

RI Shoreline Change

Special Area Management Plan

COASTAL MUNICIPALITY MEMO



TO: Municipal Planners; Planning Boards; Municipal Administrators; Public Works Officials; Emergency Managers; and Floodplain Coordinators

FROM: CRMC Rhode Island Shoreline Change Special Area Management Plan (Beach SAMP) Team

DATE: June 3, 2015

RE: Tools and Resources to Assist in Natural Hazard and Climate Change Planning

INTRODUCTION

The purpose of this memo to coastal municipalities is to share resources and tools that may assist coastal cities and towns in planning for the impacts of natural hazards and climate change. Some of these tools are new or recently adopted by the Rhode Island Coastal Resources Management Council (CRMC), and others are existing planning maps that have been made easier to locate and use.

These tools and resources will aid in planning for natural hazards and climate change in municipal comprehensive plans as required by the *Rhode Island Comprehensive Planning and Land Use Act* (RIGL 45-22.2). In particular, these resources will help to assess the impacts of:

- Storm surge and sea level rise;
- Salt marsh migration in response to sea level rise; and
- Shoreline change and erosion.

TOOLS & RESOURCES

RESILIENT COMMUNITIES: Natural Hazards and Climate Change

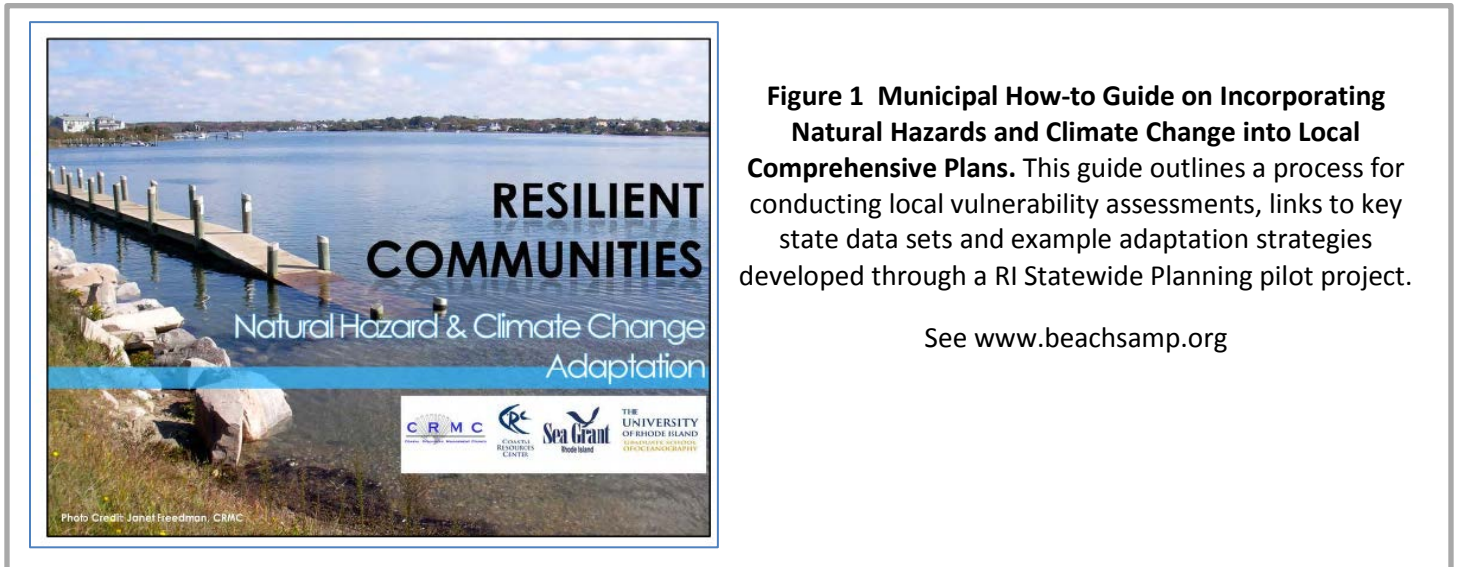
Adaptation: *A how-to guide on incorporating natural hazards planning and climate change adaptation into local comprehensive plans.*

