Table 1. Distribution of invertebrates within each drill hole.

Complex[1]		LBC																												
Phylum[2]		P	P	P	P	P	G	G	P	G	P	G	P	P	P	P	G	P	G	G	P	P	P	G	G	G	P	P	P	G
Well No.	Depth (ft.) / Species[3]	Abra aequalis	Anodontia alba	Anomalocardia cuneimeris	Brachidontes exustus	Cardita floridana	Cerithidea pliculosa	Cerithium variabile	Corbula contracta	Diodora cayenensis	Laevicardium mortoni	Littorina nebulosa	Macoma mitchelli	Macoma sp.	Mactra fragilis	Mercenaria mercenaria	Modulus modulus	Nuculana acuta	Odostomia impressa	Odostomia sp.	Ostrea equestris	Pandora trilineata	Periploma inequale	Retusa canaliculata	Rissoina chesneli	Seila adamsi	Semele proficua	Semele purpurascens	Tellina tampaensis	Vermicularia fargoi
1	65																													
2	60			A							P																			
2	65			P																										
2	70			P					P																					
3	65																													
3	70																													
4	55			P																										
4	60			A												P														
4	65			P																				P						
4	70	P		P					P							P		P				F					P	P		
4	75			P					P									P			P	P						P		
4	80			P					P										P		P	P		P			P	P		
5	55			A				P																					P	
5	60			A				P																					P	
5	65			A														P									P		P	
5	70			P					P			P		P	P			P			F			P					P	
6	60								P													P								
6	65																						P	P						
6	70																													
7	60								P													P								
7	65																				P		P	P						
7	70																													
8	50																													
8	55			A			P																						P	
8	60			A			P					P																	P	
8	65			A			P											P											P	
8	70			P					P	P		P						P			F						P			
9	60																													
9	65	P		P					P				P					P				P		P			P			
9	70			P				P	P									P			F	F		P						
9	75																	P									P			
10	70																			P							P			
11	5																													
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11	55															P														
11	60																													
11	65																													
11	70				P				P																		P			
11	75							P	P									P								P				P
11	80						P	P	P								P	P												P
12	65																													
12	70			P					P																		P			
13	5			P																	P									
13	10			P		P																								
13	15																													
13	20										P																			
13	25																													
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13	60			P																										
13	65			P					P																					
13	70			P					P																		P			
13	75	P		P					P																					
13	80								P																					
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14	45			P																										
14	50					P																								
14	55																													
14	60					P																								
14	65					P									P															
14	70		P	P					P																			P		
14	75																											P		
14	80								P																					
14	85			P					P																					
14	90					P			P												P									
14	95							P	P									P			P			P	P	P				P
14	100							P	P									P			P									P
14	105								P							P					P									
14	110							P																						
14	115			P		P												P											P	
14	120							P																						

Complex[1]		LBC-TTC				TTC-R													
Phylum[2]		G	P	P	G	C	P	G	G	S	S	G	G	G	G	P	P	G	G
Well No.	Depth (ft.) / Species[3]	Anachis obesa	Chione cancellata	Lucina amiantus	Thais haemastoma floridana	Astrangia astreiformis	Crassinella lunulata	Crepidula fornicata	Cyclostremiscus trilix	Dentalium eboreum	Dentalium texasianum	Epitonium angulatum	Epitonium humphreysi	Epitonium multistriatum	Epitonium rupicola	Lucina multilineata	Macoma tenta	Turbonilla interrupta	Turbonilla sp.
1	65			P												P			
2	60													P					
2	65																		
2	70	P		P								P				P			
3	65	P		P							P					P			
3	70	F		P						F						P			
4	55															P			
4	60	P		P															
4	65	P		P												P			P
4	70	P		P		P	P			P	P	P				P			
4	75	P		P		P						P				P			
4	80	P		P						P						P			
5	55												P						
5	60												P			P			
5	65	P		P	P				P				P		P	P			
5	70	P		P					P				P			P			
6	60	P		P	P			P				P				P			
6	65	P		P							P		P	P		P			
6	70																		
7	60	P		P	P			P				P				P			
7	65	P		P								P	P	P		P			
7	70																		
8	50																		
8	55			P					P										
8	60																P		
8	65			P												P			
8	70	P		P			P			P	P		P			P			
9	60	P		P						P						P			
9	65	P	P	P	P		P	P	P		F					P			
9	70	P		P						F	F					P			
9	75			P	P							P				P			
10	70	P		P	P											P			
11	5																		P
11	10																		P
11	15																		P
11	20																		
11	25																		P
11	30																		
11	35																		
11	40																		
11	45																		P
11	50	P																	
11	55									F									
11	60																		
11	65																		
11	70	P	P		P									P					
11	75	P	P	P			P			P				P					
11	80		P				A												
12	65																		
12	70			P	P					P						P		P	
13	5															P			
13	10															P			
13	15															P			
13	20					P										P			
13	25		P													P			
13	30															P			
13	35																		
13	40															P			
13	45		P													P			
13	50																		
13	55		P	P												P			
13	60			P															
13	65			P															
13	70	P		P			P									P			
13	75	P		P							P					P			
13	80			P												P			
14	10															P			
14	20															P			
14	25																		
14	30																		
14	35															P			
14	40															P			
14	45																		
14	50																		
14	55																		
14	60			P												P			
14	65	P		P								P							
14	70			A			P			P						P			
14	75			A						P						P			
14	80	P		P							P					P			
14	85			P															
14	90			P															
14	95	P		P			P												
14	100	P		P			P				P	P							
14	105	P																	
14	110																		
14	115										P								
14	120					P													

