

# Coast-Smart Communities: Adapting to Climate Change in Maryland



Photo: Jane Thomas



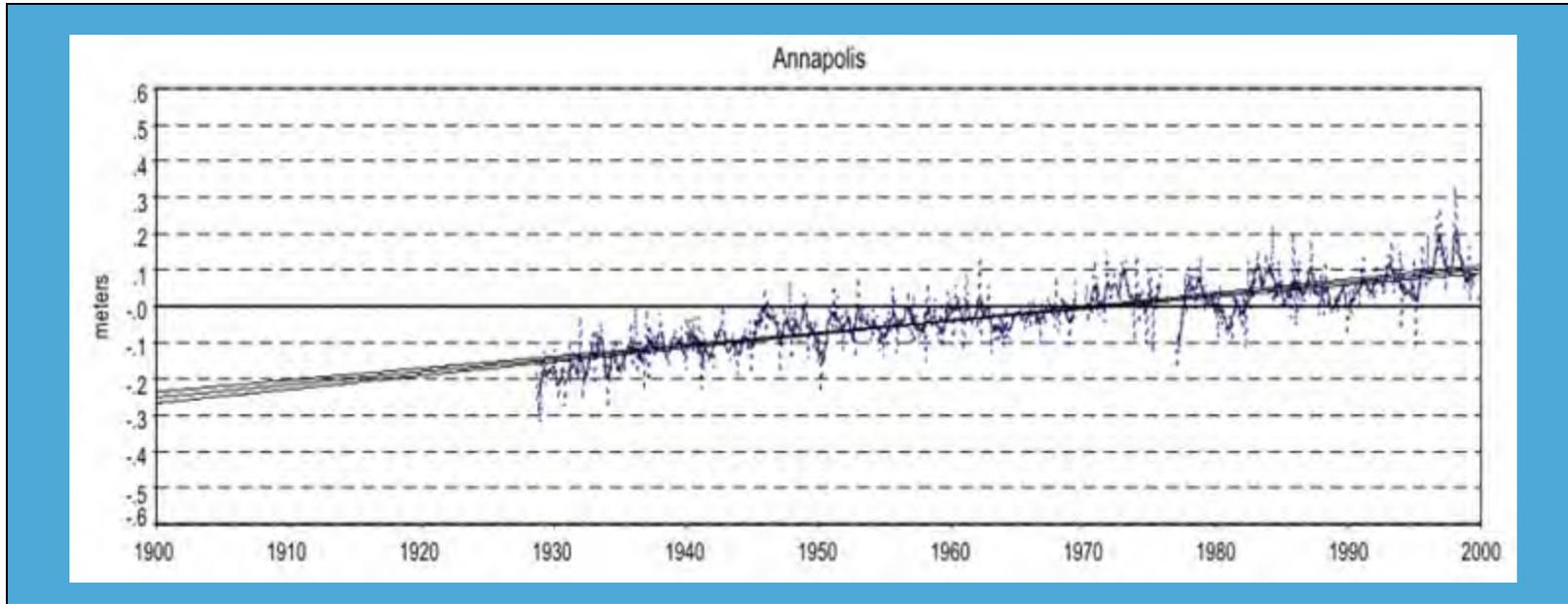
Gwen Shaughnessy  
Coastal Hazards and Climate Programs Specialist  
Maryland Chesapeake & Coastal Program

- Overview of SLR in MD
  - observed rise and projected rates
- *Coast-Smart* Communities Initiative
  - targeting assistance for local governments
- Ongoing efforts and next steps



