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Broader Impacts in NSF Research Proposals and Leveraging CSU Strengths

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- Broader Impacts

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Broader Impacts are critically important in the evaluation of NSF research proposals

Reviewers are asked to assess the potential for the proposed activity to:

advance knowledge and understanding within its own field or across different fields = **INTELLECTUAL MERIT**

benefit society or advance desired societal outcomes = **BROADER IMPACT**

Competitive research proposals have strengths in both

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Broader Impact activities help fulfill the mission of NSF:
"To promote the progress of science; to advance the national health, prosperity, and welfare; and to secure the national defense"
(NSF Act of 1950)

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Broader impacts may be accomplished through the research itself, through the activities that are directly related to specific research projects, or through activities that are supported by, but are complementary to, the project. (NSF 20-1, PAPPG)

NSF's Broader Impact Goals:

- Broadening participation in STEM
- Integrating teaching and research
- Increasing scientific literacy and public engagement
- Developing a diverse, globally competitive STEM workforce; increasing US economic competitiveness
- Increasing partnerships between academia, industry, and others
- Enhancing infrastructure for research and education

CSU faculty are well positioned to propose Broader Impact activities in all these areas

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Proposed Broader Impact (BI) components should:

- have specific, assessable goals which align with NSF's BI goals
- be well reasoned and relevant to the proposed research
- identify the target - who (in society) will benefit?
- take advantage of existing institutional programs
- be appropriate to your situation, environment, and professional goals
- be sustainable
- include an assessment plan (you may include a consultant or collaborator)
- be included in the project budget and timeline
- If possible, demonstrate previous success with similar activities

Broader Impact Sections in the Project Summary and the Project Description

Devote 1-2 pages of the Project Description to Broader Impacts

Approach your BI plan the same way you approach your research plan

Avoid the following:

- describing past accomplishments instead of what will be done during the funding period
- a laundry list that lacks convincing detail; unfocused activities with unrealistic outcomes
- developing a website or blog with no plan to attract users or to assess impact
- planning to deliver content for public education or K-12 outreach without showing evidence of need or interest, and that you are partnering with others
- including nothing beyond what is expected of you in your current position

Advice for Writing an Excellent NSF Research Proposal
(for both Intellectual Merit and Broader Impacts)

- Write to your audience
- Frame a big picture
- Identify significant needs, gaps, and hypotheses
- Describe the plan to address the needs, gaps, and hypotheses
- Emphasize creative or innovative aspects
- Provide proof-of-concept
- Describe the expected outcomes, metrics, and evaluation
- Anticipate possible problems and describe alternative plans
- Relate the outcomes to what you set out to do

Leverage CSU Strengths

- CSU mission and goals align well with NSF's goals for Broader Impacts and Broadening Participation
- The student body, faculty, and community are diverse
- Faculty actively integrate teaching and research
- Many existing CSU programs can be leveraged to recruit research students (e.g., LSAMP, McNair)
- Opportunities for undergraduate research, service learning, and internships exist
- Partnerships between academia, industry, government agencies, and K-12 exist
- You can partner with CSU science education researchers and assessment experts

Leverage CSU Strengths

- The research affinity groups like COAST can serve as resources and help you establish useful networks
- Most CSUs can (and should) take advantage of RUI (Research Experiences for Under-graduates) and ROA (Research Opportunity Awards) Programs

Other Advice

- PIs should contact the appropriate NSF program officer (develop a relationship)
- Proposals may be co-reviewed if they are relevant to more than one program
- Participate in NSF proposal review

Useful resources for Broader Impacts:

https://www.nsf.gov/od/oia/special/broaderimpacts/

The Center for Advancing Research Impact in Society (ARIS) - http://researchimpactinsociety.org