Complex[1]		TTC-NR											TTC-SBC					
Phylum[2]		G	P	G	P	G	G	P	G	G	G	G	P	S	G	E	G	P
Well No.	Depth (ft.) / Species[3]	Cantharus cancellaria	Corbula swiftiana	Mellanella sp.	Mulinia lateralis	Nassarius acutus	Natica canrena	Nuculana concentrica	Polinices duplicatus	Pyramidella crenulata	Pyramidella sp.	Turbonilla incisa	Anomia simplex	Cadulus carolinensis	Crepidula plana	Mellita quinquiesperforata	Siphonaria alternata	Tellina alternata
1	65				A	P												
2	60				P													
2	65								P									
2	70				A	P			P							F		P
3	65				A	P			P									
3	70				A	P												
4	55																	
4	60				P													
4	65				A	P			P									
4	70				A	P			P							F	P	P
4	75				A	P			P				P			F		
4	80				A	P		P	P							F		
5	55																	
5	60				P													
5	65				A				P							F		
5	70		P		A	P	P		P							F		
6	60				A	P	P		P					P		P		
6	65			P	A	P	P		P							F		
6	70				A	P			P									
7	60				A	P	P		P					P		F		
7	65				A	P	P		P							F		
7	70				A	P			P									
8	50				P													
8	55				P													
8	60																	
8	65				A	P			P				P					
8	70		P		A	P			P			P		P		F		
9	60				A	P			P									
9	65	P			A	P			P		P	P				F		
9	70				A				P			P	P	F		F		
9	75	P			A	P			P						P	F		
10	70				A	P			P									
11	5																	
11	10																	
11	15																	
11	20				P				P									
11	25																	
11	30																	
11	35																	
11	40				P													
11	45								F									
11	50																	
11	55																	
11	60															F		
11	65																	
11	70				A	P			P									
11	75				A	P	P		P									
11	80				P								P					
12	65					P												
12	70	P			A	P			P									
13	5				P													
13	10				P													
13	15				P											F		
13	20				P													
13	25				P											F		
13	30															F		
13	35				P											F		
13	40				P											F		
13	45				P													
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13	55				P													
13	60				A							P						
13	65				A			P										
13	70				A	P						P						
13	75				A	P			P							F		
13	80				A	P												
14	10				P											P		
14	20				P					P		P						
14	25																	
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14	40				P													
14	45															F		
14	50				P											F		
14	55				P													
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14	65				P											F		
14	70				A				P									
14	75				A													
14	80				A	P			P							F		
14	85				A	P										F		
14	90				A	P			P						P			
14	95				A	P												
14	100				A				P		P							
14	105				A						P					F		
14	110				A													
14	115				A						P							
14	120				A					P								

