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

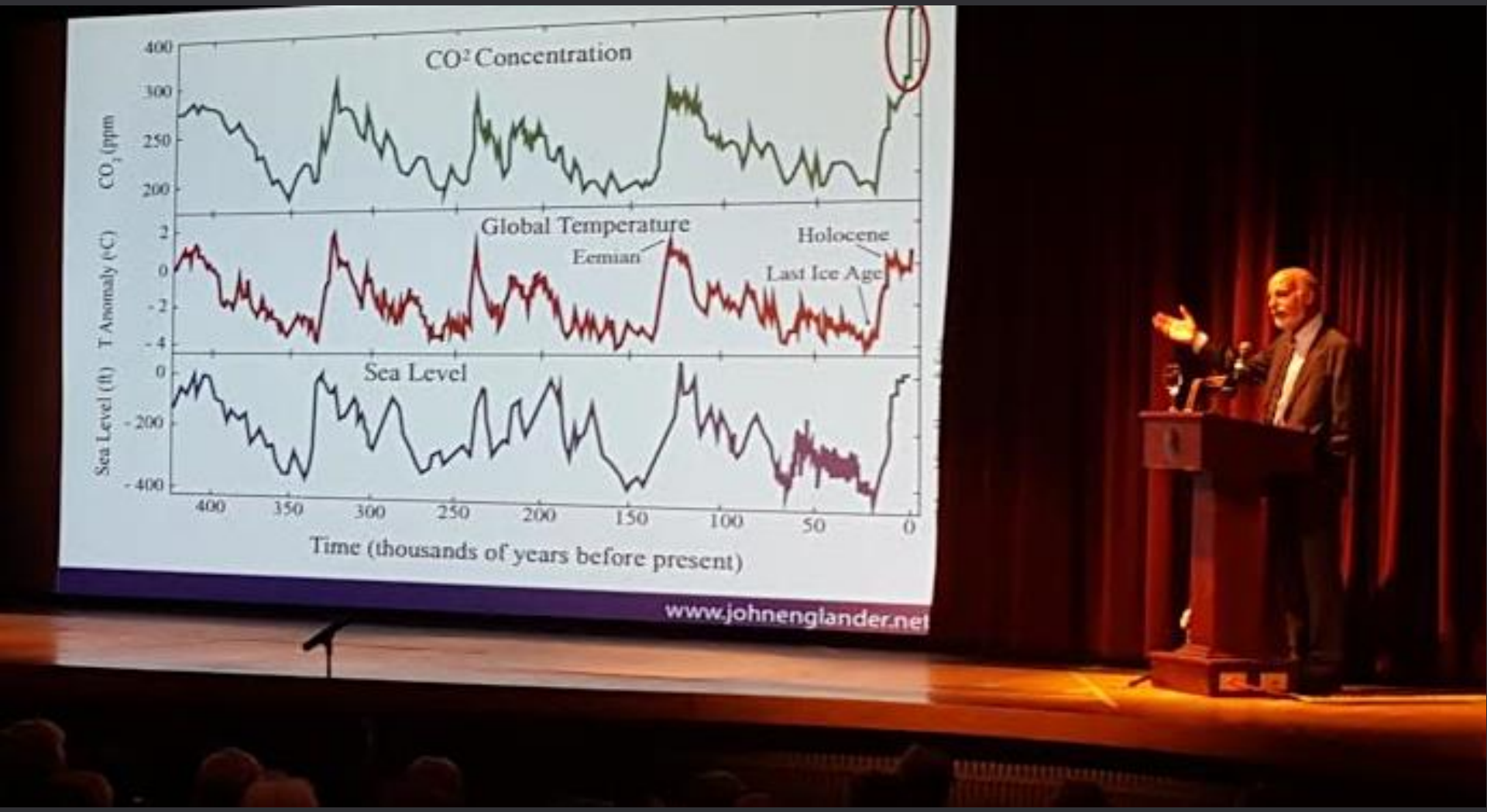
Weather It Together **is a public/private partnership to address the impacts of Climate Change and Sea Level Rise on historic and cultural resources in Annapolis, the Chesapeake Bay and the nation.**