www.beachsamp.org

By 2016, Rhode Island cities and towns will need to plan for natural hazards and the impacts of climate change within their community's local comprehensive plan. This how-to guide and presentation was created as a resource for coastal municipalities on how to conduct a preliminary vulnerability assessment and adopt climate change adaptation strategies into the local comprehensive plan. While every community is different and will follow a unique planning process, this

guide is meant to provide insights into how to successfully assess vulnerability, design, adopt and implement adaptation strategies, and monitor their effectiveness.

The guide is the result of a pilot project conducted by the University of Rhode Island Coastal Resources Center/Rhode Island Sea Grant (CRC/SG) on behalf of the Rhode Island Statewide Planning Program entitled “Adaptation to Natural Hazards & Climate Change in North Kingstown, RI” which was funded by the U.S. Department of Transportation Federal Highway Administration. The primary objective of this project was to prepare language for North Kingstown’s Comprehensive Community Plan that addresses climate change adaptation as it relates to transportation, land use, and other relevant issues. Sea level rise and flooding were the primary hazards examined, however the process presented here can be duplicated for other types of hazards. Lessons learned through that pilot project are presented for the benefit of other coastal communities engaging in natural hazard and climate change adaptation planning.



STORMTOOLS : *Web-based tool to examine the impact of storm surge & sea level rise*

www.beachsamp.org/resources/stormtools

STORMTOOLS was developed as part of the Beach SAMP project and was launched in January 2015. This web-based tool doesn’t require any downloading or special software which makes it ideal for use across municipal departments and for use out in the field. This new tool illustrates potential flooding from a variety of different sized storm events and how storm-related flooding is likely to change as sea level rises. With this tool planners and planning councils, public works officials, emergency managers and others in local government can see both where flooding is likely to occur **today** (e.g. as the result of a nor’ester, tropical storm, or hurricane) and where flooding is likely to happen **in the future** (e.g. in 10, 25, 50+ years as sea level continues to rise). In addition to showing where flooding may occur, this tool will also display how deep flood waters may be in a particular location during a storm event or sea level rise scenario (see Figure 1). This tool is especially useful for examining impacts to critical infrastructure like emergency services, evacuation routes, and municipal facilities since any statewide dataset from the Rhode Island Geographic Information System (RIGIS www.edc.uri.edu/rigis/) or local GIS datasets can be easily added to the map using ArcGIS. A short tutorial on how to use STORMTOOLS and ArcGIS to inform planning can be found at www.beachsamp.org.

