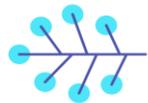


# Surfacing Social Values & Community Priorities: A Landscape Report of Relationship-Building Approaches for Public Engagement with Climate

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<https://www.aaas.org/page/center-research>.

## Executive Summary

The field of civic science encompasses a broad umbrella of initiatives that connect science in society in evidence-based ways that empower scientists to play more active roles in our shared civic life and include the active participation of marginalized communities throughout processes of engagement. Focusing on local collaborations that seek to address climate resilience, recovery, and justice in ways that aim to include community experiences and knowledge, this landscape report examines the continuum of civic science approaches in the public engagement with science (PES) space on climate resilience. In doing so, the report uplifts approaches for scientists and subject matter experts to challenge expertise barriers by promoting more equitable engagement with communities; identifies pathways for more active and equitable deliberation with community collaborators from the early processes of framing issues for engagement; and conceptualizes “streams” of engagement that can inform future PES initiatives and evaluation.

Toward these ends, the report surveys existing literature on PES, includes insights from more than 50 semi-structured interviews with thought leaders and practitioners in the field of public engagement with climate, and profiles local climate engagement initiatives to outline thematic challenges. It concludes with recommendations to inform new PES experiments and interventions, with particular focus on three groups of actors: (1) funders and institutional partners; (2) scientists and subject matter experts; and (3) PES researchers and evaluators. Finally, it explores ways to foster more equitable decision-making and information-sharing in topic-, audience-, and/or place-based PES collaborations to realize more inclusive deliberation and problem-solving. To inform the project outcomes, the study was advised by community

members, scientists, and practitioners who were convened as a part of a parallel case study project during a public forum and listening session on April 9, 2021.

### **What are some of the main thematic challenges for the field of PES?**

- 1) Inclusion of publics who may not feel included in or empowered by science and scientific institutions;
- 2) Understanding stakeholder motivations and interests more deeply;
- 3) Long-term engagement with preexisting and informal social networks;
- 4) Clear goals for PES, even when direct outcomes are not anticipated;
- 5) Upstream approaches for co-framing issues with publics.

### **What are typologies or ‘streams’ of PES on climate resilience?**

*Building upon research that considers public engagement as a spectrum or ladder, I conceptualize the landscape as a set of streams that merge and overlap and could be better harmonized toward shared visions of a culture of civic science.*

- 1) Public Dialogue: Multi-directional conversations and communication about social values and public concerns related to PES.
- 2) Public Deliberation: Deliberating on contentious science issues and surfacing stakeholder perspectives, values and concerns, which may be addressed to build consensus or may be used to develop recommendations.
- 3) Science Consultation: Advising, sharing, or translating information about options to be considered by publics.
- 4) Issue Advocacy: Advocating for particular solutions from the perspectives of particular communities and issues.
- 5) Co-Creation: Members of the public help to frame the issue for public deliberation and/or directly participate in processes of knowledge creation.

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## Project Overview

The countless ways that science and society shape each other urge deeper public engagement to bring forth social values and the motivations of all players. The American Association for the Advancement of Science (AAAS) describes public engagement with science as “intentional, meaningful interactions that provide opportunities for mutual learning between scientists and members of the public.”<sup>1</sup> Traditionally, science-society interactions have focused on improving public understanding of scientific issues. Public engagement with science (PES), on the other hand, aims to promote multi-directional shared discovery and deliberation about the desirable and undesirable effects of science and technology on individuals’ everyday experiences and on our shared civic life.

In addition to empowering scientists to play more active roles in their communities, realizing a culture of civic science will entail re-empowering people from communities that are underserved by science to take part in inclusive civic conversations for shared discovery, benefit, and problem-solving. In *Reclaiming Conversation*, Sherry Turkle reasserts the importance of conversations in the digital age, encouraging us “to remember who we are—creatures of history, of deep psychology, or complex relationships. Of conversations artless, risky, and face-to-face.”<sup>2</sup> Through inclusive civic conversations with PES, we may work to highlight social values and actors’ motivations to co-create a more inclusive, stable environment for deliberation. To these ends, Peter Levine suggests that core questions for the field of civic science are “How can scientists be a part of good conversations about contested values that involve science? And how

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<sup>1</sup> AAAS Center for Public Engagement with Science and Technology. “Why Public Engagement Matters.” <https://www.aaas.org/resources/communication-toolkit/what-public-engagement>.

<sup>2</sup> Sherry Turkle. 2016. *Reclaiming Conversation: The Power of Talk in a Digital Age*. New York, NY: Penguin Books, p. 362.

can the broader public have good conversations about science?”<sup>3</sup> In addressing these questions, PES provides opportunities to better understand the interests and motivations of various actors and include people with diverse experiences and perspectives.

For members of the public, PES could help to surface their values and priorities related to scientific and technological issues. With more direct engagement with social values and priorities, scientists may become better able to address and incorporate public concerns. Along the way, scientists may bolster the relevance and impact of their research, as well. Over time, two-way engagement through PES aims to help develop trusted, reciprocal relationships. In a review of over a thousand studies on environmental issues, a National Academies report concludes that when done well, formal efforts to engage the public improve “the quality and legitimacy of a decision and builds the capacity of all involved to engage in the policy process. . . . It also can enhance trust and understanding among parties.”<sup>4</sup>

Traditionally, interventions at the science-society interface have focused on improving public understanding of scientific issues in attempts to bring public behavior and decision-making in line with contemporary scientific understandings.<sup>5</sup> However, more than two decades worth of research in the fields of science communication and science and technology studies (STS) have suggested that this focus on reversing public knowledge deficits does not adequately reflect how science communication operates in society or how people make decisions about

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<sup>3</sup> Peter Levine. 2020. “What is Civic Science?” <https://peterlevine.ws/?p=21019>.

<sup>4</sup> National Research Council. 2012. *Using Science as Evidence in Public Policy*. K. Prewitt, T.A. Schwandt, and M.L. Straf (Eds.), Committee on the Use of Social Science Knowledge in Public Policy, division of Behavioral and Social Sciences and Education. Washington, DC: The National Academies Press.

<sup>5</sup> B. Suldovsky, B. McGreavy, L. Lindenfeld. 2017. “Science Communication and Stakeholder Expertise: Insights from Sustainability Science.” *Environmental Communication*, 11(5):587-592.

scientific information.<sup>6</sup> Instead, approaches that aim primarily to improve public understandings may risk disempowering everyday individuals' experiences, values, and firsthand knowledge.

In recent years, interest in PES approaches that involve shared discovery and benefit among scientists and members of publics has grown significantly. Nonetheless, public deficit approaches have maintained a certain “staying power” in the landscape of public engagement activities.<sup>7</sup> PES scholars have noted that much of the current landscape still “shares as a backbone” aspects of these approaches in which a primary goal of engagement is increasing public knowledge.<sup>8</sup> Despite renewed attention in PES scholarship, more experimentation is needed to translate this commitment into actual alternatives and quality PES practices.

PES scholarship has explored how to more equitably and effectively achieve shared discovery and action between scientists and members of the public. Through a literature review of recent PES scholarship and preliminary framing conversations with two dozen PES researchers, practitioners, and participants, five major themes for the field emerged that frame this landscape study:

1. *Inclusion of publics who may not feel represented or empowered by science and scientific institutions;*
2. *Attention to understanding actors' motivations and interests;*
3. *Long-term engagement with preexisting and informal social networks;*

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<sup>6</sup> J. Hansen, L. Holm, L. Frewer, et al. 2003. “Beyond the Knowledge Deficit: Recent Research into Lay and Expert Attitudes to Food Risks.” *Appetite*, 41(2): 111-121; P. Sturgis and N. Allum. 2004. “Science in Society: Re-Evaluating the Deficit Model of Public Attitudes.” *Public Understanding of Science*, 13(1):55-74; S.R. Davies. 2008. “Constructing Communication: Talking to Scientists About Talking to the Public.” *Science Communication*, 29(4):413-434; S. E. Tøsse. 2013. “Aiming for Social or Political Robustness? Media Strategies Among Climate Scientists.” *Science Communication*, 35(1) 32-55.

<sup>7</sup> Marin Bauer. 2016. “Results of the Essay Competition on the ‘Deficit Concept.’” *Public Understanding of Science*, 25(4):389-399.

<sup>8</sup> Dominique Brossard and Bruce Lewenstein. 2009. “A Critical Appraisal of Models of Public Understanding of Science: Using Practice to Inform Theory.” In L. Kahlor and P. Stout (Eds.), *Communicating Science: New Agendas in Communication: New Agendas in Communication*. New York: Rutledge.

4. *Clear goals for PES, even when direct outcomes are not anticipated;*
5. *Upstream approaches for co-framing issues for PES with publics.*

I will discuss each of these themes in greater detail in the next section. Framed by these themes, this landscape study aims to review existing approaches to identify inclusive and effective evidence-based practices for PES.

Observers have noted how differences in motivations, approaches, and vocabularies between PES scholars and practitioners have built silos and limited discussion across fields of practice and research. Scientists who are interested in public engagement, for instance, are often characterized as being motivated by desires to “raise awareness, transmit the importance of science, or correct misconceptions.”<sup>9</sup> PES scholars are regularly driven to engage publics in conversations about science and technology and are unsatisfied with—and often critical of—simply raising awareness or correcting misconceptions. On the other hand, PES scholars’ jargon and the tendency to share critiques of approaches without offering actionable solutions may alienate scientists and would-be PES practitioners.<sup>10</sup> To develop genuine dialogue among PES scholars, practitioners, and community collaborators to build alternative quality practices, practitioners should use shared, accessible language and offer actionable alternatives alongside critique whenever possible.

In an attempt to overcome the public deficit assumptions of PES scholarship itself and acknowledging that these themes have been explored in various fields, this landscape study aims to work across research and practice domains. In the early stages, I framed the landscape study through preliminary interviews with individuals from each set of participating groups. In writing

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<sup>9</sup> R.A. Salmon, R.K. Priestly, and J. Goven. 2015. “The Reflexive Scientist: An Approach to Transforming Public Engagement.” *Journal of Environmental Studies and Sciences*, 1-16.

<sup>10</sup> Matthew Nisbet and Ezra Markowitz. 2015. “Public Engagement Research and Major Approaches.” AAAS *Leshner Leadership Institute*.

the study, I shared drafts with representatives from each group for iterative feedback. Once a final draft was prepared, individuals from the case study communities, PES scholars, and practitioners deliberated over and helped to finalize the landscape study's analysis and recommendations during a public forum event in April 2021. I will outline each of these steps in greater detail in the methods section.

