

Flood Vulnerability in South Carolina

Impacts from three presidentially declared disasters in four years led, in part, to the creation of the South Carolina Office of Resilience. The South Carolina Office of Resilience (SCOR) exists to increase resilience to disasters and reduce or eliminate the long-term risk of loss of life, damage to and loss of property, and suffering and hardship, by lessening the impact of future disasters. The Disaster Relief and Resilience Act directs SCOR to develop, implement and maintain the Strategic Statewide Resilience and Risk Reduction Plan (Resilience Plan). The Resilience Plan is intended to serve as a framework to guide state investment in flood mitigation projects and the adoption of programs and policies to protect the people and property of South Carolina from the damage and destruction of extreme weather events (SC Code §48-62-30).

3,177+

hurricane- and flood-damaged homes repaired or replaced via HUD funding

100%

Low-and-Moderate Income (LMI) citizens served through HUD Disaster Recovery programs

\$455M

HUD Disaster Recovery and Mitigation funds received as a result of three presidentially declared disasters

SCOR defines Resilience as:

The ability of communities, economies, and ecosystems within South Carolina to **anticipate, absorb, recover, and thrive** when presented with environmental change and natural hazards.

South Carolina's Physiography

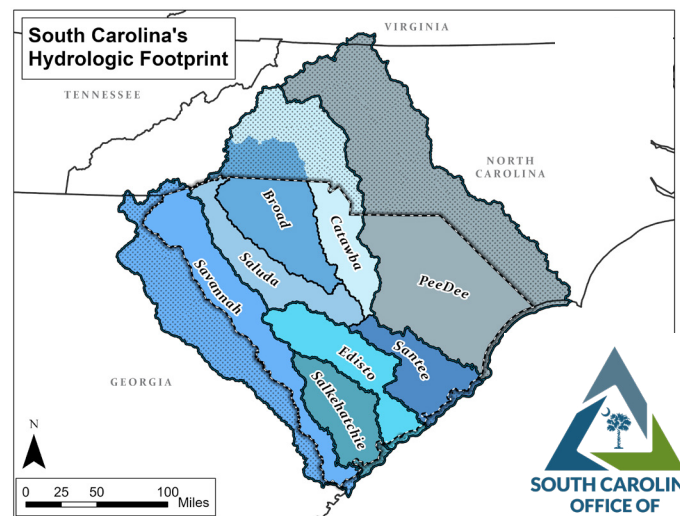
For resilience planning, SCOR is utilizing a watershed-based approach, considering the flow of water over the built and natural landscape, planning beyond jurisdictional boundaries, and considering the downstream impacts of upstream actions.

30,000
miles of waterways

8 major watersheds: (DHEC)

**BROAD
CATAWBA
EDISTO
PEE DEE**

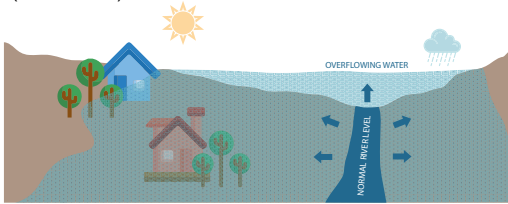
**SALKEHATCHIE
SALUDA
SANTEE
SAVANNAH**



An Overview of Flooding

Flooding is typically caused by excessive rain and insufficient drainage, including prolonged rain events or short intense rain, overflowing rivers, or dam or levee failure. South Carolina is vulnerable to several types of flooding events including river flooding (fluvial), overland flooding (pluvial), coastal flooding and even sunny day flooding.

River Flooding (FLUVIAL)



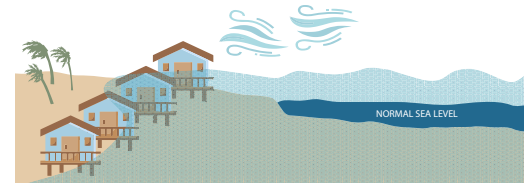
Fluvial flooding, or river flooding, occurs when the water level of the river overtops its banks or natural levees due to excess precipitation. This type of flooding can be devastating because it can occur in a different location than where the precipitation occurred.

