

What does NSF's *Broadening Impacts Criterion* mean for you?



UNIVERSITY OF MINNESOTA

Driven to Discover<sup>SM</sup>

# Goals of presentation

---

To address:

- What does refinement of the *Intellectual Merit & Broader Impacts Criteria* mean
- What the changes may mean to you
- What you need to know about *Broader Impacts* that will enable you submit a proposal that will adequately represent your ideas, be satisfactorily reviewed and ultimately funded
- How proposals submitted after January 14, 2013 will be affected

# NSF Review Criteria

---

Historically,

- NSF proposals have been evaluated using two review criteria

Intellectual merit – main criterion since 1950s

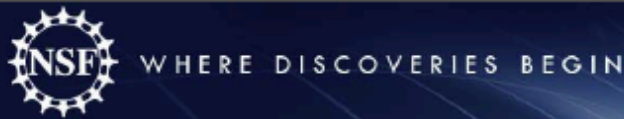
Broader impacts – added 1997

- Process Outcomes

Intellectual merit – fundamental, well understood, well received

Broader impacts – complaint that it lacked clarity, poorly understood by proposers/reviewers and unevenly executed

# *The NSF Merit Review Process in Retrospect*

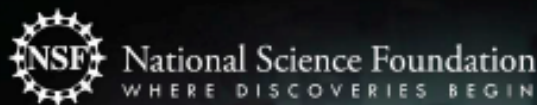


## **Merit Review at NSF**

### **Refining Intellectual Merit & Broader Impacts**

- Intellectual Merit & Broader Impacts (1997-2007)
- Emphasis on Transformative Research in Intellectual Merit & Broader Impacts (2007-2013)
- Revised Intellectual Merit & Broader Impacts (2013)
  - Three review principles
  - Two review criteria
  - Five review elements

# The NSF Merit Review Process



## NSF REVISES MERIT REVIEW CRITERIA

NSF released a revised Proposal & Award Policies & Procedures Guide (PAPPG) on October 4, 2012, which incorporates significant revisions to the NSF merit review criteria of *Intellectual Merit* and *Broader Impacts*.

These revisions are effective for proposals submitted or due on or after January 14, 2013.

For additional resources visit the Merit Review Revisions resource page at: [http://www.nsf.gov/bfa/dias/policy/merit\\_review/resources.jsp](http://www.nsf.gov/bfa/dias/policy/merit_review/resources.jsp)

### NSB Report on Merit Review Criteria - Conclusions

- The *Intellectual Merit* and *Broader Impacts* review criteria together capture the important elements that should guide the evaluation of NSF proposals;
- A set of three Merit Review Principles should be given due diligence by Principal Investigators and reviewers;
- A set of five Merit Review Elements should be considered in the review of both criteria.

### Changes to the Proposal Process

- Project Summary will contain the following required separate statements
  - Overview of the Project
  - Statement on *Intellectual Merit*
  - Statement on *Broader Impacts*
- Project Description must contain a separate section with a discussion of the *Broader Impacts*
- Proposing organizations must certify that organizational support will be made available as described in the proposal to address the *Broader Impacts* and *Intellectual Merit* activities.
- Annual and Final Reports must address activities related to the *Broader Impacts* criterion that are not intrinsic to the research.

#### IMPORTANT LINKS:

National Science Foundation  
[www.nsf.gov](http://www.nsf.gov)

Division of Institution and  
Award Support  
[www.nsf.gov/bfa/dias](http://www.nsf.gov/bfa/dias)

Policy Office  
[www.nsf.gov/bfa/dias/policy](http://www.nsf.gov/bfa/dias/policy)

NSF Proposal & Award Policies  
and Procedures Guide  
[www.nsf.gov/publications/pub\\_summ/sa?ods\\_key=pappg](http://www.nsf.gov/publications/pub_summ/sa?ods_key=pappg)

NSF Merit Review Website  
[www.nsf.gov/bfa/dias/policy/merit\\_rev](http://www.nsf.gov/bfa/dias/policy/merit_rev)

Revisions to Merit Review  
Resources  
[http://www.nsf.gov/bfa/dias/policy/merit\\_rev/resources.jsp](http://www.nsf.gov/bfa/dias/policy/merit_rev/resources.jsp)

Questions may be directed to the  
Policy Office at NSF

Email: [policy@nsf.gov](mailto:policy@nsf.gov)  
Phone: (703) 292-8243



## NSF REVISES MERIT REVIEW CRITERIA

Information for Reviewers of NSF Proposals  
Effective for proposals submitted on or after January 14, 2013

The *Intellectual Merit* and *Broader Impacts* review criteria together capture the important elements that should guide the evaluation of all NSF proposals.

