

Charleston County Multi-Hazard Vulnerability Assessment

County Council Meeting

October 10, 2024

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Project Approach

- **Coordination with Chief Resilience Officer**
- **Workshops (8 in person - 7 virtual)**
 - County Staff and Input
 - Community Focus Group
 - Department Heads
- **Council & Committee Updates**
 - **Resilience & Sustainability Advisory Committee**
 - **County Council**
- **Staff Training**
- **Final Report & Brief**



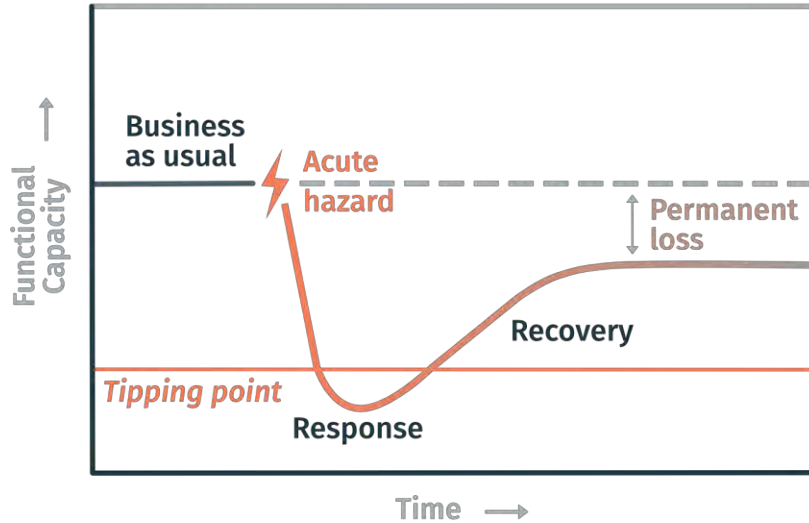
Steps to Resilience

- From the US Climate Resilience Toolkit (NOAA)
- Applied in State, regional, county, municipal planning
- Risk assessment and management framework
- Supported by resources and decision support tools

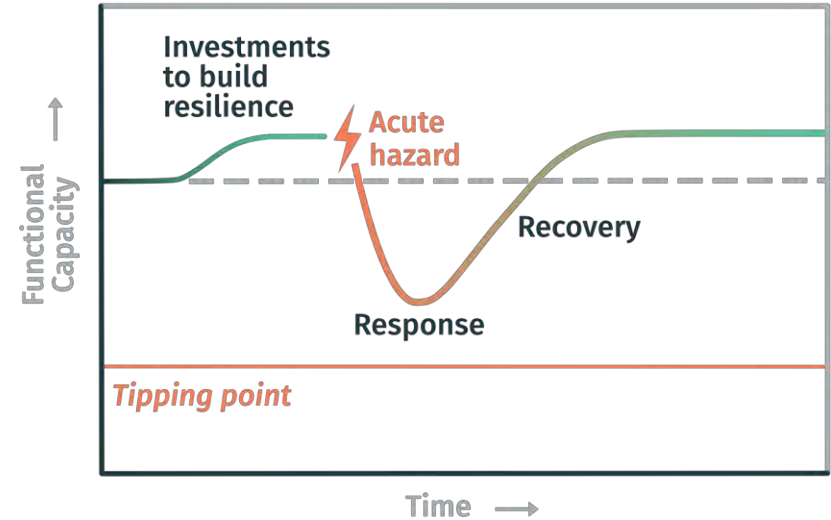


What is Climate Resilience?

