Partnership-Building and Identification of Collaborative Marsh Adaptation Projects

March 2, 2023

Sustainable Fisheries GIT Meeting

Climate Resiliency Workgroup Staff Lead: Julie Reichert-Nguyen (NOAA)
Technical Lead: Nicole Carlozo (Maryland DNR)
GIS Support: John Wolf and Coral Howe (CBP GIS Team/USGS)
Contractor: Skeo
Partner Support: The Nature Conservancy, Maryland Sea Grant, and Virginia Institute of Marine Science

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	• Identify and conserve marsh migration corridors • Restore/preserve healthy marsh sediment dynamics and vegetation • Ensure habitat connectivity
Increase in storm events & precipitation	

Why we need collaborative marsh adaptation projects

- Manage marshes to be resilient to sea level rise and other climate change impacts to preserve ecosystem services.
- Implement strategic large-scale restoration strategies with cross-goal 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.

2014 Chesapeake Bay Watershed Agreement

Climate Adaptation Outcome: Pursue, design, and construct restoration and protection projects to enhance resiliency of the Bay and aquatic ecosystems from the impacts of coastal erosion, coastal flooding, more intense and frequent, storms, and sea level rise.

Wetlands Outcome: Create or re-establish 85,000 acres tidal & non-tidal wetlands & enhance function of an additional 150,000 acres of degraded wetlands by 2025.

Fish Habitat: Continually improve effectiveness of fish habitat conservation and restoration efforts by identifying and characterizing critical spawning, nursery and forage areas within the Bay and tributaries for important fish and shellfish, and use existing and new tools to integrate information and conduct assessments to inform restoration and conservation efforts.

Project Outcomes

- Identify **common criteria** for targeting tidal marsh projects by compiling resilience and social vulnerability metrics, geographic priorities, and organizational goals across stakeholder groups.
- Identify **partners and projects** within two focus areas (MD, VA, or tribal lands) that could support large-scale tidal marsh restoration using criteria as a guide.
- Identify **data gaps and research needs** to inform on-the-ground tidal marsh management and adaptation at regional scales.
- Identify potential **research opportunities** that could coincide with tidal marsh restoration efforts to increase understanding of the success of climate resilience strategies.
- Identify **short and long-term funding opportunities** for proposed collaborative tidal marsh restoration and research projects.

Project components

July 2022-Apr 2023

Phase 1

- Review existing partner resilience, conservation, and social vulnerability metrics (GIS mapping)
- Perform partner outreach to identify priorities
- Overlay partner metric and priority maps to select two regional focus areas for in depth workshop conversations

