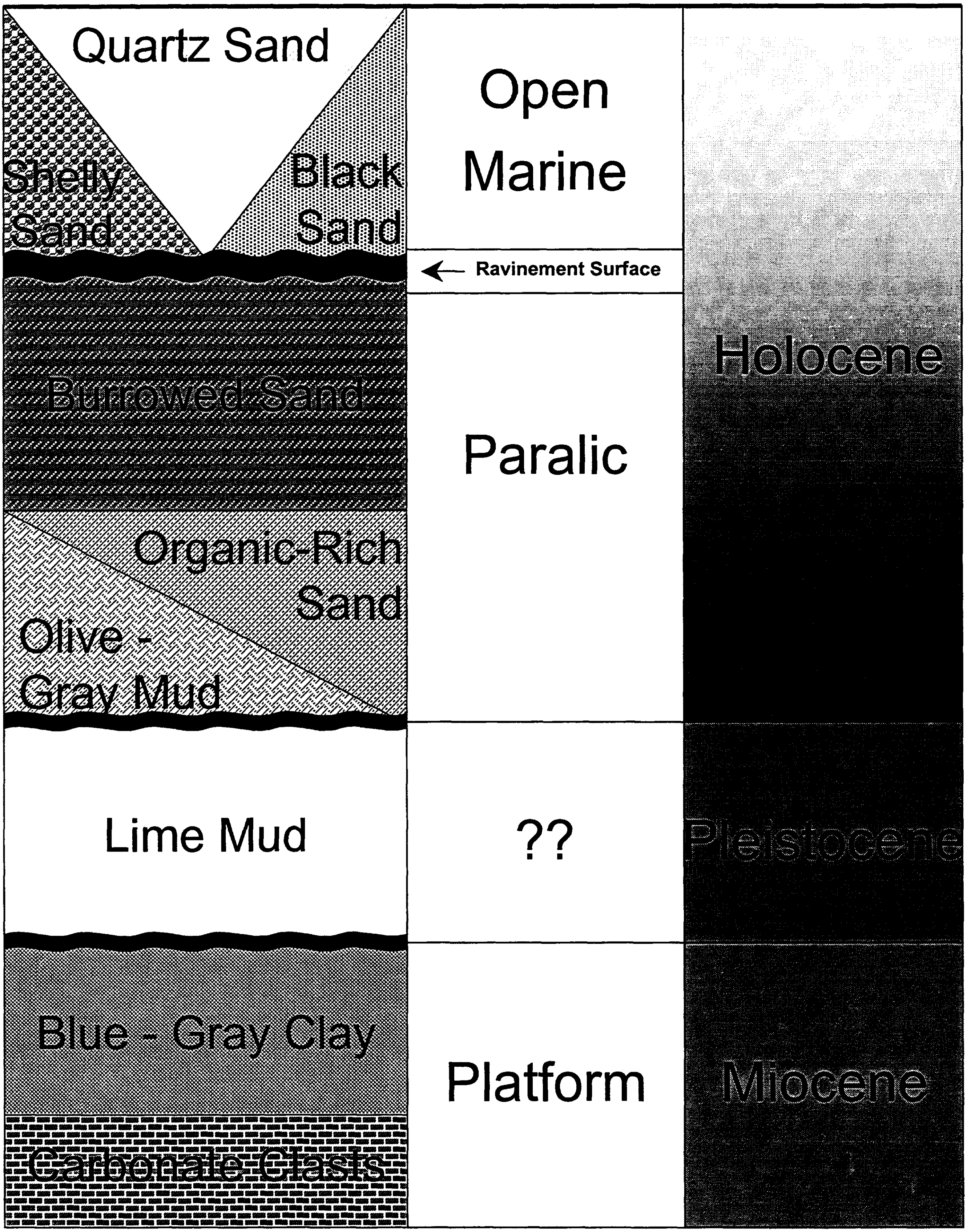

Fig. 2. Idealized facies succession of the unconsolidated sediment veneer on the west-central Florida inner continental shelf.

consists of a molluscan shell hash with greater than 40% calcium carbonate. The grain size is in the coarse sand to granule size range and carbonate contents often exceed 80%. The **black sand facies** consists of greater than 15% (generally >20%) blackened grains. Blackened grains are composed of phosphorite (francolite) particles, blackened shells and blackened quartz grains. Berman (1998) used Sr-isotope data to determined a mid Miocene age for the phosphorite fraction. In addition, the size and shape of phosphorite grains is very similar to those in the underlying Arcadia Formation (Berman, 1998). The non-blackened fraction consists of a combination of quartz sand and shell material and is similar in texture and appearance to the quartz sand facies and shelly sand facies respectively. A single radiocarbon date on an unidentified gastropod yielded an age of 640 ybp (Table 2), suggesting that at least some of the material is modern. The black sand facies may consist of a mixture of material of different ages. The phosphorite probably eroded out of the underlying platform. The quartz sands and shell fragments could also have eroded out of the underlying platform, but may have been deposited under modern, open-marine conditions as well. It is consistently found as a very thin unit immediately overlying the platform surface (i.e., there are no facies in between). Stratigraphically, however, it represents a surficial unit in the idealized facies succession.

FACIES ASSOCIATIONS

Although all nine facies do not coexist in a single core, four distinct facies associations have been identified. These are designated as: 1) the paralic association; 2) the open marine (quartz-sand dominated) association; 3) the open marine (shelly-sand dominated) association, and; 4) the open marine (black-sand dominated) association (Fig. 3). All associations contain a foundation of pre-Holocene deposits, which will be collectively refered to as "platform" facies. These consist of the carbonate lithoclast, blue-gray clay, and /or lime mud facies. Although the lime mud facies is not technically part of the platform, it is considered as such for these purposes. Platform facies are separated from overlying facies by an unconformable surface probably representing subaerial exposure associated with the most recent sea-level lowstand of approximately 18,000 years ago. Overlying this lowstand unconformity, the variety of facies associations signifies a diversity in sedimentary development throughout the Holocene transgression.

The **paralic association** is composed of the open-marine quartz sand facies at the surface overlying paralic deposits. As previously pointed out, paralic units are frequently overlain by a ravinement surface, and hence, may have been deposited in a back barrier environment. Paralic sediments lie unconformably on pre-Holocene units.

The **open marine (quartz-sand dominated) association** is characterized by the quartz sand facies overlying pre-Holocene facies with no evidence of paralic sediments and no ravinement surface identifiable. The **open marine (shelly-sand dominated) association** consists of the open marine, shelly sand facies lying unconformably on pre-Holocene facies. Once again, no paralic units are evident and no ravinement surface is distinguishable. Surficial sediment cover is characteristically thin (<1 m). The **open marine (black-sand dominated) association** consists of the black sand facies immediately overlying the Miocene platform facies. Once again, there is no preservation of paralic deposits and no distinguishable ravinement surface. Surficial sediment thickness is characteristically extremely thin (<0.5 m).

The distribution of facies associations is shown in Figure 4. The paralic and open marine (quartz-sand dominated) associations exhibit similar distribution patterns. Both are found primarily in the northern half of the study area (immediately west and north of Anna Maria Island). North of the Indian Rocks Headland, they dominate across the entire width of the study area. Between Anna Maria Island and the Indian Rocks Headland, they are found only within approximately 15 km of the shoreline. South of Anna Maria Island they are rare and only exist immediately adjacent to the modern barrier system. Seaward of Egmont Key the dominance of the open marine (quartz-sand dominated) association illustrates the influence of the Tampa Bay ebb tidal delta.

The open marine (black-sand dominated) and (shelly-sand dominated) associations occur primarily in the southern half of the study area and offshore northward to approximately the Indian Rocks Headland. The open marine (shelly-sand

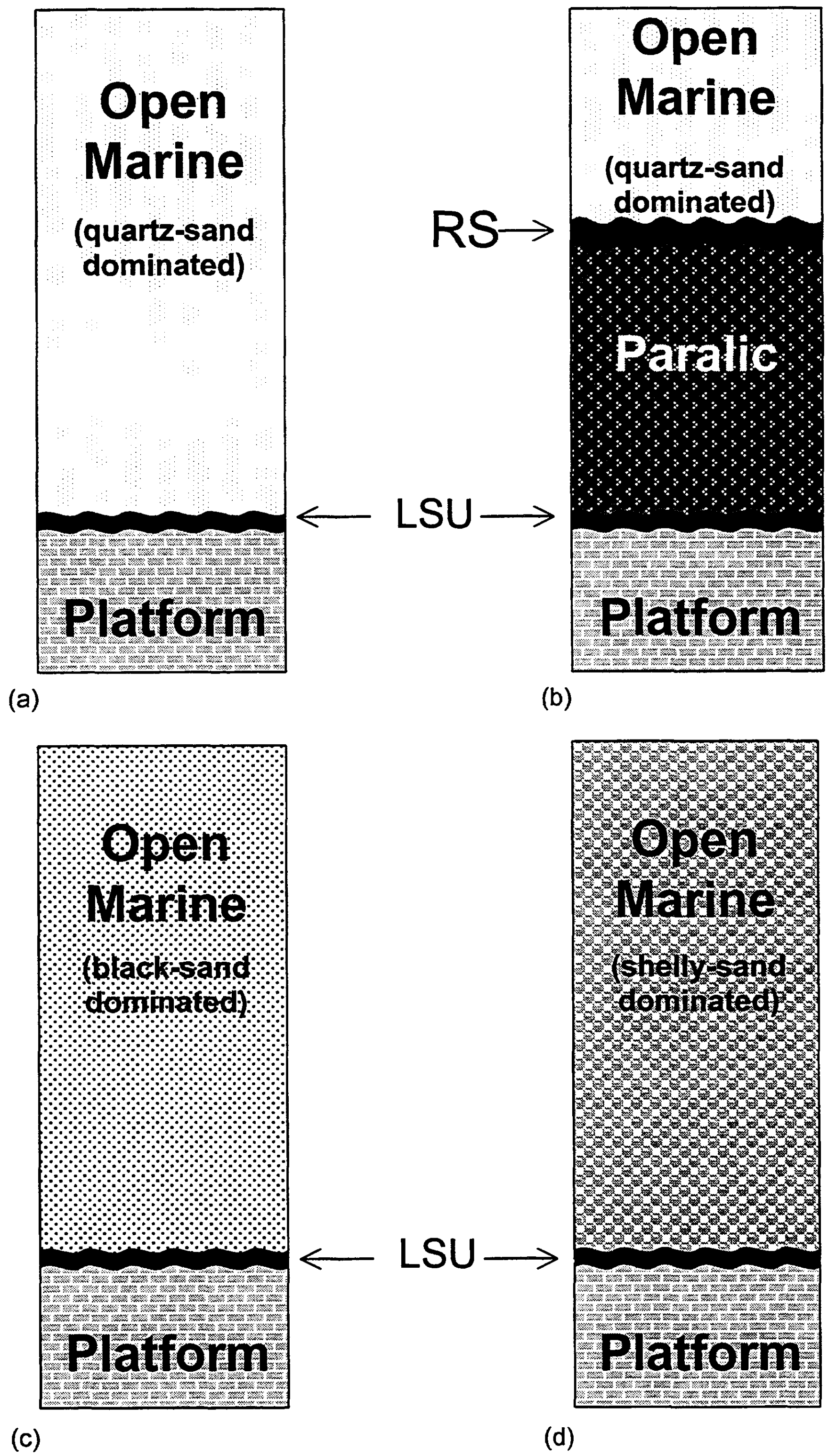

Fig. 3. Facies associations of the unconsolidated sediment veneer.
(a) open marine (quartz-sand dominated) association,
(b) paralic association,
(c) open marine (black-sand dominated) association,
(d) open marine (shelly-sand dominated) association.
RS = ravinement surface LSU = lowstand unconformity

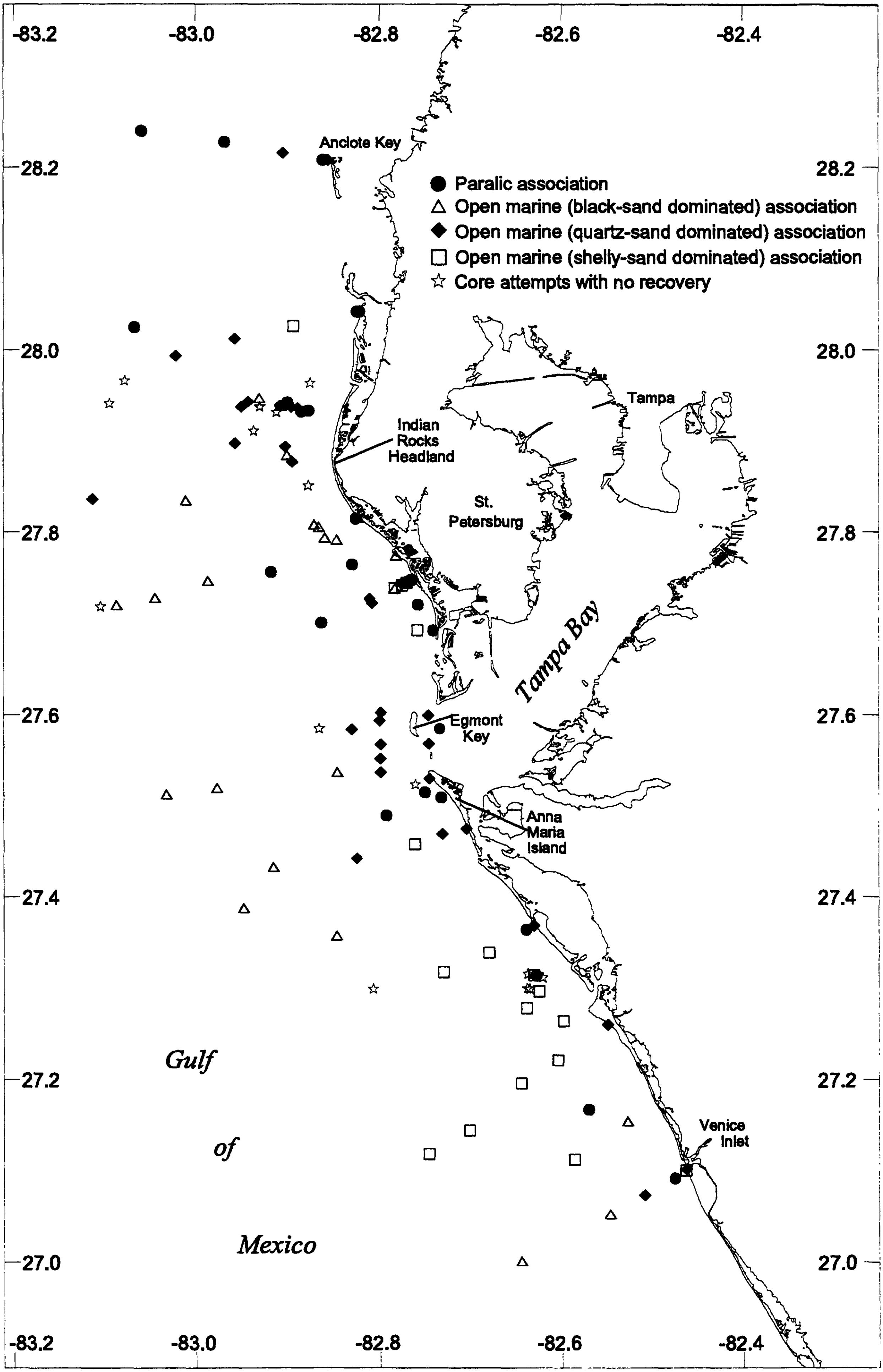

Fig. 4. Distribution of sedimentary facies associations on the west-central Florida inner continental shelf.

dominated) association is the dominant facies association south of Anna Maria Island, occupying essentially the entire inner shelf from the lower shoreface to the seaward extent of the study area. Although the open marine (black-sand dominated) association is found throughout the study area, including the southern regions, it is the dominant association seaward of approximately 10 km in the central portion of the study area. It also occurs in a small band approximately 5 km offshore of the Indian Rocks Headland.

The distribution patterns of facies associations are not random, but differ significantly, primarily between the north and south portions of the study area. A similar pattern has been recognized in the surface sediment distribution (Brooks, et al, 1998). This may simply reflect an inconsistency in preservation potential or may be a result of more fundamental differences. It does imply, however, that the inner west-central Florida continental shelf has undergone a complex evolution throughout the recent geological past.

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APPENDIX 1. Core descriptions for all vibracores collected in the study area.

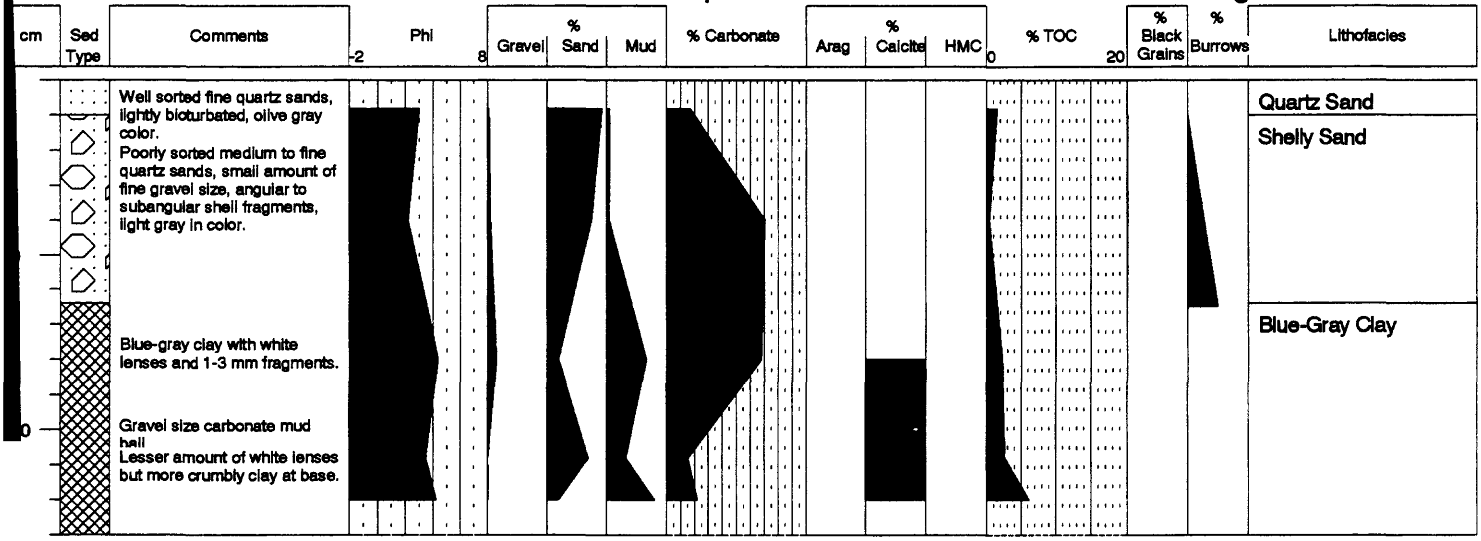
ECKERD COLLEGE

West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: USGS-95-5

Water Depth: 25' Latitude: 28° 01.550' Longitude: 82° 53.616'



A3

USGS

ECKERD COLLEGE

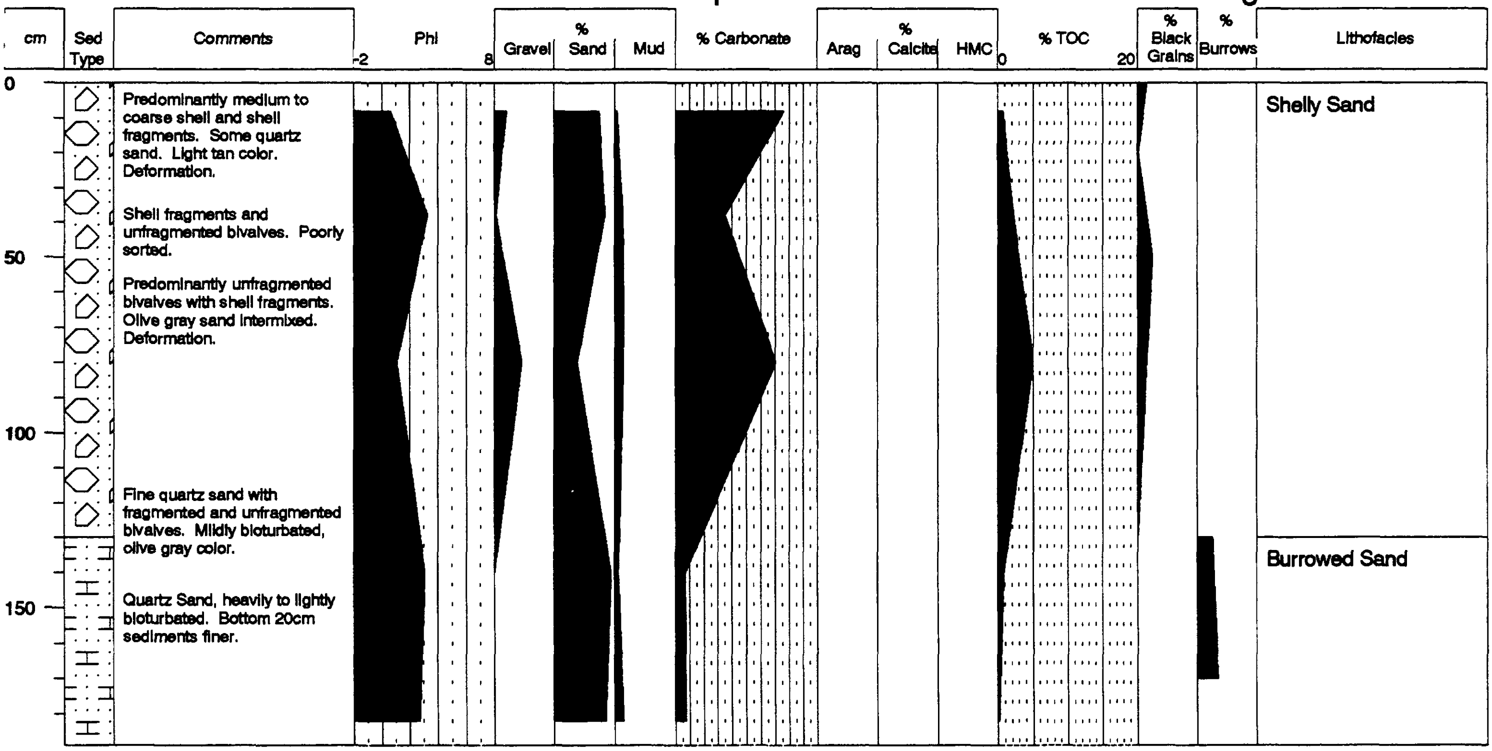
USF

West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: USGS-94-10

Water Depth: 24' Latitude: 27° 45.848' Longitude: 82° 49.807'



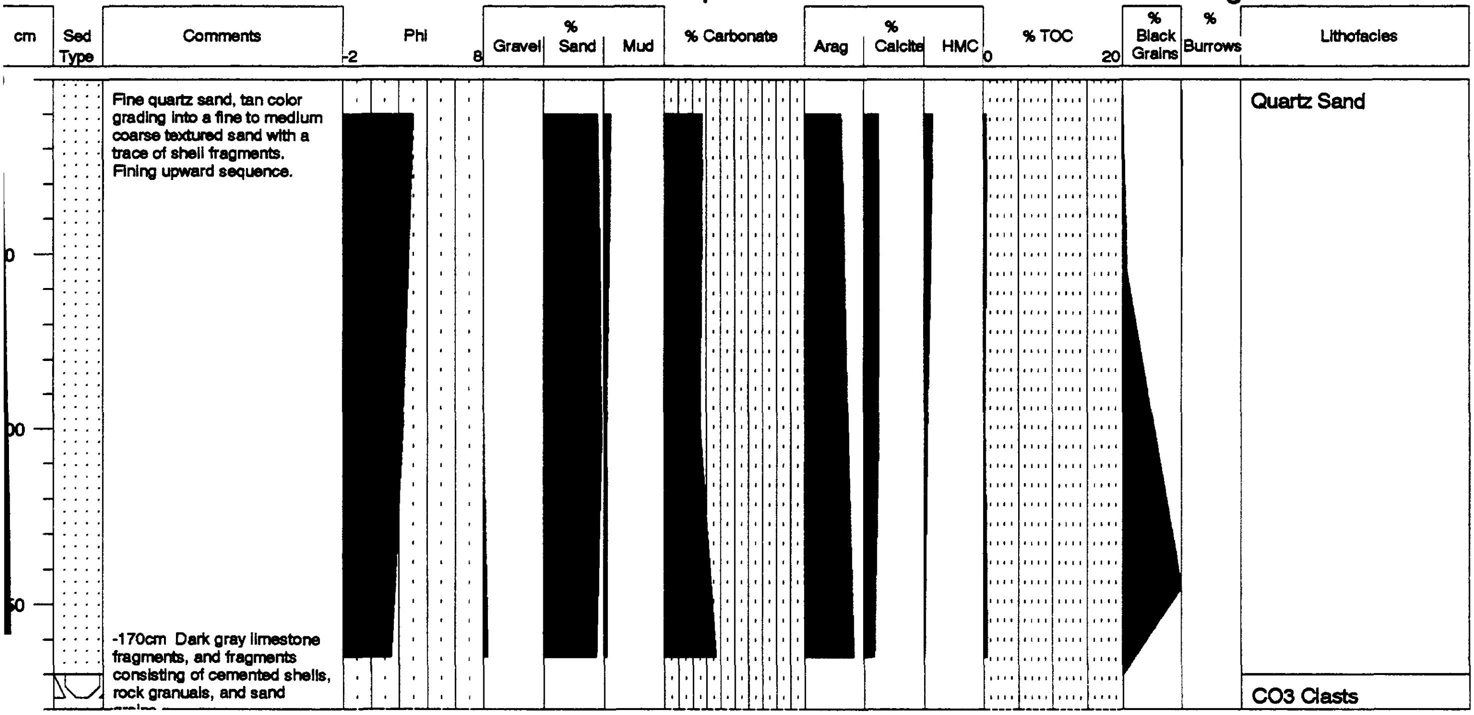
ECKERD COLLEGE

West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: USGS-95-11

Water Depth: 23' Latitude: 27° 43.317' Longitude: 82° 48.495'



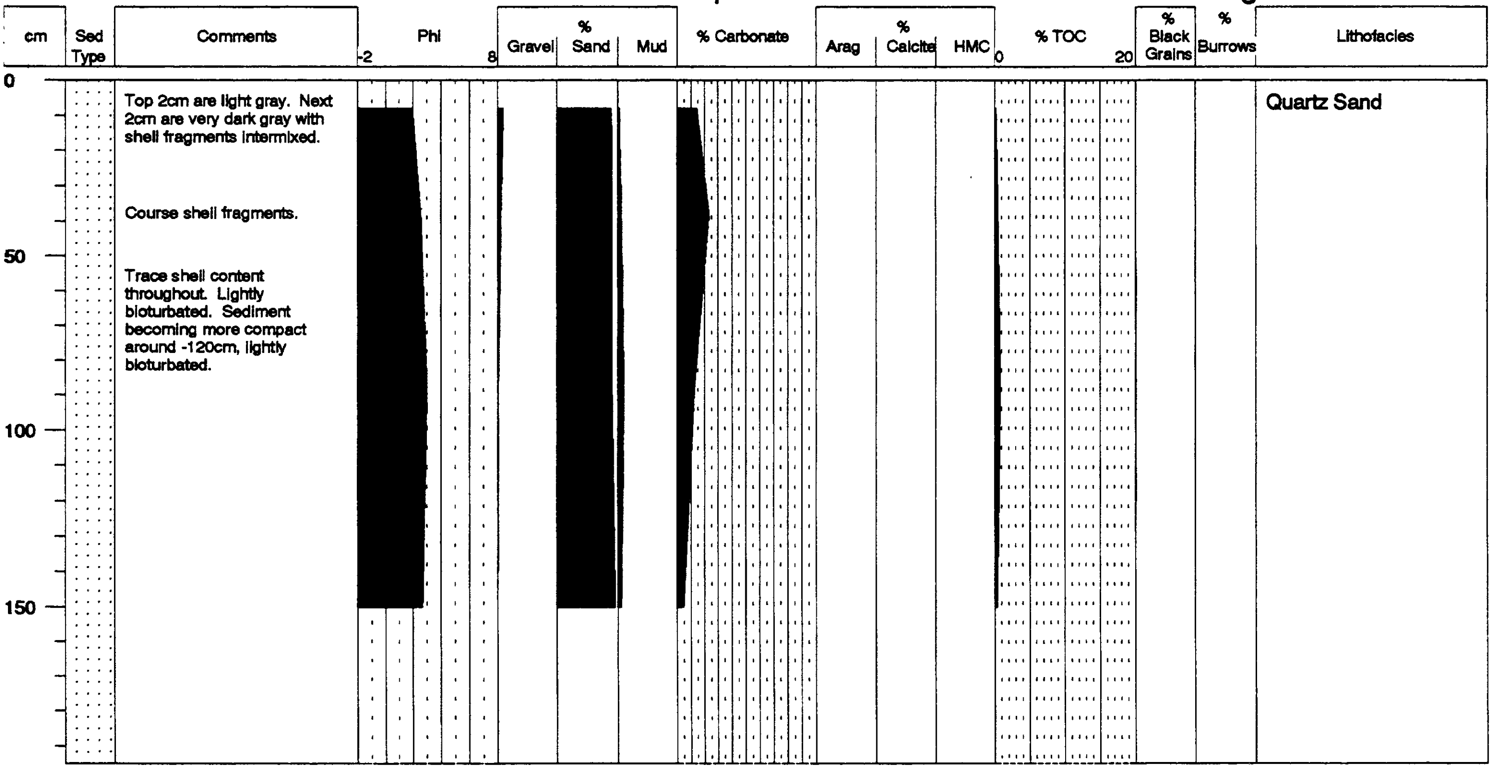
A5

West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: USGS-95-16

Water Depth: 26' Latitude: 27° 28.118' Longitude: 82° 43.888'



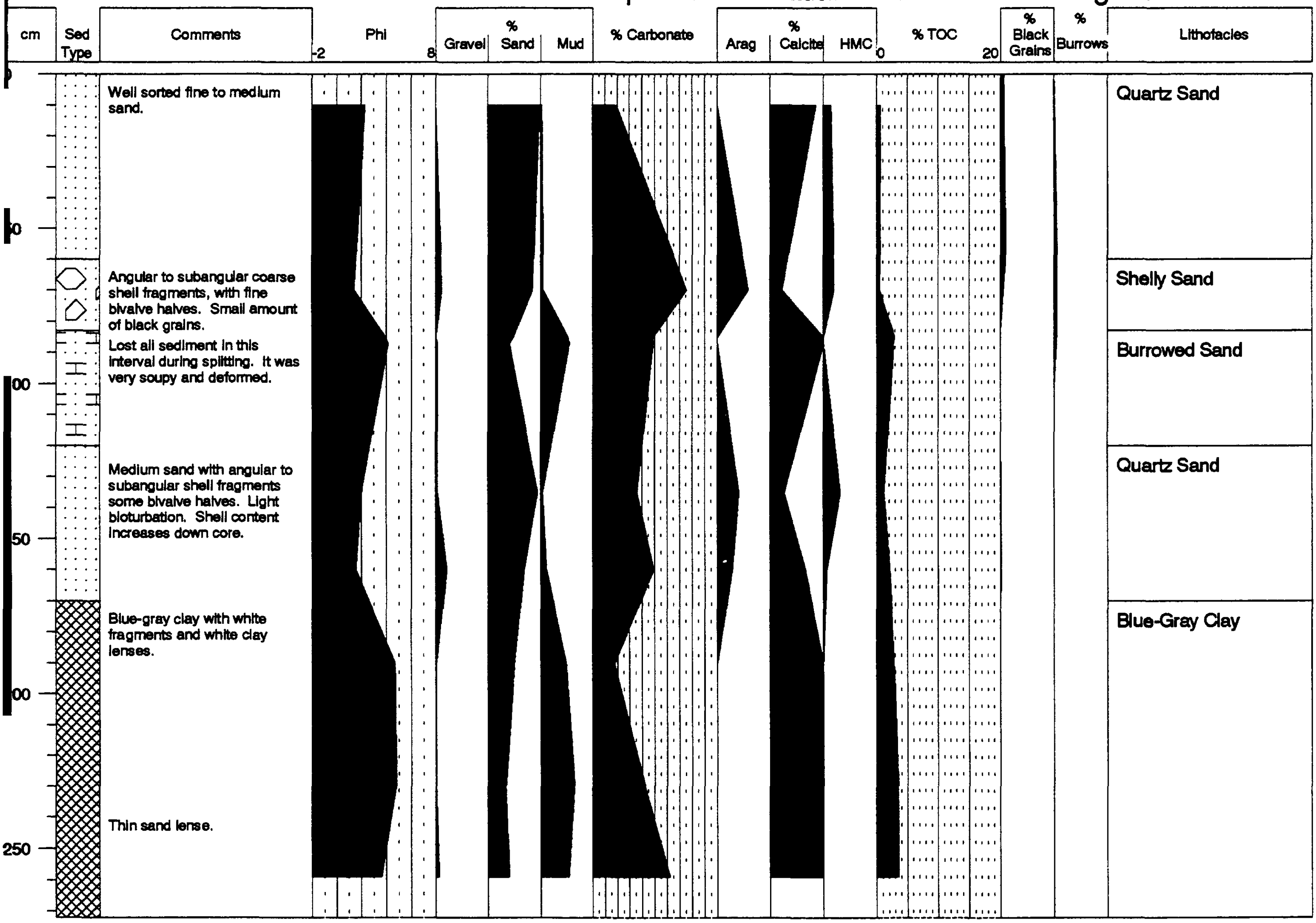
ECKERD COLLEGE

West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: USGS-95-19

Water Depth: 25' Latitude: 28° 13.675' Longitude: 82° 58.068'



A7 USGS

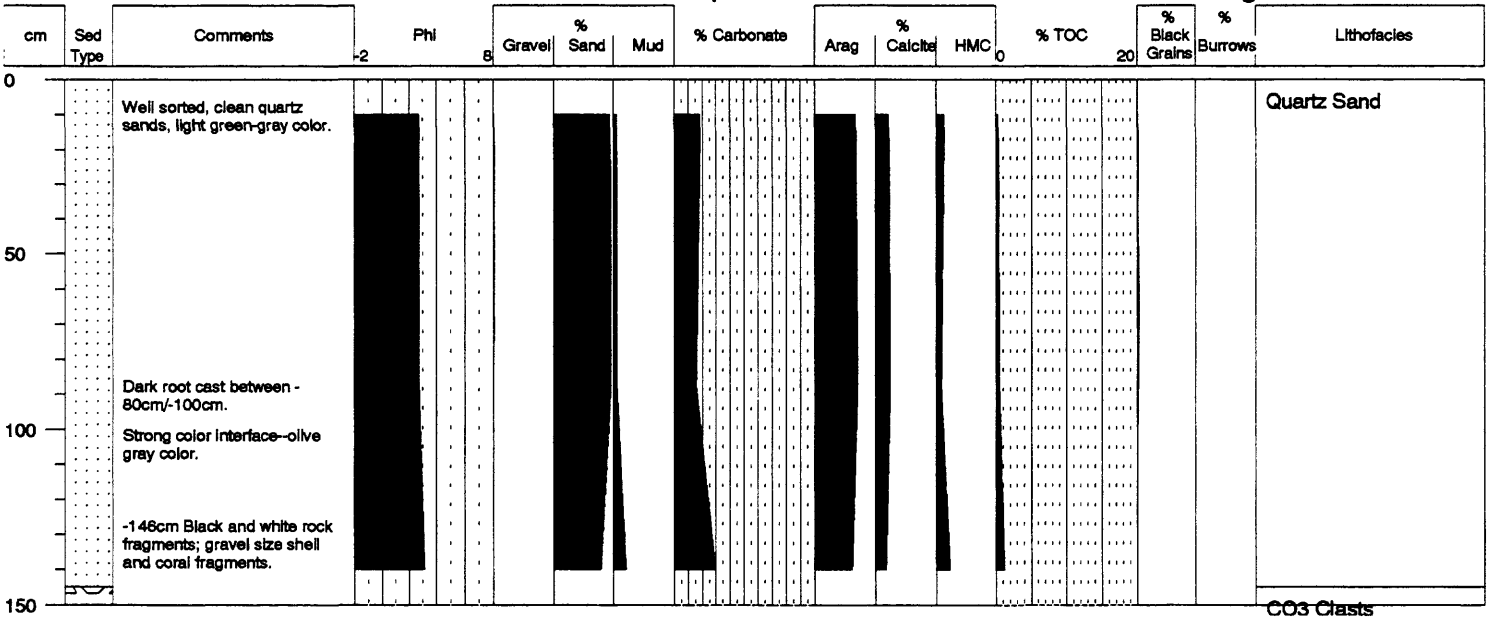
ECKERD COLLEGE USF

West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: USGS-95-21

Water Depth: 32' Latitude: 28° 00.702' Longitude: 82° 57.436'

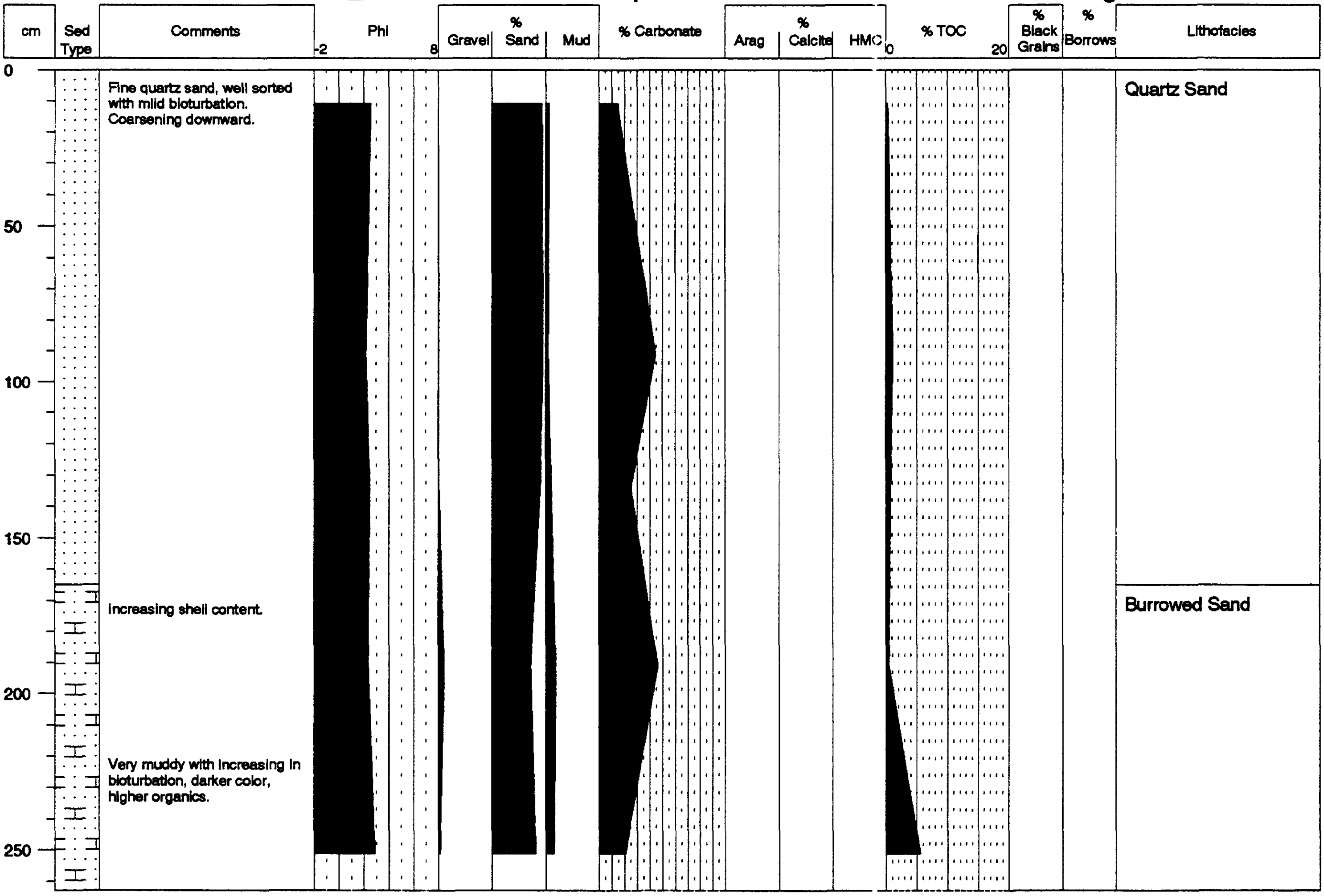


West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: USGS-95-23

Water Depth: 22' Latitude: 27° 48.985' Longitude: 82° 56.136'



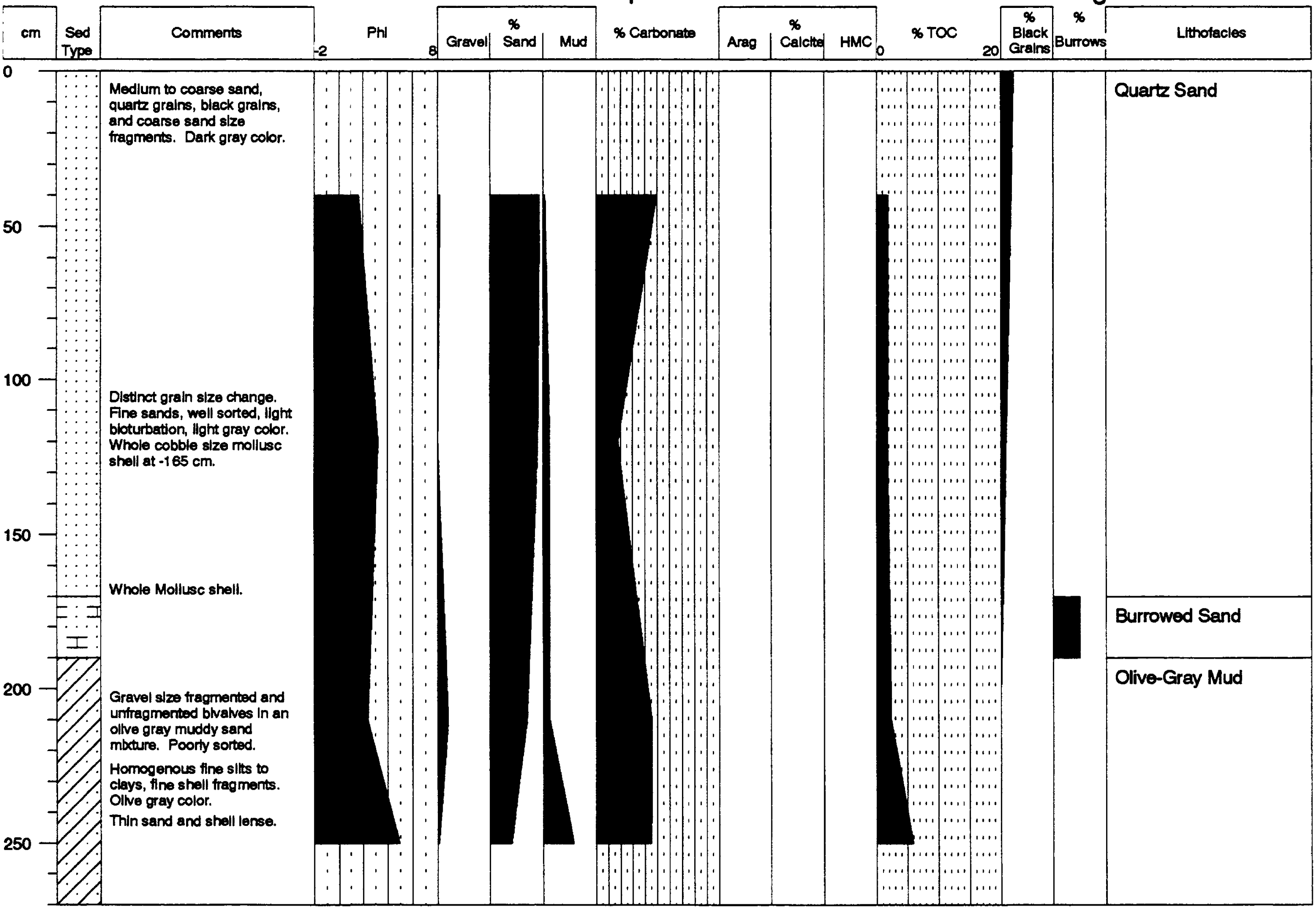
A9

West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: USGS-94-24

Water Depth: 31' Latitude: 82° 55.072' Longitude: 27° 45.365'



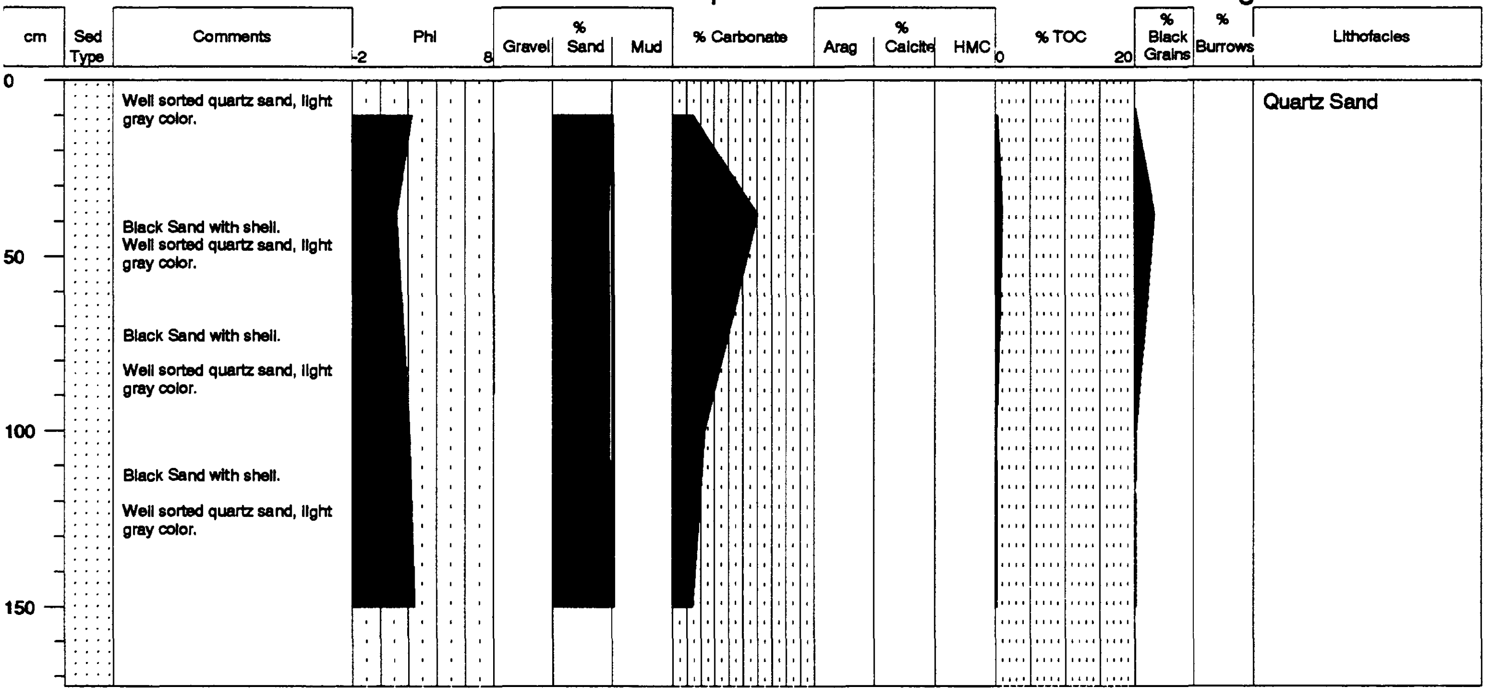
ECKERD COLLEGE

West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: USGS-95-28

Water Depth: 33' Latitude: 27° 26.517' Longitude: 82° 49.498'



