From Headwater to Sea: Adapting to Climate Change in the Chesapeake Bay

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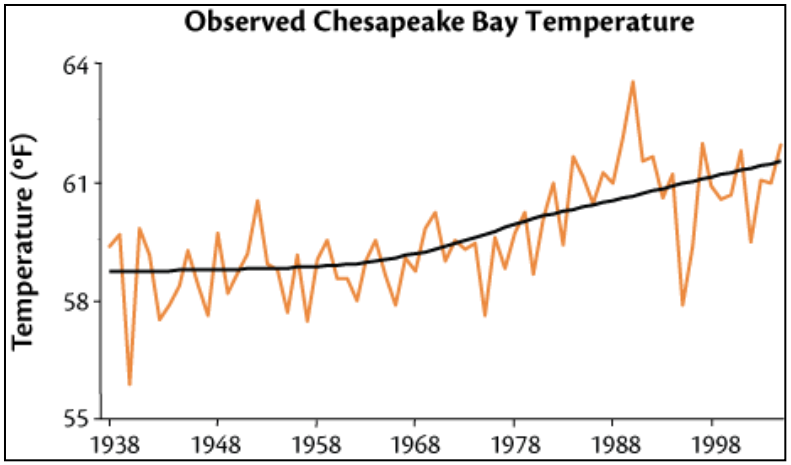
Climate Change in the Maryland
A 2100 Snapshot

- ✓ Sea Level Rise: + 3- 4 feet (1 to 1.5 meters)
- ✓ Temperature: + 2 - 4 degrees C
- ✓ Annual Precipitation: -10% to +20%
- ✓ Spring Runoff: Higher
- ✓ Summer Runoff: Lower

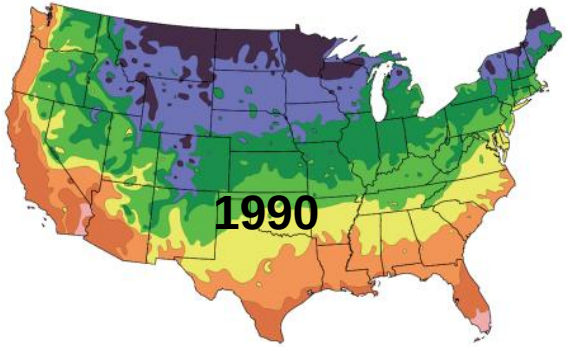
Global Climate Change = Real Consequences

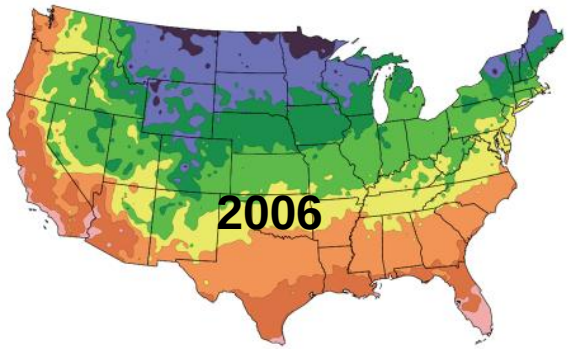
Global Climate Change: Real Consequences

