

**PORTSMOUTH COMPREHENSIVE COMMUNITY PLAN**

**ELEMENT 11 -NATURAL HAZARDS AND CLIMATE CHANGE**

**11.1 NATURAL HAZARDS AND CLIMATE CHANGE VISION**

**PORTSMOUTH WILL BE A COMMUNITY THAT HAS PREPARED ITS VULNERABLE AREAS, ASSETS AND POPULATIONS TO MINIMIZE THE EFFECTS OF NATURAL HAZARDS IN A CHANGING ENVIRONMENT.**

This section addresses Portsmouth’s management of natural hazards and climate change under the following categories:

- Existing conditions including discussion natural hazards.
- Resiliency and mitigation measures.
- Issues and opportunities.

This element is intended to promote the concept of community resilience as not simply the ability to “bounce back” from a natural disaster but the ability to “bounce forward” to a better community which is able to recover quicker and with less community disruption. It also establishes a target level for planning purposes for all public and private coastal activities of 1 to 1.5 feet of sea level rise by 2040 and a 3 to 5 feet rise in sea level by 2100.

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**11.1.1 BASIS FOR PLANNING**

This section of the Portsmouth CCP update relies on:

- Portsmouth Natural Hazard Mitigation Plan - 2018
- Portsmouth Harbor Management Plan
- NOAA Technical Report NOS CO-OPS 083 – Global and Regional Sea Level Rise Scenarios for the United States, January 2017
- Prudence Island Community Wildfire Protection Plan - 2018

**11.2 EXISTING CONDITIONS**

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**11.3.1 NATURAL HAZARDS: THREATS**

According to Portsmouth’s Natural Hazard Mitigation Plan the Town is most susceptible to the following natural hazard threats

Table 1—Level of Risk Associated with Types of Natural Hazards	
Type of Natural Hazard	Level of Risk
Hurricane	High
Nor'easter	
Coastal Flooding	
Snow Storm	
High Winds	Medium
Ice Storm	
Street Flooding	
Extreme Heat and Cold	
Drought	
Brushfire	Low
Earthquake	
Hail	
Lightning	
Tornado	
Sea Level Rise	

The following text discusses risk posed by the most severe natural threats—hurricanes, nor'easter, coastal flooding and snow storms.

#### *Hurricanes*

The Town's close proximity to the Atlantic Ocean renders it particularly susceptible to hurricanes and the resulting loss of human life and property. Probability of future hurricane occurrence is considered likely. Cyclonic storms threaten the coast of Rhode Island virtually every year. Cyclonic storms that reach Rhode Island are usually weak—Category 1 or less—notwithstanding these are still potentially dangerous storms. Portsmouth is a coastal community and, therefore, susceptible to coastal storm surge, damage from downed power lines and downed trees. Mobile homes, converted seasonal homes and older structures are at particular risk. Climate change is likely to intensify the effect of cyclonic storms. Some recent examples of severe tropical cyclones include Hurricane Irene (2011) and Tropical Storm Sandy (2012).

#### *Nor'easters*

A strong low-pressure system along the Mid-Atlantic and New England, can form over land or over coastal waters. The storm radius is often as large as 1,000 miles, and the horizontal storm speed is about 25 miles per hour, traveling up the eastern United States coast. Sustained wind speeds of 10-40 MPH are common during a nor'easter, with short term wind speeds gusting up to 70 MPH. Typically a winter weather event, Nor'easters are known to produce heavy snow, rain and heavy waves along the coast.

The Town's close proximity to the Atlantic Ocean renders it particularly susceptible to Nor'easters and the resulting loss of human life and property. Probability of future hurricane occurrence is considered highly likely. Portsmouth is a coastal community; most damage would be to utilities, roads, stormwater infrastructure, personal property, trees, and snow loads on roofs. The Blizzard of 1978 was the largest Nor'easter on record. Many people in Rhode Island

were without heat, food, and electricity for over a week. More recent events include two Nor'easters in 2011. Similar to hurricanes, changes in air and water temperatures may lead to stronger Nor'easters along the Atlantic Ocean. Portsmouth should expect stronger Nor'easters, but not necessarily more frequent storms.

