



Project Title: Initial assessment of Hurricane Sandy impacts on surface elevation change at long-term monitoring sites along the North Atlantic, US

Headline Title: Coastal Vulnerability and Wetlands Impact Assessment

Brief Summary: This project is assessing Hurricane Sandy impacts on coastal marshes and associated ecosystem services, as well as their sustainability, vulnerability to future sea-level rise and storm surge, and capacity to buffer future storm surges.

Project Location: Northeastern Atlantic coast from Virginia to Maritime Canada

Partners: This project involves researchers from Patuxent Wildlife Research Center; potential agency partners include US Fish and Wildlife Service, National Park Service, NOAA- National Estuarine Research Reserve System, The Nature Conservancy, and state and local governments.

Background: Coastal salt marshes are highly-productive, connected habitats critical for wildlife, people, and local communities. They provide a number of important ecosystem services, and in particular help protect habitats and human development as important buffers of storm surges. These wetlands systems are vulnerable to climate change impacts, such as sea-level rise and increasing intensity of storms, which will alter these habitats and the services they provide in the future. The focus of this project is to assess Hurricane Sandy impacts on coastal marshes and associated ecosystem services, as well as their sustainability, vulnerability to future sea-level rise and storm surge, and capacity to buffer future storm surges. The project should to provide valuable information for modeling efforts designed to inform strategic policy decisions, including societal adaptation to climate change and coastal planning.

Project Goals: (a) Process core samples taken by from the affected region by local management agencies and provide interpretation and analyses of storm sediment deposits associated with the monitoring stations in the network. (b) Provide statistical analyses of trend detection using the data and further apply data modeling methods to link trends to the distinct processes that contribute to system resilience or loss of function (e.g., deposition, production, subsidence, erosion). (c) Apply a newly developed Submergence Vulnerability Index (SVI) to assess marsh vulnerability to submergence.

Strategy Goals Implemented:

5.1.1: Increase coordination and communication between resource managers and natural and social scientists through existing forums (e.g., National Science Foundation (NSF), USGCRP, NCA, USDA, Cooperative Ecosystem Studies Units, CSCs, LCCs, JVs, RISAs, Associations of Fish and Wildlife Agencies, State Wetlands Managers, State Floodplain Managers, Coastal States Organization, National Estuarine Research Reserve Association, and others) to ensure research is connected to management needs.



5.1.2: Bring managers and scientists together at the appropriate scales to prioritize research needs that address resource management objectives considering a changing climate.

5.1.6: Prioritize research on questions relevant to managers of near-term risk environments (e.g., low-lying islands and glaciated areas) or highly vulnerable species.

5.1.7: Prioritize research and methods development for the valuation of ecosystem services and the role these services play in ameliorating climate change impacts on people and communities.

5.2.1: Produce regional to subregional projections of future climate change impacts on physical, chemical, and biological conditions for U.S. ecosystems.

5.2.5: Accelerate research on establishing the value of ecosystem services and potential impacts to communities from climate change (e.g., loss of pollution abatement or flood attenuation; climate regulation by forests and wetlands through carbon sequestration, oxygen production, and CO<sub>2</sub> consumption; and pollination by insects, birds, and mammals).

5.3.4: Develop and use models of climate-impacted physical and biological variables and ecological processes at temporal and spatial scales relevant for conservation.