

Flood Mitigation and Sea Level Rise Adaptation for Kiawah Island, SC

A Report

prepared by the

Flood Mitigation and Sea Level Rise
Subcommittee of the Town of Kiawah Island's
Environmental Committee



Town of Kiawah Island Vision Statement: (2015 Comprehensive Plan)

“The Town of Kiawah Island is a residential community incorporating a world-class resort and a unique, vibrant shopping village within a natural maritime setting that is being preserved and enhanced for current and future generations.”



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This report is a key-step to fulfill the Vision in light of developing environmental challenges.



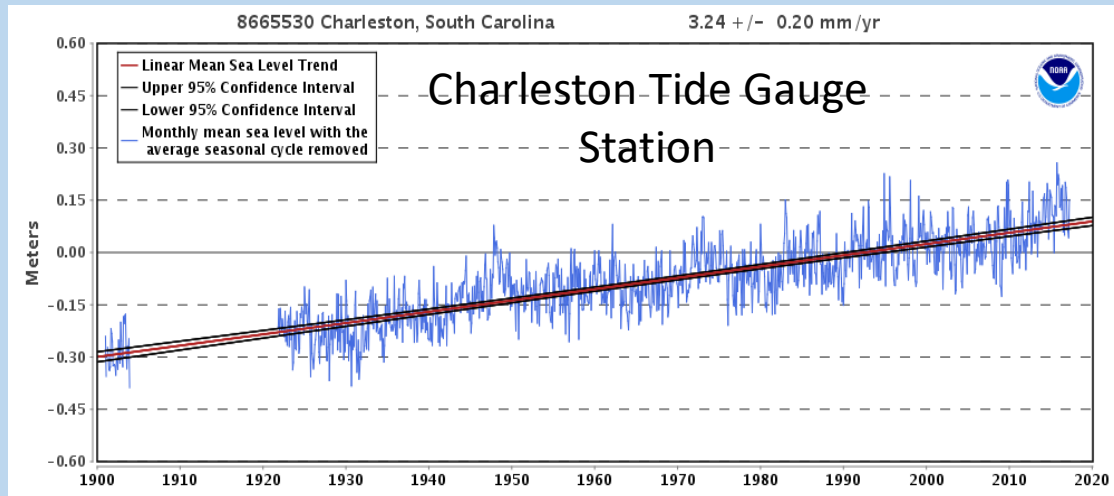
- **February 2017:** The **Town's Environmental Committee** authorized a **subcommittee** to study the impacts of sea level rise.
- Added **community members** and **professionals** from KICA and the ARB.
- In light of recent storm experience, the subcommittee added **flooding** beyond the immediate effects of sea level rise to our focus.



- **Discussions** with other communities - Charleston City, Beaufort County, Folly Beach, Seabrook Island.
- Worked with **professionals** from the Town, KICA, ARB, Kiawah Island Utility, Berkeley Electric, local prominent architects, Coastal Science & Engineering.
- Consulted **experts** from SC Sea Grant, College of Charleston, SCDNR, SCDHEC-OCRM, NOAA
- Studied many **scientific and technical reports** on environmental change.

