

West-Central Florida Coastal Transect # 7: Longboat Key

S.D. Locker, R.A. Davis, G.R. Brooks, A.C. Hine, and D.C. Twichell

College of Marine Science, University of South Florida, St. Petersburg, FL 33701 Department of Geology, University of South Florida, Tampa, FL 33620 Department of Marine Science, Eckerd College, St. Petersburg, FL 33711 U.S. Geological Survey, Woods Hole, MA 02543

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 "boomer" 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...

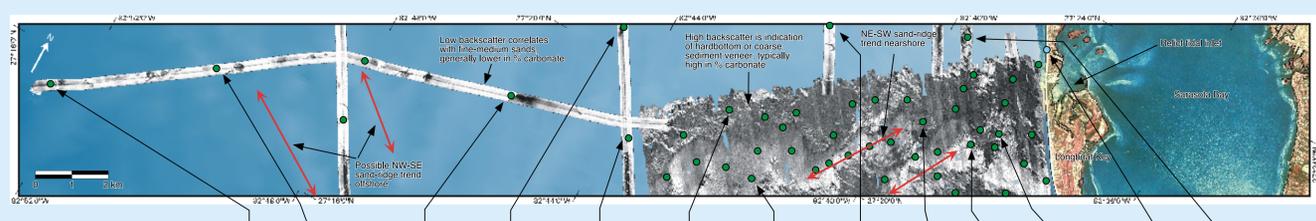
Longboat Key

The transect at Longboat Key is located across a relict tidal inlet that connected two islands in pre-historical time (FitzGerald, 1995; Barnard, 1998). The island is now a wave-dominated barrier although the southern portion was a drumstick barrier when it was separated from the northern portion...



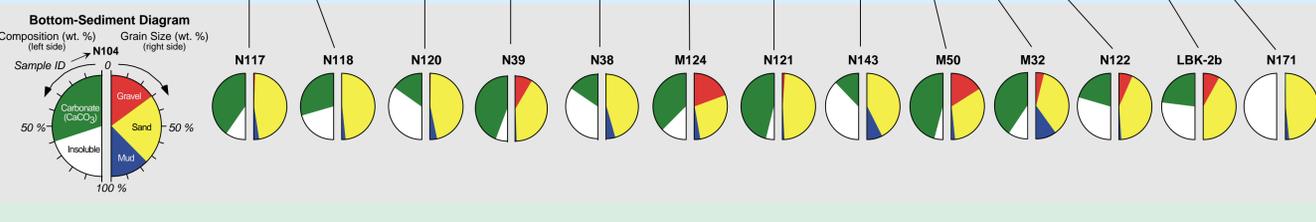
Location map

Location map showing bathymetry, cruise-track coverage, and sample locations, and location of figures. The full transect cross section A-F is presented below...



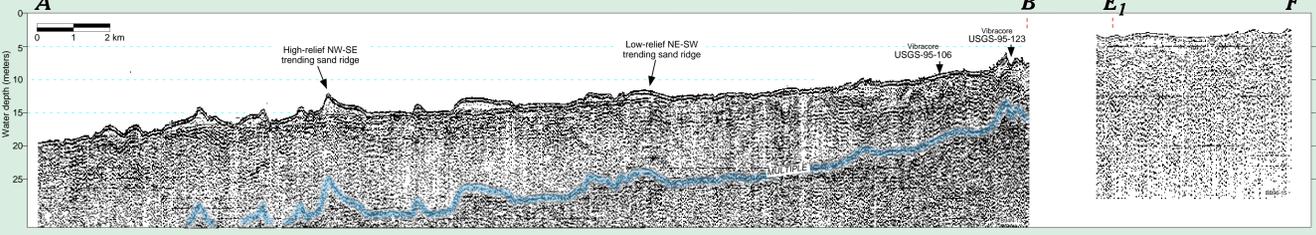
Side-scan sonar data

Side-scan sonar imagery overlain on bathymetry reveals widespread high backscatter (dark) in the inner half of the transect and lower backscatter (light gray) in the outer half of the area...



