Training and Activating Volunteer Facilitators to Support Libraries as Community Hubs for Citizen Science

PROJECT JUSTIFICATION

Libraries inform and empower individuals and communities, functioning as anchors that provide resources and guidance necessary to an evolving workforce and lifelong learners (IMLS Convening on STEM Learning in Libraries, 2014). Citizen science engages the public in scientific inquiry through data collection and analysis, provides authentic lifelong learning opportunities, is widely recognized for supporting learning in science (National Academies Press 2018), is experiencing rapid growth as made evident by the millions of participants in the U.S. contributing data to thousands of citizen science projects, and is a resource for libraries to develop "responsive models and tools that engage communities and provide learning experiences for patrons across the lifespan" (IMLS Leadership Grants 2017).

Data collected and shared by participants are used extensively by scientists and agencies to study pollution, biodiversity, space, and diseases, as well as inform policies, increasing the importance of diverse participation (geospatial, socioeconomic, and demographic). Lack of data results in undersampled areas where environmental concerns disproportionately affect poor communities, for example. Citizen science (CS), also referred to as community science or participatory research (see Supportingdoc6), is often cited as an "important vehicle for democratizing science" (Frontiers) but too often, both the data and the benefits of engagement are not equitably represented or distributed across populations. Emerging and promising research suggests that local, facilitated approaches to CS increase participant diversity and data contributions (Hunter & Cooper, in prep). Local, trained, volunteer facilitators may also hold the key to scaling, sustaining, and supporting libraries as community hubs for citizen science.

Arizona State University and SciStarter (a popular CS web hub with more than 160,000 members and thousands of searchable CS projects added by scientists), with our partners, including the National Girl Collaborative Project, STAR Net, the Association of Rural and Small Libraries (ARSL), VolunteerMatch, the NC Council of Churches and public libraries across the country, propose a National Leadership (Implementation) project, **Training and Activating Volunteer Facilitators to Support Libraries as Community Hubs for Citizen Science**. The $249,425 project will create new assets, approaches, and connections that build on the continuity, momentum, growth, and impact of our prior and current work, which supports a growing network of public libraries offering CS kits and programs.

The proposed project responds to librarians' requests for program facilitators while also addressing the known challenges that small, rural, and under-resourced libraries face by offering libraries turnkey, effective, affordable resources to meet community needs for access to CS projects and instruments. Training and Activating Volunteer Facilitators to Support Libraries as Community Hubs for Citizen Science will deliver:

- A new online, **interactive training module,** *Facilitating Introductions to Citizen Science at Your Local Library,* with badge accreditation and performance measures designed to increase self-efficacy among Ambassadors to facilitate introductions to CS at libraries. After learning the basics of CS, Ambassadors will learn how to introduce CS and SciStarter and demonstrate libraries' CS kits. Related training skills may include: facilitation, community outreach and education, public speaking, empathy, etc. (see Supportingdoc5).
- Evidence-based strategies to recruit, train, and support a network of **Citizen Science Community Ambassadors** who are prepared to support their local libraries by facilitating introductions to CS and related library programs, leading to increased and more diverse participation and learning in science.
- A **searchable database of Ambassador profiles** on SciStarter.
- A **guide for librarians and library staff** to understand how to contact and support local Ambassadors to facilitate and support CS engagement.
- **Continued support to expand and sustain the National Citizen and Community Science Library Network** of libraries across the country that offer CS kits and programs.

The project reinforces the role of libraries as valuable partners in addressing the needs of their communities by training, supporting, and making discoverable local community members as Ambassador facilitators to introduce CS and related programs to library users and increase participation among diverse populations. The project aims to increase libraries' capacity to support lifelong learning, serve education and information needs of diverse publics, and contribute to efforts that improve community well-being and strengthen civic engagement, while broadening and deepening participation in important scientific research.

Training and Activating Volunteer Facilitators to Support Libraries as Community Hubs for Citizen Science will build on past projects to create Phase Four of "Libraries as Community Hubs for Citizen Science"

Between 2017 and 2023, Arizona State University and SciStarter, in partnership with Arizona State Library, NISENet, National Girls Collaborative Project, the Network of the National Library of Medicine, the Moore Foundation, and the Association for Rural and Small Libraries (ARSL), piloted, scaled, and evaluated "*Libraries as Community Hubs for Citizen Science" (IMLS# LG-95-17-0158-17, LG-246428-OLS-20)* to strengthen the position of libraries as community hubs for STEM learning. The project addressed known critical barriers in CS infrastructure, including lack of access to necessary instruments and opportunities to connect with other citizen scientists, which prohibits sustained participation in citizen science. The project also addressed:

- **libraries**' desire for meaningful, turnkey, customizable, innovative, and locally situated STEM programming relative to their capacity and infrastructure;
- **citizen scientists**' growing interest in learning about and joining local projects and their need for short-term access to related low-cost instruments and resources;
- **scientists'** need to recruit, train, equip, and sustain citizen scientists;
- continued development of SciStarter to connect libraries and citizen scientists

