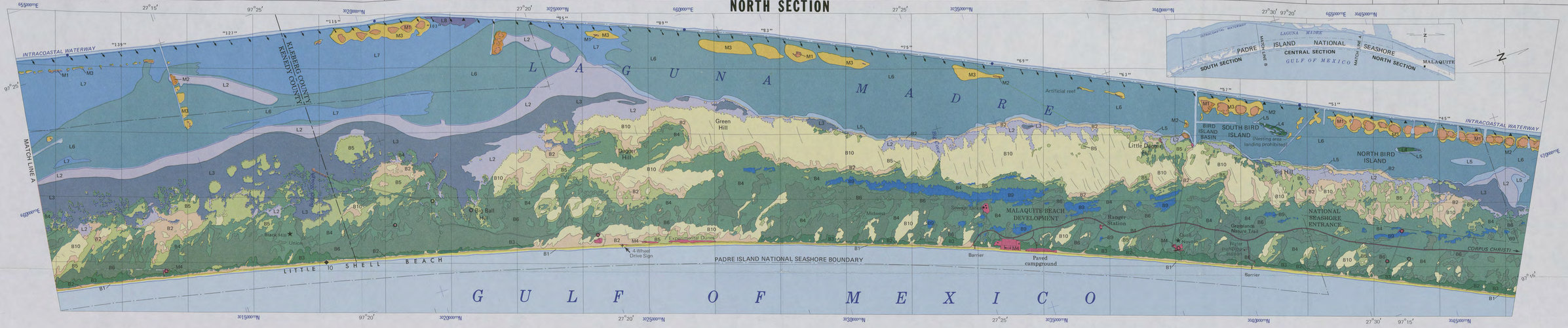
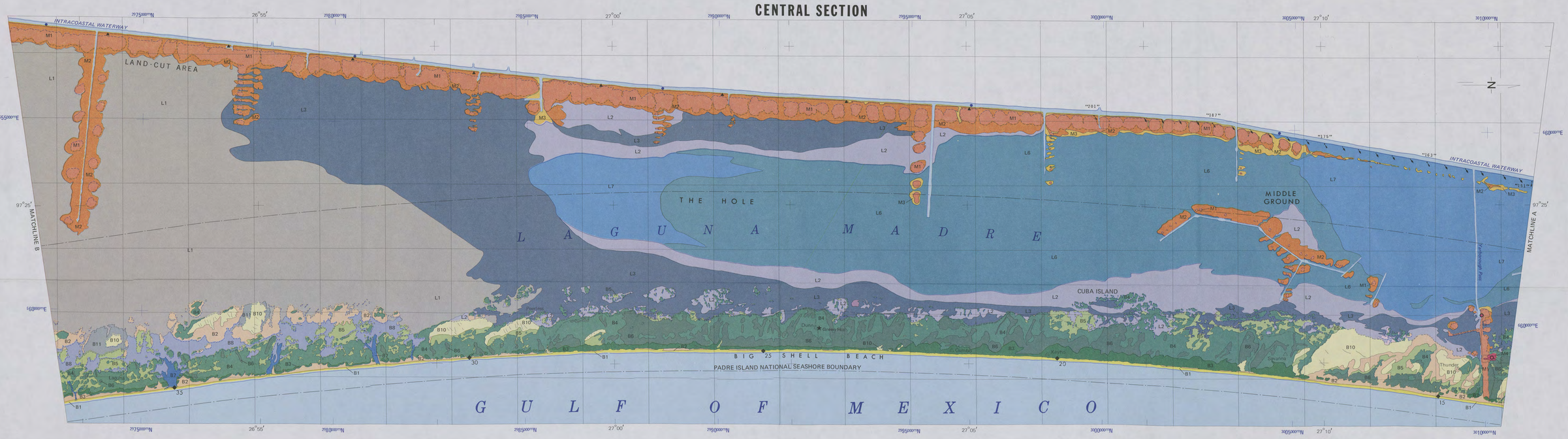
THE UNIVERSITY OF TEXAS AT AUSTIN
BUREAU OF ECONOMIC GEOLOGY
W. L. FISHER, DIRECTOR