Less Resilient

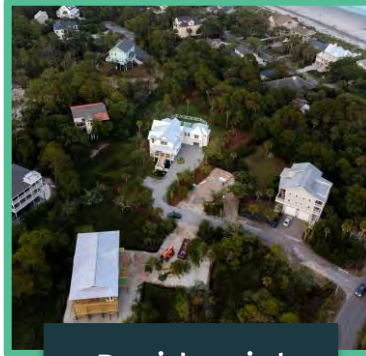


More Resilient

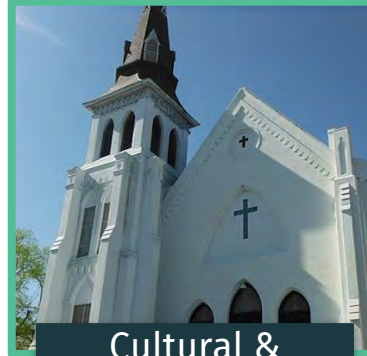


People & Community Assets

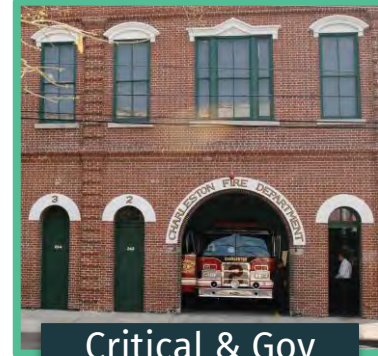
Assets are the tangible things and intangible things people or communities need and value. This includes people, resources, ecosystems, infrastructure, and services.



Residential



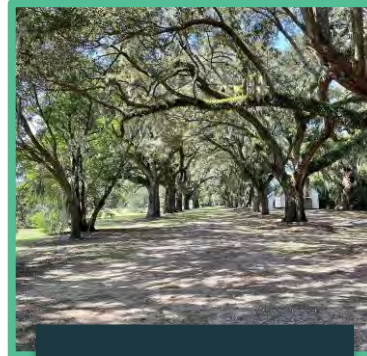
Cultural & Community



Critical & Gov
Owned



Industrial



Open Space



Commercial

Hazards

Events or conditions that may cause injury, illness, or death to people or damage assets.



**Current and Future
Flooding**
(Tidal, Coastal Surge,
Riverine, Stormwater)



**Extreme
Heat**



Wildfire



Earthquake



High Winds

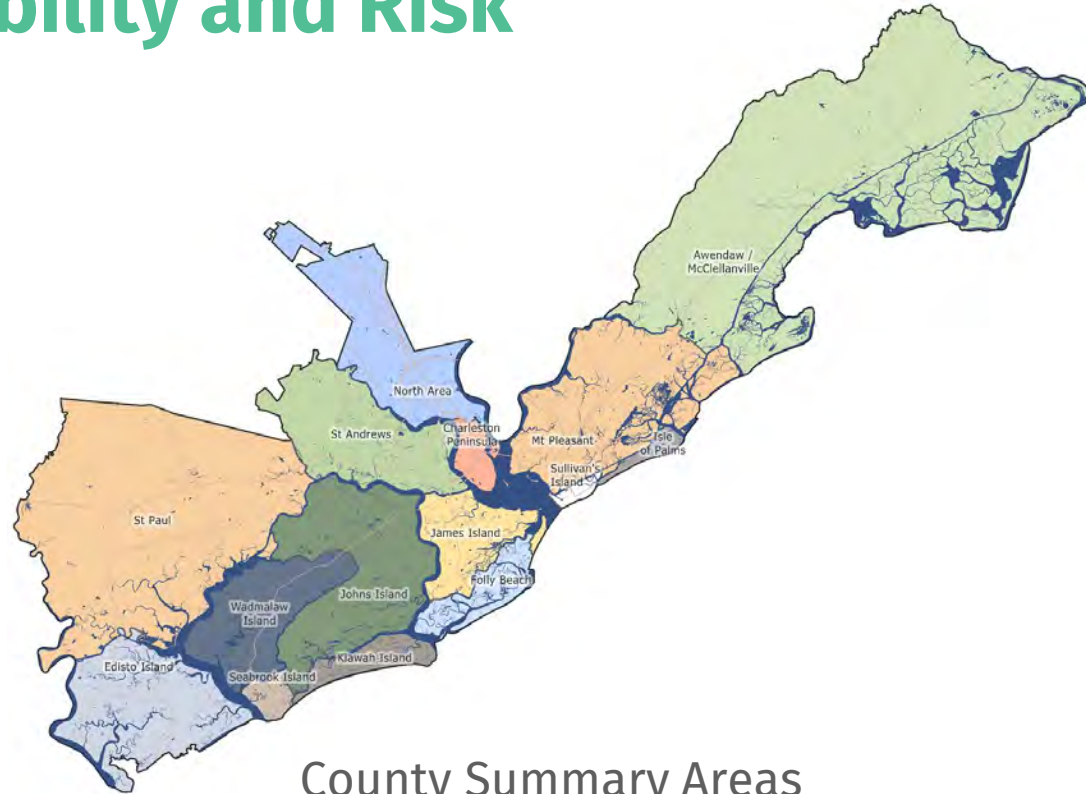
Flood data sources include: USGS, FEMA, NOAA, Woodwell Research Center)



