OO Exchange, September 11, 2026
Topical focus: COSZO and RCA
Facilitator(s): William Wilcock

Summary
Seventeen attendees participated in the virtual session. After introductory information about the DCI process, resources, and an overview of the Cascadia Offshore Subduction Zone Observatory (COSZO) and the Regional Cabled Array (RCA), three breakout groups were formed. Attendees considered all questions contained in the request for input, however, much of the discussions focused on:

- Q3. What types of observations would best advance the national interest?
- Q5. Which elements in NSF's existing observational portfolio should be maintained or updated to fulfil the identified needs?
- Q7. What are robust metrics to assess the scientific and societal impact and value of observations over time?
- Q8. How should NSF seek to balance the development of new ocean observing technologies with the collection of more data using established technologies?

Key takeaways from this OO Exchange included:

- **Fixed and mobile ocean observing assets are complementary**. There is core value in maintaining both types of systems in NSF's ocean observing portfolio, especially in the context of existing, long-term, time-series data collection.
- Current ocean observing infrastructure, including the NSF-OOI is well placed on the Cascadia Subduction Zone. Observations collected here are **important for national security and hazards mitigation** (earthquake and tsunami forecasting/predictions, including international [e.g., UN IOC/GOOS, Tsunami, and WMO]). Observations at Axial Seamount also allow for further understanding of volcanic processes (undersea) and testing of methods for forecasting volcanic eruptions that may also apply to volcanoes on land.
- New technologies (including distributed acoustic sensing, DAS) need to be validated against more established technologies, making NSF-supported facilities (like the OOI) one of the rare places that these new technologies can be vetted. Cabled access with power and real time communications is critical for many technologically advanced observations. Given that they can be operated in shallow and deep water, established observatory infrastructure offer a "test bed" for new technologies, data workflows, etc. **There is inherent value in long-term observations that can be coupled with a powerful observatory that provides a robust testing ground for the development of new technologies.**
    - Potential new technologies: New technology for national needs such as national security mineral exploration. Resident, smart autonomous vehicles. Resident AUVs. Development of DNA and in-situ chemistry samplers. Acoustic imaging capabilities. Quantum sensors are in the very early stages of readiness (gravimeters is one example) and are best tested on cable observatories.

- When looking at **metrics,** it is important to note that OOI data is publicly available. It can be downloaded and then shared with others, thus, metrics may not be representative based on the number and volume of data downloads. Also note the significant (~$50M) of external [non-NSF] funding OOI has received (since 2016)- this is a distinct success metric.
- **Connections to AI systems.** Large, long-term data sets are needed for AI and training of AI agents and recognition of patterns. Current ocean observing systems, such as the OOI, are one of the producers of large, long-term time-series data. Multidisciplinary time series data from current ocean observing systems are particularly appropriate for developing AI approaches to explore complex data sets for hidden processes. Emerging cable-related technologies like Distributed Acoustic Sensing (DAS) will be particularly suitable for AI-assisted analysis since they generate very large datasets.
- There are **distinct opportunities with underwater acoustics.** Expand passive acoustic monitoring associated with current ocean observing systems into the NW Pacific, and use active sources for underwater GPS/navigation and communication (examples with ARGO floats and AUVs), basin scale tomography, and Navy applications and CTBT monitoring.
- **Considering other operational uses and stakeholders:** earthquake early warning (USGS), rapid tsunami characterization and warning (NOAA), acoustics, sensing approaches for cable security (US Navy), development of ocean scientists and engineers (Industry, Federal agencies), volcano observatories (USGS + FAA related)
- Although the U.S.Research Fleet is not an explicit focus of this DCL, **in order to conduct high-priority research activities, now and into the future, the U.S. needs a well-supported research fleet.** Distinct challenges exist given limited shipyard capabilities and the aging of the research fleet - both fixed and mobile assets depend on access using ships of various sizes. The maintenance and support of large research ships should be a priority to assure research can be done in a timely manner. Continued support for the existing NSF-funded deep submergence vehicles (e.g. Alvin, Jason, and Sentry) is also needed to support these research endeavors.