

A thought to
ponder . . .

How do you articulate the value of
your research to society?



RESEARCH, INNOVATION & IMPACT
Societal Impact

Exploring Broader and Societal Impacts of Research

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RESEARCH, INNOVATION & IMPACT
Societal Impact



THE UNIVERSITY OF ARIZONA



Societal Impact

HOME ABOUT US EVENTS & WORKSHOPS PARTNERS ▾



RESEARCH, INNOVATION & IMPACT

Societal Impact

Mission: To work collaboratively with University of Arizona's faculty, researchers, scholars, and practitioners, and in partnership with our communities, to ensure that **equitable participation and the greatest possible societal impact of UArizona research is realized.**

<https://impact.arizona.edu>



Today's Agenda

Introduction to Research Impact

Connecting Societal Impact to Your Research

Impact Categories

Break

Understanding Your *WHY*

Planning for Impact

Impact Identity

Documenting Your Impact

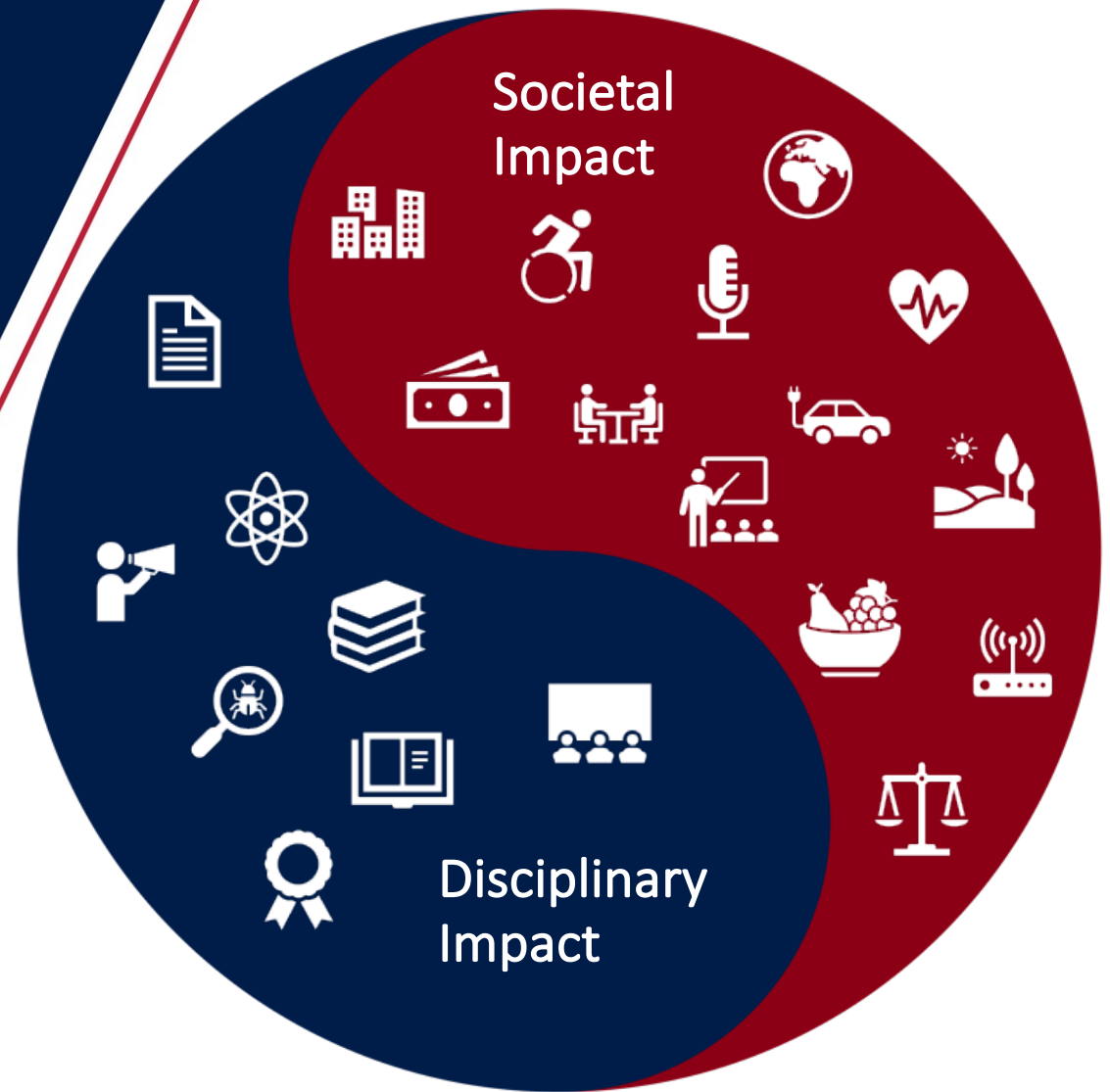
Resources

Networking

Research Impact

This research is too interesting to go to a peer-reviewed journal to only be seen by others in your discipline

Ask 'so what?', then keep asking 'so what?' until you can't ask it again





Research investments at UA, opportunities for impact



UA R & D Portfolio – For FY2020 R&D was **\$760M**.
For FY2021, it was **\$770M**



There are currently **2241 active funding awards**. Both faculty and non-faculty are PIs/Co-PIs on active awards (about 1556 of these are T/TE faculty)

Societal: Of or pertaining to society (**people** living together, in a more or less ordered community) or social groups, or to their activities.

