

MAKE AN IMPACT

WORKSHOP REPORT

13-15 MARCH 2016



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THE ARCTIC IN THE CLASSROOM PROGRAM

April 2016

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Arctic Research Consortium of the United States (ARCUS)

www.arcus.org



ABOUT THE WORKSHOP

The goal of the workshop was to bring together Arctic/remote Alaska teachers with Arctic researchers to collaborate on the development of STEM educational resources related to Arctic research priorities. This workshop is part of the Arctic Research Consortium of the United States (ARCUS) program, The Arctic in the Classroom (TAC). TAC includes the supported ongoing collaboration of workshop participants to use citizen science as a vehicle to bring data-rich lessons and activities into classrooms.

ABOUT THE ARCTIC IN THE CLASSROOM PROGRAM

The Alaskan Arctic is a science-rich region with compelling natural landscapes, ecosystems, and people. Arctic science, however, is often not communicated outside the walls of research institutions and public knowledge of the Arctic is poor. At the same time, U.S. students are falling behind in Science, Technology, Engineering, and Mathematics (STEM) and teachers are struggling to develop curriculum that engages students and meets new teaching standards. This program provides a nexus between these issues, with activities targeted to educate K-12 teachers, students, communities, and others about the Arctic. In addition to increasing knowledge about the Arctic, this project brings Arctic scientists together with educators who have expertise in communicating complex concepts and facilitates effective learning through the use of real-world Arctic science.

We aim to bring together the best practices in facilitating successful citizen science projects and community-based monitoring to support the collaboration of students, teachers, and researchers in arctic communities. For reference in this report, citizen science is the practice of involving non-specialists in the collection of data or recording observations that contribute to the authentic and meaningful body of science.

Community based monitoring can be similar. Stakeholders such as the public, professional observers, and community members may assist in the collection of data and observations, the monitoring projects themselves are driven by needs and values of the communities to which the monitoring or research is relevant.

ARCUS will identify tools within the best practices of how to administer these two types of inclusive science practices, with the goal of developing a framework for new and experienced researchers to engage arctic communities in their work, and offer a window for students and teachers into the relevancy of science projects in their communities.

PROGRAM GOALS

1. Actively engage Arctic K-12 students, teachers, and community members with local research projects through a citizen science framework.
2. Manage the teams' collaborative work resulting in K-12 arctic-focused educational resources; based on citizen science contribution in research.
3. Manage dissemination of arctic-focused educational resources and make these available to teachers in Alaska and nationwide.
4. Develop ARCUS role in researchers meeting outreach goals, including citizen science projects as proof of concept.

PROGRAM FUNDING

Support for this program is provided by the Arctic Research Consortium of the U.S. (ARCUS) and applicable community service payments from federal court settlements.

WORKSHOP DETAILS

When: March 13-15, 2016

Where: University of Alaska, Fairbanks

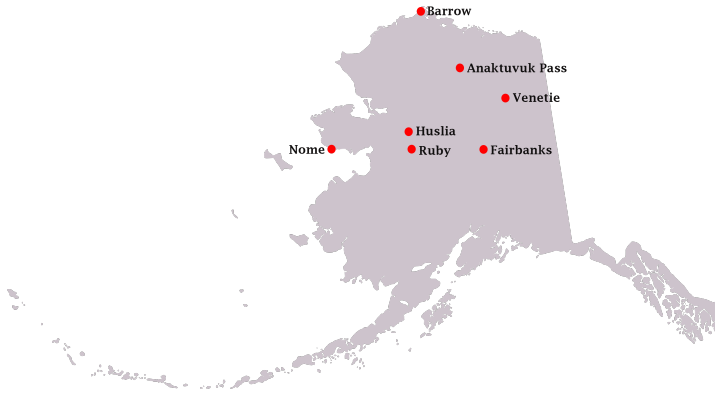
in association with Arctic Science Summit Week (ASSW) 2016

Workshop organizer, the Arctic Research Consortium of the United States (ARCUS) brought together two communities that are invested in student learning, science, and broader impacts.

- Educators that currently teach in Alaskan Arctic communities, with experience or interest in incorporating local arctic research into their teaching through citizen science and community based monitoring.
- Researchers who conduct funded research in the Alaskan Arctic with experience or interest using citizen science practices as a method to expose teachers, students, and local communities to local arctic research.

