National Landmarks at Risk:

A Colonial Capital Case Study
Annapolis, Maryland

Union of Concerned Scientists – May 20, 2014
Lisa Craig, Chief of Historic Preservation
City of Annapolis

National Landmarks at Risk:
A Colonial Capital – Planned City

Annapolis laid out in 1695 in a Baroque plan. Contains 120 colonial-era buildings including the Palladian-style Hammond Harwood.

National Landmarks at Risk:

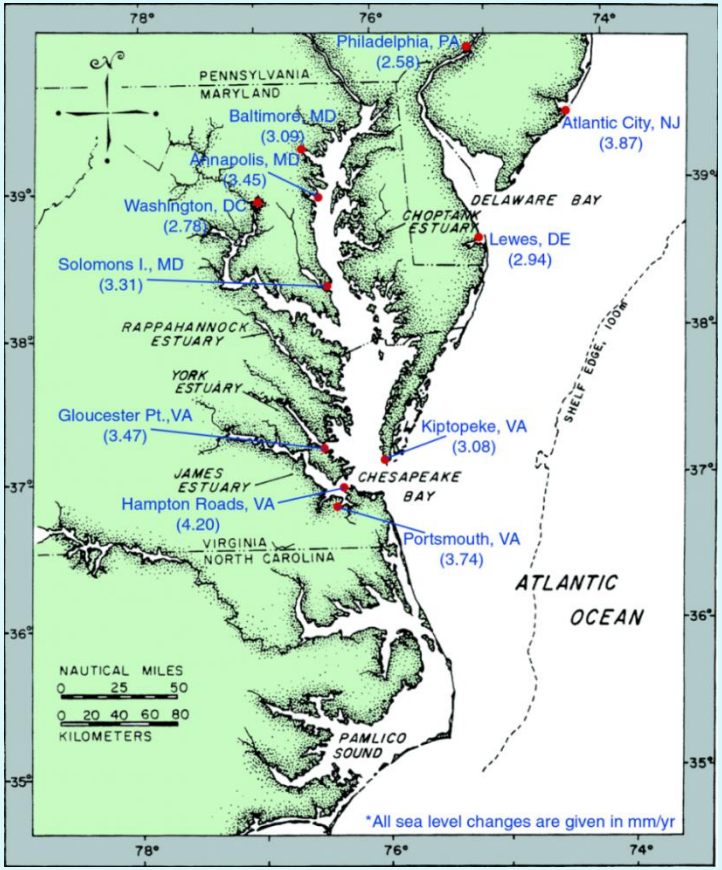
A Colonial Capital - Landmarks

Home to all four Maryland signers of the Declaration of Independence
George Washington Resigns His Commission – 1783
Nation's Capital – 1783-1784

National Landmarks at Risk:

A Colonial Capital – Naval Academy

National Landmarks at Risk:
The Chesapeake Watershed



Sea-level Rise in the Chesapeake could reach 17-28 inches above 1990 levels by 2095. To date, 13 islands have been lost.

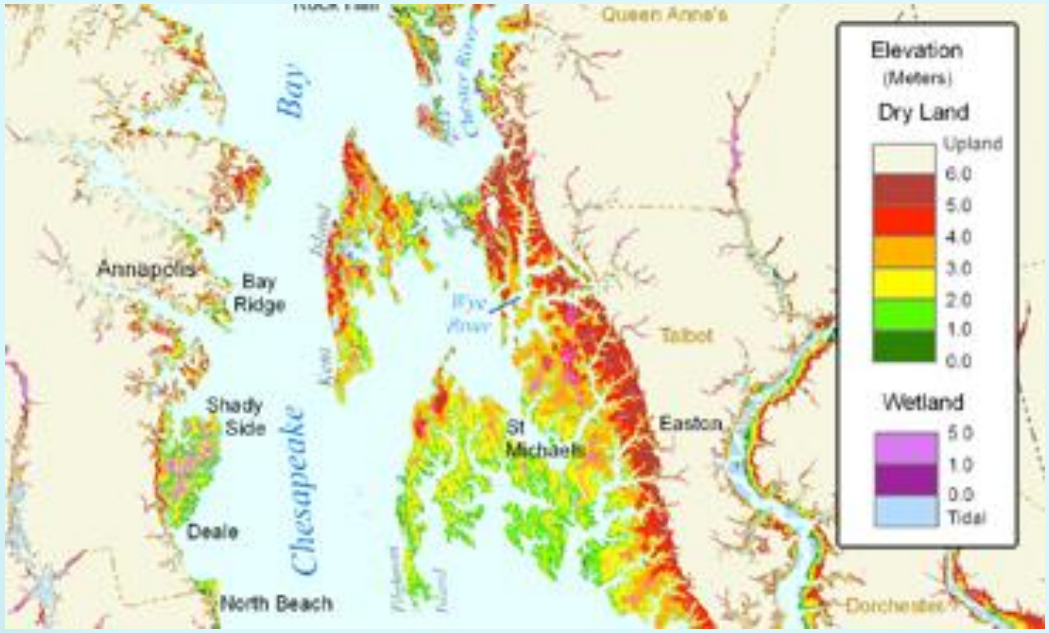
National Landmarks at Risk:

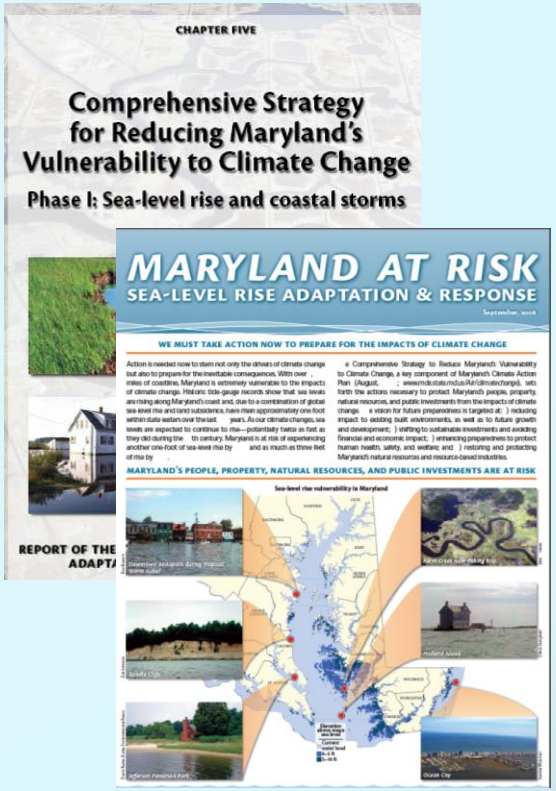
Maryland Climate Action Plan

Predictions for Sea level rise along Maryland's coast:

By 2050 - Best estimate mean sea level rise is 1.4'

By 2100 - Best estimate mean sea level rise is 3.7'



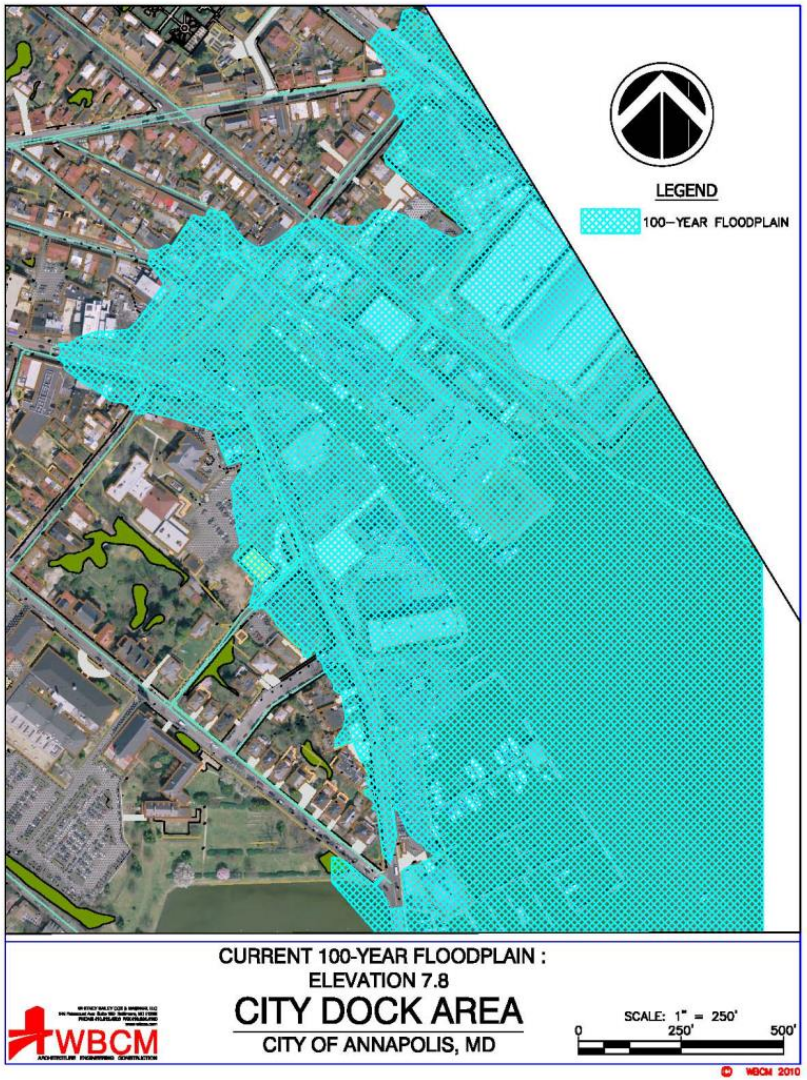


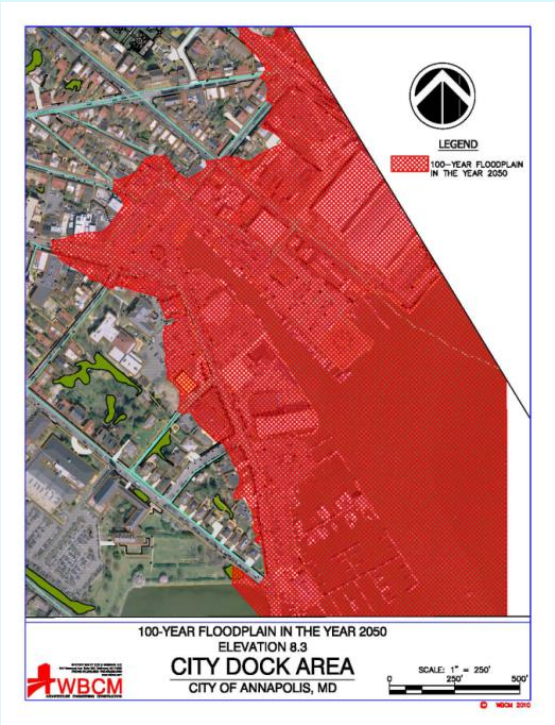
National Landmarks at Risk:
City of Annapolis Flood Mitigation

- Given the importance of the historic district and the waterfront… the Annapolis response to sea level rise must focus on protecting existing structures and infrastructure.
- The downtown should be the subject of a study to determine the costs and benefits of public decision-making in mitigating property damage.
- Future planning efforts can evaluate the need and options for protecting historic structures…
- Require floodproofing to the extent feasible while preserving the historic building exterior.

