

## **UNOLS hosts Workshop Focused on OOI's North East Pacific Arrays**

The National Science Foundation's (NSF) Ocean Observatories Initiative (OOI) program is now fully commissioned, enabling a diverse user community of scientists to access its ocean observing data. Since that time, the University-National Oceanographic Laboratory System (UNOLS) has hosted two workshops with the objective of acquainting current and potential users with the capabilities offered by the OOI systems. The most recent workshop held on September 27-29<sup>th</sup> in Portland, OR focused on the current and future science that can be addressed by the extensive OOI infrastructure operational in the Northeast Pacific. Close to 80 members of the science community attended including early career scientists, senior scientists, agency representatives and OOI program experts.

The workshop included reports by NSF, Consortium for Ocean Leadership (COL), OOI program managers, observatory operators, and science users. Rick Murray (NSF OCE Division Head) and Lisa Clough (NSF Ocean Section Head) offered information on the governance of OOI and guidance on how to include OOI data in both proposals and publications. NSF encourages the science community to use the OOI data and to provide feedback on all aspects of the program. Feedback can be provided directly to NSF by emailing <[ooi-science@nsf.gov](mailto:ooi-science@nsf.gov)>. Feedback can also be provided to the OOI program through the [OOI Help Desk](#). Greg Ulses (Vice President and Director, Ocean Observing Programs at COL) provided a brief OOI program introduction and status report.

OOI's Science Oversight Committee (SOC) members, Deb Kelley and Jack Barth, provided information about OOI's Northeast Pacific infrastructure that includes the Coastal Endurance, the Cabled, and the Global Station Papa Arrays.

The OOI Coastal Endurance Array, located off Oregon and Washington coasts, extends from the continental shelf down the slope, allowing scientists to examine coastal processes including upwelling, hypoxia, shelf breakfronts, and the role of filaments and eddies in cross-shelf exchange. Technologies employed include moored buoys with fixed sensors, moorings supporting vertical profilers, cabled seafloor nodes, and gliders.

The OOI Global Station Papa Array, located in the high-latitude, open ocean Gulf of Alaska, is a combination of fixed platforms (moorings) with moored profilers and gliders. Its sensors collect measurements of air-sea fluxes of heat, moisture and momentum, and physical, biological and chemical properties throughout the water column.

The OOI Cabled Array is the first U.S. ocean observatory to span a tectonic plate and provides a constant stream of near-real time data from the seafloor and through the water column across the Juan de Fuca plate. The data collected from all of the OOI arrays in the NE Pacific offer greater knowledge of the region's interrelated systems vital for increased understanding of their effects on biodiversity, ocean and coastal ecosystems, and ecosystem health.

OOI's Cyber-Infrastructure (CI) manages and integrates data from all OOI sensors, linking marine infrastructure to scientists and users. The data management component of the OOI is co-located with the CI group at Rutgers University. Mike Vardaro, the OOI Data Manager, provided information on capabilities of the OOI CI system, technical challenges and work in progress, and how to access the data. Mike's presentation was followed by a hands-on technical session where participants acquired firsthand experience in data querying, plotting, and downloading of OOI data. The value of the hands-on session was quickly recognized, and the session was repeated throughout the workshop.

A highlight of the workshop was the "1-slide/1-minute" presentations by workshop participants. Each participant was asked to explain how he or she plans to use OOI data in their research (see Figure 1). Participants included scientists already using OOI data as well as those who have never accessed the data but plan to in the future. These presentations were valuable in networking and identifying potential research collaborations. The attendees' enthusiasm of the OOI program was clear.



Figure 1: Workshop participants provide 1-slide/1-minute presentations on how they would use OOI data.  
*Photo by Karen Besson, UNOLS Office*

In addition to the OOI arrays, the workshop included presentations about other non-OOI observing platforms in the NE Pacific so that the full scope of ocean observing assets available in the region could be better understood. Presentations included Ocean Networks Canada, NOAA observing systems, NANOOS, MARS, Line P, and ALOHA and were accompanied by posters.

One session of the workshop was devoted to obtaining feedback on the OOI program. An OOI team of experts that included Jack Barth, Deb Kelley, Greg Ulses, and Mike Vardaro fielded questions. Workshop participants were asked to provide community feedback to NSF on whether or not the OOI facilities are currently meeting the expectations of the OOI science plan.

As NSF plans for the OOI program re-competition and future operations they are

interested in learning what is essential for science studies and what is desirable. Feedback was plentiful and much discussion was focused on improvements to data and CI systems. Program successes, major barriers to use of the system, as well as “Nice-to-have” items described by the group were identified. These will all be more fully evaluated in the coming months.

The workshop included three breakout sessions with themes focused on 1) geographic regions, 2) major science questions, and 3) technical systems. During these sessions, participants were asked to identify how the OOI assets can help answer critical science questions. Session participants were also asked to consider how they may use OOI data and assets in the future and what additional technologies would be required.

Session leaders provided summary reports following the breakouts. These summaries have been posted on the [workshop webpage](#) and will be further evaluated in the coming months to identify the critical science questions that can uniquely be answered by the long-term sustained ocean observing assets in the NE Pacific.

A special moment of the workshop was a presentation by John Delaney, UW. John’s vision of how ocean observations could revolutionize the field of oceanography played a large role in sparking the creation of the OOI program. John provided an inspirational talk that highlighted the capabilities and science reach of the OOI and other observing systems. UNOLS recognized John’s efforts and dedication to the community by presenting him with a plaque of appreciation (see Figure 2).



Figure 2: Chris Measures, UNOLS Chair, presents John Delaney with UNOLS plaque. *Photo by Karen Besson, UNOLS Office*

The workshop wrapped up with a discussion of the “Way Forward” that summarized the recommendations from the Technical Systems breakout sessions. Focus was on OOI technical assets and how these assets will help answer critical questions. Participants were asked to identify technologies and strategies that will optimize research enabled by OOI in the future. A summary of each session’s recommendations is included on the [workshop web page](#).

UNOLS thanks NSF for sponsoring this workshop. A big “thank you” to Doug Luther

(U. Hawaii) for stepping in on very short notice to lead the workshop. Special thanks also goes out to steering committee members (Larry Atkinson, OOSC Chair; Kendra Daly, USF; Kristen Davis, UC Irvine; Richard Dewey, ONC; Meghan Cronin, NOAA; Jan Newton, NANOOS, Deb Kelley, SOC/UW; Jack Barth, SOC/OSU; Mike Vardaro, CI/Rutgers) for organization of the program. Our deepest appreciation to all speakers, session leaders, and workshop participants for their continued work and interest in OOI!

Workshop presentations including the breakout session summary reports are available at on the web site [UNOLS/OOSC Community Workshop: OOI Cabled, Endurance, and Station Papa Arrays](#).

In closing and to reiterate, your feedback on all aspects of the OOI program is encouraged and can be provided to NSF by emailing [<ooi-science@nsf.gov>](mailto:ooi-science@nsf.gov).