Libraries as Community Hubs for Citizen Science: 2017–2023
***Phase One (2017–2019)*:** The project team collaborated to 1) develop and evaluate citizen science toolkits available for and through six public library partners in the Phoenix, AZ, area to learn how kits/resources are used to build or support citizen scientists at the libraries; 2) create associated resources to train, support, and communicate with librarians and citizen scientists; and 3) work with stakeholders to create a plan to scale the model among interested libraries statewide, then nationwide. Ninety percent of people who checked out kits would check out another, and most patrons "agreed" or "strongly agreed" that participating in the CS project increased their awareness and interest in CS and their knowledge of science. Librarians report feeling "confident" in understanding the kits and communicating CS impact, and most Arizona pilot librarians indicated they were "quite a bit" or "very" excited to continue CS programming after the pilot.
***Phase Two Supplement (2019–2020)**:* We tested demand in Arizona by publishing downloadable training guides for libraries to build and circulate kits and programs. Promoted through the Arizona State Library, the Arizona Library Association, and the National Citizen and Community Science Library Network, the program has scaled to nearly half of the 233 public and tribal libraries in Arizona.
***Phase Three (2020–2023)*:** The project team developed and provided libraries with open-source, downloadable "build a kit" guides, activities, and related resources that offered everything needed to circulate physical and digital toolkits and resources as well as a supported network of CS library members. The program is achieving its goals and scaling quickly: **what started as a pilot project with six libraries in Arizona has scaled to include more than 400 libraries across the country, representing an estimated 21,300 CS kit checkouts and more than 1,000,000 data contributions to science**.

Summary evaluation of Phases 1–3 of Libraries as Community Hubs for CS reported that librarians felt comfortable assisting patrons with the kits and facilitating kit circulation. Library patrons reported increased awareness, interest, and knowledge of citizen science, as well as confidence in their ability to collect and interpret data. Participating libraries are leveraging their existing infrastructure, increasing their STEM programming capacity, growing relationships and collaborations with patrons and community members, and increasing their own and their patrons' awareness and confidence in CS through "responsive models and tools that engage communities and provide learning experiences for patrons across the lifespan" (IMLS National Leadership Grants 2017). (See Supportingdoc1 "Project Phases.")

Resources developed in Phases 1–3 include **kits** and **accompanying webpages** on SciStarter with everything needed to complete one of seven CS projects on topics including air quality, light pollution, biodiversity, and more. The program also provides **Kit Building Guides, promotional materials, training for libraries and participants, and a National Citizen and Community Library Network** of 400+ libraries across the country (see Supportingdoc2).

Key Finding: Evaluation reports show that among respondents, 90% of people who checked out kits would check out another, 93.3% said the kit changed the way they think about their libraries, and 100% of librarians experienced increased confidence in talking about CS. But when asked about obstacles in an informal survey of librarians**, nearly 70% of respondents said they would be more or extremely more likely to make or keep their library a community hub for CS if offered trained Ambassadors.** Even with the resources, library training, and supplemental guides we currently provide, it can be difficult for a busy librarian to find the time to be an enthusiastic proponent of the kits and program.

"We plan on offering our kits to our patrons for as long as we can! We would love to have trained volunteers help with citizen science programming and a way to locate them!

Librarian, Lee County, North Carolina

In the past year, during follow-up calls, professional development webinars, and focus groups (report in progress), project team members heard about ongoing staffing shortages and the struggle to provide programming, especially face-to-face events, to their library users. Feedback from librarians (Phase 3) includes "The biggest obstacle to using libraries as community hubs rests on the time and staff resources necessary to actively support the projects" and "[the biggest obstacle is] Probably staff time to make sure the public is aware we have the kits."

This feedback underscores the need for the Ambassadors.

Enter Phase Four:
Training and Activating Volunteer Facilitators to Support Libraries as Community Hubs for Citizen Science

Our experienced team, representing diverse ideas, expertise, locations, demographics, interests, and connections, will develop resources to train and prepare citizen scientists, library Ambassadors, and other interested community members to facilitate introductions to citizen science in libraries using trainings, talking points, PowerPoints/printables, and CS materials the libraries already offer. In addition to responding to the needs of libraries and the communities they service, our proposed project is informed by, and advances research about, the field of citizen and community science. Published research shows that **76% of SciStarter participants engage in multiple citizen science projects** (Allf) **and many aim to deepen their engagement** (see "Behavior and Stewardship" in Image 1). Facilitating introductions to citizen science through libraries can address that aim.

