The Broader Impacts Conceptual Framework:

Encompassing the potential to benefit society and contribute to achievement of specific, desired societal outcomes (NSF-15-1)

Michael Thompson, PhD
Director of Broader Impacts in Research
University of Oklahoma
Mission:
To engage faculty and other investigators to develop relevant high-quality outcomes to their research, teaching, and public service and assist in the dissemination of these endeavors within the University of Oklahoma and out to the local and broader communities.
Broader Impacts in Research (BIR) Value
BIR: Helping faculty be more impactful

Value Proposition I:

BIR demonstrates how and why BI should be conceptualized, operationalized, and institutionalized beyond the requirements of the BI NSF Criterion. Through the development of higher quality broader impacts BIR is able to help faculty be more impactful in every aspect of their professional careers.
High Quality Broader Impacts Programs

Academic-Industry Relationships
Collaborations / Partnerships
Workforce Development
Benefitting Bio-related Programs / Activities
i.e. - OK-Bio, Bioscience Roundtable, OU Bio-tech Programs

Integration of Research, Teaching, and Public Service
Collaborations / Partnerships
Workforce Development
Benefitting Programs / Activities
i.e. - Service-Learning, Learning Communities, Case-study classrooms

Broadening Participation
Collaborations / Partnerships / EPSCoR
Workforce Development
Recruitment of Faculty and Staff
Benefitting Programs / Activities
i.e. - Multi-Cultural Faculty Associations, SWCHRS SACNAS, SHPE, NSBE, HBCU, TCU,

MORE IMPACTFUL FACULTY
Broader Impacts in Research (BIR) Value
BIR: Helping faculty be more impactful

Value Proposition II:

**BIR** helps **Faculty** and researchers **Develop** and leverage **High-Quality Broader Impacts** for **proposal** applications by:

1. Clarifying the formal and informal expectations by a number of agencies to fulfill Broader Impacts requirements
2. Proposing ideas and strategies to help faculty create their own activities or connect to existing Broader Impacts-related programs in creative and innovative ways.
3. Brokering partnerships on and off campus that can help faculty address Broader Impacts requirements
4. Collecting and sharing information about Broader Impacts trends and best practices with similar services at other universities

5. Facilitating and or helping faculty find ways to evaluate their proposed agency broader impacts
What is the Broader Impacts Conceptual Framework?

I. A Framework that allows administrators, faculty, and the public to articulate the concept of broader impacts more globally and fully...
   • Contextualizes the broader impacts concept

II. A Framework that has the potential to create better links between the linear model of research and applied research...

III. Demystifies the National Science Foundation (NSF) Definition...

IV. Helps us to determine the initial reach of broader impacts programs and portfolios...
   • University Community Level
   • Local Community Level
   • State Community Level
   • National Community Level
   • Global/International Community Level
NSF BI: The Linear Model of Research

Basic Research → Applied Research → Development → Technology → Application

Federal $$$

Infinite Time

Societal Benefit

Holland, 1928; Bush, 1945; Furnas 1948
NSF BI: The Linear Model of Research

Basic Research → Applied Research → Development → Technology → Application

Infinite Time

Implications:
• Only STEM Research can benefit society

Federal $$$

Societal Benefit

Holland, 1928; Bush, 1945; Furnas 1948
NSF BI: The Linear Model of Research

Implications:
- Only STEM Research can benefit society
- Researchers shouldn’t expect a benefit

Holland, 1928; Bush, 1945; Furnas 1948

Basic Research → Applied Research → Development → Technology → Application

Federal $$$

Infinite Time

How will my Basic Research Benefit Society?