- Some solicitations require additional review criteria that must be addressed in your evaluation.

A set of three Merit Review Principles should be given due diligence by proposers and reviewers.

- All NSF projects should be of the highest quality and have the potential to advance, if not transform, the frontiers of knowledge.
- NSF projects, in the aggregate, should contribute more broadly to achieving societal goals.
- Meaningful assessment and evaluation of NSF funded projects should be based on appropriate metrics, keeping in mind the likely correlation between the effect of broader impacts and the resources provided to implement projects.

A set of five Merit Review Elements should be considered in the review of both criteria

- What is the potential for the proposed activity to a) advance knowledge and understanding within its own field or across different fields (*Intellectual Merit*); and b) benefit society or advance desired societal outcomes (*Broader Impacts*)?
- To what extent do the proposed activities suggest and explore creative, original, or potentially transformative concepts?
- Is the plan for carrying out the proposed activities well-reasoned, well-organized, and based on a sound rationale? Does the plan incorporate a mechanism to assess success?
- How well qualified is the individual, team, or institution to conduct the proposed activities?
- Are there adequate resources available to the PI (either at the home institution or through collaborations) to carry out the proposed activities?

#### IMPORTANT LINKS:

National Science Foundation  
[www.nsf.gov](http://www.nsf.gov)

Division of Institution and  
Award Support  
[www.nsf.gov/bfa/dias](http://www.nsf.gov/bfa/dias)

Policy Office  
[www.nsf.gov/bfa/dias/policy](http://www.nsf.gov/bfa/dias/policy)

NSF Proposal & Award Policies  
and Procedures Guide  
[www.nsf.gov/publications/pub\\_summ/sa?ods\\_key=pappg](http://www.nsf.gov/publications/pub_summ/sa?ods_key=pappg)

NSF Merit Review Website  
[www.nsf.gov/bfa/dias/policy/merit\\_rev](http://www.nsf.gov/bfa/dias/policy/merit_rev)

Revisions to Merit Review  
Resources  
[www.nsf.gov/bfa/dias/policy/merit\\_rev/resources.jsp](http://www.nsf.gov/bfa/dias/policy/merit_rev/resources.jsp)