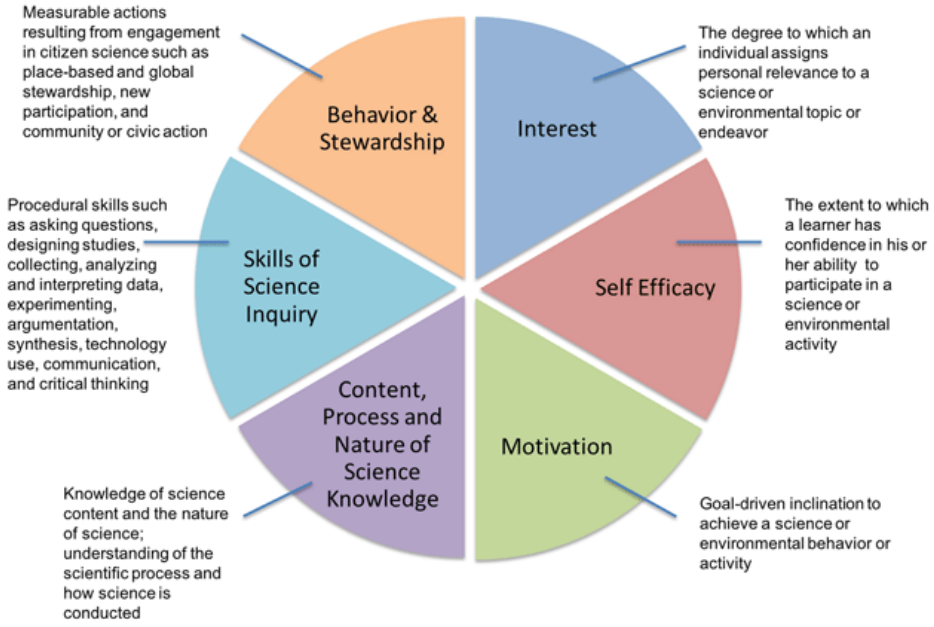


Figure 1. A Framework for Articulating and Measuring Individual Learning Outcomes from Participation in Citizen Science

Phase 4 addresses the third of three known barriers to participation in citizen science: 1) lack of awareness (addressed in Phases 1–3); 2) lack of access to materials (Phases 1–3); and 3) lack of community ("socially isolating" experiences). Ambassadors will socially engage with people in their community (Phase 4) (See Stewardship in Figure 1.)

This project will be informed by librarians experienced with the CS kits and programs; consultants who have developed recruitment, training, and evaluation best practices in CS, PD, and library settings; advisors with expertise in engaging diverse communities and professional development support for networks of libraries, facilitators, and Ambassadors; internationally recognized citizen science experts, and more (see "Project Resources" below). The project team holds substantial experience and expertise in citizen science (ASU, SciStarter); developing and implementing programming and curriculum training in libraries and community organizations (ASU, STAR Net, SciStarter, VolunteerMatch); creating and sustaining online communities of practice (NGCP, STAR Net, SciStarter, VolunteerMatch); library- and community-based programming (ARSL, NC Council of Churches, cohort of pilot library partners [see X]); and best practices for inclusive, diverse, and equitable approaches to training/learning/volunteerism and engagement (ASU instructional designers, Advisors, VolunteerMatch) with which to provide guidance on customized training materials and help coordinate efforts to recruit Ambassadors and libraries.

PROJECT DESIGN:

Training and Activating Volunteers to Support Libraries as Community Hubs for Citizen Science is a two-year project to achieve the following objectives:

Objectives	Key Activities	Measurable Outcomes
Increase volunteer awareness of CS and opportunities to facilitate introductions in libraries	-Develop recruitment and promotions strategy with advisors and collaborators. -Develop volunteer-oriented introduction to facilitating citizen science in libraries. Pilot with 20–30 diverse Volunteers; iterate, publish, and promote through SciStarter, Libraries, VolunteerMatch, and other collaborators	Ambassadors' ability to describe CS to patrons, demonstrate one project, and navigate patrons to related resources (projects, library events, and kits, SciStarter) # of Volunteers who complete the new training
Increase diverse patron awareness of and engagement in CS in libraries	Design and develop webpages so Volunteers and libraries can easily discover and navigate to resources they need (Trainings, Ambassador database, User Profiles, existing Library and CS project/event pages, etc). SciStarter.org/	# of visits to new webpage # of Ambassadors contacted by libraries # of Trainings completed # of CS events in libraries
Increase CS librarians' awareness and use of Ambassadors program	Quarterly webinars for Library Network Co-creation of a guide for libraries to learn how to find, contact, and support Ambassadors Pilot training with 10 libraries post-pilot, dissemination through partners and Network	Libraries report feeling confident in contacting and supporting Ambassadors. # of libraries that invite Ambassadors to host programs post-pilot (goal: 200 participating libraries) # of guide downloads
Enable librarians to connect with local Ambassadors to increase libraries' capacity to support CS programming and engage patrons as citizen scientists	Develop web-based map and searchable database for librarians to find and contact Ambassadors	Librarians are able to find the database and contact Volunteers. # of searches on Ambassador database # of Ambassadors contacted by libraries
Growth in the number of libraries in the National Citizen and Community Science Library Network	Sustain regular communications, webinars, and engagement with "Citizen Science Library Network," collaborate with STAR Net, ARSL, NNLM, and other library networks to regularly invite librarians and promote resources	Increased number of libraries that join the Network

Expanded participation in citizen science through libraries	Pilot libraries and pilot Volunteers will leverage Citizen Science Month (April 2024) to activate and test Ambassadors' facilitations in libraries. 200+ libraries and 400+ Ambassadors facilitate CS programs in libraries during Citizen Science Month 2025	# of Ambassador-led events/programs in libraries #Increased # of CS programs in libraries; Increased # of visits to SciStarter.org/library Increased # of data contributions to projects

PROJECT WORK PLAN

Stage 1: August 2023–April 2024

The team will continue to provide ongoing access and support for existing CS kits and resources through the SciStarter website and National Library Network to continue to expand the number of Libraries as Community Hubs for Citizen Science; NGCP, with promotional support from collaborators at STAR Net and ARSL, will lead the scaling strategies for the network. During Stage 1, parallel efforts will develop and advance:

Pilot Library & Volunteer Recruitment

- Through the development, recruitment, and ongoing support of the National Citizen and Community Library Network, hundreds of libraries offer CS kits and programs across all 50 states. In this project, among many libraries requesting trained Volunteers, the team has pre-identified 10–15 potential library sites representing a range of partners across 14 states (see Supportingdoc3) to work with advisors to recruit Volunteers to pilot the Ambassador training modules. The pilot libraries selected serve different communities: Black, Hispanic, Native American, Urban, and Rural populations.
- The project team and strategic partners, including SciStarter, NGCP, ARSL, STAR Net, VolunteerMatch, and NC Council of Churches, will meet to define the recruitment strategy for Volunteers. Co-PI Ash and NGCP will be guided by Advisors (Collins, Farooque, and Johnson) to leverage evidenced-based recruitment strategies and criteria to confirm the (10–15) pilot libraries, then recruit 20–30 Volunteers from those library communities toward increasing participant diversity. The project team will draft communications materials and host webinars to present information and get feedback on plans among pilot libraries and pilot Volunteers.

Web Development

- SciStarter creates wireframes for **Ambassador Finder tool and database,** Ambassador profile pages on SciStarter, and landing page to support the training and badge digital connections. Oregon State University will evaluate the wireframes with a select number of librarians. SciStarter will revise based on findings.

Ambassador Training Module

- PI Cavalier and instructional designer (Allen), guided by Advisors (Cooper, Collins, and Johnson), will draft, review, and iterate v1 "Facilitating Introductions to Citizen Science" training content.
- Community partners/advisors confirm location of 10–15 pilot libraries, and two Volunteers from each of those libraries' communities ("cohort 1"). Pilot Libraries (in the pilot phase) will be connected directly to the Volunteers and will invite them to come to the library to facilitate CS programs in April during Citizen Science Month.
- Cavalier, guided by Advisor (Bennett), hosts webinar for pilot Volunteers to describe the new training and answer questions; 20–30 Volunteers complete the "Foundations of Citizen Science" training module and draft version of the "Facilitating Introductions to Citizen Science at Your Local Library" and provide evaluation feedback on the draft training. **Volunteers completing both Trainings become Citizen Science Community Ambassadors** and are prepared to conduct events at their local library during Citizen Science Month 2024.

Libraries' Guide to Contacting and Hosting Citizen Science Community Ambassadors

- Project team and NGCP, guided by Advisor (Salthouse), draft a library guide with tips to invite and support

Ambassadors in the library as well as guidance on providing CS demo kits (if applicable), printed materials, and electronic resources.

Citizen Science Month Activities

- Ambassadors who completed the final version of the training module prepare to facilitate an introduction to CS at a local library during Citizen Science Month in April 2024. Libraries add these events to SciStarter for enhanced promotions. NGCP hosts webinar for pilot libraries and Ambassadors to share expectations for upcoming Citizen Science Month events in libraries; and in April, pilot libraries host Ambassadors to facilitate introductions to CS. Evaluation team will evaluate CSM programming to assess the effectiveness of the training resources and satisfaction among libraries.
- SciStarter tests digital connections between Ambassadors' SciStarter profile, training completion, and facilitation at library events (final versions of Ambassadors' profile pages will showcase Ambassadors' events following best practices in volunteer management).

Evaluation Instruments

- During Fall 2023, the evaluation team will begin to develop instruments to provide formative feedback on the Trainings, guide, and recruitment strategies. The instruments will be reviewed by the project team and advisors, and finalized by the end of November 2023.

Stage 2: May 2024–August 2024

During Stage 2, the project iterates and finalizes the Trainings, guide, and digital/web infrastructure to prepare for national scaling through VolunteerMatch, SciStarter, ARSL, STARNet, and others.

Expanded Library Recruitment

- Library Network begins promoting/identifying libraries to participate in the Ambassadors program with the goal of at least 200 participating libraries. Our aim is to recruit and train Volunteers located near the 200 library network libraries that are already participating as community hubs for CS. Simultaneously, efforts will continue to grow the library network so more libraries are aware of the CS resources, like kit guides, Trainings, and now volunteer facilitators/Ambassadors. We will disseminate through ARSL, STAR Net, and NGCP, as well as via ALA conference/webinar through their offer to share out.

Web Development

- SciStarter web development team tests **Ambassador Finder tool and database with pilot libraries, iterates and publishes.**
- SciStarter publishes Ambassador profile pages, and tests new training page and digital badge connections.

Training Revision

- **Evaluation team provides recommendations** to the project team to improve training materials, sharpen recruitment strategies, and enhance libraries' guides to contacting and supporting Ambassadors in the library.
- Project team iterates on the Ambassador training based on pilot feedback.

Preparation for National Rollout

- Development of a **marketing and communication recruitment plan** (for libraries and Volunteers) ahead of national rollout.
- Project team creates a webinar and guide to enable libraries to use the Ambassador finder to easily contact local, trained community members/Volunteers to invite them to facilitate Citizen Science Month programming.

Stage 3: September 2024–April 2025

In Stage 3, attention turns to recruiting two or more Volunteers at each of the participating 200 libraries, training them as Ambassadors, and supporting them during Citizen Science Month events:

National Rollout of Volunteer Recruitment

- The project team publishes revised training and recruits Volunteers located near at least 200 libraries in the

National Citizen and Community Science Network via 1. library partners, 2. SciStarter (160,000 members), 3. VolunteerMatch, and 4. current SciStarter partners Girls Scouts and Verizon (proven to increase diversity among citizen science participants).