GUIDEBOOK NUMBER 17
PADRE ISLAND NATIONAL SEASHORE
PLATE I

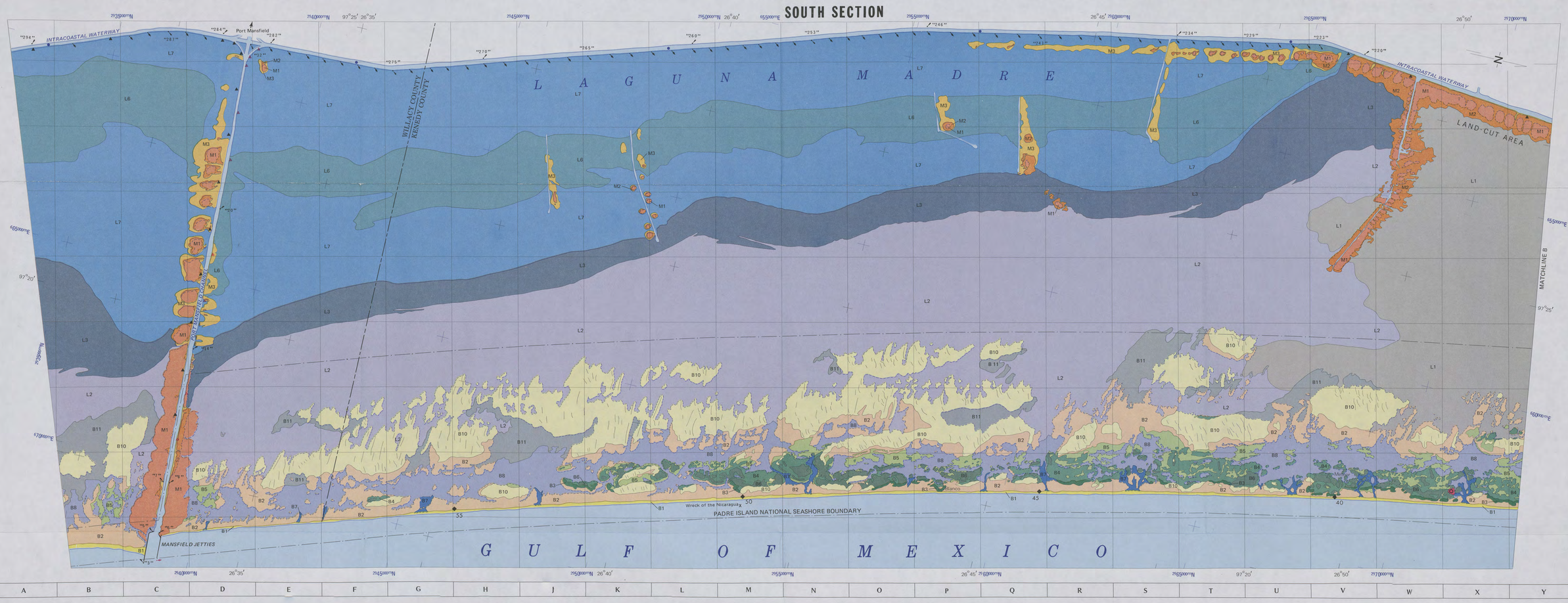
NORTH SECTION



CENTRAL SECTION



SOUTH SECTION



BARRIER SYSTEM

B1 — Beach, sand and shell, cusps and berms locally pronounced. Photo: Malaquite Beach with Gulf on left and Malaquite visitor facilities and dune ridge on right (Q-4)

B2 — Sandflat and/or coppice dune field, active sand migration, wind-shadow dunes common, may include small remnants of larger dunes partially destroyed by wind or water, commonly found immediately landward of beach and fringing back-island dune fields. Photo: Coppice dunes, up to 15 inches in height, with beach and Gulf in distance (M-4)

B3 — Fore-island dune ridge, sand, parallels Gulf shoreline, heavily vegetated on landward side, more sparsely vegetated on gulfward side, includes some fore-island stabilized blowout dunes. Photo: Continuous fore-island dune ridge immediately behind beach and narrow sandflat; highest ridge elevation approximately 20 feet (F-4)

