



Photo: Visitors to a aquarium that have staff who are trained in effective climate change interpretative practices to provide opportunities for participants to explore local relevance and solutions. ([link](#))

Building Capacity for Productive Public Engagement

NNOCCI Program

Studies have shown that nearly two-thirds of Americans talk about climate change only occasionally or not at all, resulting in a lack of community action to address one of the most important issues of our time. The National Network for Ocean and Climate Change Interpretation (NNOCCI) has demonstrated that by activating the resources of widely trusted institutions such as aquariums, zoos, museums, and other informal science education (ISE) institutions, we can break through obstacles such as the perceived complexity of science and political polarization to create a space in which productive, fact-based climate change conversations can be had and barriers to community climate action can be overcome. We now have abundant evidence that these conversations inspire ISE institution visitors to drive community-level strategies in addressing climate change. Through NNOCCI's success, we have integrated the power of climate communication within the New England Aquarium visitor experience, and have built on our knowledge to extend our strategy into Boston-area communities, particularly to coastal communities that are especially vulnerable to the impacts of climate change. By building on solid empirical research to understand what people already value, believe, and understand, networks of ISE institutions have designed communication

strategies that helped translate complex science in a way that allows people to examine evidence, make well-informed inferences, and embrace science-based solutions. The impact to date has been extensive and many more institutions support their community's climate actions in the Boston area and across the United States.

Case Study

The Case Study below outlines the impact of the New England Aquarium's climate change education programs on the climate actions in the Boston region and communities across the country and beyond.

The outcomes that New England Aquarium sets out to achieve are directly in line with MAPC's strategic goal of helping the region reduce greenhouse gas emissions and adapt to the physical, environmental, and social impacts of climate change and natural hazards through community education and an informed public. This work also supports our mission of promoting smart growth, regional collaboration, inclusive community engagement and advancing equity in the region,

Emily Torres-Cullinane, Community Engagement Manager, Metropolitan
Area Planning Council

ISE institutions can serve as conveners and facilitators, bringing together people to discuss important social and environmental issues. They can help to build relationships and trust both within and beyond their walls. In an era where partisanship has increased and trust in many institutions has decreased, the general public continues to view ISE institutions as trusted and unbiased. By building on empirical research to understand what people already value, believe, and understand, networks of institutions have designed communication strategies that helped translate complex science in a way that allows people to examine evidence, make well-informed inferences, and embrace science-based solutions. The impact to date has been extensive and many more institutions support their community's climate actions.

To build on the public's trust in ISE institutions, the New England aquarium and a wide group of partners have developed a strategy that extends outside the four walls of the Aquarium to build new kinds of community partnerships aimed at catalyzing responses to climate change. With funding from Institute of Museum and Library Services (IMLS), National Science Foundation (NSF), and National Oceanic and Atmospheric Administration (NOAA), they are piloting this work in a new community climate resilience initiative in East Boston and in nearby municipalities, including Chelsea, Lynn, and Hull. They will then leverage the NNOCCI network to expand to other urban areas that will be similarly impacted by climate change.

Through a City Team approach, the aquarium is bringing together ISE educators with city planners and scientific/technical advisors (e.g., Climate Ready Boston, NOAA, Coastal Zone Management (CZM), University of Massachusetts Boston, and Metropolitan Area Planning Council), community organizations (e.g., Green Roots, Harborkeepers, and ZUMIX in East Boston), and education partners in Innovation Lab Training (ILT). They are working with the Harwood Institute for Public Innovation and FrameWorks Institute to develop a training program for City Teams, followed by action planning, follow-up coaching, and evaluation. This ILT introduces theoretical perspectives on community engagement and science communication, as well as practical strategies for aligning community needs with learning goals and developing action strategies to respond to community challenges. Training includes specific tools for: listening to community concerns, identifying “unusual suspects” (trusted partners in communities who can accelerate progress), developing partnerships, convening community meetings, and linking scientists and grassroots community organizations in collaborative goal setting.

