

Description of the institution/organization, its mission, and the primary focus of collaborative activities to be supported through the CESU in the context of the CESU mission.

Schoodic Education and Research Center Institute (“Schoodic Institute”) is the non-profit 501.c.3 organization founded in 2004 as Acadia National Park’s partner for operating and developing programs at the Schoodic Education and Research Center (SERC). SERC is one of the National Park Service’s original Research Learning Centers created to support research that furthers the mission of Acadia National Park (and other parks in the region) while connecting researchers directly with park education and outreach efforts. Acadia National Park hosts several million visits each year—an advantageous platform for translation of science and conservation tenets directly to the public.

SERC intends to operate at a regional scale, developing and supporting research and education programs. The campus can serve as a remote field station as well as a venue for coursework, sabbaticals, conferences, workshops, retreats, training, etc.

SERC is sited in the remote Schoodic peninsula unit of Acadia National Park, across Frenchman Bay from Mount Desert Island --1 hour from Bar Harbor by road and 7 miles by sea.

Schoodic Institute develops and raises funds to support SERC programs in partnership with Acadia National Park. The Institute focuses on humans in nature through time; its vision is to build a research program that serves the Downeast region and contributes (through tightly linked education programs) to the long-term preservation of Acadia National Park and quality of life in the Downeast region. Schoodic Institute has a strong education research program, focusing on improving science education by working with teachers in Maine secondary schools.

Description or list of the primary programs, departments, or other institutional divisions of relevance to federal land management, environmental, and research agencies that will likely be engaged in CESU activities. Include website addresses for further information, as appropriate.

Schoodic Institute is growing. Our expertise is currently in a limited range of topic areas—from the creation and management of protected areas to citizen science to improving science instruction in formal education settings. We plan to expand our onsite and adjunct faculty to develop further expertise around the theme of understanding long-term socio-ecological changes—and how people learn about and engage with the nature, science, and the changes taking place around them.

Our interdisciplinary and largely applied approach has the strength of allowing us to support basic research investigations (within the context of historic Acadia National Park databases) that feed directly to resource managers, educators, and the public. Research at SERC will strengthen park management decisions and drive education efforts in Acadia National Park and over time other federally managed lands across the country.

A list of and brief description of the staff or faculty with expertise in disciplines and subject areas of relevance to federal land management, environmental, and research agencies.

The President and CEO of Schoodic Institute is Dr. Michael Soukup, formerly Associate Director for Natural Resource Stewardship and Science, Chief Scientist of the National Park Service, and Research Director at Everglades National Park. Dr. Soukup was a principal architect of the Natural Resource Challenge, the umbrella NPS program that created the CESU network, the Research Learning Center concept, the comprehensive NPS Inventory and Monitoring network, as well as the Cave Management, Night Sky, Social Science, Park Flight, Canon National Park Scholars, and the Natural Sounds programs. His B.S. degrees are from the Univ. of Richmond (B.S.) and UMass, Amherst (Ph.D.). His interests at Schoodic Institute are in building research teams for collaborative approaches to regional scale issues. He hopes to establish SERC as a site known for supporting long-term research on the relationship of people and nature through time, and transmit objective information directly to park visitors and lifelong learners.

Mr. Bill Zoellick is Education Research Program Director at Schoodic Institute. His primary research focus is on the mechanisms supporting “scale up” and sustainability of programs that improve science teaching in formal and informal settings. Current research activities include serving as principal investigator for a NOAA funded program that seeks to improve the ability of middle and high school teachers to engage students in sustained watershed inquiry projects and as PI for two programs funded by the State of Maine aimed at improving teachers’ abilities to help students use and make sense of data. He also serves as Co-PI on an NSF funded program called “Pathway to BioTrails: DNA-assisted Species Identification for Citizen Science” that seeks use DNA “fingerprinting” to improve participant learning in citizen science programs that involve species identification. A key part of his recent research grows out of his work as a senior scientist in a large, NSF Funded Math and Science Partnership program that involves sixteen school districts in comprehensive science curriculum reform for grades 6-9. In this project Mr. Zoellick is using social network analysis in combination with interviews and observation to test hypotheses about how teacher leaders help improve the practice of other teachers. Other current work for which Mr. Zoellick is seeking support with collaborators focuses on similar scale-up issues in informal science settings. Mr. Zoellick has returned to educational research after a career in software design and

