

DAVID D. HART, BRIDIE MCGREAVY, ANTHONY W. SUTTON,
GABRIELLE V. HILLYER, AND DARREN J. RANCO

Collaboration on the Mudflats

How community-university partnerships can strengthen
deliberative and democratic practices.

We began in 2006 as a group of researchers at the University of Maine who were trying to align our work with the needs of communities. Motivated in part by frustration with the fate of so much academic research that only ends up in scholarly journals, where it may be read by our peers but rarely reaches the wider world, we wondered what it would take to link knowledge with diverse actions that benefit communities.

From the start, we wanted to understand the problems people were facing in communities around Maine and in Wabanaki (“People of the Dawnland”) Tribal Nations so we could collaborate with them to co-develop research aimed at addressing these problems. We created a place at our university—the Senator George J. Mitchell Center for Sustainability Solutions—where students and faculty from the natural and social sciences, engineering, arts and humanities, and other disciplines could all participate. In the last 16 years, the center has helped launch more than 50 projects in which interdisciplinary teams have collaborated with community partners.

The world has changed during this time, with a majority of Americans now saying they are exhausted by political polarization and pessimistic that the situation will soon improve. Three out of four wish that their fellow citizens could “reject political hostility and divisiveness and focus more on their common ground.”

In response to such concerns, political leaders as well as scholars have suggested that this common ground is more likely to be found at the local level. According to such thinking, challenges facing local communities are less about competing ideologies and more about pragmatic concerns

such as infrastructure, which can make it easier for people to listen to and learn about each other in the context of community planning. In essence, local partnerships may allow for a more tailored approach to working across differences, thereby generating the kinds of “small wins” that can grow the social capital needed to address even bigger challenges.

Considering the possibility that community-university partnerships could be a route to finding common ground, as well as solving complex problems, has led us to reflect on our work at the Mitchell Center. Almost from the start, we have encountered many of the social complexities that can make working together so challenging—including obstacles to effective communication, power disparities, mistrust, differences in worldviews and priorities—and the conflicts that often result. We’re also keenly aware that universities need to strengthen their commitments to equity and justice, especially because many were created and funded in part by the dispossession of Indigenous lands and the institution of chattel slavery. Throughout our work, we have learned important lessons about the science and practice of long-term collaborations in areas where progress is not always linear or well-defined.

We’ve come to view our work as a promising strategy for strengthening the kinds of deliberative and democratic practices that might help address many local and global challenges. For us, these practices involve listening and responding across differences (the deliberative part) and finding ways to make shared decisions and take joint actions, knowing that complete agreement or mutual understanding may never be possible (the democratic part).

Common ground?

Early on, Mitchell Center researchers wondered whether we could help address challenges faced by communities that harvest clams and other bivalve mollusks from the intertidal mudflats along the length of this region's enormous coastline. For millennia, digging for clams has played an important role in the food systems, cultures, and livelihoods of Indigenous communities. These ways of life are as old as Wabanaki shell heaps, place names, and stories—which date back thousands of years—and as new as the mounds of mud marking where clambers have been digging during recent low tides.

Many people have strong connections to these flats, and those connections take a variety of forms. For hundreds of generations of Peskotomuhkati (Passamaquoddy) people, “ktoliyan elomocokek pawatomon essok” (you go to the mudflat if you want to get clams). Clamming still provides livelihoods for many coastal residents, especially for Passamaquoddy and non-Indigenous rural communities. For others, it's a recreational activity, more leisure than labor. For summer residents whose waterfront property

Listening for questions

The guiding frame for this essay—community-university partnerships—may suggest that these partnerships tend to occur in formal, easily-identifiable spaces where community members participate in a project led by the university, or vice versa, with a clearly defined objective, timeline, and set of partners. In reality, a lot of our work occurs in places where the boundaries for when the effort started, who is involved, where and how participants meet, and even what participants are trying to achieve are not clear, singular, or easily definable.

In 2011, one of us (McGreavy) was invited to attend shellfish committee meetings in a rural town hall in Lamoine, Maine, to help with a local conservation planning effort. The town's shellfish conservation committee had formed a unique, seven-town cooperative governance arrangement with a shared municipal ordinance that supported about 70 commercial clambers around Frenchman Bay. McGreavy went to listen, and perhaps to build inclusive partnerships that could help with conservation efforts.

If common ground exists at all, we find it in the shared belief that these differences, and the creativity they spur, motivates problem-solving and other kinds of connection.

includes those very flats, their connections may be less about clamming and more about breathtaking views across the mudflats. And as the Indigenous traditions of lobster and clam bakes attest, clamming remains a delicious, healthy, and accessible source of food.