Complex[1]		SBC																									MISC.		
Phylum[2]		P	P	P	P	P	G	G	P	P	P	P	P	P	P	P	G	G	P	G	G	G	P	G	G	E	A	G	-
Well No.	Depth (ft.) / Species[3]	Anadara brasiliana	Anadara chemnitzi	Anadara ovalis	Anadara transversa	Barbatia cancellaris	Cavolina longirostris	Cerithiopsis emersoni	Chione clenchi	Chione intapurpurea	Corbula dietziana	Dinocardium robustum	Donax tumidus	Donax variabilis	Dosinia discus	Dosinia elegens	Tonna galea	Kurtziella limonitella	Labiosa plicatella	Oliva sayana	Olivella mutica	Rhizorus acutus	Spisula solidissima similis	Terebra dislocata	Terebra protexta	Sea urchin spines	Crab claws	Land snail	Pebbles
1	65																												
2	60									P						P			P										
2	65																												
2	70				P					P				P									P						
3	65																				P								
3	70				P												F			P	P			P					
4	55																												
4	60																												
4	65																												
4	70	P		P	P		P		P	P		P		P				P		P	P			P	P		P		P
4	75	P	P		P	P			P	P		P		P				P		P	P			P		P			P
4	80				P		P		P	P	P			P				P		P	P			P		P			
5	55									P																			
5	60																												
5	65				P									P				P			P								
5	70				P			P	P					P				P		P	P			P					P
6	60				P				P					P				P			P			P					P
6	65	P			P									P			F			P	P								
6	70									P		P								P									
7	60				P				P					P				P			P			P					
7	65	P			P									P			P			P	P						P		
7	70									P		P								P						P			
8	50																												
8	55																												
8	60																											P	
8	65				P																								
8	70	P			P				P											P	P			P		P			P
9	60				P				P					P				P											
9	65				P				P	P				P							P					P			P
9	70				P				P					P							P								
9	75	P			P								P	P															
10	70				P					P				P								P							
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11	75	P												P			P			P	P								P
11	80									P				P															
12	65																												
12	70				P					P				P															
13	5													A															
13	10													A															
13	15				P									A															
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13	25													A															
13	30				P									A															
13	35				P									A															
13	40													A															
13	45													A															
13	50													A															
13	55				P									A															
13	60													A													P		
13	65													P															
13	70				P				P					P				P											
13	75								P	P				P						P	P			P					
13	80				P									P															P
14	10	P												A															
14	20				P							P		A															
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14	45													A															
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14	70				P				P					P							P								
14	75				P									P										P					
14	80				P				P	P				P															
14	85													P															
14	90	P			P				P					P															
14	95													P															
14	100				P				P			P		P							P								
14	105													P															
14	110													A															
14	115	P												P											P				
14	120				P				P					P						P									

Distribution of Macroinvertebrates from Subsurface Quaternary Shell Beds, Northern Padre Island, Texas

By

Gary W. Hill and Ralph E. Hunter

1979

EXPLANATION

Padre Island is one of several barrier islands along the Texas Gulf coast. Radiocarbon dating of shells from Padre Island and other barrier island sand bodies indicates that the barrier islands along the Texas coast began growing about 5000 years ago (Fisk, 1959). Development of these islands began when sea level approached to within six to ten meters of its present position following the relatively rapid rise of sea level that accompanied the melting of the last continental ice sheets (Bernard and LeBlanc, 1965).

Barrier island genesis in the South Bird 7.5-minute quadrangle was studied by drilling. One hundred and sixty (160) subsurface samples were collected from rotary drill cuttings from 14 drill holes (Fig. 1). The depth of the drill holes varied from about 21 to 38 meters. Each drill hole was sampled at about 1.5 m (5 foot) intervals. Cuttings were washed through a 0.5 mm mesh sieve and the residue analyzed for invertebrate fossils. Each sample is probably contaminated to some degree by uphole caving during drilling.

The purpose of this report is to show the distribution (Table 1) of invertebrate fossils recovered during the drilling; detailed interpretation of these data will be published later. Except for a single land snail, all fossils recovered are marine invertebrates. Species are reported simply as being present in a sample unless the species is exceptionally abundant relative to other species present or unless identification of the fossil is based only on fragments. Species are grouped into assemblages (= complexes) defined by Siler and Scott (1964). Only samples containing fossils are included in Table 1.

The Padre Island sand body overlies Pleistocene muds and sands (Fig. 2). The top of the Pleistocene sequence is marked by a weathered zone in central Padre Island (Fisk, 1959) and probably by a shell layer in the South Bird Island quadrangle (Hunter and Dickinson, 1970). However, the possibility that some of the sand overlying the shell bed is Pleistocene instead of Holocene cannot be ruled out. The shell layer is at a rather uniform depth of about 19 m (62 feet) below sea level in the South Bird Island quadrangle, whereas farther south, in central Padre Island, it is only 8 to 15 m below sea level (Fisk, 1959). The sand body continues to thin southward, and muds that are presumably part of the Pleistocene Rio Grande delta crop out locally on southern Padre Island (Rusnak, 1960). In cross section, the sand body is lenticular, grading seaward into Holocene marine muds that are probably very thin and grading landward into Holocene lagoonal muds and sands that pinch out at the mainland shore of Laguna Madre.

