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Rhode Island Shoreline Change Special Area Management Plan

“Nowhere else in the U.S. is there a management plan for tackling the complicated impacts associated with sea level rise, and Rhode Island is in a unique position to be a leader.

Here in the Northeast, we are particularly susceptible to sea-level rise impacts, and we’re already seeing the effects of climate change in increased, more intense storms, accelerated erosion of our coastline, and damage to our infrastructure.

This SAMP aims to provide tools to plan for the future.”

— Grover Fugate, Executive Director,
RI Coastal Resources Management Council (CRMC)

INTRODUCTION

The *Shoreline Change SAMP* addresses the risks associated with three coastal hazards, storm surge, coastal erosion and sea level rise, in order to provide guidance for property owners and state and local decision makers so that they can plan for and manage their risk. (Chapter 3, Page 4)



Addressing Climate Change in the Ocean State

With climate-change impacts growing yearly, Rhode Island, with 420 miles of coastline (and second highest coast-to-total area ratio in the U.S.), is particularly vulnerable. The risks from increased storms, erosion, and flooding are rising across Rhode Island's 21 coastal communities, affecting homeowners, businesses, recreational areas, and vital infrastructure. With coastal towns already feeling these impacts, a state-wide plan is needed to meet this challenge.

The *Shoreline Change Special Area Management Plan (SAMP)* provides information, guidance, and a suite of tools to empower state and local decision makers as they plan for, recover from, and successfully adapt to the impacts of coastal storms, erosion, and sea-level rise. *Rhode Island's Coastal Resources Management Council (CRMC)*, together with the *University of Rhode Island* and its *Coastal Resources Center*, and *Rhode Island Sea Grant*, began developing this plan in 2012 together with state/municipal partners, community groups and coastal residents.

Rooted in the latest climate science, *Rhode Island's Shoreline Change SAMP*—the first of its kind in the nation—lays out over seven chapters an inclusive process focused on practical solutions and outcomes, providing flexibility to property owners and municipalities in making sustainable land-use decisions. Designed to be a guidance and planning framework rather than a prescriptive policy with explicit regulations and standards, the plan will enable local decision makers to identify the best strategies for their communities.

Rhode Island Leads the Way Looking Forward

As one of the first coastal regulatory agencies in the U.S. to establish permit requirements addressing future risk from storm surge, coastal erosion, and projected sea-level rise, the CRMC hopes this process will serve as a model to other Rhode Island



agencies and municipal governments. The risks of coastal hazards extend beyond CRMC’s jurisdiction—and likely outside currently-mapped *Federal Emergency Management Agency’s (FEMA) Special Flood Hazard Areas*. Agencies embarking on state or regional projects will benefit from this process to ensure future conditions and flooding risk are evaluated so public dollars are spent wisely. The CRMC also hopes this policy framework will inform other coastal states as they develop their own plans to address the growing impacts of climate change.

The CRMC believes the process and tools introduced through the *Shoreline Change SAMP* will reduce impacts to coastal resources by protecting public health, safety, and welfare while minimizing damage and losses to infrastructure and property. Adapting to these ongoing and future conditions today will ensure Rhode Island builds resilient communities while preserving its strong coastal economy and environment tomorrow.

SHORELINE CHANGE SAMP

Three Key Innovations:

New Coastal Permitting Process

New applicants now required to complete a coastal risk assessment prior to permit being awarded.

STORMTOOLS

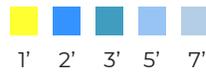
Online Mapping Tools

New interactive maps to assist coastal communities/residents in accurately assessing their risk.

Design Elevation Maps

New maps to complement FEMA Flood Insurance Rate Maps (FIRM) maps in evaluating current and future flood risk; also identifies design elevations for consideration when building/rebuilding to reduce risk from future conditions.

TOOLS TO UNDERSTAND RISK



The STORMTOOLS image shows the exposure in Warren, RI to 1, 2, 3, 5, & 7 feet of sea level rise.