Apr-Jun 2023

Phase 2

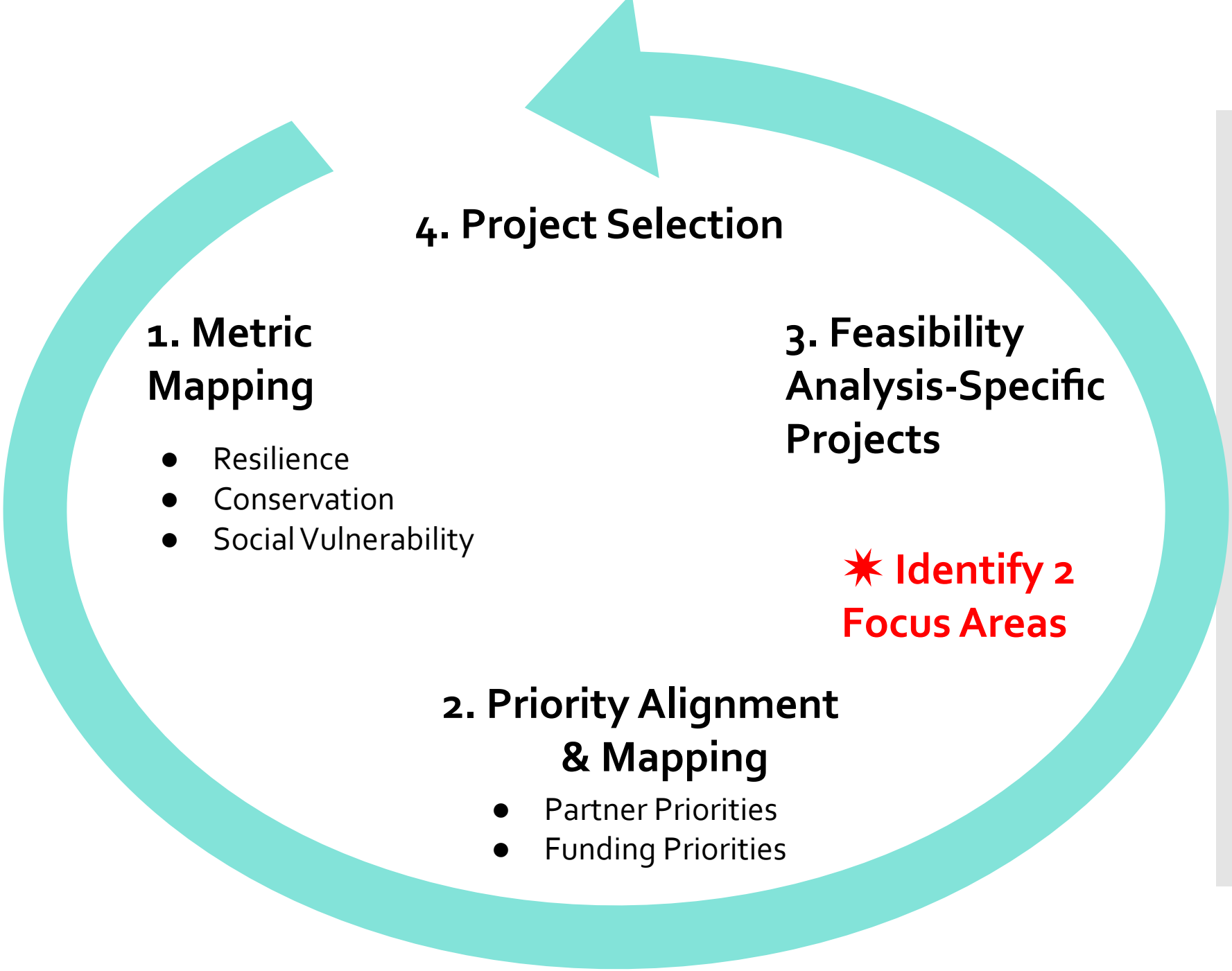
- Design 2-day workshop for MD, VA, and/or tribal stakeholders
- Identify large-scale marsh restoration and research projects and supporting partnerships

Jun-Sep 2023

Phase 3

- Prepare project report and stand-alone communication documents on metrics, identified projects, and supporting partner networks
- Link prioritized projects with list of potential funding opportunities
- Identify challenges to collaborations

DRAFT Framework for Targeting Projects



Potential Resilience Metrics

Suite of Marsh Migration Models

- NOAA SLR Viewer (National)
- SLAMM 5.0 (Chesapeake Bay)
- InVEST (Mid ATlantic)

