Broader Impacts

What are possible Broader Impacts

Broader impact activities don't need to be a separate add-on to your research.

Your project can have broader impacts through:

- Your research activities.
- Activities directly related to your research.
- Activities that are supported by, but complementary to, your research activities.

Example of Broader Impact exclusively tied to research

Development and Testing of a Global Quasi-3-D Multi-scale Modeling Framework

The work has broader impacts for the research community because it develops a new atmospheric model which is applicable to a range of research areas related to the impact of clouds on large-scale weather and climate phenomena. To ensure accessibility to the broader research community, the Q3D MMF will be constructed using a version of CAM (the spectral element version) as the GCM component. CAM is freely available, well supported and documented, and widely used, thereby maximizing accessibility. In addition, CAM is the atmospheric component model of the Community Earth System Model, which is used for projections of future climate change that inform decision makers concerned with climate impacts on natural and human systems.

What are potential channels for Broader Impact? *Non-exclusive* NSF list

- **Infrastructure**- Enhancing infrastructure for research and education.
- **Economic competitiveness-** Increasing the economic competitiveness of the U.S.
- **National security-** Improving national security.
- **STEM education-** Improving education and educator development — at any level — in science, technology, engineering and mathematics.
- **Public engagement-** Increasing public scientific literacy and public engagement with STEM.
- **Societal well-being-** Improving the well-being of individuals in society.
- **STEM workforce-** Developing a globally competitive STEM workforce.
- **Partnerships-** Building partnerships between academia, industry and others.

How are Broader Impacts evaluated as part of a proposal?

Grant reviewers will evaluate your broader impacts statement on these five criteria:

- What is the potential for the proposed activity to benefit society or advance desired societal outcomes?
- To what extent do the proposed activities suggest and explore creative, original or potentially transformative concepts?

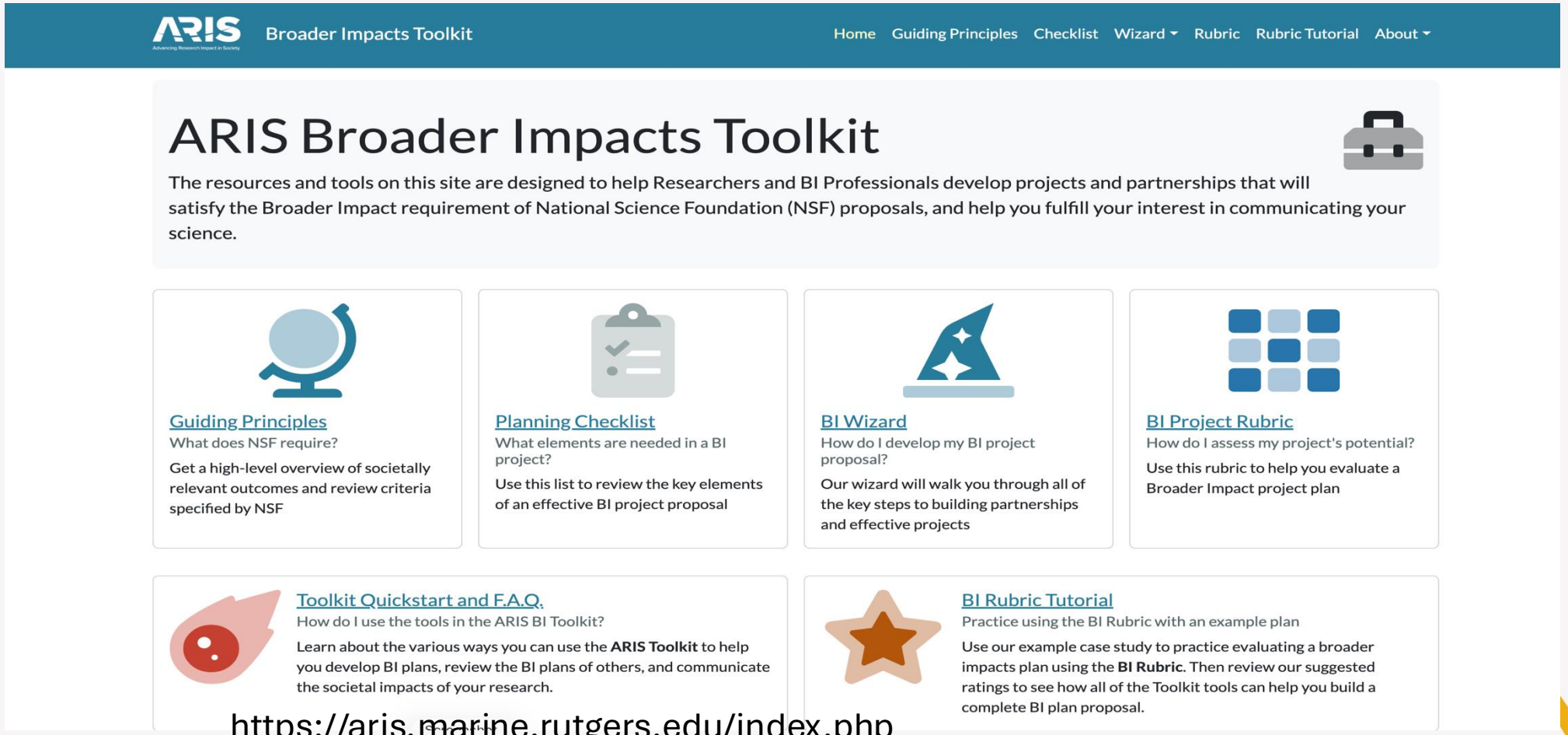
Some reviewers are looking for something new or novel with each NSF proposal, and others are looking for broader impact activities that have a proven record of success; there is no guarantee of what kind of reviewer your proposal will receive. The same problem exists with intellectual merit…