Rhode Island's Changing Shoreline

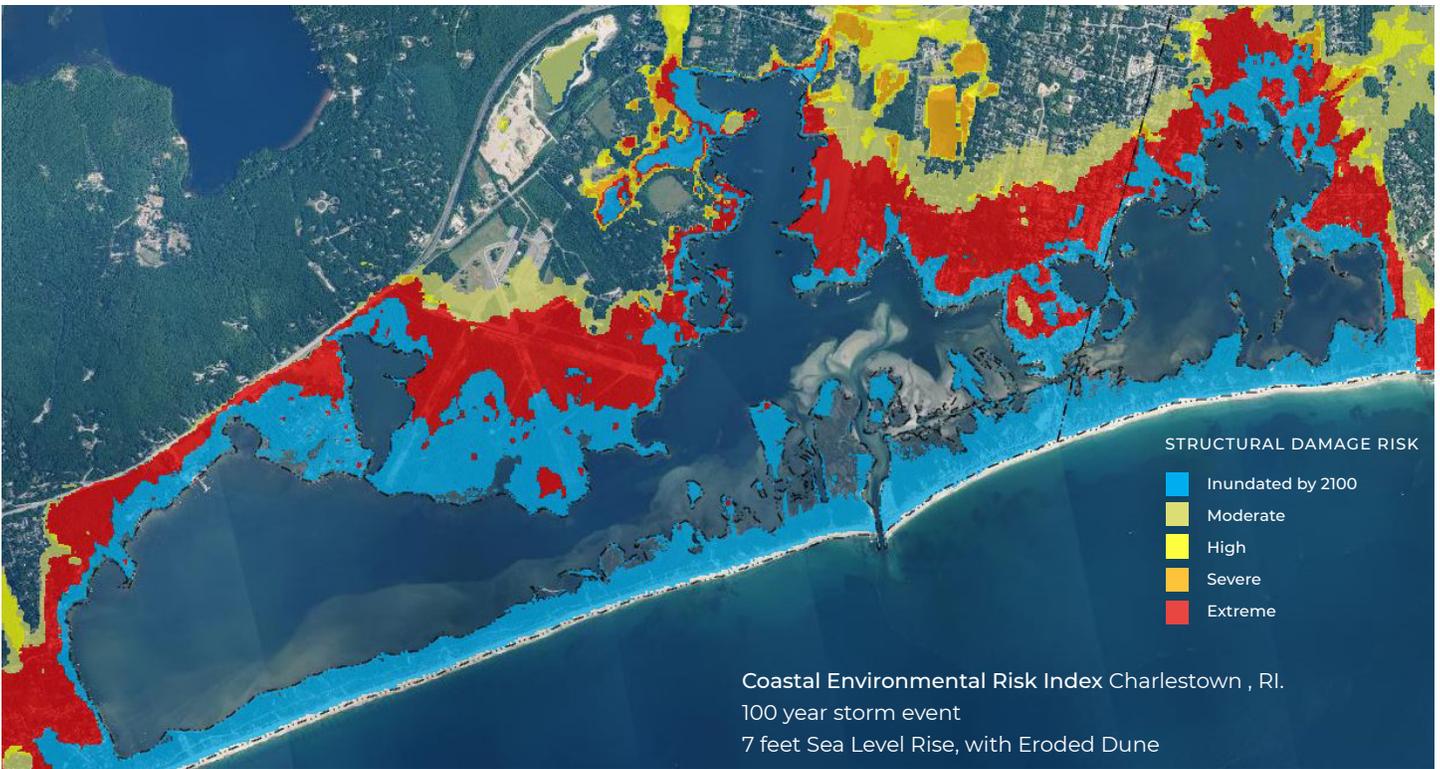
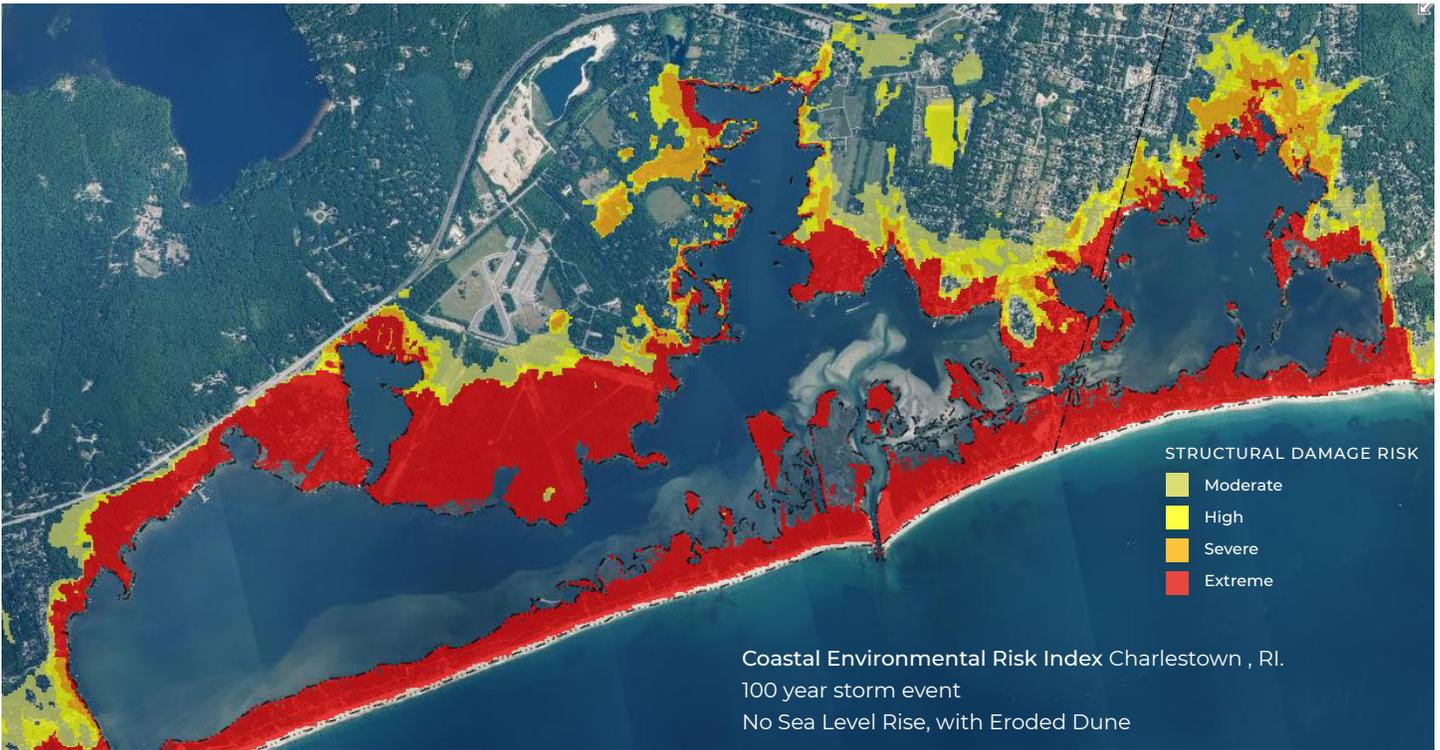
Rhode Island's iconic coastline—420 miles of barrier beaches, historic waterfronts, bluffs, headlands, and salt marshes—is a treasured asset, cherished by residents while powering major economic sectors, including tourism, marine trades, and aquaculture. Continuously shaped by storms, erosion, and tidal inundation, coastline changes are accelerating due to climate change. As storms erode beaches and flood neighborhoods, and rising sea levels subsume once-dry land, the state's coastal properties, infrastructure, and environmental assets are increasingly threatened.

