# WHAT MAKES ENGAGEMENT MEANINGFUL?

## INSIGHTS FROM THE NERRS AND ITS PARTNERS

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National Estuarine
Research Reserve System
Science Collaborative

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**About this report:**

This study was conducted under the invitation and guidance of the National Estuarine Research Reserve System (NERRS) Science Collaborative. More details about this study, including an extended report can be found here: https://deepblue.lib.umich.edu/handle/2027.42/194317

**About the Science Collaborative**

The National Estuarine Research Reserve System's Science Collaborative supports collaborative research that addresses coastal management problems important to the reserves. The Science Collaborative is managed by the University of Michigan Water Center through a cooperative agreement with the National Oceanic and Atmospheric Administration (NOAA). Funding for the research reserves and this program comes from NOAA.

To learn more about the National Estuarine Research Reserve System, visit: https://coast.noaa.gov/nerrs/

To learn more about the Science Collaborative, visit:

https://nerrssciencecollaborative.org/

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Top: Workshop at Wells NERR, Maine, during the NERRS-NERRA Fall Meeting, 2024. *Photo credit: Christopher Peter.* Bottom left: Fieldwork at Mission Aransas NERR, Texas. *Photo credit: Jace Tunnell.* Bottom right: Networking session at the St. Louis River Summit, Superior, Wisconsin, 2025. *Photo credit: Michael Anderson.*

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National Estuarine Research Reserve System Science Collaborative

# REPORT SUMMARY

The engagement, and in particular meaningful engagement, of partners is considered key to the effective practice of collaborative science. While many practitioners of collaborative science recognize that engaging meaningfully with project participants is at the heart of effective collaboration, it's not always easy to define what meaningful engagement is, and what it means in practice.

Existing literature on meaningful engagement seldom covers the processes that enable and constrain it. Further, there is a lack of guidance on how to assess whether engagement activities have been meaningful or not. Ambiguity about what meaningful engagement is, and how it is carried out, can limit practice.

The lack of practical and evidence-based guidance has prompted the NERRS Science Collaborative to examine the defining features of meaningful engagement in a deeper and more systematic manner. Insights on meaningful engagement were collected from people and partners affiliated with the NERRS. While the specifics of what meaningful engagement looks like and how to achieve it vary from project to project, the findings of this study reveal remarkably consistent themes for what tends to make engagement meaningful.

This report describes what the Science Collaborative has learned about engaging meaningfully with partners during collaborative science. While the findings and framework shared in this report are primarily intended to offer guidance to collaborative project teams within the NERRS, this work has broader applications and uses in collaborative or co-produced science beyond the NERRS. A better understanding of what makes engagement meaningful will help project teams and their partners collaborate more effectively and meaningfully over time.

# INTRODUCTION

Collaborative science is a knowledge co-creation process that is practiced by the National Estuarine Research Reserve System (NERRS). The collaborative science approach involves scientists, resource managers, communities, businesses, and others working together to pursue scientific research of mutual interest. It draws upon the special knowledge that each participant brings in order to inform the research questions, scientific approach, and the products that are developed. Collaborative science can advance understanding of coastal health and resilience in a more robust and comprehensive manner than anyone working alone could accomplish.

The National Estuarine Research Reserve System (NERRS) Science Collaborative manages a national competitive research program that supports collaborative science projects addressing critical coastal management needs. The Science Collaborative recognizes that the meaningful engagement of all participants is essential to the success of the projects it funds.

Over the years, meaningful engagement has been a frequent topic of discussion among project teams funded by the Science Collaborative. Conversations with project teams have underscored that, when present, meaningful engagement often leads to the emergence of long-lasting partnerships and more impactful outcomes. However, the Science Collaborative has also received repeated requests from project teams and their partners for additional guidance on what meaningful engagement looks like within a collaborative science context and, moreover, how it might be fostered.

Existing literature on meaningful engagement seldom covers the processes that enable and constrain it within a research setting. Further, there is little guidance on how to assess whether engagement activities have been meaningful or not. This ambiguity about what meaningful engagement is, and how it is best carried out, can limit its practice in collaborative science. Without a shared understanding of the basic principles of engagement and what makes it meaningful, the phrase *meaningful engagement* risks becoming little more than a buzzword. A lack of shared understanding of the concept can also lead practitioners to overlook or undervalue the kinds of efforts and activities that enable meaningful engagement.

## WHAT IS MEANINGFUL ENGAGEMENT?

It goes without saying that meaningful engagement is engagement that is meaningful. However, this tautology only goes so far in informing practice at the Science Collaborative. Nor is it helpful to other entities aspiring to host a productive collaborative process.

In the context of collaborative science projects, the Science Collaborative understands engagement to be the sum of interactions and relationships that may occur among project participants—whether team members, intended users of research outputs or other participants. Engagement is not one thing but rather a web of practices, behaviors, and relationships among all who are part of a project. It is also not bound by funding timelines—it is something that may occur before, after, and during a collaborative science project.

To examine the defining features of meaningful engagement in a deeper and more systematic manner, the Science Collaborative turned to the NERRS. Project teams and their partners across the NERRS represent a unique pool from which to draw potential insights about meaningful engagement because collaboration and engagement is core to the NERRS culture and management approach. To produce this report, the Science Collaborative explored meaningful engagement within the NERRS using three methods: **interviews** with project leaders, **virtual workshops and webinars** with individuals affiliated with NERRS programming, and an **online survey** with project participants (see Appendix A: Learning Methods).

