# NSF OOI PMO Report: Participating in OOI through the PI Process

James Edson, Lead PI & Amber Coogan, CEM
Program Management Office (PMO)


Coastal Pioneer MAB Array Community Workshop
Old Dominion University
Norfolk, VA
September 10-12, 2024

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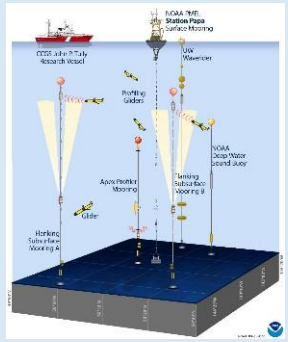
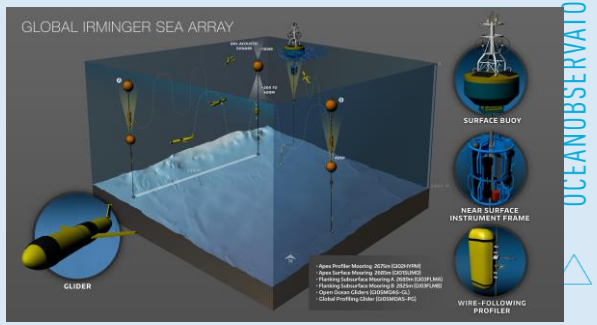
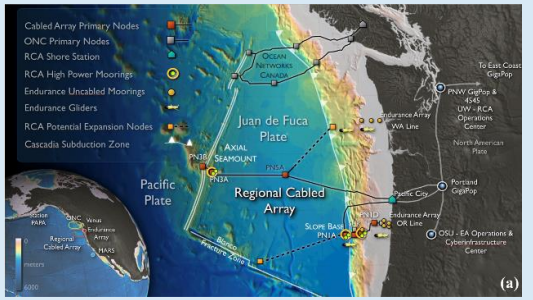
# NSF's Ocean Observatories Initiative

## A System of Systems

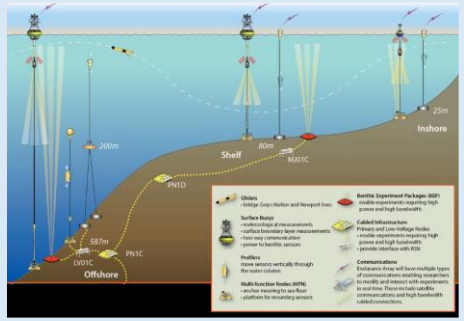





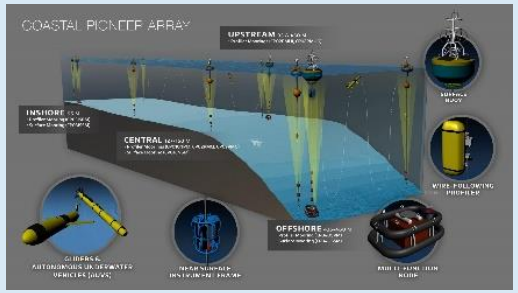

Global Station Papa and Irminger Arrays



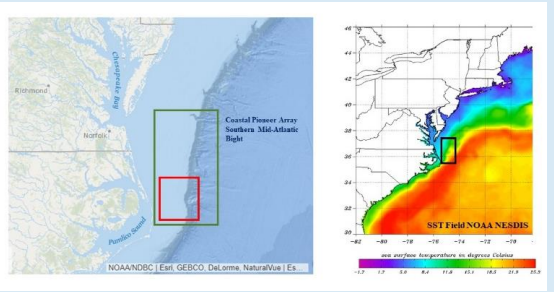

Regional Cabled Array




Coastal Endurance Array




Coastal Pioneer Arrays at NES




Coastal Pioneer Arrays at MAB

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# Democratization of Data

*The OOI provides research quality data to the user community. These data are freely available to researchers, educators, and the general public in near real-time at:*

*https://oceanobservatories.org/*

Palevsky et al., 2023: *OOI Biogeochemical Sensor Data Best Practices and User Guide. Version 1.1.1. OOI* Biogeochemical Sensor Data Working Group. https://doi.org/10.25607/OBP-1865.2 **GOOS ENDORSED PRACTICE**

Riihimaki et al., 2024: *Ocean Surface Radiation Measurement Best Practices,* Front. Mar. Sci.*, 11, https://doi.org/10.3389/fmars.2024.1359149*

# ECV Collected

## Surface Variables

- Pressure
- Radiative Fluxes
- Temperature
- Humidity
- Precipitation
- Moisture/Evaporation
- Vector Wind
- DC Stress & Buoyancy Flux

## Oceanographic

- Net Surface Heat Flux
- Temperature Profiles
- Salinity Profiles
- Currents Profiles
- Sea Level

## Biogeochemical Sensors (at multiple depths)

- pH
- $pCO_2$
- Oxygen
- Plankton & zooplankton
- Nitrate
- Chlorophyll-*a*
- Methane
- Sound
- Turbidity

