



JOINT MEETING
Manatee County Board of County Commissioners
and
Longboat Key Town Commission
Addressing Longboat Pass Management Plans

Tuesday, November 30, 2010
1:30 p.m.

Manatee County Administrative Center
Manatee Room, 4th Floor
1112 Manatee Avenue West, Bradenton FL 34205

AGENDA

Meeting Called To Order

Donna G. Hayes, Chairman

- | | |
|--|--|
| 1. Introductions and Subject Overview | Charlie Hunsicker, Director
Manatee County
Natural Resources Department |
| 2. Longboat Pass Predictive Modeling Study | Brett Moore, P.E. and
Mohamed Dabees, Ph.D., P.E.
Humiston & Moore Engineers |
| 3. Longboat Pass Model Applications for
Structural Solutions and Pass Management
Options | Tom Campbell, P.E.
Coastal Planning and
Engineering, Inc. |
| 4. Integrated Pass Management Plan Proposal | Brett Moore, P.E.,
Tom Campbell, P.E., and
Chuck Listowski, Ex. Dir.
West Coast Inland
Navigation District |
| 5. Army Corps of Engineers Current and
Proposed Pass and Gulf Intercoastal
Waterway (GIWW) Navigation Projects | Milan Mora, P.E.
ACOE Project Manager,
GIWW Projects |
| 6. Commissioners' Comments | |
| 7. Adjourn | |

Board of County Commissioners

* P.O. BOX 1000 * 1112 Manatee Avenue West * Bradenton, FL 34206 *

PHONE: 941 745-3700 * FAX: 941 745-3790

www.myanatee.org

JOINT MEETING

**Manatee County Board of County Commissioners
and
Longboat Key Town Commission**

**Addressing Longboat Pass Management Plans
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Overview

- Town of Longboat Key, Manatee County and WCIND are developing an Inlet Management Plan (IMP) for Longboat Pass
- State funding available under 2010 Florida Statutes - Chapter 161.143
- Understanding inlet dynamics and effects on beaches
- Joint management of Longboat Pass for navigation, nourishment and protection



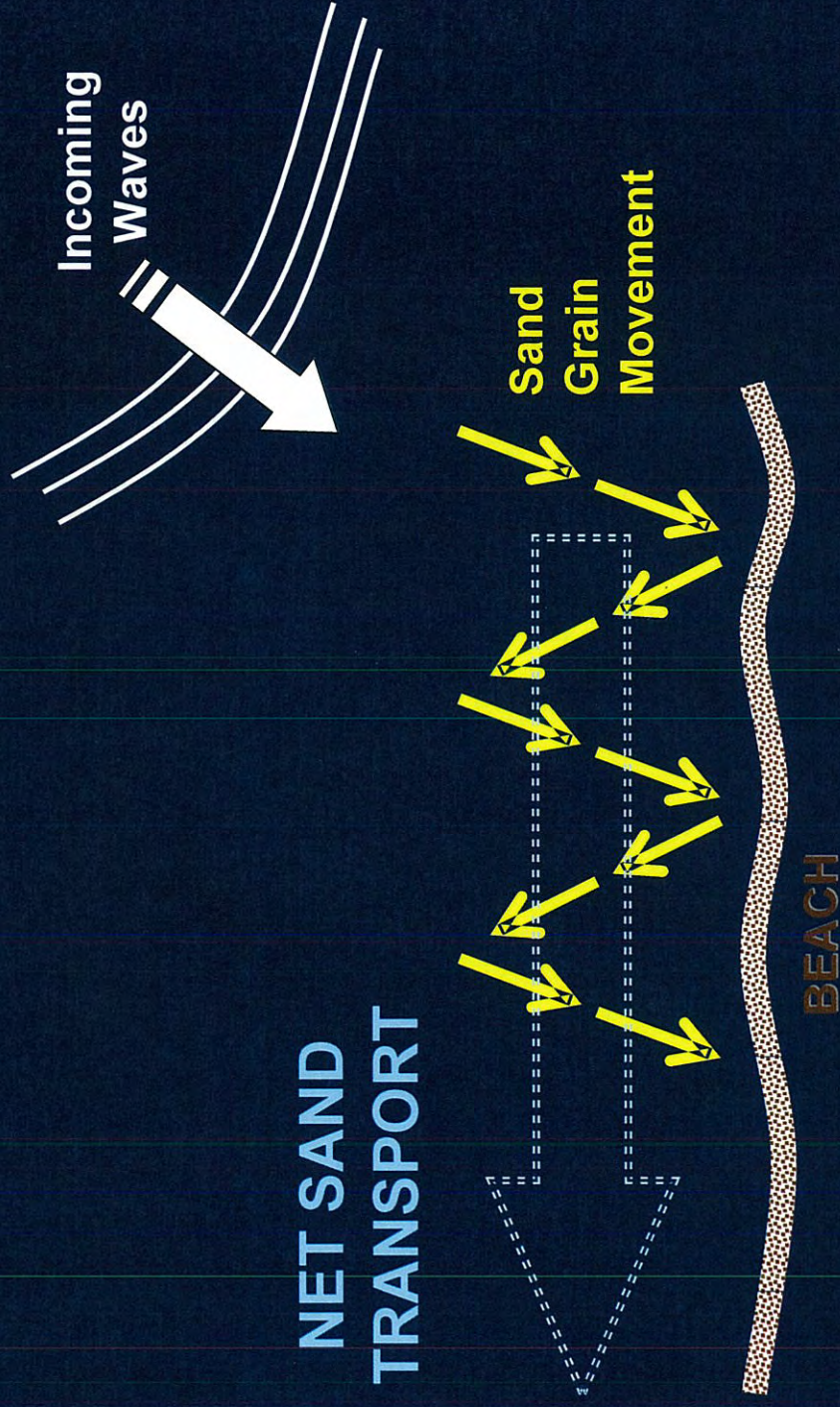
Chapter 161.143, Florida Statutes

161.143 - Inlet management; planning, prioritizing, funding, approving, and implementing projects.

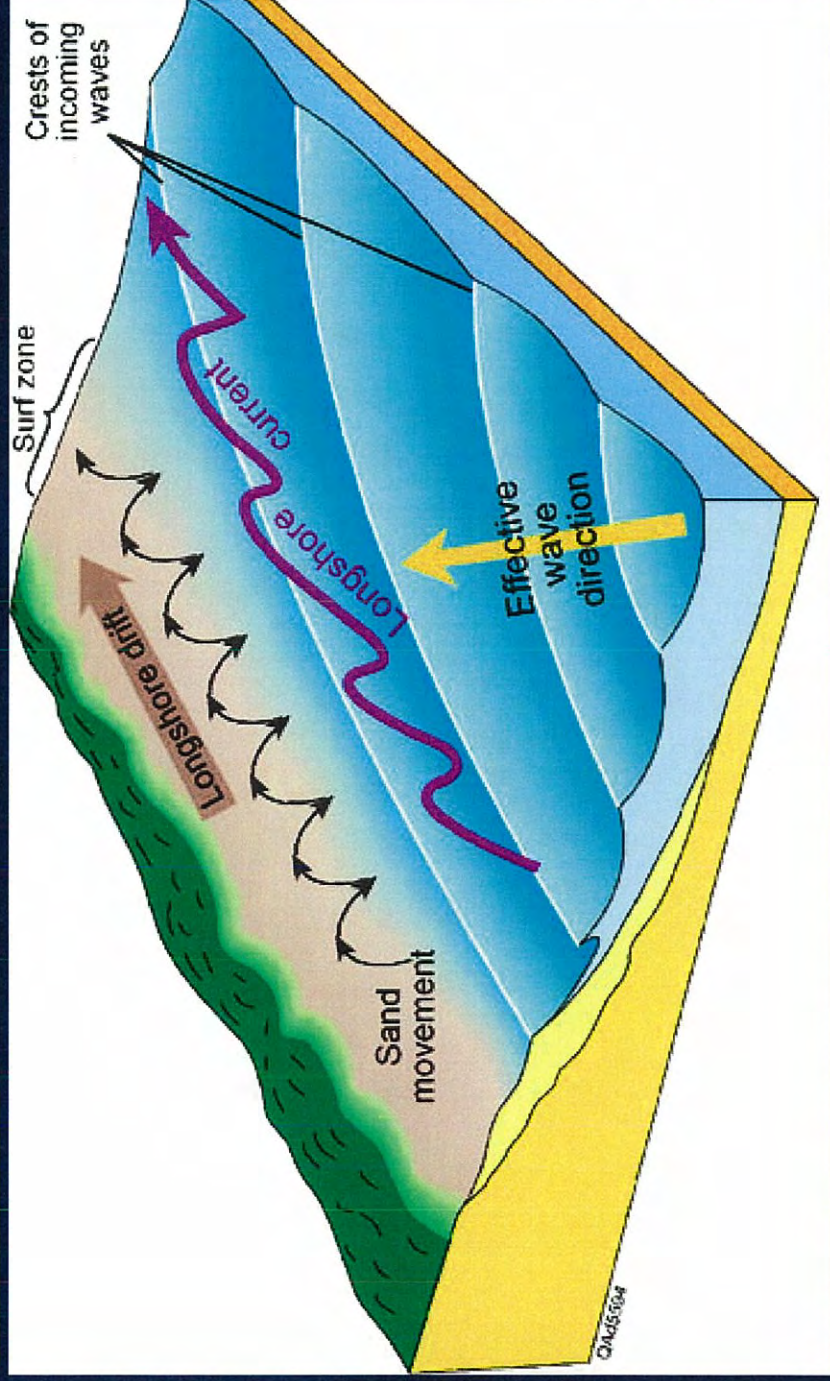
-
- (1) Studies, projects, and activities for the purpose of mitigating the erosive effects of inlets and balancing the sediment budget of the inlet and adjacent beaches must be supported by separately approved inlet management plans ... Such plans in support of individual inlet projects or activities must ... evaluate each inlet to determine the extent of the inlet's erosive effect on adjacent beaches and, if significant, make recommendations to mitigate such ongoing erosive effects and provide estimated costs for such mitigation.