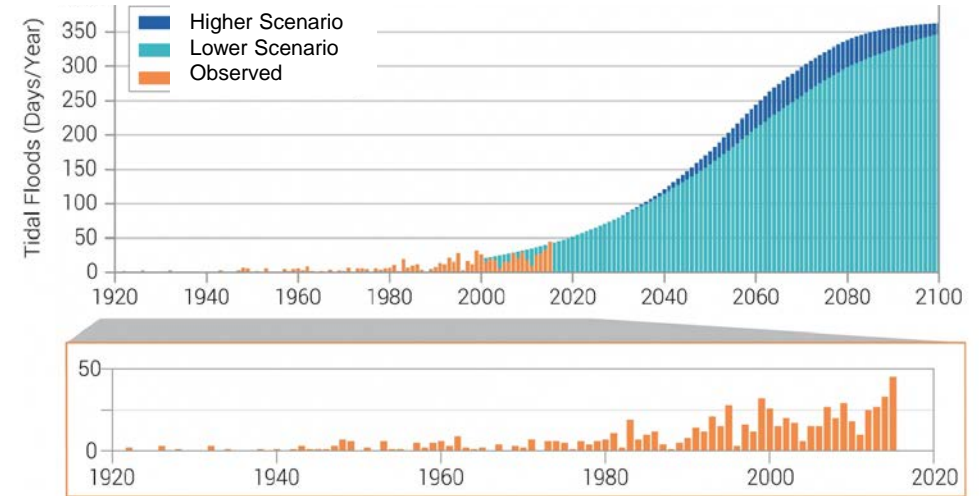


Environmental Change is Upon Us

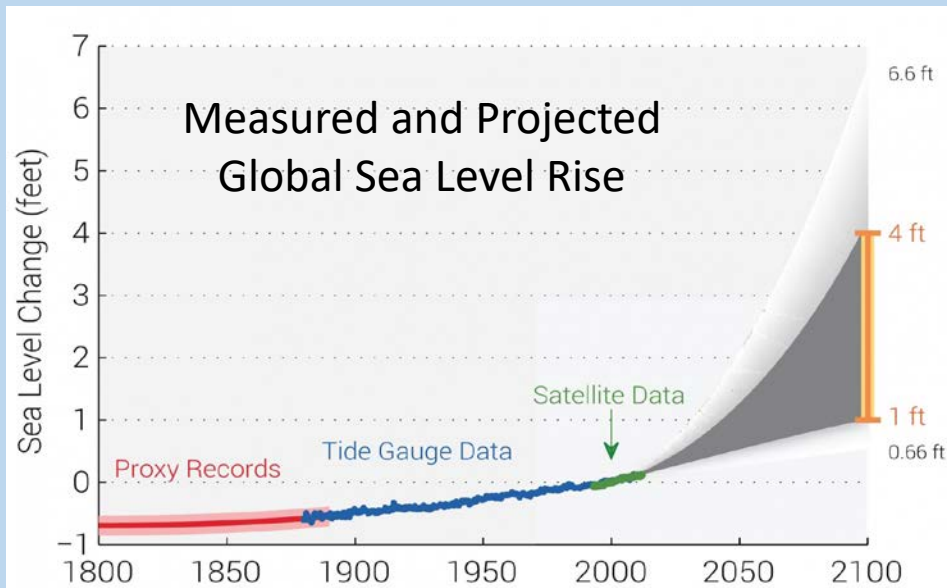


(NOAA-Tides and Currents, 2017)

Charleston Observed and Projected Tidal Floods



(Melillo et al., 2014)



(Parris et al., 2012)



