

## GUIDANCE DEVELOPED BY RESEARCH FUNDERS AND THE SCIENCE COMMUNITY

<p><b>Alaska Marine &amp; Coastal Research Funders</b></p> <p><b>Outreach/Education Requirements and Guidance</b></p>	<p><b>Alaska Sea Grant (ASG):</b> ASG issues an RFP for research projects every two years. They seek proposals in the natural and social sciences that focus on the environmental and economic viability of Alaska's coastal communities. In addition to their scientific merit and relevance, research projects must contribute to one or more of our strategic focus areas, one of which is Environmental Literacy and Workforce Development, and must incorporate outreach to communities or stakeholders.</p> <p>Each proposal must provide an engagement plan that describes how broader audiences will engage with and use the project results. This plan should explain how the project will translate and communicate research activities and results into knowledge for community economy and well-being. For projects with workforce and literacy outcomes, the primary focus should be on how the project will build environmental literacy or workforce capacity in Alaska or provide evidence-based strategies to accomplish these outcomes. ASG defines an environmentally-literate person as someone who has a fundamental understanding of the systems of the natural world, the relationships and interactions between the living and non-living environment, and the ability to understand and utilize scientific evidence to make informed decisions regarding environmental issues.</p> <p>Researchers are encouraged to use a checklist as they develop their engagement plan. The items relevant to indigenous K-12 education stakeholders are:</p> <ul style="list-style-type: none"> <li>• The project team has outreach expertise or an education partner.</li> <li>• If Alaska Native or other cultural groups are targeted, the proposal demonstrates cultural respect and partnerships with existing organizations.</li> <li>• Appropriate consultation with educators has occurred to ensure that what is proposed is feasible and that lesson plans or other educational resources developed for project outreach will be used, if outreach to K-12 teachers or students is proposed. Methods for evaluating outreach success are specified</li> </ul>	<p>Alaska Sea Grant Website<sup>1</sup></p>
	<p><b>North Pacific Research Board (NPRB):</b> Successful applicants to grants made under NPRB's core program are eligible to apply for grants of \$20,000 for outreach-specific activities and investigators involved in long-term monitoring projects are required to allocate at least \$5,000 for education/outreach. Integrated Ecosystem Research</p>	<p>NPRB website<sup>2</sup></p>

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<p><b>ASG Requirements (continued)</b></p>	<p>Programs (IERP) have their own dedicated outreach funding managed by NPRB.</p> <p>NPRB considers teachers and students to be one of the target audiences for outreach and communications and a stakeholder with direct interests with NPRB actions and objectives that can affect or be affected by NPRB. Their goal is to provide useful and accessible resources, scientific information, and scientific networking for formal &amp; informal educators.</p> <p>To achieve the best results, it is important to develop effective communication strategies that are consistent, appropriate, and invite engagement specific to the intended audience.</p> <p>NPRB requires that all requests for proposals in each of the research programs include a certain level of stakeholder and/or community involvement as well as outreach.</p> <p>Prominent marine issues that warrant funding: contaminants, harmful algal blooms, invasive species, aquaculture, climate change, and an ice-free Arctic. Climate change and impacts of diminishing sea ice cover are identified as research priorities.</p> <p>For additional guidance by NPRB to researchers about specific types of education activities, see below.</p>	
	<p><b>National Science Foundation:</b> All research proposals to NSF require outreach and/or education activities that address the “broader impacts” of the research to the benefit of society. A broader impact activity is defined as “a planned experience, engagement, action, function, etc. that is conducted over a finite period of time for a specific purpose and with a target audience.”</p> <p>Broader impact goals include:</p> <ul style="list-style-type: none"> <li>• Full participation of women, persons with disabilities, and underrepresented minorities in STEM</li> <li>• Improved STEM education and educator development at any level</li> <li>• Increased public scientific literacy and public engagement with science and technology</li> </ul>	<p>NSF grant proposal guidelines<sup>3</sup></p>

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	<ul style="list-style-type: none"> <li>• Improved well-being of individuals in society</li> <li>• Increased partnerships between academia, industry, and others</li> <li>• Improved national security</li> <li>• Increased economic competitiveness of the United States</li> <li>• Enhanced infrastructure for research and education</li> </ul>	
<p>Guidelines for academic and U.S. federal researchers in the Arctic region</p>	<p>Research results should be explained in non-technical terms and, where feasible, should be communicated by means of study materials that can be used by local teachers or displays that can be shown in local community centers or museums.</p> <p>When possible, research projects should anticipate and provide meaningful experience and training for young people.</p> <p>The rights of children must be respected. All research involving children must be fully justified in terms of goals and objectives and never undertaken without the consent of the children and their parents or legal guardians.</p> <p>Participation of subjects, including the use of photography in research, should always be based on informed consent.</p> <p><b>1. Be Accountable</b>  1.2. Act with integrity, and honor verbal and written commitments. Participation in research must be voluntary and cause no harm. When required, participants' informed consent must be obtained. Research methodology, sponsors, and how the information or images will be used and published should be disclosed and understandable to all involved. Provide reasonable opportunities to individuals, who share information or images, to review and agree, or withdraw their contributions prior to publication.</p> <p><b>2. Establish Effective Communication</b></p> <p><b>3. Respect Indigenous Knowledge and Cultures</b>  3.1. Respect is enhanced by mutual understanding. Researchers are encouraged to learn about the regions in which they will conduct research. Understand the region's history, cultures, languages, community perceptions of past and current research conducted in the region, and organizational structures, practices, values, and institutions.</p>	<p>Principles for the Conduct of Research in the Arctic</p> <p>Social Science Task Force of the NSF Interagency Arctic Research Policy Committee (IARPC)<sup>4</sup></p> <p>1990, replaced in 2018</p> <p>Principles for Conducting Research in the Arctic. "The Polar Code"  NSF IARPC 2018<sup>5</sup></p> <p>Described as "guidelines for conducting responsible and ethical research. They encourage respect for all individuals, cultures, and the environment."</p>

