Summary Points:

Christine Feurt is the director of the Coastal Training Program at the Wells National Estuarine Research Reserve in Maine, and a Research Associate with the Department of Environmental Studies at the University of New England. Dr. Feurt integrates natural and social science into stakeholder processes using the Collaborative Learning approach in order to sustain ecosystem services and build resilient coastal communities.

Terminology:

- **Collaborative Learning**: An adaptable process for engaging people with diverse perspectives and enabling them to work together to improve a situation. Throughout this presentation, a number of resources related to Collaborative Learning will be provided for additional information and context.

Resilience Dialogues: Strategies for Conflict Management in Collaborative Science

NERRS Science Collaborative Webinar

February 25, 2020

Christine Feurt Ph D
Director, Coastal Training Program
Wells NERR, Maine

National Estuarine Research Reserve System Science Collaborative

Summary Points:

Resilience dialogues are conversations that occur among people with diverse perspectives who have agreed to work together to increase community and ecological resilience. Planning and facilitating resilience dialogues requires skills in collaboration, stakeholder engagement, and conflict management.

The Resilience Dialogues project looked across a decade of collaborative science projects in the National Estuarine Research Reserve System to distill key lessons learned and best practices used to build resilience.

This webinar shared successful collaborative techniques that engaged the diverse expertise of stakeholders, developed a shared language around commonly held values, and crafted solutions-based science that respected local knowledge and the concerns of vulnerable communities. Results of the project have been used to develop training and resources for facilitators of collaborative processes and to guide the transfer of collaborative science projects to new audiences.

Dual Purpose for Today's Webinar

I. Describe the *Resilience Dialogues* project and share best practices and links to resources.

II. Identify key factors contributing to success in Collaborative Science *Transfer* projects.

National Estuarine Research Reserve System Science Collaborative

Summary Points:

The National Estuarine Research Reserve System is the setting for this project

LIST OF RESERVES

Great Lakes
1. Lake Superior, Wisconsin
2. Old Woman Creek, Ohio

Northeast
3. Wells, Maine
4. Great Bay, New Hampshire
5. Waquoit Bay, Massachusetts
6. Narragansett Bay, Rhode Island

Mid-Atlantic
7. Hudson River, New York
8. Jacques Cousteau, New Jersey
9. Delaware
10. Chesapeake Bay, Maryland
11. Chesapeake Bay, Virginia

Southeast
12. North Carolina
13. North Inlet-Winyah Bay, South Carolina
14. ACE Basin, South Carolina
15. Sapelo Island, Georgia
16. Guana Tolomato Matanzas, Florida

Gulf of Mexico
17. Rookery Bay, Florida
18. Apalachicola, Florida
19. Weeks Bay, Alabama
20. Grand Bay, Mississippi
21. Mission-Aransas, Texas

West
22. Tijuana River, California
23. Elkhorn Slough, California
24. San Francisco Bay, California
25. South Slough, Oregon
26. Padilla Bay, Washington
27. Kachemak Bay, Alaska

Pacific
28. He'eia, Hawai'i

Caribbean
29. Jobos Bay, Puerto Rico

Summary Points:

15 of the 29 reserves contrubuted to the Resilience Dialogues project, with the goal of sharing lessons learned about facilitating engagement with diverse stakeholders in collaborative science.

National Estuarine Research Reserve System Science Collaborative

http://www.nerrssciencecollaborative.org/

Science for estuarine and coastal decision-makers.

Managed by the University of Michigan Water Center, through a cooperative agreement with NOAA.

Funding opportunities support user-driven collaborative research, assessment, and **transfer activities**.

Address critical coastal management needs identified by the NERRs

Summary Points:

This slide highlights the NERRS Science Collaborative's role in this project.
Resources:

- Applicant Resources - Information and tools for developing and managing a collaborative process.

The impact of Collaborative Science depends upon successful Boundary Spanning

The evolving practice of collaborative science in the NERRS is contributing to building social and ecological resilience in estuarine systems and coastal communities.

The Resilience Dialogues project created training and resources to build practitioners' skills and competencies to facilitate collaborative science.

Aldrich & Herker (1977) *Boundary Spanning Roles and Organization Structure*. The Academy of Management Review 2(2):217-230

Summary Points:

Collaborative science depends on successful boundary spanning, which involves working at the intersections among disciplines, stakeholders, and agencies.

Since 2010, lessons learned on collaborative science in the Reserve system have contributed to building social and ecological resilience in coastal communities where practitioners and decision makers work.

Coastal Training Program coordinators working on collaborative science projects are contributing to the development of boundary spanning practices. This project created training and resources to build the skills of those boundary spanners who link science to decision making.

Resources:

- Boundary spanning at the science–policy interface: the practitioners' perspectives
- Who are boundary spanners and how can we support them in making knowledge more actionable in sustainability fields? Goodrich, K.A., Sjostrom, K.D., Vaughan, C., Nichols, L., Bednarek, A., Lemos, M.C., 2020. Current Opinion in Environmental Sustainability, Advancing the science of actionable knowledge for sustainability 42, 45–51.

Terminology:

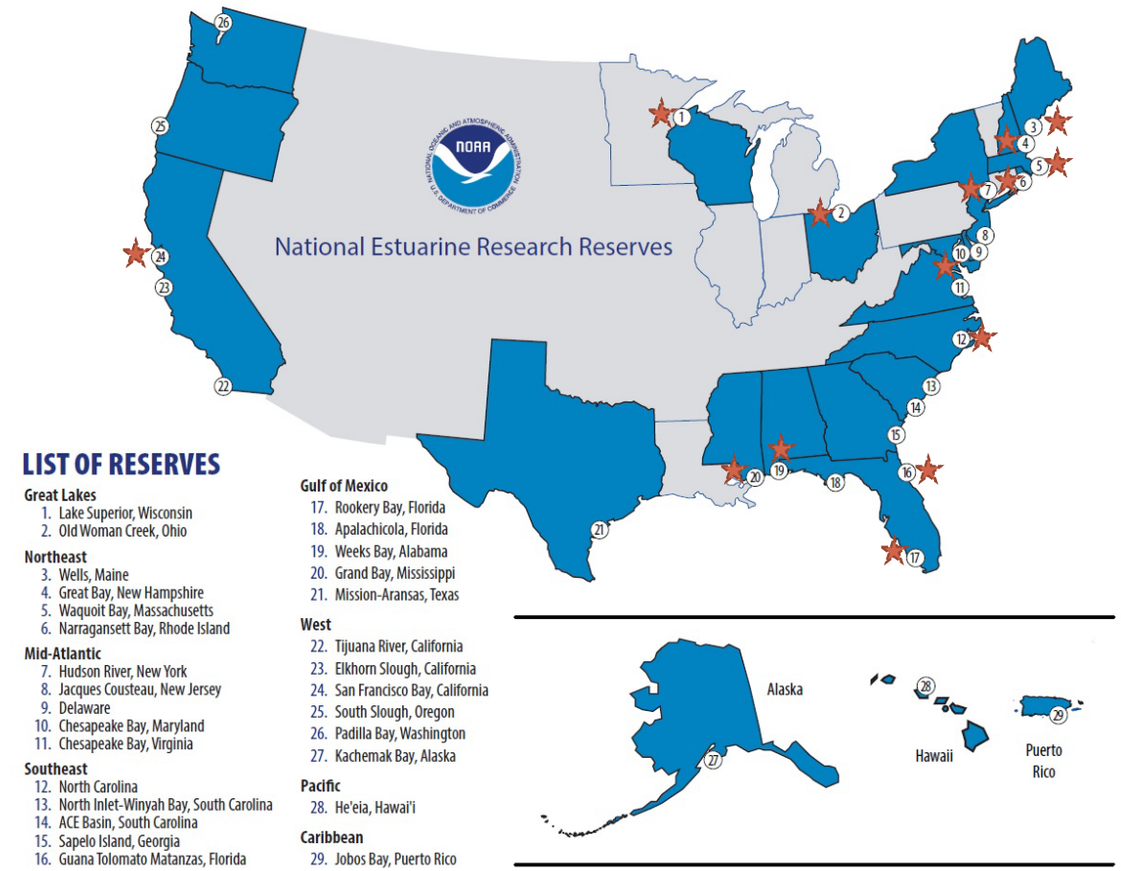
- **Boundary spanning**: A social science term to describe the formation of links between an organization's internal networks and external sources of information.

Resilience Dialogues:

Strategies for Conflict Management in Collaborative Science

October 2017-June 2020

Needs Assessment Facilitates Effective Transfer



National Estuarine Research Reserve System Science Collaborative

Summary Points:

The project started in October 2017 with a preliminary needs assessment. As part of this process, the team asked stakeholders from the reserves what they needed to do their jobs as boundary spanners, and what they could contribute based upon experiences with collaborative science projects.

Additional Notes:

- The red stars on the map shown here indicate reserves that participated in the Resilience Dialogues project.
- The presence of the Science Collaborative logo throughout this presentation indicates good ideas or traits for transferring science.

Terminology

- **Needs assessment**: A systematic process for determining and addressing needs, or "gaps" between current conditions and desired conditions or "wants."

National Estuarine Research Reserve System Science Collaborative

A Need for Transferring Knowledge and Expertise

The Coastal Training Program Coordinators (CTPCs) frequently play the Collaborative Lead role or P. I. in NERRS Science Collaborative projects.

During the past 10 years a group of CTPCs have developed knowledge and expertise specifically geared to the role of Collaborative Lead and P.I.

Recent and expected turn-over of CTPCs as well as CTPCs who have less experience in the Collaborative Lead role identified a need for transfer of knowledge and expertise in the CTP Sector.

Summary Points:

Many roles within the Reserve system are considered boundary spanning, but the Coastal Training Program Coordinators (CTPCs) are particularly focused at the intersection between science and decision making. Through workshops and tech transfer, CTPCs engage with local governments, non-governmental organizations, and state agencies to ensure that research is connected to people who rely on science.

Since 2010, several CTPCs have accumulated a wealth of expertise and lessons learned - in many cases through challenging experiences across multiple projects - by taking on leadership roles as Collaborative Leads or Principal Investigators.

Concerns that this knowledge would be lost when experienced CTPCs retired or changed jobs led to the development of the Resilience Dialogues proposal.

Resources:

- Applicant Resources: Information and tools for developing and managing a collaborative process

The Resilience Dialogues Project Has Three Goals

1. Synthesize conflict related lessons learned in the practice of collaborative science in the NERRS.

2. Increase the capacity of NERRS and others to understand and mediate conflict in their roles as science integrators, project managers and facilitators of collaborative science.

3. Improve collaboration among teams engaged in collaborative science to foster resilience in coastal communities and ecosystems.

Summary Points:

The Resilience Dialogues project set the three goals shown on the slide in order to attain results that contribute to resilience.

Resources:

- The Resilience Dialogues Project (Wells Reserve)

Resilience Dialogues are a key ingredient of Collaborative Science

Summary Points:

Building shared meaning is vital to collaborative processes

Resilience Dialogues are
conversations that occur among

people with diverse perspectives who have

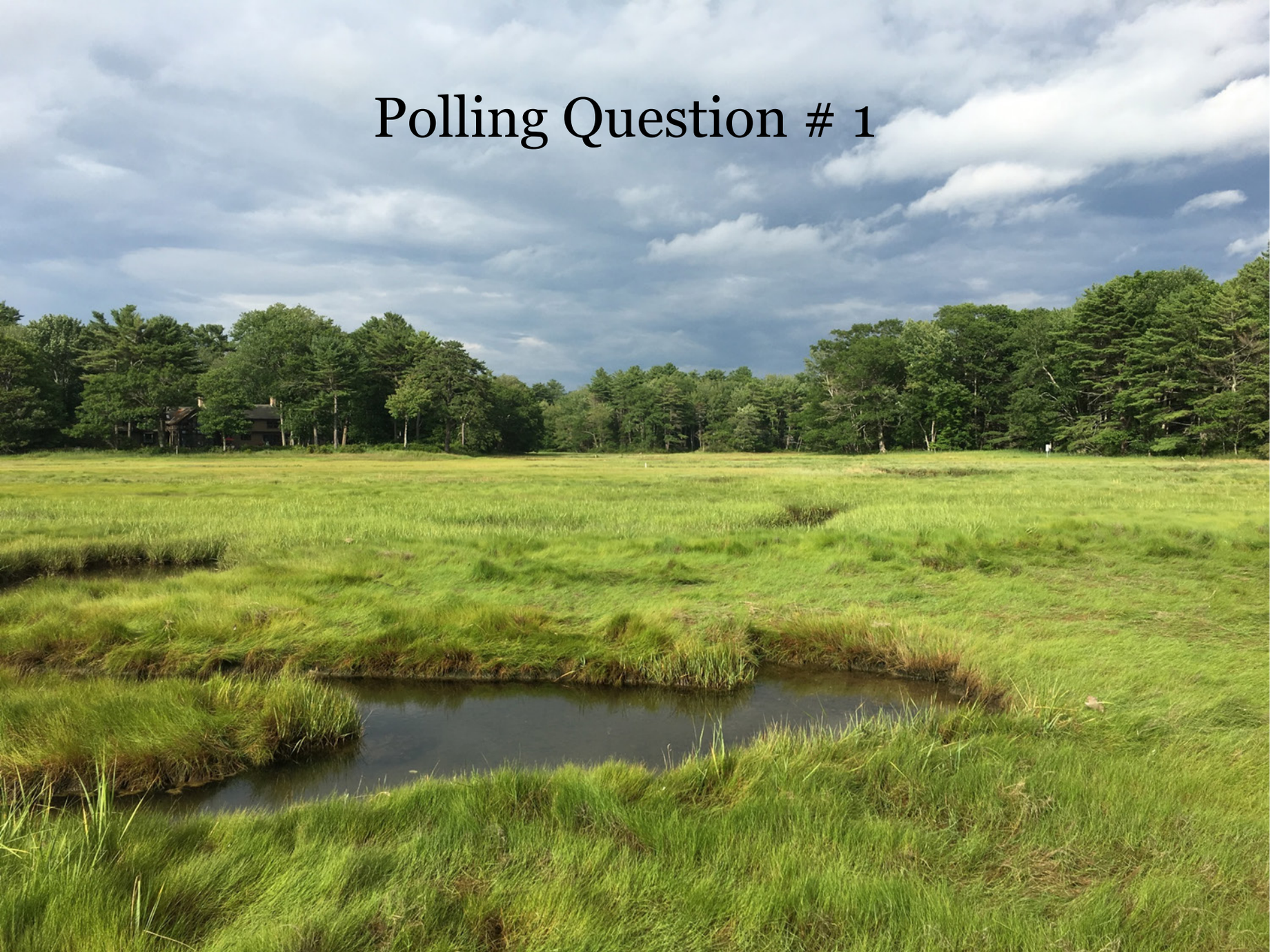
agreed to collaborate to

improve a situation that

contributes to building social and ecological resilience.

Summary Points:

Ahead of the upcoming poll question, Chris asked webinar participants to consider whether aspects of their work relate to Resilience Dialogues. The underlined components from the definition, shown on the slide, represent elements necessary for building shared meaning in collaborative processes.



Summary Points:

Based on the definition of Resilience Dialogues, how would you rate your level of experience?
(One selection)

- I'm interested but have no experience in Resilience Dialogues (**54**%)
- I have been a participant in Resilience Dialogues (**28**%)
- I have designed and/or facilitated a Resilience Dialogue (**18**%)

Resilience Dialogues require activities that reveal diverse meanings and shared goals by:

National Estuarine Research Reserve System Science Collaborative

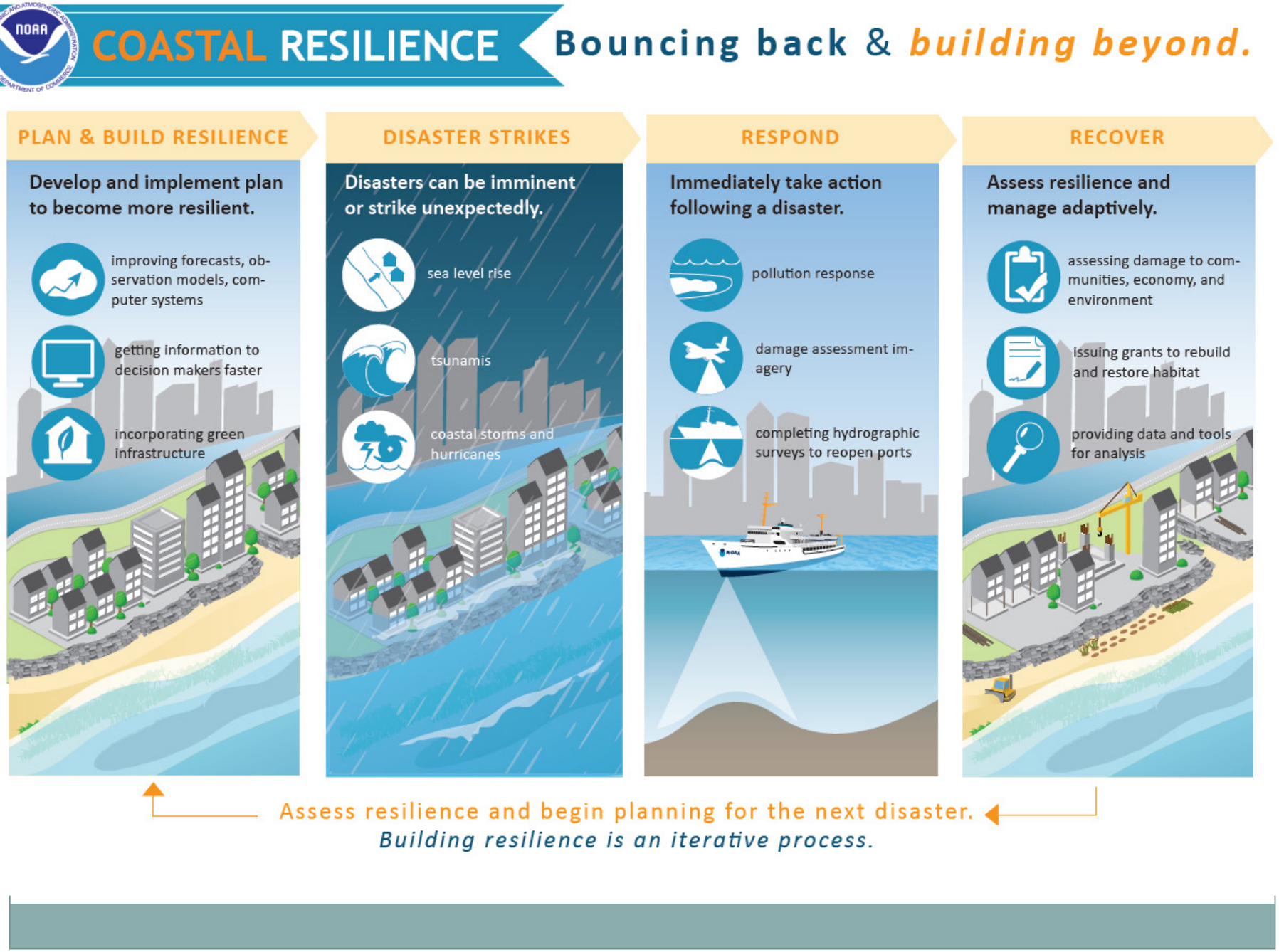
Encouraging individuals to voice ideas and share knowledge

Teaching active listening and skills for respecting the diversity of knowledge and meanings held by others

Goal: Facilitate the development of shared meaning and an understanding of the system