Societal Benefit

ARE WE ASKING THE RIGHT QUESTION?
**NSF BI: The Linear Model of Research**

**Basic Research** → **Applied Research** → **Development** → **Technology** → **Application**

**Implications:**
- Only STEM Research can benefit society
- Researchers shouldn’t expect a benefit
- Research is not valid unless it benefits some specified aspect of society

**Societal Benefit**

**How will my Basic Research Benefit Society?**

**ARE WE ASKING THE RIGHT QUESTION?**

Holland, 1928; Bush, 1945; Furnas 1948
Tenets of the Broader Impacts Conceptual Framework: Demystifying the NSF broader impacts definition

• Encompasses the potential to benefit society and contribute to achievement of specific, desired societal outcomes (NSF-15-1)

  • Achieving a Goal
    • Obtaining an outcome
    • Specifying the amount of time to achieve a goal
    • Defined measures (assessments) to determine if goal is accomplished

  • Societally Desirable
    • Positive benefit on society or an aspect of society (not one way benefit)
    • Deemed relevant for societal members

  • Process
    • Working with other stakeholders
    • Before, during, and after endeavor
The Broader Impact Conceptual Framework

Question:

Societal Benefit

Basic Research → Applied Research → Development → Technology → Application

Federal $$$

Shorter Time

Process with Stakeholders
Achieving a Specified Goal
Finite Time

Holland, 1928; Bush, 1945; Furnas 1948
The Broader Impact Conceptual Framework (BICF) Question:

How Do Research and Society Benefit Each Other?

Implications:
- ALL research can benefit society
- Researchers should expect a benefit
- Research is valid because it benefits different aspects of society and the researcher in society

Basic Research → Applied Research → Development → Technology → Application

Federal $$$

Shorter Time

Process with Stakeholders
Achieving a Specified Goal
Finite Time

Societal Benefit

PAF

Higher Quality Broader Impacts

How Do Research and Society Benefit Each Other?
BROADER IMPACTS: Encompassing the potential to benefit society and contribute to achievement of specific, desired societal outcomes (NSF-15-1)
1. Faculty conducting research can now indicate how all stakeholders, including themselves as the researcher, will benefit from the specified activity in a Broader Impacts Program.

2. Faculty should indicate all of the stakeholders.

3. Faculty should describe what process/es were developed with all stakeholders to achieve this benefit.

   - Remember that BICF implies that Broader Impacts are intentionally planned, beneficial, happen in a specified time, and are can be measured.
3. Faculty should provide a timeline that indicates when this benefit will be obtained. This means having a Broader Impacts Evaluation Plan.

4. Faculty can discuss the potential indirect Broader Impacts as a function of the overall engagement. Then there should be a discussion to how this benefit fits into NSF’s (or other funding agency) large societally beneficial outcomes.

5. Faculty should receive a letter of support from the other stakeholder/s who can define their benefit, what process led them to realize a benefit could be obtained, how the researcher will benefit from the partnership, and project when and how the stakeholder/s will know if the benefit has been obtained.

- Remember that BICF implies that Broader Impacts are intentionally planned, beneficial, happen in a specified time, and are/can be measured.
1. NSF reviewers should expect that the first five items stated in the BICF implication section for faculty should be described in the Broader Impacts statement and then further elaborated on in the Broader Impacts narrative.

2. NSF reviewers should expect faculty and other who submit a NSF proposal to have a Broader Impacts Program / Portfolio rather than just random activities.

• Remember that BICF implies that Broader Impacts are intentionally planned, beneficial, happen in a specified time, and are/can be measured.
3. There **should be evidence in the letter of support** that all stakeholders **involved**, including the researcher, **will obtain a benefit** - that is **intentional**, will happen **in a finite amount of time**, and **how it will be measured**. If this cannot be determined in the proposal then the claimed broader impact is an impact, or potential indirect impacts. Impacts are consistent with the linear model of research and certainly could eventually benefit society. Therefore words like eventually should not be used in the Broader Impacts statement and narrative unless it is accompanied with the stated indirect Broader Impacts.

- Remember that BICF implies that Broader Impacts are intentionally planned, beneficial, happen in a specified time, and are/can be measured.
Conclusions: Why Should Faculty Care?

