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Coastal & Global Scale Nodes (CGSN) Operational Status

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OOIFB Fall Meeting, 13-15 Nov 2024



CGSN Status: Overview

- Maintaining 17 moorings, 8 gliders, 2 AUVs and ~350 instruments.
- Completed 3 mooring cruises in 3 months (Apr, May, Jun)
- Successful installation of Pioneer MAB Array
- Mooring infrastructure $\geq 85\%$ operational across all arrays
- Anticipated data collection $\geq 87\%$ for moored instruments



CGSN Status: Irminger

Irminger

- Completed Irminger 11 cruise, 28-May to 02-July
- Included OSNAP mooring turns
- 2 gliders on site
- Irminger Surface Mooring operating normally
- HYPM, FLMA, FLMB fully operational.

Array	Infrastructure	Instruments	Telemetry	Collected
Irminger GSM	100%	87%	89%	89%
Irminger HYPM	100%	100%	100%	100%
Irminger FLMA	100%	100%	100%	100%
Irminger FLMB	100%	100%	100%	100%

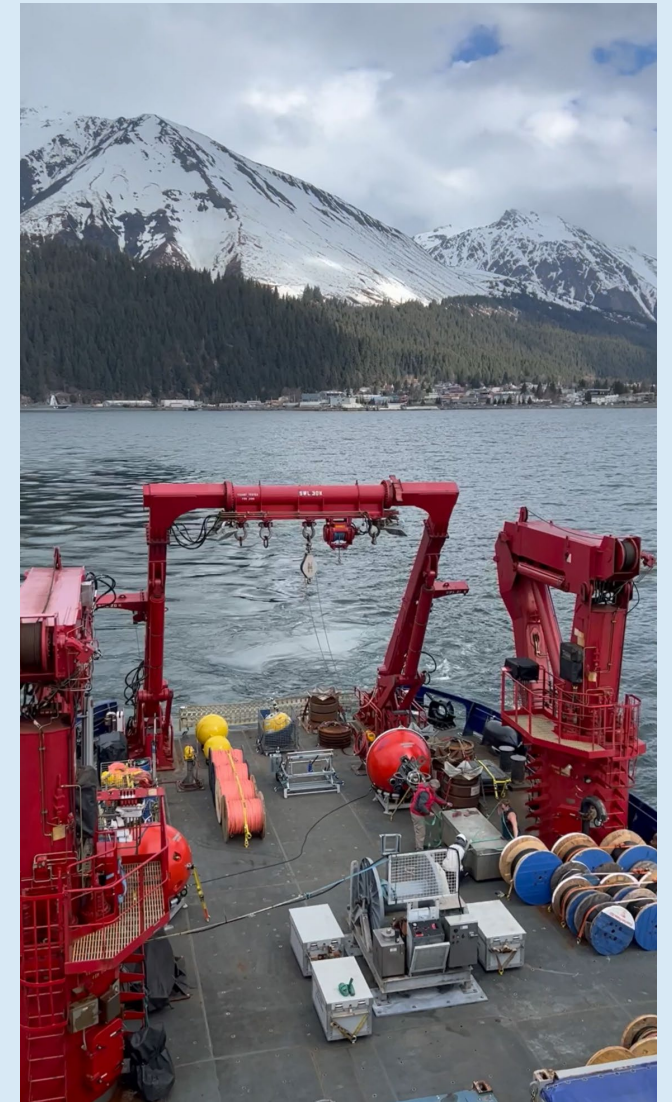


CGSN Status: Papa

Papa

- **Completed Papa 11 cruise, 26-May to 15-June**
- Included UW Waverider mooring turn
- 2 gliders on site
- HYPM, FLMA, FLMB fully operational.