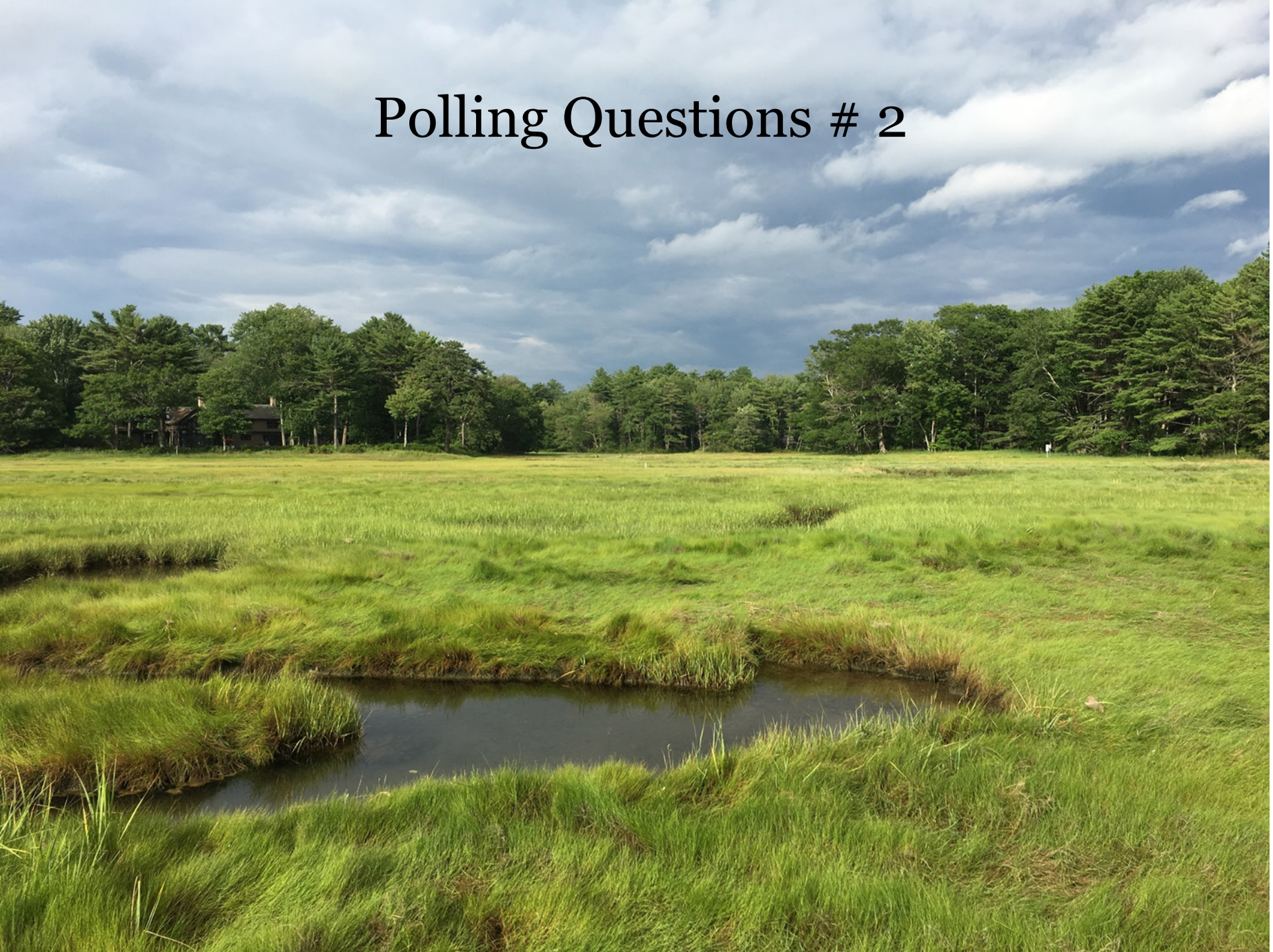
Summary Points:

At a core level, finding shared goals supports project success. Resilience Dialogue activities encourage individuals to voice ideas and share their existing knowledge. Experienced CTP Coordinators helped identify and incorporate activities into training, case studies, best practices, and resources for the project.



Summary Points:

Ahead of the second poll question, Chris asked participants to think about how their work relates to coastal resilience.



Polling Questions # 2

Summary Points:

Which of the following kinds of Resilience Dialogues apply to your work?
(Multiple selections)

- Interdisciplinary teams conducting resilience research (**38**%)
- Interactions with community members to build resilience (**48**%)
- Planning teams of professionals with diverse perspectives (**58**%)
- Other - please enter your response in the chat box (**11**%)

“Other” responses:

- I work on aquatic invasive species
- I work within an agency on a national level team to define resilience for policy purposes
- I staff a regional collaborative

Results of a Needs Assessment

Summary Points:

The first part of the project consisted of a needs assessment to determine where conflicts occurred during collaborative science projects.

Conflict arises during all phases of a collaborative science project

1. The proposal writing phase
2. Implementation of the project
3. During stakeholder engagement
4. In the final stages of the project when dissemination to end users is critical

Summary Points:

The team determined that conflicts arose during all phases of a collaborative science project.

Three kinds of conflict occur in NERRS Collaborative Science

1. Within team conflict
2. Conflict related to stakeholders/end users
3. Project management conflict

Summary Points:

The types of conflicts fell into three major categories. Examples within each type of conflict are shown on the next three slides.

Within Team Conflict

- Language barriers and differences in perspective
- Perceptions of two way communication from end users to researchers, not viewed as important by researchers as they are by Collaborative Lead
- Team member not meeting project management expectations, deliverables, timeliness

Summary Points:

Note: The highlighted examples are featured in this presentation. Training and resources address each of the sources of conflict on the slides.

End User/Stakeholder Conflict

- Conflict between goals and motivations of academic researchers and CTP concerns for end user or stakeholder readiness, involvement and expectations.
- Over-promising what can be realistically achieved.
- Concern for Reserve's reputation when a project does not meet objectives and end users are disappointed.

Summary Points:

Note: The highlighted examples are featured in this presentation. Training and resources address each of the sources of conflict on the slides.

Project Management Conflict

- Traditional Role of “P.I” is not the same as Collaborative Project Management
- Conflict arising from the Collaborative Lead role on a project: budgeting, knowledge, commitment.
- Mismatch in timing between a university research calendar and the realities of time commitment required for stakeholder engagement.

Summary Points:

Note: The highlighted examples are featured in this presentation. Training and resources address each of the sources of conflict on the slides.

