# Collaborative Tidal Marsh Adaptation Project Update

## Using resilience metrics, social vulnerability data and partnerships to identify large-scale tidal marsh adaptation projects in Maryland and Virginia

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Climate Resiliency Workgroup Meeting


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MARYLAND DEPARTMENT OF NATURAL RESOURCES

Skeo

USGS science for a changing world

NOAA FISHERIES

# Marsh Adaptation

## Working Definition:

*Incorporating climate change information and resilience strategies when planning, designing, implementing, and managing marsh restoration and conservation projects to enhance longevity of marsh area and health.*

| Climate Change Factors | Resilience Strategies |
|---|---|
| Sea Level Rise (SLR) | • Identify and conserve marsh migration corridors<br>• Acquire land/easements for marsh migration<br>• Restore/preserve healthy marsh sediment dynamics and vegetation<br>• Ensure habitat connectivity<br>• Pursue conservation incentives/carbon credit programs<br>• Construct living shorelines/natural breakwaters |
| Increase in Storm Events and Precipitation | |

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# Why We Need Collaborative Marsh Adaptation Projects

- Manage marshes to be **resilient** to sea level rise (SLR) and other climate change impacts to **preserve** ecosystem services.
- Identify **strategic large-scale** marsh adaptation projects that support **multiple benefits** instead of opportunistic, disconnected projects.
- Increase understanding of **geographical and organizational priorities** to build partnerships to support large-scale implementation.
- Align marsh resilience **research opportunities with implementation** to increase data and information on the **success** of strategies.
- Identify **short-term** and **long-term funding** opportunities.

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# Marsh Adaptation Scenario Examples

## Protection Scenario

Use data to identify ***healthy marshes*** that are susceptible to SLR and have the potential to migrate.

- Good Existing Marsh Condition
- High Climate Change Risk
- High Adaptive Capacity

## Restoration and/or Enhancement Scenario

Use data to identify ***degraded marshes*** that are susceptible to SLR and have the potential to migrate.

- Degraded Existing Marsh Condition
- High Climate Change Risk
- High Adaptive Capacity

Based on the NOAA Landscape Scale Marsh Resilience Framework and Unvegetated to Vegetated Ratio (UVVR) decision matrix by USGS (Ganju et al. 2023)

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# Mapper Approach for Targeting Collaborative Marsh Adaptation Projects

## Tier 1
## Broader-Scale Targeting

**1. Metric Mapping**

- Climate Vulnerability/ Adaptive Capacity
- Ecological
- Social Vulnerability

✷ **Identify Areas of Need for Marsh Adaptation**

**2. Partner Alignment Mapping**

- Collect partner input on where they are actively working or areas of interest

✷ **Identify Regional Focus Areas (1 + 2)**

## Tier 2
## Finer-Scale Targeting + Customization

**3. Identify specific project opportunities**

- Add specific regional data
- Connect data with funding priorities/ ecosystem services
- Partnership-building workshops