Array	Infrastructure	Instruments	Telemetry	Collected
Papa HYPM	100%	100%	100%	100%
Papa FLMA	100%	100%	100%	100%
Papa FLMB	100%	100%	100%	100%



CGSN Status: Pioneer

Pioneer

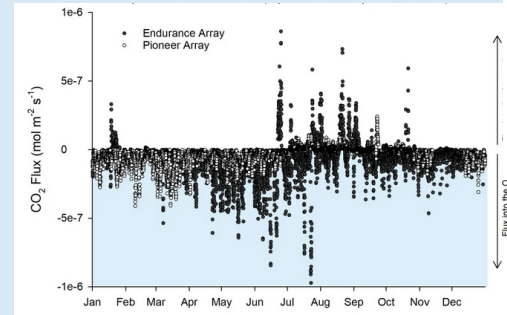
- **Completed Pioneer 20 cruise, 1-21 April**
- Initial deployment of MAB Array
- 3 surface moorings, 5 profiler moorings, 2 shallow water moorings
- 4 gliders, 2 AUVs (serviced on mooring cruises plus small boat ops)
- Successful stand-alone AUV cruise (Oct)
- Pioneer 21 cruise (December 2024) schedule & scope dependent on vessel drydocking repairs

Array	Infrastructure	Instruments	Telemetry	Collected
Pioneer CNSM	98%	86%	88%	92%
Pioneer NOSM	89%	75%	61%	87%
Pioneer SOSM	91%	80%	63%	88%
Pioneer NOPM	29%	0%	0%	100%
Pioneer EAPM	86%	100%	100%	100%
Pioneer SOPM	100%	100%	100%	100%
Pioneer NEPM	100%	100%	100%	100%
Pioneer SEPM	100%	100%	100%	100%
Pioneer WESW	86%	50%	63%	63%
Pioneer CNSW	86%	50%	100%	100%

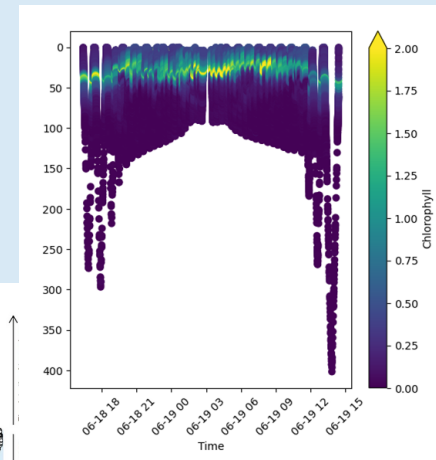


Science Highlights

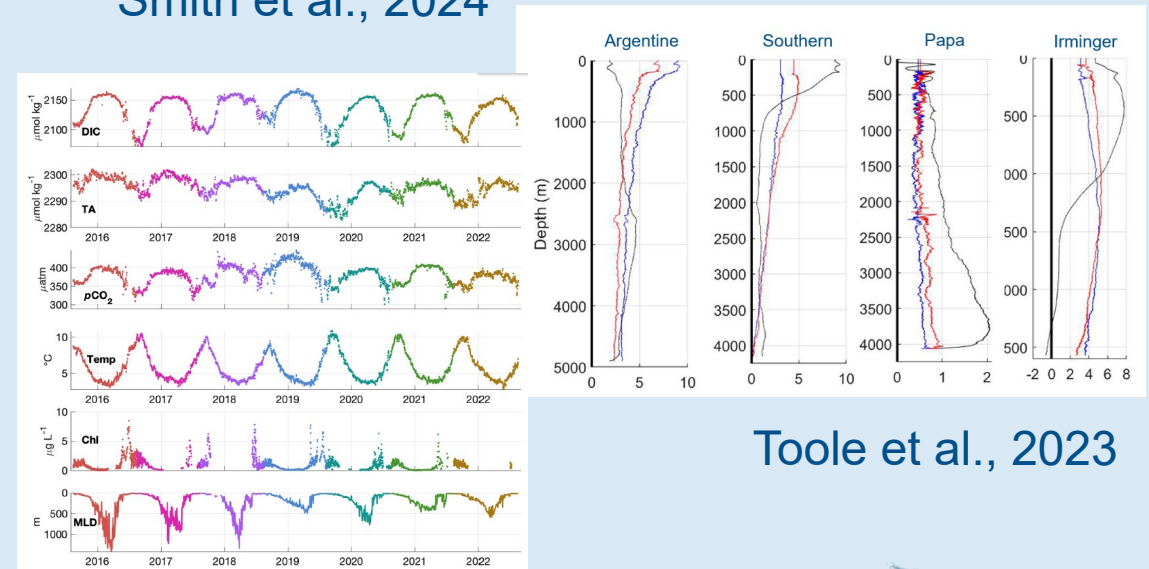
- AUV transect evaluation
 - Focused on NO₃ and Chl
 - Seasonal variability observed
- Data Sonification
 - Mapped OOI data into audio signals
 - Based on Ocean Data Labs nuggets
- Deep ocean vertical structure
 - Data from four Global Arrays
 - Evaluated vertical mode structure
- Irminger Sea carbon cycle
 - Moored data plus shipboard CTDs
 - First multi-year time series for the inorganic carbon system