Photo: MD Office of Tourism

# Historic Sea Level Rise



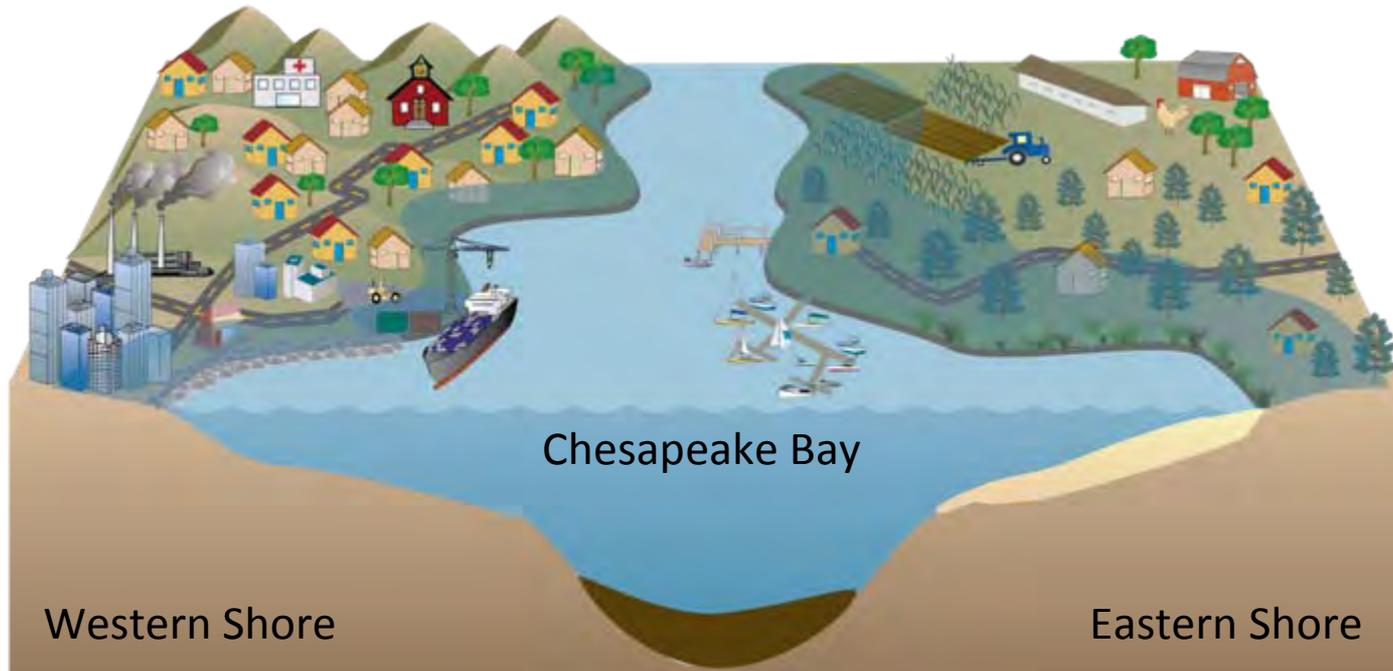
- Long-term tide gauge data provides observed changes in sea level
- On average, sea level has risen one-foot in the Chesapeake Bay region over the last 100-years.

# Relative Sea Level Rise Rates

- Factor in more localized land subsidence, and we see some differences in relative sea level rise rates in the Chesapeake
- Rates shown in feet/century



# Chesapeake Vulnerability to Sea Level Rise & Storm Surge



- Areas of dense development and infrastructure, including industry and ports
- More topographic relief with areas of steep cliffs and bluffs
- Not as intensely developed, with significant animal feeding and agriculture operations
- Flat, low-lying landscape
- Impacts of SLR inundation already evident

# Already seeing impacts on Eastern Shore...

- Drainage ditches that were once dry between rain events now hold water all the time and have tidal fluctuations
- Many houses already experiencing failing foundations and mold problems
- Failing septic systems
- Large stretches of roads currently flood during high tide events



