

WEATHER IT TOGETHER

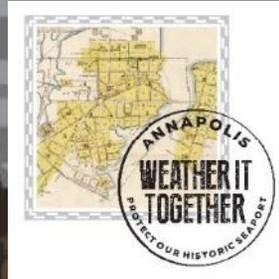
*The Annapolis Model for
Cultural Resource Adaptation Planning*



Weather It Together

A Local Model for Cultural Resource Adaptation Planning

***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 Dept. of the Environment 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 Chesapeake Bay Foundation
US ICOMOS Urban Land Institute

Weather It Together

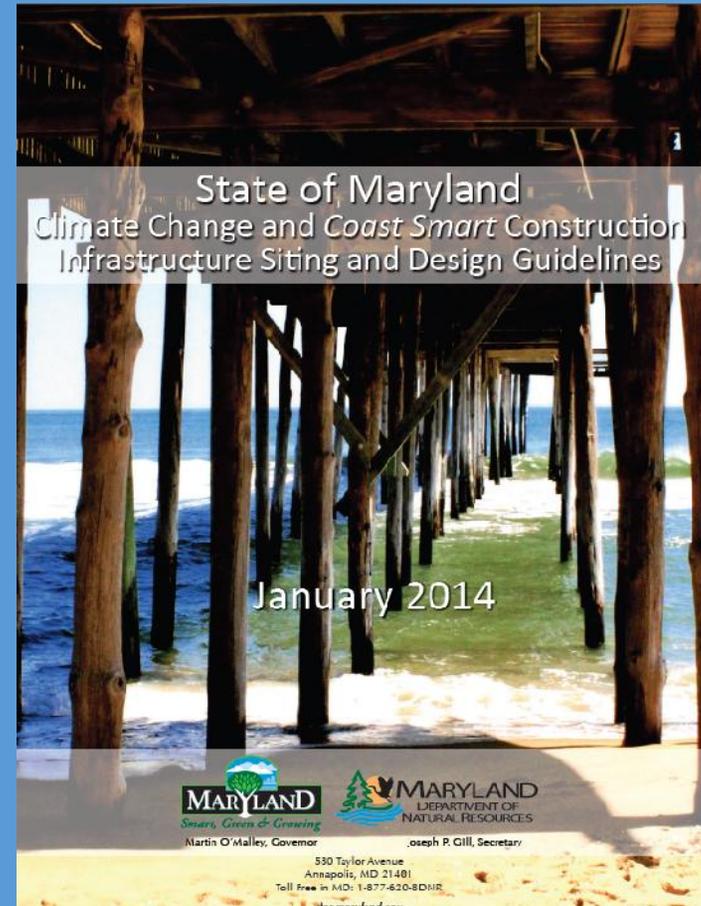
A State Model for Adaptation Planning



Maryland Commission on Climate Change

Prepared for: Larry Hogan, Governor, State
of Maryland and the Maryland General
Assembly

December 2015

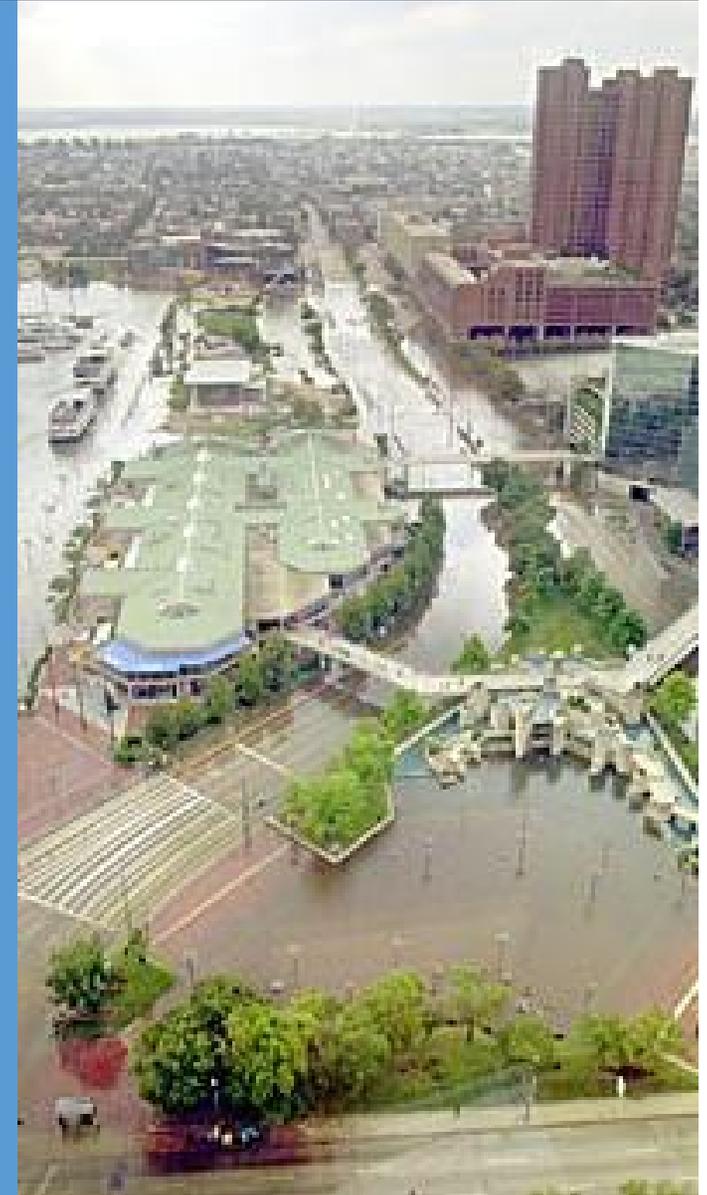


“a plan of action that addresses the drivers and causes of climate change, to prepare for the likely consequences and impacts of climate change to Maryland and to establish firm benchmarks and timetables for implementing the plan of action.”

Weather It Together

“The Choice is Not Between Mitigation and Adaptation”

The ARWG is charged with developing a comprehensive strategy for reducing Maryland’s climate change vulnerability through both short- and long-term measures that state and local governments may use to plan for and adapt to more extreme weather and a rise in sea levels due to climate change.



Weather It Together

Impacts of Climate Change on Vulnerable Communities



Poorer individuals have a greater propensity to be harmed by climate change for a variety of reasons including “their livelihoods are more likely to depend on climate sensitive sectors or on low-income, informal or hourly jobs with little protection against climate-related employment disruptions.”

Weather It Together

Building Resilience: A State Climate Action Plan Priority

- Work to increase and broaden public and private partnerships
- Address the challenge that low-income and otherwise vulnerable communities will likely be disproportionately impacted by climate change
- Assess the impacts that climate change will likely have on the state's economy, revenues and investment decisions
- Continue to deliver and refine tools and assistance for local governments

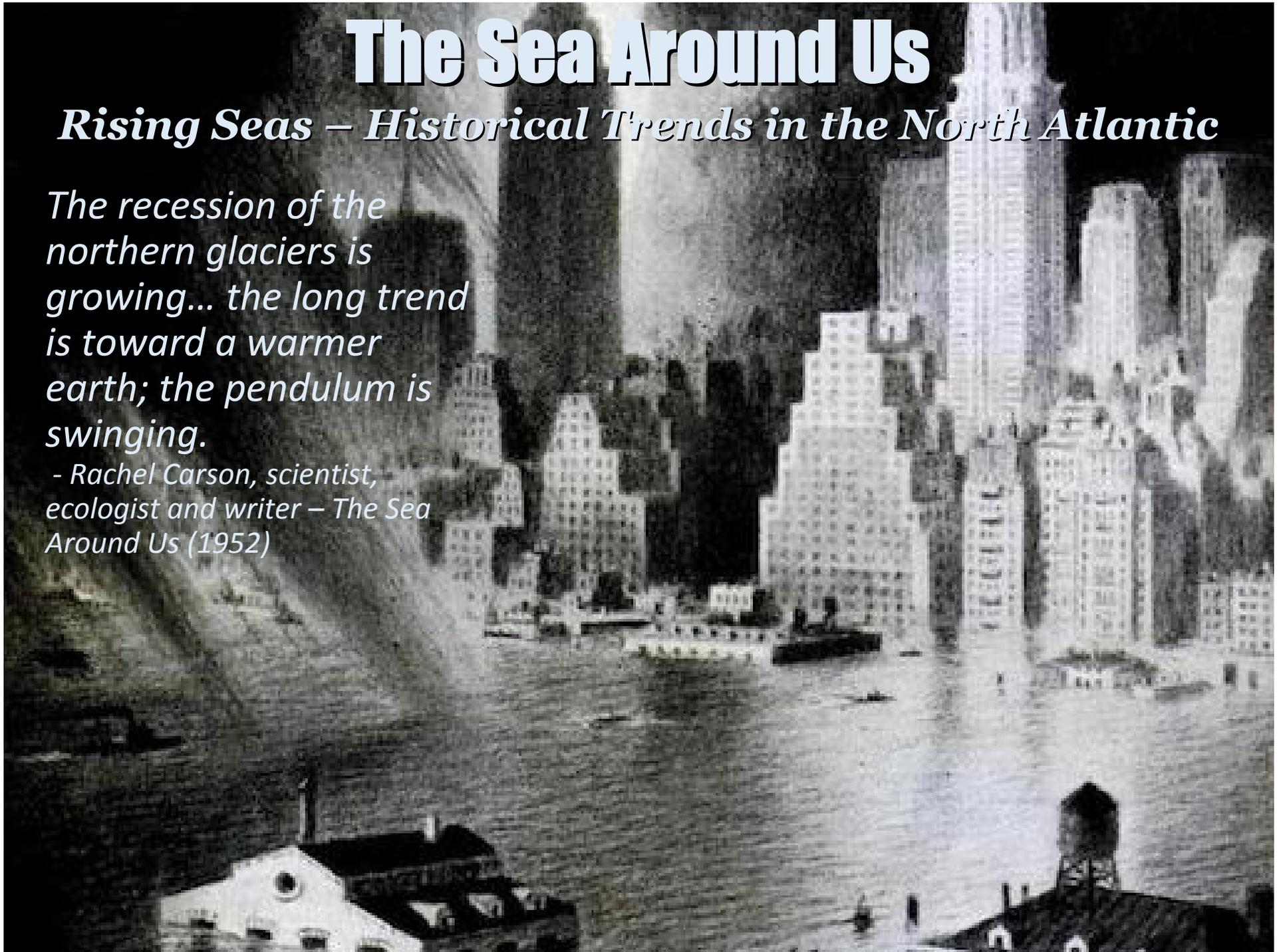


The Sea Around Us

Rising Seas – Historical Trends in the North Atlantic

The recession of the northern glaciers is growing... the long trend is toward a warmer earth; the pendulum is swinging.