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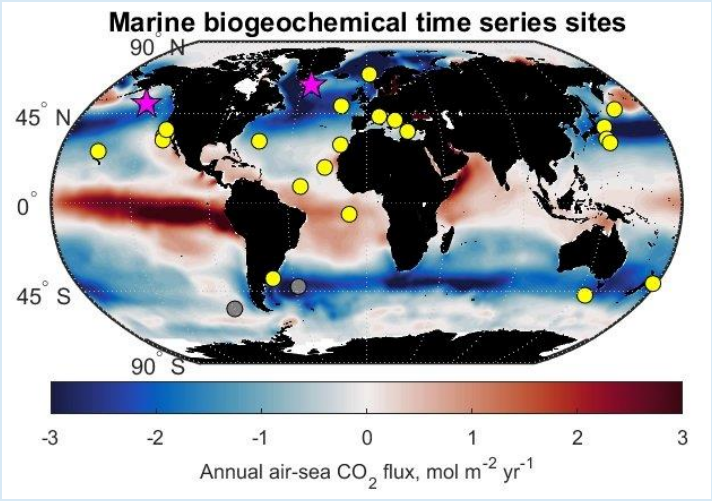
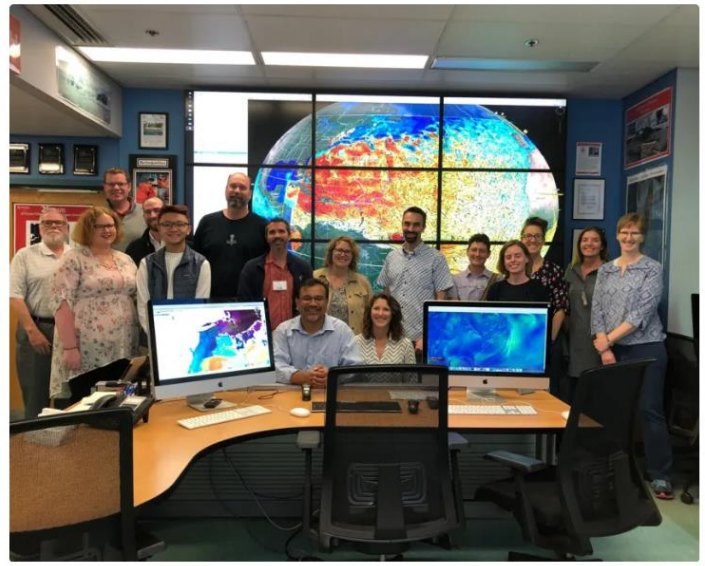
# Participating in OOI: Research Funding

https://oceanobservatories.org/how-to-participate/

- The National Science Foundation (NSF) encourages scientists to seek funding through its core science and technology programs. For information on NSF Ocean Sciences programs (OCE), please visit the NSF OCE homepage or the NSF OCE Active Funding Opportunities. For OOI program-specific proposal questions, scientists should reach out to NSF OOI representatives at ooi-science@nsf.gov.
- Funding Opportunities:
  - (NSF 22-059) Dear Colleague Letter: Ocean Technical Workforce Education. The National Science Foundation (NSF) anticipates increased investments in future ocean observing systems, including cabled and moored instrumentation systems, autonomous underwater vehicles (AUVs) and remotely operated vehicles (ROV). This call encourages curriculum development proposals with the goal of improving the education of the next generation of ocean technicians, data scientists, ocean engineers, and ocean scientists. Demonstrate a clear connection to data streams or instrumentation used for the Ocean Observatories Initiative (OOI) https://oceanobservatories.org/ or other NSF-funded ocean facilities.
  - Dear Colleague Letter: Using Long-Term Research Associated Data (ULTRA-Data). This program encourages proposals that take advantage of the multidisciplinary, long-time series measurements through programs such as the Ocean Observatories Initiative (OOI). Funding for the ULTRA-Data proposals will come from participating NSF divisions and offices including the Geosciences and Biological Sciences.



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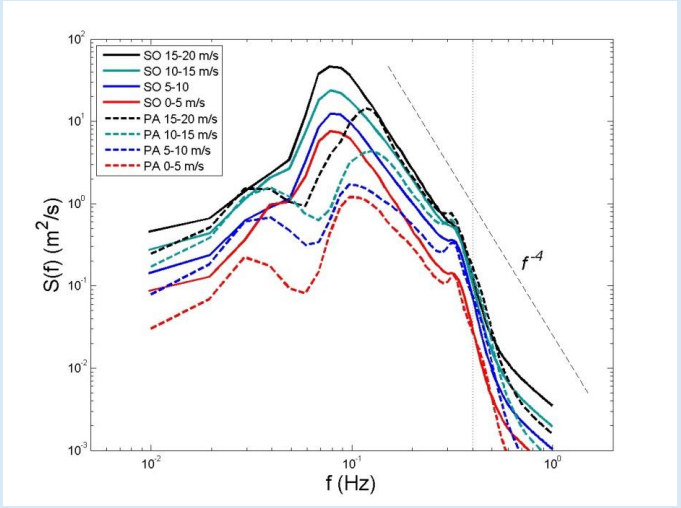
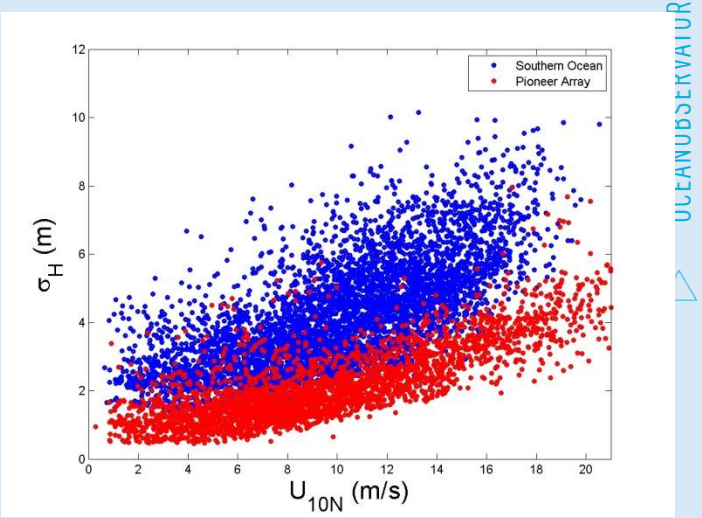
# Participating in OOI: Research Funding