The findings of this study revealed that there are often signs that can be plainly observed when participants are meaningfully engaged. Knowing these tell-tale signs can help project leaders determine whether or not meaningful engagement is occurring. The study's findings also demonstrated remarkably consistent themes for what tends to make engagement meaningful. Engagement is more likely to be meaningful when people feel respected and heard; their knowledge and interests are understood; they have agency in, and clarity about, the process, its objectives, and their role in it; they feel a sense of purpose; and they are able to foster genuine connection with others. These qualities define the essence of meaningful engagement.

## USING THIS REPORT

This report describes what the Science Collaborative has learned about engaging meaningfully with partners during collaborative science. A better understanding of what makes engagement meaningful will help project teams and their partners collaborate more effectively and meaningfully over time. While the findings and framework shared in this report are primarily intended to offer guidance to collaborative project teams within the NERRS, this work has broader applications and uses in collaborative or co-produced science beyond the NERRS.

This report is organized into two parts:

- **Part 1 presents the study's findings**, including findings about what meaningful engagement looks like and what factors make engagement meaningful.
- **Part 2 of the report covers implications** of study findings for collaborative science projects. It provides a simple framework for advancing meaningful engagement, and concludes with an overview of practical recommendations for project teams derived from the findings.

## A NOTE ON LANGUAGE

Projects funded by the Science Collaborative typically involve two core groups of people: the ***project team*** and ***intended users***.

***Project teams*** consist of people who are responsible for managing and coordinating project logistics. This might include individuals fulfilling roles such as principal investigator, technical lead, or collaborative lead.

***Intended users*** are people who intend to use the project's final outputs. Examples of intended users include, but are not limited to, reserve staff, public, private, or nongovernmental decision/policy makers, Indigenous governments, landowners, regulators, resource managers, land use planners, leaders of impacted communities, or educators at all levels.

Not all projects have a strict delineation between the project team and intended users. For example, in some projects, intended users of the research may be part of the project team. For the purposes of this report, the phrase ***project team*** is used in a narrow sense to refer primarily to individuals who are responsible for managing and coordinating the logistics of a project and its process. The phrase ***project participants*** (or simply ***participants***) is used to refer to intended users and others who contribute ideas and knowledge to the process.

Because certain sections of this report discuss engagement beyond project timeframes (i.e., before or after a project) the word ***partner*** instead of ***project participant*** is used, when appropriate, to refer to ongoing working relationships that occur outside of projects.

Direct quotes from individuals who participated in an interview, webinar, or workshop have been used throughout this report to bring the concept of meaningful engagement to life. All quotes are used anonymously and are enclosed by quotation marks.


Sign at Great Bay NERR. *Photo credit: Beth Heckman.*

# PART 1: FINDINGS ABOUT MEANINGFUL ENGAGEMENT

## WHAT DOES MEANINGFUL ENGAGEMENT LOOK LIKE?

How do you know if meaningful engagement is actually being achieved? What is the evidence? While later sections of this report describe the specific factors that help or hinder achievement of meaningful engagement in collaborative science, this section is a brief summary of what meaningful engagement looks like when it is happening.

Given that engagement is not a one time event, but rather a set of ongoing processes and behaviors that contribute to relationships, meaningful engagement will look different at different times. There is no single indicator that can confirm that engagement has been meaningful. Still, there are often signs that can be plainly observed when participants are meaningfully engaged.

Throughout this study, experienced practitioners of collaborative science, including project leads and project participants, were asked what they look for to gauge whether people are meaningfully engaged. In other words, what are the tell-tale signs? Practitioners offered wide-ranging responses that can be clustered into three distinct categories: expressions of emotion; specific interpersonal behaviors; and clear interactions with the project's substance.

Jasmine Maurer shows a sunflower star from a crab trap in Kasitsna Bay, Alaska during a collaborative science project 2023. *Photo credit: J.Argueta 2023.*

The tell-tale signs that the Science Collaborative most frequently heard from those interviewed or polled are summarized below.

Direct quotes from individuals who participated in an interview, webinar, or workshop have been used to bring these signs to life. All direct quotes are enclosed by quotation marks.

## Expressions of emotion

- **Interest:** Participants are interested, curious, and "happy to hear from [the project team]." They are excited to be involved in the project.
- **Enjoyment:** Participants are enjoying themselves. They are smiling, laughing, or having fun. They "light up" and are enthusiastic.
- **Investment:** Participants are emotionally invested, indicating they care deeply. They may share strong emotions, including emotions that might be cast as negative, such as anger or frustration.

## Interpersonal behavior

- **Responsiveness:** Participants seem eager to engage. There is no need to "chase anybody" to follow-up. Some participants might show up early or "linger after meetings."
- **Attention:** Participants are attentive and present during engagement. They are listening to each other, responding, and reacting in the present time. They are fully immersed in project activities.
- **Communication:** There is lively, animated, and engaged conversation among participants. Some participants might "stick around after a meeting because they want to keep talking."
- **Connection:** Participants work easily and comfortably with each other. Participants are able to "put their guard down." Strong working relationships or friendships emerge.
- **Sustained engagement:** There is continued or repeated involvement from participants. They consistently show up to project meetings, gatherings, and events. They stay engaged.

## Interaction with project substance

- **Curiosity:** Participants ask insightful questions or generate spinoff ideas. Participants explore new and unanticipated project directions. The project takes on a life of its own.
- **Transformation:** Participants adopt new perspectives. The project "has obviously been on their minds" and participants are "recollecting the experience or referring to it."
- **Use:** Participants use project outcomes or seek more information. Participants apply learning outside the project (e.g., to other tasks or their job).
- **Diffusion:** Participants are discussing the project with others, expanding their collaborative network. Impacts are evident beyond the immediate scope of the project.