Smith et al., 2024



Sanchez and Beaulieu, 2023



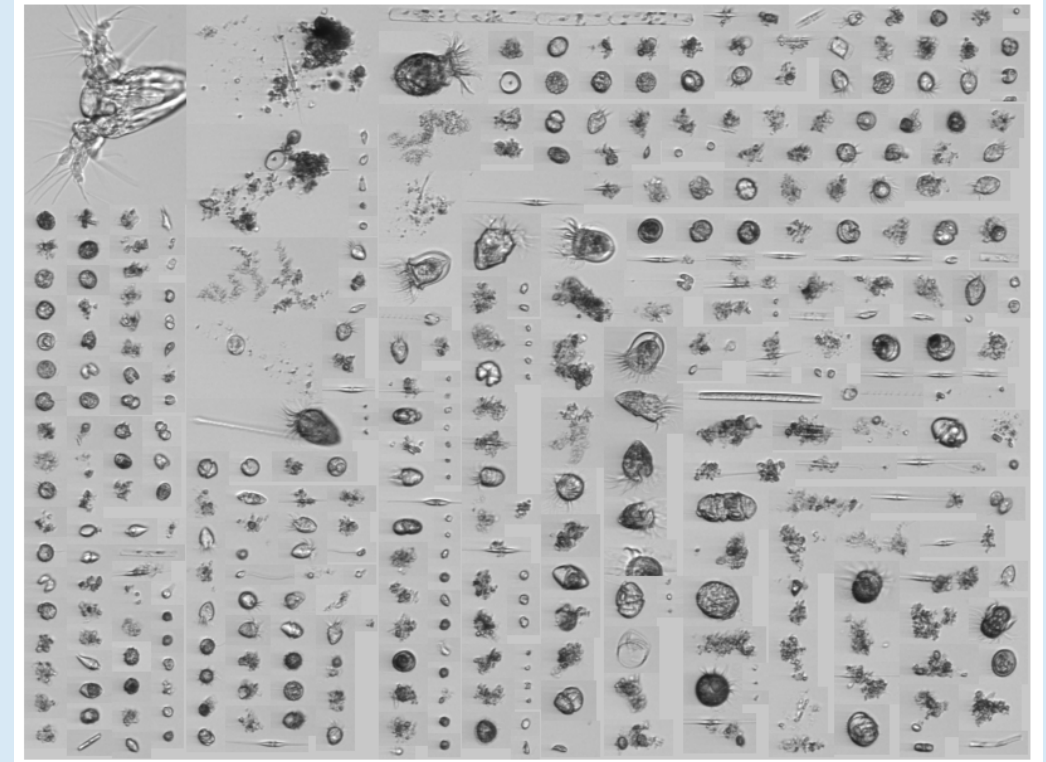
Toole et al., 2023

Yoder et al., 2024



Operational Highlights: IFCB

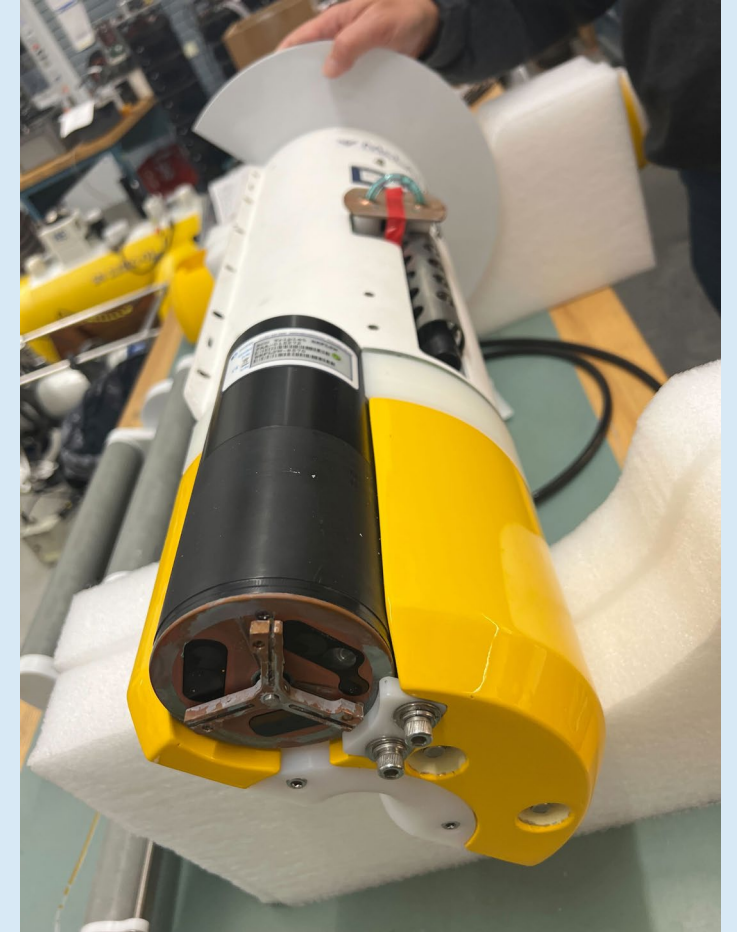
- IFCB deployed at Pioneer MAB
 - NSIF modifications required
 - Extensive pre-deployment prep and post-deployment assessment
 - Data validation from WiFi offload
- Highlighted in Newsletter article and at OOIFB Workshop
- IFCB Dashboard for data display in progress
- Discourse IFCB forum created



Dobson and Newman, CGSN

Operational Highlights: Prawler

- NRE for wave-powered profiler (Prawler) complete
- Will now accommodate 3-channel fluorometer (FLORT) with wiper
- Updated parsers and processors in development by CGSN
- Deployment with new FLORT will be on Pioneer 21 (Winter 2024)