Questions may be directed to the  
Policy Office at NSF

Email: [policy@nsf.gov](mailto:policy@nsf.gov)  
Phone: (703) 292-8243

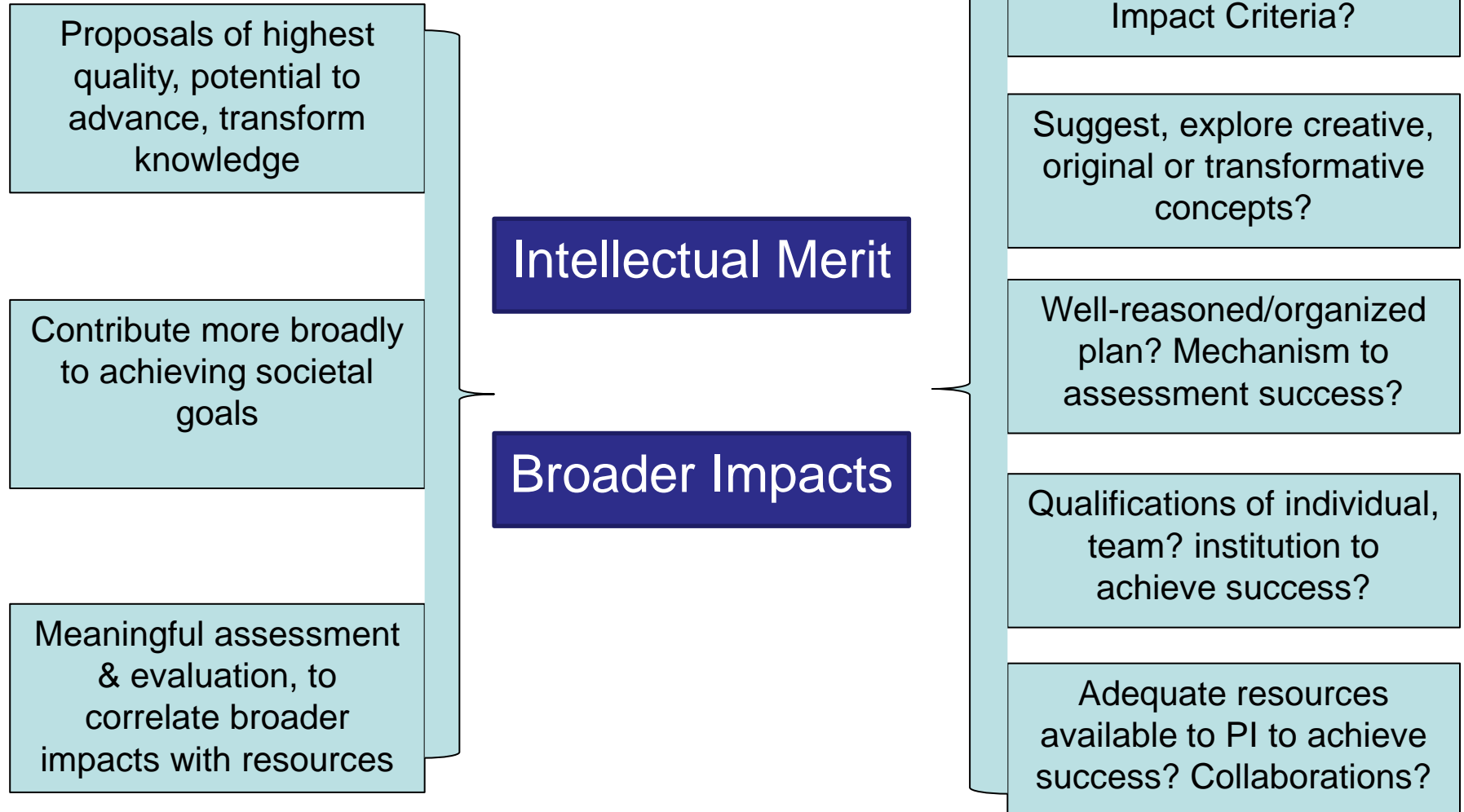


# NSF Review Criteria - Proposal/Review

## Three Review Principles

## Two Review Criteria

## Five Review Elements



# Changes to Proposal Process

---

## Changes *for Proposers:*

- ***Project Summary***
  - Overview of Project
  - Statement on ***Intellectual Merit***
  - Statement on ***Broader Impacts***
- ***Project Description***
  - Must contain a separate section with a discussion of the ***Broader Impacts***
  - ***Results from Prior Support*** (if any) must address intellectual merit and broader impacts (new)
- New certification regarding Organizational Support (new)
  - Requires AOR certification that organizational support will be made available as described in the proposal to address ***Broader Impacts*** and ***Intellectual Merit*** activities to be undertaken
- ***Annual and Final reports*** (new)
  - Must address activities related to the ***Broader Impacts*** criterion that are not intrinsic to the research



# “New” Review Criteria - Process

**Merit Review**

**Merit Review Process**

Click the square buttons to find out more information about the review process.

