Candidate Recommendation

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ORIGINAL BIG IDEA

23: Virtual topical hubs (i.e. sea level rise and inundation, earthquake/tsunami hazards, sustainability of fisheries, etc.) each focused on some specific coastal issue/problem. Annual meetings (mobile) to bring people within the hubs together (plus other relevant partner agencies and groups), biannual meetings to bring hubs together. The hubs should focus on doing things that academia does NOT traditionally do very well: engage with communities and produce PRACTICAL, usable products for coastal communities. I envision research projects that are community driven--i.e., a coastal community submits a proposal stating a problem or concern, and research groups within the relevant hubs "bid" to do research to address the problem and come up with evidence-based solutions.

What is your specific* recommendation?

Context: Several geographically-based hubs with a regional coastal focus (e.g., East Coast, West Coast, Gulf Coast, Alaska, Great Lakes), with interdisciplinary, research-driven missions and connections to regional and local stakeholders. Teams working on specific, community-initiated projects would integrate a broad variety of disciplines (e.g., geoscience, biology, social science, engineering, economics, emergency response, public health).

Challenges: How to integrate the regional hubs so that each hub can draw on expertise that is geographically dispersed (e.g., at universities or national labs)? How to draw on the experience of other hubs and avoid duplication of effort?

Recommendation: In addition to regional hubs, establish virtual hubs organized by topic or expertise, for example:
- Sea level rise, extreme events, and inundation
- Coastal engineering and infrastructure
- Earthquakes and tsunamis
- Pollution and public health
- Economic resources (e.g., fisheries)

Regional hubs would have core staff who would build and maintain connections with stakeholders, support communities by: 1) providing assistance in formulating initial proposals; 2) assisting with grant writing for project implementation, and 3) managing community-driven projects and dialogues with broad participation. For example, a regional hub could host a series of workshops with the goals of multidisciplinary network building and solution development.

Virtual hubs would provide topic-specific expertise that could be leveraged across geographic boundaries and could involve academic as well as agency partners. Virtual hub participants would act as advisers and could interact with multiple regional hubs, with a

modest level of support.

NSF would identify topics for virtual hubs, reach out to potential participants, maintain a central database, and provide incentives and support.

Why is it valuable?
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?

Virtual hubs would:
- Enable regional hubs to address local and regional problems while drawing on national and international expertise
- Allow hubs to cross-fertilize; what works in one region could be applied as appropriate in other regions
- Give virtual hub participants the opportunity to apply their knowledge to practical solutions of local problems
- Improve and facilitate relationships between academia and coastal communities

Regional hubs would:
- Enable local stakeholders to be engaged early on (start to finish) with staff support for assembling project teams and pursuing funding for implementation

The overall goal of integrating virtual and regional hubs would be to **produce science-based recommendations about what solutions are most cost-effective to support stakeholder problem-solving and decision making.**

What's the reasoning or supporting evidence behind it?
This idea addresses a classic organizational problem: people are distributed along two axes (geographical and topical). Virtual hubs would complement the geographical structure of regional hubs, increasing connections between the regional hubs and ensuring they have the necessary disciplinary expertise for solving community-identified problems.

Integrating local knowledge into project teams by involving stakeholders from beginning to end can complement academic/scientific expertise. Adopting a community-initiated and community-driven process will help to shape outcomes into more practical solutions that work "on the ground."

Existing models of network structures:

Cooperative Ecosystem Studies Units (CESU) http://www.cesu.psu.edu/
- National consortium of partners engaging federal agencies, tribes, academic institutions, state and local governments, nongovernmental conservation

organizations, and other partners
- Searchable database of research interests and expertise
- Umbrella organization facilitating partnerships among diverse groups

Long-Term Ecological Research (LTER) network https://lternet.edu/
- Regionally-based program with topical foci
- Interdisciplinary integration
- Focus on long-term and large-scale phenomena

AGU Thriving Earth Exchange (TEX; https://thrivingearthexchange.org/):
- Community leaders discuss priorities and identify a project
- TEX identifies a scientist with the right skills and expertise to engage with the community
- Community leaders and scientists work collaboratively to achieve the project objectives
- Project results are shared with other communities facing similar challenges

Case studies

We have identified two ways the hubs could leverage expertise for solving coastal problems-- by offering advice and by conducting research. For both situations, the overall aims of (1) involving communities/stakeholders throughout the process and (2) producing tangible, usable products for communities should be met.

Advising

A coastal community in the Pacific northwest may already have tsunami hazard maps and have an idea of probability of tsunami inundation. However, they want advice for mitigation strategies, emergency evacuation practices, etc. They submit a proposal for a workshop to help small coastal communities address the tsunami hazard in their area. The proposal goes out to the relevant virtual hub community, and individuals with expertise in this area can apply for travel funding to present at the workshop.

Research

Community groups (municipal governments, estuarine reserve, nonprofits, etc.) would apply for funding for a research projects aimed at addressing a specific problem facing their community. For example, an estuarine nonprofit/reserve may want to know how their salt marsh habitat will change under different sea level rise projections to identify targets for restoration. Another community facing increasingly frequent inundation of their roadways may want to know the most economically efficient and environmentally friendly methods for mitigating flooding. The idea here would be for a community to identify a problem they are facing and what unknowns exist that are preventing them from taking action to address the problem.

Regional hub staff would help community groups put together their project proposals.As part of the proposal process, the community groups could choose to recommend local resources

and people with expertise they would like to be included on the project.

Once a **community-driven project proposal** is submitted to the regional hub, members of the regional hub would review the proposals and recommend a subset for NSF support. NSF would ultimately determine which projects are funded and how much funding is allocated for each project.

Once a project is selected for funding, the project description and available funding will be distributed broadly through the CoPe communities via the relevant virtual hubs and a request will be made for **research proposals** to address the problem identified in the community-driven project proposal. The research proposals would have a mandated interdisciplinary aspect and will require some tangible product to be produced. For example, the flooding example mentioned previously may require an economist, an engineer, and a sea level rise expert, and the product produced may be a project report of various engineering scenarios and their economic projections. For the salt marsh example, the research team may be required to involve a geospatial expert, an ecologist, and a sea level rise expert, and the products may be a series of high resolution maps showing habitat change under different scenarios.

Researcher teams submitting proposals can be formed independently, or can make use of an expert database hosted through the virtual hubs to identify potential collaborators. Perhaps there could be some incentive (bonus funding?) for earmarking funding for student research.

Once research proposals have been submitted, a panel including members of the original community group as well as staff from the regional hub will decide which research group will be chosen to lead the project (and receive the funding). And then the research group will go forth and conduct their research and create their project under a timeframe agreed upon during the proposal stage. Annual (or more frequent, depending on the project) meetings between the community partner and research groups, as well as with other relevant stakeholders would ensure community engagement is consistent throughout the project and the products being worked up are on target with the communities' needs.