USGS

ECKERD COLLEGE

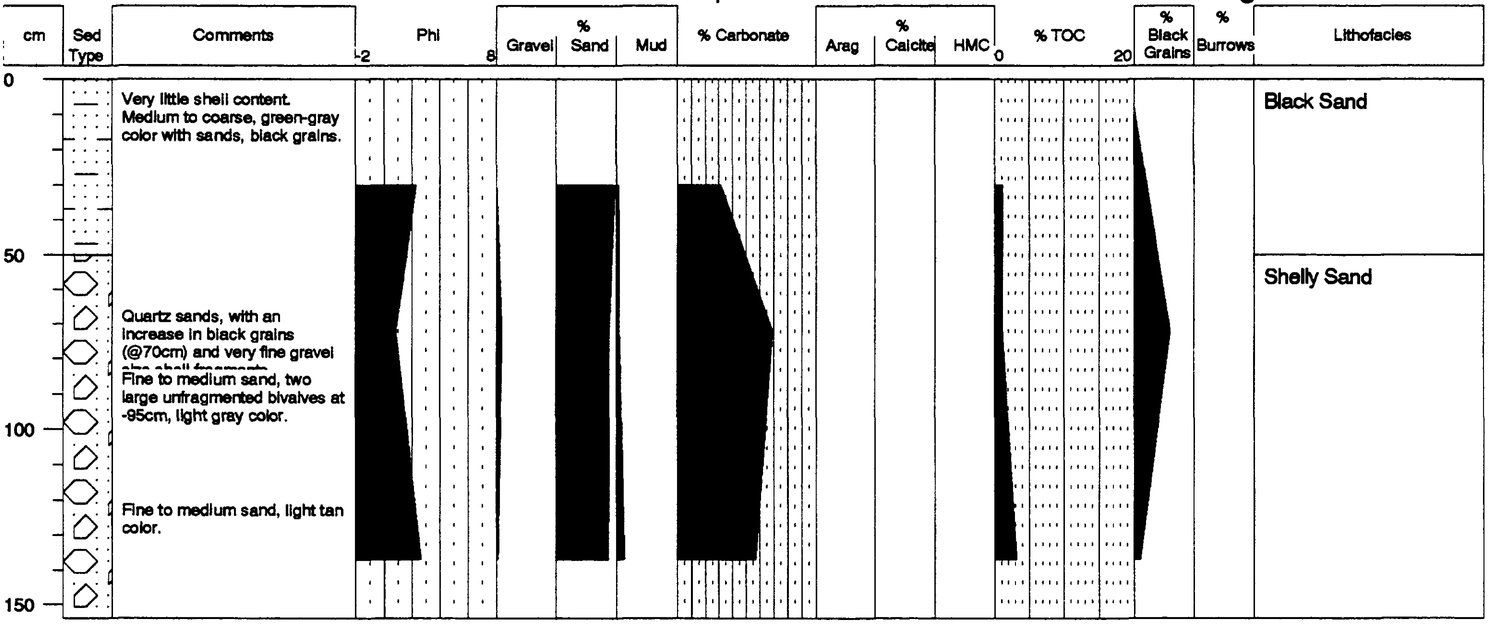
USF

West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: USGS-94-35

Water Depth: 36.5' Latitude: 82° 58.995' Longitude: 27° 44.798'



USGS

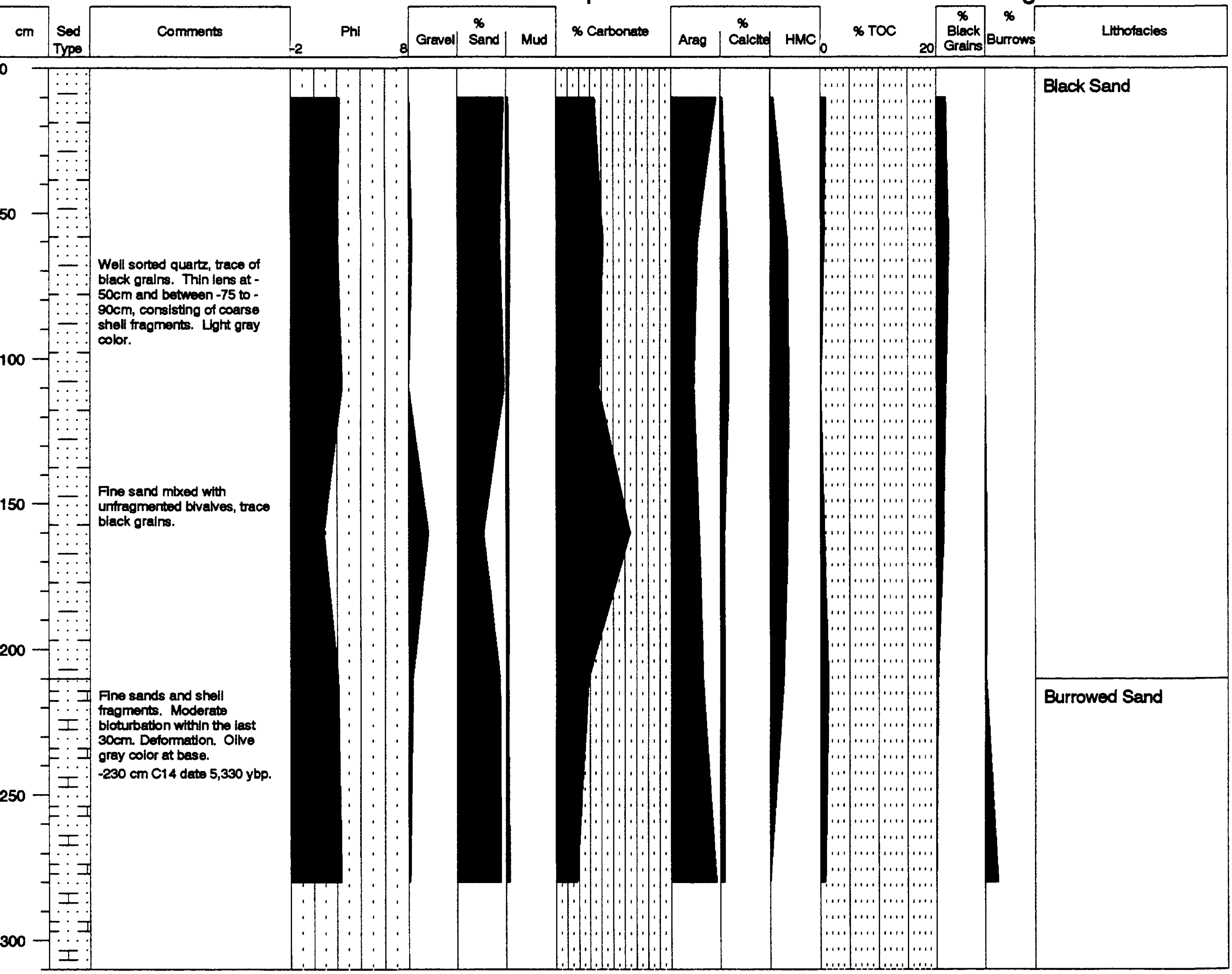
ECKERD COLLEGE USF

West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: USGS-95-38

Water Depth: 35' Latitude: 28° 14.408' Longitude: 83° 03.510'



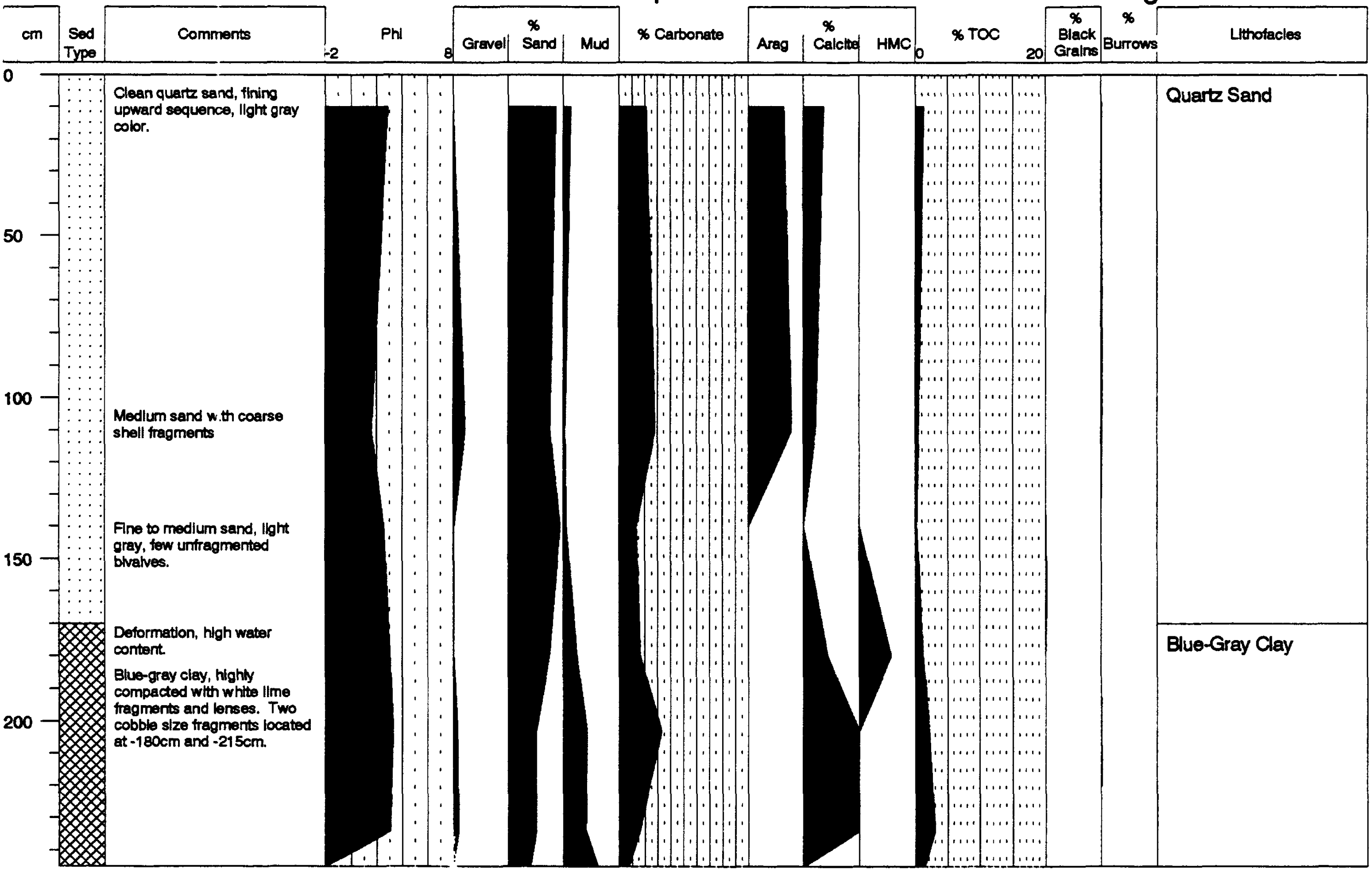
A13

West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: USGS-95-39

Water Depth: 17' Latitude: 28° 12.949' Longitude: 82° 54.285'

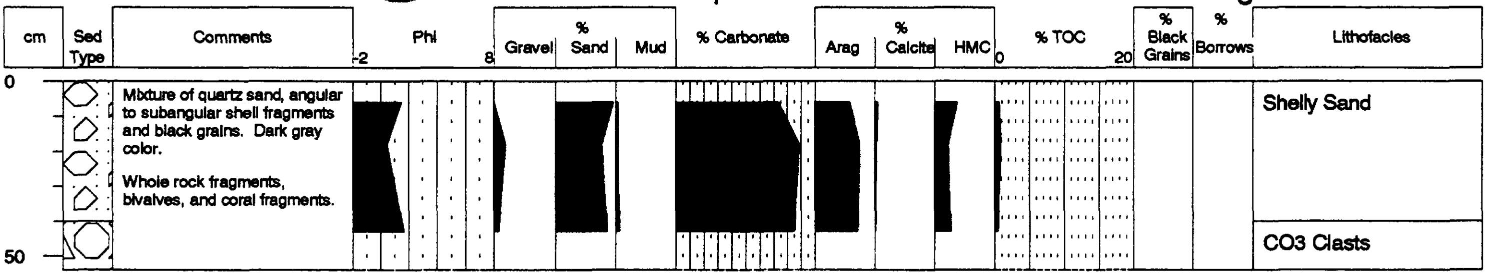


West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: USGS-95-40

Water Depth: 58' Latitude: 28° 09.965' Longitude: 83° 08.748'



A15 USGS

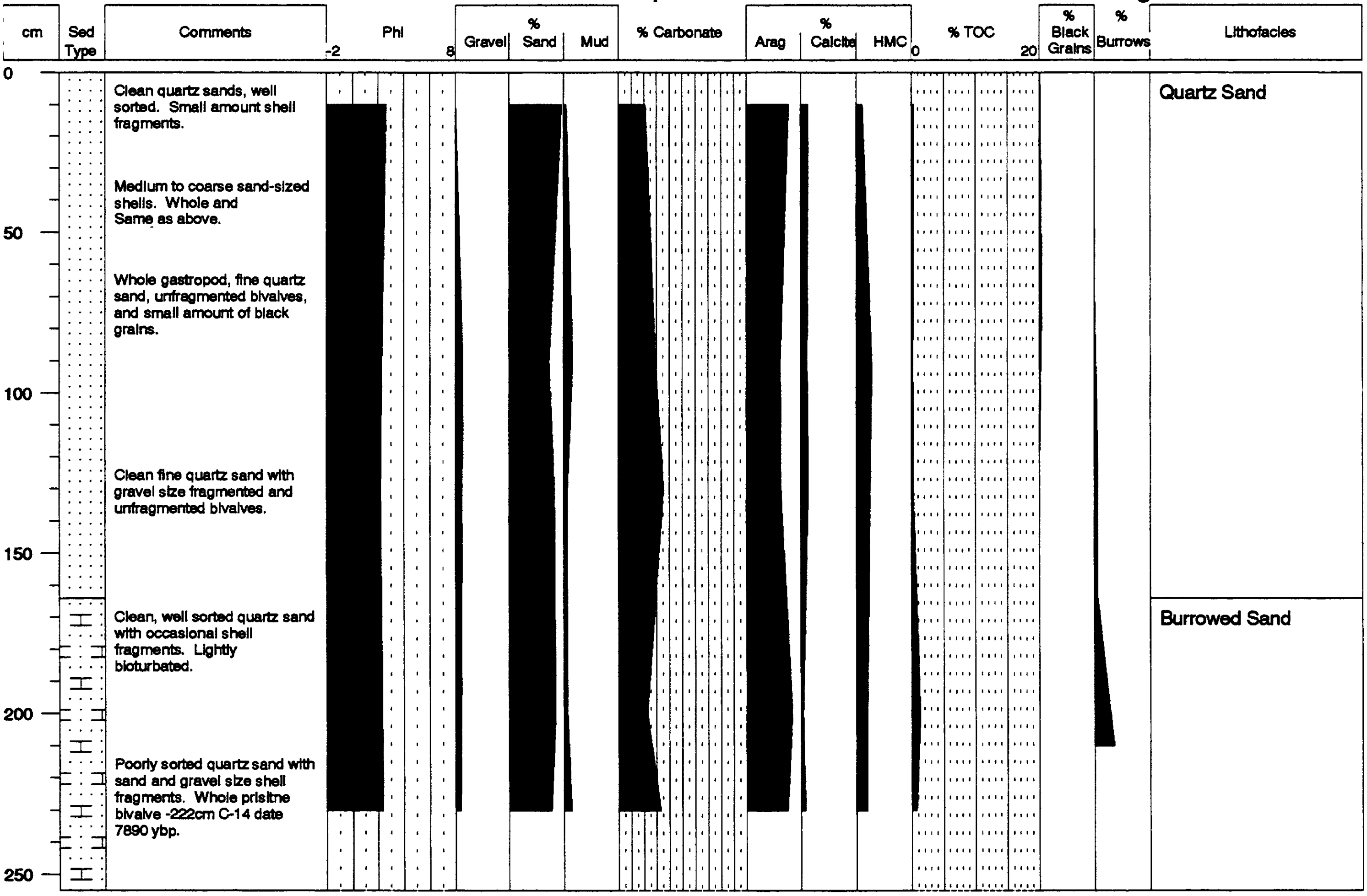
ECKERD COLLEGE USF

West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: USGS-95-43

Water Depth: 45' Latitude: 28° 01.505' Longitude: 83° 03.985'



USGS

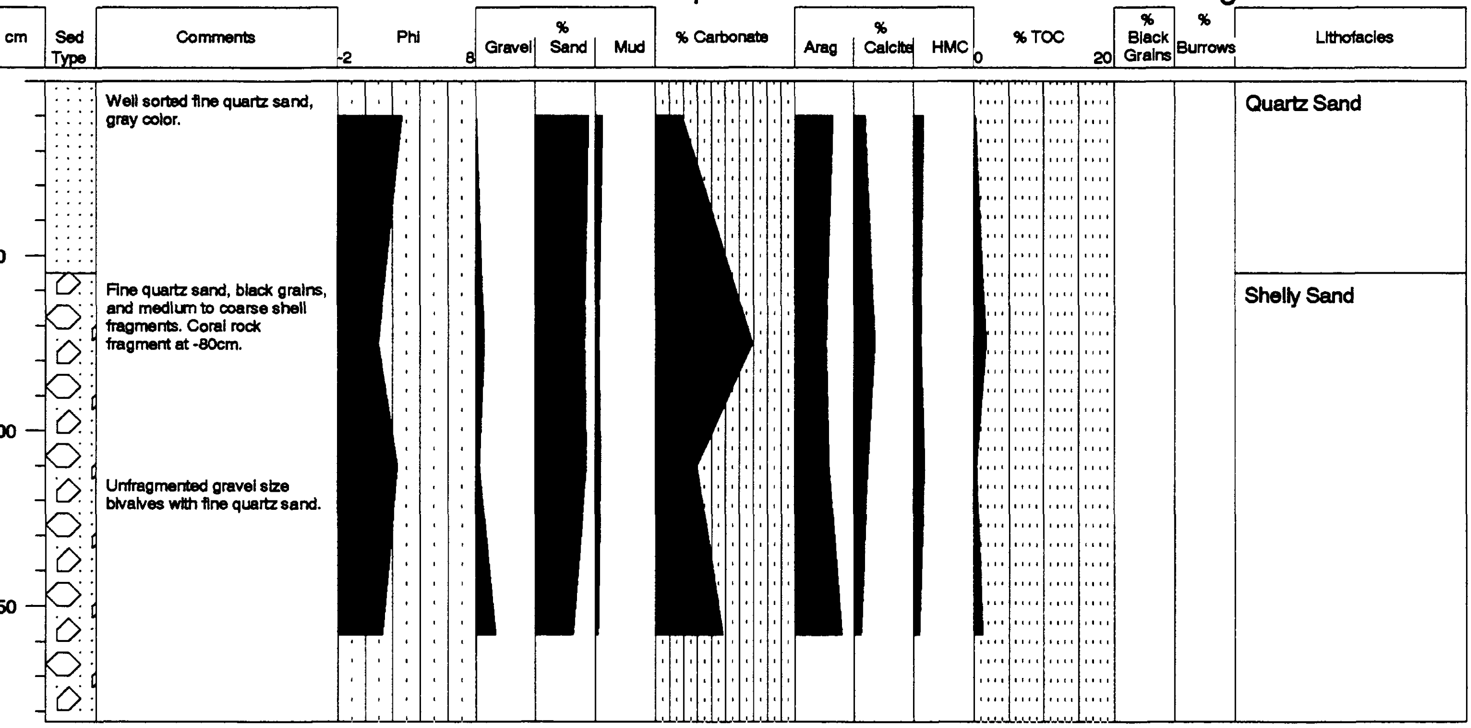
ECKERD COLLEGE USF

West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: USGS-95-44

Water Depth: 41'   Latitude: 27° 59.616' Longitude: 83° 01.269'



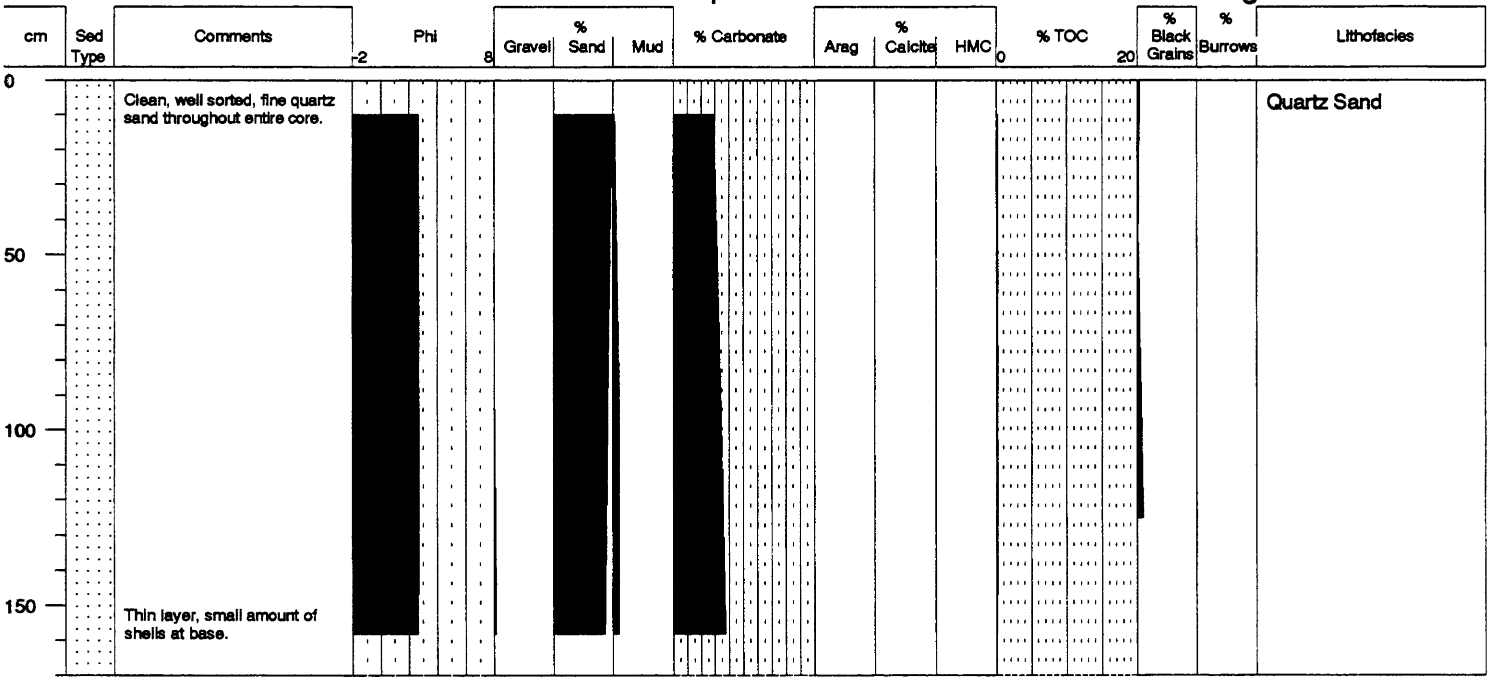
A17

West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: USGS-95-45

Water Depth: 51' Latitude: 27° 50.162' Longitude: 83° 06.743'



USGS

ECKERD COLLEGE

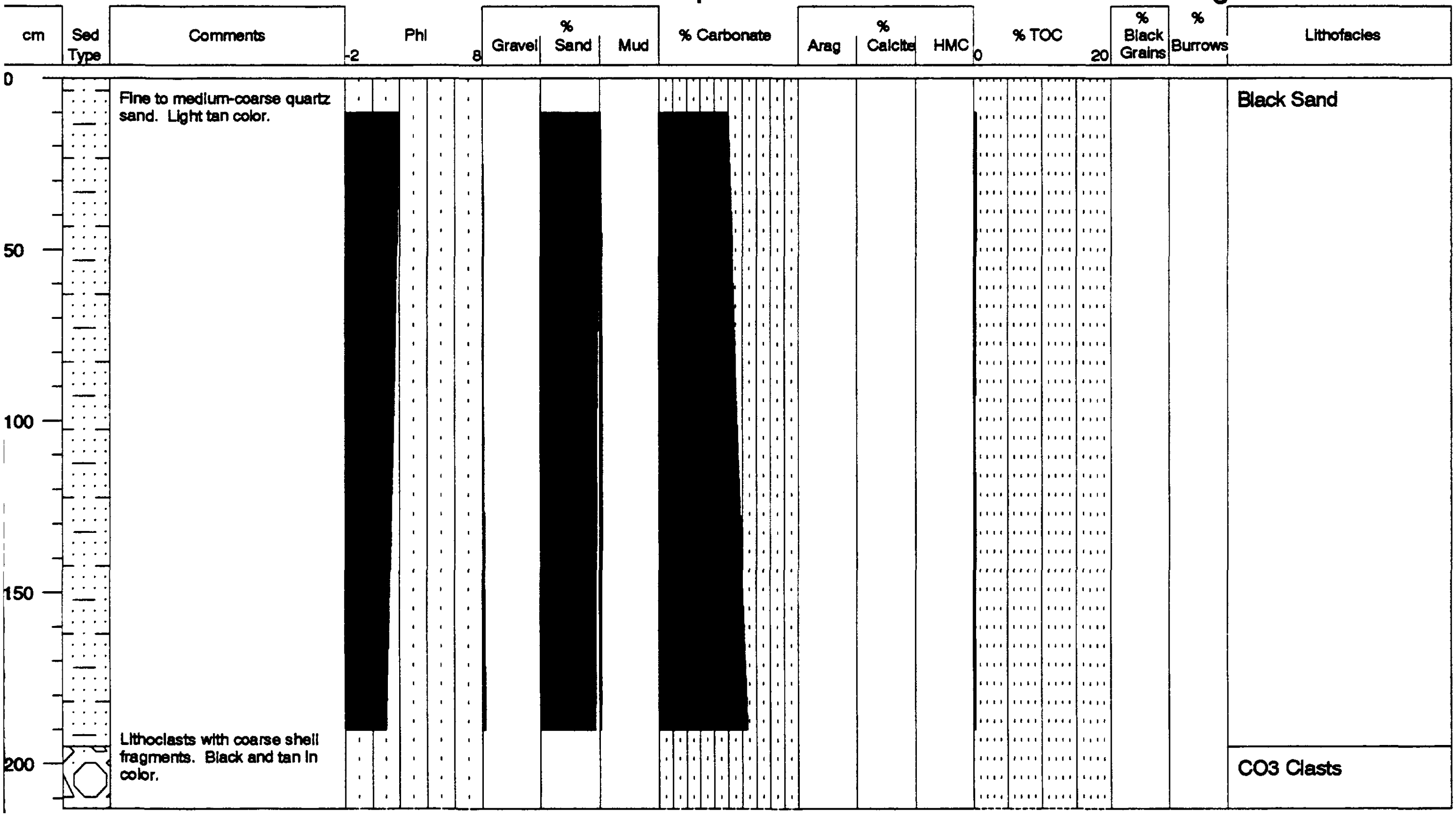
USF

West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: USGS-95-46

Water Depth: 34' Latitude: 27° 50.050' Longitude: 83° 00.613'



A19 USGS

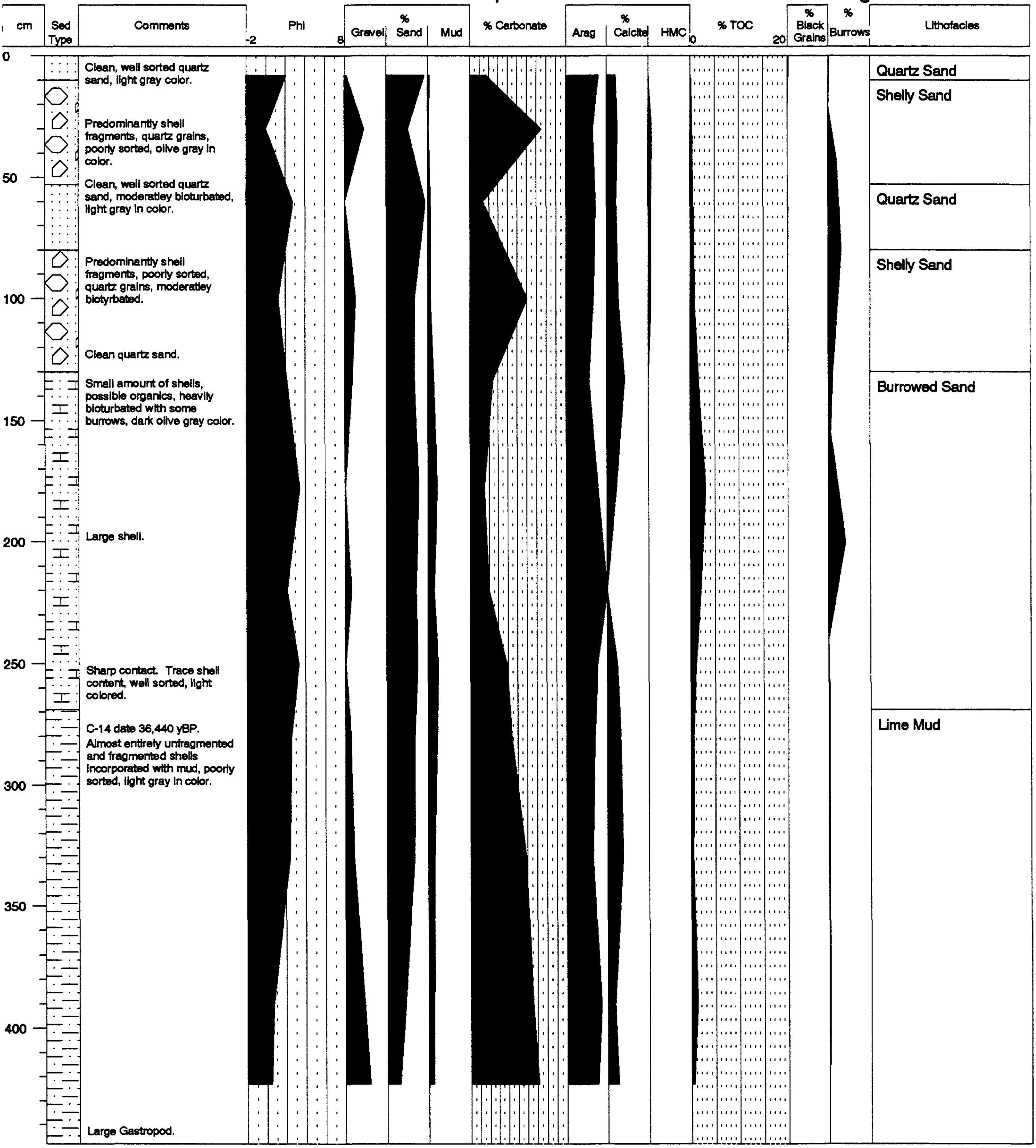
ECKERD COLLEGE USF

West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: USGS-95-47

Water Depth: 12' Latitude: 27° 44.845' Longitude: 82° 45.901'



USGS

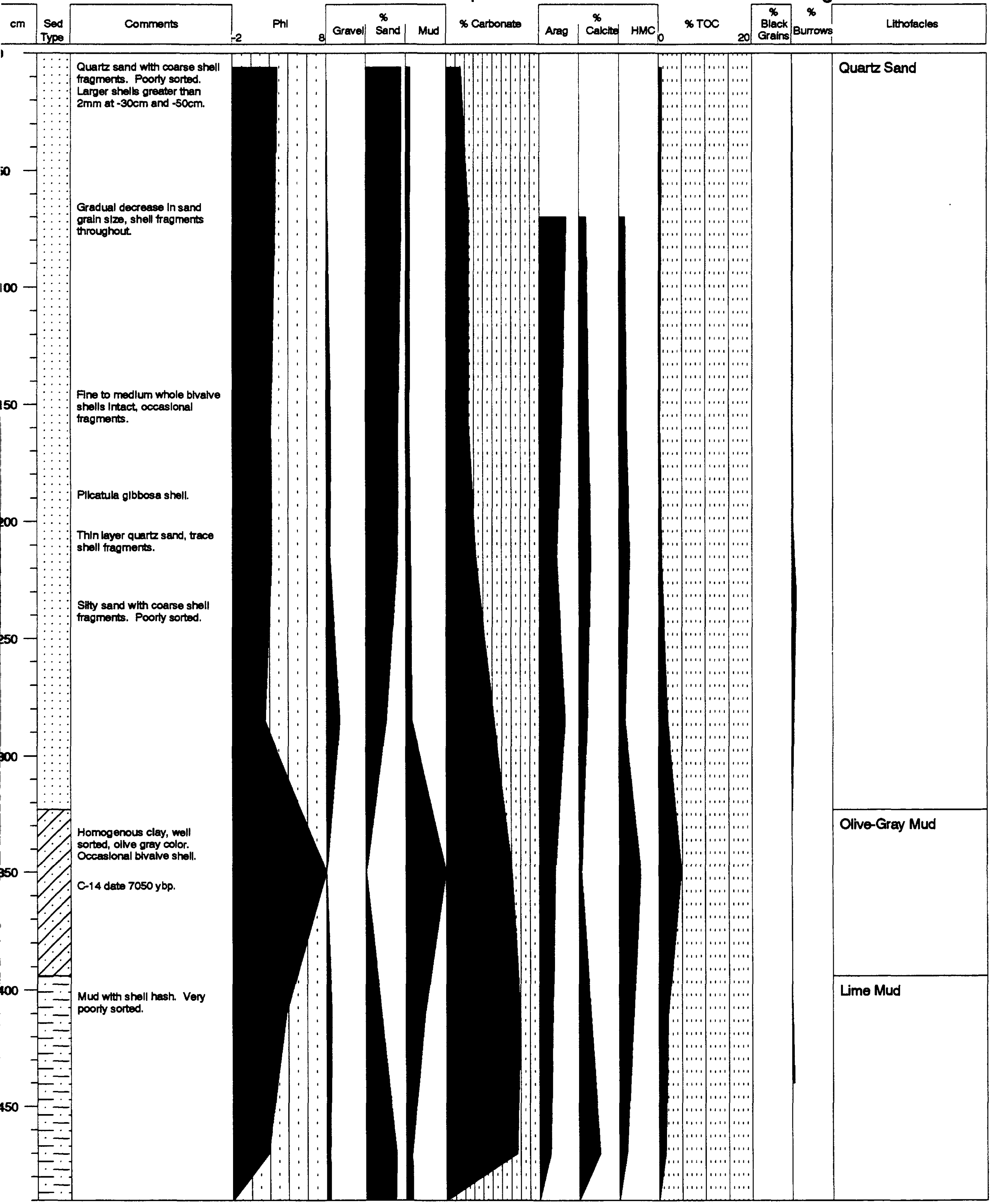
ECKERD COLLEGE USF

West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: USGS-95-48

Water Depth: 32' Latitude: 82° 51.830' Longitude: 27° 42.025'



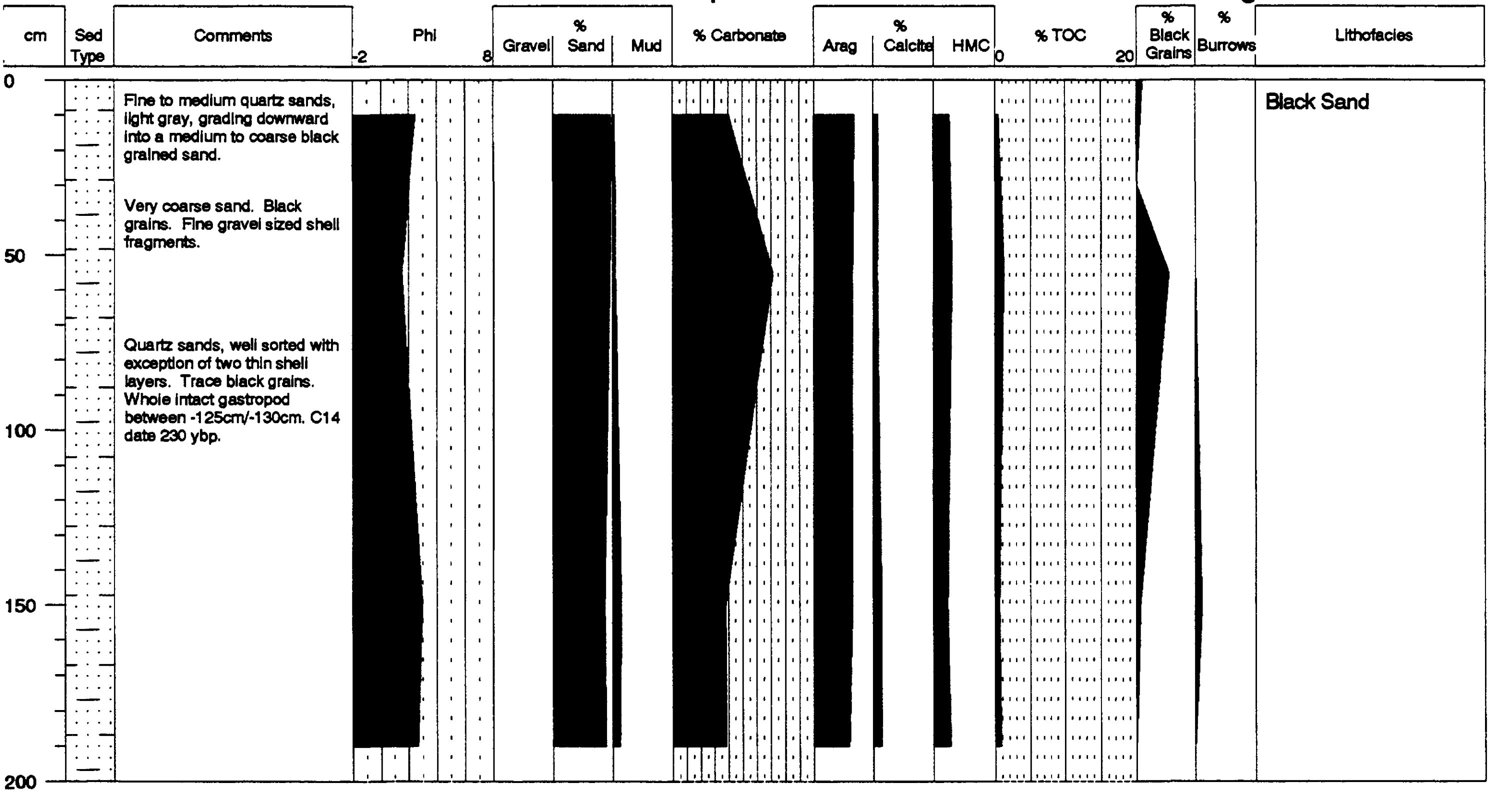
A21

West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: USGS-95-49

Water Depth: 47' Latitude: 27° 43.694' Longitude: 83° 02.627'



USGS

ECKERD COLLEGE USF

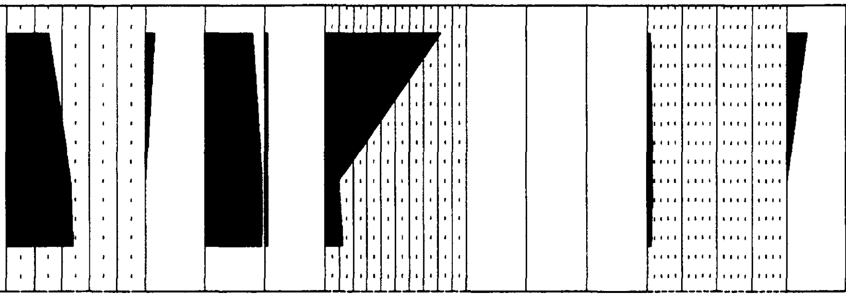
West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: USGS-95-51B

Water Depth: 26' Latitude: 27° 27.470' Longitude: 82° 45.715'

cm	Sed Type	Comments	Phi (-2 to 8)	% Gravel	% Sand	% Mud	% Carbonate	% Arag	% Calcite	% HMC	% TOC (0 to 20)	% Black Grains	% Burrows	Lithofacies
		Coarse sand with black grains and shell fragments. One whole pristine gastropod shell at -2cm.												Shelly Sand
		Clean, well sorted fine to medium sand with black grain lenses in the top 20cm.												Quartz Sand



USGS

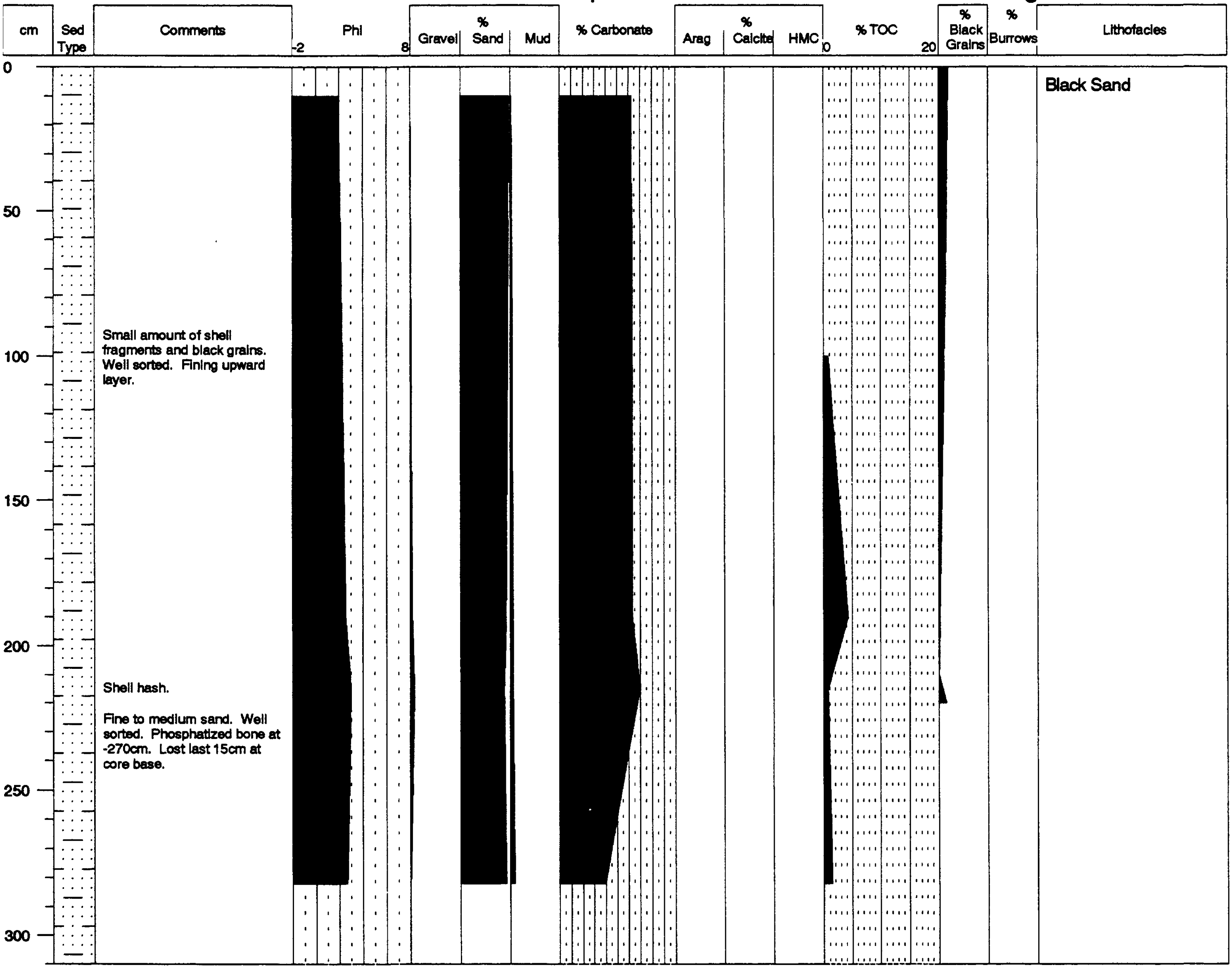
ECKERD COLLEGE USF

West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: USGS-95-53(2)

Water Depth: 44' Latitude: 27° 25.947' Longitude: 82° 54.910'



