

STRATEGIES AND RECOMMENDATIONS: ENGAGING UNDERREPRESENTED COMMUNITIES IN CITIZEN/PARTICIPATORY SCIENCE AT NOAA

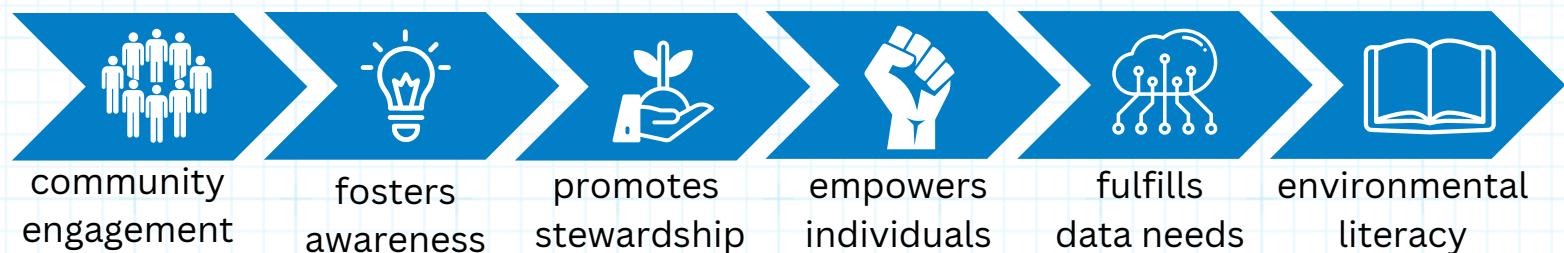
Citizen/participatory science has proven to be a powerful tool for expanding the reach and impact of scientific research by involving the general public. However, there is room for improvement in engaging certain communities who have historically been underrepresented in scientific endeavors and decision-making processes. The resource draws upon key best practices identified from 14 interviews conducted with NOAA Citizen Science project managers (see appendix) during the Summer of 2023. These interviews provided valuable insights from a program manager's standpoint, offering a better understanding of how to support projects in engaging with underrepresented communities and overcoming potential barriers. The resource aims to equip project managers with the knowledge and tools needed to create more accessible and meaningful citizen science projects that resonate with diverse audiences.

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What is Citizen Science?

NOAA defines Citizen Science as a form of open collaboration in which individuals or organizations participate voluntarily in the scientific process. This involvement ranges from data collection and analysis to problem-solving and project design. The democratization of science through citizen science initiatives has gained momentum in recent years due to its ability to not only contribute valuable data to scientific research but also engage communities in meaningful ways. [1]

Benefits of Citizen Science [2]



Disparities in Citizen Science

Despite its numerous benefits, citizen science is not immune to issues of representation and equity. Demographic analysis reveals that historically marginalized communities are underrepresented in citizen science initiatives, only perpetuating existing disparities. [3] Research reveals that a typical participant profile is skewed towards white males with higher levels of education. [1]

Evaluation of Citizen Science Engagement at Sea Grant

An evaluation of Citizen Science at Sea Grant found that 60% of programs felt they would benefit greatly by engaging more diverse participants. However, an overwhelming 80% of the programs that aimed to diversify their participant base encountered obstacles that hindered their progress. [4]



Strategies to CREATE a more inclusive Citizen Science space:



C

Conduct Comprehensive Assessment

Conduct an assessment to identify underrepresented communities in the area you serve. Delve into the demographic composition of the area in question, considering factors such as ethnicity, race, socioeconomic status, language proficiency, and cultural background.



R

Recognize Local Knowledge

Embrace a stance of openness and receptiveness to the wisdom, insights, and experiences held by community members, fostering a collaborative and mutually beneficial engagement process.



E

Ensure Equitable Access

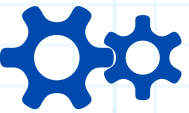
Evaluate geographical, logistical, physical, and any other considerations that might influence participation. Adopt a proactive approach to accommodate individuals with varying abilities, ensuring that project procedures are thoughtfully tailored to meet their specific needs.



