BRDO Guidance for Developing a Broader Impacts Plan for Your NSF proposal

All proposals submitted to NSF must explicitly address two merit review criteria, intellectual merit and broader impacts. While intellectual merit is about the potential to advance knowledge and encompasses the technical aspects of the proposal, broader impacts deals with the potential of the proposed research to benefit society and contribute to the achievement of specific, desired societal outcomes.

NSF’s FAQ on merit review suggests the following for your broader impacts section.

A well-written broader impacts section should include activities that are clearly described; have a well-justified rationale; and demonstrate creativity or originality, or have a basis in established approaches. The proposer should have a well-organized strategy for accomplishment of clearly stated goals; establish the qualifications of those responsible for the activities; and demonstrate sufficient resources for support. A plan should be in place to document the results.

Broader impacts may be accomplished through (NSF PAPPG, Chapter III.C.2.d.i):

- the research itself,
- activities directly related to specific research projects, or
- activities supported by, but complementary to the project.

Societally relevant outcomes, beyond scientific knowledge, may include:

- full participation of women, persons with disabilities, and underrepresented minorities in STEM;
- improved STEM education and educator development at any level;
- increased public scientific literacy and public engagement with science and technology;
- improved well-being of individuals in society;
- development of a diverse, globally competitive STEM workforce;
- increased partnerships between academia, industry, and others;
- improved national security;
- increased economic competitiveness of the United States; and
- enhanced infrastructure for research and education.

Some NSF programs expect a more extensive broader impacts section than others. For example, NSF’s Faculty Early Career Development (CAREER) Program emphasizes both research and education, and the solicitation specifies that the project description must include “a description of the proposed educational activities and their intended impact,” as well as “a description of how the research and educational activities are integrated or synergistic.” However, many NSF solicitations, including those for most standard investigator-initiated research projects, provide little guidance for the broader impacts section.

Note: This document provides general guidance and tips to help you develop a competitive NSF broader impacts plan. It in no way overrides the instructions provided in the specific solicitation you are applying to, or indeed to instructions provided in the Proposal and Award Policies and Procedures Guide (PAPPG).

Developing your broader impacts plan

Below are simple steps to help you develop a broader impacts plan. These are loosely based on the Broader Impacts Guidesheet developed by The Connector, University of Missouri System.

**Step 1: Plan**

- What are the gaps or needs in your field?
- How can your interests, skills and experience make the biggest impact?
- How can you involve others, particularly those underrepresented in STEM disciplines?
• Are there collaborators at Berkeley, at other institutions, or in other sectors that would add value to your efforts?
• How will you integrate your research with your education goals?

Step 2: Create
• Outline activities and target audiences, desired outcomes, methods;
• Define measurable goals and objectives for each activity;
• List resources, collaborators, expertise you will need to reach your goals.

Step 3: Evaluate (if new to evaluation, see BRDO evaluation page)
• Outline a plan to measure the progress and long-term impact of each activity.
• Choose evaluation methods that fit your activities and goals. Some methods to consider are surveys, focus groups, observations, tests, case studies, interviews.
• If appropriate, consider hiring a professional evaluator to design and/or evaluate your activities.

Step 4: Write
• State your goals and objectives.
• Describe your activities in detail. Include information about any collaborators and describe their role/contributions in the project. Include a timeline with key milestones.
• Describe how you will evaluate your activities. Include information on internal and external evaluators and methods and tools to be used.

General principles for high-quality broader impacts
• Your broader impacts plan should flow from—and be synergistic with—your research plan.
• Broader impacts activities should be evidence-based. Cite relevant literature on best practices in curriculum, pedagogy, evaluation.
• Each activity should have specific objectives and expected outcomes tied to meaningful assessment.
• If you are developing a new education/training activity, consider a phased development approach (i.e. design, build, test, refine). Reviewers appreciate a well-reasoned plan that has clear descriptions of each stage of the development process.
• NSF encourages proposers to collaborate with and/or utilize existing resources at their home institution (or other institutions) as well as from other sectors such as industry, museums, schools, after school programs, community organizations. For a list of possible campus and off-campus collaborators for education and outreach-type activities, see BRDO Resources for Broader Impacts.

Suggested structure for your broader impacts section

Broader Impacts
a. Overview/background/aims—Frame a big picture for your broader impacts plan. Include background, motivation, and rationale in this section. For each activity, outline aims objectives and measurable outcomes for each aim.
b. Design and methods—For each aim, detail what you will do and how you will do it. Include personnel, budget, and any collaborations.
c. Evaluation—What will success look like? Evaluation should be based on aims and expected outcomes.
d. Timeline—segment your timeline into quarters or half-years and include key milestones for each activity.
e. Integration of research and education—How will your research impact your broader impacts goals and how will your broader impacts activities feed back into your research?

Ask yourself:
− Have I clearly stated what I want to do?
− Have I clearly stated why I want to do it?
− Have I clearly stated how I plan to do it?
− Have I clearly stated how I will measure success?
− Have I clearly stated what the benefits will be if the project is successful?

Document your broader impacts efforts throughout the proposal

Take the opportunity to document your commitment and effort to broader impacts throughout the application, not just the project summary and project description. Broader impacts can be reinforced in your biographical sketch (particularly in Sect. d, synergistic activities); facilities, equipment, and other resources; references cited; budget and budget justification; and letters of support/commitment (if these are allowed; check the solicitation for instructions).

Budgeting for broader impacts

In most cases, the NSF is deliberately non-prescriptive in its guidance about the scope, effort, and financial resources it expects proposers to allocate to broader impacts activities. All items included in your NSF budget request must be allowable, reasonable, and directly allocable to the supported activity. Expectations vary widely by program and discipline; check with a cognizant NSF Program Officer if you have questions.

There are many variables involved in budgeting for broader impacts. For example, certain activities (such as curriculum development or classroom outreach activities) typically require significant effort but relatively minor financial resources, while the reverse may be true of other types of activities (such as websites or museum exhibitions). Also, when broader impacts activities are conducted in collaboration with organizations that have existing staffing and systems for promotion, outreach, and evaluation (i.e. museums, schools, science centers, etc.), costs may be significantly reduced. If your expenditures are on the low or high side, be sure to provide a clear explanation of why this is the case in the broader impacts section of your project description.

Voluntary cost-sharing is prohibited for most NSF programs. Thus, do not include in-kind contributions in either your budget or budget justification. Such resources should, however, be included in your facilities, equipment, and other resources document, but they must not be quantifiable. For additional information about cost-sharing, as well as suggested language to include in your project description, please refer to the cost-share page on the SPO website: http://www.spo.berkeley.edu/procedures/costsharing.html.

Your research administrator (RA) can offer guidance and help with budgeting.

For questions about NSF broader impacts, contact Kate Spohr, kspohr@berkeley.edu
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