

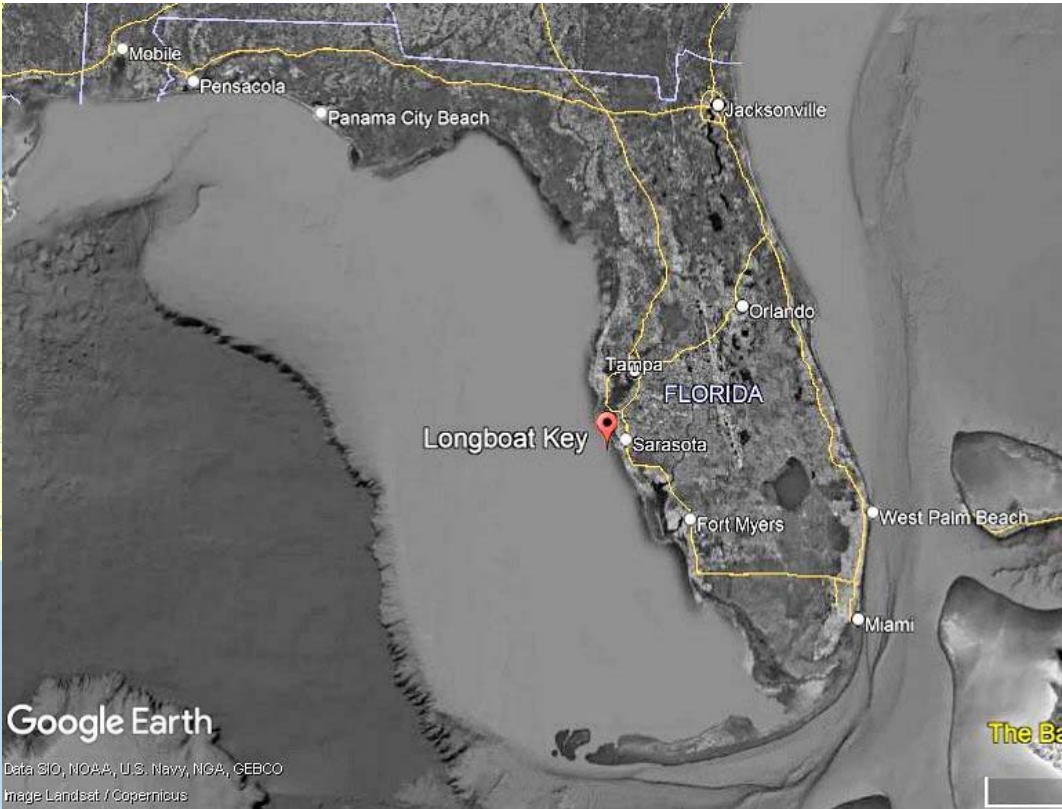
**FSBPA - February 2022**

**Krista Egan, P.E.  
Al Browder, Ph.D., P.E.**



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Coastal Engineering

# **The 2021 Longboat Key Beach Construction Season Part II (The Technical Side)**



# LOCATION



## PROJECT NEED

- Replace sand losses from last 5-15 years
- Stabilize highly erosional northern shoreline



# SCOPE

- 1 M cubic yards of sand
- 3 borrow sources
- 5 shoreline segments
- 5 rock groins
- Dune & mangrove habitat restoration



**Beach Nourishment  
& North End Structural Stabilization**

Passage Key Inlet borrow area

750K cy

4.4 mi shoreline (3 segments)

5 rock groins

Dune & mangrove habitat restoration

**Beach Nourishment**

Longboat Pass borrow area

80K cy

0.5 mi shoreline

**Beach Nourishment**

New Pass borrow area

170K cy

0.7 mi shoreline

Passage Key

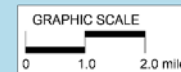
Tampa Bay




Anna Maria Is.