- Rachel Carson, scientist, ecologist and writer – The Sea Around Us (1952)



Pocantico Call to Action

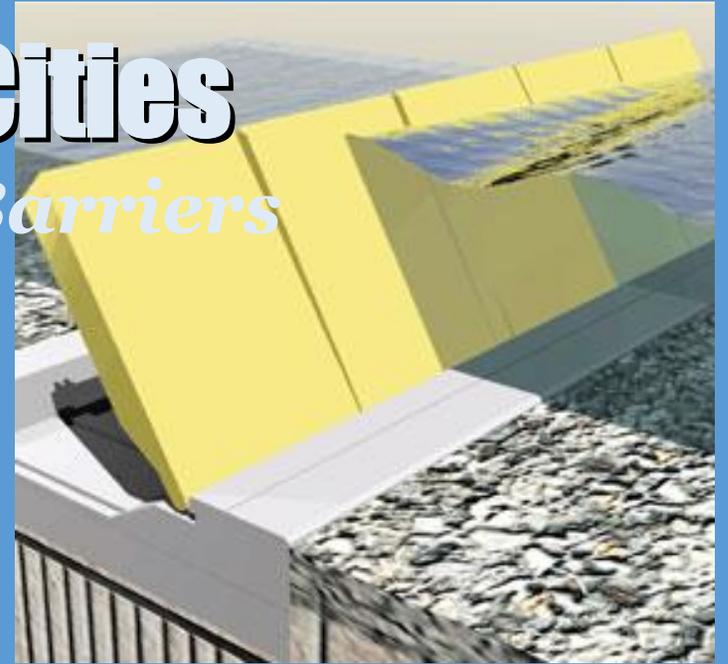
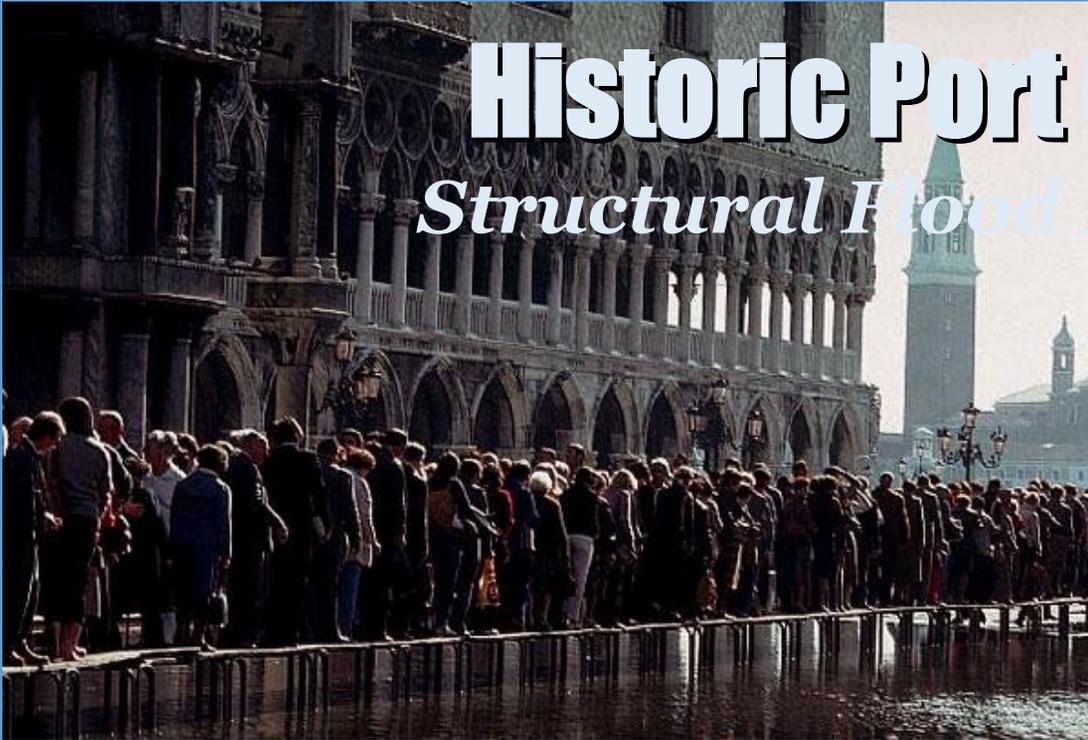
Climate Impacts and Cultural Heritage



“We call on policy-makers and government decision-makers at all levels to support communities in planning for a resilient future, including making informed choices, and assessing the costs of action and failure to act.”

Historic Port Cities

Structural Flood Barriers



MOSE (flood gates) - Venice



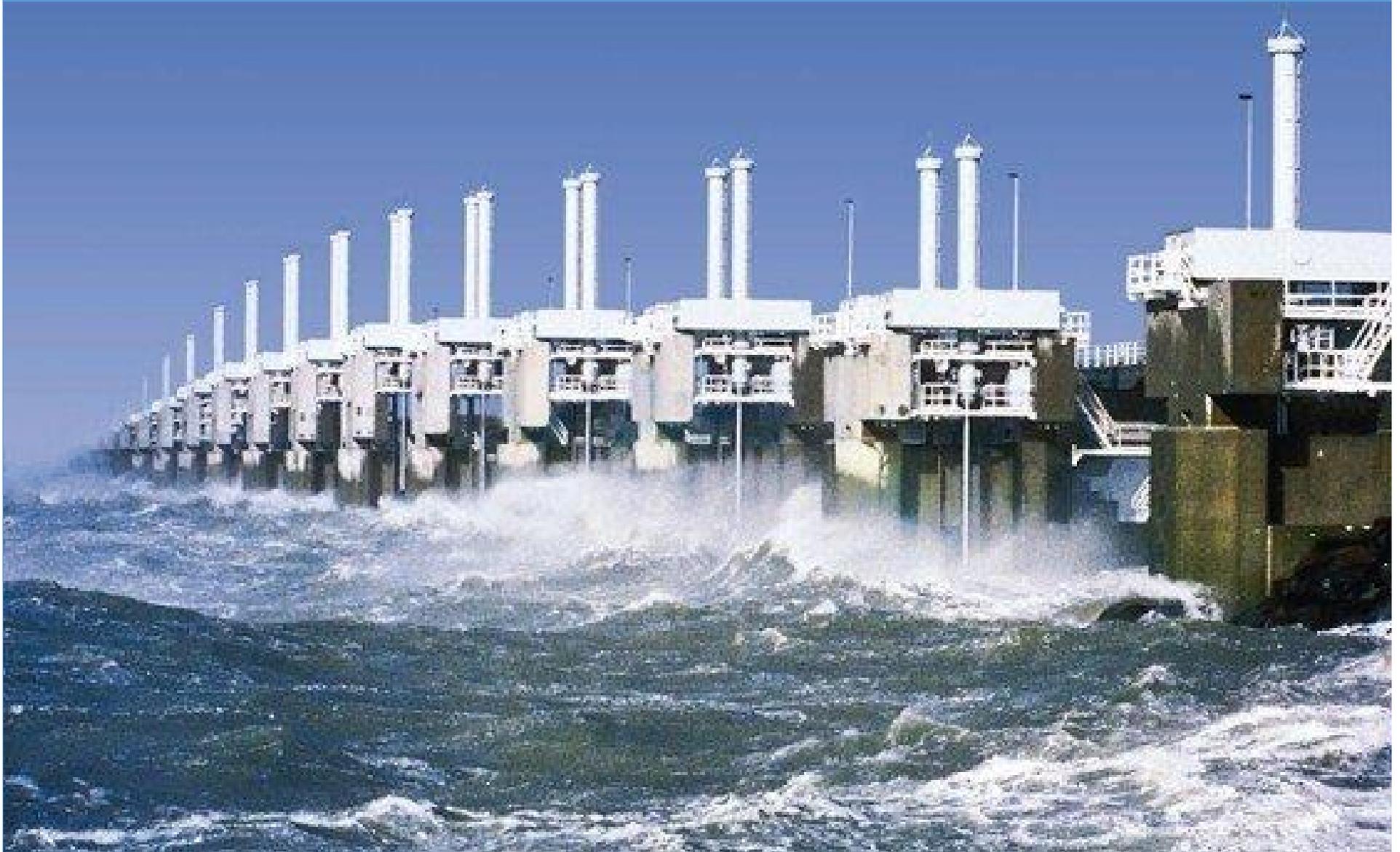
Thames Barrier - London



Delta Works - The Netherlands

Historic Port Cities

Structural Flood Barriers



Historic Seaport Cities

Tokyo's Metropolitan Area Outer Underground Discharge Channel

Winding down a series of stairs, you soon come upon a massive hall, resembling an underground Parthenon, or a scene out of a science fiction film.

-- Alex Zolbert, CNN

Historic Port Cities

Org. for Economic Cooperation & Development

136 major port cities ranked for the impact of SLR projected to 2070.

Of the top 20, six are in the United States.

#1 - Miami with \$416 billion worth of assets.

#2 - New York/Newark at \$320 billion

#3 - New Orleans at \$233 billion.



OECD Environment Working Papers
No. 1

Ranking Port Cities with High Exposure and Vulnerability to Climate Extremes

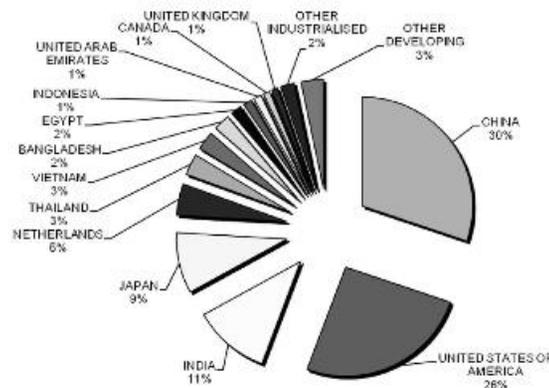
EXPOSURE ESTIMATES

R. J. Nicholls, S. Hanson,
Celine Herweijer, Nicola Patmore,
Stéphane Hallegatte, Jan Corfee-Morlot,
Jean Château, Robert Muir-Wood

JEL Classification: Q01, Q54, Q58, Q53



Figure 7. Assets exposed to sea-level rise, storm surge and subsidence by country (for scenario FAC). Total estimated exposure is \$US 35,000 billion.