Sea level has risen approximately one-foot (1/3 m) in the last century



Chesapeake Bay has warmed by more than 2°F

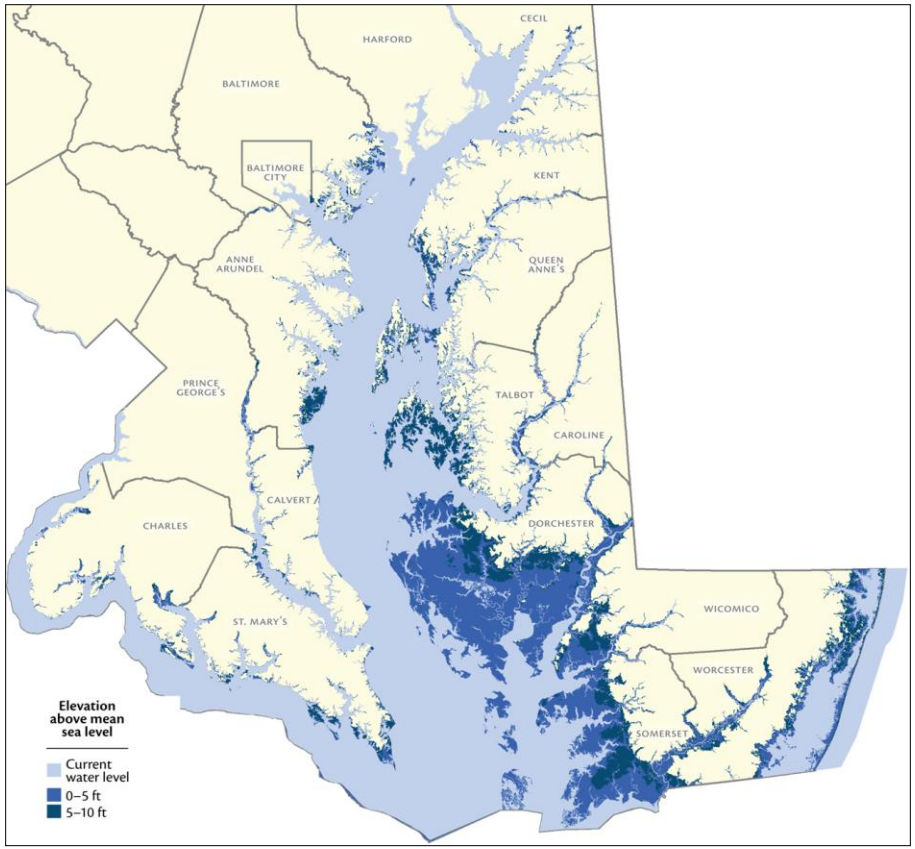




Shift in Plant Hardiness Zones
National Arbor Day Foundation

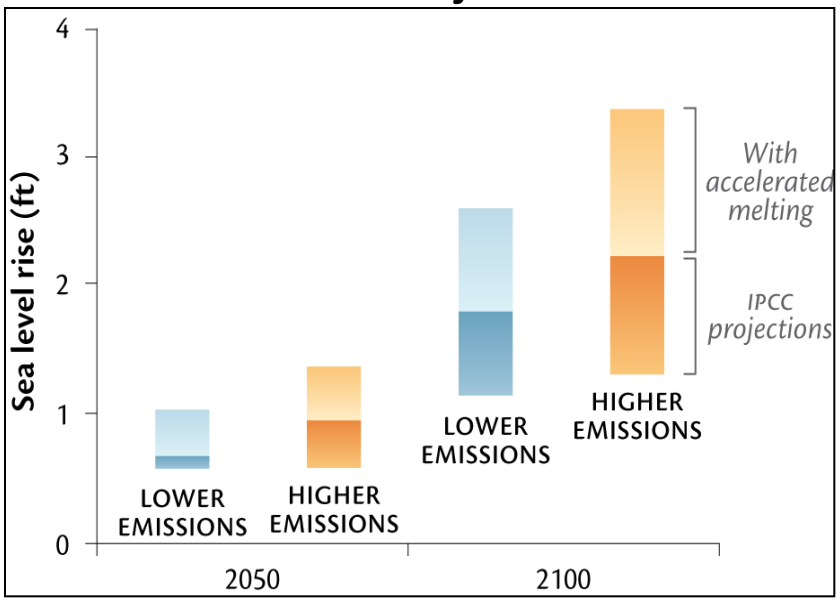
Source: http://www.umces.edu/applying-science/maryland-climate-change

Assessing State-wide Vulnerability

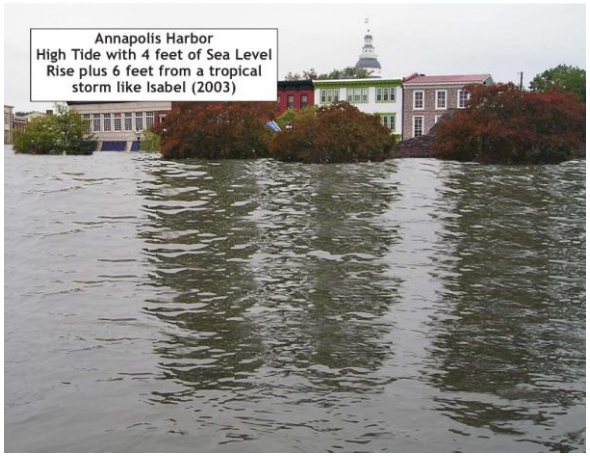


Maryland's Risk from Sea Level Rise

Future Projections



Visualizing Impacts



Climate Resilience: Mitigation + Adaptation

Mitigation

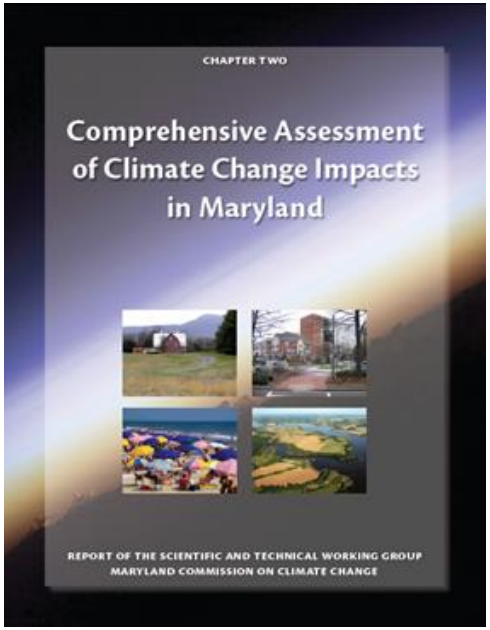
Reducing greenhouse gas emissions in order to slow or stop global climate change.