- **Faculty benefit from broader impacts**
  - Become a more comprehensive researcher
  - Increase ability to conduct more basic research

- **Faculty can have a basic understanding of what should be included in a broader impacts statement**
  - Process with stakeholders for Achieving a specified goal in a Finite time that is measured

- **Faculty can achieve higher quality broader impacts**
  - Increasing your PAF to societal benefit
  - Becomes a guide for faculty to faculty interactions and faculty to greater community /society interactions

- **Broader impacts can be utilized to shorten the time that basic research can be applied**
  - Provides a better link between basic and applied research
Part II: The Broader Impacts
Conceptual Framework- Developing a Broader Impacts Program

Encompassing the potential to benefit society and contribute to achievement of specific, desired societal outcomes (NSF-15-1)

Michael Thompson, PhD
Director of Broader Impacts in Research
University of Oklahoma
What is the Fundamental Difference between Impacts and Broader Impacts?

Answer: FINITE TIME
BROADER IMPACTS: Encompassing the potential to benefit society and contribute to achievement of specific, desired societal outcomes (NSF-15-1)
What is the Fundamental Difference between Broader Impacts and Outreach?

• Answer: PLANNED BENEFITS FOR ALL STAKEHOLDERS
Broader Impacts vs Outreach:

BROADER IMPACTS: Encompassing the potential to benefit society and contribute to achievement of specific, desired societal outcomes (NSF-15-1)
Broader Impacts vs Outreach:

BROADER IMPACTS: Encompassing the potential to benefit society and contribute to achievement of specific, desired societal outcomes (NSF-15-1)
Developing A Broader Impacts Program:

Process with stakeholders for Achieving a specified goal in a Finite time that is measured

1. Start a year in advance or as early as possible, the earlier the better.
2. Review Broader Impacts Conceptual Framework PowerPoint before developing a Broader Impacts Program.
3. Determine the origin of your broader impacts (i.e., research, teaching, service/outreach, or combination).
4. Determine if your broader impacts program focus will be in the state (range from your university to statewide), or regional (statewide to multi-state), or national (multi-state to all of the states), or international (beyond your country).
5. Contact your Broader Impacts in Research (BIR) Affiliate/Office/Unit/Director.
6. The BIR director will use a planning documentation framework created by the Mid-Continent Comprehensive Center (MCC), University of Oklahoma, depicted below to help you define, organize, implement, as well as to begin to understand how to evaluate your broader impacts program.

7. After broader impacts program is established the BIR director will follow-up yearly with you about your broader impacts program.
Part III: The Broader Impacts
Conceptual Framework- Assessing Your Broader Impacts Program

Encompassing the potential to benefit society and contribute to achievement of specific, desired societal outcomes (NSF-15-1)

Michael Thompson, PhD
Founding Director of Broader Impacts in Research
University of Oklahoma
The Future of NSF Broader Impacts:

• 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. If the size of the activity is limited, evaluation of that activity in isolation is not likely to be meaningful. Thus, assessing the effectiveness of these activities may best be done at a higher, more aggregated, level than the individual project. (NSF 15-1).
Evaluating and Understanding Your Broader Impacts:

PROGRAM

PROJECT

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component

Component
Evaluating and Understanding Your Broader Impacts Program:

Broader Impacts in Research (BIR) can help you to find ways to evaluate your broader impacts projects and programs.
Evaluating Your Broader Impacts Program:

BROADER IMPACTS: Encompassing the potential to benefit society and contribute to achievement of specific, desired societal outcomes (NSF-15-1)
BROADER IMPACTS: Encompassing the potential to benefit society and contribute to achievement of specific, desired societal outcomes (NSF-15-1)
BROADER IMPACTS: Encompassing the potential to benefit society and contribute to achievement of specific, desired societal outcomes (NSF-15-1)
BROADER IMPACTS: Encompassing the potential to benefit society and contribute to achievement of specific, desired societal outcomes (NSF-15-1).
BROADER IMPACTS: Encompassing the potential to benefit society and contribute to achievement of specific, desired societal outcomes (NSF-15-1)
BROADER IMPACTS: Encompassing the potential to benefit society and contribute to achievement of specific, desired societal outcomes (NSF-15-1)