B4 — Barrier flat, sand and shell, heavily vegetated, local ponds and marshes, isolated stabilized dunes. Photo: Barrier flat heavily vegetated by grasses and small shrubs; back-island dune field in far distance (T-4)

B5 — Barrier flat, sand and shell, sparsely to moderately vegetated. Photo: Barrier flat vegetated by sparse clumps of grasses that have migrated onto and partially stabilized a previously barren wind-deflation flat; active dunes in distance (L-4)

B6 — Stabilized blowout dunes, sand, vegetated, hummocky, commonly in elongate or parabolic forms adjacent to dune ridge and extending lagoonward across barrier flat. Photo: Vegetated, or stabilized, blowout dune extending lagoonward from fore-island dune ridge (Q-11, R-11)

B7 — Washover channel, sand, active during storms, generally perpendicular to shoreline, may form ponds between storms. Aerial photo: Storm washover channel cut through dune ridge and barrier flat; view from Gulf westward over barrier island (E-11)

B8 — Wind-deflation flat, washover fan, and storm runway, sand and mud, algal mats. Aerial photo: Deflation flat and storm runway parallel to shoreline; washover fan spreading from washover channel onto flat (E-11)

B9 — Ephemeral fresh- to brackish-water ponds and marshes occupying wind-deflation troughs, generally parallel trailing (gulfward) edge of large back-island dune fields. Photo: Water-filled wind-deflation trough, past source of sand for back-island dune field in distance (Q-3)

B10 — Back-island dune field and fore-island blowout dunes, sand, longitudinal dune types common, active sand migration. Photo: Back-island dune field with sand migrating from back right to fore left (P-3)

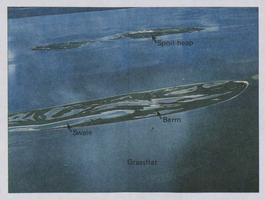
B11 — Back-island sandflat with small migrating dunes, unvegetated, rapidly changing environment transitional from back-island dune field to wind-tidal flat. Aerial photo: Back-island sandflat with small migrating dunes, transitional with wind-tidal flat in distance (D-10, E-10)

LAGOON SYSTEM

L1 — Wind-tidal flat, loose wind-blown sand forming small dunes, local algal mats, rarely flooded. Aerial photo: Wind-tidal flat with loose sand blowing over and forming dunes on algal mats; Intracoastal Waterway in distance parallel to horizon (F-9)

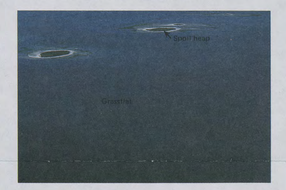
L2 — Wind-tidal flat, sand and mud, firm, upper part rarely flooded. Photo: Barren wind-tidal flat of firm sand and mud, rarely inundated by lagoon water; isolated vegetation clump approximately 2 feet in height, active dunes in far distance (P-3)

L3 — Wind-tidal flat, sand and mud, extensive algal mats, alternately emergent-submergent. Photo: Wind-tidal flat with algal mat peeled from underlying sand and mud; scale 30 centimeters (11.8 inches) in length (X-11)

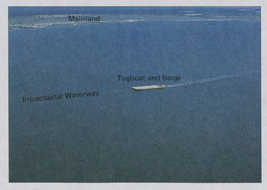


L4 — Lagoon sand and shell berms, accretionary, subaerial, vegetated. Aerial photo: South Bird Island, a sand and shell island showing accretionary vegetated berms and barren swales; spoil along Intracoastal Waterway in distance (U-2)

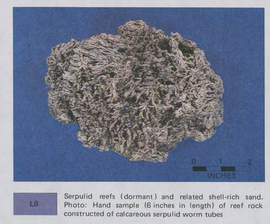
L5 — Lagoon-margin sand, subaqueous, upper part often emergent, sand waves common, depths less than 3 feet. Aerial photo: Lobes of lagoon-margin sand fringing narrow field of coppice dunes at edge of back-island area (N-2)



L6 — Grassflat, marine grasses, muddy sand with shell, shallowest parts exposed at lowest tides, algae common in shoal areas, depths generally less than 4 feet. Aerial photo: Extensive grassflat exhibiting mottled texture beneath shallow water; in distance, spoil heaps adjacent to small channel branching from Intracoastal Waterway (R-8, R-9)