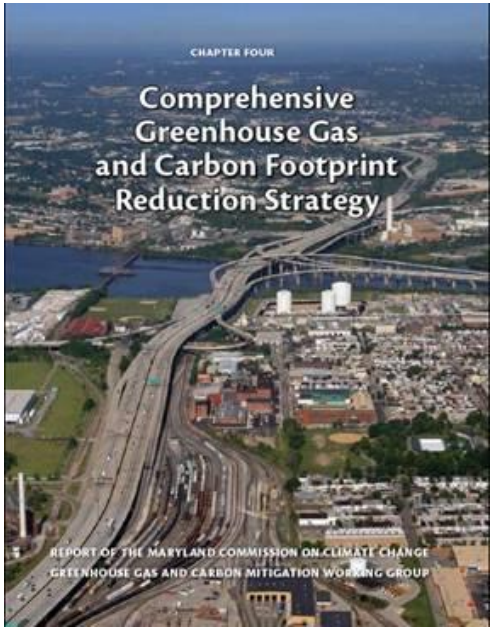
Adaptation

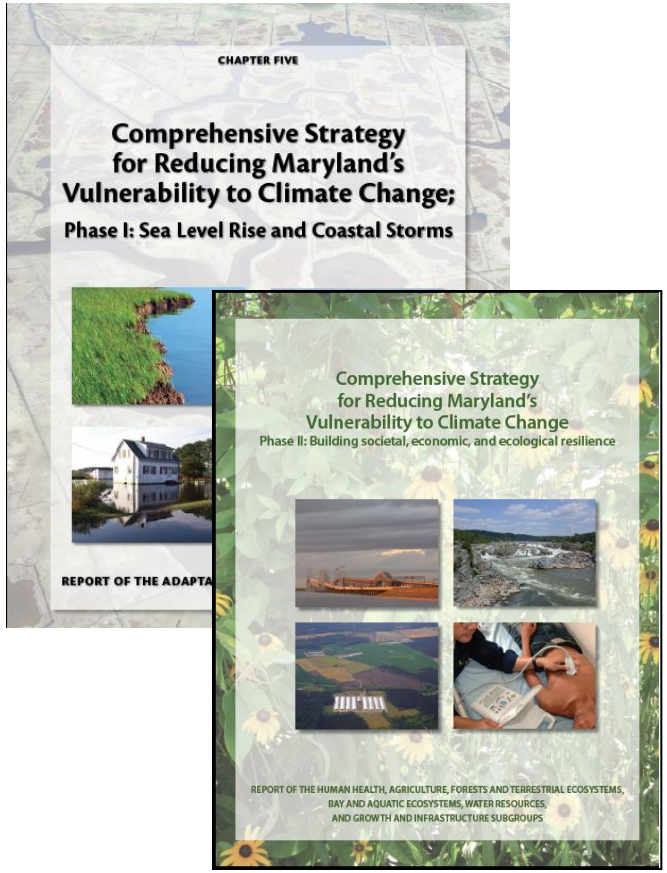
Adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities.

UKCIP (2008)

