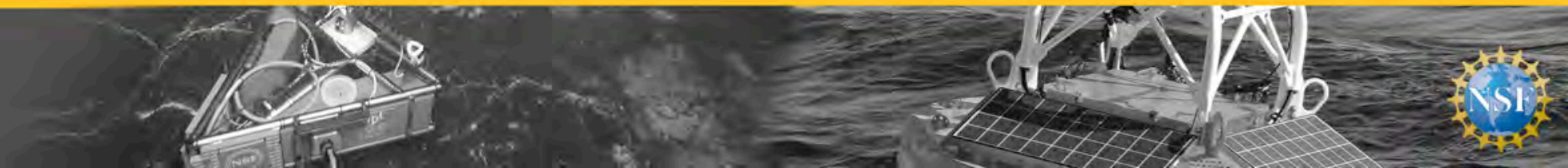
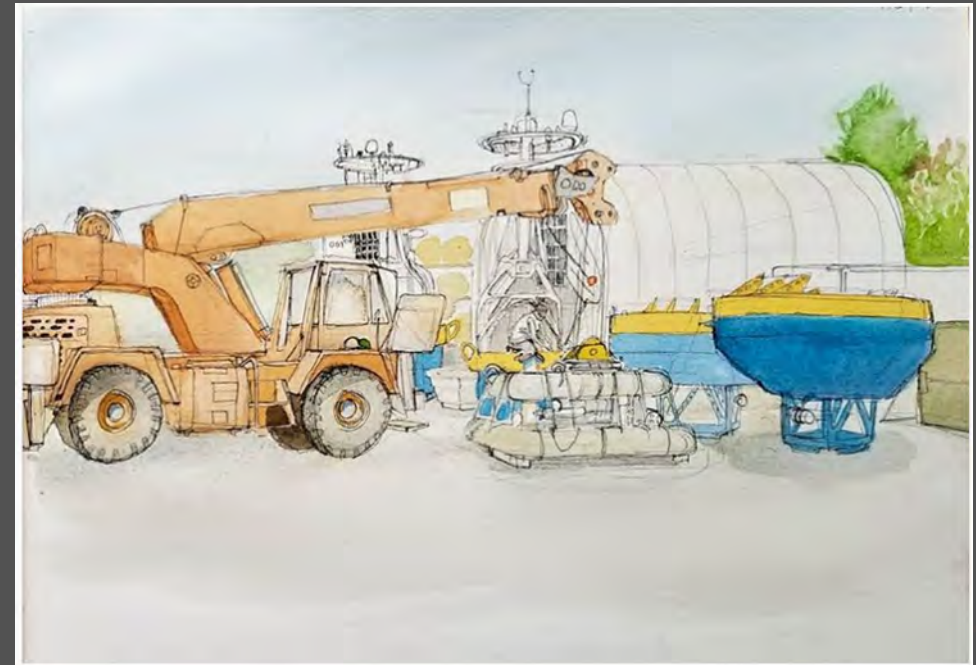
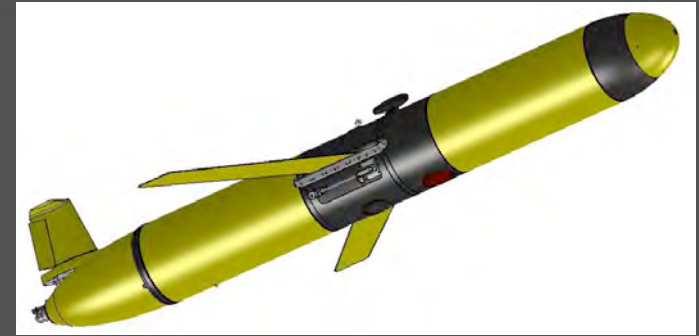


# Endurance Array OOIFB update Nov 12, 2019

[Edward.Dever@oregonstate.edu](mailto:Edward.Dever@oregonstate.edu)  
[jfram@ceoas.oregonstate.edu](mailto:jfram@ceoas.oregonstate.edu)  
[cwingard@ceoas.oregonstate.edu](mailto:cwingard@ceoas.oregonstate.edu)



