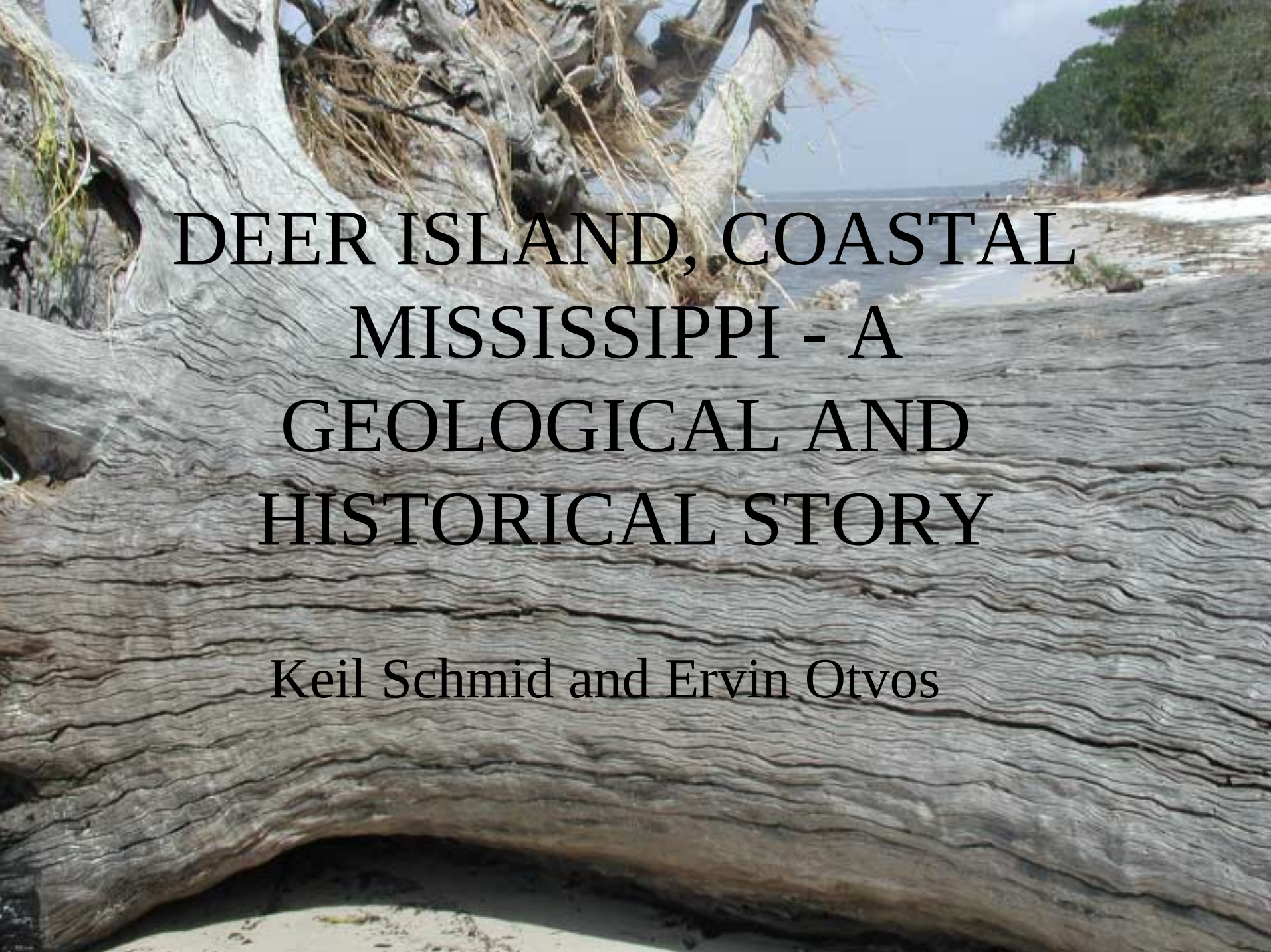
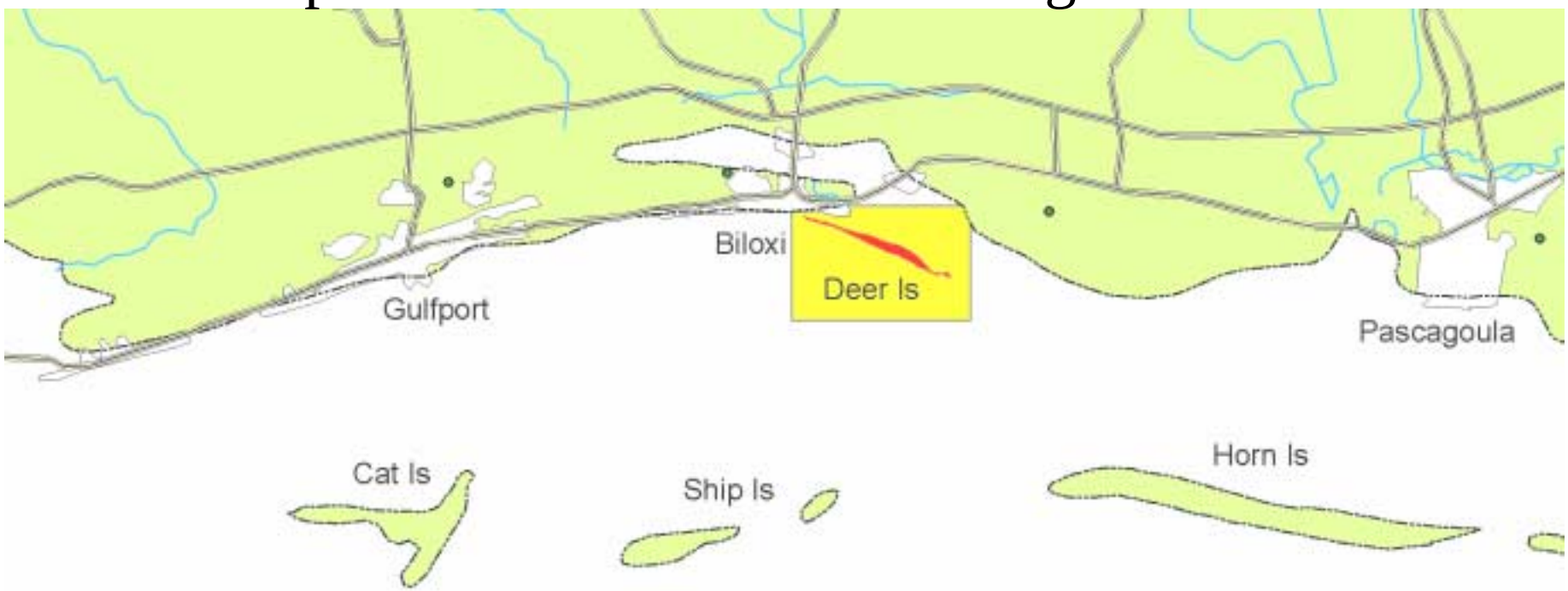


