Outline

1. OVERVIEW— Bringing Wetlands to Market: Nitrogen and Coastal Blue Carbon Project (BWM)

2. END USERS/STAKEHOLDER ENGAGEMENT Collaboration Process & Contributions to BWM

3. Linking BWM Science & Tools to Practice
WHY WE DID THIS WORK?

Bringing Wetlands to Market: Nitrogen & Coastal Blue Carbon Project
State of Our Coastal Wetlands

**BENEFITS:**
**IMPORTANT ECOSYSTEM SERVICES**
- Carbon Storage
- Habitat
- Filter Pollutants
- Recreation/Aesthetics

**THREATS:**
- Human Impacts (Nitrogen loading, sea level rise etc)
- Degradation
- Loss
- Disruption of sediment supply

**BARRIERS TO RESTORATION:**
$$$$
Riches in the Soil – The Wetland Carbon Bank

Source: Data summarized in Crooks et al., 2011; Murray et al., 2011

Tidal Salt Marsh

All Tropical Forests

$\text{tCO}_2\text{e per Hectare, Global Averages}$

Soil-Carbon Values for First Meter of Depth Only (Total Depth = Several Meters)

$\begin{align*}
8.0 \pm 1.4 \text{ tCO}_2 / \text{ha} / \text{yr} \\
0.2 \pm 0.1 \text{ tCO}_2 / \text{ha} / \text{yr}
\end{align*}$

Mean soil organic carbon

Mean living biomass
Why We Did This Work - Addressing Climate Change

- Reduce Carbon Production
- Or BOTH
- Store More Carbon
Why We Did This Work - Nitrogen Loading An Important Local Issue
Improved Understanding of C Dynamics and Biogeochemical Processes
New Tools for Managers and Policymakers

Innovative Science
- GHG Budgets
- Nitrogen Influence
- Habitat relationships

Predicting C Storage
- How does GHG flux and carbon storage change under different env. conditions?

Carbon Markets & Financing
- Address a main barrier for wetlands restoration & conservation

Economic Analysis
- Is a Carbon Market Project Worth It?

Local Case Study – How much are methane benefits worth?

COLLABORATION WITH END USERS
ENGAGING END USERS

Collaborative Process & Contributions to BWM
What Do We Mean By Collaboration?

- End users as contributors not just recipients of information
- Provide specific and explicit opportunities for users to modify/inform approach
- Facilitate interactions with users to enable two-way learning
- Flexibility in the science
The Collaborative Approach

• The Context
  – Blue carbon an emerging issue
  – Limited blue carbon focus in region
  – Heavy focus on nitrogen loading locally

• The Challenge
  – How to make the science relevant to local intended users and their management priorities
  – Complex topic – potential for broad application
  – Identifying opportunities or entry points to connect blue carbon to people’s work
  – Market vs. Non-Market

How can we put blue carbon on the map while also making BWM more useful to managers?
TIER 1 – BWM Intended Users

- Development of VCS offset methodology and guidance document
- Development of a user friendly model to help predict GHG flux and carbon budgets in different wetland environments
- Conduct and economic analysis to demonstrate methane benefits for restoration

TIER 2 – End Users

- Restoration Practitioners
- State & Federal Agencies
- NERRS
- Land Managers
- Conservation Organizations
- Coastal Managers
- Local Municipalities
- Climate Registries
- Project Developers
- Policymakers
Bringing Blue Carbon Home

NATIONAL LEVEL: Federal agencies, NERRS etc

STATE LEVEL: Massachusetts

LOCAL LEVEL: Cape Cod Towns
Stakeholder Engagement

[Images of stakeholder engagement activities]
How Did We Engage With End Users?

- Field Trip
- One-on-One
- Early Interviews
- E-Newsletter
- Workshops & Webinars
- NERRS Transfer Projects
- Economic Analysis Stakeholder Meeting & Engaging NPS & Herring River Project Team
- Survey to Assess Knowledge of Wetland Ecosystem Services and Blue Carbon
How Did We Use Input From Intended Users?

- Shaped economic analysis /Herring River Case Study
- Developed key tools for managers and policymakers
- Reached broader audiences
- Balancing market & non-market benefits
- Vetted messaging for communication products
- Explored grouping restoration projects for market credits
- Examined nitrogen (N) impacts in the research
- Increased awareness about blue carbon/expanded audiences
- Clarified carbon market process and economics
- Explored what BC strategies might be meaningful to explore
Bridging Science, Management & Policy

BWM Science Tools & Resources

- Public Perception of Wetlands
- Wetlands Restoration & Conservation
- Resilience/Adaptation Planning
- Climate Change Policies & Plans
- Regulations/Permitting
- Land Use Planning
- Research
- Education & Outreach
- Ecosystem Services Valuation
A Few Noteworthy Achievements...

- Increased awareness of Blue Carbon at national, regional, state & local levels
- Deepened relationships among scientists, agencies, and local decision-makers
- New research needs identified and many “spin off” science projects
- Growing interest in exploring BC strategies
Thank You!

BWM Project Team

BWM Stakeholders

BWM Funders – NERRS Science Collaborative

www.wbnerrwetlandscarbon.net
Research Goals

1) Quantify C sinks in salt marshes

2) Quantify vertical and lateral GHG (CO₂, CH₄, N₂O) fluxes

3) Assess the impact of N loading, sea level rise and climate on both C sequestration and net GHG emissions

4) Better understand C sequestration in wetlands and associated drivers and controls