While Rhode Island's sea level rose just 10 inches between 1930–2017, the rate in recent years is increasing. As part of the Atlantic coast, Rhode Island is in an accelerated “hotspot,” with rates higher than the global average. Current trends indicate sea levels will rise up to 9.6 feet by 2100. Additionally, the intensity of tropical storms, hurricanes, and nor'easters is expected to increase, contributing to more frequent heavy-precipitation events, which in New England have increased 71% since 1958. Increased flooding is just one outcome, as rising sea levels expand existing floodplains and result in deeper floodwaters. Coastal erosion is another—on average, Rhode Island's coastline is eroding 1.9 feet per year, with some localities nearly double that.

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Overall, current projections indicate that 11.5% of coastal residential, 18.9% of commercial, and 13.8% of public service structures are exposed to the effects of sea-level rise and storm surge under a long-range planning scenario, with some communities much higher.

The financial impact is severe. Economic losses due to tropical storms and floods have tripled over the past 50 years, and while 90% of all U.S. natural disasters involve flooding, standard homeowner's insurance does not cover it. Small businesses are particularly vulnerable to severe weather, with an estimated 40% closing and never re-opening following a storm. Coastal vulnerability and climate-change studies show that the cost of inaction is 4–10 times greater than the cost of preventive hazard mitigation.



STORMTOOLS FOR DECISION MAKERS

Mapping Tools

Online mapping tools show coastal flooding, storm surge, and sea-level-rise scenarios across 420 miles of coastline.

Visit: beachsamp.org/stormtools

Coastal Environmental Risk Index (CERI)

Predicts storm surge and wave height in conjunction with shoreline-change maps to construct risk index for individual structures. (Currently only available in select communities.)

STORMTOOLS Design Elevation (SDE Maps)

Supplement FEMA FIRM maps to evaluate future (in addition to just current) flood risk; also identifies design elevations for consideration when building/rebuilding to reduce coastal risk.



Innovative Coastal Policy A Forward-Looking Coastal Permitting Process

This SAMP is designed to help property owners and municipalities assess their specific risk from storm surge, erosion, and sea-level rise (“risk” defined as the potential for a hazard to occur, resulting in consequences for people and property). A special permitting process for property owners looking to purchase or build in the coastal zone is also being introduced.

Coastal risk cannot be fully eliminated due to the uncertainties associated with coastal storms, but it can be managed and reduced through risk assessment and adaptation strategies. The tools and process developed for this SAMP help fill this gap.