# WHAT FACTORS INFLUENCE MEANINGFUL ENGAGEMENT?

To get beyond the buzzword, the Science Collaborative sought to unpack the term ***meaningful engagement*** further. Specifically, what factors help or hinder achievement of meaningful engagement in collaborative science? Uncovering these factors can promote a shared understanding of the concept and help identify the processes that enable meaningful engagement.

The Science Collaborative asked practitioners of collaborative science to reflect on what facilitates or constrains achievement of meaningful engagement in collaborative science. Their reflections spoke to the ways that engagement is more likely to feel meaningful when people feel respected and heard; their knowledge and interests are understood; they have agency in, and clarity about, the process, its objectives, and their role in it; they feel a sense of purpose; and they are able to foster genuine connection with others.

From these answers, the Science Collaborative derived factors that influence whether engagement is experienced as meaningful. These factors can be categorized into four broad themes:

1. How participants are treated;
2. The value of the project, process, or interaction to participants;
3. Patterns of communication or group dynamics; and
4. Context, circumstances, and institutional norms.

The following sections detail these themes in greater depth by examining the factors that influence whether engagement in a collaborative science project is meaningful for participants.

Paddling in the York Watershed System with Friends of the Dragon Run, 2023. *Photo credit: CBNERR-VA .*

# 1. How participants feel treated

Project leads and participants interviewed for this study consistently shared that one of the most important determinants of meaningful engagement is how people feel treated. When people feel treated well by project leaders and other project participants, their engagement is more likely to be meaningful. The inverse also holds true: engagement is unlikely to be meaningful if people feel poorly treated. The most commonly observed factors contributing to how people feel treated are summarized below.

*NOTE: A reminder that all text enclosed in quotation marks here, and in the report as a whole, are direct quotes from interviews with project leaders, virtual workshops and webinars with individuals affiliated with NERRS programming, or an online survey with project participants.*

## Facilitating factors

### Sincerity

***"People want to feel valued, and part of a team. Not just like someone that you have to check a box and involve in some way."***

Engagement that occurs on "genuine terms" helps it to be meaningful. Project participants value knowing that those they are engaging with share an authentic commitment to collaboration and have their best interests in mind.

### Respect

***"A genuine respect and care for the people that you are working with really underpins the most successful engagement."***

Engagement is more meaningful when project participants feel respected, valued, appreciated, and treated with dignity by others. Expressing respect and gratitude for participant contributions, participants' different ways of knowing, and their time is particularly important.

### Feeling heard

***Meaningful engagement is "feeling like I was truly listened to."***

Participants value knowing that their opinions and priorities are heard, considered, and understood by those they're engaging with. For many participants, meaningful engagement involves "being seen," and having their "voice heard."

### Care

***"[Participant] ideas are not going to be ridiculed. [Participants are] going to feel comfortable and taken care of."***

Meaningful engagement is characterized by a sense of care, comfort, and security. Engagement is more meaningful when it allows people to "be real" and "put their guards down" by creating a "safe space for contributions."

## Constraining factors

### Not feeling heard

***"There's nothing more frustrating than somebody who asks for [your] feedback and [but you get] the sense that they don't care."***

Feeling ignored, misunderstood, or like people are "talking past each other" can undermine meaningful engagement. Engagement won't be as meaningful if participants' priorities or contributions aren't taken seriously, for example when a participant shares about something that "is important to [them] but the project team doesn't really incorporate that into what they are doing."

### Dismissiveness

***Engagement is less meaningful when participants feel others "don't have time for" them.***

It is challenging for participants to engage meaningfully when they feel excluded, dismissed, or irrelevant to the discussion. Meaningful engagement may be undermined if researchers are just "trying to get their science done," or when they come into an interaction "with an agenda."

### Insincerity

***Make sure that "when you say you want [participants'] input, you actually want their input."***

Engagement that feels "fake," "shallow," "superficial," "inauthentic," "pro forma" or like "a token effort" is not meaningful for participants. Meaningful engagement may be undermined if researchers are just "trying to say all the right things" or if there are ulterior motives involved. Engagement is less meaningful when there is no "follow-through" by others.

Field sampling at Guana River Estuary, FL during a collaborative science project. *Photo credit: Tyler Jones.*

## 2. The value derived from the project, process, or interaction

Participants are most meaningfully engaged when they find the project and its process to be valuable in some way. Summarized plainly by a reserve staff member: engagement is more meaningful when "everyone has fun and takes away something." What exactly project participants value "taking away" from engagement may vary widely.

### Facilitating factors

#### Mutual benefit

***"If a community is giving you something like their knowledge [or] their experience, what are you giving back to them?"***

Engagement that provides benefit to all involved enhances how people feel about the process. Project participants shared that engagement is meaningful "when both sides get something out of it or when engagement "benefits all partners in some way." A sense of reciprocity among all involved usually characterizes meaningful engagement.

#### Learning and shared understanding

***Engagement is meaningful when it "makes me think."***

Participants often value learning from others, gaining new perspectives, developing new skills, or acquiring usable knowledge. Shared learning often leads to "finding common ground" and "a shared understanding."

#### Relevance, purpose, and impact

***Engagement must be "relevant, timely, [and] salient."***

Participants appreciate engagement opportunities that align closely with their interests and needs or that advance their goals and priorities. There is value derived from feeling "invested and effective" while engaging. For example, participants expressed that they appreciate "getting things done" and "making a difference." They may become more "jazzed when they know the work [is] useful."

