Creating Transformative Knowledge

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ORIGINAL BIG IDEA Group #34:

a) I would like NSF rethink the framework of Western science-based research and consider other epistemologies. There is a lot of lip service to incorporating traditional knowledge but often just the data/facts are cherry-picked and the values intertwined with knowledge are ignored. Western science asserts that it is unbiased and purely factual, yet it is human nature (and the nature of whomever is funding research) to intertwine values with knowledge. I would like a research hub that acknowledges this and explores how scientists can be more engaged with policy decision-makers and institutional change. This goes beyond just social science research on policy and institutional change to scientists themselves working for change

b) What: Center one of the hubs around CoPe Storytelling, integrating existing knowledge, and leveraging successful communication & engagement methods, such as: 'artists in residence', public engagement around empathy-driven narratives, and radically different scenario tools such as science fiction prototyping; Who: NSF, Academic Scientists, Public Librarians, Schools, Religious leaders; When: Community results require long-term engagement in the 5 to 10 year range

<mark>What is your specific* recommendation?</mark>

<mark>(* Don't be abstract, general, or try to do too much in your recommendations. Try to be specific, actionable, stand alone)</mark>

Specific Recommendation: Establish an NSF CoPe Hub with the mandate to serve as a 'bridging institution', staffed with boundary-spanning personnel, who are able to speak to multiple knowledges and paradigms of understanding coastal challenges.

What is it? A bridging organization/institution, with boundary-spanning personnel that can speak to multiple knowledges and paradigms of understanding coastal issues and the communities that interact with coastal systems.

Goals (What does it do?)
Goal 1: Creates a space (bridging institution) that brings together Western science with other epistemologies, including art, storytelling, and indigenous knowledges (bridging capital).
Goal 2: Supports and facilitates meaningful coproduction of trans-disciplinary and transformative research.
Goal 3: Rooted in basic research, this hub aims to improve and expand the co-production of scientific theories for improved understanding, prediction, and mitigation of challenges for coastal communities.

Methodologies (How?): We propose an NSF Hub that functions as a bridging organization. This Hub can be located physically in a location with significant diversity of knowledge

systems (e.g. Alaska and its wealth of traditional knowledge), and will also have a virtual component that connects with other regions. This hub will also support location-based projects around the country and could engage with hubs in other parts of the globe that are addressing similar issues.

In the face of uncertainty relating to impacts of coastal environmental processes, variability, and natural hazards on populated coastal regions, this hub aims to build understanding and foster change through stories, art, and different ways of thinking. For example:

- *Multidirectionality*: This hub will *be* a bridging institution that promotes multi-directional flows of information. As a bridging institution this hub will bring together Western science with other epistemologies, including art, storytelling, and indigenous knowledges
- *Multi-directional learning*: Put people in situations that may transform their understandings (e.g., translating science into other formats; bring scientists on marine mammal hunts as listeners)
- Using *empathy-driven narratives* as a method for integrating traditional, Western, and other knowledges into coherent and inclusive understandings of the world.
- Converting and *blending* science articles into narratives, science fiction, art, etc.
- *Experimenting* about which forms of sharing knowledge influence or inform people effectively.
- Giving *traditional and marginalized communities* the ability to interact in more conventional scientific forums.
- The hub may include opportunities such as 'Artist-in-residence' in coastal areas. The artist would be creating art with the aim of *changing the way people think about science, knowledge, and coastal resilience*; the creation process of concept art for predicting the future or to better understand and expand how we think about the world.
- *Science fiction* prototyping as a means for interrogating how technological change will interact with society in the future (art, literature)

<mark>Why is it valuable? (Outcomes)</mark>

<mark>Who does it impact? How? How will the world be better? Who are the stakeholders and who will you partner with to make it stronger?</mark>

How will the world be better? Through blending prevailing science with non-Western perspectives, this hub will develop narratives to describe what people in coastal regions know, fear, hope for, and need to understand. The Hub will not just co-produce knowledges, it will co-convey knowledges. Through narratives, *this Hub will develop the tools needed to support solutions to real-world challenges in coastal communities.* This hub will provide a strong set of basic research around the question of how to merge and transform coastal community knowledge, to support applied research and work in coastal communities nationwide.

Who does it impact? The ultimate aim of this Hub is to provide a strong basic research foundation for increasing the resilience and adaptive capacities of coastal communities. If we are not creating bridging institutions and acknowledging the need for multi-directional, cross-scale flow of information, science will be stagnant and live exclusively in the peer-reviewed article format.

The inclusion of traditional and marginal knowledges (outside the prevailing paradigm) explicitly includes a broad community of people, including voices that are historically underrepresented and marginalized (e.g., federally recognized Tribes, environmental justice-challenged communities, Indigenous People organizations and rural community organizations, and historically disenfranchised communities). This Hub may also transform perspectives of researchers to include other epistemologies.