National Landmarks at Risk:

Annapolis Flood Plain Mapping





<u>2010</u>

100 yr. Flood Plain at 7.8 ft

High Tide (Nuisance Flooding) 3.4

<u>2050</u>

100 yr. Flood Plain at 8.3 ft

National Landmarks at Risk:

Annapolis Storm History

1775 – Hurricane claims State House roof, which is then replaced by a hurricane resistant dome.

1915 – Wind damage and flooding

1933 – Chesapeake and Potomac Hurricane

1955 – Hurricane Connie sinks tour schooner Levin J. Marvel outside of Annapolis

1999 – Hurricane Floyd results in 11.6 in. of rain

National Landmarks at Risk:

Hurricane Isabel - September 19, 2003

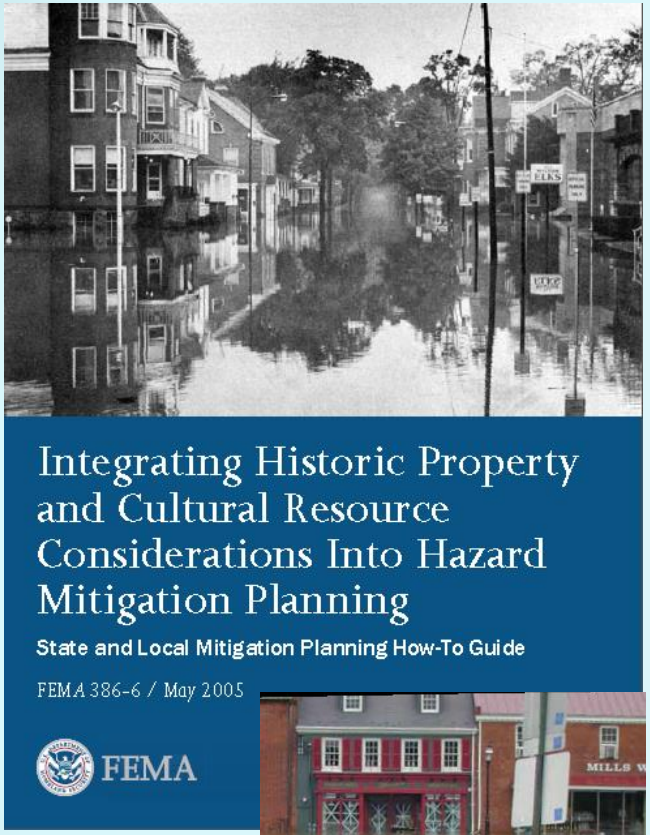
National Landmarks at Risk:
Annapolis City Dock Master Plan

"…the historic built environment of City Dock [is] threatened by sea level rise. In conjunction with the development of a Hazard Mitigation Plan to protect historic resources within the 100-year flood plain that is currently underway, the City will explore and present to the City Council for consideration several strategies for addressing the 100-year flood and sea level rise…"

National Landmarks at Risk:

Cultural Resources in Annapolis

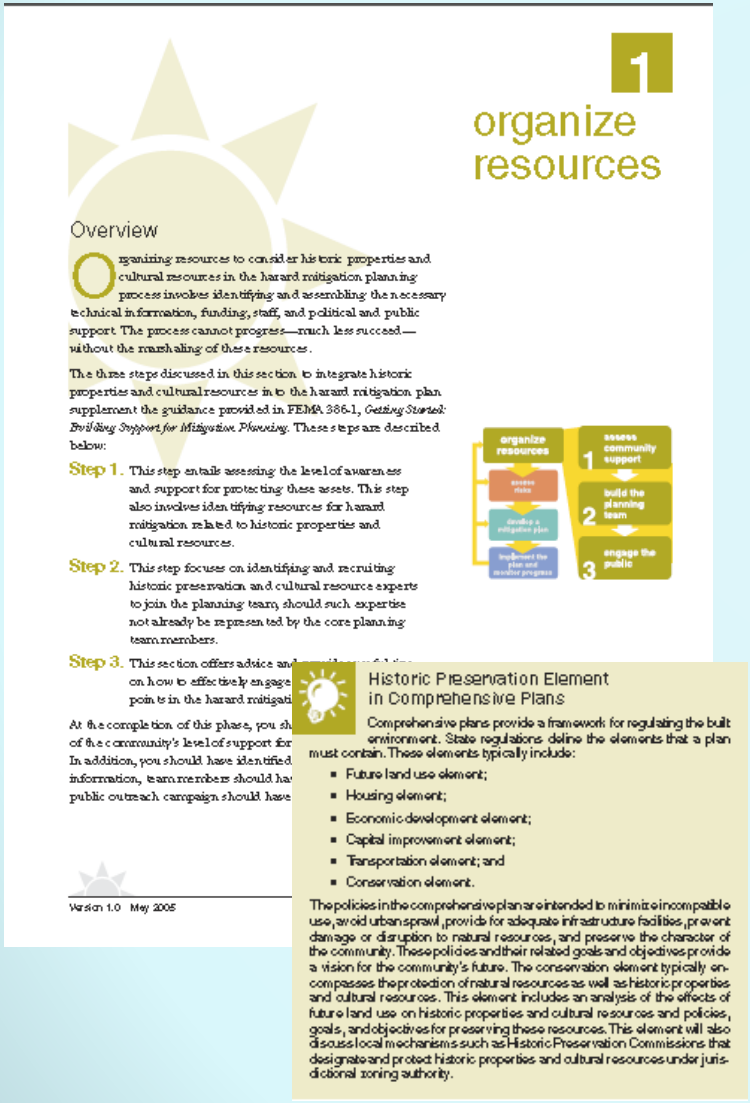
National Landmarks at Risk:
FEMA Hazard Mitigation Planning



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. Process includes:

- Organizing your efforts to develop an effective mitigation plan;
- Identifying hazards and assessing losses to your community;
- Setting mitigation priorities and goals and writing the plan;
- Implementing the mitigation plan, including project funding.

