

West-Central Florida Coastal Transect # 8: Siesta Key

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Introduction

A major goal of the West-Central Florida Coastal Studies Project was to investigate linkages between the barrier-island system along the west coast of Florida and offshore sedimentary sequences...

Methods

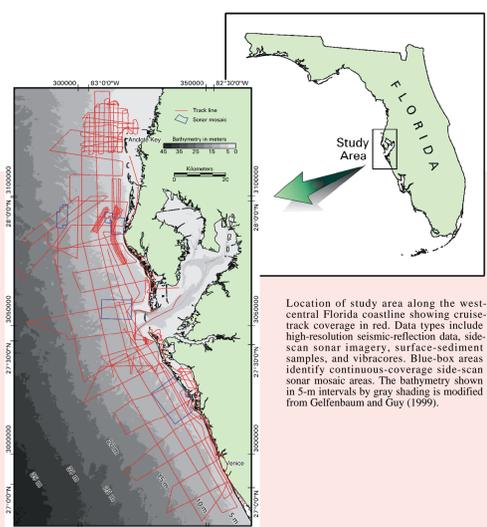
The primary data sets used in this study were collected from 1993 to 1998. Geophysical surveys included high-resolution single-channel "boom" seismic data and 100-KHz side-scan sonar imagery...

Geologic History and Morphodynamics of Barrier Islands

Barrier islands on the west-central Gulf coast of Florida display a wide range in morphology along the most diverse barrier/inlet coast in the world (Davis, 1994). In addition, the barriers have formed over a wide range of time scales from decades to millennia...

Siesta Key

Siesta Key is a pronounced drumstick barrier island with multiple generations and orientations of beach-ridge sets. Development is essentially complete on the northern part of the island and has included dredging of numerous channels to provide water access for residents...

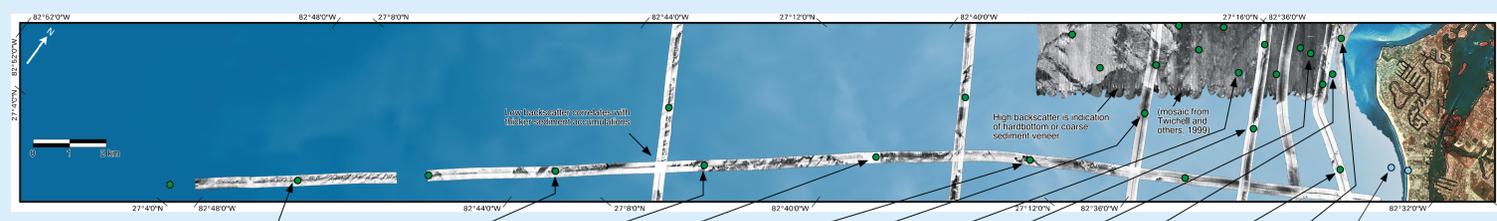


Location of study area along the west-central Florida coastline showing cruise track coverage in red. Data types include high-resolution seismic-reflection data, side-scan sonar imagery, surface-sediment samples, and vibracores...



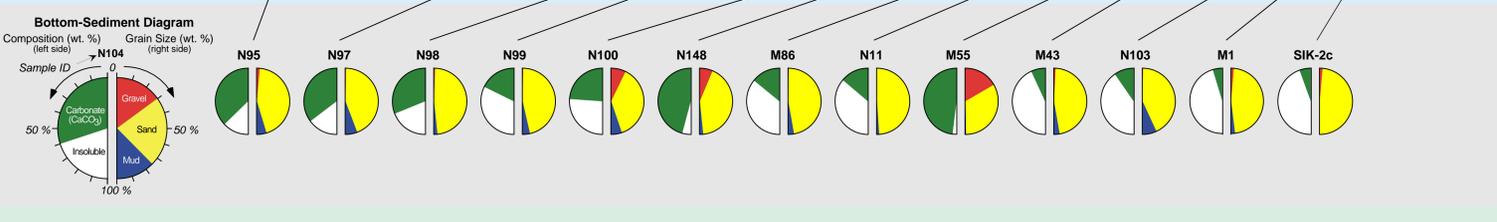
Location map

Location map shows bathymetry, cruise-track coverage, and sample locations, and location of figures. The beach has accreted seaward at the location of the transect cross section...