Photos: Diane Cole

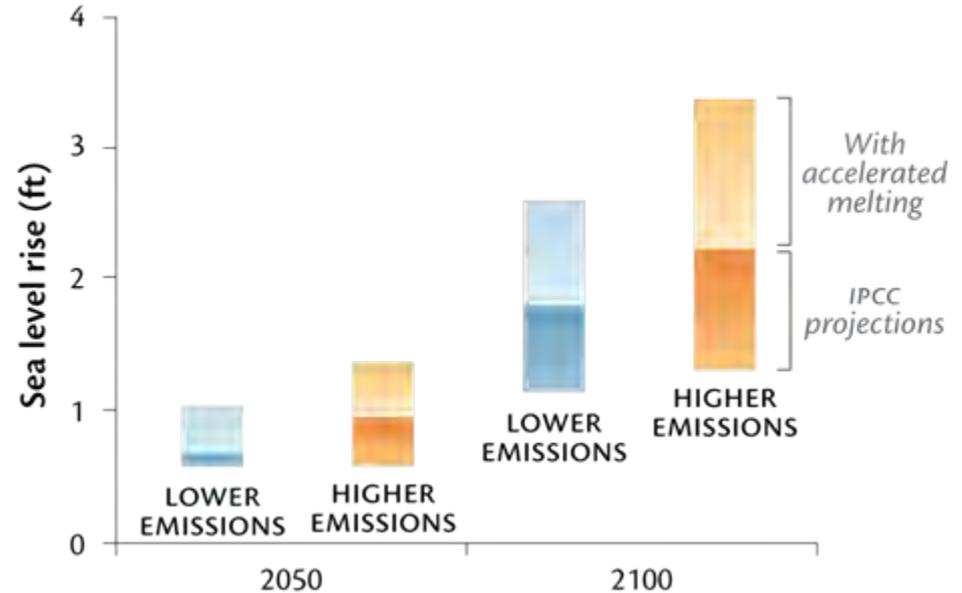
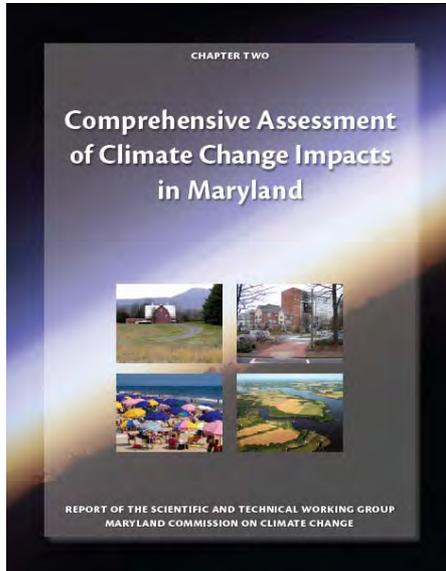
- **Charge:** Advise the Governor and General Assembly on matters related to climate change.
- **Task:** Develop a plan of action to address the drivers of climate change and prepare for the likely consequences.
- **Outcome:** MD Climate Action Plan completed August 2008



Executive Order Signing Ceremony

April 20, 2007

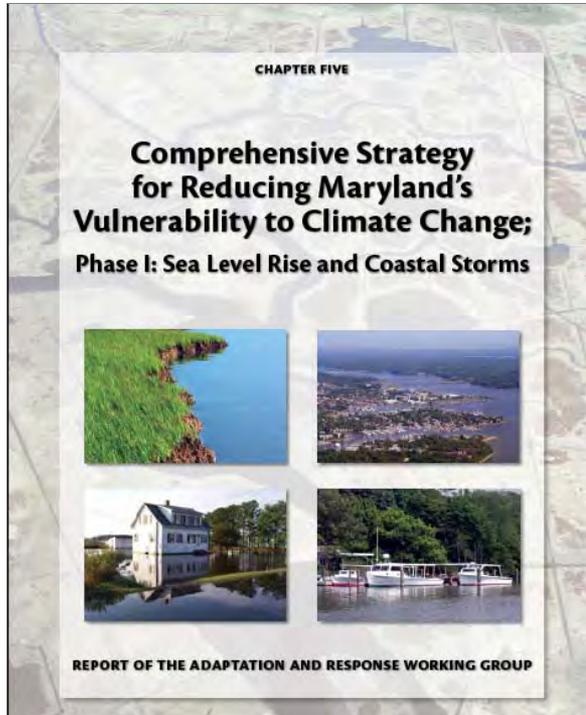
# Maryland Climate Action Plan



- IPCC 4th Assessment Projections (B1=lower emissions, A2=higher emissions) and factored in land subsidence.
- Accelerated melting is the statistical average of 3 studies looking at changes in ice flows
- Net result is 2.7 to 3.4 ft rise over the next century.