### *Coastal and Street Flooding*

According to the Rhode Island 2014 Hazard Mitigation Plan Update, "Flooding is a localized hazard that is generally the result of excessive precipitation. Flooding is the most commonly occurring natural hazard, due to the widespread geographical distribution of river valleys and coastal areas, and the attraction of human settlements to these areas. Severe storms with heavy rain can generate flash floods which strike and end quickly. Flash flooding isn't limited to streams and rivers but also streets. Conditions in Portsmouth do not typically yield flash floods. During the March 2010 flood events several roads were unpassable on Prudence Island as well as Portsmouth. Low-lying coastal roads, as well as the neighborhoods of Common Fence Point, and Island Park are the most vulnerable. Localized flooding can be expected to occur on an annual basis. The flood event which occurred in March 2010 was a 250 year +/- event. Changing climate conditions are likely to bring more rainfall events to Portsmouth and fewer snow storms. More intense storms will stress the natural floodplains and stormwater infrastructure.

### *Snow Storms*

The majority of Rhode Island lies outside the heavy snow and ice regions of the northeast. Due to its maritime climate, Rhode Island generally experiences cooler summers and warmer winters than inland areas. However, snow and ice do occur and can be more than an inconvenience and cause extensive damage. The two major threats from these hazards are loss of power due to ice on electrical lines and snow loading on rooftops. Additionally, loss of power could mean loss of heat for many residents. Winter storms vary in size and strength and can be accompanied by strong winds that create blizzard conditions and dangerous wind chill. There are three categories of winter storms. A blizzard is the most dangerous of the winter storms. It consists of low temperatures, heavy snowfall, and winds of at least 35 miles per hour. A heavy snow storm is one which drops four or more inches of snow in a twelve-hour period. An ice storm occurs when moisture falls and freezes immediately upon impact. For the purpose of this plan, snow storms include heavy amounts of snow and ice. All of which may occur independently or at the same time. A severe winter storm could have a serious impact in private, and public structures, as well as the general population throughout Portsmouth. Those most at risk to extreme cold are the elderly and those who work outside. Major snow storms are highly likely to occur in Portsmouth. Considering climate change, Portsmouth may likely see less snowfall over the winter season but may see more intense blizzards when they do occur.

### Maps to accompany this element will include:

- A map that illustrates areas that would be currently inundated in the event of a 1% (100-year) and 0.2% (500-year) storm as they appear on the most recent FEMA Flood Insurance Rate Maps (FIRMS).

- One or more maps that illustrate the areas that would be inundated in the event of a Category 1 through Category 4 hurricane.
- One or more maps that illustrate the areas that are projected to be inundated due to 1 foot, 3 feet and 5 feet of potential sea level rise.

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### 11.3.2 EXISTING, ON-GOING RESILIENCE AND MITIGATION MEASURES

The text below summarizes some of Portsmouth’s principal efforts to mitigate the adverse effects of natural hazards.

#### *Building Codes*

All municipalities within the State of Rhode Island share a single building code (RIGL 23-27.3-100 et. al.). The Code itself (which incorporates the International Building Code) was last amended in 2012 and provides comprehensive construction requirements designed to mitigate the impacts from natural hazards, such as high wind events. The Code is enforced by the Portsmouth Building Department and provides an additional layer of regulatory control to those discussed above.

#### *Zoning Ordinance – Flood Hazard Areas*

Among other things, the Zoning Ordinance of the Town of Portsmouth (February 13, 2012) aims to provide guidance to promote public health, safety, and general welfare; provide a range of uses and intensities of use appropriate to the character of the town; provide orderly growth and development; provide for the control, protection, and/or abatement of air, water, groundwater, and noise pollution, and soil erosion and sedimentation; provide for and protect the public investment in public infrastructure and facilities; promote safety from fire, flood, and other natural or man-made disasters; and coordination of land uses with other municipalities as appropriate; among others.<sup>30</sup> The Zoning ordinance promotes safety from fire, flood, and other natural or man-made disasters. Chapter 405, Article III, Section F of the Code of Ordinances describes zoning standards for the Special Flood Hazard Area.

#### *National Flood Insurance Program*

The Town of Portsmouth is an active and compliant member of the National Flood Insurance Program since 1982. As such, Portsmouth residents are able to purchase flood insurance to protect their property against flood losses. The Town of Portsmouth has adopted the most recent (September 4, 2013) Flood Insurance Rate Maps (FIRM) and Flood Insurance Study (FIS). The Town has designated the Building Official as the NFIP Coordinator to manage the program.

#### *Public Works*

The Public Works department helps the Town improve resiliency and reduce damages and cost from hazards by reviewing every site that is proposed for new development and/or redevelopment to ensure the sewer, water and stormwater regulations are followed during the design, the construction and the final acceptance of the site.

## 11.4 ISSUES AND OPPORTUNITIES

Natural hazards and climate change present a number of critical challenges for Portsmouth. Portsmouth is a coastal community on the front lines of sea level rise and the impact of coastal storms. In part, Portsmouth faces the following concerns.