In terms of broader impacts, it is fine for proposers to include existing programs in their broader impacts plans. In this instance, I counsel PIs to include a statement on what their project will bring to the existing program if funded. This helps the reviewers to see the benefit of leveraging an existing and effective program along with how the new funding will enhance it. It is also important for PIs who want to try something unconventional or novel in their broader impacts plan to cite the relevant literature to explain why this broader impact activity is a good fit for the project and the audience.

- Is the plan for carrying out the proposed activities well-reasoned, well-organized and based on 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 principal investigator (either at the home institution or through collaborations) to carry out the proposed activities?

Susan D Renoe, An insider perspective on broader impacts, *BioScience*, Volume 75, Issue 3, March 2025, Pages 207–211, https://doi.org/10.1093/biosci/biaf004

Resources to help you assess the quality/completeness of your proposed Broader Impacts



https://aris.marine.rutgers.edu/index.php

Changes since January 2025-

Broadening Participation--There are characteristics that can be used when discussing broadening participation in STEM. These non-protected characteristics include traits such as socioeconomic status, geography, institutional type, and career stage. Broadening participation can still be used as long as your activities and research are open to all Americans.

Where do I integrate BI in my NSF proposal?

Include broader impacts in the following:

- Project summary – must have own heading
- Project description – must have own heading
- Evaluation plan
- Timelines (if applicable)
- Results from prior NSF support and
- In the synergistic activities section of your biosketch

Guidance on Broader Impacts

Can be evidenced in many different ways, but remember to:

- Leverage existing programs and networks
- Assign Resources to Broader Impacts
  - Partners
  - Supplies
  - Staff
- And engage with BI partners early

WVU and Regional Broader Impact Partners

WVU CE-STEM

CENTER FOR EXCELLENCE IN STEM EDUCATION

Center for Excellence in STEM Education Strategic Plan

Vision: To break the cycle of poverty and improve health in West Virginia through education in the STEM disciplines.

Mission: To serve a key role in improving education in the STEM disciplines, grades K-20.

- Opportunity to build institutional reputation in STEM education research
- Opportunity to support STEM faculty in more effective broader impacts work

Financial Impact: On October 31, there were 149 active NSF grants in WV, 106 to WVURC. Of those, more than 20% had been written by or supported in some way by the Center. (New Center-supported funding received in 2025: $9,498,251, and a bit over $35M in the prior 5 years.)

304 293-5030
stem.center@mail.wvu.edu

Where we saw we were needed:

CENTER FOR EXCELLENCE IN STEM EDUCATION

Support of STEM faculty in achieving good broader impacts and nurturing any WVU faculty interested in engaging in STEM education improvement/research!

We engage with STEM faculty on CAREER and bench research proposals, offering support for their proposals as a whole, and focusing their broader impacts sections (where we can also provide connections with K-12, assessment or mentoring as needed). We provide letters of support for proposals for Broader Impact projects, social sciences research, evaluation services, and aid more novice PIs in the entire proposal writing process including drafting NSF documents required for proposal submission such as summaries, data management plans, biosketches, and mentoring plans.

