

BROADENING & EVALUATING
“BROADER IMPACTS” IN
CRYOSPHERIC & POLAR SCIENCES
PROPOSALS & RESEARCH

Our goal is to make **recommendations for all** involved in proposing, developing, evaluating, and engaging in broader impacts activities.



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BROADER IMPACTS

Activities or outcomes that benefit society and contribute to “specific, desired societal outcomes”

“the science”



“the outreach”



Both [intellectual merit and broader impacts] are to be given full consideration during the review and decision-making processes; **each criterion is necessary but neither, by itself, is sufficient.**” (PAPPG, NSF 22-1)

GROWING VISIBILITY FOR THE PURSUIT OF BETTER BROADER IMPACTS

SCIWS23 Building Better Broader Impacts

Liesl A Hotaling, Eidos Education/Marine Technology Society, Highlands, NJ, United States, **Janice D McDonnell**, Rutgers University New Brunswick, Department of Youth Development, New Brunswick, NJ, United States, **Jason M Cervenc**, The Ohio State University, Byrd Polar and Climate Research Center, Columbus, United States, **Karina Peggau**, Ohio State University Main Campus, Byrd Polar and Climate Research Center, Columbus, OH, United States and **Melisa Diaz**, University of Colorado-Boulder, Geography, Boulder, United States

Workshop

📅 Sunday, 11 December 2022

🕒 09:00 - 13:00

📍 McCormick Place - S105d (South, Level 1)

ED56A-02 Connecting the Polar Literacy Principles Framework to your Next Broader Impacts Project

Janice D McDonnell, Rutgers University New Brunswick, Department of Youth Development, New Brunswick, NJ, United States and **Liesl A Hotaling**, Eidos Education/Marine Technology Society, Highlands, NJ, United States

Abstract

📅 Friday, 16 December 2022

🕒 17:55 - 18:05

📍 McCormick Place - N426c (North, Level 4)

NSF OPP Arctic Sciences Section Office Hours in October
Advancing Research Impact in Society (ARIS), researchinsociety.org



POTENTIAL, BUT NO GUARANTEE, FOR POSITIVE IMPACT

May create harms to communities, result in extractive practices, or fail to consider things like time, compensation, or access.

Risk of **reinforcing problematic misconceptions** of the cryosphere.

Enhance awareness, inclusion, interaction, and action amongst **local to global communities, industry partners, policy makers, student trainees, and future workforces.**

PROBLEMS



- **The “build it and they will come” model is ineffective.**

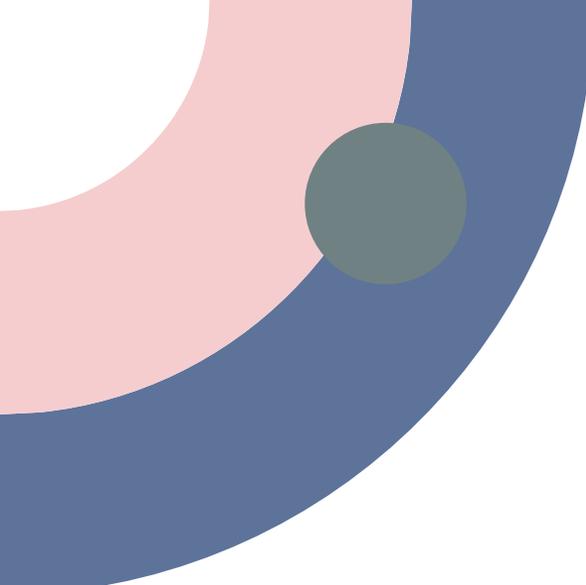
Efforts that are not designed with a clear audience and their patterns of information use in mind might only have limited engagement.

- **Proposers and reviewers may have little expertise in broader impact activities.**

We are often not trained in outreach, communication, mentoring, or co-production, nor do we have a grasp of the evidence from social science on how people think, feel, or behave with respect to science.

- **“After-thought” culture lower the bar on what is acceptable to propose and fund.**

- **Resource disparities between larger and small research institutions can limit the scale of broader impacts activities.**



RECOMMENDATIONS

PROPOSERS

Fund people for their time and expertise.

Connect with experts and resources early.

Treat broader as main outcomes

Let broader impacts evolve.

REVIEWERS

Look for letters and budget lines to support activities.

Check whether activities are supported sufficiently by institutional resources available.

Evaluate broader impacts with as much effort as intellectual merit.