# Endurance Array Turn Cruise 12

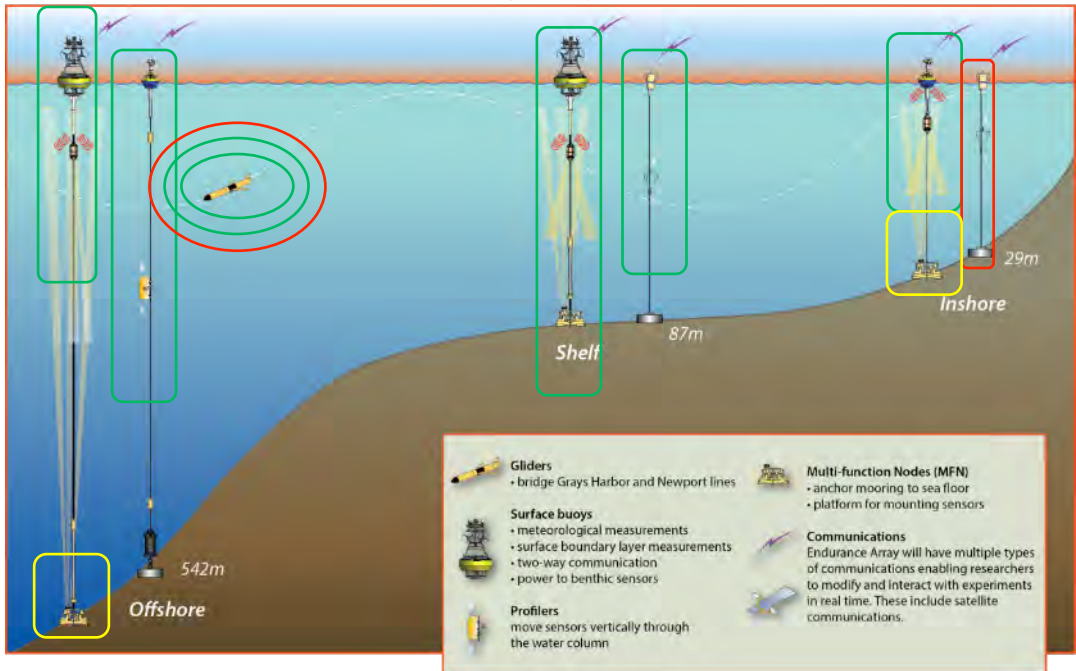
R/V Sikuliaq Oct 9-23, 2019

- Mooring operations on cruises completed successfully
- Quick Look Reports in review, full reports in prep.
- Cruise data on Alfresco
- Telemetered data from Endurance 12 in process of ingestion into CI
- Recovered instrument data from Endurance 11 being assembled, estimated ingest mid-June
- Recovered instruments being stripped, cleaned and sent to manufacturers for refurbishment and calibration
- Endurance 13 R/V Sikuliaq March 31- April 15, 2019

