

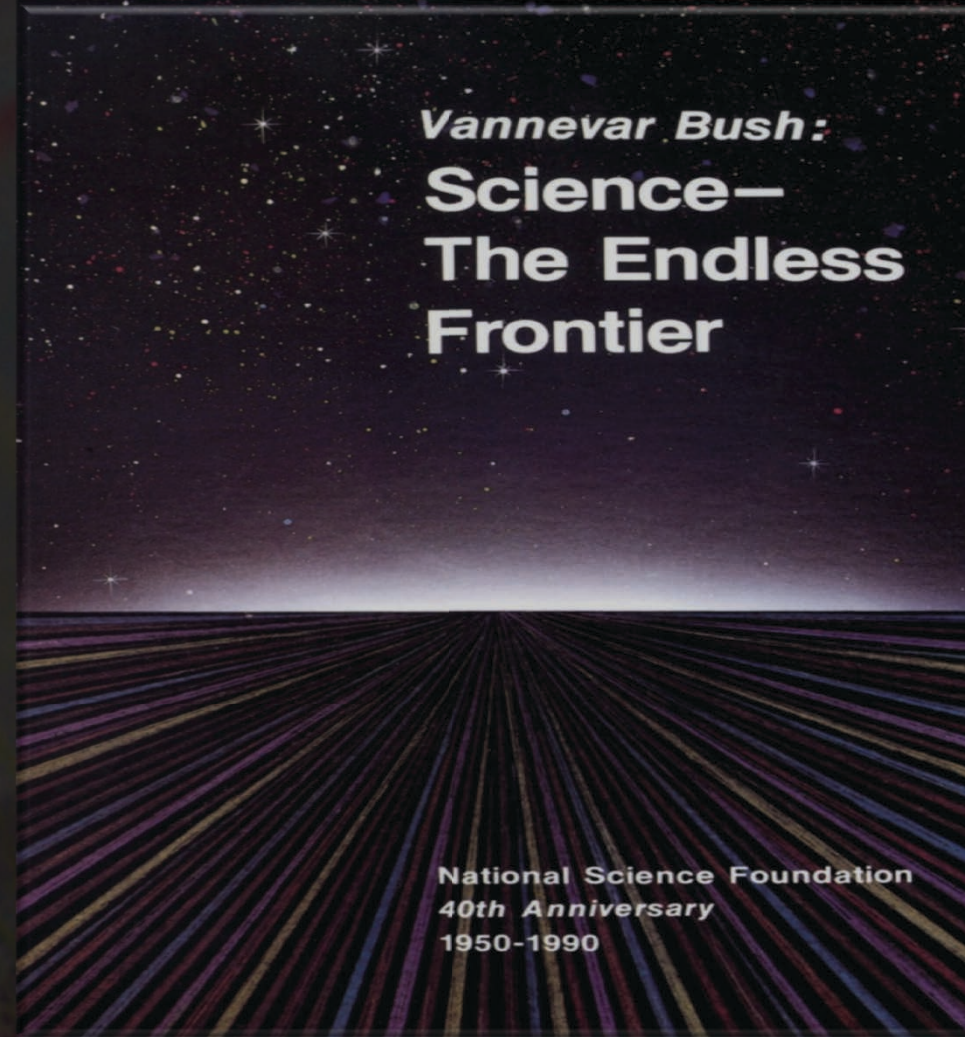


Broader Impacts: Achieving Greater Goals

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Science offers a largely unexplored hinterland for the pioneer who has the tools for his task. The rewards of such exploration both for the Nation and the individual are great.

Scientific progress is one essential key to our security as a nation, to our better health, to more jobs, to a higher standard of living, and to our cultural progress.

“to promote the progress of science; to advance the national health, prosperity, and welfare; to secure the national defense...” NSF Act, 1950

NSF Merit Review Criteria



- **Intellectual Merit:** The Intellectual Merit criterion encompasses the potential to advance knowledge;
- **Broader Impacts:** The Broader Impacts criterion encompasses the potential to benefit society and contribute to the achievement of specific, desired societal outcomes.