CZM is currently assisting coastal communities with climate change vulnerability and risk assessments, and is committed to helping advance the Aquarium’s work to develop school and community partnerships to increase public dialog about increasing climate resiliency. This work supports the goals of the Commonwealth’s StormSmart Coasts Program to provide information, outreach, and tools to help communities address climate change.

Bruce Carlisle, Director, Office of Coastal Zone Management, Commonwealth of Massachusetts

In addition, the Aquarium’s ClimaTeens program in Boston, which serves 40 teens per year over a nine-month leadership training and development program, has demonstrated the potential for youth to serve as environmental leaders. Over 65% of ClimaTeens participants live in low-income communities, which are often hardest hit by climate change. ClimaTeens participants are empowered to serve as vectors for change. Evaluation results for this program are positive, showing 94% indicated they increased their ability in and confidence to provide leadership to their peers, and 100% indicated they increased their ability in and confidence to persuade someone that an environmental issue is important.

Key outcomes of the community climate resilience initiative include the following:

- Community organizations in participating communities gain new tools, information, and resources that, combined into shared action plans, can advance community climate know-how and community-driven responses to the threats and challenges they face, and to increase the potential for shared action to help create more livable and sustainable communities.

- Community leaders demonstrate increased science know-how on climate change issues and more broadly see the role of the New England Aquarium as an integrated community partner, rather than simply a destination to visit.
- The Aquarium deploys new strategies and tools for community engagement and facilitating community change; builds new partnerships with which to define shared priorities moving forward; and develops new perspectives on our role in helping communities better address their needs and priorities.
- Other communities and organizations in the Boston area and beyond can participate in and build on this new capacity-building model.

NNOCCI Overview

“... NNOCCI has completely changed the way I approach communicating our agency’s research and mission. I feel more confident in my abilities to communicate complex and controversial subjects as a result of my NNOCCI training.”

Science Educator

NNOCCI is a network of individuals and organizations in ISE, the social sciences, and climate sciences currently working in 170 institutions in 38 states. The network shares a commitment to using evidenced-based communications methods and providing the social and emotional support needed to engage as climate communicators. By working together, they develop the knowledge, techniques, community, and confidence needed to empower their audiences. NNOCCI is a generative social impact network that advances the educational role of ISE institutions, collaborates on research and development, and continues to support a community of practice and a powerful social movement. Our consistent messaging about climate change across the country is changing public discourse to be positive, productive, solutions-focused, and supportive of community climate action.

NNOCCI provides in-depth training, called Study Circles, for ISE educators from aquariums, zoos, and science/nature centers across the U.S. Led by the New England Aquarium, NNOCCI’s network structure empowers members to support and complement each other’s skills. In addition to the 170+ ISE institutions in the NNOCCI network, our strategic partners are:

- Monterey Bay Aquarium: leads social media strategy, coalition-building expertise, and updating and managing NNOCCI’s website, Climateinterpreter.org
- FrameWorks Institute: ensures integrity of strategic framing content in training materials and activities
- New Knowledge Organization: assesses and evaluates NNOCCI’s impact in the community

- Association of Zoos and Aquariums (AZA): ensures alignment between NNOCCI and AZA initiatives, advises on best practices for structuring professional development for informal educators, and facilitates dissemination to AZA member institutions
- Woods Hole Oceanographic Institute: ensures the integrity of climate science content and dissemination to climate scientists.

Informal science educators possess a high level of public trust (The Ocean Project, 2009; Fraser and Sickler, 2009). Properly equipped, they can accelerate effective public engagement. However, informal educators need training to increase their confidence in scientific knowledge, guidance on interpreting the complexity of climate change, and support from their peers to take on a leadership role in addressing this often distressing and controversial topic for society.



Among the goals of the NNOCCI Network, a few stand out for their importance and direct relevance to community climate action:

Engaging in place-based solutions empowers communities

By focusing on specific applications and solutions to real-world problems, crisis-framing and despair is minimized. Appealing to strongly held universal values and concepts, such as responsible management and stewardship, can minimize polarization and contention.

Interpreters trained by NNOCCI help the public to see themselves as potential participants in community issues, rather than simply as individual consumers of knowledge.

