

FAS-CSPO Workshop: Building Community and Federal Capacity for Public Participation in Science

The foundation for federal science funding and government-led innovation in the United States was established in the early post-WWII era. Congressional debates and discussions within scientific associations at the time revolved around pivotal questions: Should funding prioritize basic or applied research? Should funded research be determined by individual investigators or respond to community needs? And who should lead—scientists themselves or elected officials? These questions remain important, especially after decades in which US science funding emphasized basic research driven by academic investigators and evaluated through peer-review within specialized subfields. This model, underpinned by both extramural funding and the work of mission-oriented agencies, fueled an unprecedented expansion of scientific knowledge and growth of research-oriented (R1) universities and national labs. In recent years, however, there has been a shift toward greater community involvement in setting research priorities and the desire for use-inspired and community-driven innovation.

Science and technology are often considered the exclusive domain of specialized experts—individuals trained at elite institutions and working at universities or national labs—seemingly working outside of community-based engagement. Yet, many communities are eager to undertake research, both independently and in collaboration with federal agencies, and have insights and knowledge to contribute to scientific research and technology development. Communities bring valuable insights and knowledge to these efforts, as evidenced by projects such as citizen science initiatives (e.g., birdwatchers contributing data to climate science or community groups collecting data on industrial emissions). However, communities often lack the institutional infrastructure necessary to conduct scientific and medical research that is formally recognized by the broader scientific community and federal agencies.

Workshop and Report Overview

On November 12, 2024, the Federation of American Scientists (FAS) and the Arizona State University Consortium for Science, Policy and Outcomes (CSPO) held a jointly organized workshop on the topic of **Building Community and Federal Capacity for Public Participation in Science**. Fifty experts attended, including representatives from ‘center of government’ agencies (OMB, OSTP), federal science funding agencies (NIH, NSF), federal science mission agencies (DOE, NOAA, NASA), non-profit organizations, and academia. Participants discussed three critical challenges to improving how federal agencies resource, measure, and sustain community-based participation and engagement.

- **Funding:** Through what process should agencies identify research topics and questions that benefit communities? How do we better enable researchers from a mix of institutions to participate in projects that serve the public interest?
- **Metrics:** How do we better measure outcomes, looking beyond publications and patents?
- **Outcomes:** What needs to change to give credit and follow-up support to communities that participate in research and technology development?

This report addresses progress, needs, and challenges related to public participation and community engagement (PPCE). Workshop participants identified that the field of PPCE has advanced significantly in recent years. Federal agencies have shifted from skepticism to experimentation and wider adoption of efforts to support community-based scientific research and technology development. Progress has especially been made in developing evaluation metrics and iterative funding that allows for co-creation of research. But participants also identified challenges that stem from: (1) misaligned incentives with/in academic research communities, where promotion and tenure rarely prioritize public participation or societal impact and R1 institutions still dominate grant competitions, and (2) a lack

of coordination and evaluation at the federal level that hinders trust-building with communities. Many programs and models show promise but remain siloed, and research funding largely continues to make community engagement an afterthought.

Funders, both federal and non-federal, have a unique opportunity to drive change by rewarding community engagement, by developing frameworks to measure and align societal impact with scientific community and academic research goals, and by improving inter-agency training and coordination for PPCE. Realizing empowered public participation in science will require **building and sustaining a Community of Practice (CoP)** to develop, implement, evaluate, and integrate promising practices. In the second half of this report, we propose a roadmap for implementing change towards strengthening PPCE across different stakeholders.

Progress, Needs, and Challenges

Progress

Workshop participants identified several areas in which recent projects developed by federal agencies in consultation with community partners led to new insights and progress.