A

Attract Authentic Representation

Ensure that the composition of the outreach team reflects the diversity and demographics of the community you seek to engage. Recruit staff members who have shared experiences and possibly linguistic abilities akin to those of the community.



T

Tailor Task Distribution

Ensure project tasks and roles are distributed equitably among participants, avoiding concentrating responsibilities on a select few. Offer flexibility by allowing community members to contribute in ways that suit their availability and preferences.



E

Empower Community Ownership

Empower community members to play a central role in shaping the project's objectives, methodologies, and outcomes. Encourage their active involvement in decision-making processes, allowing them to influence the direction of the initiative and take ownership of its impact.

Conduct Comprehensive Assessment

Conduct an assessment to identify underrepresented communities in the area you serve. Delve into the demographic composition of the area in question, considering factors such as ethnicity, race, socioeconomic status, language proficiency, and cultural background.

Define Project Objectives

- Clearly outline the specific goals and objectives of your project
- Determine the type of data you need to collect and the research questions you want to address

Identify Project Scope

- Determine the geographic area and community you intend to serve through the project.
- Consider the scale of the project and the resources available for engagement.

Community Analysis

- Research the demographics and social characteristics of the target community.

Seek Input from Local Stakeholders

- Engage with local community leaders, organizations, and representatives to gain insights into their needs and interests
- Attend community meetings or events to understand the concerns and priorities of the community

Assess Community Capacity

- Evaluate the community's existing knowledge, skills, and resources related to citizen science and environmental monitoring
- Identify potential partners or organizations within the community that may have experience or interest in similar projects

Identify any Barriers

- Determine the primary languages spoken within the community and assess potential language barriers.
- Consider cultural sensitivities and tailor communication and engagement approaches accordingly.

Evaluate Access and Connectivity

- Determine the availability of internet access and technology within the community for data collection and communication.
- Assess transportation options and consider the ease of physical access to project sites.

Recognize Local Knowledge

Embrace a stance of openness and receptiveness to the wisdom, insights, and experiences held by community members, fostering a collaborative and mutually beneficial engagement process.

Identify Key Knowledge Holders

- Identify individuals within the community who possess valuable traditional knowledge.
- Respectfully approach these knowledge holders and seek their guidance on the project.

Start Building Trust

- Foster relationships built on trust, mutual respect, and reciprocity with the community members.
- Publicly acknowledge the importance of local knowledge and its contribution to the project.
- Show up to any community events

Integrate Local Knowledge in Project Design

- Collaborate with community members to incorporate local knowledge into research questions and study design.
- Adapt data collection methods to include both scientific and traditional knowledge-based observations.

Facilitate Knowledge Exchange Workshops

- Organize workshops where community members can share their traditional knowledge with project team members.
- Provide opportunities for scientists and community members to learn from each other.

Incorporate Traditional Knowledge in Data Interpretation

- Integrate local knowledge into data interpretation and analysis to derive more nuanced and holistic insights.
- Encourage project team members to consider both scientific and traditional perspectives

Ensure Knowledge Ownership and Protection:

- Respect intellectual property rights and cultural protocols related to traditional knowledge.
- Obtain informed consent from the community before sharing traditional knowledge externally.

Ensure Equitable Access

Evaluate geographical, logistical, physical, and any other considerations that might influence participation. Adopt a proactive approach to accommodate individuals with varying abilities, ensuring that project procedures are thoughtfully tailored to meet their specific needs.

Accessible Project Site

- Select a project site that is easily accessible by public transportation or provides adequate parking for those with private vehicles.
- Consider the proximity to communities you want to involve to minimize travel distances.

Culturally Appropriate Material Translation

- Develop project materials in multiple languages to accommodate participants with diverse linguistic backgrounds.
- Utilize translation services or collaborate with bilingual community members for accurate translations.

Design Inclusive Data Collection Methods:

- Develop data collection methods that are adaptable to different learning styles and abilities.
- Provide multiple options for data submission, such as mobile apps, web forms, or paper-based surveys.