Today, this gloriously complex ecosystem is not only a place where land meets water and where salt- and freshwater mingle; it's also the focal point of several transitions. Climate is rapidly changing in ways that are exacerbating existing precarities and unequal power dynamics in fisheries-based economies. Despite what might appear to be a shared future, there are many different visions for what that future will be, and what it should be.

After working with clambers of diverse backgrounds for more than a decade, however, we always pause whenever anyone talks about “finding common ground.” It's true that the mudflats are held in common by coastal communities and are literally the ground upon which clambers walk. But as for the notion of finding metaphorical *common ground* on the flats and developing the capacity for collective action: that's no mean feat. If common ground exists at all, we find it in the shared belief that these differences, and the creativity they spur, motivates problem-solving and other kinds of connection.

In the Lamoine town hall, clambers brought their local knowledge to bear on shellfish management. They shared their observations of the number of clams in the mud and the differences among flats. They referenced multiple forms of evidence, including direct experience, personal testimony, photos, family and community history, and scientific studies. The clambers didn't always agree, however, on what they were seeing in the mud—and on what types of conservation measures would sustain the fishery into the future.

Through ongoing conversations, many of which occurred on the mudflats, we learned that clambers were deeply worried about the impacts of water pollution. At the time, more than 2,000 acres of mudflats in the seven towns were either permanently or periodically closed to digging because of concerns about pollution. The closures prevented clambers from digging and reduced their income. In some cases, decades-long closures had resulted after the Maine Department of Marine Resources (DMR) once found high concentrations of fecal coliform bacteria in waters near the flats. These bacteria enter the flats through contaminated freshwater runoff or sewage and can indicate the presence of harmful pathogens. For some flats, the history of when the closure happened, why it occurred,

and the current status of pollution remained a mystery. We soon realized that the process for lifting the closures involved many different people across local and state governments. As one clammer commented at the time, “When it comes to opening closed mudflats, the left hand doesn’t know what the right hand is doing.”

We went to Lamoine in search of information that would be relevant for conservation planning, but we ended up helping bring people together to define a shared question that concerned them: How do we open closed mudflats? Answering that question required scientific solutions, such as finding the most effective water testing method and using the most accurate watershed modeling approach. When communities are navigating complex challenges without much evidence, technical solutions like these can be a place to start.

But making progress also meant developing a diverse set of social solutions and approaches. For example, it’s tough to schedule a meeting when some people have to be on the mudflats at low tide to dig, others are teaching on campus, and others are home having dinner with family. Creating a scheduling app that connected tides with possible meeting times helped. Making progress toward opening closed flats often required having backup plans and built-in redundancies for when people left their respective organizations. It also meant learning how to grieve together and continue the work when key leaders died unexpectedly.

These relationships around the problem of water pollution ultimately helped open hundreds of acres of mudflats. Then, by sharing what we learned through collaborative presentations, community radio programs, and accessible online resources, we were able to support related efforts to open mudflats in other communities.

Negotiating differences

The successes we had helping open mudflats may create the impression that participants were able to overcome differences and find common ground, but this isn’t really how the process worked. Instead, collaboration required ongoing negotiations of differences and extended deliberations about where to focus and how to change these efforts over time. This is long-term work that requires learning how to inhabit and cross multiple worlds—in this case, worlds of clamming within Maine and Wabanaki communities—to try to identify how they might connect, and also to learn how to move differently within each.

During this time, the Mitchell Center was a corecipient of a major grant from the National Science Foundation (NSF) to, in the words of the grant, “strengthen the scientific basis for decisionmaking” about mudflat closures. The grant’s primary focus was on state and municipal concerns regarding degraded water quality. In our continuing partnerships with representatives from Wabanaki Tribal Nations, however, they

explained that their concerns were different from those of municipalities. For example, Passamaquoddy tribal citizens were more concerned about equity, access, and culturally appropriate approaches to water quality management than pollution closures. They also expressed concerns regarding drinking water quality, the impact of toxins on sustenance practices, and how dams degraded rivers and negatively affected Wabanaki cultures. But we found it difficult to devote sufficient attention to these concerns, partly because the reporting requirements and short duration of our NSF grant emphasized the importance of making rapid progress toward the publication of peer-reviewed papers and production of “decision support systems.”

We adjusted course to increase our focus on tribal concerns, establishing new water and shellfish restoration efforts to address these differences. But instead of seeking to overcome differences, this process has involved figuring out how to stay with and negotiate differences, always with an eye to addressing unintended exclusions and unequal power.