- **Innovative Frameworks and Collaborative Processes:** Programs like the National Oceanic and Atmospheric Administration’s Climate Adaptation partnerships and the NSF’s Technology, Innovation and Partnerships (TIP) directorate’s experimental metrics and iterative funding mechanisms (e.g., NSF’s ReDDoT funding) have introduced flexible and adaptive approaches that prioritize collaboration and co-creation between federal agencies and communities.
- **Localized and Inclusive Partnerships:** Partnerships between federal agencies and community colleges, historically black colleges and universities (HBCUs), and science museums have increased accessibility and participation in science, fostering engagement with communities and regions that lack major research universities or that have been historically underrepresented in federal science and technology projects.
- **Broader Adoption and Integration of Community-Driven Initiatives:** Federal agencies have begun embracing community-based research, with successful models gaining attention and traction (e.g. the National Science Foundation’s (NSF) CIVIC Program and the National Institutes of Health’s ComPASS Program). This reflects a paradigm shift toward valuing public participation in science and technology.
- **Recognition of Broader Societal Impacts of Engagement:** The emergence of new evaluation metrics at federal science agencies and rethinking of existing frameworks like Broader Impacts has validated approaches to including community participants in study design, research, evaluation of data, communication of results to the community (not just through peer-reviewed publications) and development of plans for next steps.

Challenges

Workshop attendees identified several challenges to further developing the field:

- **Federal Coordination to Build and Sustain Trust with Communities:** The lack of coordination across federal science agencies often results in fragmented and inconsistent outreach, eroding trust among community stakeholders. This mistrust is exacerbated by a history of broken agreements and unfulfilled promises, leaving communities skeptical of federal initiatives. Resilient relationships require creativity and flexibility, balancing the need for rigorous research methods with meaningful, sustained community engagement. Long-term investment in trust-building is critical to establishing equitable and collaborative partnerships.
- **Systemic Barriers to Balanced University Partnerships:** Research-intensive (R1) universities have built extensive infrastructure, including expert staff, accounting systems, and physical plants based on indirect cost reimbursement on federal grants. This system creates obstacles for thousands of other universities

and community-based organizations that would like to compete for federal grants but lack decades of investment to build the necessary infrastructure. The dominance of R1 institutions in grant writing and funds management often relegates smaller institutions to secondary roles in collaborations, further reinforcing disparities. Addressing these challenges requires a rethinking of funding structures to support balanced partnerships.

- **Methodological Biases:** Community-based science and qualitative research often struggle to gain validation within traditional disciplines, which favor quantitative metrics and a priori defined outcomes. This methodological bias also dominates federal agency extramural research. For all of its success, it undermines the credibility of community-driven efforts and limits the ability to measure societal impact effectively. To overcome this, it is essential to develop new methods and recognize qualitative and lived-experience narratives as valuable community contributions and increase their role in advancing scientific understanding.
- **Cultural Change in Academia through Tenure and Promotion:** While graduate students and younger researchers are increasingly embracing community-based approaches, many tenured faculty and more senior principal investigators (PIs) remain resistant due to entrenched academic structures. This resistance is compounded by traditional tenure and promotion systems that prioritize publications and patents over societal or community impact. As a result, academia's cultural inertia continues to hinder the widespread adoption of inclusive and interdisciplinary research practices. To address this, tenure requirements must evolve to reflect the growing importance of public engagement and community collaboration.

Needs

Even while celebrating recent progress, workshop attendees identified several key areas where further work is needed.