- Public
- Community
- Social
- Civil
- Communal
- Collective
- Shared
- Common
- Group
- Civic



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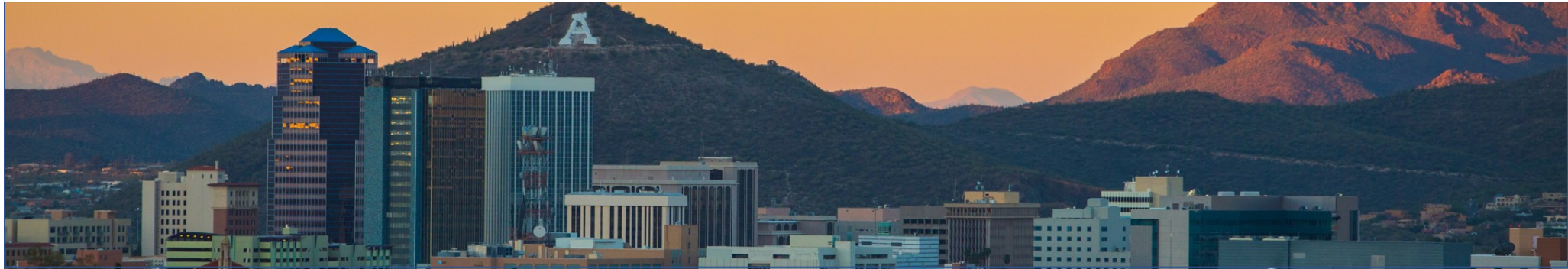


Impact:

- The effect or influence of one person, thing, or action on another
- To have a strong effect on something or someone



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What are Societal Impacts of Research?

Societal impacts are the ways that research, and the process of conducting research, contributes to society beyond the academic realm



Questions?

Connecting Your Research to Societal Impacts



How do you get societal impacts through research?



