

HERITAGE RESILIENCY IN A CHANGING CLIMATE

CLIMATE CONVERSATIONS | OCTOBER 10th, 2024





FOUNDED BY THE NEWPORT RESTORATION FOUNDATION | HISTORYABOVEWATER.OR

Keeping History Above Water® (KHAW) was founded in 2016 by the Newport Restoration Foundation to foster a multi-disciplinary conversation focused on the increasing and varied risks posed by sea-level rise to historic coastal communities. KHAW® programs, conferences, and workshops focus on protecting historic resources and neighborhoods from the increasing threat of inundation. Since the inaugural conference in Newport, KHAW® events have been hosted in Annapolis, Palo Alto, Des Moines, St. Augustine, Nantucket, Charleston, Salem, Norfolk, Trinidad and Tobago, Portsmouth, and Honolulu.







 80 historic properties primarily used as longterm rentals













- 80 historic properties primarily used as longterm rentals
- 3 public sites/museums











- 80 historic properties primarily used as longterm rentals
- 3 public sites/museums
- 32 properties located in the flood zone





74 Bridge Street, Newport RI



Christopher Townsend House: 74 Bridge Street



c. 1920s

2017









Flooding at 74 Bridge Street, 2012



Flooding in the Point neighborhood, December 2022 and 2023





Projected High Tide Flood Days – The Point by 2050



Newport Historic Districts



FEMA Floodplain



- Newport Local Historic District (LHD) is comprised of 6 National Register Historic Districts
- ~40% of the City is within the boundaries of the LHD
- 57% of Newport's housing stock dates to pre-1940s
- Some of the oldest and most significant buildings are within the flood zone



FEMA Floodplain





74 Bridge Street, Newport RI











An exhibition produced in conjunction with the Newport Restoration Foundation's Keeping History Above Water conference held in Newport, RI, April 10-13, 2016 WWW.HISTORYABOVEWATER.ORG







CHALLENGES IN MAINTAINING POINT. **BUILDING AND STREET CHARACTER**



O Bridge Street in the Point ? back and forth with the cor nity and local hist district, the owner was able to raise their home to mitigate much of the Rood risk, but well below the height that would have brought them closer to regulatory compliance. CONVENTIONAL METHODS FOR PROTECTING HOMES AGAINST FLOOD RISK ARE NOT ALWAYS COMPATIBLE WITH PRESERVING THE CHARACTER OF HISTORIC DISTRICTS LIKE THE

IN THESE CASES, FEDERAL AND STATE FLOOD **REGULATIONS ARE OFTEN UNABLE TO BE MET** WITHOUT SEVERELY COMPROMISING THE HISTORIC FABRIC - LEAVING OWNERS WITH LIMITED OPTIONS FOR PROTECTING THEIR





MA PHEE TITLE **DECREASE PRESSURE: HOME**

RESPONSIBLE STAKEHOLDERS: Ø 8

CAPTURING STORMWATER AT INDIVIDUAL PROPERTIES WILL **BE A CRITICAL COMPONENT OF ANY** LONG-TERM STORMWATER SOLUTION FOR THE POINT NEIGHBORHOOD.

PROPERTIES UPHILL FROM THE POINT ARE JUST AS CRITICAL AS THOSE IN THE POINT ITSELF.

RAIN BARBELS

- By detaining the stormwater runoff during a rain event, homeowners can help add capacity to the city's storm system and reduce overflows. The collected rain water can be reused for irrigation to water lawns, gardens, window boxes or street trees. Water not used is infiltrated slowly once storm events pass. **CISTERNS**
- -Operating under the same principle as a rain barrel, a cistern is a large capacity container used to collect stormwater from a roof and other impervious surfaces around a building. After the storm event, the water is then re-introduced into the storm water system or can be utilized by the homeowner for a variety of applications. In areas where basements see regular flooding, it is possible to convert basements to house cisterns.

RAIN GARDENS

A rain garden is a planted depression that uses native plants and landscoping to sock up stormwater that flows from downspouts or simply flows over land during a rain event. The center of the rain garden holds several inches of water, allowing stormwater to gather during a rain event. Once the storm abates, the water will slowly infiltrate into the ground as the watertable permits.



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POLICY A **CHALLENGES IN MAINTAINING BUILDING AND STREET CHARACTER**

RESPONSIBLE STAKEHOLDERS:

HISTORIC CHARACTER

FEMA

FLOOD LINE

Existing condition

REGULATORY COMPLIANCE

HISTORIC CHARACTER

AFFORDABILITY

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POSSIBLE ON SMALL LOT

PRACTICAL REALITY OF FLOODI



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AFFORDABILITY /















KHAW: Annapolis (2017) Graphic Recording by Jim Nuttle



KHAW: Nantucket (2019)





KHAW: Norfolk (2022)





KHAW: Norfolk (2022)





Offered for the first time internationally, Keeping History Above Water is arriving in Trinidad and Tobago and bringing together an interdisciplinary group of experts to discuss cultural heritage and climate change

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KHAW: Trinidad & Tobago (2023)





KHAW: Portsmouth (2023)





Sensor Deployments

- Strawbery Banke Museum Deployment 2022-23



- Hampton NH 2019

KHAW: Portsmouth (2023) – Michael Routhier sensor deployments, UNH





Walking Tours: Strawbery Banke drainage master plan and Point of Graves Cemetery





KHAW: Pacific (2024)











PRESERVATION IN A CHANGING CLIMATE SEPT. 12 – 13, 2022 Lager SALEM





How is NRF continuing the KHAW conversation in Newport?







