WEATHER IT TOGETHER
Partnering to Protect a National Treasure

KEEPING HISTORY ABOVE WATER
APRIL 10-13, 2016 | NEWPORT, RI
Weather It Together
A Model Adaptation Plan for Cultural Resources

*Weather It Together* is a public/private partnership to address the impacts of Climate Change and Sea Level Rise on historic and cultural resources in Annapolis, the Chesapeake Bay and the nation.

**Project Partners**

City of Annapolis ▪ Annapolis Partnership
Maryland Emergency Management Agency ▪ Maryland Department of Natural Resources ▪ Maryland Historical Trust
National Oceanic and Atmospheric Administration ▪ National Park Service
National Trust for Historic Preservation ▪ Preservation Maryland
Union of Concerned Scientists ▪ United States Naval Academy
United States Army Corps of Engineers
US ICOMOS ▪ Urban Land Institute
High Tide on Main Street

Annapolis Prepares for Rising Seas: History Meets the Future
Ice melts at 32 degrees. It doesn’t care if you are a Republican or a Democrat.

- John Englander, oceanographer and author of High Tide on Main Street
Since 2001, water has reached flood levels an average of 20 days or more a year in Annapolis, MC; Wilmington, NC; Washington, D.C.; Atlantic City & Sandy Hook, NJ; and Charleston, SC. Annapolis had the highest average number of days a year above flood threshold since 2001, at 34.
Annapolis experienced the greatest increase in nuisance flooding during the last 50 years - 925% - from an average of 3.8 to 39.3 per year. In the next 50 years, nuisance flooding is estimated to occur more than once a day.
“In Annapolis, home to the U.S. Naval Academy, half a foot of water flooded the colonial district, a National Historic Landmark, at high tide on Chesapeake Bay during rainstorms on April 30, May 1 & 16 and Aug. 12. Shopkeepers blocked doorways with wood boards and trash cans; people slipped off shoes to wade to work in bare feet.”
Within the next 100 years, sea level rise is estimated to reach 44 inches. To date, 13 islands have been lost in the Chesapeake.
The Chesapeake Bay
Lost Landmarks

Holland, Hooper’s and Sharp Islands – Last structures lost (2010)
Climate Change In Maryland

Coast Smart Construction

Smith Island – Maryland’s last inhabited Chesapeake Bay Island

“Exceptions should be based on an analysis of the scope, function and importance of the project, including historic and cultural preservation considerations.”
Annapolis History
A Colonial Capital

- Nicholson lays out plan for Colonial Capital - 1695
- St. John’s College (3rd oldest U.S. College) - 1696
- Alex Haley’s Kunta Kinte arrives Lord Ligonier - 1767
- Maryland State House (oldest state capitol) - 1772
- Home to Maryland’s 4 signers of the Declaration of Independence - Carroll, Chase, Paca & Stone
- General George Washington Resigns Commission - 1783
- First peacetime Capital - 1783 to 1784
- U.S. Naval Academy established - 1845
Annapolis Historic Districts

The Colonial Landmark District

- National Landmark Historic District (1965)
- National Register District (1984)
City of Annapolis
Flood Mitigation

- Focus on protecting existing structures
- Study downtown to determine the costs and benefits of public decision-making in mitigating property damage
- Evaluate the need and options for protecting historic structures
- Require floodproofing to the extent feasible
City of Annapolis
FEMA Flood Insurance Rate Map (FIRM) - 2015

Blue shading 1% annual chance (100-year) flood
Orange shading is 0.2% annual chance (500-yr) flood
Flood elevation 8.2 ft.
1% annual chance flood (4.5') plus 3.7 feet for sea level rise by 2100
Chesapeake Storm History

High Tide Marker
2003 – Isabel = 7.58’
1972 – Agnes = 3.04’
1954 – Hazel = 5.33’
1933 – C&P = 6.35’
Tropical Cyclone Isabel

September 19, 2003

Naval Academy

Market Space

Eastport
“In conjunction with the development of a Hazard Mitigation Plan to protect historic resources... the City will explore and present to the City Council for consideration several strategies for addressing the 100-year flood and sea level rise...”
Hazard mitigation planning is the process of determining how to reduce or eliminate the loss of life and property damage resulting from natural and manmade hazards.

1. Organizing your efforts to develop a mitigation plan;
2. Identifying hazards and assessing losses to your community;
3. Setting mitigation priorities and goals and writing the plan;
4. Implementing the mitigation plan, including project funding.
Weather It Together

Organize Resources

Cultural Resource Hazard Mitigation Planning

Organize your efforts to develop an effective mitigation plan... bringing together the appropriate planning team, consultants, technology, community support and financial resources.
Weather It Together Core Team includes 24 local/state/federal agencies & organizations who meet regularly to discuss planning priorities, share findings, host public meetings and hear presentations from experts on climate change, flood mitigation, data management, flood mapping and modeling, flood insurance, cultural & natural resource survey and assessment and state policies.
The City’s GIS Coordinator & Project Architect, supported by the National Park Service and the US Army Corps of Engineers, developed a database of historic survey, risk assessment and elevation information for City Dock and Eastport cultural resources.
Weather It Together