Historic Seaports: Miami

#1 Economy at Risk

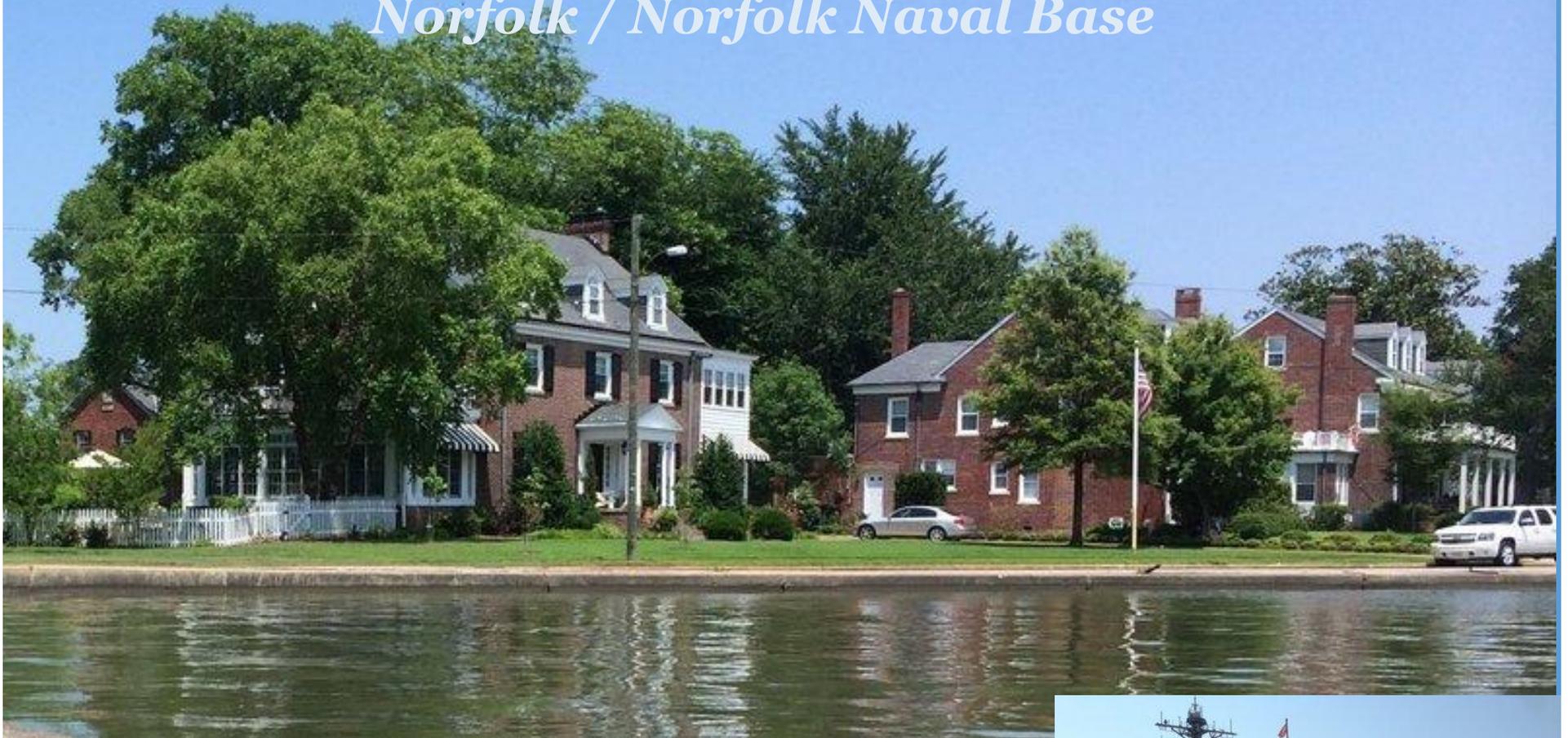


\$3.51 trillion and 4.8 million people at risk by 2070



The Chesapeake Bay

Norfolk / Norfolk Naval Base

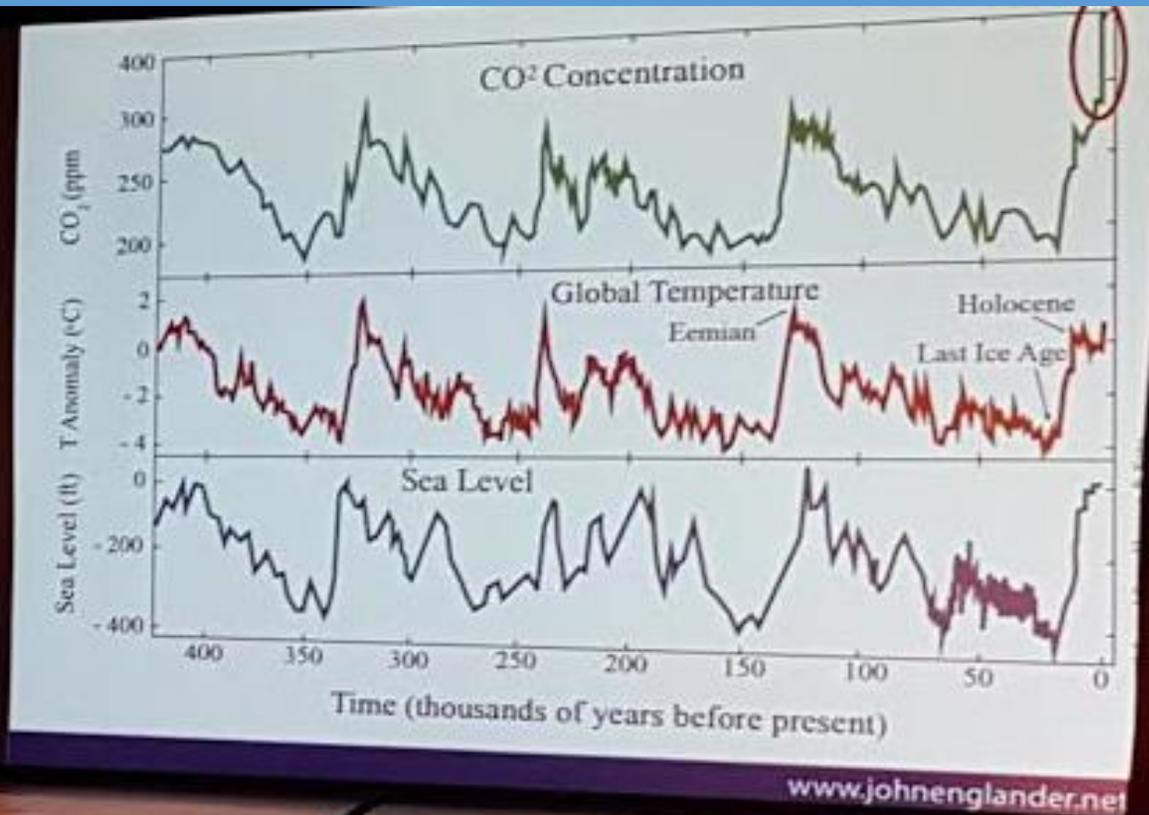


One of the at most risk cities on the East Coast, Norfolk has received government funds to raise one short stretch of road by 18 inches at a cost of more than a million dollars. Meanwhile, Norfolk Naval Base has 14 WWII piers that are estimated to cost \$35-40 million to replace.



High Tide on Main Street

Annapolis Prepares for Rising Seas



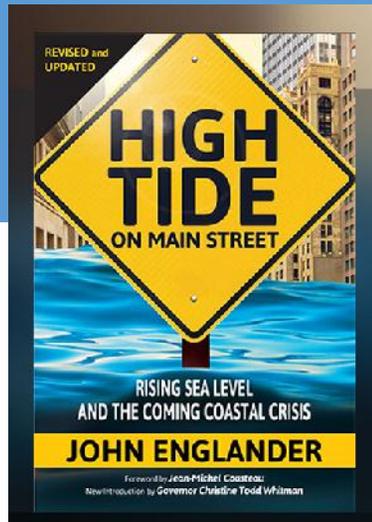
High Tide on Main Street

Resiliency Planning: Beyond Politics

ForumJournal

SUMMER 2015 | VOL. 29 NO. 4

High Water and High Stakes: Cultural Resources and Climate Change



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*



Candidates: How will you deal with sea level rise in our coastal states?



Union of Concerned Scientists

Learn more: ucsus.org/DealWithIt

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Photos by Wade Goodman, June 21, 2015, at shutterstock.com

Union of Concerned Scientists

Science: National Landmarks at Risk

National Landmarks at Risk

*How Rising Seas, Floods, and Wildfires Are Threatening
the United States' Most Cherished Historic Sites*



Since 2001, Annapolis has had the highest average number of days a year above flood threshold at 34.

NOAA Technical Report

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



Annapolis has experienced the greatest increase in nuisance flooding in the past 50 years (925%) going from an average of 3.8 to 39.3 days per year. In the next 50 years, nuisance flooding is estimated to occur more than once a

Union of Concerned Scientists

Studies: Encroaching Tides

Encroaching Tides

How Sea Level Rise and Tidal Flooding Threaten U.S. East and Gulf Coast Communities over the Next 30 Years

“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.”

