Maryland’s Coastal Resiliency Assessment

Photo Credit: Wanda Diane Cole
The mission of The Nature Conservancy is to conserve the **lands** and **waters** on which all life depends.

- Science based
- Non-confrontational
- Pragmatic solutions
  - Partnerships
  - Members
- On the ground
- Public policy
The Nature Conservancy in Maryland/DC

Maryland chapter chartered: 1977
District of Columbia added: 1996
Acres owned: >22,000
Total acres protected: >75,000
Largest private preserve in MD: Nassawango Creek
DC urban program launched: 2015
Number of chapter members: 33,000
MD/DC Chapter Priorities

CLEAN WATER
- Stormwater Pollution
- Nutrient Pollution

CLIMATE RESILIENCE
- Forest Connectivity
- Coastal Resilience
Identify locations where natural habitats can provide risk-reduction benefits to coastal communities

- Hazards = coastal flooding and erosion
- Habitats = forest, marsh, dune, underwater grass, oysters
Coastal Resilience

MD Study Area

A quick reference for hurricane categories:

- **CAT1**: Calm
- **CAT2**: Light Winds
- **CAT3**: Moderate Winds
- **CAT4**: High Winds
- **CAT5**: Extreme Winds

*Image courtesy of NCRedNeck*
General Approach:

- Where are the hazards?
- Where are the habitats?
- Where are the people?
General Approach:

- Where are the hazards?
- Where are the habitats?
- Where are the people?

Methods:

- Spatial analysis (GIS)
- Scientific literature
- Local experts
MD Assessment Team

- MD Department of Natural Resources – Chesapeake and Coastal Service
- The Nature Conservancy - MD/DC Chapter
- NOAA – project funding
- The Natural Capital Project
- Steering Committee – state, federal, non-profit
- Advisors - state, federal, academic
Map Layers on the Maryland Coastal Atlas

dnr.maryland.gov/ccs/coastalatlas/

- Shoreline Hazard Index
- Hazard Reduction by Habitats
- Community Flood Risk Areas
- Priority Shoreline Areas
- Marsh Protection Potential Index
Coastal habitats shield people and property from sea-level rise and storms

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• MD Shoreline Hazard Index
• MD Hazard Reduction by Habitats
MD Shoreline Hazard

dnr.maryland.gov/ccs/coastalatlas/
MD Shoreline Hazard

- Shoreline type
- Elevation
- Sea level rise
- Wave power
- Storm surge height
- Erosion rate

[Map of Maryland Coastal Atlas with the Shoreline Hazard Index]

dnr.maryland.gov/ccs/coastalatlas/
Coastal Resilience

MD Hazard Reduction by Habitats

[Map showing coastal hazards and habitats with a layer list for hazard reduction by habitats]

dnr.maryland.gov/ccs/coastalatlas/
MD Marsh Protection Potential

- Marsh size
- Proximity to hazards
- Proximity to people
- Persistence
- Proximity to other protective habitats

[dnr.maryland.gov/ccs/coastalatlas/]
Coastal Community Resiliency Goal

1. Evaluate the risk reduction benefits of existing natural features
2. Establish priorities for conservation and restoration to enhance **resiliency of communities** impacted by coastal hazards.

**Resiliency** – The ability of a community to prepare for, respond to, and recover from a coastal hazard event.
Community Flood Risk Areas

- Residential areas less equipped to prepare for, respond to, or recover from coastal hazard events.
  - Population Density (Residential Focus)
  - Social Vulnerability (Age <17 or >65, Income below poverty, Language Proficiency)
  - Probability of Exposure (Floodplain – 10, 50, 100, 500yr)

2013 ACS Census Data (block groups), 2015 MES Floodplain data
High and Moderate Priorities

• **Tier 1 Shorelines**
  – High Habitat Role
  – Within 2km of Risk Area
  – 22% of shoreline
  – Conserve/Maintain/Enhance

• **Tier 2 Shorelines**
  – Moderate Habitat Role
  – Within 2 km of Risk Area
  – 40% of shoreline
  – Restore – action depends on site conditions (hazard level, development level)
Climate Change Data Layers:
- Sea Level Rise Vulnerability
- Storm Surge Areas
- Wetland Adaptation Areas
- Shoreline Inventory
- Historical Shorelines/Shoreline Rates of Change
- 100 & 500 Year Floodplains

Coastal Resiliency Data Layers:
- Priority Shoreline Areas
- Shoreline Hazard Index
- Hazard Reduction by Habitat
- Marsh Protection Potential Index
- Community Flood Risk Areas
Exploring Resiliency Data

The Index ranks marshes based on their ability to protect people from coastal hazards. Conservation/restoration decisions should be made following site level analysis.

<table>
<thead>
<tr>
<th>Category</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Habitat</td>
<td>2</td>
</tr>
<tr>
<td>Persist</td>
<td>2</td>
</tr>
<tr>
<td>Area</td>
<td>4</td>
</tr>
<tr>
<td>People</td>
<td>4</td>
</tr>
<tr>
<td>Hazard</td>
<td>5</td>
</tr>
<tr>
<td>Total Score</td>
<td>17</td>
</tr>
<tr>
<td>Overall Rating</td>
<td>Very High</td>
</tr>
</tbody>
</table>
Targeting Mitigation through Data Queries

Selection of data based on Program priorities or objectives. Personalized Queries available upon request.
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State Data Integration

• DNR Land Acquisition Program
  – GreenPrint Ecological Scorecard
  – Conservation Targeting
  – Resilience Easements

• 2016 State Hazard Mitigation Plan
  – Coastal Hazards Risk Assessment
  – High Priority Mitigation Implementation
    Strategy: Coastal Restoration to Mitigate Hazards for Vulnerable
    Communities
Questions?

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Thanks to NOAA and our Steering committee!