

# Building and Maintaining Coastal Community Resilience through Blue Carbon Resources

Emily Trentacoste  
EPA Office of Research & Development

04/20/2023  
Climate Resiliency Workgroup



# Coastal Resilience & Climate Change Mitigation

## Goals:

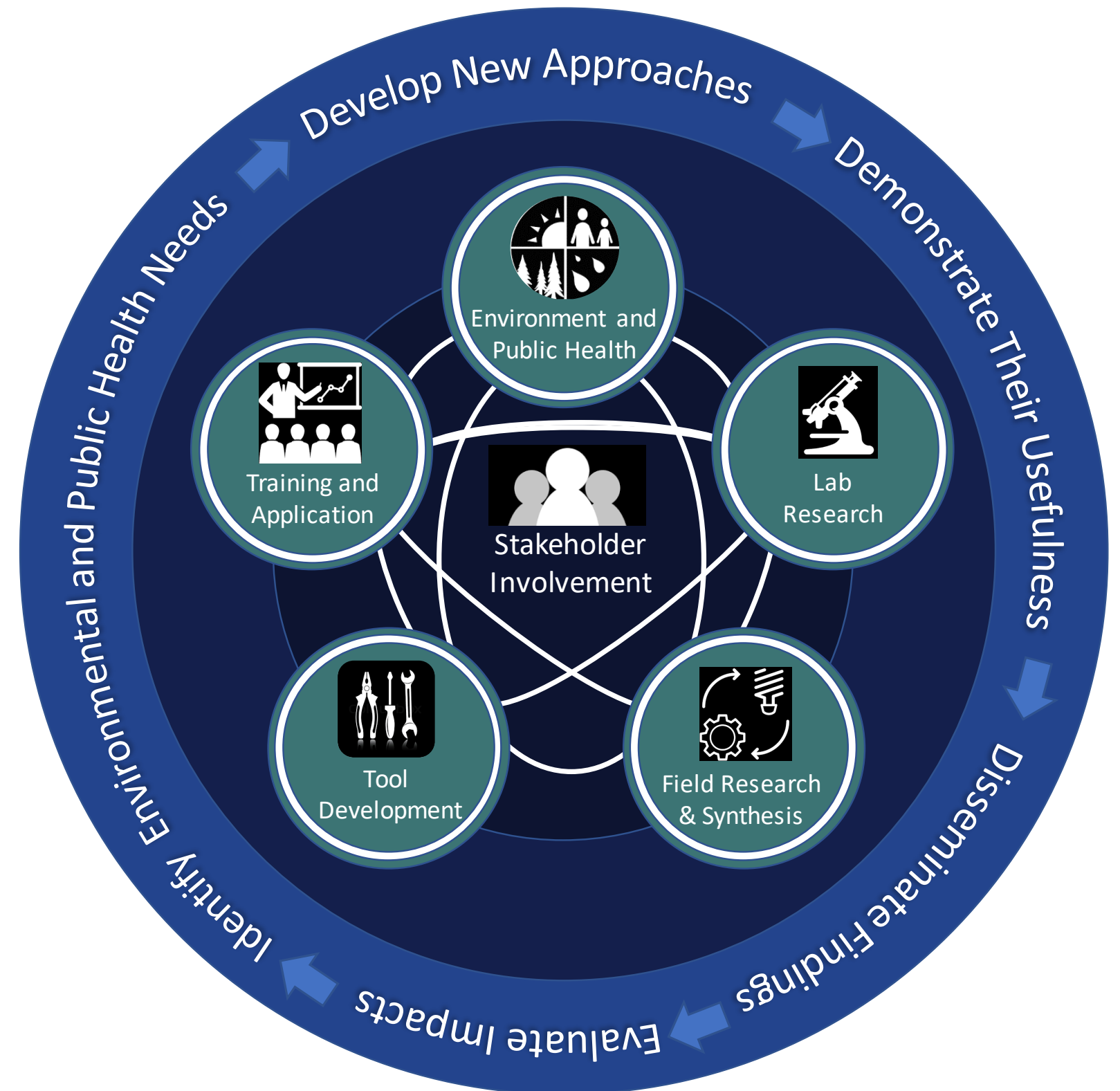
- Work with coastal community in Chesapeake Bay to help address its **coastal resilience issues**.
- Identify and assess **co-benefits** associated with different coastal resilience adaptation pathways.
- Incorporate/investigate natural infrastructure options that have **blue carbon sequestration potential**.