Surface Water & Flash Flooding (PLUVIAL)



Pluvial flooding occurs when an extreme rainfall event takes place in an area where there is inadequate drainage for that particular amount of rainfall. This type of flooding is not associated with a body of water. Flash flooding occurs due to intense, high velocity rain events and is worsened by inadequate drainage.

Coastal Flooding (DUE TO STORM SURGE OR TIDES)



Coastal flooding can be caused by storm surge, high tides, and sea level rise. Compound riverine flooding, onshore winds and the gravitational pulls of the moon and sun on the earth can all worsen coastal flooding.

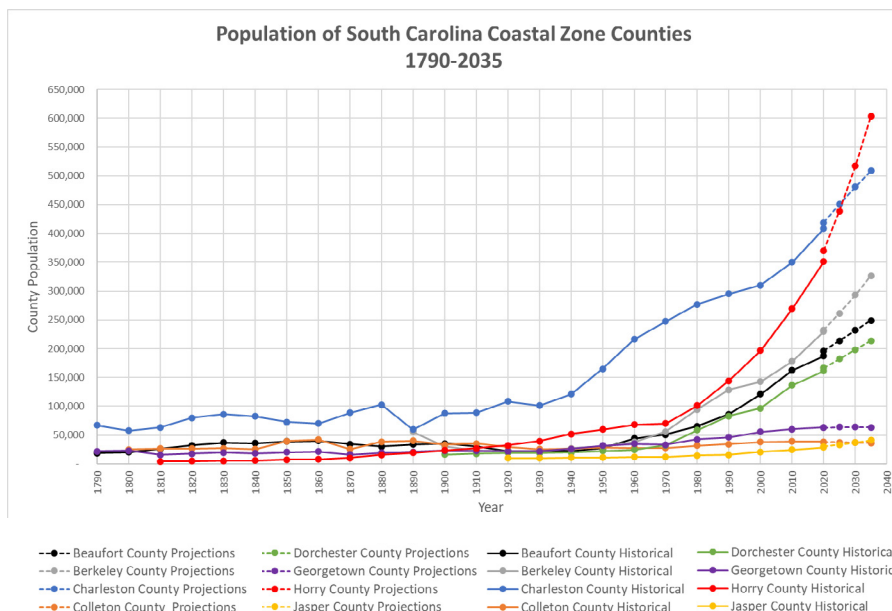
What is a 100-year flood?

The likelihood and severity of rain and flood events are often misunderstood. A 100-year flood event is more accurately described as an event with a 1% annual chance of occurring or a chance of 1 in 100. 500-year events are events with a .5% chance of occurring in any given year, and so on. This means that when flood depths are projected for events of varying severity (100-year, 500-year, 1,000-year, etc.) in given areas, those are the depths that identified areas would reach during an event of that severity.

1%
annual chance
of occurring
(a chance of 1 in 100)

Population & Land Use

South Carolina has experienced substantial population growth and its associated development, and is projected to continue growing rapidly for the foreseeable future.