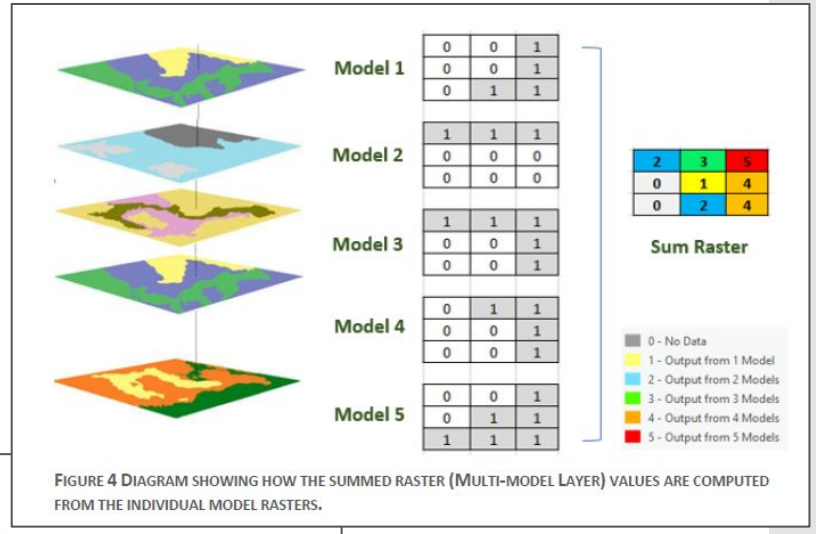


FIGURE 4 DIAGRAM SHOWING HOW THE SUMMED RASTER (MULTI-MODEL LAYER) VALUES ARE