Longboat Key

Sarasota Bay

Lido Key



  <p>Beach Nourishment – Passage Key &amp; Rock Groins</p>	Competitive Bid	<p>\$ 30,982,510.00</p> <p>BEACH \$24.5M</p> <p>GROINS \$6.5M</p>	<p>\$33/CY</p> <p>\$1.3M/groin</p>
 <p>Beach Nourishment – Longboat Pass</p>	Sole Source	\$ 1,346,594.71	\$18/CY
 <p>Beach Nourishment – New Pass</p>	Sole Source	\$ 3,512,260.00	\$20/CY
<b>TOTAL</b>		<b>\$35,841,364.71</b>	

# COST & CONTRACTING

# PASSAGE KEY INLET SAND EXCAVATION & TRANSPORT

Water depths 6 - 25 ft

Option to use rehandling area

Limited dredging area





**30''  
Cutterhead  
dredge**  
*E.W. Ellefsen /  
C.R. McCaskill*

13 September 2021  
olsen associates, inc.

# BEACH NOURISHMENT – Passage Key Inlet





**30''  
Cutterhead  
dredge**  
*E.W. Ellefsen /  
C.R. McCaskill*

**Spider Barge**

# BEACH NOURISHMENT – Passage Key Inlet



**30''  
Cutterhead  
dredge**  
*E.W. Ellefsen /  
C.R. McCaskill*

**Spider Barge**

**Scows (4)**

# BEACH NOURISHMENT – Passage Key Inlet



**30''  
Cutterhead  
dredge**  
*E.W. Ellefsen /  
C.R. McCaskill*

**Spider Barge**

**Scows (4)**

**Unloader**

# BEACH NOURISHMENT – Passage Key Inlet



Volume Dredged **907,500 CY**

Total Loads **268**  
3,400 cy / load

**48 days total**

**18,910 cy/day (avg)**

**38,970 cy/day (max)**

Scow Loads / day **6 (avg)**

**11 (max)**

# BEACH NOURISHMENT – Passage Key Inlet



NORTH

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SOUTH

# BEACH NOURISHMENT – Passage Key Inlet



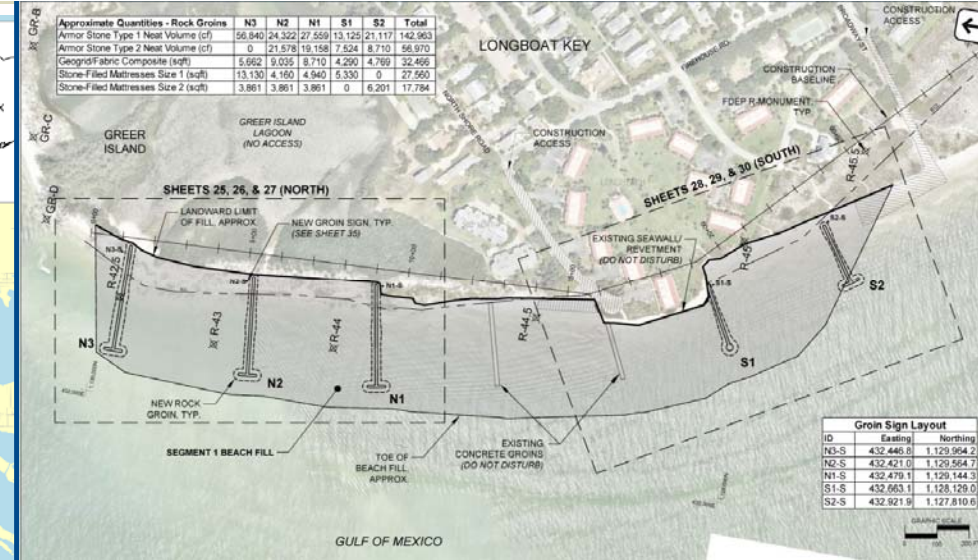
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# ROCK GROINS