management consulting. His formal training in education (M.A.Ed, University of Illinois, 1974) was under the guidance of Dr. Robert Stake and focused on curriculum evaluation.

Ms. Hannah Webber is Education Research Manager at Schoodic Institute. With formal training in both zoology and education, her expertise is in bringing working scientists and working educators together to implement Scientist-Teacher-Student Partnerships that produce useful research outcomes while also providing authentic, well-structured opportunities for science learning. Ms. Webber is currently managing a NOAA funded program that involves 25 teachers and their students in 15 different schools in a variety of watershed investigations. Some of the teachers are working with a University of Maine scientist to collect dragonfly larvae and other macroinvertebrates in studies of mercury in watersheds. Other teachers are collecting information about culverts in response to questions posed by state fisheries scientists. In a separate, NSF-funded study, Ms. Webber is working with teachers and soil scientists to collect data about the timing of nitrogen pulses in ecosystems associated with spring snowmelt. Ms. Webber has an M.S. in zoology (University of Maine, 1998) and is a candidate for a Masters of Science in Teaching at the University of Maine.

Dr. Eunice Blavascunas is a cultural anthropologist investigating people's understanding of private and public and their desire for access to and use of public and private land in Maine. In particular, she is interested in how these cultural sensibilities interact with conservation efforts, whether private or public and across levels of government—local, state, and federal. Prior to coming to Schoodic Institute, Dr. Blavascunas researched the creation of new national parks in Poland. Dr. Blavascunas received a B.S. and B.A. in Environmental Science and Liberal arts at Evergreen State College, an M.A. in Cultural Geography from the University of Texas-Austin, an M.A. and Ph.D. in Cultural Anthropology from the University of California-Santa Cruz.

Mr. Seth Benz is the Director of the *Schoodic Bird Ecology Lab* and is an ornithologist and educator. Prior to coming to Schoodic Institute he was the Director of the Hog Island Audubon Camp and Field Station in Midcoast Maine. His work has historically been in the area of developing citizen science programs and integrating them with education programs. He was Assistant Curator at Hawk Mountain and is continuing this work and a growing amount of research on bird migrations in the Gulf of Maine. Mr. Benz received his B. A. in Environmental Science (East Stroudsburg) and his Masters in Environmental Education from Lesley College. The newly established field station at the base of Schoodic Head is developing as a site to study the full range of activities of migratory bird populations as they arrive and depart from the Gulf of Maine—in an era of rapid climate change.

For academic institutions, include a description of student demographics and the institution's status as a minority-serving institution (e.g., as defined by the U.S. Department of Education). Not Applicable

Description or list of facilities, equipment, centers, or institutes that would provide support to the research, technical assistance, or educational activities of relevance to federal land management, environmental, and research agencies that will be engaged in CESU activities.

SERC was for 67 years a top secret Naval Radio listening post; after a roughly \$20 Million investment the former base is now a newly renovated 100-acre NPS Research Learning Center campus with 3 laboratories (with ventilation hoods), 10 large classrooms, a new auditorium with 124 seats, faculty offices, a fitness center, conference space and lodging for 100-150, and 350 parking spaces. There is also a new bunkhouse with 70 additional beds. The Schoodic Unit receives about 10% of Acadia National Park's visitation (ca. 200,000 visits per year). The campus is pedestrian friendly with spectacular short hikes and biking opportunities along the Schoodic Scenic Byway.