#### Decision-making and agency

***Meaningful engagement means "having a hand on the steering wheel."***

Having agency, particularly about the terms of engagement and the direction of a project, contributes to participants feeling meaningfully engaged. As one interviewee put it, it is not "true collaborative science" if "somebody in a technical role or a principal investigator role is making all the decisions."

## Constraining factors

### Disregard for participant time

**"Things that just feel like busy work take away from overall satisfaction."**

Engagement that feels "frivolous" or like "time is being wasted" is not meaningful to those involved. Engagement is not meaningful when it "takes away from the [other] work that [participants] need to do."

### Irrelevance

***If "project team [gets] a little bit off focus… [it] starts to feel not as relevant."***

When participants perceive the topic of engagement or the interaction itself as irrelevant or unproductive, meaningful engagement is undermined. A project lead shared that project leads "are much more likely to be successful [when they're] establishing value for the people [they're] engaging instead of centering [their] own interests. That can be really hard for scientists because they have a line of work and they're trying to advance their line of work."

### Feeling out of the loop, disconnected, or uncertain

***It's important that participants have "clarity around how their input is going to be used"***

It can be difficult for participants to engage meaningfully if they feel unsure about, or disconnected from, the project's process or progress. Misunderstandings about the collaborative process or infrequent touchpoints between researchers and participants can leave participants feeling uncertain about their role in the project and about project outcomes.

### Feeling overburdened or imposed upon

***Engagement can be "resource intensive on everybody."***

More engagement does not necessarily equate to more meaningful engagement. Participants become frustrated when they feel overburdened by engagement or when they feel like the team is "over-engaging." In addition, engagement that feels imposed by researcher agendas rather than collaborative integration of the interests and concerns of all involved can leave participants feeling used by researchers with no stake in the people and places they research. As one project lead shared, "collaborative science is not [about the researcher] showing up with a project idea."

# 3. Relationships, group dynamics, and patterns of communication

Relationships are what facilitate meaningful engagement and collaborative science more broadly. Strong working relationships build capacity for sustained collaboration and investing in relationships can lead to more meaningful engagement. Patterns of communication and group dynamics, particularly those that promote relationship building, are important factors in making engagement feel meaningful for participants.

## Facilitating factors

### Two-way communication

***Conversations shouldn't be "just one-sided."***

Engagement is made more meaningful by interactions that are multidirectional. Participants value the "opportunity to meaningfully express their views," not just listen to the views of others.

### Sustained commitment to people and place

***"What I look for in meaningful collaborative research is that it's not a one-off project."***

A genuine commitment to people and place fosters meaningful engagement. As one project team member said, "You have to care about the issue and the people you're working with." Meaningful engagement is more easily achieved when "everybody has a general mindset of 'we want what's best for the whole.'" Oftentimes "the most successful projects are the ones that don't treat their research as [simply] a project," but instead recognize the value of long-term commitment to collaboration.

### Interpersonal connection

***There is a "chemistry that happens when people are interacting with each other."***

A sense of connection with others promotes meaningful engagement. Participants and researchers who feel like they are on the same team or belong to the same community are more likely to feel meaningfully engaged. This feeling among participants often fosters "a mutual desire to interact again."

### Sustained or deepened relationships

***"Sacrifice the research for the relationship if you have to."***

Engagement that builds new relationships and strengthens existing ones is often more meaningful. Strong working relationships help foster trust, mutual care, respect, sincerity, comfort, joy, and fun during the collaborative process. Relationships also facilitate shared commitment and accountability because they often transcend the finite timeline of a project.

## Constraining factors

### One-sided or unbalanced engagement

***Sometimes, "the loudest voice is the one that is driving the project."***

Interactions that are characterized by "a sense of superiority," "condescension," "standoffishness," or "entitlement" can feel "one-sided" and disempowering. One-sided interactions limit opportunities for knowledge exchange between all participants.

### Closed-minded or dominating interactions

***It's important not to disenfranchise others who are "bringing a different way of knowing the world or a different perspective to the table."***

A closed-minded attitude marginalizes the knowledge, ideas, and experiences of others. Closed-mindedness can manifest as an "unwilling[ness] to work towards a common goal," "unwilling to listen," or "unwilling to see the big picture and work with others."

### Conflict and tension

***If there is "bad conflict, people can't even talk to each other."***

Unchecked conflict can limit opportunities for constructive dialogue. Unless managed, conflict or tension among individuals can lead to weak working relationships. When conflict is present, participants may become concerned that the input of others will be unfairly prioritized over their own during the project.

### Uneven power dynamics

***"[Something] that I always think about when I'm looking to engage…is power sharing"***

Engagement marked by uneven power dynamics can cause participants to feel like their engagement doesn't matter or that project leaders are offering insincere opportunities rather than authentic engagement. Participants lacking a consequential role in a project's process or outcome seldom feel meaningfully engaged.

# 4. Context, circumstances, and institutional norms

All collaborative science projects are carried out within broader social, political, and environmental conditions. There are certain contextual factors, circumstances, and institutional norms which, although mostly outside the control of any one collaborative project, can impact the ability of participants to engage meaningfully nonetheless. Conversations with project leads revealed that there are several common structural factors that can hinder meaningful engagement. While overcoming these structural challenges can be difficult due to their systemic nature, it is important to recognize how they may be interacting with the project's collaborative process.