Maryland Climate Action Plan



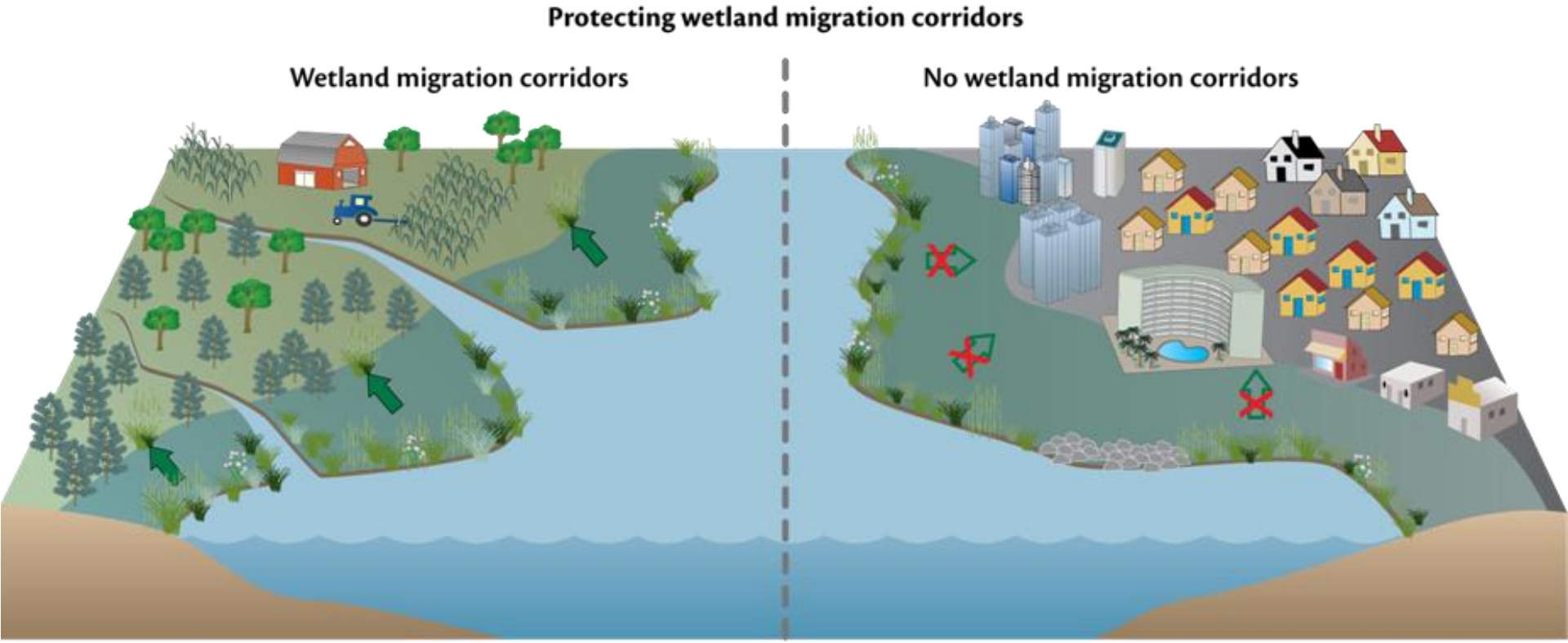




Sector-Based Adaptation Planning

Adaptation Strategy:

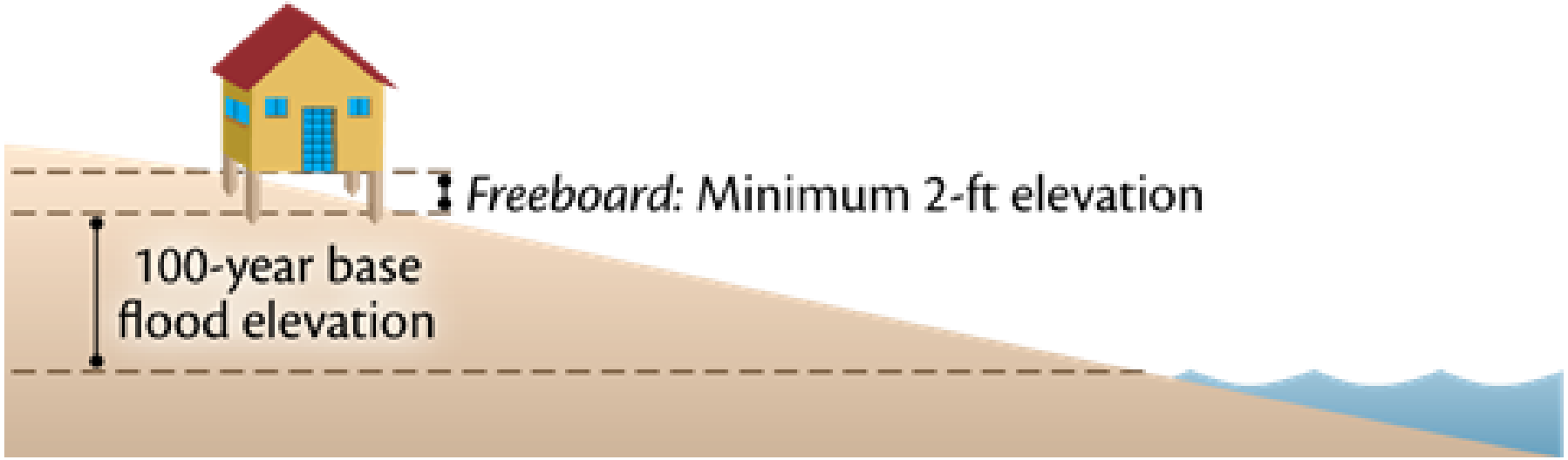
Facilitate landward movement of high priority coastal ecosystems subject to dislocation by sea level rise



Retain and expand forests, wetlands, and beaches to protect us from coastal flooding

Adaptation Strategy:

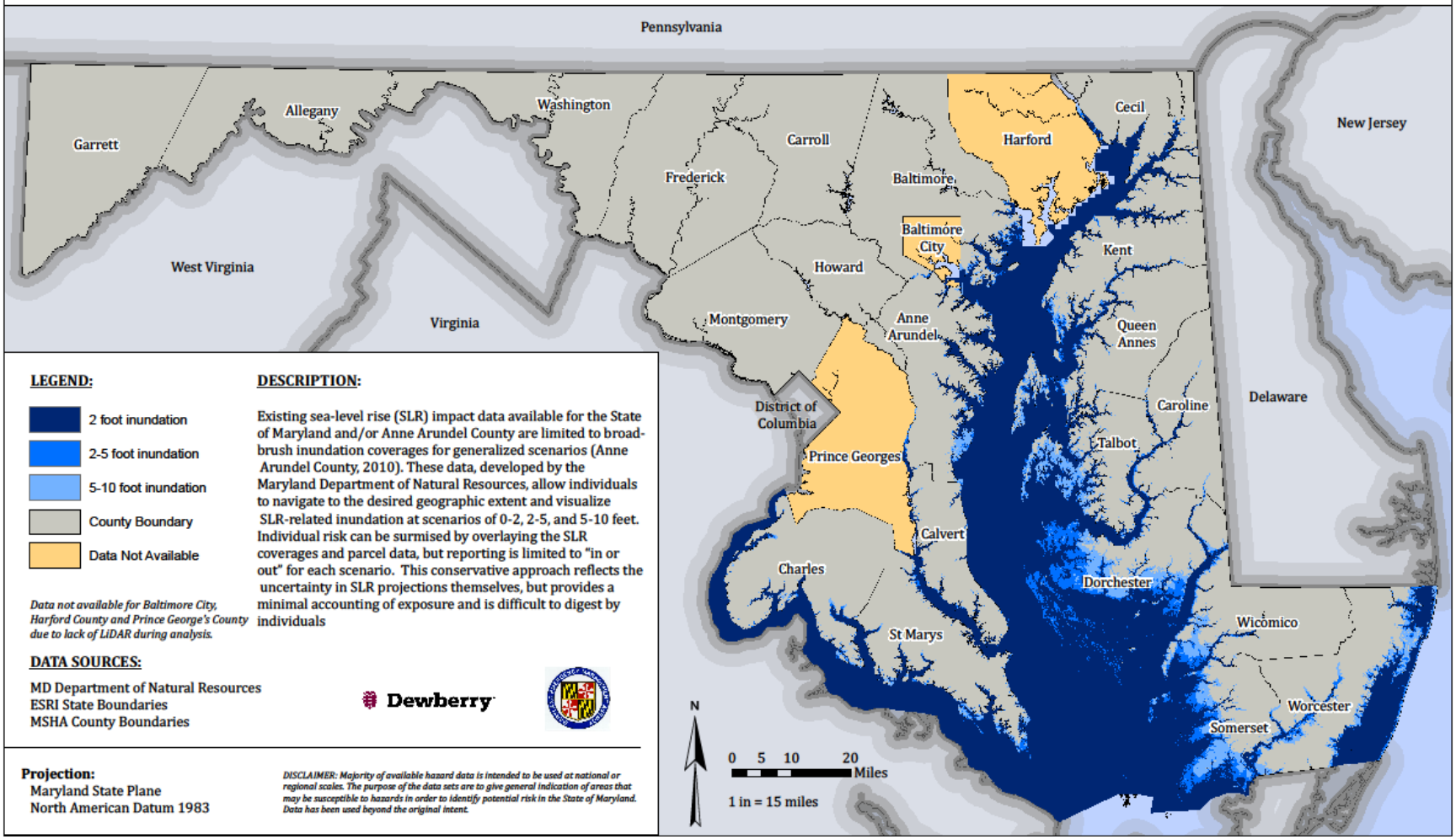
Develop siting & design criteria for coastal infrastructure



Elevate new and/or replacement structures 2+ feet above the current 100-year base flood elevation

Adaptation Strategy:
Incorporate Sea Level Rise into Hazard Mitigation Plans

Maryland Sea Level Rise
Maryland 2011 Hazard Mitigation Plan



LEGEND:

- 2 foot inundation
- 2-5 foot inundation
- 5-10 foot inundation
- County Boundary
- Data Not Available

Data not available for Baltimore City, Harford County and Prince George's County due to lack of LiDAR during analysis.

DESCRIPTION:

Existing sea-level rise (SLR) impact data available for the State of Maryland and/or Anne Arundel County are limited to broad-brush inundation coverages for generalized scenarios (Anne Arundel County, 2010). These data, developed by the Maryland Department of Natural Resources, allow individuals to navigate to the desired geographic extent and visualize SLR-related inundation at scenarios of 0-2, 2-5, and 5-10 feet. Individual risk can be surmised by overlaying the SLR coverages and parcel data, but reporting is limited to "in or out" for each scenario. This conservative approach reflects the uncertainty in SLR projections themselves, but provides a minimal accounting of exposure and is difficult to digest by individuals

DATA SOURCES:

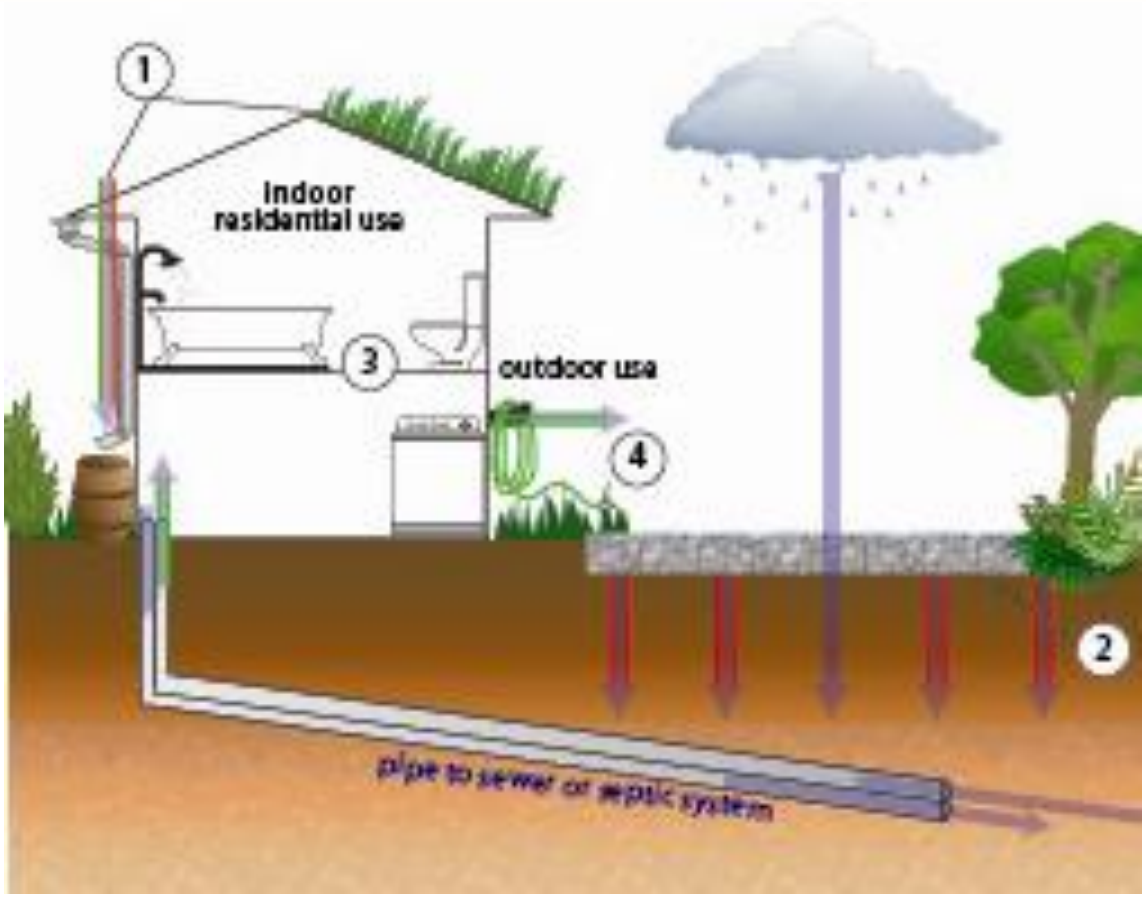
MD Department of Natural Resources
ESRI State Boundaries
MSHA County Boundaries

Dewberry

Projection:
Maryland State Plane
North American Datum 1983

DISCLAIMER: Majority of available hazard data is intended to be used at national or regional scales. The purpose of the data sets are to give general indication of areas that may be susceptible to hazards in order to identify potential risk in the State of Maryland. Data has been used beyond the original intent.

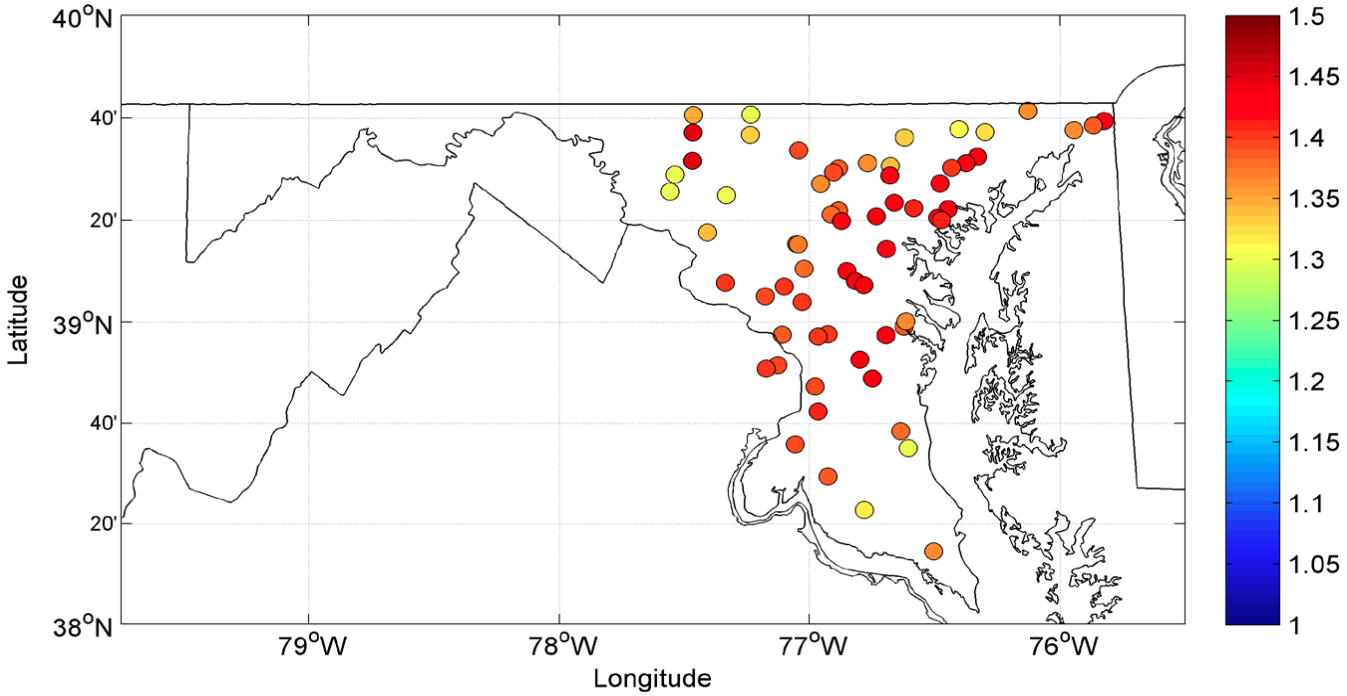
Adaptation Strategy:
Ensure long-term water supply