COMPUTED FROM THE INDIVIDUAL MODEL RASTERS.

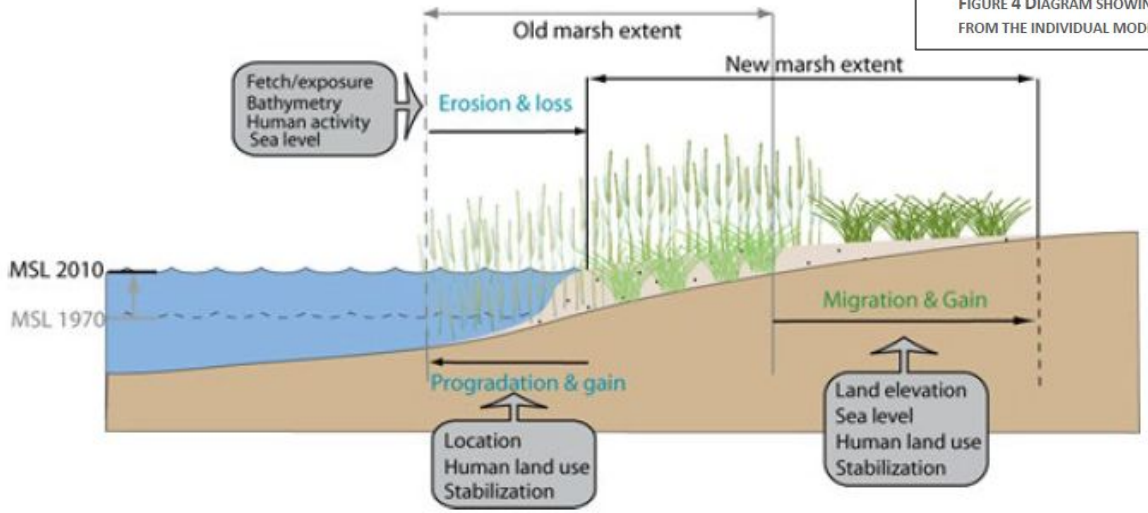
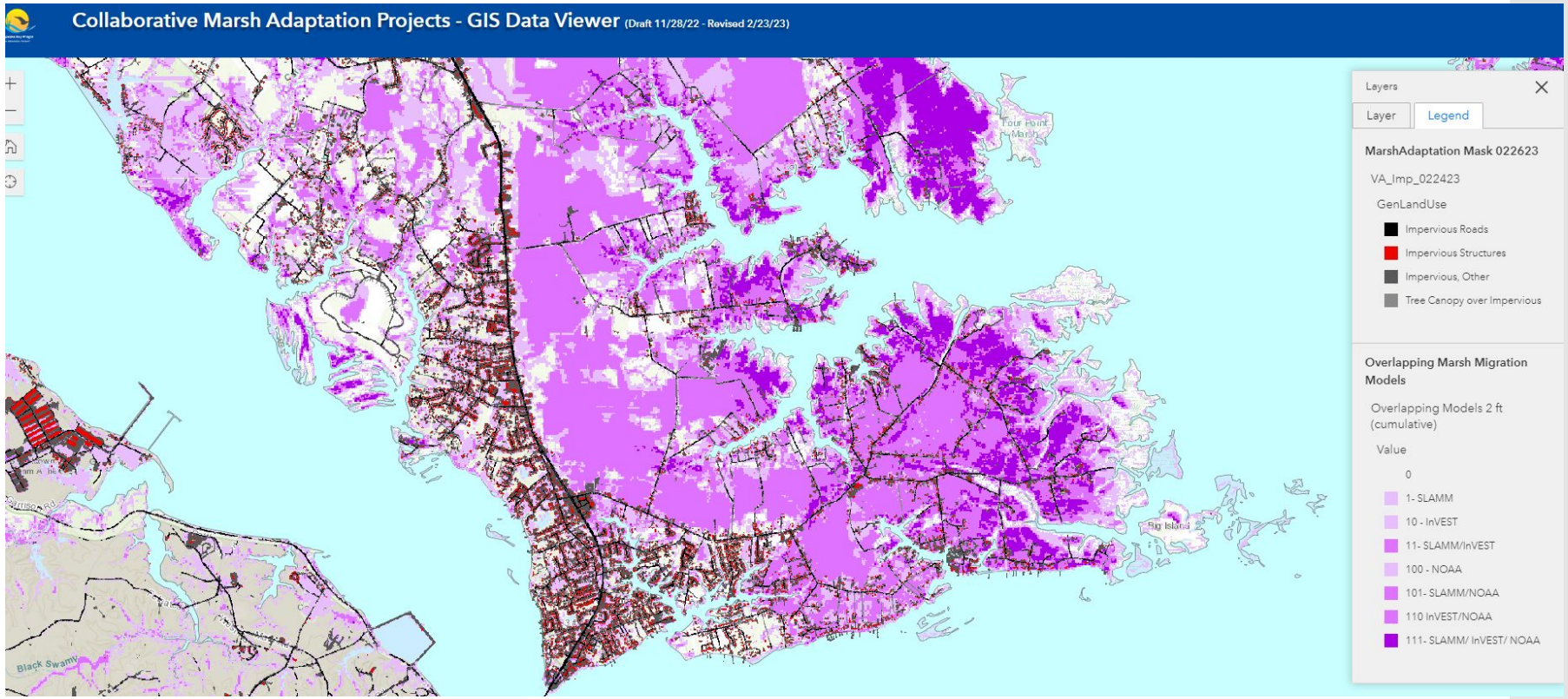