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

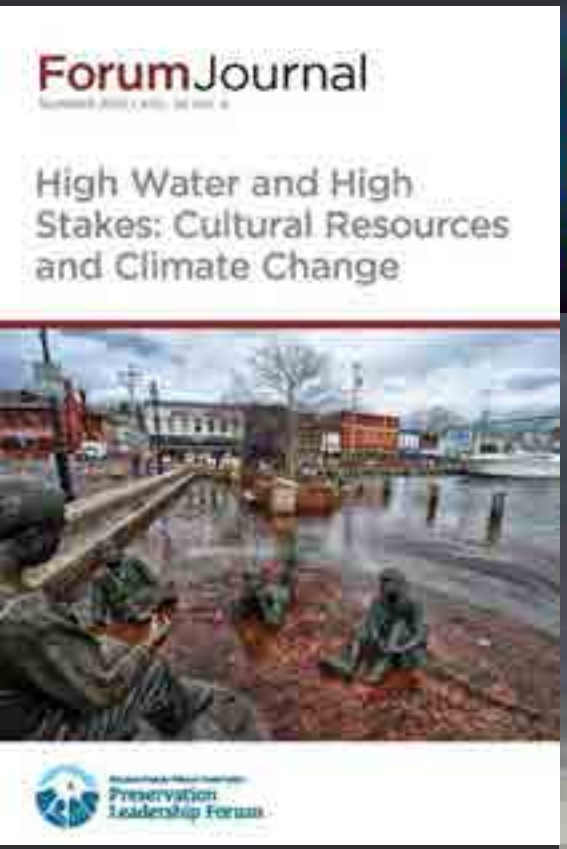
High Tide on Main Street

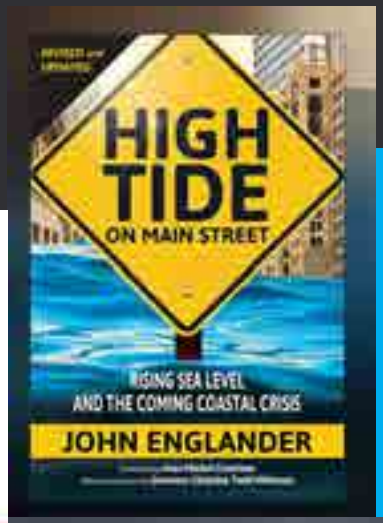
Annapolis Prepares for Rising Seas: History Meets the Future



High Tide on Main Street

Annapolis Prepares for Rising Seas





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*

Union of Concerned Scientists

National Landmarks at Risk

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.