National Landmarks at Risk:
Funding & Partners



1

organize resources

Overview

Organizing resources to consider historic properties and cultural resources in the hazard mitigation planning process involves identifying and assembling the necessary technical information, funding, staff, and political and public support. The process cannot progress—much less succeed—without the marshaling of these resources.

The three steps discussed in this section to integrate historic properties and cultural resources in to the hazard mitigation plan supplement the guidance provided in FEMA 386-1, *Getting Started: Building Support for Mitigation Planning*. These steps are described below:

Step 1. This step entails assessing the level of awareness and support for protecting these assets. This step also involves identifying resources for hazard mitigation related to historic properties and cultural resources.

Step 2. This step focuses on identifying and recruiting historic preservation and cultural resource experts to join the planning team, should such expertise not already be represented by the core planning team members.

Step 3. This section offers advice and [illegible] on how to effectively engage [illegible] points in the hazard mitigati[illegible]

At the completion of this phase, you sh[illegible] of the community's level of support for [illegible] In addition, you should have identified [illegible] information, team members should ha[illegible] public outreach campaign should have

Version 1.0 May 2005

organize resources
1 assess community support
2 build the planning team
3 engage the public

Historic Preservation Element in Comprehensive Plans

Comprehensive plans provide a framework for regulating the built environment. State regulations define the elements that a plan must contain. These elements typically include:

- Future land use element;
- Housing element;
- Economic development element;
- Capital improvement element;
- Transportation element; and
- Conservation element.

The policies in the comprehensive plan are intended to minimize incompatible use, avoid urban sprawl, provide for adequate infrastructure facilities, prevent damage or disruption to natural resources, and preserve the character of the community. These policies and their related goals and objectives provide a vision for the community's future. The conservation element typically encompasses the protection of natural resources as well as historic properties and cultural resources. This element includes an analysis of the effects of future land use on historic properties and cultural resources and policies, goals, and objectives for preserving these resources. This element will also discuss local mechanisms such as Historic Preservation Commissions that designate and protect historic properties and cultural resources under jurisdictional zoning authority.

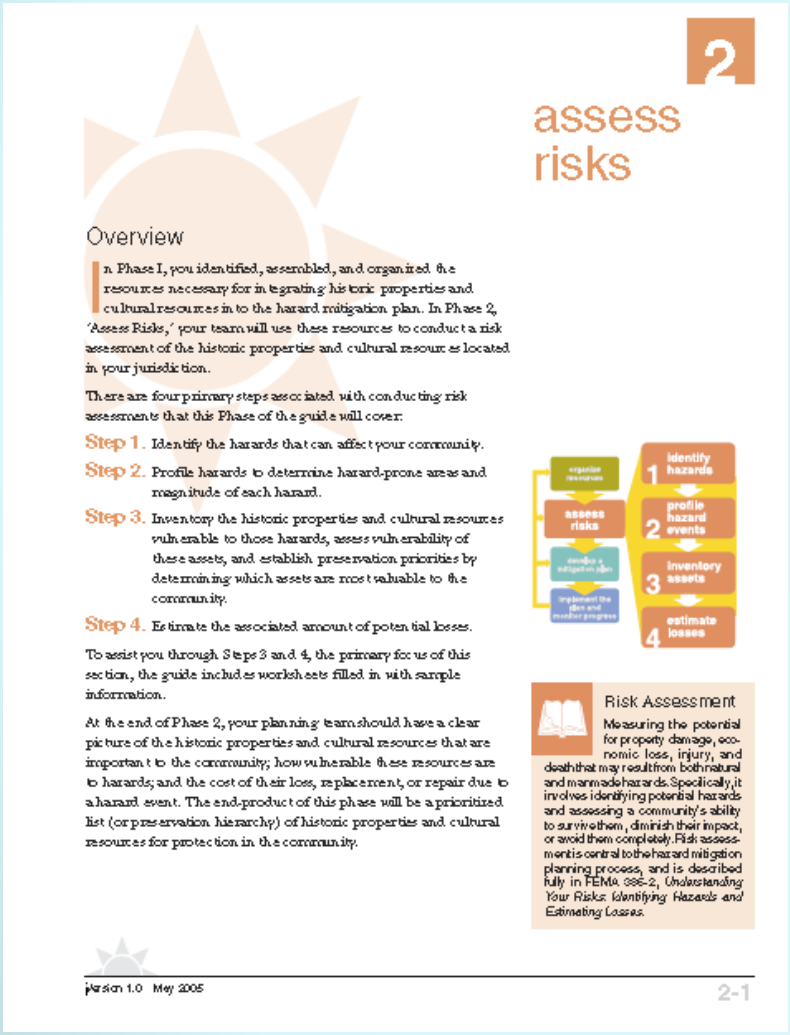
City of Annapolis - All Agencies
Annapolis Business and Resident Associations

State Agencies – State Historic Preservation Office, Dept. of Natural Resources, Maryland Emergency Management Agency

Federal Agencies – United States Naval Academy, Federal Emergency Management Agency, US Army Corps of Engineers

Nonprofits – National Trust for Historic Preservation, Preservation Maryland, Maryland Humanities Council, Historic Annapolis, Union of Concerned Scientists

National Landmarks at Risk:
Assess Risks to Cultural Resources



2

assess risks

Overview

In Phase I, you identified, assembled, and organized the resources necessary for integrating historic properties and cultural resources in to the hazard mitigation plan. In Phase 2, 'Assess Risks,' your team will use these resources to conduct a risk assessment of the historic properties and cultural resources located in your jurisdiction.