USGS

ECKERD COLLEGE

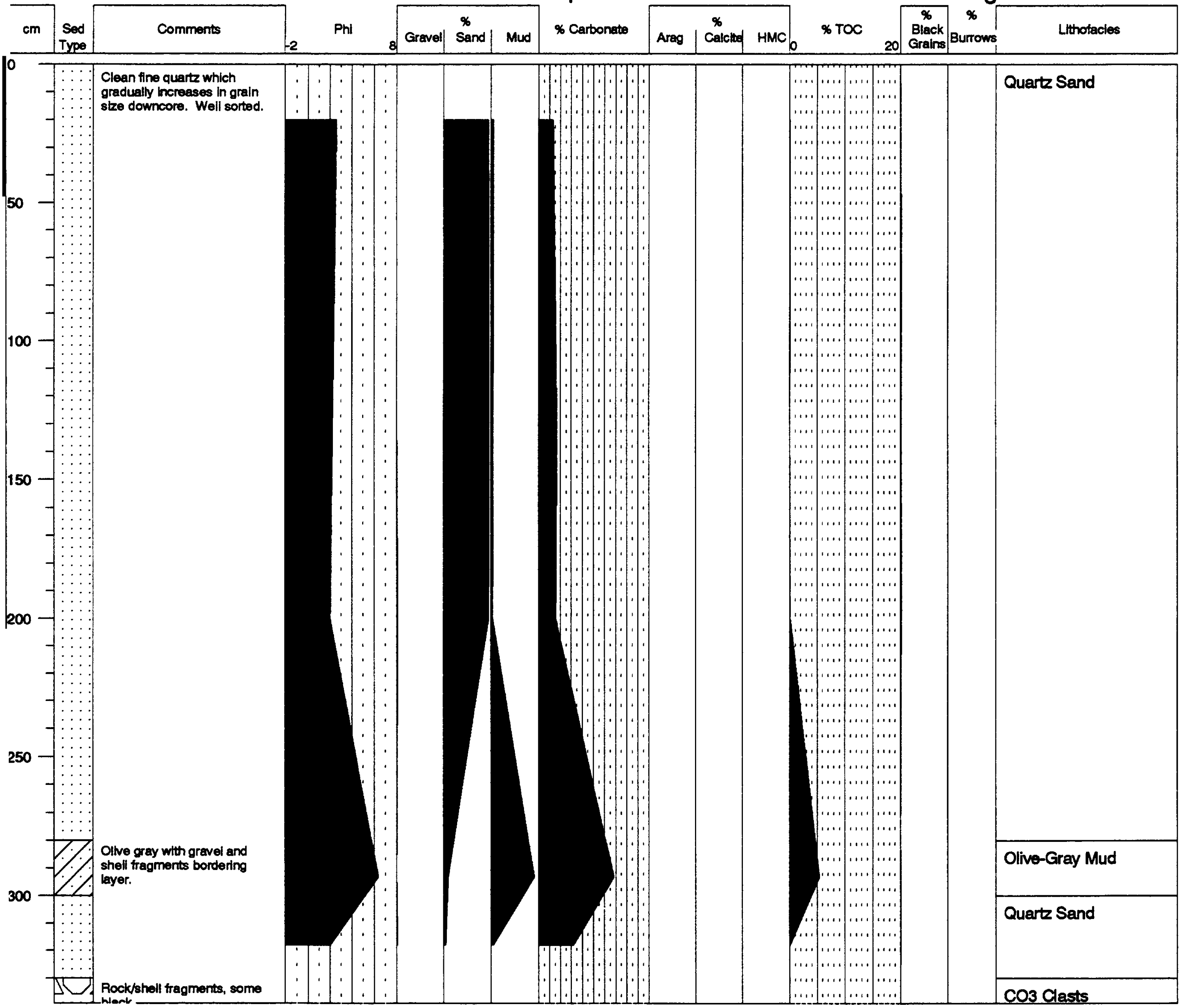
USF

West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: USGS-95-54

Water Depth: 15' Latitude: 27° 30.928' Longitude: 82° 45.033'



USGS

ECKERD COLLEGE

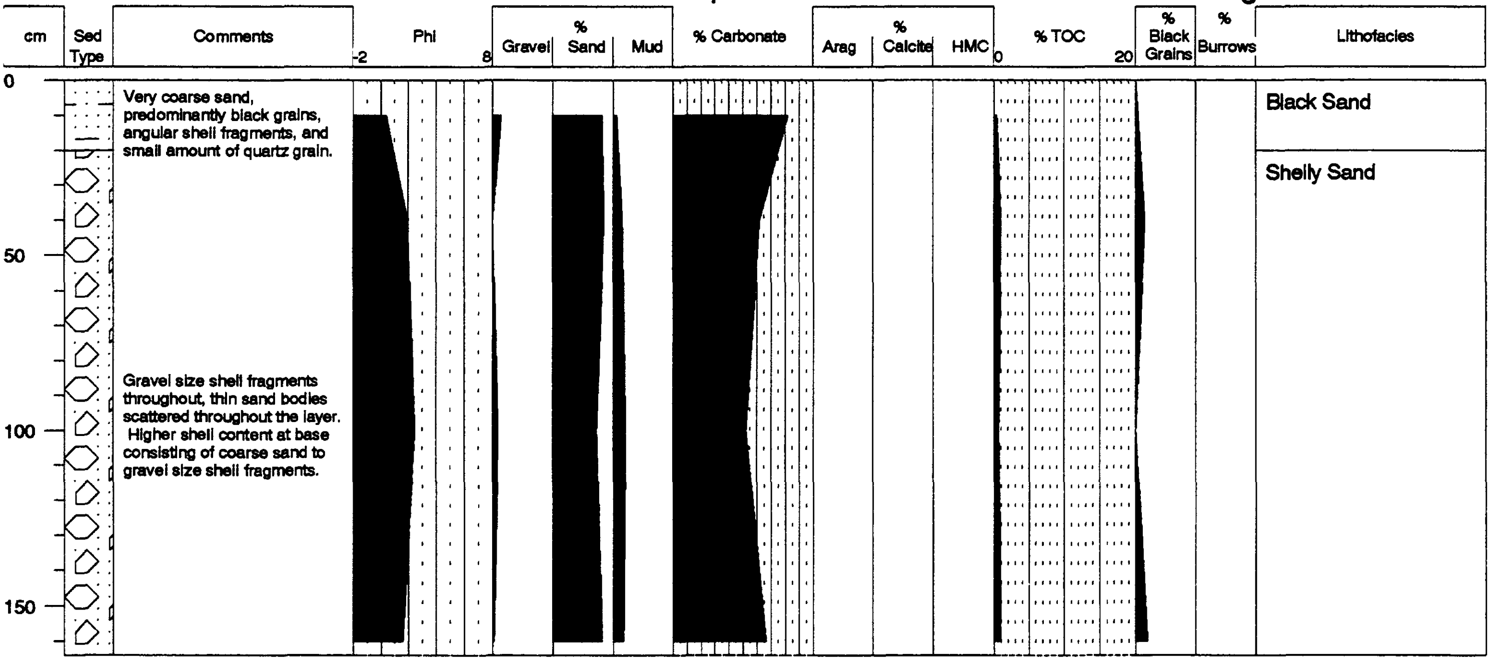
USF

West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: USGS-95-55

Water Depth: 40' Latitude: 27° 32.328' Longitude: 82° 50.792'



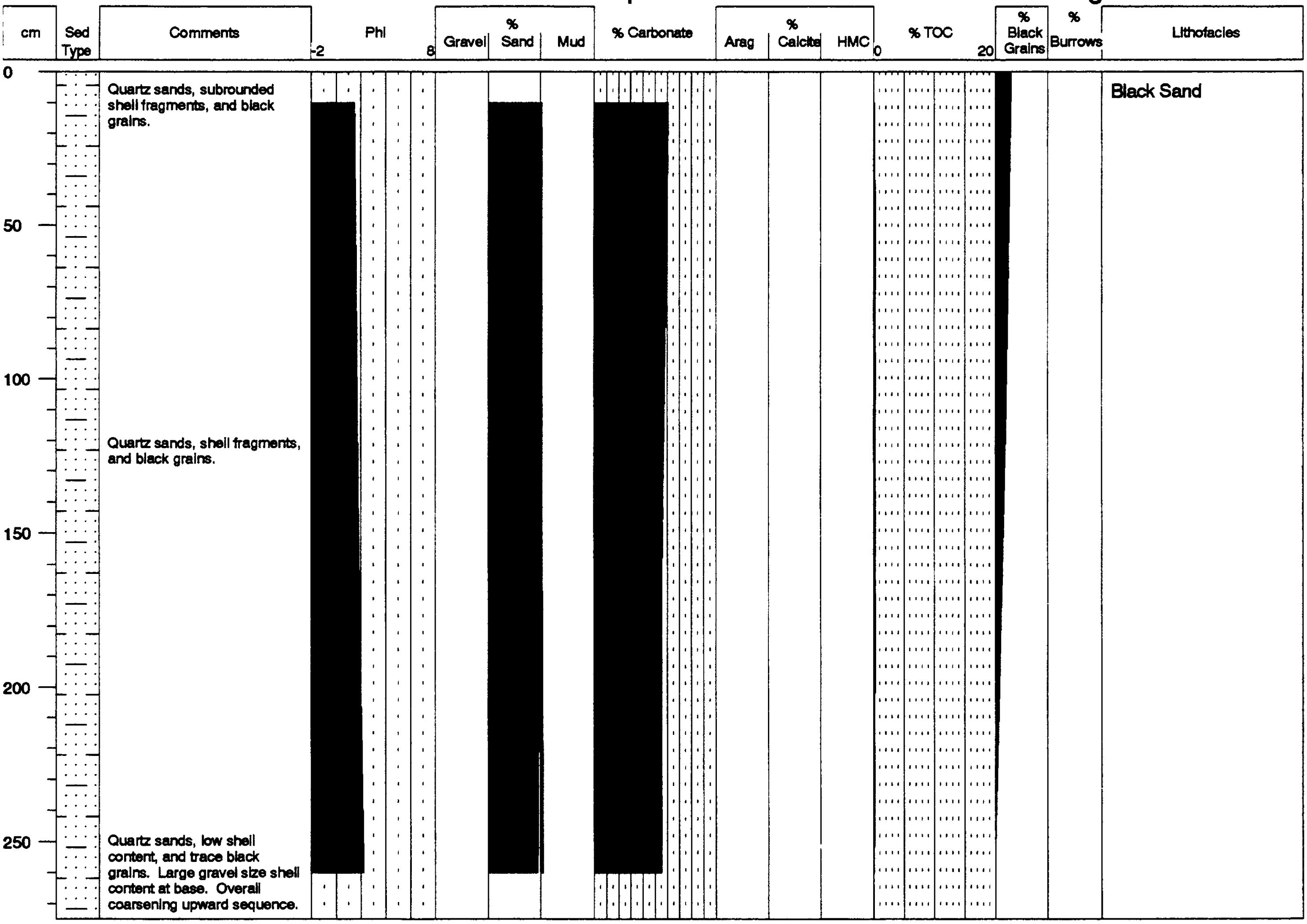
West-Central Florida Coastal Studies Project

Vibracore Description

USGS / ECKERD COLLEGE / USF

Core Identification: USGS-95-56(2)

Water Depth: 42' Latitude: 27° 31.205' Longitude: 82° 58.587'



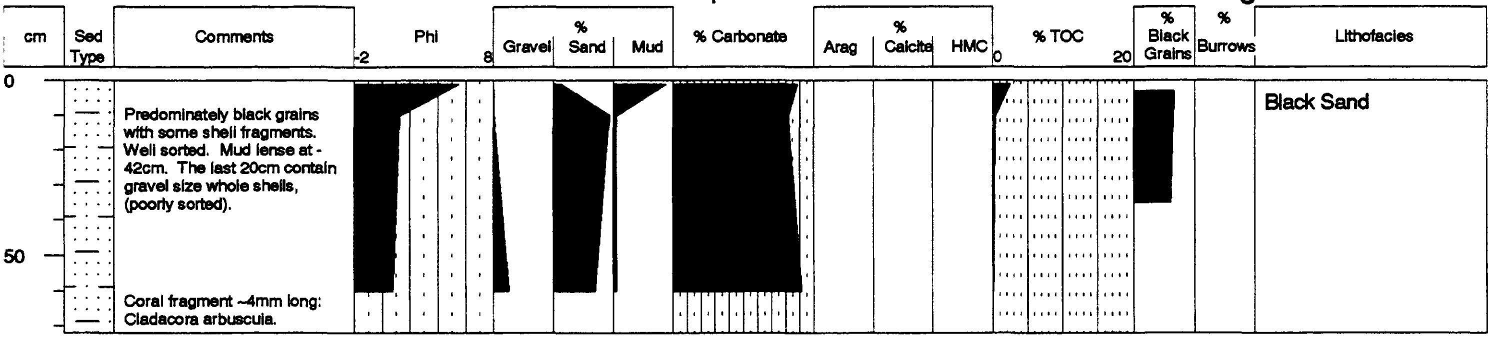
A27

West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: USGS-95-57

Water Depth: 63' Latitude: 27° 30.779' Longitude: 83° 01.903'



USGS

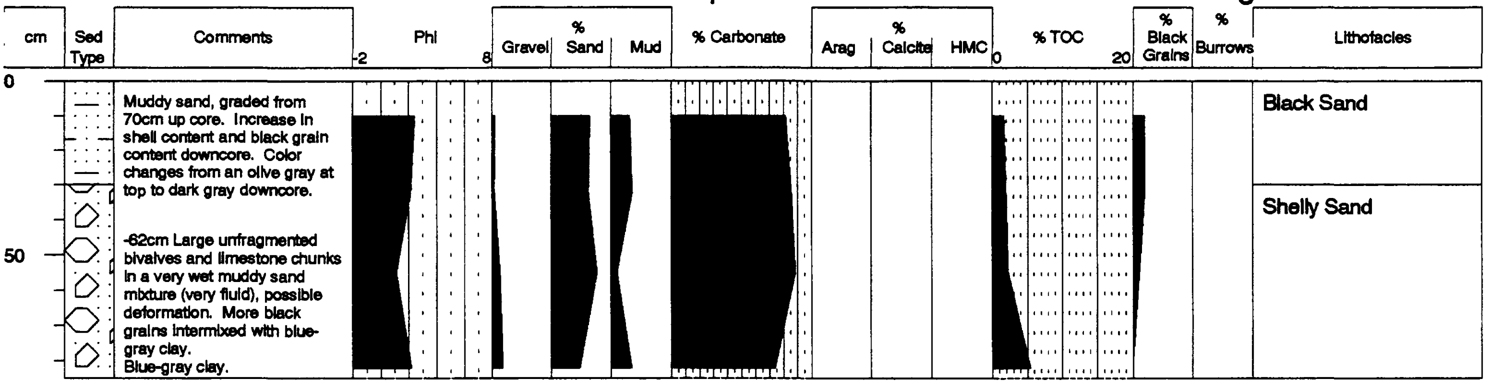
ECKERD COLLEGE USF

West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: USGS-95-104

Water Depth: 30' Latitude: 27° 09.256' Longitude: 82° 31.618'



A29 USGS

ECKERD COLLEGE USF

West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: USGS-95-105B

Water Depth: 28' Latitude: 27° 15.919' Longitude: 82° 35.876'

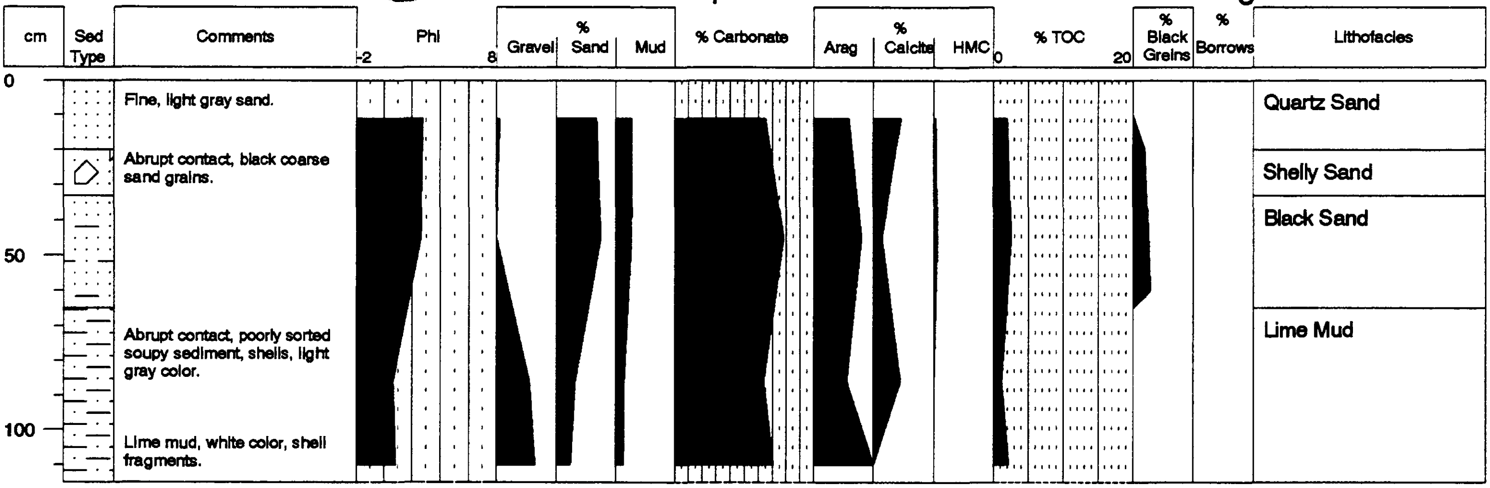
cm	Sed Type	Comments	Phi (-2 to 8)	% Gravel	% Sand	% Mud	% Carbonate	% Arag	% Calcite	% HMC	% TOC (0 to 20)	% Black Grains	% Burrows	Lithofacies
0		Very coarse to coarse sand, primarily of angular to subangular shell fragments, very little quartz sand, dark gray color. Bottom 10cm poorly sorted, large whole and fragmented shells												Shelly Sand

West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: USGS-95-106

Water Depth: 29' Latitude: 27° 21.361' Longitude: 82° 39.359'



A31

USGS

ECKERD COLLEGE

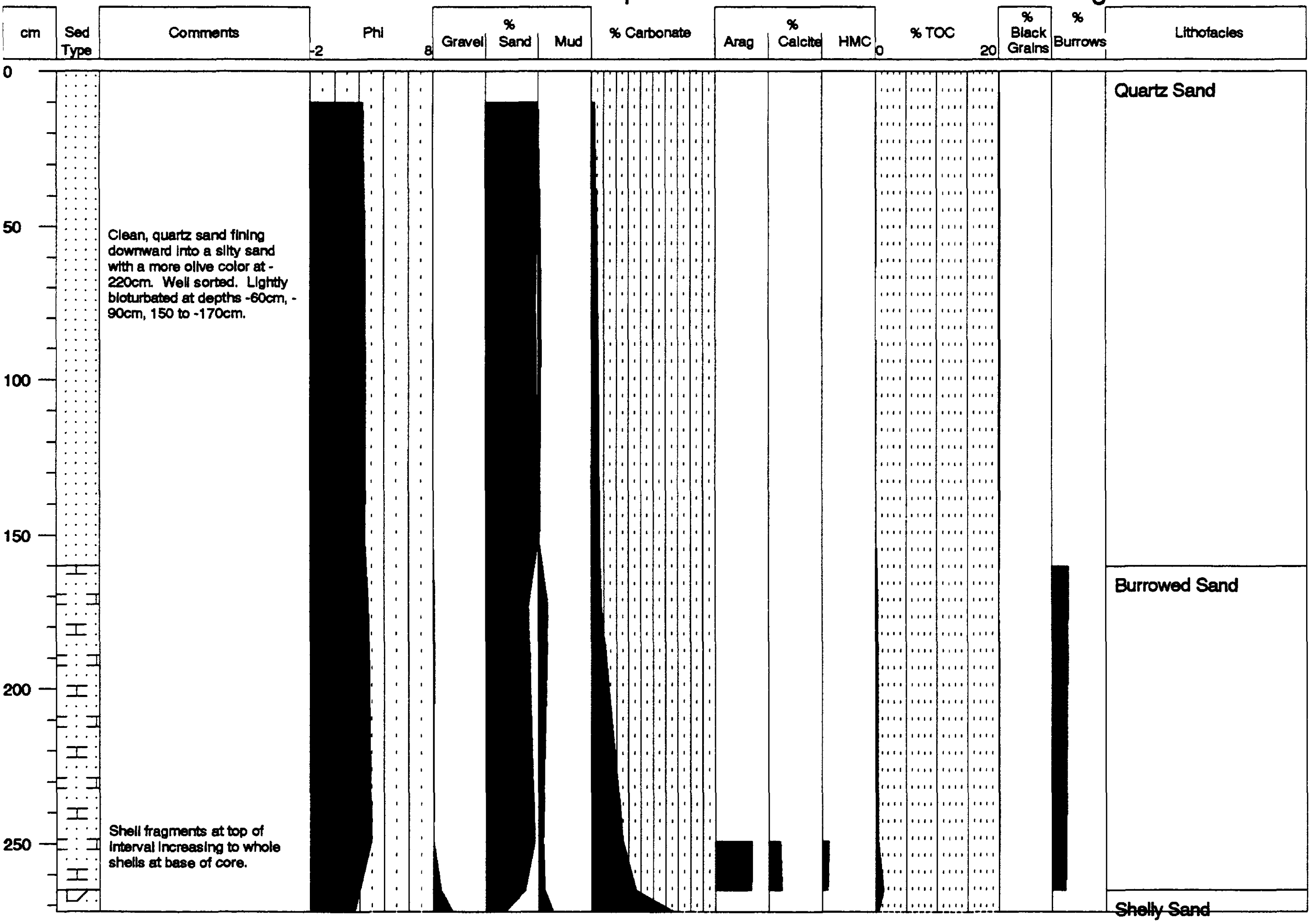
USF

West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: USGS-95-108

Water Depth: 22' Latitude: 27° 29.400' Longitude: 82° 47.553'

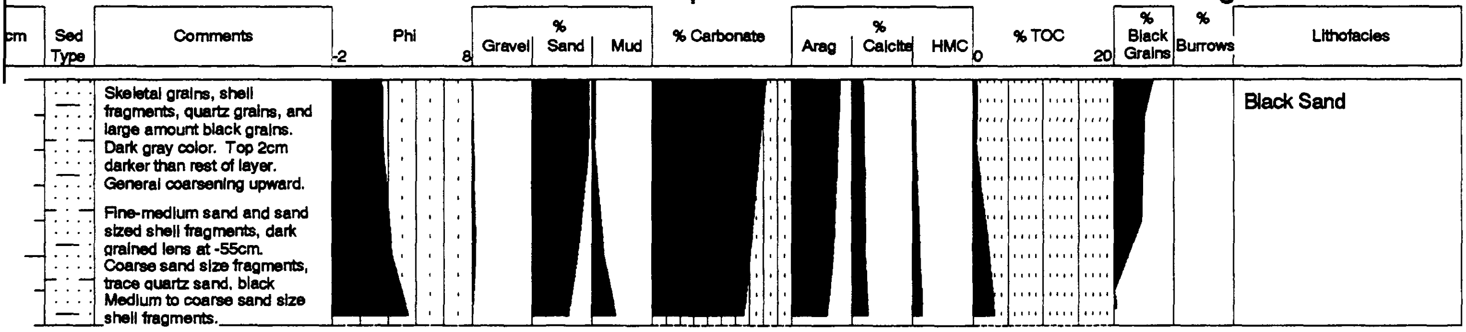


West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: USGS-95-109

Water Depth: 34' Latitude: 27° 03.184' Longitude: 82° 32.784'



USGS

ECKERD COLLEGE

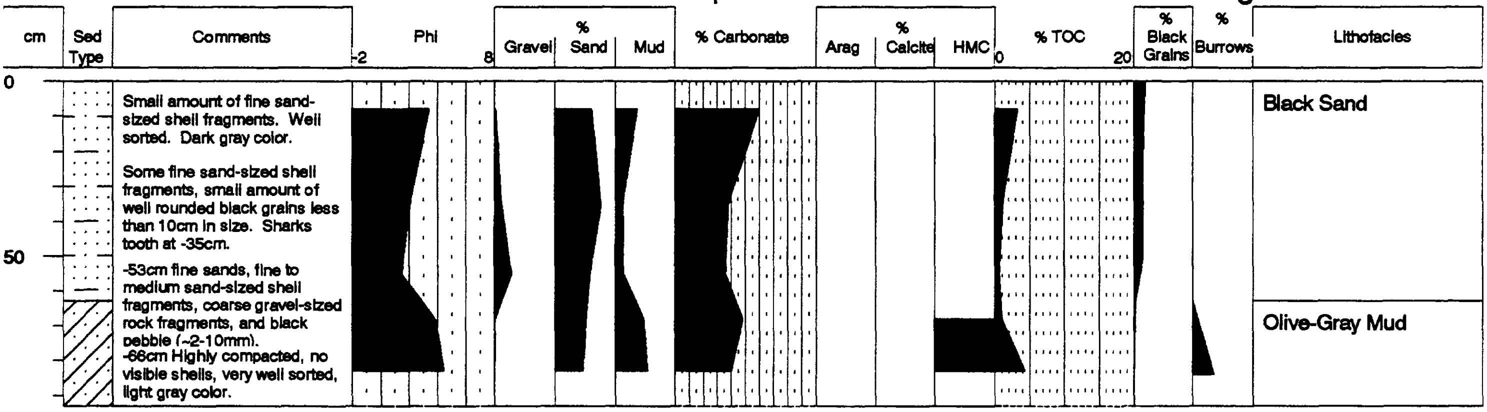
USF

West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: USGS-95-110

Water Depth: 34' Latitude: 27° 05.511' Longitude: 82° 28.512'



USGS

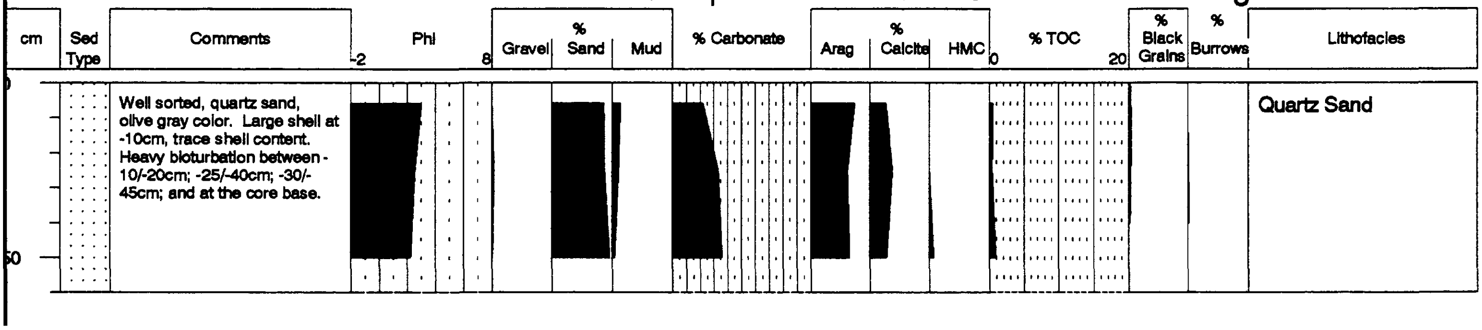
ECKERD COLLEGE USF

West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: USGS-95-111

Water Depth: 32' Latitude: 27° 04.423' Longitude: 82° 30.517'



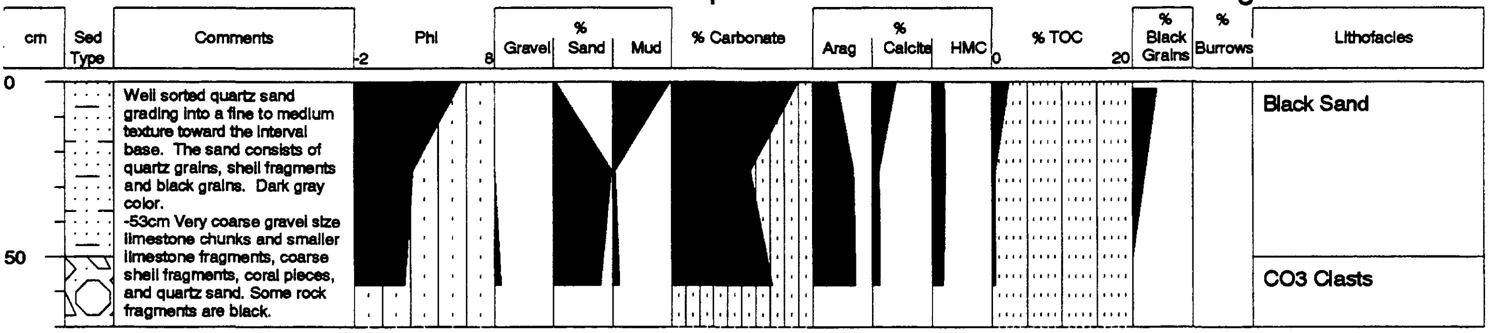
A35

West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: USGS-95-112

Water Depth: 57' Latitude: 27° 00.066' Longitude: 82° 38.663'

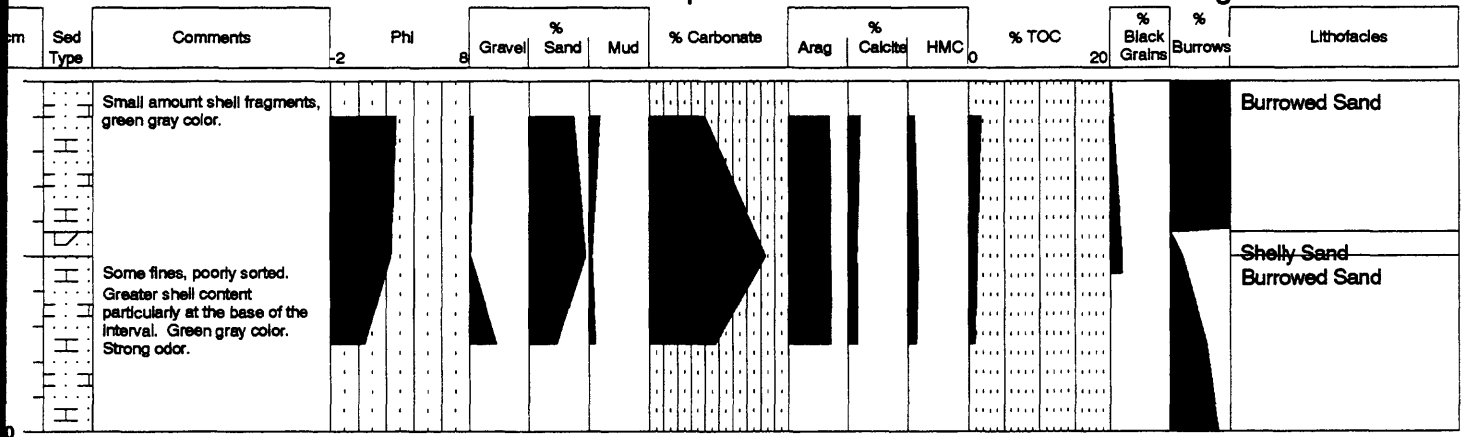


West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: USGS-95-113

Water Depth: 34' Latitude: 27° 10.002' Longitude: 82° 34.189'



A37 USGS

ECKERD COLLEGE USF

West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: USGS-95-114

Water Depth: 29' Latitude: 27° 13.291' Longitude: 82° 36.238'

cm	Sed Type	Comments	Phi (-2 to 8)	Gravel	% Sand	Mud	% Carbonate	Arag	% Calcite	HMC	% TOC (0 to 20)	% Black Grains	% Burrows	Lithofacies
0		Very coarse sand, primarily subrounded fine shell fragments with an occasional bivalve half particularly located at core base. Dark gray color.												Shelly Sand

USGS

ECKERD COLLEGE

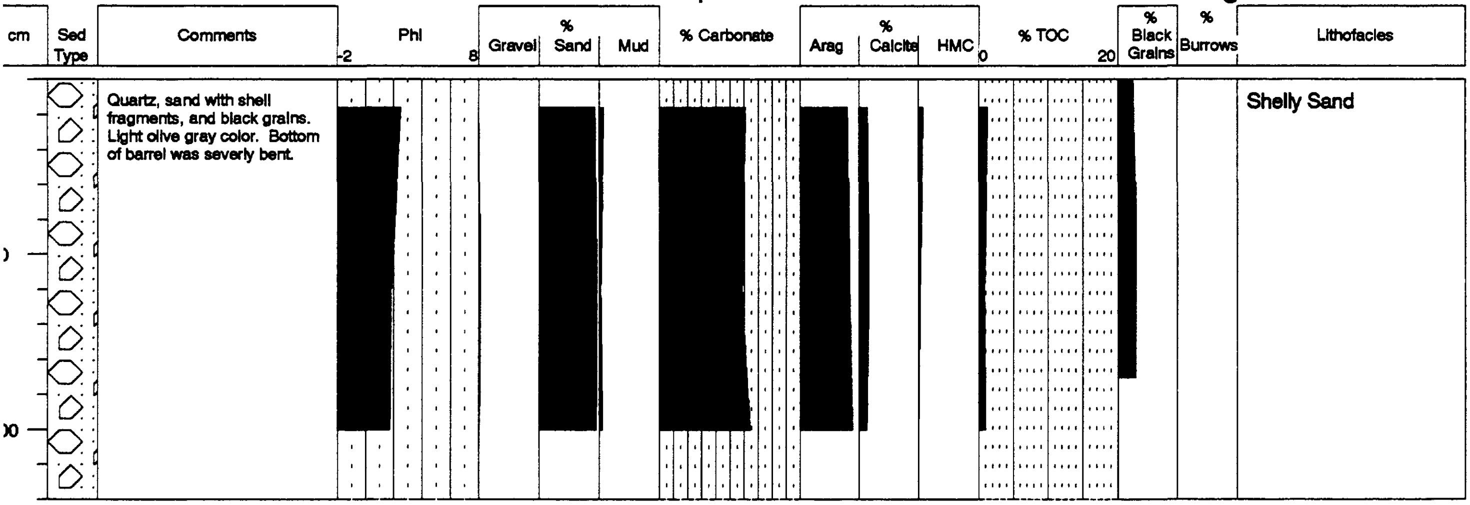
USF

West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: USGS-95-115

Water Depth: 33' Latitude: 27° 20.407' Longitude: 82° 40.818'

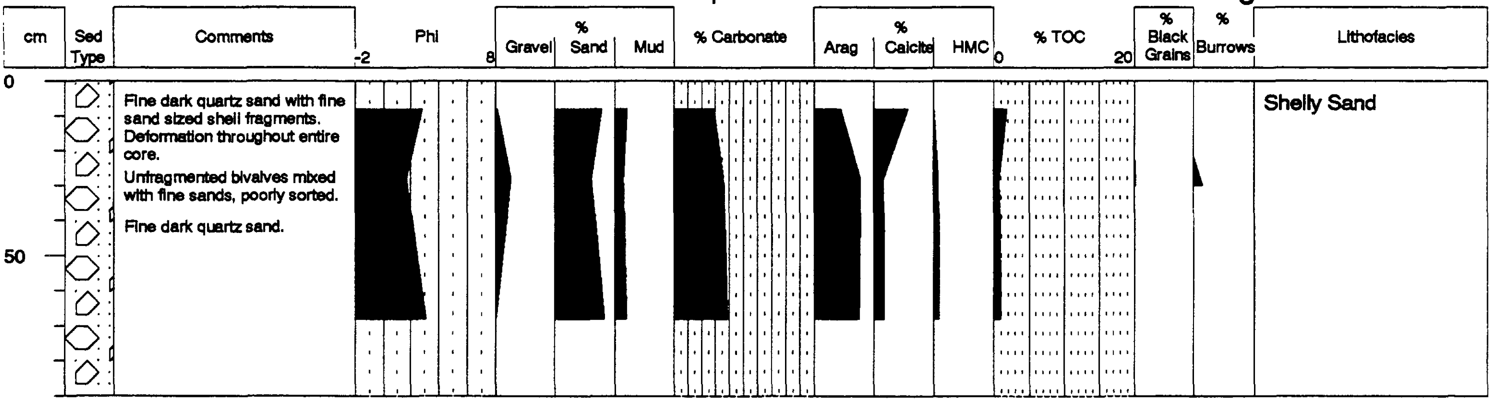


West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: USGS-95-117

Water Depth: 34' Latitude: 27° 19.122' Longitude: 82° 43.796'



USGS

ECKERD COLLEGE

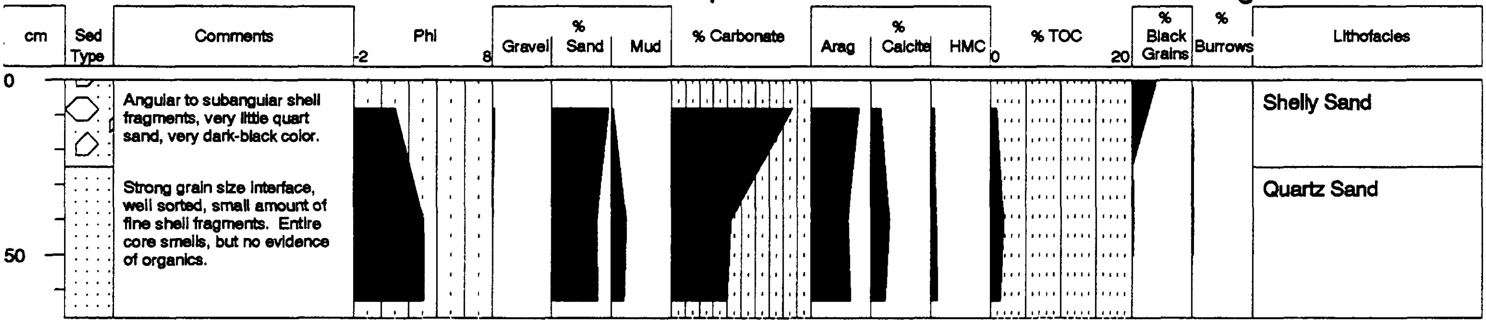
USF

West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: USGS-95-118

Water Depth: 38' Latitude: 27° 11.740' Longitude: 82° 38.666'



A41 USGS

ECKERD COLLEGE USF

West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: USGS-95-119

Water Depth: 37' Latitude: 27° 06.715' Longitude: 82° 35.154'

cm	Sed Type	Comments	Phi (-2 to 8)	% Gravel	% Sand	% Mud	% Carbonate	% Arag	% Calcite	% HMC	% TOC (0 to 20)	% Black Grains	% Burrows	Lithofacies
0		Some silty sand at very top. Quartz sand and skeletal shell mixture with a lot of black grains. Some large whole shells at base.												Shelly Sand

USGS

ECKERD COLLEGE

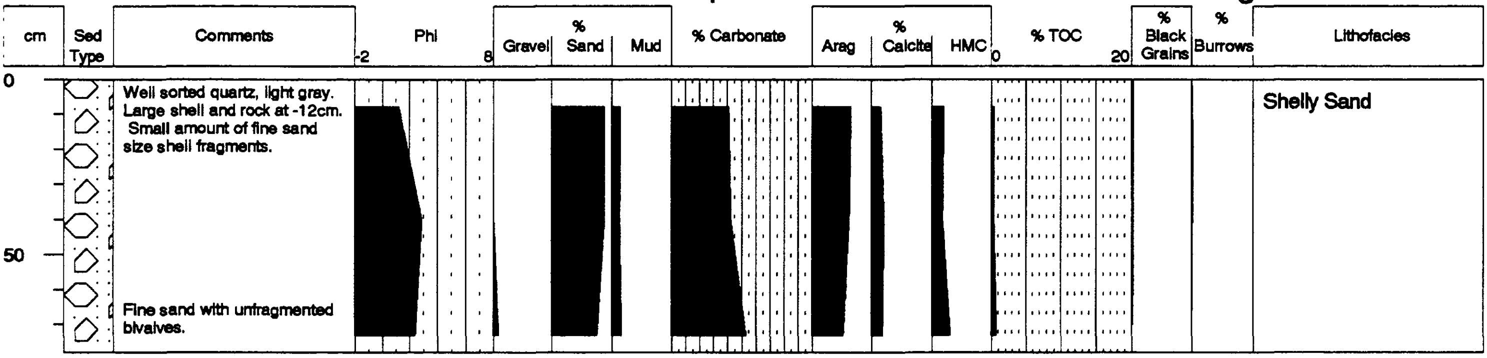
USF

West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: USGS-95-120

Water Depth: 61' Latitude: 27° 07.109' Longitude: 82° 44.779'



A43

West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: USGS-95-121

Water Depth: 51' Latitude: 27° 07.109' Longitude: 82° 42.105'

cm	Sed Type	Comments	Phi (-2 to 8)	% Gravel	% Sand	% Mud	% Carbonate	% Arag	% Calcite	% HMC	% TOC (0 to 20)	% Black Grains	% Burrows	Lithofacies
0–50		Well sorted quartz sand, very little fine shell fragments. Gray color throughout core. Fine sands, whole gastropod, and shell fragments. Moderately sorted quartz sand will small amount of fine to very fine sand size shell fragments.												Shelly Sand

USGS

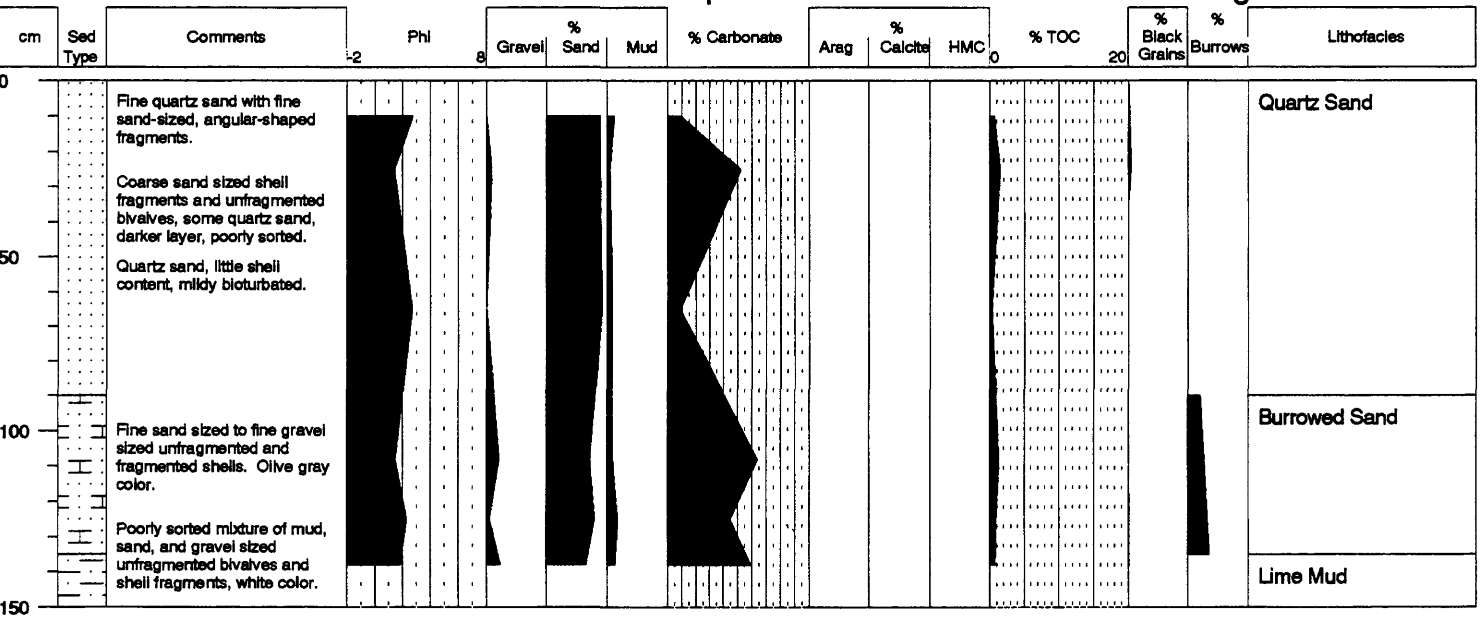
ECKERD COLLEGE USF

West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: USGS-95-123

Water Depth: 21' Latitude: 27° 21.853' Longitude: 82° 38.334'



A45 USGS

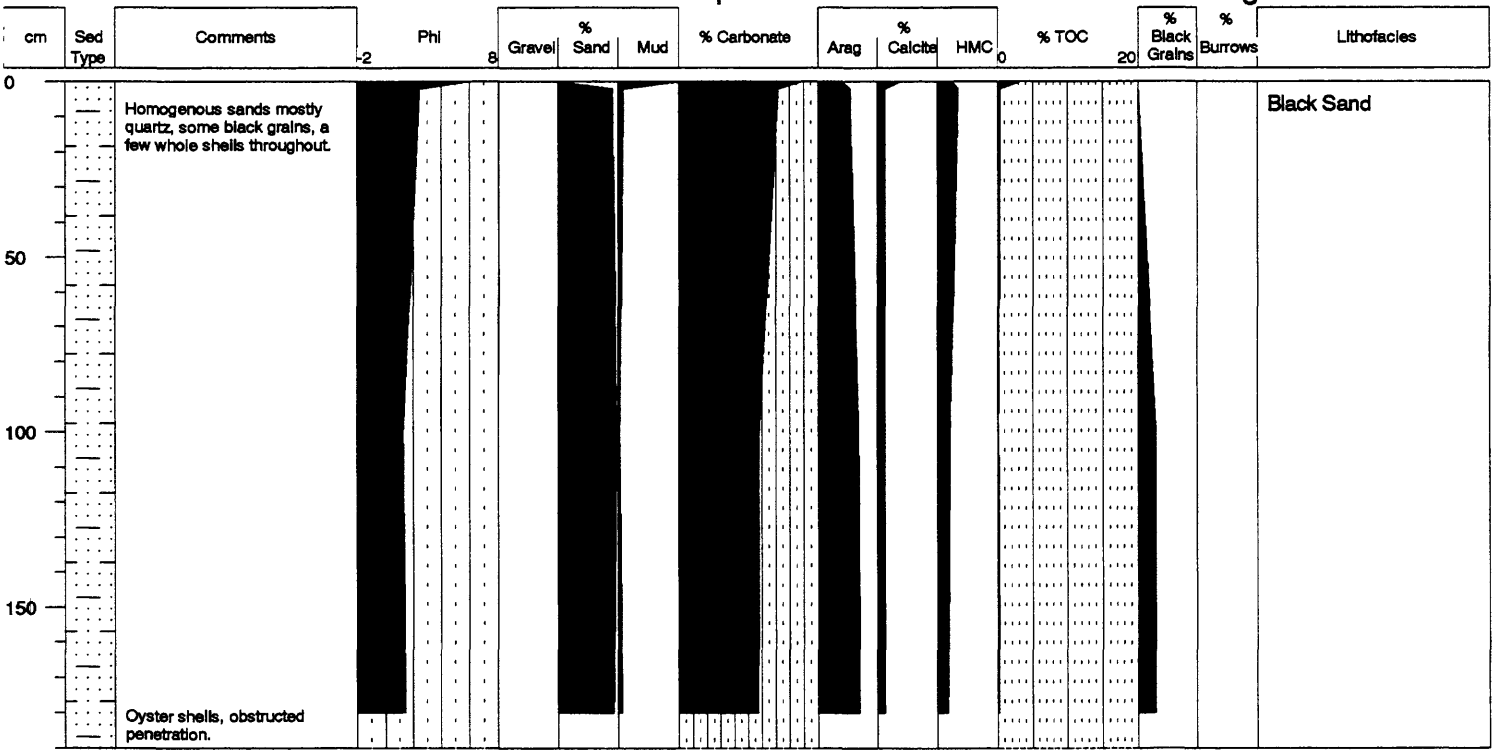
ECKERD COLLEGE USF

West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: USGS-95-124

Water Depth: 41' Latitude: 27° 21.509' Longitude: 82° 50.841'