DEER ISLAND, COASTAL MISSISSIPPI - A GEOLOGICAL AND HISTORICAL STORY

Keil Schmid and Ervin Otvos

Introduction

- Located off Biloxi, MS
- Not a barrier island
- Long history of human habitation and land use
- Over 300 acres of erosion in 150 years
- Now part of Coastal Preserves Program

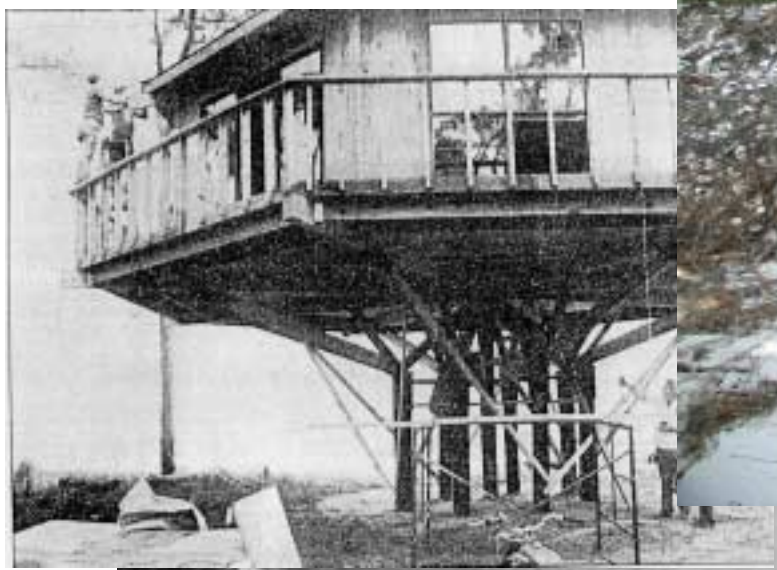


Objectives

- Establish surface and subsurface geology
- Sea-level definitions by Pleistocene and Holocene units
- Establishing geological and geomorphological controls on erosion