# What is “Solutions-Driven Research”?

- Applied research that addresses real-world problems
- Emphasizes stakeholder engagement and integration
- Measure effectiveness of science-based strategies
- Determine transferability to other locations





# Crisfield, MD: “The Crab Capital of the World”

- Founded in 1663 on Lower Eastern Shore of Maryland and became known as “The Crab Capital of the World”
- Economy and environment intertwined - large marina, seafood festivals, natural beauty - strong sense of shared history
- Facing increasing flooding issues and coastal resilience concerns
- Surrounded on 3 sides by water and many natural infrastructure/blue carbon opportunities (salt marshes, seagrasses)
- TNC NOAA-funded work convened Community Advisory Committee of local leaders from businesses, churches, and nonprofits
- Several projects coalescing in Crisfield (FEMA, EPA, City, TNC)





# Community Advisory Committee Input

- **Community's coastal resilience goals:**
  - Resilient infrastructure, job creation and training, flood-safe and affordable housing, recreational opportunities, social/cultural spaces, youth development
  - Also interested in community retention and cultural preservation, tourism tied to the waterfront (maritime history/heritage tourism, boating, fishing, nature appreciation), and fisheries (oysters, blue crabs)
- **Sources of flooding:** poor drainage, storm events, higher tides (SLR), sinking land, erosion of islands
- **Impacts of flooding:** limited economic opportunity, increased costs, mental and physical health, declining quality of life, people moving away



# Planned Work with Crisfield

Looking to work with community and City on strategies incorporating natural infrastructure, including blue carbon resources, by:

- Understanding Crisfield community's capacity for adapting to environmental change
- Aligning potential natural adaptation strategies with community's values and desired future
- Assessing natural strategies that benefit the things the community values
- Helping community consider natural strategies in their planning (what, where, and how; finding partners, funding opportunities for implementation)