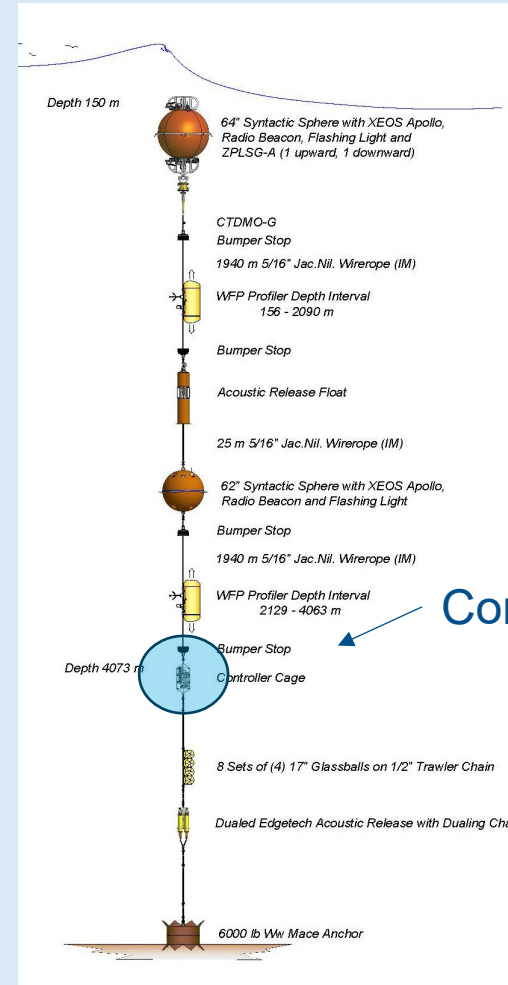
McLane Labs



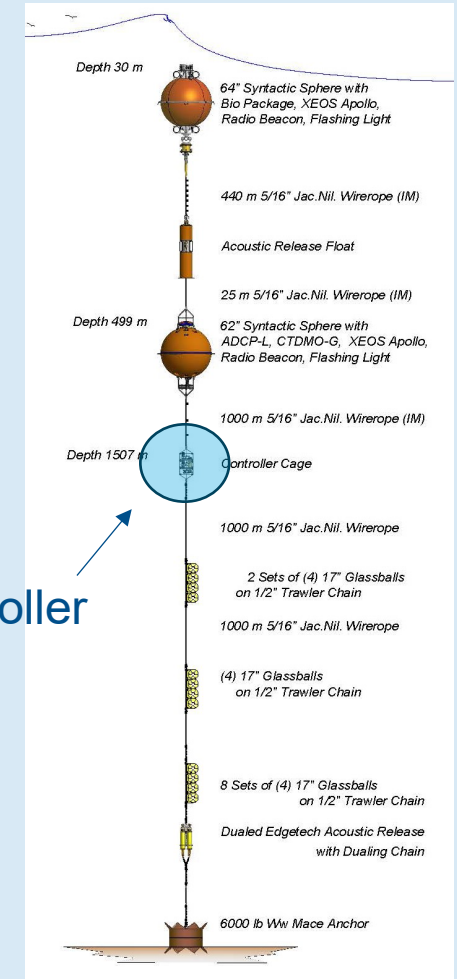
Operational Highlights: Clocks

- Upgraded real-time clock and clock board
- Replaces obsolete clock
- Increases reliability
- Implemented in controller for Papa and Irminger subsurface moorings

Hybrid Profiler



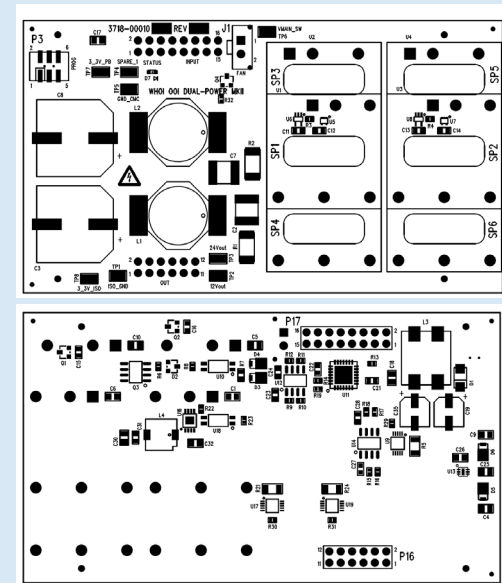