1. You do good research



2. That research connects to society

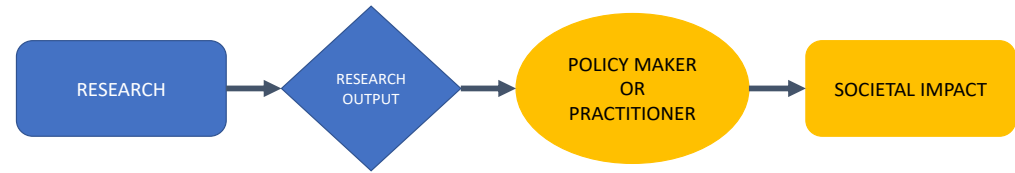


3. Societal partners use that research

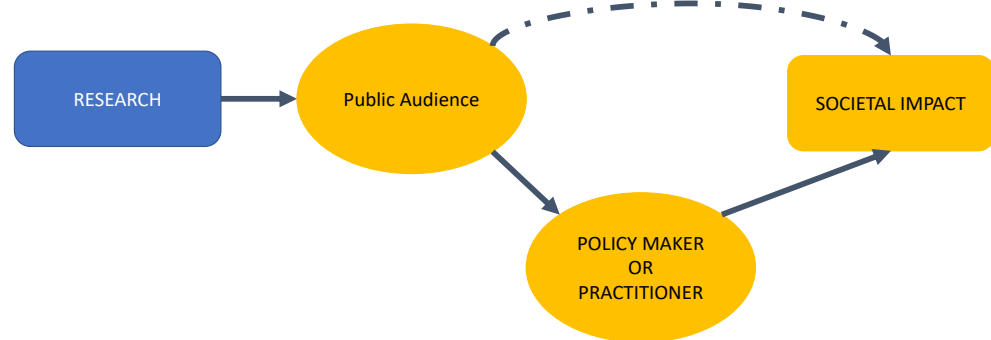


4. That research changes something for a person, organization, community, or ecosystem

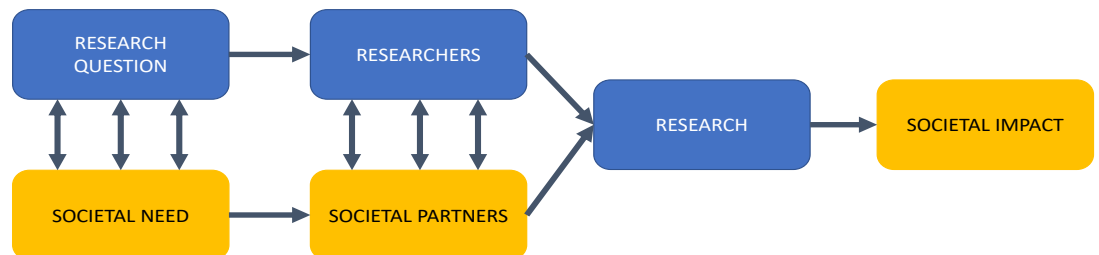
Impact Pathways



Adapted from Muhonen et al. 2020



Adapted from Muhonen et al. 2020



Adapted from Muhonen et al. 2020



Impact Categories & Frameworks



NSF's Broader Impacts Categories

| | "Archived" List | America COMPETES 2010 | AICA 2017 | PAPPG (current) |
|---|--|---|--|--|
|  <i>Training Students, STEM Education, and Workforce</i> | Advance discovery, training graduate students, mentoring postdoctoral researchers and junior faculty, involving undergraduates | Development of a globally competitive STEM workforce; improved undergraduate STEM education; improved pre-K-12 STEM education and teacher development | Developing an American STEM workforce that is globally competitive through improved pre-K-12 STEM education and teacher development, and improved undergraduate STEM education and instruction | Improved STEM education and educator development at any level; development of a diverse, globally competitive STEM workforce |
|  <i>Broadening Participation</i> | Broaden participation of under-represented groups | Increased participation of women and underrepresented minorities in STEM | Expanding participation of women and individuals from underrepresented groups in STEM | Full participation of women, persons with disabilities, and underrepresented minorities in STEM |
|  <i>Enhanced Infrastructure and Partnerships</i> | Enhance infrastructure for research and education | Increased partnerships between academia and industry | Enhancing partnerships between academia and industry in the U.S. | Enhanced infrastructure for research and education; increased partnerships between academia, industry, and others |
|  <i>Knowledge Dissemination and Scientific Literacy</i> | Broaden dissemination to enhance scientific and technological understanding | Increased public scientific literacy | Improving public scientific literacy and engagement with science and technology in the U.S. | Increased public scientific literacy and public engagement with science and technology |
|  <i>Societal Impact and Economic Competitiveness</i> | Benefits to society may occur when results of research and education projects are applied | Increased national security and economic competitiveness of the U.S. | Increasing the economic competitiveness of the U.S.; advancing the health and welfare of the American public; supporting national defense | Improved well-being of individuals in society; improved national security; increased economic competitiveness of the U.S. |



SUSTAINABLE DEVELOPMENT GOALS

17 GOALS TO TRANSFORM OUR WORLD

| | | | | | |
|--|--|--|--|--|--|
| 1 NO POVERTY | 2 ZERO HUNGER | 3 GOOD HEALTH AND WELL-BEING | 4 QUALITY EDUCATION | 5 GENDER EQUALITY | 6 CLEAN WATER AND SANITATION |
| 7 AFFORDABLE AND CLEAN ENERGY | 8 DECENT WORK AND ECONOMIC GROWTH | 9 INDUSTRY, INNOVATION AND INFRASTRUCTURE | 10 REDUCED INEQUALITIES | 11 SUSTAINABLE CITIES AND COMMUNITIES | 12 RESPONSIBLE CONSUMPTION AND PRODUCTION |
| 13 CLIMATE ACTION | 14 LIFE BELOW WATER | 15 LIFE ON LAND | 16 PEACE, JUSTICE AND STRONG INSTITUTIONS | 17 PARTNERSHIPS FOR THE GOALS | SUSTAINABLE DEVELOPMENT GOALS |

REF2021

Research
Excellence
Framework

Areas of Impact:

Impacts on the health and wellbeing of people, and animal welfare

Impacts on creativity, culture and society

Impact on social welfare

Impacts on commerce and the economy

Impacts on public policy, law and services

Impacts on production



Impacts on practitioners and delivery of professional services, enhanced performance or ethical practice