# Understanding Community Capacity

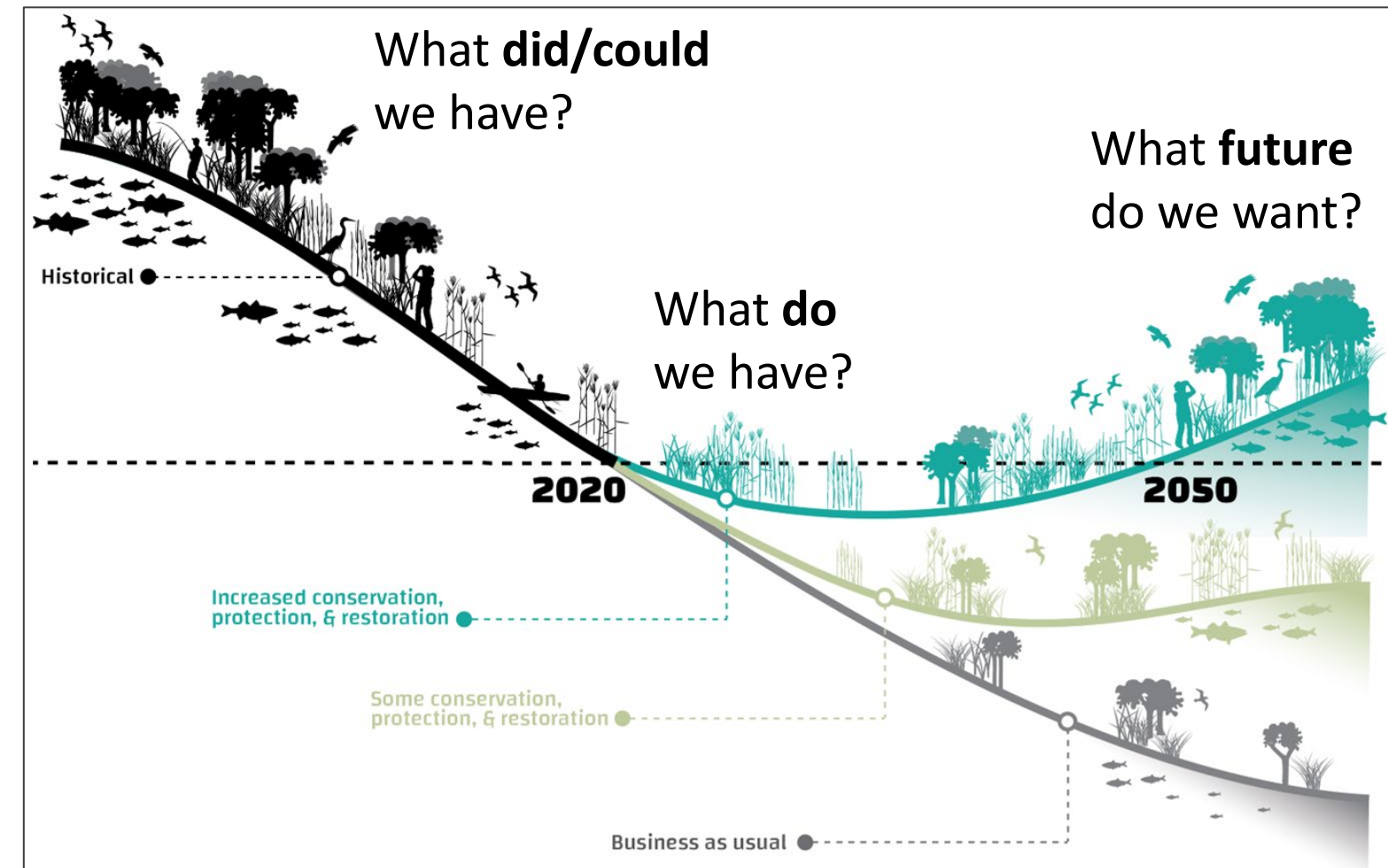
## Understanding Crisfield community's capacity for adapting to environmental change

- Current level of knowledge about flooding causes, potential adaptation measures including natural infrastructure and co-benefits
- Capacity for planning, funding, implementation
- Education and communication needs related to flooding and environmental information
- How:
  - Local government interviews, capacity assessment
  - Teacher workshops, field experiences, participatory science



## Aligning potential natural adaptation strategies with community's values and desired future

- Understanding what community values about their environment
- Understand the current and future potential for ecosystem services benefits
- Evaluate the potential role of natural infrastructure in providing valued ecosystem services
- How:
  - Focus groups or workshops
  - Final Ecosystem Goods & Services tools