As a separate yet complementary project, I have pursued three in-depth case studies of flood resilience networks in rural Iowa and Missouri to ground my analysis of these themes in a particular civic context around a shared issue. Through the case studies, I examine the motivations and interests of scientists, community organizations, and community members in becoming involved with PES efforts to address the effects of flooding in rural, Midwestern civic contexts. In addition, I explore how goals of PES efforts are articulated, how preexisting social networks are engaged, how issues for engagement are framed, and how visions of progress are evaluated.

## Existing Public Engagement with Science Research

Realizing a culture of civic science will involve empowering more people to have access to science in their everyday decision-making and encouraging more scientists to engage in our shared civic life. Put differently, a culture of civic science calls for more inclusive, in-depth engagement among publics, scientists, and civic influencers for shared discovery. With growing interest in engaging public values related to science and in building local relationships, there is a need to identify practices for public engagement with science (PES) to broker collective decision-making and information-sharing more effectively and equitably.

Toward these ends, five priorities emerged from a literature review and preliminary interviews:

1. *Inclusion of publics who may not feel represented or empowered by science and scientific institutions;*
2. *Attention to understanding actors' motivations and interests;*
3. *Long-term engagement with preexisting and informal social networks;*
4. *Clear goals for PES, even when direct outcomes are not anticipated;*
5. *Upstream approaches for co-framing issues for PES with publics.*

## **1. Inclusion of Publics Who May Not Feel Represented or Empowered by Science and Scientific Institutions**

Much of the current PES landscape has been characterized by disparities in terms of socioeconomic status, race, and level of educational attainment. With some exceptions, such as environmental justice engagement, people of higher socio-economic statuses with greater flexibility in terms of time and resources are generally more likely to participate in public engagement with science.<sup>11</sup> Similarly, young and highly educated individuals are more likely to participate in local science engagement.<sup>12</sup>

In addition to promoting more inclusive engagement in terms of race, gender, profession, and level of educational attainment, we should also be mindful of geographic disparities. Many PES efforts take place in cities with relatively high concentrations of universities, science

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<sup>11</sup> S. Trouset, K. Gupta, H. Jenkins-Smith, C. L. Silva, and K. Herron. 2015. "Degrees of Engagement: Using Cultural Worldviews to Explain Variations in Public Preferences for Engagement in the Policy Process." *Policy Studies Journal*, 43(1), 44-69.

<sup>12</sup> Pew Research Center. 2020. "Younger, More Educated U.S. Adults Are More Likely to Take Part in Citizen Science Research."

museums and centers, and highly educated individuals. In this landscape, public engagement efforts mostly engage those who, in many respects, may have higher levels of trust in scientific institutions. This may risk further polarizing publics and should be considered as a critical need in diversifying PES engagement.

In the social sciences, “metrocentric” understandings that treat cities as the standard for analysis have been critically deconstructed by post-colonial, feminist, and queer-theoretical traditions, which emphasize situated knowledge or the importance of context in informing ways of knowing.<sup>13</sup> Meanwhile, the so called “rural-urban divide” has become an increasingly common lens for political communication and media.<sup>14</sup> Accordingly, PES scholarship and practice should work to challenge metrocentric assumptions and include diverse rural perspectives. With distinct civic cultures, senses of place and belonging, public engagement with rural publics can provide fruitful opportunities to develop practices that embrace social values, community knowledge, and localized experiences more meaningfully.

Once members of the public are able to participate, however, expertise barriers may work to impede equitable engagement. Shobita Parthasarathy describes expertise barriers as “the formal and informal rules of a science and technology policy-making domain which make it difficult for those without technical expertise to engage as equals.”<sup>15</sup> In PES activities, these barriers may be even more discreet, such as unequal brokering of decision-making and information-sharing among different groups of actors. Therefore, this landscape review highlights approaches that aim to build more equitable decision-making and information-sharing.

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<sup>13</sup> Tim Bunnell and Anant Maringanti. 2011. “Practicing Urban Research Beyond Metrocentricity.” *International Journal of Urban and Regional Research*, 34(2): 415-420; Neil Brenner. 2019. *New Urban Spaces: Urban Theory and the Scale Question*. New York, NY: Oxford University Press, p. 34.

<sup>14</sup> For example, see Emily Badger. 2019. “How the Rural-Urban Divide Became America’s Political Fault Line.” *The New York Times*.

<sup>15</sup> Shobita Parthasarathy. 2010. “Breaking the Expertise Barrier: Understanding Activist Strategies in Science and Technology Policy Domains.” *Science and Public Policy*, 37(5): 355.

## 2. Actors' Motivations and Interests

The motivations that lead publics, scientists, and others to participate in PES activities remain underexamined.<sup>16</sup> Surveys of scientists who participate in PES have shown that scientists tend to view “a lack of public knowledge” as harmful such that communicating their research is viewed as “a commitment to the public good.”<sup>17</sup> Members of publics who participate in PES tend to have more polarized views about the science topic at hand.<sup>18</sup> However, more in-depth social analysis can help to enable more effective communications and engagement, especially with publics who live outside of the “proverbial choir that science communication is often preaching to.”<sup>19</sup>

In American civic cultures, efforts to engage the public in science have been characterized as facing two primary challenges. First, many high-profile science issues have been predefined in highly partisan and ideological terms. In polarized civic environments, public engagement should happen “as early as possible in a public debate, and those with a stake in the issue need to be engaged over many rounds of back-and forth communication with each other.”<sup>20</sup> Second, pipelines for emergent science and technology – from governments and universities to the consumer market – regularly lack public oversight or consultation.<sup>21</sup> With hopes to address

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<sup>16</sup> Brossard and Lewenstein 2009.

<sup>17</sup> John C. Besley and Matthew Nisbet. 2013. “How Scientists View the Public, the Media and the Political Process.” *Public Understanding of Science*, 22(6): 971.

<sup>18</sup> S. Trouset, K. Gupta, H. Jenkins-Smith, C. L. Silva, and K. Herron. 2015. “Degrees of Engagement: Using Cultural Worldviews to Explain Variations in Public Preferences for Engagement in the Policy Process.” *Policy Studies Journal*, 43(1), 44-69.

<sup>19</sup> Dietram Scheufele. 2018. “Beyond the Choir? The Need to understand Multiple Publics for Science.” *Environmental Communication*, 12(8): 1123-1126.

<sup>20</sup> National Academies of Sciences, Engineering, and Medicine. 2017. *Communicating Science Effectively: A Research Agenda*. Washington, D.C.: The National Academies Press, p. 57.

<sup>21</sup> David Guston. 2014. “Building the Capacity for Public Engagement with Science in the United States.” *Public Understanding of Science*, 23(1), 53-59.

these sorts of civic and cultural challenges, much of PES scholarship has focused on specific approaches to inform public dialogue and achieve formal input on policy.<sup>22</sup> In doing so, PES scholarship has tended to neglect the more informal, everyday interactions between scientists and publics in their particular social contexts.

Analysts and practitioners of public engagement with science have tended to idealize publics as being motivated and prepared to participate actively in engagement activities. At times, however, members of publics can be cynical about or disinterested in public engagement processes.<sup>23</sup> In addition, PES scholarship has essentialized categorizations of publics or communities as monoliths. Addressing this tendency, Sheila Jasanoff argues for “a more robust conception of *publics*—not treating them as natural collectives (e.g., housewives or teenage women) but as dynamically constituted by changes in social contexts.”<sup>24</sup> More intimate understandings of relevant stakeholders’ interests and motivations can help to improve PES approaches by aligning the goals of engagement among each set of actors from the start. In this landscape review, I explore stakeholders’ interests and motivations through interviews to examine how their different motivations are negotiated in carrying out PES activities, as well as how to understand publics as dynamic and constantly changing throughout processes of engagement.

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<sup>22</sup> Matthew Nisbet and Ezra Markowitz. 2015. “Public Engagement Research and Major Approaches.” *AAAS Leshner Leadership Institute*.

<sup>23</sup> J. Stilgoe, S.J. Lock, and J. Wilsdon. 2014. “Why Should We Promote Public Engagement with Science?” *Public Understanding of Science*, 23(1), 4-15.

<sup>24</sup> Sheila Jasanoff. 2014. “A Mirror for Science.” *Public Understanding of Science*, 23(1): 23.

### 3. Long-Term Engagement with Preexisting and Informal Social Networks

The literature review and my preliminary framing conversations emphasized the need to invest in and cultivate long-term PES approaches. One-time engagement events like science festivals and science cafés can encourage active participation for a concentrated amount of time and help to generate buzz that traditional communication approaches might not, but they are less likely to lead to sustained relationships and community-building.<sup>25</sup> Even lengthy deliberation activities do not necessarily translate into long-term increases in civic engagement for scientists and members of publics.<sup>26</sup> While recognizing the contributions of shorter events, the importance of investing in and supporting long-term engagement is broadly acknowledged in the literature and was mentioned in nearly every preliminary framing conversation. Likewise, a National Academies report on science communication concludes: “Repeated deliberation over time builds trust among diverse participants—an approach that is much more successful than inviting participation after a conflict has emerged and intensified. In some such cases, participation processes have reestablished trust, but communication remains more difficult than when public participation is initiative early on.”<sup>27</sup>

PES scholarship and practices have tended to neglect the importance of informal social networks and interactions. Especially for communities that have been historically under-engaged or who are disempowered in relation to scientific institutions, informal social networks are key for the uptake of shared learning from PES activities.<sup>28</sup> This landscape review explores

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<sup>25</sup> Eric Jensen and Nicola Buckley. “Why People Attend Science Festivals: Interests, Motivations and Self-Reported Benefits of Public Engagement with Research.” *Public Understanding of Science*, 23(5), 557-573.

<sup>26</sup> David Guston. 2014. “Building the Capacity for Public Engagement with Science in the United States.” *Public Understanding of Science*, 23(1), 53-59.

<sup>27</sup> National Academies of Sciences, Engineering, and Medicine. 2017. *Communicating Science Effectively: A research Agenda*. Washington, D.C.: The National Academies Press, p. 57.

<sup>28</sup> C. Furman, C. Roncoli, C. W. Bartels, M. Boudreau, H. Crockett, H. Gray, & G. Hoogenboom. 2014. “Social Justice in Climate Services: Engaging African American farmers in the American South.” *Climate Risk Management*, 2, 11-25.

engagement approaches that aim to connect PES with informal social networks to foster more informal, sustainable encounters among scientists, community facing-organizations, and community members.

#### **4. Clear Goals for PES, Even When Direct Policy Outcomes Are Not Anticipated**

By focusing on informal interactions rather than immediate policy outcomes, articulating clear goals for PES becomes more important and more challenging. Goals should match stakeholders' interests as well as their capacities or desired levels of engagement.<sup>29</sup> The goals of deeper engagement are often long-term, complex, and not easily defined. David Guston describes the goals and outcomes of PES as “elusive” and represented by “changes in framing and vocabulary as well as substantive, procedural, and reflexive learning by elites and mass publics.”<sup>30</sup> This landscape review will explore how current PES efforts that aim for shared learning articulate and evaluate their goals.

