Enhancing Partnership Support for Marsh Resilience Research and Projects in Chesapeake Bay

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Chesapeake Bay Program (CBP) Partnership

Chesapeake Bay Program
Science. Restoration. Partnership.

Discover the Chesapeake | Learn the Issues | State of the Chesapeake | Take Action | In the News | Who We Are | What We Do

Chesapeake Executive Council

Principals' Staff Committee

Management Board

Advisory Committees
- Citizens
- Local Government
- Scientific & Technical

Goal Implementation Teams
- Sustainable Fisheries
- Habitat
- Water Quality
- Maintain Healthy Watersheds
- Fostering Chesapeake Stewardship
- Enhance Partnering, Leadership and Management

Communications Workgroup

Scientific, Technical Assessment & Reporting

Wetland Workgroup

Climate Resiliency Workgroup (CRWG)

Partners include federal, state, and local governments, nonprofit organizations, and academic institutions
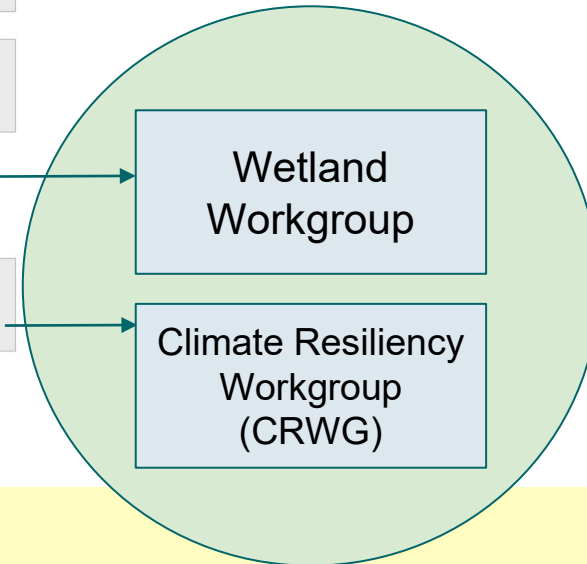
Chesapeake Bay Watershed Agreement Marsh-Related Goals

Climate Resiliency: Increase the resiliency of the Chesapeake Bay and watershed, including its **living resources, habitats, public infrastructure & communities**, to withstand adverse impacts from changing environmental & climate conditions.

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

Photo Credit: Chesapeake Bay Foundation
David Nyweide

Climate Resiliency Workgroup (CRWG) Focus

- Connect climate change research and available data to assess trends and likely impacts of changing climate and sea level conditions on water quality, habitats, and living resources in Chesapeake Bay.

- Pursue, design, and construct restoration and protection projects to enhance resiliency of the Bay and aquatic ecosystems from the impacts of climate change (e.g., coastal erosion, coastal flooding, sea level rise, more frequent intense storms)
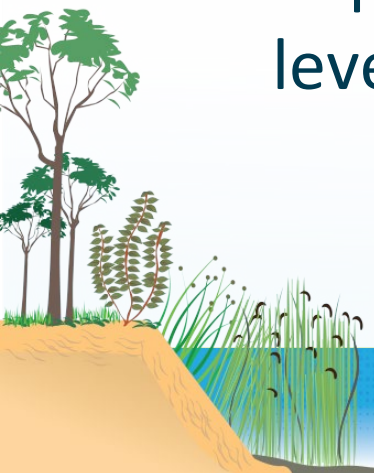
CBP Science Needs Database

All Science Needs are available on the database:
https://star.chesapeakebay.net/

Used by science providers to **identify projects of interest on which to engage CBP** and help inform natural resource decision-making and management needs

Climate Change Science Need: Quantifying Wetland Loss and Gains

Better understanding of sea level rise (SLR) and subsidence impacts related to wetland loss, marsh migration, and adjacent land use considerations

Projected sea level rise suggest wetland loss could be substantial in the Chesapeake Bay. There is a need to better understand the extent of the problem:

- Non-uniform aspects of subsidence and SLR
- Ability of wetlands to retreat (marsh migration potential)
- Identify where to target restoration or conservation
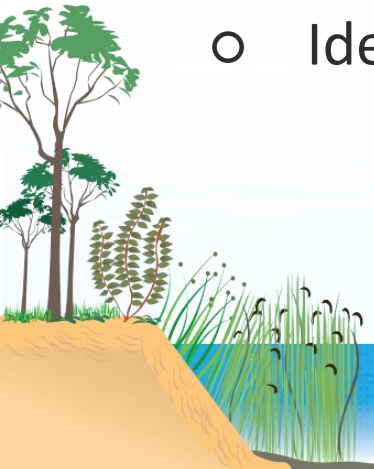
Climate Resiliency Workgroup's Ongoing Efforts

- Partnered with CBP GIS Team to conduct exploratory analyses of wetland loss and adjacent land use considerations from projected SLR scenarios (C-stREAM Internship Project)

- Partnered with Wetland Workgroup & Virginia Institute of Marine Science (VIMS) on Chesapeake Bay Trust GIT-funded project, "Synthesis of Shoreline, Sea Level Rise, and Marsh Migration Data for Wetland Targeting."

- Supporting the Chesapeake Bay Trust GIT-funded project, "Partnership-Building and Identification of Collaborative Tidal Marsh Adaptation Projects."
  - Partners: Maryland Department of Natural Resources, Maryland Sea Grant, The Nature Conservancy, VIMS