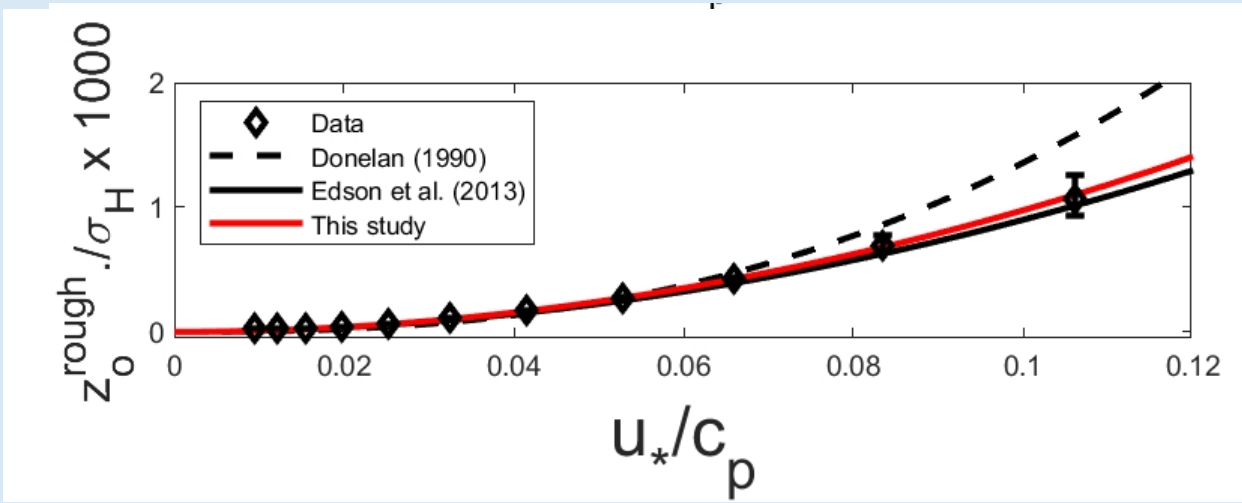




Wave spectra




Significant wave height vs wind speed

**Wave-slope dependent:** $\alpha = \frac{gz_0}{u_*^2} = f(\sigma_H k_p)$

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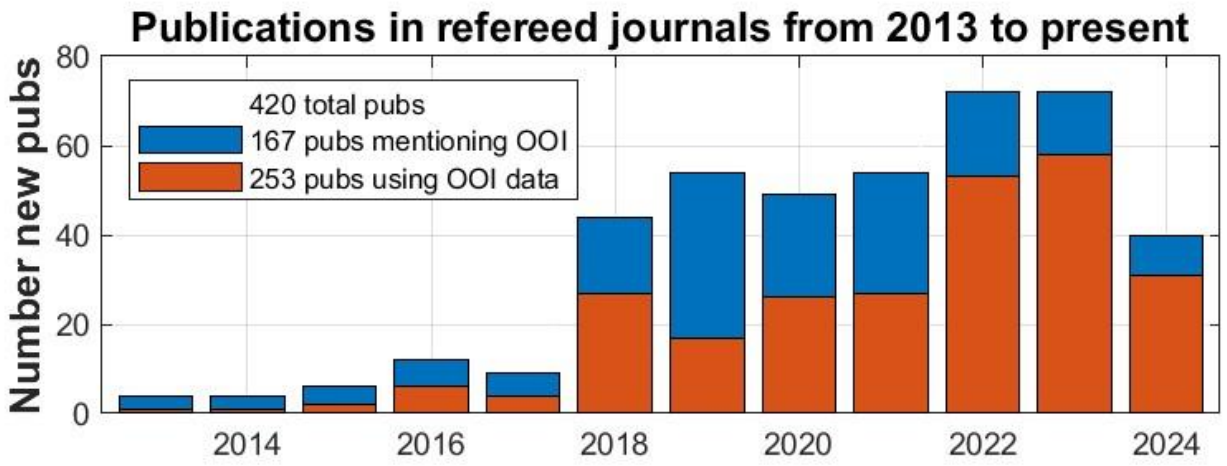
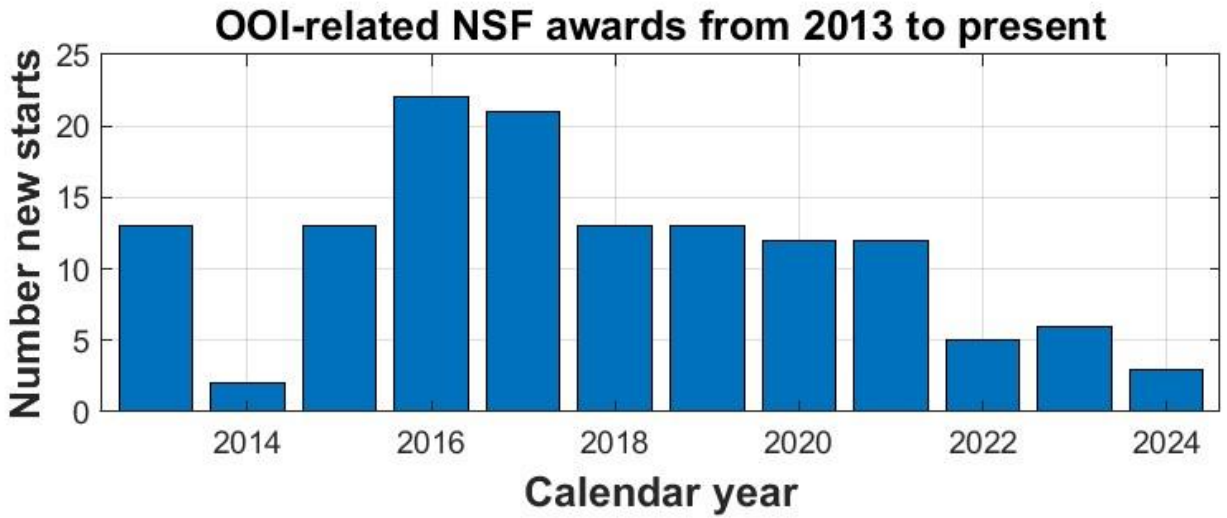
# Participating in OOI: Publications & NSF Awards

- Steady and growing data requests
- Steady and growing data user community
- Steady and growing publications
- Steady and growing external funding

