

# Sea Level Rise and the Conservation of Coastal Wetlands



**ROADS AND DEVELOPMENT** could be barriers in the future affecting salt marsh that will drown in place unless it can migrate upland with rising sea levels. CREDIT: E. BOOTH 2012

## CHALLENGES FACING COASTAL WETLANDS

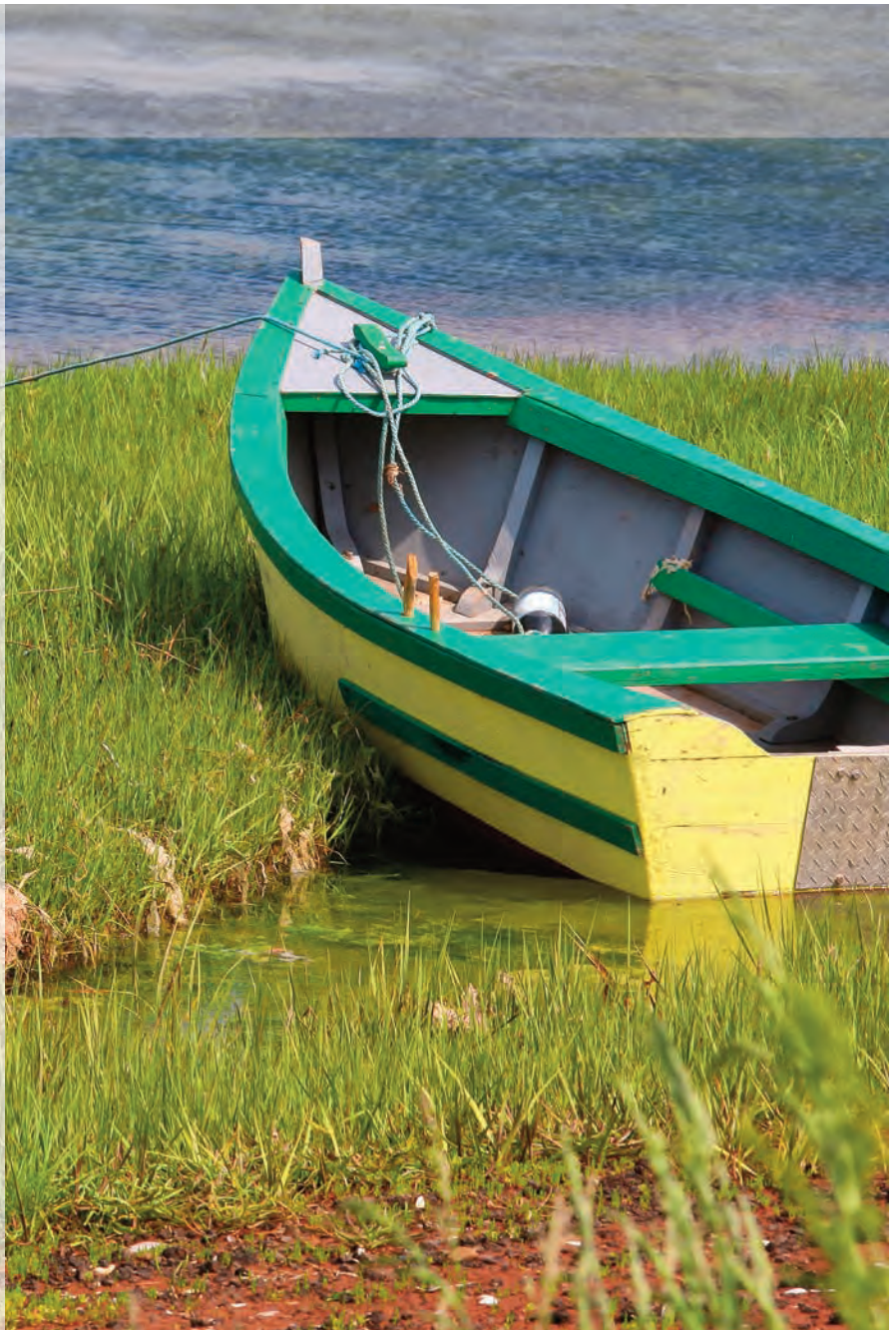
Rhode Island's coastal wetlands provide critical nursery habitat for fisheries, play a key role in absorbing nutrients that would otherwise pollute waters, and provide important economic benefits for fisheries and tourism. In addition, wetlands support recreational activities and help protect local areas from coastal flooding. These wetlands, especially tidal marshes, are very susceptible to impacts from climate change and accelerated sea level rise. As sea levels rise, marshes move, or migrate, farther upland under favorable conditions where they can still maintain tidal influence without being continuously submerged.



The rate of sea level rise in Rhode Island averaged 0.1 inches per year (or 10 inches over a 100-year period) from 1931 through 2009, as measured at the Newport tide gauge. Since 1990, this rate has accelerated to approximately 0.14 inches per year, or 14 inches over a 100-year period. If tidal marsh growth cannot keep up with the accelerated rate of sea level rise, or are not able to migrate landward to higher elevations, a significant percentage of coastal wetlands may be permanently lost by the end of this century. To minimize marsh loss, there is a need to identify and conserve adjacent uplands for marsh migration. There is also the need to develop and implement strategies and policies for the protection of targeted abutting upland areas to ensure coastal wetlands in the future.