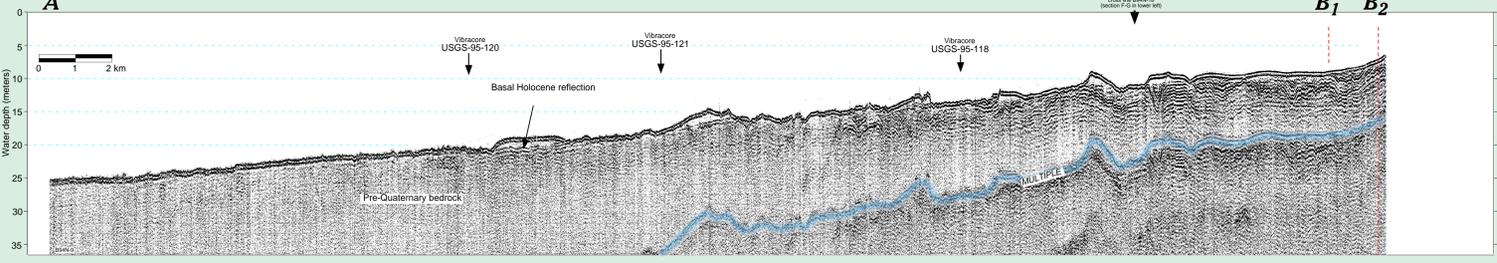
Side-scan sonar

Side-scan sonar imagery overlain on continuous-tone bathymetry indicates northeast-trending sand-ridge morphology is most common throughout the inner shelf in this region...



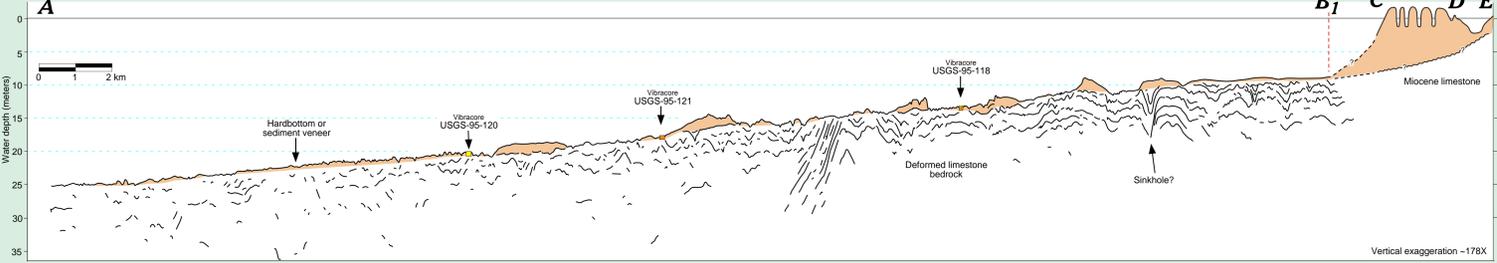
Surface sediments

Grain-size and composition data for bottom grab samples are presented below the sonar imagery. Samples generally consist of carbonate sand and gravel with subordinate amounts of quartz...



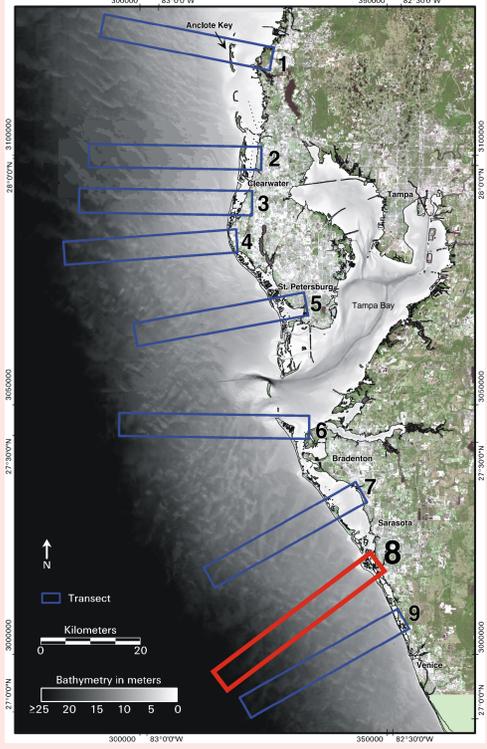
Seismic profile

Uninterpreted seismic profile reveals several Holocene sand ridges with good basal Holocene reflections marking the top of Pre-Quaternary bedrock. These ridges are separated by 1-km-or-greater expanses of sea floor where sediment thickness decreases...