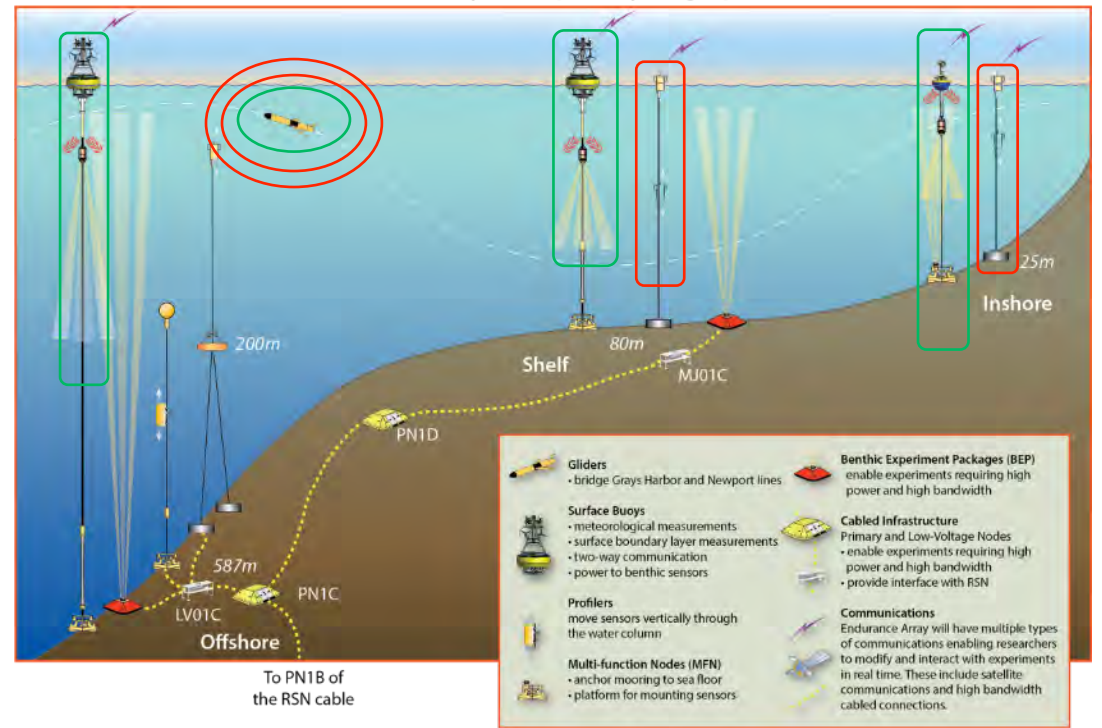


# Endurance Array Platform Status

Endurance Array – Grays Harbor Line



Endurance Array - Newport Hydrographic Line



Platforms deployed with full complement of instruments except

- All CAMDS (failed pre-deployment testing)
- ZPLSC on Washington offshore mooring (repeated pressure housing flooding)

Operating  
 [Not telemetering, but sampling]  
 Not deployed or not working

All telemetering moored instruments working properly



# Endurance 12 Mooring Status

Platform	Infrastructure %	Instruments Deployed %	Near Real Time Delivered %	Data Collected %
Oregon inshore	100%	95%	100%	100%
Oregon shelf	100%	100%	100%	100%
Oregon offshore	100%	100%	100%	100%
Washington inshore	100%	95%	57%	90%
Washington shelf	100%	97%	96%	96%
Washington offshore	100%	93%	70%	93%
Washington offshore profiler	100%	100%	100%	100%