Susan Yee, US EPA ORD



# Assessing Nature-based Strategies

## Assessing natural strategies that benefit the things the community values

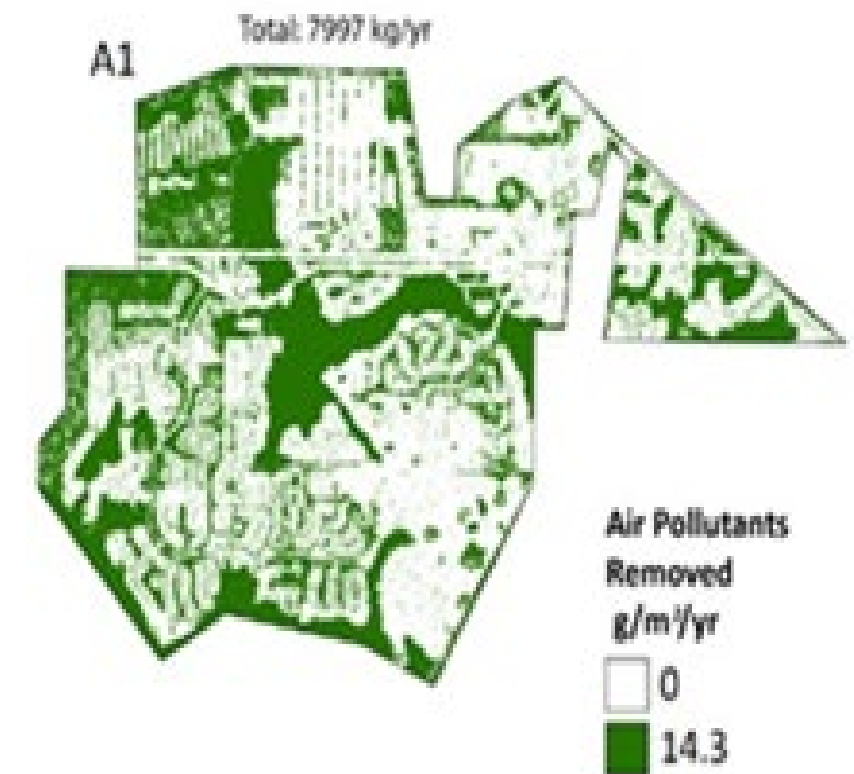
### Mapping ecosystem services

- Identify and quantify ecosystem services beneficiaries, and the quality, reliability, and availability or scarcity of ecosystem services
- Estimate how the delivery of ecosystem services benefits changes as a function of different possible coastal resilience management decisions

### Social vulnerability assessment

- Evaluate the vulnerability of community resources by assessing access restrictions under different coastal flood scenarios
- Identify priority areas to focus on for improving coastal resilience