Secure the Necessary Financial / In-Kind Resources

$348,000 in grant & in-kind support

- Historic survey, risk assessment & elevation studies (300 properties)
- Education & public outreach (branding, visual preference survey town hall, guest lectures, design charrette & social media)
- GIS subscription & training
- Draft hazard mitigation guidelines and a cultural resource plan
Weather It Together
Identify & Map the Floodplain Study Area

PROPERTIES IN THE HISTORIC DISTRICT WITHIN 10 FOOT ELEVATION LINE

ST JOHN'S BOATHOUSE
### Conduct a Cultural Resource Survey

<table>
<thead>
<tr>
<th>SDAT Tax ID Number</th>
<th>HAZARD: Coastal Name and Address of Asset Subject to Hazard (same as previous Page)</th>
<th>MHT Inventory Number (AA#)</th>
<th>Date of Construction</th>
<th>Type of Property / Type of Resource</th>
<th>Total Square Footage</th>
<th>Number of Stories</th>
<th>Structural System</th>
<th>Primary Exterior Materials of Property / Resource</th>
<th>Current Function / Use</th>
<th>Current Condition (Excellent / Good / Fair / Deteriora)</th>
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**Worksheet #3**

- Name/Address of Resource
- Date of Construction
- Type of Property
- Square Footage
- Structural System
- Primary Materials
- Current Function
- Current Condition
- Owner Interest in Mitigation
Weather It Together
Assess Property Vulnerability

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<tr>
<th>Street</th>
<th>OBJECT ID</th>
<th>SDAT</th>
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<th>Use</th>
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<th>Opening Elevation</th>
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22 Sample Properties
- Property Vulnerability (High, Med, Low)
- Loss to Structure ($)
- Loss to Contents ($)
- Loss of Function / Use ($)
- Displacement Cost ($)

Total Projected Loss/Cost

55,155,554
List the name and address of vulnerable historic properties and cultural assets. For each asset (row), fill in Columns 1 to 6. Define High, Medium, and Low for Columns 3, 4, 5, 6, and 7 at the bottom of this worksheet (optional). Fill in Column 7 by qualitatively adding Columns 3 to 6. Enter the results of Column 7 in Column 16 of Worksheet #3.

<table>
<thead>
<tr>
<th>Name and Address of Asset</th>
<th>Column 1</th>
<th>Column 2</th>
<th>Column 3</th>
<th>Column 4</th>
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**Worksheet #4**

- Historic Designation (NR, Local)
- Geographic Context of Significance
- Level of Significance (H/M/L)
- Public Sentiment (H/M/L)
- Economic Importance (H/M/L)
- Degree of Integrity (H/M/L)

**Total Level of Community Value**
Complete a Non-Structural Mitigation Assessment
Weather It Together

3-D Digital Modeling for Sea Level Rise
Weather It Together

Develop Adaptation Alternatives
Planning, Land Use & Building Codes

- Density controls
- Design Review Standards
- Easements
- Floodplain Overlay Zoning
- Open Space Preservation
- Special Use Permits
- Subdivision & Development Regulations
- Transfer of Development Rights
- Environmental Review Standards
- Building Codes
- Coastal Zone Management
Weather It Together
Develop Adaptation Alternatives
Public Engagement

- Website / Social Media
- Branding
- High Water Markers
- Interpretive Kiosks
- Videos
- Media
- Publications
Weather It Together
Develop Adaptation Alternatives
Natural Resources

Before - Erosion

After – Living Shoreline
Weathertight

Develop Adaptation Alternatives - Dry Floodproofing

Dry floodproofing involves sealing building walls with waterproof compounds and using shields (dams or perimeter barriers) to seal off doors, windows and other openings to keep the building watertight. This technique can only be used when the walls are strong enough to withstand the hydrostatic force of the water.
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Develop Adaptation Alternatives – Barriers

- Temporary Flood Wall
- Permanent Flood Wall
- Temporary Door Dam
- Backflow Preventers
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Develop Adaptation Alternatives - Elevation

“Elevation may alter the appearance and scale of a historic building and redefine its relationship to its setting… If the building is raised only several feet, elevation should not severely alter scale.”

“A preservation-sensitive alternative would be the elevation of floors within the building, particularly feasible in historic commercial structures with tall ceilings…”
“MHT is funding the project in part so that we can use it as a model for other communities throughout the state that have cultural resources threatened by sea-level rise.” – Nell Ziehl, Chief of Planning
Weather It Together
2016 Maryland Historical Trust Preservation Award
Excellence in Education and Community Engagement

www.Annapolis.gov/WeatherItTogether

WHAT PLACES MATTER MOST TO YOU?
"The principle of modern times is to neglect buildings first, and restore them afterwards" – John Ruskin

When we build, let us think that we build forever. Let it not be for present delight nor for present use alone. Let it be such work as our descendants will thank us for; and let us think, as we lay stone on stone, that a time is to come when those stones will be held sacred because our hands have touched them, and that men will say, as they look upon the labor and wrought substance of them, "See! This our father did for us."

—John Ruskin.

“Every $1 spent on mitigation saves society an average of $4.”

National Institute of Building Sciences