Island History

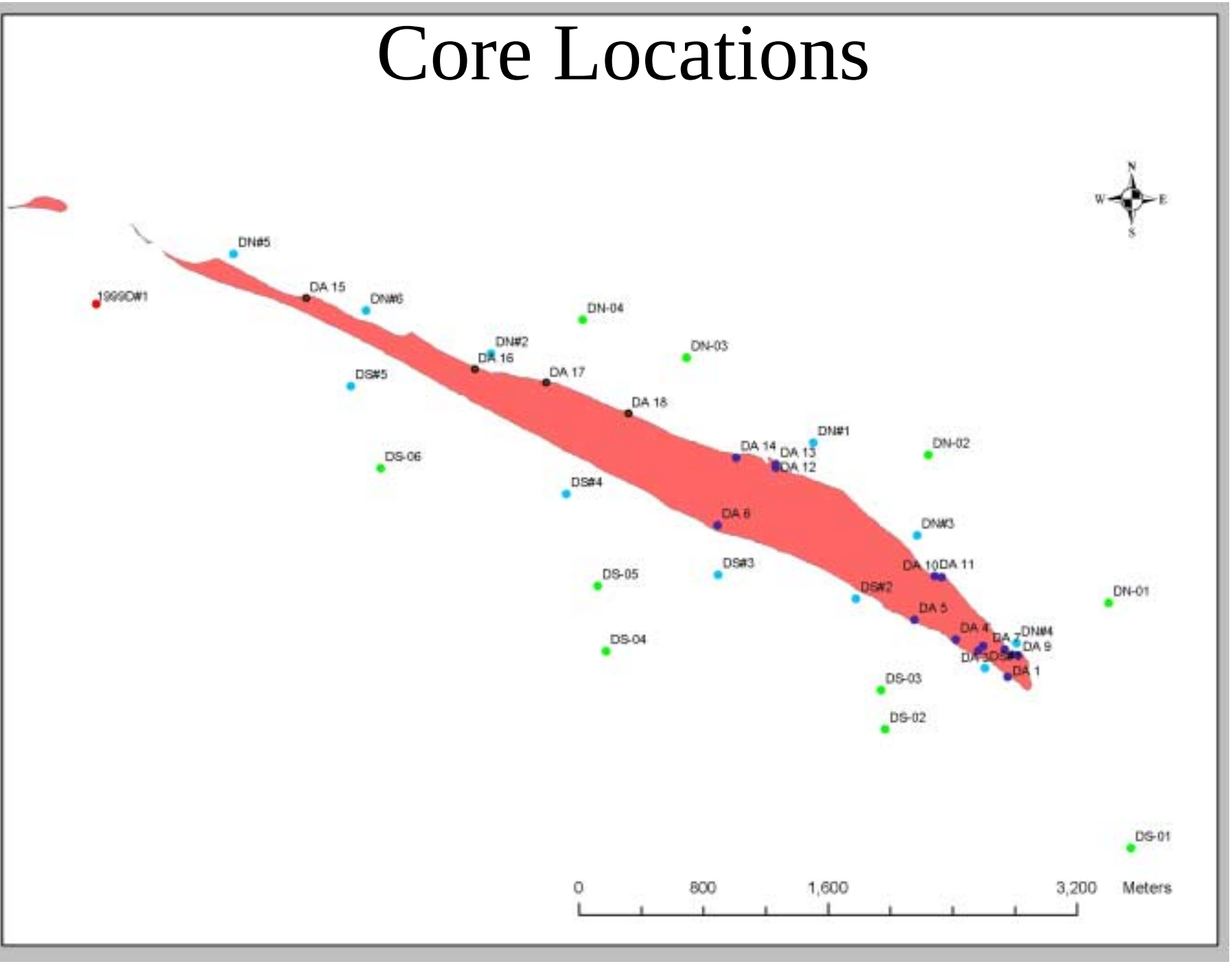
- Indian Occupation – Paleo Indian to Mississipian Periods
- European Occupation in 1717
- Farming and Fishing in 18th and 19th Centuries
- Amusement Park in 1915
- Development and Recreation Facilities Planned; Some Built and Later Destroyed by Storms