Provide Food

- Provide food or refreshments depending on timing
- Accommodate dietary restrictions when offering food

Provide Assistive Technologies:

- Make available assistive technologies for individuals with disabilities during project activities.
- Ensure that project materials and tools are compatible with screen readers and other assistive devices.

Engage Disability and Inclusion Experts:

- Consult with disability and inclusion experts to review project plans and ensure accessibility.
- Seek guidance on accommodating specific disabilities or learning needs.

Facilitate Open Communication:

- Create a welcoming environment for participants to express their needs and concerns openly.
- Encourage feedback and make necessary adjustments based on participant input.

Attract Authentic Representation

Ensure that the composition of the outreach team reflects the diversity and demographics of the community you seek to engage. Recruit staff members who have shared experiences and possibly linguistic abilities akin to those of the community.

Engage with Local Organizations:

- Establish partnerships with community-based organizations or nonprofits that serve the target population.
- Collaborate with these organizations to identify potential candidates from the community who can join the outreach team.

Recruit Bilingual and Multicultural Staff:

- Prioritize hiring staff members who are bilingual or multilingual, capable of communicating effectively with diverse community members.
- Seek individuals who have an understanding of the local culture and customs

Conduct Targeted Outreach for Recruitment:

- Utilize community-specific communication channels, such as local newspapers, community centers, or cultural events, to advertise job openings.
- Share job opportunities with relevant community networks and associations.

Use Inclusive Job Posting Strategies:

- Use inclusive language in job postings to attract candidates from diverse backgrounds.
- Advertise the position through multiple channels, including community-specific media and platforms.

Create Mentorship Opportunities:

- Establish mentorship programs where experienced team members can support and guide newer members
- Facilitate knowledge-sharing and skill-building within the team.

Create an Inclusive Workplace Culture

- Cultivate an inclusive and welcoming workplace culture that embraces diversity and values each team member's contributions.

Offer Student Opportunities

- Offer paid internships to students from the community being served
- Hire from NOAA MSI/EPP Program

Tailor Task Distribution

Ensure project tasks and roles are distributed equitably among participants, avoiding concentrating responsibilities on a select few. Offer flexibility by allowing community members to contribute in ways that suit their availability and preferences.

Identify Project Tasks and Roles

- Define the specific tasks and roles required for the citizen science project.
- Break down the project into manageable components, ensuring clear responsibilities for each task.

Determine Skill Requirements

- Identify the skills and expertise needed to carry out each task effectively.
- Consider both scientific and non-scientific skills required for different roles.

Encourage Task Preferences

- Allow volunteers to express their task preferences to create a sense of ownership and motivation.
- Consider their input while distributing tasks, when feasible.

Promote Task Rotation

- Offer opportunities for task rotation to prevent burnout and promote a diverse experience for volunteers.
- Encourage participants to engage in various aspects of the project.

Accommodate Time Commitments

- Consider different levels of time commitment from volunteers.
- Offer tasks that accommodate various availability constraints, such as short-term or one-time contributions.

Partner Experienced with Less Experienced Volunteers

- Encourage collaboration and task-sharing among volunteers to enhance efficiency and support each other.

Empower Community Ownership

Empower community members to play a central role in shaping the project's objectives, methodologies, and outcomes. Encourage their active involvement in decision-making processes, allowing them to influence the direction of the initiative and take ownership of its impact.

Form a Community Advisory Group

- Invite a diverse group of community members to join the Community Advisory Group, representing various age groups, ethnicities, and local organizations.
- Hold regular Community Advisory Group meetings to discuss project developments, seek feedback, and involve members in decision-making.

Establish Open Communication Channels

- Create accessible and welcoming channels for community members to express their ideas and feedback.
- Utilize multiple communication platforms such as in-person meetings, email, social media, or community forums.

Implement Regular Progress Updates

- Publish project updates in community newsletters, local newspapers, or on community bulletin boards.
- Organize town hall meetings to present project findings and encourage discussions with community members.

Sustain Long Term Involvement

- Establish a plan that outlines how the project's outcomes and relationships will continue to benefit the community in the future.
- Seek ways to collaborate on future initiatives and maintain continuous engagement.

