HOLDEN BEACH – Recent Beach Projects and Storm Responses

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Figure 39. Photographs of the eastern portion of Holden Beach. A. West view (3/86) of eroding shoreline and houses stranded on recreational beach. Note bulkheads, timber groins and vestiges of seawalls that litter the beach. The eastern portion of Holden Beach shoreline near the inlet has been a chronic erosion zone since the late 1970s. B. West view (11/7/97) of same area in “A” retreat of the shoreline, removal of all but one home and a refurbished dune/dike composed of truck hauled sand. C. Aerial photograph of house on beach and peat exposure. Insert depict dike along road. D. Aerial photograph depicting shoreline and chronic erosion zone. Note the homes fronted by bulkheads and remnants of those destroyed.
27 Structures Lost since 1993

Over 40 structures since 1978 (including farther west)
Nourishment Activity over last 20 years

3 Sections of Beach:
- East End (~1.5 miles)
- Central Reach (~4 miles)
- West End (~3 miles)
Recent Timeline

• **Summer 2016** – Central Reach Project Out to Bid
• **October 2016** - Hurricane Matthew
• **January-March 2017** – Central Reach Project Construction (1.31 MCY)
• **2018** – Hurricane Florence
• **2018** – Hurricane Michael
• **2019** – Hurricane Dorian
• **2020** – Hurricane Isaias

*FEMA Mitigation Involved for All of the Above Storms*
CENTRAL REACH BORROW AREA

- Shallow Cut Depth (Average 3.5 ft)

- Enough Sand for 2 Large Scale Projects
- Average 3.5 ft cut depth
HURRICANE MATTHEW

Dune Sand and Vegetation Loss

Legend
- June2016_Vegetation
- Oct2016_Vegetation

Engineered Beach Total (Stations 40+00 to 280+00)
-131,571

Total (All Stations)
-335,551

Pre-Matthew Aerial (June)
Post-Matthew Aerial (Oct)

Legend

0 250 500 1,000
Feet
2017 Central Reach Project using Offshore Borrow Area
2017 Central Reach Project Dune Plantings and Fencing
2017 LWFIX Project (Not FEMA Eligible)
2017-2020 Hurricanes Affecting HB

2017 – No FEMA Declarations

2018 - Florence

2018 - Michael

2019 - Dorian

2020 - Isaias

Isaias Recap

Isaias Landfall Stats
Monday, Aug 3

Category 1
Max Winds: 85 MPH

Around 11:10 PM ET
Ocean Isle Beach, NC

40 miles southwest of Wilmington, NC

Holden Beach, NC
Depth-of-Closure (DOC)

• Several Equations
• Several Data Sources: Buoy, Gage, Wave Models (WaveWatch, WIS, etc.)
Sand Sources: Upland Truck Haul Projects

- Good for medium sized projects (<200,000 cy)
- Minor mob/demob costs,
- Sand Color typically not as good
- Frequency of events
- Road Wear, DOT, Bond, etc.

200,000 cy @ 15 cy/truck = ~14,000 Truck Trips

**NOURISHMENT BENEFITS**

- Isaias Storm Buffer – Nourishment continues to buffer upland
- NC BIMP found that the estimated annual total impact for Holden Beach was $92.9 million, which accounted for 1,299 jobs. Additionally, the NC BIMP estimated that a 50% beach width loss would result in an estimated $14.6 million loss in output/sales/business activity. The Town’s beach management activities are of critical importance in maintaining and enhancing this important economic and environmental benefit.
October 2020 at the Pier

- April 200 Beach Conditions
- 2016 CRP Placement (Post-Project)
- 2016 Pre-CRP Beach Conditions

Graph showing elevation changes over distance.
Staying Ahead of Long-Term Erosion

2000 to 2020

<table>
<thead>
<tr>
<th>Reach Averages</th>
<th>Stations Included</th>
<th>Historical MHW Change (2000 to 2020) (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>LWF Inlet</td>
<td>5 to 15</td>
<td>+403.0</td>
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<tr>
<td>USACE East</td>
<td>15 to 40</td>
<td>+145.8</td>
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<tr>
<td>Town East</td>
<td>40 to 150</td>
<td>+110.9</td>
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<tr>
<td>Pier</td>
<td>150 to 190</td>
<td>+113.9</td>
</tr>
<tr>
<td>Town West</td>
<td>190 to 290</td>
<td>+116.8</td>
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<td>West Area</td>
<td>290 to 380</td>
<td>-1.2</td>
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<tr>
<td>Shallotte Inlet</td>
<td>380 to 420</td>
<td>+70.9</td>
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<tr>
<td>Central Reach</td>
<td>40 to 290</td>
<td>+112.7</td>
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</tbody>
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Note: view distorted vertically