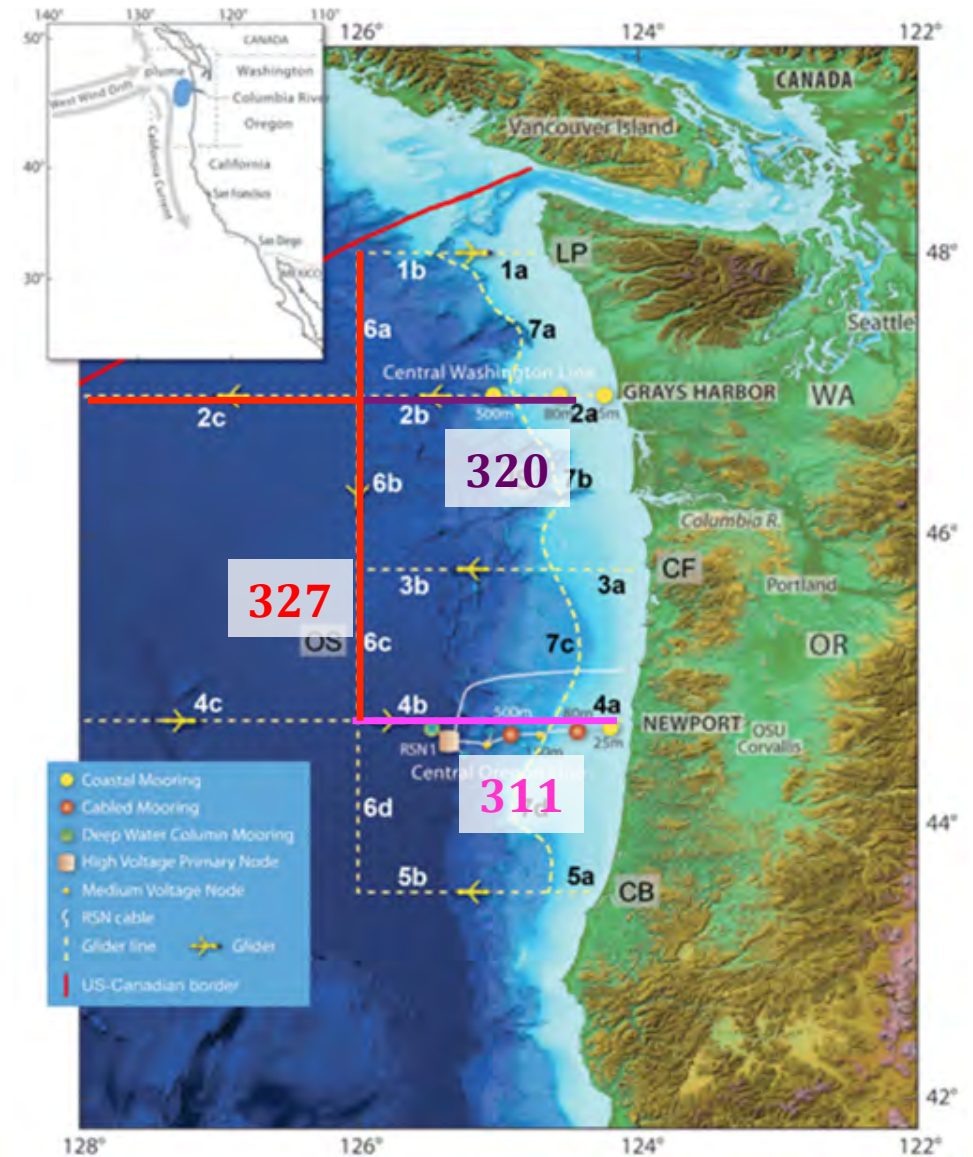
% takes into account electronics intentionally turned off (e.g., acoustic modems, FreeWave etc.)