Four Best Practices for Designing and Facilitating Collaborative Science

National Estuarine Research Reserve System Science Collaborative

1. Adapt the Collaborative Learning approach to provide the boundary spanning methodology for collaborative science
2. Assess the social-ecological system where the project is embedded
3. Develop a common language among interdisciplinary teams including local knowledge
4. Reveal and use mental and cultural models knowledge to develop shared meaning, manage conflict and track progress

Summary Points:

The team extracted four best practices for designing and facilitating collaborative science projects. In the next four slides, examples of each of the best practices listed here will be provided.

Resources:

- The Full Workbook for Collaborative Learning for Resilience Dialogues Training

Adapt the Collaborative Learning approach to provide the boundary spanning methodology for collaborative science

https://www.dealislandpeninsulaproject.org/community-conversations

Summary Points:

Best Practice: Adapt the Collaborative Learning approach to provide the boundary spanning methodology for collaborative science.

The Deal Island Peninsula Project is an ongoing partnership among the Chesapeake Bay-MD Reserve, Maryland Department of Natural Resources, and University of Maryland Anthropology Department. The partnership's goal is to "reduce the vulnerabilities of the Deal Island Peninsula area to the impacts of flooding, erosion, storm surge, changing sea levels, and social changes by creating partnerships among communities, government decision-makers and staff, researchers, and NGO representatives through a collaborative science and collaborative learning approach."

This case study exemplifies the diverse ways the Collaborative Learning approach can be adapted to foster Resilience Dialogues in collaborative science.

What is Collaborative Learning?

Working Through Environmental Conflict, The Collaborative Learning Approach

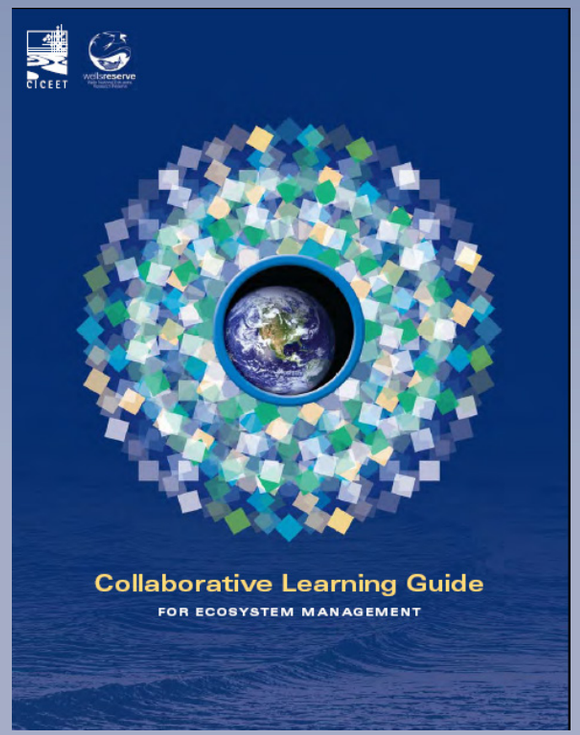
By Steven E. Daniels and Gregg B. Walker (2001)

"A framework and set of techniques intended for multiparty decision situations… A means of designing and implementing a series of events to promote:

Creative thought,

Constructive debate and the

Effective implementation of proposals that the stakeholders generate."



Theoretical Grounding:
Systems Thinking,
Conflict Resolution,
Adult Learning

Practitioners guide
Case Study from Wells NERR including cultural models

Summary Points:

Collaborative Learning is based on three theories: systems theory, conflict theory, and adult learning.

Based on the framework developed by Gregg Walker and Steven Daniels in 2001, Collaborative Learning is a practical approach that leverages sound social science based on bringing diverse stakeholders together. Wells Reserve has used this approach in their projects since the early 2000s.

The goals of collaborative learning are constructive debate and effective implementation of proposals generated by stakeholders.

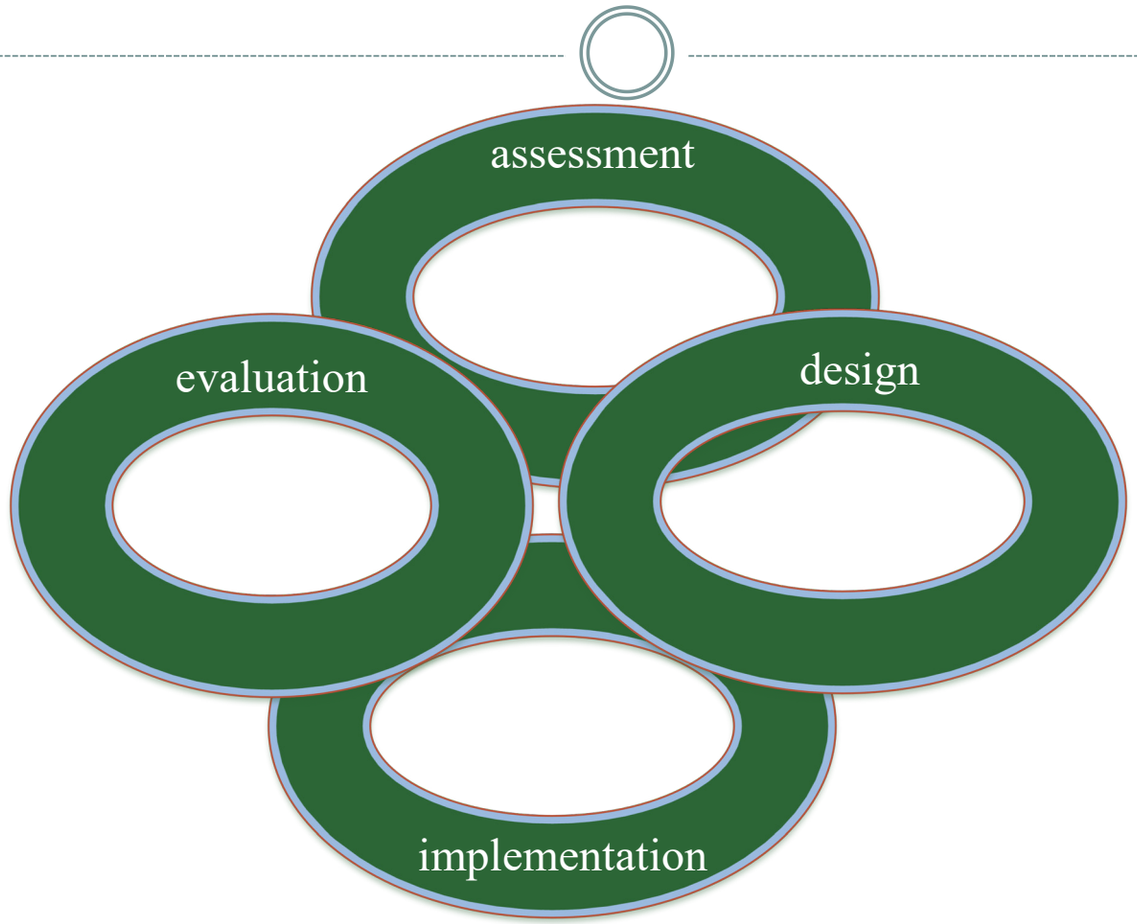
Resources:

- Collaborative Learning Guide for Ecosystem Management

Terminology:

- **Complex Systems Theory**: An approach to science that investigates how relationships between a system's parts give rise to its collective behaviors and how the system interacts and forms relationships with its environment (Bar-Yam, 2002).
- **Conflict Theories**: A collection of theories focused on competition between societal groups over limited resources.
- **Adult Learning**: The concept or study of how adults learn and how it differs from the ways children learn (LearnUpon).

