Statewide Coastal Resiliency Assessment:
Mapping Natural Solutions for Resilient Maryland Communities

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Coastal Resiliency Goal

Evaluate the risk reduction benefits of **existing natural features** and establish priorities for conservation and restoration to **enhance resiliency of communities** impacted by coastal hazards.
Coastal Resiliency Partnerships

NOAA
Critical Area Commission
MARYLAND EMERGENCY MANAGEMENT AGENCY
EASTERN SHORE LAND CONSERVANCY
natural capital PROJECT
MARYLAND DEPARTMENT OF NATURAL RESOURCES
The Nature Conservancy
MARYLAND WILDLIFE FEDERATION
THE CONSERVATION FUND
US Army Corps of Engineers
MARYLAND FOREST SERVICE
Chesapeake Bay & Coastal Service
TOWSON UNIVERSITY
“Natural Features”

Dunes and Beaches
- Benefits/Processes
  - Breaking of offshore waves
  - Attenuation of wave energy
  - Slow inland water transfer
  - Increased infiltration

Vegetated Features (e.g., Marshes)
- Benefits/Processes
  - Breaking of offshore waves
  - Attenuation of wave energy
  - Slow inland water transfer

Oyster and Coral Reefs
- Benefits/Processes
  - Breaking of offshore waves
  - Attenuation of wave energy
  - Slow inland water transfer

Barrier Islands
- Benefits/Processes
  - Wave attenuation and/or dissipation
  - Sediment stabilization

Maritime Forests/Shrub Communities
- Benefits/Processes
  - Wave attenuation and/or dissipation
  - Shoreline erosion stabilization
  - Soil retention

US Army Corps 2015, *Use of NNBF for Coastal Resilience*
Coastal Resiliency Evaluation
Terms & Definitions

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

- **Where are the people?**
  - Are there demographic/social metrics or community characteristics that limit community resiliency?

- **Where are the hazards?**
  - Identify physical parameters that contribute to erosion and inundation risk.

- **Where are the habitats?**
  - Identify natural features that provide risk-reduction benefits.
• Residential areas less equipped to prepare for, respond to, or recover from coastal hazard events.
  – Population Density (Residential Focus)
  – Social Vulnerability (Age, Income, Language Proficiency)
  – Probability of Exposure (Floodplain)
Coastal Exposure and Habitat Role

- Where do Habitats Reduce Exposure to Coastal Hazards?
  - Identify High, Moderate, Low Hazard Shorelines.
  - Evaluate Habitat Role in Reducing Exposure (erosion & inundation impacts).
High and Moderate Priorities

- **Tier 1 Shorelines**
  - High Habitat Role
  - Transition to High Hazard if Habitats are Lost
  - Within 2km of Risk Area
  - 22% of shoreline

- **Tier 2 Shorelines**
  - Moderate Habitat Role
  - Transition to Moderate Hazard if Habitats are Lost
  - Within 2 km of Risk Area
  - 40% of shoreline
Marsh Protection Potential Index

Rank existing marshes by their ability to protect people from coastal hazards, using the following characteristics:

1. **Protective capacity** (Area/Size)
2. **Proximity to hazards** (Shoreline Hazard Ranks; 100/500yr Floodplains)
3. **Proximity to people** (Population Density/Social Vulnerability Index)
4. **Persistence** (% of Marsh persisting in 2100; Wetland Adaptation Areas)
5. **Proximity to other protective habitats** (Coastal Forests; Tidal Wetlands; Dunes; SAV; Oysters)

Photo Credit: NOAA via www.climate.gov
The Index will be updated as we increase our knowledge of marsh role in wave attenuation and other ecosystem services in the Bay region.
DNR Data Applications

• Land Acquisition
  – Green Print Ecological Scorecard
  – Easement Review

• Water Quality
  – Trust Fund / Green Infrastructure

• Wildlife & Heritage
  – Natural Areas Inventory
Broader Applications

• **Restoration:** Where is habitat providing minor protection benefits?
• **GI/Hybrid Creation:** Where is habitat absent along moderate/high hazard shorelines?
• **Conservation:** Where are Priority Shorelines adjacent to the Highest Community Flood Risk Areas?
• **Water Quality/Protection Co-Benefit:** Identify Priority Shorelines and Marshes within Priority Watersheds for water quality improvement.
• **Wildlife Co-Benefit:** Identify Priority Shorelines and Marshes along priorities natural areas.
Questions?

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Special thanks to Steering Committee participants & Reviewers!