All three homes are **exposed** to flooding,
but their level of **vulnerability** varies.

Quantified Vulnerability and Risk

- Report provides vulnerability and risk data and a summary of findings
- County-wide for all hazards and community assets
- 15 individual planning area summaries



County Summary Areas

Multi-hazard Findings

- More than 35,000 properties are vulnerable to high wind due to structures constructed before wind-design requirements
- More than 5,000 properties are in zones susceptible to earthquake. About half of these were constructed before the 1886 earthquake.
- About 18,000 properties are vulnerable to potential for wildfire
- Many community assets have multi-hazard vulnerabilities (especially for flooding, wind, earthquake)
- Road access is a critical vulnerability for flooding and wildfire
- The 20-yr flood vulnerability is close to that of the 100-yr flood vulnerability

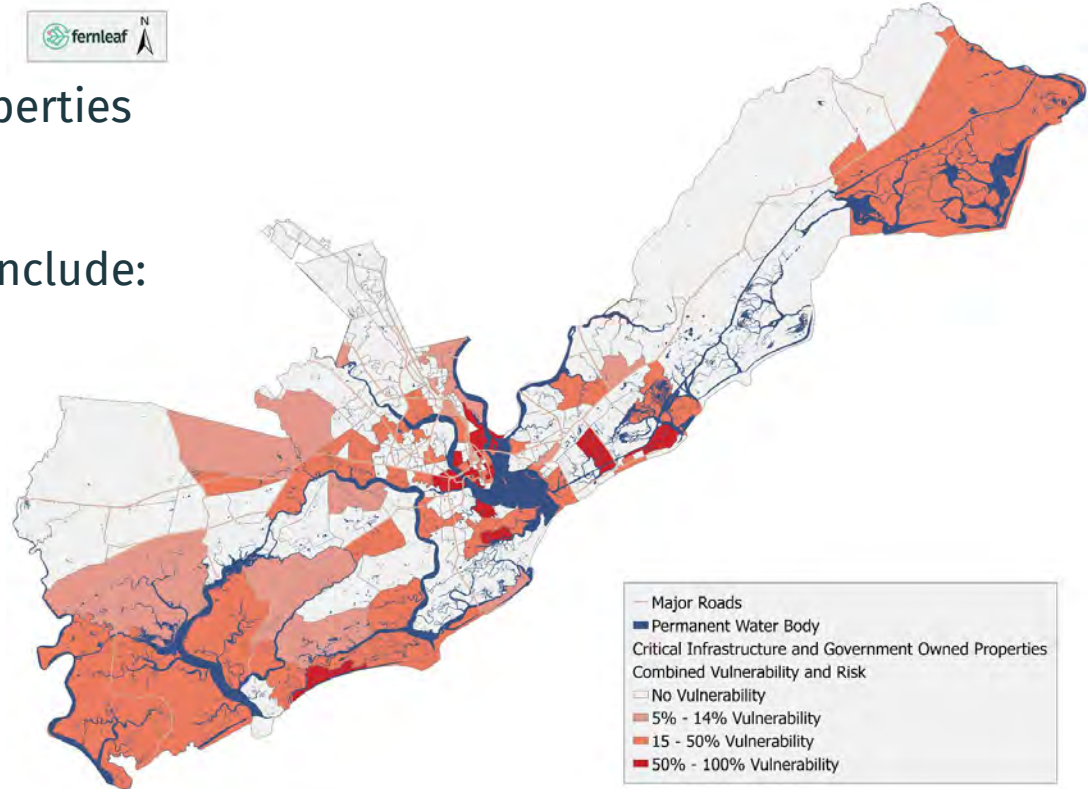
Assessment: Critical Infrastructure & 20-yr Flooding (USGS)



