



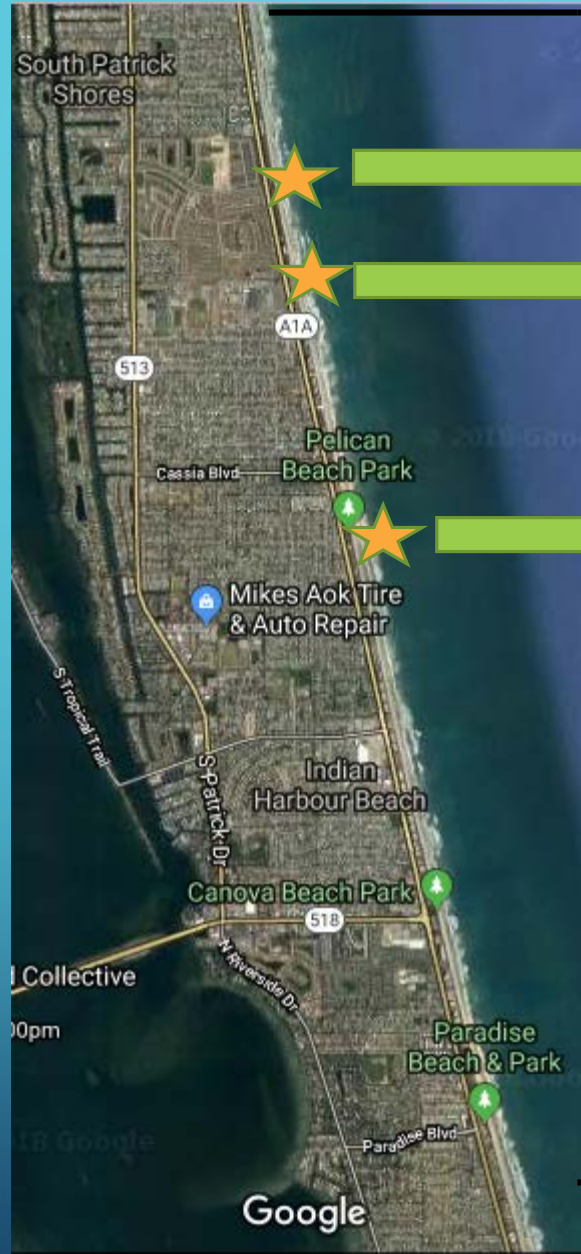
# 2018 CRITICALLY ERODED HIGH DUNE (BERM) FILL

SAND QUALITY MEASUREMENTS



**Sebastian Inlet  
Chapter**

# FILL SAND QUALITY MEASUREMENT LOCATIONS



Pre-fill sand sample 1  
Hightower Beach Park

Pre-fill sand sample 2  
Grant Avenue

Fill sand samples 3 - 6  
Shell Avenue

# SAND FILL SAMPLES

- Taken from the sand distribution point at Shell Avenue (Behind “Sun on the Beach”)
  - Samples 3 & 4
    - Blue Goose Mine, located at 5655 82nd Avenue, Vero Beach
  - Samples 5 & 6
    - Stewart Materials, LLC Capron Site, located at 13700 Indrio Road, Fort Pierce, Florida.

## SAND SAMPLE 1 (PRE-FILL)

- Sample 1 is from the Hightower beach park approximately 20 feet from the high dune line. This is pre-existing sand.
- This area was last filled on 2013/2014 from Hurricane Sandy dredge/fill sand.
- Prior to the Sandy fill, a berm fill was done in this area in 2004.

# SAMPLE 1 SAND RESULTS

- Sample 1 was within project specification tolerance.
- As this is prior fill and not subject to the current spec, it is just a reference.

## SAMPLE 2 SAND (PRE-FILL)

- Sample 2 is from the Grant Avenue approach approximately 20 feet from the high dune line. This is pre-existing sand.
- This area was last filled on 2013/2014 from Hurricane Sandy dredge/fill sand.
- Prior to the Sandy fill, a berm fill was done in this area in 2004.

# SAMPLE 2 SAND DATA



- 87.1 percent of the sample passed the No. 35 sieve
- The existing project tolerance calls for only 40 to 85 percent to pass the No. 35 sieve
- As this is prior fill and not subject to the current spec, it is just a reference.