#### **5. Upstream Approaches for Co-Creating Issues with Publics**

Policy research has held that the quality of solutions to a given problem is significantly influenced by how well the solutions are framed.<sup>31</sup> Similarly, PES scholarship has found that how issues are framed shapes how people engage with the issue.<sup>32</sup> Maxwell Boykoff describes framing as “a mechanism that both consciously and unconsciously privileges certain

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<sup>29</sup> J. L. Shirk, H.L. Ballard, C.C. Wilderman, T. Phillips, A. Wiggins, R. Jordan, and R. Bonney. 2012. “Public Participation in Scientific Research: A Framework for Deliberate Design.” *Ecology and Society*, 17(2), 29.

<sup>30</sup> David Guston 2014, p. 53-59.

<sup>31</sup> Donald Schon and Martin Rein. 1994. *Frame/Reflection: Toward the Resolution of Intractable Policy Controversies*. Basic Books; Paul Stern and Harvey Fineberg (eds.). 1996. *Understanding Risk: Informing Decisions in a Democratic Society*. National Academy of Science Press.

<sup>32</sup> A. Corner, N. Pidgeon, and K. Parkhill. 2012. “Perceptions of Geoengineering: Public Attitudes, Stakeholder Perspectives, and the Challenge of ‘Upstream’ Engagement.” *Wiley Interdisciplinary Reviews: Climate Change*, 3(5), 451-466.

interpretations and ‘ways of knowing’ over others, within a larger current of dynamic activities.”<sup>33</sup> For example, if framed largely by scientists or the PES practitioners, there is a risk that public engagement activities could become what one scholar described as “stealth issue advocacy” or seek to promote a predetermined consensus.<sup>34</sup> As sociocultural context and relevant histories influence how information is processed and thus shapes decision-making, values and experiences ought to shape how “the issue” is defined from the start. To surface and address social values and priorities more meaningfully, we should develop quality practices for co-framing issues in PES with members of publics in upstream processes of engagement to plan engagement more equitably and effectively from the start.

Despite best intentions, public engagement efforts that focus largely on public participation in the work of science, such as in data collection rather than in framing questions or sensemaking, risk framing “the issue” in scientific or technical terms.<sup>35</sup> At times, framing issues in technical terms devalues the importance of firsthand experiences and takes social values for granted. This limits opportunities for deeper shared learning for both scientists and community members, which has been demonstrated to influence public buy-in and the ability to tailor PES approaches to specific public priorities.<sup>36</sup> This landscape study aims to provide examples of more inclusive public engagement approaches to grapple with diverse ways of knowing, especially

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<sup>33</sup> Maxwell Boykoff. 2019. *Creative (Climate) Communications: Productive Pathways for Science, Policy, and Society*. New York, NY: Cambridge University Press, p.131.

<sup>34</sup> P. Macnaghten and J. Chilvers. 2013. “The Future of Publics, Policies, Practices.” *Environment and Planning C: Government and Policy*, 31.

<sup>35</sup> For examples, see: Aya Kimura and Abby Kinchy. 2019. *Science by the People: Participation, Power, and Politics in Environmental Knowledge*; Caren Cooper and Bruce Lewenstein. 2016. “Two Meanings of Citizen Science.” *The Rightful Place of Science: Citizen Science*; Anna Lawrence. 2006. “No Personal Motive?” *Volunteers, Biodiversity, and the False Dichotomies of Participation.* *Ethics, Place, & Environment: A Journal of Philosophy & Geography*.

<sup>36</sup> Furman et al. 2014.

from experiences and informal interactions, and to incorporate them in early stages of framing issues for PES.

## Streams of Public Engagement

PES scholars and practitioners alike encourage a plurality of tactics rather than a silver bullet or one-size-fits-all approach.<sup>37</sup> For example, PES research has described public engagement as a continuum or ladder with various levels of engagement that may be appropriate for different times and contexts.<sup>38</sup> Building from these conceptualizations of PES, I liken the landscape to “streams” or typologies that are necessary in their own right and can build from one another, like the confluence of small streams that together, eventually, form a river.

Driving the velocity of these streams, the depth of public engagement (which is not the same as level of impact) can be defined according to the following variables: time, dominant voice and power, repeatability, scale, and level of involvement of participants.<sup>39</sup> Time refers to the length of the event and whether or not it was a one-time event (low velocity) or continuous engagement (high velocity). Dominant voice describes who brokers information-sharing and decision-making, mostly scientists (low velocity) or members of publics (high velocity). Scalability accounts for whether the event is altogether unique to the particular time (low velocity) or if it’s readily scalable to other contexts (high velocity). The level of involvement of

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<sup>37</sup> Maxwell Boykoff. 2019. *Creative (Climate) Communications: Productive Pathways for Science, Policy, and Society*. New York, NY: Cambridge University Press, p.131.

<sup>38</sup> E.F. Einsiedel. 2014. “Publics and Their Participation in Science and Technology.” *Routledge Handbook of Public Communication of Science and Technology*, 125; Dominique Brossard and Bruce Lewenstein. 2009. “A Critical Appraisal of Models of Public Understanding of Science: Using Practice to Inform Theory.” In L. Kahlor and P. Stout (Eds.), *Communicating Science: New Agendas in Communication: New Agendas in Communication*. New York: Routledge; Sherry Arnstein. 1969. “A Ladder of Citizen Participation.” *Journal of the American Planning Association*, 35(4): 216-224.

<sup>39</sup> Martin Storksdieck, Cathlyn Stylinski, and Deborah Bailey. 2016. “Typology for Public Engagement with Science: A Conceptual Framework.” Corvallis, OR: Center for Research on Lifelong STEM Learning, p. 9.

participants and the amount of follow-up actions may also determine the velocity of the engagement.

In order of increasing “velocities” of public engagement, the streams or typologies of PES interventions on local climate resilience that emerged are *public dialogue*, *public deliberation*, *science consultation*, *issue advocacy*, and *co-production*

1. *Public Dialogue*: the first stream involves multi-directional conversations and communication about social values and public concerns related to PES. Public dialogue may involve uplifting successes and social values related to PES through publishing stories and examples through conversations with communities. In addition, this stream may involve sharing resources and guides for groups of participants interested in PES. This stream might be described as “low velocity” in terms of one-time engagement. On the other hand, it might be considered high velocity due to the ability to scale resources and successful practices;
2. *Public Deliberation*: this stream involves in-person or online events that focus on deliberation around contentious science issues in order to surface stakeholder perspectives, values and concerns, which may be addressed during the event to promote shared understanding of relevant values or concerns and may be used to develop recommendations to inform future action on the topic.<sup>40</sup>
3. *Science Consultation*: the honest broker approach is one common example of the science consultation stream. This approach is characterized by a commitment to scientists serving

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<sup>40</sup> Storksdieck et al. 2016, p. 17.

as partners that share information about options considered by publics.<sup>41</sup> In this model, honest broker scientists may advise community partners on technical questions by sharing information but do not interfere with making decisions about values and public priorities. However, processes of information-gathering are regularly informed by values and the extent to which the honest broker model is an accurate description of interactions between scientists and publics and the role of values remains contested.<sup>42</sup> I will discuss this further in the analysis.

4. *Issue Advocacy*: this stream advocates for particular solutions from the perspectives of particular communities and issues. In this way, values are explicitly linked and openly espoused. The velocity of issue advocacy is high in terms of levels of involvement and voices of members of publics.
5. *Co-Production*: this stream provides more active roles to members of publics, inviting them to help frame the issue for public deliberation and/or directly participate in processes of knowledge creation. Public co-creation can be considered relatively high velocity due to the level of involvement, degree to which members of publics have dominant voices in decision-making, and the time horizon of the process.

In the table below, I organize many of the interventions from which I was able to interview people into one of these streams of engagement. The streams regularly overlap, and some interventions may have elements of multiple streams. For example, a co-creation intervention may also involve commitments to some aspects of the science consultation approach. In such cases, I classify the interventions by what appeared to be the dominant

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<sup>41</sup> Roger Pielke, Jr. 2007. *The Honest Broker: Making Sense of Science in Policy and Politics*. Cambridge, UK: Cambridge University Press.

<sup>42</sup> Sheila Jasanoff. 2008. "Speaking Honestly to Power." *American Scientist*, 96(3): 240-243.

approach. The list of interventions is neither exhaustive of what exists in the landscape nor of my interviews, but it can adapt with and for those who are interested in building local collaborations among scientists, civic partners, and members of publics to advance local climate resilience.

## Discussion

### Inclusion of Publics Who May Not Feel Represented or Empowered by Science and Scientific Institutions.

Since I began interviews for this landscape study in April 2020, deep divisions and inequities in our society have become more apparent. In this civic context, public engagement with science may reify or interrogate these divisions. For any of the above “streams” of engagement to begin to challenge societal divisions and inequities, PES must begin by intentionally centering publics who have been subjugated and disempowered by science and scientific institutions.

PES should work to imagine broader, cross-cutting coalitions of publics who may not feel represented or empowered by science and scientific institutions, including in terms of race, ethnicity, geography, level of educational attainment, ability status, gender identity, class/occupation, religion, and all other aspects of identity and experience. During interviews for this landscape report, I found that the people who were most likely to participate in PES activities were those with polarized perspectives for or against the issue at hand, which confirms the findings of much of the previous literature. In this context, PES should be careful about not further entrenching polarized values by including more robust cross-sections of public values, perspectives, and experiences.

In the landscape of public engagement on climate resilience, many practitioners work toward greater inclusion by being intentional about who is being recruited to participate and

how, as well as structuring events to the preferences of publics. For example, some initiatives spent much time recruiting participants from particular places, such as food banks, affordable grocery stores, and so on. Much more intensive efforts are needed not only to recruit people, but to align the processes of engagement more closely with their interests and motivations.

## Actors' Motivations and Interests

The need to better understand actors' motivations and interests was evident in three main ways: the importance of context, disappointment when results did not meet stakeholders' expectations, and simplistic assumptions about non-scientists' motivations. In the discussion section, the names of individuals and organizations are referred to by pseudonyms to protect their anonymity, except in cases where they wanted to be quoted directly.

### *1. Appreciation of the Context of Engagement to Build Lasting Relationships*

Working to address sea-level rise and associated flooding and water quality concerns with a predominantly Black community in the Northeast, Michael's insights and experiences were especially illustrative of the importance of understanding the social and historical context of PES interventions. Describing one of the main challenges of his work, Michael said:

“We had to spend years convincing people in the community that we weren't continuing the work of a previous boundary organization. . . They [the previous organization] had come with good intentions but made big promises and then – at least from the perspectives of community members – they disappeared, and nothing ever happened.”