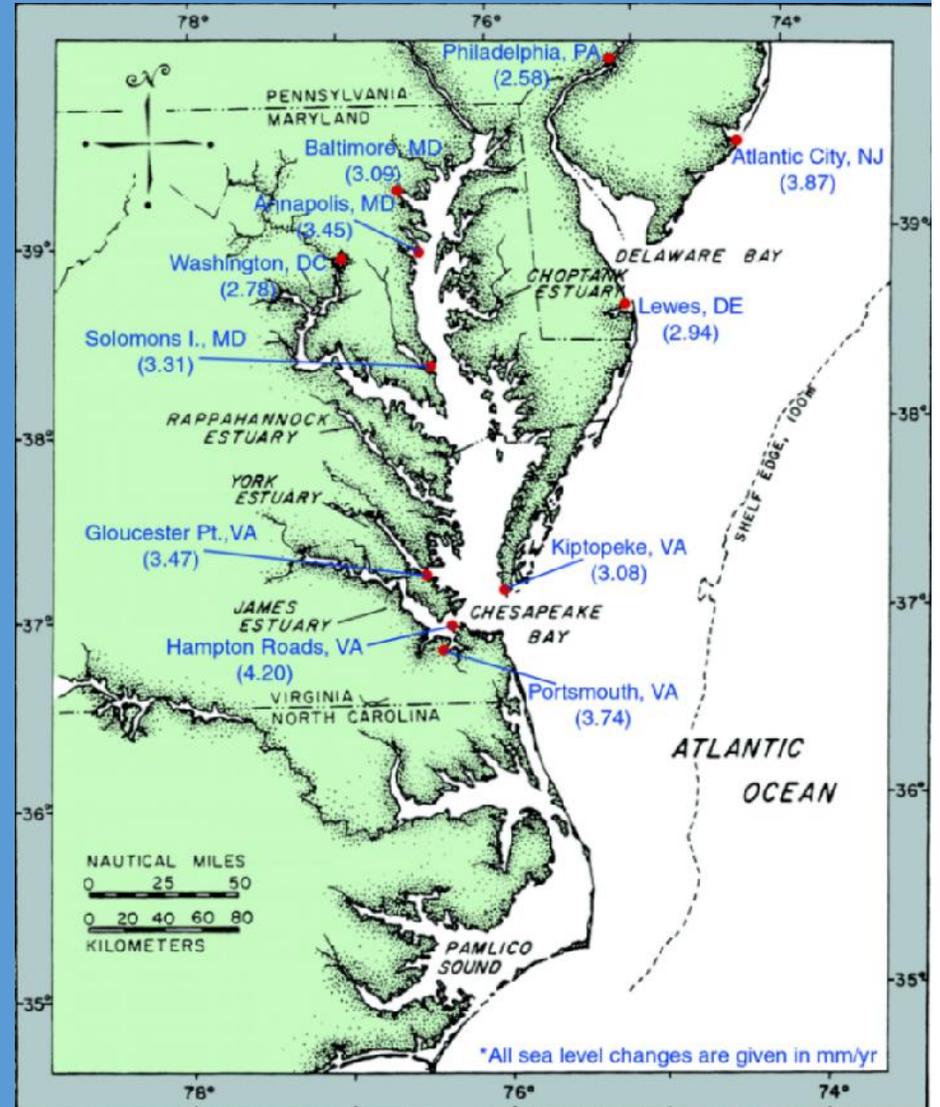


The Chesapeake Bay

Research: Lost Landmarks

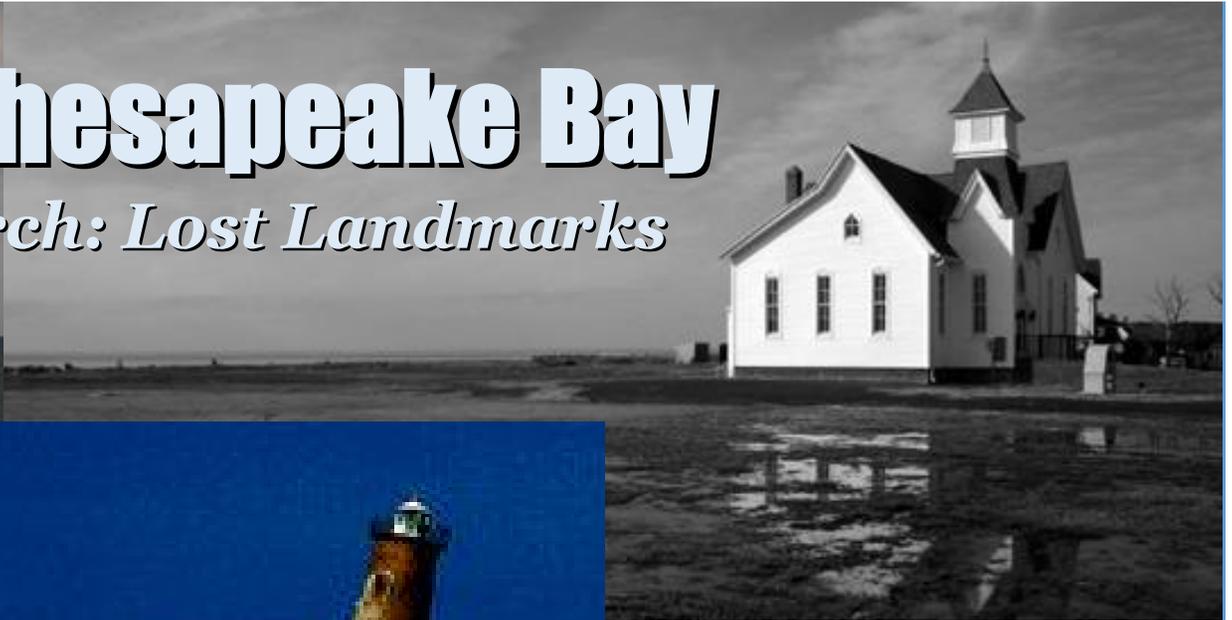


Within the next 100 years, sea level rise is estimated to reach 44 inches. To date, 13 islands have been lost in the Chesapeake.



The Chesapeake Bay

Research: Lost Landmarks



Holland, Hooper's and Sharp Islands – Last structures lost (2010)

Climate Change in Maryland

State Planning: 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.”



State of Maryland
Climate Change and Coast Smart Construction
Infrastructure Siting and Design Guidelines

January 2014



530 Taylor Avenue
Annapolis, MD 21401
Toll Free in MD: 1-877-620-EDNR

dnr.maryland.gov

Historic Annapolis

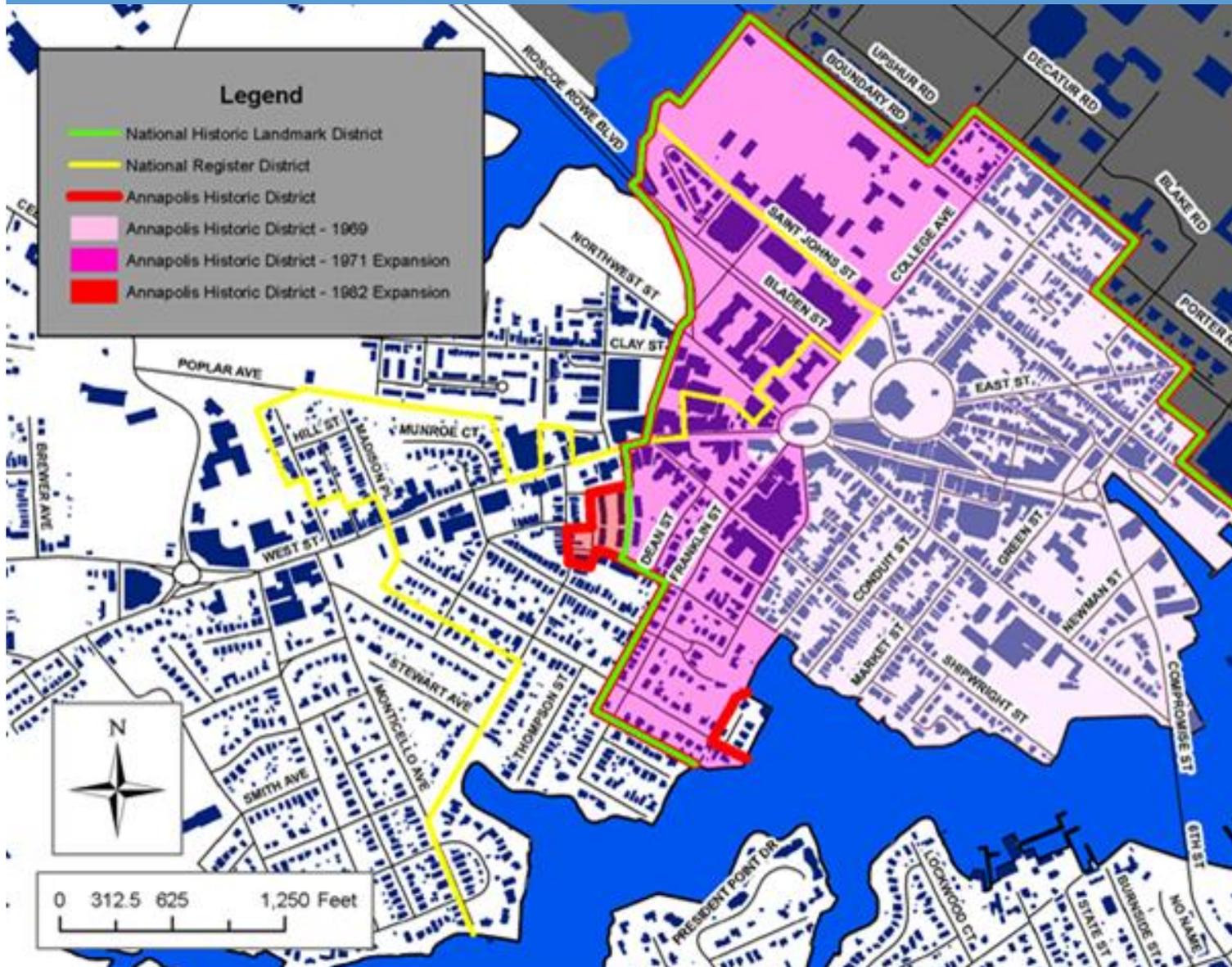
History: A Colonial Capital



- 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

Resources at Risk: Colonial Landmark District



National
Historic
Landmark
District
(1965)

Annapolis
Historic
District (1969,
1971, 1982)

National
Register
District
(1984)

City of Annapolis / USNA

Risk Assessment: FEMA Flood Insurance Rate Map Current FIRM



Blue shading 1% annual chance (100-year) flood
Orange shading is 0.2% annual chance (500-yr) flood



City of Annapolis / USNA

Risk Assessment: 2100 FIRM



Flood elevation 8.2 ft.

1% annual chance flood (4.5') plus 3.7 feet for sea level rise by 2100

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



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.