And who will you partner with to make it stronger?
- Indigenous Community (i.e., Federally recognized tribes, non-profit Indigenous organizations, international Indigenous organizations)
- Historically marginalized coastal communities that have survived environmental injustice
- Government agencies
- Universities
- Early career researchers
- Artists, writers
- High-school students
- NGOs and faith-based organizations

Who are the stakeholders? Stakeholders include all people living in coastal communities, decision-makers, coastal researchers, historically marginalized coastal communities, Indigenous Peoples, and people interested in coastal environmental issues.

Links to Outreach: This Hub will bring diverse groups of people together, as a bridging organization, and will provide a venue for creating new types of knowledge. This Hub is rooted in outreach, and goes beyond basic outreach in shaping and shifting the way scientists and communities think about coasts.

What's the reasoning or supporting evidence behind it?
Evidence based, fact based, Takes into context current research (hasn't already been tried and failed).

A co-production of knowledge approach and interdisciplinary collaborations are gaining recognition by the scientific community. NSF recommended proposals to include a co-production of knowledge approach in a call for "Stimulating Research Related to Navigating the New Arctic, One of NSF's 10 Big Ideas." The Interagency for Arctic Research and Policy Committee (IARPC) provides collaborative space for agencies, Universities, community members and other interested parties to meet.

Core Themes
This Hub is built upon core themes important to a transformative and collaborative process. These themes include:
- *Multiplicies*: This Hub will reframe how "science" is typically viewed and articulated by looking beyond prevailing scientific paradigms and including multiple perspectives, values, approaches, world views, and methodologies.

- *Transformative Research*: The prevailing scientific paradigm often aims to be

unbiased and not laden with values. This Hub will embrace the idea of transformative research, including acknowledging what informs the basis of project goals and objectives.

- *Accessibility*: Easily accessible to facilitate broader collaboration and partnering throughout research process as well as the use of the research (i.e., schools, policy-making, community planning).

- *Connectivity*: Hub as a social, technological, informational network

- *Translational*: Shared, common language to ensure communication across different knowledge systems and world views.

- *Generative*: Generates opportunities for collaboration and the potential for new knowledge to help inform issues faced by coastal communities.

How will you validate success? To ensure that the Hub is a bridging institution that builds a basic research foundation for supporting future applied research and applied work, the Hub personnel will:

- Bi-annually assess which core themes (see previous section) have been addressed, and how, and which core themes have not (yet) been addressed.

- Track each Hub project (e.g., short social surveys about whether participants feel included in research processes, whether participants change their views about coastal problems)

- Track the usefulness/success of different mediums for communicating (e.g., graphics, recordings)

- Track spin-off projects (applied research)

- Track whether and how relevant policies (e.g., in Hub communities) are changed

- Track accessibility and inclusivity: who is visiting the virtual Hub and who is participating in hub projects? Who is not? Who is involved/participates/uses/access engages with the hub? For example, this might involve a social network analysis to illustrate connectivity.

- Track and measuring the diversity of impacts radiating from the physical and virtual Hub space

How is it grounded in existing scholarship? There is a great deal of literature relating to environmental psychology suggesting that people don't change their behavior just because they are aware of an environmental problem. Gathering data alone does not promote a response. There is a need for some sort of narrative or art that connects a problem to someone's personal experience (Merrie et al. 2018; Sheppard 2012).

All research is informed by values. For example, different researchers or decision-makers may come to different conclusions about the safety of a chemical even while assessing the same data. This hub acknowledges the values that inform multiple ways of knowing and embraces the intersections of different value systems as they relate to coastal resilience.

<mark>Why do this now, above all the other things we could do?</mark> This hub should be funded first to ensure that the outcomes from this work can inform the hubs that follow it.

The current model of Western scientific research is not leading to changes in human behavior to address challenges like erosion, flooding, and sea-level rise. No amount of data-gathering can address these challenges if the science is not translated and embraced and policies, attitudes, and behaviors remain the same.

This Hub will provide the basic research into different mediums for creating, co-producing, and communicating narratives of environmental changes and challenges in coastal communities (Chapin et al. 2016; Lemos 2015; Ford et al. 2016; Bremer and Meisch 2017; Sakakibara 2010)

In a research world where costs are increasing but amount of funding available is not necessarily increasing, this work will expand the number and type of people informing and working on these issues and stimulate spin-off projects through locally driven initiatives.

Notes

"The National Science Foundation (NSF) is an independent federal agency created by Congress in 1950 "to promote the progress of science; to advance the national health, prosperity, and welfare; to secure the national defense..." NSF is vital because we support **basic research** and people to create knowledge that transforms the future" (https://nsf.gov/about/).

"**Basic research**, also called **pure research** or **fundamental research**, has the scientific research aim to improve scientific theories for improved understanding or prediction of natural or other phenomena" (wikipedia).

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