The *Shoreline Change SAMP*’s true innovation is its new coastal permitting process, ensuring that CRMC-approved projects are designed and built with a full awareness of the risks of developing in coastal hazard areas. This new process is crucial to protecting communities because short-term development decisions can lead to costly long-term problems (e.g., building a coastal road

that floods and erodes), while existing regulations, insurance programs, and management measures can create a false sense of security as they are based on static, historical data that don’t address sea-level rise and other changing conditions.

By taking into account future conditions, the CRMC’s new planning approach complements existing coastal hazards programs (such as the *FEMA National Flood Insurance Program*) built on historic data, helping to protect public health, safety, and welfare, minimizing damage and losses to infrastructure and properties, and reducing overall impacts to coastal resources. Adapting to these ongoing and future conditions will ensure Rhode Island builds resilient communities while maintaining a strong coastal economy and environment.

Coastal permit applicants within the CRMC’s jurisdiction will now be required to complete a 5-Step Risk Assessment Process, for both new properties and those undergoing major improvements.



Rhode Island's coastline is continuously shaped by storms, erosion, and tidal inundation. As the climate changes, the impacts of these natural coastal processes and hazards are increasingly threatening coastal properties, infrastructure, and social, cultural and environmental assets throughout the state. (Chapter 1, Page 3)

Five-Step Risk Assessment Process

STEP ONE PROJECT DESIGN LIFE

The applicant will choose an appropriate design life, or lifespan, for the project, and identify a projected sea level for the project site based on the selected design life.

STEP TWO SITE ASSESSMENT & BASE FLOOD ELEVATION

The applicant will review specified maps and tools to assess the exposure and potential risk from coastal hazards at the project site

STEP THREE LARGE PROJECTS

For Large Projects and Subdivisions only. If not such a project, the applicant may skip this step.

STEP FOUR DESIGN EVALUATION

The applicant will identify, document, and assess the feasibility of design techniques that could serve to avoid or minimize risk of losses.

STEP FIVE SUBMIT AN APPLICATION

The applicant will submit the permit application and include the assessment from the previous steps in the application package to the CRMC.

This process offers property owners and local decision makers direction and support via a thorough examination of coastal hazards and their associated impacts based on current climate science and coastal responses to changing sea levels over time. Adaptation strategies to consider during the planning and design development phase—including setbacks, elevation, or fortification changes—will assist applicants in evaluating the consequences of future change, thereby empowering informed decisions on the long-term use and viability of their projects.

Full coastal permitting process details and instructions are outlined in *Shoreline Change SAMP* Chapter 5, located at beachsamp.org.

A first step in the coastal risk assessment and management process is to identify the coastal hazards that are sources of risk, as well as scenarios illustrating when and how these hazards might affect coastal areas. (Chapter 3, Page 20)



ADAPTATION STRATEGIES

Creating Resilient Coastal Communities in Rhode Island Know Your Risk / Take Action

The risks to Rhode Island's coastal areas from climate change and sea-level rise are real, and the new tools and coastal permitting process laid out in the *Shoreline Change SAMP* are designed, using the latest science, to help Rhode Island's coastal municipalities, developers, and property owners become aware of the specific risks they face in the coming years.

Once their risk is determined, the CRMC encourages decision makers to take action, starting with reviewing and selecting from the adaptation strategies laid out in *Shoreline Change SAMP* Chapter 7. Various adaptations—including site selection, terrain management, flood barriers, floodproofing, and retrofitting—can be proactively implemented starting today, at the individual, community, and structural level, and will help protect Rhode Islanders against the upcoming shifts and changes in Rhode Island's shoreline.

Rhode Island's Shoreline Change Special Area Management Plan is developed and implemented by the Rhode Island Coastal Resources Management Council in partnership with the University of Rhode Island.

TO LEARN MORE: BEACHSAMP.ORG

Shoreline Change ("Beach") SAMP Document

Visit: www.crmc.ri.gov/samp_beach.html

5-Step Risk Assessment Process outlined in Chapter 5.

Coastal Property Guide

Features proactive steps across range of topics, from setbacks to septic systems, that homeowners and businesses can take to protect their coastal property.

Visit: www.beachsamp.org/relatedprojects/coastalpropertyguide

For More Information, Contact Rhode Island CRMC

Phone: 401.783.3370 Email: cstaffl@crmc.ri.gov

Online: www.crmc.ri.gov

Coastal communities will experience increasing damage to coastal properties, which may impact coastal communities and economies in a number of ways. Rhode Islanders' best protection against these damages is to begin implementing adaptation measures today. (Chapter 7, Page 3)