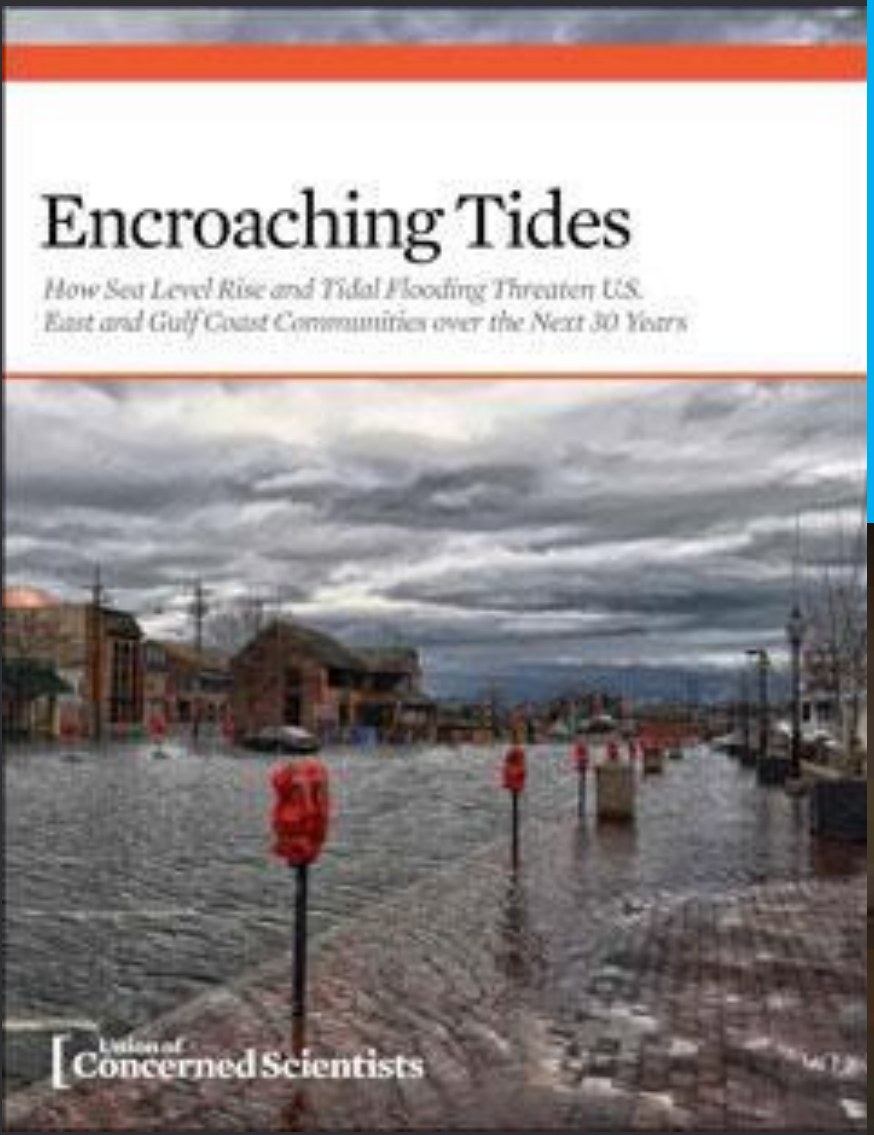
NOAA Technical Report

Sea Level Rise and Nuisance Flood Frequency Changes around the United States

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.

Union of Concerned Scientists

Encroaching Tides



"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."

