ADAPTING TO CLIMATE CHANGE
SOUTHEAST

EPA United States Environmental Protection Agency

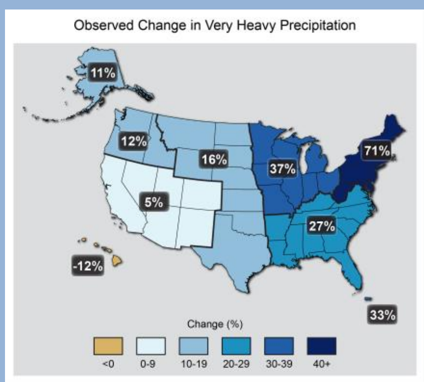
The Southeast is projected to experience higher average temperatures, increased precipitation, more frequent and intense storms, and droughts. These projected changes pose challenges to communities as they protect water sources, sensitive wetlands, and public health. **Climate impacts vary from a wet northern area to a dry southwestern area. Many communities are building resilience to the risks they face under current climatic conditions.** This fact sheet provides examples of communities that are going beyond resilience to anticipate and prepare for future impacts.

Moving Beyond Resilience to Adaptation

Climate change adaptation goes beyond resilience by taking actions to address future risks. Adaptation refers to how communities anticipate, plan, and prepare for a changing climate.

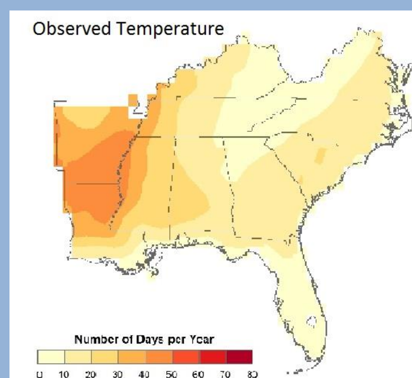
Observed and Projected Changes in the Southeast

Intense storms have increased



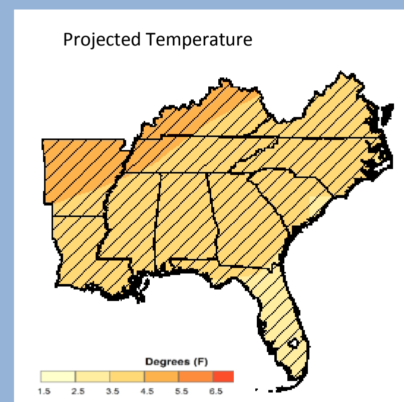
The Southeast experienced a 27% increase in the amount of precipitation falling in very heavy events (the heaviest 1%) from 1958 to 2012.

Very hot days have increased



Many parts of the Southeast experienced an increase in the average number of days with a maximum temperature greater than 95°F from 1980 to 2000.

Average Annual Temperature Increases



The Southeast is projected to experience an increase in the average annual temperature (°F) for 2041 to 2070 compared to 1971 to 1999 under a high emissions scenario.

Diversifying Water Sources to Reduce Climate Risk

Higher temperatures due to climate change in the Southeast are likely to intensify the water cycle, causing some areas to be wetter and others, drier. Fresh water resources along the coasts also face risks from rising seas. Key vulnerabilities include:

- As sea levels rise due to climate change, saltwater intrudes into surface water and groundwater sources.
- Climate change will cause more frequent and intense storms, causing increased flooding.
- Climate change will contribute to more severe droughts in some areas, prompting the need to consider alternate water sources.

Adaptation in Action

Tampa Bay Water provides drinking water for nearly two and a half million residents on the Gulf coast of Florida. Historically, the utility relied largely on groundwater to satisfy the nearly 250 million gallons of water required per day (mgd). The utility's operators recognized the increasing vulnerability of its groundwater source to saltwater intrusion and completed construction of a desalination plant in 2008. The utility now delivers blended water using groundwater, surface water, and desalinated water.

However, Tampa Bay Water faces numerous risks from climate change, including more frequent and intense storms as well as flooding and the threat of saltwater intrusion. Therefore, the utility operators decided to more systematically estimate its source water vulnerability to projected changes in precipitation levels and saltwater intrusion, and assess its ability to meet an anticipated increase in demand for water to 275 mgd by 2035. The analysis confirmed Tampa Bay Water's previous decision to diversify its water sources and indicated that its upgraded system likely enables the utility to meet its anticipated future needs even in a changing climate.

Protecting Vulnerable Wetlands

Salt marshes are important coastal ecosystems made up primarily of grasses, helping to protect shorelines from storms and providing habitat for a diverse range of wildlife, from birds to mammals, shell- and fin-fishes and mollusks. In a salt marsh, there is a delicate balance between salinity, dissolved oxygen, turbidity, bottom composition, and temperature. Salt marshes also build up coastal elevations by trapping sediment during floods, and produce new soil from roots and decaying organic matter. These areas are being reshaped by more rapid sea level rise and more frequent and intense storms. Key vulnerabilities include:

- Increased rates of sea level rise can disrupt salt marsh migration.
- More intense hurricanes and storms can damage established salt marshes.
- Increased shoreline development can block the growth of salt marshes by interfering with the deposition of silt, which would otherwise help natural marsh restoration and, hence, help reduce flooding.

Adaptation in Action

The Charlotte Harbor National Estuary Program and Southwest Florida Regional Planning Commission, supported by an EPA assistance grant, worked together to assess the historic and current range of salt marshes along the Gulf of Mexico coastline, and identify their vulnerability to future climate change. The results were published in a study, The Climate Change Vulnerability Assessment and Adaptation Opportunities for Salt Marsh Types in Southwest Florida. This study determined that the current pace of sea level rise appears to allow some marshes to migrate inland, while in other locations salt marshes are drowning due to barriers. The study further mapped these areas to better determine the barriers to movement and understand where salt marshes are able to move as they adapt to higher sea levels.

Protecting People During Heat Waves

Climate change leads to higher average temperatures and longer, more severe, and more frequent heat waves. The warming climate will increase already higher temperatures in urban areas. The rate of temperature-related deaths by 2100 will be higher in the Southeast than any other region of the United States. Impacts on human health include:

- Premature deaths for elderly people with chronic obstructive pulmonary disorders or other complex respiratory conditions are likely to increase.
- Hospital admissions and emergency room visits are expected to increase for people with pre-existing respiratory conditions.
- Children, especially those in underserved communities, are expected to miss more days of school due to respiratory illnesses.

Adaptation in Action

Cooling strategies to reduce heat islands can help communities adapt. Louisville, KY, is the fastest growing urban heat island in America due to a lack of tree cover and the prevalence of dark, dense surfaces such as asphalt, concrete, brick, and metal. To reduce future climate risks, Louisville is performing a surface materials inventory so that city managers can take action where heat relief is most needed. Heat-reducing solutions include strategic tree planting, using cooler roof technologies (green, white, and reflective roofs) and adding more porous sidewalks and other green infrastructure. Georgia was the first state to add cool roofs to its energy code, allowing a reduced roof insulation level if a cool roof with a 75 percent minimum solar reflectance and 75 percent minimum thermal emittance is installed. Florida also gives cool roofs credit in its building energy code. Buildings using a roof with 70 percent minimum solar reflectance and 75 percent minimum thermal emittance are eligible to reduce the amount of insulation needed to meet building efficiency standards, as long as a radiant barrier is not also installed in the roof area.

For a comprehensive view of projected climate changes in your region, consult:

- ***Climate Change Impacts in the United States: The Third National Climate Assessment***
- ***EPA's Climate Change Adaptation Resource Center***

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