Addressing Long-Term Shoreline Management in North and South Carolina

Jim London
London & Associates
and Clemson University
The Loyal Opposition

I'M SOOOOOO COOOOLD TODAY! GLOBAL WARMING IS SUCH BALONEY! ARRRGH!

POOR HAROLD HAS TO WAIT LONGER AND LONGER EVERY YEAR BEFORE HE CAN DO HIS GLOBAL WARMING SCREAM.
That Polar Vortex Thing
SC Beachfront Management Act of 1988

- Established baseline and setback lines based on historical erosion rates,
- Restricted building activity in erosion zones,
- Required Local BMPs to receive state funds, and
- Stated policy with regard to erosional beaches, i.e. strategic retreat policy.

- Challenged in Lucas Case.
SC Blue Ribbon Committee on Shoreline Management (2013)

Recommendation 1: Replace language regarding the policy of retreat with the following: The policy of South Carolina is the preservation of its coastal beachfront and beach/dune system.
Options for Addressing Long-Term Shoreline Change

• Armor the shoreline,
• Stabilize the shoreline, and
• Retreat from the shoreline.
### Change in SC Beachfront Area (in acres)
Since Beachfront Management

<table>
<thead>
<tr>
<th></th>
<th>1987-1999</th>
<th>1999-2006</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Municipal/Resort</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Beaches</td>
<td>1332.6</td>
<td>-429.6</td>
<td>903.1</td>
</tr>
<tr>
<td>Other Beaches</td>
<td>-895.7</td>
<td>-571.4</td>
<td>-1467.1</td>
</tr>
<tr>
<td>Statewide Totals</td>
<td>436.9</td>
<td>-1001.0</td>
<td>-564.1</td>
</tr>
</tbody>
</table>
South Carolina Beach Renourishment Projects

Renourished Beaches

Sources: NOAA, South Carolina's Coast 1999 (Shoreline); Program for the Study of Developed Shorelines; Western Carolina University; DHEC-OCRM; Bill Eiser; USACE

South Carolina Beach Renourishment Summary

<table>
<thead>
<tr>
<th>Volume (cu. yds)</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-Beachfront Management Act</td>
<td>$12,682,919</td>
</tr>
<tr>
<td>Post-Beachfront Management Act</td>
<td>$238,872,962</td>
</tr>
<tr>
<td>Total</td>
<td>$251,555,881</td>
</tr>
</tbody>
</table>
## Beach Nourishment Needs by BIMP Region and Costs by Project Partner

<table>
<thead>
<tr>
<th>Community</th>
<th>Managed Shoreline length</th>
<th>Beach fill volume</th>
<th>Total Cost Per decade</th>
<th>Federal Share millions</th>
<th>State Share millions</th>
<th>Local Share millions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>REGION 1</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ocean Isle Beach</td>
<td>5.6</td>
<td>459,720</td>
<td>$4,445,470</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Holden Beach</td>
<td>8.2</td>
<td>1,897,470</td>
<td>$18,633,120</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oak Island</td>
<td>9.3</td>
<td>745,730</td>
<td>$10,820,520</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Caswell Beach</td>
<td>3.6</td>
<td>440,990</td>
<td>$3,616,150</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bald Head Island</td>
<td>4.5</td>
<td>2,097,304</td>
<td>$17,197,872</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>REGION 2a</strong></td>
<td>17.3</td>
<td>3,886,729</td>
<td>$33,022,839</td>
<td>$18.9</td>
<td>$8.2</td>
<td>$5.9</td>
</tr>
<tr>
<td>Kure Beach</td>
<td>3.4</td>
<td>381,393</td>
<td>$5,137,423</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carolina Beach</td>
<td>2.7</td>
<td>2,428,236</td>
<td>$19,741,556</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wrightsville Beach</td>
<td>4.1</td>
<td>895,610</td>
<td>$6,555,840</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Figure Eight Island</td>
<td>5.1</td>
<td>181,490</td>
<td>$1,588,020</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>REGION 2b</strong></td>
<td>22.3</td>
<td>2,370,627</td>
<td>$24,655,778</td>
<td>$11.0</td>
<td>$6.4</td>
<td>$7.2</td>
</tr>
<tr>
<td>Topsail Beach</td>
<td>5.1</td>
<td>604,070</td>
<td>$4,911,050</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Surf City</td>
<td>6.1</td>
<td>623,770</td>
<td>$8,202,570</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>North Topsail Beach</td>
<td>11.1</td>
<td>1,142,787</td>
<td>$11,542,158</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>REGION 2c</strong></td>
<td>23.8</td>
<td>3,773,368</td>
<td>$48,052,803</td>
<td>$38.4</td>
<td>$7.2</td>
<td>$2.5</td>
</tr>
<tr>
<td>Emerald Isle</td>
<td>10.3</td>
<td>981,968</td>
<td>$13,747,573</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indian Beach / Salter Path</td>
<td>2.6</td>
<td>353,780</td>
<td>$4,952,970</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pine Knoll Shores</td>
<td>4.8</td>
<td>545,000</td>
<td>$7,771,740</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Atlantic Beach (includes Ft. Macon)</td>
<td>6.1</td>
<td>1,892,620</td>
<td>$21,580,520</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>REGION 4b</strong></td>
<td>19.6</td>
<td>2,745,080</td>
<td>$30,694,980</td>
<td>$15.3</td>
<td>$8.0</td>
<td>$7.4</td>
</tr>
<tr>
<td>Nags Head</td>
<td>11.3</td>
<td>1,859,230</td>
<td>$21,325,380</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kill Devil Hills</td>
<td>4.8</td>
<td>327,520</td>
<td>$3,579,760</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kitty Hawk</td>
<td>3.5</td>
<td>558,330</td>
<td>$5,789,840</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>TOTAL (all regions)</strong></td>
<td><strong>112.2</strong></td>
<td><strong>18,417,018</strong></td>
<td><strong>$191,139,532</strong></td>
<td><strong>$113.0</strong></td>
<td><strong>$44.0</strong></td>
<td><strong>$34.1</strong></td>
</tr>
<tr>
<td>Total per/yr Avg.</td>
<td></td>
<td>1,841,702</td>
<td><strong>$19,113,953.2</strong></td>
<td><strong>$11.3</strong></td>
<td><strong>$4.4</strong></td>
<td><strong>$3.4</strong></td>
</tr>
<tr>
<td>State</td>
<td>Federal Share</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-------------------</td>
<td>---------------</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>South Carolina</td>
<td>35.5%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>North Carolina</td>
<td>59.1%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Changes Likely to Affect Shoreline Stabilization Efforts