## Water-side only

- construction access
- material delivery

Off-site marine mattress assembly



**Armor Stone Limestone**  
18" - 52"

**Stone-Filled Marine**  
**Mattress Foundation**

**Geogrid / fabric composite**



# ROCK GROINS MATERIAL TRANSPORT



## Statewide Materials quarries in Webster & Felda

- armor stone
- marine mattress fill stone



**Total Mattress Fill Stone**  
**1,280 tons**  
**(included in cost of mattresses)**



**Total Armor Stone**  
**10,390 tons**  
**(7,560 cy)**





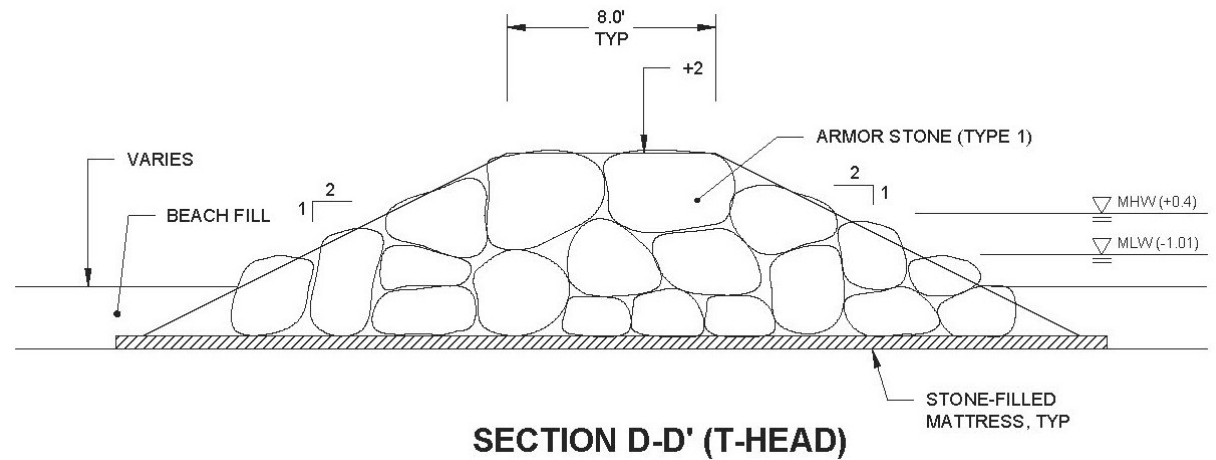
**364 marine mattresses (45,344 sf)  
23K sf geogrid / fabric composite**



**fabrication  
22 per day (avg)  
76 mats (max)**



# Armor stone payment by volume in place



**\*Frequent surveys**



# ROCK GROINS – Order of Work



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**Pre-Project**

**Post-Groin  
Construction**

**Groins +  
Beach Fill**



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**Dead  
vegetation &  
Australian  
pine removal**