Fortunately, a community foundation and other funders supported our desire to work more closely with Wabanaki partners, which has helped foster these collaborations. Tribal leaders have increased their roles in the shellfish-focused work, and we have secured funding to support them. We have also supported tribal students via an innovative program, Wabanaki Youth in Science, in which they are mentored by elders and participate in research aligned with Indigenous concerns. As one example of the enormous impact of these partnerships, we obtained partial support for the dissertation research of coauthor Tony Sutton (Passamaquoddy), who was recently awarded a tenure-track faculty position at the University of Maine focused on Indigenous food systems.

Trust and a bucket

Building trust is often described as central to successful community-university partnerships, and research backs this up. But what does trust mean in context? We have a story that we think helps illustrate what trust is, how it has shaped our work, and why we’ve come to feel that it matters.

For nearly two decades, the town of Waldoboro, Maine, has worked to identify and fix sources of pollution that were closing mudflats on the Medomak River. When rains fell, pollution levels would rise, and the DMR would close nearby flats, putting as many as 175 clambers out of work during each closure event. To address the problem, town leaders, clambers, the shellfish committee, DMR water quality staff, and local nonprofits formed the Medomak Task Force, which tracked down many sources of fecal contamination, including leaking septic systems, a town dog park, and a seaweed processing plant that was dumping bacteria-laden effluent into the river. This series of small wins helped build capacity for asking other questions. Why did some flats still

show high levels of bacteria, even after the cleanup? The task force started to question how tidal patterns were continuing to influence the circulation of pollution in the river.

One of us (Bridie) and collaborator Damian Brady, a marine scientist, worked with the Medomak Task Force to bring in Gabrielle (Gabby) Hillyer, who was at the time a dual degree graduate student in marine science and policy. Hillyer went to meetings to listen and learn from the group's knowledge about the river and then began to brainstorm research methods that would fit the context, budgets, and capacities of the community itself. This iterative process, which was shaped by listening as well as by dialogue and deliberation, fed into the development of a participatory oceanographic modeling approach to chart tidal flows using a novel and accessible technology known as bucket drifters.

Bucket drifters are exactly that: five-gallon buckets equipped with GPS that drift in the tides and track their movements, tracing tidal flows dynamically. After spending considerable time out on boats with clammers, Hillyer engaged the whole town and the DMR to identify the best locations to deploy the buckets. Then she set the buckets in the tides and sat back to collect her data.

All was going swimmingly until one of her buckets jumped the tides and, according to the GPS continuing to track its location, began literally heading down the highway. She reached out to Waldoboro Shellfish Committee vice chair Glen Melvin to let him know something was up. Glen marshaled a community-level response: Waldoboro's bucket had been stolen! The ensuing scramble involved clammers, the town manager, and even the police department as they all organized to find the bucket drifter. Thanks in part to the GPS, the pinched property was located and returned to its rightful owner—namely, the community of Waldoboro, who were so deeply invested in the study that this event became much more than the case of a missing GPS unit.

On the face of it, the story of the missing bucket might not seem like it has much to do with trust. But it does. Trust is the connective tissue that motivates people to show up for each other—in this case, for a bucket that had come to mean a lot to this group. Trust is a shorthand way of talking about a diverse set of social capacities that shape connection and foster a sense of belonging, including shared identifications, emotions, memories, experiences, and more. In this example, the evidence for trust functioning as a connective tissue is in the shared commitment of showing up for the stolen GPS. It's also in the practices that shaped how this community worked together at all stages of designing this study, and then shaped their coming together when something went wrong. As a connective tissue and force, trust is tidal in how it circulates. Trust, in this sense, is never static, and careful and curious attention can help groups track how it flows and learn how to work with it as a vital force in their communities.

Students as learners, leaders, and teachers

One of the most compelling reasons for universities to collaborate with communities is that such partnerships contribute to their core mission of training future generations of leaders, problem-solvers, critical thinkers, and engaged citizens. Students themselves say, for instance, that they “place high priority on both finding purpose in their work and gaining real-world work experiences,” according to a study by Gallup and Bates College. These experiences not only help prepare students for successful careers; they often spark lifelong passions.

But students can also play crucial roles in community-university partnerships. For example, in the bucket drifter story, Hillyer worked with researchers to understand the multiple methods for answering community questions about tidal flows—and she developed new technologies that could be replicated and understood by the community. This created the space for shared ownership, where the community recognized the missing bucket not as “Gabby's bucket” but as “Waldoboro's bucket,” generating an important foundation for future collaborations.