USGS

ECKERD COLLEGE

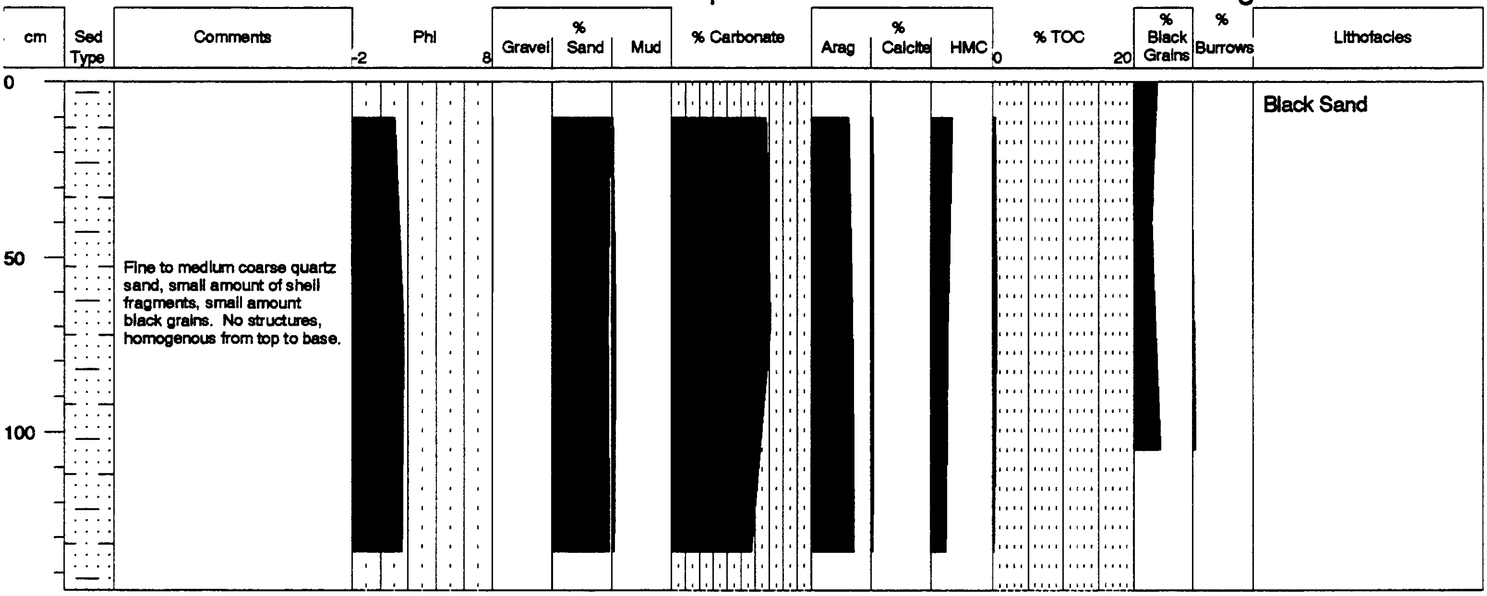
USF

West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: USGS-95-125

Water Depth: 56' Latitude: 27° 23.283' Longitude: 82° 56.841'

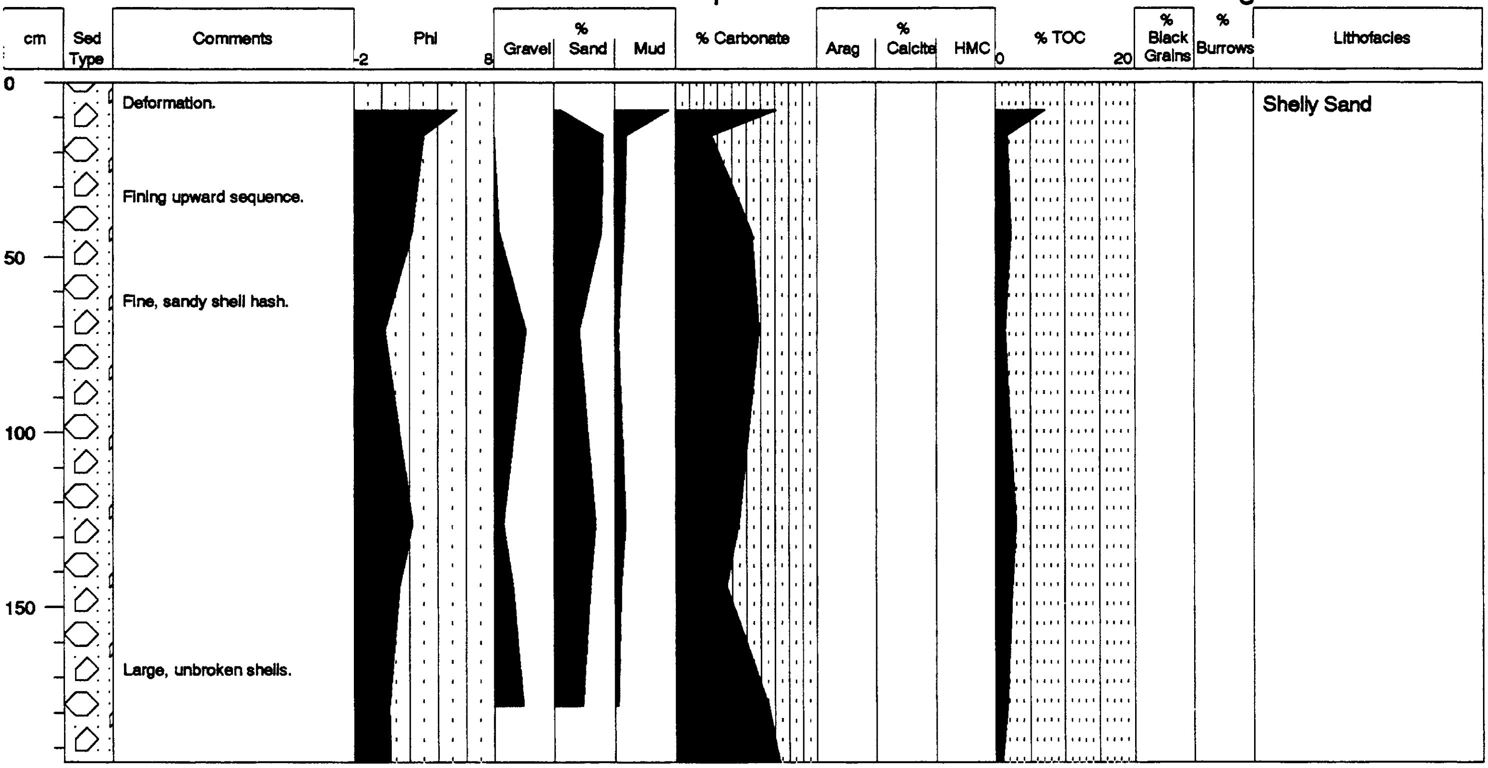


West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: USGS-96-201

Water Depth: 19' Latitude: 27° 44.302' Longitude: 82° 47.004'



USGS

ECKERD COLLEGE

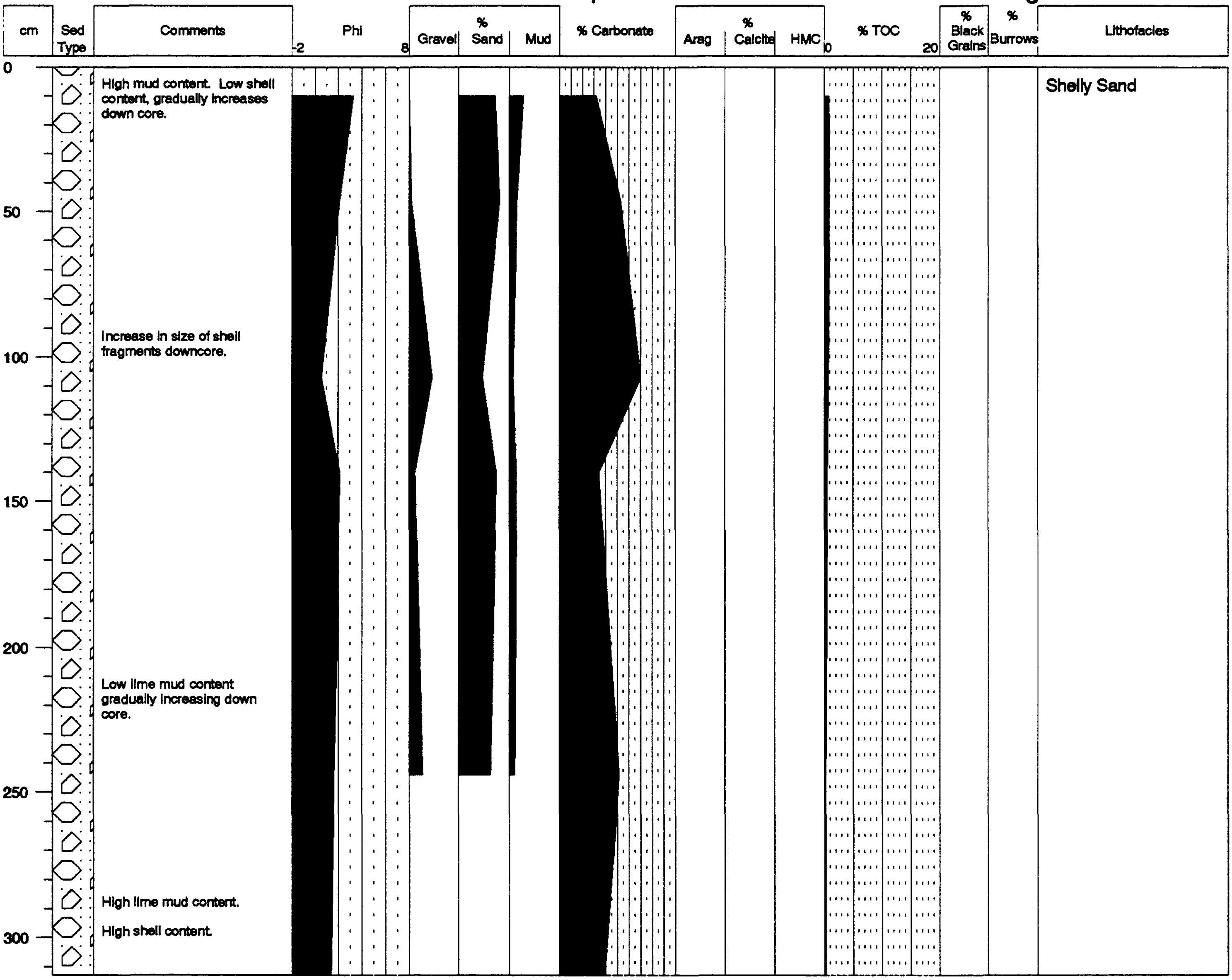
USF

West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: USGS-96-202

Water Depth: 15' Latitude: 27° 44.483' Longitude: 82° 46.529'



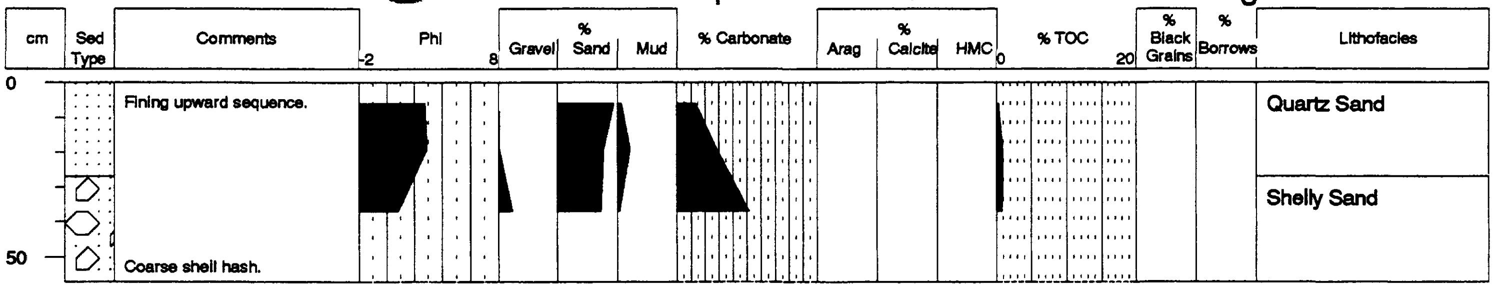
A49

West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: USGS-96-203A

Water Depth: 9.5' Latitude: 27° 44.883' Longitude: 82° 45.829'



USGS

ECKERD COLLEGE

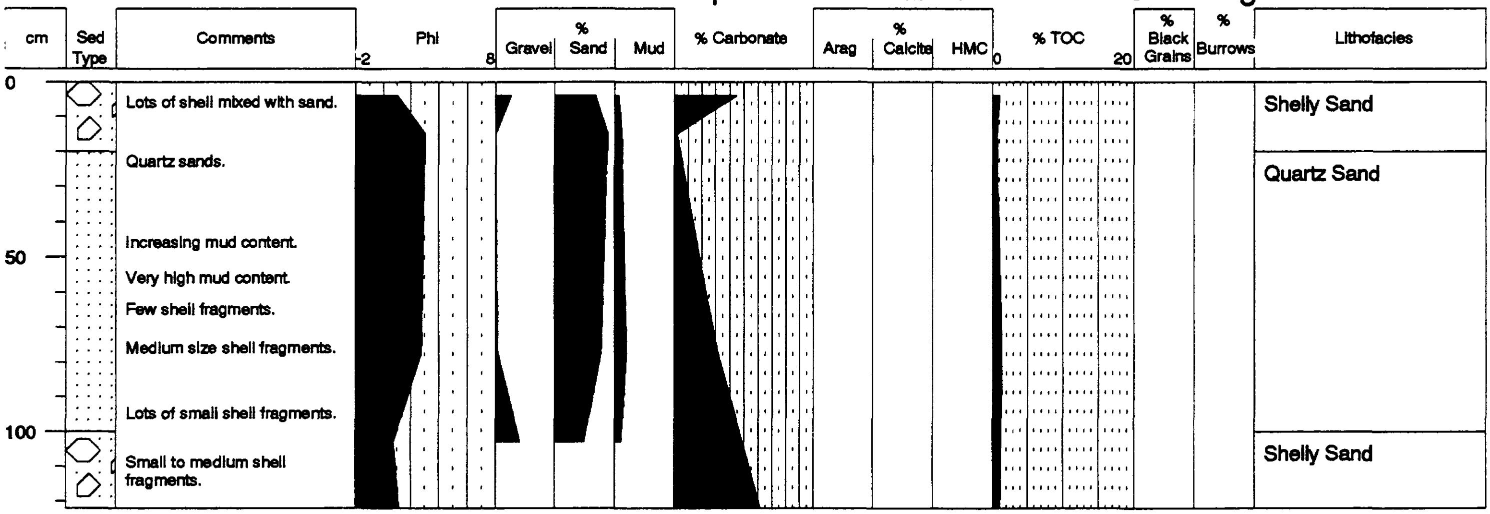
USF

West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: USGS-96-204

Water Depth: 12' Latitude: 27° 44.669' Longitude: 82° 46.225'



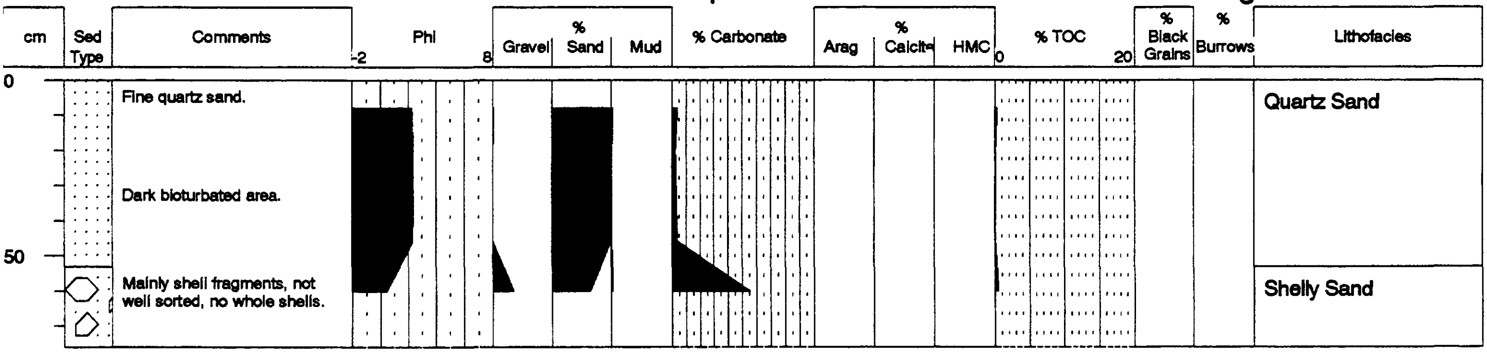
A51

West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: USGS-96-206

Water Depth: 7.9' Latitude: 27° 31.811' Longitude: 82° 44.738'



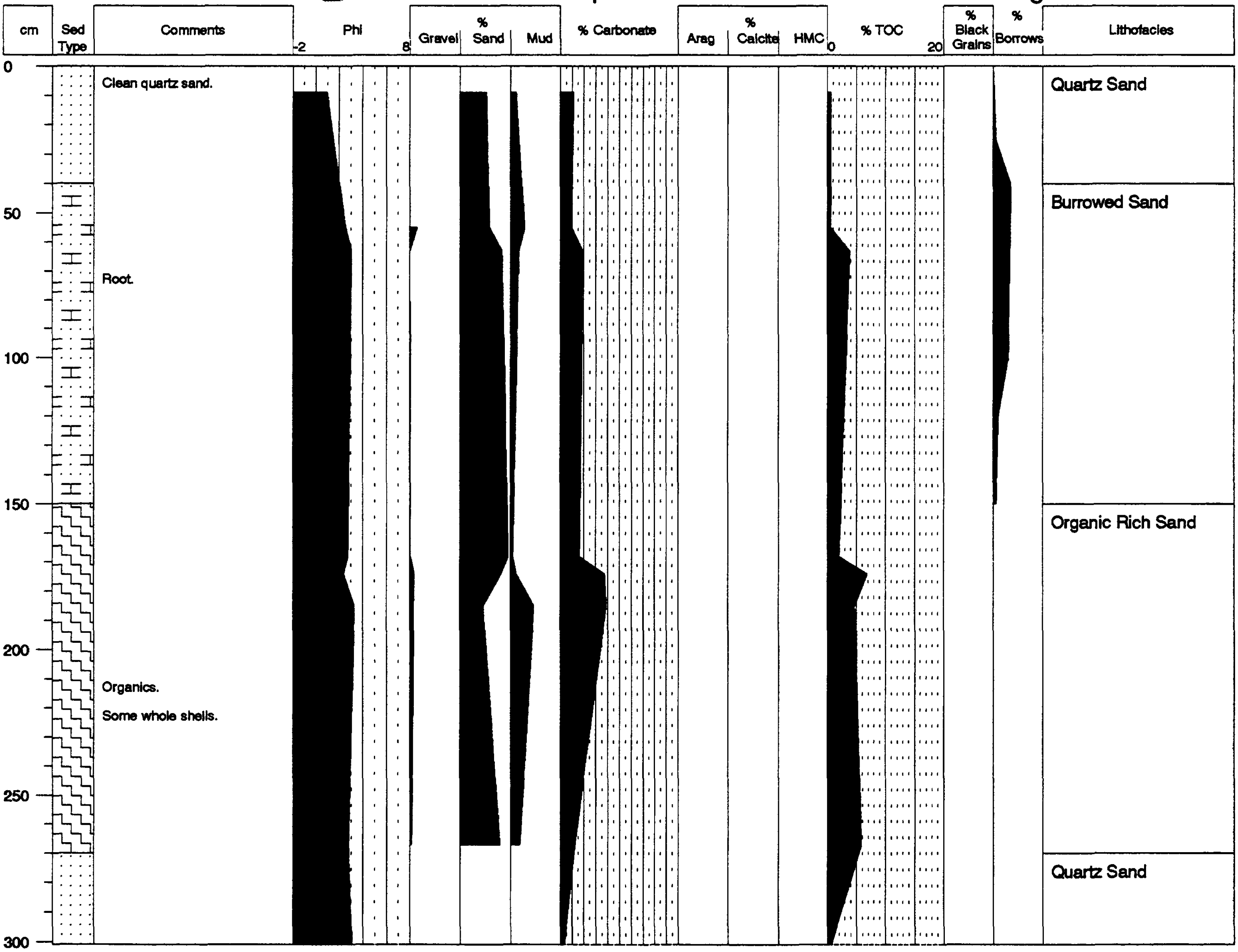
West-Central Florida Coastal Studies Project

Vibracore Description

USGS · ECKERD COLLEGE · USF

Core Identification: USGS-96-207

Water Depth: 11' Latitude: 27° 46.195' Longitude: 82° 47.278'



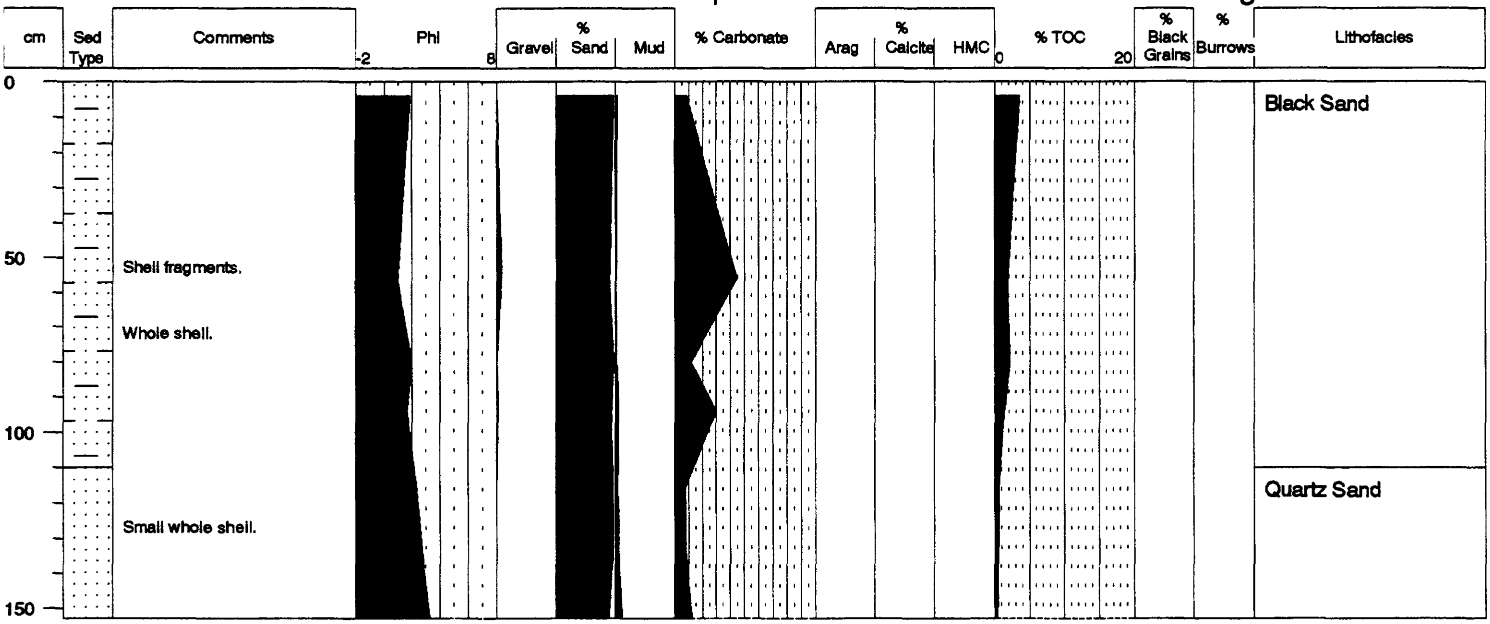
A53

West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: USGS-96-208

Water Depth: 6' Latitude: 27° 46.451' Longitude: 82° 46.933'

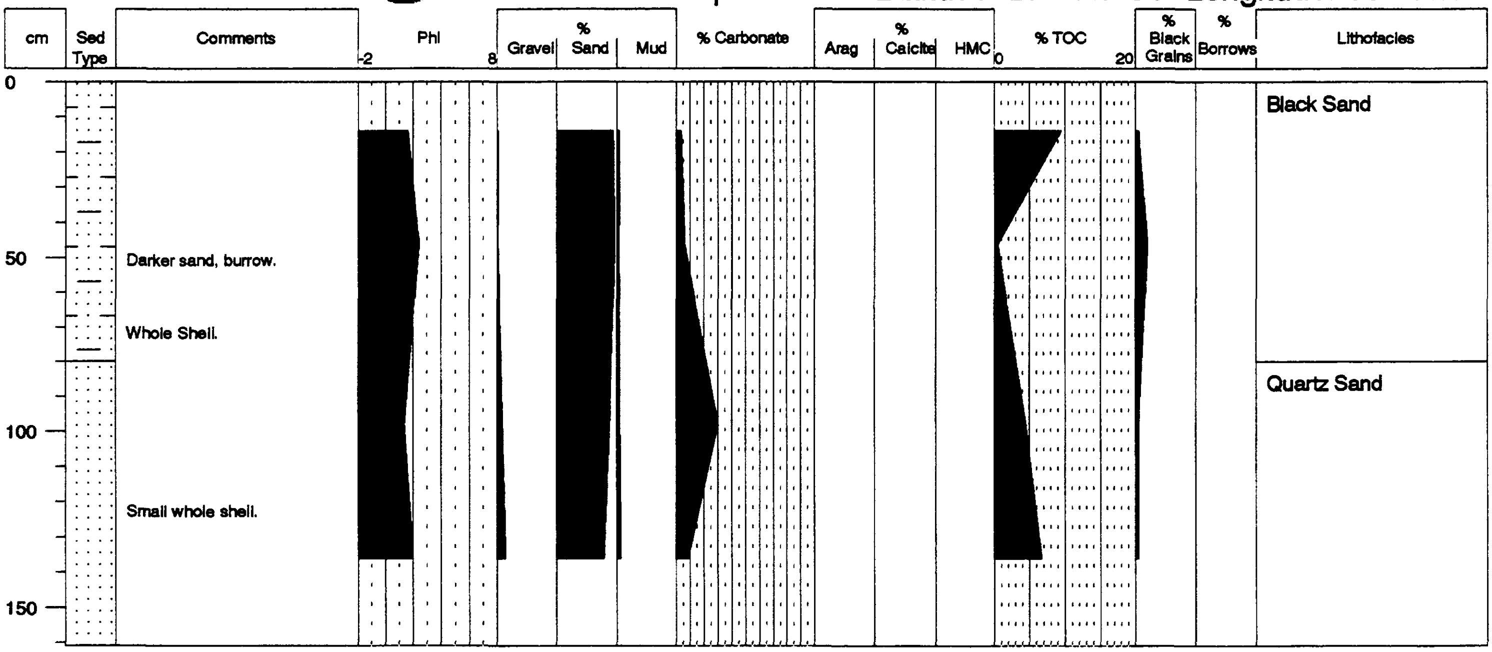


West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: USGS-97-208B

Water Depth: 7' Latitude: 27° 46.451' Longitude: 80° 46.945'



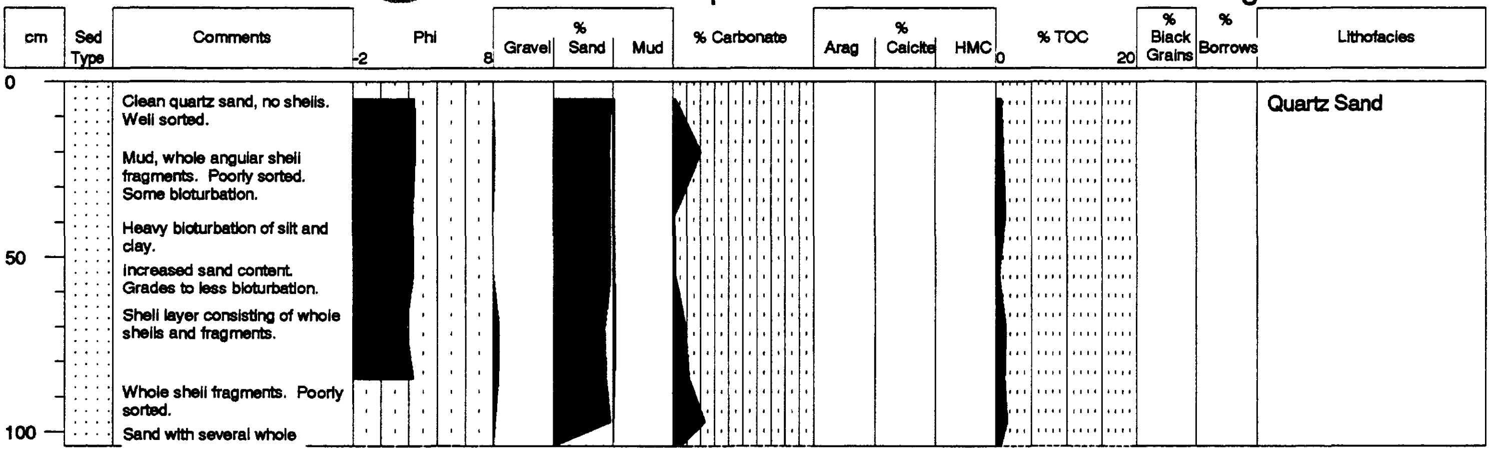
A55

West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: USGS-96-209

Water Depth: 7.9' Latitude: 28° 12.485' Longitude: 82° 51.4'



USGS

ECKERD COLLEGE

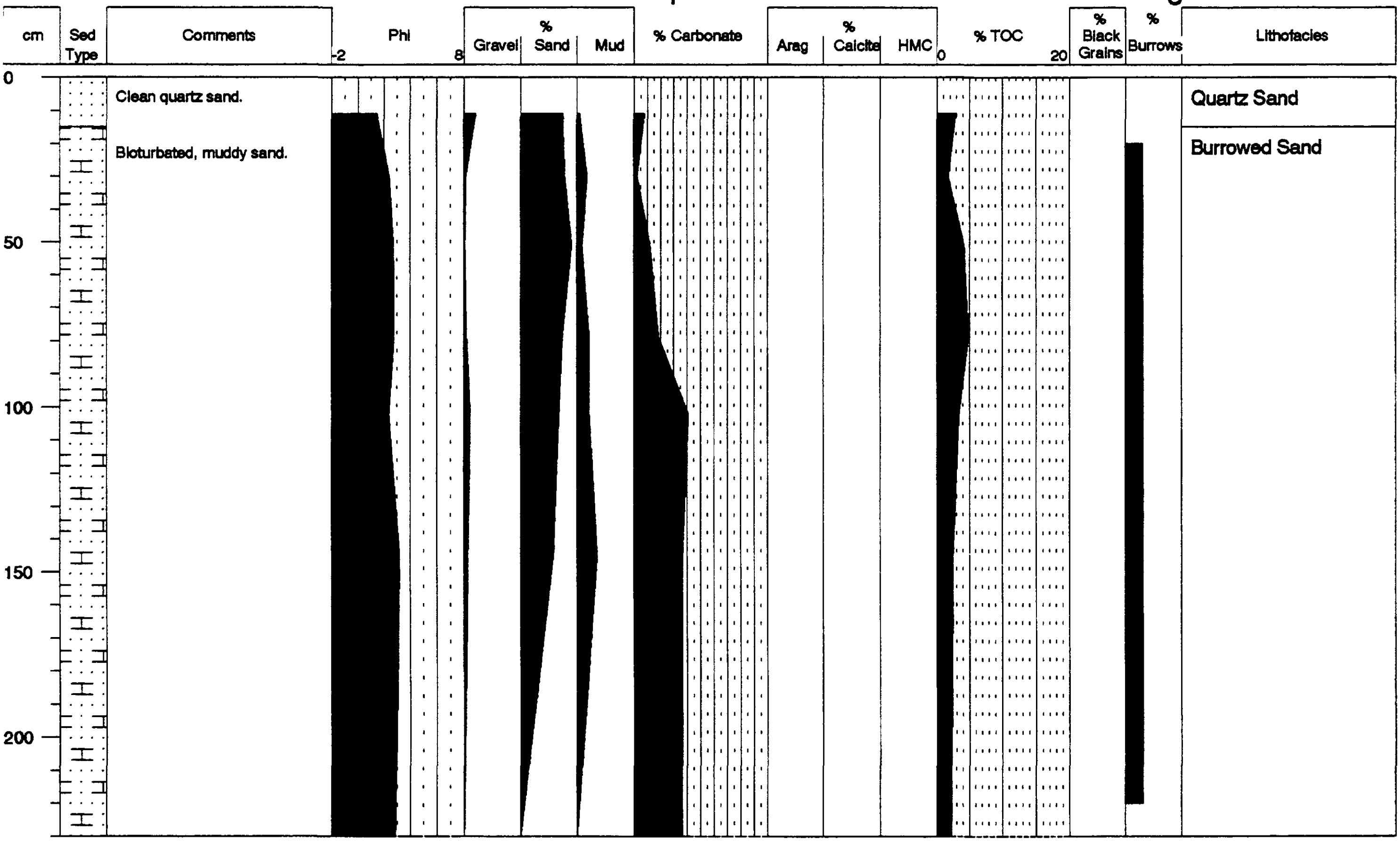
USF

West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: USGS-96-210

Water Depth: 10.4' Latitude: 27° 12.496' Longitude: 82° 51.717'



USGS

ECKERD COLLEGE

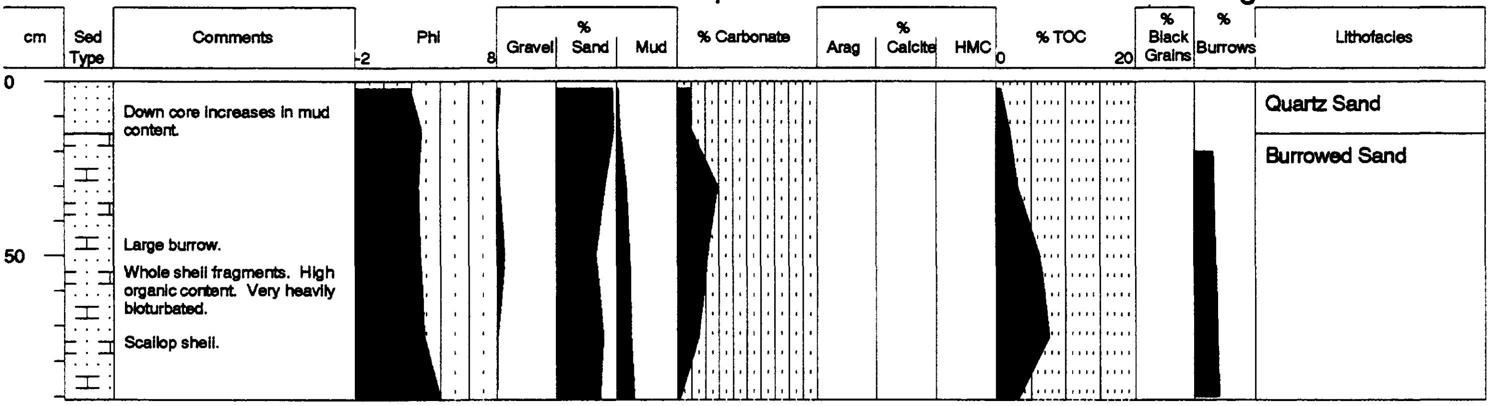
USF

West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: USGS-96-211

Water Depth: 8' Latitude: 28° 2.517' Longitude: 82° 49.321'

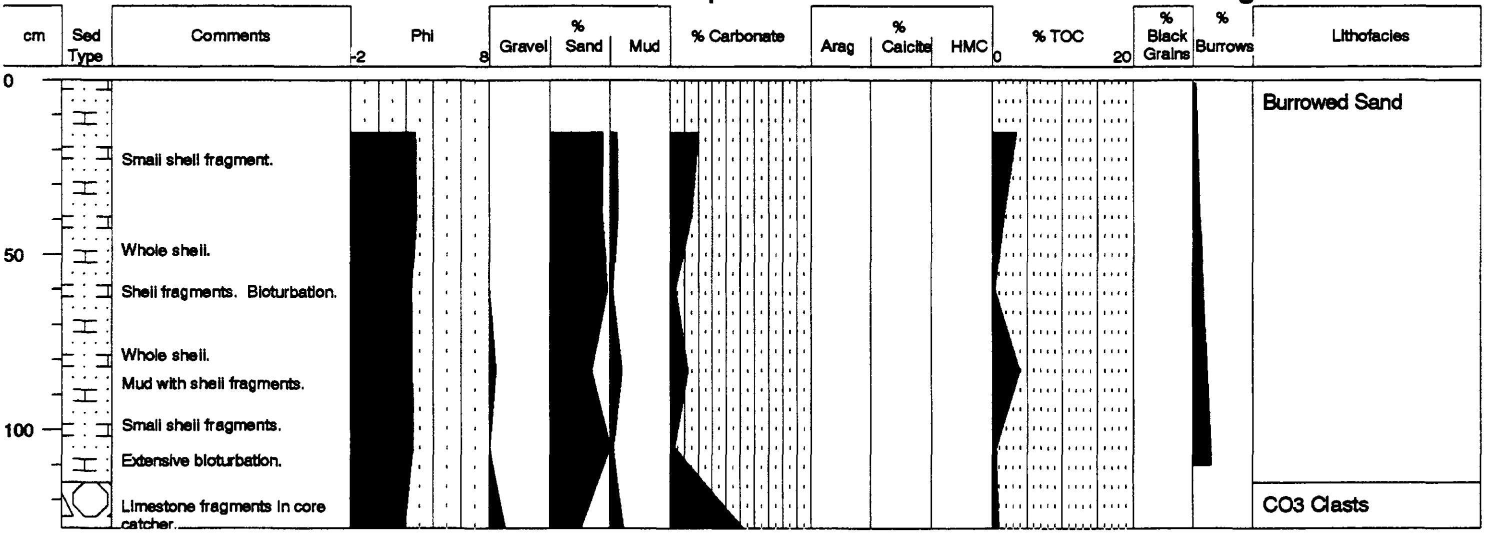


West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: USGS-96-212

Water Depth: 10.5' Latitude: 28° 02.506' Longitude: 82° 49.495'



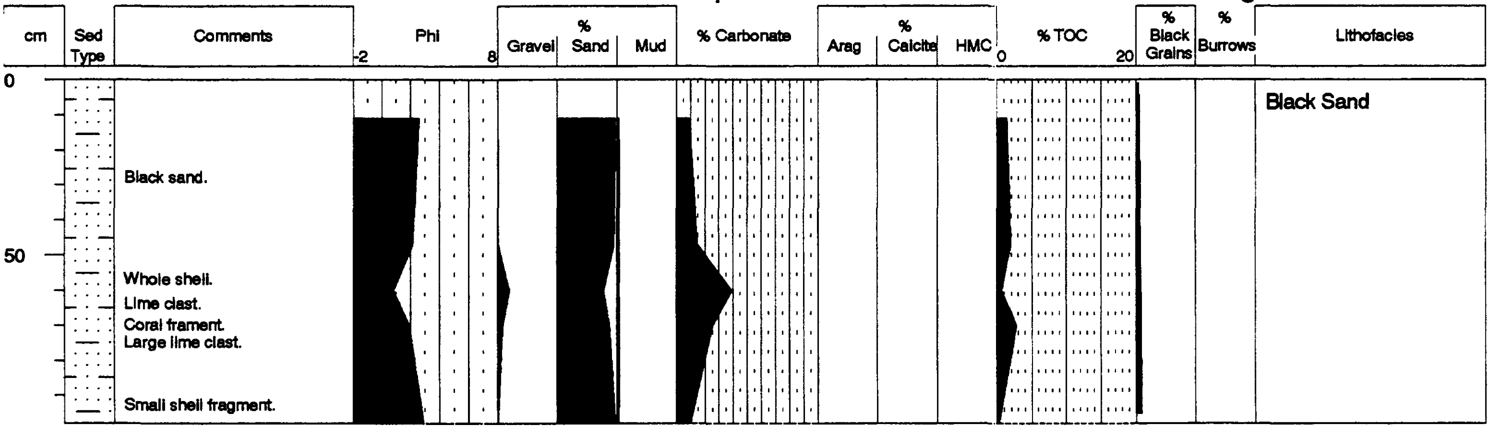
A59

West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: USGS-96-213

Water Depth: 5.3' Latitude: 27° 48.95' Longitude: 82° 49.386'



USGS

ECKERD COLLEGE

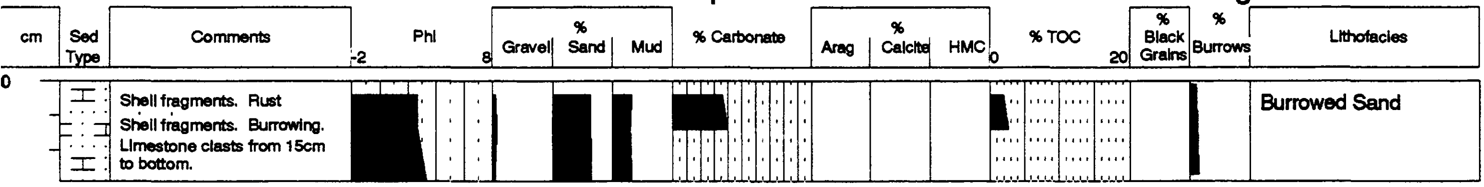
USF

West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: USGS-96-214

Water Depth: 12.6' Latitude: 27° 48.88' Longitude: 82° 49.586'



A61 USGS

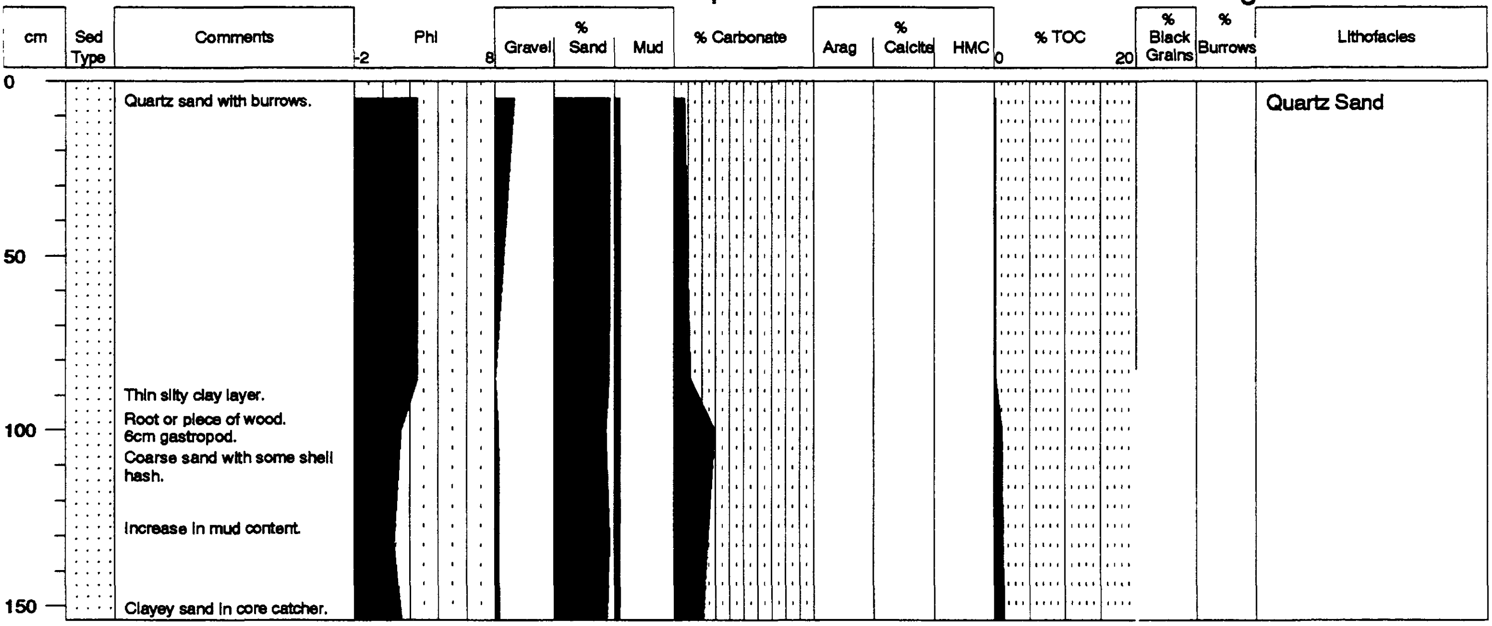
ECKERD COLLEGE USF

West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: USGS-96-215

Water Depth: 11.9' Latitude: 27° 6.093' Longitude: 82° 27.744'



USGS

ECKERD COLLEGE

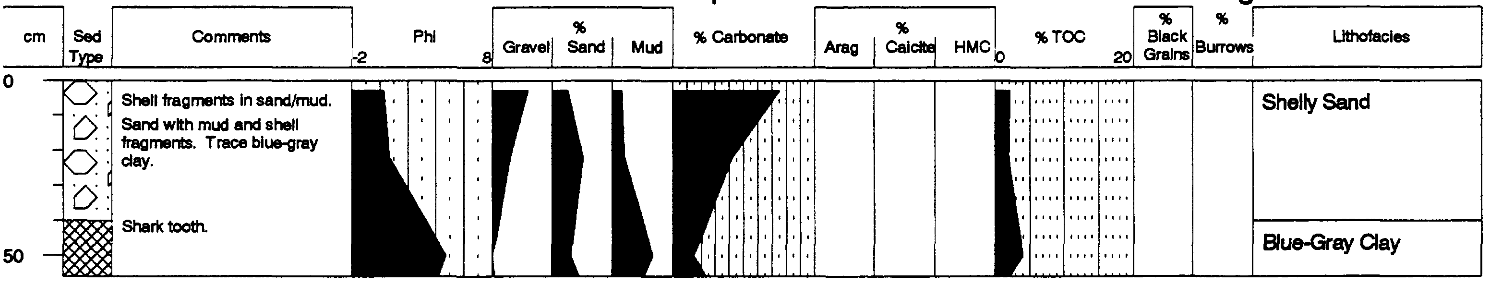
USF

West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: USGS-96-216

Water Depth: 14.5' Latitude: 27° 6.031' Longitude: 82° 27.79'