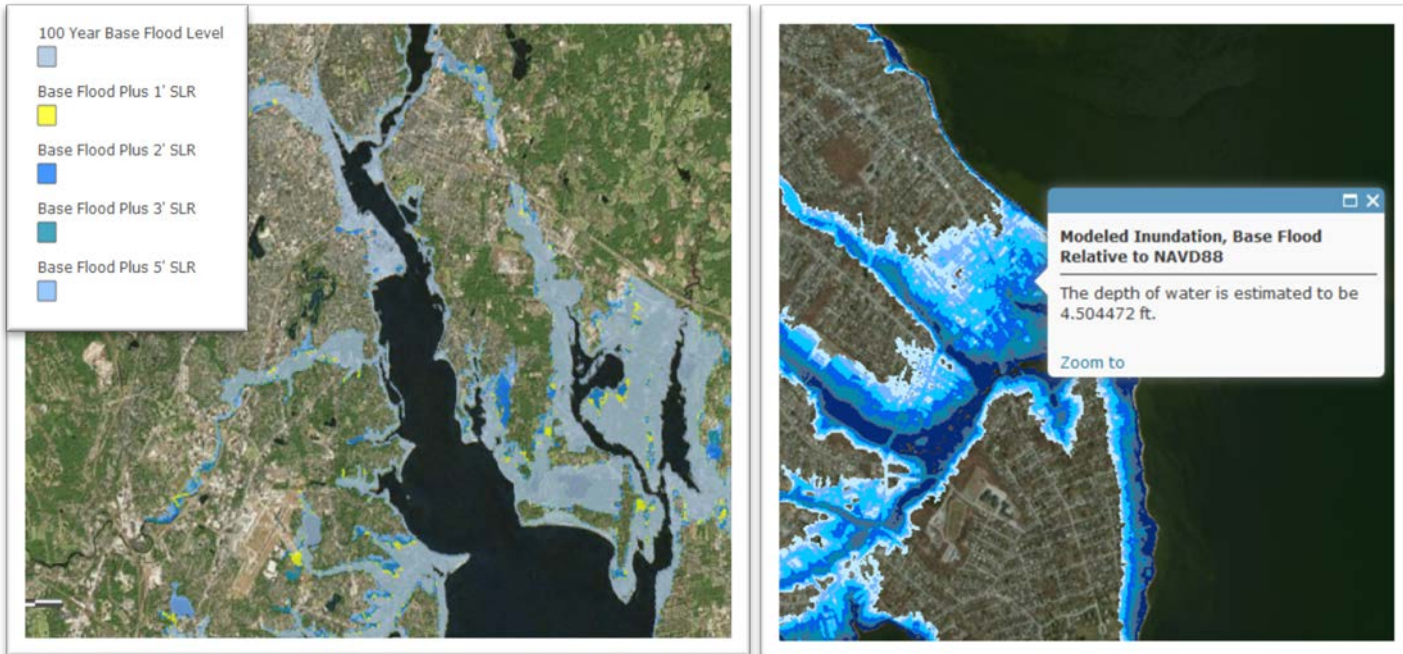


Figure 2 STORMTOOLS Maps of Potential Flooding from Storm Surge Events Plus Sea Level Rise. This tool will show where flooding may occur & how deep the water may be at a particular location.

