

# Linking Marshes & Communities in the Midst of Change

A collaborative approach to socio-economic assessment to increase coastal marsh and community resilience on the Chesapeake Bay



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## Introduction

**Sea level rise** and other stressors in the mid-Atlantic U.S. are impacting the **resilience** of coastal communities, and are increasing their overall **physical and socio-economic vulnerabilities**. The Deal Island Peninsula on the Eastern Shore of the Chesapeake Bay, MD (Figure 1) is being used as a case study of a **coastal heritage community** that is experiencing these stressors and is involved in **stakeholder-driven resilience and adaptation planning**. The “Deal Island Peninsula Marsh & Community Project” is funded by the NERRS Science Collaborative.

The goals of this project are to:

1. Enhance stakeholder collaboration and elicit local knowledge
2. Develop and test a broadly transferable process based on the Collaborative Learning approach that elicits stakeholder-driven coastal decision-making
3. Examine coastal decision-making and socio-ecological service values using integrated ecological, economic, and anthropological applied science methods.



Figure 1. (a) Chesapeake Bay watershed, (b) study site: Deal Island Peninsula, (c) aerial view of marshes and communities of the Deal Island Peninsula.

**The focus of this poster is to describe the collaborative approach taken towards a socio-economic assessment of the Deal Island Peninsula.**

## Socio-Economic Assessment Objectives

- 1) Better understand stakeholder relationships with marsh ecosystems and services they provide.
- 2) Bring stakeholder perceptions and values of socio-ecological services into a coastal decision-making framework.
- 3) Bridge the gap between science and decision-making through improved communication and collaboration.

## Approach: Collaborative Learning

- Collaborative Learning (Figure 2) is an interdisciplinary framework to community-based ecosystem management, which utilizes participatory decision-making within a diverse stakeholder group. (2, 5)
- We are using Collaborative Learning to promote understanding of perspectives, values, and knowledge about marshes, local communities, climate change, and environmental stressors on the Deal Island Peninsula.