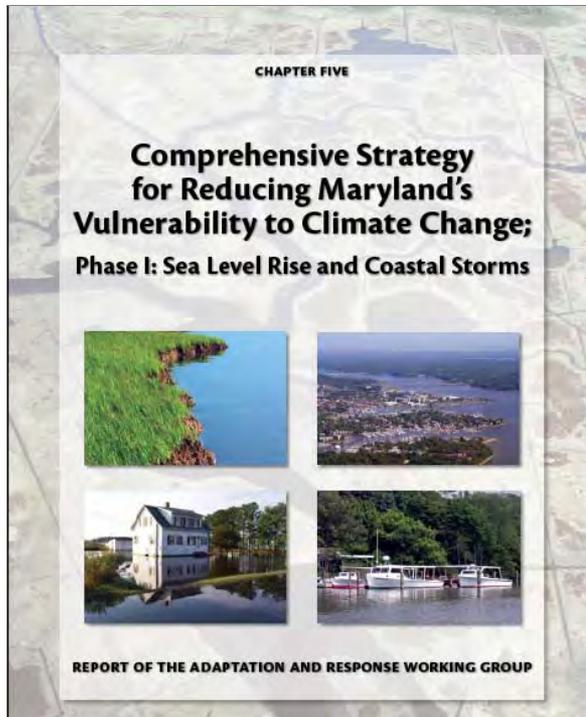
# SLR Adaptation & Response

- 19 policy recommendations
  - \* Built Environment and Infrastructure
  - \* Natural Resources and Resource Based Economies
  - \* Human Health, Safety and Welfare
  - \* Adaptation and Response Toolbox



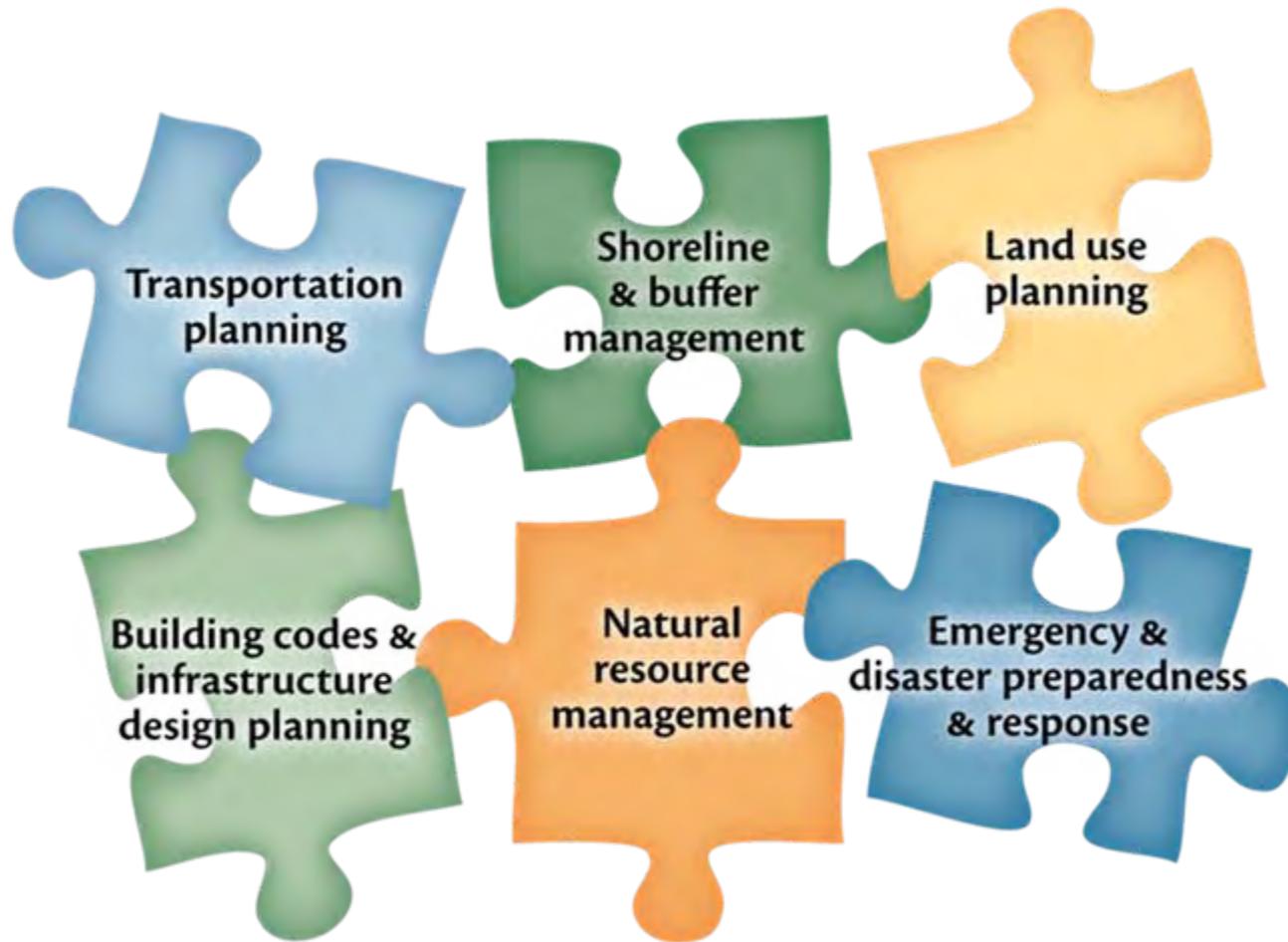
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**\*\*Many of these recommendations are cross cutting between the different categories & require implementation at the local level**