## Contextual factors that shape engagement

### Familiarity with collaborative science

***"A lot of this stuff is really outside of our training."***

Project leads and participants who are new to collaborative science may be unfamiliar with the principles that distinguish a collaborative approach from more conventional, non-collaborative approaches to research. Lacking familiarity, researchers, as well as project participants, may fail to appreciate key components of collaborative science such as the tending of relationships, the integration of multiple sources of knowledge, and the management of group dynamics. A lack of familiarity with collaborative science may be caused, or compounded by, an institutional bias toward more conventional approaches to research. Institutional emphasis on more conventional scientific methods can make it difficult for science practitioners to access formal training related to collaboration or engagement. Some interviewees noted that they've had to personally advocate for a greater emphasis on collaborative methods and relationship building within their institutions or programs.

### Prior experiences with scientific research

***It's important to be "really mindful of the extractive nature of science."***

The perceptions and past experiences that participants bring to collaborative science projects affect the ways in which they engage, or even if they choose to engage at all. Negative experiences of research and researchers are often rooted in past or contemporary harms caused by research and extractive approaches to research. Due to past interactions with research or researchers, participants in collaborative projects may distrust researchers or worry about potential harm created during the research process. Such dynamics can undermine meaningful engagement, making participants wary of sharing their interests, ideas, or local knowledge.

### Challenges associated with integrating multiple ways of knowing

***"Institutional science is only one way of experiencing and knowing the world."***

The strength of collaborative science lies in harnessing diverse and differing sources of knowledge. However, these very differences can challenge engagement. It can take a significant amount of time and commitment to work through conflicting worldviews and approaches to science and to achieve common goals.

## Coordinating institutional timelines

***"I think sometimes the pace of the science doesn't always meet the pace that's needed for [intended] users."***

Engaging participants meaningfully can be more challenging when participants have differing needs and expectations for project pace. Sometimes project timelines move at a pace that feels too slow for participants. Slow project timelines can mean that project outcomes are not available in a timeframe that is relevant for intended users and their institutions (e.g., participants expect or need to use project outputs sooner than they are available). At other times, project pace can feel too rushed to participants. Interviewees noted that expedited project pace often occurs when the project team is beholden to funding requirements and other institutional constraints. Accelerated project pace can come at the expense of the time needed to establish the relationships and trust necessary for meaningful engagement.

## Research funding models

***"I've started to get real nervous of grants [that are] so tied to the timeline."***

Scientific research, including collaborative scientific research, is often carried out within, or adjacent to, institutions and funding models that operate on a project-by-project basis. Research projects, particularly those funded by grants, may be marked by discrete timelines with a beginning and end. In contrast, relationships, including those that facilitate more meaningful engagement, lack a prescribed timeline, and often have an element of continuity to them. Having to rely on grants-based funding mechanisms can make it more difficult to foster the types of relationships that promote meaningful engagement. The unreliability and intermittence of grant funding can also present challenges for establishing long-term relationships with new partners.

## External events that shift participant priorities

***Recognize that "people's priorities are variable."***

External events can cause unexpected shifts in participants' priorities or capacity for engagement. For example, public policy changes, personal life events, or urgent public issues such as natural disasters may redirect intended users' attention or availability. Elections and administrative change can also cause changes to the individuals who represent an organization as a project participant or intended user. As a result, participant commitment or capacity to engage may wane, causing disengagement and disruption to interdependent team dynamics.

# PART 2: ADVANCING MEANINGFUL ENGAGEMENT

## A FRAMEWORK FOR ADVANCING MEANINGFUL ENGAGEMENT

A project team can play an active role in advancing meaningful engagement by thoughtfully designing and managing the project's collaborative approach. As detailed in earlier sections, whether engagement is experienced as meaningful by participants is influenced by a set of factors that relate to how individuals feel treated, the level of value that participants find in the project and process, and the communication patterns, group dynamics, and relationships that develop during engagement. The context within which collaborative projects are carried out also affects the ability of participants to engage meaningfully.

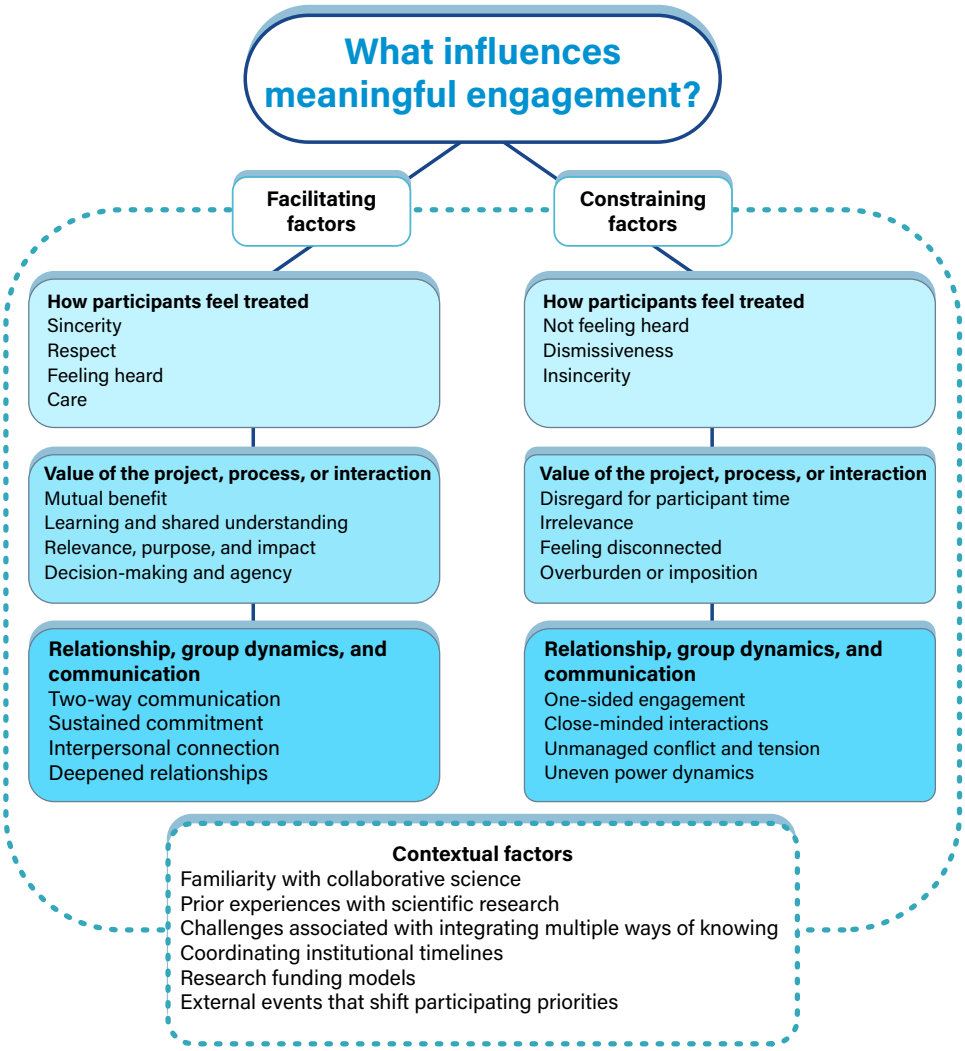
**To foster meaningful engagement in practice, project teams should consider two main objectives:**