Successive Waves Carry Sand Downdrift Along a Longshore Current



Successive Waves Carry Sand Downdrift Along a Longshore Current



http://coastal.beg.utexas.edu/thscmp/fg_mustang_3.htm



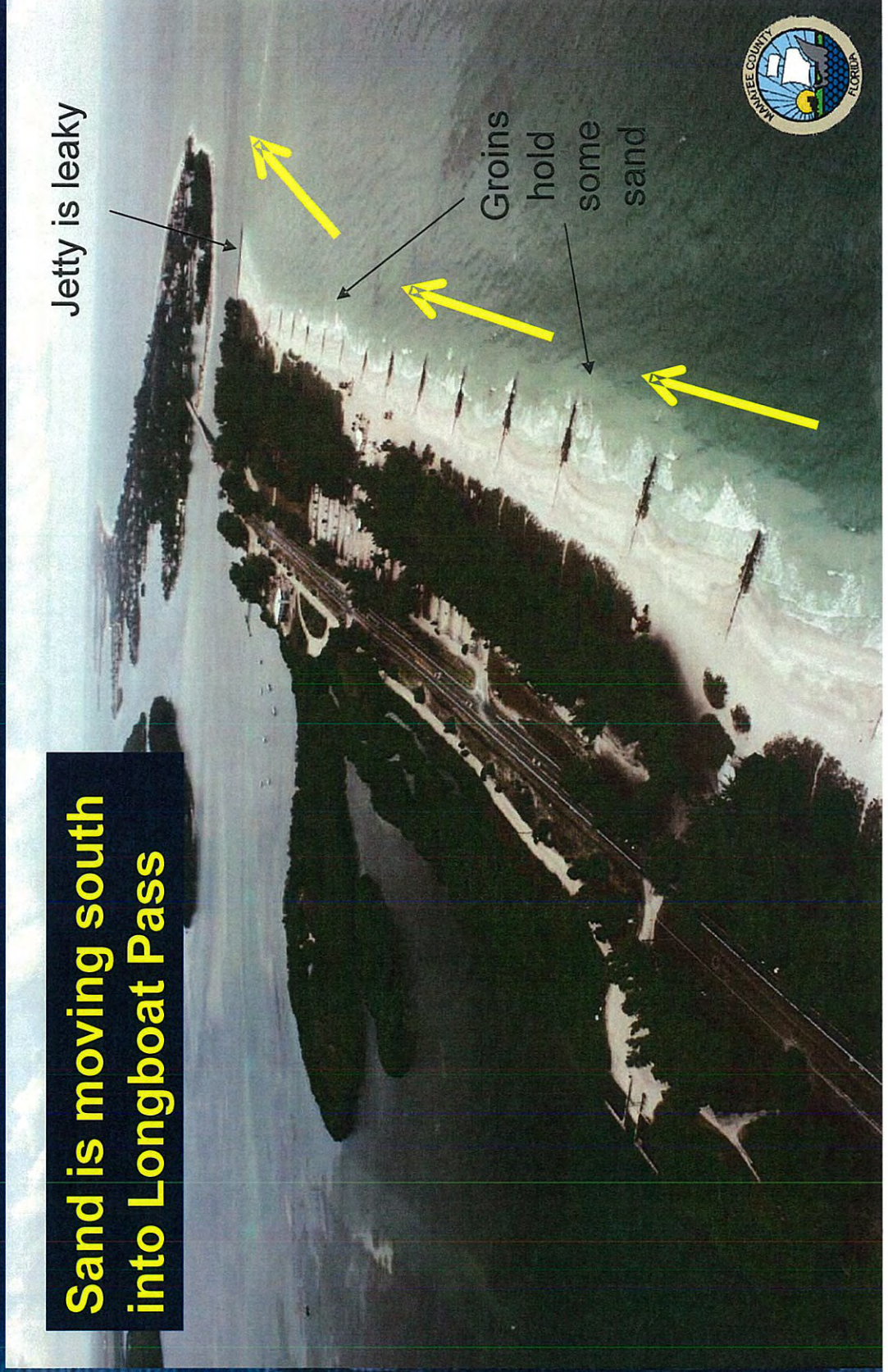
Longshore Sand Transport

Anna Maria Island

**Sand is moving south
into Longboat Pass**

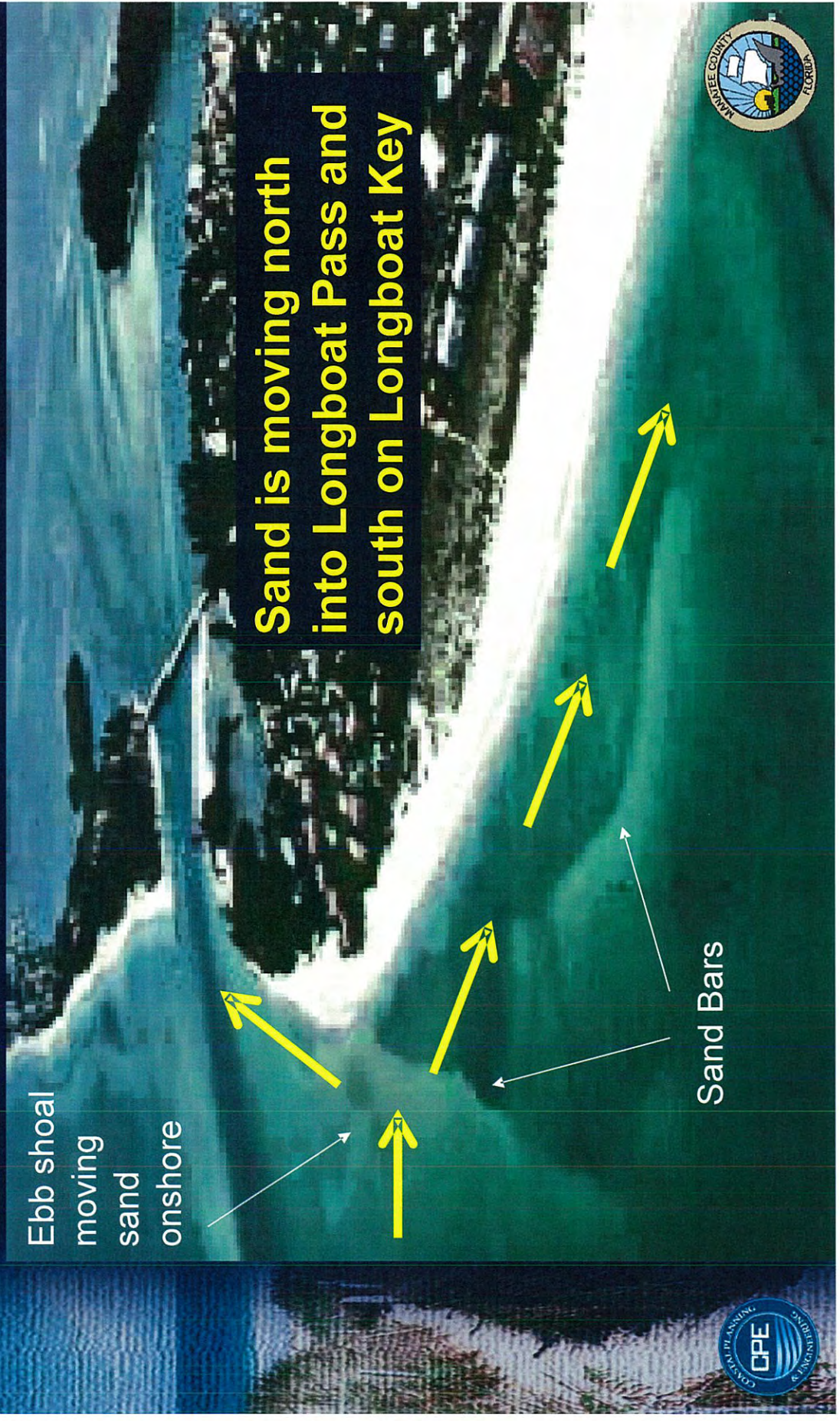
Jetty is leaky

Groins
hold
some
sand

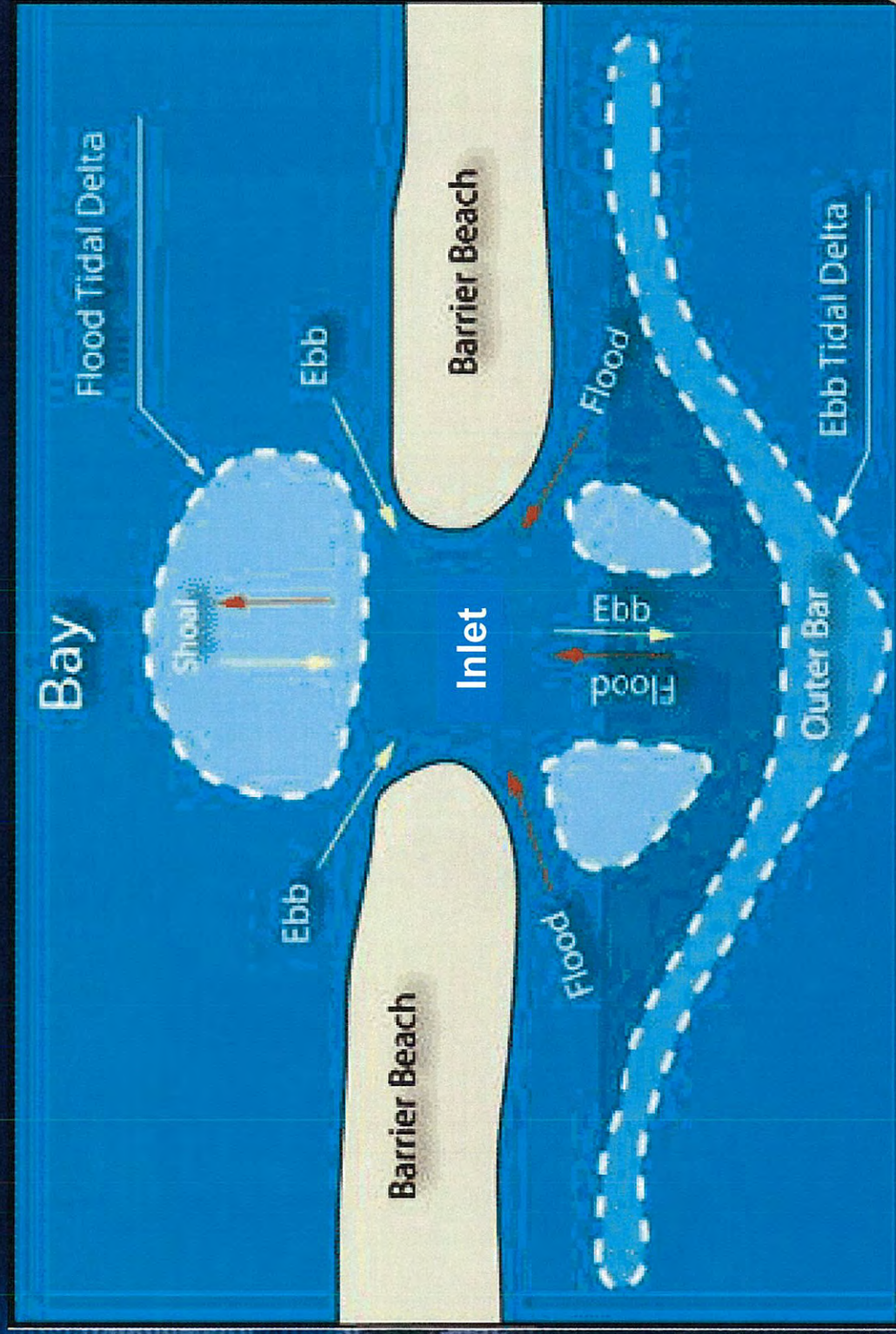


Longshore Sand Transport

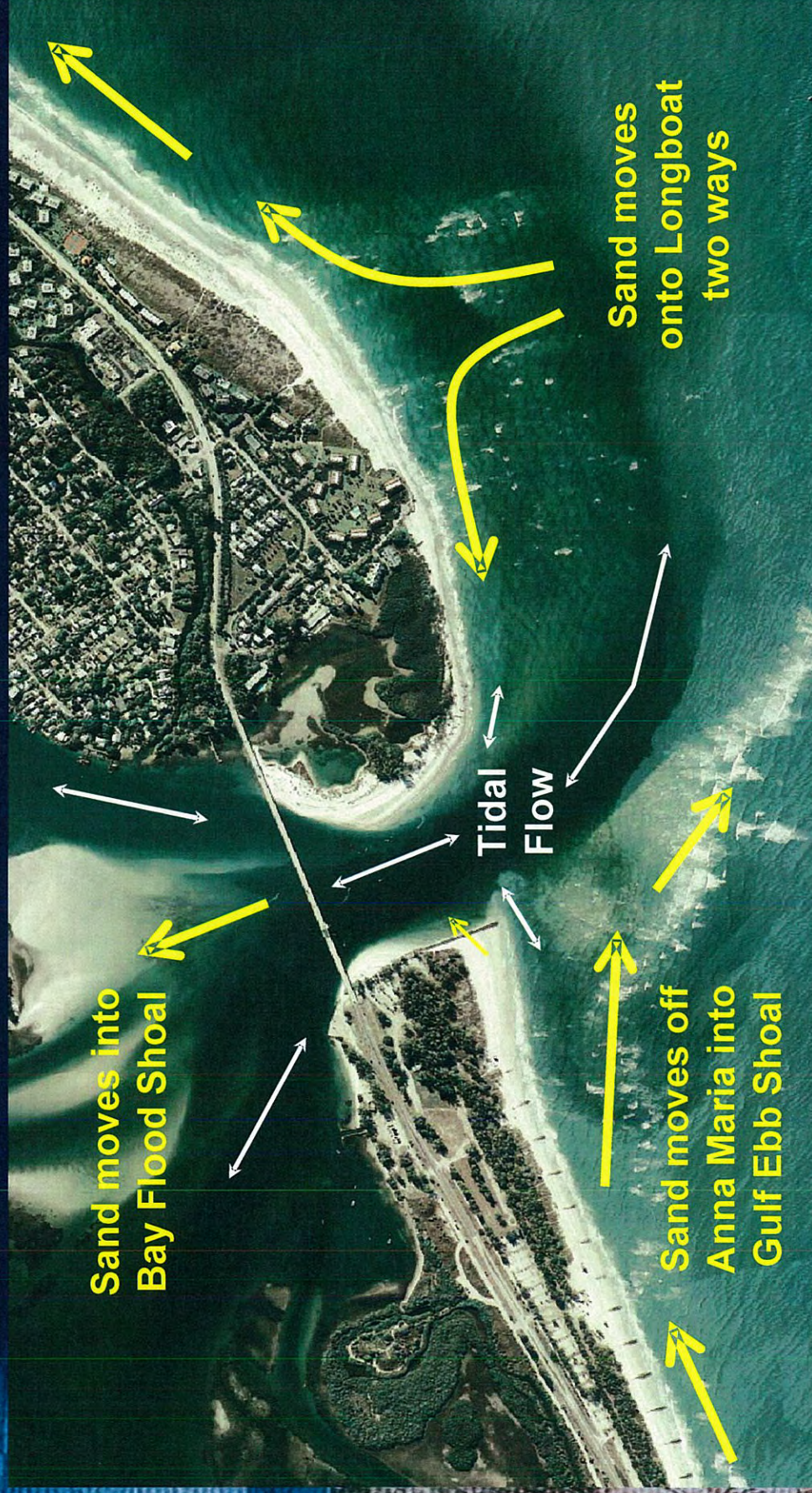
Longboat Key



Gulf Ebb and Bay Flood Shoals Collect Sand



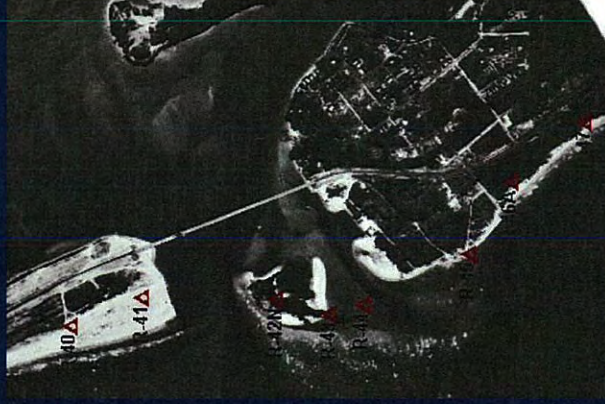
Longboat Pass Dynamics



Historic Variability



1952



1963



1977

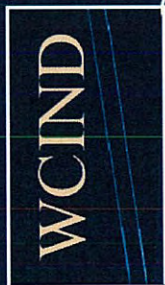


2010

- Management challenges
- Multiple municipalities affected



Inlet Management Plan



PLAN DEVELOPMENT
AND IMPLEMENTATION



Conclusions

- Inlets trap sand from beach transport
- Sand lost to inlets does not benefit adjacent beaches
- Changes in shape or orientation of inlet affects adjacent beaches and navigation
- Town of Longboat Key, Manatee County and WCIND are developing an Inlet Management Plan (IMP) for Longboat Pass to fully address these issues





COASTAL PLANNING & ENGINEERING, INC.

2481 NW BOCA RATON BOULEVARD, BOCA RATON, FL 33431

561-391-8102 PHONE 561-391-9116 FACSIMILE

Website: www.coastalplanning.net

E-mail: mail@coastalplanning.net

November 19, 2010

Charlie Hunsicker
Director
Natural Resources Department
Manatee County Government
415 10 Street West
Bradenton, FL 34205

Re: Management of Longboat Pass

Dear Charlie:

This is to describe the present management situation of Longboat Pass, located between Anna Maria Island and Longboat Key, and to summarize recent events concerning the Pass.

Longboat Pass divides Anna Maria Island to the north from Longboat Key to the south, and is a federally authorized navigation project. The federal government periodically dredges the navigation channel to maintain navigation through Longboat Pass. The present location of the federally authorized navigation channel at the Pass assumes an approximate center location, some distance away from the adjacent islands. It was last excavated in the center (authorized) position by the U.S. Army Corps of Engineers (USACE) in 1997. Since that time, the navigation channel has naturally drifted south and is now positioned just north of the north end of Longboat Key. The federally authorized, centrally located channel is presently shoaled. At this time, the USACE is conducting the engineering for maintenance dredging of Longboat Pass and may be considering maintaining the modified channel location of just north of Longboat Key rather than maintaining the central channel location.

In recent years, the County has considered excavating Longboat Pass to obtain sand for beach nourishment purposes. The County is presently planning to construct a beach nourishment of the eroded beach immediately north of Longboat Pass (Coquina Beach). Construction is scheduled for this winter. In the initial stages of engineering for the Coquina Beach nourishment project, we considered the use of Longboat Pass sediment as the sand source for the project. Longboat Pass sand was considered for use because the sediment would be the least costly alternative to nourish the eroded beach and would have a high probability of being compatible with the sediment of Coquina beaches. Also, dredging the Pass may provide the secondary benefit of enhancing navigational conditions in the Pass. In the past, sediment had been excavated from the channel by the USACE during navigation maintenance efforts with placement on both Longboat Key and Anna Maria Island. Thus, the possibility of extracting sediment from Longboat Pass for beach nourishment purposes was considered a cost effective method to obtain

sediment for the beach with the added benefit of improving navigational conditions through Longboat Pass.

In 2007, Coastal Planning & Engineering, Inc. (CPE) conducted geotechnical investigations in Longboat Pass and determined that the combined volume of sediment within the federally authorized channel and portions of the northern ebb tidal shoal would provide sufficient sediment volume for the Coquina project, as designed at that time. Geotechnical investigations indicated the sediment was beach compatible. However, the Florida Department of Environmental Protection (FDEP) advised the County that the federally authorized navigation channel could be excavated but not the ebb tidal shoal material. The FDEP disallowed the use of the ebb tidal shoal material because of concern for possible adverse coastal effects from removing ebb tidal shoal sand. As a result, the volume available from Longboat Pass was not sufficient based upon the preliminary Coquina Beach project design and use of Longboat Pass as the Coquina project sediment source was abandoned. Sand for the project will be obtained from a borrow area located offshore of the north end of Anna Maria Island.

In 2008, the West Coast Inland Navigation District (WCIND) and the FDEP released a draft report of a study of Longboat Pass. The study recognized that the present southerly position of the channel would likely minimize USACE channel maintenance requirements and costs and, as a result, the USACE has considered excavating the southern channel location. The central channel location would not be maintained under this scenario.

In recent years there has been observational evidence that the southerly location of the channel may contribute to the erosion of Greer Island and northern Longboat Key. As a result, the Town of Longboat Key Town Commission has expressed concern regarding the potential adoption of the southerly location of the channel by the USACE as the new maintained channel location, citing concern of continuing erosion pressure of the northern Longboat Key beaches due to the allowed channel drift to the south. In response to concerns about the potential for the southerly channel's impact on northern Longboat Key, the County and the Town have met with the WCIND and the USACE. After hearing the concerns of the County and the Town, the WCIND indicated a willingness to continue supporting the maintenance of the channel in its authorized center position.

The concept of the Town and County taking control of the next excavation of the central channel location has also been considered. In the event that the USACE was not funded to excavate the center channel location, we were requested to provide an estimated engineering and construction cost to excavate an estimated 200,000 cubic yards with near proximity placement on the beach. The engineering and construction cost estimate was as follows:

- | | | |
|-----|--|----------------------------|
| (1) | Dredge and Equipment mobilization/demobilization of an interior hydraulic cutterhead dredge: | \$650,000 to \$750,000 |
| (2) | Excavation of 200,000 cubic yards with placement on adjacent beaches and an estimated \$5.50 to \$6.50 cubic yard: | \$1,100,000 to \$1,300,000 |

(3)	Beach Tilling:	\$10,000
(4)	Geotechnical Investigations of Longboat Pass:	completed
(5)	FDEP and USACE Permitting:	\$140,000
(6)	Plans and Specifications:	\$50,000
(7)	Construction Bidding Assistance:	\$15,000
(8)	Construction Administration:	\$100,000

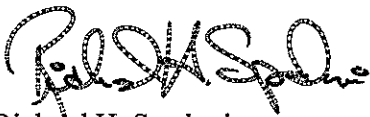
Estimated Cost Range: \$2,065,000 to \$2,365,000

It is recognized that Longboat Pass is an integral part of the regional coastal system which includes both Longboat Key and Anna Maria Island. The Pass greatly influences the erosional and accretional conditions of the Gulf coastline of both Longboat Key and Anna Maria Island. Considering the effort and resources both the County and Town employ to maintain and preserve the beaches of Longboat Key and Anna Maria, appropriate management of Longboat Pass by the Town and the County would be expected to enhance the preservation and maintenance of the adjacent beaches. In a cooperative effort, the Town and the County are funding the development of an Inlet Management Plan (IMP) for Longboat Pass. The IMP will utilize the information presented in the WCIND study and build upon it. The IMP will address many of the issues related to the management of the Pass and the adjacent beaches. Included in the IMP will be a three dimensional modeling evaluation of the navigation channel and the effect of the channel location on the adjacent coastlines. The results of the IMP will serve as a guide for the future management of Longboat Pass.

If you have any questions, please call me.

Sincerely,

COASTAL PLANNING & ENGINEERING, INC.



Richard H. Spadoni
Senior Vice President

cc: Beau Suthard, P.G., CPE
Tom Pierro, P.E., CPE

Regional Model for Sarasota Bay
Application to local inlets
Longboat Pass Study

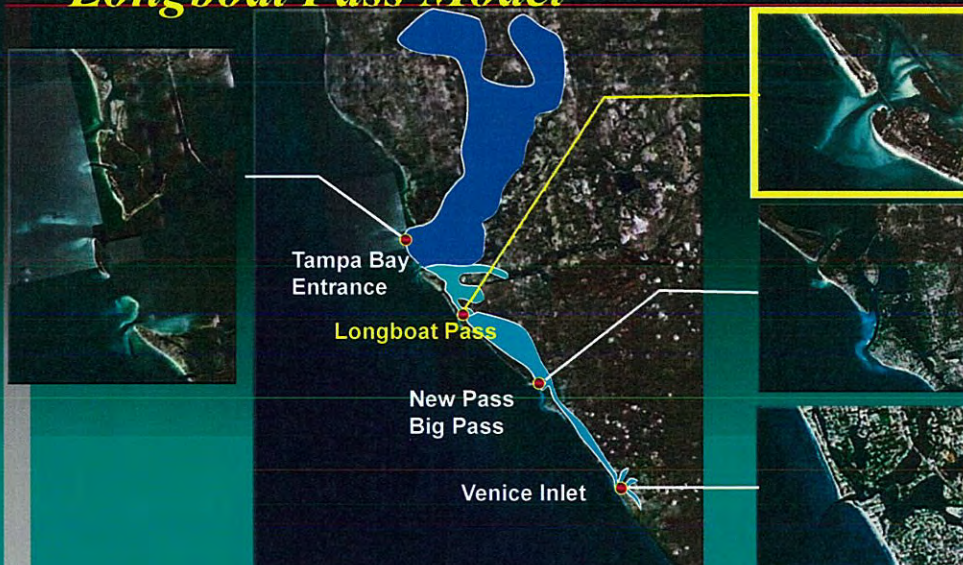
Prepared for

West Coast Inland Navigation District
Florida Department of Environmental Protection

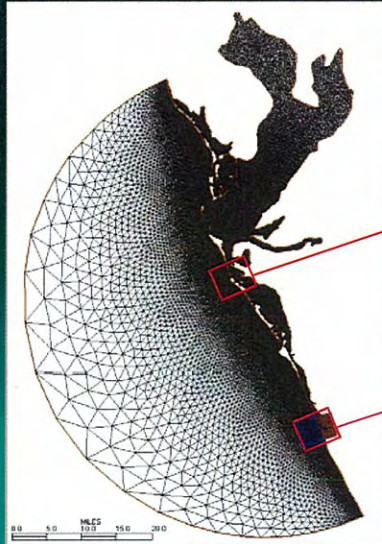
Presented By

Humiston & Moore Engineers

Longboat Pass Model



Sarasota Bay / Tampa Bay Regional model



■ applications to local Inlet

■ Longboat Pass (WCIND, DEP)

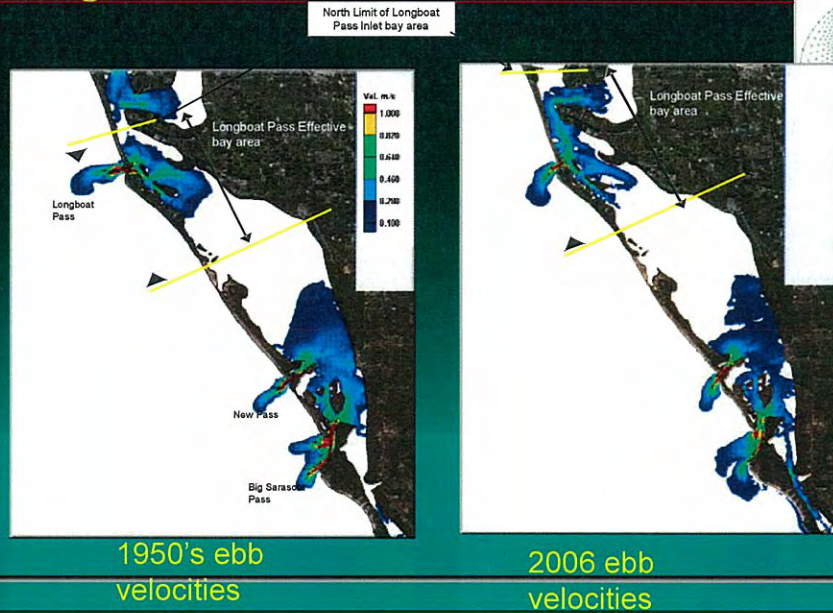
■ Venice Inlet (WCIND, DEP)