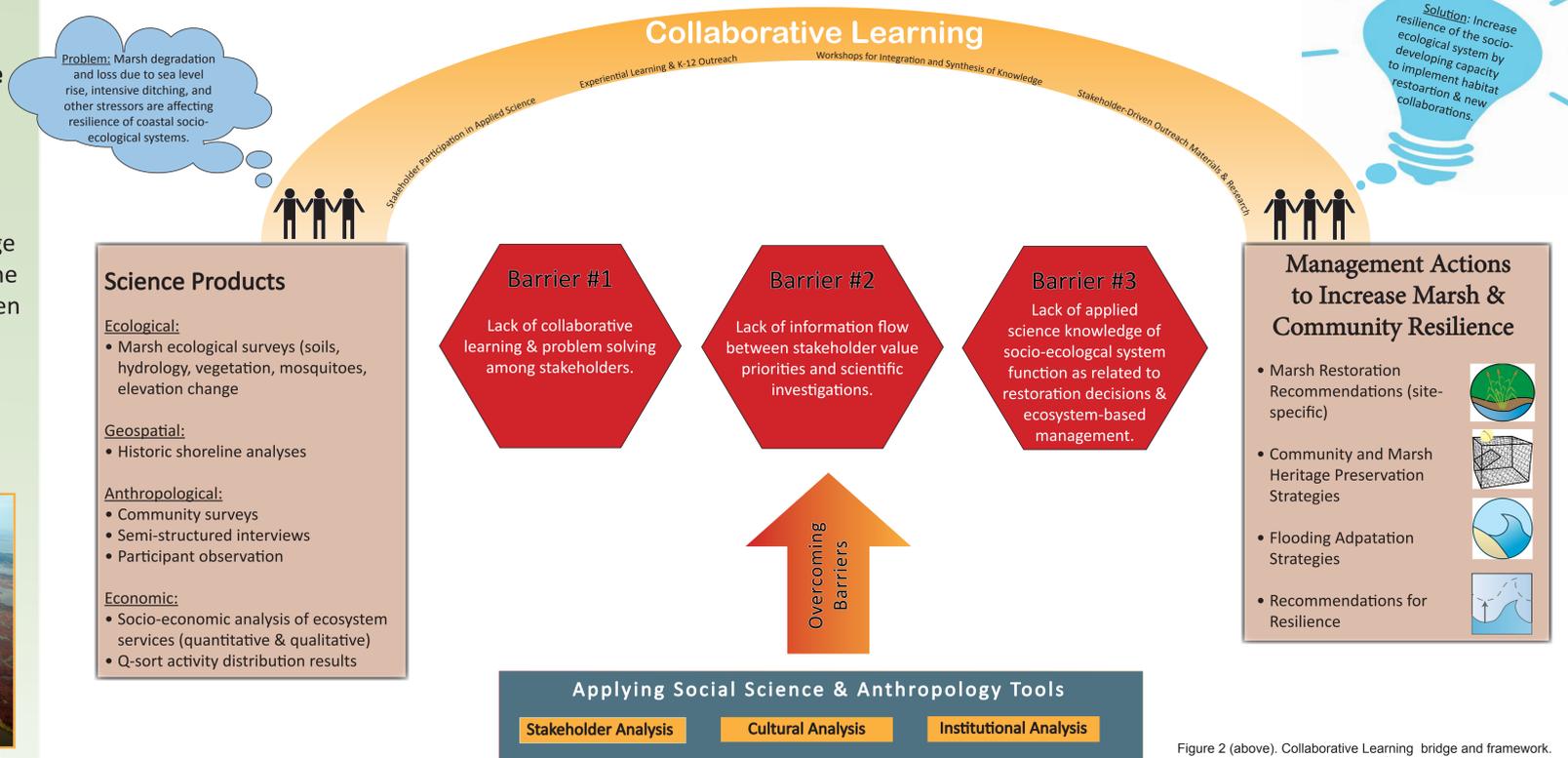


Figure 2 (above). Collaborative Learning bridge and framework. Adapted from Feurt (2008).

## Method: Q-sorts

A Q-sort aims to assess diverse viewpoints and values on a topic through quantitative and qualitative techniques.

1. Socio-ecological service statements were derived from stakeholder inputs from the first project workshop
  - Services fell under three of following categories: consumptive use, non-consumptive use, and non-use (Figure 6)
2. A Q-sort activity was conducted at a public workshop (Figure 3)
  - 26 stakeholders sorted 19 cards in a pre-determined distribution (Figure 4) from more to less important (1, 3, 4, 6)
  - Each card had a typed statement of a socio-ecological service (Figure 5)
  - Stakeholders were asked to group services based on which they felt were more or less important to sustain in good condition for the long term

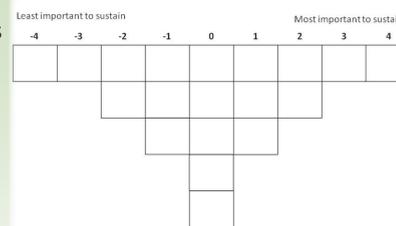


Figure 4. Q-sort template used to rank and prioritize statement cards.



Figure 3. Setting up the physical layout for the Q-sort activity.



Figure 5. Preparing statement cards for the Q-sort activity.

## Results & Interpretation

- Stakeholders identified the most important services to sustain on the Deal Island Peninsula as 1) marsh system vitality, 2) marshes reducing storm and erosion impacts, and 3) habitat for juvenile fish, crabs, and oysters (Figure 7)



Figure 6. Socio-ecological services of value derived from stakeholder input at the first project workshop.

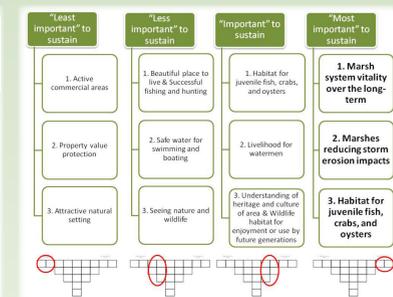


Figure 7. Top three services chosen by all participants at each level of importance/ranking on the Q-sort template.

- Stakeholders are thinking about **long-term impacts** rather than only short-term needs (Figure 8)
- The consistent focus across stakeholders on system-wide services should promote **collaborative adaptation and problem-solving**

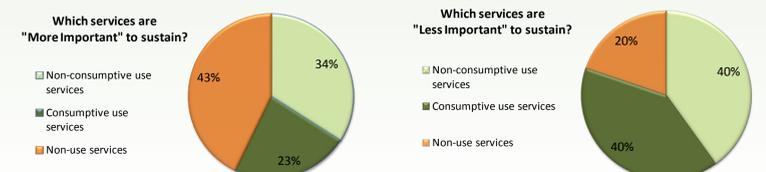


Figure 8. Percent of total sorted service statements (496) under each category of the service type that were placed under each importance bin. Columns 1 to 4 on the Q-sort template were in the “More Important” bin (pie chart on the left) and columns -1 to -4 were in the “Less Important” bin (pie chart on the right).

## Ongoing Work (project-wide)

- Semi-structured stakeholder interviews
- Cultural models
- Collection of marsh ecological data
- Geospatial analyses
- Adult experiential learning activities
- K-12 education and outreach
- Public stakeholder workshops
- Science communication & translation
- Stakeholder engagement in applied science investigations
- Marsh restoration

## What Do You Think?

... this work means for natural and biophysical scientists?  
 How are stakeholders involved in applied science investigations?  
 ... this community can learn from other coastal communities?  
 ... about the community ranking results?



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