✷ **Identify Collaborative Marsh Adaptation Projects**

Framework utilizes existing datasets

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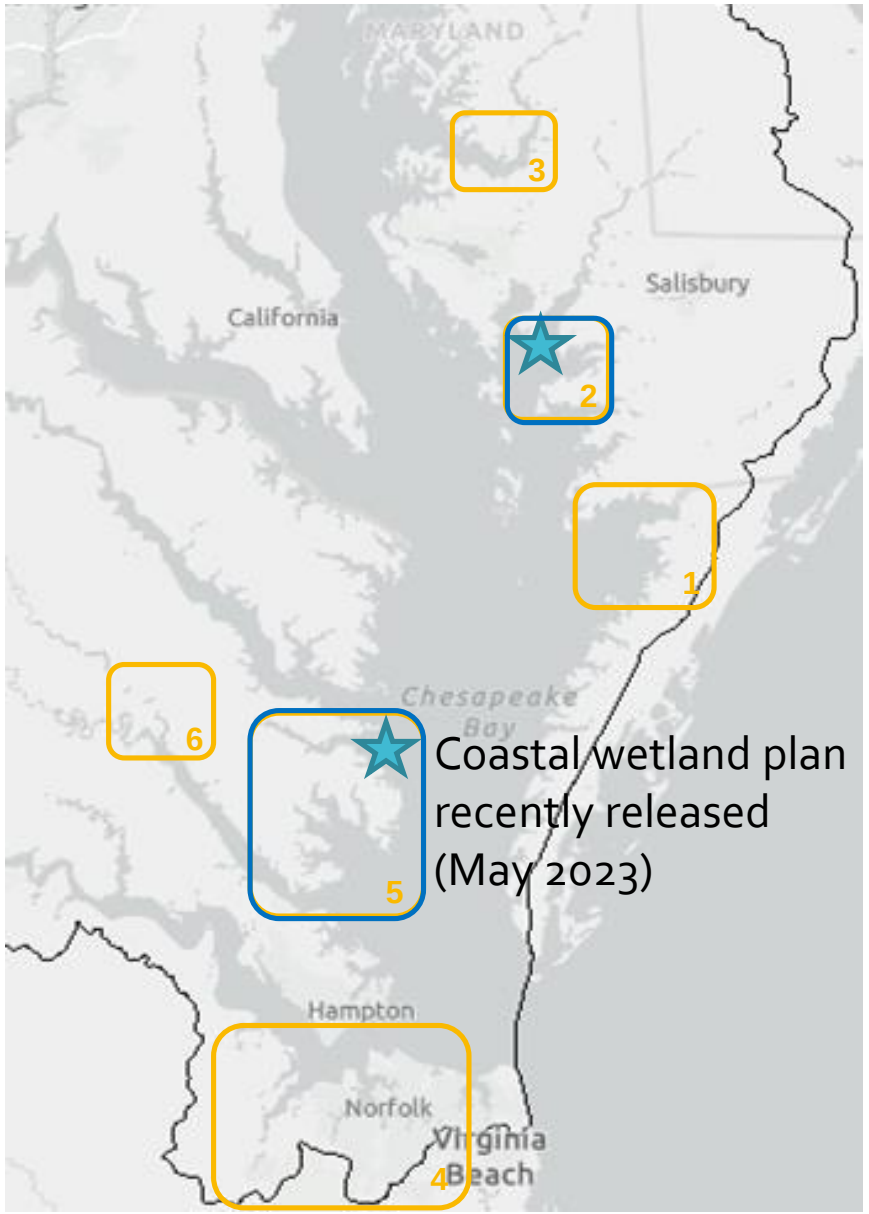
# Identified Marsh Adaptation Project Focus Areas

**Bold:** Selected for first workshop (January 2024)

1. Pocomoke Sound Area (Crisfield, MD to Saxis, VA)
2. **Wicomico River (Monie Bay to Deal Island, MD)**
3. Choptank River, MD
4. Suffolk/Elizabeth River, VA
5. **Middle Peninsula, VA**
6. Middle Peninsula Tribal Lands (Mattaponi, Pamunkey)

Other: Chickahominy River, VA was identified as a potential focus area due to social vulnerability considerations, but was removed because of limited opportunities for large scale adaptation.