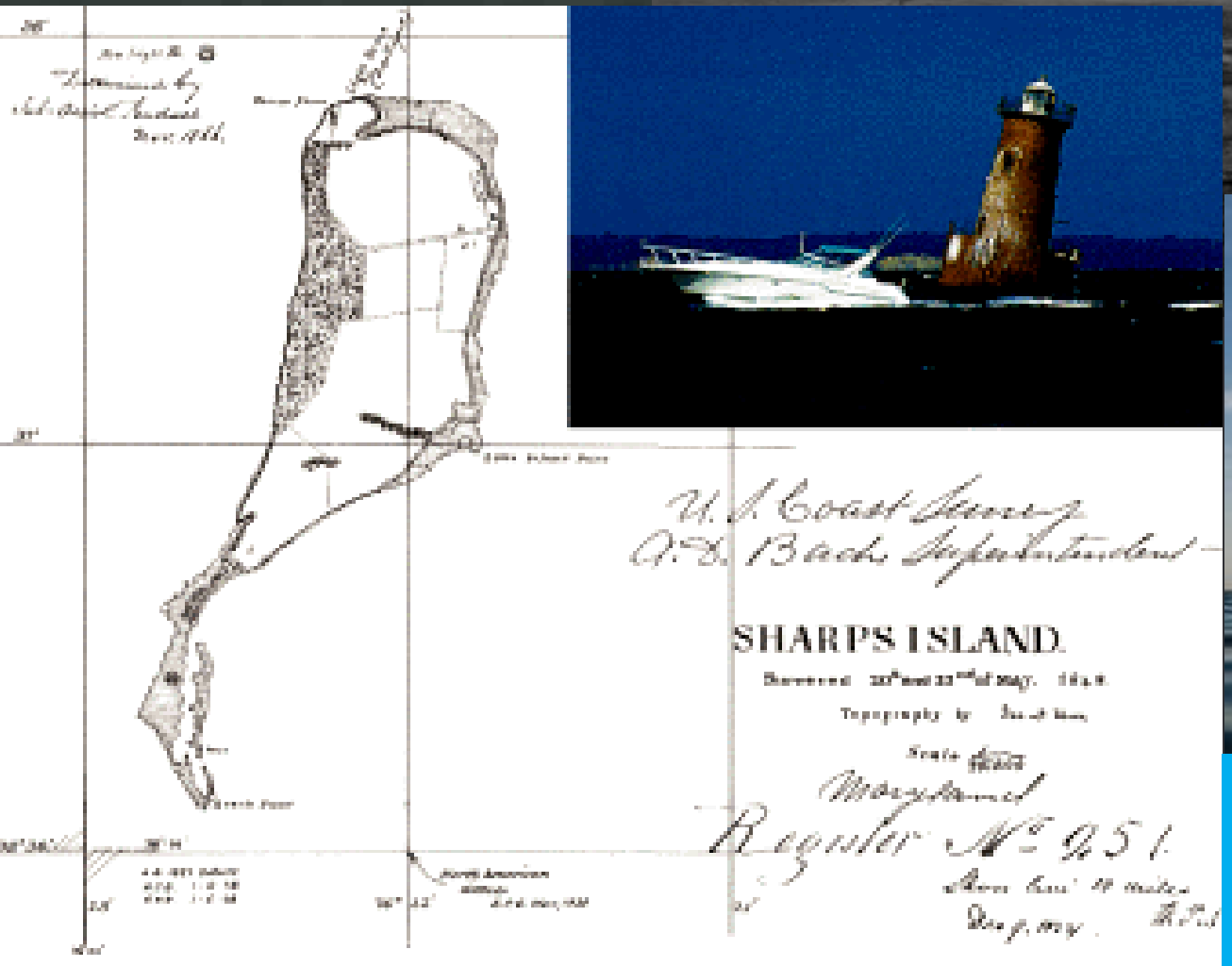
The Chesapeake Bay

Lost Landmarks

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."