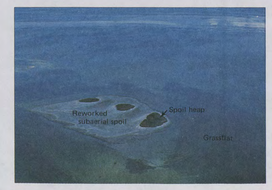
L7 — Lagoon-center sand, muddy, locally sparse grass, depths up to 8 feet. Aerial photo: Expanse of lagoon water covering submerged lagoon sand on either side of Intracoastal Waterway marked by barge and wake; mainland shoreline in distance (F-14, G-14)



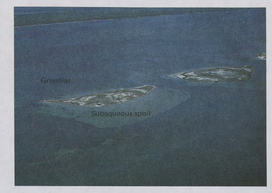
L8 — Serpulid reefs (dormant) and related shell-rich sand. Photo: Hand sample (6 inches in length) of reef rock constructed of calcareous serpulid worm tubes

MAN-MADE OR MAN-MODIFIED UNITS

M1 — Spoil heap or mound, subaerial, partially vegetated, locally reworked, includes small areas of made land. Aerial photo: Vegetated spoil heaps fringed by barren, reworked subaerial spoil along Intracoastal Waterway; mainland shoreline in distance (S-8, T-8)



M2 — Subaerial spoil, reworked, barren, local algal mats. Aerial photo: Barren subaerial spoil reworked from spoil heaps, direction of spoil transport primarily toward dredged channel in lower left; grassflats surrounding reworked spoil and heaps (C-2, D-2)



M3 — Subaqueous spoil, reworked, local marine grass. Aerial photo: Subaqueous spoil (depths less than 3 feet) encircling subaerial heaps along Intracoastal Waterway; grassflat surrounding spoil (U-2, west of Intracoastal Waterway)

M4 — Land modified by human activity, designated by label or symbol. Aerial photo: A purposeful land modification—Malaquite Beach Development with parking lot, visitor facilities, and maintained beach (Q-4)

NOTE: Areas where photographs were taken are indicated by the map coordinates (for example, Q-4) following map unit descriptions

- Paved road
- Shell or sand road, regularly maintained
- Sand road, not always passable
- Buildings, tanks, and other man-made structures, shown with approximate shape, excludes numerous State-permitted spoil cabins along Intracoastal Waterway
- Historic line camp used in cattle drives
- Oil or gas exploration or production site (active or abandoned)
- Blanco — Triangulation station
- Orientation of active dunes
- 45 — Marker showing approximate number of miles from beach access road south of Malaquite Beach (marker locations subject to change)

Approximate mean sea level, outlines environments that are generally classified as subaqueous

Approximate maximum high sea level, outlines environments that are commonly flooded by wind tides and storms (elevations generally less than 3 feet)

Dredged channels (those shown by light-weight blue lines are commonly modified by natural filling or erosion and may not be navigable)

Aids to Navigation (adopted from Nautical Charts 11305, 11306, and 11308, National Oceanic and Atmospheric Administration, 1975)

- Light or light beacon
- Black buoy
- Day beacon, black
- Red buoy
- Day beacon, red
- 5-mile station

5000-meter Universal Transverse Mercator grid ticks, zone 14, shown in blue

Mapping by B. R. Weise and W. A. White. Geology mapped on color-infrared stereoscopic aerial photographs (May 1975) provided by the Land Resources Program of the Texas General Land Office. Map units adopted from studies by L. F. Brown, Jr., and J. H. McGowen, Environmental Geologic Atlas of the Texas Coastal Zone, Bureau of Economic Geology. Map base constructed from orthophotographic maps (1975) provided by the General Land Office and from U.S. Geological Survey topographic maps (1951-1969). Cartography by D. F. Scranton; J. W. Macon, Chief Cartographer. Mapping in cooperation with the National Park Service, Padre Island National Seashore.

LOCATION MAP

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SCALE 1:48,000

0 1 2 3 4 5 6 MILES
0 4,000 8,000 12,000 16,000 20,000 24,000 28,000 FEET
0 1 2 3 4 5 6 7 8 KILOMETERS

GEOLOGY AND NATURAL ENVIRONMENTS OF PADRE ISLAND NATIONAL SEASHORE, TEXAS