Download a printable version of the Merit Review Process Illustration. [PDF \(21K\)](#)

**PHASE I**

PROPOSAL PREPARATION AND SUBMISSION  
90 DAYS

1 OPPORTUNITY ANNOUNCED → 2 PROPOSAL SUBMITTED → 3 PROPOSAL RECEIVED

**PHASE II**

PROPOSAL REVIEW AND PROCESSING  
6 MONTHS

4 REVIEWERS SELECTED → 5 PEER REVIEW → 6 PROGRAM OFFICER RECOMMENDATION → 7 DIVISION DIRECTOR REVIEW

**PHASE III**

AWARD PROCESSING  
30 DAYS

8 BUSINESS REVIEW → 9 AWARD FINALIZED

**Merit Review Home**

- Director's Statement
- Phase I: Proposal Preparation and Submission
- Phase II: Proposal Review and Processing
- Phase III: Award Processing
- Non-Award Decisions and Transactions
- Merit Review Facts
- Why You Should Volunteer to Serve as an NSF Reviewer
- Additional Resources
- Contact Us

**Proposals and Awards**

- Proposal and Award Policies and Procedures Guide
  - Introduction
  - Proposal Preparation and Submission
    - Grant Proposal Guide
    - Grants.gov Application Guide
  - Award and Administration
    - Award and Administration Guide
- Award Conditions
- Other Types of Proposals

[http://www.nsf.gov/bfa/dias/policy/merit\\_review/merit\\_animation.jsp](http://www.nsf.gov/bfa/dias/policy/merit_review/merit_animation.jsp)



# NSF Review Criteria Description

---

- Every NSF solicitation poses a set of questions to provide *context* for the ***broader impacts criterion***
- Suggested questions are a *guide* for considering broader impacts
- They are not:
  - A list of “requirements”
  - Apply to every proposal
  - An official checklist

# *NSF Project Officer Questions for Broader Impacts*

---

*Will your project...*

- Advance discovery - promote teaching & learning?
- Broaden participation of underrepresented groups?
- Enhance the infrastructure?
- Include broad dissemination?
- Benefit society?

*NOTE: Broader impacts includes more than broadening participation*

# *Does your proposal involve STEM education?*

---

*Will the project...*

- Involve a significant effort to facilitate adaptation at other sites?
- Contribute to the understanding of STEM education?
- Help build and diversify the STEM education community?
- Have a broad impact on STEM education in an area of recognized need or opportunity?
- Have the potential to contribute to a paradigm shift in undergraduate STEM education?

# Characteristics of Broader Impacts Plan

---

Question:

What are the desirable features of a broader impacts plan or strategy

- Include strategy to achieve (Broader) impacts
- Have a well-defined set of expected outcomes - ***metrics to match***
- Make results meaningful and valuable, consistent with technical project tasks
- Have detailed activities
- Provide rationale to justify activities and plan
- How will project be assessed?
- What are the metrics?
- Include evaluation of impacts
- Use logic models
- Have a well-stated relationship to the audience or audiences (Program Officer/Review Panel)

# Develop collaborations for your proposal

---

- Partner with *museums, nature centers, science centers*, and similar institutions to develop exhibits in science, math, and engineering.
- *Involve the public or industry*, where possible, in research and education activities.
- Give science and engineering *presentations to the broader community* (e.g., at museums and libraries, on radio shows, and in other such venues).
- Make *data available* in a timely manner by means of databases, digital libraries, or other venues such as CD-ROMs

# Disseminating Results

---

- *Publish in diverse media* (e.g., non-technical literature, and websites, CD-ROMs, press kits) to reach broad audiences.
- Present research and education results in formats useful to *policy-makers, members of Congress, industry*, and broad audiences.
- Participate in *multi- and interdisciplinary conferences*, workshops, and research activities.
- Integrate research with education activities in order to *communicate broader impacts in expanded context*.

# Summary-Broader Impacts

---

- Use and build on NSF's new guidelines
  - Use listed categories in solicitations as *suggestions*
  - Highlight representative activities on website
  - *Be expansive* in using guidelines — be creative, but realistic
  - Discuss previous review comments with your Program Officer
- Develop activities to show impact of project
- Seek and develop *new* approaches
- Use logic models to help find new ideas
- *Integrate and align* with other project activities – make proposal *cohesive*
- Repeat correlations between *2 Merit Review Criteria, 3 Principles and 5 Elements, even at risk of redundancy*