Regional Model

- Model coverage
- Temporal stages
 - 1880's
 - 1950's
 - Present conditions



Regional model results

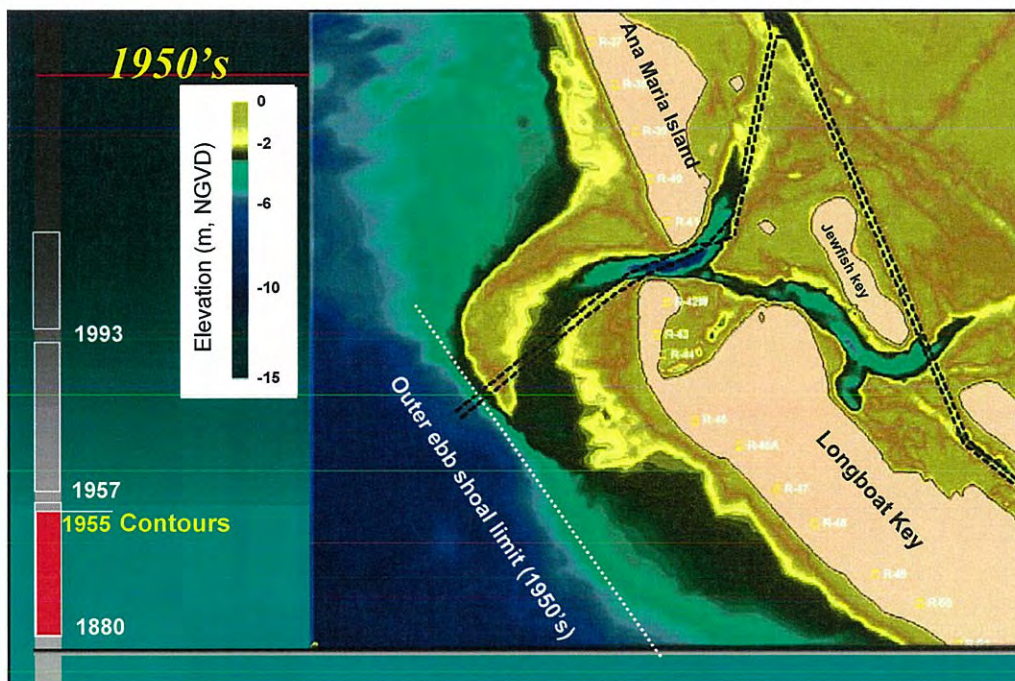


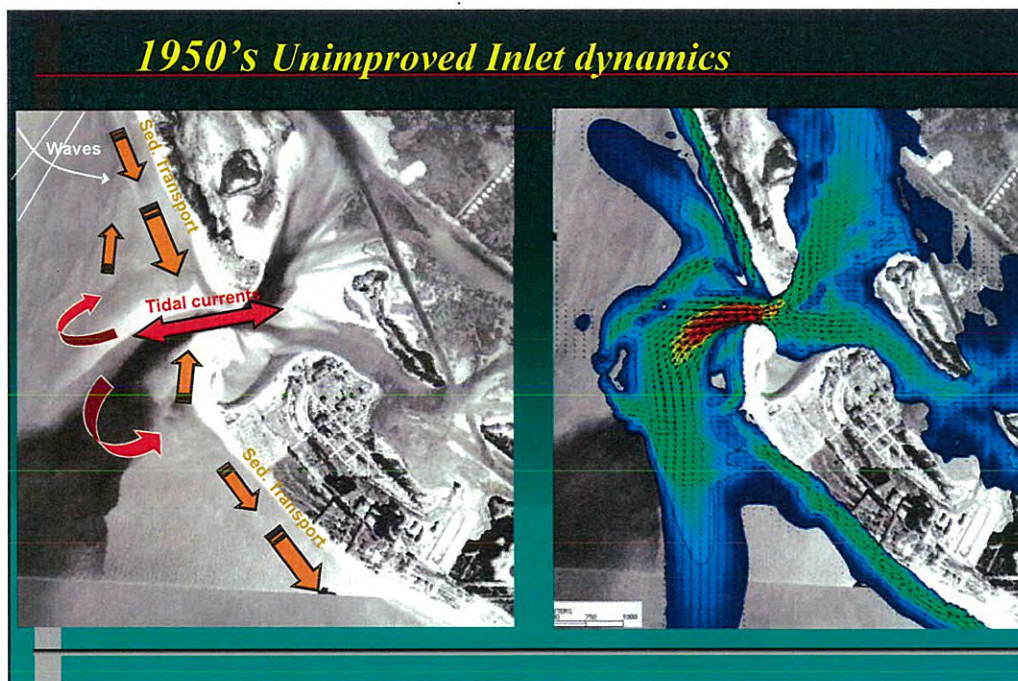
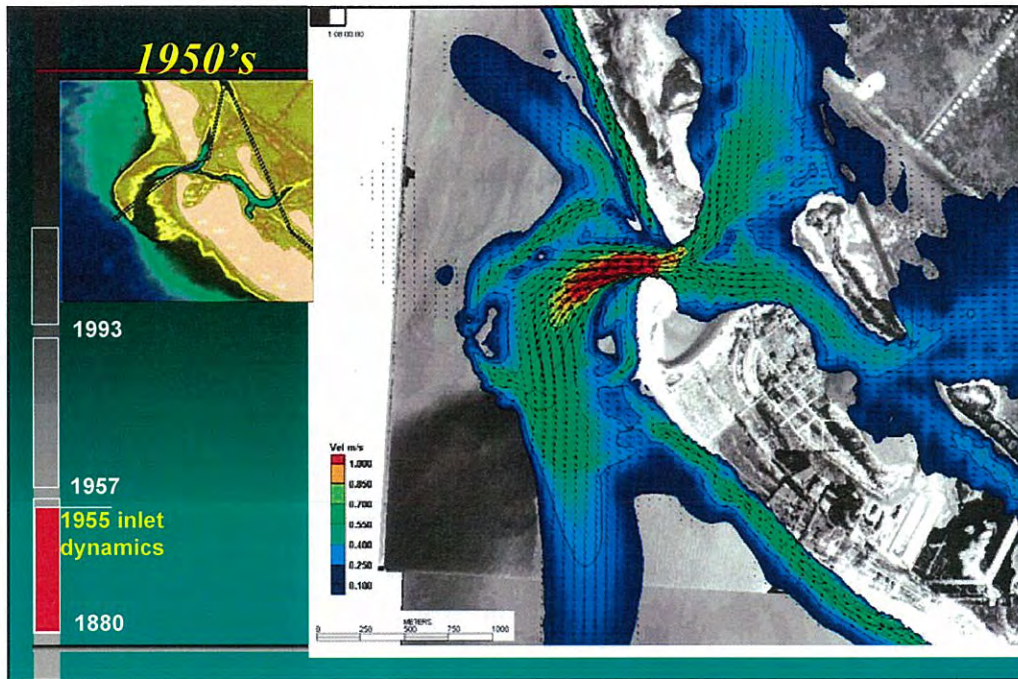
Longboat Pass Case Study

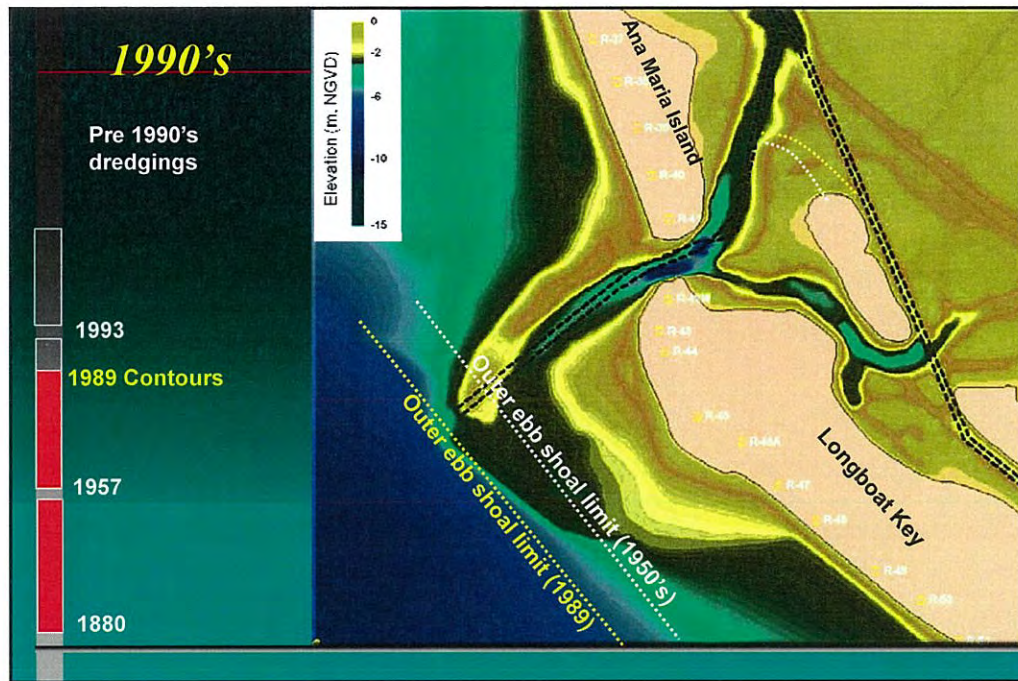
Longboat Pass Inlet evolution

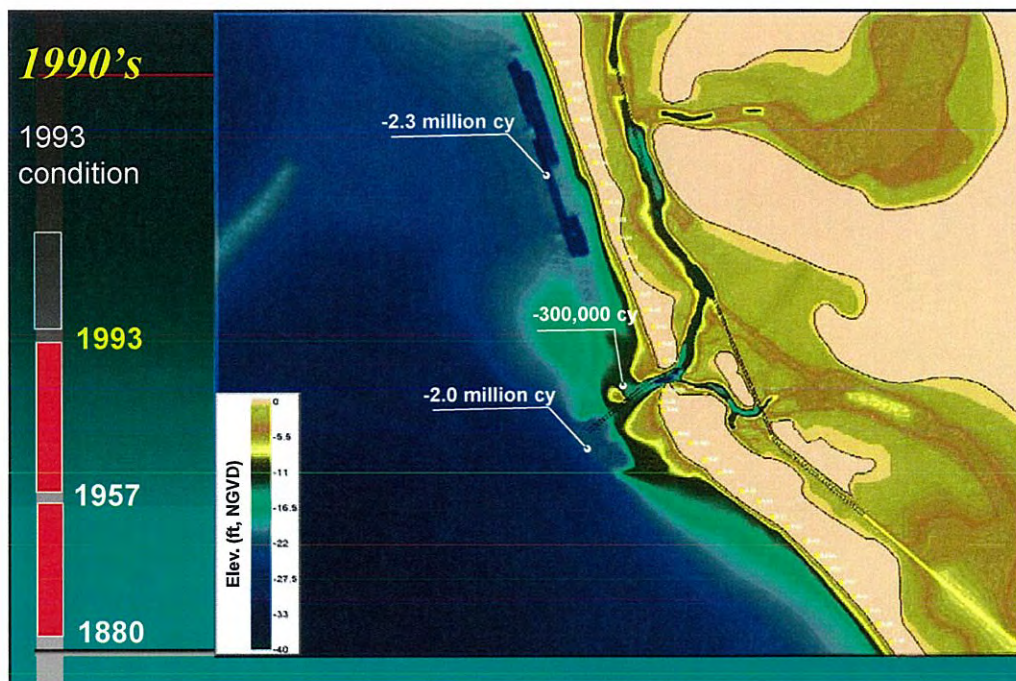
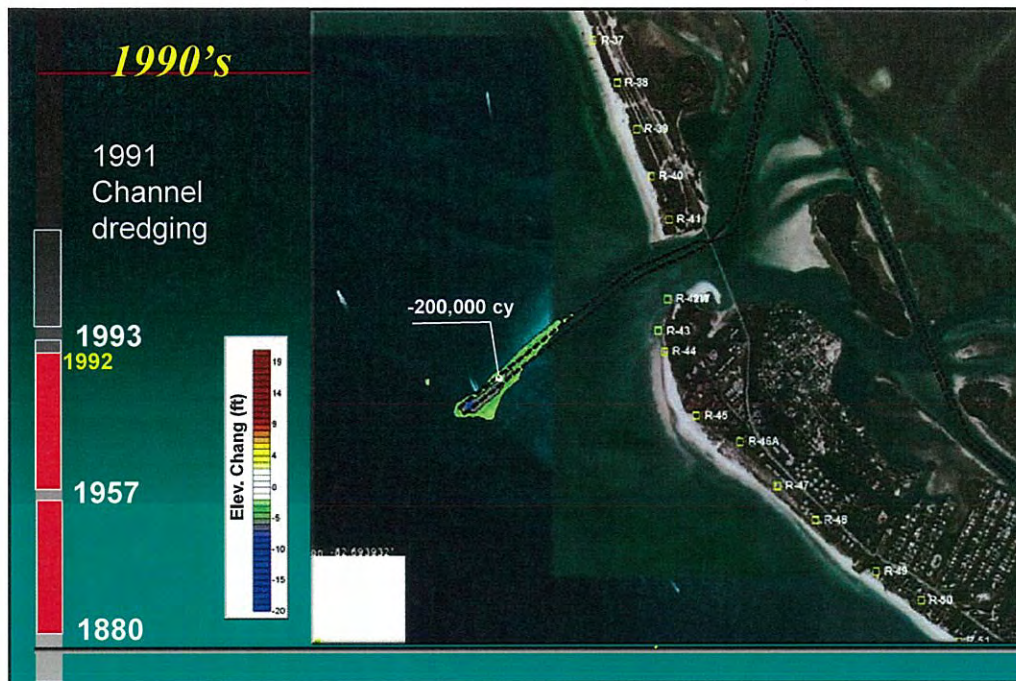
- 1993 *Dredging of ebb shoal as sand source*
- 1957 *Jetty Construction*
- 1880 *Inlet opened*





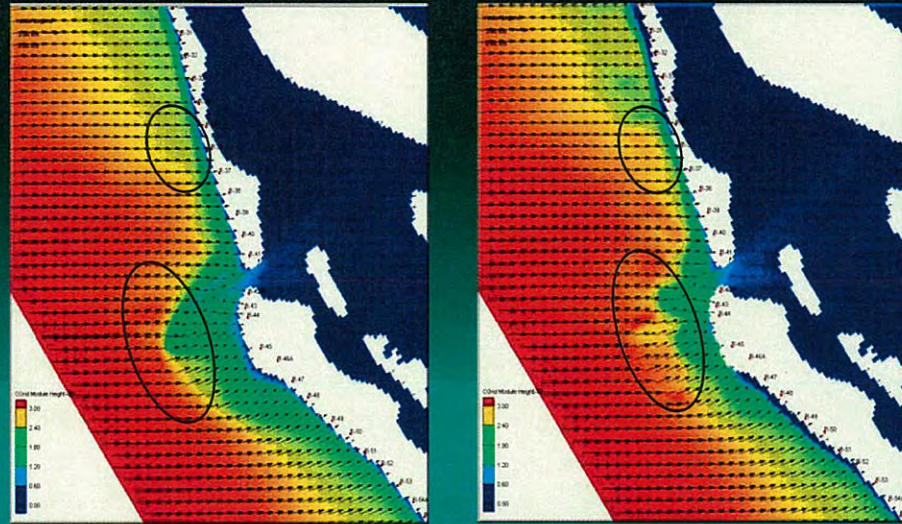






1990's Dredging effects

W Waves

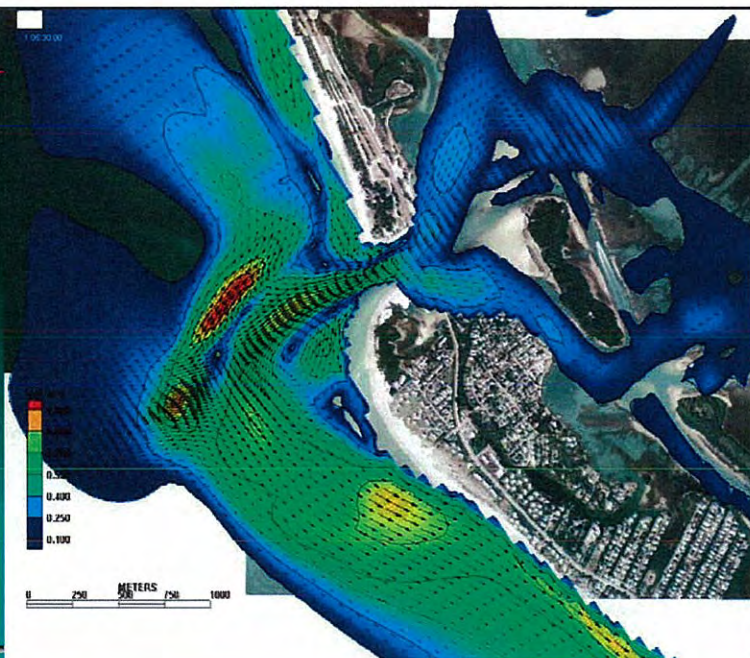


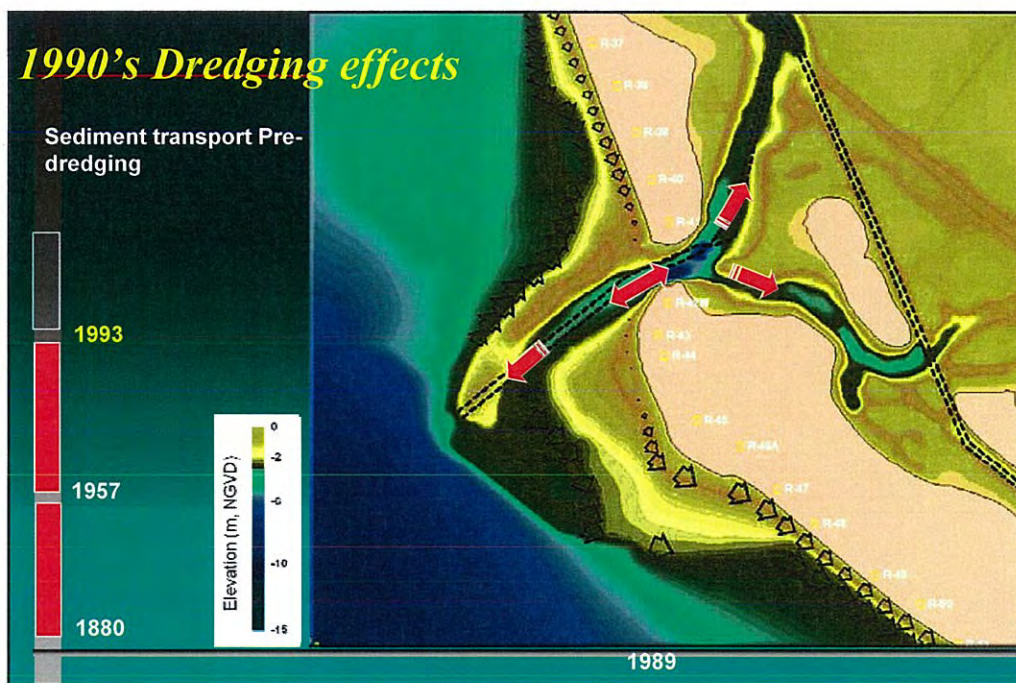
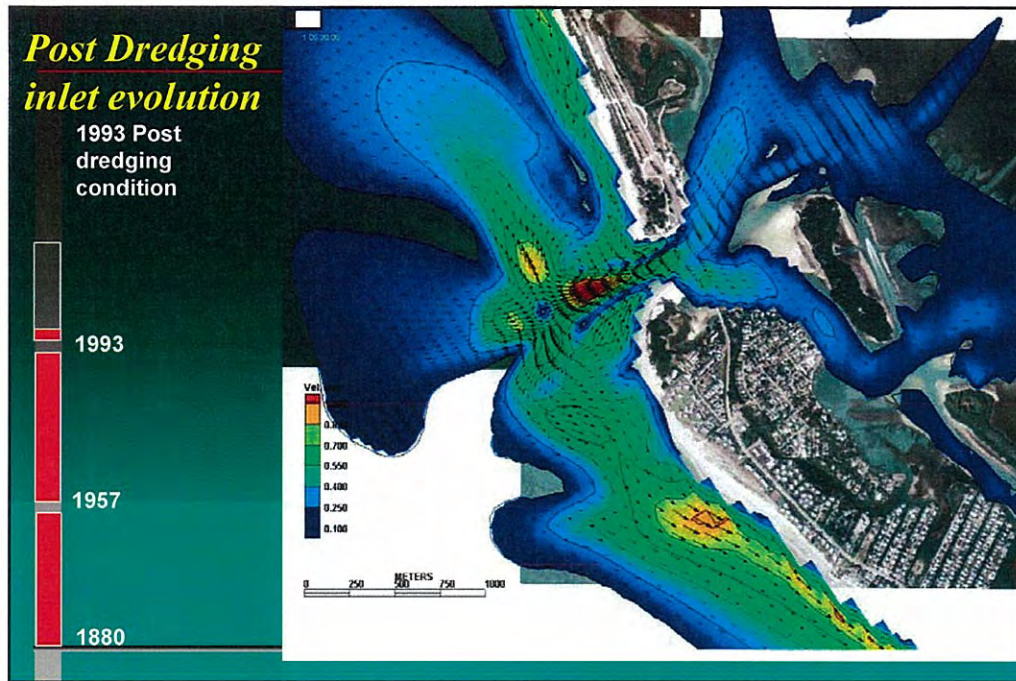
1989

