New Faculty National Science Foundation (NSF) Broader Impacts (BI) Workshop Series:

Conceptually Understanding BI Through the Research and Scholarship of Broader Impacts (SoBI) - Part iii.

MICHAEL THOMPSON, PHD “THE BROADER IMPACTS GUY”
DIRECTOR OF BROADER IMPACTS IN RESEARCH (BIR): HTTP://BIR.OU.EDU/
OFFICE OF THE VICE-PRESIDENT FOR RESEARCH (OVPR)
Conceptually Understanding the Term Broader Impacts (BI):

**Broader Impacts (BI)** - is defined as encompassing the ability to benefit society and contribute to achievement of specific, desired societal outcomes (NSF-16-1).
Broader Impacts (BI) is an International Issue !!!
What Does Broader Impacts (BI) Really Mean?: A Cross Case Analysis

Broader Impacts (BI) is defined as encompassing the potential to benefit society and contribute to achievement of specific, desired societal outcomes.

EU- Davis and Laas, 2014

So read, we may identify three important similarities between RRI and the criterion of broader impacts:

1. **Societally desirable**. NSF apparently has a conception of science, technology, engineering, and mathematics as working to achieve “societally relevant outcomes” - presumably outcomes “relevant” in a positive way, that is, outcomes society should desire (even if it does not). Both RRI and broader impacts seek science and innovation that serve society.

2. **Process**. There is in both criteria the idea of a process by which researchers in academia (and other research institutions) might work with industry and others to achieve societally desirable outcomes. Admittedly, the part played by process in the NSF criterion (“partnerships” and “participation”) seems far less central than in RRI (more about that below).

3. **Specific goals**. The list of societally desirable outcomes that the broader impacts criterion aims at is at least partially the same as that Europe has or might be expected to put together. For example, Europe wants its research and innovation to increase its economic competitiveness just as the US wants its research and innovation to do (see, for example, Directorate-General 2013).

England, Scotland, Wales, and Northern Ireland, 2014

**Impact: 20 per cent of the overall results**

**Definition for the REF**

‘Impact’ is any effect on, change or benefit to the economy, society, culture, public policy or services, health, the environment or quality of life, beyond academia.

**Information provided in submissions**

Each submission included:

- **Impact case studies**. These four-page documents described impacts that had occurred between January 2008 and July 2013. The submitting university must have produced high quality research since 1993 that contributed to the impacts. Each submission included one case study; plus an additional case study for every 10 staff.

- An impact template. This document explained how the submitted unit had enabled impact from its research during the period from 2008 to 2013, and its future strategy for impact.

**Assessment criteria**

Impact case studies were assessed in terms of the ‘reach and significance’ of the impacts.

Impact templates were assessed in terms of how far the approach and strategy are conducive to achieving impacts.

Netherlands, 2014

**What is valorisation?**

Over the last decade there is an ongoing debate about the societal impact and utilisation of academic research. This is also called ‘valorisation of knowledge’ or ‘technology transfer’ and can be defined as:

The process of value-creation out of knowledge, by making this knowledge suitable and available for economic or societal utilisation and to translate this into high-potential products, services, processes and industrial activity.

**Broader Impacts (BI): Process with stakeholders/people for Achieving a specified goal that is societally beneficial in a Finite time that is measured (BICF Lexicon and SBT&P, 2014).**

Reference: Davis M. & Laas K., (2014), Sci Eng Ethics. A Comparison of Criteria...
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National Science Foundation (NSF) Merit Review Principles and Criteria

NSF uses two merit review criteria for evaluating research proposals for funding: Intellectual Merit and Broader Impacts. Both criteria are to be given full consideration during the review and decision-making processes; each criterion is necessary but neither, by itself, is sufficient. Therefore, proposers must fully address both criteria.

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

Broader Impacts may be accomplished through the:

I. the research itself.
II. activities that are directly related to specific research projects
III. activities that are supported by, but are complementary to the project.

The following questions will be asked of BOTH CRITERIA when reviewing proposals:

1. To what extent do the proposed activities suggest and explore creative, original, or potentially transformative concepts?
2. 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?
3. How well qualified is the individual, team, or organization to conduct the proposed activities?
4. Are there adequate resources available to the PI (either at the home organization or through collaborations) to carry out the proposed activities?