Despite being born and raised in the community, Michael struggled to overcome community members' mistrust from their prior experiences. He explained how some of his colleagues – scientists and other non-profit staff – were concerned about what they saw as an apparent

“lack of interest” from members of community. Michael, on the other hand, took community members’ recent experiences as a starting point. He interpreted their hesitation not as a lack of interest, but as reluctance to spend more time on a project that might be abandoned without explanation yet again. Through games and fun activities at community events, Michael developed trust and slowly convinced community members that the project he was working on was worth believing in and working toward.

Michael’s experiences are a testament to the power (and challenges) associated with engaging one’s own community as a “trusted messenger.” However, his story also demonstrates the potential harm that PES interventions and practitioners can do in terms of compounding mistrust if we do not take the time to consider nuanced perspectives to understand the context of engagement. A similar phenomenon was present across several other interviews in diverse contexts, suggesting that what might initially appear as a lack of interest or misunderstanding on the part of the public is often mistrust based on lived experiences that are bubbling to the surface.

For example, Sarah, a PES practitioner in the Southwest working with Latino/a communities to advance resilience to climate change discussed how community members’ experience with the state, especially the notoriety of a local sheriff’s “tough on immigration” actions, served as a significant barrier to recruitment and community participation in PES interventions. Many of these efforts took place in city buildings. While this challenge was obvious to those with connections to community members, some practitioners interpreted the troubles with turnout as an apparent lack of interest or motivation on the community’s part. Understanding this context and incorporating it into processes of engagement, the location of

events and who attended from local government became of particular importance for beginning to create opportunities to develop trust and meaningful public engagement.

Similarly, Carol, a retired community member in the rural Midwest who advocates for local leaders to take action to prevent flooding in her town, was dismayed by what she perceived as scientists' discomfort or unwillingness to attend other kinds of events in her community that were not explicitly about science. She explained,

“They drove around town. . . but that’s about it. Then, they came back for their events, and later ask why no one came to their panel at the library. . . I want them to be out getting students involved. . . out where people really are!”

Carol sharply explained that we cannot be surprised when few people from the community show up when we as PES practitioners do not show up in the community to understand community members' interests and motivations.

These short anecdotes assert the importance of tailoring the content as well as the processes of engagement to match the context. As mere starting points, these examples demonstrate that context in terms of the localized history of past relationships inform community members' interests, motivations, and reasonings about issues and approaches for public engagement with science. Therefore, motivations and interests should be understood in more complicated, dynamic ways that are specific to the time and places where public engagement takes place.

## 2. *Disappointment When Results Did Not Meet Stakeholders' Expectations*

Several interviewees expressed disappointment when the results of public engagement did not meet their personal expectations or interests. Nearly a dozen scientists and community members expressed that this disappointment would make them reluctant to volunteer for similar interventions in the future. Articulating clear goals that are particular to

each individual from the start of the intervention and providing resources for long-term engagement beyond volunteerism appear to play central roles in sustaining public engagement. I will discuss each of these points further in their respective sections below.

Across most of my interviews, a common tension emerged. Scientists often wanted the local intervention to provide the opportunity for more formalized research opportunities, but the funding ecosystem for participatory community research can be quite limited and competitive. Sicilia, an associate professor who volunteered for a community science collaboration on water quality as a local scientist and fellow community member, explained:

“My university prides itself on public service and social justice and encourages faculty to volunteer in these kinds of ways. . . I enjoyed my time with them [the community-facing organization] and felt we had a real impact. . . In addition, it has helped me to better understand what kinds of research would be most useful to our surrounding communities. . . Still, I would be cautious about doing this again as just a volunteer. . . In the back of my mind, I had some idea that more concrete research could come out of it, but we did not receive any of the grants that we applied to. . . I have offered to answer any questions they [the community-facing organization] have going forward, but I do not think I can commit so much time again anytime soon.”

Like all the scientists I interviewed, Sicilia had a sincere desire to have a positive impact with the surrounding community and was disappointed that engagement could not become a professional focus. Even as a faculty member at a university that aims to celebrate public service, she felt as if it was not possible to integrate public engagement into her work in a lasting way.

On the other hand, community members are sometimes less interested in research and are often more interested in how local collaborations can promote actionable solutions. Brenda, a semi-retired community member who has been involved with several community science projects decisively proclaimed,

“At this point, we’re past research! We need to do something to get people out of harm’s way. . . We need someone to help get people to listen to us and I’m doubtful another study is going to do that on its own.”

Brenda appreciated the volunteer scientists who helped to define and measure the problems associated with flooding in her community, but she seemed to implicitly reject the idea that the data and research could “speak for itself.” Instead, she felt that further collaboration should focus on dissemination of the research that already existed and convening decision-makers, fellow community members, and scientists to deliberate over possible pathways toward solutions that the research had already identified.

PES interventions should enable all actors to openly articulate their interests and intended results from the start of engagement to identify overlapping goals. Shared goals may help to mitigate against disillusionment and promote more long-term engagement, as we work to create a more robust funding infrastructure for community-driven research. Meanwhile, in co-creating shared goals, public engagement practitioners should acknowledge and address power asymmetries among actors and move beyond expectations that research or the data will speak for itself.

### 3. *Simplistic Assumptions About Non-Scientists’ Motivations*

In myriad ways, interviewees suggested that public engagement tends to treat non-scientists’ motivations as relatively narrow and overly simplistic. Succinctly describing these challenges for public engagement, Sandra, a community advocate for solutions to water quality in the rural Midwest, stated:

“You have been algorithm-ed. We all have. . . At some point, you have to put down the phone and meet the person – face-to-face once it is safe to do that again – as a full, complicated person just like you are. If you treat someone like they’re just a check-marked box, then you aren’t going to get very far.”

Sandra and several other interviewees felt that the public engagement efforts they had been a part of at times boxed people into standardized categories to tailor the content of engagement in ways that were overly generalized. In doing so, these interviewees appeared to challenge the idea that you could adequately achieve shared learning or engage people with differing views by adjusting content without also adjusting the processes of engagement. Sandra conclusively suggested, “I don’t think you can out algorithm the algorithm,” asserting that people desperately crave authentic, personalized communication and engagement over what she seemed to perceive as impersonal brand strategies.

Kevin, an engineering professor, argued that without understanding the interests and motivations of community members, even apparent successes of public engagement can have undesirable effects. He described a small town where he completed a several years-long project to advance flood resilience for low-income community members through buyouts and wetland restoration. However, Kevin feared that increased resilience alone without a deeper understanding of what community members wanted could equate to gentrification.

Describing these concerns, Kevin said:

“If we only prevent flooding and buy-out most of the low-income residents who live in the vulnerable neighborhoods, then over time that could start to look a lot like gentrification. Thanks to our ‘success’ of greater resilience to flooding, new development of relatively expensive apartments would likely continue at a faster rate. Eventually, the small town could become more of a bedroom community for a larger city about 40 minutes away. . . . Unintentionally pricing people out of their community does not sound like resilience to me. And that’s why we really need to listen to what the community wants throughout the process.”

In this brief analysis of potential unintended gentrification as the result of greater “resilience,” Kevin thoughtfully articulates the dangers of well-intentioned yet paternalistic approaches to engagement that may address the problem at hand but operate with overly narrow conceptualizations of community members’ interests. He demonstrates reflexivity in

action, identifying what perspectives are missing and what values have been taken for granted. In this way, uplifting community experiences and values – such as senses of place, belonging, and how people understand their relationship to scientific institutions and the state, to name a few important ones – appears central to realizing a culture of civic science, which emphasizes working *with* rather than *for* communities.

### Long-Term Engagement with Preexisting and Informal Social Networks

To guide public engagement with deeper understandings of the public’s interests and values, nearly all of the interviewees mentioned the importance of promoting more long-term engagement. As a county official in the rural Midwest succinctly summarized, “Some of these project timelines on disaster preparedness and resilience are ridiculous and we all know it. . . We need to focus on people and places, rather than discrete projects with timelines made from magical thinking.” In the current landscape, achieving more long-term engagement is often limited by challenges associated with funding resources and participant burnout.

Several interviewees were convinced that the competitiveness of resources was a significant factor in burnout among scientists and other public engagement practitioners. Steve, a scientist who is committed to public engagement in rural Missouri, explained:

“Sweat equity and goodwill are important but they can only take us so far. . . I would love to do more. . . And I have offered to continue to support the organization on the ground by answering any technical questions they have along the way, but there’s only so much we can do as volunteers. . . The funding sources for long-term research and translating it into action are very limited and competitive. . . but I would love to do more if I could.”

Despite the zeal that public engagement might appear to demand, examples from the landscape study demonstrate that culture change can occur when PES engages even a relatively small number of community members. Zach, a PES practitioner who developed and oversaw a state-wide public engagement project on water quality with scientists, members of the public,

and county officials, argued that the changes that resulted from his engagement were due to a small fraction of community members. However, he cautioned that the impacts of local champions are fragile and need support if they are to become lasting change:

“So much of what we’ve been able to accomplish is thanks to a handful of local champions. . . I believe that we have changed the local culture around water quality with only 10 percent of the community involved in several places. . . But it can all fall apart just as easily when people get worn down. These sorts of culture changes cannot last with only a few fire souls keeping it going. . . We have to continue to support them or else it just won’t last. And that’s what happened in most of our communities.”

As perhaps another factor in the impact of his efforts on water quality in the Midwest, Zach’s public engagement programs engaged people in various informal settings, such as community events, bars, houses of worship, and so on. Several of the public engagement researchers who I interviewed described informal public engagement as an area that has been neglected by the current landscapes of research and practice. Laura, a PES researcher, asserted:

“We often paternalistically assume that marginalized people do not have the agency to build impactful networks on their own or that they somehow don’t live in social networks already. . . We say things like ‘we need to build-relationships that advance equity. . .’ But look at the thriving mutual aid networks in several cities across the country. . . and other digital networks and campaigns that we have seen recently. . . In many cases, we need to reframe engagement as supporting existing networks, rather than ‘building relationships’ that we, for whatever reasons, think should exist.”

Efforts to foster more long-term engagement, therefore, should not aim to build altogether new relationships or to develop enough “fire souls” on its own accord. In order to identify and work toward civic science culture change in more inclusive and lasting ways, public engagement should build upon this example to embed in, and co-create with, pre-existing social networks through interactions in informal contexts.

## Clear Goals for Public Engagement, Even When Direct Outcomes Are Not Anticipated

The goals of PES are often “elusive” and should closely align with deeper understandings of participants’ interests and motivations. In pursuing more long-term public engagement, articulating clear goals for PES becomes more challenging and important. As discussed in the section on participants’ interests and motivations, failing to address and incorporate individuals’ intended outcomes may lead to disappointment that can make people reluctant to participate in future efforts or remain involved long-term.