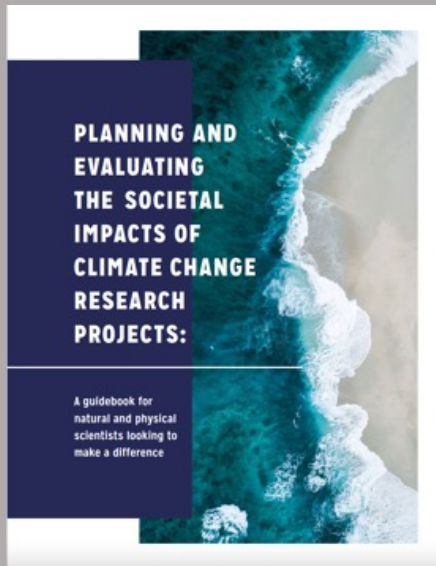
Impacts on the environment

Impacts on understanding, learning and participation



Research Impact Toolkit

| | | | |
|-----------------|---|---|--|
| ACADEMIC IMPACT | ACADEMIC  Contribution to advances across and within disciplines, including significant advances in understanding, method, theory and application. | CULTURAL  Contribution to people's understanding of ideas and reality, values and beliefs. | ECONOMIC  Contribution to a company's revenues and profits (micro level), and economic returns through increased productivity or economic growth (macro level). |
| | EDUCATIONAL  Contribution to education, training and capacity-building, including through curricula, educational tools, and qualifications. | ENVIRONMENTAL  Contribution to managing the environment, such as protecting natural resources, reducing environmental pollution, improving weather forecasting, and tackling the climate crisis. | HEALTH  Contribution to public health, life expectancy, health-related quality of life, prevention of illness, and reduced health inequality. |
| | POLITICAL  Contribution to how policymakers act, to how policies are constructed, and to political stability. | SOCIAL  Contribution to community welfare and quality of life, and to behaviours, practices, and activities of people and groups. | TECHNOLOGICAL  Contribution to the creation or improvement of products, processes and services. |



Meadow, Alison M., and Gigi Owen. 2021. Planning and Evaluating the Societal Impacts of Climate Change Research Project: A guidebook for natural and physical scientists looking to make a difference. Tucson: University of Arizona. <http://doi.org/10.2458/10150.658313>



Instrumental impacts – your research led to tangible changes to plans, decisions, practices, or policies



Conceptual impacts – your research contributed to changes in people’s knowledge about or awareness of an issue



Capacity building impacts – your research contributed to enhancing the skills, expertise, or resources of an organization or group of people



Connectivity impacts – your research led to new or strengthened relationships, partnerships, or networks that endure after the project ends



Socio-environmental impacts – changes to social and/or ecological systems, such as improvements in health and well-being or in ecosystem structure and function, that result from actions taken because of your research.



Questions?



Revisiting. . .

How do you articulate the value of
your research to society?

To Better Understand Value, Explore Your *WHY*

So That Statement

- ✓ *"I will do A, so that B," . . .*
- ✓ *"so that X,"*
- ✓ *"so that Y,"*
- ✓ *"so that Z!"*

Asking *WHY*?

- ✓ *Why do I get out of bed each day?*
- ✓ *Why did I choose this research field?*
- ✓ *Why does my research matter?*
- ✓ *Why should anyone care?*

"I will offer a coding boot camp for female HS teachers, so that they can feel more comfortable teaching CS courses, so that they can encourage more girls to take CS, so that we get more females as CS majors, so that we have a more diverse CS workforce, so that we have more innovative solutions"



10-Minute
Activity

How do you articulate the value
of your research to society?



5-Minute Break

A blue ballpoint pen is positioned diagonally across a document featuring a bar chart with blue bars. The background is a dark gradient on the left side, transitioning into the document's content. An orange horizontal bar is located in the upper left corner of the dark area.

Planning for Impact



All proposals submitted to the NSF are evaluated on their intellectual merit (whether or not they advance the field) and their broader impacts (benefit to society).

NSF Broader Impacts



- **Broader Impacts:** the potential to **benefit society** and contribute to the achievement of *specific, desired societal outcomes*
- Broader Impacts may be achieved **through the research & education** itself, or **through specific activities** that are directly *related to identified outcomes*

Designing Your Broader Impacts Plan



What activities fit between *Desire* and *Reality*?

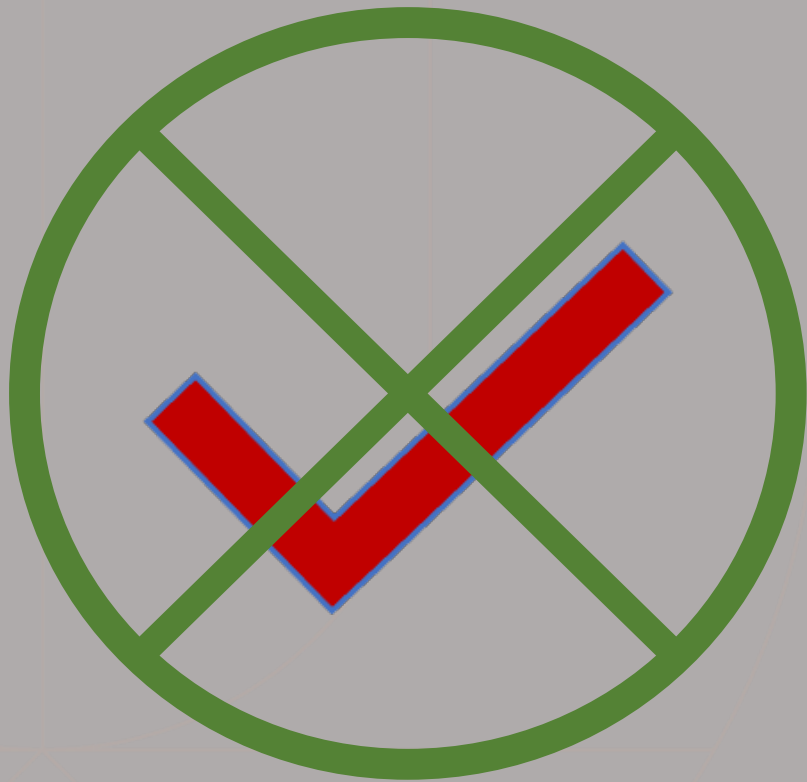
- Do activities align with your *WHY*?
- What do you want to try?
- What do you have experience with?
- What resources are available?
- What fits with the mission of your department?
- Are the activities appropriate for your target audience?

