

## **Developing a Broader Impacts Plan for Your NSF proposal**

Kate Spohr, Berkeley Research Development Office, March 2022

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.

Broader impacts may be accomplished through:

- 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 historically excluded groups in STEM, including women, persons with disabilities, and Black, Indigenous, and persons of color;
- 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 minimal guidance for the broader impacts section. When in doubt, check with a cognizant program officer.

NSF's [FAQ on merit review](#) provides this advice 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.*

The following sections provide guidance and tips to help you develop a competitive NSF broader impacts plan.

## Developing your broader impacts plan

Below are simple steps to help you develop a broader impacts plan.

### *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, in the community, 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 goals and objectives that are specific, measurable, achievable, relevant, and time-bounded;
- 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, case studies, interviews, assessment of student work (such as posters, reports, presentations, etc).
- If appropriate, consider hiring a professional evaluator to help you design your evaluation plan and select or create evaluation instruments that meet your needs.

### *Step 4: Write*

- We suggest the following structure for your broader impacts section.
  - a. *Overview/background/goals*—Begin your broader impacts section with a strong rationale and vision. Describe a set of well-reasoned goals and objectives for the programs/activities you are proposing, and clearly describe the context, background and motivation for these activities.
  - b. *Design and methods*— For each activity, detail what you will do and how you will do it. Include personnel, budget, and contributions of collaborators.
  - c. *Evaluation*—What are your expected outcomes of your activities/programs? How will you measure whether you are achieving these outcomes? How will evaluation results be used to improve and refine your programs?
  - d. *Timeline*—Create a timeline segmented into quarters or half-years for the project period. Include key milestones for each program/activity.
  - e. *Integration of research and education*—How will your research project 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.** Broader impacts should be reinforced in biographical sketches (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.** NSF typically provides minimal guidance about the scope, effort, and financial resources it expects for broader impacts activities, so it is up to the proposer to provide a sound rationale for his/her broader impacts activities and budget. NSF reviewers will scrutinize your project description, budget, and budget justification to ensure that adequate resources have been allocated to your broader impacts activities. A rough rule of thumb is to allocate 5%-10% of the total project budget to broader impacts, but there are many variables that can lower or raise costs. Keep in mind that all items included in your budget request must be *allowable, reasonable, and directly allocable to the supported activity*. Set up a meeting with a cognizant program officer to discuss your ideas and get feedback on the type, scope, and budget for your broader impacts activities.

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 as well as in the budget justification. 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 museum exhibitions or interactive websites with extensive graphics). 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.

*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 attachment, 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>.

### **General principles for high-quality broader impacts**

- Your broader impacts plan should flow from—and be synergistic with—your research plan.
- It is generally more effective to focus on a smaller number of well-integrated, carefully linked programs or activities than to have a long list of unrelated programs.
- Broader impacts activities should be evidence-based. Cite relevant literature on best practices in curriculum, pedagogy, evaluation.
- Each activity should have specific objectives and clear 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](#).

*For questions or assistance with broader impacts, contact the Berkeley Research Development Office (BRDO @berkeley.edu).*