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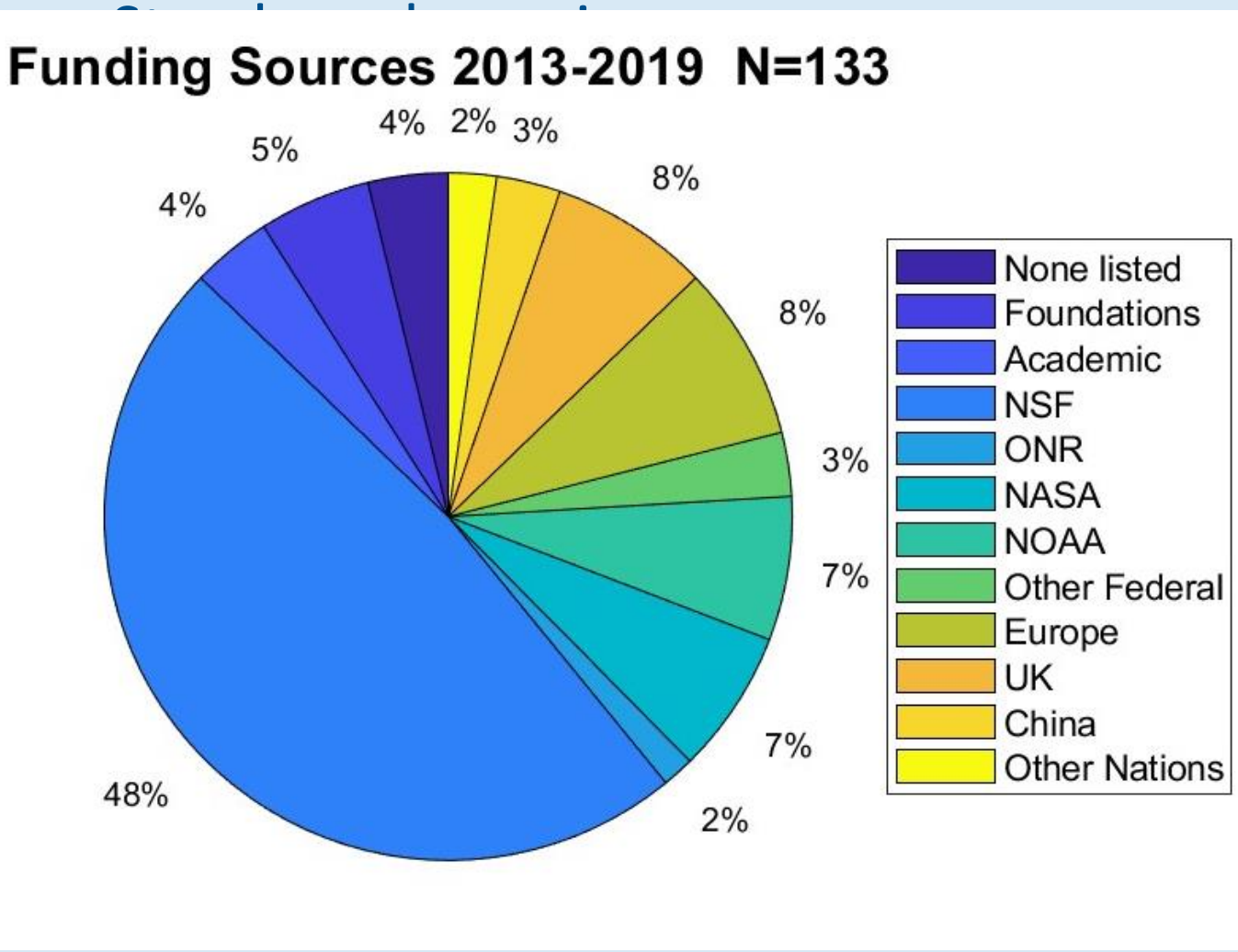
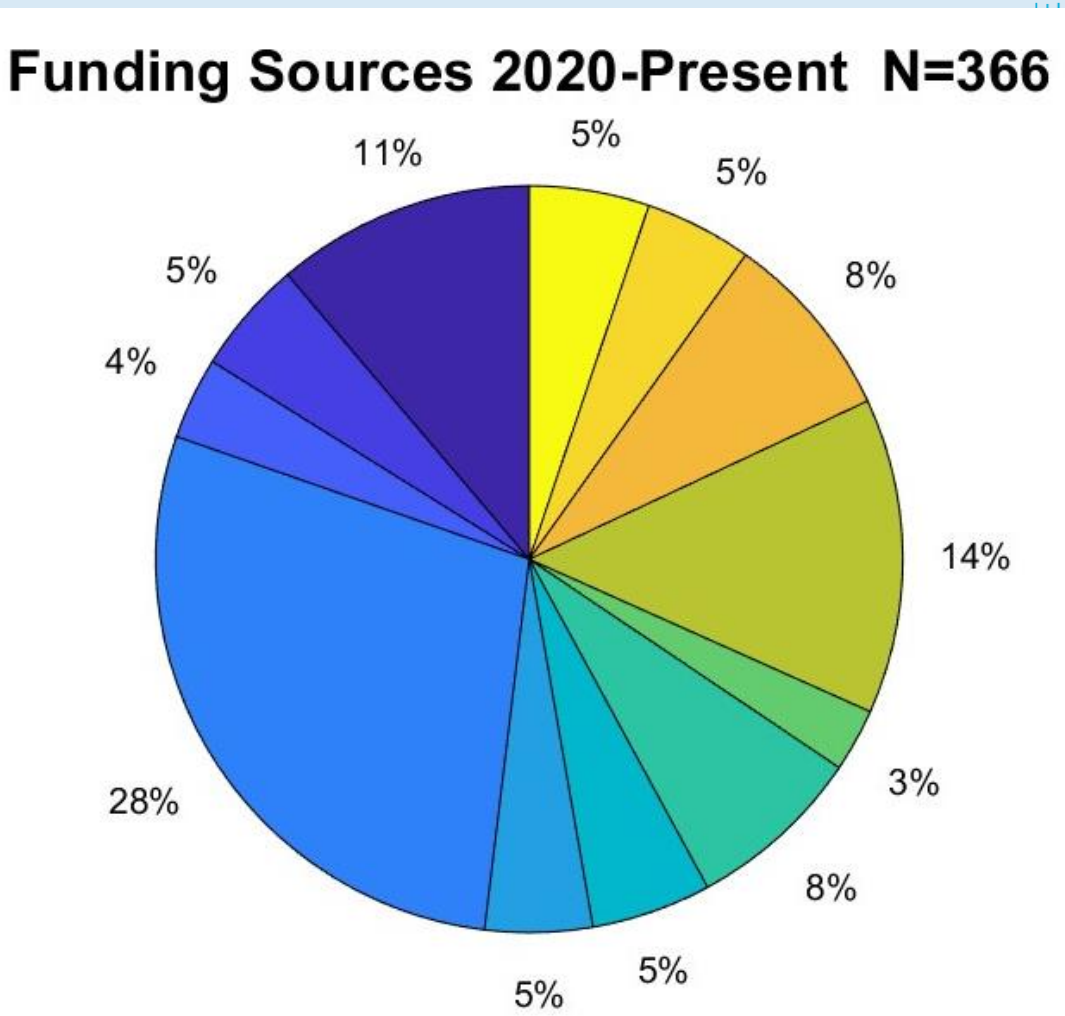
https://oceanobservatories.org/science/publications/