304 293-5030
stem.center@mail.wvu.edu

West Virginia Science Public Outreach Team (WVSPOT)

Website: wvspot.org

Email: spot.wv@gmail.com

Director: Sophie Saint Georges, (304) 456-2368

WVU STEMCARE

WVU STEMCARE: A statewide initiative in partnership with Mylan–A Viatris Company, delivering hands-on STEM activities, classroom resources, and outreach for K–12 students and teachers that build a growth mindset and strengthen problem-solving skills through real-world STEM learning experiences.

Website: https://extension.wvu.edu/stemcare

STEMCARE®

TURNING POSSIBILITIES INTO OPPORTUNITIES

WVU STEAM TAC

WVU STEAM TAC: Delivers in-class STEAM experiences for grades 6–12 through hands-on “classroom immersions,” in which STEAM TAC specialists lead design-based challenges alongside educators and students in schools across the state. Sponsored by industry partners and WVU college units, each immersion highlights specific college and career pathways and includes pre- and post-lesson materials, instructional resources, toolkits, and follow-up support to extend STEAM learning beyond the classroom visit.

Website: https://steamtac.wvu.edu/

Contact: Dr. Jen Robertson-Honecker Jen.Robertson@mail.wvu.edu,

WVU Extension Associate Professor

WVU STEMCARE Director and WVU STEAM TAC Faculty Liaison

4-H STEM Initiatives

WVU STEM Ambassador Program and 4-H Summer Camps: Each summer, our STEM programs engage thousands of youth statewide through hands-on learning experiences that build connections to real-world research and future college and career pathways.

The Annette S. Boggs STEAM Education Center at WVU Jackson's Mill: A hub for hands-on learning, the center engages thousands of youth and educators annually through field trips, professional development, and programs like 4-H Code Camp, with access to innovative tools such as 3D printers, laser cutters, and mini-PCR technology.

Website: https://extension.wvu.edu/youth-family/4h/programs/stem

Contact: Suzanne McDonald smcdonal@mail.wvu.edu

WVU Extension Service Associate Professor

EXTENSION

Office of Undergraduate Research

For Faculty Mentors, the Office of Undergraduate Research:
connects faculty with student researchers;
aids faculty members in supporting undergraduate research activities;
provides budgetary templates and language for inclusion of undergraduate researchers in proposals;
aids faculty in writing proposals to support undergraduate research sites (e.g., NSF REU Site proposals);
offers on-campus programming (e.g., SURE), career mentoring speakers, and coordinated workshops for undergraduate researchers;
acts as a resource for undergraduate research activities across WVU.

https://undergraduateresearch.wvu.edu

Spark! Imagination and Science Center
(located in Morgantown)

- **What is Nano?** Learn about this cutting edge science of materials a billionth of a meter in size.
- **Sun, Earth, Universe** -Learn about how scientists study the Earth, Sun, solar system and universe; design, build and test your own model spacecraft; use tools to see the invisible; and see how scientists use color to help us understand data
- **Space Weather** -Investigate weather in space and how it effects Earth while exploring a plasma ball, magnets, and more
- **Cam's Imagination Playground** -Our newest and bluest exhibit promotes creativity, collaboration, and problem solving skills.
- **Dinosaurs** -Uncover the world of dinosaurs by becoming a paleontologist, digging for fossils, and putting a dinosaur together.
- **Engineer It!** Try out those engineering skills by planning, building, testing, and re-working creations with a ball ramps, wind tunnel, light table, magnetic tiles, and more. (Sponsored by KeyLogic)
- **Grow Up Strong!** Encourage children to take care of their bodies through exercise, nutrition, and visiting the doctor and dentist in this exhibit. (Sponsored by Cardinal Pediatrics)
- **Mary McIntosh Davis Imagination Station**- Ignite imagination through dress-up, puppets, percussion instruments, and more.

https://sparkwv.org

The Osher Lifelong Learning Institute (OLLI)

The Osher Lifelong Learning Institute (OLLI) at WVU promotes connection, curiosity, exploration, discovery, and discussion through learning and social engagement in non-credit classes, lectures, field trips, and events designed for older adults. We foster a vibrant community where learning thrives through peer exchange, collaboration, and leadership.

Contact: Jascenna Haislet, Director

Jascenna.haislet@hsc.wvu.edu

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http://www.olliatwvu.org

WestVirginiaUniversity. | OSHER LIFELONG LEARNING INSTITUTE OLLI