Coastal Resilience in Beaufort County

Working Collaboratively to Integrate Climate Science into Planning

2021 SCAPA Fall Conference
Resilience Planning through 2015

- 2015 Beaufort County Sea Level Rise Action Plan developed by S.C. Sea Grant Consortium and the Carolinas Integrated Sciences and Assessments.
- Action Plan was incorporated into County’s Comprehensive Plan and Hazard Mitigation Plan.
- Introduced sea level rise and climate change into the public forum.
Current Resilience Planning Efforts

- In 2019, the county convened the Beaufort County Sea Level Rise Task Force made up of county and municipal staff, local environmental experts, as well as members of the development community.
- Process facilitated by SC Sea Grant Consortium
- Conducted a series of exercises identifying local impacts of sea level rise and identified actions local communities can take.
Resilience Solutions: Awareness

**DEFINITION.** Effectively communicating to and educating all relevant parties, facilitating conversations about applying science to decision-making, and providing opportunities for conversations about next steps.

**STRATEGY**  Collaboration: Work collaboratively to encourage communication and joint activities among government agencies and the private sector to increase the region’s capacity to adapt to sea level rise.

**MEASURES OF SUCCESS.** Coordination between all stakeholders and jurisdictions have put everyone on the same page. Our residents and stakeholders recognize what is at stake and support our efforts.

**ACTIONS**

- **Maintain** an ongoing, collaborative working group called the Coastal Resilience Working Group (CRWG) made up of county and municipal staff, environmental experts, and members of the development community tasked with assessing issues and ideas related to sea level rise and resilience.

- **Identify** the sea level rise and climate change scenarios, based on the National Climate Assessment and other science-based documents, to use for planning purposes that can be incorporated throughout county policy and comprehensive planning. Use it to update the SLR Action Plan on an ongoing basis.

- **Work** collaboratively with municipalities to develop science-based decision-points that inform future policy changes and actions.

- **Apply** for a grant to work with the University of South Carolina, College of Charleston, the Carolina Integrated Sciences & Assessments, DNR, and the SC Sea Grant Consortium on conducting research that can inform the decision-point development process.

**HIGH PRIORITY**

**LOW EFFORT**
Resilience Solutions: Study

DEFINITION. Gathering scientific data and stakeholder information to support decision-making and developing plans that identify future policies and strategies that improve Beaufort County’s long-term resilience.

STRATEGY

Identify Critical Infrastructure: Define what counts as critical infrastructure for sea level rise planning in public, private, and quasi-public areas. Identify locations and any existing coordination between public and private entities for maintaining or upgrading critical infrastructure to meet future conditions.

HIGH PRIORITY

LOW EFFORT

MEASURES OF SUCCESS. Data and information collection that supports development of effective and appropriate policies and strategies. Development of a framework for moving forward with resilience actions. Identification and development of preliminary policies and strategies.

ACTIONS

Map and analyze locations of existing vulnerable critical infrastructure and examine with projected future conditions. This includes developing an inventory of low-lying public facilities and infrastructure, including roads, sewer, water, public buildings, and stormwater infrastructure.

Develop a strategy to retrofit the most vulnerable existing critical infrastructure facilities.

Work with EMD and other local government officials to develop a risk rating system for existing critical facilities and roads.

Evaluate whether facilities most at risk should be relocated in full or mitigated on existing sites.
Resilience Solutions: Action

DEFINITION. Beaufort County and related jurisdictions are adopting and implementing the policies and strategies identified in the plan stage.

STRATEGY Building Higher and More Resilient: Establish policies to address the FEMA Flood Insurance Rate Map’s reduction in Base Flood Elevations (BFE).

MEASURES OF SUCCESS. Implementation of various policies and protocols that improve Beaufort County’s long-term resilience. Buildings are higher and safer. Infrastructure is being made more resilient. Resilience is being put into action.

HIGH PRIORITY

HIGH EFFORT

ACTIONS

- Adopt a minimum of three (3) feet of freeboard above BFE to compensate for the reduction in BFE and to account for projected sea level rise. This number is based on the 3-foot maximum freeboard FEMA incentivizes with lower flood insurance premiums plus an additional foot to account for future conditions.