- **Reduce Administrative Barriers to Community Participation:** Agencies should streamline grant application processes, simplify reporting requirements, and offer participants in research projects support such as childcare and local travel assistance. Administrative hurdles, complex grant applications, and inaccessible language deter community organizations from participating in federally funded projects. Streamlining application processes, offering shorter concept notes, and simplifying reporting requirements will make federal opportunities more accessible. The Office of Management and Budget (OMB) should also explore ways to reduce accounting and reporting requirements that disproportionately affect smaller institutions and community-based organizations.
- **Leverage Existing Community Expertise and Infrastructure:** Definitions of “community engagement” and “public participation” should highlight the importance of utilizing existing community organizations and local expertise as critical assets for federal programs. Many federal programs overlook the value of local knowledge and existing community structures. OMB and the Office of Science and Technology Policy (OSTP) should promote the inclusion of community leaders and organizations in decision-making processes, from program design to evaluation. This could be achieved by federal science agencies funding tribal colleges, science museums, and regional universities as connectors between federal agencies and local communities, and by working with Community Action Agencies across the U.S.
- **Enhance Transparency and Build Trust with Communities:** The principle of transparency should emphasize ongoing follow-up activities, clear communication about how engagement influences decisions, reflections on power dynamics, and sustained relationships with communities. Trust between communities and federal agencies remains a critical challenge. Long-term relationship building and follow-up activities are crucial for maintaining trust and ensuring that federal programs align with community priorities.
- **Foster Equity in Research and Partnerships with Universities:** Inclusivity principles should explicitly address equity in partnerships between research-intensive institutions (R1s) and smaller research, like community colleges, HBCUs, and minority-serving institutions (MSIs). OMB, OSTP, and federal science

agencies can develop guidelines for equitable collaboration, like shared leadership models and equitable distribution of indirect costs.

- **Implement Innovative Funding Models for Communities and Universities:** Success metrics should include iterative and adaptive evaluations, such as conditional funding tied to milestones or feedback from community participants. Traditional funding mechanisms do not align well with community timelines or needs. Innovative models such as microgrants and planning grants can provide flexibility and encourage sustained engagement. OMB and OSTP can guide federal science agencies in adopting these models to ensure equitable participation and accountability in federally funded projects.
- **Invest in Training and Capacity Building for Federal Staff and Communities:** Federal science agencies should provide training for federal staff on cultural sensitivity and community engagement while funding new roles including community coordinators or engagement specialists. Building the capacity of both federal staff and community stakeholders is essential. Agencies should offer training in cultural sensitivity, interdisciplinary collaboration, and effective community engagement. These investments will ensure both federal staff and communities are equipped to engage meaningfully with community partners.
- **Develop Standards for Cross-Agency Coordination:** Federal science agencies should be directed to create shared tools and methodologies to ensure consistent and equitable engagement practices across federal programs. Workshop participants emphasized the lack of coordination across federal science agencies for community engagement efforts, resulting in siloed initiatives and inconsistent practices. OMB and OSTP can lead in developing cross-agency standards for engagement practices and foster communication pipelines across agencies for intel sharing. Creating unified frameworks, such as a shared repository of engagement tools and methodologies, would streamline efforts, ensuring equitable public participation across federal programs.
- **Expand Metrics to Capture Societal and Community Impacts:** Definitions should explicitly include societal impact metrics such as trust, empowerment, and community well-being. Adding these terms clarifies the broader goals of public engagement. Traditional metrics such as patents and publications fail to capture the broader societal and community impacts of federal initiatives. Both quantitative and qualitative metrics, co-designed with communities, should be used to evaluate success. Metrics could include trust-building, empowerment, environmental improvements, or health outcomes, ensuring alignment with the lived experiences of underserved populations. This shift would better capture the value of federal engagement in fostering societal well-being.

Future Work

Building on the workshop discussions, the FAS and CSPO team identified five key areas for a multi-stakeholder Community of Practice to further develop PPCE policy and practice.

- **Demand-side activities to better understand communities.** Actions include:
 - Establishing collaborative frameworks where communities are involved from the very beginning of project planning.
 - New forms of community surveys that identify opportunities for new collaborative research and technology development to solve local problems.
 - Simplifying the language in federal requests for proposals (RFPs) and other communications, aligning these with community priorities, and leveraging trusted interlocutors such as community leaders, health workers, or local organizations.
- **Training and Capacity Building.** Actions include:
 - Developing cross-agency knowledge sharing on engagement practices.
 - Investing in tools and resources to integrate engagement into research efforts.