WORKSHOP OVERVIEW

Seven K-12 teachers from rural and remote communities around Alaska (Nome, Barrow, Anaktuvuk Pass, Ruby, Venetie, Huslia and also Fairbanks) met with ten arctic researchers (representing University of Alaska, USGS, and University of Montana).



For three days, they collaborated and co-created citizen science projects that will assist in engaging local communities and students in local research efforts. The full participant list is available at the workshop website: <https://www.arcus.org/tac/2016-workshop>

Days one and two of the workshop were dedicated to building a professional community of educators and researchers that are working, conducting research, living, and/or teaching in arctic communities. Participants and expert presenters shared their knowledge, experience, and advice to *co-create* the workshop space for collaboration. Day three of the workshop leveraged the common day events of the concurrently held Arctic Science Summit Week (ASSW) that brought over one thousand scientists, policymakers, and stakeholders to Fairbanks, Alaska for 12-18 March 2016.



Workshop participants formed groups based on criteria such as science/education goals, geography, and other professional interests. Significant workshop time was spent in these groups developing their ideas for collaboration.

ASSW is the annual gathering of international organizations involved in Arctic research. The Summit is designed to strengthen international, interdisciplinary collaborations and facilitate communication across academia, government agencies, local communities, industry, non-governmental organizations and other Arctic stakeholders. The Summit was composed of plenary presentations, panel discussions, open and closed-business meetings, and working group sessions. The full agenda and speaker biographies are available on the workshop website: <https://www.arcus.org/tac/2016-workshop>.

Workshop participants attended the International Arctic Assembly with other conference goers, networked within the science community, and then wrapped-up the day with reflections and plans for post-workshop implementation. The intended outcomes were achieved; to bring a better awareness of linkages between education, local arctic communities, and the local research efforts to carry forward into the coming field seasons and school years.

In addition to the educators and researchers, ARCUS included various pertinent content and practice experts to share their knowledge and mentorship with the participants including education and outreach program experts from University of Alaska Fairbanks, the North Slope Borough and the Columbia University Climate Center.

ARCUS decided to bring a unique aspect to the workshop. Writer Erica Watson, MFA, attended days one and two of our workshop to record her thoughts on the presentations and work sessions. While science meeting workshop reports are important artifacts, they often remain inaccessible, nor of much relevance, outside the research community. Because the workshop purpose of bringing together Arctic teachers, researchers, and communities for a common purpose, organizers felt that Erica's work could speak to a broader audience; to capture the detail and energy behind the work that our participants are so passionate about. Ultimately,



Katie Villano Spellman presents her findings on citizen science.

her writing will become an accessible artifact of our process of learning and collaboration.

"It was an honor to join the work of this talented and generous group of teachers and researchers. What I found most impressive and refreshing is that in a room full of so many professional specializations and areas of expertise, everyone brought an enthusiastic openness to interdisciplinary thought. Differences in spiritual or cultural tradition, academic fields, or life experience were not perceived as barriers to be overcome, but as assets in the quest to better understand our world, and to share that understanding with others. I'm excited to see all the directions their work will take from here."



Erica Watson, synthesizing her thoughts and observations of the workshop.

- Erica Watson

WORKSHOP EVALUATION

METHODOLOGY

Program staff adapted evaluation surveys questions created for other ARCUS education initiatives. The evaluation had two primary objectives that link back to the overall program goals:

1. Determine the workshop successes, improvements to be made, and areas of focus for future project planning to create collaborative citizen science projects in local communities.
2. Determine if ARCUS's role in facilitating the experience is of current and future value for the participants.

To gather the information, staff developed a post-workshop survey and did their own analysis. The program itself will be evaluated annually by a contracted external evaluation team, Goldstream Group in Fairbanks, Alaska. The evaluation method has some limitation. The evaluation's sample size is too small to generalize

the findings and compare to other organization-facilitated collaboration workshops or citizen science efforts. Second, the evaluation relies heavily on self-reported data. Self-reported data is limited by the fact that it rarely can be independently verified.

RESULTS

A total of 15 participants responded to the post-workshop survey, with a near even split of teachers and researchers while complimented by some of the content and practice experts. Questions were answered in either a rating system (i.e., Strongly Disagree, Disagree, Agree, Strongly Agree, or N/A) or in an open-ended format.