# Participating in OOI: Growing and Diverse Funding



# Participating in OOI: Cruise Participation

https://oceanobservatories.org/how-to-participate/

Opportunities exist for researchers, teachers, students, and others to participate on OOI operations and maintenance cruises as a researcher or observer. Some factors to be addressed to determine participation include **available bunk space, required lab space, and the amount of technical support needed to conduct add-on research**. Non-OOI activities are conducted on a not-to-interfere basis relative to primary OOI activities.

- Numerous past cruises have accommodated researchers and others from outside the OOI Program to collect samples and to conduct at-sea experiments and engagement activities at no additional costs at sea.
- Depending on the time required for non-OOI work to be conducted, there may be OOI staffing costs incurred and additional ship time needed. Requests for additional ship time can be made through the **UNOLS** as part of a proposal.
- More extensive participation on cruises requiring additional ship-time and technical support is possible and has been accommodated in the past, but requires significant lead-time to discuss details.
- For further information, send an email to ooi@whoi.edu to discuss interests and opportunities for upcoming cruises.

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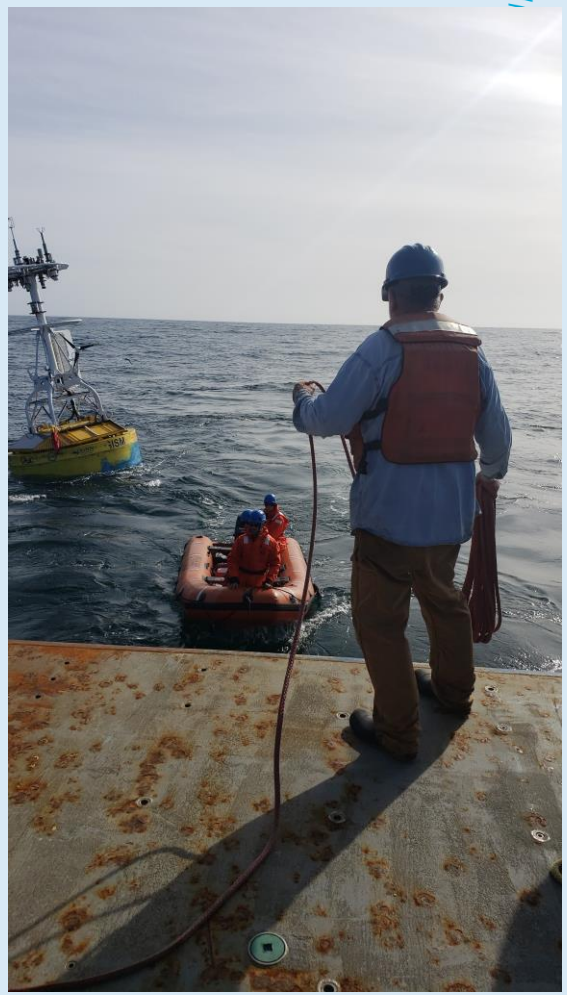
# Participating in OOI: Adding Instruments

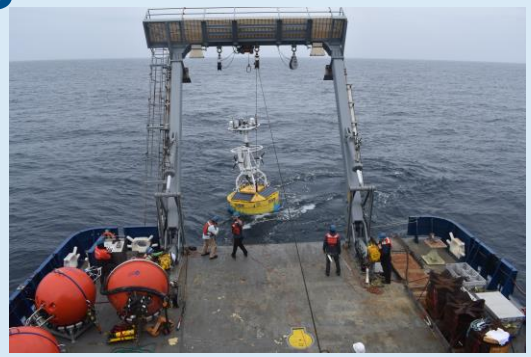
https://oceanobservatories.org/how-to-participate/adding-instruments-or-platforms/

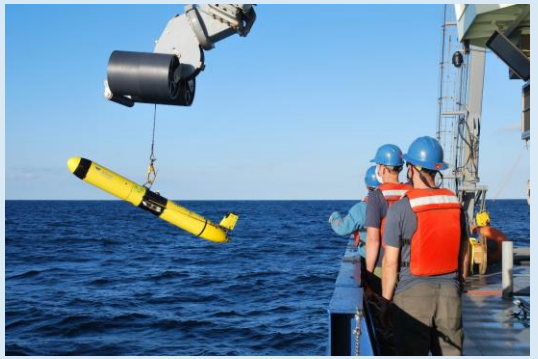
**The process for adding new instruments or infrastructure to the OOI consists of several steps:**