FIGURE 11. MECHANISTIC DRIVERS OF MARSH CHANGE. MECHANISMS IN GREY BOXES EXACERBATE OR MITIGATE THE EFFECTS OF MARSH CHANGE DRIVERS. FROM MITCHELL 2018.

Utilizing method from Mitchell et al. 2022, Synthesis of Shoreline, Sea Level Rise, and Marsh Migration Data for Wetland Restoration Targeting (GIT-funded project)

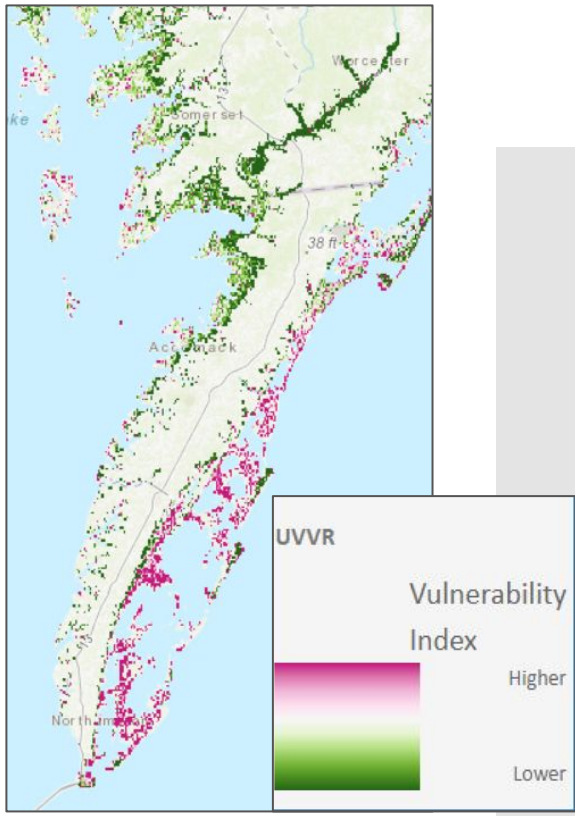
Example: Marsh Migration Model Overlay



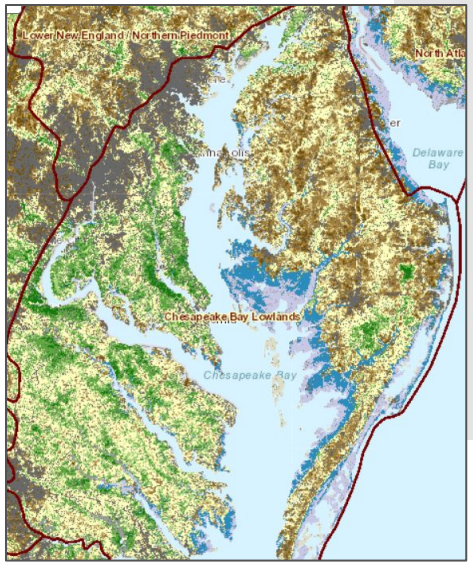
Potential Resilience Metrics

- **Marsh Condition:** USGS Coastal Wetlands Synthesis/Coastal Change Hazards (Chesapeake Bay/East Coast)