In addition, long-term public engagement with climate at times struggles to maintain clear, shared understandings of what is within the scope of engagement. For instance, many of the examples from this landscape – and the concept of community resilience itself – evoke commitments to systems thinking approaches, which aim for more holistic understandings to help in “making distinctions and recognizing systems, relationships, and perspectives (DSRP).”<sup>43</sup>

While interviewees praised systems thinking approaches for highlighting the interconnectedness of challenges and making problem definitions more nuanced, they also expressed that these approaches could lead to vastly different understandings of the scale of “the problem” among different participants. For example, participants in a public engagement intervention on flood resilience might have different assumptions about whether or not they should squarely address aspects of housing, economic resilience, and so on. While they may desire to address each of these interlocking challenges or systems, capacities are inevitably limited and narrowing in on an appropriately scaled answer to the classic civic question of “what should we do?” becomes all the more challenging without clear, shared goals.

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<sup>43</sup> Derek Cabrera and Laura Cabrera. 2008. “Systems Thinking.” *Evaluation and Program Planning*, 31(3):299-310.

After all, participants in engagement efforts that are infused with systems thinking approaches inevitably operate with certain implicit definitions such that boundaries are still being drawn. As discussed earlier and despite intentions to the contrary, these boundaries, interests, and motivations may not be made explicit. Martin, a scientist who engages communities on sustainable agriculture, explained:

“We are constantly drawing boundaries, but we are not transparent about what they are. We have to do more work to recognize and question where the boundaries came from and why.”

This type of comment reaffirms the importance of making implicit definitions explicit and ensuring that the brokering of decisions about goals are transparent, equitable, and iterative to be clear about where, when, and how each group of participants have decision-making power throughout engagement.

Across the landscape, there are several approaches to creating clear goals that aim to be more inclusive and transparent. For example, scenario role-playing exercises and participatory community modeling may help to elucidate individuals’ priorities under different hypothetical circumstances, which can help to identify shared goals. In addition, deliberative exercises, storytelling, listening sessions, and fishbowl-style events, if designed thoughtfully, can help to overcome some of the expertise barriers and co-create clearer shared goals.

### [Upstream Approaches for Co-Creating Issues in PES with Publics](#)

Across the landscape, two polarities emerged regarding upstream approaches for co-creating the definition of issues for public engagement with communities: *honest brokers vs. value surfacers* and *crisis talk vs. the everyday*. By polarities, I intend to emphasize that interviewees framed them as important ideals that were in tension *and* were each important in their own right, rather than as either-or propositions. First, nearly all of the scientists I

interviewed expressed a desire to serve as an honest broker or unbiased, non-prescriptive consultant to communities. Of course, these scientists were also driven by their own values and visions for better futures that they held as community members and hoped to highlight. Second, from the perspective of interviewees, the crises of the day could serve as opportunities for more engagement. As has been described elsewhere in this report, they also expressed a desire to connect with publics in more everyday contexts.

### *Honest Brokers vs. Value Surfacers*

Nearly all the scientists in this study referred to themselves as honest brokers or consultants to communities. They articulated their roles in ways that were similar to the following definition that was provided by Walter, a hydrologist who does public engagement in the South:

“The first step was for us to meet as scientists and decide our role in this before meeting the community group. . . We decided that we were there to provide expertise and not to advocate for particular interests or solutions. . . We helped to explain reports and research, prepared them with background information for presentations to decision-makers, and answered any questions they had about the science behind it along the way. . . After they processed all the information, then we would help to outline all of the possible pathways and their pros and cons, but we would not get into the business of making value judgements about what the community should do; that was up to them.”

How does this understanding of the role of scientists in public engagement play out in practice?

Some community members took issue with the sort of detachment that scientists imagined as a part of their honest broker role. For example, Candice explained:

“A lot of times, they [scientists and subject matter experts] are uncomfortable with our emotion and passion. . . for this to work, we have to get a little uncomfortable.”

In addition, Walter expressed frustration with some of what he perceived as the limitations of the honest broker model. In one of the communities where he worked, Walter was quite certain that a local industry was a significant contributor to recent increases in the severity

of flooding and associated water quality challenges. He thought that if someone were to measure the company's impact, perhaps they would minimize some of their harmful practices or contribute funds to solutions directly. However, Walter did not feel that he could encourage community members to do so. Instead, he simply mentioned the possibility of studying the company's impact, but members of the community organization did not seem interested in pursuing it. Describing this challenge, Walter said:

“If I were wearing just my researcher hat, I would write openly and measure the company's harm to the community... If documented, they might be compelled to fund some of this work. . . In this role [volunteering to do public engagement], I feel like I shouldn't do anything that could be perceived as actively encouraging them to take on a local industry, which is one of the primary employers in the area. I can only mention this potential aspect of the research in passing. . .”

Walter demonstrates that in local science engagement, the role of a scientist is often more complicated than deciding between “fact” or “fake.” Instead, scientists play a role in advising community members to decide what facts are most relevant and how to put them together to make decisions about what “we” should do. Despite arguably making the right decision to preserve community members' autonomy, Walter's inability to bring up these value questions more directly appears to have limited broader discussion and opportunities for more in-depth mutual learning. This observation and Walter's cognitive dissonance are in line with scholarship from the field of science and technology studies (STS) that suggests that information-gathering almost inevitably involves questions of values.<sup>44</sup>

Rather than encouraging ideals of value neutrality and complete disinterestedness for scientists, I suggest that we reframe the role of scientists in public engagement as *honest value surfacers* to open richer opportunities for co-creation. In this conceptualization, scientists help to make space for honest discussions of values through deep listening and inclusive problem-

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<sup>44</sup> Sheila Jasanoff. 2008. “Speaking Honestly to Power.” *American Scientist*, 96(3): 240-243.

solving and more long-term relationships. Meanwhile, this reframe also allows us to acknowledge that scientists themselves are people who live in communities and possess values that they cannot leave at home. Therefore, PES collaborations should seek to define the particular values of all actors and inclusively deliberate over them in ways that empower publics to decide which pathways to pursue. Through seeking and acknowledging a more open dialogue that honors community knowledge and values, issues for public engagement may be more readily and holistically co-created through early, upstream approaches.

### *Crisis Talk vs. The Everyday*

Beginning interviews for the landscape study in the relatively early days of the U.S. experience of COVID-19 pandemic, I could not help but notice that interviewees seemed affected by the zeitgeist of several crises. Several interviewees suggested that “crises can open the door and then a lightbulb will go off,” asserting that the crises we were experiencing and their dependency on science could serve to unlock new kinds of trust via necessity.

On the other hand, and as I have mentioned throughout this landscape study in various ways, the interviewees stressed the importance of connecting with people in informal social contexts in everyday ways that could promote a sense of agency. I immediately noticed a tension between this emphasis on “the everyday” and the perceived promise of “crisis talk.” The interviewees’ emphasis on everyday issues was rooted in the belief that it could allow for deeper shared learning and more in-depth co-creation, in part because everyday issues had not yet fallen victim to polarized, prepackaged framings. Meanwhile, the urgency of present crises demand more rapid action and collaboration, which seemed to come in ways that are framed in polarizing ways by mass media and partisans.

I describe this in terms of a polarity because we should acknowledge the tensions within these ideas while working toward more co-creation in PES in both streams. In terms of co-creation, crisis talk can promote greater senses of urgency for collaborations, but it may also limit possibilities for deliberation. For example, research on the ways we talk about crises has demonstrated that “crisis talk” regularly limits the kinds of questions that are asked, narrows the types of expertise that are deemed relevant and who can be at decision-making tables, and diminishes feelings of agency to do anything about the crisis at hand.<sup>45</sup>

Again, interviewees expressed both sides of this polarity. For example, they expressed that they had become local points of contact for answering questions about COVID-19 because of their prior public engagement efforts. Meanwhile, others expressed that senses of fatalism and hopelessness had spread in their community. For example, one community member said with dismay, “Everyone’s tired of hearing me talk about COVID and flooding. I don’t think either are going to get people involved any time soon.”

For these reasons, PES should primarily focus on more everyday issues to inspire a greater sense of agency and hope. To do so, the relationship must come before the science or the crisis. When engaging on issues related to crises, PES interventions should be thoughtful to mitigate against the ways crisis talk can stand in the way of believing in one’s ability to make a difference as well as the kinds of deep listening and broadened deliberation that this landscape study aims to elevate. This understanding encourages public engagement practitioners to leverage and be led by preexisting community networks, rather than starting from scratch.

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<sup>45</sup> Joseph Masco. 2017. “The Crisis in Crisis.” *Current Anthropology*, 58(15):565-576.

## Recommendations

### **1. Build deeper engagement with and understandings of each group of participants' motivations and interests.**

Funding & Institutional Partners: Raise standards for matching processes of engagement – in addition to the content of engagement – to both place and stakeholders' particular interests to promote more meaningful senses of belonging in PES.

Scientists & Subject Matter Experts: Alongside inclusive science communication and engagement practices, regularly interrogate assumptions about stakeholders' interests and motivations with deep listening and reflexivity.

PES Researchers & Evaluators: Operationalize social science and science communication research in practical terms to identify ways to evaluate PES and each groups of participants' senses of efficacy, belonging, and improved understandings of actors' interests and motivations.

### **2. Establish upstream approaches for co-creating issue-framing with publics as a norm.**

Funding & Institutional Partners: For topic-, audience-, and/or place-based PES, establish upstream engagement as a norm for selecting and framing issues for engagement.

Scientists & Subject Matter Experts: Identify and include stakeholders early in the processes of engagement to build reflexive practices for rethinking assumptions about interests and motivations in ways that are grounded in stakeholders' lived experience, identities, senses of place, and social values. Acknowledge and address expertise barriers from the start of engagement.

PES Researchers & Evaluators: Examine the ways that expertise barriers operate in social processes of co-creation and identify practical steps for achieving more inclusive PES.

### **3. Foster long-term engagement with informal social networks.**

Funding & Institutional Partners: Provide resources to trusted messengers with longstanding connections within preexisting social networks whenever possible to scale their engagement efforts. Elevate the visibility and appreciation of PES in informal networks, both digital and in-person, that engage publics related to everyday experiences.

Scientists & Subject Matter Experts: Reflect on opportunities and informal networks where you can meet stakeholders where they are in everyday contexts.

PES Researchers & Evaluators: Examine how PES can operate most effectively and equitably in informal spaces and connect with everyday experiences.

#### **4. Articulate clear goals for PES, even when direct outcomes are not anticipated.**

Funding & Institutional Partners: Include co-creation of clear goals in evaluation of PES even when direct outcomes are not anticipated.

Scientists & Subject Matter Experts: With deeper understandings of stakeholders' interests and motivations, identify what success means for each stakeholder early on in the intervention and define inclusive goals accordingly.

PES Researchers & Evaluators: Develop measurable approaches for evaluating progress toward goals that are specific to context, issue areas, and each groups of participants' particular motivations.