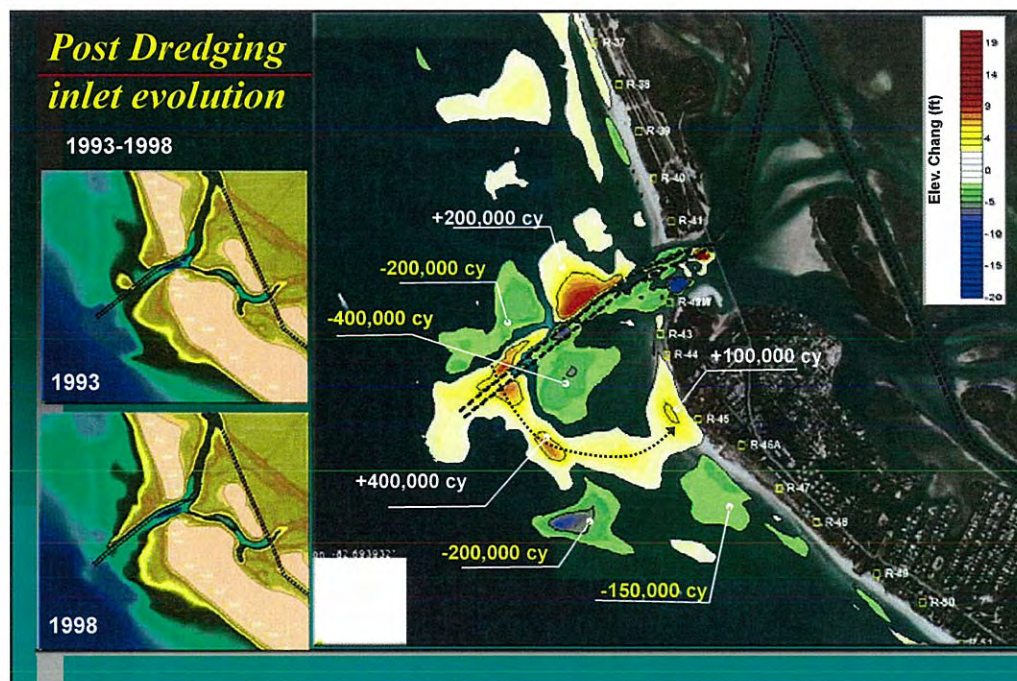
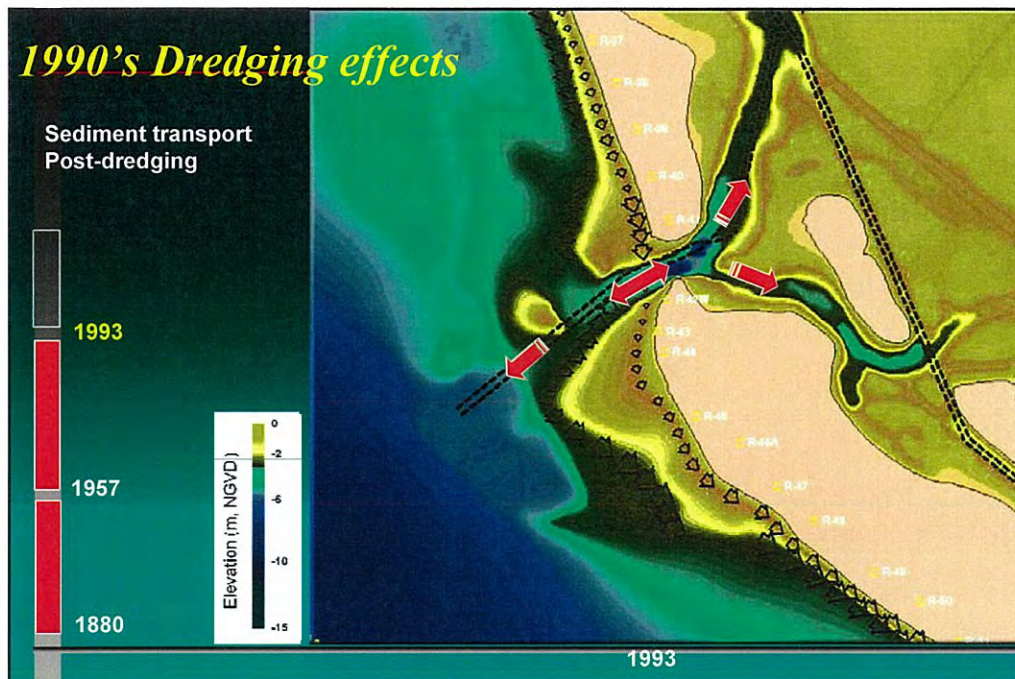
1993

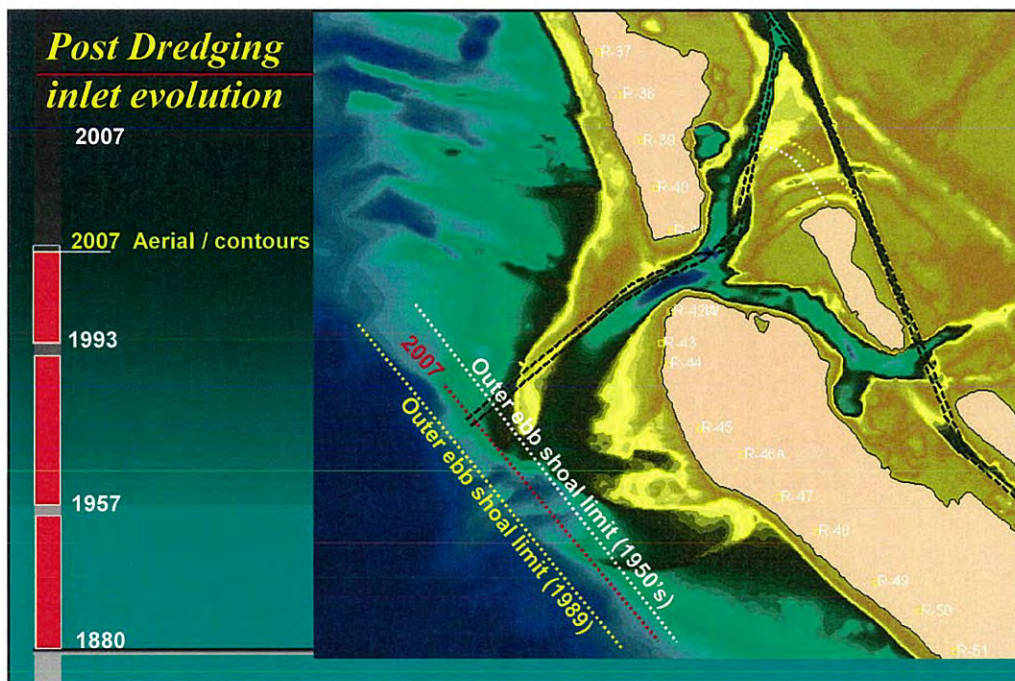
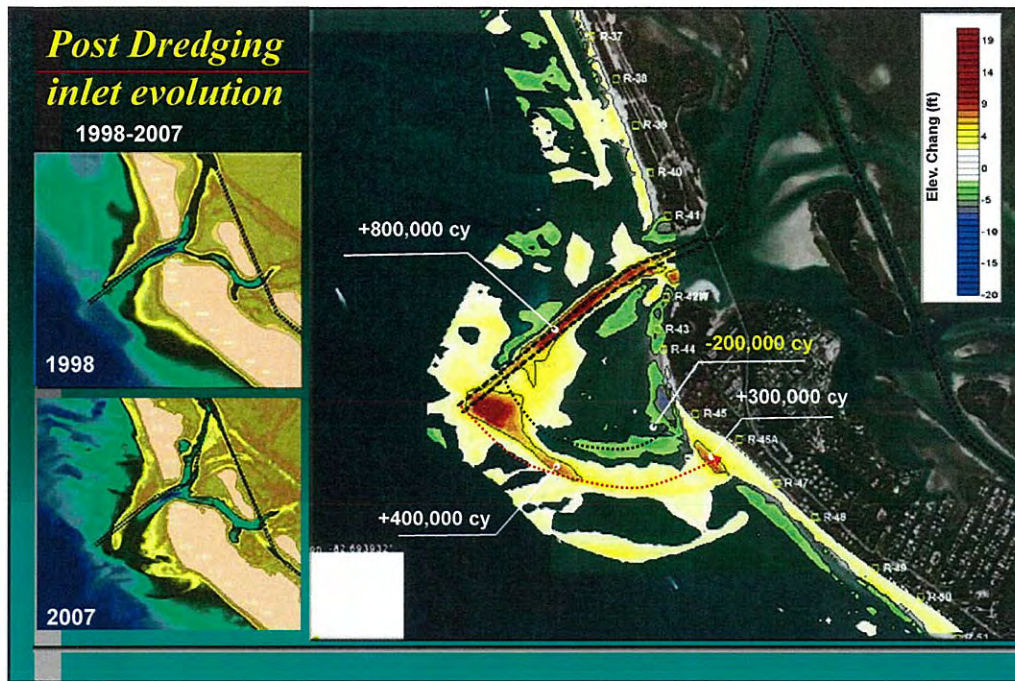
Pre Dredging inlet evolution

Pre-dredging conditions









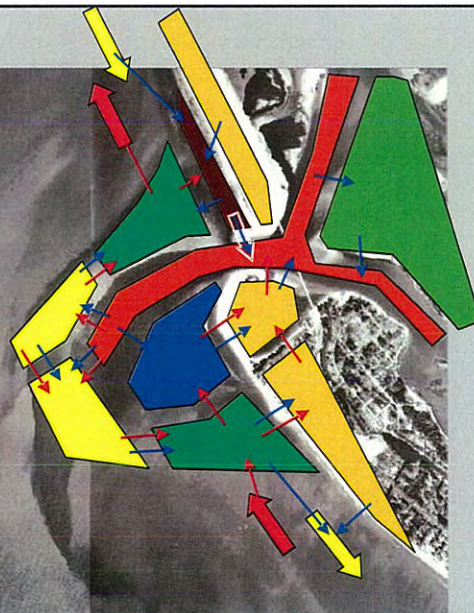
Effects of 1993 ebb shoal mining on Shoreline change of North Longboat Key

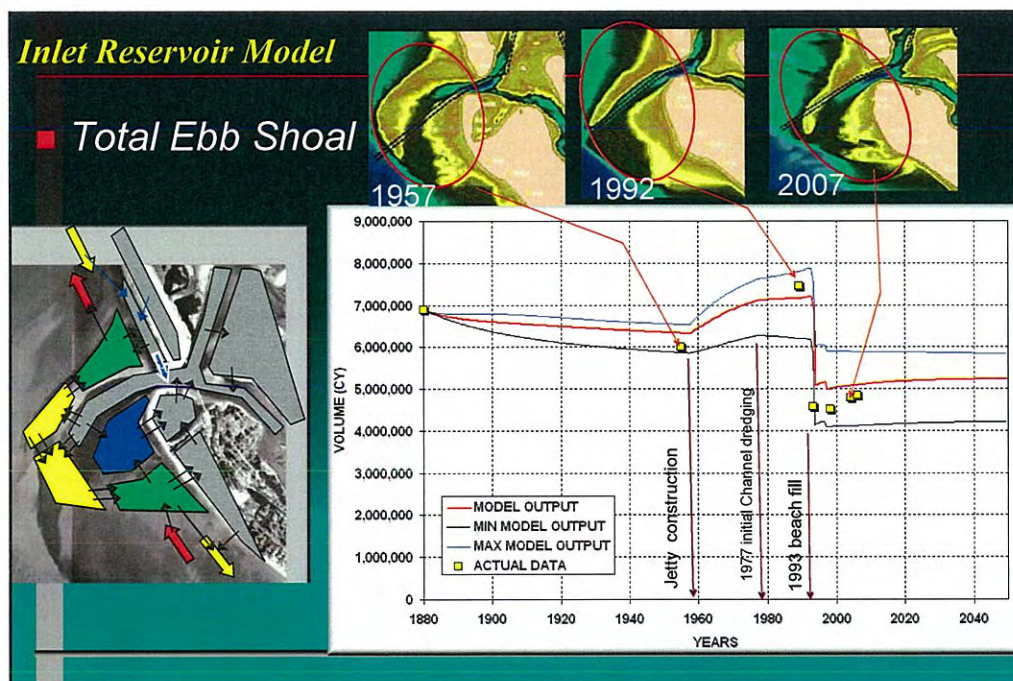
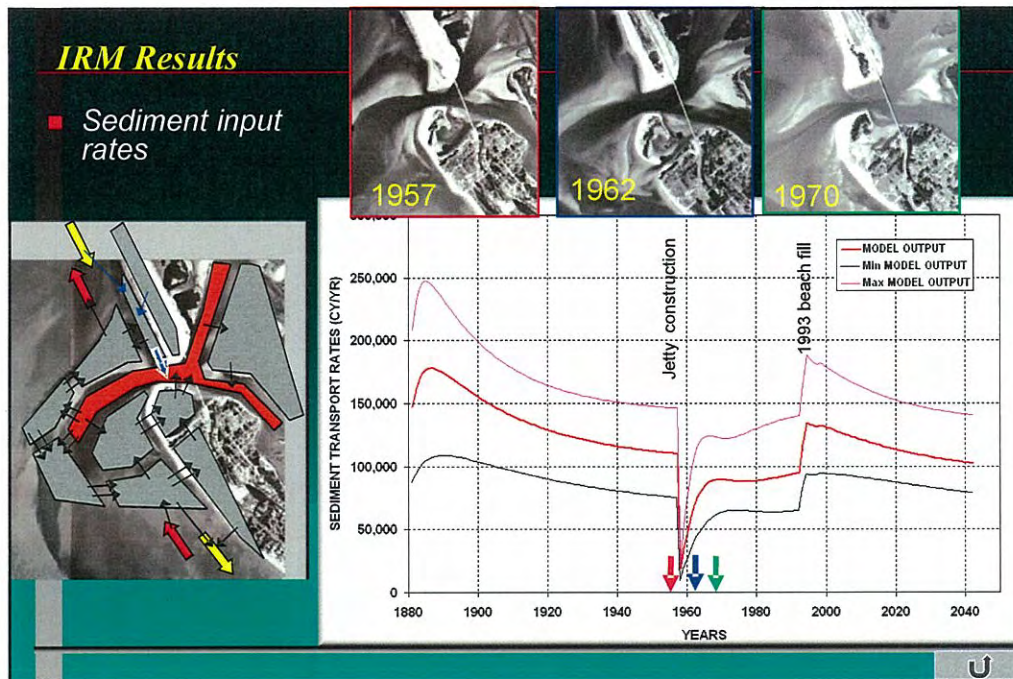


Inlet Reservoir Model

- Morphologic features
 - Volumes
 - Rates

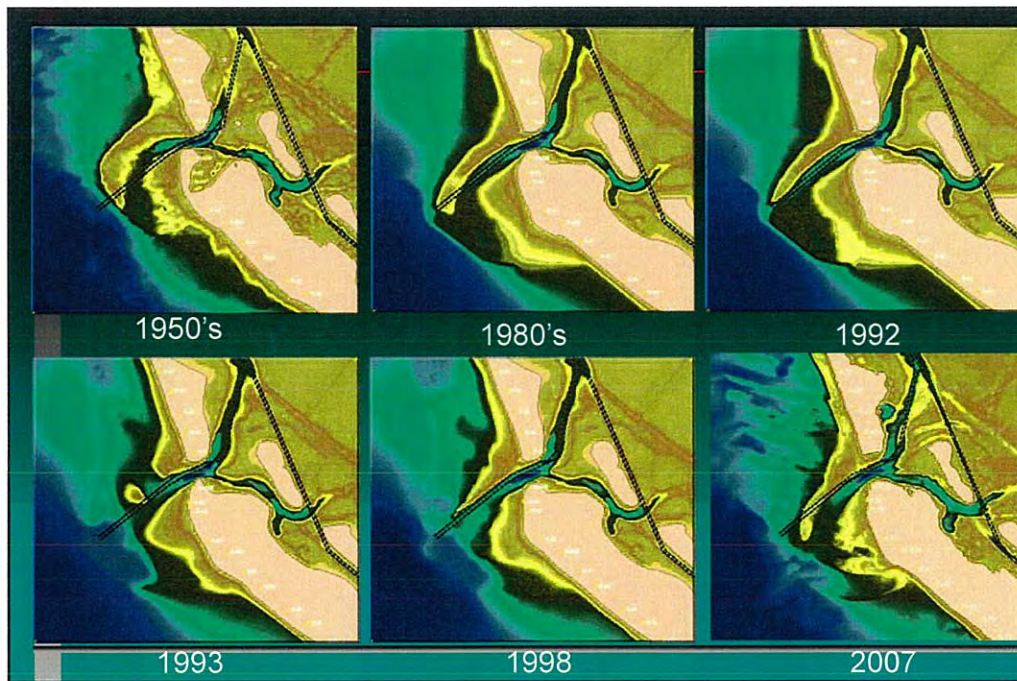
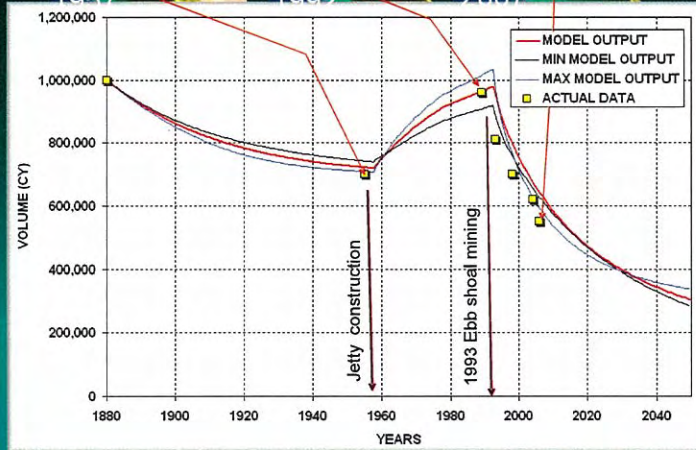
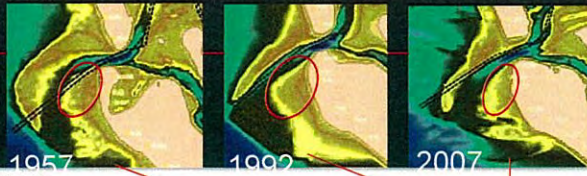
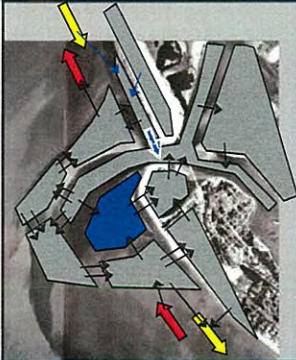
- Ebb shoal
- Bypassing Bar
- Channel
- Flood shoal
- Shoal
- Beach