# REFERENCES

---

- NSF GPG, Chapter II - Proposal Preparation Instructions  
<http://www.nsf.gov/pubs/gpg/broaderimpacts.pdf>
- Proposal Award & Procedures Guide (nsf13001)  
[http://www.nsf.gov/publications/pub\\_summ.jsp?ods\\_key=papp](http://www.nsf.gov/publications/pub_summ.jsp?ods_key=papp)
- Merit Review (Home)  
[http://www.nsf.gov/bfa/dias/policy/merit\\_review/](http://www.nsf.gov/bfa/dias/policy/merit_review/)
- Revised Merit Criteria  
[http://www.nsf.gov/bfa/dias/policy/merit\\_review/resources.jsp](http://www.nsf.gov/bfa/dias/policy/merit_review/resources.jsp)
- Revised Review Tutorial  
[http://www.nsf.gov/bfa/dias/policy/merit\\_review/merit\\_animation.jsp](http://www.nsf.gov/bfa/dias/policy/merit_review/merit_animation.jsp)



# *The NSF Merit Review Process in Retrospect*

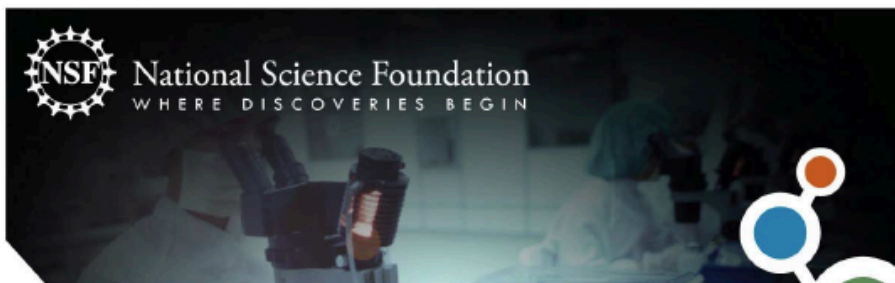


## **Merit Review at NSF**

### **Refining Intellectual Merit & Broader Impacts**

- Intellectual Merit & Broader Impacts (1997-2007)
- Emphasis on Transformative Research in Intellectual Merit & Broader Impacts (2007-2013)
- Revised Intellectual Merit & Broader Impacts (2013)
  - Three review principles
  - Two review criteria
  - Five review elements

# The NSF Merit Review Process



## NSF REVISES MERIT REVIEW CRITERIA

Information for Reviewers of NSF Proposals

Effective for proposals submitted on or after January 14, 2013

The *Intellectual Merit* and *Broader Impacts* review criteria together capture the important elements that should guide the evaluation of all NSF proposals.

- Some solicitations require additional review criteria that must be addressed in your evaluation.

A set of three Merit Review Principles should be given due diligence by proposers and reviewers.

- All NSF projects should be of the highest quality and have the potential to advance, if not transform, the frontiers of knowledge.
- NSF projects, in the aggregate, should contribute more broadly to achieving societal goals.
- Meaningful assessment and evaluation of NSF funded projects should be based on appropriate metrics, keeping in mind the likely correlation between the effect of broader impacts and the resources provided to implement projects.

A set of five Merit Review Elements should be considered in the review of both criteria

- What is the potential for the proposed activity to a) advance knowledge and understanding within its own field or across different fields (Intellectual Merit); and b) benefit society or advance desired societal outcomes (Broader Impacts)?
- To what extent do the proposed activities suggest and explore creative, original, or potentially transformative concepts?
- Is the plan for carrying out the proposed activities well-reasoned, well-organized, and based on a sound rationale? Does the plan incorporate a mechanism to assess success?
- How well qualified is the individual, team, or institution to conduct the proposed activities?
- Are there adequate resources available to the PI (either at the home institution or through collaborations) to carry out the proposed activities?

## Merit Review at NSF

### Refining Intellectual Merit & Broader Impacts

- Intellectual Merit & Broader Impacts (1997-2007)
- Emphasis on Transformative Research in Intellectual Merit & Broader Impacts (2007-2013)
- Revised Intellectual Merit & Broader Impacts (2013)
  - Three review principles
  - Two review criteria
  - Five review elements