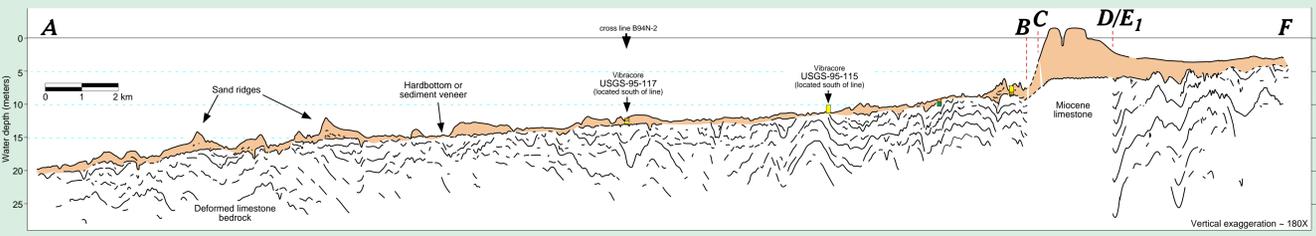
Surface sediments

Grain-size and composition data for bottom grab samples are presented below the sonar imagery (see Brooks and others, 1998). Samples generally consist of quartz-rich sand and carbonate gravel and mud...



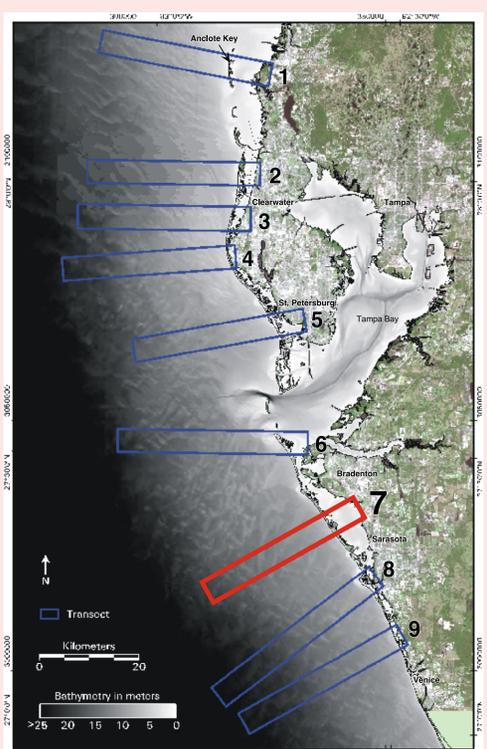
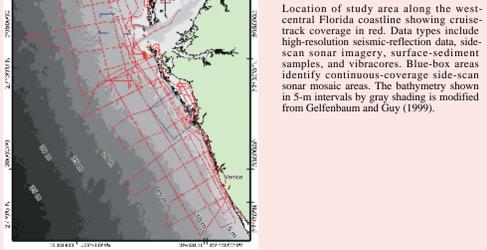
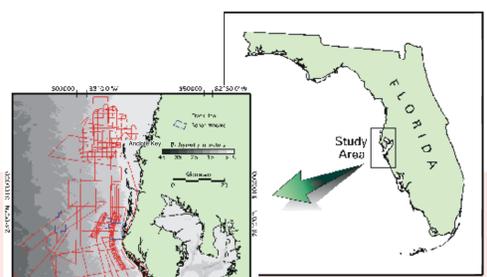
Seismic-profile data

Uninterpreted "boomer" seismic-reflection data reveal distinct sand bodies offshore reaching over 3 m in thickness, and a much thinner section onshore. A well-defined, high-amplitude reflection marking the base of the Holocene section is easily identified beneath the sand ridges...