# Adaptation and Response: Integrated Planning for SLR





For local  
communities,  
choosing a path to  
plan for sea level rise  
difficult to navigate...

*Where and how do  
they start?*

# Putting the resources at the level where work gets done...



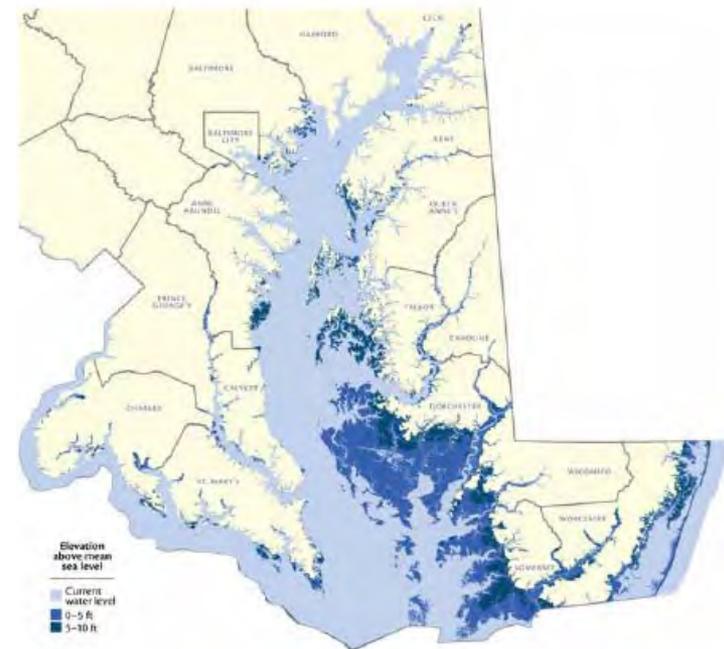
## ***Coast-Smart Communities Initiative:***

Provide local communities with the information and resources that they need to plan and adapt to sea level rise and coastal hazards.

# Provide the Right Technical Tools

- High Resolution Topographic Mapping (LIDAR)
- Shoreline Erosion and Change Mapping
- Comprehensive Shoreline Inventory
- USACE Chesapeake Bay Erosion Study & Erosion Vulnerability Assessment
- Sea Level Rise Modeling: Worcester & Dorchester Counties
- State-wide Sea Level Rise Vulnerability Mapping

Statewide SLR Vulnerability



# Targeted Outreach & Education

Utilize new and existing educational, outreach, training and capacity building programs to disseminate information and resources

## How Prepared Are you For Rising Waters?

### Planning for Sea Level Rise Regional and Local Considerations for Coastal Areas

December 9<sup>th</sup>, 2008






9:00am – Introductions: Maryland, New Jersey, and Virginia  
Via Video Conferencing