America COMPETES - 2010



SEC. 526. BROADER IMPACTS REVIEW CRITERION.

(a) GOALS.—The Foundation shall apply a Broader Impacts Review Criterion to achieve the following goals:

- (1) Increased economic competitiveness of the United States.
- (2) Development of a globally competitive STEM workforce.
- (3) Increased participation of women and underrepresented minorities in STEM.
- (4) Increased partnerships between academia and industry.
- (5) Improved pre-K–12 STEM education and teacher development.
- (6) Improved undergraduate STEM education.
- (7) Increased public scientific literacy.
- (8) Increased national security.



From NSF GPG



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 values the advancement of scientific knowledge and activities that contribute to the achievement of societally relevant outcomes.





From NSF GPG

Such outcomes include, but are not limited to: full participation of women, persons with disabilities, and underrepresented minorities in science, technology, engineering, and mathematics (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.





National Science Board: *Broader Impacts*

- The Broader Impacts criterion encompasses the potential to benefit society and contribute to the achievement of specific, desired societal outcomes.
- These outcomes include:
 - increased participation of women, persons with disabilities, and underrepresented minorities in science, technology, engineering, and mathematics (STEM);
 - improved STEM education at all levels;
 - increased public scientific literacy and public engagement with science and technology; improved well-being of individuals in society;
 - development of a globally competitive STEM workforce;
 - increased partnerships between academia, industry, and others;
 - increased national security;
 - increased economic competitiveness of the United States;
 - and enhanced infrastructure for research and education.
- These examples of societally relevant outcomes should not be considered either comprehensive or prescriptive. Investigators may include appropriate outcomes not covered by these examples.