# Endurance Array Glider Coverage

## Since May 2019 meeting:

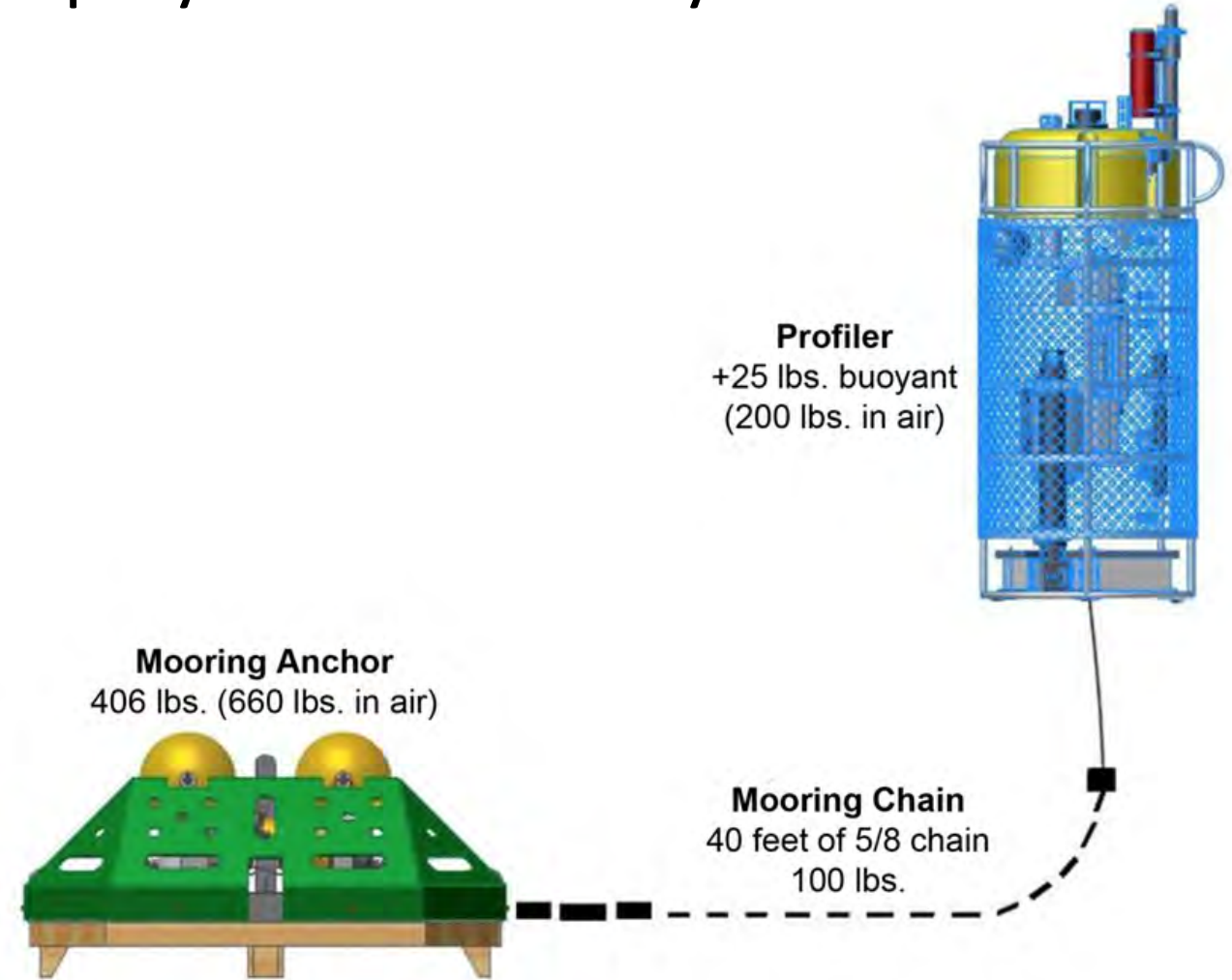
- 10 gliders deployed between 15 May and 11 Nov (12 per scope)
- 4/7 deployments to full duration (3 still deployed)
- 2 gliders leaked (2, 14 days) – aft section and digifin leaks
- 1 glider recovered (69 days) after biofouling affected navigation
- 3/3 current deployments operating normally (1 1000 m and 2 200 m pumps)
- Components sent to TWR since start of OOI 2.0 after funding received. Tracking towards \$250k MoN limit
- Less than full complement of glider deployed due to slow servicing and one glider lost 2018
- Glider deployment (Newport line, inshore) planned for Nov 14, 2019



# Endurance Array CSPP deployment summary

## Since May 2019 meeting:

- 9 CSPP deployments between May and Oct (375/694 scoped profiling days)
- 3 deployments completed normally (3 months)
- 1 broke free during a high wave event
- 1 battery adaptor plate failure
- 2 battery problems
- 1 antenna problem
- 1 currently deployed and operating at CE07SHSM (Iridium connection)
- 1 planned for deployment at CE02SHSM (cell connection) Nov 14, 2019



# Endurance Array PY I community engagement

- Outreach to individual investigators – support proposals and OOI data use
- Participation in regional and national meetings – convey knowledge of OOI status and engage community in OOI use
- Increase OOI data visibility and use – make data more accessible
- Graduate student outreach – provide seagoing opportunities and encourage graduate student access to data
- Undergraduate and other stakeholder outreach – provide opportunities for students, increase knowledge of OOI data availability