9:15am - Regional Implications of Climate Change  
Dr. Mike Kennish,  
Rutgers University – Institute of Marine and Coastal Sciences

9:45am - State-based Case Studies –  
Via video conference with New Jersey and Virginia

**Maryland: Sea Level Rise Planning for Local Governments:**  
Vulnerability Assessment, Long Range Planning, Code and Ordinance Development  
Zoe Johnson & Gwen Shaughnessy, Coastal Planners & Representatives from Dorchester, Somerset and Worcester Counties

10:15-10:30am – Break

**New Jersey: How Planning for Sea Level Rise is Affecting the National Flood Insurance Program –**  
Mr. Mark Crowell, FEMA

**Virginia: Climate Change Planning: on the Ground in Virginia**  
Skip Stiles, Wetlands Watch

11:30am – Lunch (will be provided)

12:30-2:30pm: **Maryland Climate Action Plan, Local Government Involvement and Future Opportunities**  
• MD Climate Action Plan: Local Government Component  
• Local Government Sea Level Rise Guidance Documents  
• Other local, state, regional and national efforts  
• Implementation and Future Direction

2:30-3:00pm – **Wrap up and next steps**

**Where:**  
University of Maryland  
Center for Environmental Science

**Annapolis Synthesis Center**  
111 Cathedral Street  
Suite 302  
Annapolis, MD 21401

**Register:** There is NO registration fee. Space is limited  
Contact: Dionne Bell: 410 267 8732  
Register by December 1<sup>st</sup>





## MARYLAND AT RISK

### SEA-LEVEL RISE ADAPTATION & RESPONSE

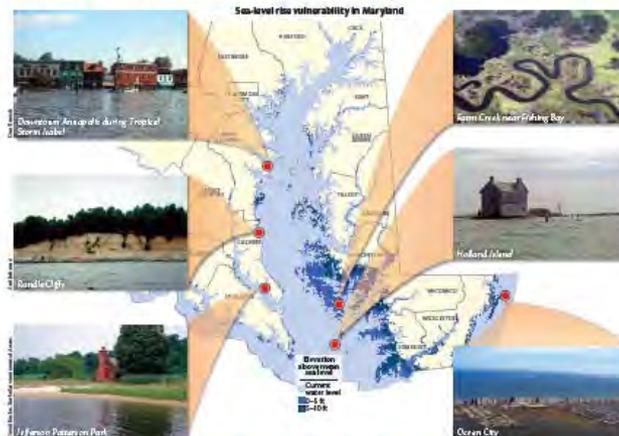
September, 2008

**WE MUST TAKE ACTION NOW TO PREPARE FOR THE IMPACTS OF CLIMATE CHANGE**

Action is needed now to stem not only the drivers of climate change but also to prepare for the inevitable consequences. With over 3,000 miles of coastline, Maryland is extremely vulnerable to the impacts of climate change. Historic tide-gauge records show that sea levels are rising along Maryland's coast and, due to a combination of global sea-level rise and land subsidence, have risen approximately one foot within state waters over the last 100 years. As our climate changes, sea levels are expected to continue to rise—potentially twice as fast as they did during the 20th century. Maryland is at risk of experiencing another one-foot of sea-level rise by 2050 and as much as three feet of rise by 2100.

The Comprehensive Strategy to Reduce Maryland's Vulnerability to Climate Change, a key component of Maryland's Climate Action Plan (August, 2006; [www.mde.state.md.us/air/climatechange](http://www.mde.state.md.us/air/climatechange)), sets forth the actions necessary to protect Maryland's people, property, natural resources, and public investments from the impacts of climate change. The vision for future preparedness is targeted at: 1) reducing impact to existing built environments, as well as to future growth and development; 2) shifting to sustainable investments and avoiding financial and economic impacts; 3) enhancing preparedness to protect human health, safety, and welfare; and 4) restoring and protecting Maryland's natural resources and resource-based industries.