- All recruited Volunteers will complete the Foundations of Citizen Science module and the new Ambassadors training module. As Volunteers complete the two Trainings, they are immediately and automatically added to the Ambassadors database where libraries can discover and contact them.
- **Recruitment and training webinars** will be created and hosted by VolunteerMatch with guidance from our advisors, while the project team **hosts monthly community calls** with Ambassadors to provide technical support and build a community of practice. Ambassadors develop and host Citizen Science Month programming at their local library.

Stage 4: May 2025–July 2025

Program implementation continues as the project team turns attention to program sustainability. Project dissemination through the Library Network, CSA, and other networks (see Dissemination Plan below) and final reporting.

PROJECT RESOURCES:

Personnel: Project Director **Darlene Cavalier**, MA, the founder of SciStarter and Professor of Practice at ASU, is a globally recognized expert, speaker, and author on CS and public engagement in science who designs innovative facilitated programs with libraries, museums, community-based organizations, companies, and media partners. Co-PI/PD **Deron Ash**, MSTP, has led the team's kit development efforts for the past three years and brings a wealth of experience in project organization, operations, and logistics. Our diverse advisors, leaders in their fields, will guide recruitment strategies: **Dr. Mahmud Farooque** has built a model for engaging diverse publics in science and science policy, cited by the U.S. Office of Management and Budget (OMB) in its "Study to Identify Methods to Assess Equity: Report to the President"; **Dr. Caren Cooper** is a CS expert and researcher at NCSU who created the Inclusive, Diverse, Equitable, Accessible, Large-scale (IDEAL) Participatory Science Initiatives; **Nicole Johnson** designs and facilitates mission-centered trainings with diverse people through the NC Council of Churches; **Lydia Collins** is a PhD Candidate, conducting research on the motivations of library staff who offer citizen science outreach and programming to Black, Indigenous, and People of Color (BIPOC) to determine what resources are needed to support sustainable engagement in their communities as well as design and development of resources that follow cultural humility practice; **Jennifer Bennett**, as the Director, Education & Training at VolunteerMatch, is a national leader in developing volunteer recruitment and management best practices to ensure the needs of Volunteers are front and center.

The **National Girls Collaborative Project** (NGCP will manage the library network.NGCP is an expansive national network of informal STEM educators (practitioners, community-based organizations, K-12 and higher education, researchers, government) and delivers high-quality professional development and webinars to provide robust research-based resources and curriculum for over 40,000 informal STEM learning programs across all 50 states. Informal STEM learning programs in the NGCP network include afterschool, summer learning, and other out-of-school time opportunities in a wide variety of settings.

Independent project evaluation will be conducted by the **STEM Research Center at Oregon State University** and led by senior researcher **Dr. Heather Fischer**, with support from Center Director **Dr. Martin Storksdieck**. The Center conducts applied research on STEM education and science engagement at the intersection of research, policy, and practice, with a strong focus on equity and social justice and the goal to align understanding of how all people learn throughout the lifespan in formal and informal settings with evidence-based strategies for STEM engagement. The Center's mixed-method evaluative approach will include formative and summative components to determine the extent to which the project's annual and overall objectives and outcomes have been met during and at the conclusion of the two-year funding period, gauge the quality and impact of the project's activities, and identify any unintended outcomes.

Other Resources: The project makes use of SciStarter's existing training modules (completed by more than 13,000 SciStarter members to date) to help enable people to review basic concepts, sharpen skills, and earn badges that verify the specific skills they practiced or acquired. Of people who completed the Foundations of Citizen Science training, 94% increased their awareness, understanding, and interest in citizen science "a great deal." The vast majority of participants reported that the tutorial significantly increased their confidence in completing various CS tasks, including participating in citizen science, collecting data, and analyzing data. Existing training modules include the Foundations of Citizen Science,

Building Data Literacy through Citizen Science, Libraries as Community Hubs for Citizen Science, Teaching in Higher Ed with Citizen Science, and Data Ethics for Project Leaders.

BUDGET: The total project is estimated at $249,425 including salaries ($37,320), fringe ($10,536), travel ($5,200), materials ($2,400), consultant services ($137,500, including instructional designer $6K, network management and webinars $72K, project evaluation $10K, front/back-end development $22K, graphic design $4K, library advisors $14K, library partners $5K, pilot volunteer stipends $2K, Badgr design $2.5K), other ($5,000, including Articulate subscription), and indirect costs of $51,469. See attached budget sheet and budget justification for details on project expenditures.

PROJECT RESULTS: This project will develop an understanding of how network support structures, recruitment strategies, and access to trained, local Volunteers can support libraries as hubs for lifelong learning while broadening, deepening, and increasing participant diversity in important scientific research. If successful, the project will enroll more than 1,000 libraries in the National Library Network, train 400 community Ambassadors, and support 200 libraries across the country with access to trained Volunteers to activate or sustain CS programming. The program provides libraries with an open-source and reusable training module that can be embedded on any library website and access to a database of Ambassadors. This project addresses the known challenges that small, rural, and under-resourced libraries face, thereby increasing libraries' capacity to support lifelong learning, serve education and information needs of diverse publics, and strengthen civic engagement.