# Letters of Technical Feasibility and other contacts for proposals that would utilize OOI

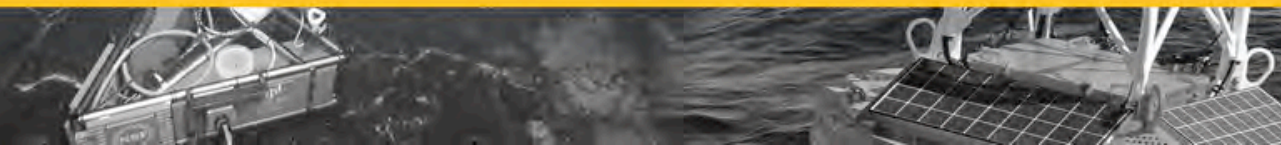
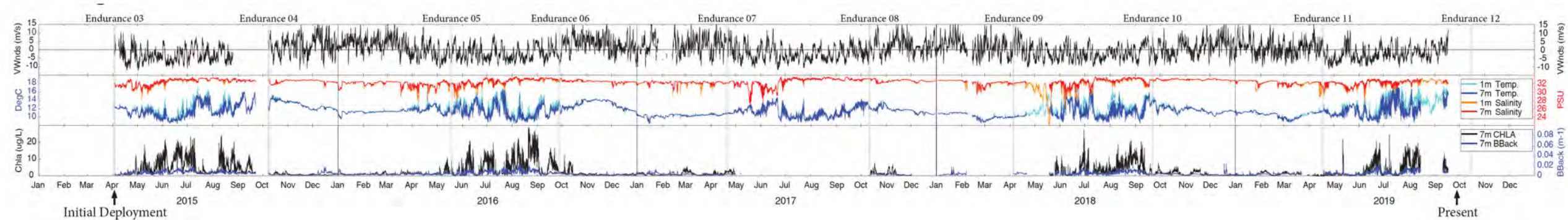
- Sea-Bird National Oceanographic Partnership Program (NOPP) proposal submitted by Sea-Bird in Feb 2019. Paul Matthias (PMO) provided a technical feasibility assessment letter. This proposal is still pending.
- Provided a technical feasibility assessment for a NASA proposal submitted by Dr. Maria Kavanaugh (asst. prof. Oregon State Univ.). This proposal was funded in Aug 2019.
- Have been in contact with several other proposers with pending or planned proposals to core NSF, NASA, STC





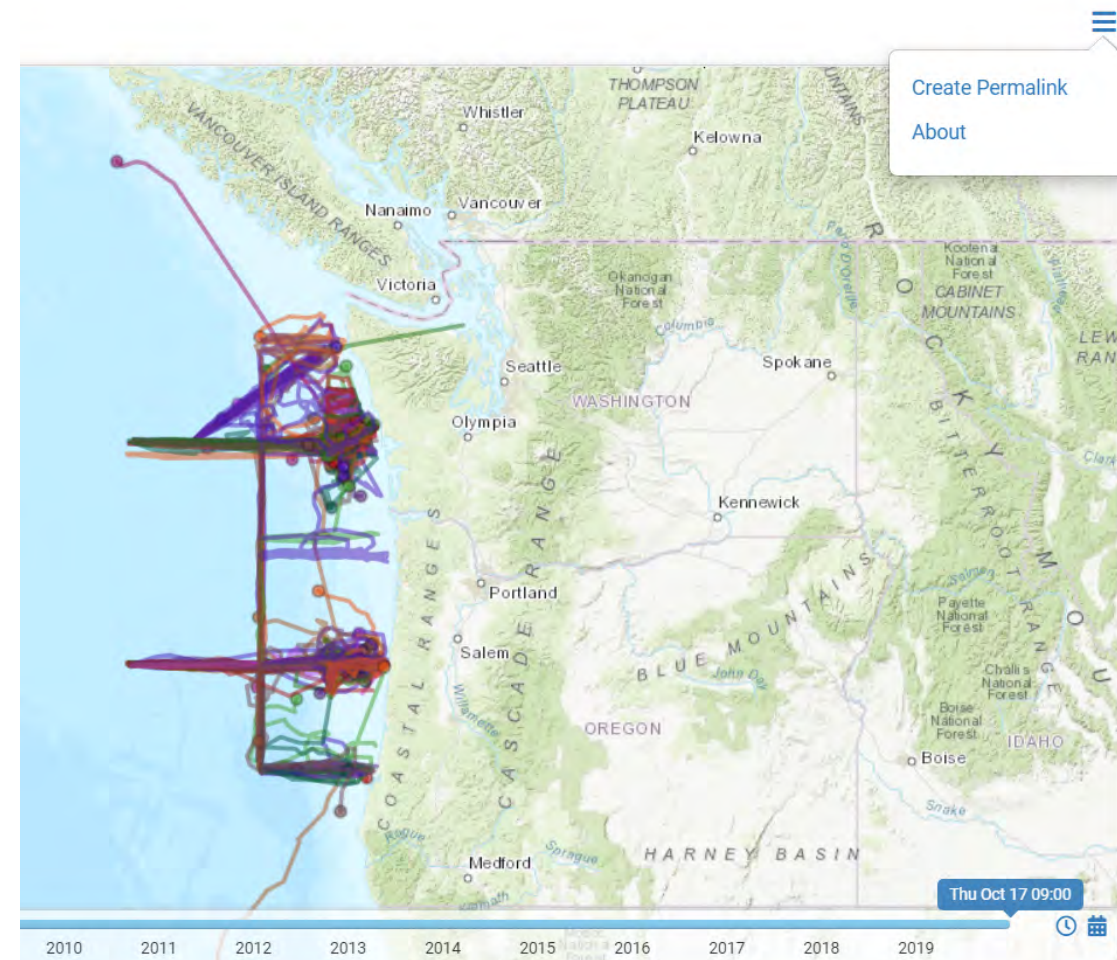
# Participation in regional and national meetings