A63 USGS

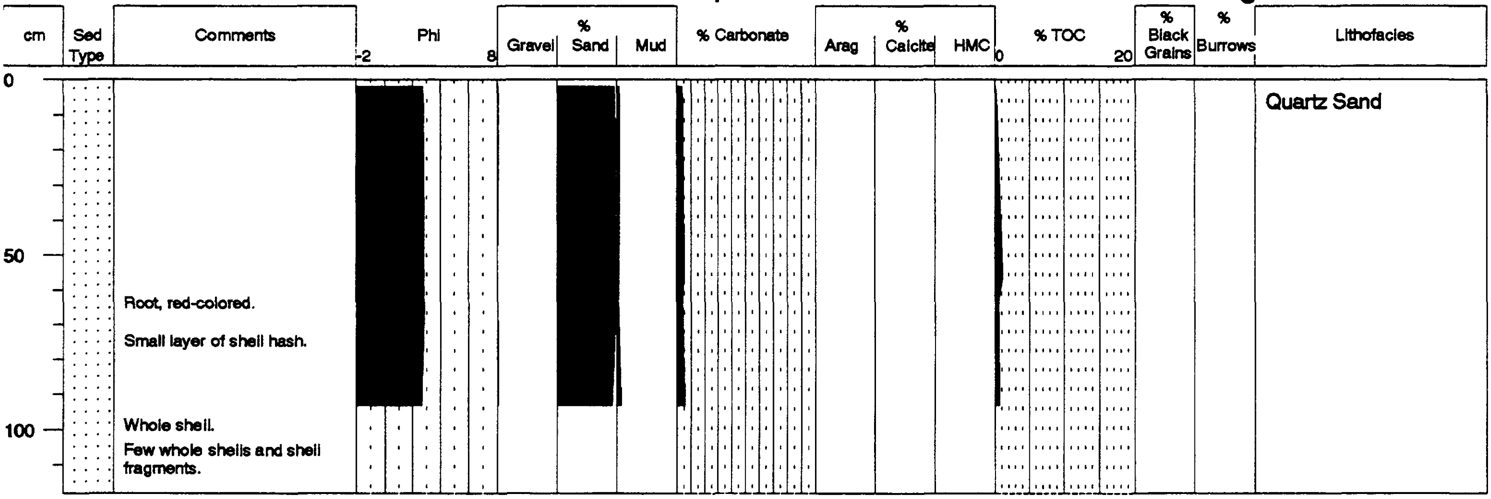
ECKERD COLLEGE USF

West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: USGS-96-217

Water Depth: 10.5' Latitude: 27° 15.675' Longitude: 82° 32.909'

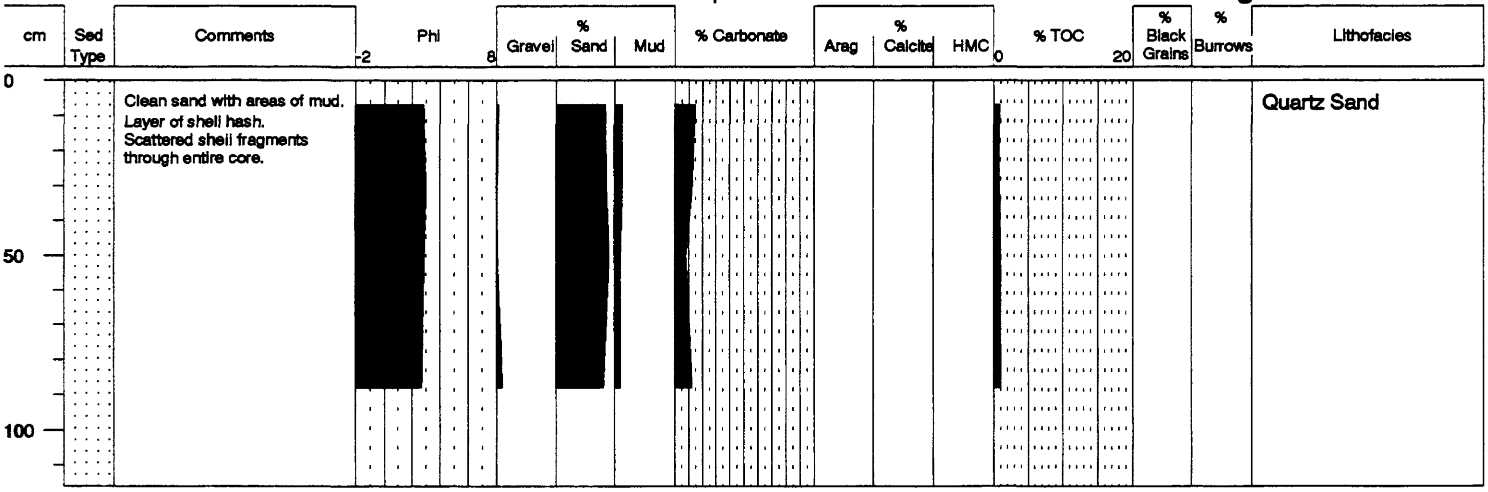


West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: USGS-96-218

Water Depth: 14.5' Latitude: 27° 15.64' Longitude: 82° 32.919'



A65

USGS

ECKERD COLLEGE

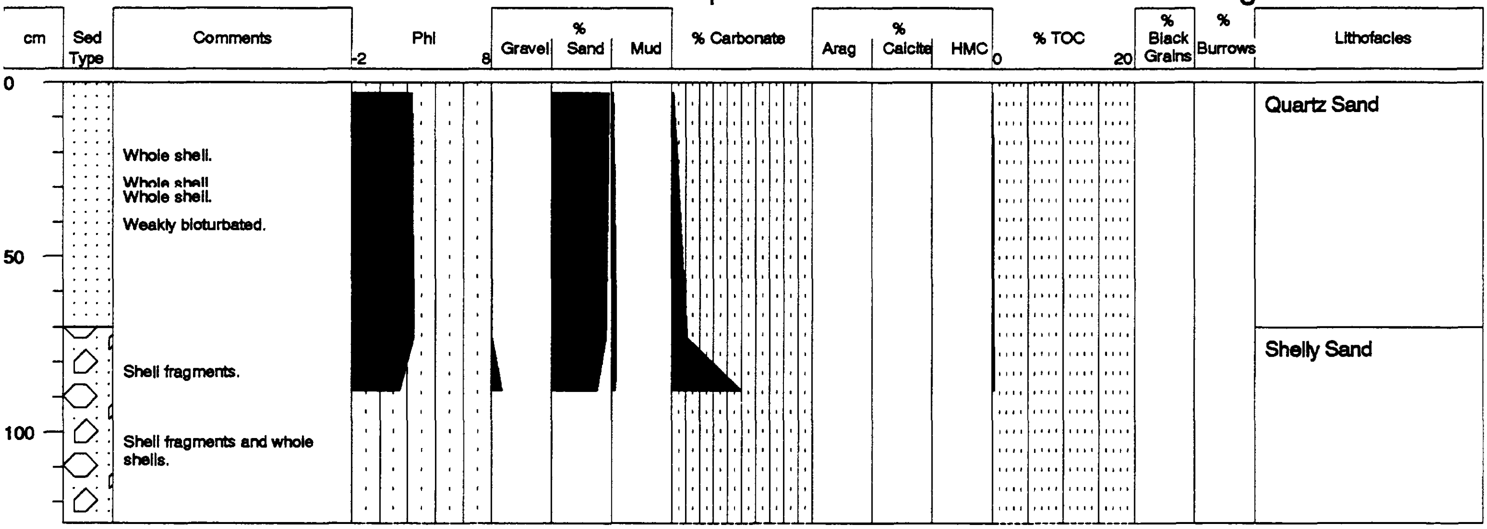
USF

West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: USGS-96-219

Water Depth: 10.2' Latitude: 27° 22.124' Longitude: 82° 37.846'

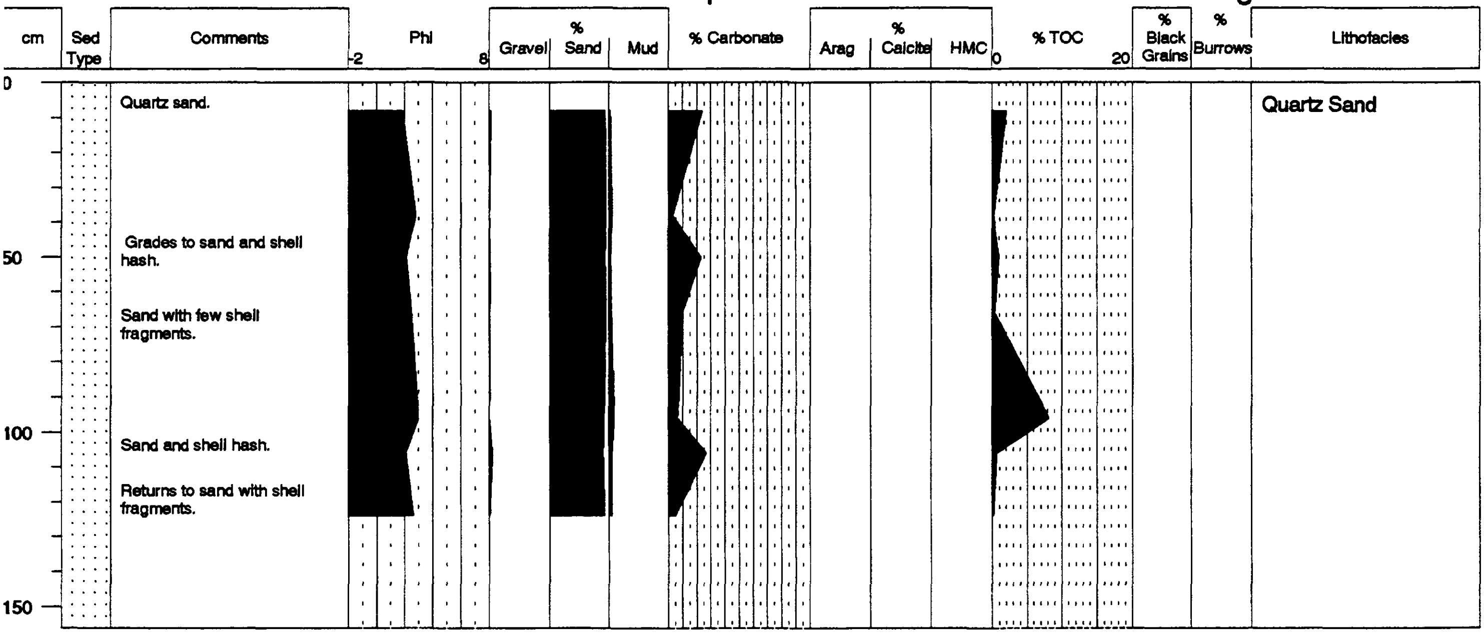


West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: USGS-96-220

Water Depth: 6' Latitude: 27° 22.129' Longitude: 82° 37.818'



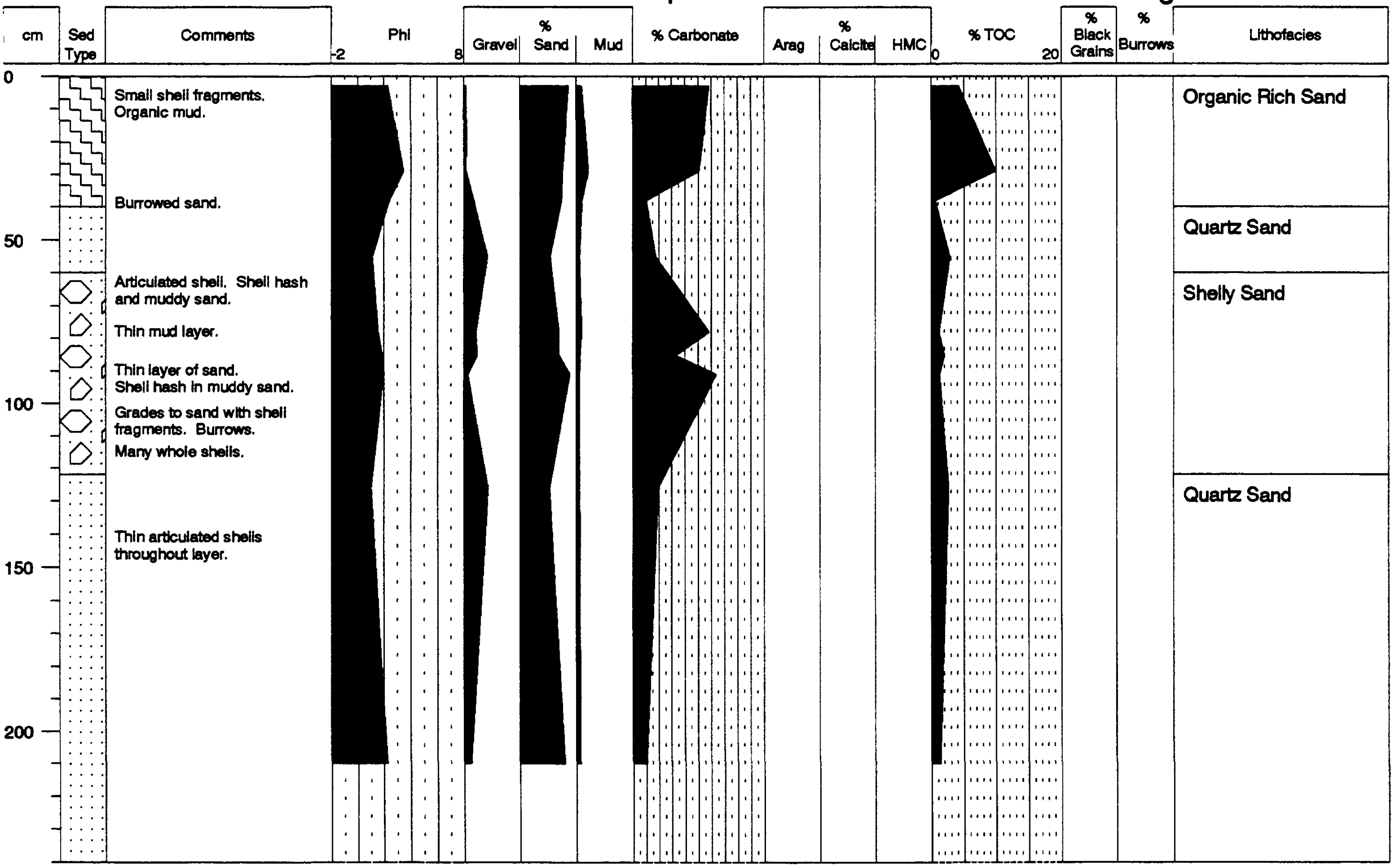
A67

West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: USGS-96-247

Water Depth: 18.5' Latitude: 27° 44.825' Longitude: 82° 46.015'



USGS

ECKERD COLLEGE

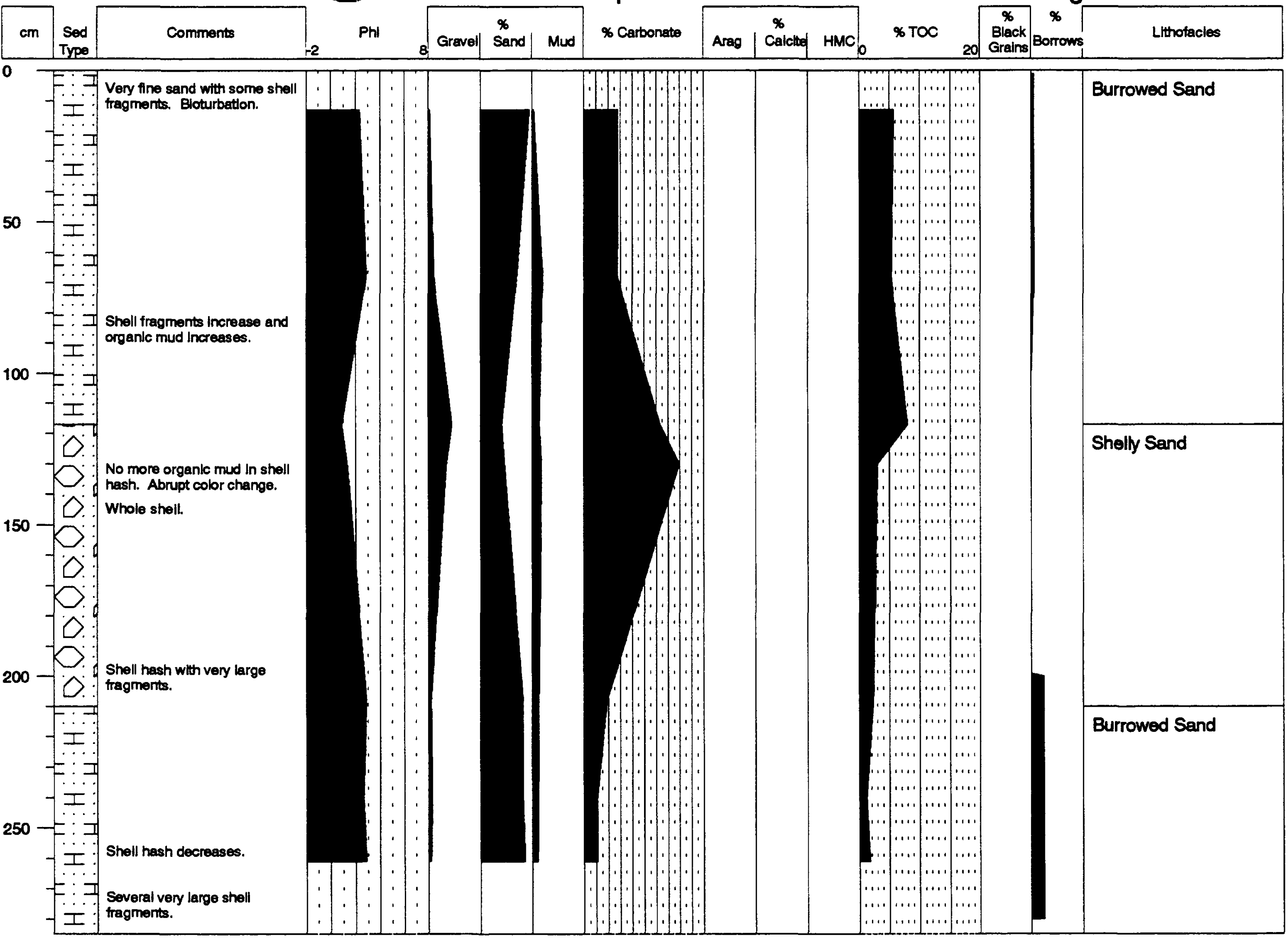
USF

West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: USGS-97-248

Water Depth: 15' Latitude: 27° 44.699' Longitude: 82° 46.291'

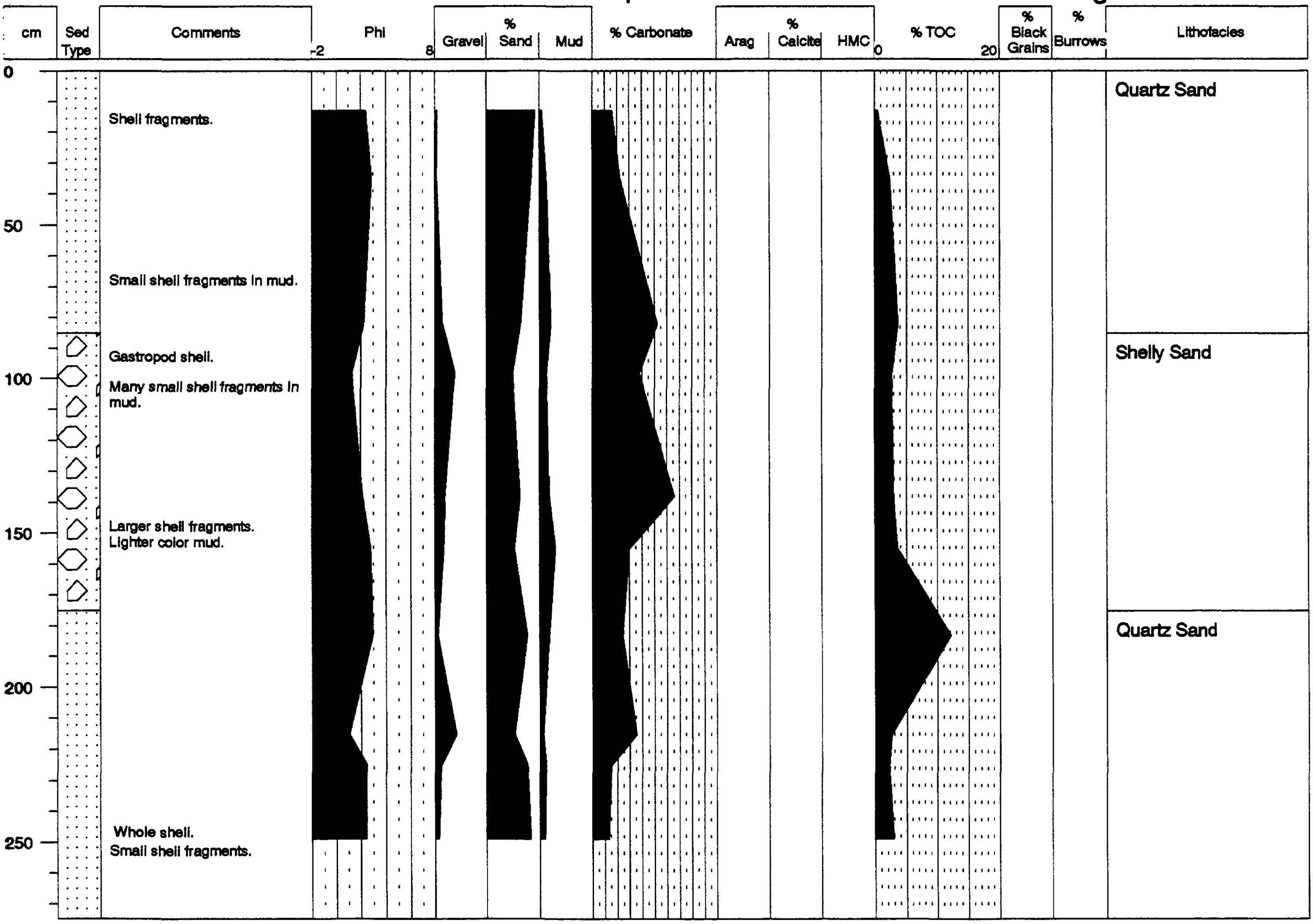


West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: USGS-96-249

Water Depth: 17' Latitude: 27° 44.567' Longitude: 82° 46.552'

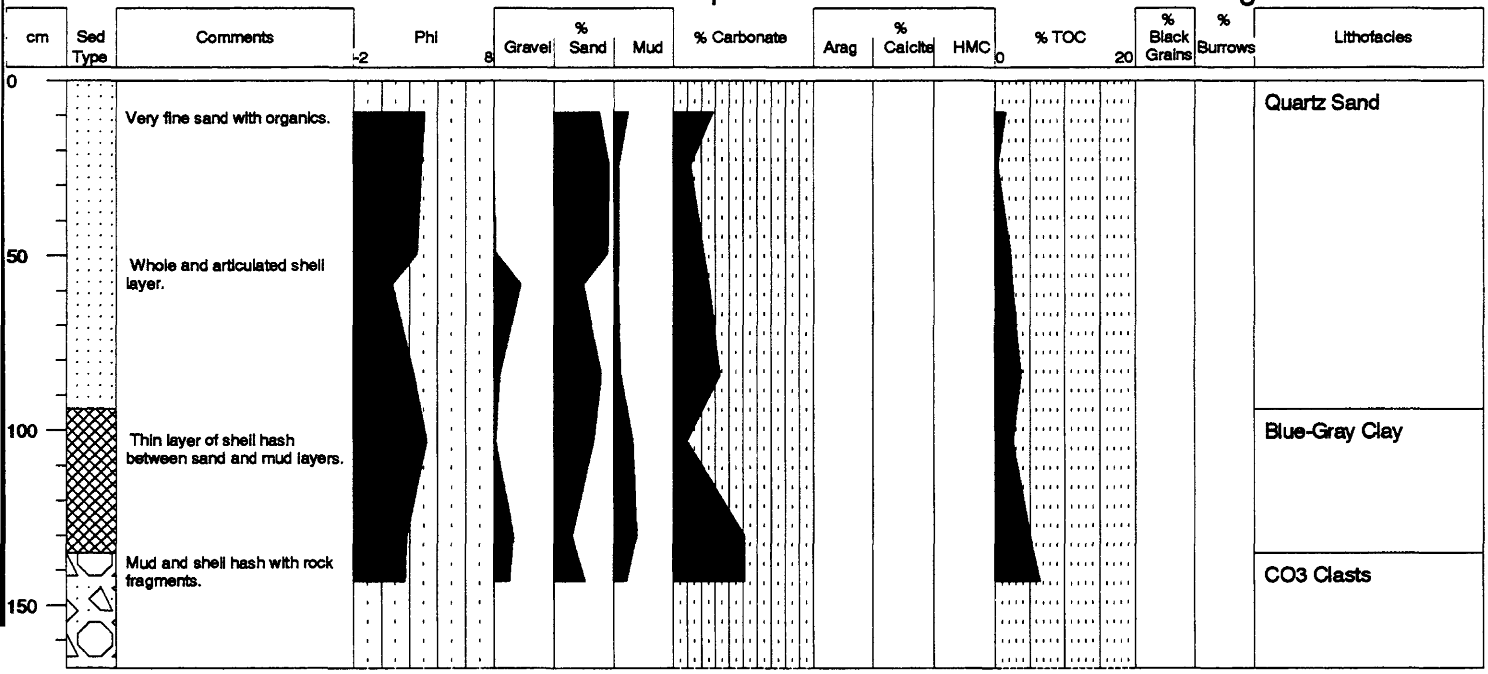


West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: USGS-97-250

Water Depth: 24' Latitude: 27° 43.593' Longitude: 82° 48.649'



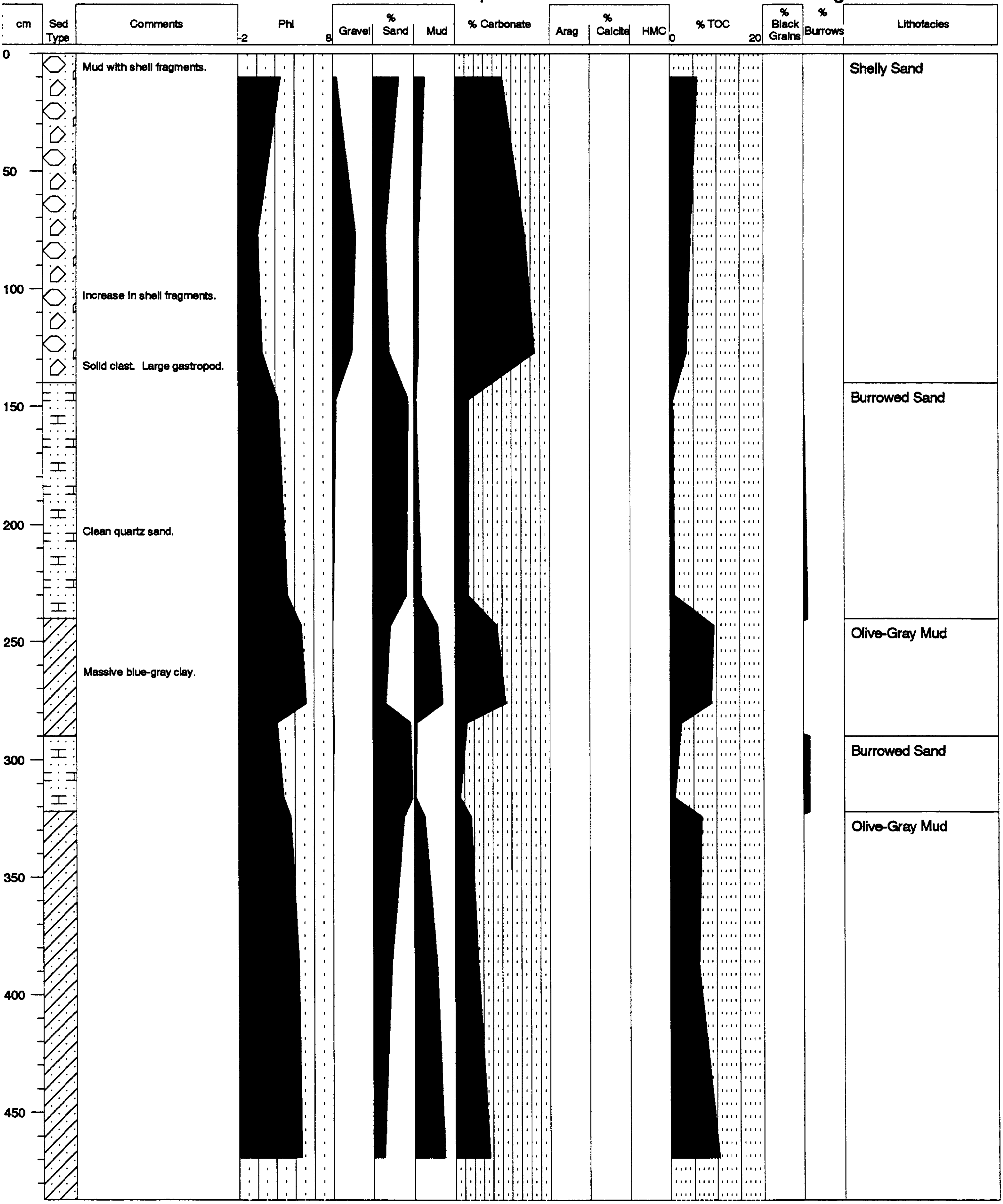
A71

West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: USGS-97-251

Water Depth: 21.2' Latitude: 27° 43.232' Longitude: 82° 45.482'



USGS

ECKERD COLLEGE

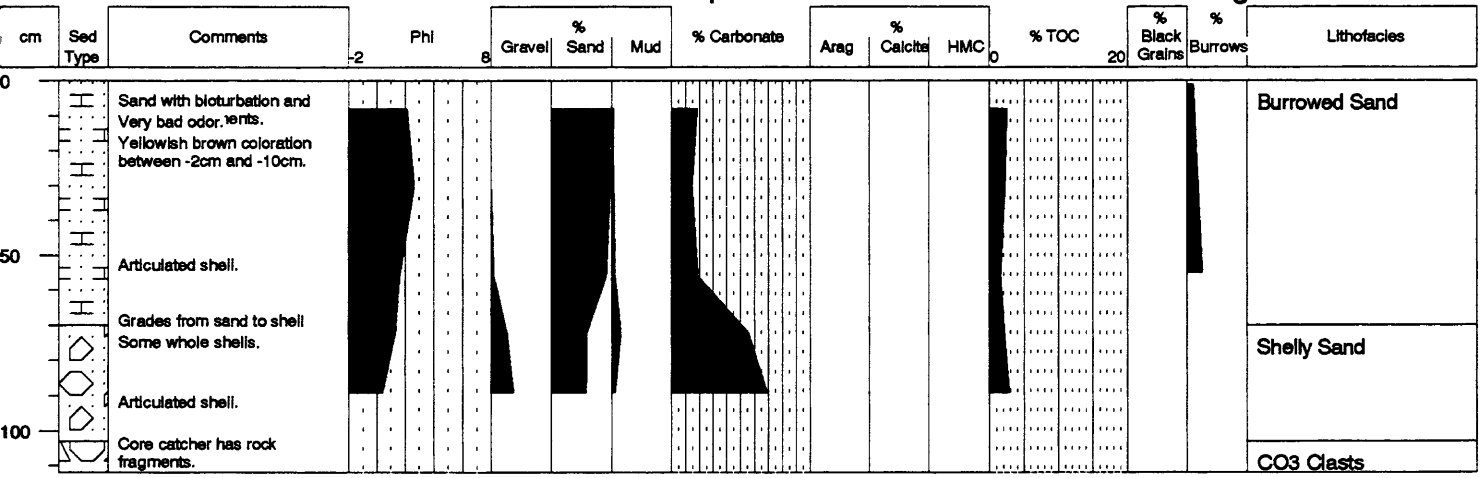
USF

West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: USGS-97-252

Water Depth: 14.9' Latitude: 27 45.054' Longitude: 82 46.444'



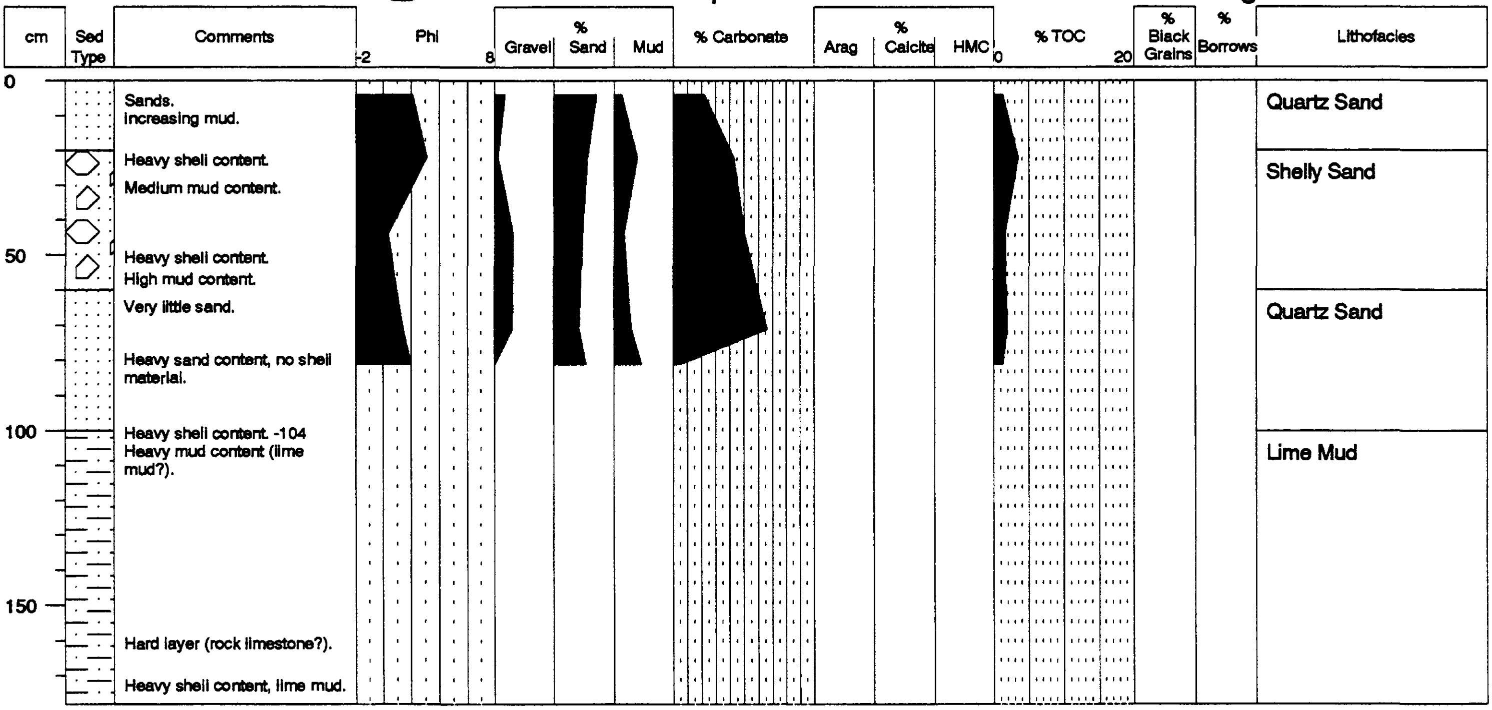
A73

West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: USGS-97-253

Water Depth: 24.3' Latitude: 27° 42.61' Longitude: 82° 46.747'



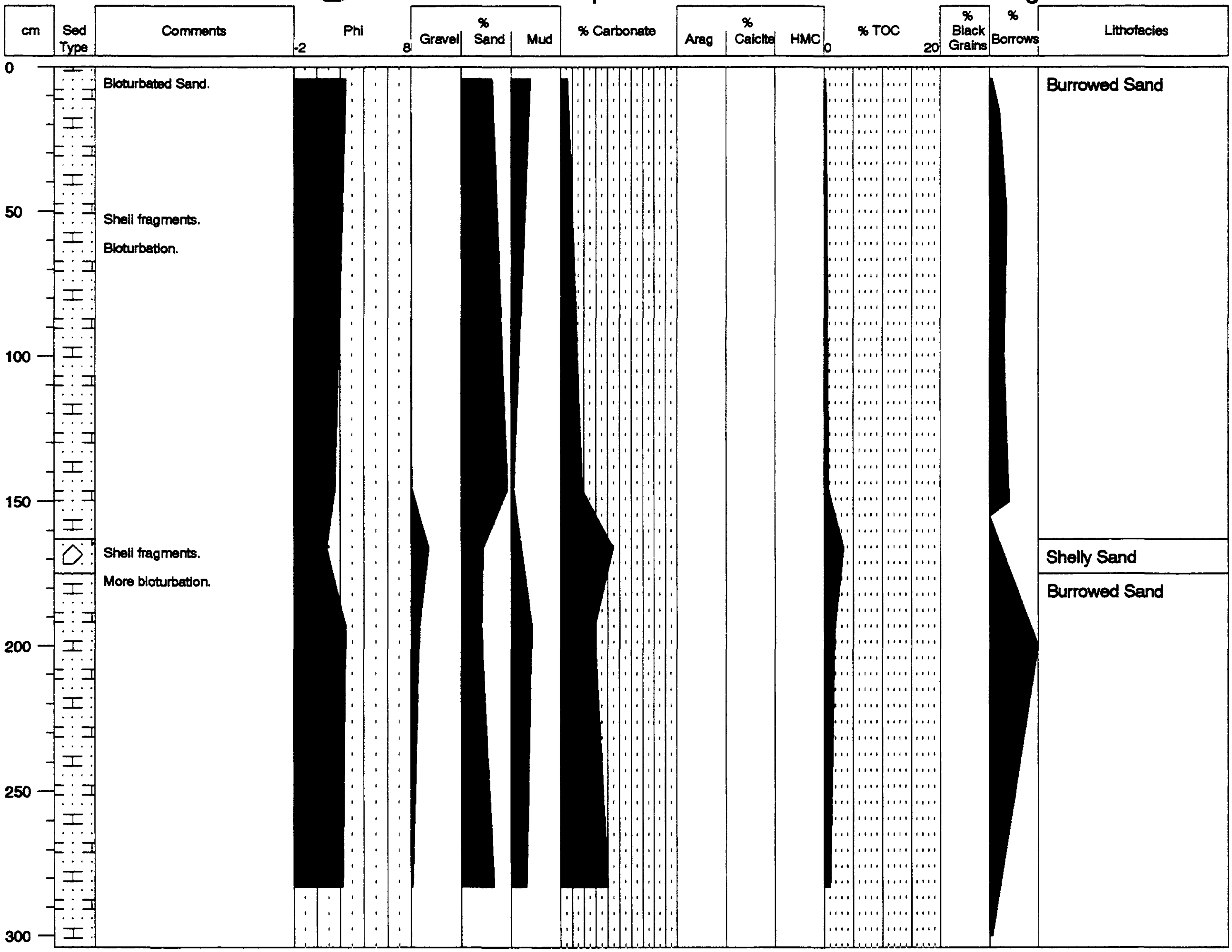
West-Central Florida Coastal Studies Project

Vibracore Description

USGS
ECKERD COLLEGE
USF

Core Identification: USGS-97-254

Water Depth: 9.8' Latitude: 27° 43.497' Longitude: 82° 44.705'



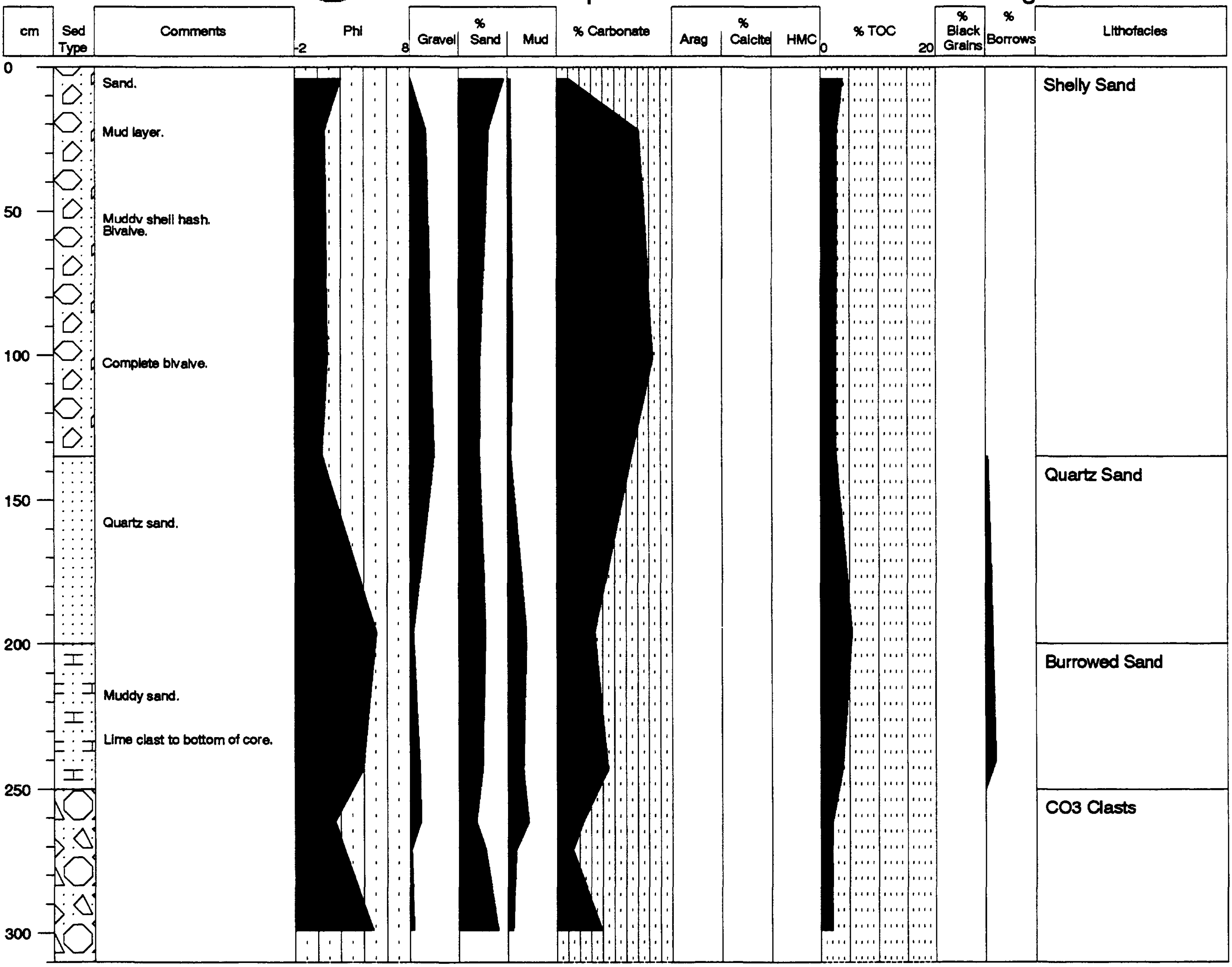
A75

West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: USGS-97-255

Water Depth: 21' Latitude: 27 41.528' Longitude: 82 46.945'

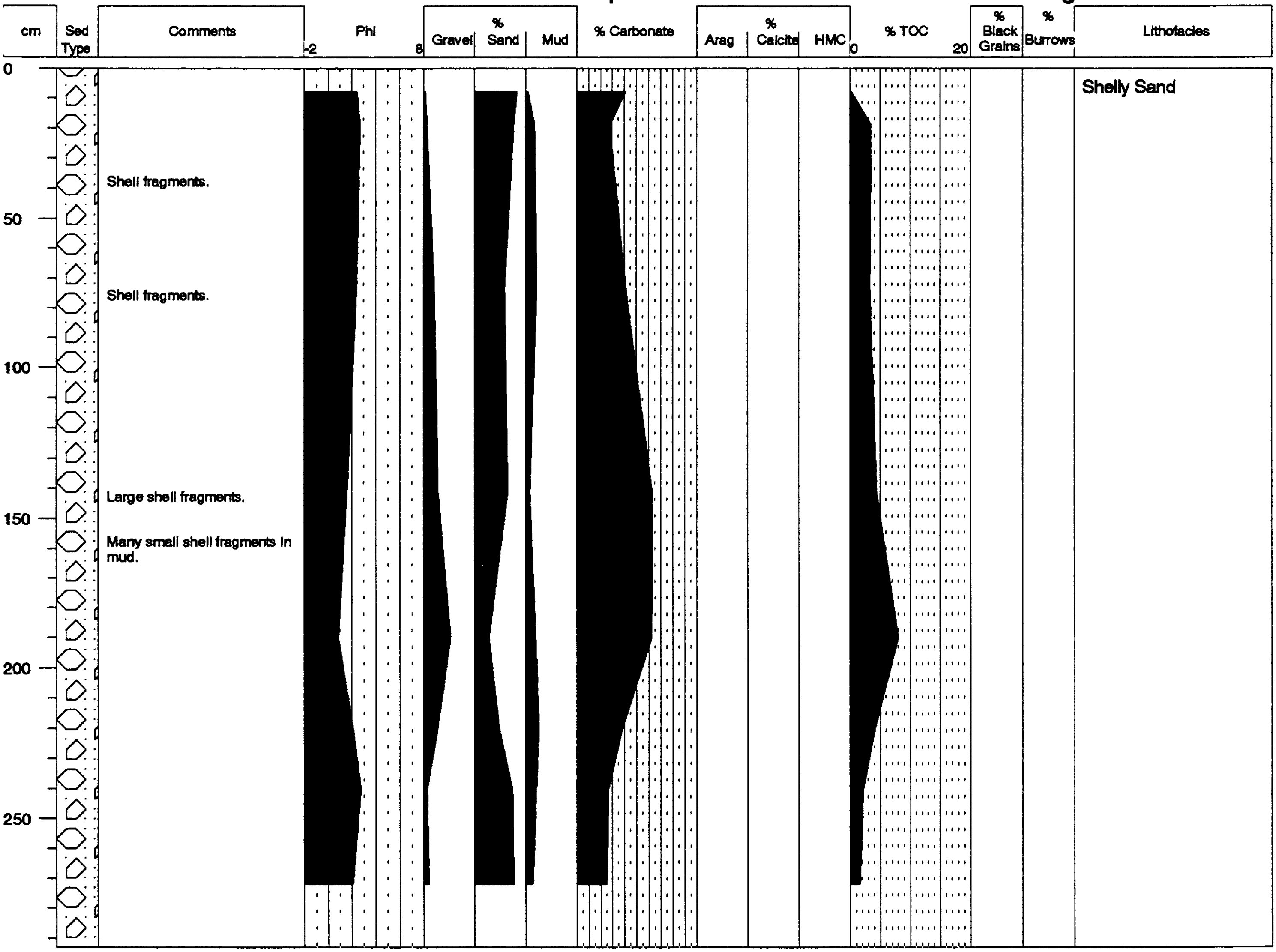


West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: USGS-97-256

Water Depth: 18' Latitude: 27° 41.529' Longitude: 82° 45.533'