#### **5. Include publics who may not feel represented or empowered by science and scientific institutions.**

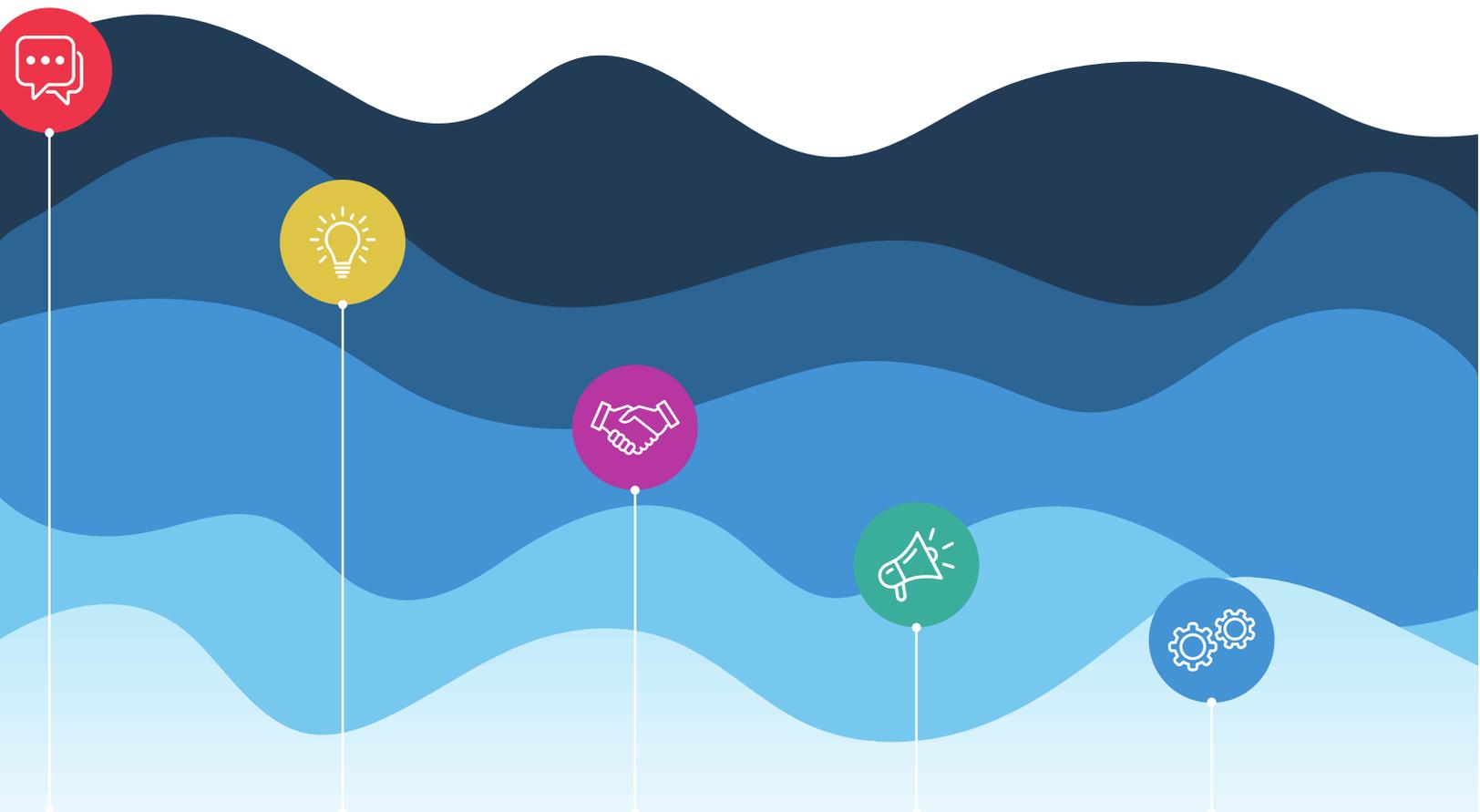
Funding & Institutional Partners: Support PES interventions that address the ways that science and technology are experienced and perceived differently across geography, acknowledging how senses of place intersect with race, gender, level of educational attainment, as well as other dimensions of diversity, equity, and inclusion.

Scientists & Subject Matter Experts: Regularly examine what perspectives, experiences, and identities are missing from the conversation. In outputs, be upfront and reflective about missing or marginalized experiences in the PES intervention.

PES Researchers & Evaluators: Analyze how PES interacts with different civic contexts and ways of reasoning about civic questions that are informed by place and identities to strengthen PES practices.

### Streams of Public Engagement on Climate Graphic

The field of civic science encompasses a broad umbrella of initiatives that connect science in society in evidence-based ways that empower scientists to play more active roles in our shared civic life, and that include the upstream participation of marginalized communities in early processes of engagement. Within this continuum, the graphics below represent the “streams” of public engagement with climate.



## PUBLIC DIALOGUE

- AAAS**  
[How We Respond](#)
- GEOS Institute**  
[Climate Ready Communities](#)
- NASEM**  
[Resilient America Program](#)
- Public Agenda**  
[The Hidden Common Ground Initiative™](#)
- Yale Program on Climate Change Communication**  
[Climate Change in the American Mind](#)

## PUBLIC DELIBERATION

- Center for Rural Strategies**  
[The Rural Assembly](#)
- Colorado Water Center**  
The Poudre Runs Through It
- CSPO Community Forums**  
[Community Engagement for Environmental...](#)
- NAAEE & Kettering**  
[Environmental Issue Forums](#)

## SCIENCE CONSULTATION

- AAAS**  
[Local Science Engagement Network \(LSEN\)](#)
- [Buy-In](#)
- Babbitt Center**  
[Growing Water Smart](#)
- [Grassland 2.0](#)
- [ISeeChange](#)
- [Iowa Watershed Approach](#)
- Mississippi River Cities and Towns Initiative**  
[Disaster Resilience and Adaptation](#)
- NASEM**  
[Resilient America Community Pilot Program](#)
- [Science for Climate Action Network \(SCAN\)](#)
- ThinkWater**  
[Wisconsin Network](#)

## ISSUE ADVOCACY

- Coal River Mountain Watch**  
[Save the Endangered Hillbilly](#)
- Deep South Center for Environmental Justice**  
[Climate Action Equity Project](#)
- Earth Justice**  
[Centerville, IL](#)
- Honor the Earth**  
[Stop Line 3](#)
- UCS**  
[Team-Based... Organizing Initiative](#)

## PUBLIC CO-PRODUCTION

- Anthropocene Alliance**  
[Higher Ground](#)
- AGU**  
[Thriving Earth Exchange](#)
- Healthy Flint Research Coordinating Center**  
[Community Ethics Review Board](#)
- Museum of Science Boston**  
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# STREAMS OF PES INTERVENTIONS ON CLIMATE RESILIENCE



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# PUBLIC DIALOGUE

## AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE (AAAS)

### How We Respond

**DATES:** 2019 to present

**DESCRIPTION:** How We Respond profiles 18 communities that are using scientific information to adapt to climate change impacts and/or reduce greenhouse gas emissions. The project demonstrates what is possible and offer solutions and approaches for communities to consider.

**ACTORS:** AAAS staff writers, scientists, public officials, and local stakeholders in 18 communities.

**FUNDING PARTNERS:** Linden Trust for Conservation; individual donors

**METHODS:** case studies; resources for action

**WEBSITE:** <https://howwerespond.aaas.org/>

**REPORTS AND RESOURCES:** Resources for [communities](#) and taking action as an [individual](#)

## GEOS INSTITUTE

### Climate Ready Communities

**DATES:** 2019 to present

**DESCRIPTION:** Climate Ready Communities brings Whole Community Resilience to local governments through an assisted “Do-It-Yourself” approach that is free or low-cost. The report offers resources for local civic and community organizations for encouraging local public officials to adopt a Whole Community Resilience approach.

**ACTORS:** GEOS Institute staff; planners, development officials, etc.

**FUNDING PARTNERS:** Emerged from ClimateWise project that was initially funded by the Kresge Foundation; now self-supported by the Institute’s consulting services.

**METHODS:** How-to guide

**WEBSITE:** <https://climatereadycommunities.org/>

**REPORTS AND RESOURCES:** *Climate Ready Communities: A Practical Guide to Building Climate Resilience*

## NATIONAL ACADEMIES (NASEM)

### Resilient America

**Dates:** 2012 to present

**DESCRIPTION:** Resilient America facilitates partnerships among scientists, data providers, practitioners and decision-makers; investigates the attributes of equitable, resilient systems, and communities; shares accessible science and data for supporting resilience and action.

**ACTORS:** NASEM staff academics; policy decision-makers

**FUNDING PARTNERS:** DHS; FEMA; other federal partners; private non-profit

**METHODS:** Develops tools, best practices, metrics; facilitates relationships across stakeholders

**WEBSITE:** <https://www.nationalacademies.org/resilient-america>

**REPORTS AND RESOURCES:** <https://www.nap.edu/author/OSP/policy-and-global-affairs/office-of-special-projects>

## PUBLIC AGENDA

### The Hidden Common Ground Initiative™

**DATES:** 2018 to present

**DESCRIPTION:** The Hidden Common Ground Initiative™ challenges the dominant narrative of a hopelessly divided America through research, journalism, public engagement, and storytelling that elevates the areas where Americans agree on solutions to contentious issues and by fostering productive dialogue on those issues where we truly disagree. Some of these efforts have focused on climate change.

**ACTORS:** Public Agenda staff, *USA Today*, Ipsos

**FUNDING PARTNERS:** Knight Foundation; Charles Koch Foundation; Rockefeller Brothers Fund; Carnegie Corporation of New York; Kettering Foundation; America Amplified; National Issues Forum

**METHODS:** journalism; storytelling

**WEBSITE:** <https://www.publicagenda.org/programs-reports/the-hidden-common-ground-initiative/>

**REPORTS AND RESOURCES:** “America’s Hidden Common Ground on Climate Change: Results from a Public Agenda/USA TODAY/Ipsos Snapshot Poll”

**YALE PROGRAM ON CLIMATE CHANGE COMMUNICATION**  
**Climate Change in the American Mind**

**DATES:** 2005 to present

**DESCRIPTION:** Climate Change in the American Mind is a twice annual representative survey that investigates, tracks, and explains public climate change knowledge, risk perceptions, policy support, and behavior.

