RESILIENT LAND USE GUIDE FOR NH

CASE STUDY: PORTSMOUTH, NH

One community's approach to protect historic resources from sea level rise and storm surge.

OVERVIEW – ASSESSING THREATS TO HISTORIC RESOURCES FROM SEA LEVEL RISE AND STORM SURGE

Portsmouth is defined by its waterfront setting and architecture reflecting nearly four centuries of history. The Downtown Historic District was listed on the National Register of Historic Places in 2017 and has more than 1,200 historically significant buildings. The city's rich history and vibrant downtown are cornerstones of the region's economic success and protecting these resources from sea level rise and storm surge is a priority for the community.

In 2017, Portsmouth completed an Historic Resources Climate Change Vulnerability Assessment and Adaptation Plan to characterize, risk-assess, and prioritize key historic assets located in areas at highest risk for coastal flooding. The Plan integrates quantitative data, such as flood elevation, topography, and structure value, with qualitative data, such as historic survey forms and National Park Service designation, to develop a Historic Resource Valuation and Risk Assessment Map. The Plan provides adaptation action recommendations for specific parcels, as well as a greater understanding of groundwater issues likely to emerge as sea level continues to rise.

The assessment involved a multidisciplinary team of consultants who integrated a wide variety of economic, environmental, cultural, historic, archeological, and engineering factors. Using innovative visualization, valuation, and modeling tools the team developed a method with broad-based applicability to other coastal communities to promote resiliency. Funds were provided by the National Park Service under the Hurricane Sandy Pre-Disaster Mitigation grant program.

PORTSMOUTH'S APPROACH

A Local Adaptation Committee of stakeholders concerned about Portsmouth's historic assets was central to development of the methods, results, and recommendations in the Plan. Committee members included representative from the City Council, the Historic District Commission, the Conservation Commission, City staff, historic preservation experts, residents of the study area, and local businesses.

The Plan focused on four target areas in Portsmouth and evaluated the economic impact of flooding and sea level rise in a variety of land uses and settings. Strawbery Banke Museum, a 10-acre living history museum at the center of the National Register Strawbery Banke District, was evaluated for both sea-level change and rising groundwater of seepage impacts on historic structures. Sections of the historically significant North Mill Pond and South End neighborhoods were also studied and included assessments of private, historically significant homes, cemeteries, as well as the culturally significant Prescott Park. In the downtown, the study evaluated impacts of sea level rise for the port and working waterfront and the associated land-side support services.

South Mill Pond (8)
Richards Avenue area

Candidate Action
Flood district designation, residential floodproofing rebate program

Potential Feasibility
The row of residences along Richards avenue has a relatively high composite value and risk score (Figure 12). One option that may benefit structures throughout the South Mill Pond strategy area or the whole City is creation of a flood district where a rebate program that covers part of the cost of implementation of floodproofing techniques would be offered for owners of residential property. Programs of this type resemble rebate programs that many municipalities offer for installing solar panels. Feasibility would likely be determined by political will to support the financial commitment to be made by the City, however firm conclusions would need to be developed through careful evaluation of social, political, and financial capacity for broad-based programs of this type in the City.

Potential Effectiveness
Depending on degree of participation in such a program, it could substantially reduce potential for flood-related losses throughout a designated flood district. Prior to reaching firm conclusions about likely effectiveness, however, these possibilities would need to be carefully evaluated using hydrologic models to confirm amounts of protection each type of floodproofing under consideration might convey to structures in the district.

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An online Story Map was created to allow Committee members an interactive means of visualizing sites evaluated and the adaptation actions under consideration. Hydrologic modeling was conducted to visualize extents of surface water flooding under different tidal, surge, and sea level rise scenarios. Recommendations were made for actions to update planning and code regulations and emergency management documents to reflect results of the Plan, as well as for a network of groundwater monitoring wells and other collaborative monitoring activity that could be undertaken.

RESOURCES

- Rockingham Planning Commission: www.therpc.org
- City of Portsmouth Historic Resources Climate Change Vulnerability Assessment and Adaptation Plan: https://www.cityofportsmouth.com/planportsmouth/historic-properties-climate-change-vulnerability

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