The Importance of Broader Impacts at NSF

BIRDS

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  - To understand the intent and importance of broader impacts
  - To inspire you to think of ways your research can have broader impact and thus write meaningful (to you and the reviewers) broader impacts statements.

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- 1997: Four merit review criteria merged into two
  - Intellectual Merit
    - Intrinsic scientific merit
    - Soundness of team's approach
  - Broader Impacts
    - Utility or relevance of project
    - Effect on the infrastructure of science and engineering

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- 2002: NSF announced that any proposal that did not address both Intellectual Merit and Broader Impacts would be **returned without review.**

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- NSF continually needs to explain what basic research is and the importance of science and engineering to society, the economy, and the well-being of the nation.

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  - “Science for the Masses”, Nature, May 2010
    - “No agency has gone as far as the US NSF…”
    - “The criterion was established to get scientists out of their ivory towers and connect them to society” A. Bement, former NSF Director
    - “By not tracking broader-impacts activities, the NSF undervalues its true contribution to society” M. Roberts, Univ. Colorado, Boulder

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Science for the masses

The US National Science Foundation's insistence that every research project addresses 'broader impacts' leaves many researchers baffled. Corie Lok takes a look at the system.

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- Section 214(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.

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- Section 214 (b) Policy- Not later than 6 months after the date of enactment of this Act, the Director shall develop and implement a policy for the Broader Impacts Review Criterion that--

  (1) provides for educating professional staff at the Foundation, merit review panels, and applicants for Foundation research grants on the policy developed under this subsection;

  (2) clarifies that the activities of grant recipients undertaken to satisfy the Broader Impacts Review Criterion shall--

  (A) to the extent practicable employ proven strategies and models and draw on existing programs and activities; and

  (B) when novel approaches are justified, build on the most current research results;

  (3) allows for some portion of funds allocated to broader impacts under a research grant to be used for assessment and evaluation of the broader impacts activity;

  (4) encourages institutions of higher education and other nonprofit education or research organizations to develop and provide, either as individual institutions or in partnerships thereof, appropriate training and programs to assist Foundation-funded principal investigators at their institutions in achieving the goals of the Broader Impacts Review Criterion as described in subsection (a); and

  (5) requires principal investigators applying for Foundation research grants to provide evidence of institutional support for the portion of the investigator's proposal designed to satisfy the Broader Impacts Review Criterion, including evidence of relevant training, programs, and other institutional resources available to the investigator from either their home institution or organization or another institution or organization with relevant expertise.

NSF Broader Impacts Website

my italics

- Advance discovery and understanding while promoting teaching, training, and learning
- Broaden participation of under-represented groups
- Enhance infrastructure for research and education
- Broaden dissemination to enhance scientific and technological understanding
- Benefits to society

Selected Representative Examples

- Develop educational materials for elementary, high-school and undergraduate students
- Involve elementary, high-school and undergraduate students in the research where appropriate
- Create mentoring programs
- Maintain and operate shared research infrastructure
- Establish international, industrial or government collaborations
- Form start-up companies
- Present research results to non-scientific audiences such as policy-makers
- Give presentations to the public
- Develop exhibits in partnership with museums

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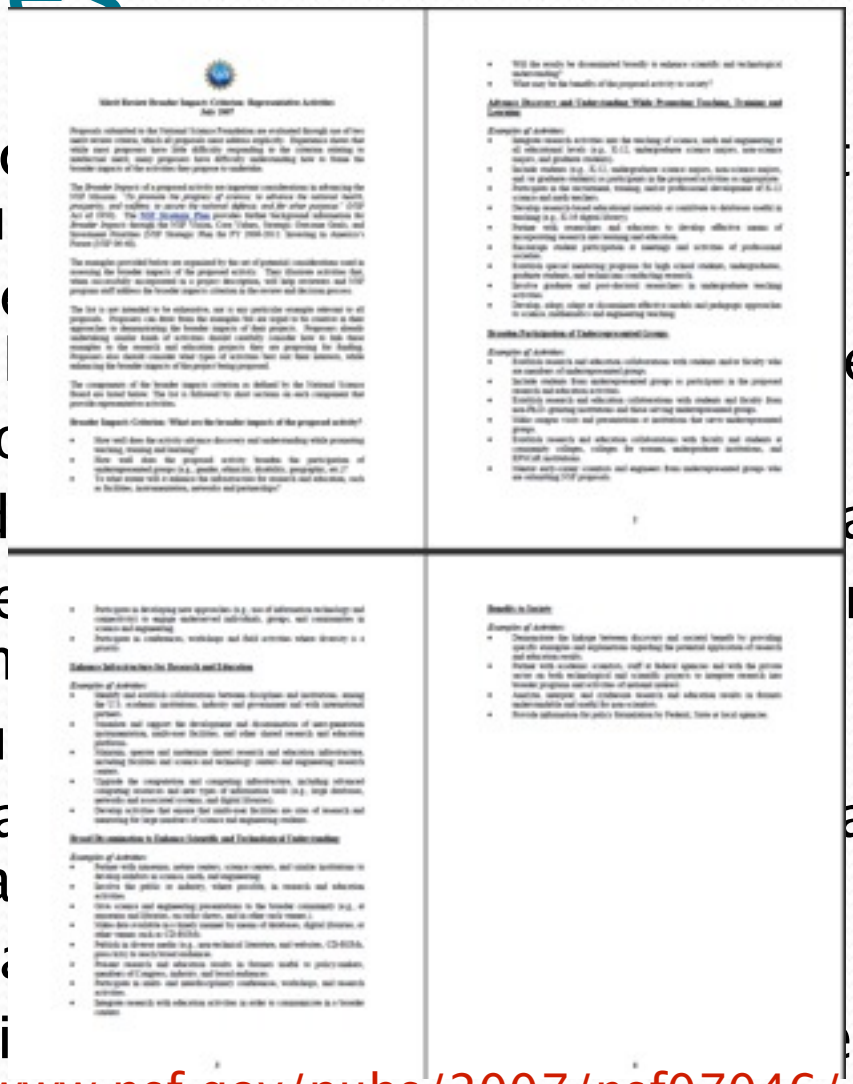

http://www.nsf.gov/pubs/2007/nsf07046/nsf07046.jsp

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- Who should be responsible? The PI? The University? NSF?

FY11 Funding Opportunities

- CISE core (CCF, CNS, IIS) and cross-cutting research program solicitations posted June 11
  - Cross cuts: Smart Health and Well-being, Network Science and Engineering, Trustworthy Computing
- CISE + X programs
  - Cyber-Physical Systems (with ENG)
  - Social-Computational Systems (with SBE)
  - Interface between Computer Science and Economics (with SBE)
  - Software for Sustained Innovation Institutes (with OCI) (S^2I^2)
  - … [Please see website www.cise.nsf.gov] …
- CISE education program (coming this summer)
  - Long and fat pipeline: K-16 x Diversity of all dimensions
- NSF foundation-wide activities in FY11 Budget Request
  - Science, Engineering and Education for Sustainability (SEES)
  - Cyberlearning Transforming Education (CTE)
  - Cyber-enabled Discovery and Innovation (CDI)
  - Science and Engineering Beyond Moore's Law (SEBML)
- Increase in Graduate Research Fellowships and CAREER awards

Thank You!