Being a part of a network increases confidence which leads to more dialogue and action

The NNOCCI initiative has reached aquariums, zoos, and science/nature centers across the United States and beyond. As shown in "Catalyzing Public Engagement with Climate Change Through Informal Science Learning Centers" in the journal of Science Communication, visitors to institutions that have participated in NNOCCI training are significantly more:

- Knowledgeable about climate change science
- Hopeful that we can solve climate change challenges
- Confident talking about climate change with others
- Likely to believe that talking with community leaders lead to community level change
- Likely to engage in community-level community action to address climate change.

Examples of these community actions include engaging local policy makers, joining a local climate action organization, donating to an organization addressing climate change, voting for candidates who pledge to address climate change, signing petitions, and personal activities such driving less and purchasing energy efficient appliances. Positive impacts created by these NNOCCI-inspired community leaders illustrate how NNOCCI can effect on-the-ground, community level change by changing the conversation around climate change.

A "train the trainer" model has a high return on investment

Since its inception in 2009, NNOCCI has trained 400 individuals, who have, in turn, trained more than 38,000 people to use NNOCCI's communication techniques, influencing 150+ million visitor interactions per year. NNOCCI members also build exhibits, create educational programming, foster community partnerships, and develop training programs that engage millions of Americans in climate conversations every day.



Photo: Climate change interpretation in action at the New England Aquarium

Lessons of what works inform other institutions programs

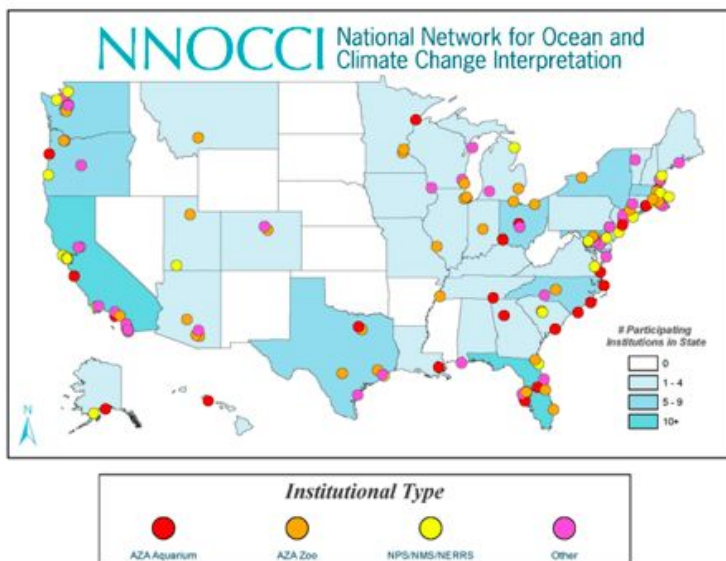
The New England Aquarium has been applying the lessons learned from NNOCCI in the Visualizing Change project, a related NOAA-funded collaboration among several aquariums,

focused on developing strategically-framed “visual narratives” that take advantage of global datasets presented on platforms such as the Science on a Sphere. Observations during formative evaluation demonstrate that after listening to a strategically-framed presentation, visitors can describe climate change causes, impacts, and solutions.

National/International Impact

NNOCCI’s approach to communication can be impactful at scale because we provide techniques and tools – instead of a “script” – which educators can adapt to resonate best with their communities. NNOCCI’s work has already had an impact on a national level, and exploratory work has been done on extending this approach to Canada, United Kingdom, Brazil, and China.

NNOCCI training focuses on how to increase public understanding, self-efficacy, and support for solutions related to climate change causes and impacts. Each Study Circle brings together pairs of educators representing ten institutions from across the country with two climate scientists and three facilitators. Participants invest approximately 70 hours over 4-6 months, learning and practicing research-based communication techniques and climate science.



Map of NNOCCI Network

Graduates of these workshops become part of our national network in the United States. They then implement new messaging techniques at their respective institutions and train volunteers, staff, and community partners to communicate using NNOCCI’s proven, evidence-based method. Network members receive continued support via webinars, network newsletters, and online social groups to share their successes and innovations, incorporate the latest science, ask for help, and improve our collective practice.