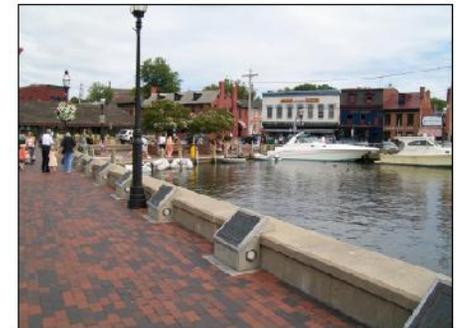
Step 1 - Organize Resources

Research: Flood Mitigation Studies

- 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:
Whitney, Dailey, Cox & Magnani, LLC
849 Fairmount Ave
Baltimore, Maryland 21226

March 2011

Step 1 – Organize Resources

Research: Comprehensive & Master Plans

Annapolis City Dock Master Plan

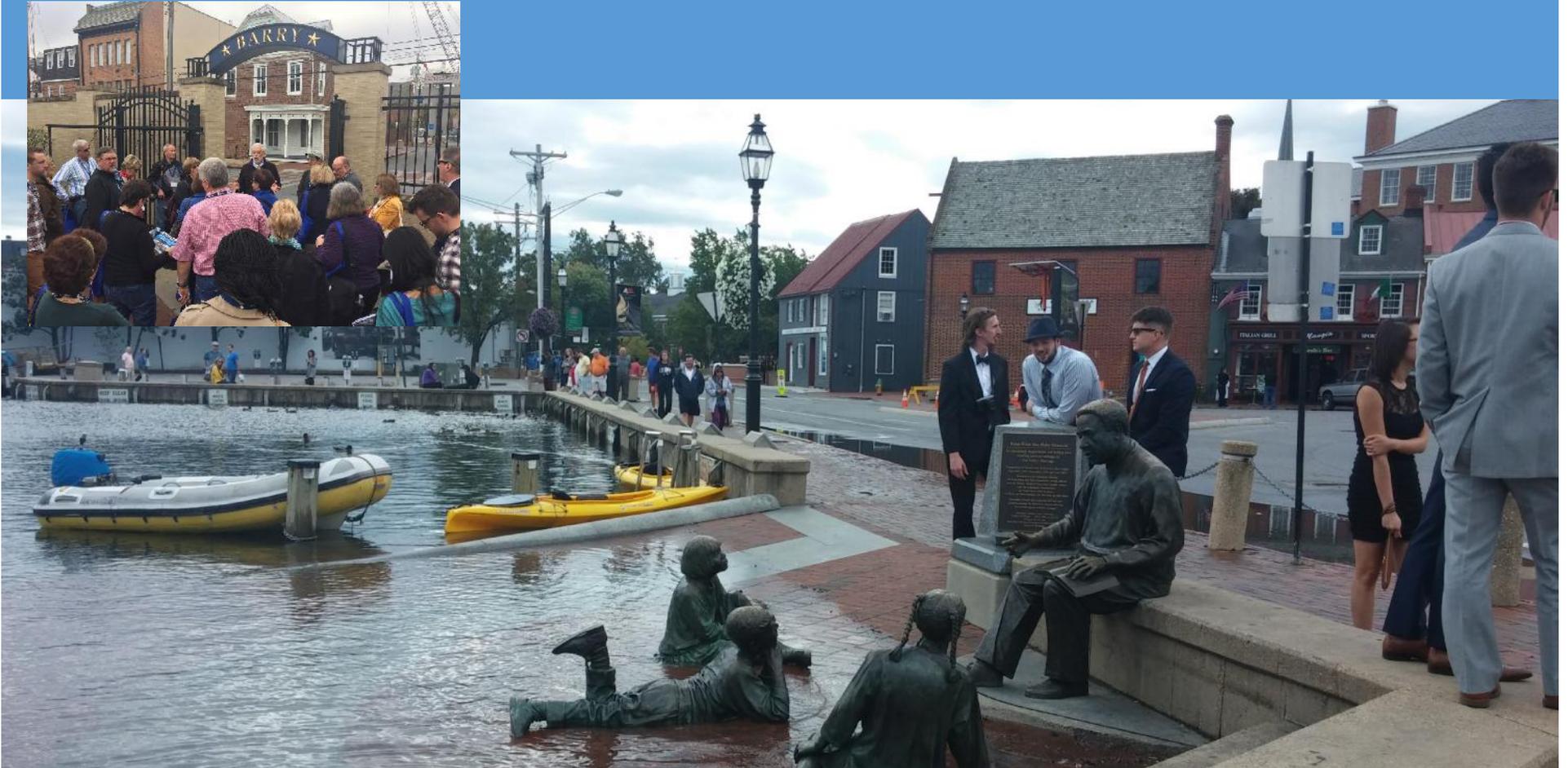
A Framework to Guide Improvements & Redevelopment



“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...”

Step 1 – Organize Resources

Build the Planning Team



Organize your efforts to develop an effective mitigation plan... bringing together the appropriate planning team, consultants, technology, community support and financial resources.

Step 1 – Organize Resources

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.**

Step 1 – Organize Resources

Utilize the Necessary Technology (GIS)

Legend

 study area (<7' NAVD88)

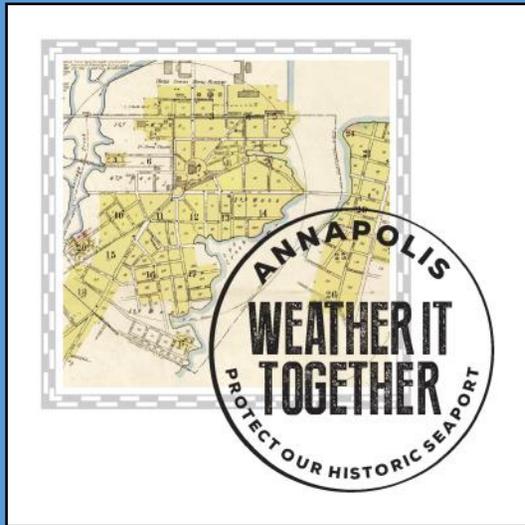


Develop a database of historic survey, risk assessment and elevation information for City Dock and Eastport cultural resources.

FLOOD HAZARD MATRIX												
#	Street	OBJECT ID	SOAT	MHT Inventory	Date of Construction	Use	First Floor Elevation	Lowest Opening Elevation	Total Square Footage	Number of Stories	Basement	
140	DOCK ST	116	20900037808500	AA-448	1850	Residential	3.74	5.74	7700	2	No	
126	DOCK ST	119	20900030863200	AA-198	1875	Commercial	1.70	1.70	4320	3	No	
130	DOCK ST	71	20900031003112	AA-427	1820	Commercial	3.17	3.17	2340	2	No	
132	DOCK ST	70	20900032295300	AA-427	1820	Commercial	2.09	2.09	790	1	No	
133	DOCK ST	73	20900031160622	N/A		Commercial	2.10	2.10	5020	3	No	
124	DOCK ST	123	20900030963200	AA-455	1900	Commercial	2.19	2.19	5020	3	No	
122	DOCK ST	122	20900030963200	AA-1289 AA-456	1870	Commercial	2.04	2.04	1012	2	No	
120	DOCK ST	151	20900031161300	AA-456	1910	Commercial	2.04	2.04	3972	2	No	
118	DOCK ST	150	20900031160700	N/A	1881	1887	Commercial	3.22	3.22	11410	2	No
110	DOCK ST	110	20900030142123	N/A	1900	Commercial	1.48	1.48	8600	2	Yes	
12	DOCK ST	141	20900030018161	N/A	1900	Commercial	3.03	3.03	3216	3	No	
10	DOCK ST	130		N/A		Commercial	2.82	2.82	3850	3	No	
6	DOCK ST	121		N/A	1970	Commercial	3.57	3.57	1268	2	No	
2	DOCK ST	60	20900030804180	N/A	1871	Commercial	3.57	3.57	1268	2	No	
1	DOCK ST	57		N/A		Commercial	3.57	3.57	1268	2	No	
9	DOCK ST	41	20900033321688	N/A	1900	Commercial	3.57	3.57	1268	2	No	
13	EAST ST	41	20900032127302	N/A	N/A	Other	8.53	8.53	5078	1	No	
18	EAST ST	20	20900035814900	AA-1823	1881	1927	Residential	8.61	7.68	2114	2	No
3	PFFT ST	8	20900034829402	AA-1265	1865	1869	Commercial	8.58	8.58	2751	2	No
14	PFFT ST	58	20900030811000	N/A	1948	Residential	10.08	10.08	2980	3	No	
10	PFFT ST	41	20900032966500	AA-1298	1975	Residential	8.97	8.97	836	2	No	
8	PFFT ST	175	20900034865900	AA-1296	1885	1890	Residential	8.74	8.74	2751	2	No
12	PFFT ST	20	209000307056737	AA-1207	1865	1890	Residential	9.01	8.01	840	2	No
163	GREEN ST	86	209000307611000	AA-621	1819	Commercial	10.30	7.58	1934	2	No	
165	GREEN ST	120	20900032092300	N/A		Commercial			4488	2	No	
151	KING GEORGE ST	22	209020900030052	N/A	1930	Residential	0.25	0.25	1450	2	Yes	
149	KING GEORGE ST	23	209020900030056	AA-1152	1820	Residential	0.25	0.25	1392	2	Yes	
147	KING GEORGE ST	26	20900030006040	AA-1111	1913	1921	Residential	0.30	0.30	1080	2	No
145	KING GEORGE ST	27	20900030006038	N/A	1811	1867	Residential	7.11	7.11	1120	2	No
143	KING GEORGE ST	1	20900032841300	AA-1139	1881	1887	Residential	0.33	0.33	1294	2	No
139	KING GEORGE ST	2	20900034288100	Fordina	1860	1861	Residential	0.38	1.87	2688	2	No

Step 1 – Organize Resources

Secure the Necessary Financial / In-Kind Resources



- Maryland Historical Trust/SHPO (\$25,000)
- National Trust for Historic Preservation (\$25,000)
- Preservation Maryland (\$4,000)
- MD Dept. of Natural Resources/NOAA (\$48,000)
- Urban Land Institute, Baltimore Chapter (\$20,000)
- USACE (est. \$120,000+ in-kind)
- MEMA/FEMA (\$106,000)
- National League of Cities – (\$10,000+)



Step 2 - Identify Hazards

Chesapeake Storm & Tidal Flooding History



THE DEVASTATION OF AGNES is evident in his dramatic photo of the bridge connecting Calo to Elcott City. The bridge was almost demolished and had to be rebuilt.

AGNES

DAYS OF RAGING RIVERS

25 years later, memories of that powerful storm and the resilience of the people left to rebuild still survive

"It was awful but it was awesome. ... I had never experienced such a sight."

CHARLES COHEN
nearly 25 years ago today, on June 19, Agnes lashed down on Florida and started her deadly march up the East Coast.

In the wake of the devastating storm, it hit Maryland, with light to moderate rains on the Eastern Shore, and 11.0 inches of rain in the Patuxent reservoir. Most people never thought flooding could be so much damage.

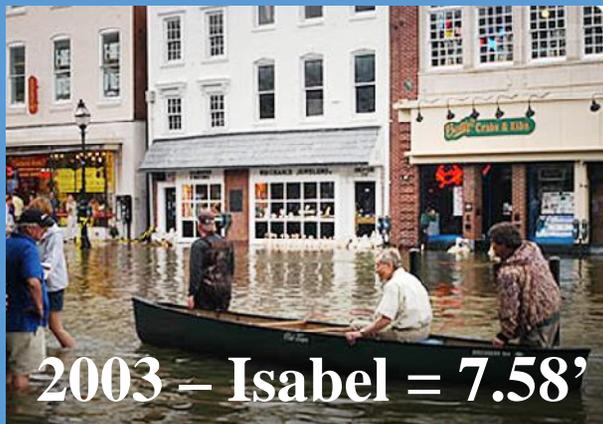
It was June 1972, and a typical Maryland summer with its sticky heat had already made its presence known, as for the rain was a relief, but the storm from locked over the East Coast and the skies opened up. The soil couldn't absorb any more water but there was much more to come. A Hurricane called Agnes emerged just south of Puerto Juarez, Mexico on June 15 and marched across the Gulf of Mexico, taking into a tropical storm through Georgia, then re-emerged as a hurricane as it entered North Carolina.