Sea Level Rise Effects: Exploratory Vulnerability Analyses – Marsh Migration Potential
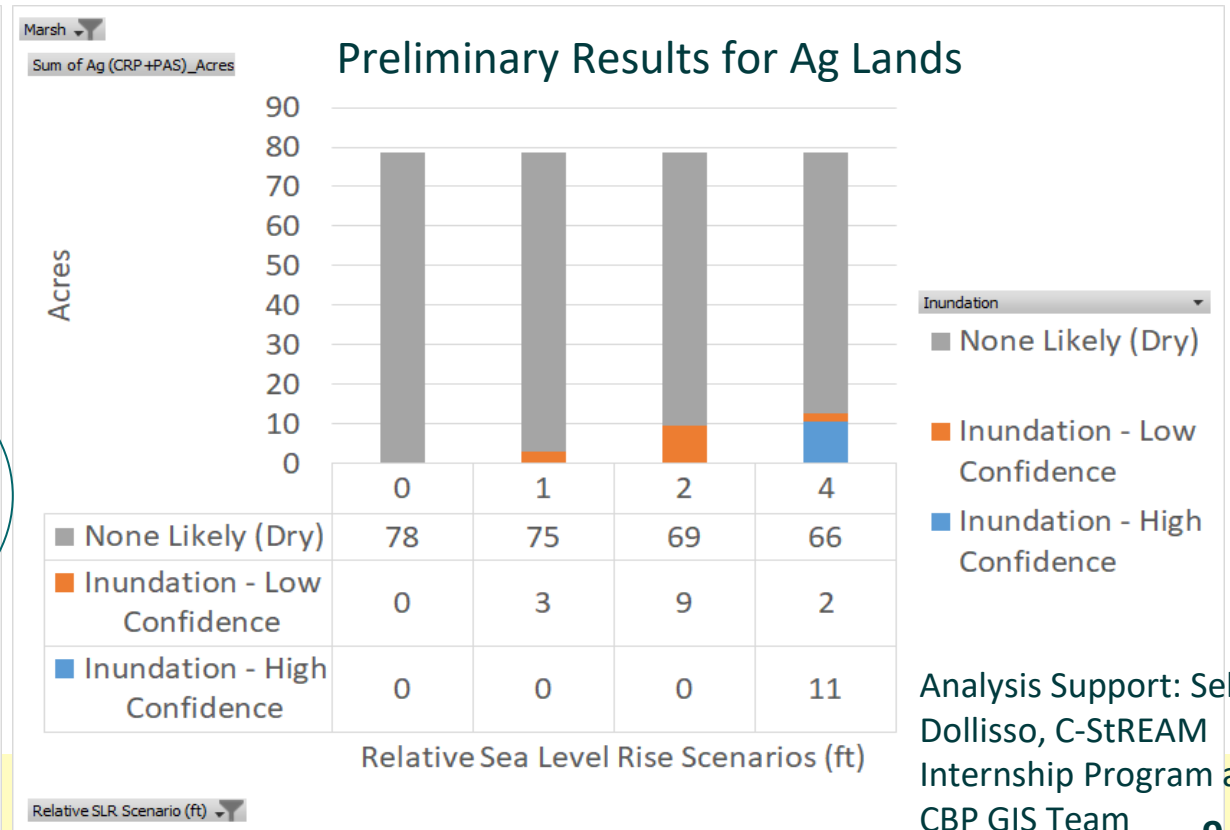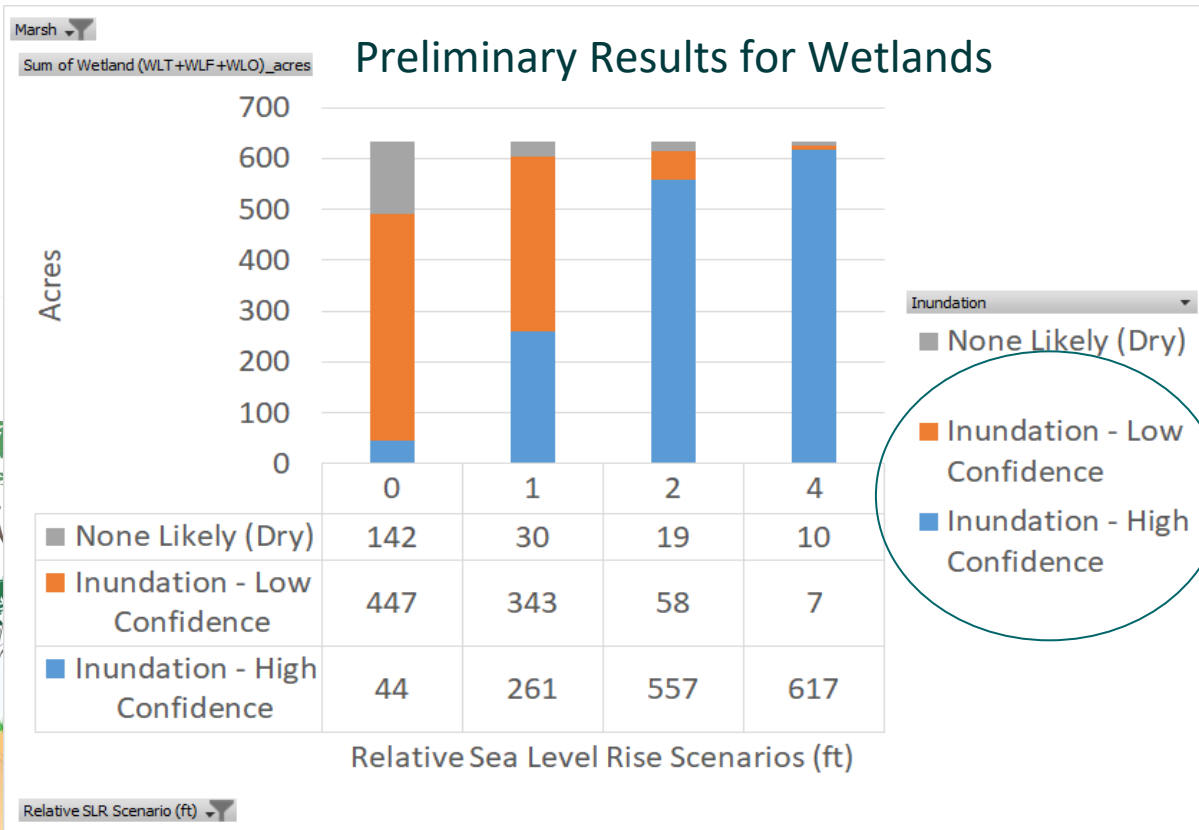
Example Analysis for Unnamed Marsh
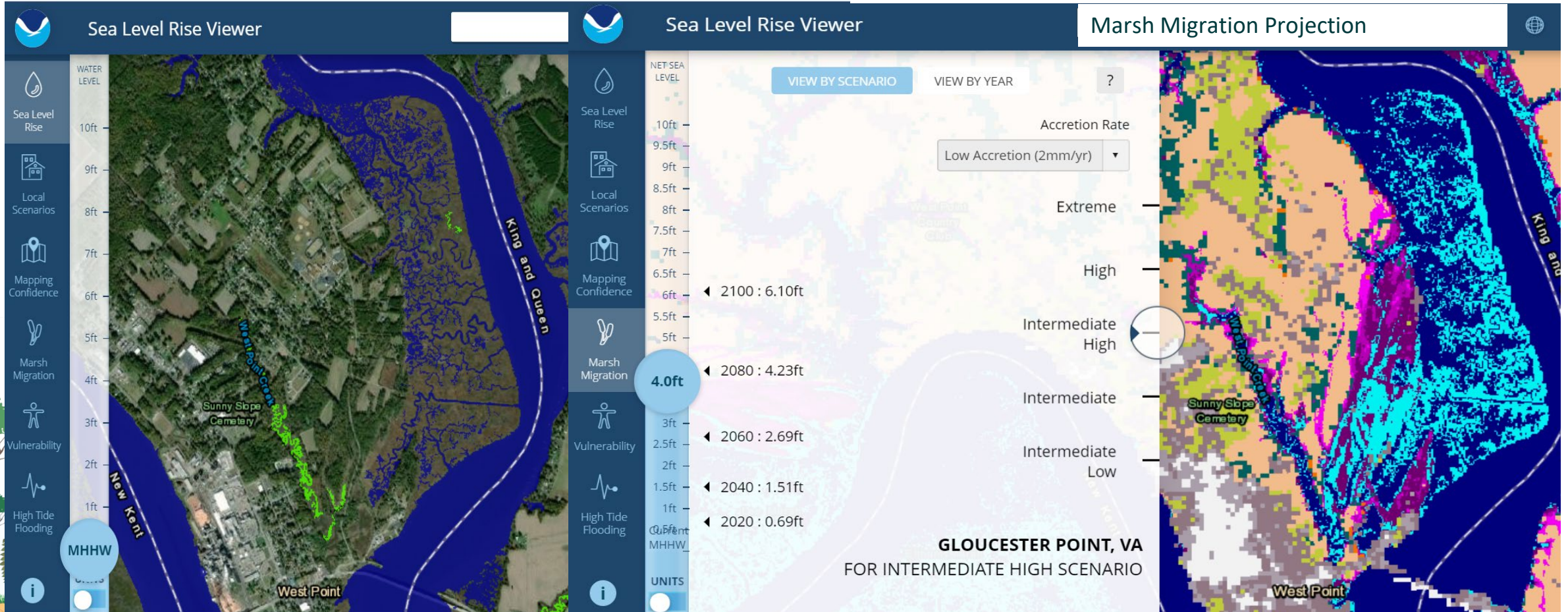
NOAA Sea Level Rise Viewer: coast.noaa.gov/slr/