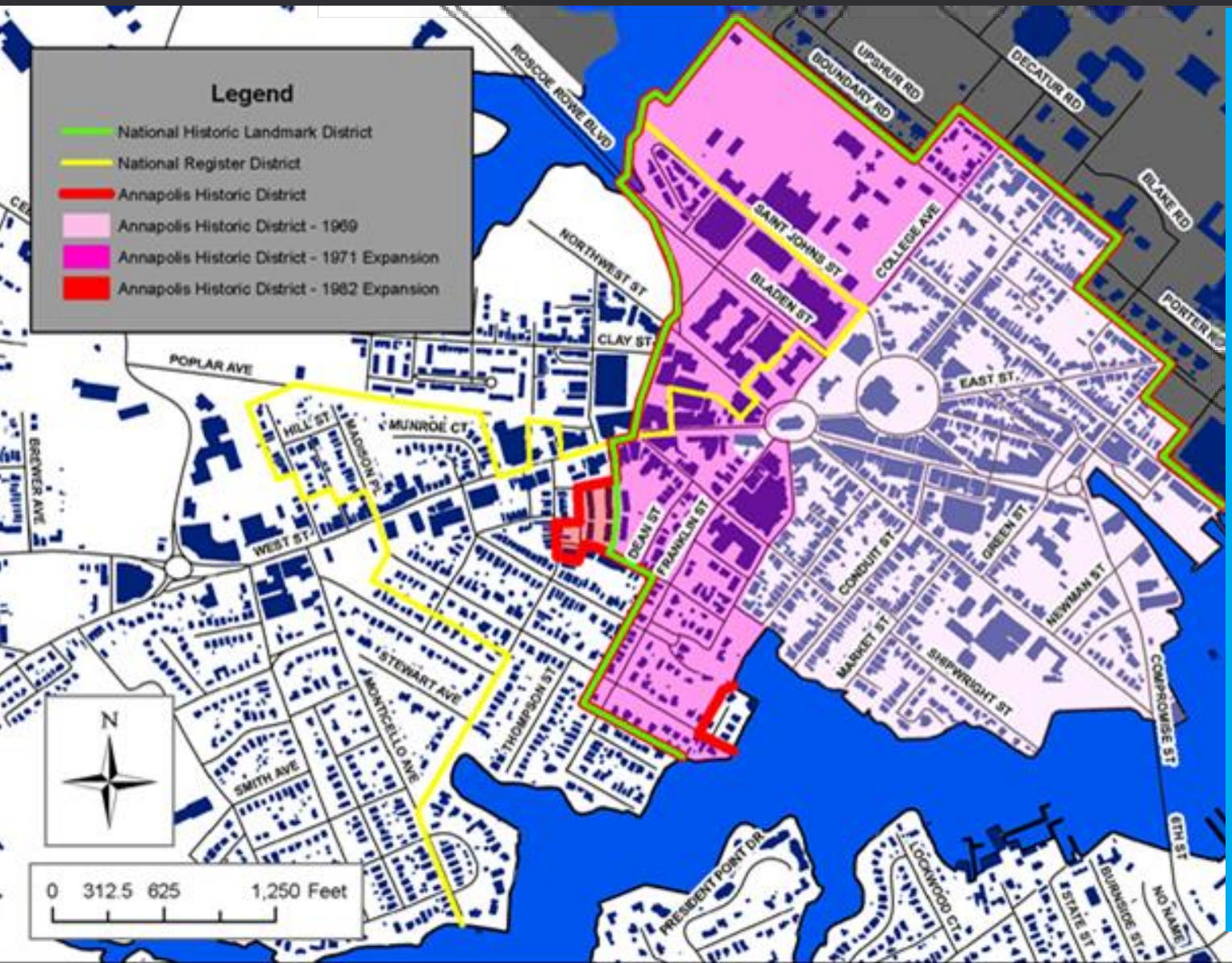
Annapolis History

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

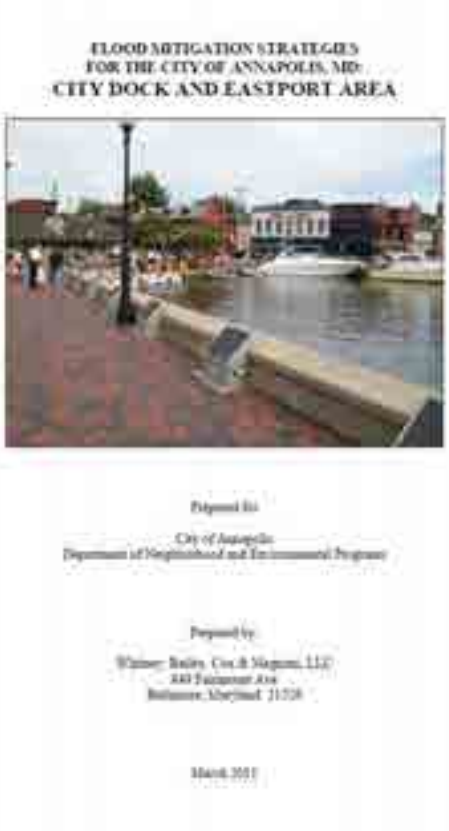


- National Landmark Historic District (1965)
- Annapolis Historic District (1969, 1971, 1982)
- National Register District (1984)

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*



FLOOD MITIGATION STRATEGIES
FOR THE CITY OF ANNAPOLIS, MD:
CITY DOCK AND EASTPORT AREA

Prepared for

City of Annapolis
Department of Neighborhood and Environmental Programs

Prepared by

Wilmer Bailey Cox & Magoon, LLC
840 Fairmount Ave
Baltimore, Maryland 21210

March 2011

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

City of Annapolis / USNA

FEMA FIRM - 2100

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

Comprehensive Plan

Annapolis City Dock Master Plan

A Framework to Guide Improvements & Redevelopment

"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…"

Protecting Our Historic Seaport

FEMA Hazard Mitigation Planning

Integrating Historic Property and Cultural Resource Considerations Into Hazard Mitigation Planning

State and Local Mitigation Planning How-To Guide

FEMA 386-6 / May 2005

FEMA

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.

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Organize Resources

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

Build the Planning Team / Engage the Public

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.

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Utilize the Necessary Technology (GIS)

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.

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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

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Identify & Map the Floodplain Study Area

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Conduct a Cultural Resource Survey

A	B	C	D	E	F	G	H	I	J	K	L	M
			HAZARD: Coastal									
		SDAT Tax ID Number	Name and Address of Asset Subject to Hazard (same as previous Page	MHT Inventory Number (AA#)	Date of Construction	Type of Property / Type of Resource	Total Square Footage	Number of Stories	Structural System	Primary Exterior Materials of Property / Resource	Current Function / Use	Current Condition (Excellent / Good / Fair /Deteriora
1		06 000 00030807	1 Southgate Avenue	1450	1910 - 1915	Detached House	4901					
2		06 000 05035575	12 Fleet Street	1267	1875	Attached House / Duplex	840					
3		06 000 00143206	9 Pinkney Street	1241	1880	Attached House / Rowhouse	1336					
4		06 000 03587510	18 Pinkney Street / Shiplap House	643	1713 / 1723	Detached House / Historic	2255					
5		06 000 02047510	130 Prince George Street / Sands House	652	1739 / 1765	Detached House	2740					
6		06 000 07808800	142 Dock Street / Stevens Hardware	458	1880	Attached Comm Bldg	5720					
7		06 000 02423500	100 Main Street / A.L.Goodman	536	1908 - 13	Attached Comm Bldg	7354					