- Fall 2018 AGU OOIFB Town Hall - Asst. Prof. Ashley Burkett (Oklahoma State Univ.) is now deploying settling devices on Endurance Array multifunction nodes (bottom landers).
- February 2019 ASLO – OOI talk on observations and infrastructure. After speaking with researchers there, started working to push OOI data onto GOA-ON.
- Sep-Oct 2019 EPOC – Fram attended and presented time series of Endurance OOI data along with links to python and Matlab scripts to download data via the M2M interface.
- Sep 2019 OceanObs'19 – Risien, Barth, and Fram attended. Also contributed to the EarthCube TimeSeries meeting and submitted OOI glider line information to the OceanGlider BOON database.



# Increasing OOI data visibility and use

- Pushing data to community data bases
  - NDBC – meteorological data, including wave and radiation data
    - Updated telemetry to 2 hours, NDBC review of metadata and data
  - NANOOS – meteorological and water column data
  - GOA-ON – water column data focusing on pCO<sub>2</sub>
  - Glider DAC – CTD data, now expanded to include fluorescence and O<sub>2</sub> data
- Development of additional software and scripts
  - Python and Matlab scripts for M2M download of OOI data
  - Tools for download, plotting, and quality assessment of profiler data.



# Outreach to graduate students

- UNOLS cruise volunteer program
  - Criteria: interest in data types provided by OOI, residence at non-UNOLS vessel operating institution, diversity
  - One student on spring 2019 cruise, expanded to two students on Fall 2019. Expect two students per cruise going forward.
- Other graduate cruise participants accommodated on as available basis after contacts with the outside PI's
- Informal interactions arising from graduate student visits, help desk tickets, UNOLS cruise volunteer participation etc.
  - Provided graduate students from UW, ASU, VIMS, OSU, UGA with scripts for accessing OOI data via M2M, OOI raw data, and the glider DAC.