The Broader Impacts criterion encompasses the potential to benefit society and contribute to the achievement of specific, desired societal outcomes. Such outcomes include, but are not limited to:

1. Full participation of women, persons with disabilities, and underrepresented minorities in STEM (specifically African Americans, Hispanics, Native Americans, Alaska Natives, and Pacific Islanders)
2. Improved STEM education and educator development at any level
3. Increased public scientific literacy and public engagement with science and technology
4. Improved well-being of individuals in society
5. Development of a diverse, globally competitive STEM workforce
6. Increased partnerships between academia, industry, and others
7. Improved national security
8. Increased economic competitiveness of the United States
9. Enhanced infrastructure for research and education

Note: Plans for data management and sharing of the products of research, including preservation, documentation, and sharing of data, samples, physical collections, curriculum materials, and other related research and education products should be described in the Special Information and Supplementary Documentation section of the proposal.
IMPACT:

To have a strong effect on someone or something and/or the action of something coming into contact with another resulting in a benefit (this is assumed but not always) which can happen in an infinite amount of time. This does not have to be planned.
Potential STEM and Social Science Stakeholders

- 200 US Taxpayers
- 74.3 Taxpayers Kids Ages 0-17
- 20.3 Students in Higher Education
- 1.56 Higher Education Staff and Faculty

References:
- IRS Tax Statistics
- US Department of Labor - Statistics
  http://www.dol.gov/dol/topic/statistics/
- Census for students
  http://www.census.gov/hhes/school/data/cps/2010/tables.html
- Higher education staff/faculty
How Do **YOU** Specifically Demonstrate Your Stakeholders Have Made a Wise Investment?

**BENEFITS**

- 74.3 Taxpayers Kids Ages 0-17
- 20.3 Students in Higher Education
- 1.56 Higher Education Staff and Faculty
- 200 US Taxpayers

**Numbers in Million**

References:
- IRS Tax Statistics
- US Department of Labor – Statistics
- Census for students
- Higher education staff/faculty
Disseminate knowledge and Communicate knowledge in cyclic fashion

*Impact Identities* coined by Julie Risien
The Five Structures of Broader Impacts (BI):

**BI IDENTITY:**
Is who you are, the way you think about yourself, the way you are viewed by the world, and the characteristics that define you based off of a process/es with stakeholders/people to achieve a societal benefit in a finite amount of time that is measured. Everyone has a BI identity.

**BI Identity Non-Academic definition:** Is who you are and how you plan to engage and benefit others by leaving a legacy through your research, teaching, occupation, and/or service.
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**Basic structure for thinking, writing, and evaluating your broader impacts***

- **Inputs**: Resources dedicated to or consumed during the event.
- **Activities**: What is done with the inputs to accomplish the goal, purpose, and objectives of the event.
- **Outputs**: The direct products and services of the inputs and activities of the event.
- **Outcomes**: Benefits for participants and other beneficiaries as a result of the activities and outputs of the event.

- **Short-Term Outcomes**
- **Intermediate Outcomes**
- **Long-Term Outcomes**
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**BI Identity Non-Academic definition:** Is who you are and how you plan to engage and benefit others by leaving a legacy through your research, teaching, occupation, and/or service.
You May Already Be Doing Broader Impacts it Just Might Not be Getting Funded by NSF!!!
HOW DO I GET STARTED?

Understanding, Developing, Writing, and Implementing, Your Broader Impacts Identity (BII):

**Broader Impacts Identity (BII)** - Is who you are, the way you think about yourself, the way you are viewed by the world, and the characteristics that define you based off of a process/es with stakeholders/people to achieve a societal benefit in a finite amount of time that is measured. Everyone has a BI identity. (BICF Lexicon and SBT&P, 2014).

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how do you plan to accomplish this in your research, teaching, and service? (i.e. what is the one thing that you can do in your research, in your teaching, and in your service, such that by doing it everything else becomes easier or unnecessary at this 15 year point?) *no more than 6 sentences for this section.*

**Broader Impact Identity**

The Smith Collaboratory (TSC)*, using participatory and co-communal methods to produce geographic knowledge, seeks to benefit local, university, regional, and trans-border communities by investigating, understanding, and portraying the impacts of cultural policies, political atmospheres, and environmental imagery about, from, with, and in response to historically underrepresented perspectives—particularly those formulated and fostered in terms of Indigenous, gender and nation. This is done in three main ways.

**Creative Scholarship & Research**

Interpretive study of the organizational geographies and exhibition tactics of Indigenous media, as well as collaborative visualizations of Indigenous geographies.