A77

USGS

ECKERD COLLEGE

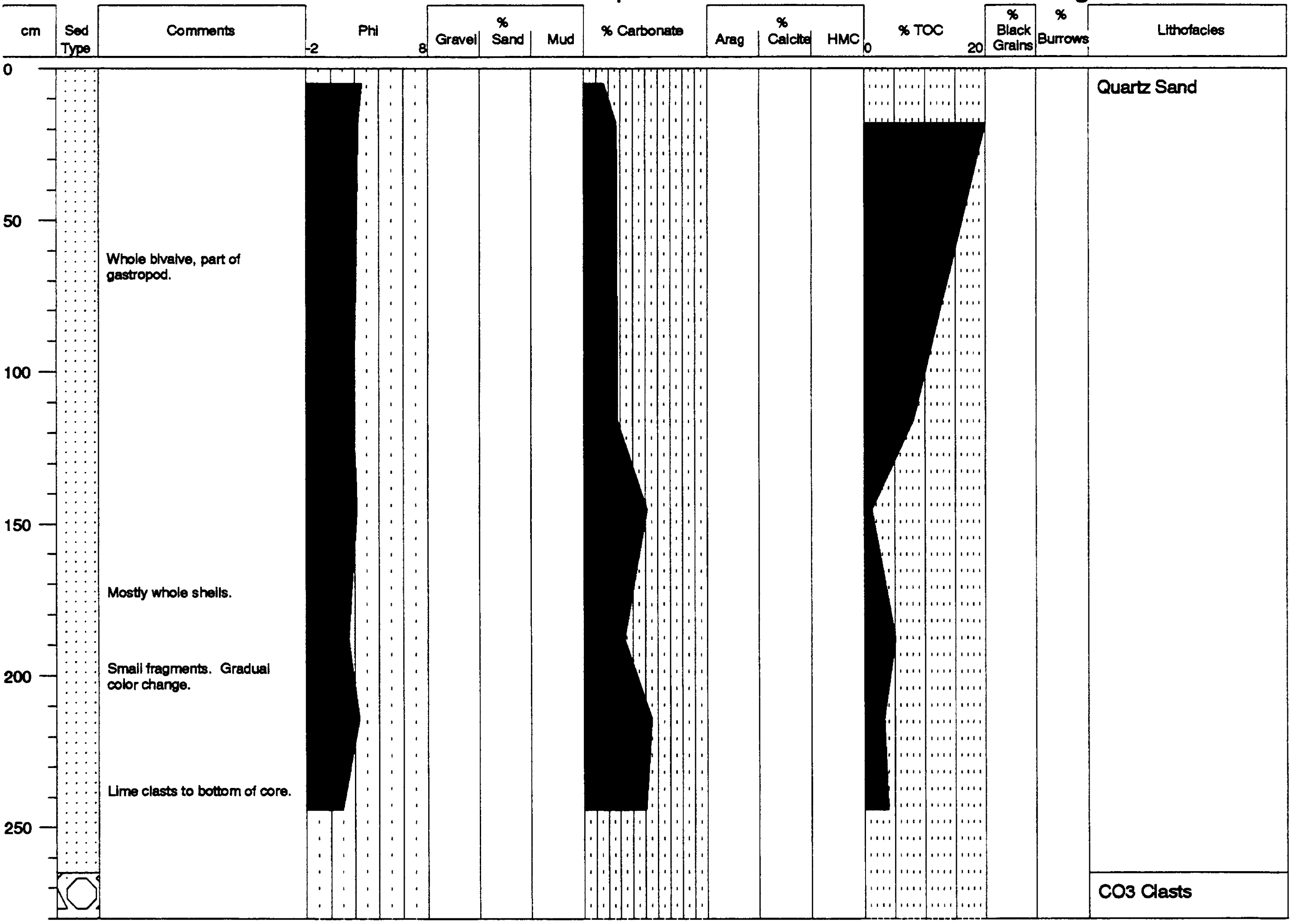
USF

West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: USGS-97-257

Water Depth: 16' Latitude: 27 41.524' Longitude: 82 45.244'

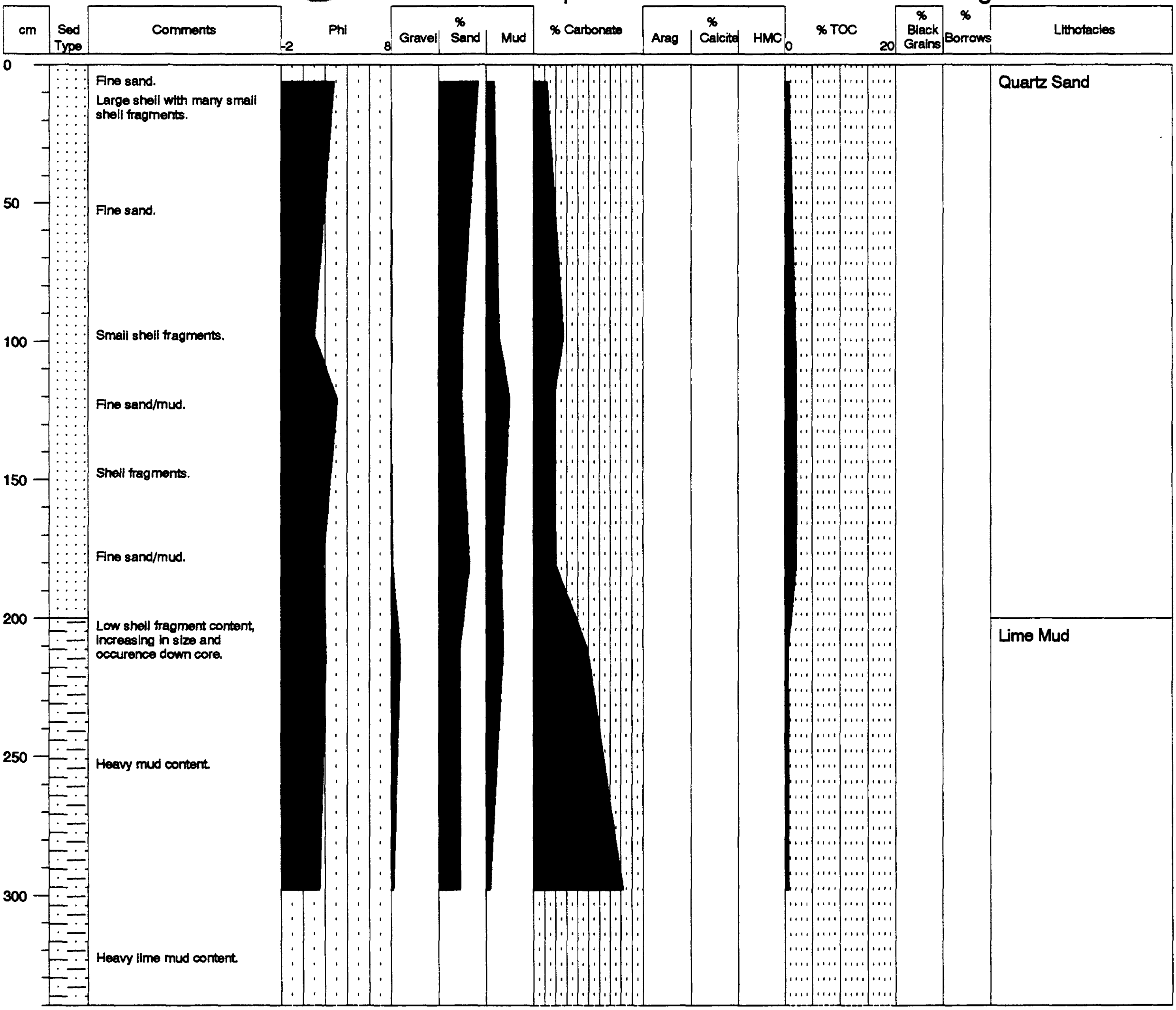


West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: USGS-97-258

Water Depth: 14' Latitude: 27° 41.523' Longitude: 82° 44.973'



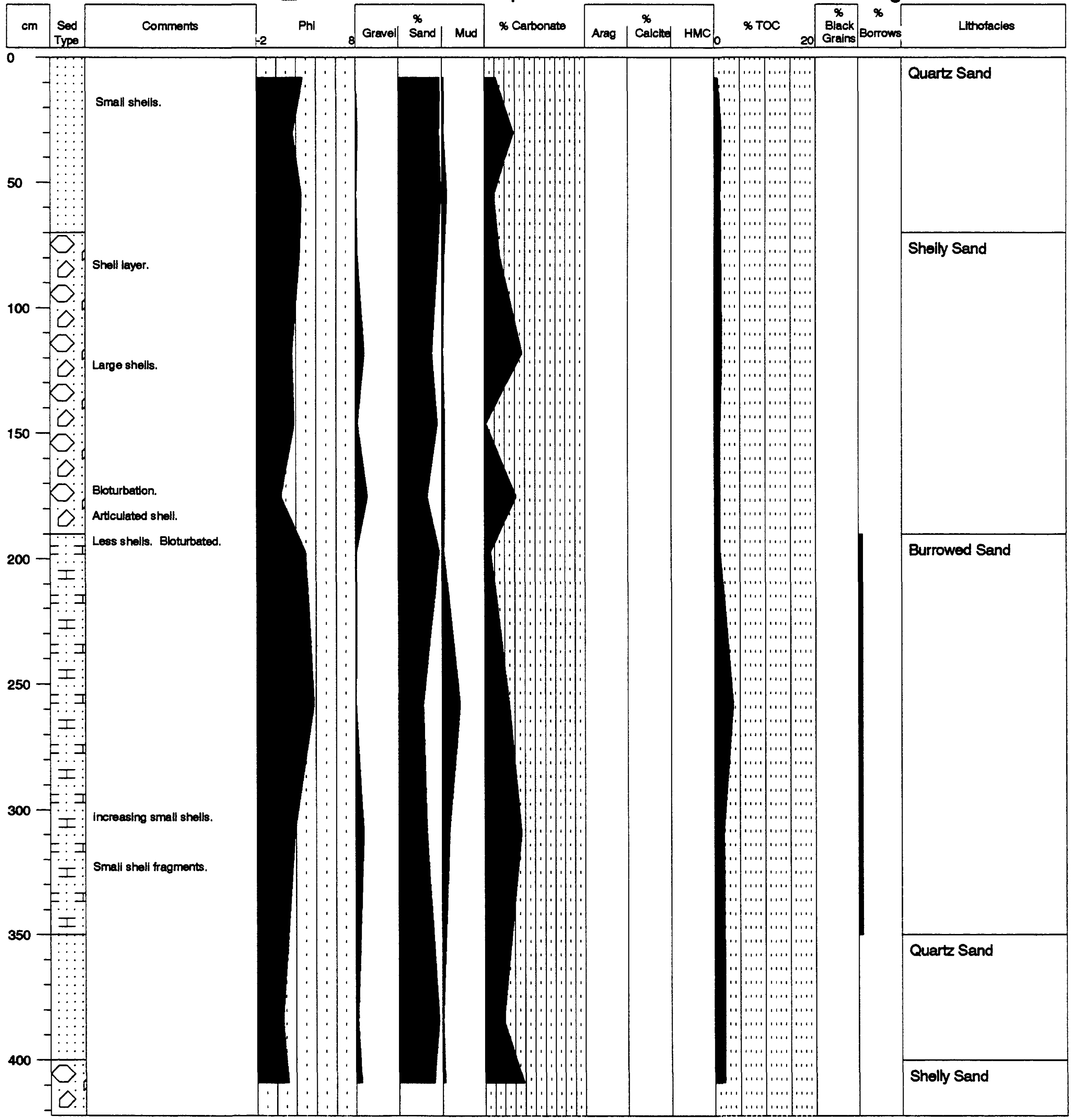
A79

West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: USGS-97-259

Water Depth: 9' Latitude: 27° 41.521' Longitude: 82° 44.483'



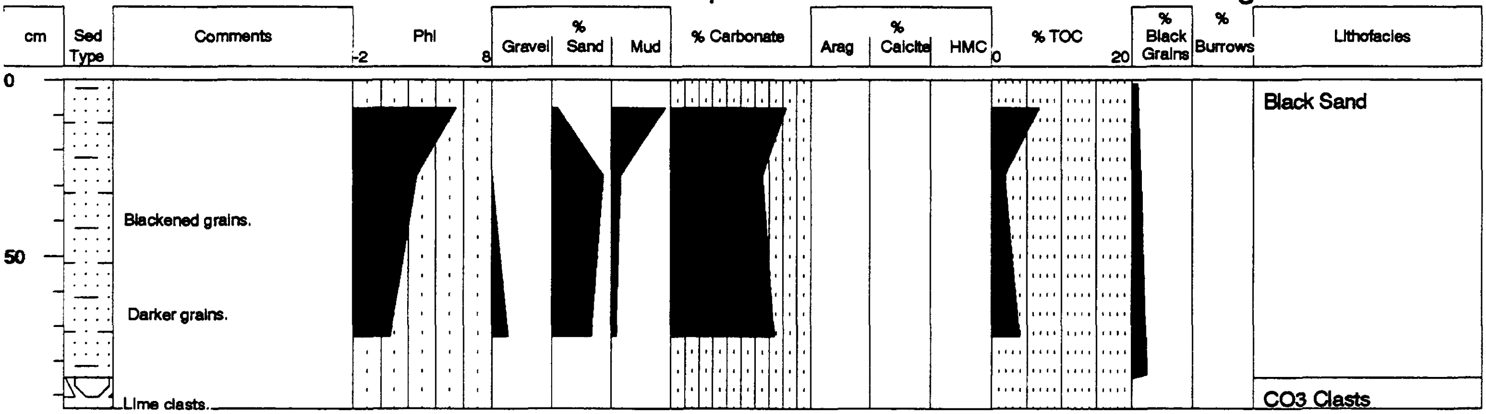
West-Central Florida Coastal Studies Project

Vibracore Description

ECKERD COLLEGE

Core Identification: USGS-97-263

Water Depth: 65' Latitude: 27° 43.225' Longitude: 83° 5.107'



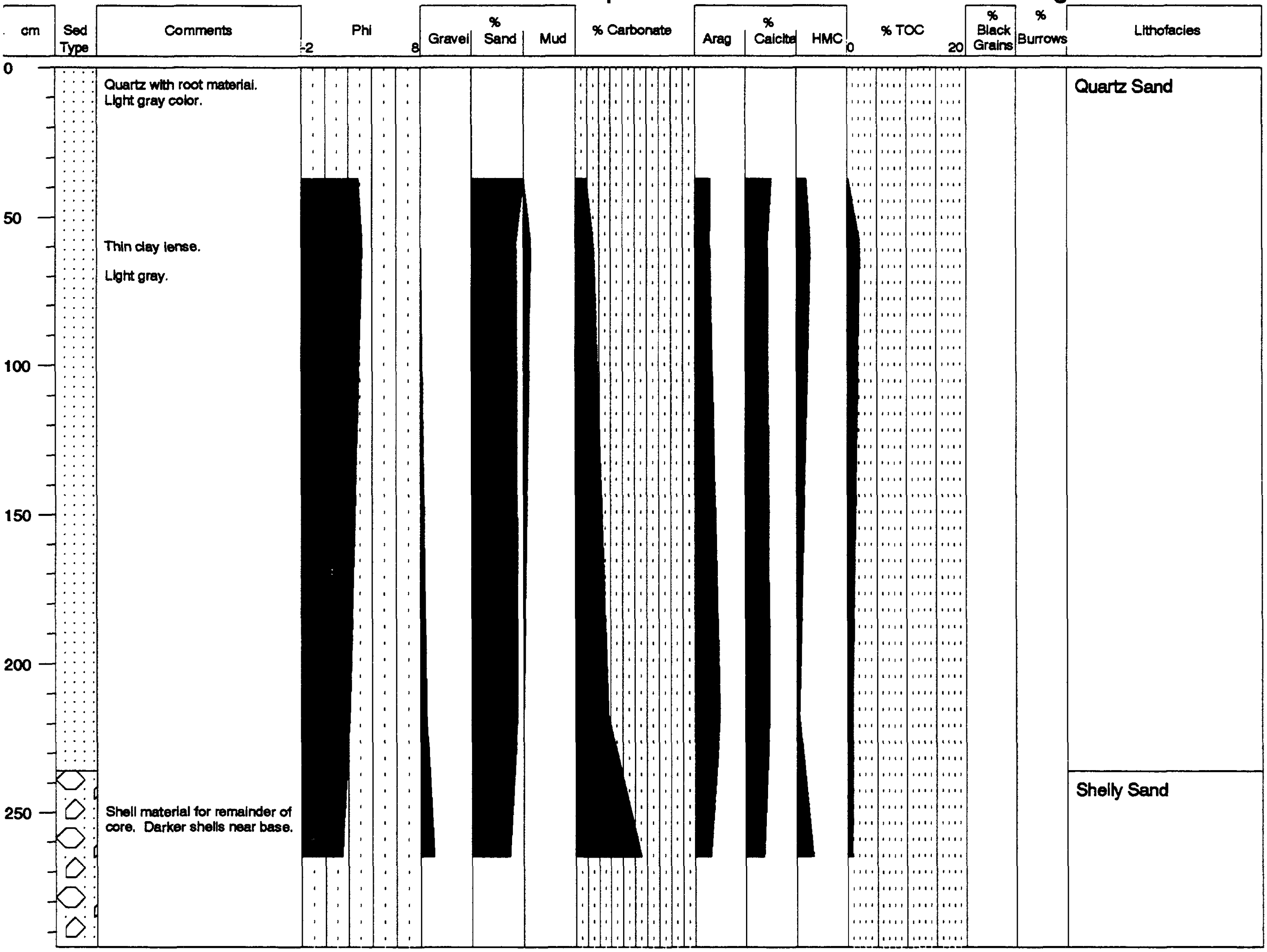
A81 USGS ECKERD COLLEGE USF

West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: WF-93-4

Water Depth: 21' Latitude: 27° 35.071' Longitude: 82° 49.860'

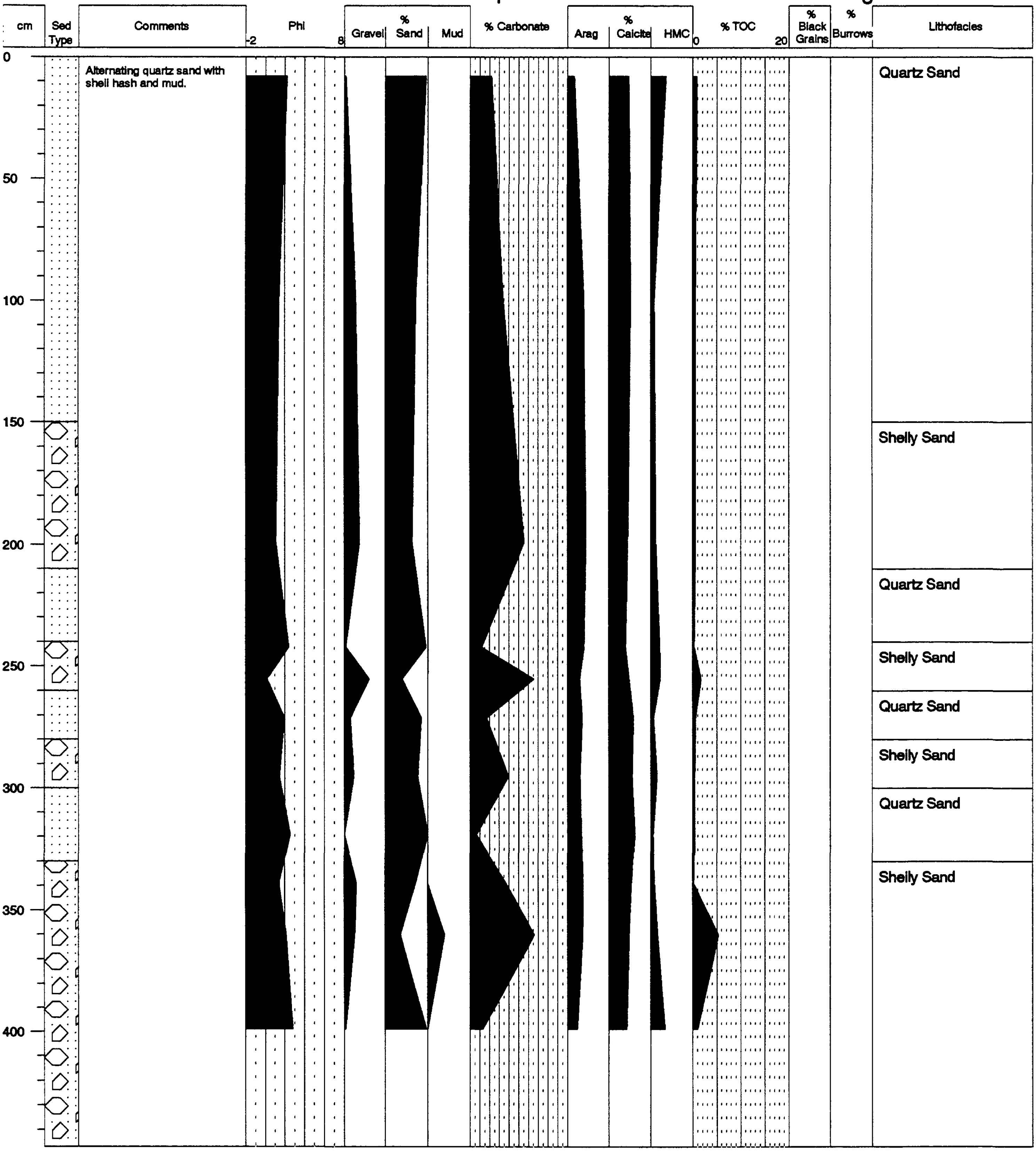


West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: WF-93-5

Water Depth: 17' Latitude: 27° 35.043' Longitude: 82° 48.974'



A83 USGS

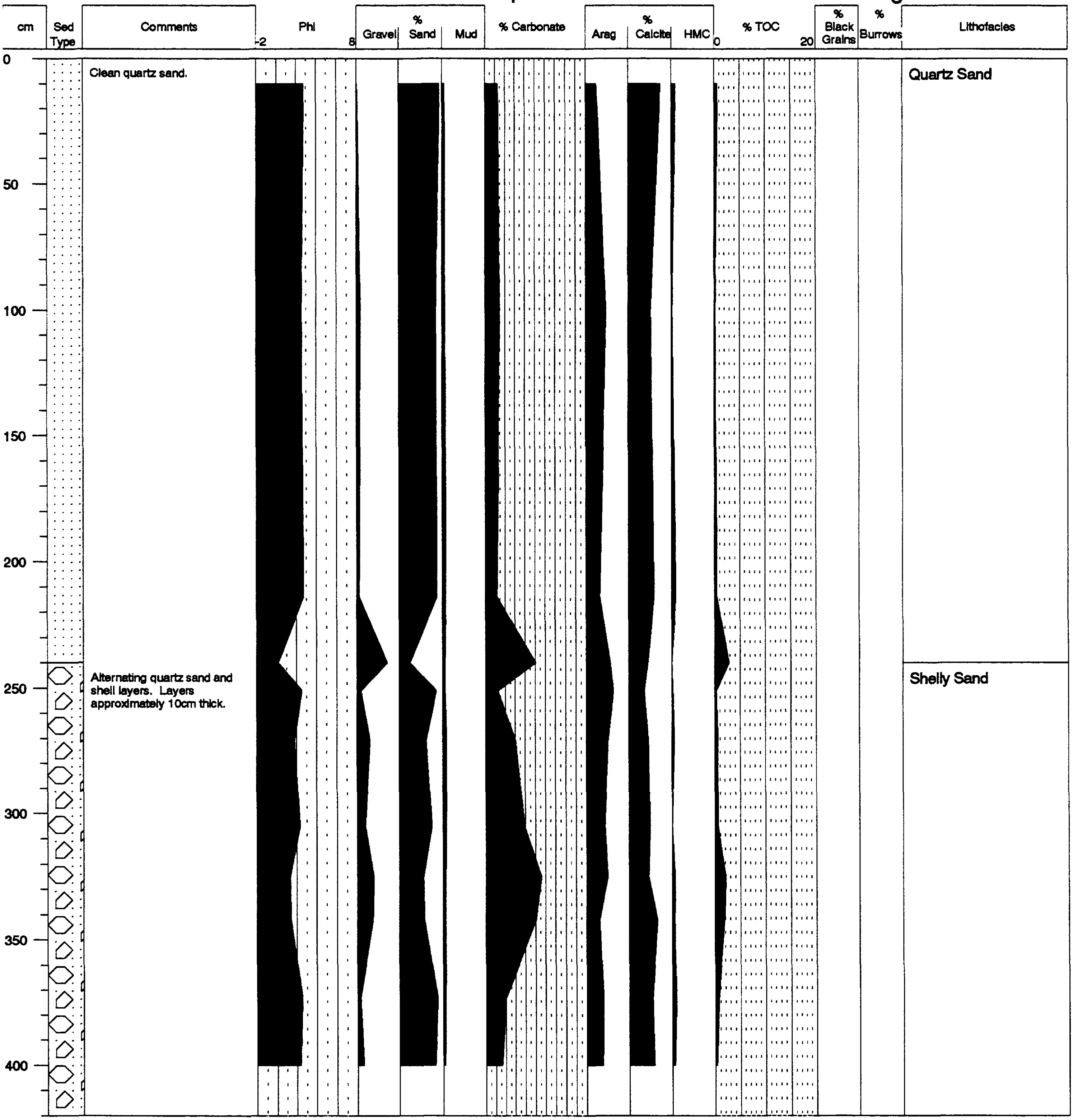
ECKERD COLLEGE USF

West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: WF-93-6

Water Depth: 14' Latitude: 27° 35.605' Longitude: 82° 47.992'



USGS

ECKERD COLLEGE

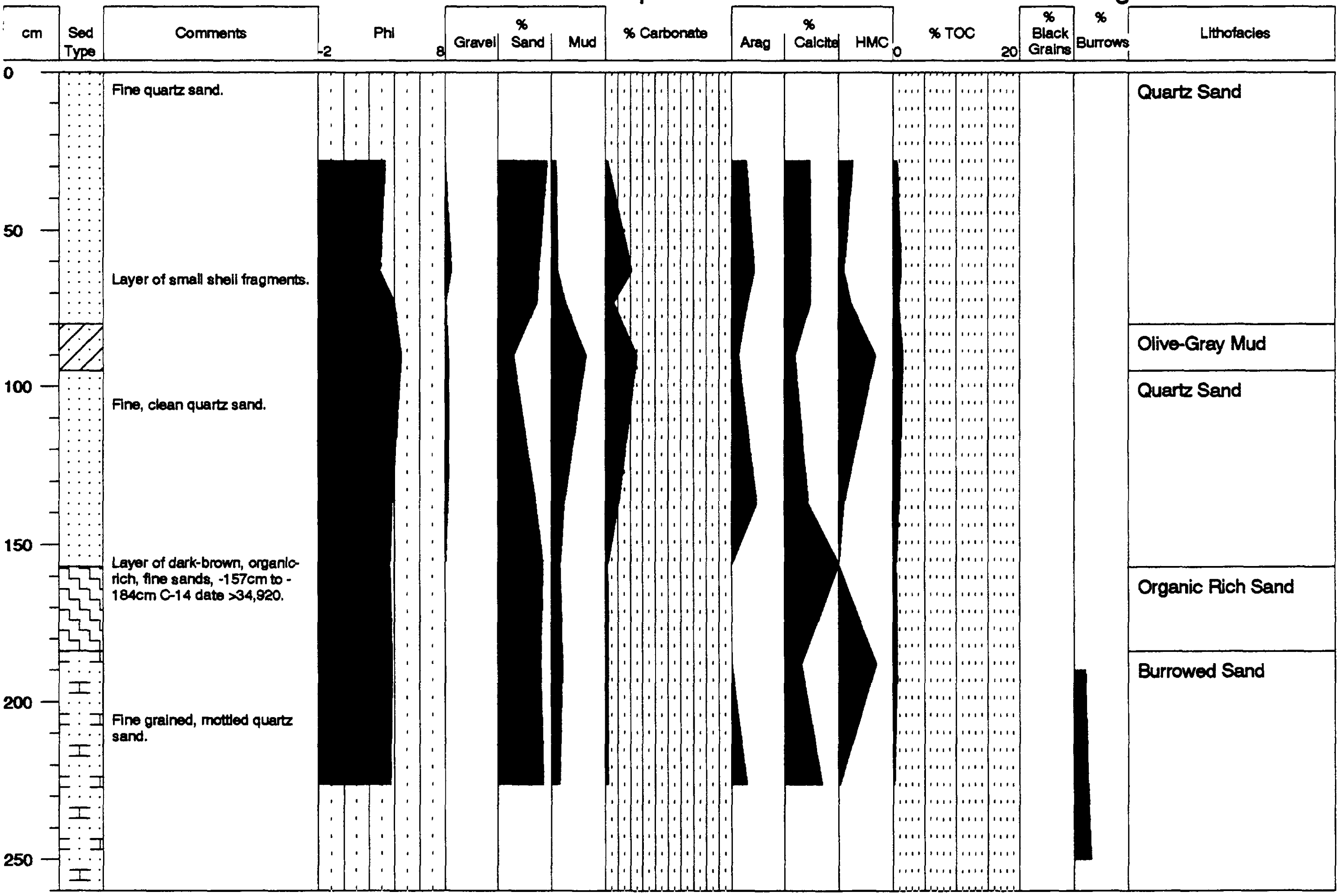
USF

West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: WF-93-13A

Water Depth: 14.5' Latitude: 27° 30.581' Longitude: 82° 43.946'



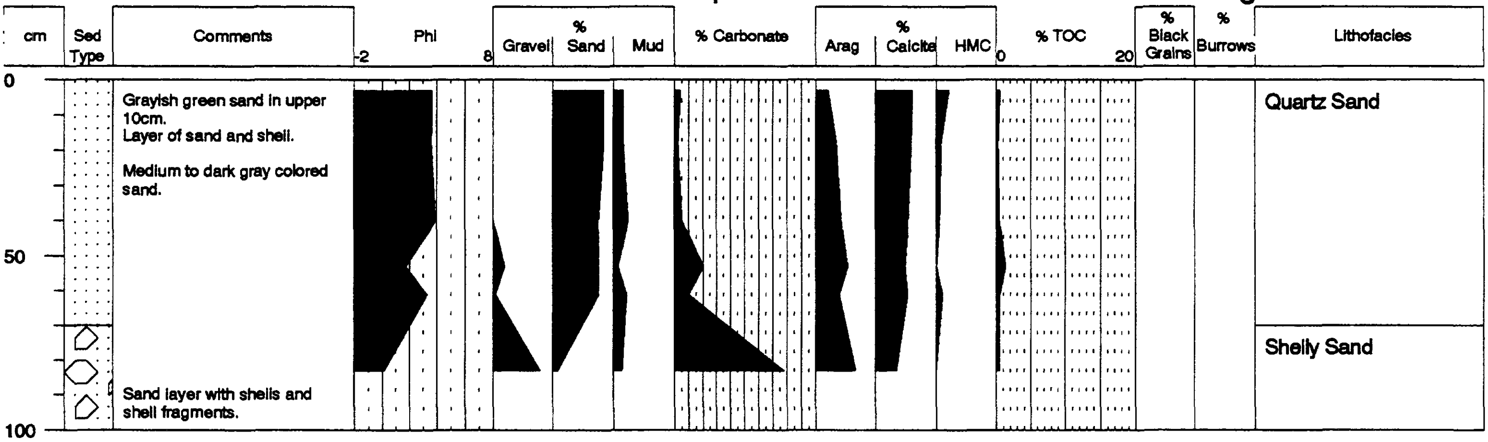
A85

West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: WF-93-14

Water Depth: 19' Latitude: 27° 36.135' Longitude: 82° 47.913'



USGS

ECKERD COLLEGE

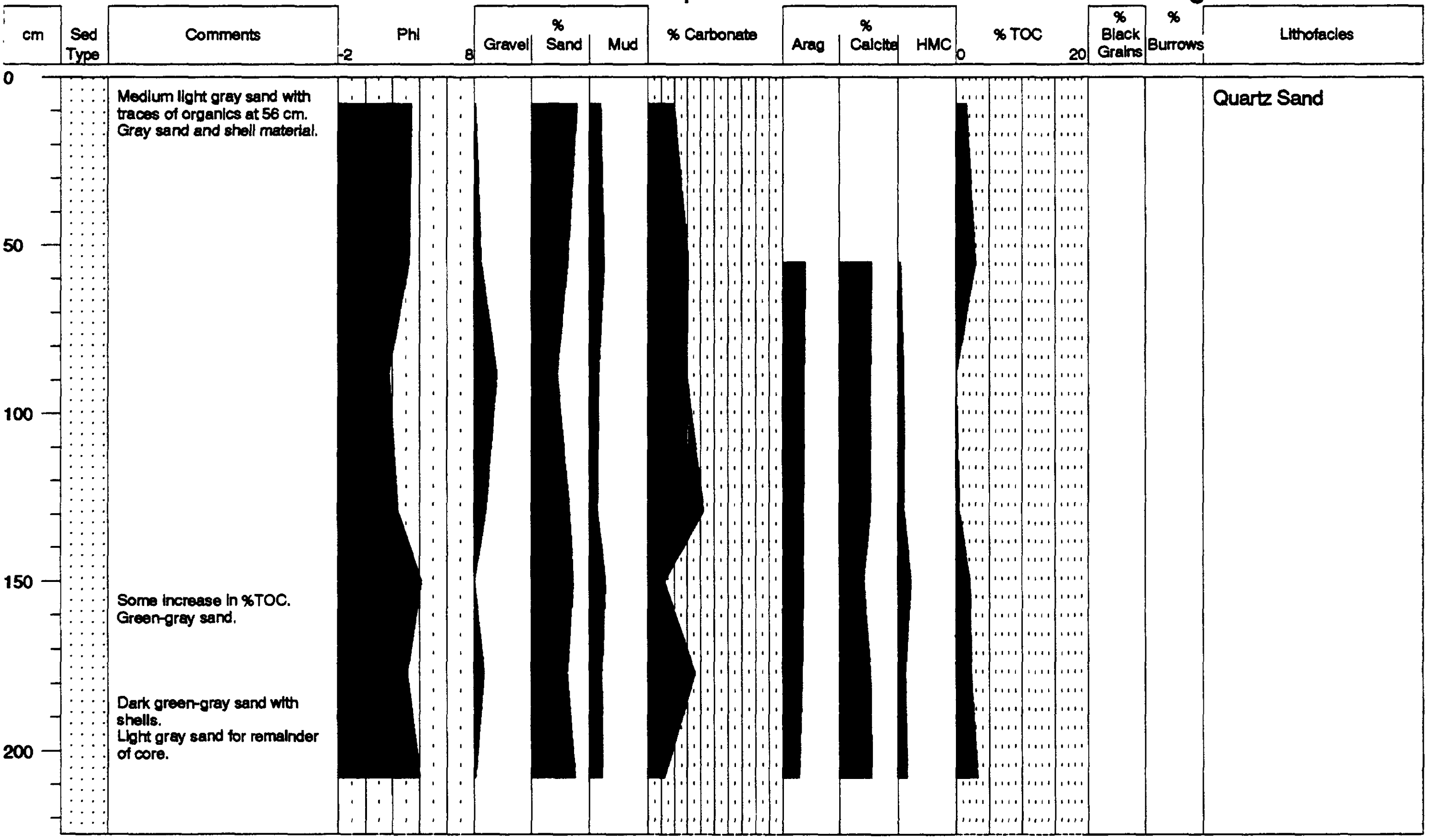
USF

West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: WF-93-15A

Water Depth: 16' Latitude: 27° 34.064' Longitude: 82° 47.945'



A87 USGS

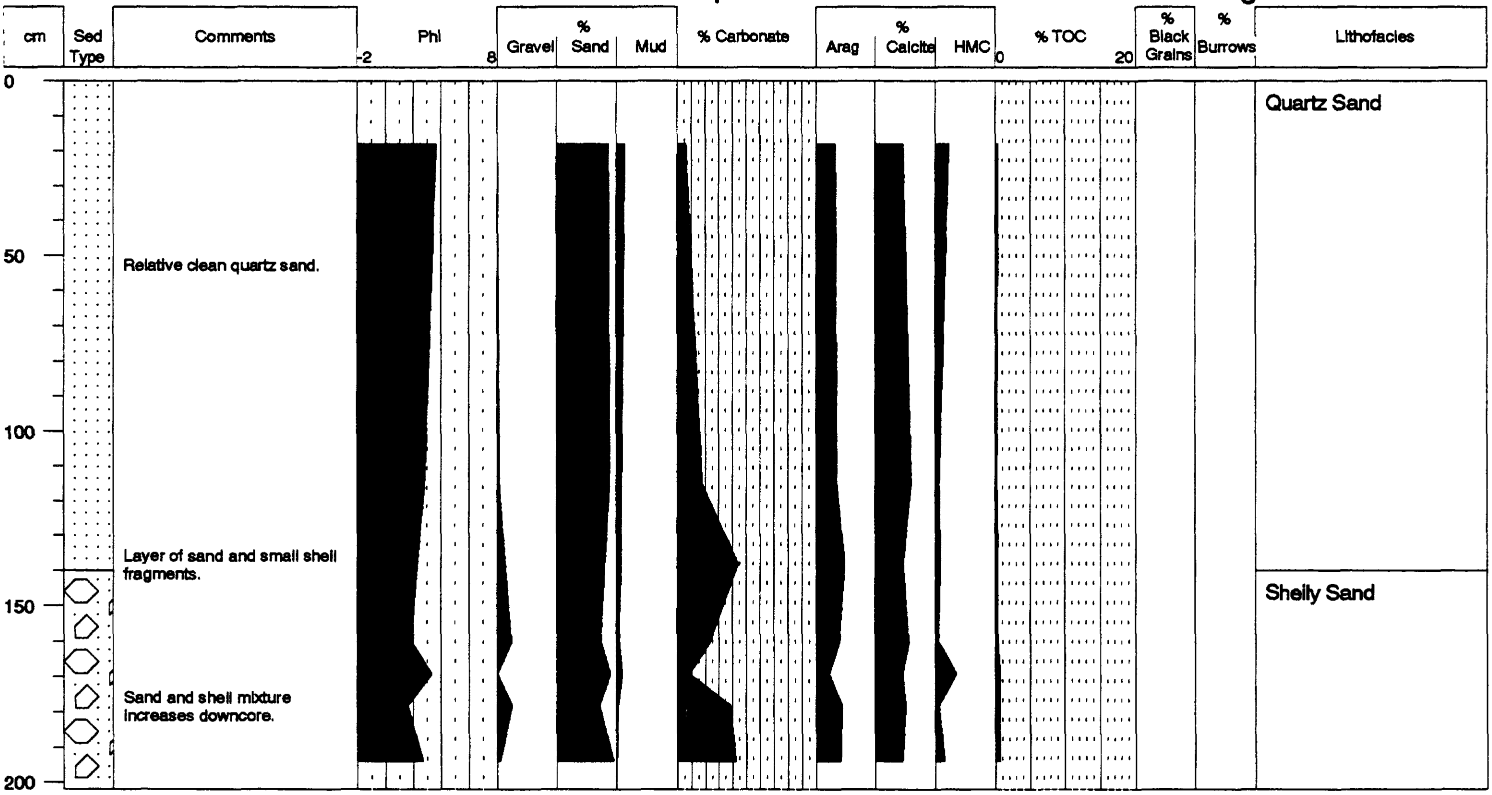
ECKERD COLLEGE USF

West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: WF-93-19

Water Depth: 18' Latitude: 27° 33.120' Longitude: 82° 47.940'



USGS

ECKERD COLLEGE

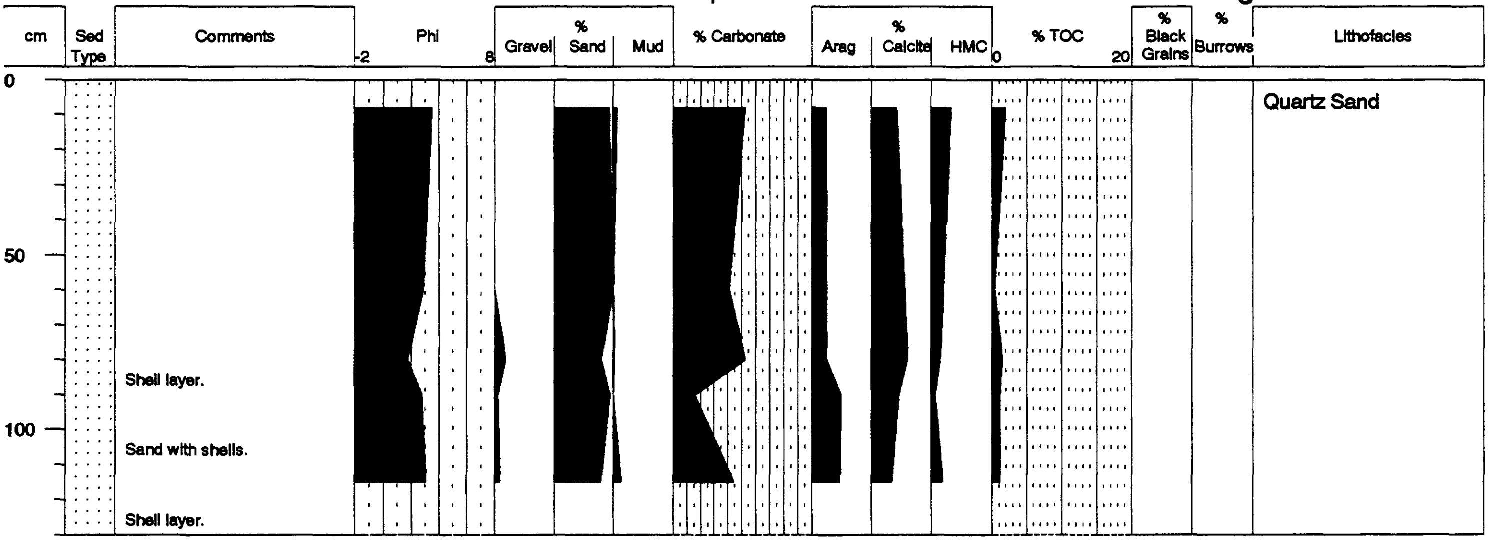
USF

West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: WF-93-20A

Water Depth: 26' Latitude: 27° 32.251' Longitude: 82° 47.930'



A89 USGS

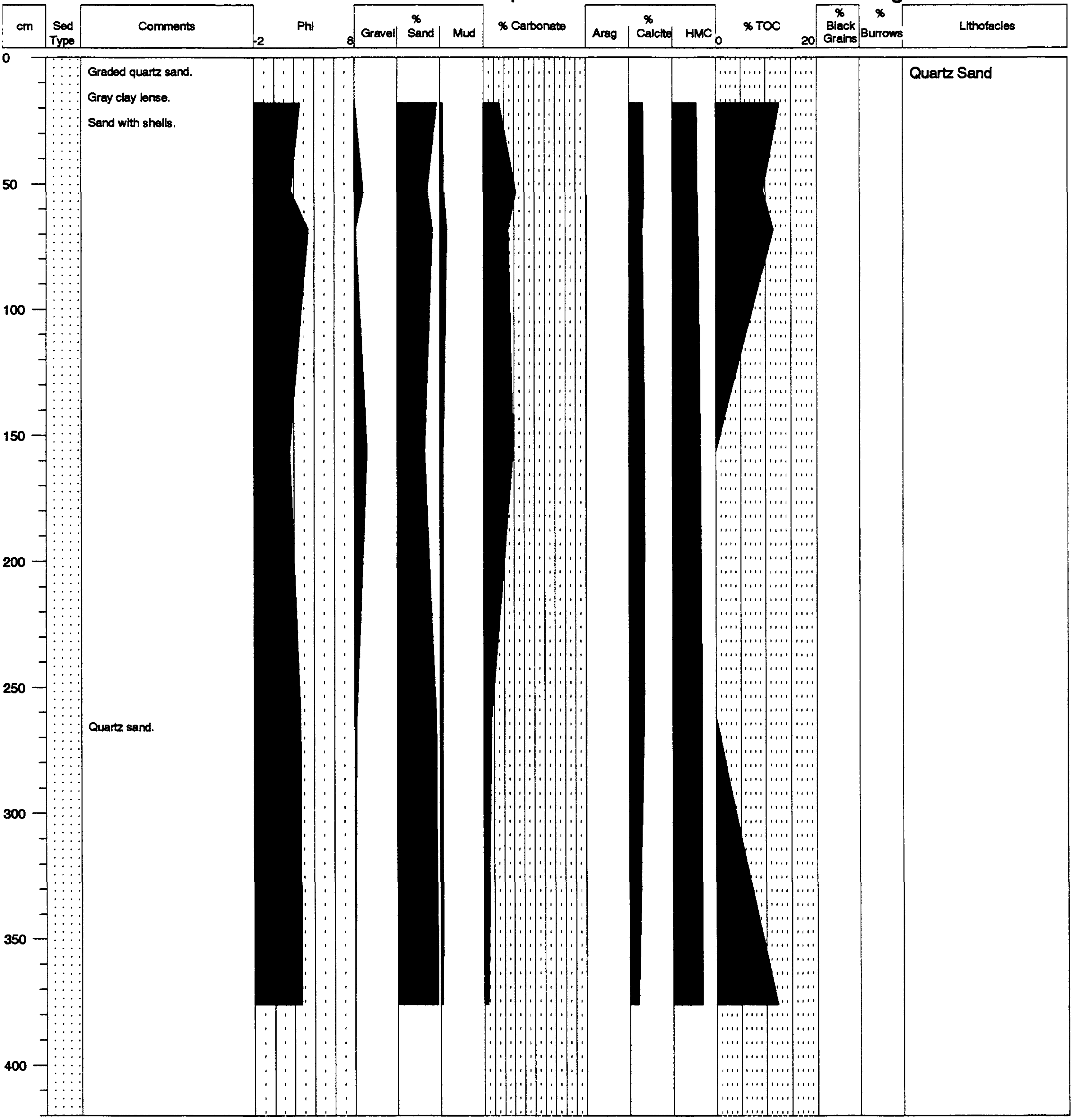
ECKERD COLLEGE USF

West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: WF-93-21

Water Depth: 16' Latitude: 27° 34.935' Longitude: 82° 45.011'