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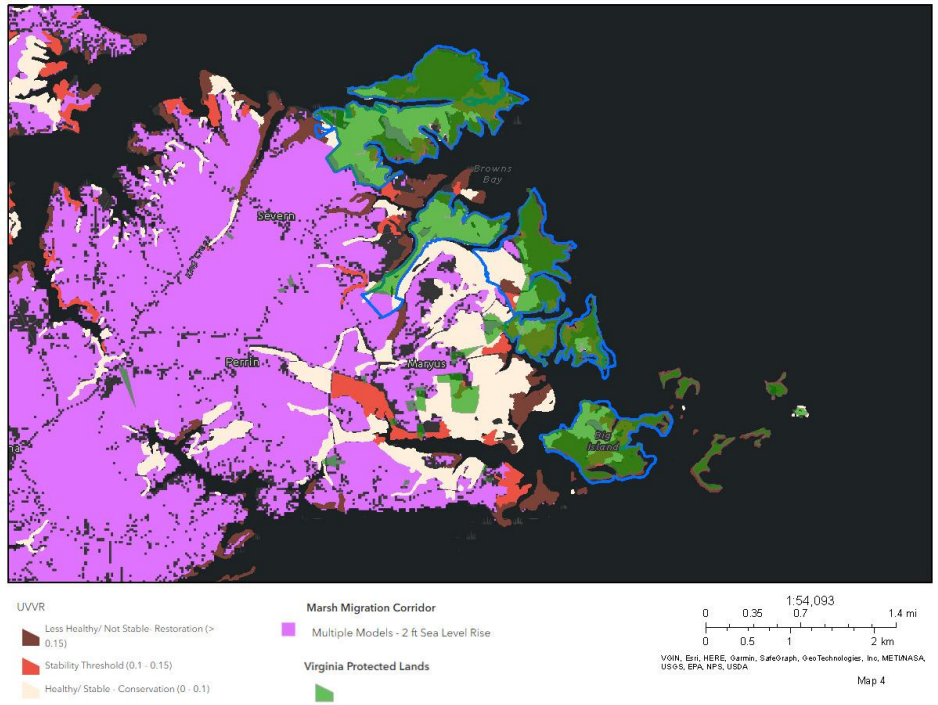
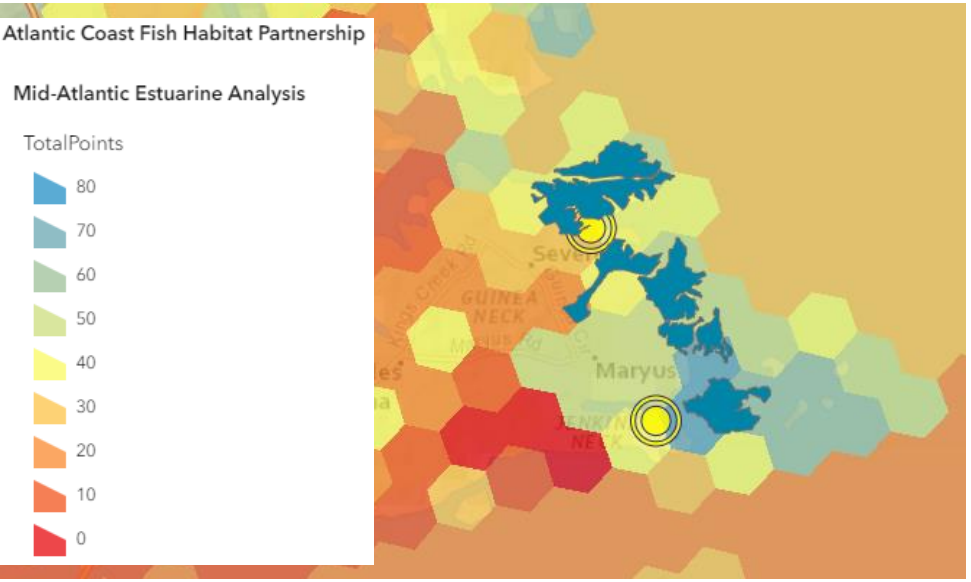
Marsh Health (UVVR) and Marsh Migration Corridor Envelope (2') with VA Protected Lands




Higher score = better fish habitat

# Guinea Marsh Complex Targeting Analysis

## Adaptive Capacity (Tier 1 Data)

- Protection: Has extensive protected lands and state targeted conservation areas along with undeveloped, privately owned lands that adjoin stable marshes for marsh migration land use planning.
- Restoration: Opportunities to restore unstable marshes where protected land adjoins areas with extensive healthy marsh and potentially suitable migration corridors.