1. Promoting factors that make engagement meaningful.
2. Avoiding or managing factors that constrain meaningful engagement.

Figure 1 offers a framework for pursuing these two objectives given the factors that facilitate and constrain meaningful engagement as identified in this study. The diagram can be used as a reference for project teams as they scope, design, and manage their projects' collaborative processes.

Because meaningful engagement is a dynamic and evolving process that is often context dependent, the framework is intended to prompt reflection rather than serve as a prescriptive checklist. For example, a project team might reflect on how each factor represented in the framework is present or absent in their collaborative process.

**Figure 1.** What influences meaningful engagement?



# RECOMMENDATIONS FOR ADVANCING MEANINGFUL ENGAGEMENT IN COLLABORATIVE SCIENCE PROJECTS

This section provides five recommendations to advance meaningful engagement in collaborative science, derived from the rich reflections offered by experienced collaborative science teams. Some recommendations are broad (e.g., considerations to keep in mind over the course of a project) while others are more focused (e.g., practical strategies that may be most useful at key moments during a project.) Although these recommendations are primarily intended to offer guidance to collaborative project teams within the NERRS, this work has applications and uses in collaborative or co-produced science more broadly.

**The five recommendations are:**

1. Embrace a collaborative mindset
2. Tailor the process to context
3. Set the stage for clear and efficient collaboration
4. Plan effective communications and group gatherings
5. Tend to relationships

Each recommendation is discussed in further detail below. These recommendations are intended to be applied alongside the framework presented in Figure 1.

Engagement activity at Guana Tolomato Matanzas NERR, Florida. *Photo credit: Guana Tolomato Matanzas NERR.*

## Recommendation 1: Embrace a collaborative mindset

Embracing a collaborative mindset is fundamental to successful collaborative science and should inform every aspect of a project, including engaging participants and working with intended users. A simple checklist of best practices is rarely enough to ensure meaningful engagement. Beyond applying thoughtful practices, project teams must also bring a collaborative mindset to their approach. To do so, team members should strive to:

- **Foster care** for people and places by investing in long-term relationships. Equitable and reciprocal relationships are the bedrock upon which co-creation of knowledge can occur.
- **Practice humility** by acknowledging the limits of one's training or expertise. In a collaborative science project, everyone involved—whether a team member or participant—is considered an expert in their own knowledge system and sphere of influence.
- **Be curious** by trying to learn new things from and with participants in an open-minded and thoughtful manner.
- **Commit fully and genuinely** by bringing one's full self to the collaboration.
- **Build trust** through transparency, competency, and by sharing responsibility and accountability.
- **Be open and welcoming, not imposing**, of a research initiative. Don't assume partners are interested in participating. Instead, seek consent from partners and potential partners before conducting research that involves them. Revisit and reaffirm consent throughout the project (e.g., jointly deciding how to protect sensitive data or knowledge). Be sensitive to the power dynamics that may arise within a project team and be sure to talk about and address these dynamics.
- **Express gratitude** for participants' contributions.

Further reading on the Science Collaborative's "Mindset and Principles" can be found at nerrssciencecollaborative.org.

Georgetown Climate Adaptation Project at North Inlet-Winyah Bay NERR, South Carolina. *Photo credit: Maeve Snyder.*

## Recommendation 2: Tailor your project's engagement by "doing your homework"

What meaningful engagement looks like, and the practices that may be used to foster it, often vary from project to project. "Doing your homework" means taking action to better understand unique participants and partnering communities. This could mean seeking out one-on-one conversations, attending events or volunteering with partnering organizations, participating in long-standing working groups, or investing in relationships. While "doing their homework," project teams should consider the following.