NSB Recommendations

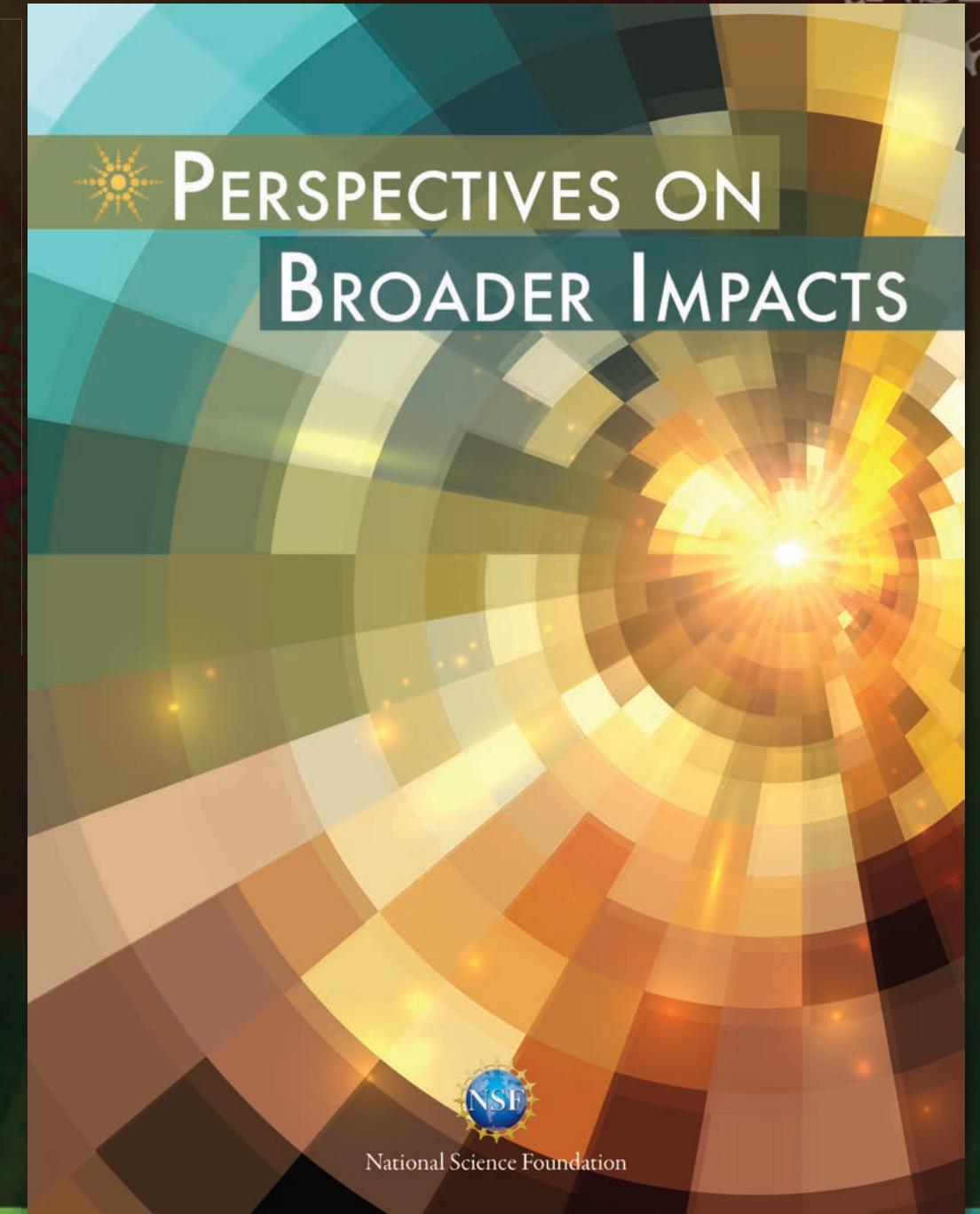


- “Just as institutions play an important role in facilitating research-related activities of their investigators, often in ways that align with strategic departmental and institutional (and possibly state-wide, regional, or national) priorities and investments, such a role can extend to activities directed toward the broader impacts of the project as well.”
- “... such efforts might be more effective if coordinated appropriately in ways that leverage particular institutional assets or strategic directions and even link investigators from multiple projects.”
- NSF should encourage institutions to pursue such cooperative possibilities, which have the dual benefit of retaining the contributions of individual investigators while addressing national goals and yielding benefits broader than those within a given project.

Broader Impacts - Stakeholders



- Public
- Policymakers
- Institutions – Universities
- Researchers
- Students
- NSF





Feedback from Committees of Visitors

- Greater clarification about the meaning of and expectations about the Broader Impacts criterion needed.
 - How important is it for Broader Impacts to be novel?
- Inconsistent interpretation and handling of BI criterion by reviewers as well as NSF staff.
 - Variability across Programs, Divisions, Directorates
- Recommendations:
 - Improved training for reviewers and NSF staff
 - Clarification of the language used to define Broader Impacts,
 - Provision of examples of significant Broader Impacts



How can we turn BI into exciting opportunities?

Key Elements

- Frameworks for thinking about BI
- Non-prescriptive models for BI
- Roles for Institutions
 - Universities
 - K-12, community colleges
 - Foundations
 - Local, regional, national organizations
 - Industry and private sector
 - NSF

Possible Mechanisms

- **Facilitation** on campuses for BI formulations
- **Leveraging** complementary activities
- **Alignment** and coherence among BI activities and goals
- Together, these mechanisms have the potential to achieve results at scale

Food for Thought

- IM : Publications :: BI : ?
- How can we fuel “competition” for great BI concepts and outcomes?
- Can/should non-prescriptive BI goals be defined by Directorate/Division/Program?
- How can the conversation at this meeting be scaled to the larger research community?
- Are there “early adopters” of new ways of thinking about BI?

It is critical that all stakeholders achieve common and shared understanding of BI and engage in mutually reinforcing activities to achieve the promise and expectations behind BI



QUESTIONS?

IDEAS, SUGGESTIONS!

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