Reduce water use and reuse

Increase water capture and storage

Adaptation Strategy:
Reduce the impacts of flooding and stormwater



Projected change in 100 year floods in 2100

Protect headwater streams and expand floodplain protection

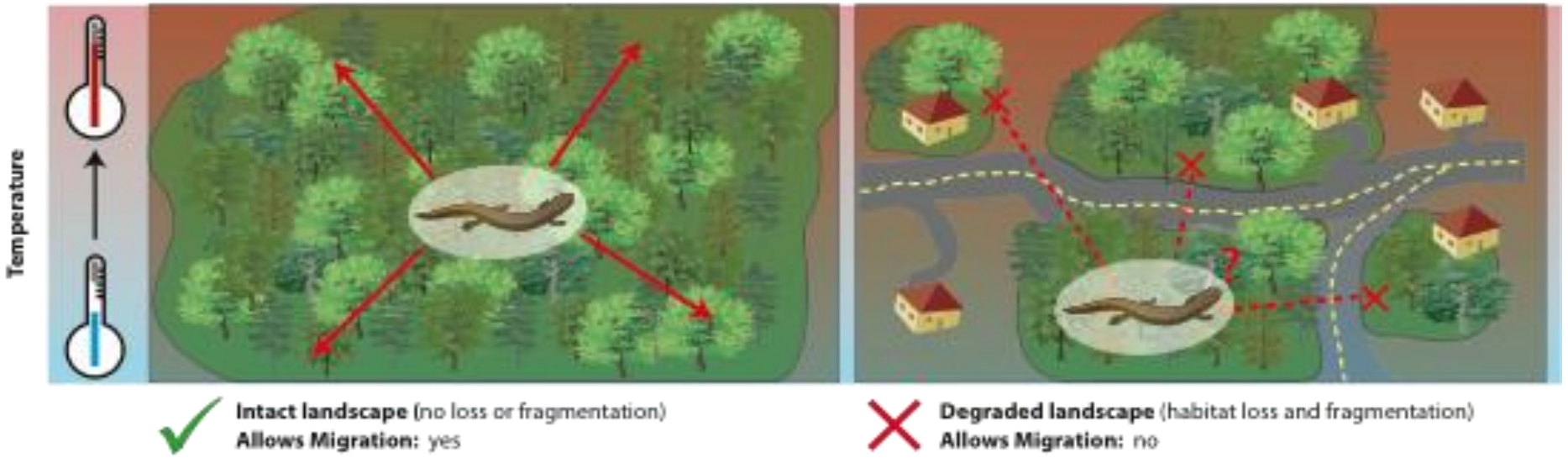
Embed resiliency in water infrastructure design

