EFFECTS OF CLIMATE CHANGE ON COASTAL FORESTS

A McIntire-Stennis supported project

CLEMSON
College of AGRICULTURE, FORESTRY AND LIFE SCIENCES

In September 1989, the strongest and costliest hurricane in South Carolina history, Hurricane Hugo, led to 35 deaths and an estimated $5.9 billion in economic impact, but the damage it caused to the state's coastal plain forests has been less simple to quantify.

For a quarter-century since, scientists in the state have been collecting historic data on the effects of extreme weather events such as Hugo on coastal forests to provide insights on the long-term recovery of natural forest ecosystems after major disturbances.

Now, project investigator and Clemson University associate professor Bo Song and her group have been working to extend the scope of their study by focusing more on climate change related disturbances and analyze the collected data to predict the long-term effects of these disturbances on coastal forests.

The ultimate goal is to use advanced technology, such as 3D visualization and interactive animations, to demonstrate research results to promote sustainable environment, climate change adaptation and environmental protection to benefit the current and future living environment of South Carolina.

Global climate change projections suggest South Carolina's coastal forests will be among the ecosystems most immediately threatened by projected increases in hurricanes, which lead to major shifts in forest structure. This study will contribute to understanding the successional shift and the potential long-term effects of global climate change on coastal forests.

COLLABORATION

Faculty at Clemson University's Baruch Institute of Coastal Ecology and Forest Science and the USDA Forest Service at Francis Marion National Forests have been collecting data since 1994, and the Andrew W. Mellon Foundation has funded a study to monitor the long-term recovery of coastal plain forests after Hugo. Plots were established at four different coastal sites — Francis Marion National Forest (U.S. Forest Service), Beidler Forest (Audubon Society), Congaree National Park (National Park Service) and Hobcaw Barony (Belle W. Baruch Foundation) — to collect the data.

HURRICANE HUGO RECOVERY
WIND GUSTS OF 110 MPH
6' TO 9' SALTWATER FLOODING
RE-INVENTORY PLOTS FOR 10 YEARS
MEASURE TREE DAMAGE AND GROWTH

About McIntire-Stennis

The McIntire-Stennis program, a unique federal-state partnership, cultivates and delivers forestry and natural resource innovations for a better future. By advancing research and education that increases the understanding of emerging challenges and fosters the development of relevant solutions, the McIntire-Stennis program has ensured healthy resilient forests and communities and an exceptional natural resources workforce since 1962.

USDA

IMPACT

The target audience includes researchers, land managers and the public, and the results of the group's analysis will be published in peer-reviewed journals within two years after the project starts to provide insights into the long-term recovery of natural forest ecosystems after events such as Hugo.

50
The number of 20x100-meter plots established at Francis Marion National Forest, Beidler Forest, Congaree National Park, and Hobcaw Barony to collect long-term data that is essential for understanding the effects of hurricane damage on coastal forests.

120 mph
The strongest wind gust in South Carolina during Hurricane Hugo, recorded by the Snow Goose, which was anchored along the Sampit River near Georgetown.

8,800
The square mileage of trees downed at Francis Marion National Forest during Hugo, or enough timber to build 660,000 homes.