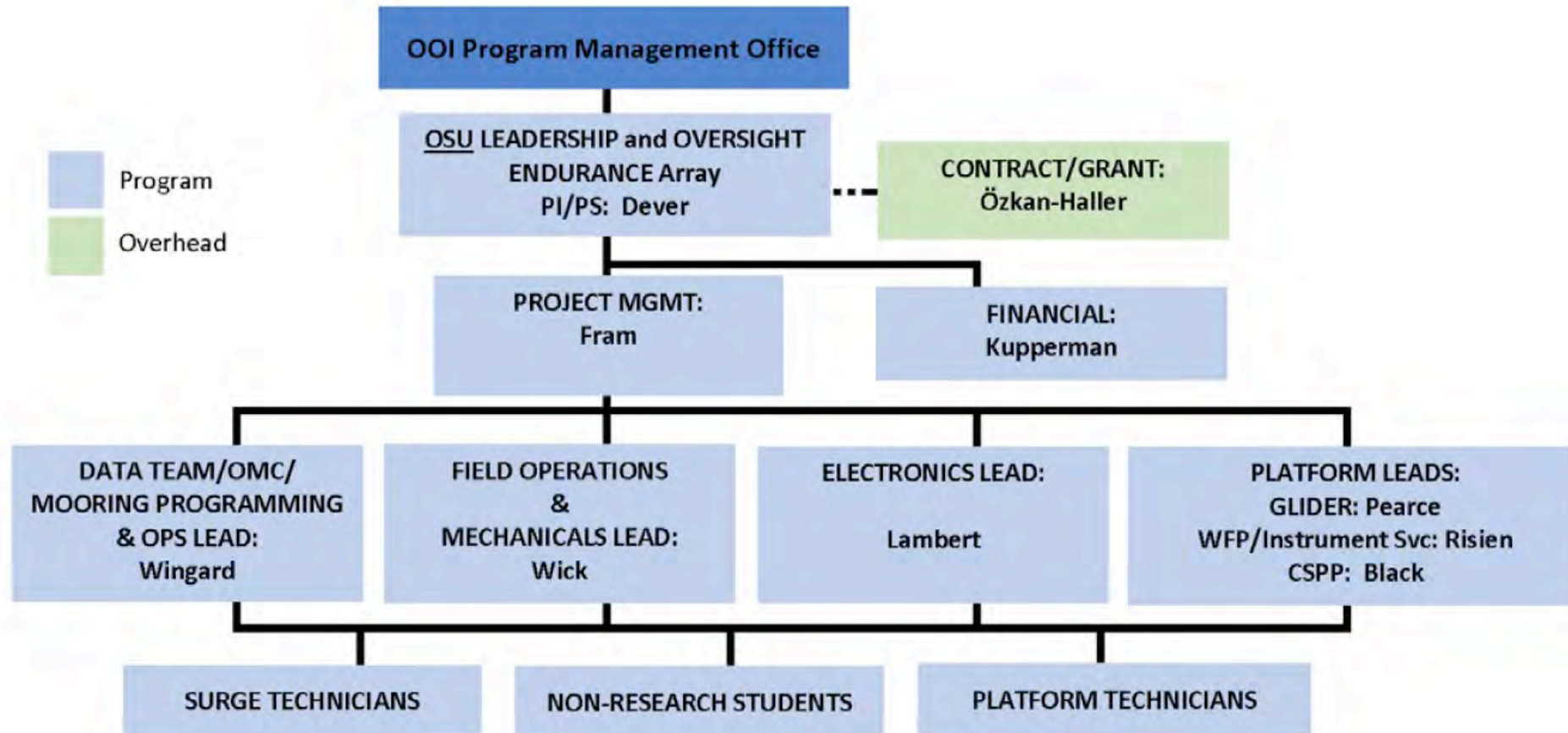


# Contacts with other stakeholders

- Oregon Dept. of Fish. And Wildlife (ODFW) and Quinault Nation interest in hypoxia
- Regional meetings focused on governmental and other stakeholders
  - Fram participated in July 2019 PMEC conference, Portland, OR – led to PMEC access of OOI wave data
  - Fram was keynote speaker for 2018 Pacific NW Marine Technology Society summit.
  - Risien and Barth participated in NANOOS conference, Seattle WA
- REU program tours, undergraduate student employees, artist at sea
- Public Events
  - HMSC Marine Sciences Day, Newport OR
  - Da Vinci Day, Corvallis OR



# EA org chart: about 12 FTE, no changes



# Challenges (essentially unchanged since May 2019 OOIFB meeting)

- CSPP failures
  - Iridium communications issues
  - Power issues
- Instruments
  - No CAMDS servicing, affected Endurance 12 deployment
  - ZPLSC housing at CE09OSSM (542m) showed has flooded several times in the past. Working on plan to deploy shallower downward-looking using a variant of ZPLSG type on wire following.
  - Users have pointed out some issues in O2 data quality (biofouling and calibration performed by YSI)
- Glider servicing
  - Items are taking a long time, affecting deployments
- UNOLS ship scheduling, ship costs and transit. Reducing Fall 2020 cruise by 3 days to mitigate risk.
- Heavy Lift Winch used successfully on 2017, 2018, and 2019 cruises. Some continuing issues with lineout and tension readouts.

