

Great public engagement with science is

Reciprocal

Advancing Public Engagement Across LTERs



Great public engagement with science is:

- **Strategic** - guided by clearly articulated, audience-specific goals and objectives
- **Cumulative** - supports ongoing, positive encounters between scientists and publics via multiple pathways
- **Reciprocal** - grounded in two-way exchange and mutual meaning-making
- **Reflexive** - operates in iterative loops of reflection and adaptation
- **Equitable** - recognizes systemic injustices in science and society, acknowledges biases, and is intentionally inclusive
- **Evidence-based** - builds from knowledge about how people learn about and use science

What does it mean to be reciprocal?

Effective public engagement with science (PES) is a two-way street with reciprocal exchanges between scientists and publics. Reciprocal PES means that scientists and publics are learning from each other and working together to uncover knowledge and create products. There are clear benefits for everyone in a reciprocal partnership. This approach is in stark contrast to deficit models that prioritize the goal of filling in knowledge gaps; they assume that community members are passive audiences with little to contribute and who don't turn to science to solve their problems because they are unaware of the facts. Decades of research have found such deficit models to be ineffective and highlight the need to incorporate reciprocal approaches.

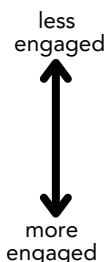
Valuing participants' expertise

Reciprocity recognizes that diverse forms of expertise — not just scientific expertise—are important. Community members bring with them their own unique life experiences, perspectives, assets, values, and agency. Reciprocal PES requires scientists to learn about the people in their community, the expertise they bring to the table, and consider how that expertise benefits science. This learning can take many different forms, including attending events held by community partners as well as hosting listening sessions, facilitated dialogues, and networking events. With a deeper understanding of what a community cares about, scientists and communicators can design PES events and research around issues relevant to participants' lives.

Building relationships

Reciprocal partnerships are relationships that must be intentionally built, and that process takes time. As described above, part of this process involves listening to community members to learn about the issues they care about and showing that scientists respect the publics' expertise. More broadly, scientists need to build trust with publics by demonstrating their goodwill. They can do so by holding events in locations where community groups gather, sharing the societal benefits of their research, identifying shared interests between themselves and community members, providing opportunities for participants to share their feedback, and following up after events with gratitude and updates on how they have acted on the feedback and ideas shared. This work is essential for building a foundation of trust between scientists and communities that enables mutual learning and co-creation.

Dimensions of Public Engagement with Science



What the public does

- Watch and read
- Ask questions or interact
- Talk and share views
- Deliberate and problem-solve together
- Produce recommendations

What the scientists do

- Advise the communication specialists
- Make presentations to the public
- Work to improve communication skills
- Welcome and value public input
- Act on public input

Case Study: Reciprocal PES in Action

By Ken Dunton, Lead PI BLE LTER

The studies conducted by the Beaufort Lagoon Ecosystems (BLE) LTER are focused on the lagoons and estuaries of the Alaska Beaufort Sea. These nearshore systems support a vibrant coastal fishery that is critical to the subsistence lifestyle of the local Inupiat, whose lands researchers occupy when conducting studies near the city of Utqiagvik and the small village of Kaktovik. Since 2007, LTER scientists have developed a long-term working relationship with the Kaktovik community by developing educational programs through their K-12 Kaktovik Oceanography Program (KOP) and the Kaveolook School. They also formed a Traditional Knowledge panel that meets regularly and communicates their discoveries in an annual newsletter and through evening gatherings at the Community Center. This long history of engagement has enabled trusting relationships between BLE scientists and the Kaktovik community, and for those relationships to grow and change over time. For example, the mayor of Kaktovik participated in the KOP as a student over a decade ago, and now provides the LTER with support and resources for their research and engagement.

The Kaktovik community also considers the LTER to be a partner and resource. In 2023, community members came to the LTER with their concerns about dwindling local fish populations and contaminants. In response, BLE scientists have been working with the community to co-create a fishery monitoring program. The program empowers community members to collect local hydrographic data and share it back with scientists so that they can collectively assess local fish populations. Community-led data collection is very helpful to BLE scientists who do not live locally and would not otherwise have access to the data. This work is mutually beneficial to scientists and the community because it enables the LTER to conduct research that aligns with site priorities and answers questions that matter deeply to the community.

Mutual benefits

Reciprocal PES activities are designed to foster mutual sharing, listening, and learning by both scientists and community members. Scientists should share about their research and how it connects to the community's lives, and ask the community to share their input on specific issues related to the topic. Scientists and participants should have ample time to talk about how the science impacts their community and vice versa, to ask questions, and to share any concerns. Scientists should actively engage when participants share their feedback. Reciprocal activities feel more like a dialogue and less like a presentation. Finally, it's important for scientists to follow up with the community after an activity to share how they are acting on the ideas and feedback that the community provided.

Co-creating

Reciprocal partnerships can go beyond mutual sharing and learning and take it to the next level by creating something new together that is beneficial to scientists and publics. For example, partnerships might jointly craft research plans, design community programs, or produce policy recommendations. Importantly, co-creation can take many different forms and doesn't require all stakeholders to participate in the same ways or in all aspects of creation.

Evaluation planning

Simple process metrics can document reciprocal practices. What are participants and scientists doing during PES activities? Is the scientist giving a talk or is there a group deliberation? Who shared feedback and who did not? Outcomes can also be measured, for example, by surveying participants about whether they feel their input was valued by scientists. Follow-up data collection with scientists might focus on how their ideas about their research have changed as the result of activities. Reciprocity also means working with communities to identify outcomes they care about.

Learn More

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Besley, J. C., & Dudo, A. (2022). *Strategic Science Communication: A Guide to Setting the Right Objectives for More Effective Public Engagement*. JHU Press. [\(to learn more about how scientists can build trust with publics\)](#)

Canfield, K., & Menezes, S. (2020). *The State of Inclusive Science Communication: A Landscape Study*. Metcalf Institute, University of Rhode Island. Kingston, RI. [\(to learn about how reciprocity is key to inclusive engagement\)](#)

Garlick, S., & Fallon, K. (2023). The ECO framework: advancing evidence-based science engagement within environmental research programs and organizations. *BioScience*, *biad037*. [\(to learn about co-creation in PES\)](#)

Nadkarni, N.M., Weber, C.Q., Goldman, S.V., Schatz, D.L., Allen, S., & Menlove, R. (2019). Beyond the deficit model: the ambassador approach to public engagement. *BioScience*, *69*, 305-313. [\(to learn about STEMAP, a scientist training program that emphasizes reciprocal approaches\)](#)