• Accelerated Sea Level Rise,
  – Frequency/Scale of Renovation Cycles,
  – Increased per Unit Costs,

• Environmental Constraints,
  – Sand Availability,
  – Habitat Issues,

• Long-Range Funding Sources,
  – Civil Works Appropriations – Folly Beach,
  – Emergency Funding Allocations – Superstorm Sandy.
Should taxpayers continue to fund beach renourishment efforts?

- Yes: 27%
- No: 67%
- No strong opinion: 6%

Source: Charleston Post and Courier Newspaper
New York Rising Buyout & Acquisition Program

- Program established following Superstorm Sandy, Hurricane Irene and Tropical Storm Lee.
- Establishes enhanced buyout areas w/ purchases at 100% of pre-storm market value + available incentives (5&10% offered).
- Outside enhanced area, post-storm market value + resettlement incentive up to max btwn pre- and post-storm value.
- Initial Target areas:
  - Ocean Breeze, Staten Island
  - Oakwood Beach, Staten Island
  - Graham Beach, Staten Island
  - Suffolk County, Long Island.
Recent Studies of the Economic Impact of Sea Level Rise

Assessment of Property Loss

- Sea level rise scenarios
- Time frame of assessment
- Variability in property listings at county level
- Partial or full property loss accounting
- Storm events: timing, flood and wind damage
- Discounting of future losses
Sea-Level Rise

The Impacts and Economic Costs of Sea-Level Rise on Coastal Zones in the EU and the Costs and Benefits of Adaptation

Summary of Sector Results from the ClimateCost project, funded by the European Community’s Seventh Framework Programme

Sally Brown, Robert Nicholls, Athanasios Vafeidis, Jochen Hinkel and Paul Watkiss
EU Assessment System

- Vulnerability assessment based on sea level rise and storm surge,
- Projected damages under alternative SLR scenarios,
- Adaptation costs for interventions, and
- Benefit-Cost Ratios for Damage and Adaptation Costs.
NC Beach & Inlet Management Plan (2011)

• Stems from 2000 legislation requiring DENR to develop a state management and restoration strategy that could be used for local government planning purposes.

• First statewide compilation of data and issues related to managing North Carolina beaches and inlets.
NC BIMP Recommendations

• Establish dedicated state fund to address shoreline management issues along with funding criteria.

• Work with local entities to establish local funds along lines of those in New Hanover and Carteret Counties.

• Promote regional management.
Cost Share in North Carolina for Federal and Non-Federal Projects

- Federal 65%
- State 26.25%
- Local 8.75%
- State 30%
- Local 70%
Benefits Associated with a Stable Beach System

• Non-Market Benefits – public beach, natural systems, habitat.

• Market Benefits – tourism and property value.
Who Should Pay?

Capture Benefit Stream:

• Tourists
  – Accommodation Tax Revenues
  – Hospitality Taxes, Sales Taxes

• Local Property Owners
  – Property Tax
  – Special Tax District
Other State Examples

Florida
• State contributions of $37m in FY14, $105m over next five years.
• Local Gov’ts – Municipal services benefit units, bed taxes, general fund.

Texas
• $62m in state funds over last decade, oil spill fund.
• Local Gov’ts – not less than 25% local match, generally use property taxes.
SC Blue Ribbon Committee

Recommendation 12: Establish a dedicated funding source to adequately and reliably fund the Beach Restoration and Improvement Trust Fund and expand the purpose, appropriations, and designation of funds to include additional beach management options.

Does not address local funding mechanisms – should be part of local BMPs.
Advantages of Dedicated Funding Framework

• Adopts long-range rather than ad hoc approach to funding shoreline management.
• Identifies appropriate funding source(s).
• Provides predictability/transparency.
• Sends the right signals – skin in the game.
Retreat as Long-Term Approach

• Institutionally prescribed retreat has had limited impact as retreat continues to be option of last resort.
• Physical change and economic reality will be the drivers that move the conversation.
• Stabilization will be utilized where economically viable/politically feasible.
• The proper mix between stabilization and retreat will require a framework that assesses full costs and rewards responsible actions.
Questions?