- Building capacity in local organizations to engage with research efforts and aligning efforts across agencies to invest in partnership infrastructure.
- Training the next generation of practitioners that can engage in relationship building between researchers and community groups.
- **Improved Metrics.** Actions include:
 - Creating evaluation metrics for research that prioritize societal outcomes through both qualitative and quantitative measures.
 - Designing metrics with project collaborators and program officers.
 - Using both quantitative and qualitative metrics for a comprehensive evaluation.
 - Recognizing strong partnerships and relationships as key to research success.
 - Developing iterative evaluation systems that evolve based on community needs.
- **Enhanced Incentives.** Actions include:
 - Build accountability to achieve broader impacts, and scope how other funding agencies can develop broader impacts-criteria.
 - Encouraging funders to actively incentivize and reward public participation efforts as a part of research efforts.
 - Developing recognition processes for faculty and universities that are delivering on societal benefit.
 - Funding efforts in a pay-for-success manner to track progress toward goals.
- **Streamlined Processes.** Actions include:
 - Simplifying grant regulations to reduce administrative burdens on communities and lower-resourced institutions and using flexible funding authorities.
 - Encouraging co-creation at all stages of research and funding processes.
 - Clarifying follow-through on community benefits from federal efforts, such as Community Benefits Plans.
 - Scoping legal barriers to PPCE and community-engaged science and developing legislation that minimizes these barriers.

A Preliminary Roadmap for Action

Center-of-Government Federal Agencies

Agency Actors: OMB, OSTP

Responsibility: Capacity, Metrics, Incentives, Processes

OMB's draft Memorandum, *Broadening Public Participation and Community Engagement with the Federal Government*, sought to standardize language, principles, frameworks, and measures across the federal government for PPCE. Much of this framework is focused on PPCE for government decision-making, whereas PPCE in S&T involves co-developed research priorities and projects led or funded by federal agencies.

OSTP can lead the effort by building on the framework in OMB's memorandum, specifically by providing guidance for federal science agencies on how to leverage existing authorities and funding mechanisms to:

- Reduce barriers to making investments in community capacity to participate in, shape, and even lead scientific research and technology development (e.g. IRB, funding mechanisms).
- Train research leads in and outside of the federal government to lead processes of knowledge creation in service of achieving community priorities.

- Identify workforce-building efforts for PPCE practice.
- Develop a scalable metric for societal benefits that can be adopted across government.
- Evaluate progress across federal science agencies towards societal benefits and levers to build University infrastructure for benefits tracking.

Federal Science Funding and Program Agencies

Agency Actors: NSF, NIH, DOE, NOAA, NASA, USDA, DoD, NIST, USGS

Responsibility: Capacity, Metrics, Incentives, Processes

As the decision makers for how appropriated funding for research and development is deployed, federal science funding and program agencies can make choices that **build PPCE infrastructure** for research and technology development. This can be accomplished through:

- Program design changes to establish more planning grants to foster relationships between research partners, like between an academic institution and a community-based organizations (CBOs).
- Program agencies can leverage cooperative agreements with CBOs, though these contracting mechanisms are challenging for smaller organizations to implement.
- Grant requirements can be adapted to reduce the burdens on less-resourced partners, such as CBOs, MSIs and HBCUs.
- Federal funding agencies could recognize relationships as research infrastructure, and direct infrastructure-building grants to partnerships offices.
- For agencies with other transaction authorities (OTAs), partnerships with community-based organizations could be assessed via pay for performance systems for both research and technology deployment.
- Prize and challenge grants, which are available to all federal agencies, can deploy resources more quickly to CBOs, though their novelty suggests test initiatives and assessment should be carried out before the practice is widely scaled.
- As program officers evaluate grants with PPCE-activities, they can engage grantees to pursue societal benefits through co-developed impact metrics.