Study Circles use a strategic framing™ approach (Gilliam and Bales, 2004), which supports effective communication by (1) building on careful empirical research to understand what people already value, believe, and understand and (2) designing and testing communication strategies that help translate complex science in a way that allows people to examine evidence, make well-informed inferences, and embrace science-based solutions.

By using scientifically accurate, [tested language](#), the complexity of earth and climate systems can be more easily understood. By connecting to widely held values – such as [protection](#) and [responsible management](#) – people can be helped to understand what is at stake and how the ocean and climate connect to their daily lives. By helping people understand human impacts, people will gain awareness that their involvement makes a difference; and, by emphasizing actionable, [community-level solutions](#), community climate action can be initiated.

This approach explains causes and consequences to orient thinking and discourse toward effective interventions. For example, explaining that burning fossil fuels releases large amounts of carbon dioxide into the atmosphere, where it acts like a heat-trapping blanket, has been shown to help non-experts think more effectively about ways to address the root cause—burning fossil fuels (Frameworks Institute, 2014). Understanding the chain of cause and effect helps individuals to appreciate the root source of the problem, and what kinds of solutions are likely to be effective.

Based on attendance records from zoos, aquariums, and other informal science education institutions, attendance at NNOCCI-affiliated institutions is estimated to exceed 150 million people, or about 45% of the US population. When the social networks of these visitors is considered, in addition to the social networks of the communicators and their colleagues, it is no surprise that the national dialogue on climate change is moving toward finding effective solutions to one of the great environmental challenges of our time.

“I think the government has to be involved in finding a solution. For example, where we live there is some type of public transportation, but I think the schedule is one bus every hour. If you rely on that as your main form of transportation, you’re going to get to work in two hours. So it’s not feasible, and therefore you have to drive your vehicle. If we had a good public transportation system, we could use it, instead of relying on our cars.”

Visitor to a NNOCCI-affiliated institution

Lessons Learned

Informal science centers can play a pivotal role in strengthening climate know-how, promoting effective public discourse, and motivating community climate action. The NNOCCI model has shown that a motivated group of communicators – armed with effective messaging techniques and emotional support from members of a tight-knit community of practice that shares their values and concerns – can shift the national dialogue about climate change. There are several key takeaways from this work:

Community fosters climate action

The Climate Interpreter portal supports educators or volunteers at aquariums, zoos, national parks, national marine sanctuaries, and other informal science education institutions that are addressing climate change. They can join and connect and share with a community of colleagues and peers.

Local resources support climate engagement and action

Providing opportunities for educators to directly respond to local impacts of climate change encourages a sense of community responsibility while increasing people's understanding, talking about, and acting on climate change.

Museums Can Be Leveraged To Increase Local Climate Dialogue

Museums have a large reach and are highly trusted. Sixty-one percent of Americans regularly visit ISE institutions and represent a wide swath of society. So if they can be reached, a significant impact can be achieved. The ripple effects of effectively engaging ISE institutions has been surprisingly extensive, with lasting impacts documented on trained informal educators; their colleagues, friends, and families; and the millions of visitors with whom they engage. These impacts include improved understanding of the causes of and challenges created by climate change, greater hope about addressing climate challenges in their communities, and increased motivation to engage in community climate action.

Point of Contact

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New England Aquarium

Partners

[Monterey Bay Aquarium](#)

[New England Aquarium](#)

[New Knowledge Organization Ltd.](#)

[Woods Hole Oceanographic Institution](#)

[Association of Zoos & Aquariums](#)

[FrameWorks Institute](#)

[NOAA](#)

Resources/Website

[National Network for Ocean and Climate Change Interpretation - NNOCCI](#)

[NNOCCI: Changing the Conversation on Climate Change Video](#)

[National Network for Ocean and Climate Change Interpretation \(NNOCCI\) Recommendations](#)

[ClimaTeens](#)

[Community Partners for Resilience](#)