Collaborative Learning is a Four Phase Process



Summary Points:

Collaborative learning is a four-phase iterative process that involves pre-project assessments, project design, implementation, and evaluation:

- **Assessments** are completed before a project is implemented to identify stakeholders, their concerns, and potential sources of conflict.
- **Design** involves selecting the most important methods for engaging stakeholders during the collaborative science project. The Deal Island example below demonstrates the diversity of ways collaborative learning events can be designed.
- **Implementation** is the execution of the event, during which participants share knowledge and expertise, and co-produce new knowledge and insights.
- **Evaluation** occurs throughout the project to maintain alignment with project goals and stakeholder priorities.

Example: With Deal Island, the project team implemented a diversified collaborative learning approach to address land erosion of salt marshes. One such strategy involved engaging the Deal Island community in collaborative research which, over time, led to a collection of collaborative learning strategies that engaged researchers, resource managers and the Deal Island community in workshops, collaborative research projects and themed community conversations.

The Social Contract of Collaborative Learning

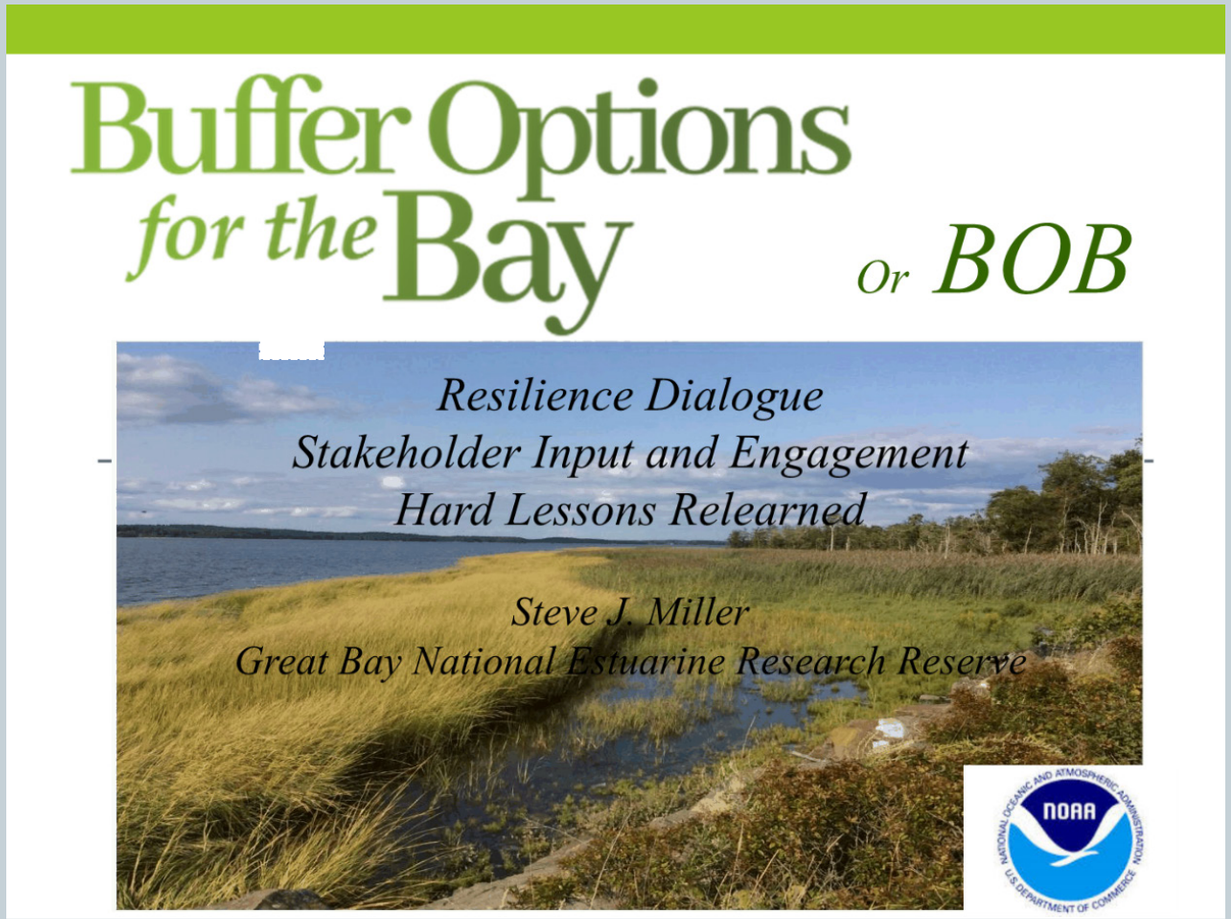
1. Safe space to share ideas
2. Based on a solid assessment
3. Respect expertise in the room
4. Learn by doing with self reflection
5. Iterative process
6. Mindful of adult learning principles
7. Aims to make progress on a situation

Summary Points:

An additional consideration about the Social Contract of Collaborative Learning: consensus is not necessarily the goal; rather the goal is to agree to improve a situation in order to foster resilience.

The collaborative learning process is described in the Collaborative Learning Guide for Ecosystem Management and The Resilience Dialogues Collaborative Learning Resources Participant Workbook.

Assess the social-ecological system where the project is embedded



Summary Points:

Best Practice: Assess the social-ecological system where the project is embedded.

In Great Bay, New Hampshire, stakeholders, government agencies, and researchers have been working to reduce nitrogen to a manageable level.

The Buffer Options for the Bay project followed a series of collaborative projects in the region. The project team began with a community assessment involving interviews, focus groups, and meetings with decision makers who were either regulators or had control of buffers on their own property. The assessment information drove the development of "how-to" guides for stakeholders on working with landowners to protect buffers and work with regulations.

Resources:

- Community Assessment summarizing the local factors influencing buffer-related decision-making in four communities

Develop a common language among interdisciplinary teams including local knowledge

Summary Points:

Best Practice: Develop a common language among interdisciplinary teams including local knowledge.