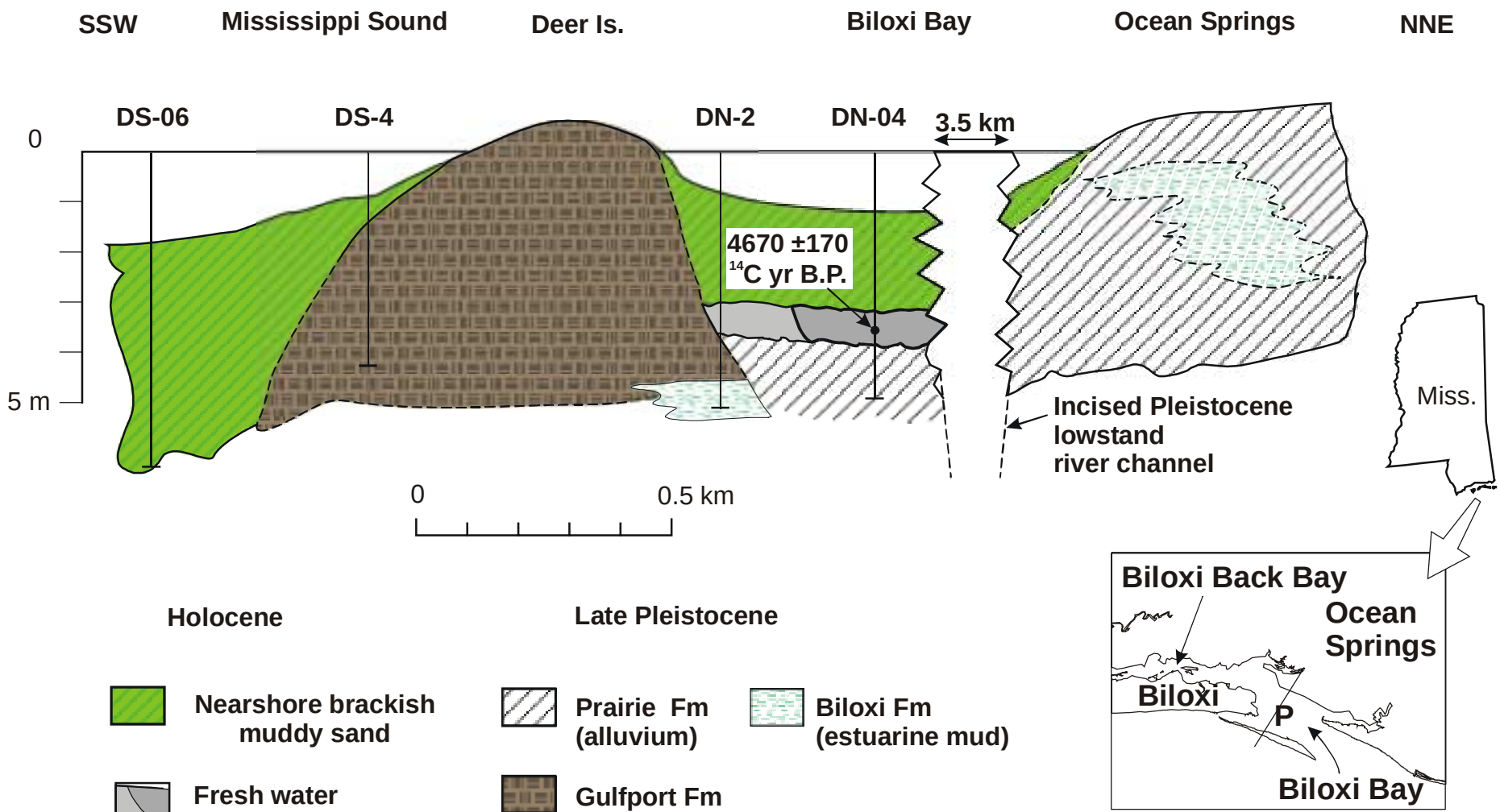
Methods

- GPS Shoreline Surveys
- Vibracores (offshore)
- Hand Augers (onshore)
- Sediment Texture & Micropaleo
- GIS analysis

Core Locations



Geology – Western Profile



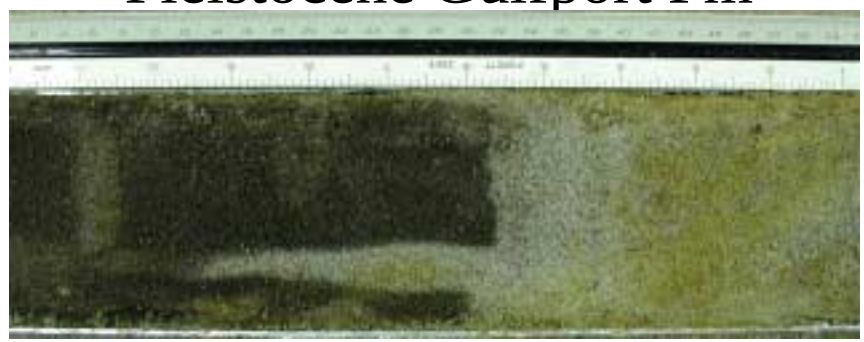
Island Lithology

Holocene Brackish Mud

Pleistocene Prairie Fm (?)