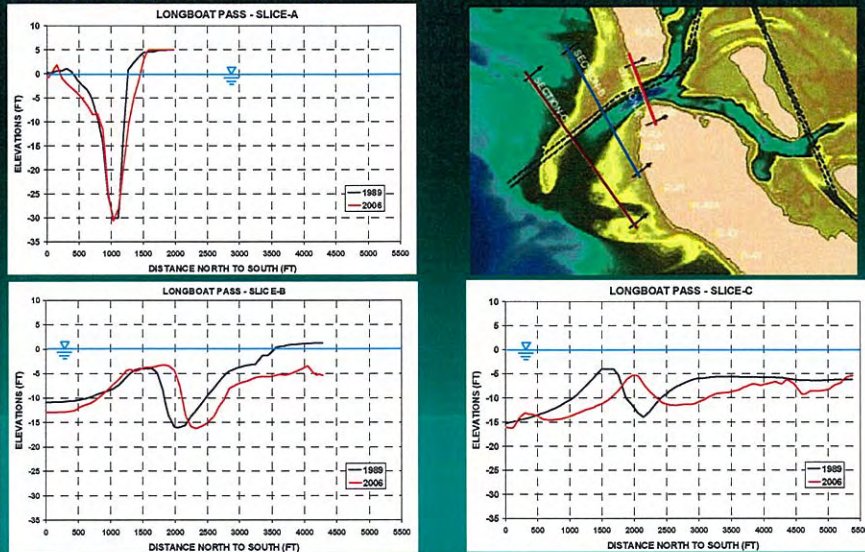


Inlet Reservoir Model

■ Beer Can Shoal



Effect of 1993 dredging on inlet evolution



Longboat Pass study findings

■ Event

- Jetty construction
- Navigation dredging
- Ebb shoal mining

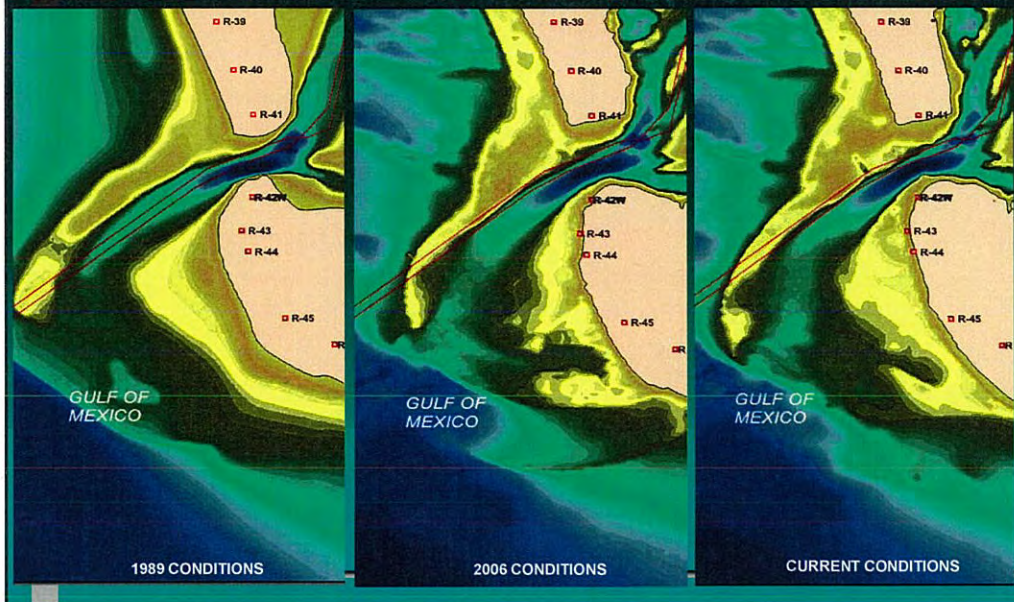
■ Consequences

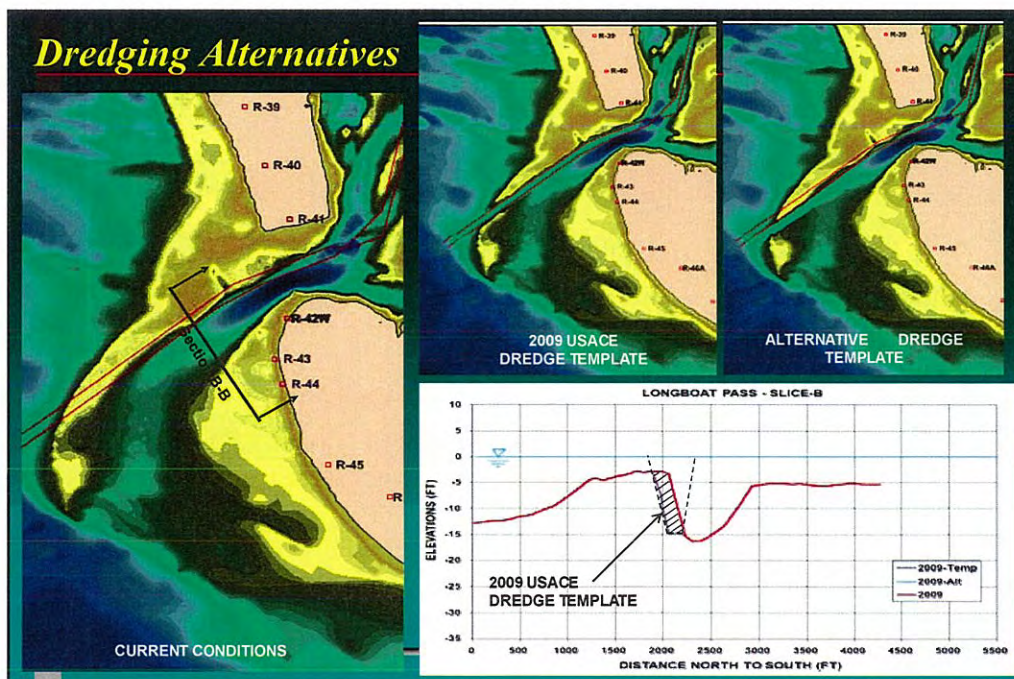
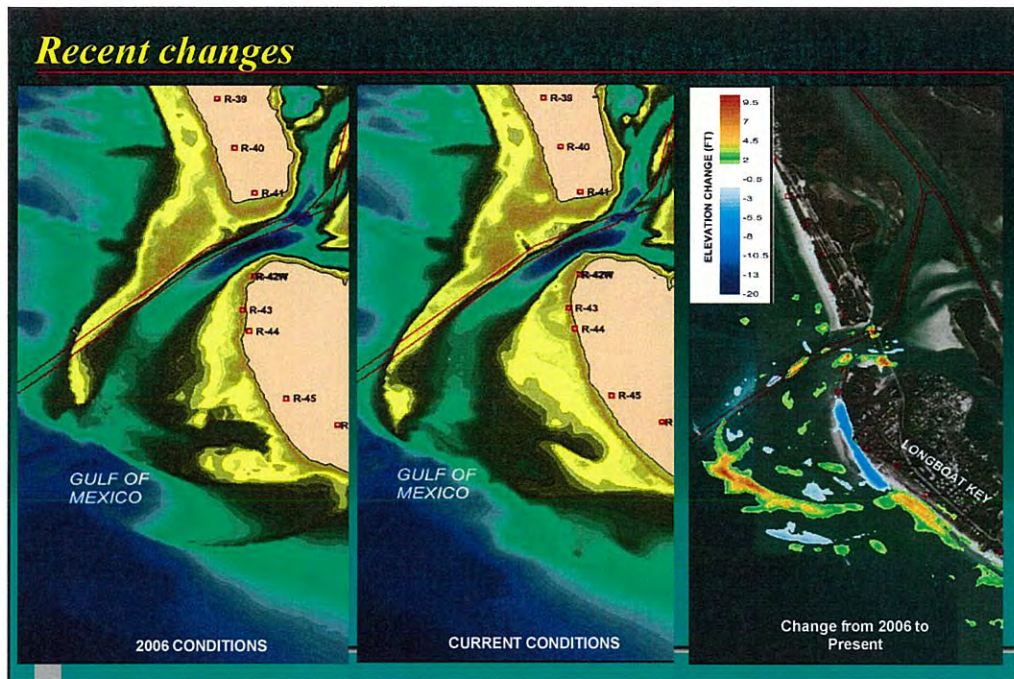
- Growth in tidal prism and ebb shoal volume
- Short term interruption in sand bypassing
- No detrimental effects on inlet features
- Limited decrease in ebb shoal volume
- Large scale morphology changes
- Inlet and morphological feature migration
- Chronic beach erosion problems
- Higher infilling rates of navigation channel

Longboat Pass study recommendations

- *ICW & flood shoal*
 - *Opportunity to use beach compatible material from ICW for beach and dune restoration*
- *Ebb shoal and navigation channel*
 - *Allow system to recover to near equilibrium volume prior to considering mining ebb shoal for major beach fill*
 - *Limit ebb shoal dredging to maintenance of navigation channel when necessary*
 - *Adjust the navigation channel to near natural tidal channel*

Recent changes





Longboat Pass Model Applications for Structural Solutions and Pass Management



Thomas Campbell, P.E.
Coastal Planning & Engineering, Inc.
2481 NW Boca Raton Boulevard
Boca Raton, FL 33431



Longboat Pass Alternatives

- ❖ Anna Maria Island Jetty Sand Tightening & Extension
- ❖ Longboat Key Terminal Groin
- ❖ Longboat Key Terminal Groin + Breakwater
- ❖ Longboat Key Terminal Groin + Permeable Adjustable Groins
- ❖ Inlet Channel Dredging

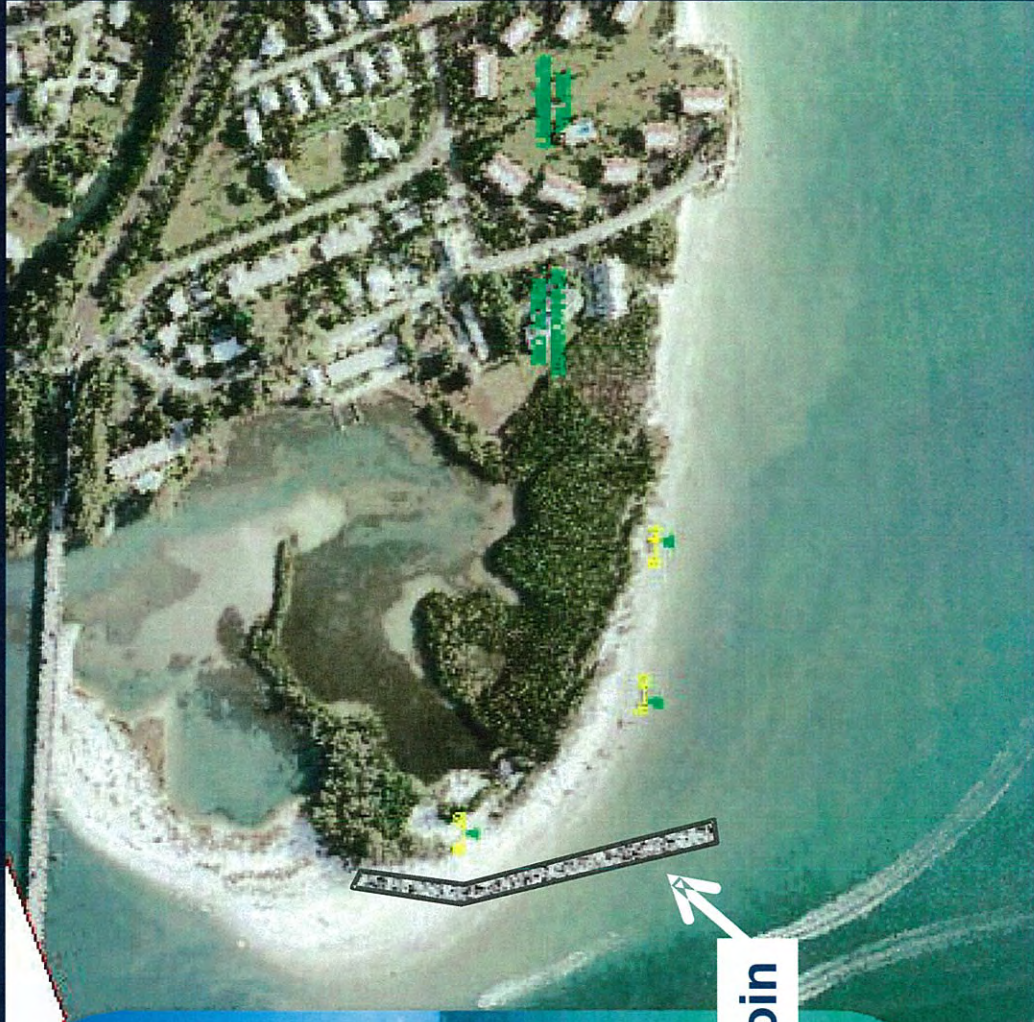


Anna Maria Island Jetty Sand Tightening + Extension

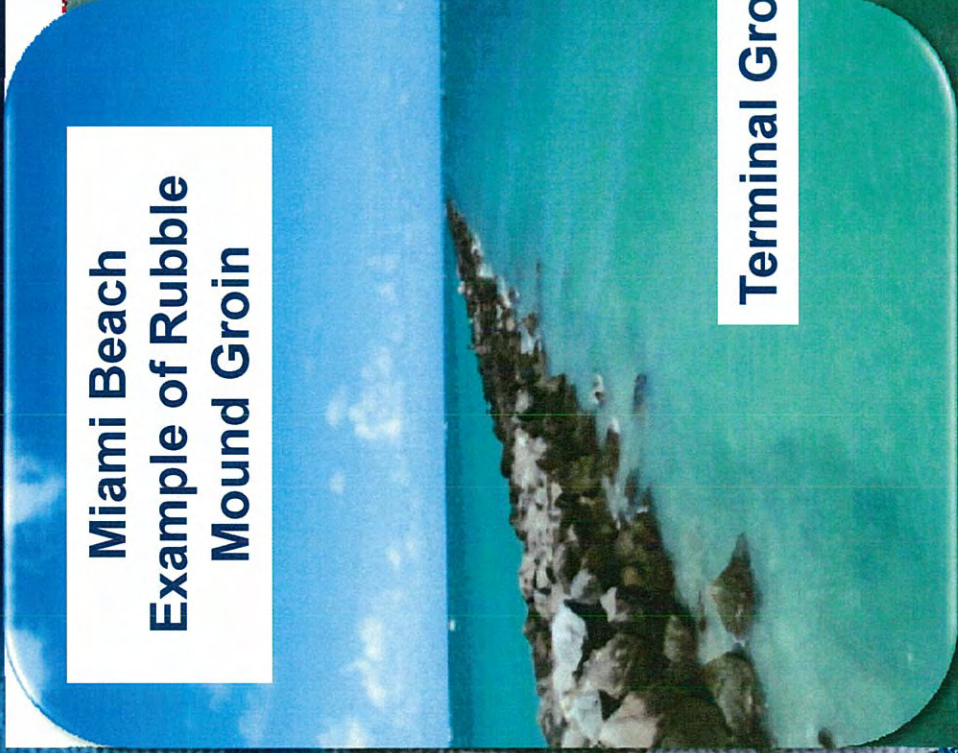


Longboat Key Terminal Groin

**Miami Beach
Example of Rubble
Mound Groin**



Terminal Groin



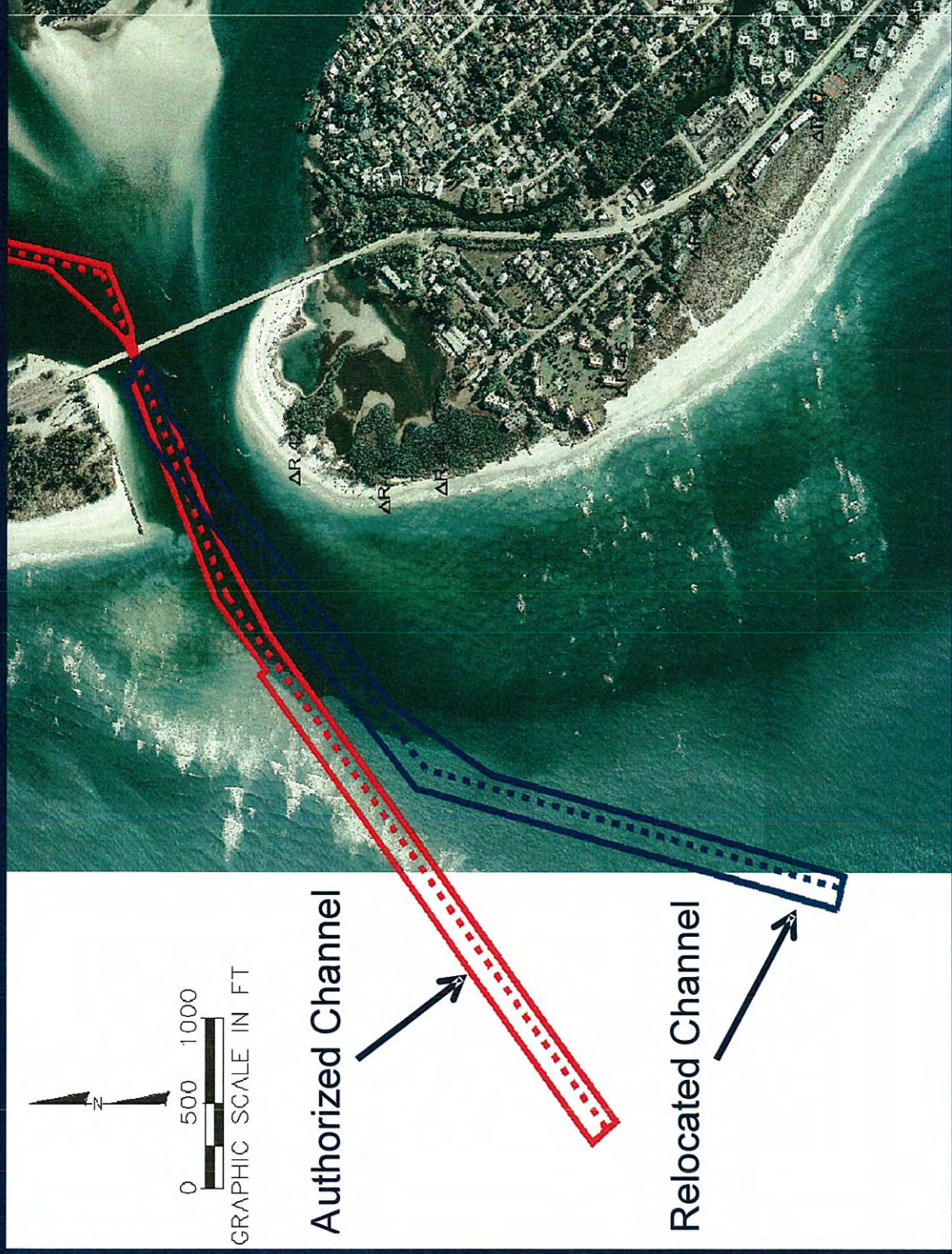
Longboat Key Terminal Groin + Breakwater