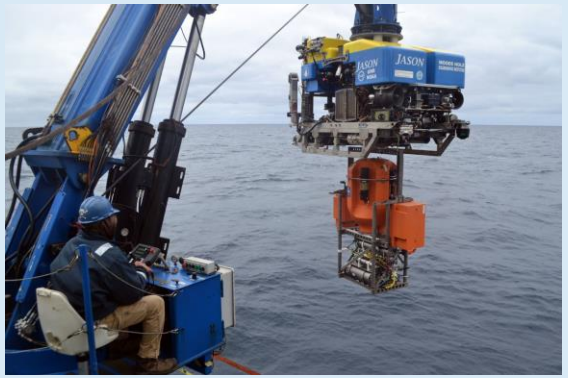
1. The first step in the process is to contact the applicable MIO or send an email to **ooi@whoi.edu** with a brief description of what you would like to add (e.g., instrument and infrastructure) and at which array location(s). This information will be used to determine a relevant point of contact (POC) within the MIO.
2. If the PI decides to submit a proposal, the MIO POC's will assist the PI towards completion of an **Instrument Integration and Planning Form** (**IIPF**), which provides a technical description of the project.
3. The MIO staff works with the PI to create a **Technical Feasibility and Cost Letter** (**TFCL**) which includes a description of the technical scope of the project, deployment information (e.g., ship or ROV time), and OOI required costs.
4. The POC presents a summary of the technical plan, which may be in the form of a draft **TFCL**, to the Scientific Oversight Committee (SOC).
5. **6.** If the SOC views the proposed addition as **feasible and a reasonable-risk** to OOI infrastructure, the MIO staff works with the PI to finalize the **TFCL**.
6. The PI submits a proposal to obtain funding for all activities and expenses related to the additions. Anticipated work by the MIO will be included as a **subcontract,**
7. If funding is approved, the PI works with MIO staff to schedule and accomplish the proposed addition and related activities.



# Participating in OOI: New & Ongoing Activities







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## The OOI has been awarded a Cooperative Agreement for support of Operations and Maintenance for the next five years.

- $220M award for OOI 2.5.
- Does not include ship costs, which will now be handled as normal between NSF and UNOLS with input from OOI.

## Proposed Program Enhancements

- **Data Specialist for each MIO:** Much needed help with our ongoing QA/CC efforts and generation of curated data sets for the research and educational communities.
- **Associate Project Scientists:** The next generation of OOI scientists. Discussions have also included hiring post-docs, ECS, visiting scientists, sabbatical support to expose more researchers to OOI.
- **Data Ambassador Program:** Teams of scientists/engineers and data specialist to provide presentations and data training sessions for new and existing users.
- **Tech Refresh:** Replace aging infrastructure, new data center for CI, improved technology upgrades, and some new sensors.
- **Science User Groups for Research (SUGR) Meetings:** Not to replace OOIFB workshops and other activities, but to enhance interaction with the user community.

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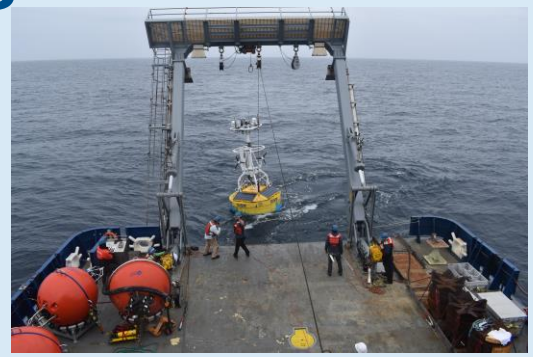

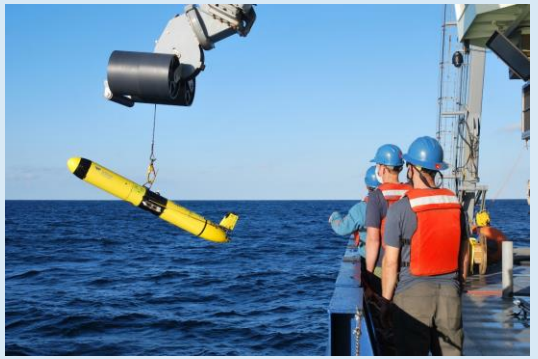

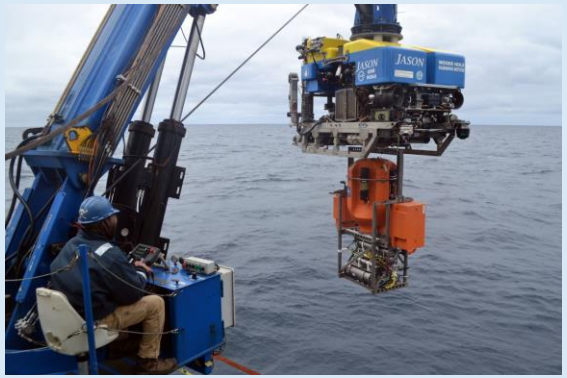

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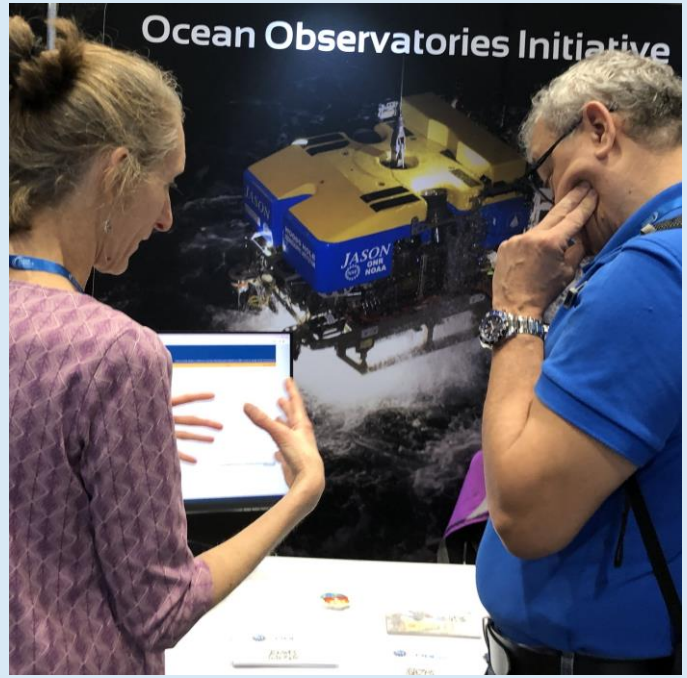
# Participating in OOI: New Activities

**Data Ambassador:** The main objective of the Data Ambassador (DA) Program is to get members of the MIOs out in the community to elevate the visibility of the OOI and grow the user base. The DA program will provide additional opportunities for engagement, increase the use of OOI data for research and education, and enhance opportunities for underserved populations in oceanography and marine sciences. Activities will be considered part of the DA Program if the activities encourage use of OOI data.