SERC's remote National Park/Maine coast location borders two of the poorest and most underserved counties in the nation, and provides research access into a number of marine habitats, pristine tidepools (viz. long-term protection by US Navy security fencing), and coastal and upland forest habitats. Schoodic lies in the pathway of significant bird, bat and insect migratory activity, and exceptionally dark night sky. Schoodic peninsula has a rare Jack Pine forest, and a rare, well-protected coast-to-interior-mountain corridor (Schoodic Mountain to Schoodic Head) supporting the movement of bear, moose, bobcat, and coyote.

SERC's location within Acadia NP provides access to a rich data context, chronicled and documented in archives spanning nearly 100 years. The SERC campus is well positioned to support research in the lightly populated and underserved Downeast region of Maine.

Schoodic Institute will directly participate in and support research with facilities, logistical support and fundraising in the areas of migratory species ecology, ocean health, coastal forest health, citizen science (via its Citizen Science Academy), STEM education, and the implications of climate change on protected area management.

Description or list of past research, technical assistance, and educational services supported through federal financial assistance awards that are of relevance to federal land management, environmental, and research agencies that will be engaged in CESU activities.

Mr. Zoellick's research is focused on professional development for formal and informal educators and learning in informal settings. Current and past projects have included (1) an investigation of integration of citizen science focused on characterization of local mercury levels in biota into high school science education (funded by the Maine Department of Education); (2) an investigation of teacher learning and practice development in integrating extended watershed investigations into middle and high school science programs (funded by NOAA); (3) an investigation of middle school teacher and student data literacy and of mechanisms to improve teacher ability to help students learn to make sense of data (funded by the Maine Department of Education); (4) an investigation of the development of a community of practice among middle school science teachers implementing new curricula and of teacher practice improvement related to community participation – focused on the issues of scale-up and sustainability for science program interventions (funded by NSF); (5) an investigation of teacher practice development in integrating an extended investigation of nitrogen in snowmelt into science classroom work (funded by NSF); and (6) an investigation of participant learning in an informal science education program that makes use of DNA barcoding (funded by NSF).

Publications and presentations resulting from the above work include:

- Zoellick, B. (2013). Use of social network analysis to study teacher communities in design based implementation research. Paper presented at *National Association for Research in Science Teaching Conference*, Rio Grande, Puerto Rico, 6-9 April 2013.
- Zoellick, B., Nelson, S. J., & Schauffler, M. (2012). Participatory science and participatory education: Bringing both views into focus. *Frontiers in Ecology and the Environment*, 10(6), 310–313.
- Zoellick, B., S.J. Nelson, B. Bisson, M. Schauffler, H. Webber (2011). A framework for participatory science in high schools that supports useful scientific research as well as student learning: Requirements and constraints. Poster presented at the *2011 AGU Fall Meeting*, San Francisco, CA, 5-9 December 2011.
- Zoellick, B., S.J. Nelson, B. Bisson, M. Schauffler (2011). Watershed studies in schools: Supporting student understanding of systems concepts. *Maine Water Conference*, Augusta, ME. 16 March 2011.
- Zoellick, B., Trimboli, S., & Sachs, S. (2009). Real science, real connection to parks. In *Rethinking protected areas in a changing world: The 2009 George Wright Society Biennial Conference on Parks, Protected Areas, and Cultural Sites*, edited by D.H. Harmon. Hancock, MI: The George Wright Society.

The Schoodic Institute has also received funding for research and education related to:

- plan climate change-related citizen science along the Appalachian Trail (funded by NPS),
- design and write evidence-based stories reflecting climate change impacts to be communicated by television meteorologists (funded by NSF),

- convene a working group to assess the role of citizen science in natural resource science, management, and policy (funded by USDA Forest Service and NPS), and
- organize the first open national conference on public participation in scientific research (funded by the S. D. Bechtel, Jr. Foundation, Nature, DataONE, NSF, Ecological Society of America, and the Association of Science-Technology Centers).

These projects have significantly advanced the field of citizen science and are helping to inform how citizen science can contribute to valuable science, management, policy, and education outcomes.

