

# Peer Review of the Lido Key Federal Shore Protection Project



# Introduction

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# Project Background

- The Lido Key Federal Shore Protection Project (Lido SPP) is a federally authorized Hurricane and Storm Damage Reduction (HSDR) project;
- Consists of beach nourishment of 1.6 mile segment of south Lido Key shore between FDEP Range Monuments R-34.5 and R-44 with approximately 950,000 cubic yards (cy) of sand.
- The primary sand source is the Big Sarasota Pass channel and ebb shoal
- Features Include 80-ft wide beach berm width at +4-ft elevation (NAVD88) with a 1V:20H seaward slope
- Construction of two shore perpendicular groins between R-42+400' and R-43+500'
- Project is currently in permitting phase; date of construction is unknown

# Objectives

- Atkins was tasked by Sarasota County to conduct a peer review of the Lido Key Shore Protection Program.
- Atkins Review County Provided Documents to Determine:
  - Whether the USACE has provided assurance that the shoreline and user experience at Ted Sperling Park at South Lido Beach are not impacted
  - Whether the USACE has provided assurances that removal of the proposed volume of sand from Big Sarasota Pass channel and ebb shoal would not adversely impact Lido and Siesta Key beaches
  - Whether the USACE has provided assurances that the proposed project will not adversely impact navigation within Big Sarasota Pass
  - To Consider a No-Action Alternative

# Reports Reviewed per SOW



<b>FURNISHED REPORTS</b>				
	<b>Report Title</b>	<b>Date of Report</b>	<b>Length of Report (pgs.)</b>	<b>Included in Review</b>
1	Draft Environmental Assessment, Additional Sand Sources, Hurricane and Storm Damage Reduction Project Lido Key Feasibility Report, Sarasota County, Florida	March 2015	81	No
1g	Appendix G - Study of Big Sarasota Pass Sediment Mining Alternatives for Sarasota County, Lido Key Federal Shore Protection Project	March 2015	190	Yes
2	Sarasota County, Florida Hurricane and Storm Damage Reduction Project Lido Key Feasibility Report with Environmental Assessment	2002 (and 2004 Addendum)	188	Yes
2a	Appendix A – Engineering Analysis and Design	2004	117	Yes
3	Lido Key Genesis Shoreline Modeling Study	May 2014	35	Yes
<b>SUPPLEMENTAL/REFERENCE REPORTS</b>				
	<b>Report Title</b>	<b>Date of Report</b>	<b>Length of Report (pgs.)</b>	<b>Read for Reference (Yes/No)</b>
1	Sediments and Processes at Big Sarasota Pass, Sarasota County, Davis & Wang	2004	32	Yes
2	Cumulative Effects of Channel and Ebb Shoal Dredging on Inlet Evolution in Southwest Florida, Dabees & Kraus	2008	13	Yes
3	Comprehensive Inlet Management Plan Big Sarasota Pass and New Pass System for Sarasota County	May 2010	31	Yes
4	Analysis of Lido Key Groin Field – December 2014, Sarasota County, Florida, HSDR Project (USACE, Jacksonville District – December 2014)	December 2014	-	Yes

## Ted Sperling Park – (South of R-43+500')

- Reports and findings supplied have not provided assurance that the shoreline and user experience impacts to Ted Sperling Park at South Lido Beach will not be impacted:
  1. GENESIS model utilized in study does not model currents/sediments to assure that shunting of sand offshore will not occur during strong littoral currents.
    - there is no evidence provided that the GENESIS model can prognosticate bypassing rates of sediment around/through the groins.
  2. GENESIS model verification is in question due to:
    - suggestions that calibration coefficients may be different from verification coefficients utilized in modeling of no-groins shorelines
    - different data sets from different hindcast models (WIS, WaveWatch) were utilized in calibration and verification of the modeling effort

# Findings

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## Lido Key Beach – (North of R- 43+500')

- No issue noted with beach fill placement or COE design on Lido Key

## Siesta Key Beaches and Shorelines

- Reports and findings have not provided assurances that removal of the proposed volume of sand from Big Sarasota Pass channel and ebb shoal will not adversely impact Lido and Siesta Key beaches:
  1. CMS model utilized in reports does not show verification of the model, hence there are no assurances that the model can prognosticate (predict) results of BSP dredging events.
  2. CMS model should undergo verification with wave/sediment data over a reasonable period of time with same coefficients/approaches/equations used in calibration.
  3. To provide additional confidence in CMS model and parameters utilized for COE model dredge event runs, a similar model such as Delft3D should be utilized with the same data to assure similar trends/results to COE findings.



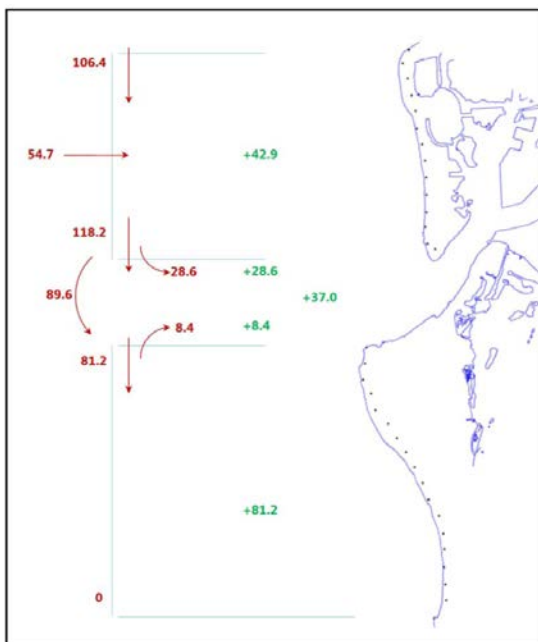
## Navigation in Big Pass

- Reports and findings have not provided assurance that the proposed project will not adversely impact navigation within Big Sarasota Pass:
  1. CMS model utilized in reports does not show verification of the model, hence there are no assurances that the model can prognosticate (predict) results of BSP dredging events.
  2. CMS model should undergo verification with wave/sediment data over a reasonable period of time with same coefficients/approaches/equations used in calibration.
  3. To provide additional confidence in CMS model and parameters utilized for COE model dredge event runs, a similar model such as Delft3D should be utilized with the same data to assure similar trends/results to COE findings.

# Findings

## No-Action Alternative

- Without nourishment, Lido Key will continue to erode at rates consistent with the 1987-2006 sediment budgets provided for area of nourishment between R-34.5 and R-44 ( i.e. ~ 12,000 cy/year in accord with CT,CEC,USF/2008 report sediment budget [Fig 53] and finalized COE budget [Fig 56] ).



- As recent data has not been collected to update sediment budget cell changes, nor littoral drift rates along Lido Key, it is unclear as to what present day sediment budget would show.

Figure 56 from COE Study of Big Sarasota Pass Mining Alternatives  
 Numbers = 1000 Cubic Yards

# Conclusions and Recommendations

- With the information provided and reviewed, it is difficult to agree with aspects of the reports and findings. With gaps in data, age of some data and uncertainty of some calibrations/verifications provided in the referenced material, it is difficult to verify the results. Finally, through the use of the models employed in this effort, there remains question to their ability to predict the outcome of the proposed action.
- Atkins recommends the project sponsors:
  1. Share proof of model calibration, field verification of data, and related items as described in the Atkins report, facilitating dialog and agreement of model outputs
  2. Verify the results of models used by employing an alternative model (DELFT3D, XBEACH, Mike21)
  3. Develop a monitoring program (pre and post construction)