## Modeling and Experimental Research to Guide Management of Community Adaptations in the South Atlantic Coastal Plain in Response to Climate Change and Sea Level Rise



Maritime Forest destroyed by coastal erosion in Georgia

- ***The Challenge:*** Changes in climate will significantly affect terrestrial communities of the coastal region in the South Atlantic Landscape Conservation Cooperative (SALCC) in two ways: inundation of habitats caused by rising sea levels and changes in species' ranges and composition. Changes in habitats of eastern North America during the last century have affected birds - this may accelerate. Changes in avian breeding ranges may already be occurring. Modeling climate change can predict community types in the SALCC over the long term; however, experimental research is needed to provide information and guide managers in maintaining populations and communities over the next 20 to 30 years.



Sapelo Island dune system

- ***The Science:*** We propose to use a combination of field sampling, species distribution modeling, and experimentation to assess the potential influence of climate change and sea level rise on target communities in the lower coastal plain, particularly for SALCC partners' lands. We hope to inform potential management actions by using spatial tools to assess the potential for replacing communities through habitat acquisition or reconfiguration. To do this, we will create an inventory of community types (key vegetation and terrestrial and wetland animal species, especially those endangered and of special concern) for SALCC partners' lands with emphasis on coastal regions. We will work within 100 km of the coastline which buffers the maximum predicted sea level rise of 2.4 m by the year 2100. In addition, we will assess, the quantity of each community lost or converted under alternative models of climate and subsequent sea-level rise, and rank communities, by ownership, from most to least threatened by sea-level changes. We will highlight models that predict species vulnerability to sea-level rise, but also will provide models forecasting changes in species distribution, connective corridors, and patch sizes at the landscape level.



Sapelo Island marsh, shrub, forest

- ***The Future:*** This research addresses SALCC priority science needs by providing data to develop priority species-habitat relationships, by producing predictive models for species and habitat vulnerability assessment, and by producing predictive models to evaluate sea-level rise impacts to species and habitats. Experimental research will also evaluate habitat restoration techniques that can assist these priority communities to adapt to the changes caused by climate and sea-level rise.

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