**MARYLAND'S PEOPLE, PROPERTY, NATURAL RESOURCES, AND PUBLIC INVESTMENTS ARE AT RISK**



**Sea-level rise vulnerability in Maryland**

• Annapolis: Annapolis during Tropical Storm Isabel

• Hoopeck Creek near Fishing Bay

• Sandie Cliff

• Hoopeck Island

• Ocean City

• 1/2 Marsh: Pasture on Park

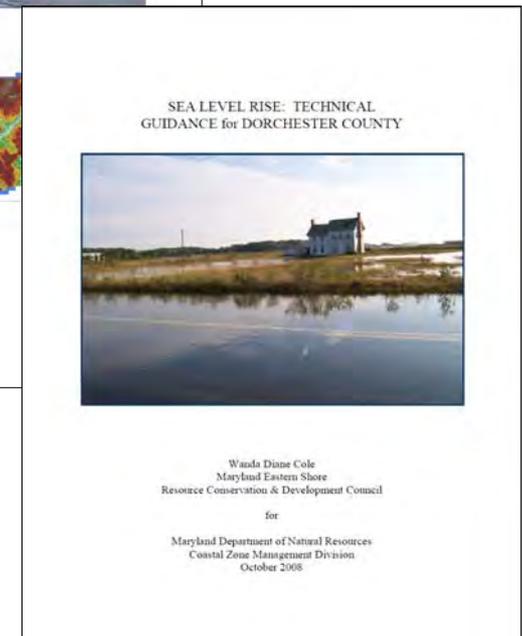
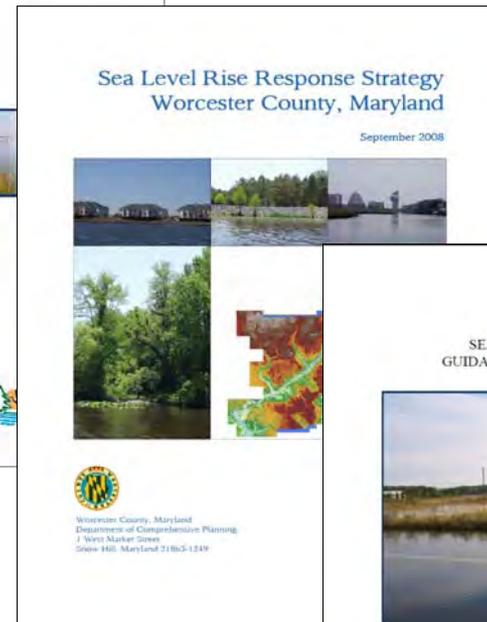
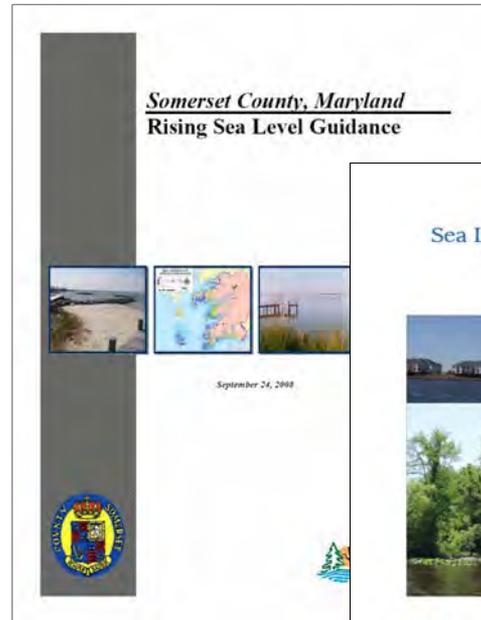
• Chesapeake Bay: Current water level 10'-0" and 10'-10"

# Using Photographs to Visualize Risk



# Policy & Planning Guidance

In 2008, three coastal counties received funding assistance to conduct vulnerability assessments and prepare policy and planning guidance materials



# Building *Coast-Smart* Communities Role-play



Photos: MD DNR

The role-play exercise is centered on community-based negotiations for adaptation actions, listed on a scorecard with the associated effectiveness and cost for each action.