"People had to decide whether to move away, or stay and make things better."

JANET MYTROW
On June 21 and 22, 1972 the heavy rains of Tropical Storm Agnes made history on the East Coast by causing extensive flooding in many locations, causing the loss of several lives and destruction that took years to repair. If it could be repaired at all. The storm caused over \$77 million worth of property damage in the state of Maryland—the largest ever recorded from a natural disaster in the state's history. President Nixon declared most of the state a disaster area, and Vice President Agnew visited Ellicott City personally to assess the damage.

Most dramatically hit in Howard County was the area now known as the Historic District of Ellicott City, then simply as Main Street. A flood marker next to the Ellicott City B&O Railroad Station Museum looks impressively high, but marks the area that was under ten feet of water at one point.

Continued on page 9 *Continued on page 11*

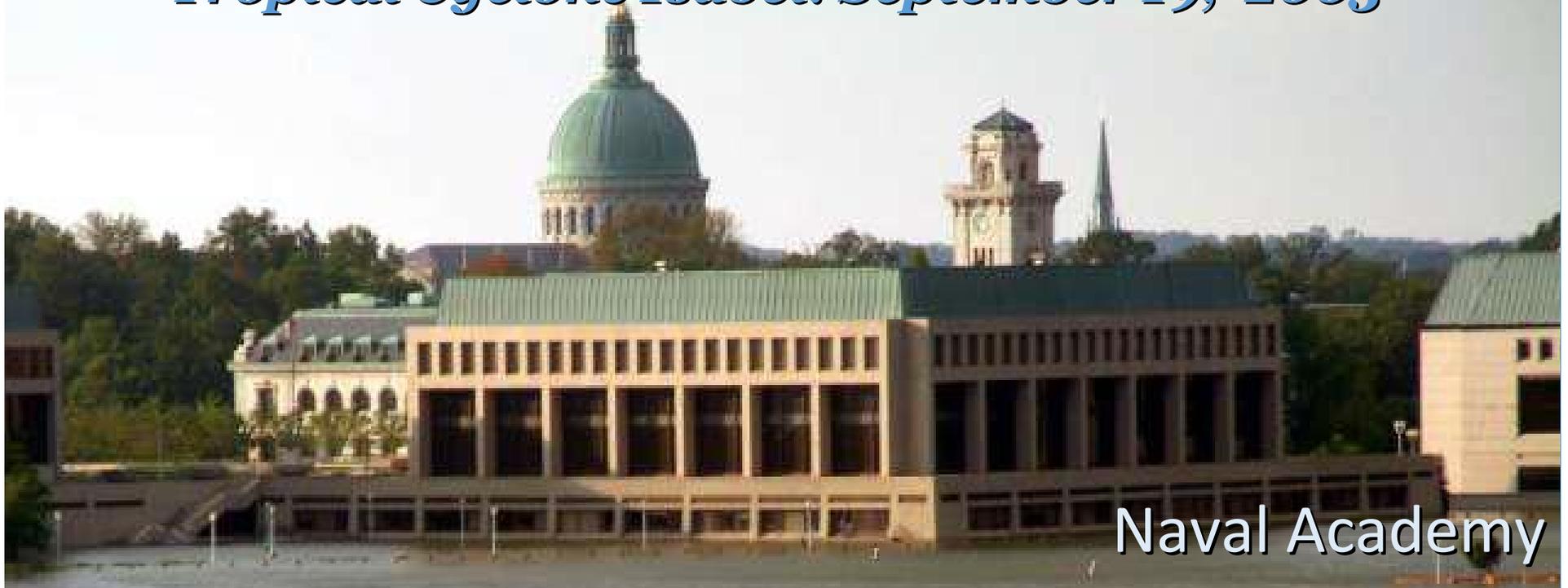


1972 - Agnes

HPowell

Step 2 - Identify Hazards

Tropical Cyclone Isabel: September 19, 2003



Naval Academy



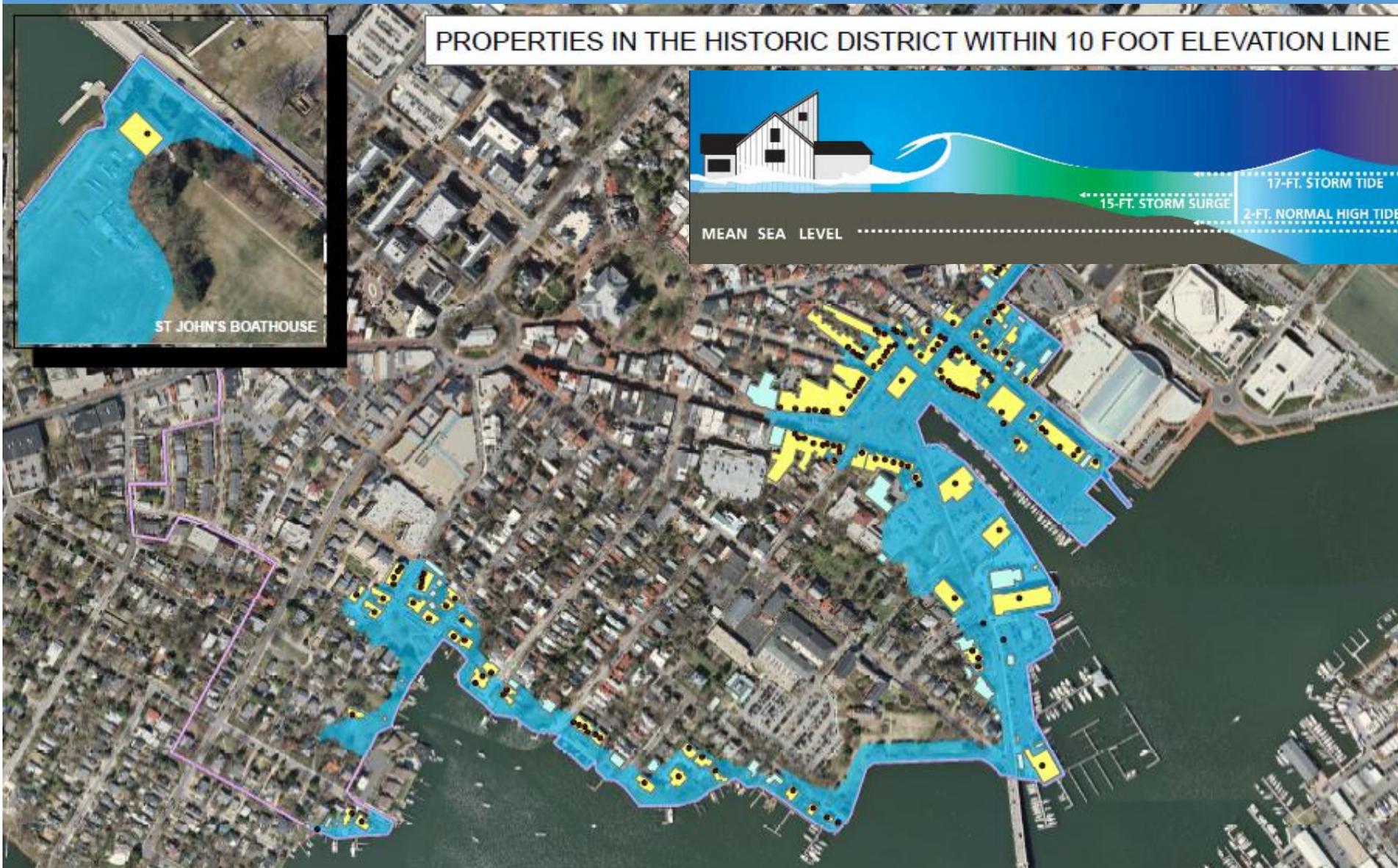
Market Space



Eastport

Step 2 – Identify Hazards

Identify & Map the Floodplain Study Area



Step 2 – Identify Hazards / Survey

Conduct a Cultural Resource Survey

A	B	C	D	E	F	G	H	I	J	K	L	M
		SDAT Tax ID Number	HAZARD: Coastal 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

Step 2 – Survey / Assess Risks

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 Com	3.74	3.74	5720	2	No
126	DOCK ST	113	20600006983200	AA-1239	1875	Commercial			6026	3	No
136	DOCK ST	71	20600006109313	AA-457	1850	Commercial	1.76	1.76	4320	3	No
132	DOCK ST	70	20600005295300	AA-457	1825	Commercial	3.17	3.17	2340	2	No
130	DOCK ST	73	20600001160625	N/A		Commercial	2.06	2.06	780	1	No
124	DOCK ST	153	20600006983200	AA-455	1900	Commercial	2.16	2.16	6026	3	No
122	DOCK ST	152	20600006983200	AA-1239 AA-456							
120	DOCK ST	151	20600001157800	AA-456							
118	DOCK ST	150	20600001160700	AA-455	189						
110	DOCK ST	110	20600000142123	AA-455							
12	DOCK ST	144	206000090019164	N/A							
10	DOCK ST	138		N/A							
6	DOCK ST	124		AA-455							
4	DOCK ST	80	20600006384160	AA-455							
1	DOCK ST	17		N/A							
8	DOCK ST	41	20600003321968	N/A							
13	EAST ST	44	20600002427600	N/A							
16	EAST ST	20	20600002844800	AA-1803	189						
6	FLEET ST	6	20600004692602	AA-1265	188						
14	FLEET ST	58	20600000951000	N/A							
10	FLEET ST	61	20600002365950	AA-1266							
8	FLEET ST	125	20600004692602	AA-1265	188						
12	FLEET ST	60	20600005035575	AA-1267	188						
193	GREEN ST	86	20600000761000	AA-521							
195	GREEN ST	139	20600003092900	N/A							
151	KING GEORGE ST	22	20652090030056	N/A							
149	KING GEORGE ST	23	20652090030055	AA- 1112							
147	KING GEORGE ST	25	20600090005540	AA-1111	191						
145	KING GEORGE ST	24	20600090005539	AA-1110	189						
143	KING GEORGE ST	1	20600002847600	AA_1109	189						

147 Properties

- Property Vulnerability (High, Med, Low)
- Loss to Structure (\$)
- Loss to Contents (\$)
- Loss of Function / Use (\$)
- Displacement Cost (\$)