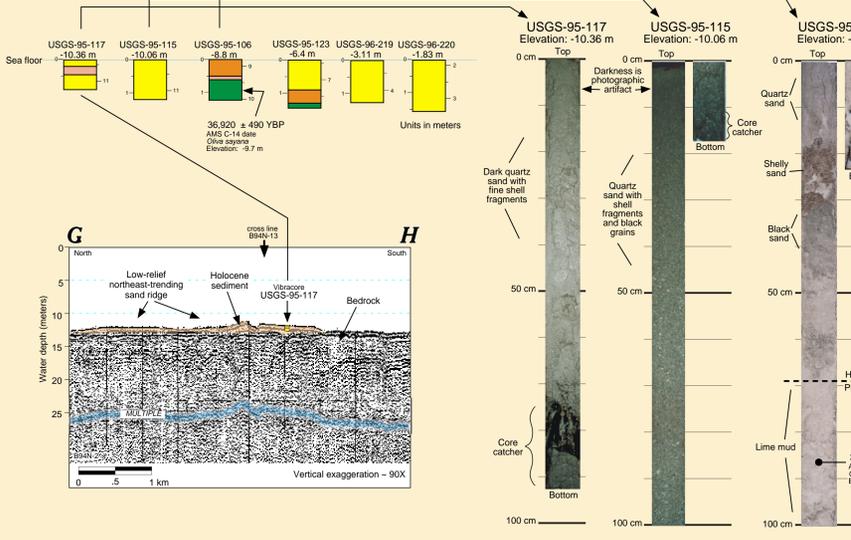
Transect cross-section A-F

Integrated stratigraphic cross section combining line-drawn interpretation of seismic data, ground-truthed by coring, with a coastal cross section based on vibracores...



Oblique aerial photograph of Longboat Key taken in 1994. The sinuous Buttonwood Harbor lagoon is a relict tidal inlet. Extensive channel deposits recovered in vibracores are now overlain by washover, beach, and dune deposits...

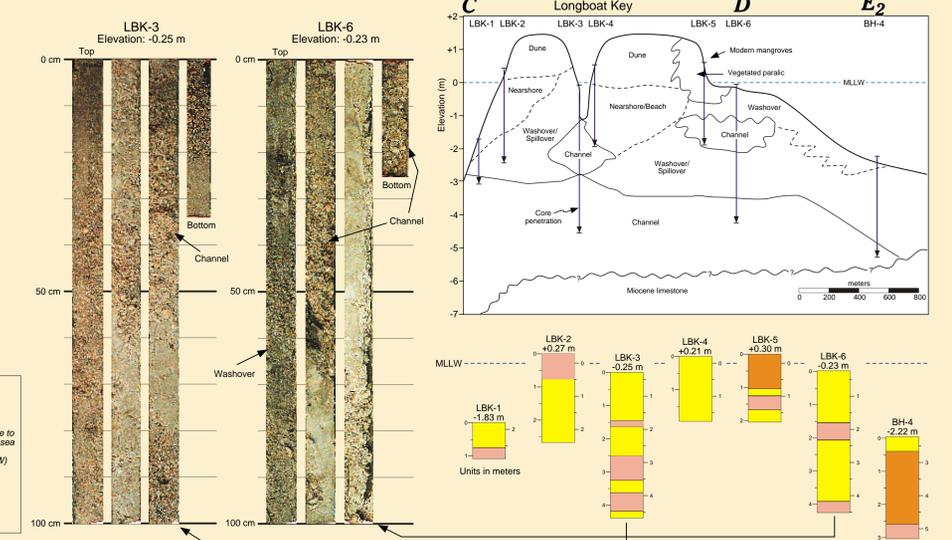
Offshore Cores



Core Data

Seven generalized sedimentary-facies types were defined for a unified comparison of core data from the entire study area. All seven color-coded facies for the entire study area are shown in the Explanation below...

Barrier-Island Cores and Transect



References Cited

Barnard, P.L., 1998. Historical morphodynamics of inlet channels: West-Central Florida. St. Petersburg, University of South Florida, unpublished M.S. thesis, 179 p.

Acknowledgments

The large field program and combination of data sets brought to this compilation are the result of significant efforts by many people. Kristy Guy and Beau Suthard helped compile, process, and display much of the imagery presented...

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