The shell layer beneath the South Bird Island quadrangle probably represents a late Pleistocene lagoon. Pelecypods make up the majority of the fossil material in the shell bed. Radiocarbon dates of two samples of *Mulinia lateralis* from the shell layer at about 21 m (65 feet) in wells number five and six are 27,380 ± 1100 and 29,980 ± 1070 years B.P. (Valastro and Davis, 1970). Underlying the shell layer is clay, sandy clay, and clayey sand of Pleistocene age (Hunter and Dickinson, 1970) with shells representing a normal Gulf fauna.

Sand-size characteristics (Dickinson, 1971) and distribution of invertebrate fossils above the major shell bed at 19 m indicate that during the last few thousand years, some parts of the barrier island in the South Bird Island quadrangle have prograded seaward by deposition of sand on their shorefaces, whereas other parts have remained stationary or have moved landward by shoreward erosion. On the landward side, Padre Island has prograded into the lagoon by the deposition of sand washed or blown across the island.

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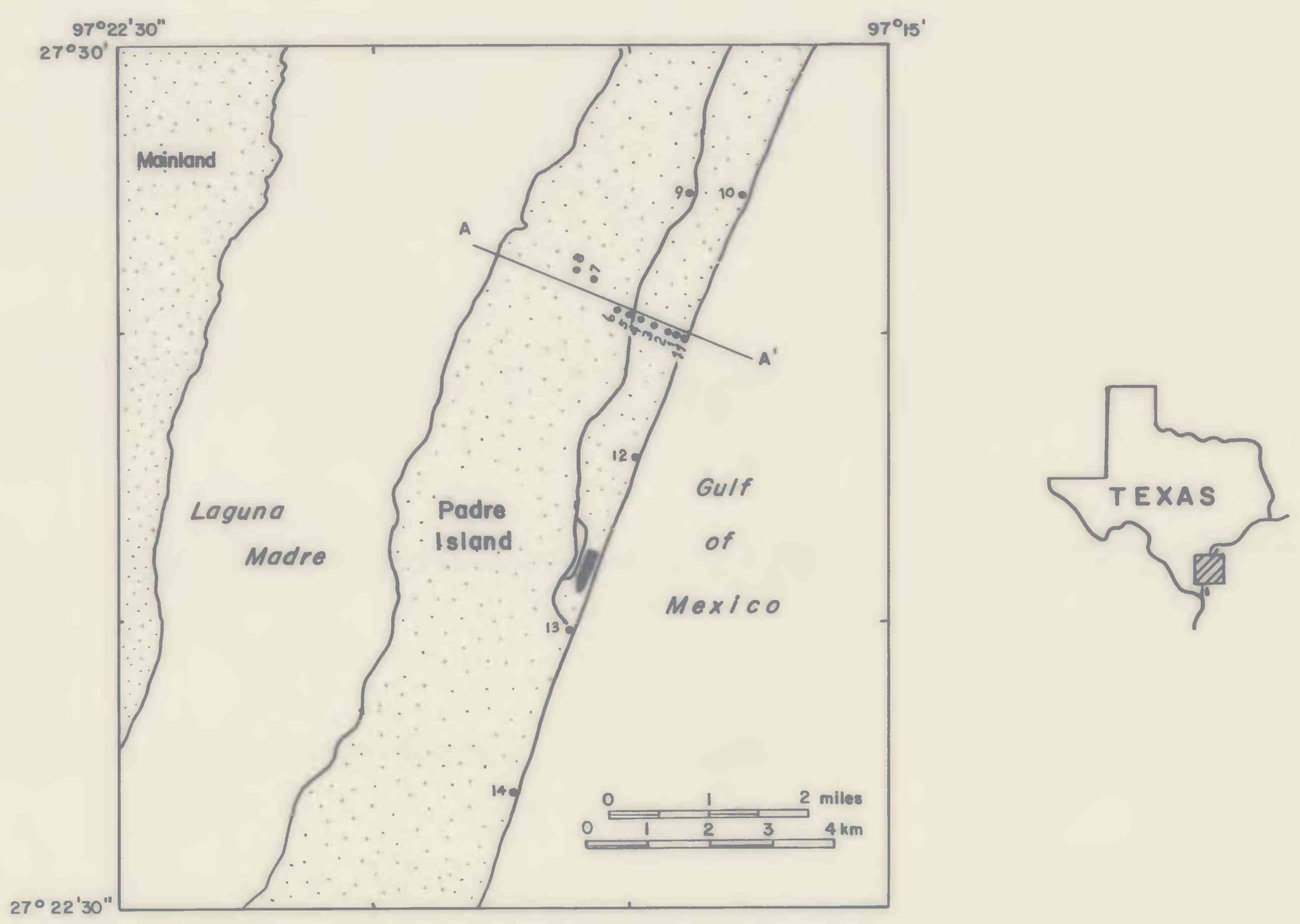