Scenarios	Relative Sea Level Rise Scenarios		
	1 ft	2 ft	4ft
Projected Year (Intermediate High)	~2030	~2050	~2080

Preliminary Results for Wetlands

Marsh ▾
Sum of Wetland (WLT+WLF+WLO)_acres

	0	1	2	4
None Likely (Dry)	142	30	19	10
Inundation - Low Confidence	447	343	58	7
Inundation - High Confidence	44	261	557	617

Relative Sea Level Rise Scenarios (ft)

Preliminary Results for Ag Lands

Marsh ▾
Sum of Ag (CRP+PAS)_Acres

	0	1	2	4
None Likely (Dry)	78	75	69	66
Inundation - Low Confidence	0	3	9	2
Inundation - High Confidence	0	0	0	11

Relative Sea Level Rise Scenarios (ft)

Inundation
- None Likely (Dry)
- Inundation - Low Confidence
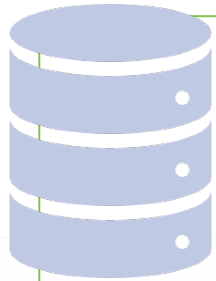- Inundation - High Confidence

Analysis Support: Selaam Dollisso, C-StREAM Internship Program and CBP GIS Team

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Ongoing Funded Project - Targeting Wetland Restoration with Existing Data