### Ecosystem Services



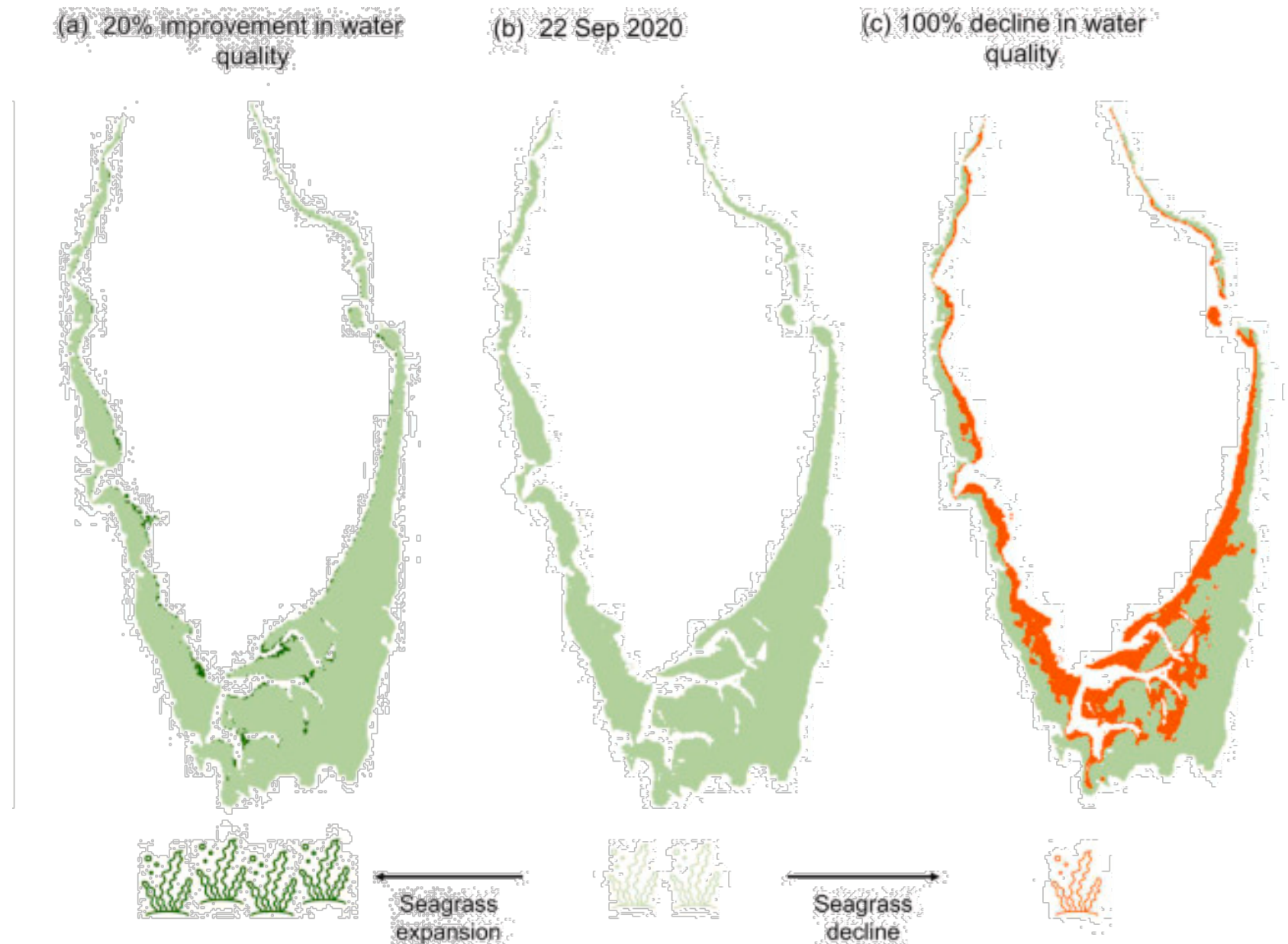
Rich Fulford,  
US EPA ORD

# Assessing Nature-based Strategies (continued)

## Assessing natural strategies that benefit the things the community values

### Analyze blue carbon resources

- Compile and synthesize resources and datasets characterizing blue carbon in the Chesapeake Bay and assess uncertainty
- Understand where seagrass is likely to grow under different flood/climate predictions and assess value seagrass may provide
- Project changes to habitat suitability and carbon sequestration of natural infrastructure



[Lebrasse et al. 2022.](#)