Designing Your Broader Impacts Plan

Consider:

- Audience
- Activities
- Outputs
- Short-term Outcomes
- Long-Term Outcomes
- Long-Term Impact that connects to the value of your research to society





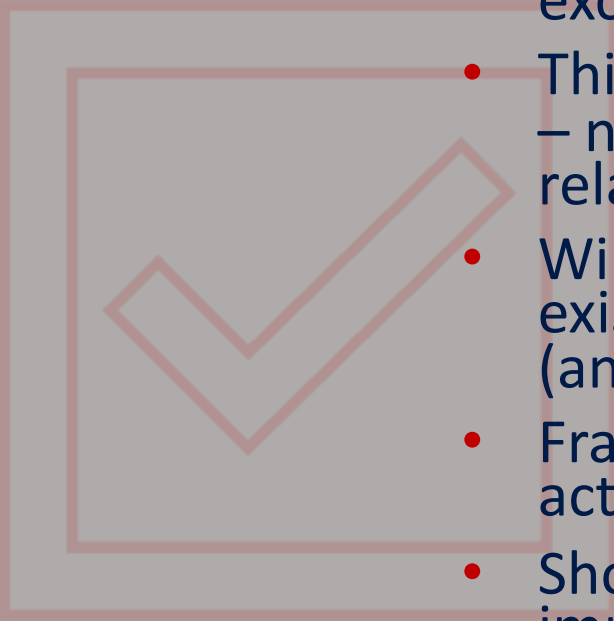
Broader Impacts

We are no longer just checking the box



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Impacts Plans

- 
- Approach it the same way as your research—with excitement, creativity, rigor and commitment
 - Think about who you want to partner with and why – new partners or building on existing relationships?
 - Will you create a brand-new initiative or are there existing programs or initiatives you can work with (and support)
 - Frame your plan as a program —not just a list of activities
 - Should integrate your research with your broader impact goals & objectives

Effective Broader Impacts are...

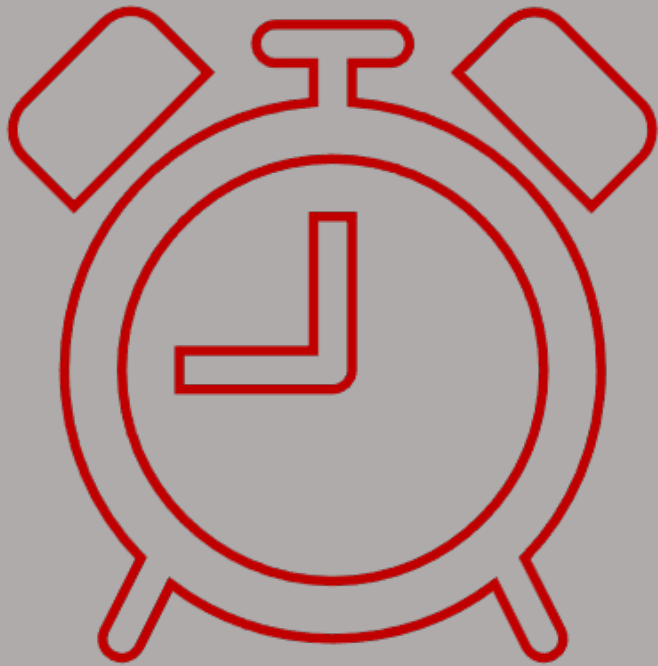


NSF is not alone

Funding agencies are expecting identifiable societal impacts from research they fund.