## Social Vulnerability (Tier 1 Data)

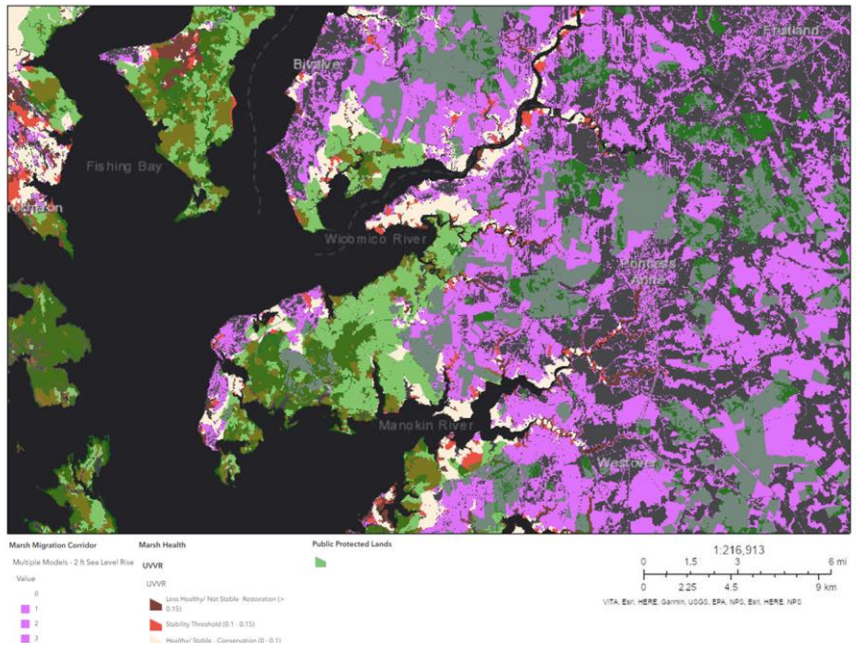
- Marsh complexes in this area provide protection for nearby high-risk community areas as sea level rises (FEMA data).

## Ecosystem Services (Tier 2 Data)

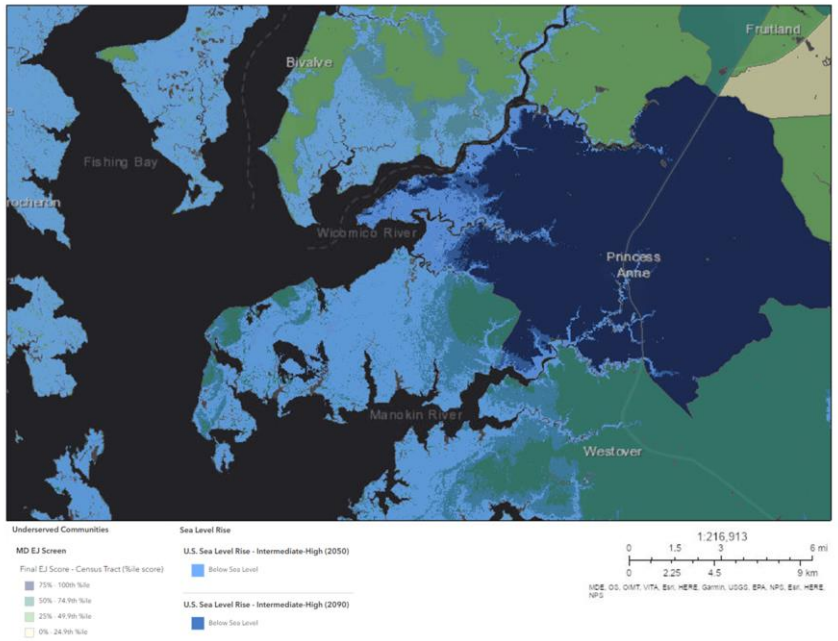
- High estuarine fish habitat scores (60 and greater total points) .
- Marsh habitat providing protection for aquaculture operations (yellow targets on map).

# Wicomico River Targeting Analysis

Marsh Health (UVVR) & Marsh Migration Corridor Envelope (2') with MD Protected Lands




MD EJ Score, NOAA SLR Int-High (2050 & 2090)




## Adaptive Capacity (Tier 1 Data)

- Protection: Has areas of stable marsh adjacent to potential marsh migration corridors, with opportunities for protection on both protected lands and undeveloped, privately owned lands.
- Restoration: Has areas of less stable marsh that overlap with protected lands and are adjacent to stable marsh and potential marsh migration corridors.