# **DUNE & MANGROVE RESTORATION**



**Dead  
vegetation &  
Australian  
pine removal**

**Mangrove  
fringe  
restoration  
1K plants**

# DUNE & MANGROVE RESTORATION



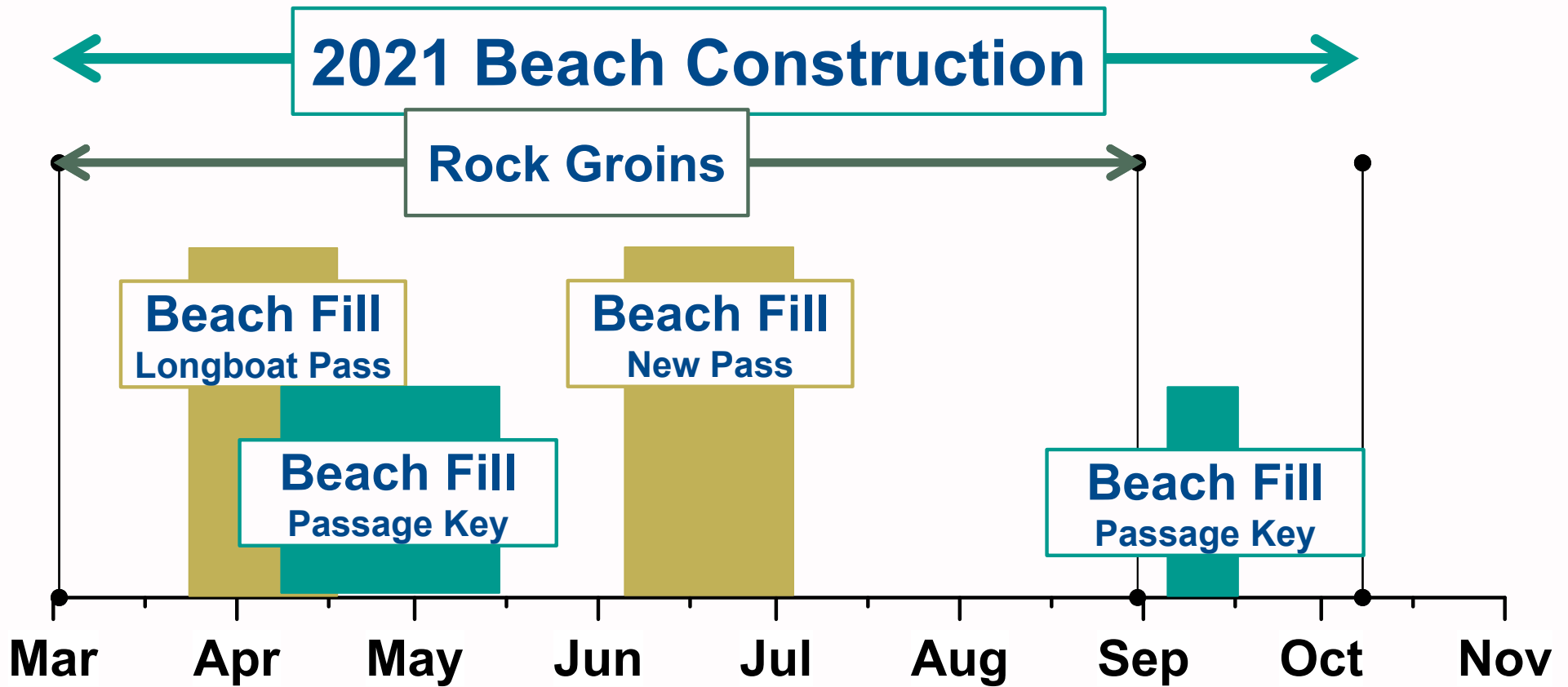
**Dead  
vegetation &  
Australian  
pine removal**