There are four primary steps associated with conducting risk assessments that this Phase of the guide will cover:

Step 1. Identify the hazards that can affect your community.

Step 2. Profile hazards to determine hazard-prone areas and magnitude of each hazard.

Step 3. Inventory the historic properties and cultural resources vulnerable to those hazards, assess vulnerability of these assets, and establish preservation priorities by determining which assets are most valuable to the community.

Step 4. Estimate the associated amount of potential losses.

To assist you through Steps 3 and 4, the primary focus of this section, the guide includes worksheets filled in with sample information.

At the end of Phase 2, your planning team should have a clear picture of the historic properties and cultural resources that are important to the community; how vulnerable these resources are to hazards; and the cost of their loss, replacement, or repair due to a hazard event. The end-product of this phase will be a prioritized list (or preservation hierarchy) of historic properties and cultural resources for protection in the community.

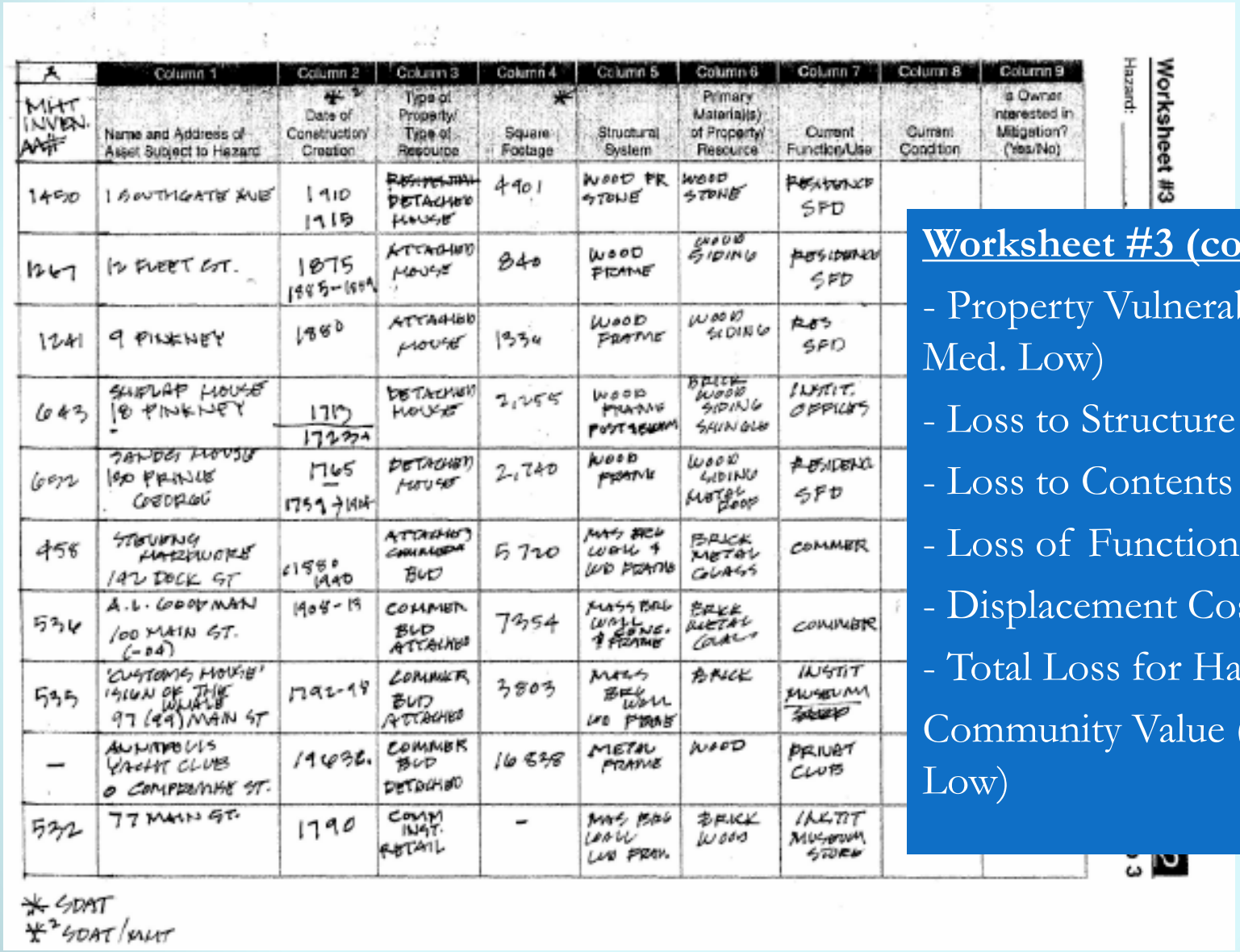
Risk Assessment

Measuring the potential for property damage, economic loss, injury, and death that may result from both natural and man-made hazards. Specifically, it involves identifying potential hazards and assessing a community's ability to survive them, diminish their impact, or avoid them completely. Risk assessment is central to the hazard mitigation planning process, and is described fully in FEMA 386-2, *Understanding Your Risks: Identifying Hazards and Estimating Losses.*