## Social Vulnerability (Tier 2 Data)

- MD EJScreen: Communities in the area are categorized as more vulnerable based on pollution burden exposure and effects, sensitive populations, and socio-economic/demographic status.
  - Aligns with greater risk from sea-level rise impacts (NOAA SLR Projections 2050 & 2090).
  - Marsh migration corridors adjacent to the Wicomico River could increase protection for communities as sea level rises.

## Land Use Planning (Tier 2 Data)

- MD Wetland Adaptation Areas & Land-Use: MD Wetland Adaptation Areas and Land-Use data provides insights into where to facilitate land (undeveloped, developed, agricultural) to wetland transition activities.

# January 2024 Tidal Marsh Adaptation Workshop

## Overview

- Virtual workshop for 75+ stakeholders working in Wicomico River, MD and Middle Peninsula, VA focus areas held January 2024.
- Workshop focused on addressing challenges and recognizing opportunities to advance tidal marsh projects in these areas.
- Workshop sessions included "lightning" talks, discussions specific to each focus area, and a shared learning discussion.
- Key themes included:
  - Innovating resilience tools and technologies
  - Managing marsh transition
  - Incentivizing marsh adaptation actions related to protection and restoration
  - Addressing marsh loss through short term and long-term planning tracks
  - Coordinating and collaborating on projects

# Middle Peninsula Discussion

- **Marsh Adaptation Decision-Making Needs**
  - How to set restoration priorities with sea level rise – weighing cultural significance with likelihood of marsh persistence
  - Better understanding of trade-offs with current ecosystem services versus future ecosystem services after marsh migration
- **Procedural and Regulatory Needs**
  - Funding language should clearly define underserved communities
  - Regulatory frameworks that allow for innovative approaches (e.g., "sand-boxing")
  - Increased accessibility and incentives for private land donations in vulnerable areas
  - Strategies to address obstacles in permitting for beneficial use of dredge - Virginia Coastal Management Program looking to develop permitting guidance

# Wicomico Discussion

- **Marsh Adaptation Decision-Making Needs**
  - Strategies on how to manage land/resource transitions (e.g., forest loss, increases in phragmites, insuring cropland, etc.)
  - Approaches for considering marsh condition, vegetation, elevation, and ecosystem services when deciding Thin Layer Placement (TLP)
  - Land-use considerations when planning where marshes will migrate (e.g., residential versus agricultural)
- **Procedural and Regulatory Needs**
  - Aligning funding, permitting and sediment supply/distance to placement site for TLP projects
  - How to navigate actions on public versus private land
  - Flexibility when implementing beneficial use at multiple scales
- **Outreach and Community Needs**
  - Consider unintended consequences – marginalized communities have expressed concerns around experimental techniques being used with them first
  - Intentional community outreach through connecting with trusted community members

# Additional Recommendations/ Actions from Shared Learning

- **Coordinating Project Pipelines**
  - Create a subregional network of potential projects and sources for beneficial use – align partners with opportunities to reduce costs associated with moving and storage of sediment.
- **Planning and Permitting**
  - Investigate adjustments to sediment use requirements by Army Corp. of Engineers – facilitate working sessions with permitting agencies.
  - Consider portfolio approach to planning that allows for short (5-year) and long-term (30-yr) goals – engage local, regional, state, and federal leaders in discussions about setting funding priorities to allow this approach.
- **Working with Communities**
  - Improve communication with communities throughout project life cycle.
  - Provide outreach to educate communities and landowners about beneficial use, marsh function, dredge characteristics and more.
  - Invest in near-term projects to protect the safety and livelihoods of existing communities, and work toward long term transition with landowners.

# Next Steps

- **September 2024**: Planned release of final report; develop communication products.
- **August-October 2024**: Work with the Chesapeake Bay Program's GIS Team to incorporate the marsh adaptation mapper in the CBP targeting tools.
- **October 2024**: Planning marsh adaptation meeting with Envision the Choptank partners in October 2024.
- **2024-2025**: Seek funding to support additional marsh adaptation efforts on follow-up topics and/or support of analyses or workshops for other focus areas.

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# QUESTIONS

Project and Workshop Materials:
https://marshworkshop.skeo.com/

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Removed slides below (for reference)

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