Description or list of current formal agreements and informal relationships with federal agencies that are of relevance to federal land management, environmental, and research agencies that will be engaged in CESU activities.

National Science Foundation

Maine Physical Science Curriculum Partnership: Research and Infrastructure for Ongoing Educational Improvement – in partnership with the University of Maine – award amount: \$12,347,770. SERC Institute sub-award: \$445,856. (Current)

Biogeochemical Controls on Altered Nitrogen Cycling in the Third Decade of Whole-Watershed Simulated Nitrogen Deposition – in partnership with the University of Maine – award amount: \$1,477,052. SERC Institute sub-award: \$47,691. (Current)

Pathway to BioTrails: DNA-assisted Species Identification for Citizen Science – in partnership with Mount Desert Island Biological Laboratories – award amount: \$249,849. SERC Institute sub-award: \$46,881. (Current)

Citizen Observations Leading to Learning, Environmental Citizenry and Transformations (COLLECTS) – in partnership with the University of Maine – requested award: \$1,468,312. SERC Institute sub-award: \$20,000. (Pending)

National Oceanic and Atmospheric Administration

Acadia B-WET: a partnership to help teachers engage students in sustained, project-oriented investigations of the American eel (*Anguilla rostrata*) in Gulf of Maine watersheds – in partnership with the University of Maine – award amount: \$261,266. (Current)

The Future of Four Seasons in Maine: a Scientist-Teacher-Student Partnership to investigate climate – in partnership with the University of Maine – requested award: \$237,129. SERC Institute sub-award: \$156,555. (Pending)

Signs of the Seasons: Building educators' capacity to engage learners in constructing and exploring data stories about climate change – in partnership with Maine Sea Grant and the University of Maine – requested award: \$784,332. SERC Institute sub-

award: \$280,025. (Pending)

National Park Service

Cooperative Agreement to jointly manage the Schoodic Education and Research Center, one of the 19 NPS Research Learning Centers. Responsibilities include promoting and facilitating research and education, establishing partnerships, providing technical assistance to NPS, and facilitating communication and collaboration among stakeholders. (Current)

Combining Climate Change Research and Education across an Iconic Transect: The Appalachian Trail – award amount: \$60,000. (Current)

Confirmation of the institution's/organization's willingness to accept a limited overhead rate of 17.5% and cost items to which the rate is applicable for activities conducted through the CESU, including research, technical assistance, and educational services (this overhead rate applies to the entire institution/organization for CESU activities).

SERC Institute by signing below signifies its willingness to accept a limited overhead rate of 17.5 %.

Designation of a technical representative (with full contact information – name, title, full address, phone, fax, email) to serve on the CESU steering committee, participate in CESU annual/semi-annual partner meetings, and facilitate internal and external communication, promotion, and response to CESU correspondence and administrative actions (e.g., announcements, new member applications, processing agreements/amendments, five-year reviews).

Technical Representative:

Michael Soukup, Ph.D.
President/CEO
SERC Institute
2007-288-1339

Agreement to relay agency-specific research, technical assistance, and educational needs and associated funding opportunities to other institutional/organizational members (e.g., faculty, students).

Schoodic Institute agrees to relay agency-specific research, technical assistance, and educational needs and associated funding opportunities to other institutional and

organizational members (e.g., faculty, students), and looks forward to participating in multi-member research projects and initiatives.

Signature (or endorsement) from an appropriate official, with authority to commit institutional resources in a binding multi-year federal cooperative and joint venture agreement (e.g., president, executive director, chief financial officer, vice president for research, director of sponsored programs.)

A handwritten signature in black ink, appearing to read "Michael S. Suter". The signature is fluid and cursive, with a long horizontal stroke at the beginning.

Letter(s) of support from one or more CESU federal agency partners sponsoring the new partner's application, including a description of successful past collaborative work supported through federal financial assistance awards. See Attached letter