



Backyard Buoys: Equipping Underserved Communities with Ocean Intelligence Platforms

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Overview

The aim of “Backyard Buoys” is for Indigenous and other coastal communities to collect and use ocean data to support their blue economy: maritime activities, food security, and coastal hazard protection. These communities have been substantially underserved and climate change is making predictability even harder. To serve the desire for autonomy, our innovations include a sustainable process for community-led stewardship of affordable ocean buoys and mobile and web-based applications (apps) that render data easy to understand and bridge to Indigenous knowledge.

Description

We bring together regional ocean observing networks of the U.S. Integrated Ocean Observing System (IOOS), underserved Indigenous communities, and a sensor company working collectively to democratize local wave measurements and provide a solution to the existing hurdle of observing technologies that are too expensive and cumbersome to purchase and sustain. Through co-design of an implementation and stewardship plan, as well as apps tailored to transmit data in low-bandwidth scenarios, we are revolutionizing the status quo. By using lower-cost tools and deepening the human and data connections, collectively our system is effective at addressing needs within the hyper-local scale – sorely lacking in the design of existing ocean observing systems – while assuring it is within a globally-connected network.

Differentiators

This project is not about putting buoys in the water, but identifying the barriers and challenges that communities will run into as they attempt to get buoys in the water. We are the explorers together. Backyard Buoys continues to advance the convergent achievements of the Phase I effort, fostering the original partnerships while adding new partners focused on education and project management. We are sharing training and activities on various aspects, including: Sofar wave buoy operations, mooring design, data analysis, Indigenous knowledge integration, wave and climate modeling, engagement, and education. The Indigenous communities engaged during Phase I are the ultimate stewards of the wave buoys within their own waters throughout the project and beyond. To date, they have identified their optimal locations for deployments and are conducting deployment and recovery tasks. The communities are doing this themselves, rather than sending a researcher to each community, and have autonomy over data sharing. This aspect is a switch from the typical ocean research model, where the communities are simply told what is going to happen in their community, without much consideration for their needs or broader goals.

Road Map

Our team makes progress through Working Groups that have been established to provide a shared forum for technical support and to identify expansion opportunities. Working Groups include Buoy Operations, Data Tools,

Educational Development, and Co-Design. One of the primary tools is the development of Community Research and Implementation Plans (CRISPs) that are used by community stewards to execute the Backyard Buoy project. CRISPs are developed with a user-friendly web-based tool designed to encourage community involvement. Low-bandwidth data tools such as Text-a-Buoy and a mobile app have been co-designed to provide the necessary real-time wave data. We are implementing wave buoys in all three regions, along with the data dissemination applications. An education and translation layer focuses on engaging the communities more fully by developing educational materials that will be used in the region. To grow community participation in the project, each region will provide opportunities aimed at inspiring a younger generation to participate in ocean observation.

Partnerships

We have a geographically, academically, institutionally, and culturally diverse group of partners collaborating on Backyard Buoys. Our partnership is between 1) three U.S. IOOS Regional Associations; 2) Indigenous partners in each region; 3) a proven ocean wave buoy developer; 4) educational partners; and 5) project management.

- **Pacific Northwest:** Northwest Association of Networked Ocean Observing Systems (NANOOS), Quileute Tribe, Quinault Indian Nation, Western Washington University
- **Alaska:** Alaska Ocean Observing System (AOOS), Alaska Eskimo Whaling Commission, University of Alaska Fairbanks, Alaska Department of Natural Resources, Alaska Native Science and Engineering Program
- **Pacific Islands:** Pacific Islands Ocean Observing System (PacIOOS), Marshall Islands Conservation Society, National Park

of American Samoa, Hawai‘i Sea Grant, Conservation International Hawai‘i

- **Buoys:** Sofar Ocean Technologies
- **Project Management:** Weston Solutions

Intellectual Property

The Intellectual Property (IP) will be freely shared within and beyond the partners. IP primarily consists of data delivery systems and web intake surveys. The ocean observing buoy systems being deployed are already mature and commercially available products that are wholly owned and patented by Sofar.

Additional Information (optional)

Based on the outcomes from the CRISPs and Working Groups, an Ocean Best Practices document will be developed that will guide other regions and groups in lessons learned and practices that lead to success.

An additional benefit of getting wave buoys in the water at sites which are in historically under-measured regions and have a diverse range of environmental conditions is the generation of data from highly-localized coastal areas available for large scale scientific research to improve climatologies and predictions, especially important in light of climate change. This is critical for effective advanced planning to ensure a safe blue economy for the communities.



Photo Caption: Quileute Tribe deploying wave buoy off La Push, WA.