Submission form for Ocean-Shot Concepts-Round 2

Response ID:39 Data

1. (untitled)

1. Ocean-Shot Contact Information: *Note - This information will be shared with the National Committee for the Ocean Decade in order to receive feedback. It will also be made publicly available if the Ocean-Shot concept is accepted into the Ocean-Shot Directory.

Primary Contact Name (First & Last) : Robinson Fulweiler
Organization : Boston University
Email address : rwf@bu.edu

2. Ocean-Shot Title

Revolutionizing Coastal Ocean Research through a Novel Share Model for the Long-term Sustainability of Humanity

3. Author(s): *Please list contributors to the submitted Ocean-Shot concept with first and last names in the order you wish them to be referenced for *potential* use in the Ocean-Shot Directory. Examples can be found here:

Robinson Fulweiler, Peter Girguis, Zara Mirmalek

4. Ocean-Shot Directory Summary (Please provide a short introduction/description of the Ocean-Shot concept for *potential* use in the Ocean-Shot Directory, 100 word limit. Examples can be found here.):

We propose a bold vision for conducting ocean science. While the coastal ocean is essential to the well-being and long-term sustainability of humanity, our scientific knowledge on coastal ecosystems falls woefully short. We are calling for a new model that addresses social, economic, political, and logistical factors that impede participation in coastal investigations and stewardship. Our aim is to produce a science research model that increases access to coastal ocean science through instruments and community relationships. Our new model will build on familiar tenets of the share economy developed to respond to the needs of coastal ocean research and science.

5. Abstract (describe hypothesis, scientific and/or technological objective, 200 word limit):

Despite the importance of the coastal ocean it remains remarkably understudied leaving us without the data needed to advance how we understand, manage, and protect it. In part, this is because ocean research remains dominated by scholars from affluent nations and institutions, resulting in intrinsically biased observations. These conditions are scientifically and ethically problematic. Further, they hinder solutions for the long-term sustainability of the coastal ocean, and thus humanity. To secure our future we need a transformative vision for how we conduct science. We set out to help catalyze this change by addressing social, economic, and logistical impediments that stifle equal opportunity for research. We will produce an instrument share model that develops on the familiar tenets of the share economy adjusted to respond to the needs of coastal ocean research. Specifically, we propose: 1) novel sensor suites to address the most pressing coastal ocean data gaps (e.g., quantifying coastal carbon fluxes); 2) novel share model that allows access to these sensors regardless of geography, institutional affiliation, or budget; and (3) access to training in sensor development, use, deployment, and data uses. These solutions will promote better management of coastal systems, transform how we conduct science, and preserve ecosystem services.

6. Please select the challenges (no more than 3) that are most relevant to your concept (Expanded reference below):

Challenge 5: Enhance understanding of the ocean-climate nexus and generate knowledge and solutions to mitigate, adapt and build resilience to the effects of climate change across all geographies and at all scales, and to improve services including predictions for the ocean, climate and weather.
Challenge 10: Ensure that the multiple values and services of the ocean for human wellbeing, culture, and sustainable development are widely understood, and identify and overcome barriers to behavior change required for a step change in humanity's relationship with the ocean.

7. Describe how your Ocean-Shot addresses the selected challenges (150 word limit).

Enhancing our understanding of the ocean-climate nexus (Challenge 5) will only be achieved by creating opportunities for any and all stakeholders to participate. Equitable access is at the heart of our proposal, and our model explicitly tackles the structural barriers that keep them from fully participating in ocean research and management (Challenge 9). By broadly sharing "carbon" sensor packages (designed to better quantify carbon cycling dynamics) we will increase data collection across coastal ocean habitats, which play a major role in carbon sequestration. Thus, we can better inform blue carbon restoration efforts. Finally, the instrument share model would not only broaden access to instruments for data needs that are local and transnational (Challenge 10) but also serves as a platform to examine how an unprecedented range of stakeholders interact with the coastal ocean. We aim for access to reflect all who are actively interacting with these ecosystems.