- **Habitat Connectivity:** The Nature Conservancy (TNC) Resilient and Connected Landscapes (East Coast)

USGS: Unvegetated to Vegetated Ratio (UVVR)



TNC Resilient Sites



Potential Conservation Metrics

Regional:

- Habitat/Species: EPA EnviroAtlas (National)
- Habitat Connectivity: Nature's Network (Mid-Atlantic)

State:

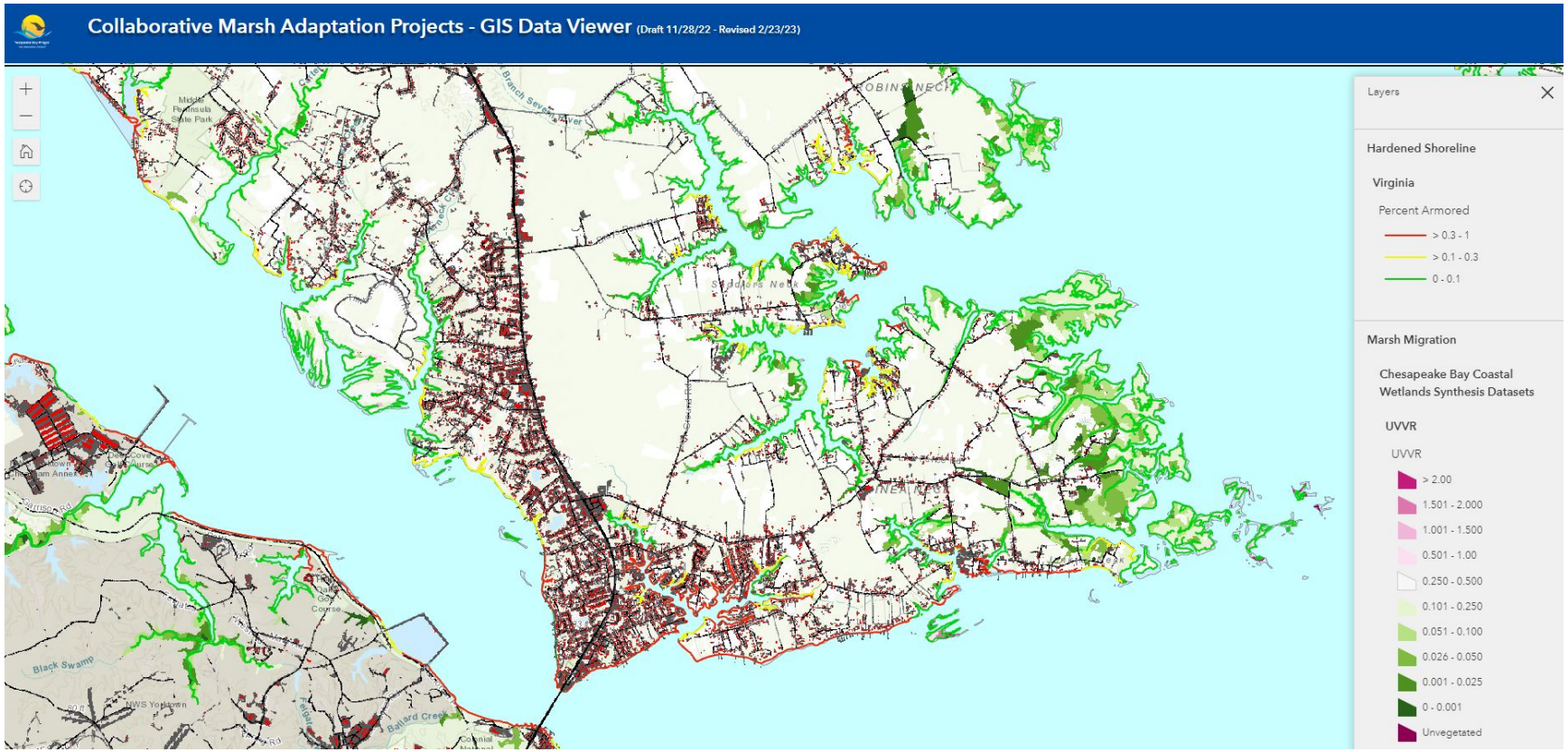
- Virginia Natural Heritage Data Explorer (DCR)
- VIMS AdaptVA
- MD DNR Greenprint
- MD Critical Area