Holocene Fresh Water Swamp 4670 yr BP

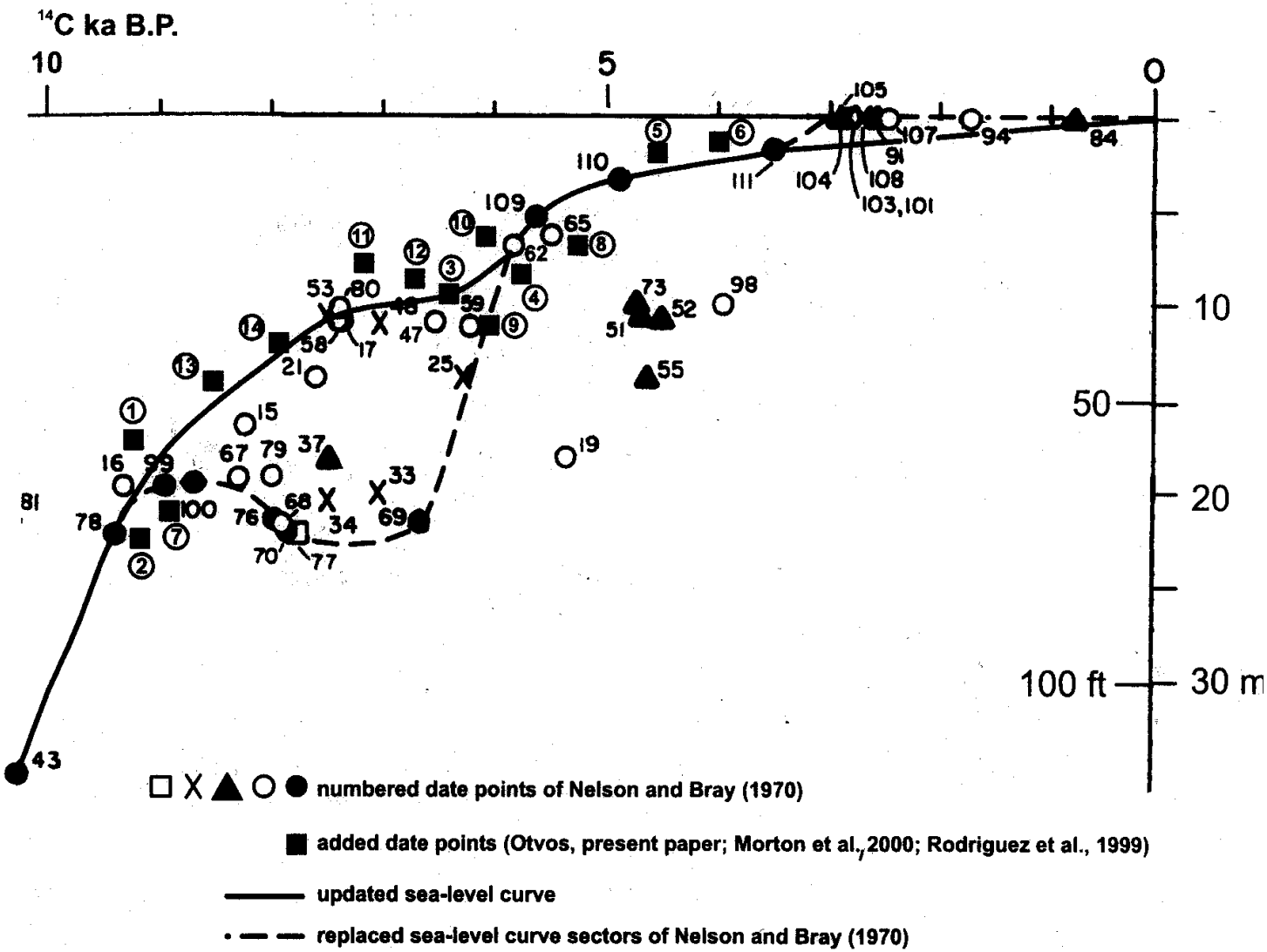
Pleistocene Gulfport Fm



Holocene M. Sand

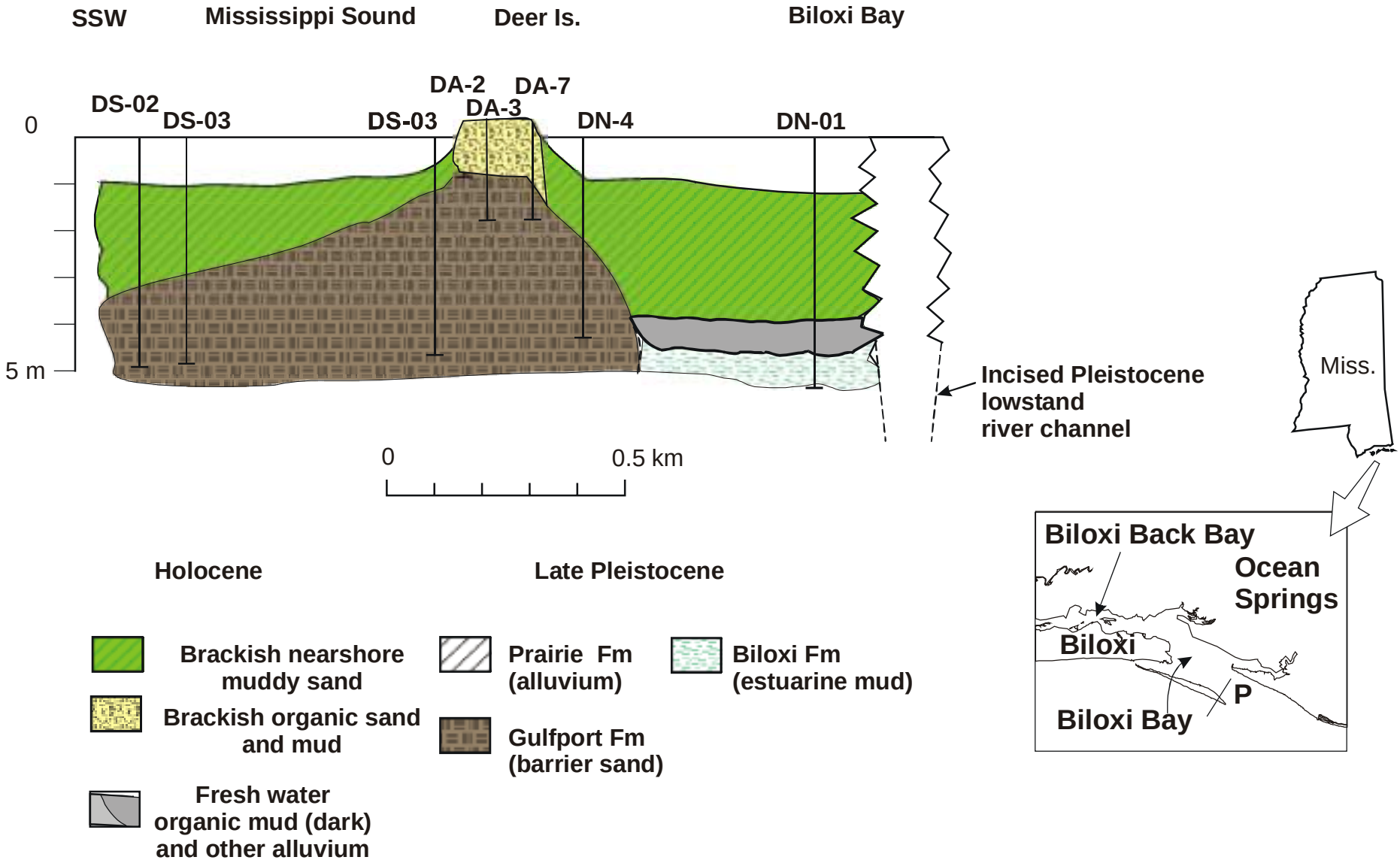
Pleistocene Biloxi Fm

Sea Level


14C ka B.P.
10
5
0
10
50
20
100 ft
30 m
numbered date points of Nelson and Bray (1970)
added date points (Otvos, present paper; Morton et al., 2000; Rodriguez et al., 1999)
updated sea-level curve
replaced sea-level curve sectors of Nelson and Bray (1970)