Library Cohorts	Selection Criteria	**Corresponding Ambassador Cohorts**	Selection Criteria
10–15 pilot libraries	a) CS Library Network member offering CS programs and kits, b) requesting Ambassador facilitators, c) primarily serving diverse communities (rural, Black, Tribal, Hispanic)	**20–30 pilot Ambassadors -**	Once pilot libraries are confirmed, project team, advisors, collaborators, and pilot libraries will recruit pilot Ambassadors who are representative of the pilot library communities they live in
200 libraries	a) CS Library Network member offering CS programs and kits, b) requesting Ambassador facilitators	**400+ Ambassadors (Volunteers who have completed training)**	Completed Foundations training and the new "Facilitators" training on SciStarter; recruited by libraries, SciStarter (160,000 members), VolunteerMatch, and other dissemination partners
1,000 libraries	Target number of libraries in the CS Library Network by July 2025	**2,000+ Ambassadors (projections albeit beyond this SoW)**	Completed Foundations training and the new "Facilitators" training on SciStarter; recruited by libraries (library Ambassadors), SciStarter (160,000 members), VolunteerMatch, and other dissemination partners

NATIONAL IMPACT: The project reinforces the role of libraries as valuable partners in addressing the needs of their communities by training, supporting, and making discoverable local community members as Ambassador facilitators to introduce CS and related programs to library users and increase participation among diverse populations. The project aims to increase libraries' capacity to support lifelong learning, serve education and information needs of diverse publics, and contribute to efforts that improve community well-being and strengthen civic engagement, while broadening and deepening participation in important scientific research. Local, facilitated approaches to CS increase participant diversity and data contributions.

DISSEMINATION PLAN: We will leverage our individual networks to collaboratively share project resources, best practices, and opportunities through the National CS Library Network, presentations at the Citizen Science Association conference (we are organizing a symposium at the CSA conference in May 2023), state library conferences, and continued speaking engagements with NNLM, LIBER, etc. SciStarter's blog on DiscoverMagazine.com and SciStarter's communications platforms help us reach millions of people. We will seek publication in *Citizen Science: Theory and Practice* and library journals to build on and fill current gaps in relevant literature, disseminating information about the new Ambassadors and training, through conference talks, blog posts, and webinars at ALA and through the communications platforms of our partners, including ARSL and NNLM. The Network will continue to offer webinars, networking activities, navigation to build/circulate kits, etc. To broaden awareness of the CS Library Network and resources for libraries, we have secured commitments from the Association for Rural and Small Libraries, STAR Net, VolunteerMatch, NGCP, and are in discussions with ALA to arrange webinars.

DIVERSITY PLAN: Efforts to address geospatial and socioeconomic diversity issues in CS projects are increasingly common. Partnering with local individuals or organizations has been suggested as one solution to diversity issues (Bonney et al. 2016; Pandya 2012; Salmon et al. 2021) and shown to be an effective strategy (Davis, Ramírez-Andreotta and Buxner 2020) particularly for advisor Cooper's CS project, Crowd the Tap. Results suggest that this diversity would not have been possible without facilitator organizations. There was also some evidence that this helped her team engage lower-income communities as well.

Our library and volunteer recruitment and training efforts will focus on rural, faith-based, migrant, and tribal communities informed by the diversity, expertise, and reach of our advisors. We are partnering with ARSL to welcome more and often under-resourced rural libraries to the network and train and support their underserved populations. Not only can this increase participant diversity but it can fill geospatial gaps in data needed to accelerate research on human and environmental health. Likewise, our partnership with the NC Council of Churches enables us to collaborate with their experienced and trusted director to recruit members of the largely Black, faith-based community and continue to increase participant engagement and diversity. Advisor Mahmud Farooque will offer his guidance on reaching diverse populations of participants gained through the experience of developing Participatory Technology Assessment (pTA) public forums.

The Foundations of Citizen Science Training Module and a growing list of CS project resources on SciStarter are available both in English and Spanish and some are being translated into Navajo. The proposed training module and library guide will include evidence-based approaches to communicate with others who differ in gender, race/ethnicity, age, socioeconomic status, age, etc. when facilitating introductions to CS with library users or contacting and supporting Volunteers in the library.

PROGRAM SUSTAINABILITY: At the completion of the project, project resources and best practices will be published on SciStarter.org under a Creative Commons license. ASU and SciStarter will continue to support the library network and citizen scientists as we intend to join forces on future proposals that sustain and extend the program to science museums with NISE Net and STAR Net, developing a robust community of practice between CS, museums, and libraries. Grants to CS libraries from the National Network of Libraries of Medicine, the Rural Activation and Innovation Network, and a growing number of state libraries will help sustain the project for years to come.

Schedule of Completion

August 2023:

- Project kickoff meeting to review project goals, deliverables, and timeline.

September - October 2023:

- Advisors and library partners meet monthly (virtually) with project team to begin developing recruitment strategies to identify, train, support and sustain a national Citizen Science Community Ambassadors network.
- Project team and instructional designer outline content, activities, and assessments for training module for Citizen Science Community Ambassadors, with guidance from the NC Council of Churches.
- Evaluation team begins to develop instruments to provide formative feedback on the training and recruitment strategies, and training module.