# Why a Role-play Exercise?



Photos: MD DNR

- Practice Makes Perfect: Put community stakeholders in the “drivers seat”

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Photos: MD DNR

- Practice Makes Perfect: Put community stakeholders in the “drivers seat”
- Teaching tool: Learn about issues, actions, and other perspectives and interests
- Need to Start Somewhere: Show participants that there *ARE* things we can do, not just “doom and gloom”

# Role-play Scorecard

- 5 Categories
  - \* Reducing Vulnerability of the Built Environment
  - \* Water & Wastewater Infrastructure
  - \* Protecting Wetlands & Wildlife
  - \* Farm & Forestland Protection
  - \* Public Education

COAST-SMART COMMUNITIES SCORECARD Minimum 100 points, Maximum 25 \$ to qualify	Cost to County	Score
<b>CATEGORY 1: Reducing Vulnerability of the Built Environment (Minimum 25 points)</b>		
<b>Subcategory 1: Remove from harm's way</b>		
1. Ban the building of new primary dwellings and prohibit the expansion of footprints on existing developed lots within the 100-year tidal floodplain.	\$	10
2. Incorporate elements into the county's comprehensive plan that address and accommodate for sea level rise and an increased storm surge vulnerability zone. This could include provisions such as overlay zones, tiered zoning with increasingly strict regulations within areas of vulnerability, increased buffers in areas of vulnerability, etc.	\$	8
3. Establish a transferable development rights (TDR) system to encourage swapping of land in coastal areas vulnerable to sea level rise and storm surge for inland parcels (this is versus a zoning approach)	\$\$	8
4. Develop a timeline and strategic plan to move or abandon existing infrastructure in areas subject to more frequent storm surge and damage due to sea level rise inundation.	\$	9
5. Require mandatory disclosure statements about property's vulnerability to sea-level rise in all real estate transactions	\$	7
6. Establish and fund a buy-out program for the purchase of repetitive loss properties within the 100 year floodplain	\$\$\$ - State Match	9
<b>Subcategory 2: Protect in place</b>		
7. Require a 2-foot freeboard elevation above the FEMA requirements for all new and existing buildings in the 100-year tidal floodplain	\$\$\$	8
8. Develop an Infrastructure Improvement Plan that establishes timelines for raising roads and bridges, higher volume stormwater management, etc. based on vulnerability to sea level rise	\$\$	7
9. Provide tax rebates on investments in adaptation measures for homeowners and small business owners in at risk areas (e.g., elevating houses, upgrading well water and septic systems)	\$\$ - State Match	6
10. Create a comprehensive local adaptation plan	\$\$ - State Match	7
11. Enhance federal flood insurance by contributing to a state insurance pool for homeowners and small businesses located in areas vulnerable to sea level rise and storm surge.	\$\$\$\$ - State Match	8

# Hypothetical Scenario - Background Info

- **Incentives:** Created for climate change adaptation through *Coast-Smart* Communities Program, including:
  - o Grants for implementation
  - o Reduced premiums for coastal flood insurance
- **Qualification:** Communities that undertake at least a minimum amount of *Coast-Smart* activities listed on scorecard
- **Pilot Community:** “Springtown, MD” creates an advisory committee to decide on *Coast-Smart* actions
- **Budget Constraints:** Must obtain minimum scorecard score without exceeding cost limits outlined in community budget

## BUILDING COAST-SMART COMMUNITIES

An Interactive Summit



Photo: MD DNR

# *Coast-Smart Summit & Role-play Exercise*

## April 27, 2009

# 1<sup>st</sup> Round of *Coast-Smart* Communities Projects

- Start date October 2009
- Development of a strategic plan targeting sea level rise and climate change in Anne Arundel County
- Improvements to Caroline County's floodplain and stormwater management programs and ordinances
- Sea level rise adaptation and response plan for the City of Annapolis
- Integrated community and watershed design project for the town of Queenstown



# Next Steps & Ongoing Efforts...

- Develop statewide SLR guidance for local governments - expansion of *Coast-Smart* Communities scorecard into a self-assessment tool
- Duplicate role-play exercise in coastal communities (two planned for spring)
- Seek opportunities to expand financial assistance available to local communities undergoing adaptation planning



Photo: MD DNR



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<http://maryland.coastsmart.org/>