**ACTORS:** Yale Program on Climate Change Communication; George Mason University Center for Climate Change Communication

**FUNDING PARTNERS:** 11<sup>th</sup> Hour Project; The Energy Foundation; The MacArthur Foundation; Grantham Foundation

**METHODS:** reports; journalism

**WEBSITE:** <https://climatecommunication.yale.edu/about/projects/climate-change-in-the-american-mind/>

**REPORTS AND RESOURCES:** *Climate Change in the American Mind, April 2020; Global Warming's Six Americas*

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# PUBLIC DELIBERATION

## CENTER FOR RURAL STRATEGIES

**DATES:** 2017 to present

**DESCRIPTION:** The Rural Assembly is a coalition of over 400 organizations and individuals from 47 states working to build more opportunity and better policy for rural communities across the state. Stewardship of natural resources is one of the coalition's policy priority areas.

**ACTORS:** Center for Rural Strategies staff; Rural Voices for Conservation Coalition; Aspen Institute Community Strategies Group; Citizen University; Rural Policy Research Institute

**FUNDING PARTNERS:** The Duke Endowment; Mary Reynolds Babcock Foundation; Rockefeller Brothers Fund; Redwood Coast Rural Action; Carnegie Corporation of New York; Media and Democracy Fund

**METHODS:** Big ideas forum; storytelling; convening diverse rural voices; resources and media support for rural-led campaigns; rural women lead profiles

**WEBSITE:** <https://ruralassembly.org/>

**REPORTS AND RESOURCES:** <https://www.ruralstrategies.org/economic-transition>

## COLORADO WATER CENTER

### The Poudre Runs Through It Annual Forum

**DATES:** 2014 to present

**DESCRIPTION:** The annual Poudre River Forum, as part of the Poudre Runs Through It (PRTI) Study/Action Group, brings together those who farm, deliver clean potable water, drink beer, recreate, and advocate for river health to learn more from one another and to explore how we can move from conflict to collaboration.

**ACTORS:** Colorado Water Center; 25 committee members of the PRTI Study/Action Group; Center for Collaborative Conservation

**FUNDING PARTNERS:** Cities of Greeley, Fort Collins, Thornton, CO; Cache La Poudre National Heritage Area; Northern Water; Hartford Homes; New Belgium Brewing; Morning Fresh Dairy Farm; over 30 additional local industry and media partners

**METHODS:** public forum; awards; network-building among local stakeholders

**WEBSITE:** <https://watercenter.colostate.edu/poudre-river-forum/>

**REPORTS AND RESOURCES:** <https://watercenter.colostate.edu/prti-resources/#1554158053414-70ffae98-58d8>

**CONSORTIUM FOR SCIENCE, POLICY, & OUTCOMES (CSPO)**  
**Science Center Public Forums: Community  
Engagement for Environmental Literacy, Improved  
Resilience, and Decision-Making**

**DATES:** 2015 to 2018

**DESCRIPTION:** This three-year project aimed to engage lay citizens in eight communities to discuss the hazards they face and improve public awareness of these hazards; increase the capacity of museums as convening institutions for public engagement; incorporate the coastal, weather, and climate science needed to inform decisions; and involve the public directly in decisions about measures that contribute to resilient communities, ecosystems, and economies.

**ACTORS:** Consortium for Science, Policy, & Outcomes (CSPO) staff; Museum of Science Boston (David Sittenfeld); Arizona Science Center, Phoenix, AZ; Museum of Life Science, Durham, NC; Science Museum of Minnesota, St. Paul, MN; Gulf Coast Exploreum Science Center, Mobile, AL; Oregon Museum of Science and Industry; Portland, OR; Chabot Space and Science Center, Oakland, CA; Bishop Museum, Honolulu, Hawaii.

**FUNDING PARTNERS:** National Oceanic and Atmospheric Administration (NOAA)

**METHODS:** public forums; network-building

**WEBSITE:** <https://cspo.org/research/science-center-public-forums-community-engagement-for-environmental-literacy-improved-resilience-and-decision-making/>

**REPORTS AND RESOURCES:** *Cooling a Warming Planet? Public Forums on Climate Intervention Research*

**NORTH AMERICAN ASSOCIATION FOR ENVIRONMENTAL EDUCATION  
(NAAEE) AND THE KETTERING FOUNDATION**

**Environmental Issue Forums**

**DATES:** 2014 to present

**DESCRIPTION:** The Environmental Issue Forums (EIF) provides tools, training, and support for engaging adults and students in meaningful discussions about sticky issues that affect the environment and communities. Led by trained, neutral moderators in communities across the country, the forums provide a way for people of diverse views and experiences to seek a shared understanding of the problem and to search for common ground for action.

**ACTORS & FUNDING PARTNERS:** NAAEE; Kettering Foundation; School of Natural Resources at the University of Missouri

**METHODS:** public forums and deliberation; network-building of local forums

**WEBSITE:** <https://naaee.org/our-work/programs/environmental-issues-forums>

**REPORTS AND RESOURCES:** *Using Environmental Issues Forums to Enhance Deliberation: Case Studies*; [moderator resources](#); [environmental issues guides](#); [EIF in the classroom](#)

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# SCIENCE CONSULTATION

## AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE (AAAS) Local Science Engagement Network (LSEN)

**DATES:** 2019 to present

**DESCRIPTION:** The LSEN Network is a grassroots engagement and advocacy campaign to establish, nurture, and guide local and state-based multi-disciplinary peer networks of scientists and science enthusiasts dedicated to elevating the role of science in evidence-based policy. In Colorado, Georgia, and Missouri, LSEN aims to provide ongoing capacity building in science communication, civic engagement, and advocacy and to determine the local-, community-, and state-level context within which science advocacy can engage with and inform the deliberative process concerning climate policies, programs and practices.

**ACTORS:** AAAS staff; University of Colorado Boulder; Science for Georgia staff; Missouri Science and Technology Policy Initiative staff

**FUNDING PARTNERS:** Grantham Foundation for the Protection of the Environment; the Atkinson Family Foundation; Benjamin and Ruth Hammett; Rush Holt and Margaret Lancefield; the estate of Abraham Ringel

**METHODS:** science advocacy opportunities; network- and capacity-building

**WEBSITE:** <https://www.aaas.org/programs/local-science-engagement-network-lsen>

**REPORTS AND RESOURCES:** “AAAS Local Science Engagement Network gets under way.” *Science*. December 20, 2019.

## BABBITT CENTER

### Growing Water Smart

**DATES:** 2017 to present

**DESCRIPTION:** Growing Water Smart introduces communities to a range of collaboration, communication, public engagement, planning, and policy implementation tools to realize their watershed health and community resiliency goals. Through workshops with community teams of five to seven individuals, communities aim to better integrate land use and water planning by devising action plans and follow up events with the support of experts and Babbitt Center resources.

**ACTORS:** Babbitt Center staff; Sonoran Institute; community teams with local planners and public officials in communities in Arizona, California, and Colorado; planning and resiliency experts

**FUNDING PARTNERS:** Arizona Community Foundation; Colorado Water Conservation Board; Gates Family Foundation

**METHODS:** boundary-spanning action planning workshops; community self-assessments with legislative requirements of each state; post-workshop activities to advance plans

**WEBSITE:** [growingwatersmart.org](http://growingwatersmart.org)

**REPORTS AND RESOURCES:** *Growing Water Smart Metrics: Tracking the Integration of Water and Land Use Planning* by the Sonoran Institute

## Buy-In

**DATES:** 2020 to present

**DESCRIPTION:** Buy-In is a planning firm that aims to use the power of geospatial data and participatory planning to help households access and local governments design buyout programs that are transparent, efficient, and equitable.

**ACTORS:** Buy-In staff; individuals; local governments and community partners; MIT DesignX

**METHODS:** community engagement consulting; technical assistance

**WEBSITE:** <https://buy-in.org/>

## Grassland 2.0

**DATES:** 2019 to present

**DESCRIPTION:** Grassland 2.0 works to develop pathways for increased farmer profitability, yield stability, and nutrient and water efficiency, while improving water quality, soil health, biodiversity, and climate resilience through grassland-based agriculture through co-learning at regional learning hubs.

**ACTORS:** Grassland 2.0 staff; farmers; public and private leaders

**FUNDING PARTNERS:** Sustainable Agriculture Systems Coordinated Agricultural Program of the USDA National Institute of Food and Agriculture

**METHODS:** scenario planning; surveys; two “learning hubs” in Wisconsin hosted by local organizations that provide opportunities for two-way communication and co-learning among Grassland 2.0 staff and the local region and people; GrazeScape™ and SmartScape™ decision-support tools; grassland leader stories

**WEBSITE:** <https://grasslandag.org/>

**REPORTS AND RESOURCES:** <https://grasslandag.org/stories/>

## ISeeChange

**dates:** 2012 to present

**DESCRIPTION:** As a community-powered weather and climate journal, ISeeChange aims to offer communities a way to build and celebrate relationships linking community members, journalists, scientists, and public agencies. ISeeChange's platform enables users to post photos and experiences of their environment and connect with others experiencing similar environmental challenges. Citizens' monitoring activities and experiences are gathered and shared with journalists, scientists, and public agencies.

**ACTORS:** ISeeChange staff; community members who use the platform; journalists; public agencies; environmental researchers; NASA; Berkeley BEACON2N Project; Yale Climate Connections

**FUNDING PARTNERS:** Wyncote Foundation; Ford Foundation; AIR New Enterprise Fund

**METHODS:** citizen data-gathering; network-building; storytelling

**WEBSITE:** <https://www.iseechange.org/>

**REPORTS AND RESOURCES:** <https://iseechangealmanac.tumblr.com/>

## Iowa Watershed Approach

**DATES:** 2016 to present

**DESCRIPTION:** The Iowa Watershed Approach (IWA) engages stakeholders throughout the watershed with the goals of reducing flood risk, improving water quality, increasing resilience, improving quality of life and health for Iowans, and developing a replicable program for other flood-prone communities.

**ACTORS:** IWA staff; University of Iowa; University of Northern Iowa; Iowa State University; project coordinators at each of the 9 watersheds; fiscal agents in Benton, Buena Vista, Fremont, Iowa, Johnson, Mills, Winneshiek, and Howard counties; cities of Dubuque, Storm Lake, and Coralville; Iowa Economic Development Authority; Iowa Department of Natural Resources; Homeland Security and Emergency Management

**FUNDING PARTNERS:** Housing and Urban Development (HUD) Disaster Resilience Grant; Rockefeller Foundation

**METHODS:** measure and communicate flood resilience resources; enhance flood resilience content in formal watershed plans; community conversations; flood resiliency scenario

**WEBSITE:** <https://iowawatershedapproach.org/>

**REPORTS AND RESOURCES:** <https://iowawatershedapproach.org/resources/>

## MISSISSIPPI RIVER CITIES AND TOWNS INITIATIVE

# Disaster Resilience and Adaptation Program

**DATES:** 2011 to present

**DESCRIPTION:** The Mississippi River Cities and Towns Initiative (MRCTI) builds the capacity of member mayors, empowering them with the tools and support to undertake effective local initiatives to move toward sustainable economies and achieve local environmental protection goals.