- **Participant priorities, values, and goals:** What is important to participants? What do participants want to "get out of the project"? How can the project be made more relevant to participant priorities? How does the project support their longer-term efforts or goals?
- **Participant engagement preferences:** How do participants want to be involved in the project? How much capacity do participants have for engagement? How do participants prefer to communicate or convene?
- **Participant accessibility needs:** What accommodations do participants need in order to engage? What formats for engagement are best suited for your participants?
- **Relevant community organizations, institutions, and leaders:** What can the project team learn from related efforts already underway? What organizations or community champions are concerned with or already working on the project's topic?
- **Previous research experiences:** What research efforts have partners already been involved in, and what were the outcomes? How can the current project build on past research efforts? If the community has had negative experiences with prior research, how can the project team ensure this project is different?
- **Sociopolitical context:** What policies are in effect in the project's area? What role will institutional cultures play in the project? Who has jurisdiction and is in a position to help or hinder the project? Who are rights holders in the project's area, and what rights do they hold? In what ways does the project affirm Tribal nations' rights to sovereignty and self-determination?


A map of the York River, Virginia annotated with sticky notes during a collaborative science project. *Photo credit: GCBNERR-VA.*

## Recommendation 3: Set the stage for clear and efficient collaboration

Building a common understanding of both the project and its process is essential to lay the groundwork for meaningful engagement. Clarifying the collaborative process, including expectations and responsibilities of all involved, helps to increase confidence in the process, promote accountability, and make participation feel more comfortable. "Everybody needs to be fluent in what it [takes]" to do collaborative science, commented one project lead. Taking the following steps can set the stage for more meaningful engagement:

- **Provide participants with a clear explanation** of why they have been asked to participate and how their contributions to the project will matter.
- **Ensure project objectives and scope are clear to all participants** to avoid confusion or conflicting expectations. This clarity can be accomplished through a thoughtful orientation at the beginning of the project, or co-development of formal problem statements.
- **Avoid overpromising "what the science can do."** Be realistic about the project's scope and what the project will achieve. Overpromising can distort participants' expectations for the project and its outcomes.
- **Clarify participant roles and responsibilities so everyone has common expectations.** Some projects co-develop the group's norms and expectations at the beginning of the project in the form of a charter or other document.
- **Be transparent about how project decisions will be made.** It is especially helpful for participants to understand what aspects of a project can and cannot be shaped by their input.
- **Manage power dynamics proactively** in order to mitigate conflict, promote more inclusive engagement and foster a collaborative mindset. Set ground rules for group discussions and consider using strategies to demonstrate that all input is being considered fairly.
- **Develop science communication norms.** Build a shared lexicon by clarifying unfamiliar terminology or terminology that is used differently across disciplines or communities. This can ensure that discussions are more accessible.

TOTE workshop at Chesapeake Bay NERR, Maryland. *Photo credit: Coreen Weilminster.*

TOTE workshop at Narragansett Bay NERR, Rhode Island. P*hoto credit: Maureen Dewire.*

# Recommendation 4: Plan effective communications and group gatherings

Effective communication and thoughtful group gatherings are critical for creating opportunities for meaningful engagement. The following process management recommendations are clustered into three categories: organizing project logistics; determining the scale, timing, and frequency of engagement; and facilitating knowledge exchanges that are mutually beneficial and compelling.

## Organize project logistics

- **Tap into collaborative expertise.** When appropriate, consider seeking out additional resources or assistance from practitioners who are experienced in collaboration and facilitation. One interviewee remarked, "the biggest mistake that people make is they don't avail themselves of expertise" in collaborative methods.
- **Account for adequate time and resources.** Collaborative projects typically have more moving pieces than traditional research projects. Effective coordination of project logistics can facilitate team cohesion and help make sure that participants are "on the same page." Take time to ensure that "project parts are moving in sync, especially when working on projects that have "multiple disciplines coming together that don't normally talk to each other."

## Determine an appropriate scale, timing, and frequency of engagement

- **Engage participants during early project stages.** Early engagement can help ensure the project's relevance for participants, develop a shared understanding of the project and process, strengthen relationships, and foster a sense of ownership or connection to the project.
- **Engage with consistency and reliability.** Consistent and reliable opportunities for engagement can help foster trusting relationships that are based on commitment and accountability. This in turn can help participants feel like a valuable member of a team. Repeated and iterative check-ins also allow for ample opportunities for participants to shape the project and its outcomes.
- **Avoid overburden.** The level of engagement desired during the collaborative process is likely to vary from project to project or even over the course of a single project. Scale engagement to participant preferences. Be mindful not to overbuild the collaborative process. More engagement doesn't necessarily equate to more meaningful engagement.
- **Demonstrate respect for participants' time.** Regardless of engagement timing, frequency, or scale, being mindful of participants' time helps participants feel respected and appreciated. Some project teams tap into synergies to make engagement more time-efficient. For example, some teams take advantage of standing meetings, participant events, and other opportunities that reduce the time burden of engagement. One project team member recommends: "try to engage or meet with [partners] during already scheduled meeting times—something that they regularly go to, to show that you're respectful of their time."

## Facilitate compelling and mutually beneficial knowledge exchanges

- **Think beyond meetings.** Instead, offer varied opportunities for engagement, such as field trips, demonstrations, volunteer service days or informal activities to get to know each other. Providing a variety of modes of engagement can help ensure that engagement is inclusive, comfortable, and mutually beneficial for all participants.