1. Identify the hazards that can affect your community
2. Profile hazards to determine hazard-prone areas and magnitude of each hazard.
3. Inventory vulnerable historic/cultural resources
   - assess vulnerability
   - establish preservation priorities
4. Estimate the associated amount of potential losses

National Landmarks at Risk:

Cultural Resource Inventory



Worksheet #3

Hazard:

MHT INVEN. AA#	Column 1 Name and Address of Asset Subject to Hazard	Column 2 Date of Construction/ Creation	Column 3 Type of Property/ Type of Resource	Column 4 Square Footage	Column 5 Structural System	Column 6 Primary Material(s) of Property/ Resource	Column 7 Current Function/Use	Column 8 Current Condition	Column 9 Is Owner Interested in Mitigation? (Yes/No)
1450	1 SOUTHGATE AVE	1910 1915	~~RESIDENTIAL~~ DETACHED HOUSE	4901	WOOD FR STONE	WOOD STONE	~~RESIDENCE~~ SFD		
1267	12 FLEET ST.	1875 1885-1894	ATTACHED HOUSE	840	WOOD FRAME	WOOD SIDING	~~RESIDENCE~~ SFD		
1241	9 PINKNEY	1880	ATTACHED HOUSE	1334	WOOD FRAME	WOOD SIDING	RES SFD		
643	SHIPLAP HOUSE 18 PINKNEY	1717 1723+	DETACHED HOUSE	2,255	WOOD FRAME POST1930M	~~BRICK~~ WOOD SIDING SHINGLE	INSTIT. OFFICES		
602	TAYLOR HOUSE 190 PRINCE GEORGE	1765 1759+1800	DETACHED HOUSE	2,720	WOOD FRAME	WOOD SIDING METAL ROOF	~~RESIDENCE~~ SFD		
458	STEARNS HARDWARE 192 DOCK ST	c1880 1940	ATTACHED COMMERCIAL BLD	5 720	MAS BRK WALL & WD FRAME	BRICK METAL GLASS	COMMER		
536	A.L. GOODMAN 100 MAIN ST. (-04)	1908-19	COMMER BLD ATTACHED	7354	MASS BRK WALL STONE & FRAME	BRICK METAL GLASS	COMMER		
595	'CUSTOMS HOUSE' SIGN OF THE WHALE 97 (99) MAIN ST	1792-19	COMMER BLD ATTACHED	3803	MASS BRK WALL W/ FRAME	BRICK	INSTIT MUSEUM ~~SOLD~~		
—	ANNAPOLIS YACHT CLUBS 0 COMPROMISE ST.	1968?	COMMER BLD DETACHED	16 838	METAL FRAME	WOOD	PRIVAT CLUB		
532	77 MAIN ST.	1790	COMM INST. RETAIL	-	MAS BRK LOAD WD FRM.	BRICK WOOD	INSTIT MUSEUM STORE		

* SDAT
** SDAT/MHT

Worksheet #3 (cont.)

- Property Vulnerability (High, Med. Low)
- Loss to Structure ($)
- Loss to Contents ($)
- Loss of Function / Use ($)
- Displacement Cost
- Total Loss for Hazard Event

Community Value (High, Med. Low)

National Landmarks at Risk:

Private Property - Flood Mitigation

Door/window barriers, wall barrier and elevated interior first floor

National Landmarks at Risk:

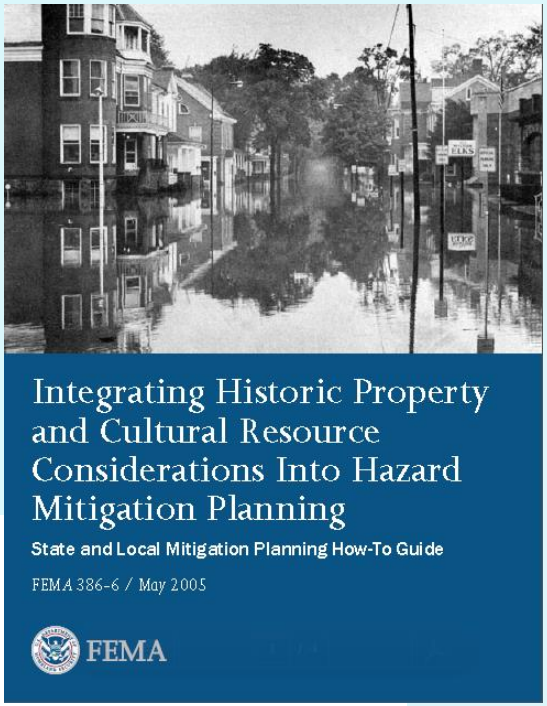
Public Infrastructure Protection

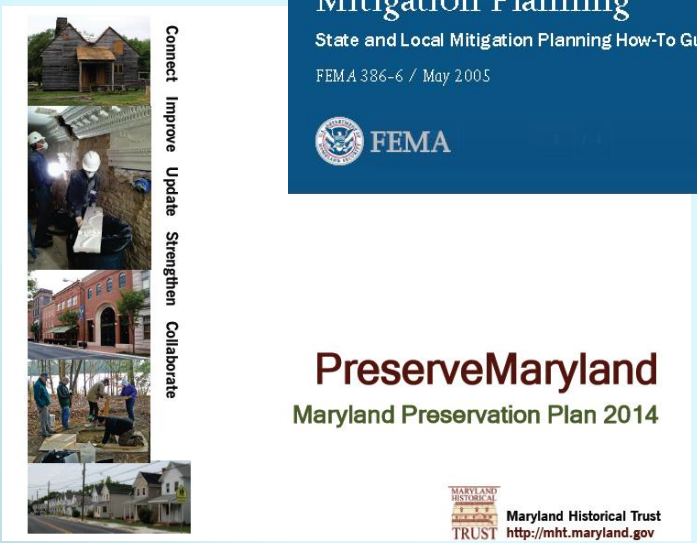
- City Dock flood protection measures limited due to majority of land being privately owned.
- Shared responsibility with the Naval Academy for protecting 4,500 linear feet of shoreline adjacent to the Academy.
- Backflow preventers need to be installed at each sewer connection.
- Floodwalls, coffer dams, pumping station, temporary pumps, backflow preventers, flap valves and duckbill valves needed.