November 2023 - December 2024

- Project team develops **draft of Libraries' Guide to Contacting and Hosting Citizen Science Community Ambassadors** to include guidance on providing citizen science demo kits (if applicable), printed materials,, and electronic resources.
- Project team and partners refine recruitment strategies, draft related communications materials and discuss plans for recruitment/training webinars led by VolunteerMatch.org.
- Instructional designer develops and iterates Ambassador training module.

January 2024:

- Community partners/advisors confirm location of at least 10 participating pilot libraries, each of which will recruit two volunteers reflecting the communities they aim to serve ("cohort 1"). Recruitment process guided by NC Council of Churches.
- Project team finalizes Library Guide.

February 2024:

- Volunteers take "Foundations of Citizen Science" training and draft version of the "Facilitating Introductions to Citizen Science at Your Local Library" training module and provide feedback on the draft training.
- Evaluation team evaluates the training and event planning process.

March 2024:

- **Recruitment/training webinars** run by VolunteerMatch.
- Volunteers complete the final version of the training and prepare to facilitate an introduction to citizen science at a local library during Citizen Science Month in April 2024.

April 2024:

- **Volunteers host programming in libraries** during Citizen Science Month (April). Libraries add these events to SciStarter for enhanced promotions.
- Library Network begins promoting/identifying libraries to participate in the Ambassadors program with the goal of at least 200 participating libraries.
- SciStarter tests digital connections between volunteers' SciStarter Profile, training completion and facilitation at library events (final versions of Volunteers' profile pages will showcase Volunteers' events following best practices in volunteer management).
- Evaluation team will evaluate CSM programming to assess the effectiveness of the training resources and satisfaction among libraries.

May 2024 - June 2024

- SciStarter web team produces wireframes for new **Volunteer Finder tool**, Ambassador profile pages on SciStarter, and landing page to support the training and digital badge connections.

- **Evaluation team provides recommendations** to the project team to improve training materials, sharpen recruitment strategies, and enhance libraries' guides to contacting and supporting Ambassadors in the library.

July 2024 - August 2024

- Volunteer Finder tool, SciStarter pages finalized.
- Project team iterates on the volunteer training based on pilot feedback.
- Development of a **marketing and communication recruitment plan** ahead of national rollout.
- Project team creates a webinar and guide to enable libraries to use the volunteer finder to easily contact local, trained community members/volunteers to invite them to facilitate Citizen Science Month programming.

September 2024 - October 2024

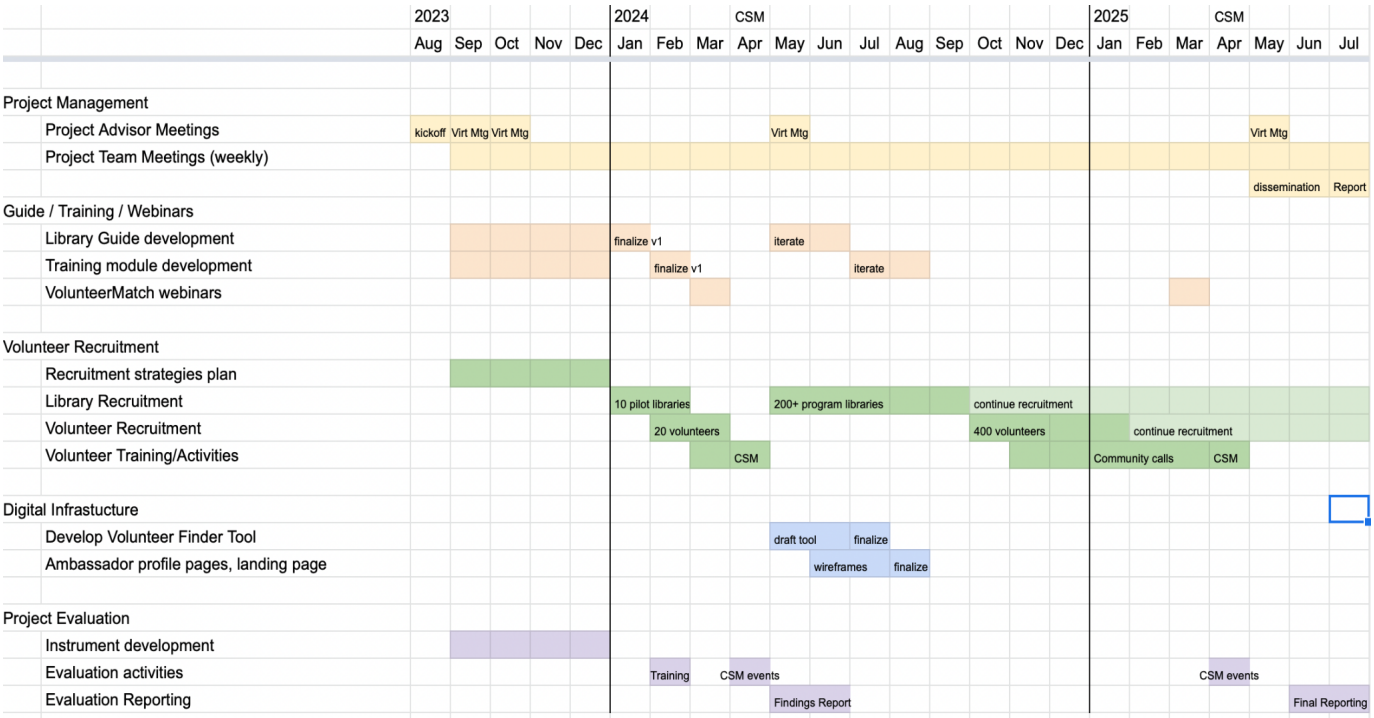
- **The project team publishes revised training and recruits volunteers** located near at least 200 libraries in the National Citizen and Community Science Network via 1. library partners, 2. SciStarter (160,000 members), 3. VolunteerMatch., 4. SciStarter partners (Girlscouts, Verizon)

November 2024 - April 2025

- The project team **hosts monthly community calls** with trained volunteers to provide technical support and build a community of practice.
- VolunteerMatch training webinar (March)
- Volunteers develop and host Citizen Science Month programming at their local library.