- Recently Completed Projects:
  - Organizational ethnography of Indigenous video production and consumption in Canada, Mexico, and cultural publications of articles and book chapters
  - Production of two Indigenous videos: Listening for the Rain and Reclaiming Your Creek Superfund Site

- Future Work:
  - Video portraits of Tribal Environmental Professionals
  - Examination of Indigenous video production in Peru
  - More media art projects focused with geospatial and fieldwork informed data

**Teaching & Mentorship**

Post-colonial pedagogies for exploring the cultural and geographical geographies of authoritative knowledge production and encouraging inquiry into how scientific diplomacy and performance changes over time and space.

- Undergraduate Courses:
  - Introduction to Human Geography
  - What is Science?
  - American Landscape
  - Research Methods and Professional Development

- Undergraduate / Graduate Course:
  - Interpreting Society & Environment, Qualitative Research Methods

- Graduate Courses:
  - Introducing Critical Theory
  - Contemporary Geopolitical Thought
  - Geographies of Development
  - Critical Geopolitics

**Community Engagement**

Catalyzing, promoting, and participating in events that showcase Indigenous media and facilitate helpful conversations about social and environmental justice.

- University of Oklahoma Screening Partners:
  - Native Crossroads Film Festival & Symposium
  - Department of Anthropology and Department of Geography & Environmental Sustainability
  - College of International Studies
  - College of Atmospheric & Geographic Sciences

- Other Recent Screening Partners:
  - South Central Climate Science Center
  - Oklahoma City Public Schools, Metro-tech, and Oklahoma City Community College

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*THE SMITH COLLABORATORY (TSC):* The integration of multi-disciplinary national/international partnerships to provide culturally supportive scholarship, teaching, and mentorship.

*Professionaly where would you like to be in 15 years in your teaching, research, and service? I.e. Would you like to have a center, institute, a huge network; Be known locally, regionally, nationally, internationally; What kind of impact in your teaching, research, and service? (No more than 10 sentences for this section. Make sure to elaborate on teaching, research, and service for this question.) Please type here:

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Long-Term Outcomes to Impacts

Translating the FII-SAP into the BI Identity/Professional Identity Canvas
NSF 5 Step Development Plan

NSF BI 5-Step Plan Development Review Sheet:

Step 1: Have you performed an inventory of your BI internal factors below? Yes or No
- What are your strengths?
- What are you passionate about?
- What does your research lend itself to?
- What is your time, effort, and logistical constraints?

Step 2: Have you performed an inventory of the BI external factors below? Yes or No
- Who is your audience?
- What level?
- What context?
- What exists already?
- What is missing?
- Who are your potential partners?

Step 3: Have you defined your goals? Yes or No
- Is your BI plan specific?
- Is your BI plan measurable?
- Is your BI plan realistic?

Step 4: Have you established BI implementation details? Yes or No
- What is your BI timeline (with milestones)?
- What is your BI budget?
- What is your BI effort, personnel?
- What is your BI assessment/evaluation to determine your BI success?
- What will you do to ensure that your BI is sustained past the funding period?

Step 5: Here are several other basic elements for success. Check all that apply.
- Have you provided sufficient detail (avoid leaving assumptions about the project plan to the reviewers)?
- Have you integrated your education and research activities to the best degree possible?
- Have you aligned the project with collaborators/stakeholders/partners as appropriate?
- Have you involved your whole lab if possible?
- Have you include meaningful engagement with underrepresented groups if possible?

Note: Please contact SIR and/or CIPEE for clarification if needed.

Revised UC Berkeley Checklist
Broader Impacts Identity (BII) - Is who you are, the way you think about yourself, the way you are viewed by the world, and the characteristics that define you based off of a process/es with stakeholders/people to achieve a societal benefit in a finite amount of time that is measured. Everyone has a BI identity. (BICF Lexicon and SBT&P, 2014).

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Identity Development is closely tied to Career Development which embodies crystallization, specification, and implementation, (Kail and Cavanaugh, 2000), can be extrapolated to Graduate, Faculty, and etc., Development.
The Components that Make up Your BI Identity

1. Research and/or Teaching and/or Service

2. Societally Centric Beneficial Engaged Outcomes (SCBEO)

3. Legacy in Addition to Your Field
**Broader Impact Identity**

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**Recently Completed Projects:**
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- Production of two Indigenous videos: *Listening for the Rain* and *Remotely Setting* (*Tar Creek Superfund Site*)

**Future Works:**
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- Examination of Indigenous video production in Peru
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