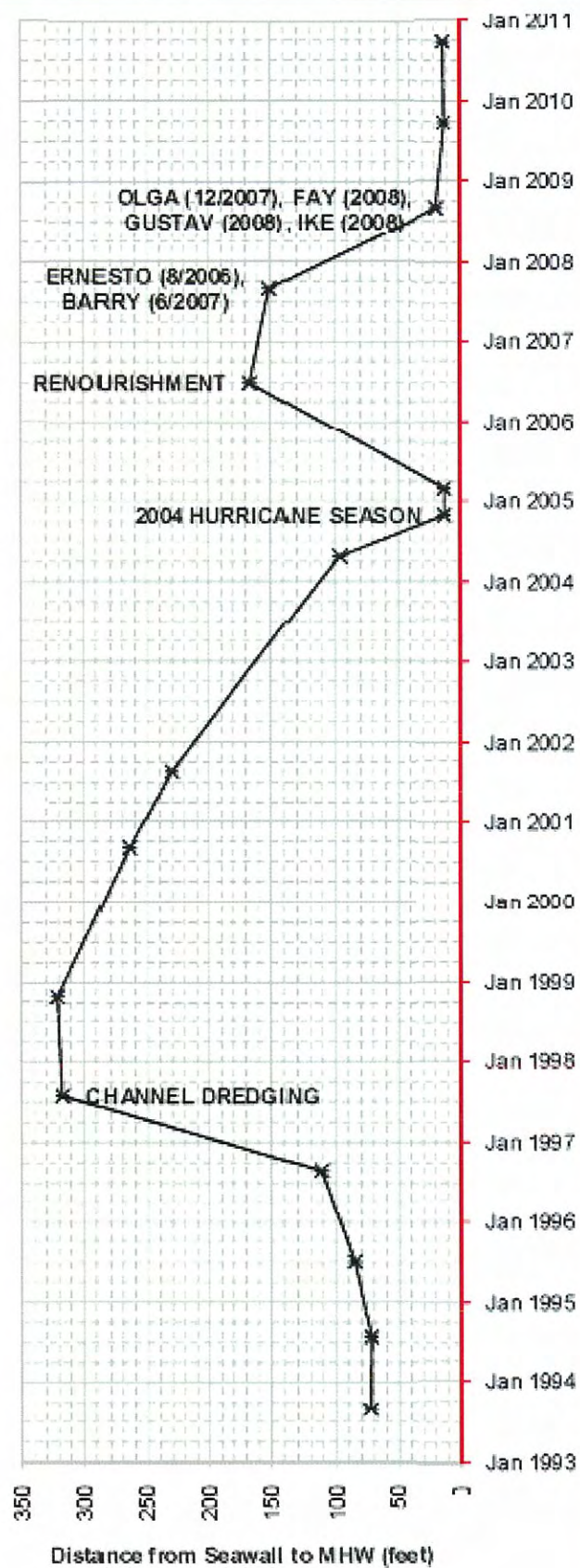
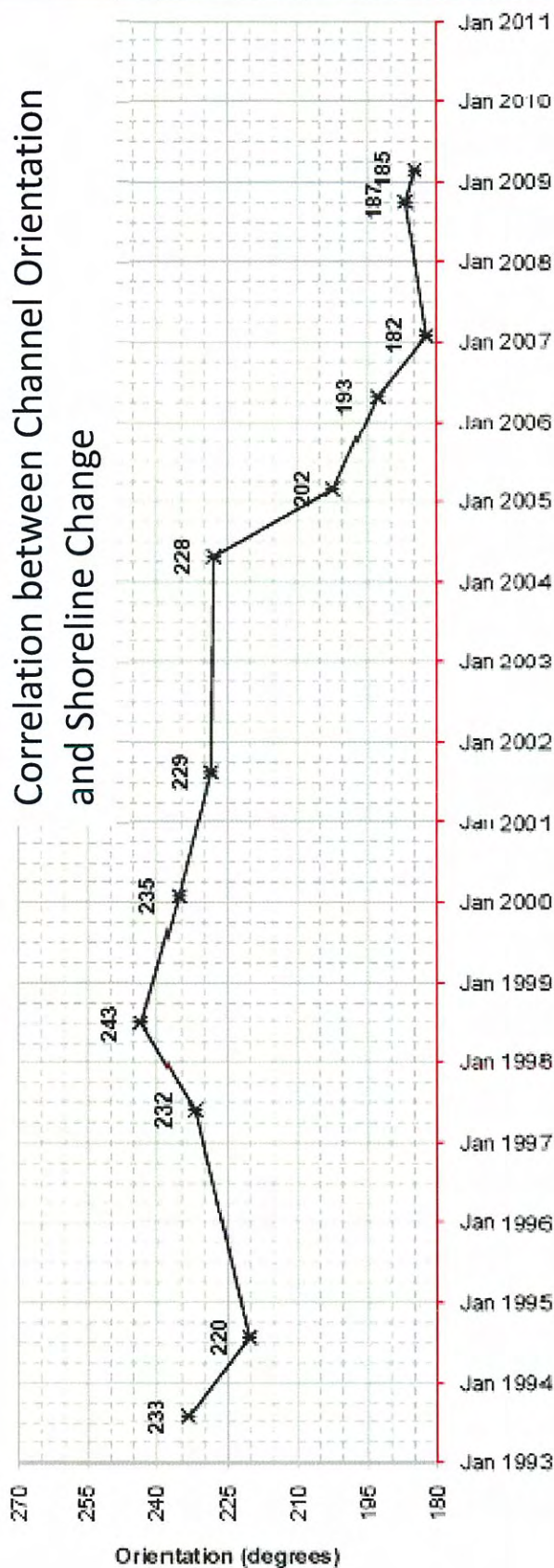
Longboat Key Terminal Groin + Permeable Adjustable Groins



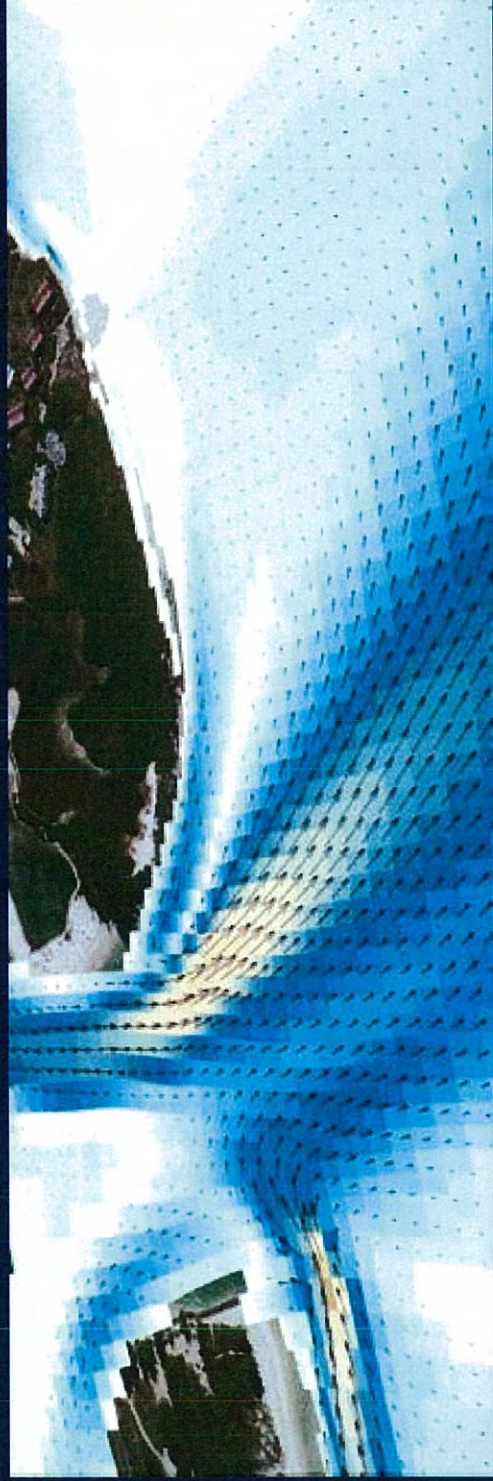
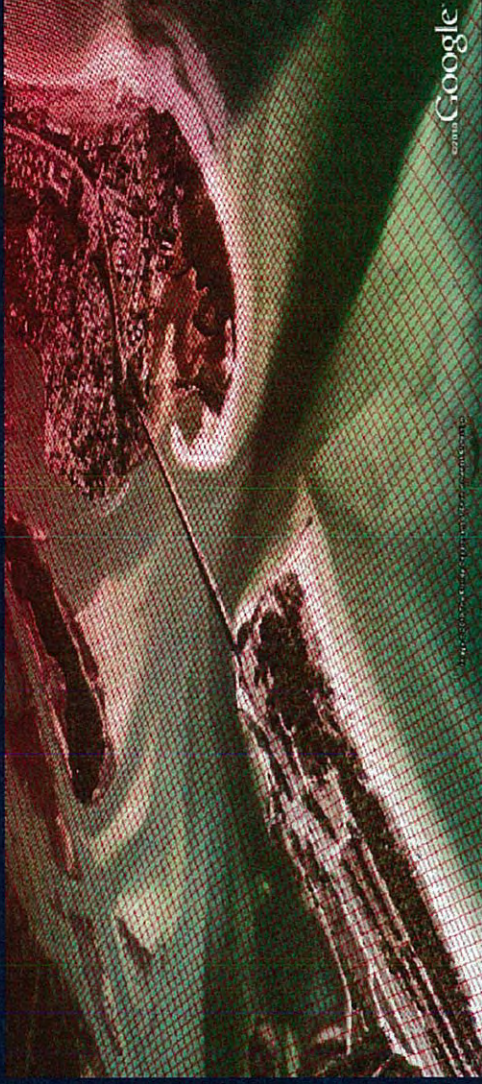
Inlet Channel Dredging



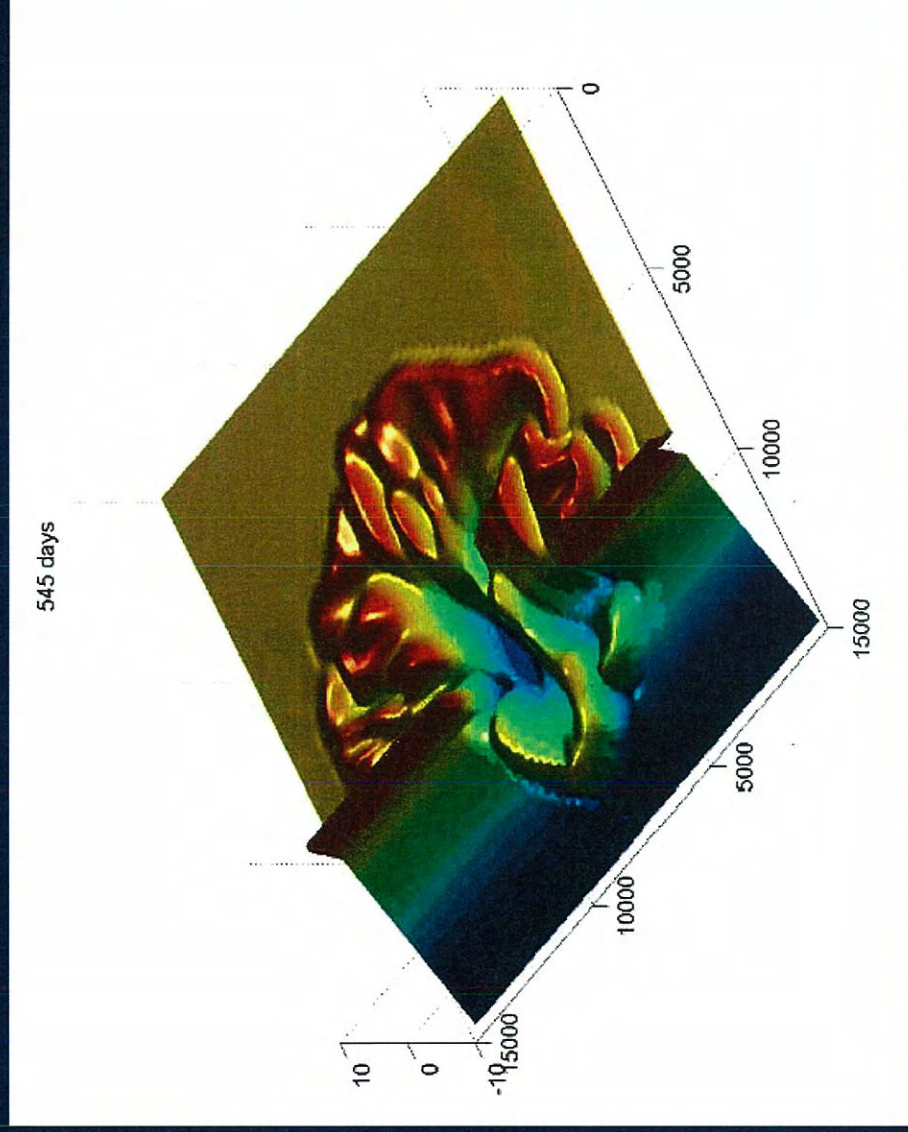
Correlation between Channel Orientation and Shoreline Change



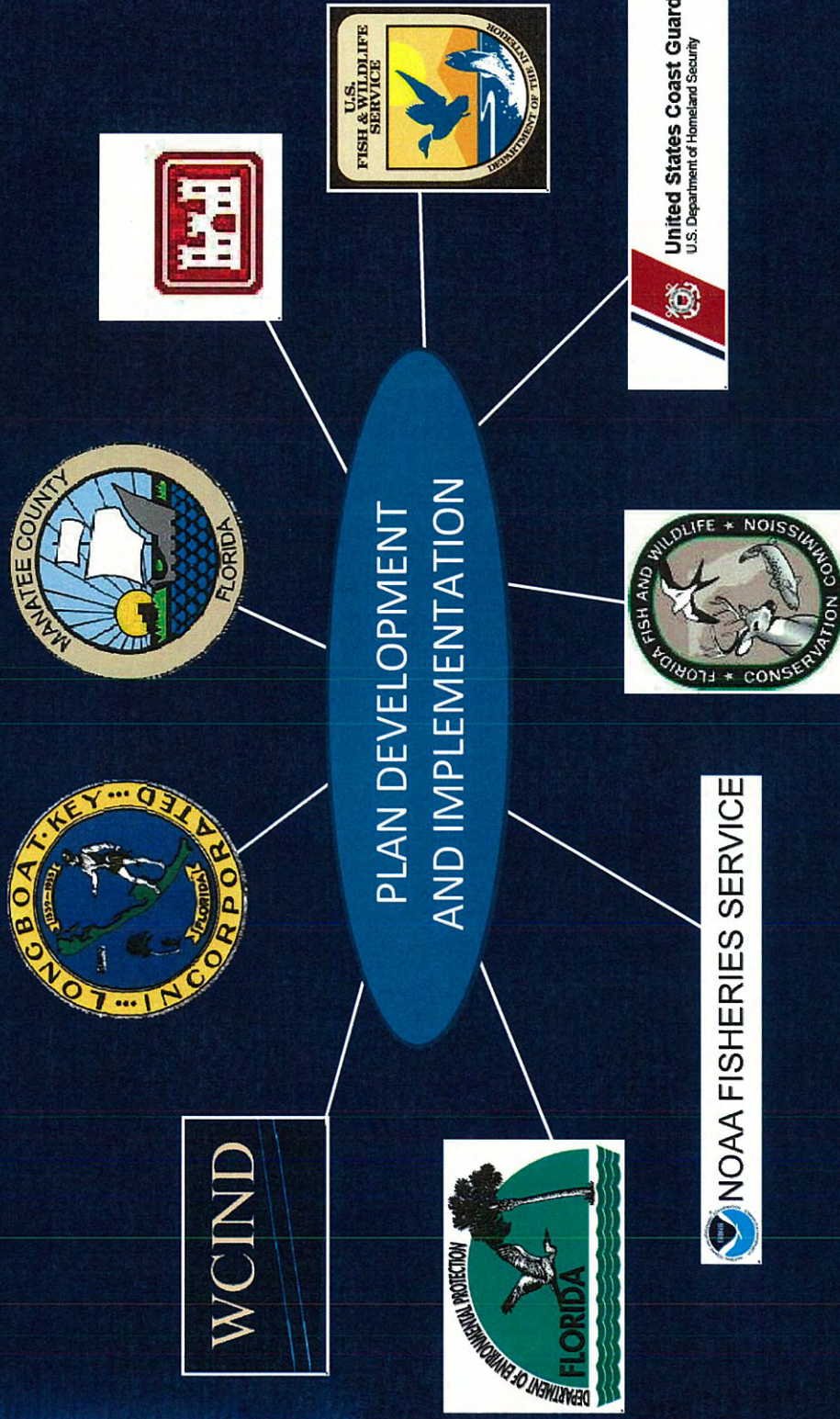
Delft 3D Flow and Transport Modeling



Delft 3D Inlet Formation



Inlet Management Plan



GIWW – CR to AR



Sunshine Skyway Cuts



Anna Maria Cuts

1



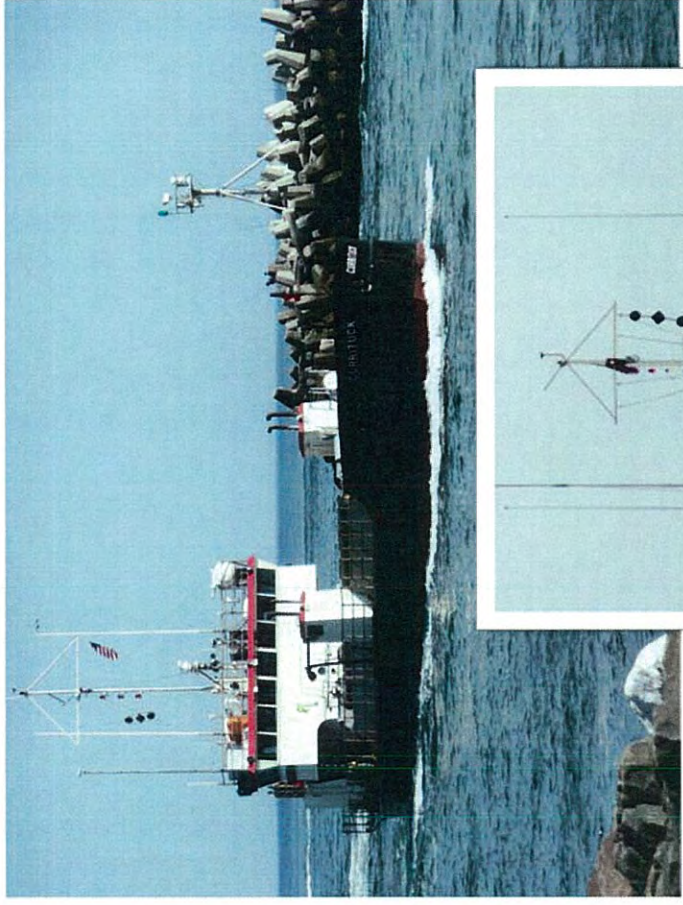
GIWW – CR to AR



Vicinity of Longboat Pass
Cuts



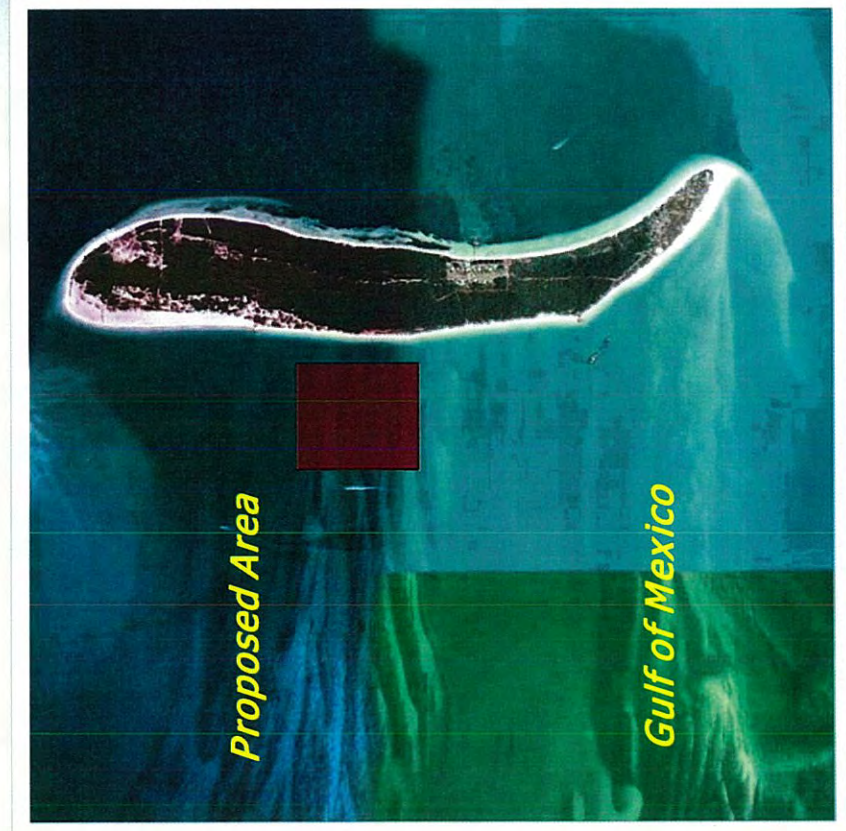
Hopper Dredge Currituck



- 150' Long
- 315 cy yd Hopper
- 3500 cy/day
- Minimum 10' depth



Disposal



Egmont Key





HUMISTON & MOORE ENGINEERS

COASTAL
ENGINEERING DESIGN
AND PERMITTING

5679 STRAND COURT
NAPLES, FLORIDA 34110
FAX: 239 594 2025
PHONE: 239 594 2021

Brett D. Moore, P.E.
Humiston & Moore Engineers
Project Manager/ Principal Engineer

Brett D. Moore, P.E., has over 28 years of experience in coastal engineering after obtaining his masters degree in Coastal Engineering from the University of Delaware in 1982. Prior to co-founding Humiston and Moore Engineers in 1991, Mr. Moore spent 6 years as a coastal engineer in the State of Florida Department of Natural Resources (DNR) coastal regulatory program (1982-1988) where he served as Engineering Supervisor for his last 2 years. From 1988 to 1991, Mr. Moore worked directly with Ken Humiston, P.E. in running the coastal engineering department at Coastal Engineering Consultants, Inc. in Naples, Florida. The regulatory background at the State DNR, currently the Department of Environmental Protection (DEP), has proven to be very beneficial in understanding the permitting process and underlying policies and objectives of the various regulatory programs.