Total Projected Loss/Cost
\$288.5 million

Step 2 – Survey / Assess Risks

Complete a Non-Structural Mitigation Assessment



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

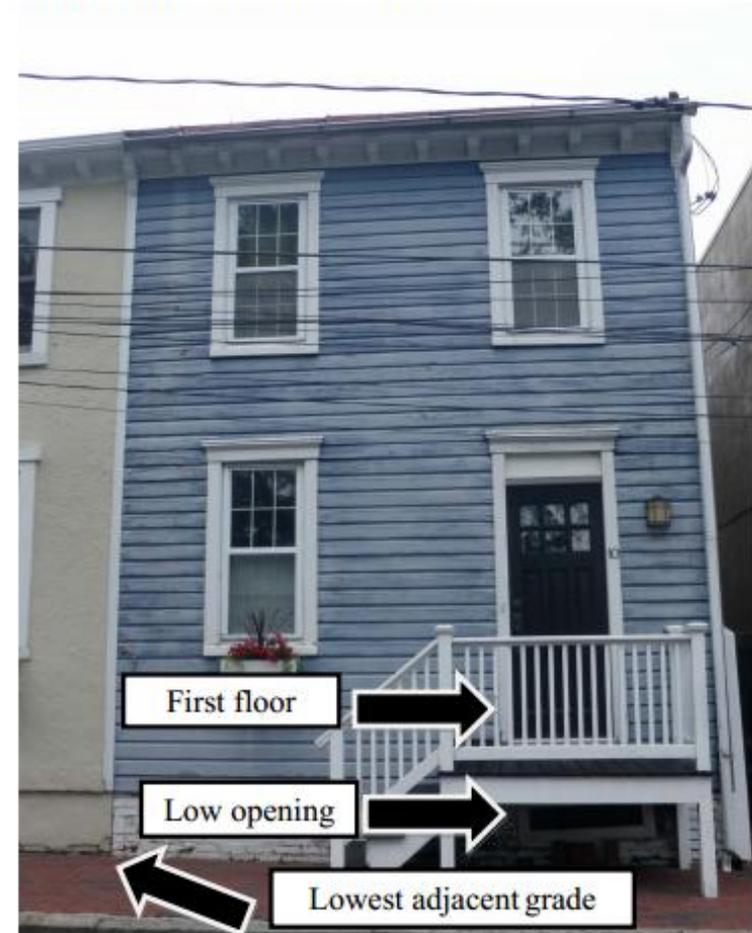


Prepared for: City of Annapolis
145 Gorman Street, 3rd Floor
Annapolis, Maryland 21401

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.

Step 3 – Set Priorities

Determine Community Value

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.

Date:

Worksheet #4

Determine Community Value for Historic Property and Cultural Resource Assets

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)
ANNAPOLIS - JONAS GARDEN TRIAKHE 123 COMPROMISE	NR / AHD	LOCAL					
GIBSONS LODGING 110 FR. GUARD	NR / AHD	STATE					
MIDDLETONS TAYLOR 2 MARKET ST	NR / AHD	STATE					
PATTERSON ROAD 24 MARKET ST	NR / AHD	LOCAL					
16 RIVINGTON ST	NR / AHD	LOCAL					
TODD AND PERRY WATERFRONT MARKET 2145 PINEWAY	NR / AHD ? INDIVIDUAL	NATIONAL					
RECALCULATING WALK BEHIND 71 MAIN 2145 COMPROMISE							
BENEFICIAL HOPSON BOATHOUSE ST. JOHNS							
1 DECK 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**

Step 3 – Set Priorities

Assess Public Sentiment – Visual Preference Survey

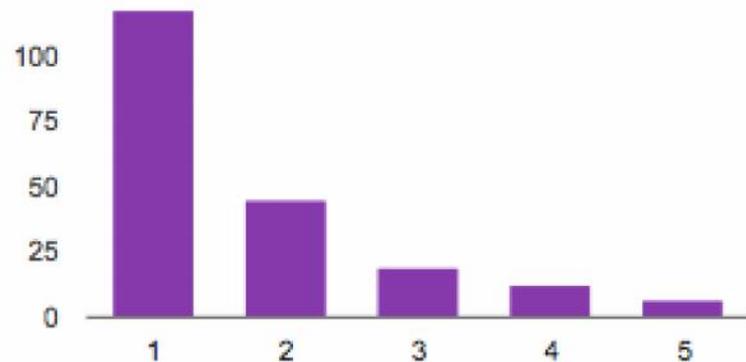


WHAT PLACES MATTER MOST TO YOU?

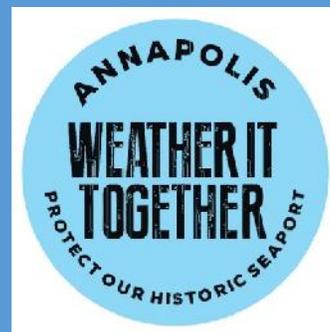
Step 3 – Set Priorities

Assess Public Sentiment – Online Survey

The city needs to start immediately to create a plan to address the flooding, natural hazard issues.



Strongly Agree: 1	118	58.7%
2	45	22.4%
3	19	9.5%
4	12	6%
Strongly Disagree: 5	7	3.5%



www.Annapolis.gov/WeatherItTogether

Step 3 – Write the Plan

Establish Goals & Objectives

Goal #1: Public and private property owners in Annapolis will incorporate hazard mitigation improvements into their routine maintenance, repair and rehabilitation projects to protect cultural resources from tidal flooding, sea level rise and other natural disasters.

Objective #1 - The City of Annapolis will develop and implement an economic development plan that will incentivize the protection of Historic District properties as an economic development priority for sustained growth and financial security.

Weather It Together

Sendai Framework for Disaster Risk Reduction 2015 - 2030

Goal: Prevent new and reduce existing disaster risk through the implementation of integrated and inclusive economic structural, legal, social, health, cultural, educational, environmental, technological, political and institutional measures that prevent and reduce hazard exposure.... and increase preparedness for response and recovery...

FEMA-Based Adaptation Strategies for Annapolis

Land Use Planning & Building Codes

Public Education & Engagement

Natural Resource Protection

Non-Structural Protection

Structural Protection

Policies & Incentives

Step 3 – Write the Plan

Adaptation: Land Use Planning & 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

Step 3 – Write the Plan

Adaptation: Public Education & Engagement

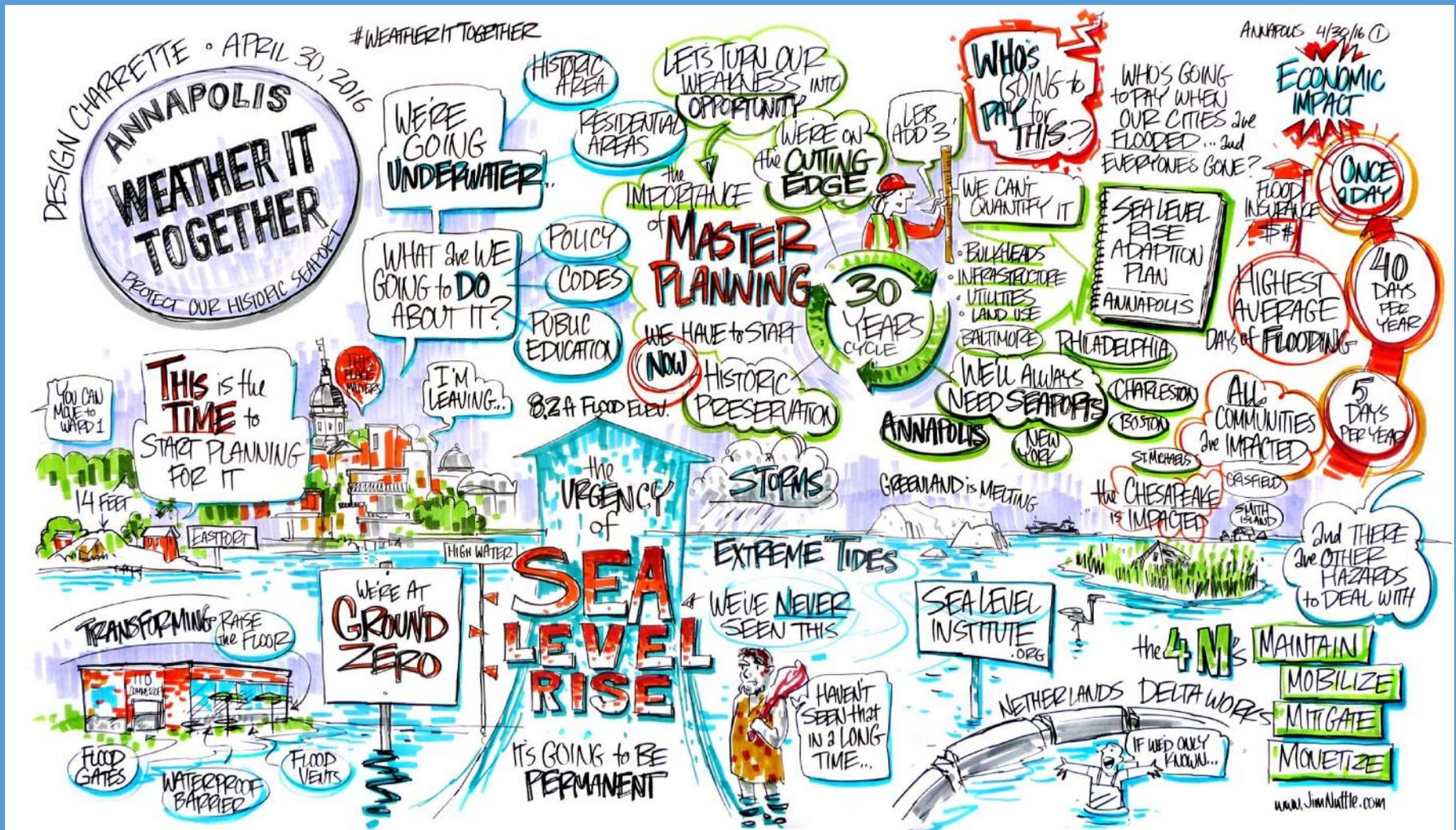


- Website / Social Media
- Branding
- High Water Markers
- Interpretive Kiosks
- Videos
- Media
- Publications



Step 3 – Write the Plan

Adaptation: Public Engagement – Graphic Recording



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Step 3 – Write the Plan

Adaptation: Natural Resource Protection



Before - Erosion

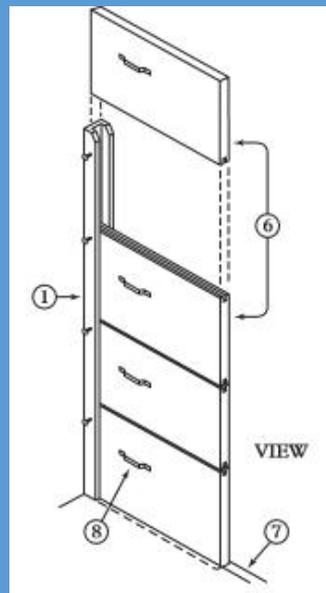


After – Living Shoreline

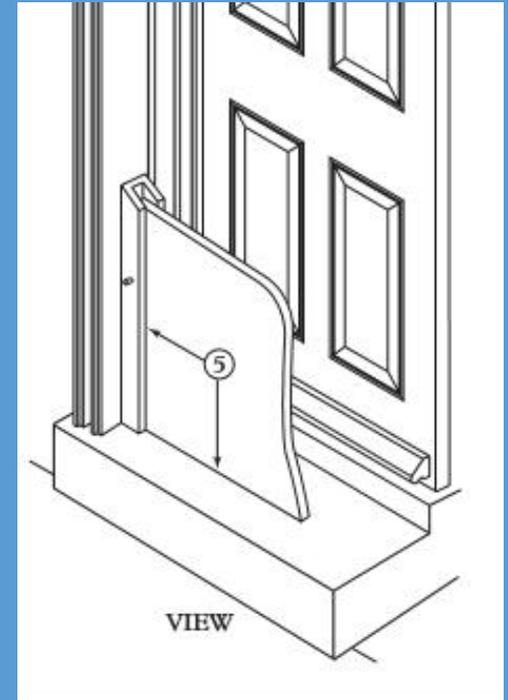
Step 3 – Write the Plan

Adaptation: Non-Structural - 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.