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

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Assess Property Vulnerability

FLOOD HAZARD MATRIX

#	Street	OBJECT ID	SDAT	MHT Inventory	Date of Construction	Use	First Floor Elevation	Lowest Opening Elevation	Total Square Footage	Number of Stories	Basement
142	DOCK ST	115	20600007808800	AA-548	1880	Attached Comm	3.74	3.74	5720	2	No
126	DOCK ST	113	20600006983200	AA-1239	1875	Commercial			6028	3	No
138	DOCK ST	71	20600006109313	AA-457	1850	Commercial	1.76	1.76	4320	3	No
132	DOCK ST	70	20600005295300	AA-457	1825	Commercial	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
130	DOCK ST	73	20600001160625	N/A		C					
124	DOCK ST	153	20600006983200	AA-455	1900	C					
122	DOCK ST	152	20600006983200	AA-1239 AA-456	1875	C					
120	DOCK ST	151	20600001157800	AA-456	1916	C					
118	DOCK ST	150	20600001160700	AA-455	1891-1897	C					
110	DOCK ST	110	20600000142123	AA-455	1930	C					
12	DOCK ST	144	20600090019164	N/A	1960	C					
10	DOCK ST	138		N/A		C					
6	DOCK ST	124		AA-455	1940's	C					
4	DOCK ST	80	20600006384160	AA-455	1974	C					
1	DOCK ST	17		N/A		C					
8	DOCK ST	41	20600003321968	N/A	1960	C					
13	EAST ST	44	20600002427600	N/A	N/A	C					
16	EAST ST	20	20600002844800	AA-1803	1891-1897	R					
6	FLEET ST	6	20600004692602	AA-1265	1885-1889	C					
14	FLEET ST	58	20600000951000	N/A	1946	R					
10	FLEET ST	61	20600002365950	AA-1266	1975	R					
8	FLEET ST	125	20600004692602	AA-1265	1885-1889	R					
12	FLEET ST	60	20600005035575	AA-1267	1885-1889	R					
193	GREEN ST	86	20600000761000	AA-521	1819	C					
195	GREEN ST	139	20600003092900	N/A		C					
151	KING GEORGE ST	22	20052090030056	N/A	1980	R					
149	KING GEORGE ST	23	20052090030055	AA- 1112	1880	R					
147	KING GEORGE ST	25	20600090005540	AA-1111	1913-1921	R					
145	KING GEORGE ST	24	20600090005539	AA-1110	1891-1897	R					
143	KING GEORGE ST	1	20600002847600	AA_1109	1891-1897	R					

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

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Determine Community Value

Determine Community Value for Historic Property
Worksheet #4 and Cultural Resource Assets

Date: _____

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.

Name and Address of Asset	Column 1 Historic Designation (National Register, Local Landmark, etc.)*	Column 2 Geographic Context of Significance (National, Tribal/ State, Local)	Column 3 Level of Significance (High, Medium, Low)	Column 4 Public Sentiment (High, Medium, Low)	Column 5 Economic Importance (High, Medium, Low)	Column 6 Degree of Integrity (High, Medium, Low)	Column 7 Total Level of Community Value (High, Medium, Low)
ARNSPOWS [illegible]	~~LOCAL~~ NR / AHD	LOCAL					
GIBBONS LODGING 110 FR. [illegible]	NR / AHD	STATE					
MIDDLETONS TAVERN 2 MARKET SQ	NR / AHD	STATE					
PASTORS ROW 26 MARKET ST	NR / AHD	LOCAL					
16 RENEW ST	NR / AHD	LOCAL					
TOBACCO FRIES WATERFRONT WARE-HOUSE 2 (4) FINKNETY	NR / AHD 9 INDIAN	NATIONAL					
RESTAURANT BEHIND 77 MAIN # 143 COMPROMISE							
BENEFICIAL-HOPSON BOATHOUSE ST. JOHNS							
1 DOCK ST HARBORMASTER							

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

US Army Corps of Engineers

Complete a Non-Structural Mitigation Assessment

Nonstructural Mitigation Assessment for the City of Annapolis Historic District
Annapolis, Maryland

Prepared for: City of Annapolis
145 Gorman Street, 3rd Floor
Annapolis, Maryland 21401

Prepared by: Planning Division
U.S. Army Corps of Engineers, Baltimore District
P.O. Box 1715
Baltimore, Maryland 21203-1715

DECEMBER 2014

FIGURE 2-1 BUILDING ELEVATION SURVEY POINT TYPES

Lowest adjacent grade in this example is the front left corner, the lowest point closest to where the water is coming from. **Low opening** in this example is the basement window, where water would first enter the building during flooding. **First floor opening** here is the front door, where the most damage would typically occur if flood waters reached this elevation.