- **Keep the project true to participant priorities.** Follow up on participants' contributions to demonstrate accountability. "When you ask for people's input, do what they say to do. Give them what they want!" said one project team leader, or explain why you can't when necessary.
- **Be responsive to all input and express gratitude.** Reiterate the value of participant ideas, even if they cannot be incorporated into the project due to the project scope or timeline. Express gratitude for participants' ideas to affirm that participants are a critical part of the team. When crediting team members, do not overlook intended users of the science.
- **Honor partners' choices not to divulge knowledge or information.** Respecting participants' refusal to share certain types of knowledge can deepen trust and consent within collaborative relationships. Understand that "just because you ask a question doesn't mean someone has to answer it." Decide together how knowledge and data outcomes will be shared and obtain consent from all involved prior to dissemination of project findings. Make appropriate arrangements for data sovereignty and keep participants informed of potential dissemination of project findings that might occur after the project's conclusion (e.g. will findings be published in a peer reviewed journal; will they be presented at conferences?) Some project teams incorporate confidentiality into the collaborative process when it is important to do so for one or more of the participants, for example by preserving participant anonymity in project notes and limiting meeting recordings.

## Recommendation 5: Tend to relationships to build capacity for meaningful engagement

Meaningful engagement, and collaborative science more broadly, is facilitated by relationships. Investing in meaningful relationships can also lead to more meaningful engagement and continued collaboration. To advance meaningful engagement by attending to relationships, the project team should:

- **Dedicate adequate time to building trusting relationships.** Design the collaborative process with the understanding that relationship building "takes a long time and [is] absolutely essential."
- **Tend to relationships as an ongoing and continuous process.** Time for relationship-building should be accounted for over the entirety of a project, not just at the beginning.
- **Make time for unstructured or informal interactions.** Unstructured time offers opportunities for participants to connect with each other informally or on a personal level. Informal interactions are a time when "you're not asking anything from anyone, you're just there to give and to be immersed and be fully present." Spending time in person can help foster connection. Project teams have shared that face-to-face interactions often have a certain "chemistry" that cannot be reproduced virtually "despite best efforts and all the technology we've thrown at it." Sharing food and drink can also help create low stakes settings for participants to get to know each other.
- **Think beyond the project timeframe.** Sustain engagement with partnering organizations and communities outside of the project timeframe if appropriate. Remember that relationships don't follow grant funding timelines. Instead of investing in relationships "on a project-by-project basis," strive for continuity by tending to relationships over the long term. The project team should plan for end-of-project transitions and take time to imagine what the partnership might look like moving forward.

# LOOKING AHEAD

The specifics of what meaningful engagement looks like and how to achieve it vary project to project. However, the findings of this study revealed remarkably consistent themes for what tends to make engagement meaningful. These findings help piece together a common understanding of meaningful engagement. The need for a common understanding is increasingly urgent as the imperative for engagement that is truly meaningful becomes recognized and valued more widely by researchers and funders alike.

This study found that engagement is more likely to be meaningful when people feel respected and heard; their knowledge and interests are understood; they have agency in, and clarity about, the process, its objectives, and their role in it; they feel a sense of purpose; and they are able to foster genuine connection with others. In contrast, engagement is less likely to be meaningful when people feel dismissed or like their knowledge isn't valued; when engaging feels irrelevant or like a poor use of time; and when interactions are marked by uneven power dynamics. This understanding of meaningful engagement can serve as a useful starting point for practitioners of collaborative science.

Above all, this study underscores the importance of researchers and practitioners becoming familiar with their partners and project participants and investing in relationships to understand what makes engagement meaningful within their unique contexts. Understanding what meaningful engagement means to your partners and project participants can support the flourishing of collaborative science.


Workshop at the NERRS-NERRA Fall Meeting 2024. P*hoto credit: Christopher Peter.*

# APPENDIX A: LEARNING METHODS

This work was initiated as part of the Science Collaborative's ongoing efforts to learn from project teams and share lessons across teams. Project teams across the NERRS and their partners represent a unique pool from which to draw potential insights about meaningful engagement because collaboration and engagement are core to the approach of the NERRS.

Insights on meaningful engagement were collected from people and partners affiliated with the NERRS using three methods:

1. One-on-one interviews
2. An interactive workshop and webinar participation
3. An online survey

More details about each of these methods are provided below.

## Interviews

Interviews were conducted in summer of 2023 with fifteen individuals who have participated in collaborative research projects funded by the Science Collaborative. Projects funded by the Science Collaborative are selected based on their potential to address management needs, meet intended user needs and adhere to the Science Collaborative's articulated "Mindset and Principles." The fifteen interviewees were recommended for interviews by the Science Collaborative because they currently fulfill, or previously fulfilled, a leadership role in collaborative science projects and were deemed to be particularly reflective practitioners. All interviewees had five years or more of experience designing and managing collaborative research processes.

## Interactive webinars and workshop polls

The Science Collaborative hosted two virtual workshops and one webinar focused on meaningful engagement between June 2023 and February 2024. The workshops were attended by project leads and collaborative leads associated with projects currently receiving project funding from the Science Collaborative. The webinar, held in January 2024, was attended by over 200 individuals affiliated with federal and state agencies, local governments, universities, NGOs, community-based organizations, for-profit organizations, and the National Estuarine Research Reserves.

As is typical of the Science Collaborative's programming, which often draws on peer-to-peer learning methods, the Science Collaborative posed several questions to attendees during or before the webinar and workshops to prompt thinking and encourage conversation. Attendee answers provided valuable insights into how people understand and experience meaningful engagement.

## Online survey

To understand perceptions of meaningful engagement more fully across various project participant roles, additional data were collected via an online survey. The survey was distributed via Qualtrics in April 2024 to 42 projects receiving funding from the Science Collaborative. The survey protocol consisted of six multi-part questions that focused on demographic information, motivations for joining a collaborative science project, and factors that influence ability to engage meaningfully during a collaborative science project. A total of 33 individuals completed the survey. Survey data were used to validate insights drawn from the interviews, webinar, and workshops.

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