**Mangrove  
fringe  
restoration  
1K plants**

**Dune  
vegetation  
20K plants**

# DUNE & MANGROVE RESTORATION





# SCHEDULE

\*Sea turtle nest monitoring  
Apr 15 – Nov 1

\*Shorebird monitoring  
Feb 15 – Aug 31

# LONGBOAT PASS & NEW PASS SAND EXCAVATION & TRANSPORT





**Volume Dredged 78,500 CY**

**26 days total**

**3,020 cy/day (avg)**

**7,040 cy/day (max)**

## **BEACH NOURISHMENT – Longboat Pass**



**BEFORE**



# BEACH NOURISHMENT – Longboat Pass



**Volume Dredged 190,540 CY**

**29 days total**

**6,570 cy/day (avg)**

**11,420 cy/day (max)**

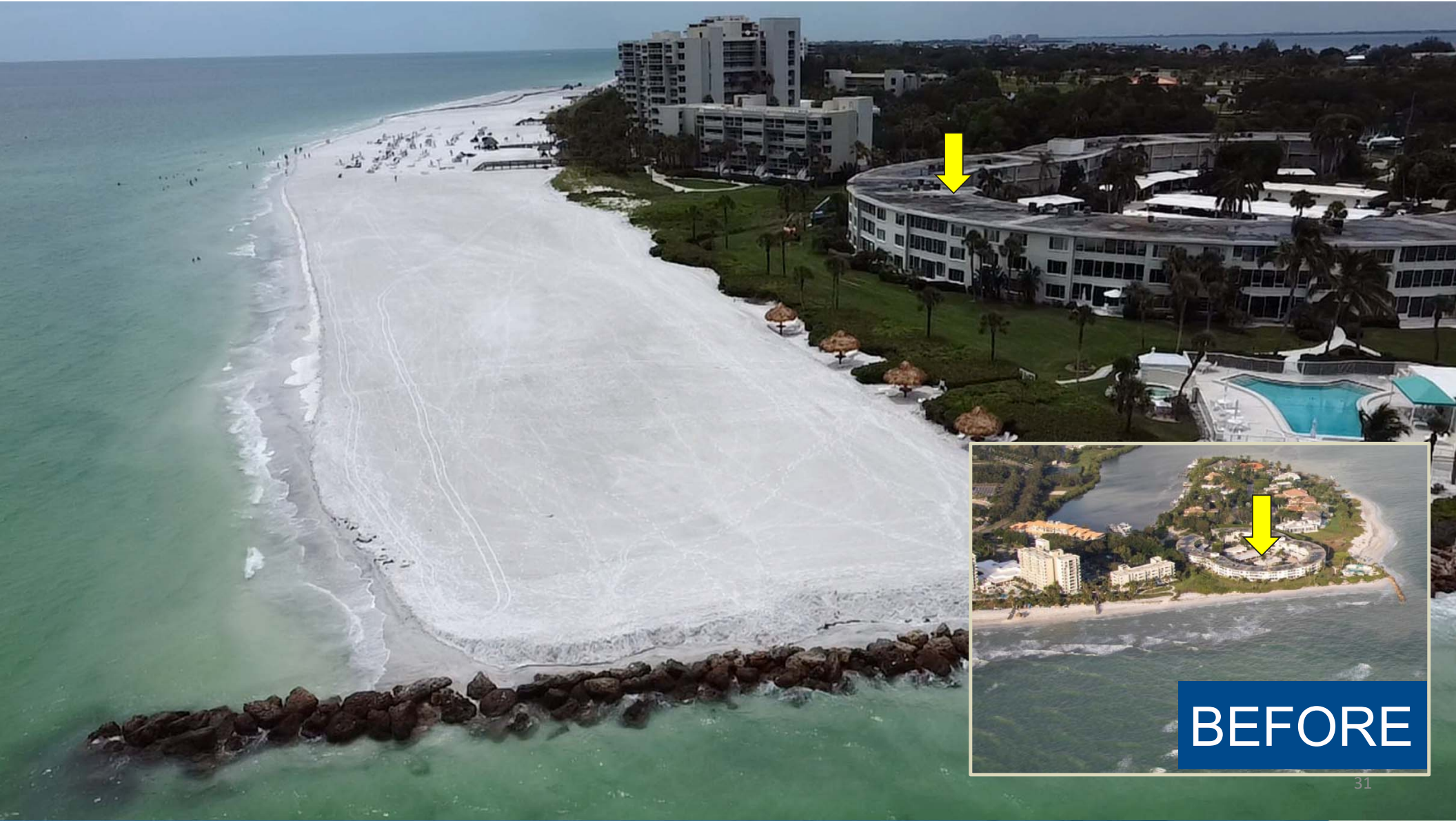
**BEACH NOURISHMENT – New Pass**



# BEACH NOURISHMENT – New Pass



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BEFORE

# TAKEAWAYS

- Design for multiple approaches
- Flexible scheduling
- Coordinate with neighbors
- Early & frequent communication  
w/regulatory & environmental monitors



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**The 2021 Longboat Key  
Beach Construction  
Season Part II  
(The Technical Side)**

**Krista Egan & Al Browder**

Contact: [kegan@olsen-associates.com](mailto:kegan@olsen-associates.com)

**SPONSORS**

- Town of Longboat Key
- FDEP
- FEMA / FLDEM
- Manatee Co.

**ENVIRONMENTAL  
MONITORS**

- Mote Marine Lab
- Steven Sauers  
Environmental  
Management

**PRIME CONTRACTORS**

- Weeks Marine
- Cottrell Contracting

**SUBCONTRACTORS**

- Kelly Brothers
- McKim & Creed
- Hyatt Survey Services
- Statewide Materials
- Earth Balance

**THANK YOU**