Figure 1. Location of drill holes on Padre Island, Texas, within the South Bird Island 7.5-minute quadrangle.

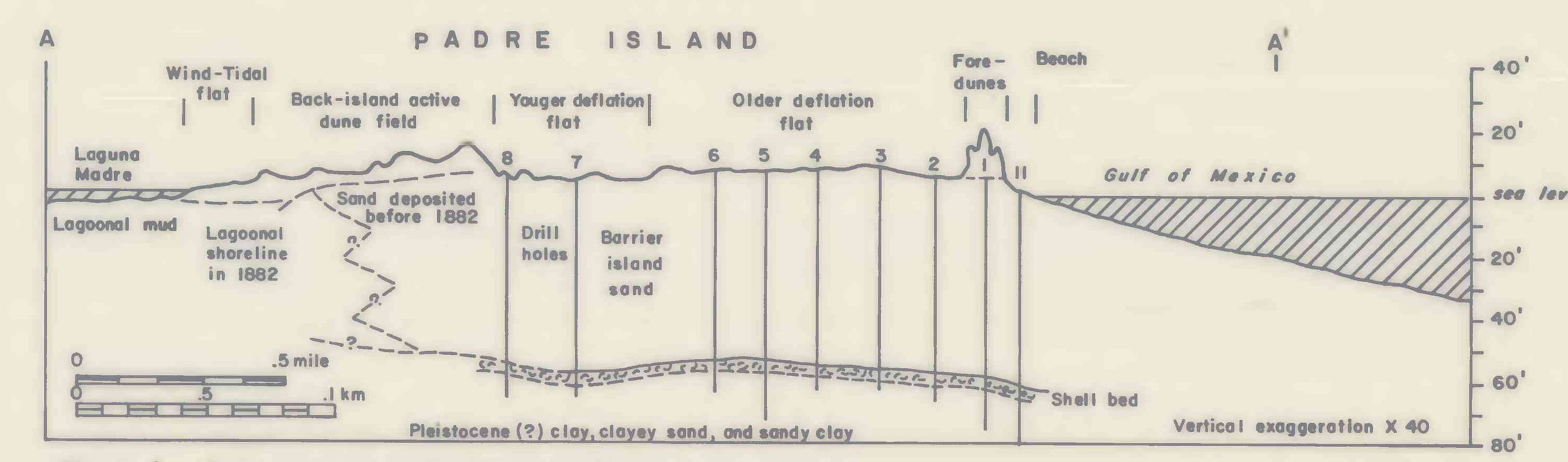

Figure 2. Cross section A-A' of Padre Island, Texas, within the South Bird Island 7.5 minute quadrangle. Modified from Hunter and Dickinson (1970, section A-A').

Footnotes

[1]Complex:
- LBC = Lagoonal-Bay Complex
- LBC-TTC = Lagoonal-Bay Complex and Tidal Delta-Tiday Channel Complex
- TTC-R = Tidal Delta-Tidal Channel Complex (Restricted)
- TTC-WR = Tidal Delta-Tidal Channel Complex (Non-restrictive)
- TTC-SBC = Tidal Delta-Tidal Channel Complex and Shelf-Barrier Complex
- SBC = Shelf-Barrier Complex

[2]Phylum:
- A = Arthropoda
- C = Coelenterata
- E = Echinodermata
- G = Mollusca (Gastropoda)
- P = Mollusca (Pelecypoda)
- S = Mollusca (Scaphopoda)

[3]Species:
- A = Abundant
- P = Present
- F = Fragment only