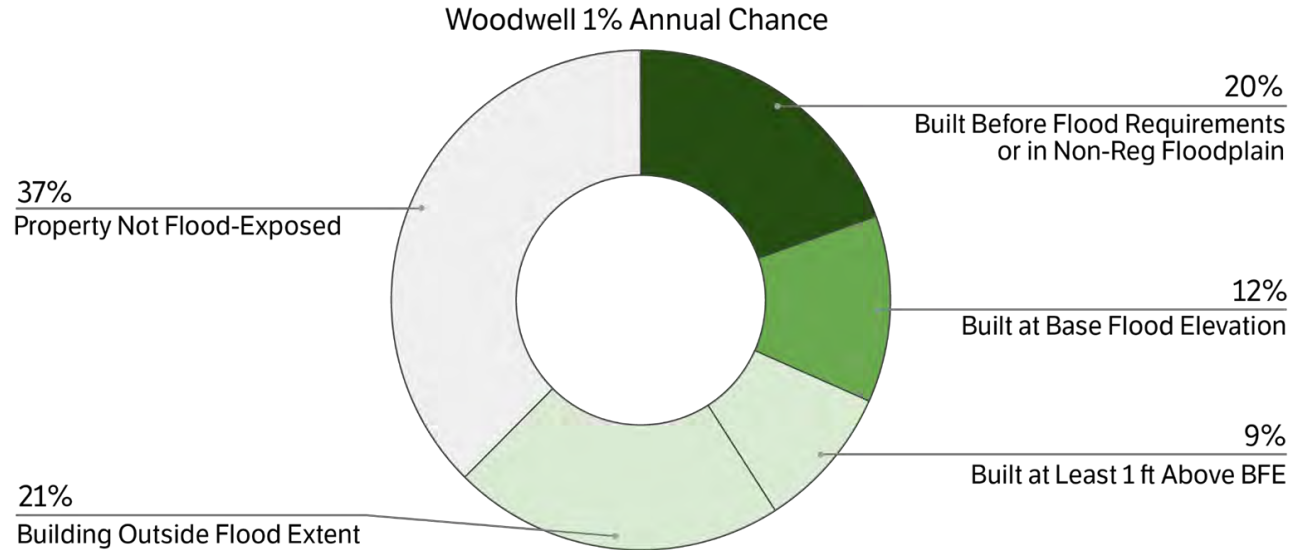
14% of critical infrastructure properties are **vulnerable** county-wide

Example types of infrastructure include:

- Schools
- Communications
- Police/Fire/EMS
- Hospitals
- Pump/lift stations



Key Takeaway: Flood Vulnerability Outside of Regulatory Floodplain



20% of all properties in the County are not elevated.