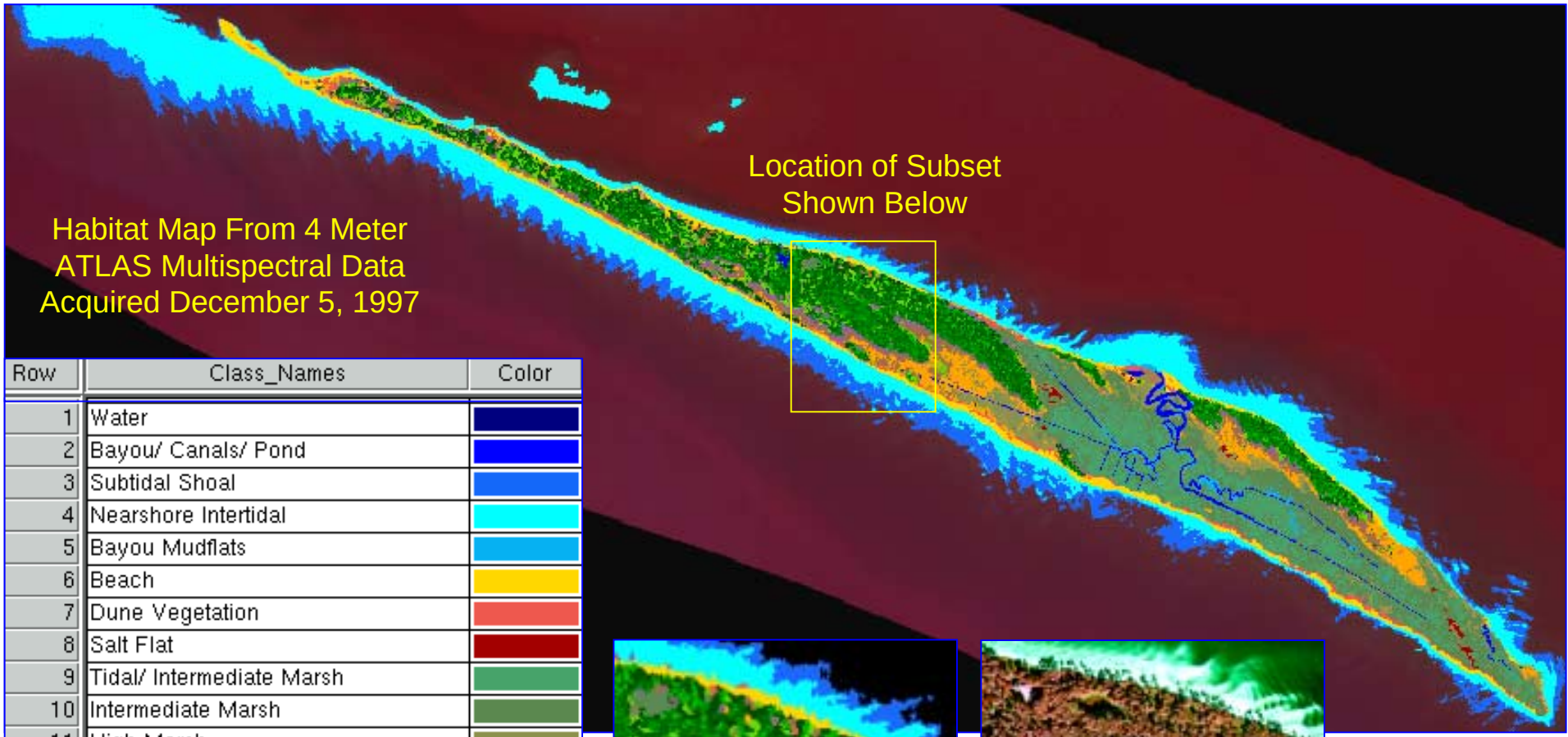
Shorelines:Western Island

Geology – Eastern Profile

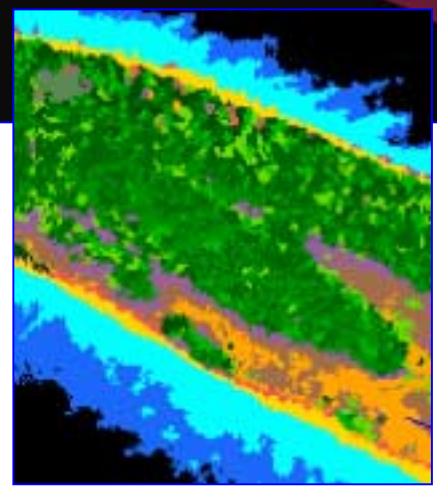


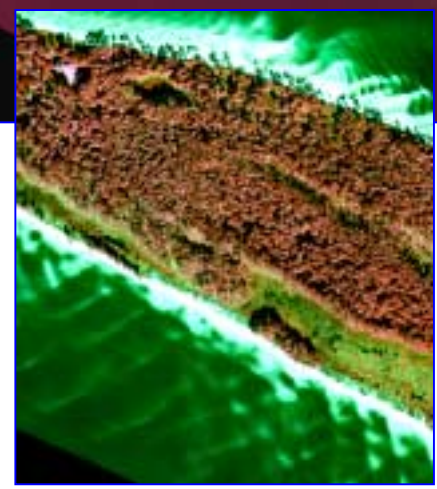
Shorelines: Eastern Island

Deer Island Habitats from 4-Meter ATLAS Imagery

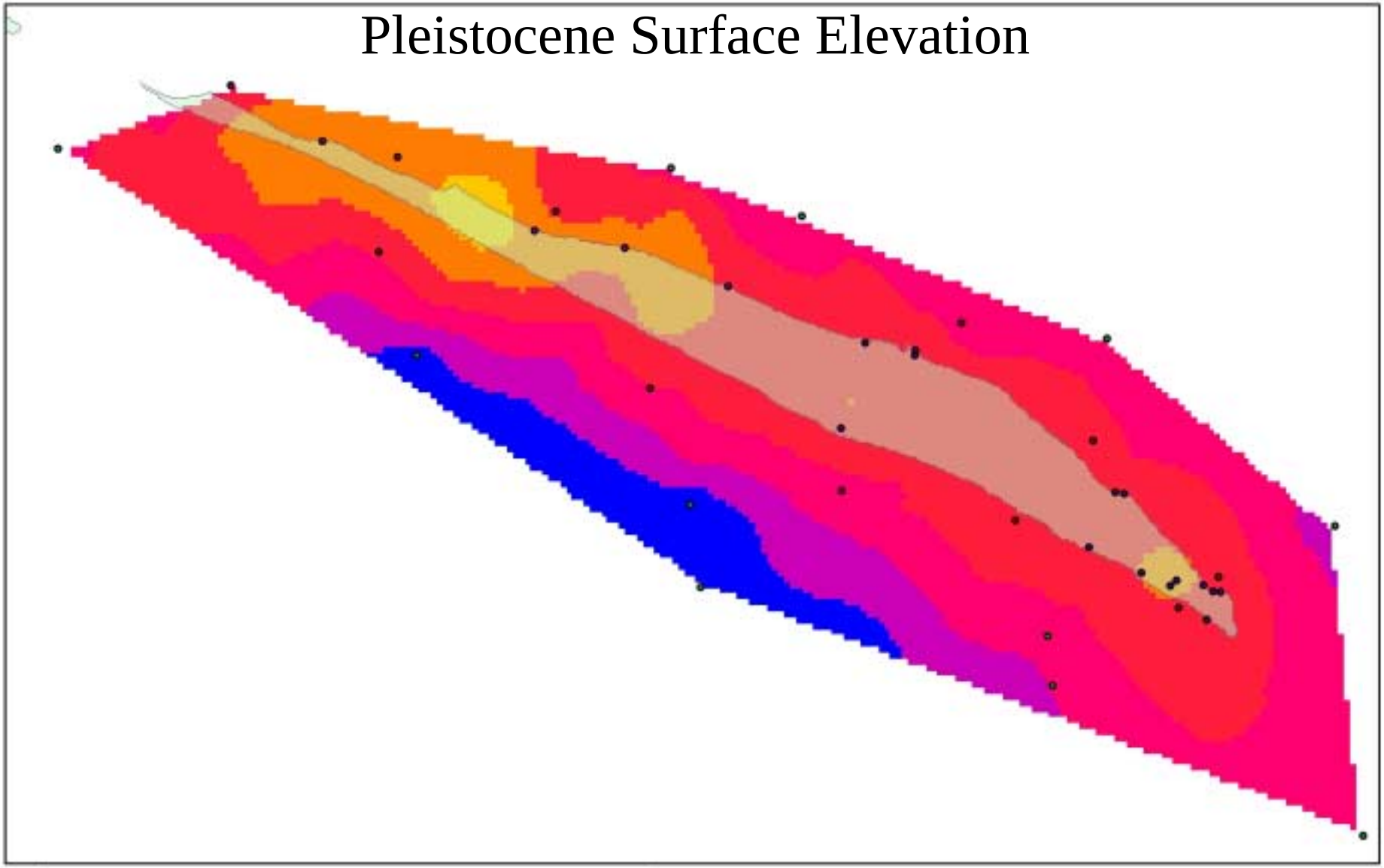


Row	Class_Names	Color
1	Water	
2	Bayou/ Canals/ Pond	
3	Subtidal Shoal	
4	Nearshore Intertidal	
5	Bayou Mudflats	
6	Beach	
7	Dune Vegetation	
8	Salt Flat	
9	Tidal/ Intermediate Marsh	
10	Intermediate Marsh	
11	High Marsh	
12	High Marsh/ Dune Vegetation	
13	Scrub/ High Marsh	
14	Low Scrub	
15	High Scrub	
16	Low Mixed Hardwood/Pine Forest	
17	High Pine Forest – Sunny	
18	High Pine Forest – Less Sunny	
19	Low Pine Forest – Sunny	
20	Low Pine Forest in Deep Shadows	