As co-founder and vice president of Humiston and Moore Engineers (1991 – present), Mr. Moore has been responsible for the design and management of two beach restoration projects, five erosion control projects, and numerous inlet studies and erosion studies, many in Florida. Mr. Moore participates in technical conferences, has authored technical papers and has spent the last 19 years working on the development of the firm. He is an active member of the local chapter of the American Society of Civil Engineers and the Florida Shore and Beach Preservation Association. Mr. Moore was appointed to the 1999 Coastal Engineering Technical Advisory Committee to advise the DEP Bureau of Beaches and Coastal Systems on management of Florida's beaches. In 2009, Mr. Moore was appointed to the Florida Beaches Habitat Conservation Plan Steering Committee.

Mohamed A. Dabees, Ph.D., P.E.
Humiston & Moore Engineers
Project Engineer / Senior Coastal Modeler

Mohamed A. Dabees, Ph.D., P.E. is a registered professional engineer with over 20 years of experience in coastal engineering. Dr. Dabees obtained his Doctorate in Coastal Engineering from Queens University, Canada, in 2000, where his dissertation included the development of an advanced coastal process model. Since that time has been working at Humiston and Moore Engineers where he has continued the development and application of numerical modeling of coastal processes. He has provided technical analysis and design for various federal, state and local projects. His work focuses on erosion control, tidal inlets, regional hydrodynamics, long-term morphology, regional sand management, beach restoration and coastal structures. His contribution to the research of long-term morphology modeling and application is documented through numerous publications and technical reports. He has completed numerous regional and local modeling studies of tidal inlets and estuaries throughout the state of Florida.

Dr. Dabees is recognized internationally as an expert in the field of coastal modeling and has established innovative procedures in evaluation of inlet evolution and stability analyses. Applied results and H&M's ongoing R&D program have maintained H&M's reputation as being on the leading edge of this technology, with both regulatory agencies and with the international technical community responsible for development of many of these sophisticated modeling procedures.

THOMAS J. CAMPBELL, P.E., DC.E.
President/ Principal in Charge

EDUCATION: ME 1973 Ocean-Coastal Engineering - Florida Atlantic University
BE 1971 Civil and Structural Engineering - Cooper Union

PROFESSIONAL MEMBERSHIPS:

American Shore and Beach Preservation Association (ASBPA) – Director and Vice President
Florida Shore and Beach Preservation Association (FSBPA) – Ex-Officio Director
Florida Engineering Society (FES)
National Society of Professional Engineers (NSPE)
Association of Coastal Engineers (ACE)
Coastal Engineering Technical Advisory Committee (CETAC)

EXPERIENCE:

Thomas J. Campbell, P.E. is the President and one of the founders of Coastal Planning & Engineering, Inc. (CPE). Mr. Campbell has directed environmental and physical monitoring, coastal engineering analysis, design, geotechnical surveys and numerical modeling for beach restoration projects for over 30 years and has unmatched practical experience in beach design on the East and Gulf coasts of the U.S. Under his direction, CPE has constructed more than 60 beach restoration projects nationwide.

Mr. Campbell is a registered P.E. in 5 states, heads the Scientific Advisory Committee for the American Shore and Beach Preservation Association, is a Director of the Florida Shore and Beach Preservation Association and is on the editorial board of the *Journal of Coastal Research*, and the FSBPA publication, *Shore and Beach*.

Mr. Campbell is also a contributing author to the book Beach Nourishment and Protection. In 1985, Mr. Campbell was the Chairman of the Engineering Committee of the Florida Governor's "Restore our Coast" Task Force. In 1995, Mr. Campbell served on the National Research Council's Marine Board Committee on Beach nourishment. In 2003, Mr. Campbell was the Chairman of the Design Panel of a State and Federal (LCA) program that resulted in the program: "Implementing a Louisiana Barrier Island and Barrier Shoreline Restoration Program."

Mr. Campbell is currently a Ph.D. candidate at Delft Institute of Technology under Dr. Marcel Stive and is preparing a thesis on a Morphodynamic Model of Barrier Island Erosion. Mr. Campbell is a master of regional planning and funding acquisition and has extensive knowledge of both current issues and the lessons learned from coastal management projects nationwide. He received the Jim Purpura Award from the FSBPA in 1982 for outstanding contribution to coastal engineering in the State of Florida.

Comprehensive Long-Range Coastal Management

For the past 23 years Mr. Campbell has served as Principal in Charge and Chief Engineer for all CPE projects including supervision of the preparation and/or review of more than 20 coastal and

inlet management plans as well as sand bypass feasibility studies. He has supervised engineering analysis and developed program designs based on analysis of historical data, coastal processes, geotechnical and hydrographic information, environmental concerns, and permitting limitations, as well as cost/benefits analysis, funding options, and the potential for regional cost savings

Environmental Monitoring and Assessments Related to Beach Nourishment Projects

Mr. Campbell has been Principal in Charge for beach nourishment projects which included detailed qualitative and quantitative environmental and coastal assessment; monitoring of the project area before and after construction; biological inventories and mapping of hardbottom habitats; water quality sampling; sedimentation rate analysis and infauna analysis. Representative projects that include environmental monitoring are: the Collier County Beach Renourishment, the Anna Maria Island Beach Nourishment project, the Boca Raton Beach Restoration Project, and the Delray Beach beach renourishment project.

Regional Sand Search and Hydrographic Investigations

Mr. Campbell has directed sand search investigations in a total of 23 geographic locations including 17 locations in Florida and others in New Jersey, New York, Louisiana, Texas, Georgia and Virginia. Under the direction of Mr. Campbell, CPE has identified billions of cubic yards of sand resources on the Continental Shelf in State and Federal waters, including finding sand in areas where no sand was believed to exist. Of that volume, hundreds of millions of cubic yards of beach quality sand have been either placed on beaches or reserved for use in future beach nourishment projects.

Beach Nourishment and Coastal Structures Design and Permitting

As Principal in Charge and Chief Engineer, Mr. Campbell has directed the design and construction of more than 60 beach nourishment projects and 30 projects involving coastal structures. These projects include numerical modeling and statistical analysis of coastal processes, engineering design, modeling of projected levels of protection provided by various beach designs, beach and hydrographic surveys, storm damage assessments, economic evaluations, permitting, funding and cost estimating.

Funding Strategies

Mr. Campbell is exceptionally well versed in funding options and the requirements for eligibility and opportunities for combining Federal, State, local and private financial support. In 1985, Mr. Campbell assisted the Florida Department of Natural Resources, currently the Department of Environmental Protection, through the "Restore Our Coast" Task Force to develop funding mechanisms for coastal erosion projects throughout Florida. Since that time, Mr. Campbell has obtained Florida State funding for 8 beach nourishment projects and received the 1997 "Distinguished Service Award" from the FSBPA for leadership of the legislative committee which promoted Florida's dedicated funding source for beaches.

RICHARD H. SPADONI

Senior Vice President

Coastal Planning & Engineering, Inc.

EDUCATION: BS/1977/Ocean-Coastal Engineering
BS/1972/Marine Biology and Geology

REGISTRATION: 2002 / NOAA Scientific Diver
1996 / The Coastal Society
1992 / NITROX Certification
1991 / PADI Advanced Open Water SCUBA Diver
1991 / PADI Rescue Diver Certification
1989 / National Association of Environmental Professionals
1989 / Florida Association of Environmental Professionals
1989 / American Shore and Beach Preservation Association
1977 / Florida Shore and Beach Preservation Association
1968 / YMCA Open Water SCUBA Diver

PROJECT MANAGEMENT AND DESIGN

- Has served as a Project Manager and/or Chief Biologist for numerous beach nourishment and renourishment projects since 1977, including geotechnical (sand search) investigations and Environmental Assessments.
 - Project Manager for all phases of the Manatee County, Anna Maria Island Beach Nourishment and Renourishment Projects (1989 - present)
 - Project Manager and Chief Biologist for the Lido Key (Sarasota, Florida) beach renourishment project constructed in May 1998.
 - Project Manager and Chief Biologist for the 1988 Boca Raton Beach Restoration Project and 1998 renourishment project constructed in April 1998.
 - Project Manager for the Galveston, TX Beach Nourishment Project (1994/95).
 - Project Manager and Chief Biologist for the Delray Beach, Florida beach renourishment project (renourished in 1978, 1984, 1992, and 2002).
 - Designer of a nearshore artificial reef as mitigation for the Boca Raton Beach Restoration Project (1988).
 - Designed, permitted, and provided construction supervision for the Boca Raton Inlet navigation dredging and beach fill (beach restoration) projects of 1985 and 1996 (recent project construction completed November 29, 1996).
 - Project Manager for the emergency coral reef restoration project at Mona Island, Puerto Rico (1997) for the National Oceanic and Atmospheric Administration.
 - Designer of a shore-detached groin which diverts sand around a rock outcrop formation preserving it for snorkelers (Boca Raton, 1988).
 - Project Manager for the design of a coral reef repair at Looe Key National Marine Sanctuary, Florida Key for the National Oceanic and Atmospheric Administration.
 - Assisted in the implementation of seven other beach restoration projects.
- Conducted final design modifications and assisted in the preparation of the final project plans and specifications for the
 - Anna Maria Island Beach Renourishment Project (2001-2002).

- Lido Key Beach Nourishment Projects (1997, 1999 and 2002).
- South Boca Raton Beach Nourishment and Renourishment Project (1986, 1992, 2002).
- Delray Beach Fourth Periodic Beach Renourishment Project (1984, 1992, 2002).
- Boca Raton Beach Renourishment Project (1988, 1998).
- Boca Raton Inlet Management Plan Implementation Project (1996).
- Central Boca Raton Beach Nourishment Project (2003).
- Proposed construction of an artificial reef and terminal groin to replace surf zone reef formation which would be buried by the Boca Raton beach nourishment project (1988). This was the first time the State of Florida accepted mitigation (artificial reef) to issue permits for a beach nourishment project.
- Developed and permitted a 3 mile long mixing zone for the Delray Beach First Periodic Beach Renourishment Project (1984) in conjunction with the Department of Environmental Regulation (DER). This was the first water quality variance for a beach restoration issued in the State of Florida.

ENVIRONMENTAL SURVEYS / ASSESSMENTS

- Served as Chief Biologist for the following projects which included detailed environmental and coastal assessments; epibiotic density assessments; and identification and mapping of hardbottom habitats:
 - Hollywood Beach, FL AT&T Subaqueous Cable Route Environmental Assessment, (1998).
 - Delray Beach Environmental Assessment (1977, 1983, 1991, 1997)
 - Boca Raton Environmental Assessment (1997)
 - South Boca Raton Environmental Assessment (1984 - 1995).
 - Fort Pierce Inlet Management Plan Biological Assessment (1990).
 - Vero Beach Biological Assessment (1990).
 - Delray Beach Biological Assessment and Coral Growth Studies (1987).
 - North Boca Raton Biological Assessment and Coral Growth Studies (1987).
 - Lake Boca Raton Environmental Assessment (1985).
 - Vero Beach, Florida City, West Palm Beach, Orlando AT&T Subaqueous Cable Route Environmental Assessments (1983).
 - Jupiter Island Environmental Assessment (1980).
 - Jupiter / Tequesta Environmental Assessment (1979).
- Conducted periodic environmental monitoring of hardbottom habitats including biological analysis, video and still photography and analysis, water quality analysis, sedimentation rate measurements and benthic infauna sampling for:
 - Anna Maria Island Beach Restoration Project (1990 – 1995, 2001 - Present).
 - Boca Raton Beach Renourishment Project (1988 – 1992, 1994 – 2000).
 - Boca Raton Inlet Management Plan Implementation Project (1994 – 1998, 2001 – Present).
 - Delray Beach Periodic Beach Renourishment Projects (1978 – 1979, 1984 – 1986, 1990 – 1994, 2001 – 2002).
 - Town of Palm Beach, Florida Beach Restoration Project (1990, 2002 – Present).

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Senior Vice President

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- Directed interpretation of side scan sonar and bathymetric data and conducted environmental assessments and hardbottom habitat mapping for:
 - Anna Maria Island Beach Restoration Project (1990).
 - Longboat Key Mid-Key Interim Beach Nourishment Project (1996).
 - Captiva Island Beach Renourishment Project (1995).
 - Venice Beach Nourishment Project (1991).
 - Lido Key Beach Nourishment Project (1991).
 - Molasses Key Reef Restoration Project at the *M/V Wellwood* Grounding Site (2001).
 - Looe Key Reef Restoration Project at the *R/V Columbus Iselin* Grounding Site (1998 – 1999).
- Interpreted aerial photography, mapped hardbottom and / or seagrass habitats and conducted habitat characterization studies for the:
 - Anna Maria Island Beach Restoration Project (1990).
 - Lido Key Beach Nourishment Project (1992).
 - Central Boca Raton Beach Nourishment Project (2001).
 - Boca Raton Inlet Management Plan Implementation Project (1995).
 - Smathers Beach (Key West) Beach Renourishment Project (1997 – 1998).
- Directed the development of environmental monitoring and / or mitigation plans for the following projects:
 - Anna Maria Island Beach Renourishment Project (2002).
 - Delray Beach, Florida Fourth Periodic Beach Nourishment (2002).
 - South Boca Raton Beach Renourishment Project (2001 – Present).
 - Emergia Telefonica Sam – 1 Fiberoptic Cable Project in Boca Raton, FL (1999).
 - Central Boca Raton Beach Restoration Project (2001 – Present).
 - Boca Raton North Beach Nourishment Project (1986 – 2002).
- Conducted environmental inventories/assessments of marine and estuarine habitats for State mandated Inlet Management Plans adjacent to:
 - New Pass (1992).
 - Big Sarasota Pass (1992).
 - Venice Inlet (1992).
 - Boca Raton Inlet and Adjacent Beaches Management Program (1989-1995).
 - Hillsboro Inlet (1991).
 - Fort Pierce Inlet (1990).
- Developed the preliminary Environmental Assessment for the Staten Island, New York Erosion Control and Flood Protection Project Reconnaissance Study (1995).
- Conducted beach suitability assessments, including penetrometer testing and data analysis, of marine turtle nesting beaches as required by State and Federal approvals for the following projects:
 - Anna Maria Island Beach Restoration Project (1993).
 - Lido Key Shore Protection Program (1998 – Present).
 - Boca Raton Beach Renourishment Project (1988, 1998 – 2000).
 - Boca Raton Inlet Management Plan Implementation Project (1996 – 1998).
 - Delray Beach, Florida Beach Renourishment Project (1993 – 1995).
- Conducted benthic infauna sample collection and sample preparation in conjunction with the

following projects:

- Anna Maria Island Beach Restoration Project (1990, 1992 – 1994).
- Lido Key Beach Nourishment Project (1991).
- City of Boca Raton Inlet Management Plan Implementation Project (1994).
- Delray Beach Third Periodic Beach Renourishment Project (1990, 1992 – 1995).
- Conducted dune vegetation and revegetation assessment of the Boca Raton North Beach Restoration Project area (1989).
- Prepared the 1989 Captiva Island Beach Renourishment Project environmental assessment (1988).

COASTAL PROJECT PERMITTING & NEPA COMPLIANCE

- Processed several coastal construction permits and approvals required by State and Federal permitting agencies for Manatee County for beaches, reefs and pier reconstruction.
- Assisted in development of an Environmental Impact Statement for the Broward County Shore Protection Project (2000 – Present).
- Prepared a Statement of Findings for the USACE on the South Boca Raton Beach Renourishment Project (2001).
- Assisted in development of an Environmental Impact Statement for the EcoElectrica Cogeneration Plant, Guayanilla, Puerto Rico (1995 – 1996).
- Coordinated acquisition of coastal construction permits and approvals required by State and Federal permitting agencies for the:
 - Anna Maria Island Beach Renourishment Project (1998 – 2002).
 - Anna Maria Island Beach Restoration Project (1990 – 1992).
 - Lido Key Mid-Key Interim Beach Renourishment Project (1998 – 2001).
 - Lido Key Beach Nourishment Project (1993 – 1996).
 - Panama City Beach Nourishment Project (1996 – 1998).
 - South Boca Raton Beach Renourishment Project (2000 – 2002).
 - Delray Beach, Florida Fourth Periodic Beach Renourishment Project (1999 – 2002).
 - Looe Key Reef Restoration Project at the *R/V Columbus Iselin* Grounding Site (1999).
 - Smathers Beach (Key West) Beach Renourishment Project (1998 – 1999).
 - Emergia Telefonica Sam – 1 Fiberoptic Cable Project in Boca Raton, FL (1998 – 1999).
 - North Boca Raton Beach Renourishment Project (1995 – 1997).
 - Boca Raton Inlet Management Plan Implementation Project (1994 – 1996).
 - 1992 Delray Beach Third Periodic Beach Renourishment Project (1990 – 1992).
 - Boca Raton North Beach Restoration Project (1984 – 1988).
 - Boca Raton Inlet Feeder Beach Project (1984 – 1985).
 - Delray Beach First Periodic Beach Renourishment Project (1982 – 1984).
 - Delray Beach, Florida Beach Restoration Project (1977 – 1978).
 - Galveston, TX Beach Nourishment Project (1993 – 1995).
 - Underwater Freshwater Transmission Pipeline at Vieques – Culebra, Puerto Rico (1993 – 1995).

ARTIFICIAL REEF ENVIRONMENTAL MONITORING

- Performed quarterly environmental monitoring of mitigative artificial reefs constructed in conjunction with the 1992 Anna Maria Island Beach Restoration Project. Studies included fish censuses, and documentation of the macro-benthic community using both video and still photography (1992 – 1995).
- Performed an environmental investigation of an existing artificial reef site for placement of a mitigative artificial reef to be constructed in conjunction with the Anna Maria Island Beach Restoration Project (1991).
- Performed environmental monitoring of mitigative artificial reef constructed in conjunction with the Emergia Telefonica Sam – 1 Fiberoptic Cable Project in Boca Raton, FL (1999 – Present).
- Performed environmental monitoring of mitigative artificial reef constructed in conjunction with the 360Networks Atlantica I Fiberoptic Cable Project in Boca Raton, FL (1999 – Present).
- Performed environmental monitoring of mitigative artificial reefs constructed in conjunction with the Boca Raton North Beach Renourishment Project (1996–Present) and the North Boca Raton Beach Restoration Project (1988 – 1991).

PROJECT PERFORMANCE DOCUMENTATION

- Co-authored environmental assessment / monitoring reports for the:
 - Anna Maria Island Beach Renourishment Project (2002)
 - Anna Maria Island Beach Restoration Project Artificial Reef Feasibility and Hardbottom Monitoring Study (1990, 1992).
 - Longboat Key Artificial Reef Monitoring Program (1995).
 - Delray Beach, Florida Fourth Periodic Beach Nourishment (2002).
 - South Boca Raton Beach Renourishment Project (2001 – Present).
 - Boca Raton Inlet Management Plan Implementation Project (1995).
- Co-authored project performance monitoring reports which include mean high water line change evaluations, volumetric change analysis, and sand sample evaluation for the:
 - Anna Maria Island Beach Restoration Project (1993 – Present).
 - Lido Key Beach Nourishment Project (1998 – Present).
 - Delray Beach Third Periodic Beach Renourishment Project (1996 – Present).
 - Boca Raton North Beach Renourishment Project (1988 – Present).
 - Boca Raton Inlet and Adjacent Beaches Monitoring Program (1988 – Present).