AdaptVA Lands for Protection

Targeted Ecological Areas, MD Greenprint

Potential Fish Habitat Metrics to Connect with Funding Opportunities

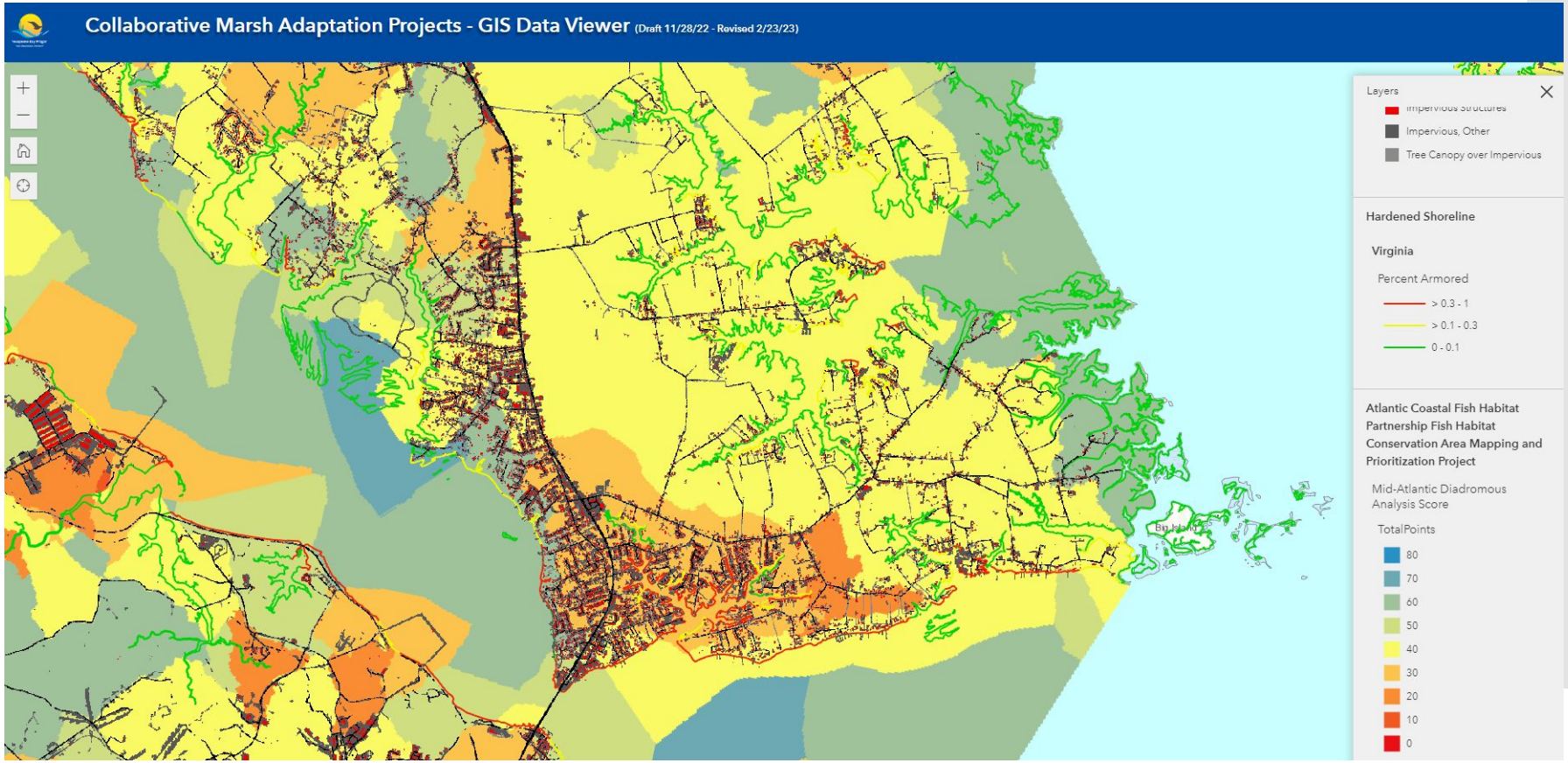
- **CBP Hardened Shoreline Threshold Based on Fish Species Decline (per 1000 meters) - Resilience Interpretation (Draft)**
  - < 10% hardened = most resilient (green)
  - 10-30% hardened = moderately resilient (yellow)
  - >30% = least resilient (red)