Academic Research Institutions

Responsibility: Capacity, Metrics, Incentives

As the main recipients of federally funded research, universities play a pivotal role in developing infrastructure for collaboration with community-based organizations and community experts. There are a few ways to level the playing field and create more equitable PPCE:

- Universities can establish and support centers and institutes for participatory engagement in science. These should serve as a shared resource for researchers to engage meaningfully and ethically with local CBOs, government partners, and other community members. Many higher education institutions have such centers, though largely either as stand-alone research entities or as a part of undergraduate civic education and experiential learning. Community colleges, regional universities, HBCUs, and MSIs often have closer ties with their local communities; yet, because of a lack of infrastructure, they often are not competitive with R1 universities for federal grants. While R1s that are successful at getting grants can partner with these research institutions, such as by being the lead on the grant application, the high indirect cost-shares of these institutions for admin costs is a substantial barrier to equitable collaboration.
- Universities can create learning tracks and degree programs for aspiring PPCE practitioners to address the growing demand for professionals who can effectively communicate science and bridge the gap between scientific and non-scientific communities. Universities are the main training ground for future scholars

and practitioners of PPCE. Many PPCE in science practitioners develop their skill sets outside of the university classroom, through internships and fellowships, and universities can encourage this form of learning.

Non-Governmental Boundary Organizations

Sample Actors: FAS, CSPO, the American Geophysical Union, the Association of Science and Technology Centers, Pew Charitable Trusts, and others.

Responsibility: Capacity, Metrics, Incentives

Non-government boundary organizations need to be more responsive to helping collaborators, federal and non-federal, meet demands for PPCE in science. Boundary organizations can form the connective tissue between different actors to search for needs and identify solutions:

- Boundary organizations can advance the application of research to policy through partnerships with philanthropies and other groups. Federal science funding and program agencies want to see societal impact from research but may be wary of funding efforts directly related to policy change, and boundary organizations are suited to fill the gaps.
- Boundary organizations can serve as the home for knowledge on leading practices, continuing the work of developing the field and setting longer-term goals. They can be a ‘matchmaker’ between organizations that seek specific kinds of partnerships or knowledge sharing and can organize short courses on community engagement.
- Boundary organizations can develop reward systems for success in PPCE in science, such as prizes and credentialing.
- Boundary organizations can provide the training grounds for PPCE in science. Boundary organizations can play a key role in workforce development and field-building to ensure early career scientists and engineers have pathways to engage in this work.

Philanthropic Organizations

Responsibility: Capacity, Incentives

Given the barriers posed by federal funding, philanthropic organizations can play a critical role in infrastructure building for PPCE in science.

- Philanthropic organizations can invest in the infrastructure at universities and within CBOs to engage meaningfully with each other on societally beneficial research and technology efforts. This is especially helpful because non-federal agencies can often be more flexible in how they distribute funding.
- Philanthropic organizations can create incentives and demands through stipulating strong collaborations with diverse partners in their calls for proposals. Clear signals about the types of research that philanthropies will fund would encourage more researchers to integrate these practices into their research agendas.

Community-Based Organizations

Responsibility: Capacity, Metrics, Incentives

Since this report does not outline how best to create change within community organizations, we focus here on how larger institutions can better elucidate the needs of community groups. Community-based organizations historically have not led federally-funded R&D projects, so intentional investment is needed to understand community priorities and latent research skills, inventiveness, and technology development capabilities. For example, boundary organizations like MetroLab have been leading local government R&D agendas to understand what local government partners need from universities and federal science funding and program agencies. Individual federal science funding and program agencies, or a collaborative, could lead or invest in similar agenda-

setting efforts across the country to source a **public agenda for science and technology**. Universities with strong community partnerships could be resourced as intermediaries to help shape this agenda with their communities. Part of this effort would involve understanding how different communities want to be engaged, what they need to become empowered partners in the research process, and what meaningful progress looks like for them.

About the Project

The workshop and this report were produced through a collaboration of the Federation of American Scientists (FAS) and Arizona State University's Consortium for Science, Policy and Outcomes (ASU-CSPO). The project was led by Grace Wickerson [gwickerson@fas.org] at FAS and Arthur Daemmrich [arthur.daemmrich@asu.edu] at ASU-CSPO, with the support and co-authorship of Leah M. Friedman at ASU.