USGS

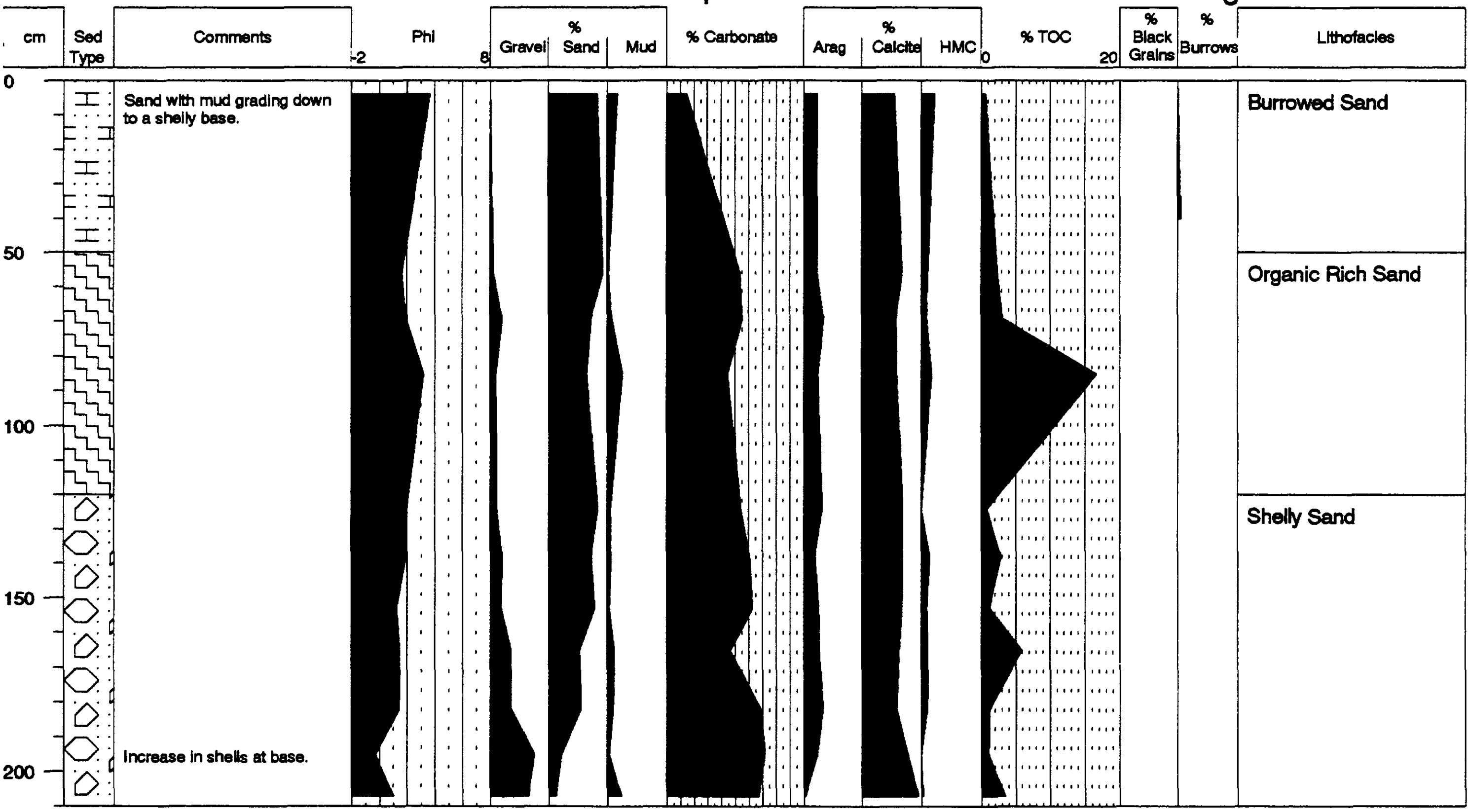
ECKERD COLLEGE USF

West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: WF-93-22

Water Depth: 25' Latitude: 27° 35.100' Longitude: 82° 44.05'



A91

USGS

ECKERD COLLEGE

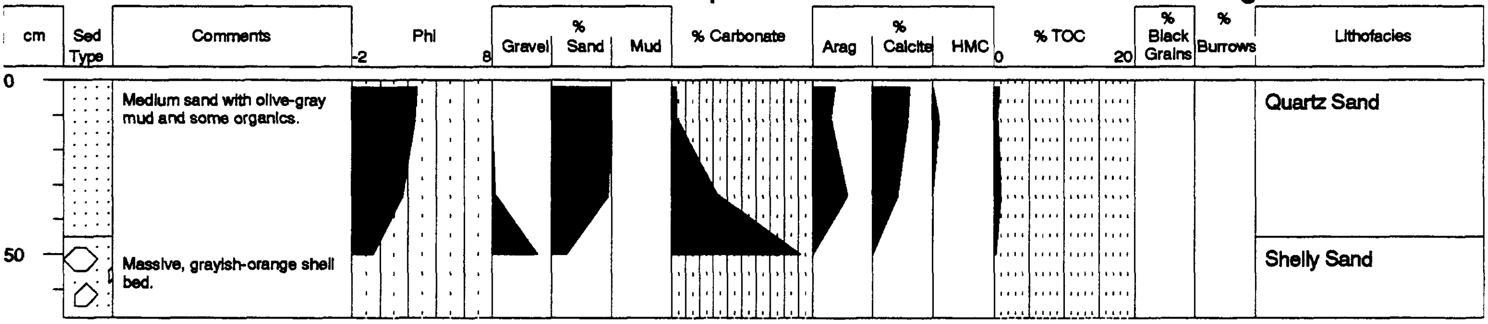
USF

West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: WF-93-23

Water Depth: 26' Latitude: 27° 34.120' Longitude: 82° 44.795'



USGS

ECKERD COLLEGE

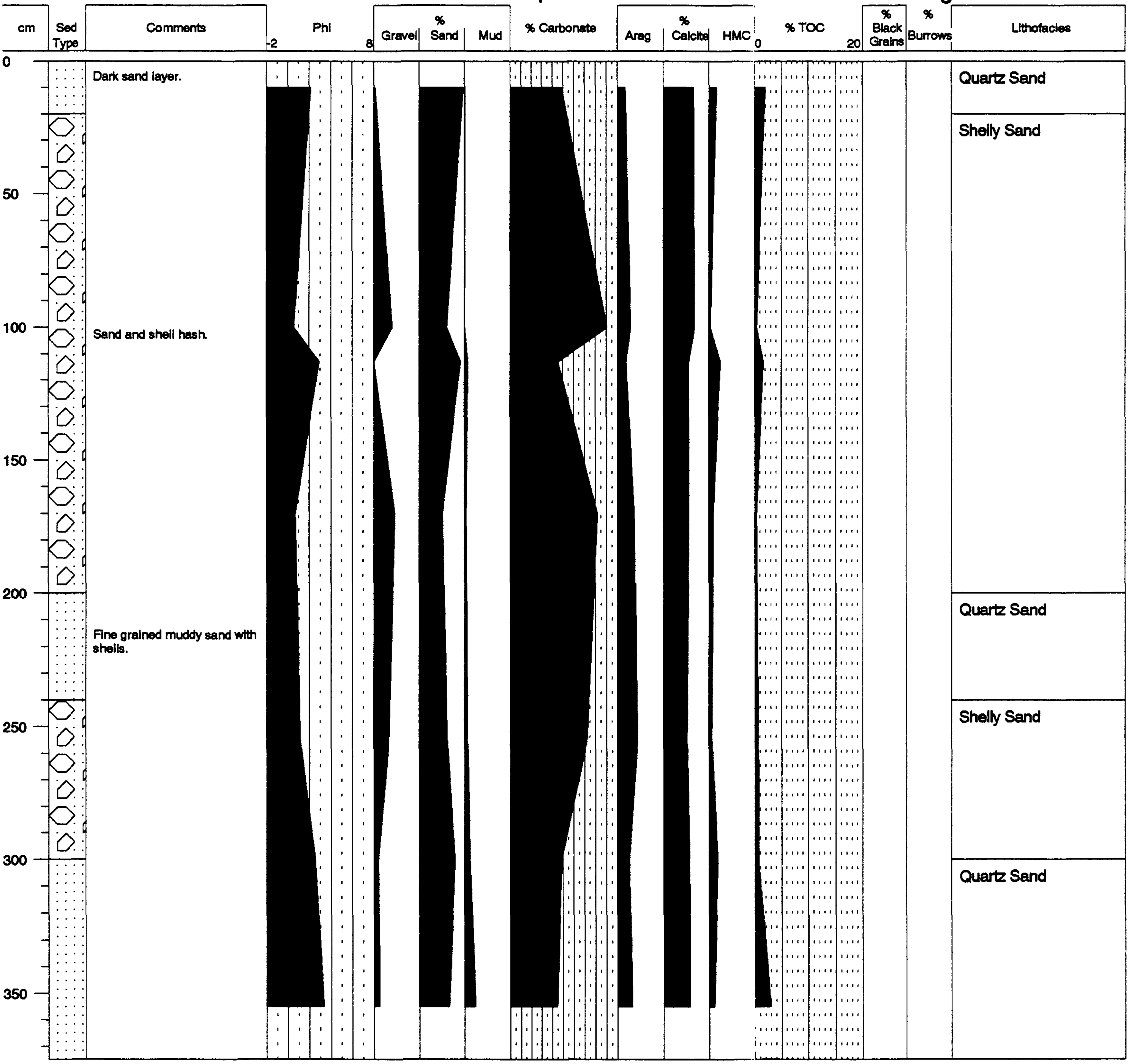
USF

West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: WF-93-24

Water Depth: 38' Latitude: 27° 35.963' Longitude: 82° 44.816'



A93

USGS

ECKERD COLLEGE

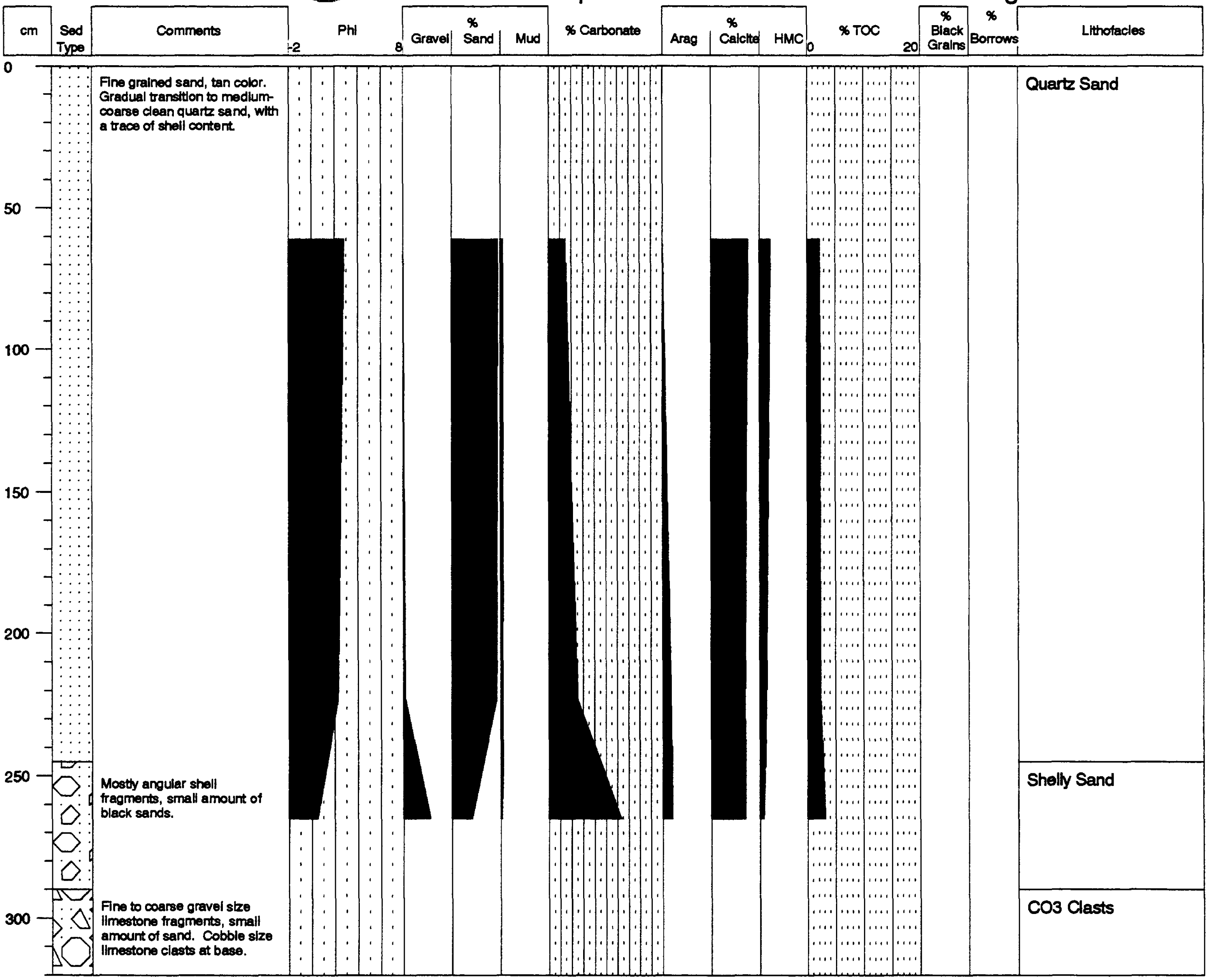
USF

West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: COE-94-1(2)

Water Depth: 28.2' Latitude: 27° 56.199' Longitude: 82° 56.995'



USGS

ECKERD COLLEGE

USF

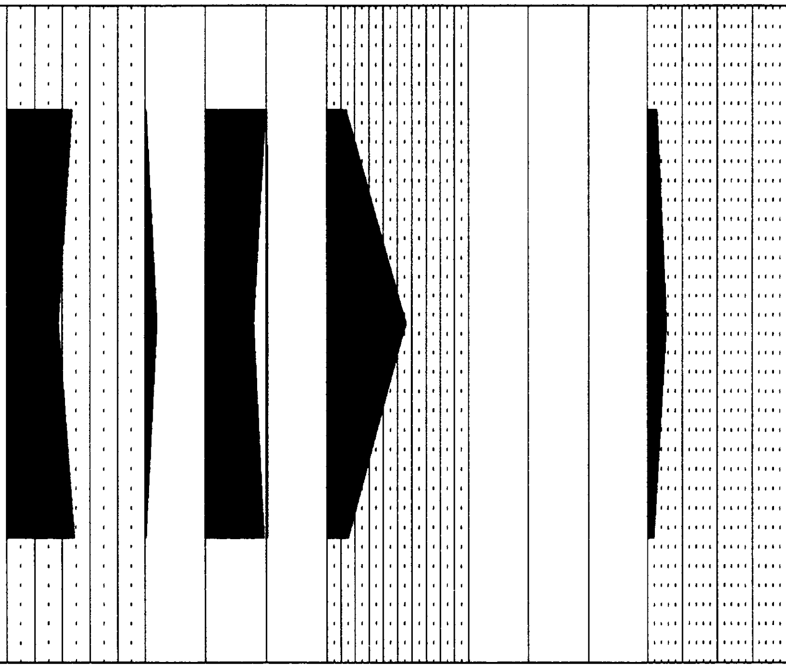
West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: COE-94-2(2)

Water Depth: 23.5' Latitude: 27° 56.563' Longitude: 82° 56.549'

cm	Sed Type	Comments	Phi (-2 to 8)	% Gravel	% Sand	% Mud	% Carbonate	% Arag	% Calcite	% HMC	% TOC (0 to 20)	% Black Grains	% Borrows	Lithofacies
0		Clean, fine to medium quartz sand. Trace shell fragments. Gray color.												Quartz Sand
50														
100		Sand with some angular shell fragments, small amount black sands.												
		Clean quartz sand, fine to medium, gray color, trace shell content.												
150														



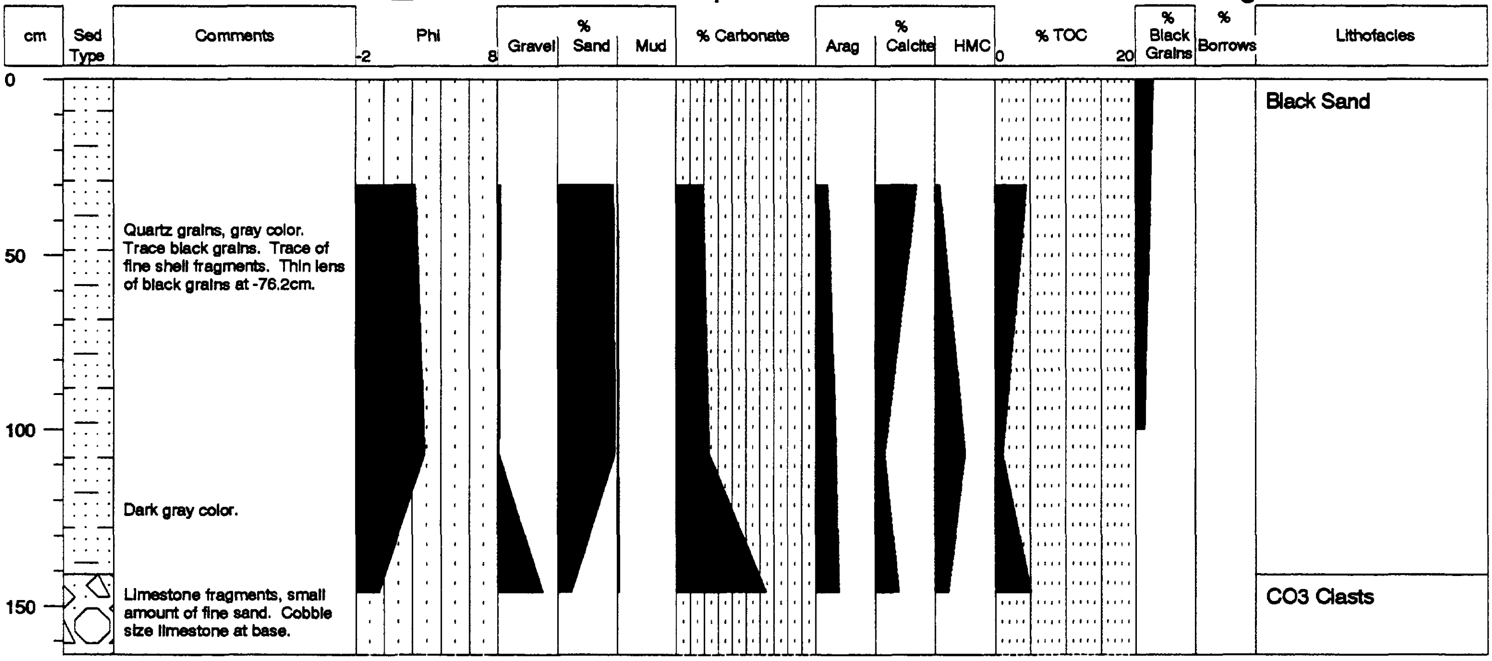
A95

West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: COE-94-3(2)

Water Depth: 23.4' Latitude: 27° 56.812' Longitude: 82° 55.809'



USGS

ECKERD COLLEGE

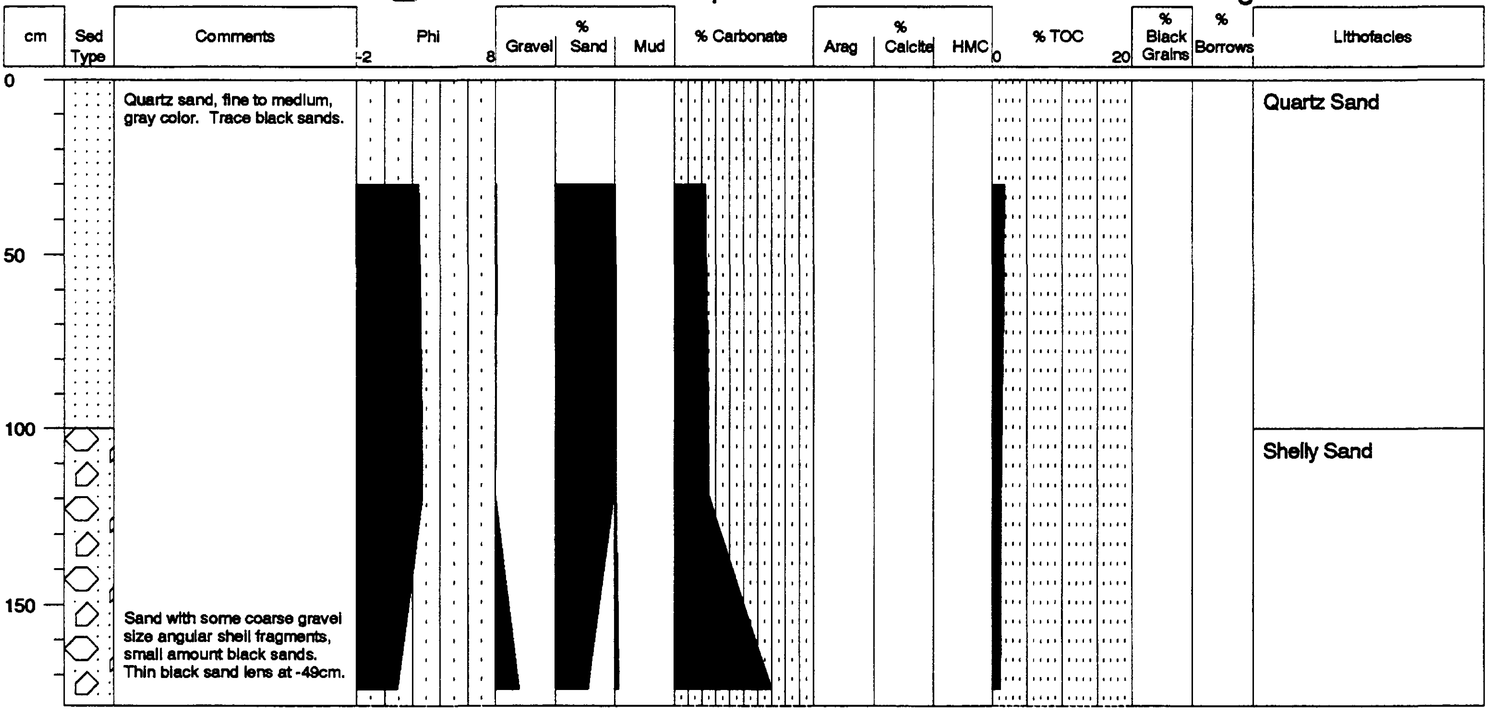
USF

West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: COE-94-4(2)

Water Depth: 24' Latitude: 27° 53.803' Longitude: 82° 57.400'



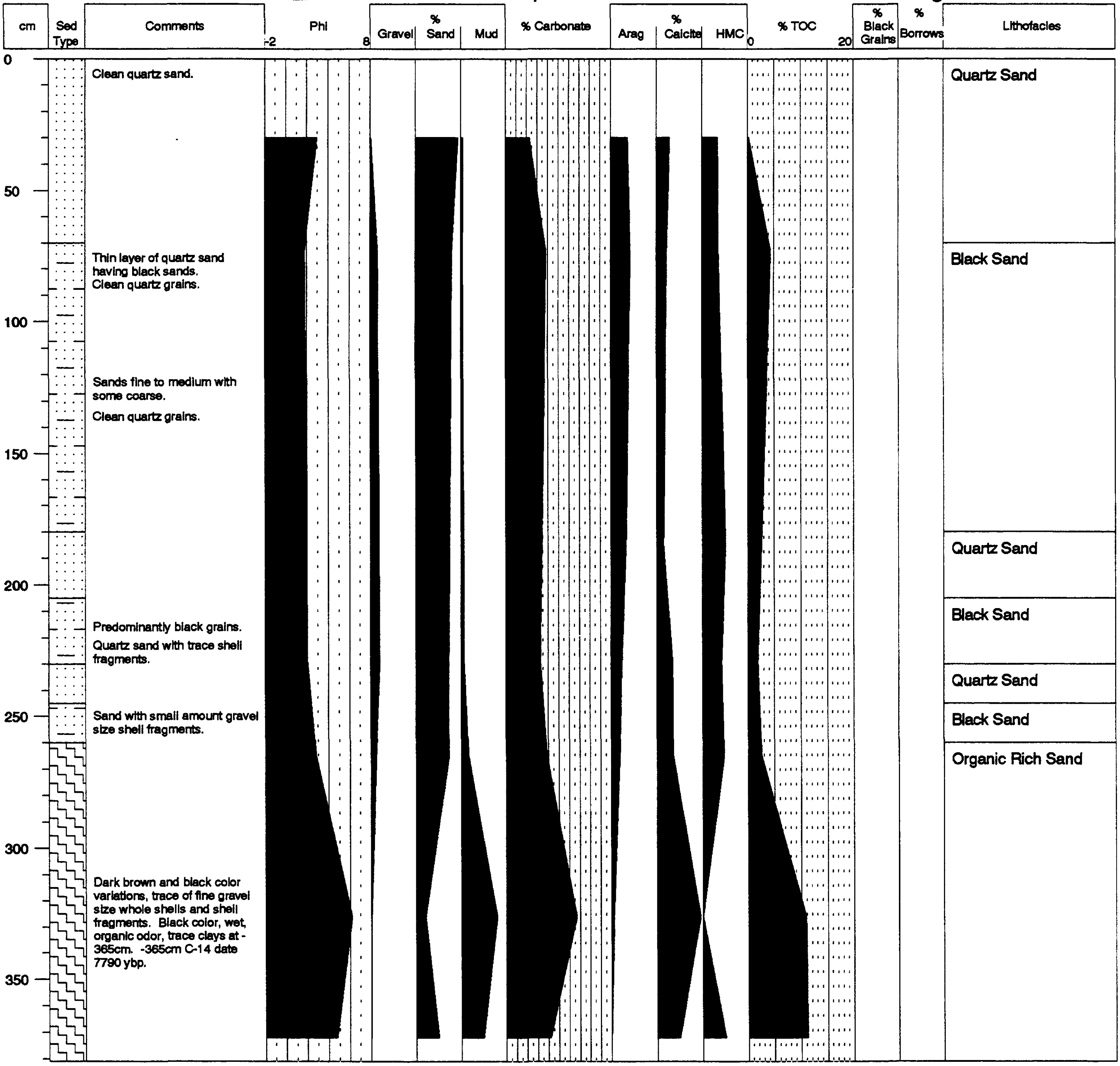
A97 USGS ECKERD COLLEGE USF

West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: COE-94-6(2)

Water Depth: 19' Latitude: 27° 56.500' Longitude: 82° 53.999'



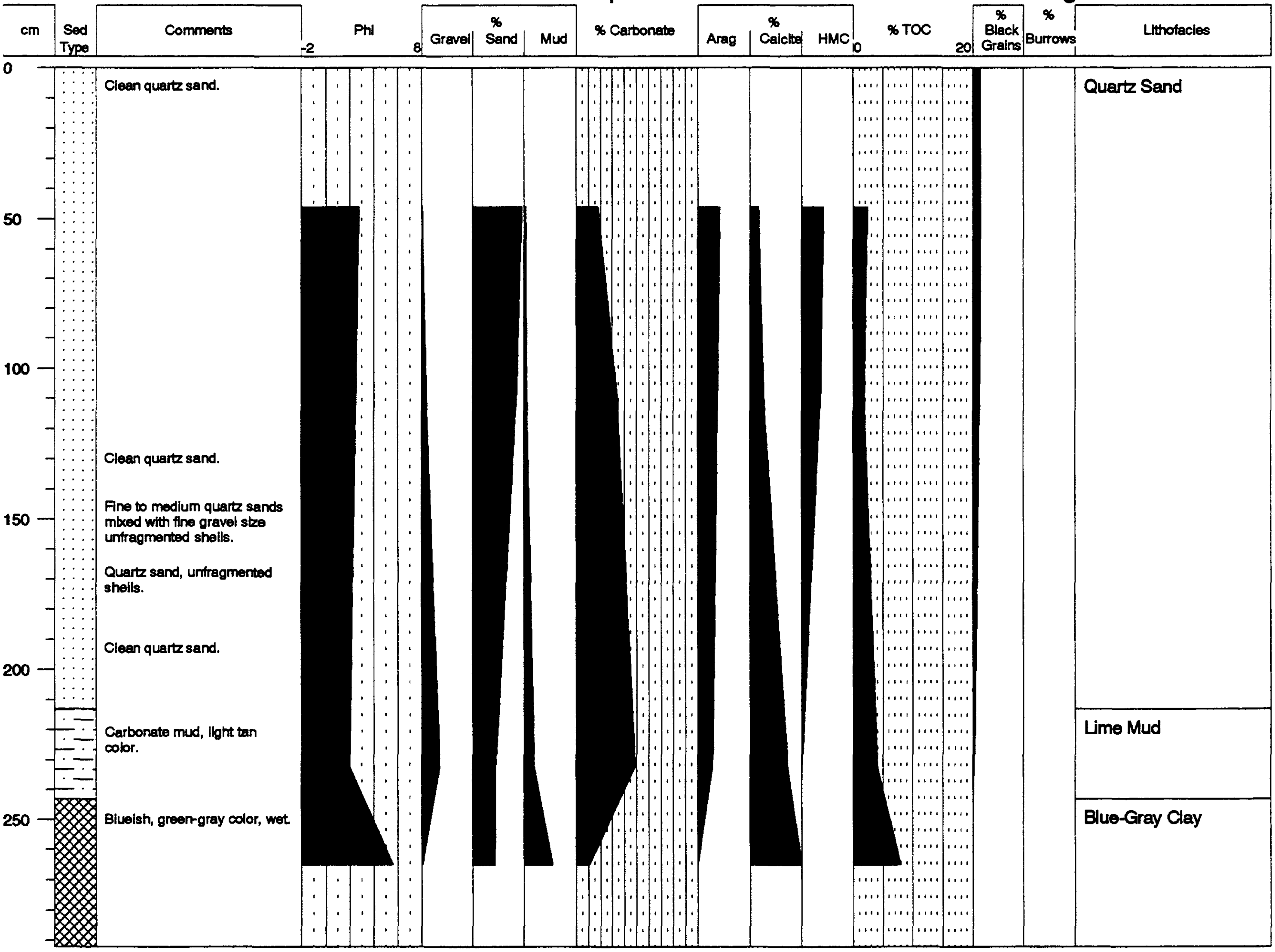
ECKERD COLLEGE

West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: COE-94-8(2)

Water Depth: 18' Latitude: 27° 56.194' Longitude: 82° 53.762'



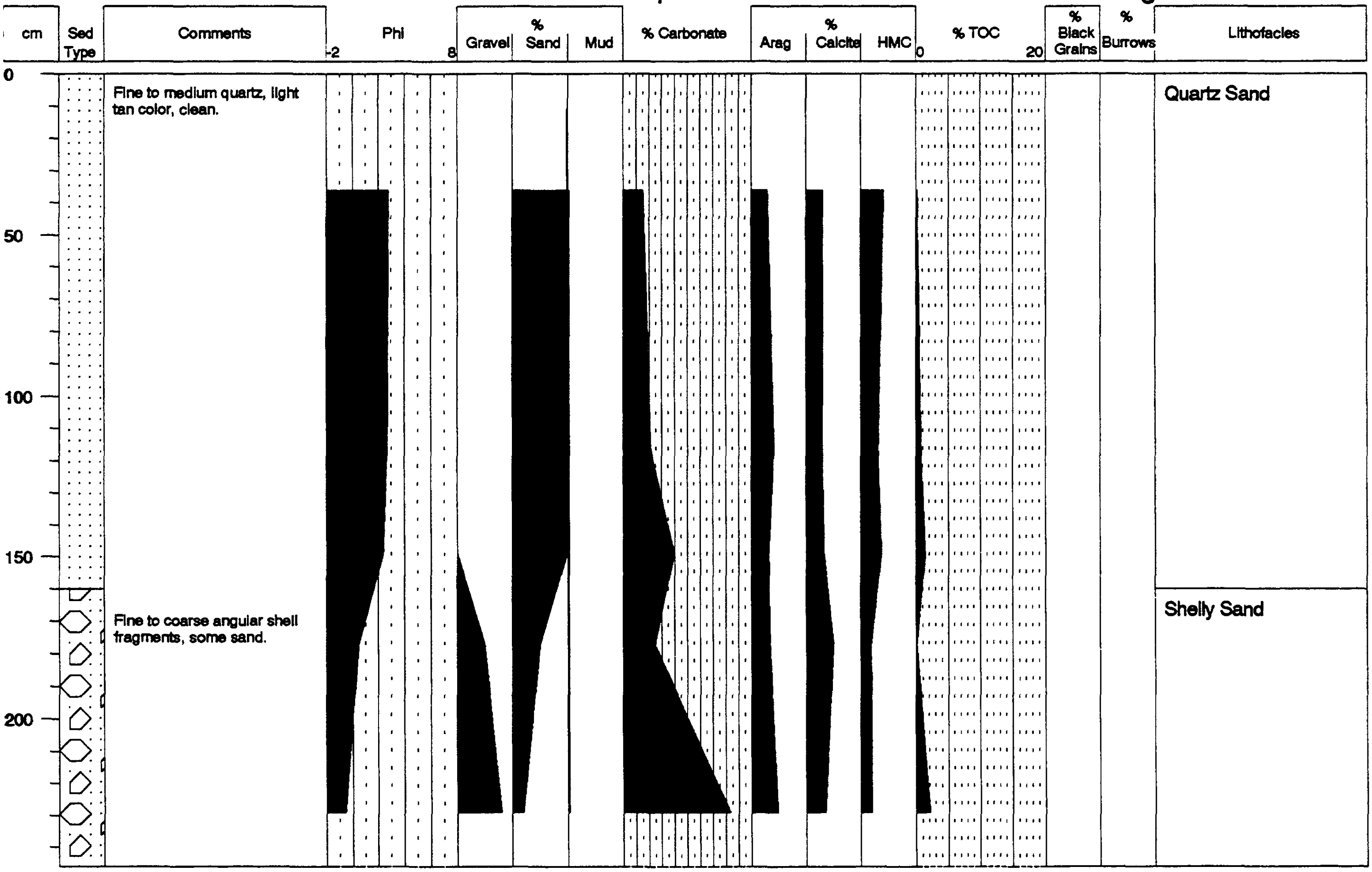
A99

West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: COE-94-9(2)

Water Depth: 8.1′ Latitude: 27° 53.568′ Longitude: 82° 54.134′



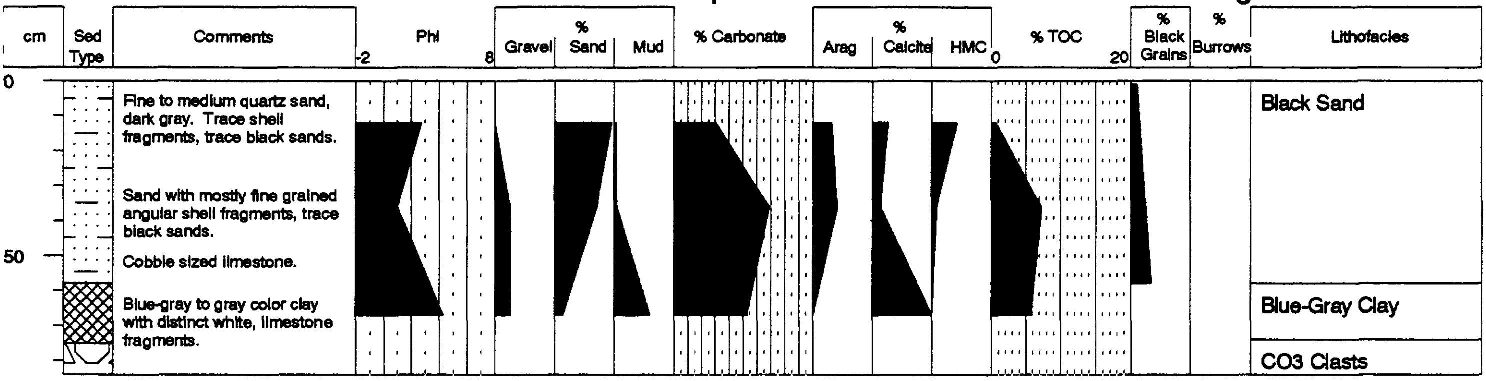
ECKERD COLLEGE

West-Central Florida Coastal Studies Project A100

Vibracore Description

Core Identification: COE-94-10(2)

Water Depth: 21' Latitude: 27° 53.025' Longitude: 82° 54.032'



A101

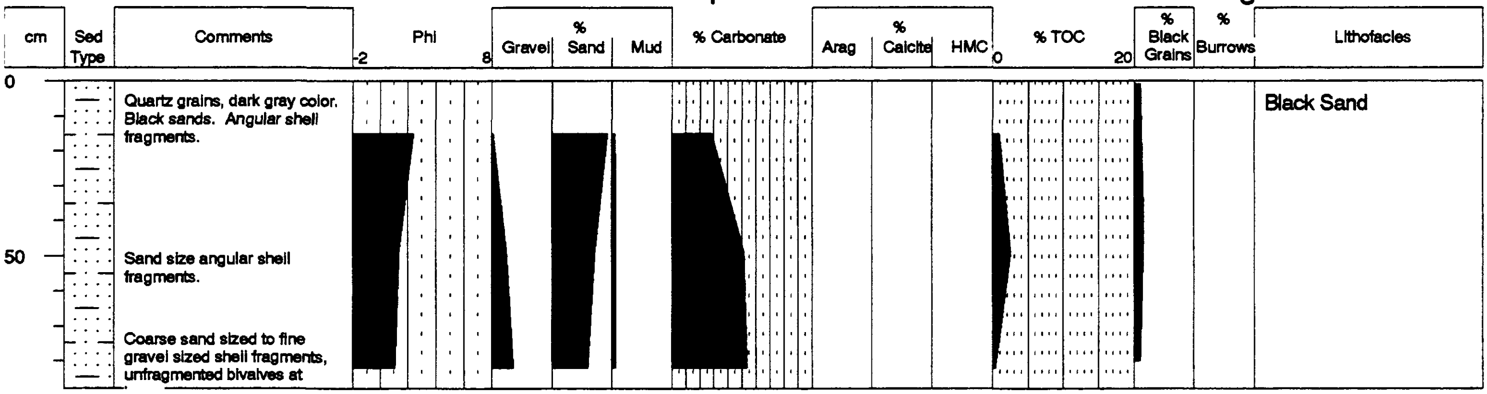
West-Central Florida Coastal Studies Project

Vibracore Description

USGS
ECKERD COLLEGE
USF

Core Identification: COE-94-11(2)

Water Depth: 14' Latitude: 27° 48.493' Longitude: 82° 52.288'



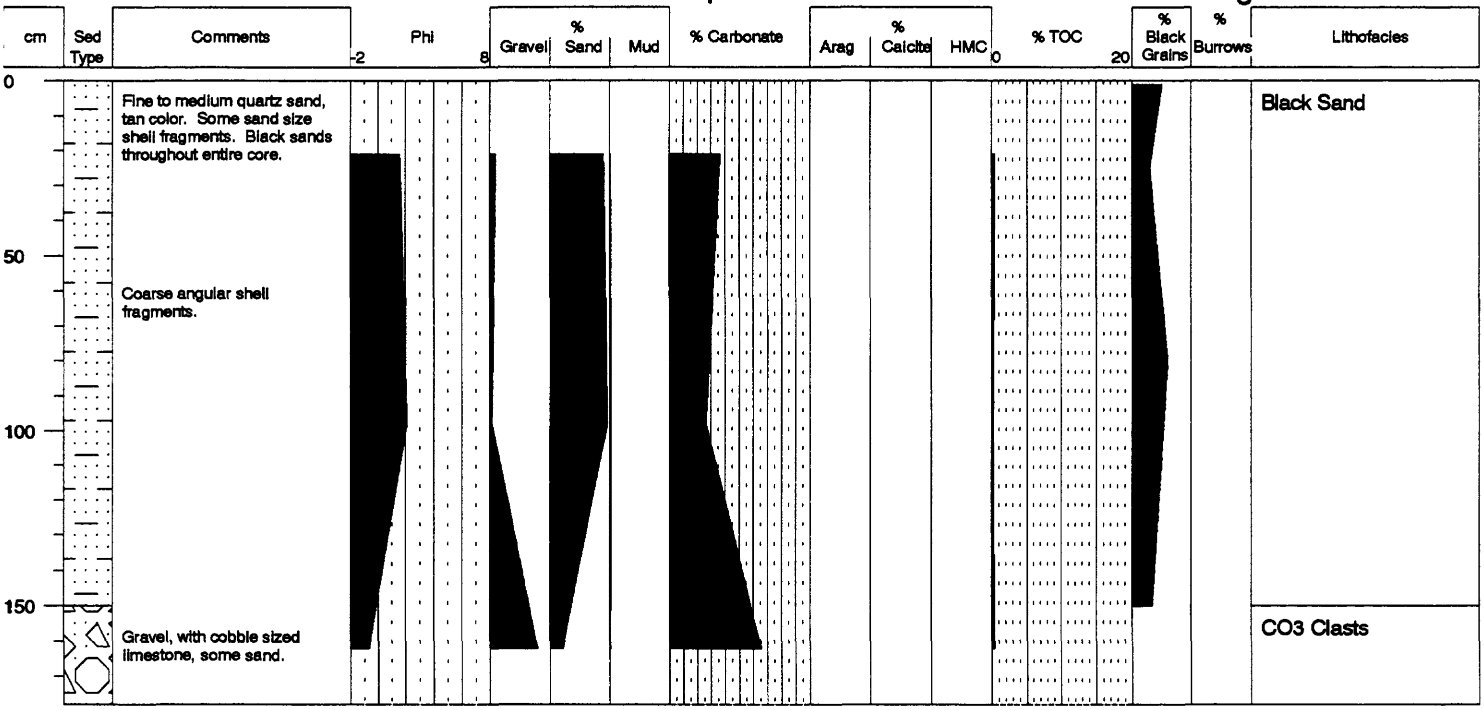
USGS
ECKERD COLLEGE
USF

West-Central Florida Coastal Studies Project A102

Vibracore Description

Core Identification: COE-94-12

Water Depth: 19.8' Latitude: 27° 47.624' Longitude: 82° 51.609'



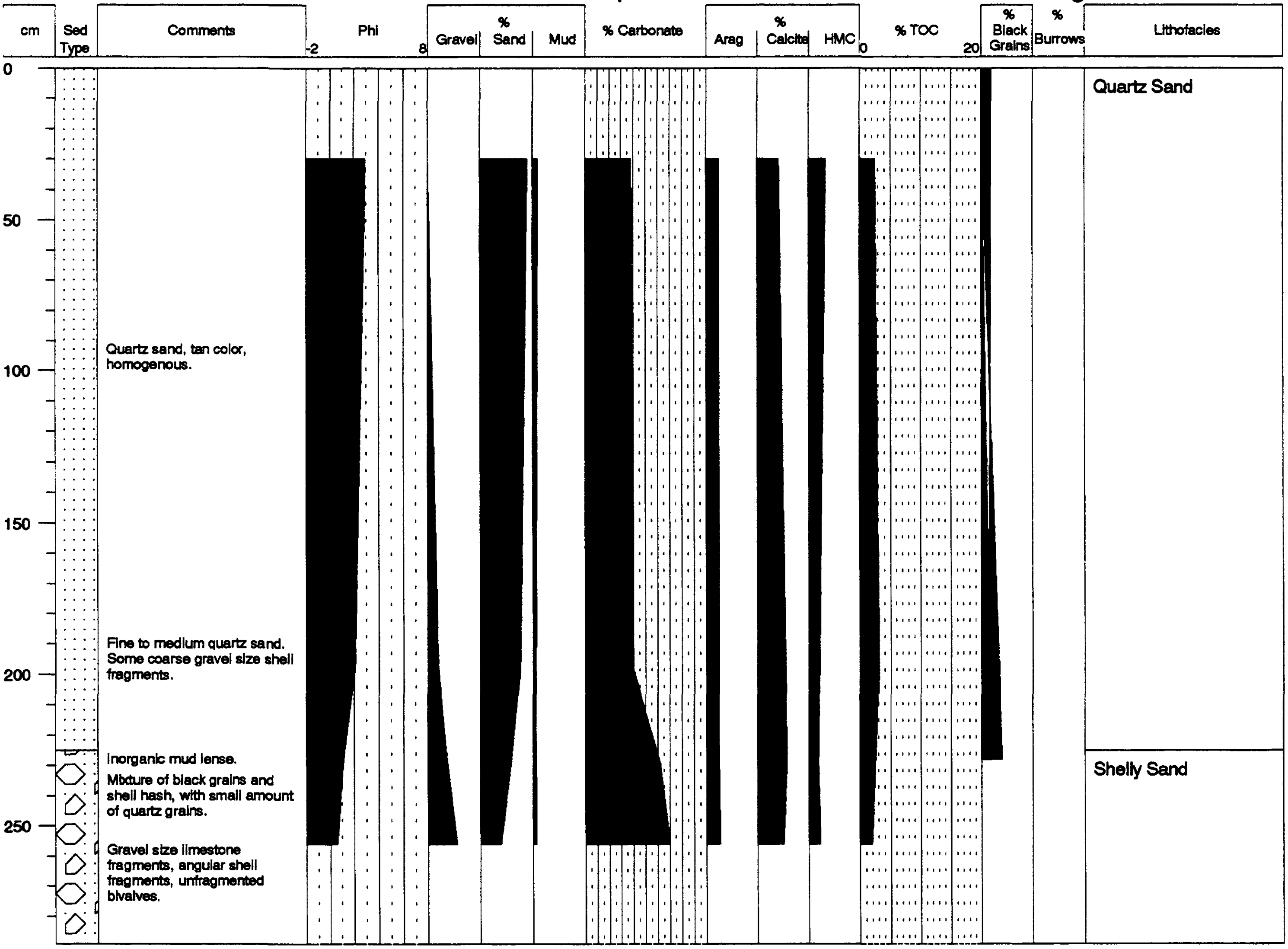
A103

West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: COE-94-13(2)