## SAMPLE 3 & 4



- Out of project tolerance due to 92.7 and 91.8 percent, respectively, of the samples passing the No. 4 sieve, which is outside of the project tolerance of 95 to 100 percent
- Out of project tolerance due to 20.6 and 20.5 percent, respectively, of the samples passing the No. 80 sieve, which is outside of the project tolerance of 0 to 18 percent.



## SAMPLE 5 & 6

- Samples 5 & 6 were within project specification tolerance.

# OTHER SAND QUALITY TESTING RESULTS

- The only volatile organic compound found was Acetone
  - Less than the most stringent FDEP SCTL in each sample and is likely a laboratory contaminant.
- Semi-volatile organic compounds, pesticides, herbicides, and PCBs were not detected above the method detection limit in any sample.
- Arsenic was detected in samples 1-4
  - Concentrations exceeded the 2.1 milligram per kilogram (mg/kg) FDEP Residential Direct Exposure (RDE) SCTL

# CONCLUSIONS

- Sand from the Blue Goose mine failed in grain size and for Arsenic traces.
  - The samples were out of project tolerance due to the wider variability in the grain size, specifically the material was coarser than the tolerance for the No. 4 sieve and finer than the tolerance for the No. 80 sieve.

## DETAILED SAMPLES

- Actual statistical data for the samples as measured.
- There is some variability in the statistics for the samples, so it is potentially something to monitor with more samples spread over some determined time or lot delivery of sand as per budgeting allowances.

# SAND SAMPLING

- Sample a-c: Doubletree Suites Motel area.
- Sample d-e: Terrace Shore Drive area.
- Seb. Inlet Surf rider Proposed:
  - Mean Grain Size: 0.33-0.55 mm
  - CaCO<sub>3</sub> content: 0-50%
  - Silt Content (passing #200 sieve): < 2%
  - Shell content (passing #4 sieve): < 2%

Sample	Mean Grain Size	CaCO <sub>3</sub> Content	Silt Content	Gravel Content	Weight % of Sand
a	0.47	24.85	1.08	0.22	98.69
b	0.39	10.11	0.62	0.13	99.25
c	0.45	28.06	1.24	0.13	98.63
d	0.33	1.58	0.2	0	99.8
e	0.49	31.83	1.46	0.1	98.44
std. dev.	0.059	11.515	0.453	0.071	0.498

# REFERENCE

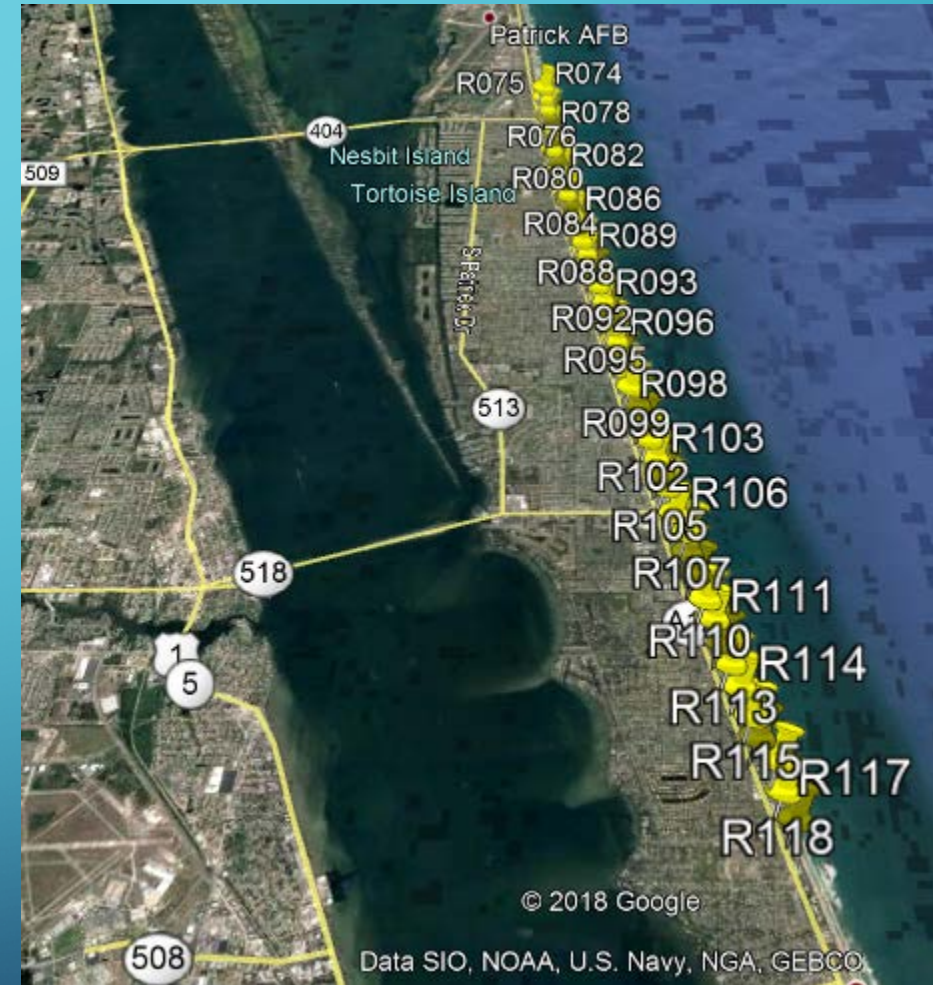
- Matt Shelton, Project Manager, Tetra Tech, *“City of Satellite Beach Mid-Reach Soil Sampling Letter Report, Satellite Beach, Florida,”* March 6, 2018
- Olsen Associates, Inc., *“Engineered Berm Project for Shore Protection Along Central and Southern Brevard County, Florida,”* August, 2009
- FY2013/14 Local Government Funding Requests Project Assessment, 1/28/2013
- Lainie Edwards, Ph.D., *“Permit Modification No. 0254479-004-JN, Permit No. 0254479-001-JC, Brevard County , Mid-Reach Beach Restoration Project,”* Beaches, Inlets and Ports Program Division of Water Resource Management, July 14, 2016