Vulnerability Study (2020)

Consider exposure:

Sea-level rise as determined by 100-year flood zone

• Impact of additional 3-5 feet of sea level rise

Consider sensitivity:

Condition of properties

- Foundations
- Storm windows
- Utilities
- Etc.

Monitor properties post-storm

FLOOD INSURANCE

MOST PROPERTIES ARE VULNERABLE TO FLOODING

Flooding can happen just about anywhere it rains or snows. On average, 40% of the National Flood Insurance Program (NFIP) flood insurance claims occur outside the high-risk flood areas. That's why it's important to protect the life you've built with flood insurance, even if you live in an area with low-to-moderate flooding risk.

The official definition used by the NFIP is "A general and temporary condition of partial or complete inundation of two or more acres of normally dry land area or of two or more properties (at least one of which is your property) from:

- Overflow of inland or tidal waters;
- Unusual and rapid accumulation or runoff of surface waters from any source;

THE NFIP OFFERS BUILDING COVERAGE

The following items are a sample of those covered under building coverage:

- The building and its foundation
- Carpet permanently installed over unfinished flooring
- Central air-conditioners
- Electrical systems
- Furnaces and radiators
- Ranges, cooking stoves, and ovens
- Refrigerators
- Window blinds

For a complete list, see your policy or contact your insurance agent.

Additionally insure properties from flooding

Data collection to determine proper adaptation for every property

- How is water entering property?
- How often is building flooding?
- How often is the sump pump running?
- How is humidity affecting the structure?
- How can green solutions aid in water movement away from building?
- What are the City and neighbors doing?

ELEVATE CRITICAL SYSTEMS

Data collection to determine proper adaptation for every property

- Can systems be fortified?
- Can systems be elevated?
- Is a new utility structure needed? (Historic District review)
- Does the basement need to be removed from household use?

Rough Point water infiltration project (2021-2023)

Integrate climate resiliency into interpretation

As you explore Rough Point, you will notice a significant restoration project underway.

Rough Point's oceanfront location means that the house is subject to frequent battering from strong winds, saltwater spray, and intensifying storms due to climate change.

Rough Point project interpretation

Partnerships to advance preservation priorities: First regional *Design Guidelines for Elevating Historic Buildings* (2020)

- 1) Streetscapes and context consideration
- 2) Site design consideration
- 3) Foundation design consideration
- 4) Architecture and preservation

History of building elevation in the Point

the current flood zone in Newport, RI

NRF

Streetscape elevations were employed to show that cohesive elevation projects over time will change entire neighborhoods, not only individual buildings.

<u>47 Poplar Street</u> 1/8" = 1'-0"

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Elevate to 4'

- A. Move Building Back on Lot
- B. Rebuild Stone Foundation
- C. Add Flood Vents to Side Elevations
- D. Rebuild and Extend Stone Stair
- E. Preserve and Elevate Chimney

7 Foot Elevation

PROPOSED SOUTH ELEVATION

PROPOSED EAST ELEVATION

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SUDING SHIELD

LIFT OUT SHIELD

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Examples of flood shields to protect entrances. The photo above shows a shield and shield track in deployed position (Venice, Italy).

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Guidelines include commercial building flood proofing considerations. These recommendations expanded upon the existing Design Guidelines and will be beneficial for the district at large.

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YES: Property owners are encouraged to use permeable materials for driveways such as gravel instead of hard surfaces like concrete or asphalt (left). Another approach is to only hard surface the driveway "ribbons" as shown at right (Nantuck: Massachusets).

YES: Permeable pavement materials should also be considered for new or replacement parking areas to limit water runoff and ponding (Charleston, South Carolina).

The front lawn of this dwelling incorporated native grasses on either side of the walkway to absorb water (Nantucket, Massachusetts)

· Encourage the use of plantings or other pervious materials to help absorb water.

The dwelling at 5 Marsh Street uses appropriate native grasses in its planter bed.

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Beyond building specific interventions, the guidelines include landscape and site guidance to alleviate flooding, including permeable pavers and plantings that fit within the character of the Historic District.

O1: EXTERIOR PERSPECTIVE - EXISTING

74 Bridge Street: Sold & elevated with a preservation easement in place

HISTORY ABOVE WATER

KEEPING

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