In our standard model, DA teams will consist of an Assistant Project Scientist (APS) or PI and an OOI Data Specialist (DS). The APS or Pl will present a talk or seminar, followed by a mini workshop on how to use OOI data by the DS on how to access the data. However, this is one of many formats under discussion and we welcome suggestion from our user community.

We encourage anyone with interest in a site visit from a DA team to contact our CE Office at **ooi@whoi.edu**.



# Participating in OOI: New Activities



**SUGR:** The MIO PI and PM have begun to plan the first of many Science User Groups for Research (SUGR) meetings. We anticipate that these will be smaller and more focused than workshops organized by OOIFB. We expect that tech refresh and new sensors will be topics of interest for these meetings. The first SUGR meeting is being planned around the AGU Fall Meeting in Washington, DC, The CE O ffice is currently working with one of our user group to organize a session on the carbon cycle. We welcome any interested colleague to contact us to express their interest in participating on this topic.

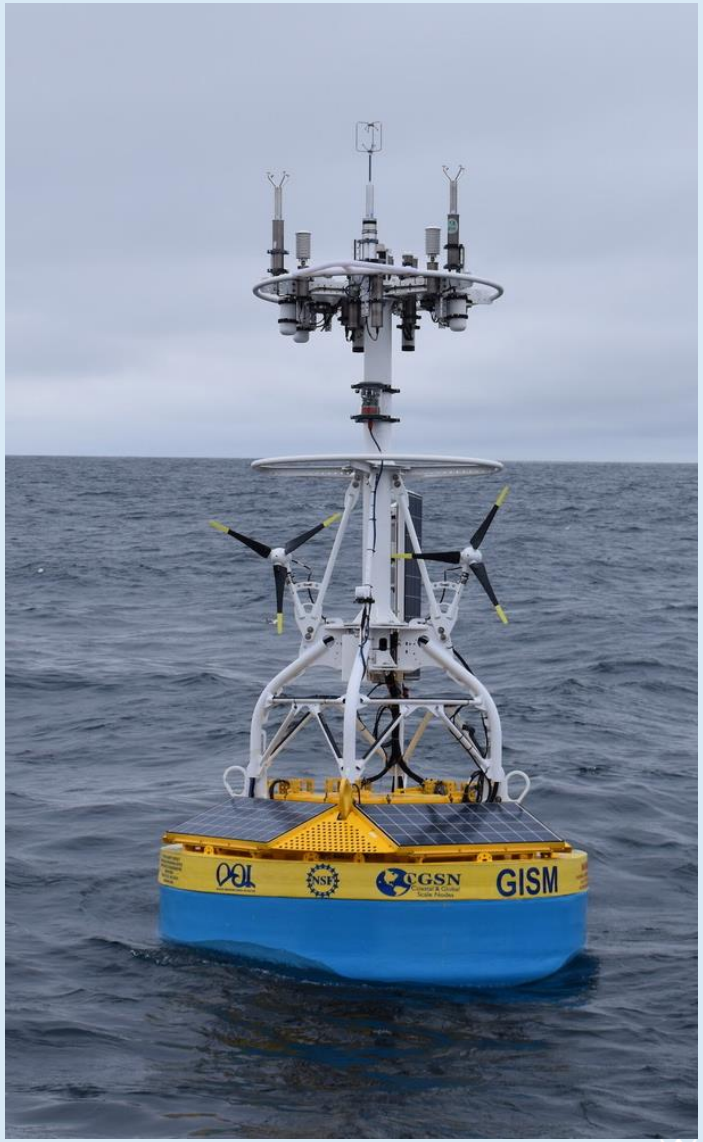

Other topics of interest for future SUGR meetings include:

- Marine carbonate system measurements (pH and pCO2)
- Nitrate measurements (NUTNR)
- Turbulent flux measurements of surface stress and heat flux (FDCHP, METBK)
- Community modeling using bio-optics (OPTAA, FLORT, SPKIR)
- Bio-acoustic sonar measurement (ZPLSC-B & C)
- Links among turbidity, particulates, pressure and waves on the continental shelf (30-100m depth)

We encourage anyone with an interest in helping to organize a SUGR meeting to contact our Community Engagement Office at **ooi@whoi.edu**.

# Participating in OOI

- Secure research funding from NSF and other Federal Agencies.
- Take advantage of shipboard opportunities on turn-around cruise.
- Apply for internship opportunities through UNOLS, MATE and other programs.
- Add instruments and platforms to OOI infrastructure.
- Host a Data Ambassador visit at your institution.
- Suggest, organize and attend a SUGR meeting.
- Contact our Community Engagement Office at ooi@whoi.edu about DA visits and SUGR meetings.
- Just use it! The OOI data is freely available and can be used without additional support for numerous research projects.



