Land management strategies for a disappearing seashore

North Carolina Beach, Inlet & Waterway Association’s 2020 Annual Conference

David E. Hallac and Michael Flynn
Cape Hatteras National Seashore
National Parks of Eastern N.C.
North Carolina

South Carolina

Virginia Beach

Cape Hatteras
National Seashore
67 miles

Cape Lookout
National Seashore
58 miles

Wright Brothers
National Memorial

Fort Raleigh
National Historic Site

Moores Creek
National Battlefield

National Parks of Eastern North Carolina
Sand Fencing in the 1930s

1936: looking north from Cape Hatteras Lighthouse.

1938: 600 miles of fencing was installed from 1936-1940.
Grass Planting in the 1930s

Planting grass by hand --
141 Million sq. ft.
2.4 Million trees and shrub were planted
You can fight Mother Nature but winning is another matter....

Buxton Inlet - 1962
AERIAL PHOTO OF BORROW PIT  FRAME NO. 529

DATE: 7/12/73  TIME: 1630
TIDE: High 3.8 ft. (1119) WAVES: NE
WAVE HEIGHT: 1.7 ft.
Wildlife habitat
Challenges retaining and recruiting staff
Hatteras to Ocracoke

Data from: the North Carolina Department of Transportation Ferry Division
Challenges associated with erosion are likely to become more significant and complex with SLR.


GLOBAL WARMING AND COASTAL EROSION

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“The relative sea level trend is 5.08 millimeters/year with a 95% confidence interval of +/- 1.16 mm/yr based on monthly mean sea level data from 1977 to 2019 which is equivalent to a change of **1.67 feet in 100 years.**” emphasis added (bold)

From: https://tidesandcurrents.noaa.gov/sltrends/sltrends_station.shtml?id=8652587
Land management strategy

- erosion forecasts and vulnerability analyses of existing resources.

- interim and long-term sediment management efforts for reasonably foreseeable project requests and habitat restoration.

- The future: comprehensive, interagency adaptation plans
Impacts of erosion on land area, vegetation, wildlife habitat, and recreational use at Cape Hatteras
### Preliminary Results: Summary Statistics

<table>
<thead>
<tr>
<th>Location</th>
<th>Shoreline Movement (m)</th>
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</thead>
<tbody>
<tr>
<td>Bodie Island</td>
<td>-44.6</td>
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<tr>
<td>Tri-Villages</td>
<td>-28.9</td>
</tr>
<tr>
<td>Hatteras North</td>
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</tr>
<tr>
<td>Avon</td>
<td>-47.0</td>
</tr>
<tr>
<td>Haulover/Buxton</td>
<td>-24.3</td>
</tr>
<tr>
<td>South Beach</td>
<td>14.8</td>
</tr>
<tr>
<td>Frisco</td>
<td>-29.4</td>
</tr>
<tr>
<td>Hatteras</td>
<td>-29.0</td>
</tr>
<tr>
<td>Ocracoke Island</td>
<td>-19.8</td>
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</tbody>
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Median NSM compared to 2009
Preliminary Results: Change in Area - Seashore

Change in Area compared to 1946/1949

<table>
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<tbody>
<tr>
<td>Bodie Island</td>
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<td>-367</td>
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<td>239</td>
<td>323</td>
<td>368</td>
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<td>-39</td>
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<tr>
<td>Hatteras</td>
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<td>-38</td>
<td>-66</td>
<td>-125</td>
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<tr>
<td>Ocracoke Island</td>
<td>-254</td>
<td>-229</td>
<td>-266</td>
<td>-342</td>
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</tbody>
</table>
Preliminary Results: NSM – Bodie Island
Preliminary Results: NSM – South Beach

South Beach

Shoreline Movement (m)

Station (m)
North to South

Ramp 48
Ramp 49

2017
Preliminary Results: NSM – Hatteras

Shoreline Movement (m) vs. Station (m)
North to South

Ramp 55
Sediment Management Framework and Environmental Impact Statement

The framework is needed to:
• Provide timely response for localized beach nourishment requests as a result of increased storm events and projected sea level rise
• Consider opportunities to restore coastal habitats
Three alternatives: related to requests to issue special use permits.

- Alternative A - No Action
- Alternative B – NPS Preferred Alternative
- Alternative C

https://parkplanning.gov/CAHASediment

Cooperating agencies
The future

- Community engagement
- Interagency planning
- Strategic science and research to inform alternatives

Thank you