See www.beachsamp.org/resources/stormtools

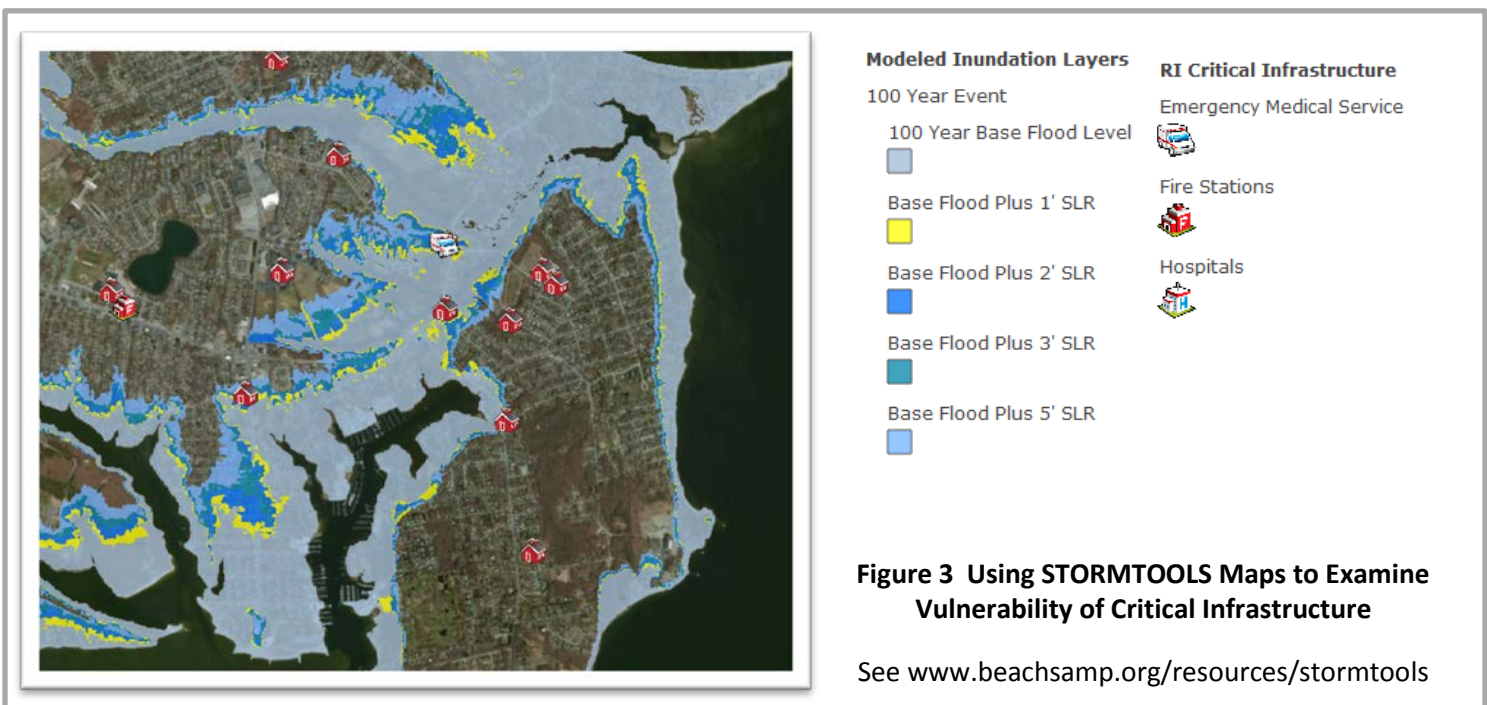


Figure 3 Using STORMTOOLS Maps to Examine Vulnerability of Critical Infrastructure

See www.beachsamp.org/resources/stormtools

Sea Level Affecting Marsh Migration (SLAMM): *Statewide maps illustrating how salt marshes may migrate as sea level changes.*

http://www.crmc.ri.gov/maps/maps_slamm.html (pdf maps & summary report)

<http://www.edc.uri.edu/rigis/data/data.aspx?ISO=oceans> (direct link to GIS data)

Salt marshes are among the most productive habitats on the planet supporting numerous economic and environmental benefits such as nursery and forage for many marine fish and invertebrates, as well as nesting and migratory feeding sites for a number of bird species. Salt marshes help to keep coastal waters clean by filtering pollutants and sequestering nitrogen from nearby upland sources. In addition to these benefits, marshes can help to reduce the damage from coastal storms and erosion to shoreline infrastructure by absorbing wave energy. Unfortunately, much of these important habitats have already been lost due to filling and development by earlier generations unmindful to the damage and impacts on the marsh ecosystem. Present day marshes are now threatened by another crisis as rising seas advance upon our developed coastline. Under these circumstances, marshes will be squeezed between existing development and advancing seas and most likely will drown in place and disappear forever. Yet, if an unimpeded path is provided, there is the potential for these coastal wetland habitats to migrate landward with the rising water. With the proper information and knowledge, local and state resource managers, planners and conservationists can take action to ensure that adjacent upland areas are available for these marshes to migrate landward and persist for future generations.

The RI SLAMM project results will directly inform local municipalities, conservation organizations, and state agency decision-makers in developing adaptive management strategies to provide resiliency for critical coastal habitats and abutting upland areas necessary for the future success of migrating coastal wetlands. The project results will also assist in the restoration planning efforts for coastal wetland ecosystems throughout the state.