Fish threshold research supported by Fisheries GIT, Smithsonian Environmental Research Center, and Virginia Institute of Marine Science

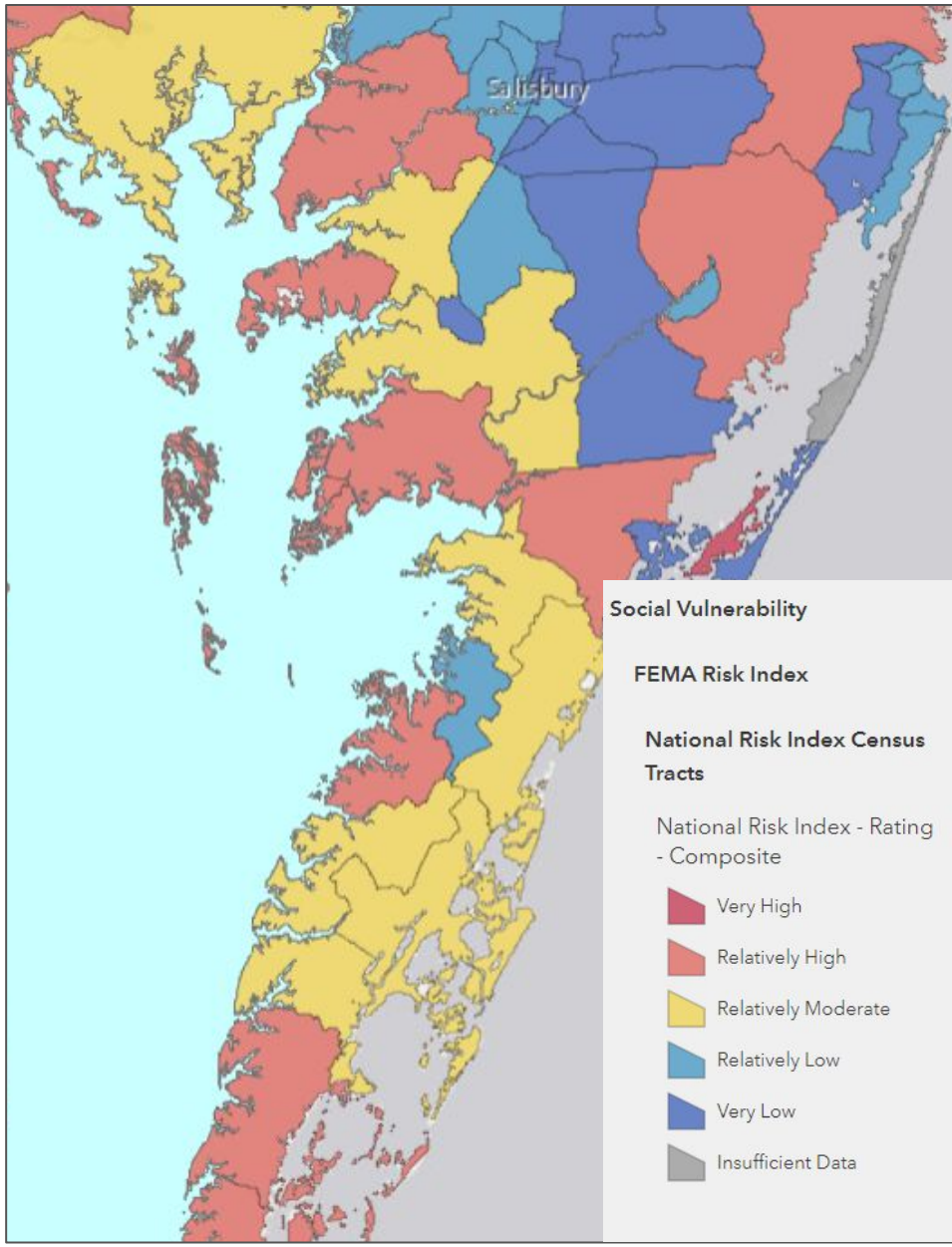
Potential Fish Habitat Metrics to Connect with Funding Opportunities

- **Atlantic Coastal Fish Habitat Partnership Diadromous Fish Habitat Scores**
  - Scores = 0-80 with higher scores representing better habitat (less vulnerable)
  - Metrics for scoring included impervious surface, point and nonpoint source pollution, riparian buffers, species access, flow alteration, local fragmentation, ESA critical habitat



Potential Social Vulnerability Metrics

- FEMA National Risk Index
- CDC Social Vulnerability Index
- EPA EJ Screen
- Health Resources and Services Administration
- American Community Survey
- White House Climate and Economic Justice Screening Tool (CEJST)



Identification of Partners and Priorities

Identify federal, state, local and regional partners that support marsh restoration, conservation and/or resilience research projects.

- Identify partner geographic and organizational priorities.
- Identify partner roles in conservation, restoration and research.
- Understand how they are incorporating climate change information.
- Better understand needs/gaps in marsh adaptation and management.

Next Steps

- **Early March:** Test targeting metrics with members from Middle Peninsula Habitat Restoration Steering Committee
- **Mid-March:** Initial partner outreach to identify priorities
- **Late March:** Meet with Steering Committee to refine targeting methodology
- **Early April:** Select 2 focus areas (MD, VA) based on agreed upon metrics and partner interests
- **~April-May:** Workshop Development & Participant Identification (includes more local outreach)
- **~June/July:** Hybrid Workshop: Identify collaborative large-scale marsh adaptation projects within focus areas and connect potential partners to seek federal infrastructure funds

How You Can Help

- Provide input on data layers to connect with fish habitat and use in targeting framework to identify marsh adaptation projects.
- Participate in providing information on marsh habitat priorities during outreach efforts.
- Help connect fish-related analyses with marsh adaptation projects to align with relevant funding criteria (e.g., NOAA Transformational Habitat, NFWF Chesapeake WILD)
  - E.g., fish habitat suitability analysis (Tuckey presentation)

Contact Information: Julie Reichert-Nguyen, NOAA/Climate Resiliency Workgroup Coordinator, julie.reichert-nguyen@noaa.gov