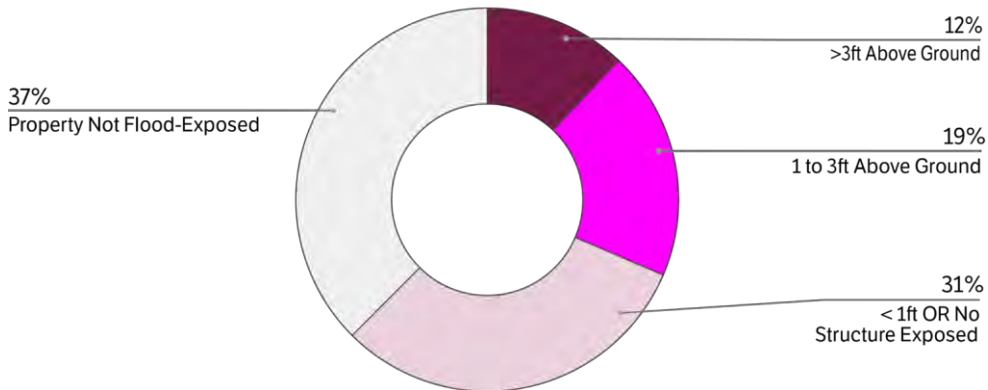
Key Takeaway:

Future Flooding Will Increase in Severity

The number of properties with potential for 3 ft of flooding will **more than double** with 2.5 ft of sea level rise.

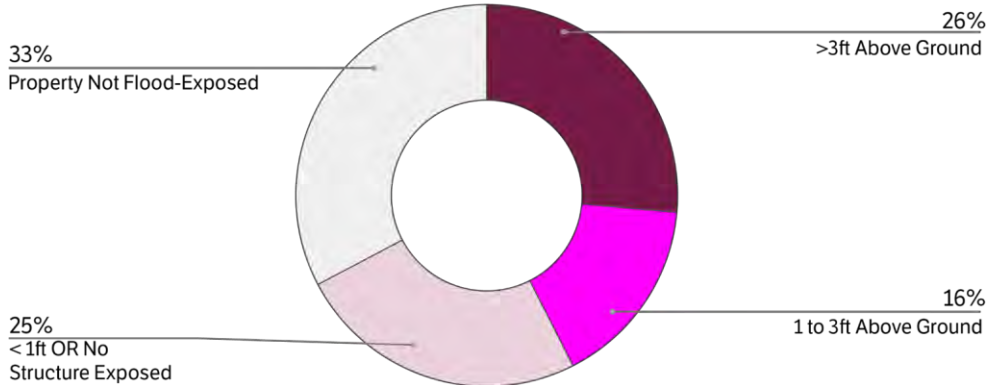
Risk Consequence | Woodwell Current 1% Annual Chance