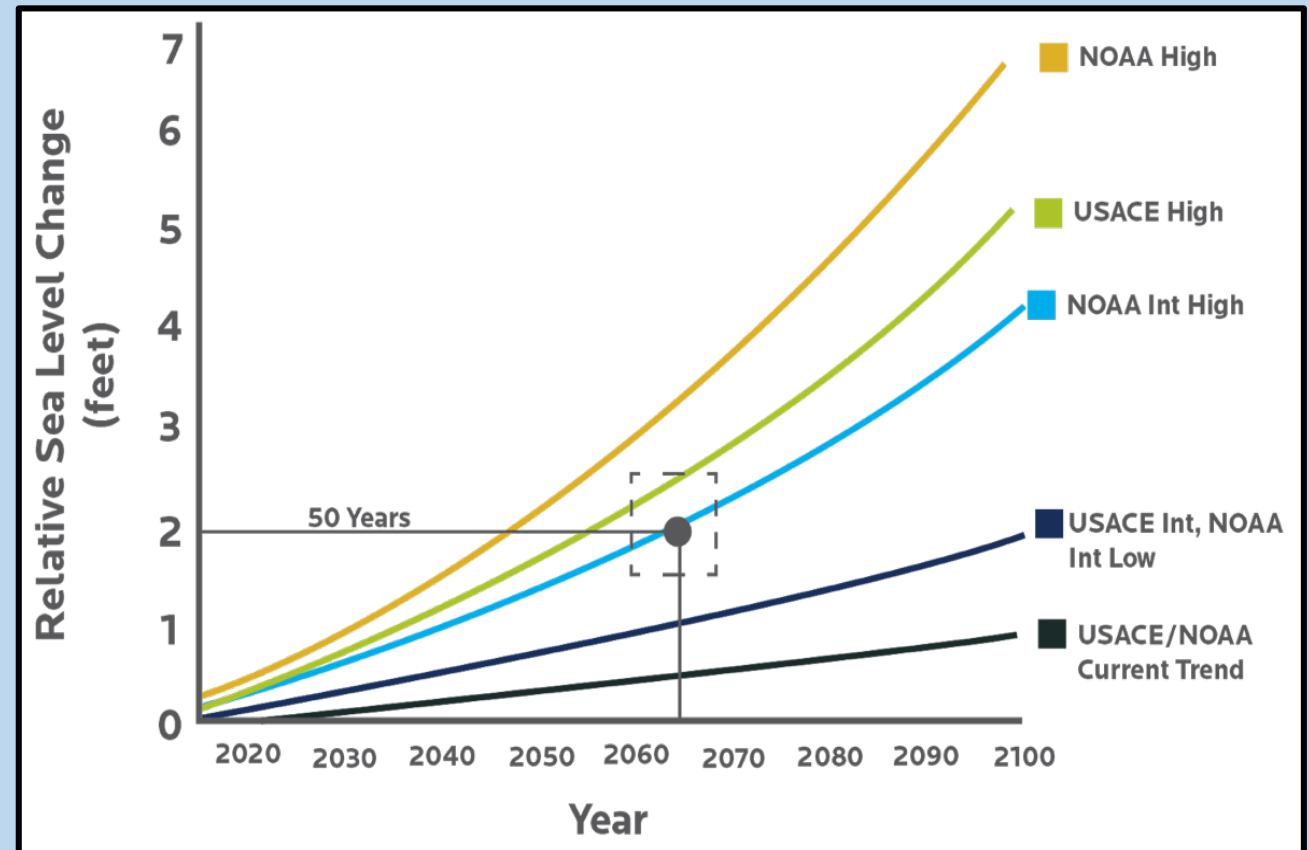
STRUCTURE OF THE REPORT

- Introduction
- Executive Summary
- Background Information
 - Sea Level Rise drivers, trends, projections
 - Committee decisions on report organization, projections, elevation references
- Assessments, Concerns, and Recommendations
- A Path Forward
- Appendices
 - Definitions, Experts consulted, References cited, Subcommittee members
 - Kiawah Island inundation maps – College of Charleston
 - Weather trends and projections
 - Elevation measurements
 - Supplemental information about Kiawah stormwater management



CHOICE OF SEA LEVEL RISE PROJECTION

- Focused on an **intermediate-high scenario** of sea level rise.
 - historical relationship between temperature and ice loss
 - assumes moderate ice loss
- Recognize uncertainty
- 30 – 50 years
- 1.5 – 2.5 feet
- Same scenario used by Charleston
- Should be reviewed every four years based on new data and adjusted as necessary.



(Marcy and Jackson, 2016; Williams and Cabiness, 2017)



SCOPE OF THE REPORT

1. Precipitation-induced Flooding

2. Tidal (Nuisance) Flooding

3. Storm Surge



+ Combinations of these

4. Sea Level Rise

- Challenge in its own right
- Exacerbates all the others
 - Tides and surges start from higher baseline.
 - Precipitation stormwater drains more slowly.



AREAS OF INVESTIGATION

- Stormwater and Nuisance Flooding Management
- Roads Infrastructure
- Emergency Management
- Potable Water and Wastewater Management
- Electricity Service
- Flooding Adaptations for Residential Structures
- Landscaping Adaptations
- Rules and Regulations
- Beach Environment
- Salt Marsh Environment
- Terrestrial Ecosystems and Groundwater
- Education for Sea Level Rise Adaptation