8. Vision and potential transformative impact (200 word limit):

The coastal ocean provides ecosystem services that are vital to the health of the biosphere and humanity. Increasingly we are relying on coastal systems to help mitigate climate change (e.g., C sequestration: "blue carbon"), boost the economy (e.g., shipping of goods), provide food (e.g., aquaculture), etc. However, there is a paucity of data for developing predictive models and informing management and policy decisions to sustain coastal ecosystems. A grand challenge then in ocean research is to increase the spatial and temporal resolution of data collection in a timely, cost-sensitive, and equitable manner. But a novel sensor suite is not enough to overcome scientific and cultural norms impeding coastal ocean monitoring. Here we propose to transform how coastal ocean science is conducted – starting by addressing key issues that impede progress. These challenges do not stem singularly from resource limitations for acquiring sensors. Rather, they thrive on existing cultural norms, seeded in history and yet still defining who is supported to study the ocean today. A radical new approach is needed, one whose foundation is equitable access and one that will foster the development of a new generation of ocean scientists, technology developers, and users unburdened from history.

9. Realizable, with connections to existing U.S. scientific infrastructure, technology development, and public-private partnerships (150 word limit):

Our interviews with stakeholders have emboldened us to act. The community is calling for change, and the scientific enterprise needs it. We bring our expertise in coastal systems, sensor development, and social sciences together to change how ocean research is currently conducted. We can leverage $10 million for deep sea technology development to expand these instruments to the coastal ocean. With new sensor suites in hand, we will work with the community to build an instrument share model that is adoptable and adaptable. Model development and test timeline is coordinated with sensor development timeline. Circulation of sensors among a broad range of stakeholders is possible through institutional, university, and NGO partnerships. In particular, the Schmidt Ocean Institution (SOI, a multimillion dollar not-for-profit for advancing ocean science and technology) will provide communication and transportation to disseminate sensors globally. Our dedication to open access will allow anyone globally to access training materials.

10. Scientific/technological sectors engaged outside of traditional ocean sciences (100 word limit):

At the core of this concept is engaging with a wider community from the onset. Our direction is to circumvent the traditional barriers that impede conducting ocean research by providing new access to sensors regardless of budget, background, or institution. From development to adoption stages, we will involve stakeholders from the broad community that is humankind. We aim to advance ocean knowledge with a diversity of stakeholders drawn together without prejudice towards academic institution affiliation (e.g., teaching, research), area of interest (e.g., fisheries, water quality), area of application (geography), category of national identity, or interest in knowledge application.

11. Opportunities for international participation and collaboration (100 word limit):

To achieve our stated goal, we need a global reach. We are proud to say that we have established partnerships with the Schmidt Ocean Institute, as well as scientists, educators, and makers working in the Atlantic, Pacific, and Indian Oceans. Further, we will build on synergistic projects that will enable us to cooperatively test, refine, and implement our share model with collaborators in the South Pacific, Africa, and the Middle East. Notably, we are eager to collaborate with stakeholders across the globe and will actively seek new partnerships that broaden the scope of who traditionally collects coastal ocean data.

12. Develops global capacity and encourages the development of the next generation of ocean scientists (100 word limit):

Our goal is to cultivate a new generation of ocean stewards globally. To promote wide-spread engagement with the coastal ocean by enabling users to collect data with novel sensors. The instrument share model seeks to remove the cost barrier for sensor use, the social barrier that requires users to rely on institutional backgrounds for obtaining instruments, and the "use" barrier by developing a broadly accessible suite of user video tutorials and virtual trainings. Our training program will be open access utilizing digital platforms (e.g., edX, YouTube). We will promote workforce development in sensor technologies with technical instruction and social engagement.

2. Thank You!

Thank You Email

Jul 01, 2021 12:18:26 Success: Email Sent to: rwf@bu.edu