Transect cross section A-E

Integrated stratigraphic cross section combining line-drawn interpretation of seismic data, ground-truthed by coring, with a coastal cross section based on vibracores. Cores in the offshore transect have no cross-shelf correlation potential...

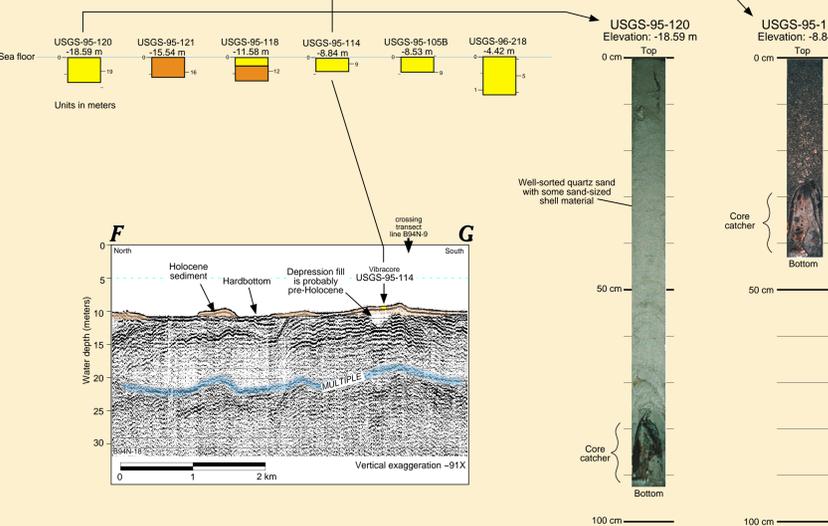


Location of west-central Florida coastal-transect maps with Transect #8 shown in red. 1997 LANDSAT TM imagery of Florida's west coast is merged with a bathymetric-surface model (Gelfenbaum and Guy, 1999)...

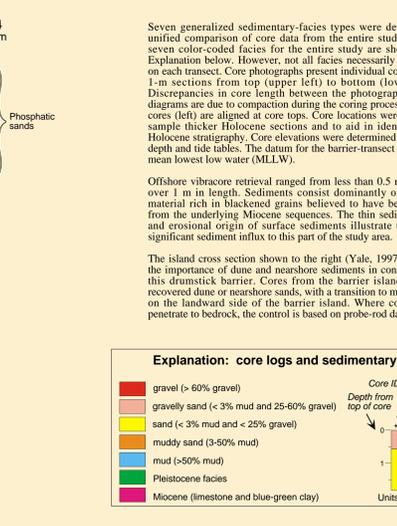


Oblique aerial photograph of Big Sarasota Pass taken in 1997. The island transect (C-D) is shown here with vibracore interpretations presented below. The extensive development on this wide prograding end of the barrier has obliterated the numerous prograding beach ridges that characterize a drumstick barrier...

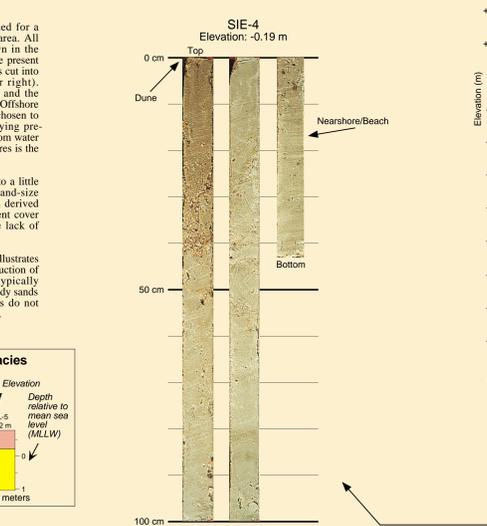
Offshore Cores



Core Data



Barrier-Island Cores and Transect



References Cited

Brooks, G.R., Doyle, L.J., Suthard, B.C., and DeWitt, N.T., 1999. Inner West-Central Florida continental shelf: Sedimentary facies and facies associations. U.S. Geological Survey Open-File Report 98-796, 124 p.

Acknowledgments

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Data references:

Color Infrared Digital Orthophoto Quarter Quadrangles (CIR DOQQ), (1994, 1995), USGS EROS Data Center, Sioux Falls, SD 57198. CD-ROM.

List of west-Florida coastal-transect series maps (1 sheet each):

- Transect #1: Anclote Key, USGS Open-File Report 99-505
Transect #2: Caladesi Island-Clearwater Beach, USGS Open-File Report 99-506
Transect #3: Sand Key, USGS Open-File Report 99-507