Adaptation Strategy:
Protect and restore at-risk species and habitat

Increase legal protection for temperature sensitive species

Implement projects to increase resilience and coordinate across boundaries

Adaptation Strategy: Reduce existing stressors



Remove impervious surfaces and barriers to habitat connectivity

Prepare for new or expanding ranges of invasive species

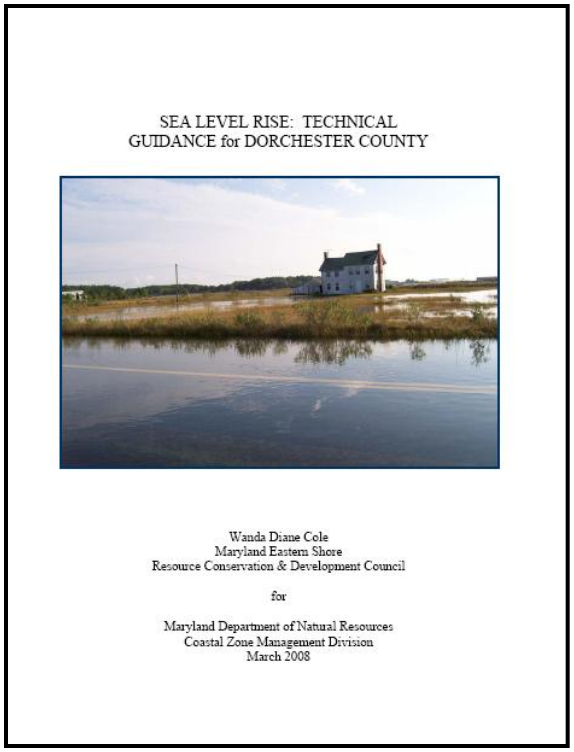
DNR Policy: Building Resilience to Climate Change

DNR policy to guide investments in and management of land, resources and assets so as to better understand, mitigate and adapt to climate change.

- New Land Investments
- Facility Infrastructure Siting & Design
- Habitat Restoration
- Research & Monitoring
- Resource Planning
- Government Operations
- Advocacy

Intent: Through implementation of this policy, DNR will guide its own actions, and will lead by example, encouraging our sister agencies and local government leaders to plan for and to mitigate the effects of climate change.

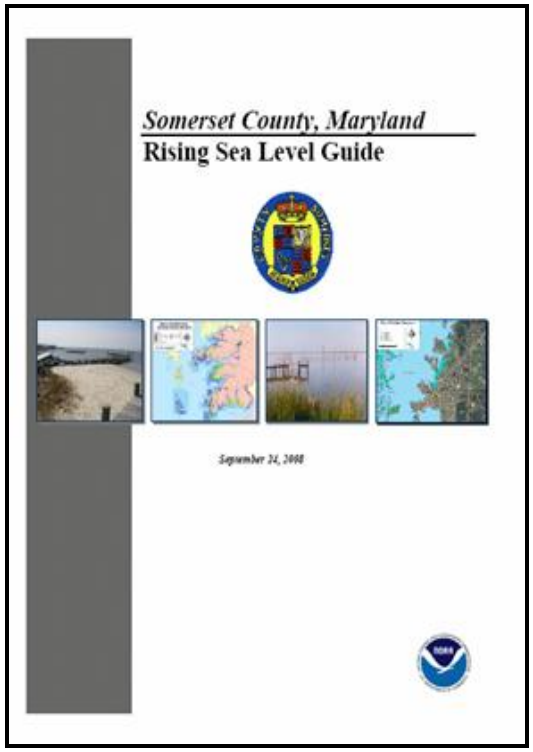
Adaptation Strategy:
Develop technical planning guidance to advise adaptation planning at local level


SEA LEVEL RISE: TECHNICAL
GUIDANCE for DORCHESTER COUNTY

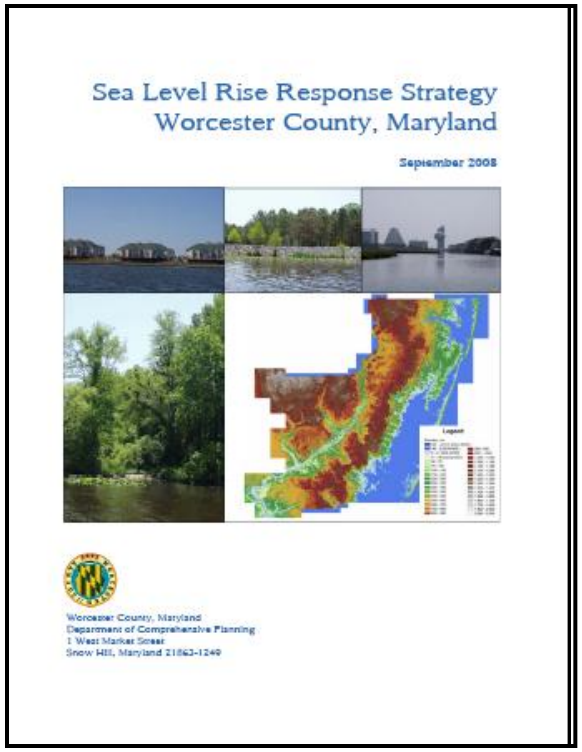
Wanda Diane Cole
Maryland Eastern Shore
Resource Conservation & Development Council

for

Maryland Department of Natural Resources
Coastal Zone Management Division
March 2008


Somerset County, Maryland
Rising Sea Level Guide

September 31, 2008


Sea Level Rise Response Strategy
Worcester County, Maryland

September 2008

Worcester County, Maryland
Department of Comprehensive Planning
1 West Market Street
Snow Hill, Maryland 21863-1249

The Coastal Communities Initiative grant program provides financial and technical assistance to local governments to promote the incorporation of natural resource and/or coastal management issues into local planning and permitting activities.

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MARYLAND DEPARTMENT OF NATURAL RESOURCES

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