Between 2010 and 2020,
SC's population grew

10.7%

By 2035, SC's population
is expected to grow

22.4%

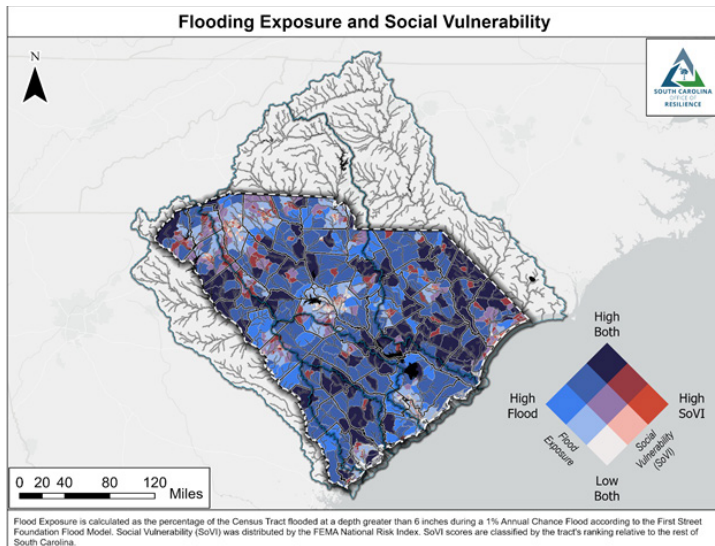
By 2035, it is expected that

32%

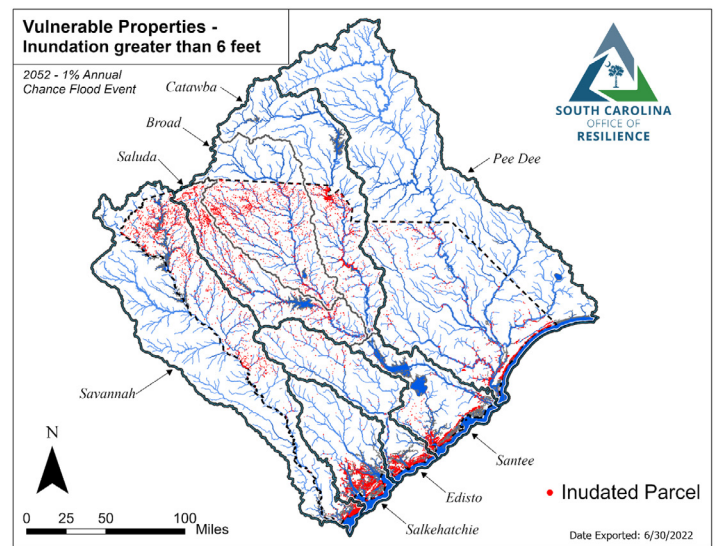
of SC's population will live in
Coastal Zone counties

Flood Vulnerability in South Carolina

The Flood Vulnerability chapter of the Resilience Plan offers a preliminary assessment of the current and future flood vulnerability of a variety of sectors in South Carolina. SCOR utilized the First Street Foundation's flood model and property level statistics to identify key locations across the state that may currently flood and that are projected to flood during various scenarios in the future. The 2022 and 2052 1% annual chance flood event was used.

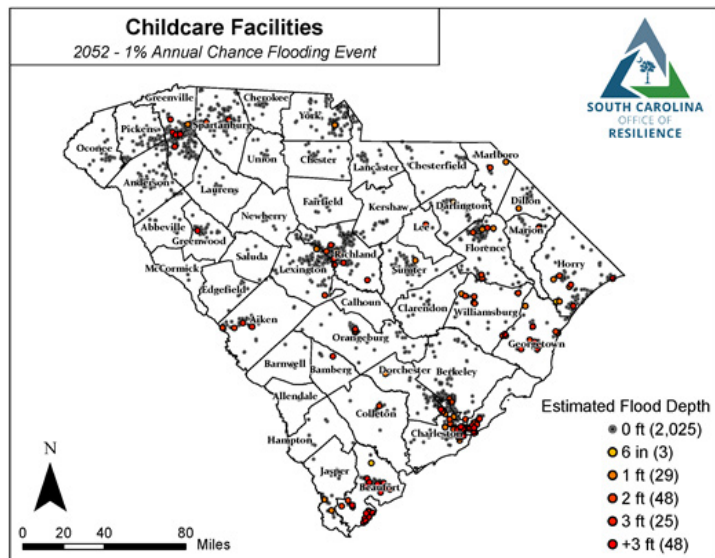


This map highlights areas that have both high flood exposure and high social vulnerability (SoVI) to such events. Social vulnerability measures the sensitivity of an area's population to natural hazards based on its ability to respond to and recover from the impacts of hazards based on a number of factors including poverty, transportation, housing, and others.



Parcel level data from First Street was used to quantify the vulnerability of individual properties across the state.

63,762 parcels are estimated to see greater than 6 feet of inundation in the 2052 1% annual chance flood event.



The First Street 2022 and 2052 1% annual chance flooding event models were overlaid with data sets obtained from state partners and public sources to quantify the current and future vulnerability of the following key locations across the state.