OVERALL WORKSHOP ASSESSMENT

In response to evaluation on the learning environment and overall quality of the workshop, nearly all participants (73-93%) strongly agreed with with following:

- The activities were carefully planned
- The presenters were effective instructors
- The presenters were well-prepared
- The activities held my interest
- My questions and concerns were addressed
- Participants were active learners
- Interactions between presenters and participants were collegial
- Interactions among participants were collegial

On a ranking scale (Poor, Fair, Good, Excellent) more than 80% of respondents felt the workshop provided excellent opportunities to

- improve your citizen science knowledge
- build your interest in citizen science
- network with people of similar interest
- be part of a professional community
- consider classroom applications of citizen science

In both of these questions, zero respondents reported the lowest ranking (strongly disagree) for any component.

SUMMATIVE GAIN AND GAP ANALYSIS

The survey asked participants where they feel they received adequate training and information as well as areas that they need more support. In this matrix, respondents indicated "I am set, I don't need any more information" for the following:

- Purpose of The Arctic in the Classroom program
- Strategies to bring citizen science into my classroom
- Strategies to involve educators in citizen science projects
- Strategies to involve students in citizen science projects
- Continuing communication and collaborations within the Make an Impact group
- Understanding the role of Arctic policy in decision making
- ARCUS' support and processes for The Arctic in the Classroom project
- Next steps

In review, we are particularly keen to note that the overall purpose of the program is clear, as well as that the value of ARCUS facilitation and support was clearly recognized.

ARCUS program staff will focus on the following areas for future project planning, as respondents indicated that "A little bit more information would be helpful":

- Characteristics of a successful citizen science project
- Defining success for citizen science projects
- Frameworks for co-creation and collaboration of Citizen Science projects
- Strategies to bring citizen science into my research
- Strategies to involve scientists in citizen science projects
- Strategies to involve community members in citizen science projects
- Refining or building on the citizen science project planning template
- Finding resources about and people that work in citizen science

OPEN-ENDED RESPONSES

Three open-ended questions prompted more feedback on the benefits of the workshop, what more needs to be addressed, and room for improvement.

"I'm still a little overwhelmed with all the ideas/thoughts/tasks. I don't think there's really a way to deal with adding more processing time, which is what I feel like I need some more of." -Anonymous Participant

WORKSHOP PRODUCTS

PROJECT PLAN DRAFTS

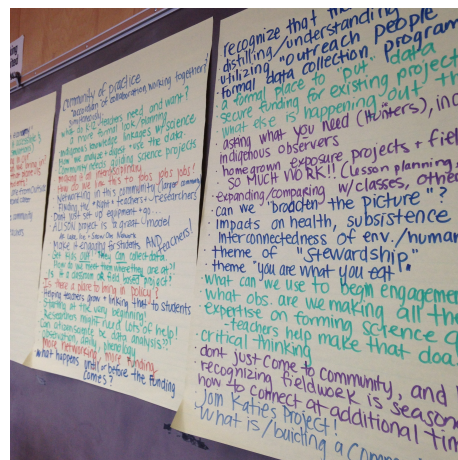
Participants were able to self-select into collaboration teams to discuss the possibilities for engaging students and communities in citizen science projects. The template used to guide these collaborations was prepared and presented by workshop organizers. The goal of the workshop was to allow teams to begin drafting ideas in the template. A completed draft template is due to ARCUS in late spring 2016. ARCUS will use these drafts to further refine and support the goals of these teams in the subsequent years. The template is a 12-page document with questions on the following aspects of project planning. The full project plan template is available on workshop website: <https://www.arcus.org/tac/2016-workshop>

WRITER IN RESIDENCE

Writer Erica Watson (mentioned previously) attended days one and two of the workshop to listen, record, and synthesize the presentations, discussions, and work sessions. She is working with ARCUS to identify possible publications for a written product on the workshop process and outcomes. We aim to have a final product and submission plan by summer 2016.

MATERIALS ARCHIVE

The ARCUS workshop webpage is hosting the materials associated with and presented at the workshop including the participant contact list, agenda, PDFs of workshop presentations, this workshop report, and a document of all citizen science and education resources mentioned during brainstorming sessions. <https://www.arcus.org/tac/2016-workshop>



Expectations and needs from workshop participants incorporated into the sessions.

INTERNET MEDIA ARCHIVE PHOTOS

30+ photos are being submitted to the ARCUS Internet Media Archive from staff organizers. <https://media.arcus.org>

TAC PARTICIPANT EMAIL LIST

ARCUS created a group email list to continue the exchange of information amongst all participants. TAC_participants@arcus.org