

Connecting Science and Communities: the role of NGOs and boundary organizations

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NGOs as knowledge brokers (abba cddc effe gg)

Who knows? And what? And how do we exchange?

What is the role of NGOs in this?

How can they help with an analysis

or synthesis, outreach, across a range

of issues, scales, locations, and sectors?

Their role can be producing knowledge, growing

Capacity, doing outreach, showing

data, communicating as vectors

crossing disciplines, engaging, serving

as connectors and as knowledge brokers,

instigating discovery, fire stokers

sharing information worth conserving.

In sum, NGOs can fill many functions

Especially at boundaries and at junctions.

I wrote this English sonnet to introduce several themes I will discuss today. The main conference topic, as you all know, is “Connecting Science and Communities in a Changing North Pacific.” This is incredibly timely, as it is coastal communities who are some of the first to see the effects of global change, in an example of, to change a phrase slightly, “act globally, feel locally.” The effects of our global actions, from greenhouse gas emissions, to plastic pollution, to large-scale agricultural practices, are seen not only on global scales, through things like accelerating increases in global sea surface temperature, widespread deoxygenation, and increasing ocean acidification, but also – and especially – at local levels, in communities that are seeing changes in fish stocks in long-standing commercial fisheries, or are losing sources of drinking water because of saltwater intrusion, or that that cannot hunt safely because of melting sea ice, or are suffering economic losses because of more damaging or more frequent storms, or even that have to move because of sea level rise, to list but a few consequences of climate change.

But how do we actually connect different sources of knowledge and information among those very diverse groups who hold them? Even in situations where it seems communication should be straightforward – in a university setting, for example – we see how difficult it is to bridge disciplines, both within natural or social sciences as well as arts and humanities, not to mention across them. Once we start bringing in other sectors and actors – citizens, communities, businesses, government officials – the complexity of information sharing becomes even greater, and connecting knowledge and action becomes yet more complicated.

In this environment, boundary organizations can help cross lines, translate, pass messages, and engage with actors who themselves may be more siloed or who focus their expertise on one aspect of a problem. The concept of boundary organization is used to talk about organizations that mediate, usually between science and policy, and has grown to be used broadly for organizations that connect the science and policy through means including communication, education, outreach, and advocacy.

Not all boundary organizations, obviously, are NGOs, and not all NGOs are boundary organizations, but many serve in that function either occasionally or explicitly. I have direct experience with two, Ocean Conservancy, a US-based NGO that works on ocean issues, including climate change, ocean acidification, Arctic, ocean planning, plastics, and fisheries, among others. I also have been working over the past couple of years as co-chair of the Ocean Knowledge-Action Network Development Team, a group set up by co-sponsors Future Earth, the Intergovernmental Oceanographic Commission, the World Climate Research Programme, and the Scientific Committee on Oceanic Research to connect ocean and coastal actors from around the world to bring knowledge to action by working with networks including and representing individuals and organizations from academia, civil society, government, and the private sector.

Both of these organizations are operating in a context of global change – the central feature of the Anthropocene – and are having to respond to this change in how they act. Helping communities navigate the changes, work to slow them, adapt to what they cannot avoid, and develop resilience, has to permeate every initiative, program, campaign, and action we take. And understanding the changes requires having the best information, science, data, and knowledge, in all its multifarious forms, available and accessible. So this can be a key place where NGOs help connect knowledge holders, users, and decision makers.

And an added complication – as if we needed one – is that knowledge is not always produced nor are decisions always made at scales relevant to where impacts are felt. Sometimes, decisions are even blocked at particular scales... looking south to the United States and the current Administration here.... Again, NGOs may be able to bridge, cross, or jump scales to address this.

Crossing scales: a Spenserian sonnet (abab bcba cdcd ee)

Different groups work at different scales
 Here are examples of a few I know
 From local to global, a few short tales
 Of oysters, networks, management, that show
 Ways science and communities can grow
 Their knowledge. Boundary organizations
 Link individuals, groups, networks, co-
 Producing at scales from towns to nations
 And beyond – global observing stations'
 Data are transformed, made accessible
 For managers working in locations
 Where they see change, in terms expressible.
 Likewise, knowledge from people on the ground
 Should inform decisions, and be shared 'round.

My second sonnet leads in to a few examples of specific cases of how NGOs I work for or with have engaged to connect science and communities for action in a changing environment. I'll talk about three different examples: some of California's ocean-climate actions, working on ocean acidification with oyster growers and decision makers, and endeavoring to make sure the UN Decade of Ocean Science for Sustainable Development addresses both the science and sustainability parts of its name.

In California, Ocean Conservancy and other NGOs have been working with scientists, government agencies, communities, and legislators to promote ocean-climate action. The ocean is critical to California's welfare and identity. Climate change threatens to destroy this; rising sea levels, ocean acidification, extreme climate variations, kelp bed loss, and species shifts and losses are just some of the unprecedented climate-driven ocean issues already happening in California. To combat climate change, California has worked for more than a decade to reduce greenhouse gas emissions, build resilience, and plan for unavoidable impacts. Ocean solutions are a key component of its strategies, and the state has led the world to protect the ocean from climate change. Boundary organizations have played a key role in this. These include quasi-NGOs like California's Ocean Science Trust, set up by statute to provide scientific advice to state agencies, in particular the California Ocean Protection Council, from experts from multiple disciplines. They also include groups that work on the ground with communities that are seeing first-hand the effects of ocean change and that bring that information to decision makers at local and state levels. And they include NGOs that work with state agencies and legislators to connect community and academic science and knowledge to legislation and regulation.