COMMERCIAL & RESIDENTIAL PROPERTIES

Vulnerable properties by parcel (individual parcel data not publicly available); mobile homes

ANTHROPOGENIC SYSTEMS VULNERABILITY

Water supply; hazardous waste locations; sewerage system discharge; dry cleaners; mines; solid waste

ECONOMIC SYSTEMS

Agriculture; food systems; manufacturing (industrial buildings and sites); businesses and commercial properties

COMMUNITY RESOURCES

Military; public safety; law enforcement; detention centers; fire & EMS stations; schools; hospitals & other medical facilities; childcare; Veterans' Affairs; places of worship

CULTURAL RESOURCES

(museum collections, libraries, archives, historic sites and landscapes, archaeological sites, historical cemeteries, etc.)

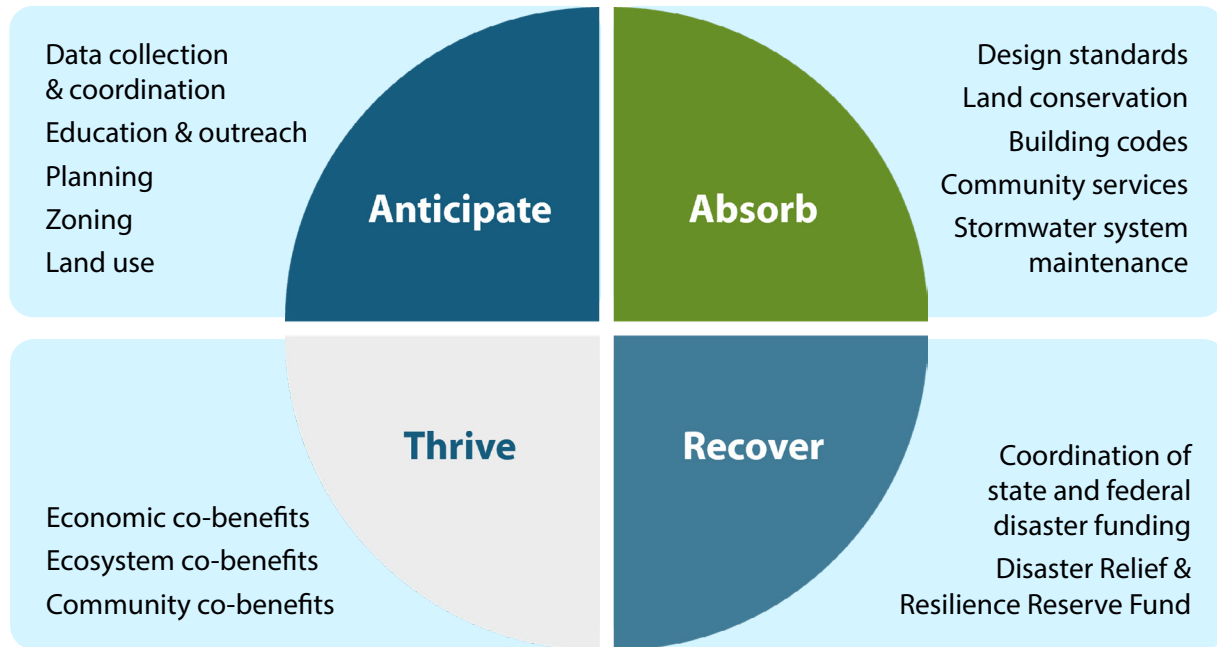
INFRASTRUCTURE

Roads and bridges; air facilities; ports; railways; power plants, substations, and other critical infrastructure)

NATURAL SYSTEMS VULNERABILITY

Forestry; beaches; salt marshes; wildlife; hunting & fishing areas

The final Strategic Statewide Resilience & Risk Reduction Plan, due July 2023, will put forth actionable recommendations to help guide state investment in flood mitigation projects, and will recommend programs and policies to protect people and property of SC from the damage and destruction of extreme weather events. Recommendations will align with the four components of SCOR's definition of Resilience:



Using the First Streets Foundation inundation data, the 2019 National Land Cover Dataset, United States Geological Survey (USGS) Soil Data, and the National Oceanic and Atmospheric Administration (NOAA) Marsh Migration Model, SCOR has identified flood mitigation priority areas for each watershed in the state, as well as a statewide priority map. These areas will reduce severity and exposure to flooding in South Carolina. By protecting these areas associated with low runoff or high flood risk, we can protect South Carolinians and reduce severity and exposure to flooding.