## PROJECT PURPOSE

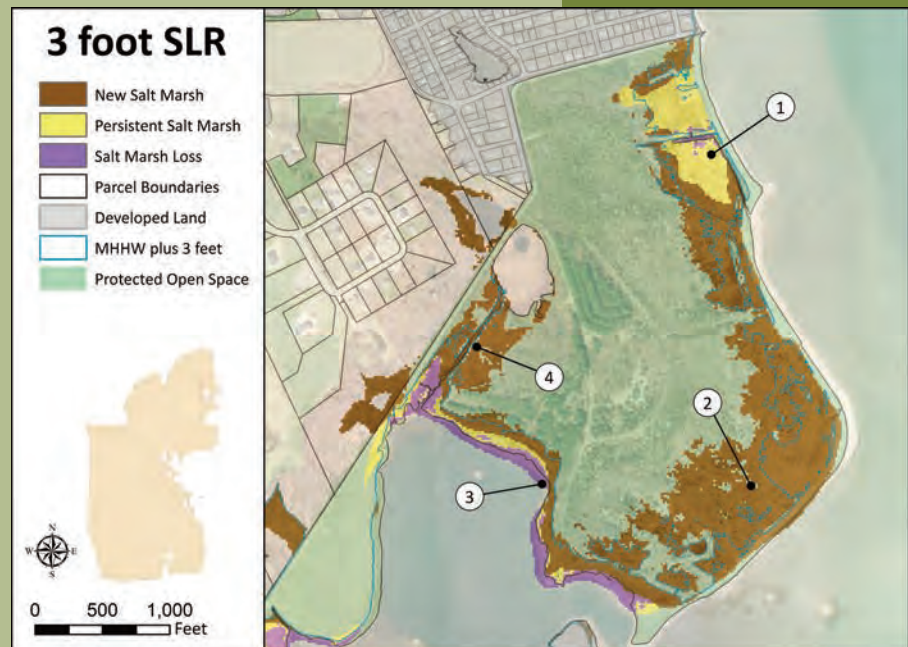
This 2-year collaborative effort of state agencies, non-profits, and the University is aimed at developing effective adaptation strategies to protect and restore coastal wetland ecosystems while engaging and educating community stakeholders on ways to reduce impacts from sea level rise. It is envisioned that this project will recommend strategies that can be implemented at the local and state level and will be integrated into the state's Shoreline Change (Beach) Special Area Management Plan. This project is funded by National Oceanic and Atmospheric Administration's Coastal and Ocean Climate Application program.



### CALF PASTURE POINT IN NORTH KINGSTOWN

A 3-foot sea level rise scenario shows both challenges and opportunities for the beach and marsh. While today's marsh will persist in some areas (1), there is some habitat loss (3) in other areas. With projected future tidal inundation there is an opportunity for marsh to establish (2, 4) in upland areas owned by the town for recreation and conservation.

(K. RUDDOCK, 2011)



## PLANNING FOR COASTAL WETLAND CONSERVATION

Better understanding how dynamic wetland ecosystems may respond to climate change and how communities can begin to prepare is critical to the future of these salt marshes. A number of research and outreach activities are planned to address these issues:

- + MAPPING AND MODELING** – Building upon a pilot project in North Kingstown, the Sea Level Affecting Marshes Model (SLAMM) is being used to simulate coastal wetland migration under various sea level rise scenarios. This information will be used to facilitate development and implementation of adaptive strategies to protect and restore coastal wetlands.
- + ANALYZING OPTIONS FOR MARSH MIGRATION** – The long-term sustainability of these habitats depends on the ability to identify and protect areas where marshes can move upland as sea level rises and to identify barriers to that movement. The maps will be used to help identify upland areas that provide the best opportunity for salt marsh migration that might otherwise be drowned by rising seas.
- + ENGAGING COMMUNITIES** – Forums will be held with coastal communities to review the maps, validate the information, and provide input on appropriate adaptation recommendations, policies, and practices. The team will convene workshops to share tools for decision makers.
- + ADAPTING POLICIES AND STANDARDS** – Recommendations will be developed for proposed changes to Rhode Island's Coastal Resources Management Program and other initiatives to help insure the future viability of coastal wetlands as sea level rise accelerates.

## PUTTING VALUES BEHIND SALT MARSH PROTECTION

- + The economic value of each acre of wetland for coastal protection is estimated at \$2,930 annually (RI), \$6,471 for maintaining fisheries (US East Coast), \$780-\$15,000 for water purification and \$12 for carbon sequestration (US).
- + Coastal wetlands in RI support \$75 million in commercial fishery landings; a \$150 million recreational fishery; and a tourism and outdoor recreation industry valued at \$2 billion on Narragansett Bay alone.
- + 2010 estimates indicate that Rhode Island has approximately 4100 acres of saltmarsh, a significant decrease (over 50%) since the 1700s due to man-made alterations and filling.



**SALT MARSHES** support numerous fish and wildlife species by providing valuable nursery, spawning and feeding areas. CREDIT: R. HANCOCK; SAVE THE BAY

## LEARN MORE OR GET INVOLVED

**PARTICIPATE** in community meetings or public events as we work in Region 1: South Shore and Block Island, Region 2: Narragansett Bay, and Region 3: Aquidneck Island and Sakonnet River

**STAY INFORMED** visit the web <http://seagrant.gso.uri.edu/climate/index.html>

**JOIN** the listserv for updates by sending a request to [amber@crc.uri.edu](mailto:amber@crc.uri.edu)

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