"Synthesis of Shoreline, Sea Level Rise, and Marsh Migration Data for Wetland Restoration Targeting"
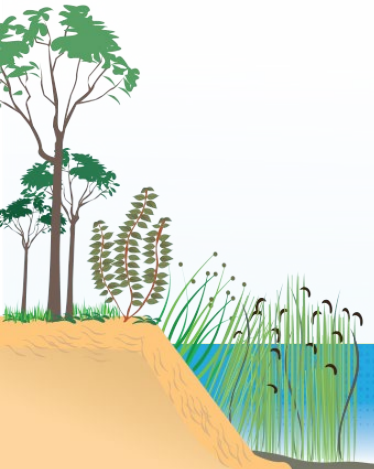
Outcomes

Data Synthesis: Compilation of metadata of available studies/data related to sea level rise, topography, shoreline condition, wetland area, and migration corridors and marsh migration model comparison.
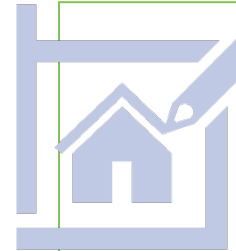
Pilot Project: Apply synthesized information to wetland restoration and conservation targeting at a local scale, directly influencing decision-making in an area of interest by stakeholders.
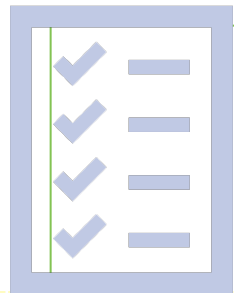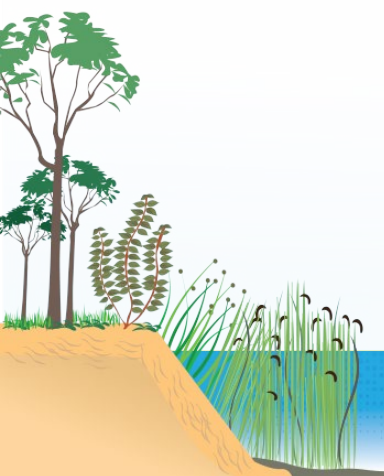
Data Methodology: Make this process accessible and replicable in other areas/communities.

Connect stakeholder resilience metrics for targeting marsh restoration projects

Collaborative Marsh Adaptation Projects

Align stakeholder organizational & geographic priorities with resilience research opportunities

Identify potential partnerships to support implementation
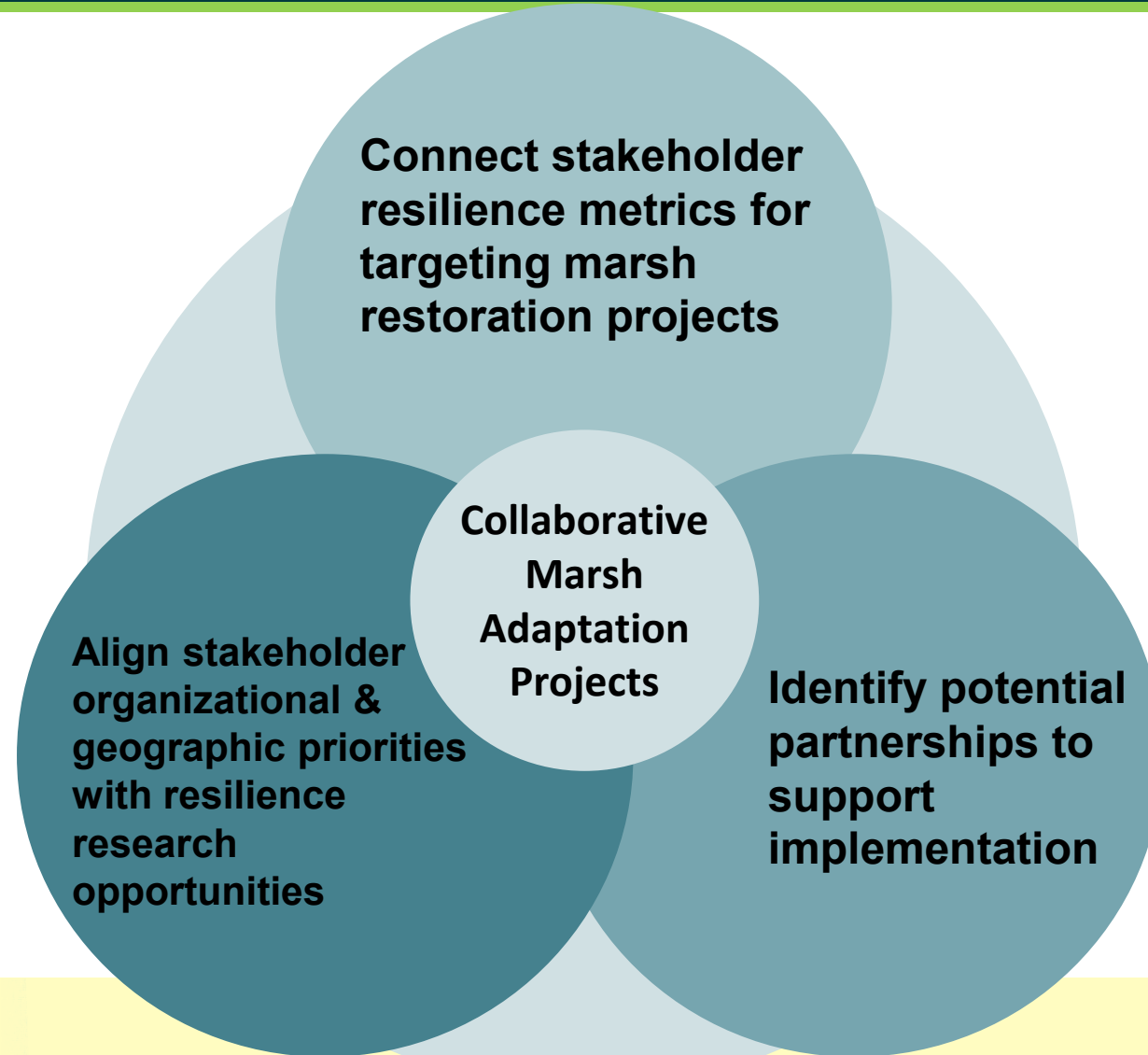
Climate Change Indicator Framework