Arnett, James, Christine Kirchhoff, J., Ryan M. Meyer, Alison M. Meadow, and Angela T Bednarek. 2020. Sponsoring actionable science: What public science funders can do to advance sustainability and the social contract for science. *Current Opinion in Environmental Sustainability* 42:38-44.

| Funding body | Program area | Program feature |
|---|---|--|
| US National Oceanic and Atmospheric Administration | <i>National Estuarine Research Reserve System</i> [29] | Requires collaboration with users and evaluates changes in user context before and after project |
| US National Oceanic and Atmospheric Administration | <i>Regional Integrated Science & Assessment</i> [30] | Encourages co-production and provides longer-term programmatic style funding to build relationships within regions |
| EU Directorate General for Research & Innovation (Horizon Europe) | <i>Climate Services, Climate Action Work Programme</i> [31] | Requires co-production and engages with small & medium sized enterprises |
| UK Research & Innovation | <i>Global Challenges Research Fund</i> [32] | Requires collaboration with users and host country scientists |
| US National Aeronautics & Space Administration | <i>Applied Science, Earth Sciences</i> [33] | Requires attention to application readiness; and engagement (including financial contributions) by users |
| EU Directorate General for Research & Innovation (Horizon Europe) | <i>Science with and For Society</i> [32] | Encourages/requires citizen science & co-production |



**DON'T WAIT UNTIL
THE LAST MINUTE!!!!**



Try your hand

What Could Your Broader Impact Plan Look Like?

Organizing Your Thoughts: Backward Design*

What do you want to accomplish?

How would you know you've done it?

How will you do it? Who will help?

What will it take to do it?

What good will this project do?

*Wiggins, G., Wiggins, G. P., & McTighe, J. (2005). *Understanding by design*. Ascd.
<https://revistas.udistrital.edu.co/index.php/calj/article/view/11490>

Questions?



Developing Your Impact Identity



Consider this an essential part of your long-term career portfolio, not simply a different 'statement' for each proposal you write, or each project



Discovering your impact identity can help you to articulate your impact mission in proposals



Identify what societal impacts are priorities for you – in what ways are you hoping to change the world and why did you choose this professional pathway?



How might your current work actually change the world and for whom?



What people, programs, expertise, partners, institutions, tools do you already have access to that can help you reach your impact goals?



Getting Started

- What is your favorite thing to do? What are your hobbies?
- What do you NOT like to do?
- What things are you juggling?



Documenting Your Impact

Why I wrote an impact CV

It's not easy to demonstrate research impact, says Katherine Andrews – even when there's a clear clinical need, as in malaria drug development.

[Katherine Andrews](#)



Credit: Mark Kauzlarich/Bloomberg/Getty

Impact CV

<https://www.nature.com/articles/d41586-022-00300-6>

Headings

- Advancing Knowledge
- Research Capacity Building
- Informing Decision Making
- Health Impacts
- Economic Impacts
- Social Impacts
- Impact Practices

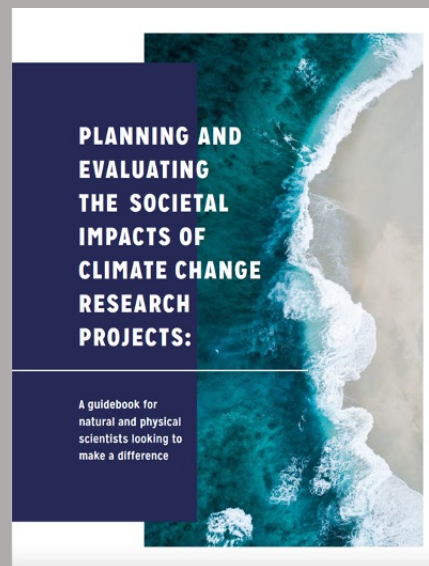
Tools for documenting impact

Research Impact Canada



https://researchimpact.ca/kmb_resource/impact-and-engagement-case-study-guidelines/

Meadow and Owen: Planning and Evaluating Societal Impacts



Meadow, Alison M., and Gigi Owen. 2021. Planning and Evaluating the Societal Impacts of Climate Change Research Project: A guidebook for natural and physical scientists looking to make a difference. Tucson: University of Arizona. <http://doi.org/10.2458/10150.658313>

UArizona Promotion Guidelines 2022 - 2023

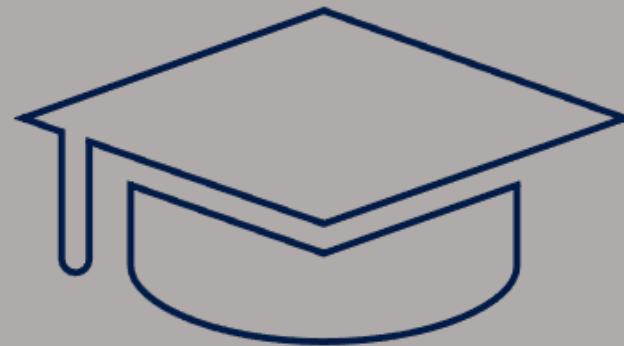
Advice on Candidate Statements

- How can you integrally relate your research and scholarship to your teaching and service to demonstrate your impact?
 - Has your research improved your teaching or position effectiveness? For example, have you worked with more graduate students or residents or helped collaborators in new ways?
 - How does your work *contribute to the missions of your department and the university*, for example, through the creation of internships, research opportunities, or partnerships?
 - What is the *broader social and economic impact* of your program of work?