Flanking



Operational Highlights: Power Boards

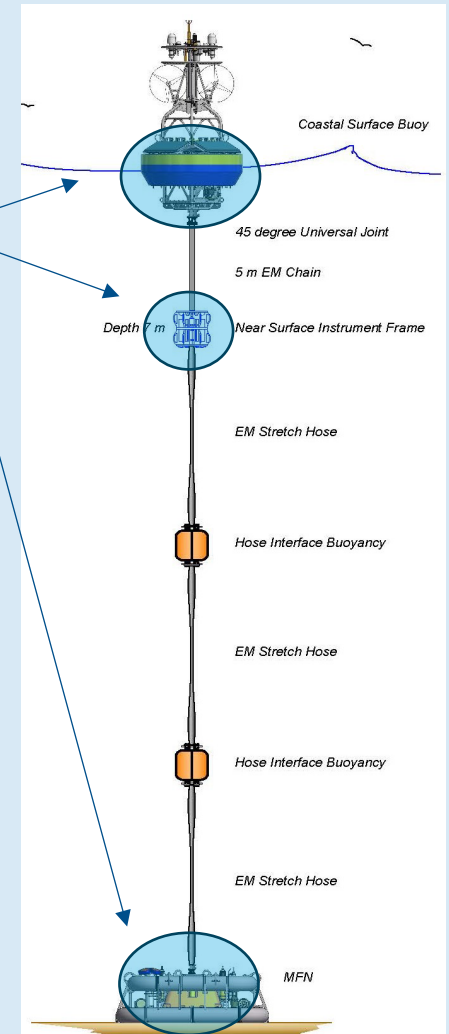
- Developed new dual-power board
- 12 and 24V at 30 and 60W
- Replaces under- and over-spec'd power supplies (15 and 120W)
- Replaces obsolete parts
- Significantly increases efficiency
- Initial deployments:
 - EA ISSM (all locations)
 - Pioneer CNSM (NSIF, for IFCB)