Coffer Dam protecting Market House, Flap Valve & Rubber Duckbill Valve

National Landmarks at Risk:

A Model Program





"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, Office of Preservation Planning

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Annapolis, Maryland

Union of Concerned Scientists – May 20, 2014

Lisa Craig, Chief of Historic Preservation

City of Annapolis

National Landmarks at Risk: A Colonial Capital Case Study - Annapolis

Slide 1

- Sea-level rise is threatening Maryland's historic seaports.
- In Annapolis, the City's Historic Preservation Division is partnering with local, state and federal agencies, resident associations, businesses and historic preservation groups to prepare a disaster mitigation plan addressing the threat associated with sea level rise and flooding.
- Developing a property inventory, public outreach program, risk assessment tool and model mitigation projects, the plan's development follows the approach recommended by the Federal Emergency Management Agency through its "how-to" guide to State and Local mitigation planning.

Slide 2

- Laid out in 1695, Annapolis was one of the first planned cities in the United States. Its historic core contains the country's largest concentration of eighteenth-century brick buildings, including the Palladian-style Hammond-Harwood House, widely regarded as one of the finest colonial buildings in America.
- Settled by nonconforming Protestants from Virginia and other religious independents, Annapolis later became the capital of the colony, and the state of Maryland.
- The city's eighteenth-century waterfront bustled with ships bringing visitors, immigrants, servants, and slaves to town.
- Imported goods from Europe, the Caribbean, and other colonies filled dockside warehouses.

Slide 3

- All four of Maryland's signers (Thomas Stone, Samuel Chase, William Paca and Charles Carroll) of the Declaration of Independence lived in Annapolis.
- The city was the first post-Revolutionary War capital of the United States, hosting the Continental Congress in 1783 and 1784.
- George Washington resigned his commission as commander of the Continental Army here in 1783, and the Treaty of Paris, which formally ended the war, was ratified in the State House in 1784, now the longest operating StateHouse in the nation.

Slide 4

- Annapolis is also known as the home of the U.S. Naval Academy.
- Founded as the Naval School in 1845, with an initial enrollment of about 50 students, most of its Beaux Arts–style historic buildings date from the early 1900s, including the chapel with its iconic dome.
- Hurricane Isabel caused widespread and serious flooding in the city during September 2003, when water levels at the Naval Academy reached about six and a half feet above average, more than two feet over the current 100-year flood level; causing more than $120 million in damage.

Slide 5

- The next major storm that hits Annapolis, MD, could cause extensive flooding and widespread damage to the city's historic center.
- Because sea levels continue to rise in Chesapeake Bay, a so-called 100-year storm (a severe event with a 1 percent chance of occurring in any given year) would likely severely damage many historic structures in Annapolis, take years from which to recover, and seriously harm the city's tourism economy.
- With its expansive coastline, low-lying topography, and growing coastal population, the Chesapeake Bay region is among the places in the nation most vulnerable to sea-level rise.
- Sea-level rise in the Chesapeake Bay region could reach 17-28 inches above 1990 levels by 2095.

Slide 6

- **As to Predictions for Sea level rise along Maryland's coast, by 2050** the best estimate mean sea level rise is 1.4' **By 2100, b**est estimate mean sea level rise is 3.7'
- The State of Maryland has developed a Climate Action Plan to protect people, property, natural resources and public investments from impacts due to climate change.

Slide 7

As part of the Maryland Climate Action Plan, sea rise studies conducted for lower Eastern Shore counties evaluated three possible responses to sea level rise: protect, retreat/relocate, and abandon. In Annapolis, the results of that analysis were as follows:

- Given the importance of the historic district and the waterfront, and the recreational and economic needs for waterfront access, the Annapolis response to sea level rise must focus on protecting existing structures and infrastructure.
- The downtown should be the subject of a study to determine the costs and benefits of public decision-making in mitigating property damage.
- Future planning efforts can evaluate the need and options for protecting historic structures…
- Require floodproofing to the extent feasible while preserving the historic building exterior.

Slide 8

2010 - 100 yr. Flood Plain at 7.8 ft / High Tide (Nuisance Flooding) 3.4
2050 - 100 yr. Flood Plain at 8.3 ft

Slide 9

- Since 1667 - The "Year of the Hurricane" when the first recorded severe storm tracked through the Chesapeake region on Sept. 6, the Chesapeake Bay and Annapolis has realized a doubling of severe storm events each Century.
- With major storm events occurring In **1769 -** The Great Chesapeake Bay Hurricane, in **1775 the** hurricane which claimed the State House roof in Annapolis resulting in today's striking hurricane-resistant dome. **In 1878 t**he Great October Gale, **In 1915 a** tropical storm which tracked through Annapolis, the worst storm in years with sustained wind damage and flooding, the **1933** Chesapeake and Potomac Hurricane made landfall in North Carolina on August 23 before tracking through Virginia and pounding Annapolis, **1954** Hurricane Hazel with gusts near 100 mph in **1955** Hurricanes Connie and Diane resulted in strong gales which sunk the tour schooner *Levin J. Marvel*, about 20 miles south of its home port of Annapolis resulting in 14 passengers drowned. In **1972 -** Hurricane Agnes was one of the state's most destructive natural disasters, an ecological calamity for the Chesapeake Bay, In **1999** Hurricane Floyd dumped more than 11.60 inches of rain on Annapolis… and then there was 2003, Tropical Cyclone Isabel with more than nine hours of high winds creating extreme flooding along the Chesapeake Bay and its tidal tributaries.