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3-D Digital Modeling for Sea Level Rise

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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

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Develop Adaptation Alternatives
Public Engagement

- Website / Social Media
- Branding
- High Water Markers
- Interpretive Kiosks
- Videos
- Media
- Publications

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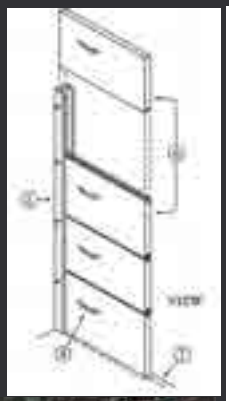
Develop Adaptation Alternatives
Natural Resources

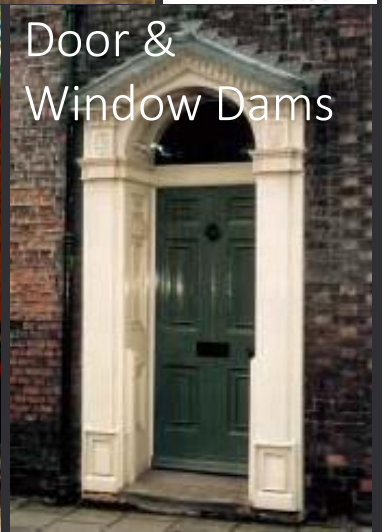
Weather It Together

Develop Adaptation Alternatives - Dry Floodproofing

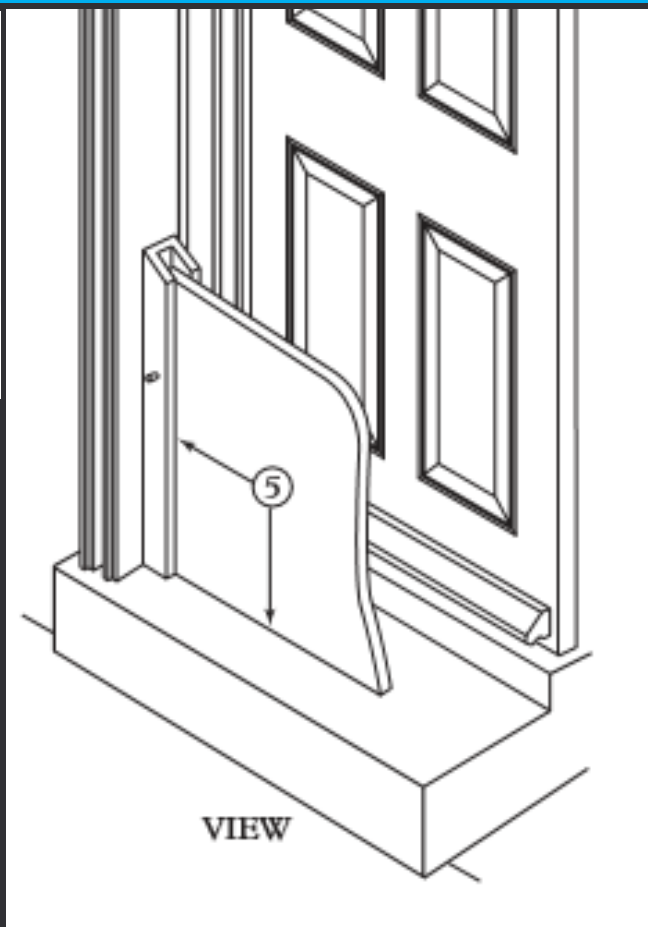
Dry floodproofing involves sealing building walls with waterproof compounds and using shields (dams or perimeter barriers) to seal off doors, windows and other openings to keep the building watertight. This technique can only be used when the walls are strong enough to withstand the hydrostatic force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

Storefront Vestibule - CMU





Door &
Window Dams



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Develop Adaptation Alternatives – Barriers

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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…"

Weather It Together

Promote the Program Model

"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

Crisfield, Somerset County

St. Michaels, Talbot County

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