Power Board Locations



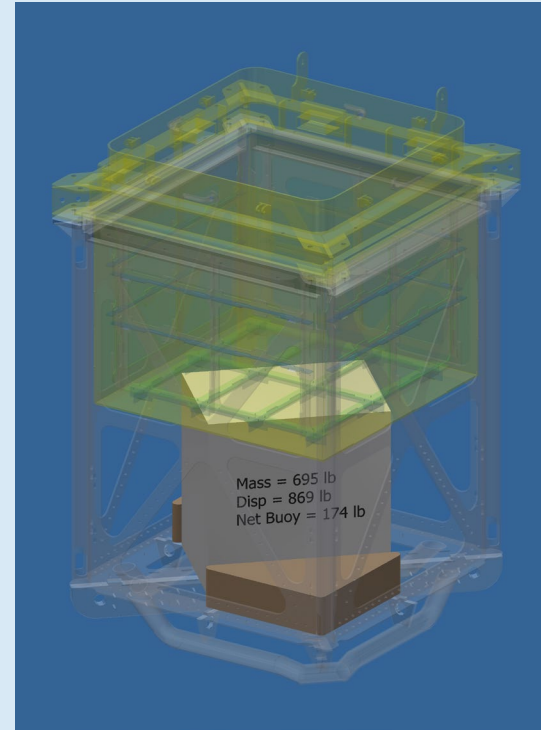
PCB assembly drawings

Surface Mooring



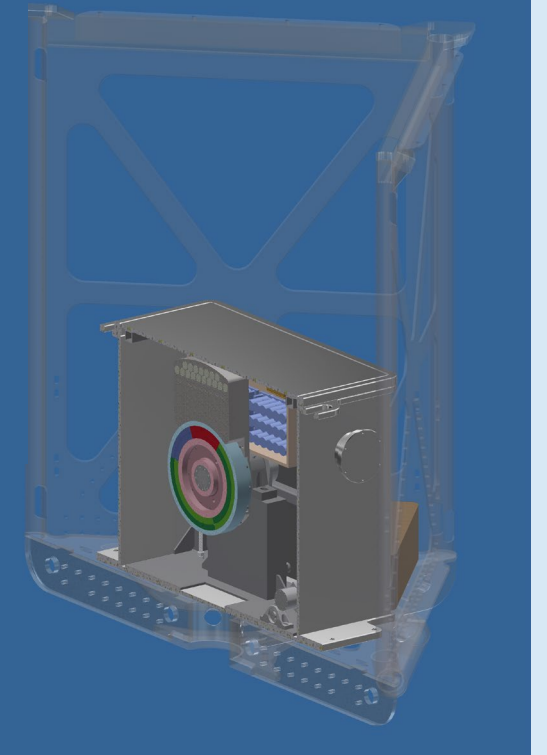
Operational Highlights: WEC

- Developing wave energy conversion (WEC) device
 - Joint project with DOE/Sandia; WHOI subaward
- Phase-1 (design) complete
 - Mechanical design evaluated
 - Electrical integration at WHOI, October 2024
- Phase-2 (build) in progress
 - Planned deployment on Pioneer CNSM fall 2025