**BACKGROUND: MID-REACH**

# MID REACH OFFICIAL DESIGNATION

- The Mid-Reach official boundaries are defined by R-monuments R075.4-R118.3.
- 7.8 miles in length.
- From a street view, this is roughly just south of Grosse Point (Dunkin Donuts) northward to R075.4, Pineda Avenue.





# BERM PRIOR FILL

- Initial Project
    - December 2004 – April 2005
    - 307,300 cu. yds.
  - Hurricane Wilma Reparations
    - Spring 2006
    - 127,584 cu. yds.
  - TS/Hurricane Noel Reparations
    - Spring 2008
    - 95,777 cu. yds.
  - Tropical Storm Fay
    - Spring 2009
    - 91,822 cu. yds.
- Mid Reach Sand Fill Rate ('04-'09)
  - 1.9 cy/ft/yr
- Total Sand Cost: \$2.59 Million



## BERM FILL (CONT.)

- 2013 Severity of Erosion
  - For Mid Reach, historical MHW shoreline positions in FDEP database between 1/1978 and 5/2010 were used to determine the average shoreline change rate.
  - Both the Department and the Local sponsor agree that the project area has experienced severe dune erosion. However, the survey data indicates that the shoreline position has been relatively stable.
- Threat to upland structures
  - The 25-year combined total storm tide elevation for the project area is approximately 6.2 feet, NAVD (BSRC, 2010). The length of developed property is approximately 46,280 feet. Based on running the SBEACH model for the 25-year storm conditions, using April 2012 survey profiles and January 2012 aerial photos of the project area, the length of property containing threatened structures is approximately 240 feet.

# MID REACH SAND FILL (MODIFICATIONS TO PERMIT)

- On December 30, 2009, the Department issued Permit No. **0254479-001-JC** to Brevard County authorizing the placement of approximately 900,000 cubic yards of beach-quality material from **two borrow areas (Canaveral Shoals I and II)**
- Of the calculated 900,000 cubic yards of beach fill
  - Approximately 600,000 cubic yards will be hydraulically placed between FDEP reference monuments R-110 to R-118.7, including a 400-foot taper from R-118.3 to R-118.7
  - The remaining 300,000 cubic yards will be temporarily stockpiled and then transferred by truck to the northern 6.2-miles of Mid-Reach, between FDEP reference monuments R-75.4 and R-110.
- Permit modification will be extended until December 30, 2024

# PROPERTY RIGHTS

- [161.141](#) Florida Statutes

# CONTRIBUTIONS TO PRESENTATION

- Sebastian Inlet Surfrider At-Large member: Roger Ross
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