- Adopt a Design Flood Elevation (DFE) consisting of Base Flood Elevation (BFE) plus freeboard adopted by the local community. Require new construction to adhere to the DFE requirements regardless of whether the property is located in Zone AE.

- Revisit these policies periodically based on emerging scientific evidence and changing conditions in the future.
Resilience Solutions: Reassess

**DEFINITION.** Checking in to see if the policies and strategies are working as intended. Continuously examining scientific data that informs ongoing work under the Awareness, Study, and Action stages.

**STRATEGY**  
Assess Current Codes and Programs: Examine and analyze existing codes and programs that have been implemented to meet the goals of identified sea level rise planning.

**MEASURES OF SUCCESS.** Policies and practices are continually updated with the most recent scientific data for informing effective resilient actions. Periodic assessment of the outcomes of what’s been implemented. Plans that are revised as a result of reassessments.

**HIGH PRIORITY**

**HIGH EFFORT**

**ACTIONS**

- **Monitor** and update policies and practices based on ongoing collection or study of tide levels, ground water volume and salinity, and rainfall.

- **Reassess** criteria for when the County intervenes, either through policy or funding regarding flooding and sea level rise impacts to public, quasi-public, and private infrastructure and individual properties to ensure equitable and proportional responses.

- **Monitor** the application of the Southern Lowcountry Stormwater Ordinance and Design Manual and make necessary adjustments to the manual as revealed by new development and available science.

- **Update** the Coastal Resilience Overlay and policies that address how vulnerable critical infrastructure facilities are retrofitted and that require the design and location of future capital improvements and critical infrastructure to account for projected sea level rise and lifespan of the structure.
Lessons Learned

- Don’t go it alone - Resources are available – SC Sea Grant, CISA, local experts and advocates.
- Present facts and data
- Articulate coastal flooding as compounded nuisances rather than catastrophe
- Build on existing toolbox
Increasing Flood Days

Total number of flood days at Ft. Pulaski gauge

Source: NOAA NOS, SC Sea Grant, SCDHEC/MyCoast
2018 November King Tides

Photo: SCDHEC/MyCoast – Patricia Snow
Impact of Sea Level Rise: Nuisance vs. Catastrophe

- Minor Coastal flooding is becoming more noticeable and widespread
- Examples of Nuisances:
  - Overwhelmed stormwater drainage capacity
  - Frequent road closures
  - General deterioration of infrastructure due to inundation of salt water exposure
- Compounded nuisances can lead to tragic events
Creeping impacts of low level coastal flooding

<table>
<thead>
<tr>
<th>Flooding Depth</th>
<th>Impacts</th>
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<tbody>
<tr>
<td>4-6 inches</td>
<td>Pedestrians impaired</td>
</tr>
<tr>
<td>6-12 inches</td>
<td>Roads become impassable for cars</td>
</tr>
<tr>
<td>12-24 inches</td>
<td>Roads become impassable for trucks and SUVs</td>
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<tr>
<td>24-36 inches</td>
<td>Roads become impassable for EMS and special vehicles</td>
</tr>
<tr>
<td>Over 36 inches</td>
<td>Specialized rescue equipment impeded</td>
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<tr>
<td>High Water Event</td>
<td>Frequency</td>
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<td>----------------------------------</td>
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<tr>
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<td>2 times a month</td>
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Coastal Resiliency Toolbox

- River Buffers
- On-site stormwater infiltration (LID)
- Open Space preservation
- Stormwater volume controls
- Wetland preservation
- Limits on dirt fill in low-lying areas
- Required disclosure of low-lying properties
- Additional Restrictions on low-lying property
- Policies governing location of critical facilities/infrastructure
- Etc.
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Next Steps

- Adoption of Envision Beaufort County (Comprehensive Plan) with prominent resilience theme
- Installation of local tide gages through ASBPA Coastal Communities Water Level Observing System
- Studying and monitoring impacts of sea level rise on groundwater via NOAA grant
- EPA – Sustainable Communities Program – assessment of unique challenges of sea level rise on the Gullah/Geechee community