WEC
Coe et al., DOE

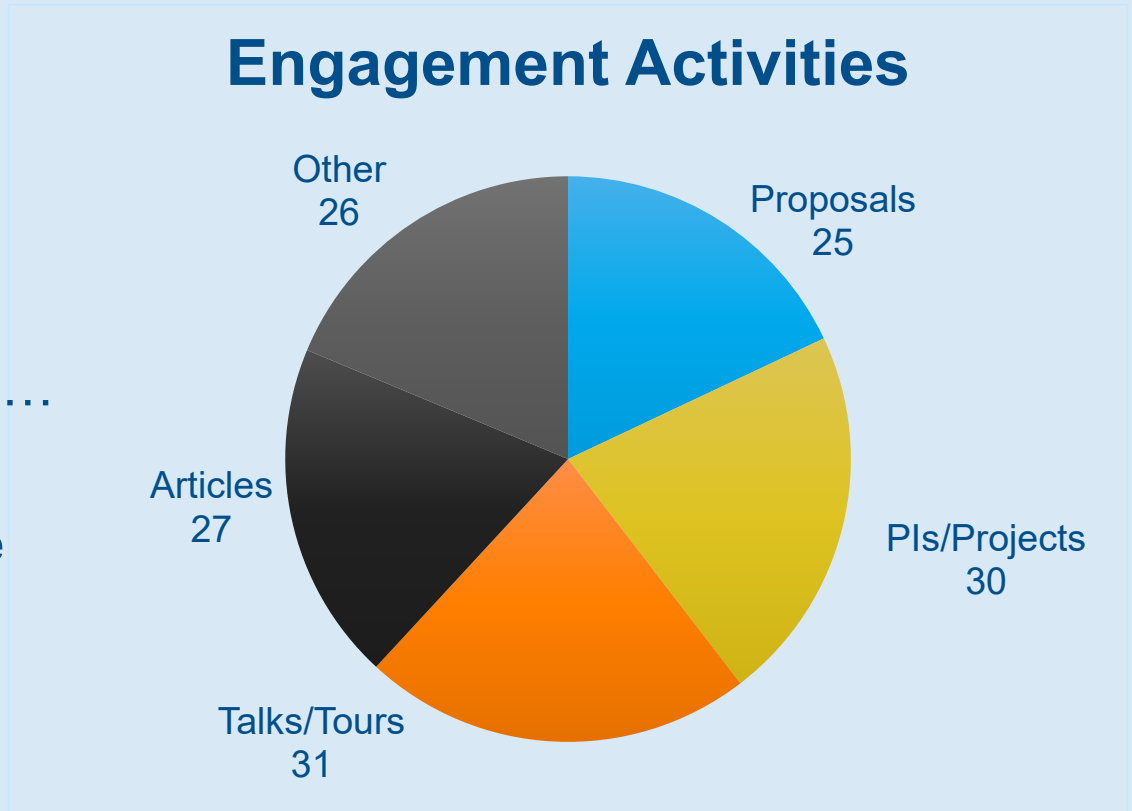
Mech Interface
Peters et al., WHOI



Community Engagement

Over 130 Outreach and Engagement activities in PY-VI (Q1+Q4)

- Proposal-Related:
 - Feasibility assessment, subcontracts
- PIs and Projects:
 - Collaborations and Ancillary Activities
- Talks and Tours:
 - Conferences, workshops, LOSOS tours, ...
- Articles:
 - Contributions to Newsletter and Website
- Other:
 - Interns, committees, working groups, ...



Community Engagement Highlights

- **Proposal Related:**
 - CPIES deployment at Pioneer MAB
 - OSNAP expanded water sampling
- **PIs and Projects:**
 - UNH CO2 flux project collaboration
 - MATE ROV competition, CGSN example
- **Meetings, Talks and Tours:**
 - Summer STEM tours
 - Pioneer MAB workshop
- **Articles:**
 - Wave parameters from MOPAK data
 - BCO-DMO data availability
- **Other:**
 - PEP Scholar mentorship
 - Woods Hole Science Stroll

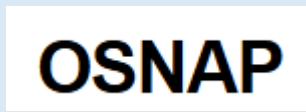
Pioneer MAB Workshop



Summer STEM tours



Collaborating Projects and Organizations





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Questions?