Water Depth: 19' Latitude: 27° 56.120' Longitude: 82° 53.315'



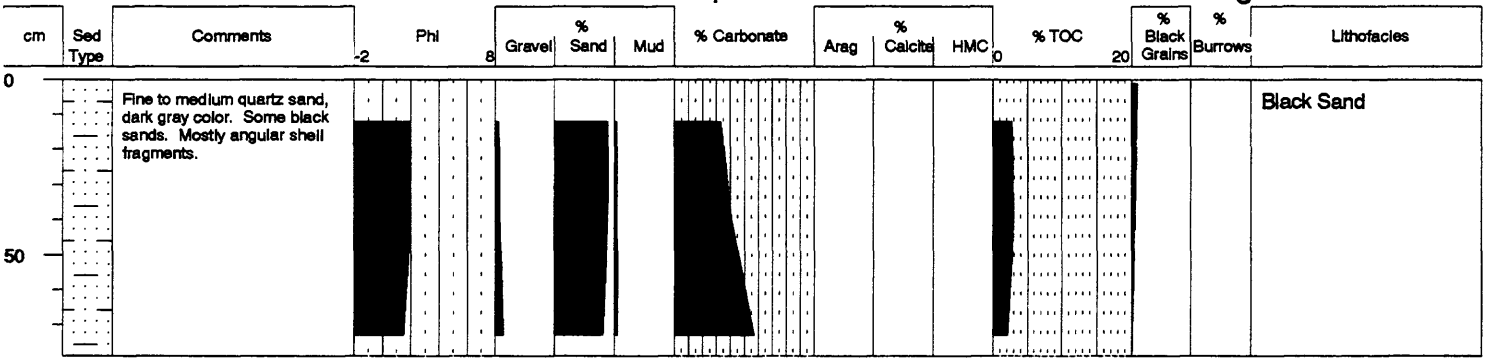
West-Central Florida Coastal Studies Project A104

Vibracore Description

ECKERD COLLEGE

Core Identification: COE-94-14

Water Depth: 11.8'   Latitude: 27° 48.337'   Longitude: 82° 51.991'



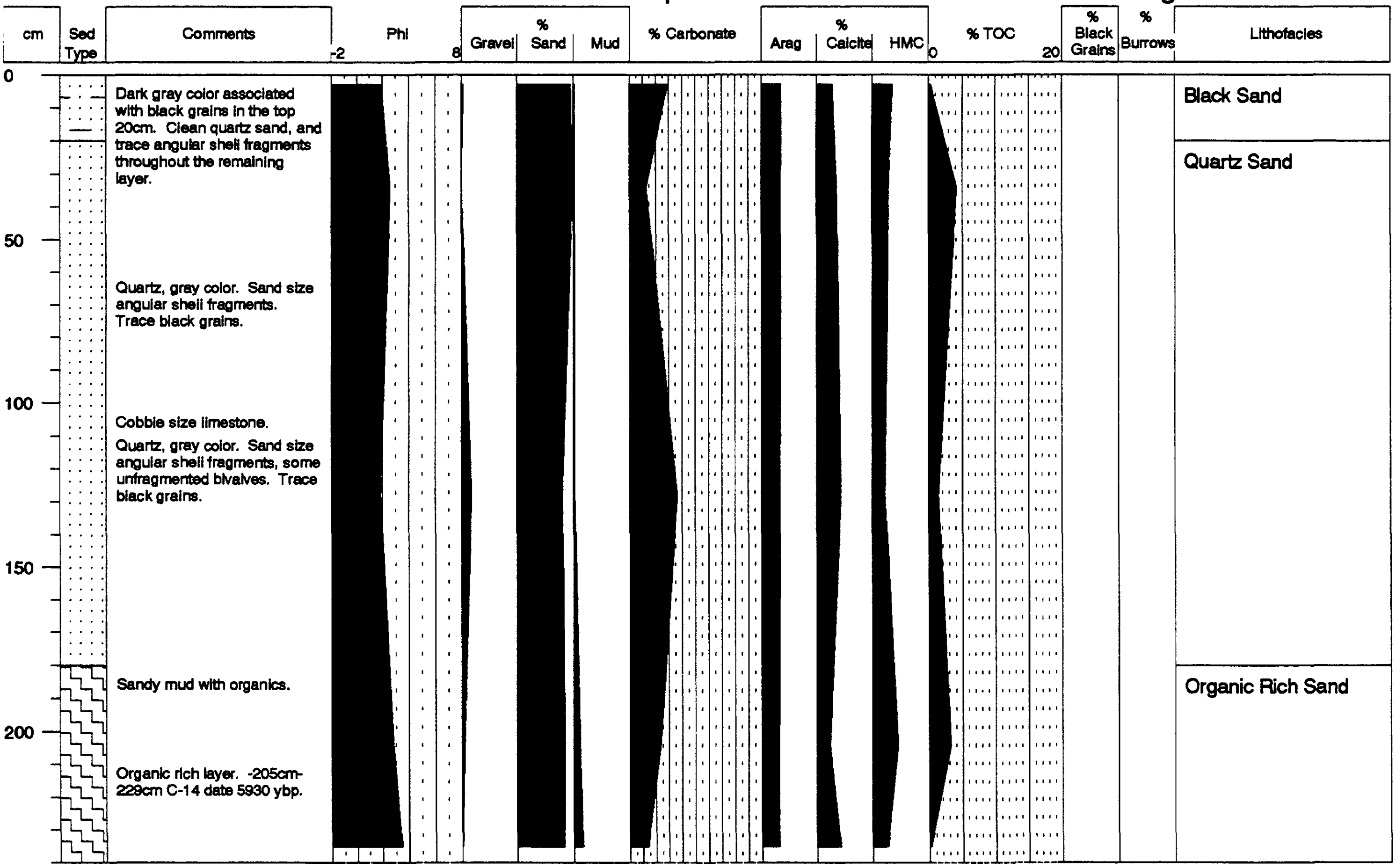
A105

West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: COE-94-16

Water Depth: 16' Latitude: 27° 55.895' Longitude: 82° 53.118'

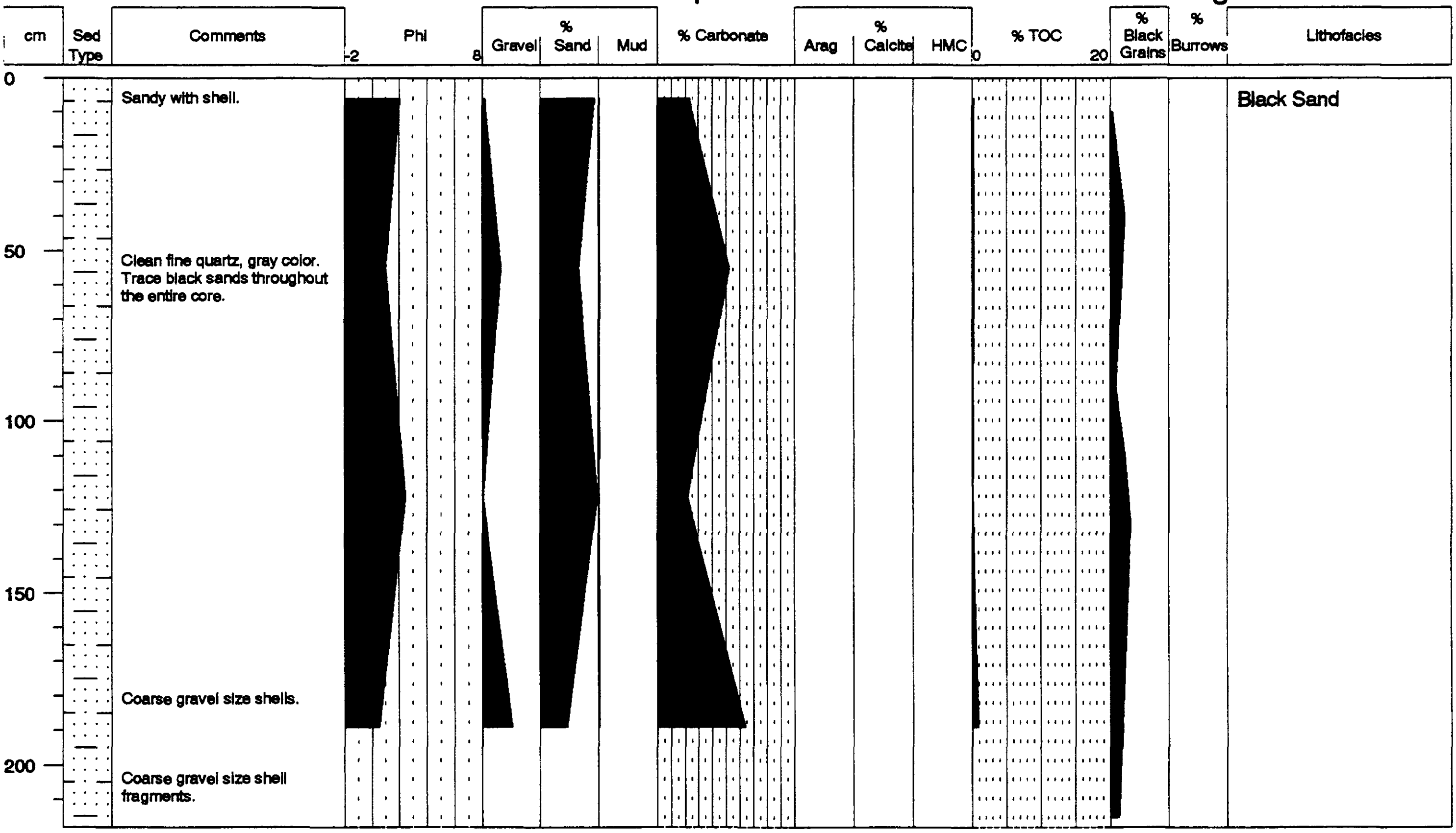


West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: COE-94-17(2)

Water Depth: 10.7' Latitude: 27° 47.530' Longitude: 82° 50.834'



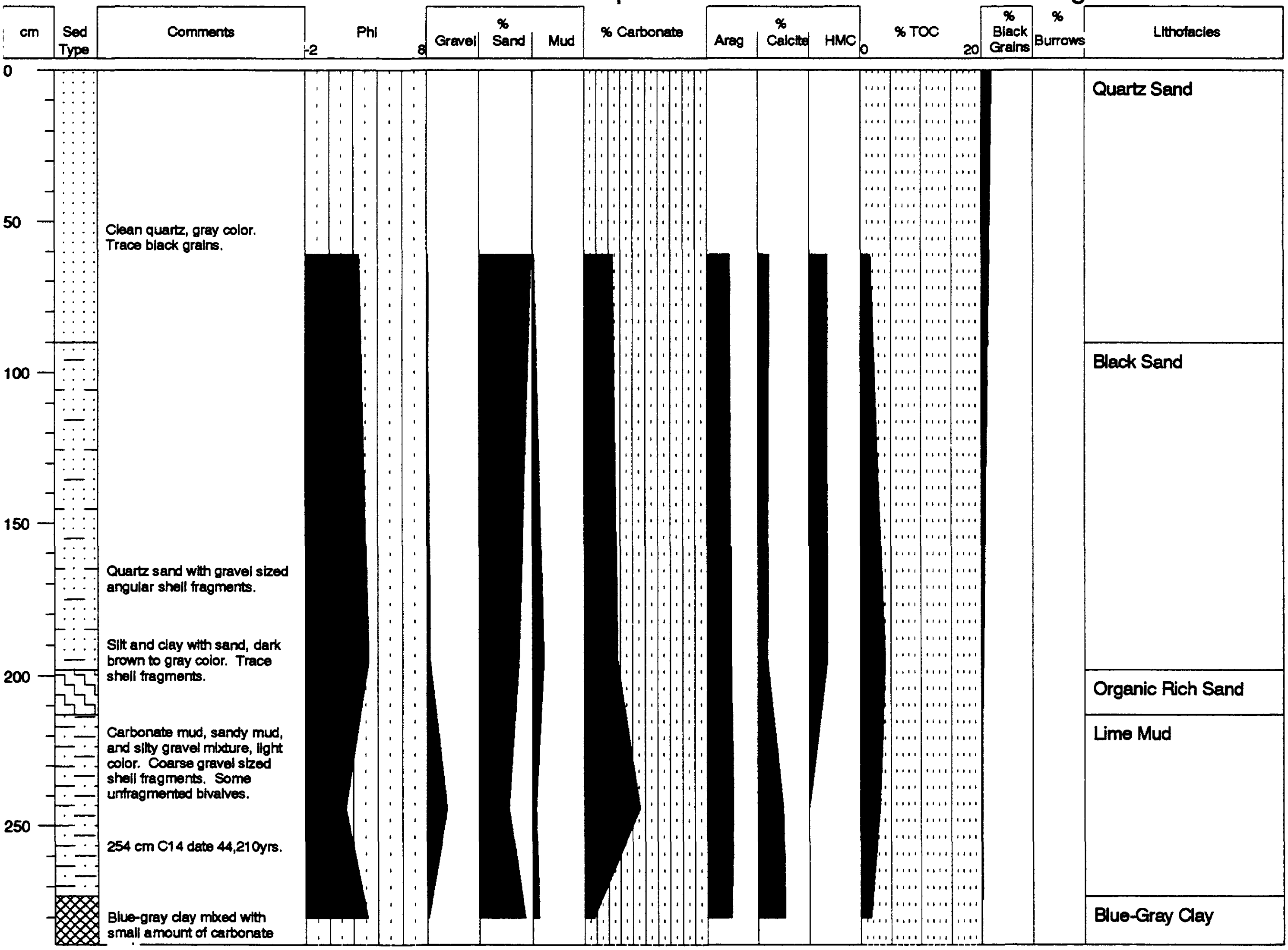
A107

West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: COE-94-18(2)

Water Depth: 15' Latitude: 27° 55.969' Longitude: 82° 52.647'



USGS

ECKERD COLLEGE

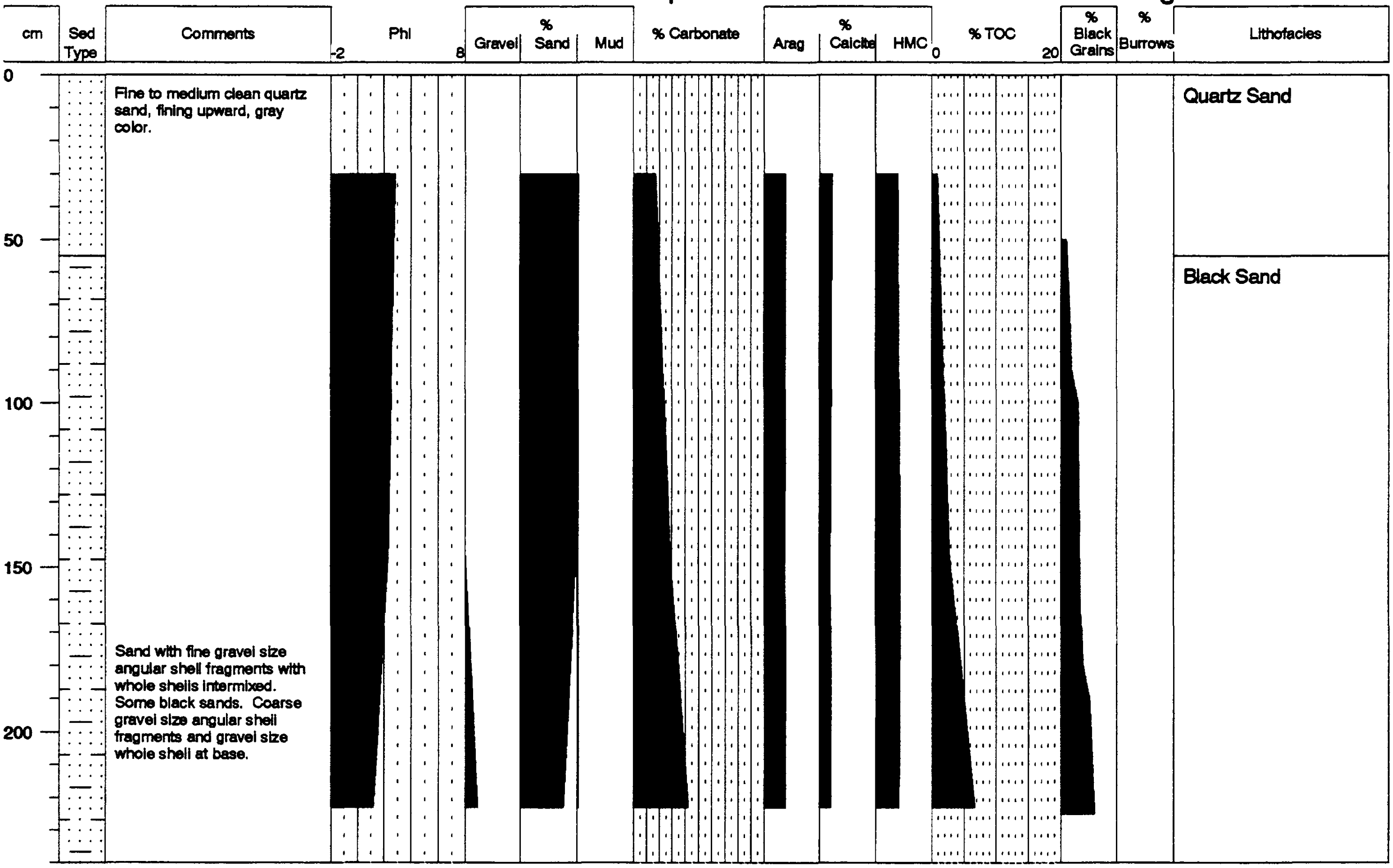
USF

West-Central Florida Coastal Studies Project A108

Vibracore Description

Core Identification: COE-94-22

Water Depth: 17' Latitude: 27° 52.565' Longitude: 82° 53.700'



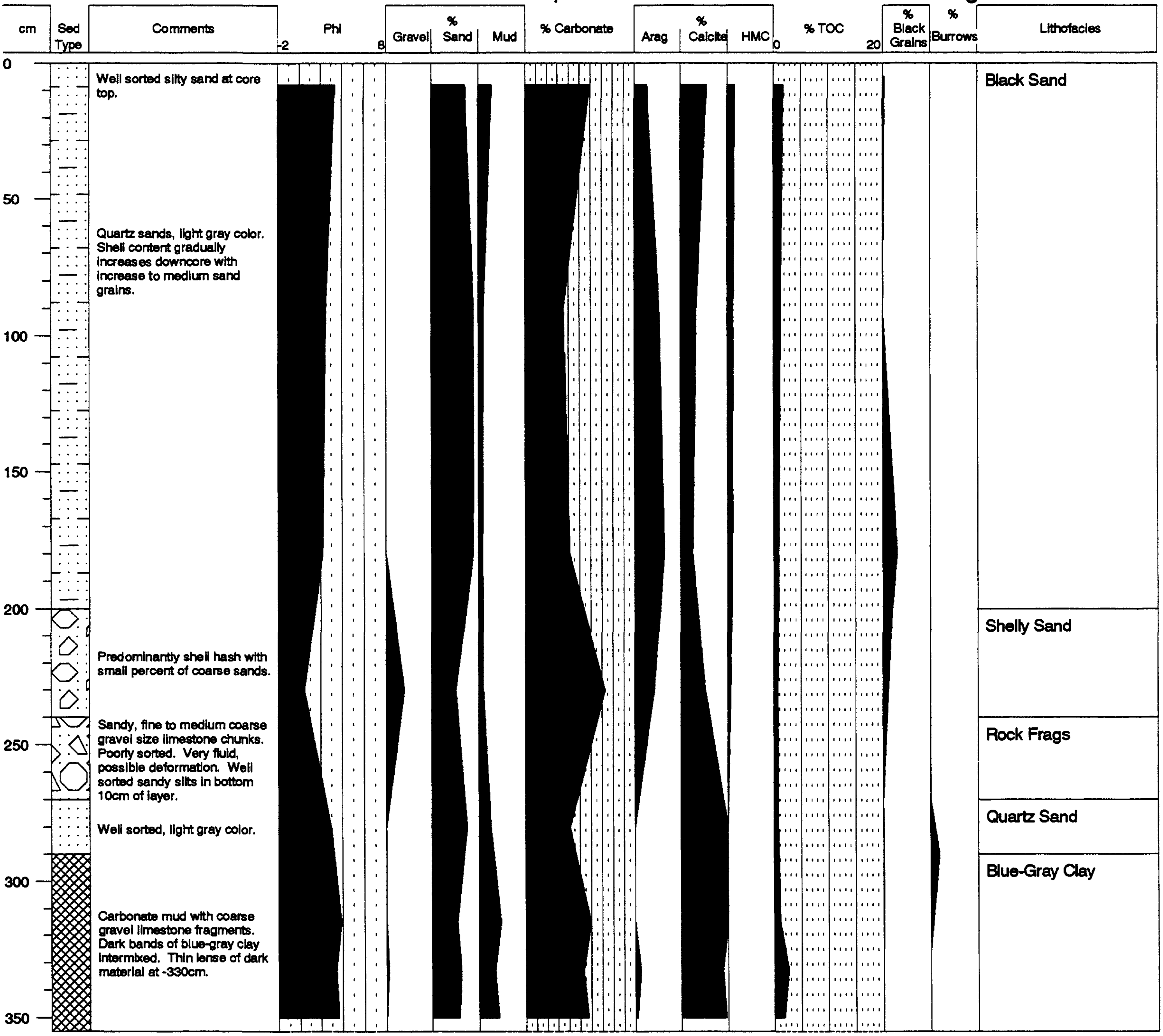
A109

West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: IRB-95-1

Water Depth: 22'   Latitude: 27° 56.332' Longitude: 82° 54.397'



USGS

ECKERD COLLEGE

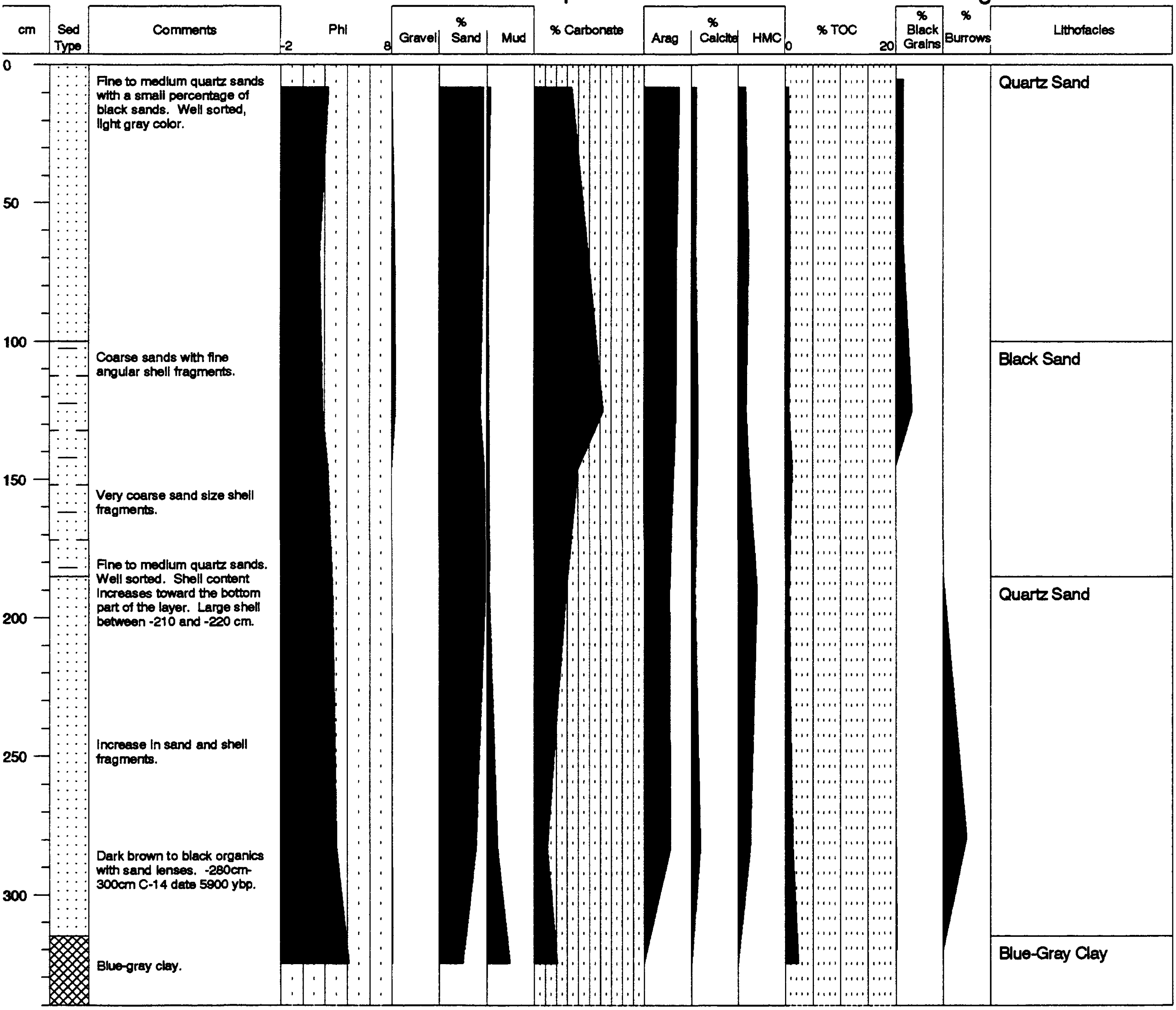
USF

West-Central Florida Coastal Studies Project A110

Vibracore Description

Core Identification: IRB-95-2

Water Depth: 18' Latitude: 27° 56.286' Longitude: 82° 54.478'



A111 USGS

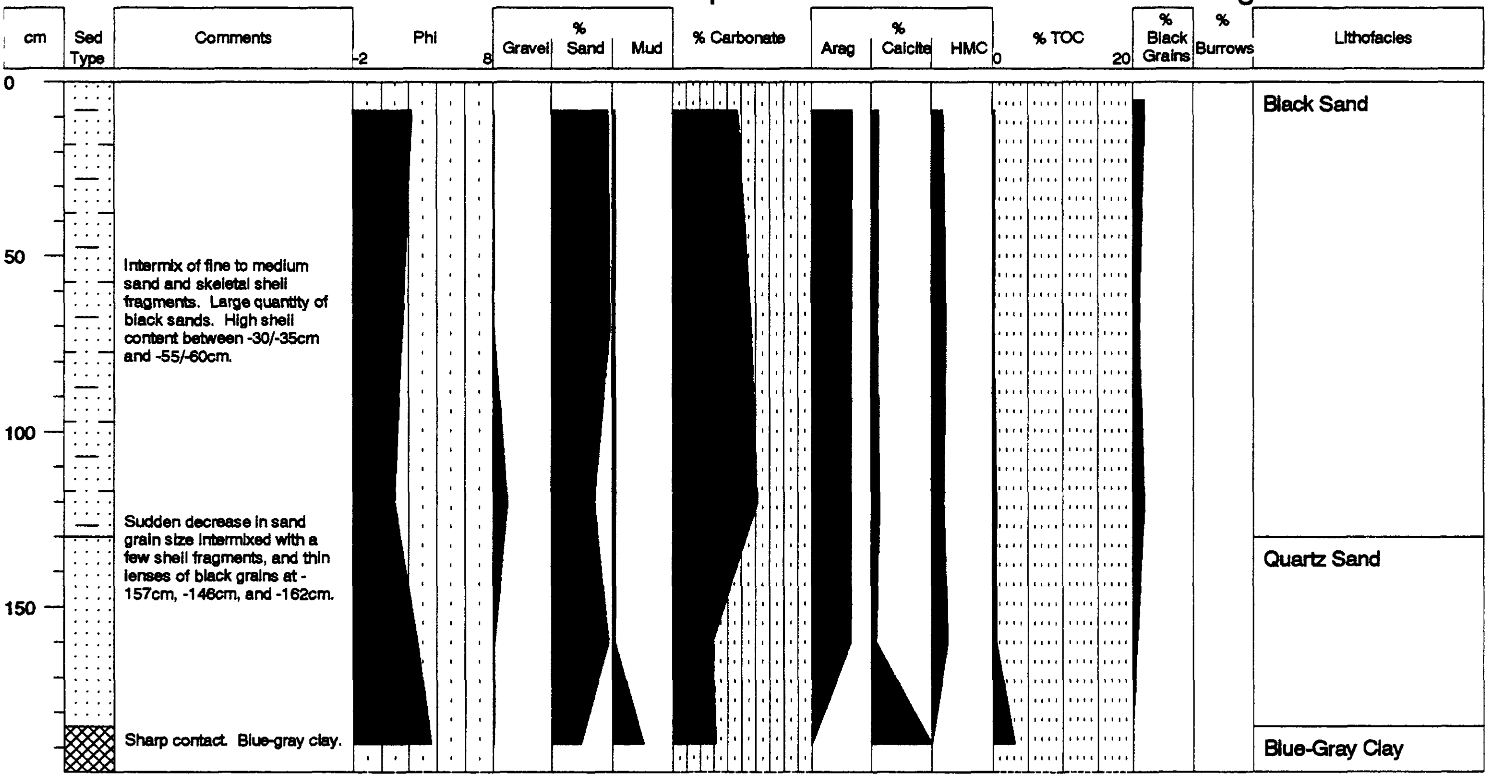
ECKERD COLLEGE USF

West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: IRB-95-3

Water Depth: 18' Latitude: 27° 56.299' Longitude: 82° 53.616'



USGS

ECKERD COLLEGE

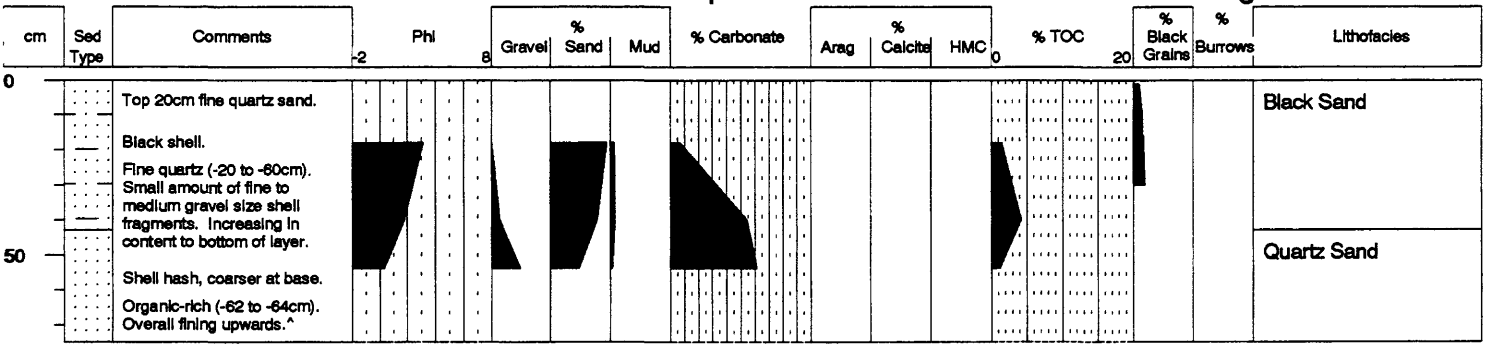
USF

West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: SAR-96-201

Water Depth: 21' Latitude: 27° 20.498' Longitude: 82° 36.754'



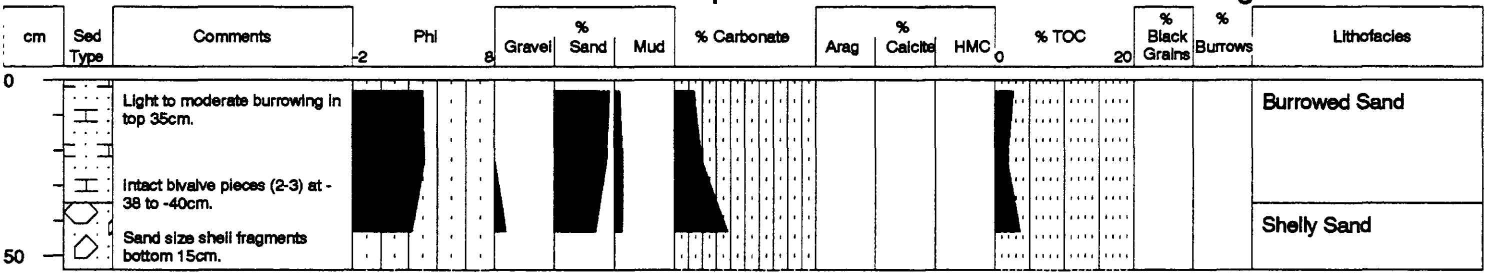
A113

West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: SAR-96-203

Water Depth: 29' Latitude: 27° 18.895' Longitude: 82° 37.666'

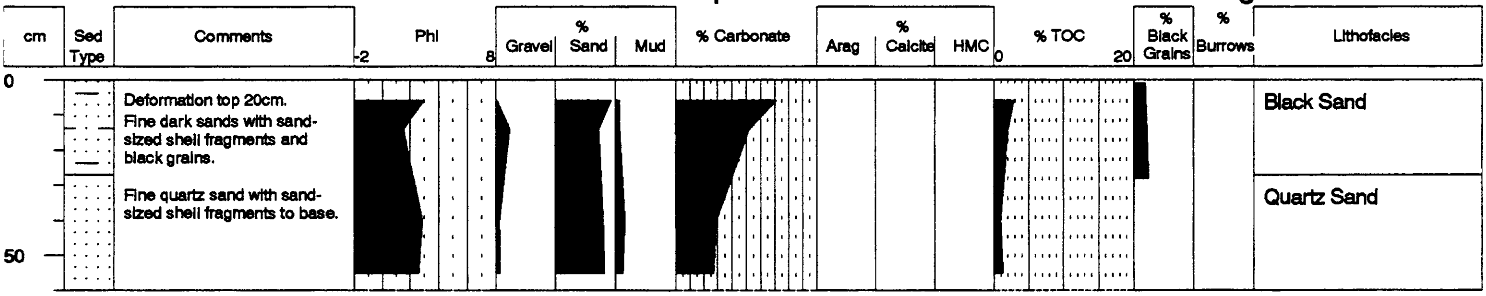


West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: SAR-96-204

Water Depth: 30' Latitude: 27° 18.862' Longitude: 82° 37.795'



A115

West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: SAR-96-205

Water Depth: 30' Latitude: 27° 18.92' Longitude: 82° 37.824'

cm	Sed Type	Comments	Phi (-2 to 8)	Gravel	% Sand	Mud	% Carbonate	Arag	% Calcite	HMC	% TOC (0 to 20)	% Black Grains	% Burrows	Lithofacies
0–50		High water content. Top 20cm, coarse sand-sized shell fragments. Fine sand. Fine sand-sized shell fragments. Mud with sand layer. (-20 to -35cm). Fine sand with sparce fine-grained shell fragments to Large shells at base of core.												Shelly Sand

USGS

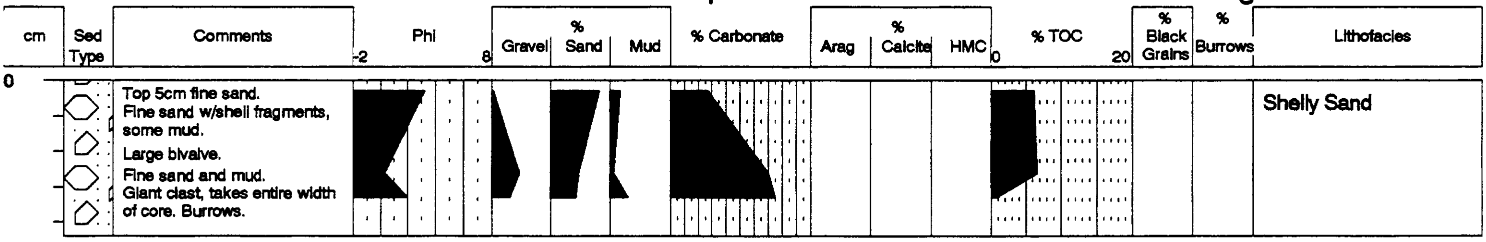
ECKERD COLLEGE USF

West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: SAR-96-208

Water Depth: 33' Latitude: 27° 17.865' Longitude: 82° 37.491'



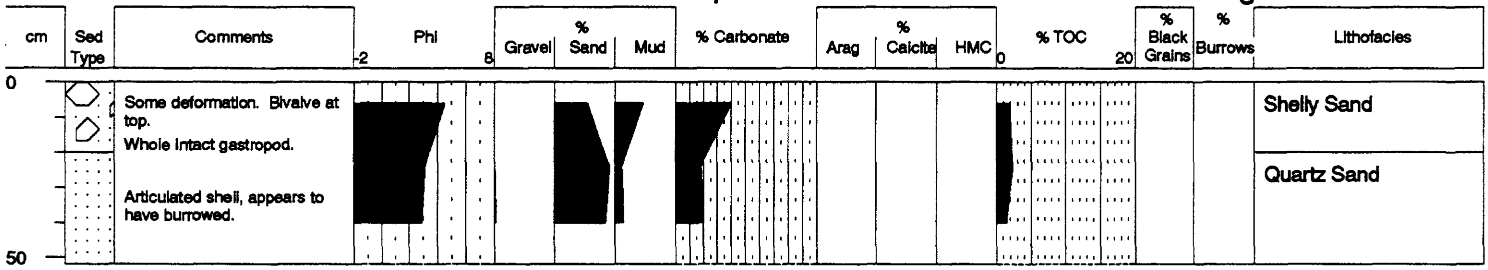
A117

West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: SAR-96-209

Water Depth: 28' Latitude: 27° 17.964' Longitude: 82° 37.957'



USGS

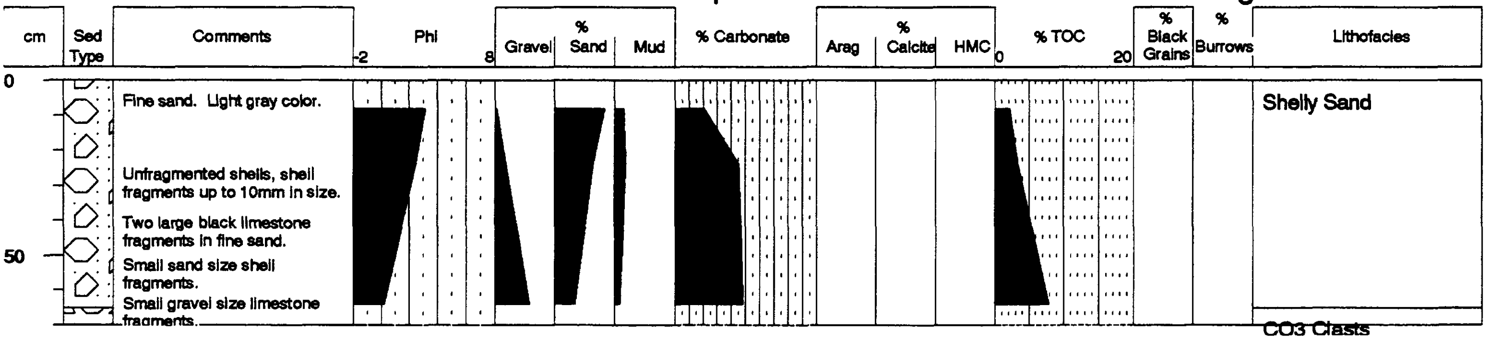
ECKERD COLLEGE USF

West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: SAR-96-212

Water Depth: 33' Latitude: 27° 16.753' Longitude: 82° 38.335'



A119

USGS

ECKERD COLLEGE

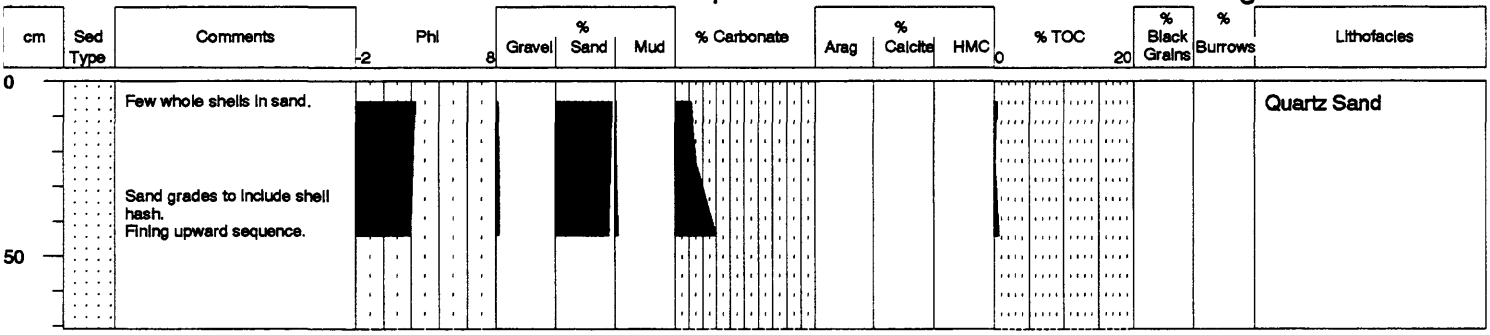
USF

West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: SAR-96-221

Water Depth: 9' Latitude: 27° 28.495' Longitude: 82° 42.209'



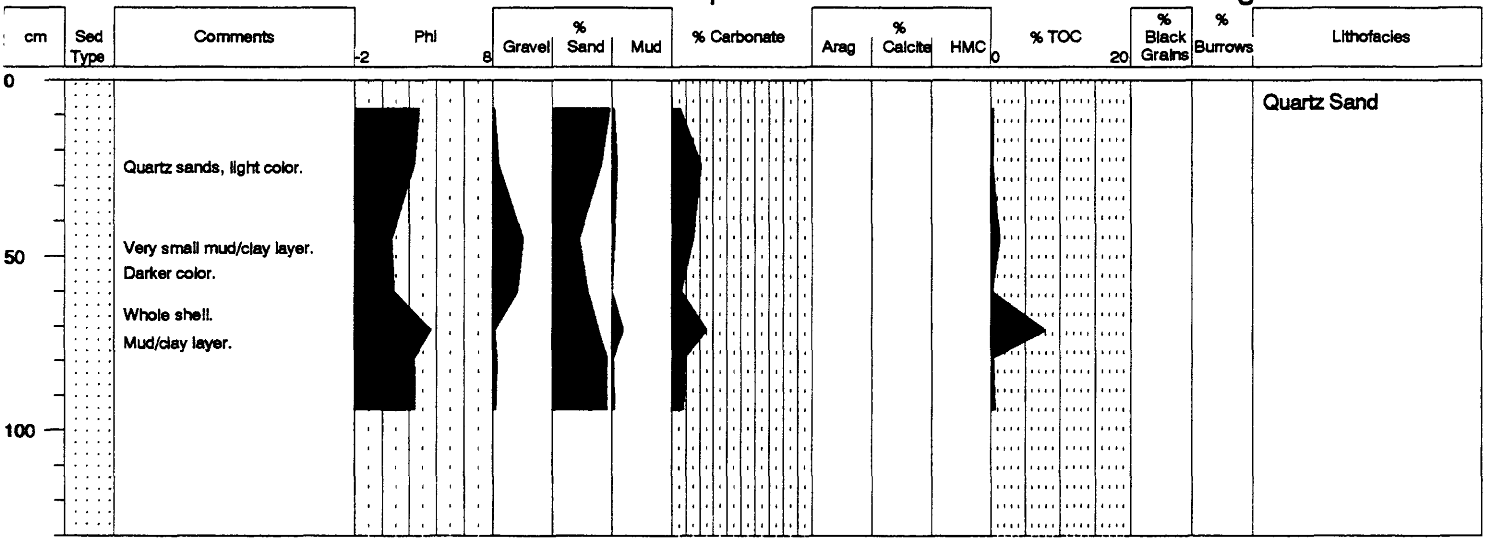
USGS
ECKERD COLLEGE
USF

West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: SAR-96-222

Water Depth: 15.6' Latitude: 27° 28.487' Longitude: 82° 42.279'



A121

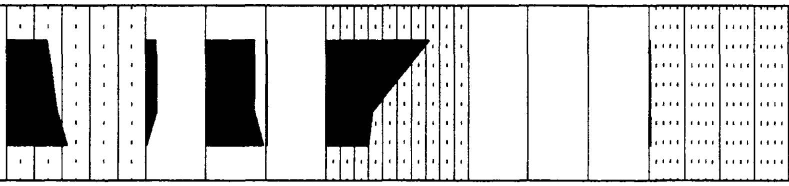
West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: AM-95-1

Water Depth: Latitude: Longitude:

cm	Sed Type	Comments	Phi (-2 to 8)	% Gravel	% Sand	% Mud	% Carbonate	% Arag	% Calcite	% HMC	% TOC (0 to 20)	% Black Grains	% Borrows	Lithofacies
0		Coarse angular shell hash. Well graded shell hash.												Shelly Sand
		Quartz sand. Poorly sorted. Light gray. Large gastropod shell @ bottom with large fragments												Quartz Sand
50														



USGS

ECKERD COLLEGE

USF

West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: AM-95-2

Water Depth: Latitude: Longitude:

cm	Sed Type	Comments	Phi (-2 to 8)	% Gravel	% Sand	% Mud	% Carbonate	% Arag	% Calcite	% HMC	% TOC (0 to 20)	% Black Grains	% Burrows	Lithofacies
0		Quartz sand with 10% angular shell fragments. Poorly sorted												Quartz Sand
		Shelly sand. Poorly sorted.												Shelly Sand

A123 USGS

ECKERD COLLEGE USF

West-Central Florida Coastal Studies Project

Vibracore Description

Core Identification: AM-95-3

Water Depth: Latitude: Longitude:

cm	Sed Type	Comments	Phi (-2 to 8)	% Gravel	% Sand	% Mud	% Carbonate	% Arag	% Calcite	% HMC	% TOC (0 to 20)	% Black Grains	% Burrows	Lithofacies
0		Little deformation at very top of core Quartz sand. Well sorted. Light gray. Thin lens of shells, medium, angular. Shells, some black ~15%.												Quartz Sand

USGS

ECKERD COLLEGE USF

West-Central Florida Coastal Studies Project

A124

Vibracore Description

Core Identification: AM-95-4

Water Depth: Latitude: Longitude:

cm	Sed Type	Comments	Phi (-2 to 8)	% Gravel	% Sand	% Mud	% Carbonate	% Arag	% Calcite	% HMC	% TOC (0 to 20)	% Black Grains	% Borrows	Lithofacies
0		Well sorted quartz sand. -10 Thin lens (-10cm to -12cm) of black angular shell fragments, medium. Coarse angular shells mixed with small amounts of sand.												Quartz Sand