May 2025 - July 2025

- Continued program implementation. Project team focuses on program sustainability.
- Project dissemination and final reporting.



Digital Product Plan

Type

The Program PI and participants will generate content including, but not limited to, project plans and designs, still images, digital toolkits, best practices documents, surveys, an online interactive multimedia training module offered through a SciStarter microsite, public-facing web tools on SciStarter, open badge accreditation, and other works related to their participation.

We will create a digital version curriculum for the online tutorial which will be on a microsite with HTML pages of text and CC licensed videos and images, instructions, and volunteer best practices. Additional documents in Word, PPT, PDF of supporting materials, instructions, promotional materials, press releases and an informational brochure describing the accreditation badge; links will be posted on SciStarter.org.

Content will be produced by ASU, SciStarter, staff, advisors and partners. We will use Zoom for webinars, training and team meetings. Content will be published and shared on SciStarter.org, the SciStarter YouTube channel and related blog posts and websites. Content will be created using WORD, Excel, PPT, PDF and other content creation tools.

We will use formats including DOC, DOCX, PPt, PPTX, XLS, XLSX, PDF, JPG, GIF, and MP4. We will use the highest quality settings appropriate for displays. The online interactive training module and SciStarter webpages will use HTML.

Availability

We will create digital content for this project and assign Creative Commons licensing to allow for sharing and attributions. All content will be openly available online at SciStarter.org and Youtube.com/@SciStarter and made accessible via standard web browsers.

Access

Project advisor Lydia Collins will review content to ensure materials are culturally sensitive. All content created for this project will be assigned Creative Commons licensing to allow for sharing and attributions. Program participants and PIs will generate content including, but not limited to, project plans and designs, digital toolkits, surveys, best practices documents, open badge accreditation, online interactive tutorial and microsite, public-facing web tools on SciStarter, and other works related to their participation. ASU and SciStarter will own copyrights on the materials but will assign Creative Commons licensing to assure sharing attribution.

Sustainability

All digital content will be reviewed and approved by the PI and a content development specialist with experience in science writing and instructional designers and developers will manage quality assurance testing and debugging.

All content will be archived on SciStarter.org using SciStarter's django framework and Amazon Web Services. Codes will be documented and shared on GitHub. A backup of all public facing documents, planning, design, meeting notes, online tutorial curriculum, still images, and archived materials will be stored and tracked on the Arizona State University Google drive. A document version tracking spreadsheet will be organized, managed and updated by project staff.

Organizational Profile

Arizona State University's (ASU) charter, as approved by the Arizona Board of Regents, is to be a comprehensive public research university, measured not by whom it excludes, but rather by whom it includes and how they succeed; advancing research and discovery of public value; and assuming fundamental responsibility for the economic, social, cultural and overall health of the communities it serves. The charter reflects the vision of a new model of academic institution, termed the "New American University", that is reinventing the learning, living and research environment.

ASU's model eliminates traditional academic silos in favor of fusing disparate disciplines as it establishes new schools, colleges, and departments which allow scientists, economists, philosophers and others to come together to create a new and rich academic landscape. This in turn inspires students to think and learn in new and fundamentally different ways.

As of the 2020-21 academic year, ASU has an enrollment of over 135,000 students across 5 campuses in the Phoenix metro area and online, making it one of the largest public university in the U.S. by enrollment. ASU is re-writing traditional ideas of research university inclusiveness with over 53% of its student body identified as non-white, the highest category of which are Hispanic students (26%). In addition, 14% of the student population is international, drawn from over 150 countries. 67% of ASU's on-campus students are in-state residents.

Established in 1885, ASU has, over the last 10 years, emerged as the country's fastest-growing research university among those with $100 million+ in annual research expenditures. Seven academic libraries service the university community, and, at 4.5 million volumes, the system is ranked as the 34th largest research library in the nation.

The current project would be housed and operated from the School for the Future of Innovation in Society, founded in 2015 from its roots as a decade-old organization known as The Consortium for Science, Policy, and Outcomes. The School, and its sister research arm, the Institute for the Future of Innovation in Society, is working to dissolve the boundaries between scientific researchers and engineers, corporate interests, policymakers, the public and other stakeholders aiming to change how we as a society think about, learn about, and talk about science and technology. Through research centers such as the Center for Engagement and Training in Science and Society (CENTSS), SFIS is developing novel approaches to interaction and engagement by integrating multiple disciplines, education levels, experiences, areas of expertise, and modes of communication. CENTSS partners with SciStarter, the premier digital resource for citizen science, developing novel methods to involve lay citizens in advancing research through local, national, and international science projects.