Depth of Flooding



Risk Consequence | Woodwell Future 1% Annual Chance

Depth of Flooding



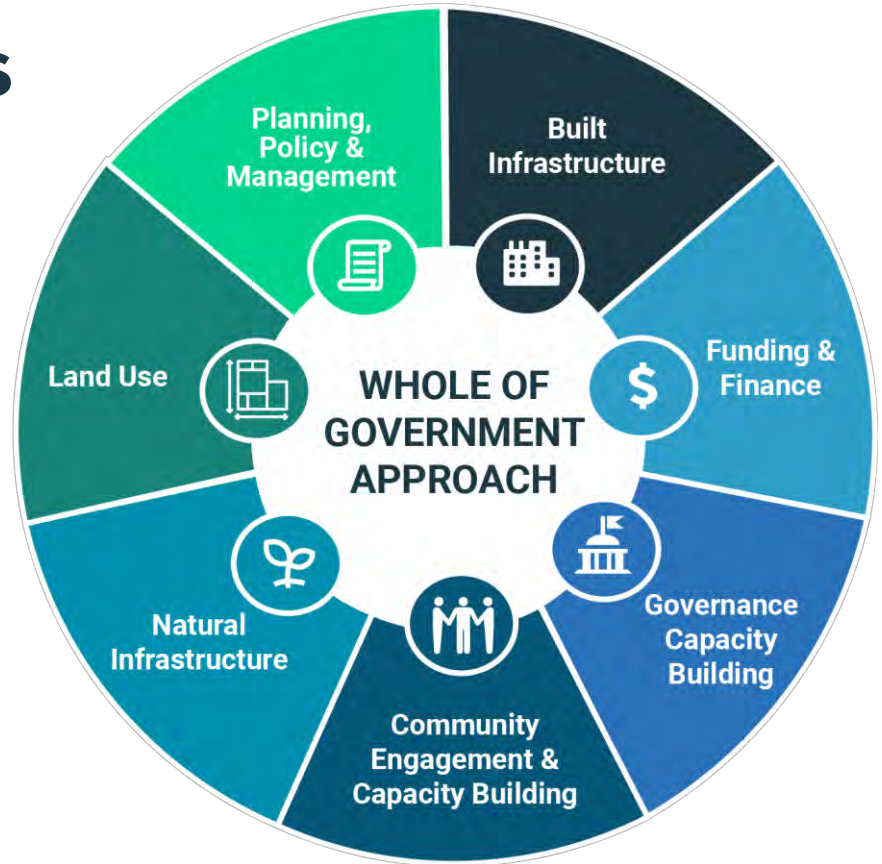
Next Steps

- Building awareness: identifying and communicating vulnerabilities
- Opportunity to incorporate the assessment into planning initiatives.
- Continued engagement with community leaders and focus group.
- Use of assessment for grant applications and funding opportunities.
- Project in County selected by the Climate Smart Communities Initiative for Fernleaf to develop a Flood Mitigation strategy (at no cost to the County).

Preliminary Strategies and Actions

Whole-of-Government Approach

- Actions within existing plans, programs, operations
- New multi-benefit strategies
- Actions that target key vulnerabilities and match the scale of the issues
- Robustness in the face of future change



Preliminary Strategy Examples

Strategy 5: Extreme Heat Planning

Develop a heat education, warning, and response program with local agencies, community-based organizations, medical institutions, and state agencies.

Strategy 6: Resilience of County-Owned or Managed Properties

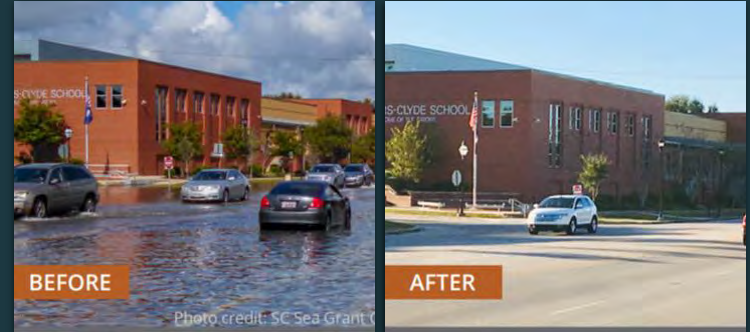
Enhance resilience of and through County-owned facilities and infrastructure.

Communicating Project Benefits

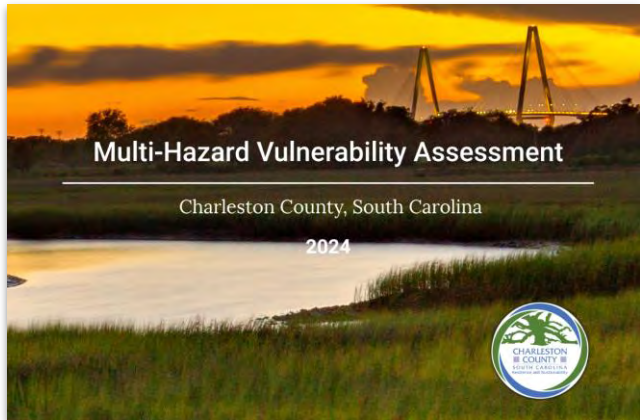


Example: Tidal flooding reduction from 3 check valves:

- 50% of Churches
- 20% of Public Housing
- 10% of Critical Facilities



Final Report and Resources



Preliminary Strategies and Actions

Strategies List

- S01 Programmatic Approach to Flood Mitigation
- S02 Collaborative Easement Acquisition Process
- S03 Drainage System Maintenance
- S04 Emergency Services Planning
- S05 Extreme Heat Planning
- S06 Resilience of County-Owned or Managed Properties
- S07 Climate Resilient Broadfields Redevelopment
- S08 Local Resilience Fund
- S09 Structured Resilience Governance
- S10 Resilience in Codes and Guidance
- S11 Stormwater Special Protection Areas

Strategies & Actions

Appendices

Appendix A: Complete Flood Hazard Assessment Findings

SOCIAL STRESSORS AND DISPROPORTIONATE IMPACTS

In Charleston County, the CEJIS identifies 22 disadvantaged census tracts (Figure A-3). The central region, stretching from Lincolnton down the neck of the Peninsula, shows a concentration of disadvantaged communities, with over half of the tracts in this section of the county being significant burdens in one or more categories. Nearly all tracts in this area experience four or more of the eight burdens. One census block, just north of Lake Ridge, stands out as facing all eight burdens, highlighting the severely compounding social stresses in this area. Health disparities in this tract include high rates of asthma (97th percentile), diabetes (98th percentile), and heart disease (98th percentile), and low life expectancy (99th percentile). Environmental concerns are also prominent, with poverty to superfund sites (98th percentile) and exposure to toxic wastewater discharge (98th percentile).

Four tracts in the western part of the County, covering (left to right) Wadswade Island, Adams Run, Hollywood, Meggett, Beemer, and Rockwell, are identified as disadvantaged for transportation based on the average relative cost and time spent commuting for work or essential services (64th percentile). Two of these tracts also have a high rate of diabetes (88th percentile). In the eastern part of the county, the census tract that includes the Town of Anderson and McConallville faces a combination of legacy pollution from a former military training site, transportation barriers (98th percentile), and high exposure to wastewater discharge (98th percentile).

Flood frequency was identified as a significant stressor in the communities with community partners. The Flood Action Research Atlas (FARA) developed by the US Department of Agriculture provides information about flood frequency by identifying low income and low flood access tracts. Tracts highlighted in Figure 27 are the census tracts that are disadvantaged for flood frequency. These communities with low income and low flood access are more than 100% of the population in the county.

Additional Findings

Flood Appendix B: Planning Area Summaries of Flood Hazards

Charleston County's 16 planning areas reflect a unique mix of urban centers, rural landscapes, unincorporated zones, coastal regions, and marshlands. Planning areas were previously designed by the County in order to recognize the diverse needs of its community, taking into account environmental factors, historical significance, and local growth trends.

Information about the vulnerability and risks for each planning area is summarized in the following pages and can be used as a reference for planners and stakeholders, helping them make informed decisions that honor the unique characteristics of each area.



Planning Area Summaries

FEMA NFHL 1% AND 2% ANNUAL CHANCE FLOODING SCENARIO

- All 6 lodging facilities (hotels, motels, etc.) are vulnerable.
- 1 of the 2 communications properties and 1 of the 2 utility properties are vulnerable.
- All vacant residential properties in Folly Beach are exposed, as well as all parcels identified as protected land.

USGS COSMOS CURRENT 1% ANNUAL CHANCE FLOODING SCENARIO

- 3 of the 6 lodging properties identified in Folly Beach are vulnerable to this threat.
- 1 communication property (owned by AT&T) and 1 utility property are vulnerable.
- 160 vacant residential properties (64th) and all but a 100th of protected land is exposed.

WOODWELL CURRENT 1% ANNUAL CHANCE FLOODING SCENARIO

- All but 1 lodging facility are vulnerable.
- 1 communication facility and 1 utility parcel are vulnerable.
- All but 2 vacant residential properties (170) total are exposed and all but 1 parcel is identified as protected land.

Thank you!

Special thanks to all County staff
and community focus group
members