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	<p>3.2. Adhere to local and Indigenous traditions, customs, and locally-adopted research guidelines.</p> <p>3.3. Be open to new viewpoints and be aware of and acknowledge differences and biases when discussing analysis and interpretation of data and observations with residents. Arctic Indigenous Peoples hold unique knowledge and understanding of their homelands and can offer valuable collaborative partnerships with scientists. Inclusion of Indigenous Knowledge in research is encouraged</p> <p><b>4. Build and Sustain Relationships</b></p> <p>4.1. Build meaningful relationships based on good faith and partnership with communities and their representatives.</p> <p><b>5. Pursue Responsible Environmental Stewardship</b></p>	
<p>Advice from early career scientists</p>	<p><b>Share your knowledge</b></p> <ul style="list-style-type: none"> <li>• Work with local collaborators to organize or facilitate community knowledge sharing events such as a Science and Traditional Knowledge Camp. These events actively engage youth and knowledge holders in the community and serve as a way to link traditional, local, and scientific knowledge.</li> <li>• Make arrangements with teachers at the local school to go into classrooms and teach youth about your area of expertise and your research.</li> <li>• Bring educational materials to leave in the community (e.g., in schools, libraries, government and agency offices, colleges).</li> </ul>	<p>Tondu et al. 2014<sup>6</sup></p>

<sup>1</sup><https://alaskaseagrant.org/research/engagement/>

<sup>2</sup><https://www.nprb.org/nprb/communications/>

<sup>3</sup>[https://broaderimpacts.net/wp-content/uploads/2016/05/nabi\\_guiding\\_principles.pdf](https://broaderimpacts.net/wp-content/uploads/2016/05/nabi_guiding_principles.pdf)

<sup>4</sup><http://ankn.uaf.edu/IKS/conduct.html>

<sup>5</sup><https://www.nsf.gov/geo/opp/arctic/conduct.jsp>

<sup>6</sup>J.M.E Tondu, A.M. Balasubramaniam, L. Chavarie, N. Gantner, J.A. Knopp, J.F. Provencher, P.B.Y. Wong and D. Simmons, Working with Northern Communities to Build Collaborative Research Partnerships: Perspectives from Early Career Researchers. Arctic Institute of North America, Calgary, Alberta, Canada. 2014. 11 pp.

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## NPRB Guidance for Specific Types of Outreach Activities Targeting K-12 Audiences

### Examples of Deliverables

#### In the Classroom:

**Virtual Field Trips.** Use Google Earth or story mapping applications to upload images and video during a research project or websites like Field Trip Zoom.

**Classroom Connections:** Bring your research to the classroom. Help design an experiment based on your research project and conduct it with students. Always contact teachers well in advance to ensure proper planning. Use Google Chat, Skype, the Center for Interactive Learning and Collaboration (CILC) or other virtual communication portals to connect multiple schools.

**Lesson plans:** Lesson plans development thematically tailored directly to research projects is one of the more common outreach initiatives that NPRB receives annually. Be sure to include science, national, and statewide educational standards. Find a teacher to assist in development and deployment to ensure proper assessment. Thinking about hosting the lesson plans on your own website? Try hosting lesson plans online where teachers go to get resources such as BrainPop Educators, Teachers.Net, Teacherlingo.com, DigitalWish, iTunes U, and more.

### Examples of Community Engagement

**Classroom Engagement:** Working with coastal community students can be a rewarding experience for both investigator and students. Should logistics accommodate, it would be ideal to offer more than one opportunity for classroom engagement in rural communities. Contact the appropriate school district during the planning process to seek endorsement, and plan on coordinating with teachers to best incorporate your content in their classrooms. Conducting laboratory experiments, field trips, or assisting with data collection are all interactive options that extend scientific concepts in a fun, educational manner.

**Citizen Science and Local Research:** Community-based participatory research is an excellent way to lower investigator travel cost, increase community engagement, and increase scientific understanding and capacity. Additionally it has the ability to forge relationships between coastal community members and scientists while also providing valuable data that may not otherwise be collected without community support.

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**Meetings, Events, Science Fairs:** Examples - Bering Sea Days, regional and statewide science and engineering fairs, tribal, council, and commission meetings; WhaleFest Kodiak and Sitka, Ocean Science Bowl, Polar Science Week-end

**Digital Products:** blogs, vlogs, apps, StoryMaps, digital storytelling, crowdsourcing data

**Written Products:** children's books, board games, encouraging science and art collaborations

**Exhibits:** Aquaria, museum, traveling exhibits