They also involve many layers. For example, California regularly prepares a report to inform and direct state action for adaptation, known as Safeguarding California. Spurred by California's first climate change assessment, a 2008 executive order directed the state to develop a statewide adaptation strategy. The Safeguarding California Plan outlines adaptation goals across statewide sectors including ocean and coastal resources and is updated regularly, with input from government actors, scientists, ocean users, coastal communities, and the public. Safeguarding California is not regulation, but rather a directive to state agencies to complete recommended adaptation actions relevant to each state agency's existing mission and mandates and is a resource for communities around the state.

The next layer is continuing to build off of the knowledge in the state to work on implementation actions. For example, Ocean Conservancy has been working with other NGOs on a suite of adaptation legislation, including bills that specifically address the ocean and coasts. You can see how the interconnections between science and communities – writ large, and including coastal communities that are facing sea level rise and other ocean changes – intersected and led to legislation, with one adaptation bill passed this legislative session, and others likely to be passed early in 2020. This year's SB 576 was signed by the Governor last month and would establish a state climate ready program at the state's coastal conservancy to address the existing and potential impacts of climate change along the coast. It would also provide authority to the OPC to explore the coordination of science along the Pacific Rim to facilitate information sharing on coastal climate adaptation. Two other bills on adaptation and resilience are also intended to help the state prepare for climate change. One would establish a governing structure, metrics and goals, and fiscal tools to support climate resiliency, and the other would provide authority to the Governor and the Secretary of Natural Resources to coordinate on climate resiliency with other states, regions, and nations.

These bills came out of work the state, working with affected communities and experts, has already done, including the Safeguarding California plan, as well as activities in agencies in the state, including the Ocean Protection Council, the Coastal Conservancy, and the California Coastal Commission, among others, and build on them to keep improving the state's preparedness. And NGOs played key roles in this process, from their involvement with the state's adaptation planning as experts, their work bringing communities – including underserved and historically underrepresented communities – into the process, and at the State Capitol in Sacramento, advising legislators on relevant issues and language, connecting state legislators and the administration, and lobbying for the passage of these bills. So different forms of

knowledge entered into the political process, often mediated by NGOs; in turn, the bills pave the way for additional science that is targeted to communities to help them adapt to climate change.

Other work where NGOs are seeking to mobilize science in ways that help communities, and to mobilize communities to bring their knowledge to guide and spur action, traverses several scales, from local to state to regional to national to global. Ocean acidification has large implications for the delicate ecosystems that rely on shellfish and the role they play in the environment. And clearly, to solve the problem of ocean acidification, we need to cut carbon emissions. But there are many steps we can take right now to help mitigate the damage locally and regionally. NGOs as boundary organizations work with leaders from coastal communities, the business sector, scientists, and government officials to address carbon pollution and ocean acidification collaboratively. They are often on the front lines of research, outreach, and action on ocean acidification. This includes advocating for federal funding to understand the problem better – for example, Ocean Conservancy has brought oyster growers to the US Congress to push for research funds, and advocated for the National Estuaries and Acidification Research Act (NEAR Act) that the House of Representatives passed in 2019 and that is expected to have a companion Senate bill.

NGOs also do outreach and education to highlight the problem, and bring together stakeholders and scientists to find solutions. Examples include organizing a US-Chile shellfish growers' knowledge exchange early this month. It included meetings with shellfish growers and OA researchers in Chile as well as high-level meetings with officials from the Ministries of Foreign Affairs and Science to exchange knowledge and best practices. And boundary organizations help bring together groups like this – government officials at national and subnational levels – to share best practices more broadly and to advocate for ocean and climate action, including through the International Alliance to Combat Ocean Acidification, which counts Ocean Conservancy and other NGOs along with US states (including the West Coast states of California, Washington, and Oregon), provinces (including British Columbia), First Nations (including the Suquamish Tribe, Tsleil-Waututh Nation, and the Makah Tribe) and countries, including Canada, among others as members.

Finally, boundary organizations can weave networks that connect knowledge and communities. One such initiative is the Ocean Knowledge Action Network, with a development team that has representation from six continents and from backgrounds including journalism, natural and social sciences, ocean conservation, and public health. It was explicitly created to bring science from the global research projects like SOLAS, IMBeR, Future Earth Coasts, and others, along with science from other research communities, into action. But it is a small group for such vast and global ambitions, so the key is to take advantage of working at boundaries of science, knowledge, policy, and action. A focus for the Ocean KAN is thus the UN Decade of Ocean Science for Sustainable Development, where achieving the second part of the title is going to need boundary work to connect to the first part of the title – in both directions. Some of the ways of getting there are by supporting capacity building and early career researchers and professionals, many of whom are interested in co-producing knowledge with communities, and in working at the edges of science and action themselves. Boundary organizations like the KAN and others can facilitate this work.

Turning to action: An Italian (Petrarchean) Sonnet (abba abba / cdcdcd); forgive me for using data as a singular. I know that data are, not is.

Just data by itself does not provide
Answers. Even analyzed, it still needs

Work to convert information to deeds
And translation for those who must decide
Which actions to take, and what is implied
By different choices, and who must take heed
Of how their communities can succeed,
Adapt and thrive, with science as a guide.
So all of us here have a role to play
NGOs can help amplify, connect
Our science, develop it in a way
People can understand, trust, and respect
And use. Knowledge to action, so they say
Let's make that real, tangible, and direct.

Questions for the audience:

Do you have examples of where boundary organizations have helped connect science with communities? Directly? Indirectly?

What would be most useful for your community – and here I mean both in terms of where you live but also your academic or work community – to help co-produce and/or share knowledge?