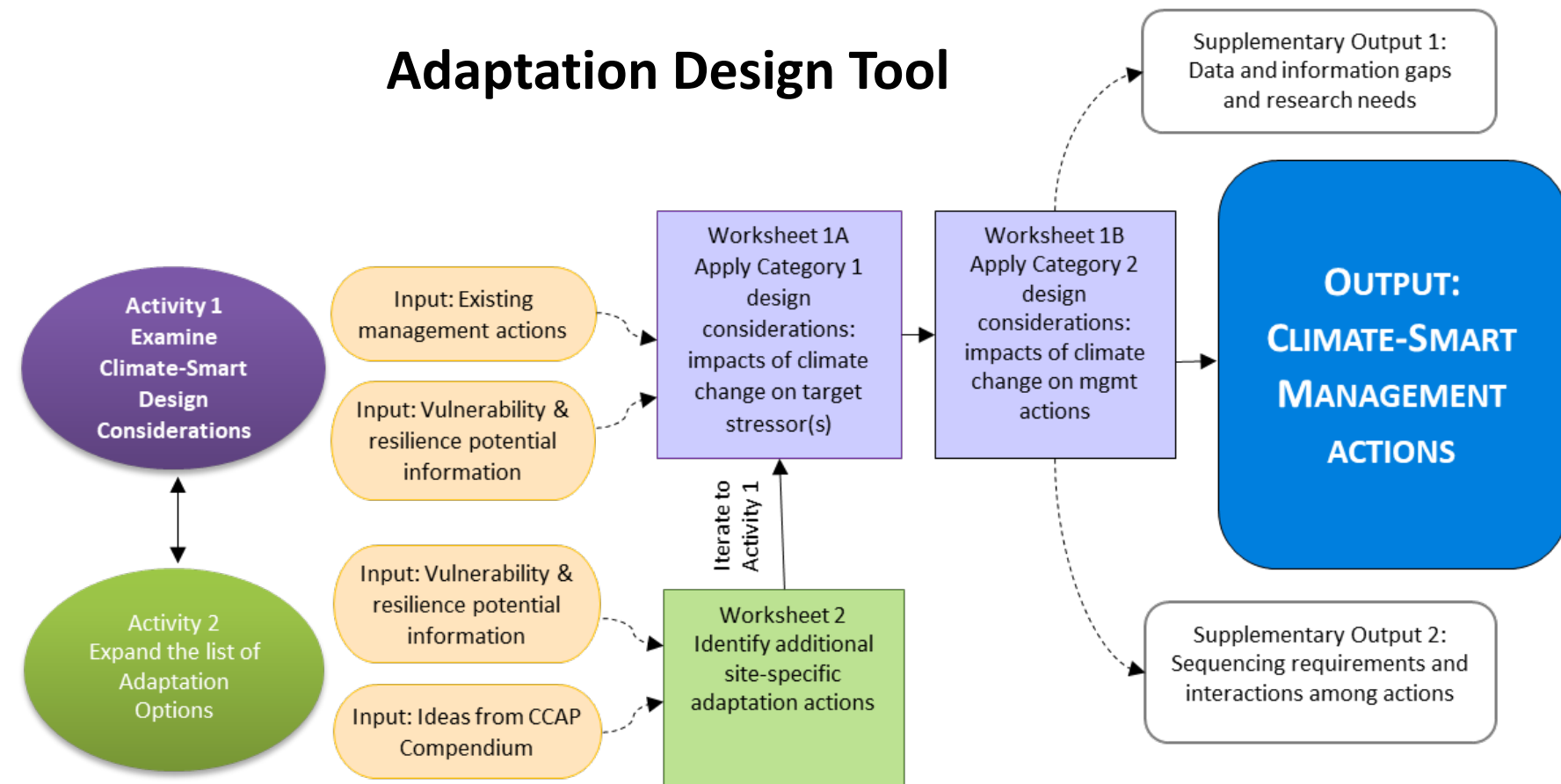
[Marine Environmental Research](#)



# Natural Strategies in Planning

## Help the community consider natural strategies in their planning

- Support decision-making around trade-offs of different nature-based strategies
- Use EPA's Adaptation Design Tool to explore resilience-focused design options
- Incorporate community preferences and values around decision frameworks that include a broader range of environmental, social, and health benefits



Jordan West, US EPA ORD

# Coordination and Implementation

- **EPA Office of Research & Development** is coordinating with other partners working in Crisfield:
  - **EPA Region 3/CBPO** are part of project team
  - **EPA Creating Resilient Water Utilities (CRWU)** team conducted an assessment focused on Crisfield's ditch system and drainage management under climate projections
  - **The Nature Conservancy** is working with the community (and **GMU** and **UMD**) on addressing tidal flooding issues
  - TNC is working with EPA ORD on marsh restoration opportunities
  - **FEMA** is providing direct technical assistance to the City to increase capacity for grant applications
  - Other partners have expressed interest in potential additional components (e.g., **National Park Service** in recreation)



# Thank you!

Questions?

[Trentacoste.Emily@epa.gov](mailto:Trentacoste.Emily@epa.gov)