**ACTORS:** MRCTI staff; member mayors; Upper Mississippi River Basin Association

**FUNDING PARTNERS:** EcoAdapt; FEMA; NOAA; Geos Institute; Tetra Tech

**METHODS:** capacity-building of civic leaders; partnership-building among 7 trade centers and 18 community foundations

**WEBSITE:** <https://www.mrcti.org/>

**REPORTS AND RESOURCES:** <https://www.twodegreesadapt.com/mrcti>

## National Academies (NASEM) Resilient America Community Pilot Program

**DATES:** 2014 to 2018

**DESCRIPTION:** The Resilient America Program partnered with four communities to explore and implement opportunities for strengthening community resilience, with focus areas that were selected by each community: Linn County/Cedar Rapids, Iowa (flood resilience); Charleston, South Carolina (flood resilience); Seattle, Washington (climate resilience); and Tulsa, Oklahoma (economic resilience).

**ACTORS:** NASEM staff (Lauren Alexander Augustine, Charlene Milliken, and Sherrie Forrest); Puget Sound Regional Council (PSRC); the Office of Finance in the Tulsa Mayor's Office; city and county officials in Cedar Rapids and Charleston

**FUNDING PARTNERS:** private for-profit funder; private non-profit funder; DHS National Protection and Programs Directorate and other federal partners sponsored particular events

**METHODS:** risk communication; relationship-building within the community and among local stakeholders and federal officials; measuring flood resilience; sharing data and information; extreme events simulations

**WEBSITE:** <https://www.nationalacademies.org/our-work/resilient-america-community-pilot-program#sectionProjectScope>

**REPORTS AND RESOURCES:** "Community Pilot Partnership Program: 2014-2018"

## Science for Climate Action Network (SCAN)

**DATES:** 2019 to present

**DESCRIPTION:** Adding capacity to existing initiatives, SCAN helps leaders and citizens to apply science in flexible, ongoing ways to weigh tradeoffs and co-benefits and select adaptation and mitigation pathways that increase resilience and preparedness.

**ACTORS:** network of practitioners, scientists, government agencies, nonprofits, and businesses.

**PARTNERS:** The Earth Institute at Columbia University; American Meteorological Society; New York Department of Environmental Conservation; Center for Climate Adaptation Science and Solutions; Center for Community and Citizen Science; the American Geophysical Union; the Nature Conservancy; Aspen Global Change Institute; Urban climate Change Research Network; Climate Adaptation Task Force; Waterfront Alliance; Adaptation International

**METHODS:** Adding boundary-spanning capacity to existing initiatives

**WEBSITE:** <https://www.climateassessment.org/>

**REPORTS AND RESOURCES:** <https://www.climateassessment.org/resources>

## THINKWATER

### Wisconsin Water Thinkers Network

**DATES:** 2015 - 2019

**DESCRIPTION:** ThinkWater implements systems thinking-based water education, research, and Extension programming to better address complex water problems.

**ACTORS:** local scientists; community members; extension professionals; educators

**FUNDING PARTNERS:** U.S. Department of Agriculture

**TACTICS:** annual in-person gathering; regional gatherings; ThinkWater School

**WEBSITE:** <https://www.thinkwater.us/state-implementation>

**REPORTS AND RESOURCES:** <https://www.thinkwater.us/toolkit-for-governmental-agencies-n>

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## ISSUE ADVOCACY

### COAL RIVER MOUNTAIN WATCH

#### “Save the Endangered Hillbilly”

**DATES:** 2003 to present

**DESCRIPTION:** A campaign among environmentalists, retired miners, union officials, and Appalachian activists to ban mountaintop removal and other environmentally damaging practices by the coal industry in Appalachia.

**ACTORS:** Coal River Mountain Watch; United Mine Workers; Appalachia Rising activists

**METHODS:** trusted messengers; coalition-building; creative messaging

**WEBSITE:** <https://www.crmw.net/>

**REPORTS AND RESOURCES:** [Guide to Citizen Enforcement Options](#); [“This is Our Home. We Don’t Want to Live Nowhere Else.”](#) 2017. *Environment and Energy News*.

### DEEP SOUTH CENTER FOR ENVIRONMENTAL JUSTICE

#### Climate Action Equity Project

**DATES:** 2017 to present

**DESCRIPTION:** The Deep South Center for Environmental justice coordinates the Climate Action Equity Project, which is a joint endeavor with the City of New Orleans. Tasked with developing recommendations to achieve equitable outcomes in neighborhoods most at risk by climate change and social inequity, members of the Advisory Group that leads the project were chosen by community-based organizations and local resource groups with subject matter expertise.

**ACTORS:** Deep South Center for Environmental Justice Staff; community advisors selected by community-based organizations; City of New Orleans staff

**FUNDING PARTNERS:** The Greater New Orleans Foundation; Partners for Places

**METHODS:** community forums; trusted messengers

**WEBSITE:** <https://www.dscej.org/our-work/community-engagement>

**REPORTS AND RESOURCES:** [Taking Steps Together on Equity & Climate Change: A Report by and for New Orleans](#)

## HONOR THE EARTH

### Stop Line 3

**DATES:** 2013 to present

**DESCRIPTION:** Stop Line 3 is an indigenous-led campaign against the Line 3 crude-oil pipeline, which received final approval in December 2020 after years of legal battles and conflicting regulatory decisions. The campaign has developed a [coalition](#) of civic leaders, local researchers, religious leaders, climate and science advocacy networks, and so on to chronicle the campaign, document environmental risks and engage decision-makers.

**ACTORS:** Honor the Earth; White Earth and Red Lake Nations; Minnesota 350; Sierra Club; GreenPeace; Giniw Collective

**METHODS:** coalition-building; lobbying decision-makers

**WEBSITE:** <https://www.stopline3.org/>

**REPORTS AND RESOURCES:** <https://www.stopline3.org/resources>

## UNION OF CONCERNED SCIENTISTS

### Team-Based Organizing Initiative

**DATES:** 2019 to present

**DESCRIPTION:** The UCS team-based organizing initiative is designed to support scientists and experts in launching a new science advocacy group or increasing the skills and success of an existing group.

**ACTORS:** UCS staff; UCS members; 500 Women Scientists pods

**METHODS:** year-long leadership development opportunity; potential [Science for the Public Good Fund](#) grant funding; advocacy tools and trainings; individual coaching from UCS staff; national action opportunities

**WEBSITE:** <https://www.ucsusa.org/resources/team-based-organizing-initiative>

**REPORTS AND RESOURCES:** [Science Advocacy Toolkit](#)

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# PUBLIC CO-PRODUCTION

## ANTHROPOCENE ALLIANCE

### Higher Ground

**DATES:** 2017 to present

**DESCRIPTION:** The Anthropocene Alliance’s Higher Ground is a coalition of 62 [grassroots, frontline groups](#) of individuals who have been impacted by floods and hurricanes. Through a partnership with the Thriving Earth Exchange, 29 groups have been matched with pro bono scientists. Other groups have been matched with lawyers and green infrastructure planning experts.

**ACTORS:** Anthropocene Alliance staff; grassroots groups of community members; partner pro-bono scientists, lawyers, and planners; Buy-In; National Fish and Wildlife Federation; American Planning Association

**FUNDING PARTNERS:** individual donors

**METHODS:** matchmaking; building capacity for frontline voices; coalition-building

**WEBSITE:** <https://anthropocenealliance.org/>

**REPORTS AND RESOURCES:** The alliance offers many resources, from how to organize a “Twitter storm” and how to engage politicians to flood slogans and chants for public protest: <https://anthropocenealliance.org/guidance>

## AMERICAN GEOPHYSICAL UNION

### Thriving Earth Exchange

**DATES:** 2013 to present

**DESCRIPTION:** AGU’s Thriving Earth Exchange (TEX) connects communities with scientists and supports them as they work together to tackle local challenges related to natural hazards, natural resources, and climate change through over 100 six to eighteen-month community science projects to date.

**ACTORS:** TEX staff; local AGU member scientists and other local scientist partners; community-facing organizations; local planners; EPIC-N; National League of Cities; Association of Science and Technology Centers (ASTC); International County/City Management Association; American Political Science Association (APSA); Anthropocene Alliance; the Mountain Institute

**FUNDING PARTNERS:** The Gordon & Betty Moore Foundation

**METHODS:** iteratively defining project focus, scope, outcome, and impact with community and scientific leads; matching community needs with appropriate and willing scientific partner(s); share output and impact with government official; feedback afterward on how TEX can improve

**WEBSITE:** <https://thrivingearthexchange.org/about-tex/>

**REPORTS AND RESOURCES:** Thriving Earth Exchange Project Milestones: <https://thrivingearthexchange.org/milestones/>; webinars: <https://thrivingearthexchange.org/webinars/>

## MUSEUM OF SCIENCE BOSTON

### Co-Created Public Engagement with Science (CC-PES)

**DATES:** 2018 to present

**DESCRIPTION:** CC-PES seeks to advance new approaches to, and evidenced-based understanding of, the design and development of STEM learning in informal environments through a model of co-creation with four target audiences at 4 science centers across the country. The approach of CC-PES aims to “turn the traditional model upside down and empower community leaders and their constituents to choose what matters most to them, developing the forum topics themselves.”

**ACTORS:** Museum of Science Boston staff; Oregon Museum of Science; the Michigan Science Center; North Carolina Museum of Life and Science; Urban College of Boston

**FUNDING PARTNERS:** National Science Foundation (NSF)

**METHODS:** public forum; co-creation of forum focus area(s); diverse geographical contexts

**WEBSITE:** <https://www.mos.org/press/press-releases/CCPES>

## PUBLIC AGENDA

### Cycles of Resilience

**DATES:** 2018 to 2020

**DESCRIPTION:** In communities that have long felt neglected and distanced from centers of science and science-based decision-making, Cycles of Resilience creates new pathways to bring residents, scientists and members of local government together to form relationships, exchange knowledge, nurture ideas and empower community-led action. The project also aimed to engage people in more informal settings and through game activities.

**ACTORS:** Public Agenda Staff; the Science and Resilience Institute at Jamaica Bay (SRIJB); CUNY-Brooklyn College Center for the Study of Brooklyn; Canarsie Community Development, Inc.; Canarsie Neighborhood Alliance

**FUNDING PARTNERS:** Spitzer Foundation; NY Community Trust

**TACTICS:** interactive community action planning forum; listening sessions; “Get to Know the Bay” boat cruise tour; Jamaica Bay trivia games at community festivals, civic meetings, and recreation centers

**WEBSITE:** <https://www.publicagenda.org/cycles-of-resilience/>

**REPORTS AND RESOURCES:** <https://canarsiecourier.com/interactive-forum-spotlights-resiliency-plans-for-canarsie-p4345-199.htm>;  
<https://michaelmenser.info/2020/07/23/cycles-of-resilience/>

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