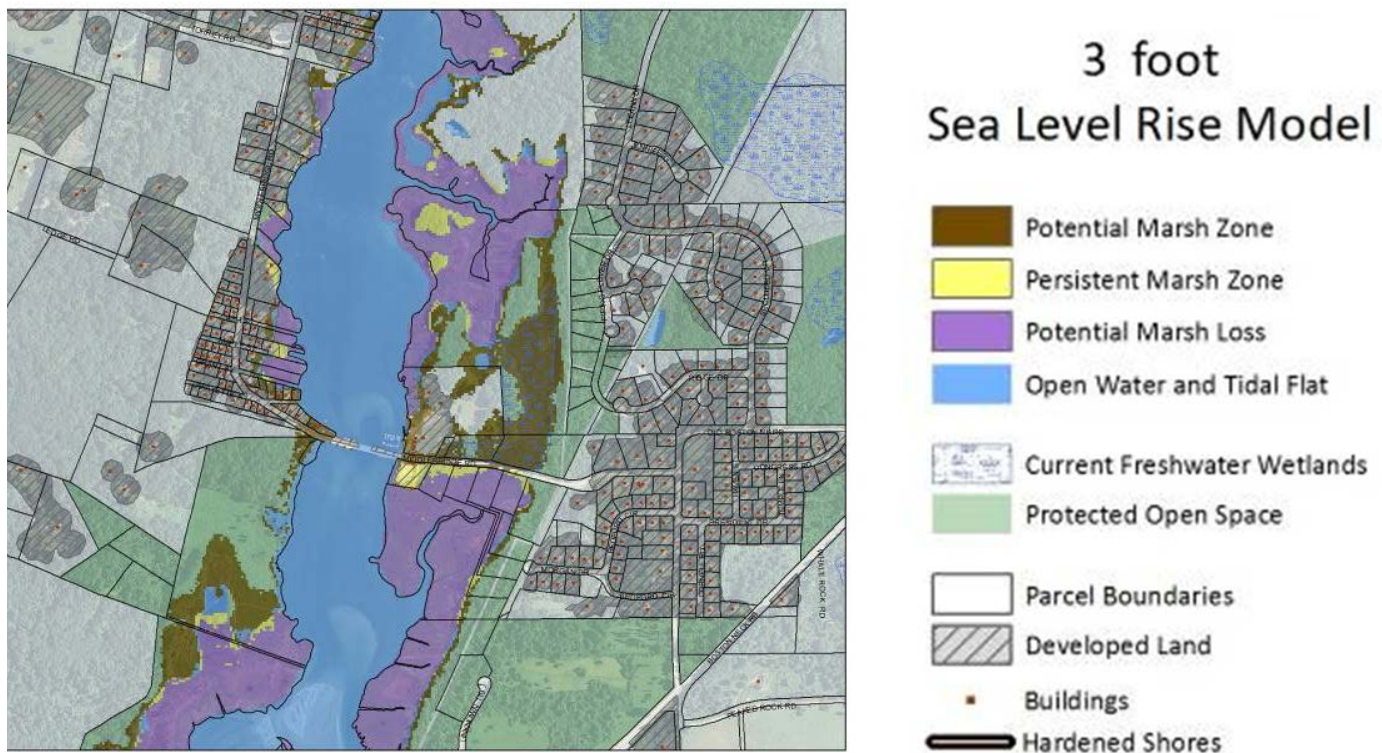


Figure 4 Sea Level Rise and Marsh Migration Maps Available for Entire Coastline of Rhode Island.

See www.beachsamp.org

SHORELINE CHANGE MAPS: *Statewide maps illustrating coastal erosion.*

<http://www.beachsamp.org/resources/shoreline-change-maps/>

http://www.crmc.ri.gov/maps/maps_shorechange.html

Shoreline change maps depict the location of the shoreline at a given time based on measurements from aerial photography and the location of the wet/dry line along the shore. These maps provide a valuable resource to better understand how the coastline has changed over time through erosion. Current statewide shoreline change maps illustrate shoreline position as of 2003 or 2004; however Washington County shoreline change maps are in the process of being updated to show where the shoreline is located in 2014 following Superstorm Sandy and will be available at the end of 2015.