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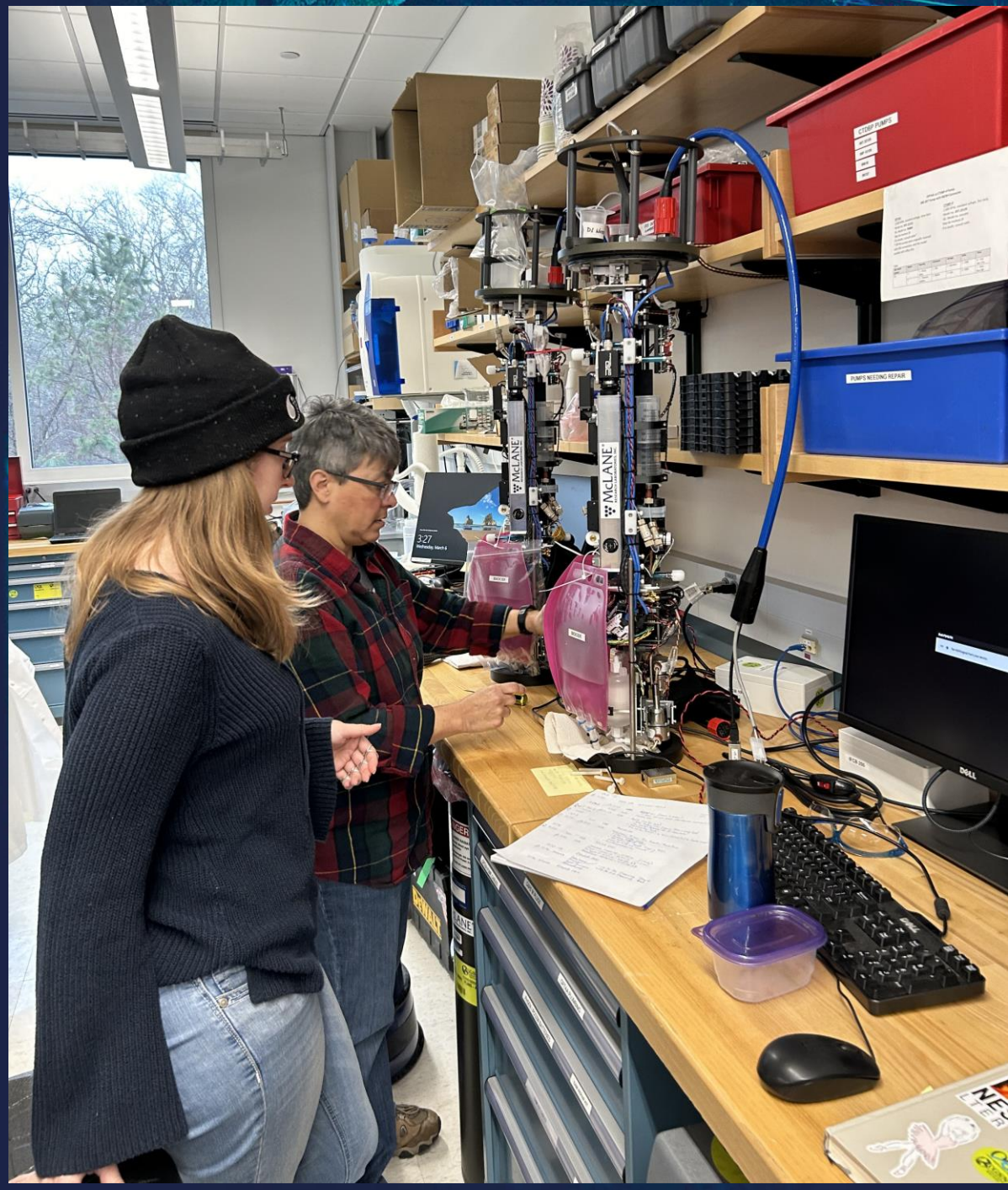
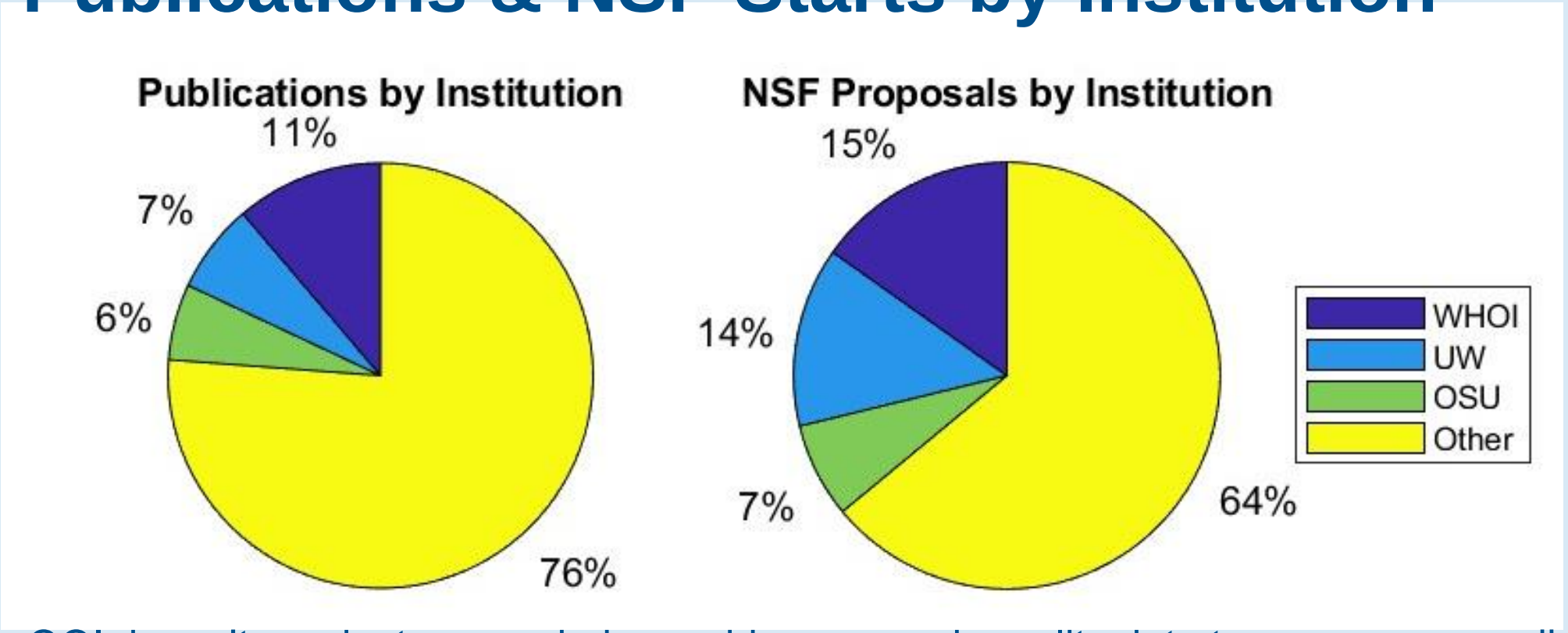
# QUESTIONS?



# Publications & NSF Starts by Institution




- The OOI doesn't conduct research, is provides research quality data to an ever-expanding user base.
- NSF funding is going to a wide range of universities, collages, and research institution.
- The OOI infrastructure  had supported the research of numerous PIs using diverse funding sources.