Global/International Community:

BROADER IMPACTS

Partnerships

Partnerships

Partnerships

Sustainable Impact

Sustainable Impact

Sustainable Impact

RESEARCH

TEACHING

SERVICE/OUTREACH

BROADER IMPACTS: Encompassing the potential to benefit society and contribute to achievement of specific, desired societal outcomes (NSF-15-1)
What Can I Use As a Guide to Help Me Determine if My BI Program is Working?

• **Community-Engaged Research (CEnR)** is a framework or orientation for conducting research that supports the premise that people ought to be involved in the decisions, as well as the cultivation of information those decisions are guided by, that affect their lives (Cornwall and Jewkes 1995; Israel et al. 1998).

Source: [http://epa.gov/ncer/rfa/forms/cenr.pdf](http://epa.gov/ncer/rfa/forms/cenr.pdf)
What Can I Use As a Guide to Help Me Determine if My BI Program is Working?

Figure 1: Spectrum of Community Involvement in Research

<table>
<thead>
<tr>
<th>Increasing level of community involvement, impact, trust, and communication</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Outreach</strong></td>
</tr>
<tr>
<td>Some community involvement</td>
</tr>
<tr>
<td>Communication flows from the academic/Agency research partner to the community, to inform or share</td>
</tr>
<tr>
<td>Provides community with information</td>
</tr>
<tr>
<td>Entities coexist</td>
</tr>
<tr>
<td>Outcomes: Establishes channels for communication and outreach</td>
</tr>
<tr>
<td><strong>Consult</strong></td>
</tr>
<tr>
<td>More community involvement</td>
</tr>
<tr>
<td>Information or feedback obtained from the community to help inform the research project conducted by academic/Agency researchers</td>
</tr>
<tr>
<td>Entities share information and feedback</td>
</tr>
<tr>
<td>Outcomes: Develops connections and obtains information and feedback from community</td>
</tr>
<tr>
<td><strong>Involve</strong></td>
</tr>
<tr>
<td>Community involvement</td>
</tr>
<tr>
<td>Communication is bidirectional between the academic/Agency research partner and community</td>
</tr>
<tr>
<td>Involves more participation with community on issues</td>
</tr>
<tr>
<td>Entities cooperate with each other</td>
</tr>
<tr>
<td>Outcomes: visibility of partnership established with increased cooperation</td>
</tr>
<tr>
<td><strong>Shared Leadership/Participatory</strong></td>
</tr>
<tr>
<td>Strong bidirectional relationship</td>
</tr>
<tr>
<td>Decision making is equally shared; communication is bidirectional</td>
</tr>
<tr>
<td>Entities have formed strong partnership on each aspect of project from development to solution</td>
</tr>
<tr>
<td>Entities form bidirectional communication channels</td>
</tr>
<tr>
<td>Outcomes: Partnership building, Trust building</td>
</tr>
<tr>
<td><strong>Community-Driven</strong></td>
</tr>
<tr>
<td>Strong community leadership</td>
</tr>
<tr>
<td>Final decision making is at the community level</td>
</tr>
<tr>
<td>Communities may consult with external academic partners to assist with technical questions</td>
</tr>
<tr>
<td>Outcomes: Research reflects the needs and desires of the community, community leadership on issues of concern</td>
</tr>
</tbody>
</table>

The University of Oklahoma Broader Impacts Program Partnerships...

Coming Soon

BIR Catalogues
FOR MORE INFORMATION

Contact

Michael Thompson, PhD
Founding Director of Broader Impacts in Research (BIR)
Office of the Vice President for Research (VPR)
University Of Oklahoma (OU)
Email: mthompsonvpr1120@ou.edu
Website: http://bir.ou.edu
Phone: 405-325-5484