In this sense, engaged research that centers students can be more productive for each party, destabilizing the usual power structures and activating networks. As learners, students embedded in community-driven work see how their own skills, effort, and knowledge immediately serve people and communities they have relationships with, creating and fulfilling a “science as service” mentality. Students can also act as vital connectors, creating multiple relationships and ties between the community and the university as well as with other students. This is especially true when the students are from those communities, as is the case with many of our tribal partnerships. Community members will sometimes take a parental or caring interest in a student that is different from the kind of care they might show a professor. Such networks and experiences become part of the mental map young researchers carry forward. These experiences have strengthened Hillyer's commitment to the ebb and flow of engaged research.

Hard tellin', not knowin'

Academics often say their work is about “creating new knowledge,” reflecting the idea that such knowledge is inherently valuable, sometimes with the added hope that it can lead to so-called better outcomes. But in working with our partners on the mudflats who are grappling with tangible, tangled problems, we've come to a different understanding of the role of knowledge.

Every March, the Maine Fishermen's Forum hosts a Shellfish Focus Day to bring together clammers, civic leaders, shellfish wardens, industry representatives, and researchers to discuss how the state's communities are planning for the future. Sometimes these projects are

This is long-term work that requires learning how to inhabit and cross multiple worlds—in this case, worlds of clamming within Maine and Wabanaki communities—to try to identify how they might connect.

framed in the context of climate adaptation, but many times they're not, as climate change remains a contested term here. In 2021, a virtual panel discussed the disappearance of clams from flats in parts of the state and how some communities are experimenting with clam farming to restore intertidal ecosystems and sustain shellfishing livelihoods. One clammer commented, "It's hard tellin', not knowin'."

This phrase is often repeated in Maine communities, where it means different things depending on the speaker and the situation. With regard to the clam farms, it reflects the difficulty communities experience when making decisions with limited knowledge—scientific, economic, regulatory—including an unease that past experiences may not apply in the future.

In the phrase "hard tellin', not knowin'" is a motivation for a shared search for answers, as partial or incomplete as they may be. The phrase names a relationship to knowledge that makes communities open to partnerships where multiple forms of knowing can come together to enrich a collective understanding of what is happening and what is most needed. This approach to knowledge also promotes experimentation, creativity, and learning—as we can see in the many experiments with clam farming and ecosystem management led by clammers along the coast. The phrase also serves as a powerful reminder that academic knowledge is inevitably uncertain and incomplete, which underscores the need for researchers to approach such partnerships with humility.

Shared doing, shared learning

Amid the political turmoil of climate change and the COVID-19 pandemic, some academics lament that society should "follow the science." In our experience, however, finding ways to agree about something like climate change is less important than identifying tangible, material objects that can serve as the focus for shared experimentation and learning.

Toward this end, we've come to embrace "boundary objects," including tools like bucket drifters, DNA tests to determine pollution sources, and community mapping. These tools function as boundary objects because they allow collaborators to come together around a shared focus—such as following drifter buckets to learn about tides—in ways that allow for differing perspectives to remain.

These objects enable communities to work together to understand how other members view the world and to find ways to connect across differences. Shared mapping and writing projects, for example, allow collaboration to emerge simultaneously with an open, active, and ongoing negotiation of difference. When clammers and mussel harvesters in Lamoine encountered discord over competing needs within the bay, we used collaborative mapping efforts to identify the areas of concern and create space to talk about different views regarding what needed to be done. This mapping helped produce the state's first collaborative intertidal management plan focused on mussels, which now serves as a model that other towns have followed. After communities produce maps and related documents, these often circulate in ways that allow formerly disconnected communities to learn about what is going on in the next town, bay, or sovereign territory.

Ultimately, the general confusion implied by "hard tellin', not knowin'" can be a catalyst to learning and connection, as well as a way to scale the impact of community knowledge. It may not be possible to send a university representative to every community, but by producing shared learning resources, knowledge can be shared by community members themselves. Importantly, this approach to learning by doing is not about reaching a final destination, but staying with the "not knowin'" and seeing where that might lead.

Building collaborative networks for the long haul

For the five of us, the experience of working with communities is a potent reminder that we are engaging in something much bigger than our individual lives and careers. This is messy work in which we stumble, fall, reflect, and—with luck and persistence—rise, regroup, and renew our efforts. Conventional university approaches to partnerships rarely resemble our experiences. Some of our partnerships are organized in traditional ways, but more occur in network-based collaborations, with many leaders and other participants who come into and out of the partnership in various ways at different times. Where the effort begins and ends and who is responsible for what parts are continually changing.

Despite the blurriness, network-based approaches have many benefits. They create opportunities for mutual learning, promote diverse forms of leadership, and foster connections across scales, contexts, organizations,

and individuals. Sometimes called third spaces, they enable more flexible, inclusive, and effective forms of decisionmaking that help communities adapt to social and environmental change.