UArizona Promotion Guidelines 2022 - 2023

Inclusive View of Scholarship

- recognizes “original research contributions in peer-reviewed publications as well as *integrative and applied forms of scholarship* that involve cross-cutting *collaborations with business and community partners*, including *translational research, commercialization activities*, and *patents*.”



UArizona Promotion Guidelines 2022 - 2023

Leadership and Service Portfolios

- This portfolio provides an opportunity to document the scope, quality, and impact of your contributions in areas that are *beyond the traditional academic community*. This section may include description and evidence of *community and economic impact* in extension, position effectiveness for information professionals or innovations in translational or applied research and/or patent inventions.
- *Can request a letter from partners* documenting research collaborations.



Activity:

- Broader impact identity worksheet



Training



Partnerships



Scholarship

ARIS

Advancing Research Impact in Society

ARIS Broader Impacts Toolkit



The resources and tools on this site are designed to help Researchers and BI Professionals develop projects and partnerships that will satisfy the Broader Impact requirement of National Science Foundation (NSF) proposals, and help you fulfill your interest in communicating your science.

This site is brought to you by the [Center for Advancing Research Impact in Society \(ARIS\)](#) and [Rutgers University](#).



Guiding Principles

What does NSF require?

Get a high-level overview of societally relevant outcomes and review criteria specified by NSF



Planning Checklist

What elements are needed in a BI project?

Use this list to review the key elements of an effective BI project proposal



BI Wizard

How to I develop my BI project proposal?

Our wizard will walk you through all of the key steps to building partnerships and an effective project



BI Project Rubric

How to I assess my project's potential?

Use this rubric to help you evaluate a Broader Impact project plan

<https://aris.marine.rutgers.edu/wizard/>

Checklist and Guiding Principles

The image shows two overlapping documents from ARIS (Advancing Research Impact in Society). The top document is the 'Broader Impacts Plan Checklist', which is a web-based tool. It includes a navigation bar with 'Plan Elements', 'Wizard', 'My Summary', 'Checklist', 'Rubric', and 'About'. The checklist text states: 'This checklist was developed from the NABI Guiding Principles document as a quick assessment to help you gauge the completeness of your BI Plan. You use this checklist to check off the items you have addressed in your plan. Then, review the items you have not addressed, and consider adding text to address them.' It contains several sections with checkboxes, including 'Does your project address one or more of the target outcomes for which NSF (check all that apply) values them?' and '2) What is the potential for the proposed activity to benefit society and contribute to achievement of specific desired societal outcomes?'. The bottom document is the 'Broader Impacts Review Document for National Science Foundation Proposals'. It features the ARIS logo and the title. The text explains that the document is designed to assist NSF program managers, proposal reviewers, and review panels. It also includes a section titled 'GUIDING PRINCIPLES AND QUESTIONS' with a list of outcomes: 'Full participation of women, persons with disabilities, and underrepresented minorities in STEM', 'Improved STEM education and educator development at any level', 'Increased public scientific literacy and public engagement with science and technology', 'Improved well-being of individuals in society', 'Development of a diverse, globally competitive STEM workforce', and 'Increased partnerships between academia, industry, and others'. The document also references the 'NSF Merit Review Criteria published in the Award Policies and Procedures Guide (PAPPG 20)'.

<https://aris.marine.rutgers.edu/wizard/>

Broader Impacts Wizard

The Broader Impacts Wizard will help you develop a broader impacts plan that will satisfy the National Science Foundation (NSF) Broader Impact requirements and fulfill your interest in communicating your science.

The quick and easy process will help frame discussions with your BI partner(s) to produce an outline of important points to include in your NSF proposal.

Note, as you go through the Wizard, there are questions you can answer to save your thoughts. This data is only saved locally in your web browser and is not shared with our server. When you are done, you can copy all your work from the [summary](#) page. This will give you the notes you need to continue your work on the Broader Impact elements of your proposal.



Wizard Objectives:

- Support early career researchers in developing Broader Impacts projects.
- Expedite facilitation of BI meetings with researchers
- Collection of effective practices in one product
- Case studies that illustrate effective practices and a career trajectory of doing BI



Non linear BI Plan Elements

Let's get started!

Start anywhere in the cycle to develop a strong BI plan.



Who will I engage?

Finding Partners and
Determining your Target
Audience

Determine who you
want to reach with your
BI efforts and how you
can have a positive
impact.



How much will this cost?

Developing your Budget

Brainstorm the
resources will you need
to achieve your
objectives and develop a
viable budget



How is my research relevant to society?

Explore a range of BI
options supported and
encouraged by NSF



How will I know if my BI project is successful?