**Door &
Window Dams**



Step 3 – Write the Plan

Adaptation: Non-Structural - 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...”



Building Exterior



Building Interior

Step 3 – Write the Plan

Adaptation: Non-Structural/Structural-Barriers



Temporary Door Dam



Permanent Flood Wall



Temporary Flood Wall



Backflow Preventers

Step 4 – Implement the Plan

Adaptation: Structural - Floodwalls

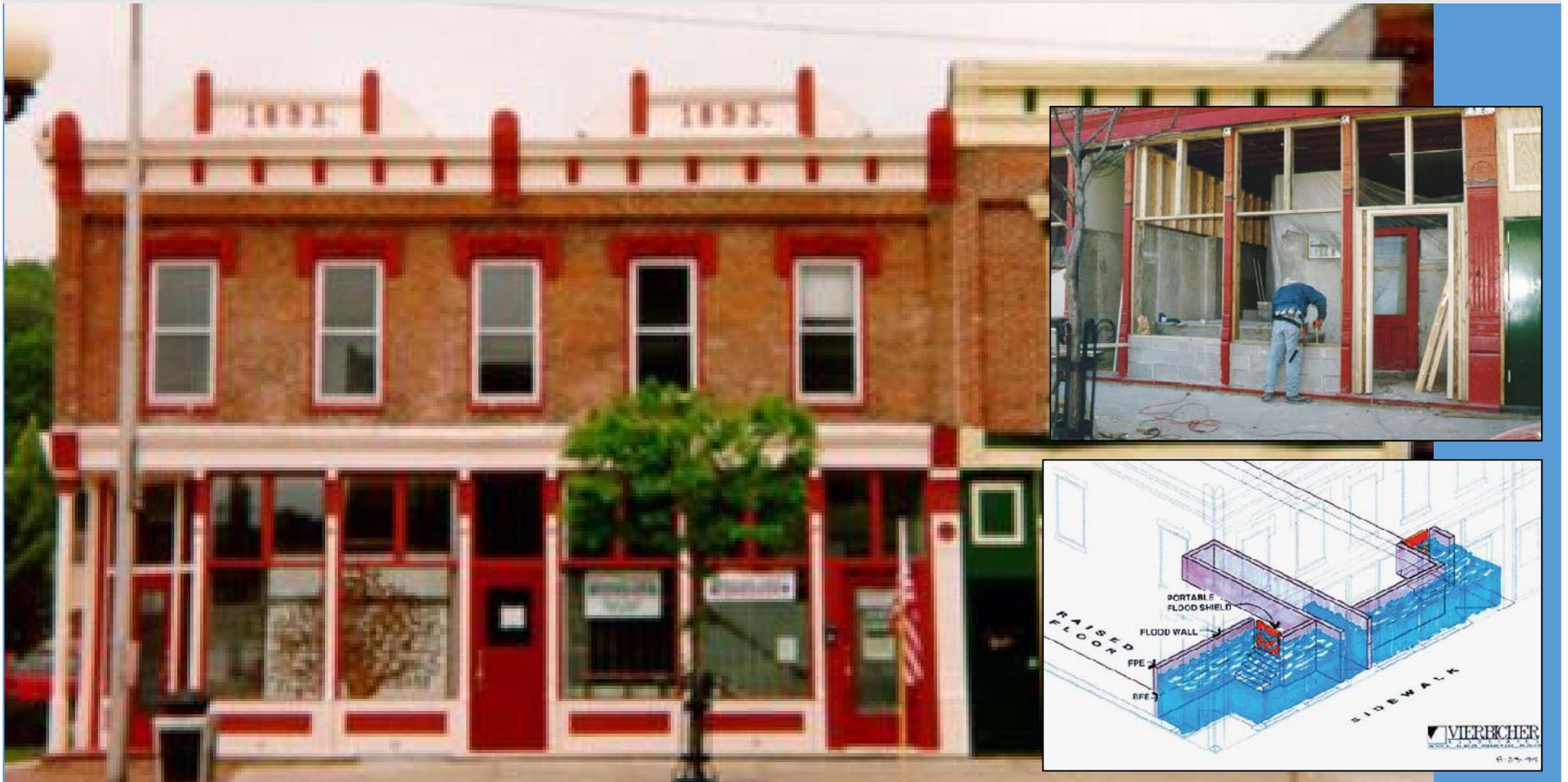
- Seek FEMA funding for model adaptation projects for priority properties in floodplain area.
- Work with Naval Academy to protect 4,500 linear feet of shared shoreline.
- Work with USACE to design for installation of backflow prevents at each sewer connection.
- Secure funding for floodwalls, coffer dams, pumping station, temporary pumps and valves.



Step 4 – Implement the Plan

Adaptation: Economic Policies & Incentives

City property tax credit applied to certified expenses for hazard mitigation / adaptation equal to 25% of rehabilitation cost on residential and income-producing properties (including interior improvements)



Step 4 – Implement the Plan

Promote the Planning Methodology

“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



Connect Improve Update Strengthen Collaborate

PreserveMaryland
Maryland Preservation Plan 2014



Maryland Historical Trust
<http://mht.maryland.gov>



Crisfield, Somerset County



St. Michaels, Talbot County

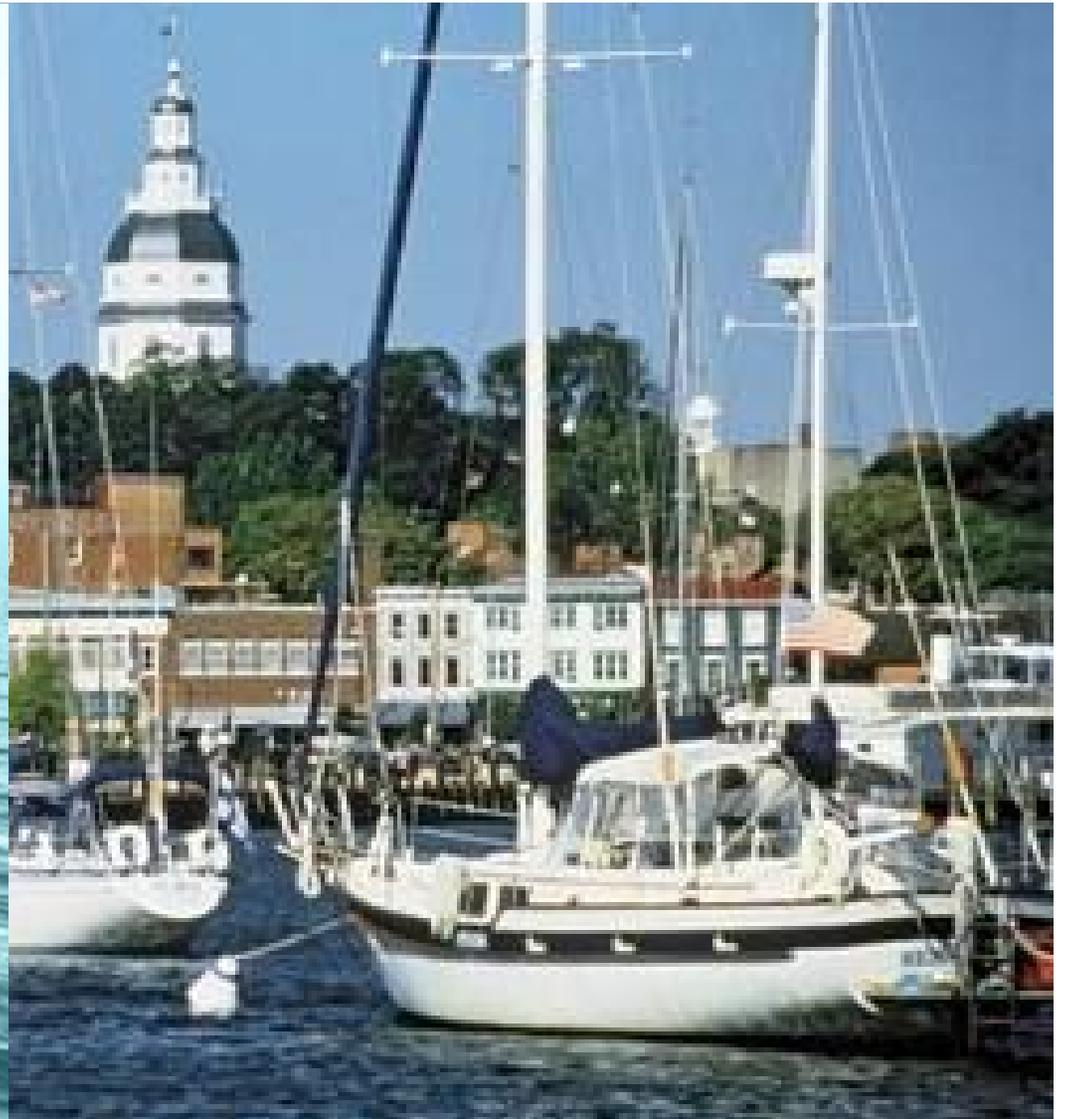
Weather It Together

*2016 Maryland Historical Trust Preservation Award
Excellence in Education and Community Engagement*



WHAT PLACES MATTER MOST TO YOU?

KEEPING HISTORY ABOVE WATER



WEATHER IT TOGETHER

*The Annapolis Model for
Cultural Resource Adaptation Planning*