- According to the Town’s Natural Hazard Mitigation Plan, Portsmouth has over an estimated 8,000 buildings with a total replacement value (excluding contents) of \$2,364 million (2010 dollars). Approximately 93% of the buildings and 82% of the value are associated with residential housing.
- The predicted impacts of climate change and sea level rise range widely. The available data is unreliable and impacts are both potential devastating and largely uncertain.
- Given the uncertainties and serious risks associated with future natural disasters and sea level rise, the Town will need to develop a public information and communication strategy that allows citizens and property owners can determine their own tolerance for risk and make intelligent choices on how to manage that risk.

With a footnote to the above NOAA technical report, this section will discuss the rationale for scenario planning in the face of uncertain and/or unreliable data.

## 11.6 GOALS, POLICIES AND IMPLEMENTATION ACTIONS

### GOAL NH/CC - 1

***Achieve a level of economic, societal and ecological resilience in our built and natural environment that enables Portsmouth to recover quickly from the effects of natural hazards and climate change and minimizes long-term community disruption.***

#### *Policy NH/CC - 1.1*

***Manage land use and the built environment within the floodplain and other vulnerable areas to not only mitigate but increase community resilience to, the effects of natural hazards and climate change.***

Action NH/CC - 1.1a – Evaluate current zoning and land use regulations related to future effects of climate change and update as needed.

Action NH/CC - 1.1b – Work with RIDOT to identify ways to mitigate future impacts and increase resilience to flooding, storm surge and sea level rise along Park Avenue in Island Park And other vulnerable State roads.

Action NH/CC - 1.1c – Develop “Where, When and How” land use and development management scenarios to address the effects of climate change and sea level rise.

Action NH/CC - 1.1d – Work with Federal and State partners to investigate and prioritize improvements in the town-owned storm drain system to enhance discharge, retention and infiltration capabilities.

Action NH/CC - 1.1e – Work with Federal and State partners to evaluate the functionality of onsite wastewater treatment systems due to various potential natural hazard scenarios.

Action NH/CC - 1.1f – Improve Portsmouth’s mapping and data gathering capabilities to support assessment, analysis and planning activities.

Action NH/CC - 1.1g – Update and obtain approval by RIDEM of Emergency Action Plans (EAPs) for all significant and high hazard dams in Portsmouth.

*Policy NH/CC - 1.2*

***Preserve and enhance the capacity of the natural environment to improve Portsmouth’s resilience to the effects of natural hazards and climate change.***

Action NH/CC - 1.2a – Work with the Aquidneck Land Trust and others to identify and conserve areas vulnerable to the effects of increased natural hazards due to climate change.

Action NH/CC - 1.2b – Investigate the implementation of green infrastructure stormwater management strategies to enhance infiltration and increase retention on town properties and roadways.

Action NH/CC - 1.2c – Investigate the adoption of low-impact development standards to reduce the amount of impervious coverage and increase stormwater infiltration.

Action NH/CC - 1.2d – Work with stakeholders to identify, prioritize and implement coastal adaptations projects to allow wetlands expansion and salt marsh migration.

*Policy NH/CC - 1.3*

***Require all municipal departments, boards and commissions to incorporate resilience to natural hazards and climate change in all long-range planning and public infrastructure projects.***

Action NH/CC - 1.3a – Maintain a FEMA-approved Hazard Mitigation Plan and report implementation progress on an annual basis.

Action NH/CC - 1.3b – At least on an annual basis, review Hazard Mitigation Plan, the Comprehensive Plan, SAMP plans, the city’s land use regulations and the local Harbor Management Plan for consistency.

Action NH/CC - 1.3c – Establish a category in the 5-year Capital Improvement Program specifically for community resilience and hazard mitigation projects.

*Policy NH/CC - 1.4*

***Work to reduce the economic impacts of and increase the societal resilience to the effects of natural hazards and climate change.***

Action NH/CC - 1.4a – Participate in the FEMA Community Rating System and provide resources necessary to coordinate an effective implementation program. Determine a rating score target to be achieved by 2025.

Action NH/CC - 1.4b – On a quarterly basis, conduct community outreach including public forums and posting of information on the town website to educate residents regarding the risk of from the effects of natural hazards and the concept of community resilience.

Action NH/CC - 1.4c – Encourage the formation of neighborhood associations to assist in the monitoring of impacts of climate change.

Action NH/CC - 1.4d – Provide support for property owners to help take advantage of funding opportunities that assist with covering the costs of mitigating risk in flood zone areas.

Action NH/CC - 1.4e – Collaborate with State agencies and others to implement the Prudence Island Community Wildfire Protection Plan.