Explore evaluation
strategies for your BI
project



Pulling it all together

Use our interactive
worksheet to draft an
outline for your BI plan

BI Rubric @

<https://aris.marine.rutgers.edu/wizard/rubric.php>



Broader Impacts Plan Rubric

Question 1: What is the potential for the proposed activity to benefit society or advance desired social outcomes?

| Excellent Job! | Very Good Job! | Good - You are headed in the right direction. | Fair - Reconsider your approach? | Poor - Needs Work? |
|--|---|---|---|--|
| Target audience characteristics: The characteristics of the target audience, including who they are, where they are located, and how many will be engaged are clearly described. The target audience is well-aligned with project objectives. | | | | |
| Participants are clearly described. The description includes strong details about who participants are and how many will engage in the project. The target audience is very well-aligned with project objectives. There are strong letters of collaboration. | Participants are described. The description includes details about who participants are and how many will engage in the project. The target audience is generally well-aligned with project objectives. There are letters of collaboration. | Participants are somewhat clearly described. There is some information on who participants are and how many will engage in the project. The target audience is somewhat well-aligned with project objectives. | Participants are not well described. There is little information on who participants are and how many will engage in the project. It is unclear if the target audience is well-aligned with project objectives. | Participants are not described. There is no information on who participants are and how many will engage in the project. |
| Target audience engagement: The mechanisms for engaging the target audience are clearly described and well-aligned with project objectives. | | | | |
| Mechanisms for engaging participants in the project are very clearly described and well-aligned with project objectives. | Mechanisms for engaging participants in the project are described and generally well-aligned with project objectives. | Mechanisms for engaging participants in the project are somewhat clearly described and somewhat well-aligned with project objectives. | Mechanisms for engaging participants in the project are not well described and not well-aligned with project objectives. | No information is provided on the mechanisms for engaging participants in the project. |

Research Impact Canada

The screenshot shows the homepage of Research Impact Canada. At the top, there is a navigation menu with links for LEARNING, RESEARCH, KMB FORUM, RESOURCES, ABOUT RIC, and BLOG. The main header features the Research Impact Canada logo and the tagline "TURNING RESEARCH INTO ACTION". Below this, a sub-header states: "Research Impact Canada is a pan-Canadian network dedicated to maximizing the impact of research for the public good." The central focus is a promotional banner for "THE CANADIAN KNOWLEDGE MOBILIZATION FORUM RETURNS! GET YOUR TICKETS". The banner includes a list of bullet points and a paragraph describing the forum as a biennial event for professional development and networking. Below the banner, a section titled "CHECK OUT SOME OF OUR WORK" features three cards: "RESOURCES" (peer-reviewed online repository), "COURSE" (practical online modules), and "FORUM" (bi-annual event). Each card has a corresponding icon and a "VIEW RESOURCES", "VIEW COURSE", or "LEARN MORE" button.

RESEARCH IMPACT CANADA | TURNING RESEARCH INTO ACTION

LEARNING RESEARCH KMB FORUM RESOURCES ABOUT RIC BLOG

The University of Arizona homepage

FR

TURNING RESEARCH INTO ACTION


Research Impact Canada is a pan-Canadian network dedicated to maximizing the impact of research for the public good.

-
-
-
-
-

THE CANADIAN KNOWLEDGE MOBILIZATION FORUM RETURNS! GET YOUR TICKETS

The Canadian Knowledge Mobilization Forum 2022 (CKM22) is happening virtually from June 13-17th, 2022. The Forum is a biennial event that provides opportunities for professional development, learning and networking for those interested in knowledge mobilization, translation, and exchange. It brings together a community dedicated to sharing learnings, best practices, tools, and resources. View the agenda here! In-Person Events in addition to the [...]


CHECK OUT SOME OF OUR WORK



RESOURCES

View our peer-reviewed online repository of knowledge mobilization tools and resources.


[VIEW RESOURCES](#)



COURSE

Follow a series of practical online modules, each focused on a specific knowledge mobilization skill.

[VIEW COURSE](#)



FORUM

Share what you know and learn from others working in the KMB field at this bi-annual event - happening June 2022!

[LEARN MORE](#)

<https://researchimpact.ca/>

For even more information

- Bayley, Julie Elizabeth, and David Phipps. 2019. Building the concept of research impact literacy. *Evidence & Policy: A Journal of Research, Debate and Practice* 15 (4):597-606.
- Edwards, David M, and Laura R Meagher. 2020. A framework to evaluate the impacts of research on policy and practice: A forestry pilot study. *Forest Policy and Economics*:101975.
- Greenhalgh, Trisha, James Raftery, Steve Hanney, and Matthew Glover. 2016. Research impact: a narrative review. *BMC medicine* 14 (1):78.
- Hicks, Diana, Paul Wouters, Ludo Waltman, Sarah De Rijcke, and Ismael Rafols. 2015. Bibliometrics: the Leiden Manifesto for research metrics. *Nature News* 520 (7548):429.
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Thank You

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- UA Societal Impact: impact@arizona.edu



RESEARCH, INNOVATION & IMPACT
Societal Impact

Give Us Some Feedback!



https://uarizona.co1.qualtrics.com/jfe/form/SV_37U4EYW4Xzyoh0y