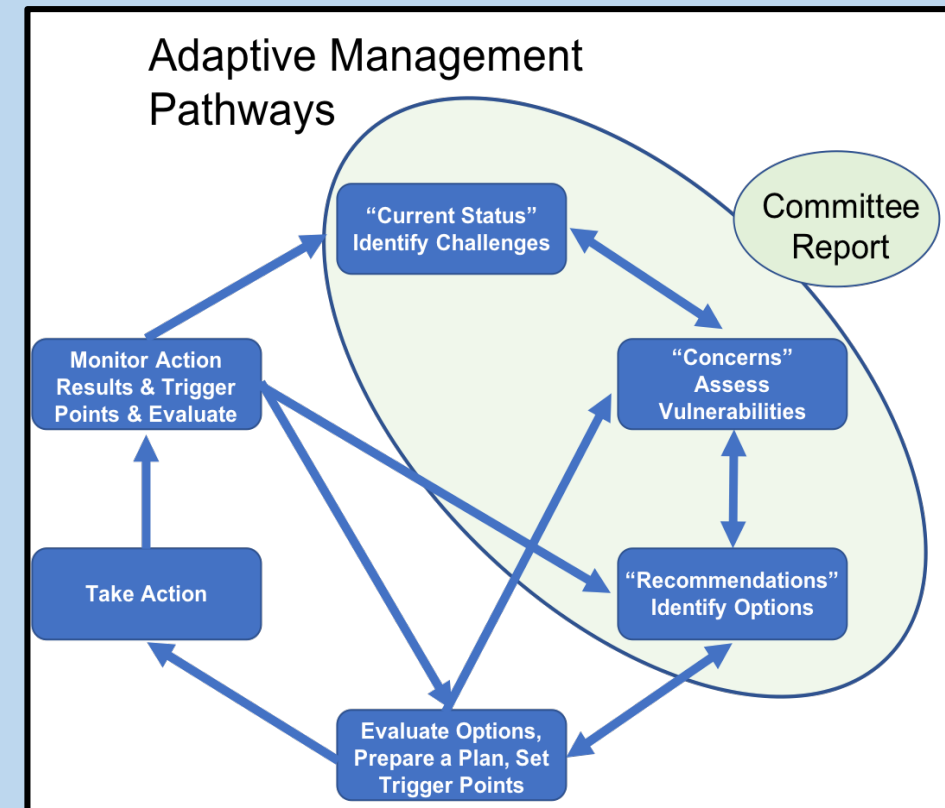
TOPIC ORGANIZATION

- Significance (importance for quality of life)
- Current Status on Kiawah (descriptive)
- Concerns (potential vulnerabilities)
- Recommendations (140 total)
- Responsibilities and Partners (e.g. Town, KICA, ARB, Conservancy, Resort, Individual Property Owners)
- Recommended Readings/Additional Information



A PATH FORWARD

- Rates and magnitude of environmental change are uncertain.
- Some issues require immediate action, while others should wait.
- Recommend an “Adaptive Management Pathways” approach.
 - Establish Thresholds and Trigger Points
 - Take action
 - Review regularly
 - Revise and readjust
- Establish permanent commitment and structure focused on adaptation!
- Cooperation among all Kiawah entities!
- Collaboration with others beyond Kiawah!



(Modified from CoastAdapt, 2017)



Report does not sugar-coat challenges faced by all coastal communities.

Kiawah Island is in an enviable position:

- Healthy beach & marsh ➡ some storm protection.
- Small, relatively homogeneous community ➡ flexibility to act.
- Broad base of experience and expertise } ➡ ability to solve tough problems.
- Financial resources }
- Governing structure is an asset
 - HOA (KICA) can take actions a municipality cannot.
 - The Town has responsibilities and authorities that an HOA does not.



OPPORTUNITY!

- Capitalize on our assets, tackle the challenges, work vigorously and openly.
- Goal: Make Kiawah the best adapted and most resilient coastal community on the East Coast.
 - Remain the premier residential-resort destination.
 - Leader among all coastal communities in adapting to environmental changes.
 - Ensure our stability and vitality for decades to come.

..... If we choose to embrace the challenge.







It is our hope that this report will be useful and provide a platform for moving forward to successfully address the challenges we face. Our committee members are unanimous in the belief that, by working together, we can address our challenges in a sensible, affordable way, and maintain the beautiful, functional island that we love.



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