Physical Indicators
Signals of Change

→

Impact Indicators
Ecological and Community Threats

→

Climate Resilience Indicators
Preparedness

Example

Sea Level Rise → Loss in Wetlands → Change in Land Use Designation to Allow for Marsh Migration

Knowledge Gaps and Science Needs Aided by Funded Projects

- Quantifying wetland vulnerability and extent (gains and losses) due to sea level rise.

- Marsh migration model use considerations to support restoration and land use decision-making.

- Identifying marsh resilience criteria and partner networks to support large-scale tidal wetland restoration projects.

- Supporting future climate change indicator capturing sea level rise effects to wetlands that has utility for wetland restoration decision-making.

Hot Topic – Science Needs Related to Ecosystem Services

- Quantification of carbon sequestration benefit of tidal wetlands (application of blue carbon crediting protocols)

- Better understanding how wetlands can provide a resilience benefit related to flood mitigation—quantification of this ecosystem service

- Fish impacts from wetland habitat loss

- Better understanding of resilience strategies for wetland restoration efforts (e.g., plant species and sediment considerations, optimal design and siting to withstand changes and maintain nutrient reduction effectiveness, retreat planning)

Contact Information

Julie Reichert-Nguyen, CRWG Coordinator
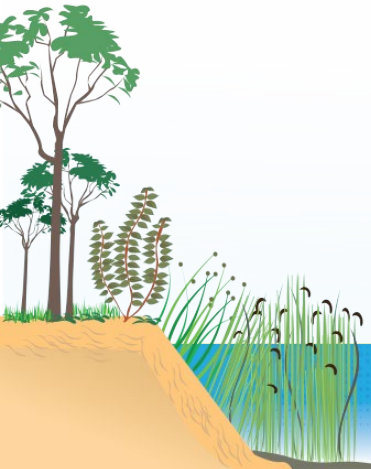julie.reichert-nguyen@noaa.gov

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Chesapeake Bay Program
Climate Resiliency Workgroup
www.chesapeakebay.net/who/group/climate_change_workgroup

- **Climate Monitoring & Assessment Outcome:** Monitor and assess trends and likely impacts of changing climate and sea level conditions on the Chesapeake Bay ecosystem, including the effectiveness of restoration and protection policies, programs, and projects.

- **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
  - sea level rise
  - more frequent intense storms

NOAA