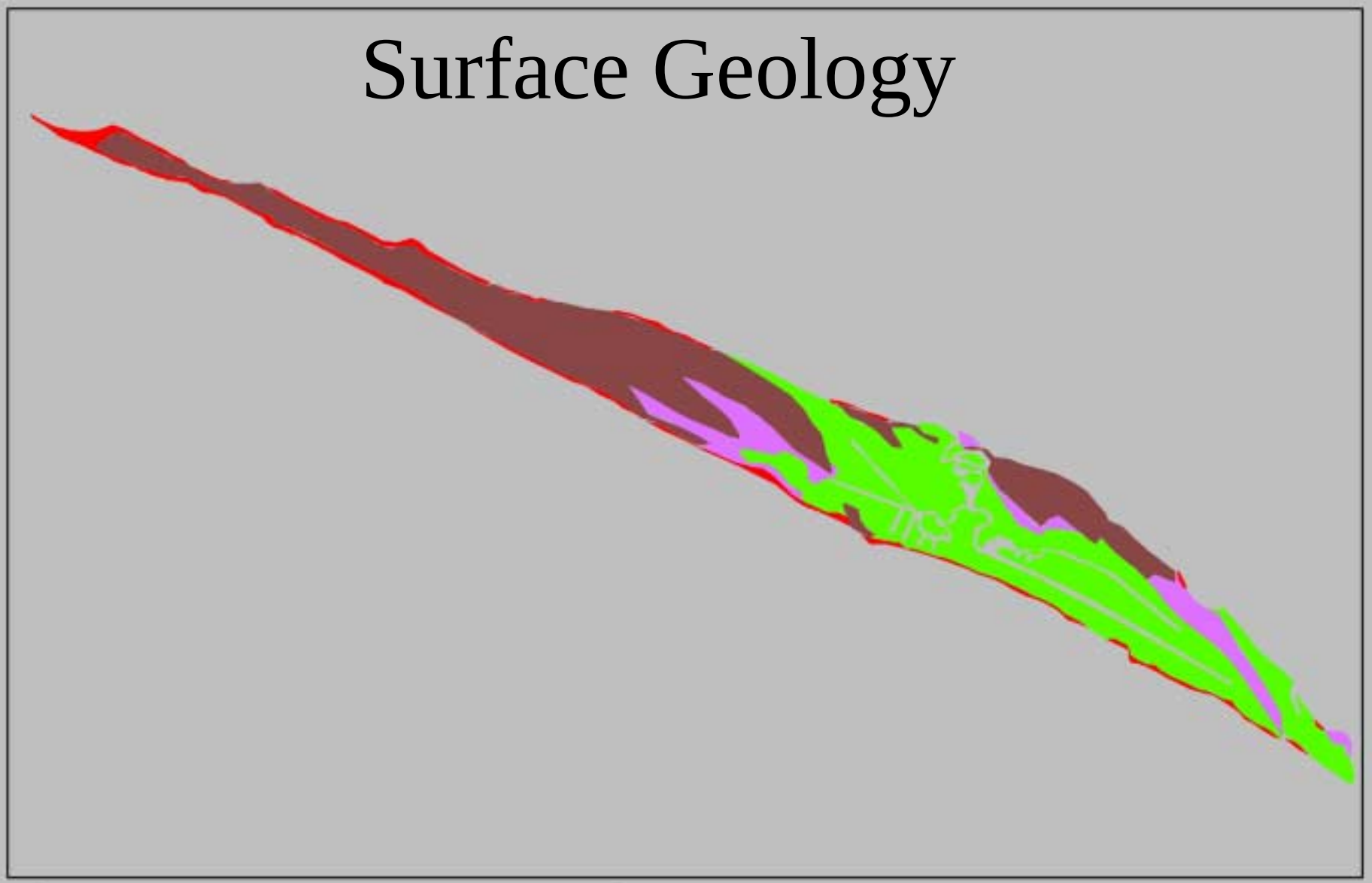




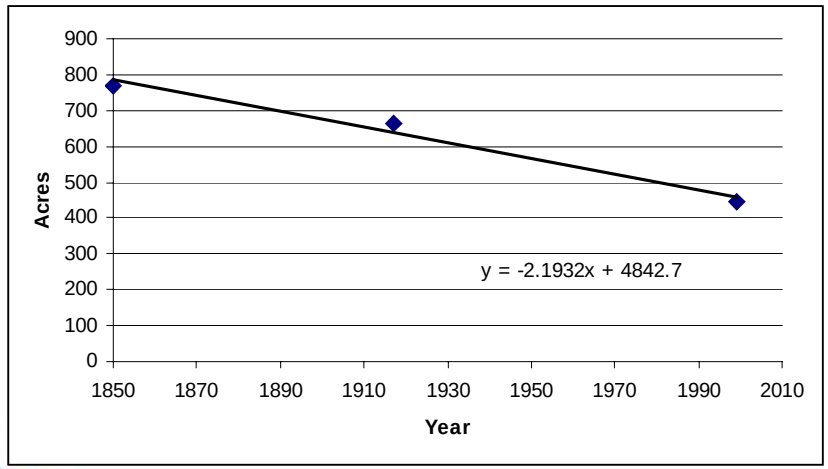
Pleistocene Surface Elevation



Surface Geology



Shorelines



Average area change = -2 acres/year

Accretion

1999 shoreline

1917 shoreline

1850 shoreline

0 750 1,500 3,000 Meters

Conclusions

- Island wrapped around Pleistocene Gulfport Fm barrier ridge complex. Its surface dips toward S.E.
- Island flanked on east by incised late Pleistocne Biloxi River valley, drowned and partially filled during mid-late Holocene transgression
- Sea-level stood at ca. –1 to -1.5 m at approximately 4.7 ka BP
- 2 acres/yr island area lost to erosion; a 34% land loss since 1852. Island length reduced from 8.0 km to 6.5 km.
- Erosion most prominent in the southeast where Holocene muddy sands and marsh deposits form the shoreline