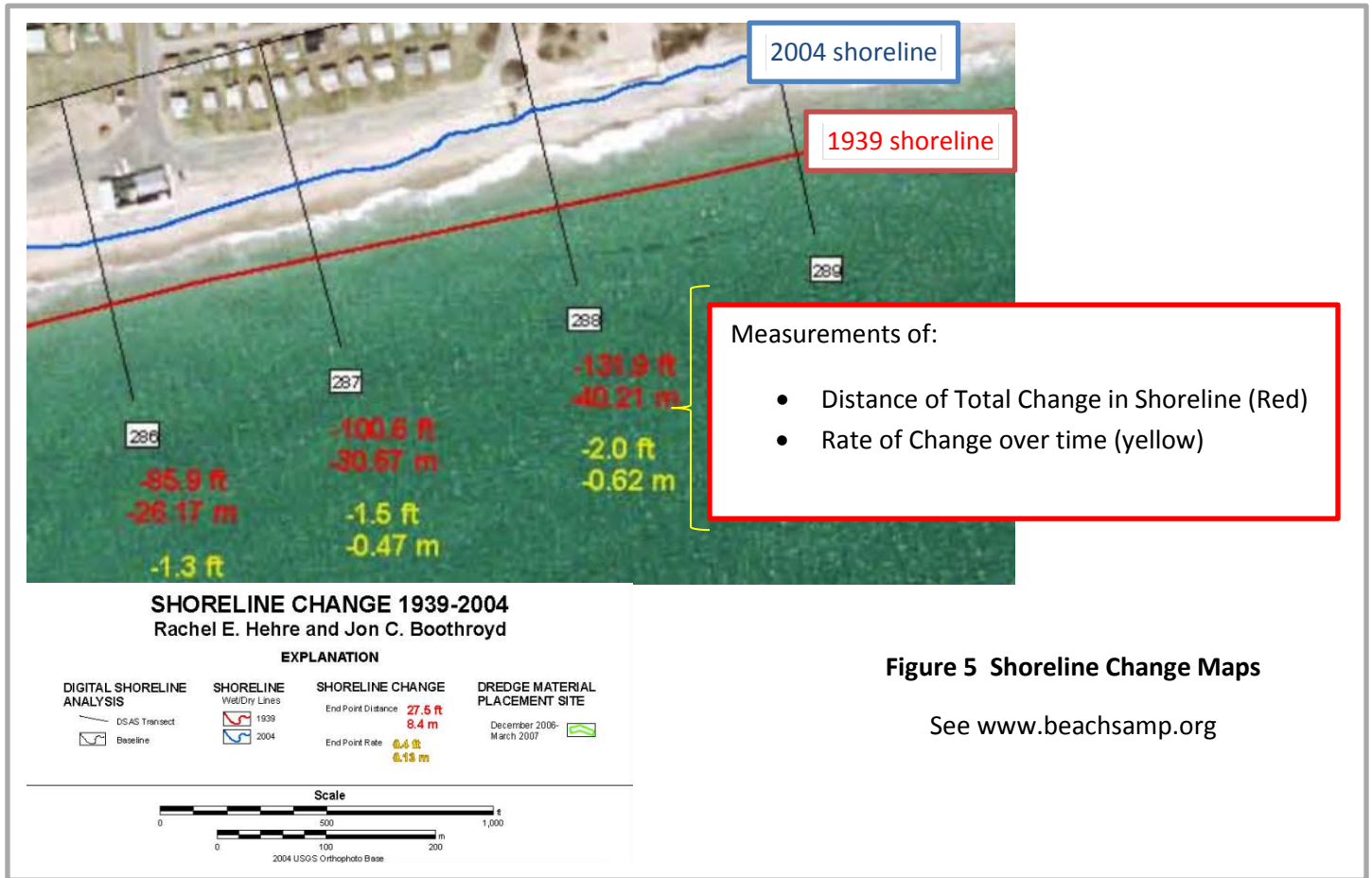


Figure 5 Shoreline Change Maps

See www.beachsamp.org

ADAPTING COASTAL & WATERFRONT BUSINESSES: New resources focused on what businesses can do to deal with the impacts of storms and sea level rise.