This example involves the Hudson River Reserve's work on addressing hardened shorelines and sea level rise. The Hudson River Sustainble Shorelines Project involved engineers, municipal officials, state officials, and researchers. As such, project collaborators encountered challenges in the form of discipline-specific language that did not necessarily translate between team members.

To address this challenge, Hudson River Reserve Coastal Training Program Coordinator Emilie Hauser produced a Terminology Guide with scientific citations to assist in the development of a shared language among collaborators.

Reveal and use mental and cultural models knowledge to develop shared meaning, manage conflict and track progress

Summary Points:

Best Practice: Reveal and use mental and cultural model knowledge to develop shared meaning, manage conflict, and track progress.

A project titled *Protecting Our Children's Water*, which brought together watershed management practitioners and diverse stakeholders, combined cultural models knowledge with the Collaborative Learning approach to develop action strategies for watershed protection in Maine.

Resources:

- Cultural Models - A Tool for Enhancing Communication and Collaboration in Coastal Resources Management: A Primer for Coastal Training Program Coordinators in National Estuarine Research Reserves
- Collaborative Learning Guide for Ecosystem Management
- Situation Map Activity for revealing mental and cultural models

Mental & Cultural Models Defined

Mental models are a simplified representation of the world used by people to *interpret observations, infer from what is known to unknown and solve problems.*

Mental models that are shared within a culture or social group are cultural models. People organize their culture's beliefs and values with cultural models.

(Kempton, et al., 1995, emphasis added)

Cultural models are shared perceptions and attitudes about how the world works. They are implicit, taken for granted and operate below the level of consciousness.

(Holland and Quinn, 1987; Strauss & Quinn, 1997)

Summary Points:

Our mental and cultural models can get us into trouble

It ain't what you don't know that gets you into trouble.

It's what you know for sure that just ain't so.

Mark Twain

Summary Points:

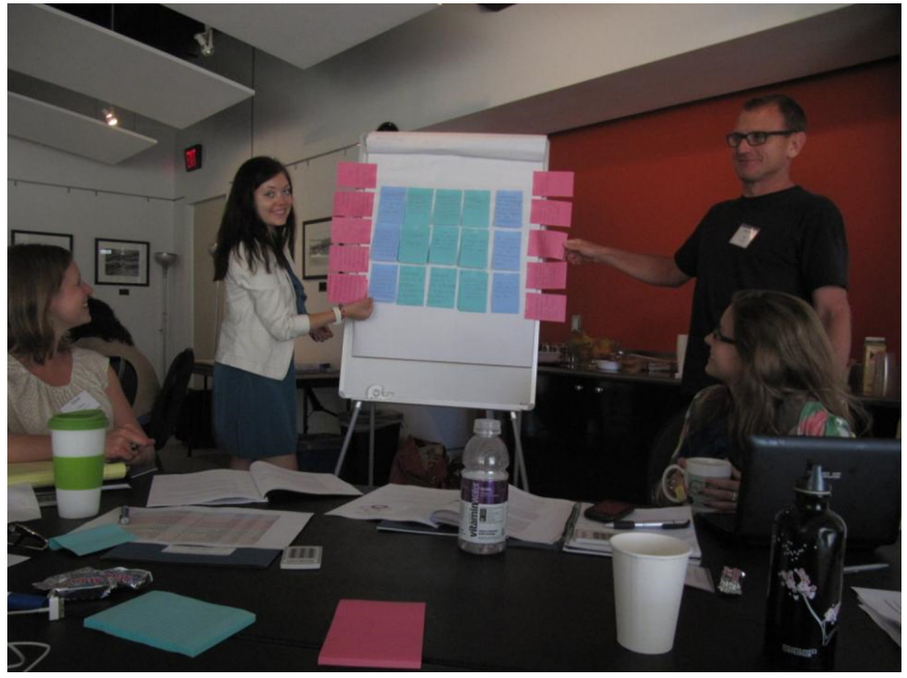
In conversations among stakeholder groups, mental and cultural models can become common causes of conflict when people think they know what others are thinking.

A key aspect of success in conflict management is taking steps to actually understand what other people are thinking, as opposed to drawing an inference that may be incorrect or partially correct.

Knowledge of mental and cultural models contributes to understanding of diverse perspectives

National Estuarine Research Reserve System Science Collaborative

The dialogue during the creation of the "situation map" reveals that cultural and mental models build shared meaning and systems understanding



Summary Points:

Resilience Dialogues training includes a situation map activity designed to be used with stakeholders. That activity is included in the Training Workbook and the resource below.

Resources:

- Facilitated activity to reveal mental and cultural models

Key "Take-a-Ways" for Today's Webinar

***Resilience Dialogues* project best practices**

- Adapt the Collaborative Learning approach to provide the boundary spanning methodology for collaborative science.
- Assess the social-ecological system where the project is embedded.
- Develop a common language among interdisciplinary teams including local knowledge.
- Reveal and use mental and cultural models knowledge to develop shared meaning, manage conflict and track progress.

Key factors contributing to success in a Collaborative Science *Transfer* projects

- Needs Assessment begins during the proposal writing phase.
- The impact of Collaborative Science depends upon successful Boundary Spanning.
- Stakeholders collaborate to develop clear, practical, measurable goals linked to impact.
- Boundary spanning activities that build shared meaning are vital to collaborative science.

Summary Points:

Resources for Resilience Dialogues

Resilience Dialogues Trainings (4 best practices modules; workbook; agenda; worksheets)