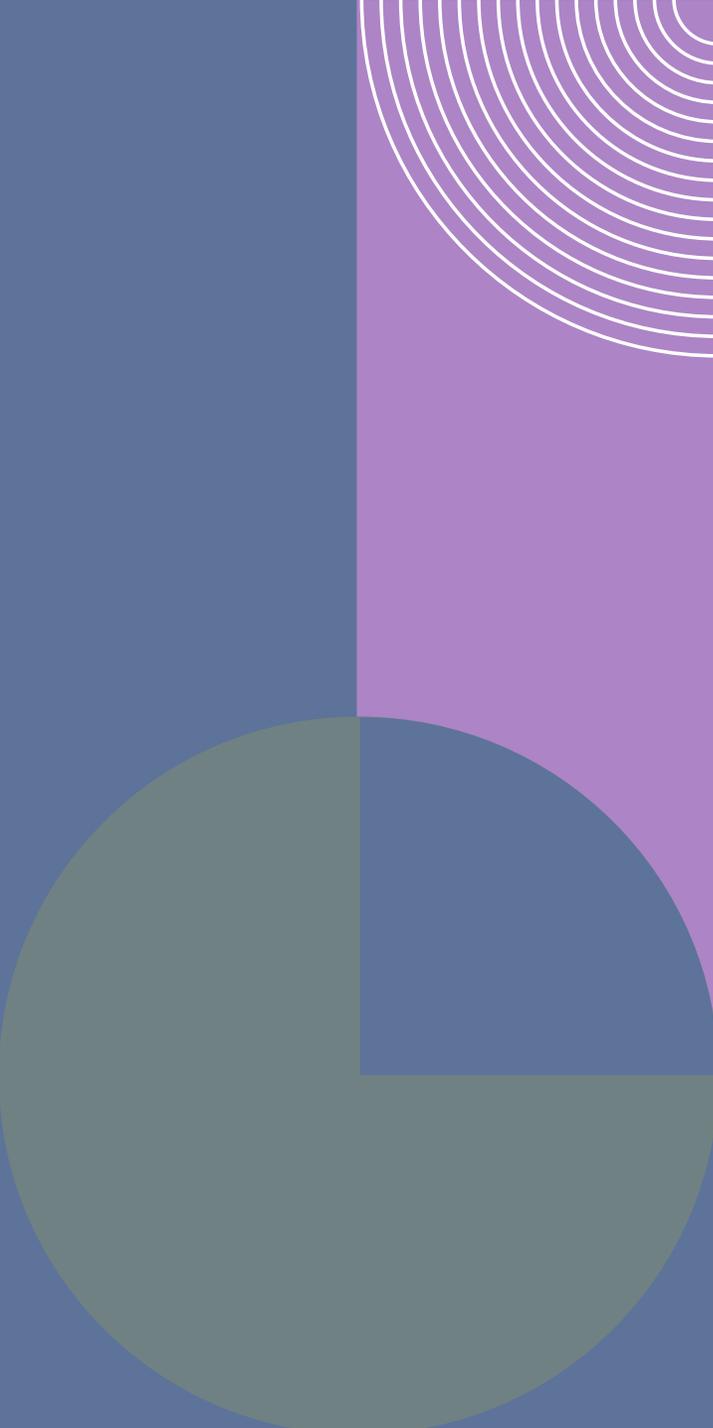
FUNDERS

If not, make broader impacts required.

Seek evaluation by experts.

Encourage proposers to detail relevant facilities and resources in “facilities” documents

Encourage upfront and/or integrated broader impacts in project descriptions.



RED FLAGS

-  Insufficient goals, objectives, and methods
-  Insufficient outcomes or measures of success
-  Insufficient reference to background literature
-  No letters of collaboration if individuals, organizations, or institutions mentioned
-  Insufficient funding for activities

GUIDING QUESTIONS

Who is the audience?

What are the goals, methods, and outcomes?

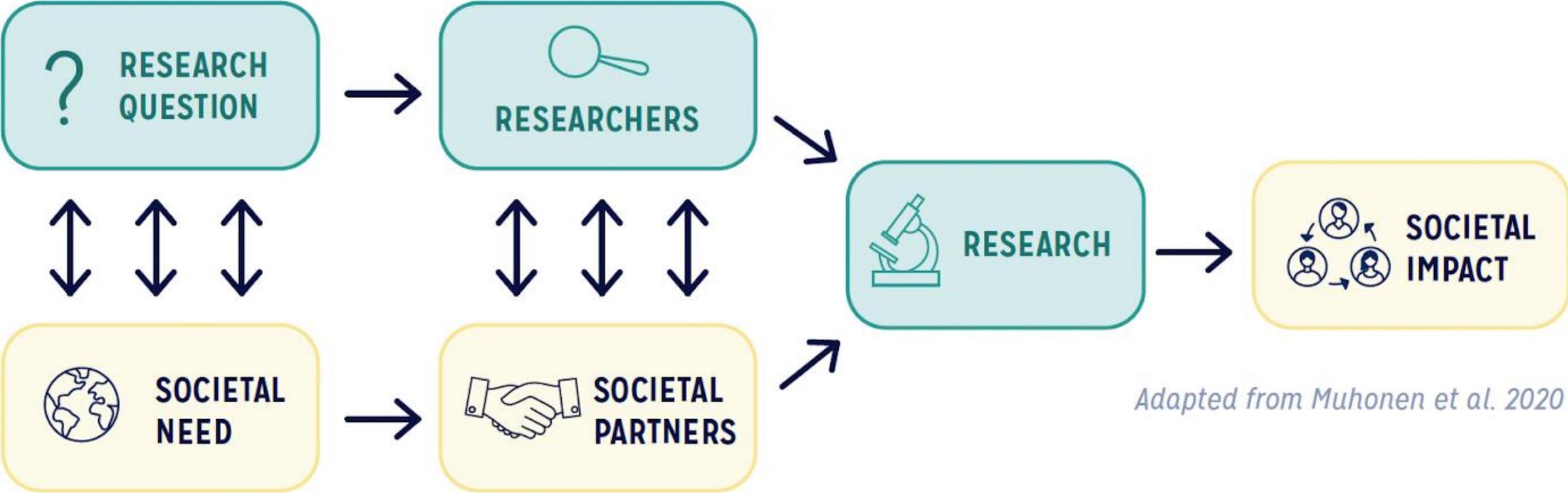
Who else is doing this work?

Are there missed opportunities for evaluation, research development, and sustainability?

Are parties involved supported, valued, and given resources they need?

SOCIALLY-ENGAGED RESEARCH PRACTICES

are more effective in generating research that is useful to and used by society.



Adapted from Muhonen et al. 2020

IN CONCLUSION

Better broader impacts take into account **intentionality**, **feasibility**, **accessibility**, and **usability**.

Proposers: Start early and connect with experts.

Reviewers: Evaluate with as much rigor as for the science.

Funders: Seek expert review and structural changes that promote intentional broader impacts.

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