The University of Rhode Island Graduate School of Oceanography's Coastal Resources Center and Rhode Island Sea Grant recently developed two new resources focused on adapting coastal and waterfront businesses. The first is a catalog of adaptation techniques ranging from how you can design a new facility or retrofit an existing building to be

more resilient to storms, flooding and sea level rise. This catalog provides a wide range of information and links to helpful resources on business continuity planning, how to deal with storm water, or how to improve the performance of your roof during a storm.

A new report entitled the Newport Resilience Assessment Tour shares the insights on assessing the risks and vulnerabilities of waterfront business districts like Newport and identifies a set of best management practices & actions to increase resiliency.

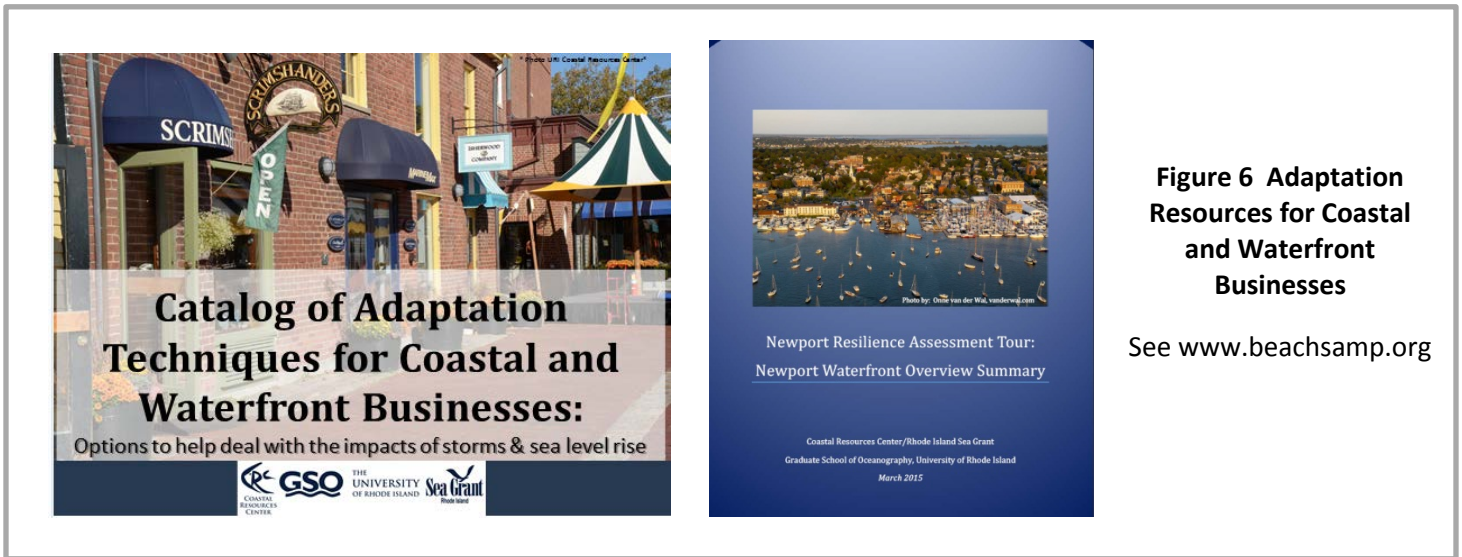


Figure 6 Adaptation Resources for Coastal and Waterfront Businesses

See www.beachsamp.org

RHODE ISLAND COASTAL PROPERTY GUIDE: *What coastal property owners, renters, builders and buyers should know about the Rhode Island shoreline.*

This guide outlines the 10 things you should know about coastal property in Rhode Island ranging from: how to figure out if you are in a flood zone; what types of setbacks or regulations apply; restrictions on the property due to the adjacent CRMC water type classification; determining if erosion and sea level rise impact the property and surrounding; and how to make existing building more resilient.

Figure 7 Rhode Island Coastal Property Guide can be found online at: www.beachsamp.org