Celebrate Contributions

- Host community appreciation events to recognize and celebrate the efforts of all citizen scientists involved.
- Provide certificates or awards to acknowledge individual contributions to the project.

Resources and Acknowledgements



To Learn More Check Out:

[NOAA Libraries Webinar on Engaging Underrepresented Groups with Case Study](#)

[Citizen Science Trainings and Other Support](#)

[NOAA Citizen Science Action Plan](#)



[To Join the NOAA Community of Practice listserv, email \[citizenscience@noaa.gov\]\(mailto:citizenscience@noaa.gov\)](#)

For questions or comments, please email citizenscience@noaa.gov

[1] Dibner, K. A., Pandya, R., & National Academies of Sciences, Engineering, and Medicine. (2018). Overview of Citizen Science as a Context for Learning. In *Learning Through Citizen Science: Enhancing Opportunities by Design*. National Academies Press (US).

[2] Bonney, R., Ballard, H. L., Jordan, R., McCallie, E., Phillips, T., Shirk, J., & Wilderman, C. C. (2009). Public participation in scientific research: Defining the field and assessing its potential for informal science education: A CAISE inquiry group report.

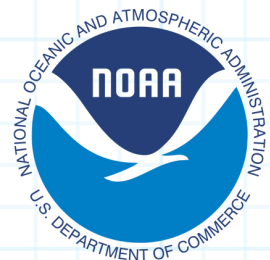
[3] Banks, J.A. (1997). *Educating Citizens in a Multicultural Society*. Multicultural Education Series. New York: Teachers College Press

[4] Stepenuck, K. & McQuain, L. (2023). *Diversifying Participation in CS Programs: Insights from Across the Field*.

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Appendix

Interview Participants:

Hudson River Eel Project

Tribal and Indigenous Communities HABs

Florida Microplastics

Urban Heat Island Mapping

Marine Debris Monitoring

Cooperative Observer Program

Community Collaborative Rain, Hail & Snow Network (CoCoRaHS)

NOAA-Wide Citizen Science Coordinator

Coastal Research Volunteers

LiMPETS

Nurdle Patrol

Stellwagen Sanctuary Seabird Stewards (S4)

OceanEyes

Interview Questions:

Introduction:

- Please briefly introduce your name, title, and describe the citizen science project(s) you are currently managing at NOAA. What are its (their) goals and objectives?
- Have you made any specific efforts to engage underrepresented groups in your project? Are there any specific communities you connect, or seek to connect with?

If they do engage with underrepresented groups:

- Did you intentionally design your project to engage with underrepresented groups?
 - How did you do this? Did you take input from members of those communities?
- Are there any specific recruitment or outreach strategies that you have found effective in engaging underrepresented groups?
 - Are there any strategies that have not been successful?
- What feedback or insights have you received from underrepresented participants in your citizen science project?
 - How has this feedback influenced the project's development or implementation?
- Have you conducted any evaluations or assessments to measure the impact of your efforts in engaging underrepresented groups?

Appendix Cont.

If they don't engage with underrepresented groups:

- Is engaging underserved groups as participants something you would like to do as your project advances?
 - Yes: What specific barriers or challenges (language, cultural, socioeconomic) have you encountered when attempting to engage underrepresented groups in citizen science projects?
 - No: Why?
- Have you considered strategies to overcome these barriers and increase the participation of underrepresented groups?
- What resources or support do you believe would be beneficial in helping you engage underrepresented groups more effectively in citizen science projects?
- Are there any existing policies, guidelines, or procedures within or impacting your project that might unintentionally exclude or deter underrepresented groups? If so, how could these be modified to promote inclusivity?
 - Line Office, NOAA, Dept of Commerce, Federal Wide Levels?

Wrap Up:

- Is it okay if I share your stories/anecdotes with others?
- What resource(s) could NOAA develop to help you and other citizen science project managers in engaging underrepresented groups?
- In your experience, what are some key best practices or recommendations for engaging underrepresented groups in citizen science projects at NOAA?