Slide 10

Initially a Category 4 Hurricane, Isabel was downgraded to a Tropical Cyclone by the time it reached the Chesapeake Bay. Isabel was the worst hurricane to affect the Chesapeake Bay region since 1933. Storm surge values of more than 8 feet flooded rivers that flowed into the Bay across Virginia, Maryland, Delaware, and Washington, D.C. The most intense hurricane of the 2003 season directly resulted in 17 deaths and more than 3 billion dollars in damages. The storm surge from Isabel caused disastrous flooding in the historic City Dock area, damaging dozens of buildings. It took a decade before the 1858 Market House was restored, reopening in 2013.

Slide 11

"…the historic built environment of City Dock [is] threatened by sea level rise… the City will explore and present to the City Council for consideration several strategies for addressing the 100-year flood and sea level rise. The study of strategies will include impacts on the historic fabric and infrastructure, visual impact, economic impact, engineering feasibility, insurability of structures, cost/benefit analysis, impact on the use of space in the city dock area for other purposes, and relationship to the flood control measures and plans of the United States Naval Academy."

Slide 12

The city is preparing for the inevitability of another major storm and, by 2050, for at least a doubling of high-tide flooding events. In order to ensure the preservation of the buildings and streetscape within the 100-year floodplain of the city's Historic Landmark District, Annapolis is developing a Cultural Resource Hazard Mitigation plan—beginning with a comprehensive survey of all 140 at-risk buildings in the district— supported in part by the National Trust for Historic Preservation, the Maryland Historical Trust, Preservation Maryland, the Maryland Dept. of Natural Resources and the US Army Corp of Engineers.

Among the many important buildings close to the City Dock that the survey will include are the waterfront Tobacco Warehouse (early nineteenth century); Middleton Tavern (ca. 1750), from which renowned visitors including George Washington and Thomas Jefferson traveled by ferry across the bay; and the Sands House (ca. 1739), one of the city's oldest and lowest-lying buildings. Annapolis's

pioneering approach to minimizing damage and disruption from future climate change is likely to become a model for other historic coastal cities.

Slide 13

Whether a disaster impacts a major cultural institution, a historic "main street," or collections of family photographs or business records, the sudden loss of historic properties and cultural resources can negatively impact a community's character and economy, and can affect the overall ability of the community to recover from a disaster event. FEMA has provided a publication to show communities, step by step, how to develop and then implement a pre-disaster planning strategy for their historic properties and cultural resources.

Slide 14

Partners/Funders = City of Annapolis - All Agencies, Annapolis Business and Resident Associations **= State Agencies** – State Historic Preservation Office, Dept. of Natural Resources, Maryland Emergency Management Agency **= Federal Agencies** – United States Naval Academy, Federal Emergency Management Agency, US Army Corps of Engineers **= Nonprofits** – National Trust for Historic Preservation, Preservation Maryland, Maryland Humanities Council, Historic Annapolis, Union of Concerned Scientists

Slide 15

Plan requires communities to 1) Identify the hazards that affect the community 2) Profile to determine hazard-prone areas and the magnitude of each hazard 3) Inventory vulnerable historic/cultural resources and establish preservation priorities and 4) Estimate the associated amount of potential losses

Slide 16

Risk assessment includes analysis of the property's vulnerability, values associated with the loss of the structure, its contents, its function, and displacement of the residents or the business. In completing the preliminary estimates on damage impacts to properties within the 100 year flood plain area, we calculated that for 11 representative properties in the Historic District – mix of new and old, masonry and frame, residential and commercial, public and private, the resulting in a combined economic loss of totaled $23,879,149 with the lowest at $163,550 and the highest at $8,529,290.

Slide 17

Mitigation strategies for individual properties include several types of purpose-built flood barriers suitable for historic buildings. Most door and window barriers consist of various types of waterproof board and seals, which are inserted at times of flooding into small-section timber or metal channels on either side of the front door frame. Perimeter barriers are installed at the boundary of the property, and are intended to prevent water reaching the building at all. The City of Annapolis will develop design guidelines to assist property owners in deciding which barrier type works best for their property.

Slide 18

Flood protection measures for public areas within the City Dock are limited due to the fact that the vast majority of the land is privately owned. The City of Annapolis is working to share responsibility with the United State Naval Academy for protecting the shoreline at the area where the Dock is adjacent to the Academy. There is roughly 4,500 linear feet of shoreline that will need protection. A combination of floodwalls, coffer dams, pumping stations, temporary pumps, backflow preventers, flap valves and duckbill valves will be incorporated into the strategy.

Slide 19

"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." As a matter of fact, the Technical Survey team currently working on the Annapolis plan traveled to Crisfield MD, which is still recovering from the impacts of Hurricane Sandy, to provide some necessary technical expertise to that small historic Eastern Shore community.

Slide 20

Last night I was at a City Council hearing where cuts to our Emergency Preparedness and Response Management office were proposed. Beyond the obvious concern expressed by the community about the value this program offers, one insightful comment was made by a representative of Chesapeake Ready… "the local community is responsible for their business resiliency." And that is what we in Annapolis are doing… taking the lead in planning responsibly, one property at a time, for a more resilient Historic District that will take our 3 centuries of landmarks safely into tomorrow's economy.