CONSTRUCTION OBSERVATION / PROJECT IMPLEMENTATION

- Observed construction activities for the:
 - Anna Maria Island Beach Renourishment Project (2002).
 - Anna Maria Island Beach Restoration Project (1992 – 1993).
 - Lido Key Interim Beach Renourishment Project (2001)
 - Lido Key Beach Nourishment Project (1998).
 - Molasses Reef Restoration Project at the *M/V Wellwood* Grounding Site (2002).
 - South Boca Raton Beach Renourishment Project (2002).

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Senior Vice President

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- Delray Beach, Florida Fourth Periodic Beach Renourishment Project (2002).
- Looe Key Reef Restoration Project at the *R/V Columbus Iselin* Grounding Site (1999).
- North Boca Raton Beach Renourishment Project (1998).
- Boca Raton Inlet Management Plan Implementation Project (1996).
- Shore detached groin and mitigative artificial reef modules required as part of the Boca Raton North Beach Restoration Project (1988).
- Boca Raton North Beach Restoration Project (1988).
- City of Galveston (Texas) Beach Restoration Project (1994 – 1995).
- Mona Island Reef Restoration Project at the *Fortuna Reefer* Grounding Site (1997).
- Molasses Reef Restoration Project (2002).

COASTAL/BEACH MANAGEMENT AND COMPREHENSIVE PLANS

- Conducted comprehensive project area demographic assessments required for erosion control line establishment and project permitting for the:
 - City of Boca Raton (1995).
 - City of Delray Beach (1989).
- Co-authored four ordinances and amended three existing City of Boca Raton Codes designed to implement the City's Coastal Management and Conservation Elements of the Comprehensive Plan (1990).
- Co-authored State of Florida mandated Inlet Management Plans for:
 - New Pass, Sarasota County, Florida (1991).
 - Big Sarasota Pass, Sarasota County, Florida (1991).
 - Boca Raton Inlet, Palm Beach County, Florida (1991 – 1992).
- Co-authored Comprehensive Plan, Coastal Management Elements for three (3) Florida municipalities:
 - City of Boca Raton (1989).
 - City of Delray Beach (1989).
 - Town of South Palm Beach (1989).
- Co-authored the City of Boca Raton, Coastal Management Element evaluation and appraisal reports (1988).

THOMAS P. PIERRO, P.E., D.CE

Senior Coastal Engineer

Coastal Planning & Engineering, Inc.

EDUCATION:

M.S./2001/Ocean Engineering/FAU

B.S./1999/Ocean Engineering/FAU

REGISTRATIONS AND CERTIFICATIONS:

- Professional Engineer (Florida PE # 64683)
- ASCE-ACOPNE Diplomate of Coastal Engineering
- PADI Certified Open Water SCUBA & NITROX Diver

ASSOCIATIONS:

- American Society of Civil Engineers
- Florida Shore and Beach Preservation Association
- American Shore and Beach Preservation Association
- Surfrider Foundation

EXPERIENCE AND QUALIFICATIONS:

Tom Pierro is a Senior Coastal Engineer with broad experience in project management, planning, design and permitting, engineering and modeling, plans & specifications, field investigation, construction oversight, and feasibility studies of coastal engineering projects. Since 2001, served as Project Engineer on several shore protection, beach nourishment and marine structure projects for CPE including:

Manatee County, FL – Completed a comprehensive feasibility study for Manatee County in 2007. Tom and his team are currently moving forward with design, permitting and construction of the Coquina Beach, Beach Nourishment Project, the City of Anna Maria Hurricane Repair Project and placement of a geotextile groin adjacent to the island's southern jetty. Tom is currently working with the County to rebuild a fishing pier in Bradenton Beach.

Lido Key, FL – Project engineer for the Lido Key Beach Nourishment Project. Development an extensive 3D numerical model (Delft3D) centered on the project area to evaluate the effects of dredging the New Pass ebb shoal on the surrounding coastal system. Permits were successfully obtained as a result of the modeling effort and the project was constructed in early 2009. The project won the ASBPA Best Restored Beach Award for 2009.

Pinellas County, FL – Worked with the County to evaluate options to install permanent groin stabilization structures to reduce erosion at Upham Beach. Project includes development of engineering alternatives, advanced wave breaking modeling and permitting assistance. Additional efforts include project bidding and construction observations.

Collier County, FL – Design engineer and onsite representative for the construction of Collier County's renourishment project completed in 2006. Work began with preparation of a comprehensive engineering report to identify alternatives, feasibility and scope for the project. As a component of the major beach renourishment project, designed and developed plans and

THOMAS P. PIERRO, P.E. , D.CE

Senior Coastal Engineer

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specifications for the construction of a 1.09 acre artificial reef in Naples, FL.

Lee County, FL – Worked with the Corps of Engineers as representative of the local sponsor during construction of the Federal 2005-06 Captiva and Sanibel Islands Renourishment Project. Acted as onsite engineer and consultant for construction of beach and rehabilitation of the terminal groin at Redfish Pass, a local component of the Federal project.

Panama City Beach, FL – Project engineer for renourishment of the 17.5-mile beach restoration project, which was implemented as storm response by the Corps of Engineers in 2005-06. Studied the results of annual monitoring to prepare a preliminary engineering report evaluating hotspots that lead to alternatives for renourishment.

City of Boca Raton, FL – Project engineer on the three main coastal projects for the City of Boca Raton (North, Central and South Boca Raton). Provided construction oversight for beach nourishment and structural projects, in addition to design and permitting for the Boca Inlet Jetty Repair and North Boca Raton Beach Renourishment constructed in 2009. Prepared annual budget estimates for the City's coastal program and developed State required Long Range Budget Plans and quarterly reports for State cost-sharing.

Town of Palm Beach, FL – Project engineer for coastal projects for the Town of Palm Beach including monitoring of the Midtown Beach Renourishment Project, Phipps Beach Restoration Project and the Reach 8 Beach Restoration Project. Tom and his team designed a 0.8 acre limestone boulder artificial reef as a component of the Phipps Project, developed plans and specifications and managed the construction in 2007, which was completed on time and within budget.

Fire Island, NY – Design engineer and construction manager for the Fire Island Pines and Western Fire Island (Saltaire, Fair Harbor, Dunewood and Lonelyville) Beach Renourishment Projects. Performed preliminary engineering through final design including survey data analysis, volumetric and shoreline changes, diffusion analysis, borrow area development, design life and construction templates. Prepared technical, design and monitoring reports, plans and specifications, permit documents, and aided in the facilitation of bidding among the five communities. Full-time onsite engineer during the 2003-04 construction phase.

SELECTED PUBLICATIONS:

- Pierro, T., Benedet L. and Barletta, R., Upham Beach Stabilization Project: Boussinesq wave modeling to address concerns of local surfing community. FSBPA 23rd Annual National Conference on Beach Preservation Technology, February, 2010, Melbourne, FL.
- Pierro, T., DavisShaw, A. and Spadoni R., 2009 FEMA Hurricane Repair Project at Lido Key, Florida. ASBPA 2009 National Coastal Conference on Integrating Coastal Science and

THOMAS P. PIERRO, P.E. , D.CE

Senior Coastal Engineer

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Policy, October, 2009, St. Pete Beach, FL.

- Pierro, T. and Finkl, C., Beach nourishment within the purview of environmental limitations. FSBPA 22nd Annual National Conference on Beach Preservation Technology, February, 2009, St. Petersburg, FL.
- Pierro, T., Thomson, G. and Benedet L., Incorporating surfing concerns into federal projects. ASBPA Conference on Sustainable Shorelines, October 2008, Chicago, IL.
- Pierro, T. and Benedet L., Surfing engineered beaches. FSBPA 21st Annual National Conference on Beach Preservation Technology, January, 2008, Sarasota, FL.
- Benedet, L., Pierro T., and Henriquez, M., 2007. Impacts of coastal engineering projects on the surfability of sandy beaches. Shore & Beach, Volume 75, No. 4, Fall 2007, American Shore & Beach Preservation Association, Ft. Myers, FL, pp 3-20.
- Neal, R. and Pierro, T., Impacts of the 2004 hurricane season on the Lee County coastline, Shore & Beach Vol. 73, No. 2 & 3, Spring/Summer 2005, pp. 55-60.
- Barr, B. C., D. N. Slinn, T. Pierro, and K. B. Winters (2004), Numerical simulation of turbulent, oscillatory flow over sand ripples, Journal of Geophysical Research, 109, C09009, doi:10.1029/2002JC001709.
- Keehn & Pierro, Temporal variations of offshore sand bars in response to extreme storm events (Coastal Sediments 2003).
- Pierro, T., et. al., Numerical simulations of oscillatory flow over sand ripples (AGU 2000)
- Reddy, D.V., et. al., Municipal ash as a substitute to natural resources in concrete applications (OWCS 1999)

BEAU SUTHARD
Marine Geophysicist
Coastal Planning & Engineering, Inc.

EDUCATION: M.S./2005/University of South Florida/Geological Oceanography
B.S./1997/Eckerd College/Marine Science (Geology)

EXPERIENCE:

Marine Geophysicist

Mr. Suthard is the Director of CPE's Tampa Bay Regional office in St. Petersburg. The Tampa Bay Regional Office is responsible for the planning and execution of all CPE geophysical operations, including the deployment and operation of CPE's sidescan sonar, seismic sub-bottom, and magnetometer systems. Mr. Suthard has conducted full geologic mapping studies (including both field operations and office-based data processing, analysis, and interpretation), full geologic stratigraphic evaluations, sediment search investigations and cultural resource investigations including sidescan sonar, seismic-reflection, fathometer, and magnetometer surveys, followed by vibrocore collection and analysis, in support of large-scale mapping projects. Such projects include:

- Sand Key, Florida. Offshore Geophysical/Geotechnical Investigation (2009)
- Broward County, Florida. Offshore Geophysical/Geotechnical Investigation (2009)
- West Belle Pass, Louisiana. Offshore Geophysical/Geotechnical Investigation (2008-09)
- Bay County, Florida. Offshore Geophysical/Geotechnical Investigation (2008-09)
- Longboat Key, Florida. Offshore Geophysical/Geotechnical Investigation (2008-09)
- Cape Romano, Florida. Offshore Geophysical/Geotechnical Investigation (2008-09)
- Sand Key, Florida. Offshore Geophysical/Geotechnical Investigation (2008)
- Anna Maria Island, Florida. Offshore Geophysical/Geotechnical Investigation (2008)
- Sand Key, Florida. Artificial Reef As-Built Sidescan Sonar Survey (2007)
- East Marsh Island, Louisiana. Offshore Geophysical/Geotechnical Investigation (2007)
- Palm Beach County, Florida. Offshore Geophysical Investigation (2007)
- Galveston/Jefferson Counties, Texas. Offshore Geophysical/Geotechnical Invest. (2006)
- Lido Key, Florida. Offshore Geophysical/Geotechnical Investigation (2006)
- Nantucket, Massachusetts. Offshore Geophysical/Geotechnical Investigation (2006)
- Alligator Point, Florida. Offshore Geophysical/Geotechnical Investigation (2005)
- Lower Mississippi River, Louisiana. Geophysical/Geotechnical Investigation (2005)
- Scofield Pass, Louisiana. Pipeline Survey (2005).
- Sandy Point, Louisiana. Vibrocore Investigation (2005)
- North Topsail, North Carolina. Offshore Geophysical/Geotechnical Investigation (2005)
- South Pelto, Louisiana. Offshore Geophysical/Geotechnical Investigation (2005)
- New Cut, Louisiana. Offshore Geophysical/Geotechnical Investigation (2005)
- Fakahatchee Bay, Collier County Florida, Sidescan Sonar Benthic Habitat Mapping (2004)
- Faka Union Bay, Collier County Florida, Sidescan Sonar Benthic Habitat Mapping (2004)
- East & West Grand Terre, LA. Geophysical/Geotechnical Investigation (2003-04)
- Barataria/Plaquemines, Sandy Point, LA. Geophysical/Geotechnical Investigation (2003)

Research Assistant

University of South Florida, College of Marine Science *November, 1999 – May, 2005.*

United States Geological Survey, *November, 1998 – November, 1999*
St. Petersburg, Florida

Prior to coming to CPE, Mr. Suthard was a Graduate Research Assistant at the University of South Florida College of Marine Science (USF CMS), and, prior to that, a Research Assistant with the United States Geological Survey in St. Petersburg, Florida. His primary responsibility was to describe the sediment infilling history of Tampa Bay, Florida, based on the collection and interpretation of high-resolution seismic-reflection data. Responsibilities also included assisting with research projects administered through the USF Center for Coastal Ocean Mapping and the USGS, including coastal and extended deep-sea research cruises conducting sidescan sonar, seismic reflection, multibeam bathymetry, vibracoring, bottom sampling, and QTC sidescan sonar bottom classification surveys. These projects included field investigations requiring over seventy research cruises aboard the *r/v G.K. Gilbert* (twenty-eight as chief scientist), and over fifteen extended cruises onboard the *r/v Bellows* and *r/v Suncoaster*.

ANALYTICAL TECHNIQUES/EQUIPMENT PROFICIENCY:

Side-scan sonar data collection, processing, and interpretation, including the:

- EdgeTech 4200-HFL Dual-Mode, Dual-Frequency Sidescan Sonar;
- EdgeTech 272-TD Dual-Frequency Sidescan Sonar;
- Klein Associates System 3000 Dual-Frequency Sidescan Sonar.
- Single channel (electrodynamic “boomer”) seismic reflection data collection, processing, and interpretation, including the:
 - EdgeTech subbottom (chirp) profilers (SB-0512i, SB-216s, and SB-424 models).
 - Vibracore and bottom sample collection and processing.
 - Bathymetric data collection, processing, and interpretation (single beam and multibeam).
 - Magnetometer data collection.
 - Sedimentological and statistical analyses.

SPECIALIZED COMPUTING:

SonarWiz.MAP, sidescan sonar and seismic data processing and interpretation software
SonarWeb Pro, sidescan sonar and seismic data processing and interpretation software
Triton Brand Software, sonar and seismic data processing and interpretation software packages
Hypack, hydrographic survey software
Erdas Imagine 8.3, GIS/mapping software.
ArcGIS, GIS/mapping software.
Surfer mapping software.
Canvas graphics/drafting software.

PUBLICATIONS:

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Milan Mora is a project manager with the U.S. Army Corps of Engineers. He has been employed with the Jacksonville District since 2008 in the Coastal, Navigation and Antilles Branch of project management. He is currently the project manager for more than 10 coastal/navigation projects throughout the state of Florida.

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COUNTY ORGANIZATION AND
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161.143 Inlet management; planning, prioritizing, funding, approving, and implementing projects.—

(1) Studies, projects, and activities for the purpose of mitigating the erosive effects of inlets and balancing the sediment budget of the inlet and adjacent beaches must be supported by separately approved inlet management plans or inlet components of the statewide comprehensive beach management plan. Such plans in support of individual inlet projects or activities must, pursuant to s. [161.161\(1\)\(b\)](#), evaluate each inlet to determine the extent of the inlet's erosive effect on adjacent beaches and, if significant, make recommendations to mitigate such ongoing erosive effects and provide estimated costs for such mitigation.

(2) The department shall establish annual funding priorities for studies, activities, or other projects concerning inlet management. Such inlet management projects include, but are not limited to, inlet sand bypassing, modifications to channel dredging, jetty redesign, jetty repair, disposal of spoil material, and the development, revision, adoption, or implementation of an inlet management plan. The funding priorities established by the department must be consistent with the requirements and legislative declaration in ss. [161.101\(14\)](#), [161.142](#), and [161.161\(1\)\(b\)](#). In establishing funding priorities under this subsection and before transmitting the annual inlet project list to the Legislature under subsection (5), the department shall seek formal input from local coastal governments, beach and general government associations and other coastal interest groups, and university experts concerning annual funding priorities for inlet management projects. In order to maximize the benefits of efforts to address the inlet-caused beach erosion problems of this state, the ranking criteria used by the department to establish funding priorities for studies, activities, or other projects concerning inlet management must include consideration of:

- (a) An estimate of the annual quantity of beach-quality sand reaching the updrift boundary of the improved jetty or inlet channel.
- (b) The severity of the erosion to the adjacent beaches caused by the inlet and the extent to which the proposed project mitigates the erosive effects of the inlet.
- (c) The overall significance and anticipated success of the proposed project in balancing the sediment budget of the inlet and adjacent beaches and addressing the sand deficit along the inlet-affected shorelines.
- (d) The extent to which existing bypassing activities at an inlet would benefit from modest, cost-effective improvements when considering the volumetric increases from the proposed project, the availability of beach-quality sand currently not being bypassed to adjacent eroding beaches, and the ease with which such beach-quality sand may be obtained.

(e) The interest and commitment of local governments as demonstrated by their willingness to coordinate the planning, design, construction, and maintenance of an inlet management project and their financial plan for funding the local cost-share for initial construction, ongoing sand bypassing, channel dredging, and maintenance.

(f) The previous completion or approval of a state-sponsored inlet management plan or local-government-sponsored inlet study concerning the inlet addressed by the proposed project, the ease of updating and revising any such plan or study, and the adequacy and specificity of the plan's or study's recommendations concerning the mitigation of an inlet's erosive effects on adjacent beaches.

(g) The degree to which the proposed project will enhance the performance and longevity of proximate beach nourishment projects, thereby reducing the frequency of such periodic nourishment projects.

(h) The project-ranking criteria in s. 161.101(14) to the extent such criteria are applicable to inlet management studies, projects, and activities.

(3) The department may, pursuant to s. 161.101 and notwithstanding s. 161.101(15), pay from legislative appropriations provided for these purposes 75 percent of the total costs, or, if applicable, the nonfederal costs, of a study, activity, or other project concerning the management of an inlet. The balance must be paid by the local governments or special districts having jurisdiction over the property where the inlet is located.

(4) Using the legislative appropriation to the statewide beach-management-support category of the department's fixed capital outlay funding request, the department may employ university-based or other contractual sources and pay 100 percent of the costs of studies that are consistent with the legislative declaration in s. 161.142 and that:

(a) Determine, calculate, refine, and achieve general consensus regarding net annual sediment transport volumes to be used for the purpose of planning and prioritizing inlet management projects; and

(b) Appropriate, assign, and apportion responsibilities between inlet beneficiaries for the erosion caused by a particular inlet on adjacent beaches.

(5) The department shall annually provide an inlet management project list, in priority order, to the Legislature as part of the department's budget request. The list must include studies, projects, or other activities that address the management of at least 10 separate inlets and that are ranked according to the criteria established under subsection (2).

(a) The department shall make available at least 10 percent of the total amount that the Legislature appropriates in each fiscal year for statewide beach management for the three highest-ranked projects on the current year's inlet management project list.

(b) The department shall make available at least 50 percent of the funds appropriated for the feasibility and design category in the department's fixed capital outlay funding request for projects on the current year's inlet management project list which involve the study for, or design or development of, an inlet management project.

(c) The department shall make available all statewide beach management funds that remain unencumbered or are allocated to non-project-specific activities for projects on legislatively approved inlet management project lists. Funding for local-government-specific projects on annual project lists approved by the Legislature must remain available for such purposes for a period of 18 months pursuant to s. 216.301(2)(a). Based on an assessment and the department's determination that a project will not be ready to proceed during this 18-month period, such funds shall be used for inlet management

projects on legislatively approved lists.

(d) The Legislature shall designate one of the three highest projects on the inlet management project list in any year as the inlet of the Year. The department shall annually report to the Legislature concerning the extent to which each inlet project designated by the Legislature as inlet of the Year has succeeded in balancing the sediment budget of the inlet and adjacent beaches, mitigating the inlet's erosive effects on adjacent beaches, and transferring or otherwise placing beach-quality sand on adjacent eroding beaches.

(6) The department shall adopt rules under ss. [120.536\(1\)](#) and [120.54](#) to administer this section.

History.—s. 2, ch. 2008-242.