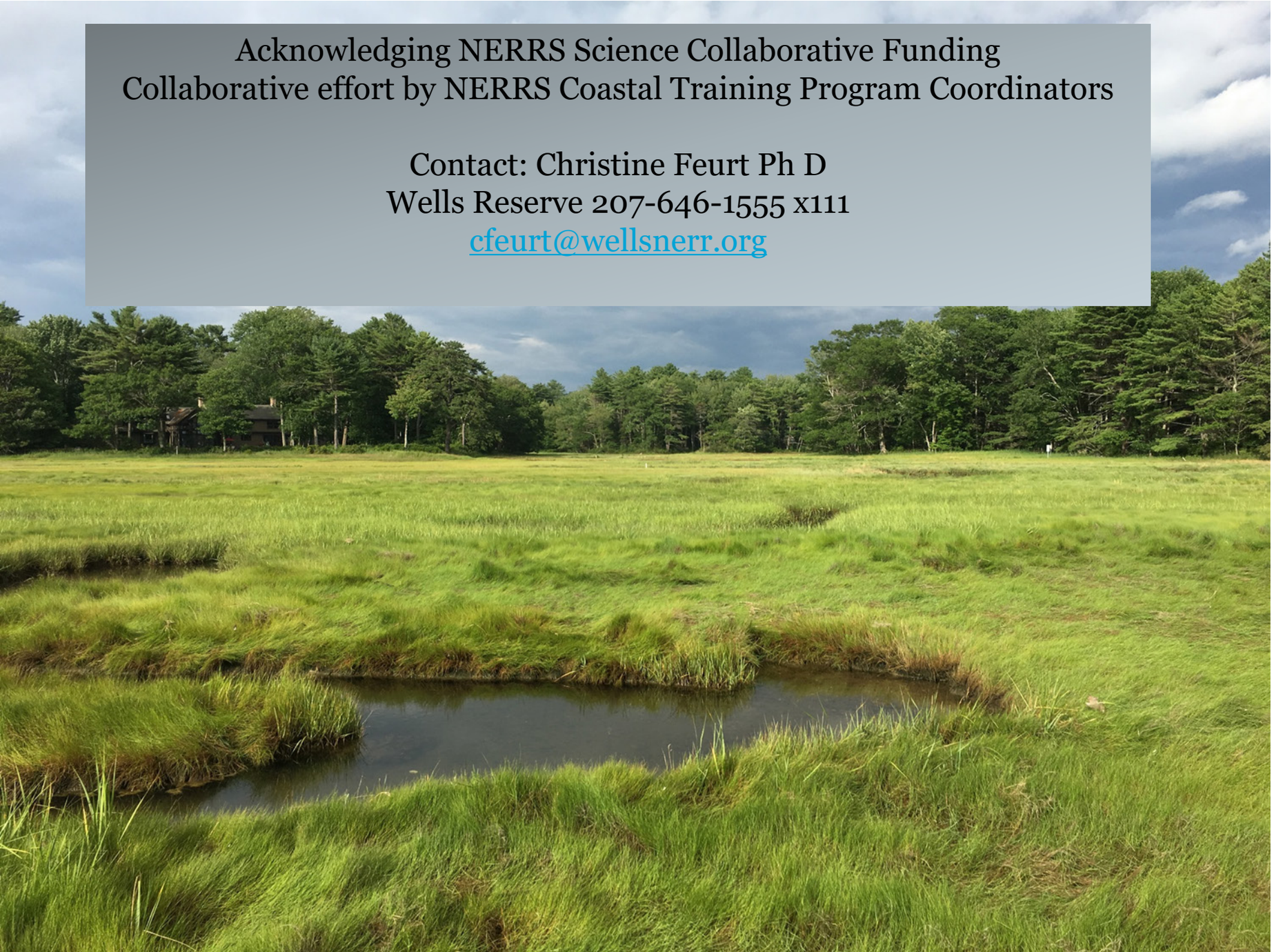
Case Studies illustrating best practices

Crucial Conversations (Vital Smarts certified training through the NERRS)

“Clickable Links” - Resources for collaboration, stakeholder engagement, conflict management

Summary Points:

Resources on Collaborative Learning and Cultural Modules available summer 2020 from the Science Collaborative project page and the Wells Reserve Resilience Dialogues page.



Acknowledging NERRS Science Collaborative Funding
Collaborative effort by NERRS Coastal Training Program Coordinators

Contact: Christine Feurt Ph D
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Summary Points:

Q&A

Use the “Questions” function in the GoToWebinar console

Chris Feurt

Director, Coastal Training Program

Wells National Estuarine Research Reserve, ME

Questions:

Do you have any resources for where there are language barriers within the team?

- **A:** Most of my experience has been with language barriers between disciplines, but I would advise that people use resources such as Emilie Hauser’s terminology guide. People should also be attentive and call each other on terms they don’t understand. In general, identify that there are barriers. When we train teams on collaborative science and boundary spanning, we spend some time practicing interviews and making sure that people are able to establish a culture that allows them to feel comfortable asking questions.

How does this apply to working with Tribal Nations?

- **A**: We do have some reserves that have done research projects with Tribal Nations. A colleague working with tribes in the western states has described differences in both language and pace at which people work. One of the reasons I like the cultural models aspect so much is that it’s based in anthropology and acknowledges differences in culture. The Deal Island project provides some examples of diverse cultural perspectives.

Q&A

Use the “Questions” function in the GoToWebinar console

Chris Feurt

Director, Coastal Training Program

Wells National Estuarine Research Reserve, ME

National Estuarine Research Reserve System Science Collaborative

Questions:

You mentioned that stakeholders in this process have typically agreed to participate. Do you have any tips for people who have been told to participate?

- **A**: One of the first activities we always do is establish a connection between the person’s work and the goals of the project. Make an effort to make the collaborative learning activities fun - and providing free food is always helpful.

What was most surprising to you in doing a deep dive into processes and potential conflicts?

- **A**: During the needs assessment, we were surprised to hear that the conflicts we encountered in Maine were commonly occurring in other locations across the country as well. Increasingly, team science is interdisciplinary and involves large groups, so we anticipate that these common sources of conflict will reappear as more projects adopt interdisciplinary approaches. An additional resource that may be of interest: Enhancing the Effectiveness of Team Science (National Academies)

How can Collaborative Leads best address mismatches between the pace of planning and stakeholder time commitments?

- **A**: We sometimes call this the “stakeholder burnout” question. Sometimes it’s just a matter of making sure you have enough people so that you aren’t always going to the same person for everything. In some rare cases, it can also be helpful to compensate stakeholders who may be missing work to participate in focus groups.

Thank you for joining us

Please complete the short survey at the end of the webinar, and be on the lookout for the webinar brief!

Chris Feurt

Director, Coastal Training Program
Wells National Estuarine Research Reserve, ME

Research Associate, Department of Environmental Sciences
University of New England, ME

National Estuarine
Research Reserve System
Science Collaborative

Questions:

Have you ever encountered conflicts with intellectual property when working with groups of academics?

- **A**: I never have, but of course that could be a very common problem. As intellectual property is one of the most important aspcts of academic research, the research has to be designed in a way that respects intellectual property but still engages stakeholders.

Do you have any tips for working and building dialogues with people who may have learning disabilities?

- **A**: This goes along with the principles of adult learning in general. Doing a needs assessment helps you understand, before you get a group in the room, how you may need to design around different styles of learning. This can include field trips too - collaborative learning doesn't have to be confined to a room.

How do you respect stakeholders while also "researching" them?

- **A:** That's a very basic tenet of social science. When you're trained as a social scientist, one of the first things you learn is to respect the people you're working with. There are very strict protocols (Institutional Review Board) that social science researchers must follow to make sure they aren't violating the rights of any potential subjects. An additional resource: University of New England Policies, Procedures and Guidance on Research with Human Subjects.