As third spaces, such networks can also help destabilize the position of the university as a center of expertise to which communities come for “enlightenment.” A network doesn’t have a single center, which allows multiple forms of knowledge to flow together or diverge as the situation requires. It is also distinct from attempts to “integrate” knowledge into a university, which only serves to center the university and reproduce the systemic inequities and injustices that are tied to university histories, especially at land and sea-grant universities such as ours.

In 2018, a few of us used these ideas to guide the design of the Maine Shellfish Learning Network (MSLN), which works to build connections and conversations among the Maine and Wabanaki shellfish fisheries. The MSLN is a deliberate attempt to create a self-sustaining network that can evolve to meet the needs of the region’s different communities.

Our collaboratively defined mission promotes learning, leadership, and equity within Maine and Wabanaki wild clam and mussel fisheries. This means we also commit to equitable learning and interactions among ourselves. We codevelop job titles and respective responsibilities, engage in shared decisionmaking, write grant budgets with an eye to pay equity and stipends for participation, and generally err on the side of being inclusive and transparent even when doing so slows things down. These kinds of commitments also support diverse forms of leadership, including students and partners who bring unique interests and skills to bear on the formation and sustenance of the network. Many others have also contributed to the network’s growth, including a diverse group of faculty, staff, university leaders, and funders.

Networks don’t follow straight lines. They branch, fork, come back together, and reverse on themselves. While these descriptions focus on spatial patterns, this characterization also holds over time. Network-based collaboration does not follow the linear temporality of a clock, an academic calendar, or a grant. Instead, there are multiple forms of time at play, each with its own rhythms. Tides, for instance, are a form of time our network-based collaborations required us to tune into, but one that does not obey academia’s rules.

Even as we work to strengthen the Mitchell Center’s long-term capacity for engaging in such partnerships, it’s also clear that there is a collective need for a much larger network. Given what sometimes feels like an inexhaustible supply of wicked problems—such as pandemics, injustice, climate change, food insecurity—what would it take to mobilize a network of thousands of universities committed

to working with communities to address such local and global challenges? Of course, many other universities in the world are already engaged in community partnerships, but it’s difficult to know what lessons are being learned in different contexts. What kinds of commitments and processes would enhance network-wide learning in a global environment undergoing rapid social and environmental transformation? Would students and faculty find such work rewarding, and would communities actually benefit? If such a collaborative network helped build more productive forms of deliberation as well as more equitable and resilient democratic practices—step-by-step and place-by-place—the benefits might add up to something big.

David D. Hart is the director of the Senator George J. Mitchell Center for Sustainability Solutions and a professor in the School of Biology and Ecology at the University of Maine.

Bridie McGreavy is an associate professor in the Department of Communication and Journalism, faculty fellow in the Mitchell Center for Sustainability Solutions at the University of Maine, and coleader of the Maine Shellfish Learning Network. **Anthony Sutton** (Passamaquoddy) is an assistant professor of Native American Studies and Food Systems at the University of Maine and coleader of the Maine Shellfish Learning Network. **Gabrielle V. Hillyer** is a PhD candidate in ecology and environmental sciences in the National Research Traineeship Conservation Science Program at the University of Maine and project coordinator for the Maine Shellfish Learning Network. **Darren J. Ranco** (Penobscot) is chair of Native American Programs, professor of anthropology, and faculty fellow in the Mitchell Center for Sustainability Solutions at the University of Maine.

RECOMMENDED READING

- D. D. Hart and L. Silka, “Rebuilding the Ivory Tower: A Bottom-Up Experiment in Aligning Research With Societal Needs,” *Issues in Science and Technology* 36, no. 3 (Spring 2020): 64–70.
- B. McGreavy, D. Ranco, J. Daigle, S. Greenlaw, N. Altvater, T. Quiring, N. Michelle, J. Paul, M. Binette, B. Benson, A. Sutton, and D. Hart, “Science in Indigenous homelands: addressing power and justice in sustainability science from/with/in the Penobscot River,” *Sustainability Science* 16, no. 3 (2021): 937–947.
- B. McGreavy, S. Randall, T. Quiring, C. Hathaway, and G. Hillyer, “Enhancing adaptive capacities in coastal communities through engaged communication research: Insights from a statewide study of shellfish co-management,” *Ocean & Coastal Management* 163 (2018): 240–253.
- T. J. Shaffer and N. V. Longo, eds., *Creating Space for Democracy: A Primer on Dialogue and Deliberation in Higher Education* (Sterling, VA: Stylus Publishing, 2019).