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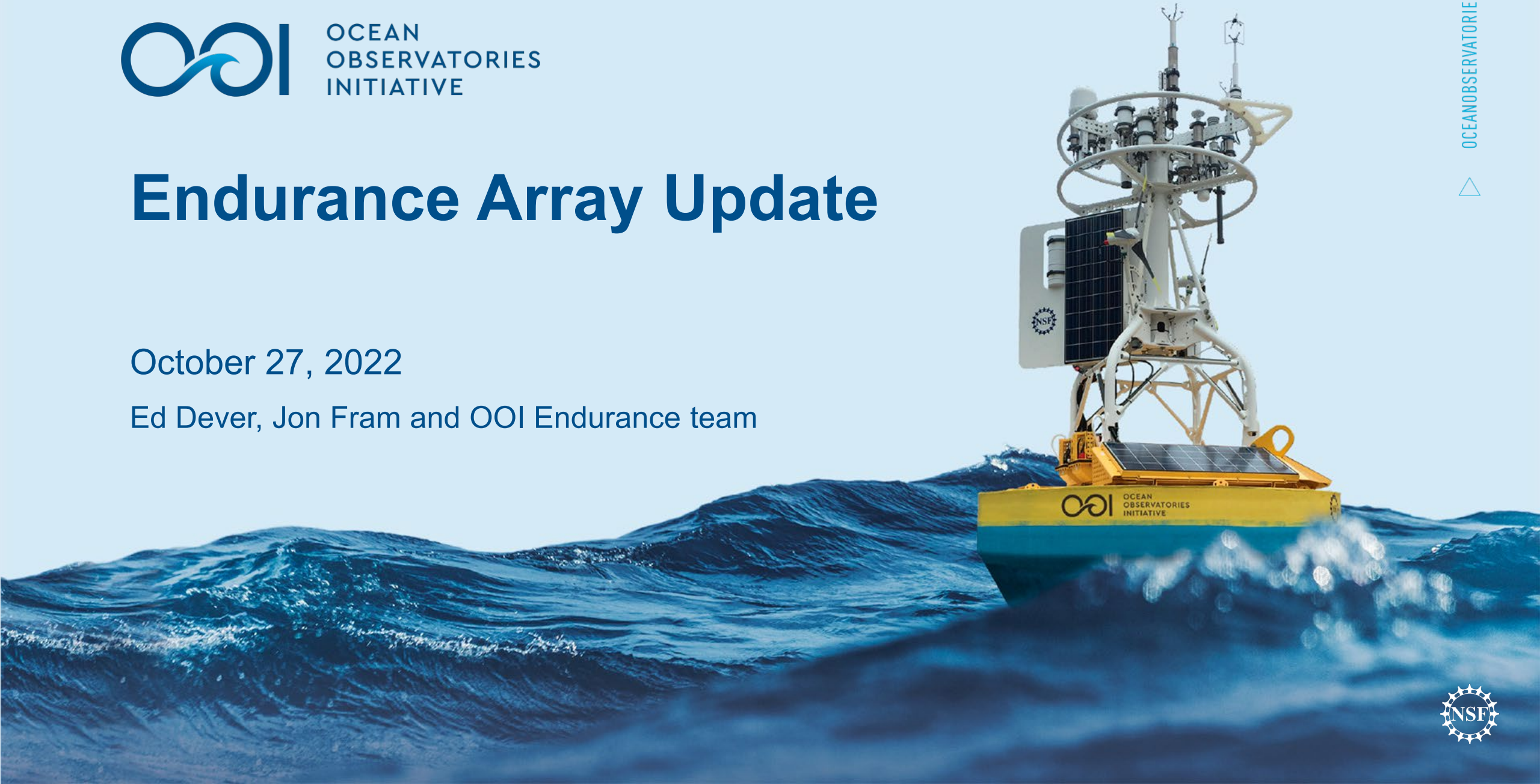
Endurance Array Update

October 27, 2022

Ed Dever, Jon Fram and OOI Endurance team



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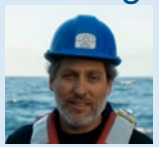
The EA Team

13 FTE

Principal Investigator/
Project Scientist

Ed Dever
0.6 FTE

Project Management



Jon Fram
0.9 FTE

Finance

Pei Kupperman
0.45 FTE

Field Ops And
Mechanical Lead

Alex Wick
1 FTE

Electronics Lead

Steve Lambert
1 FTE

Data Lead

Chris Wingard
1 FTE

Moorings

Kristin Politano
1 FTE

Platform Leads

Gliders

Stuart Pearce
1 FTE

CSPPs

Linus Stoltz
1 FTE

WFP

Craig Risien
0.2 FTE

Undergraduate Student
Research Assistants
0.2 FTE

Surge
Technicians
1.65 FTE

Platform
Technicians
3 FTE

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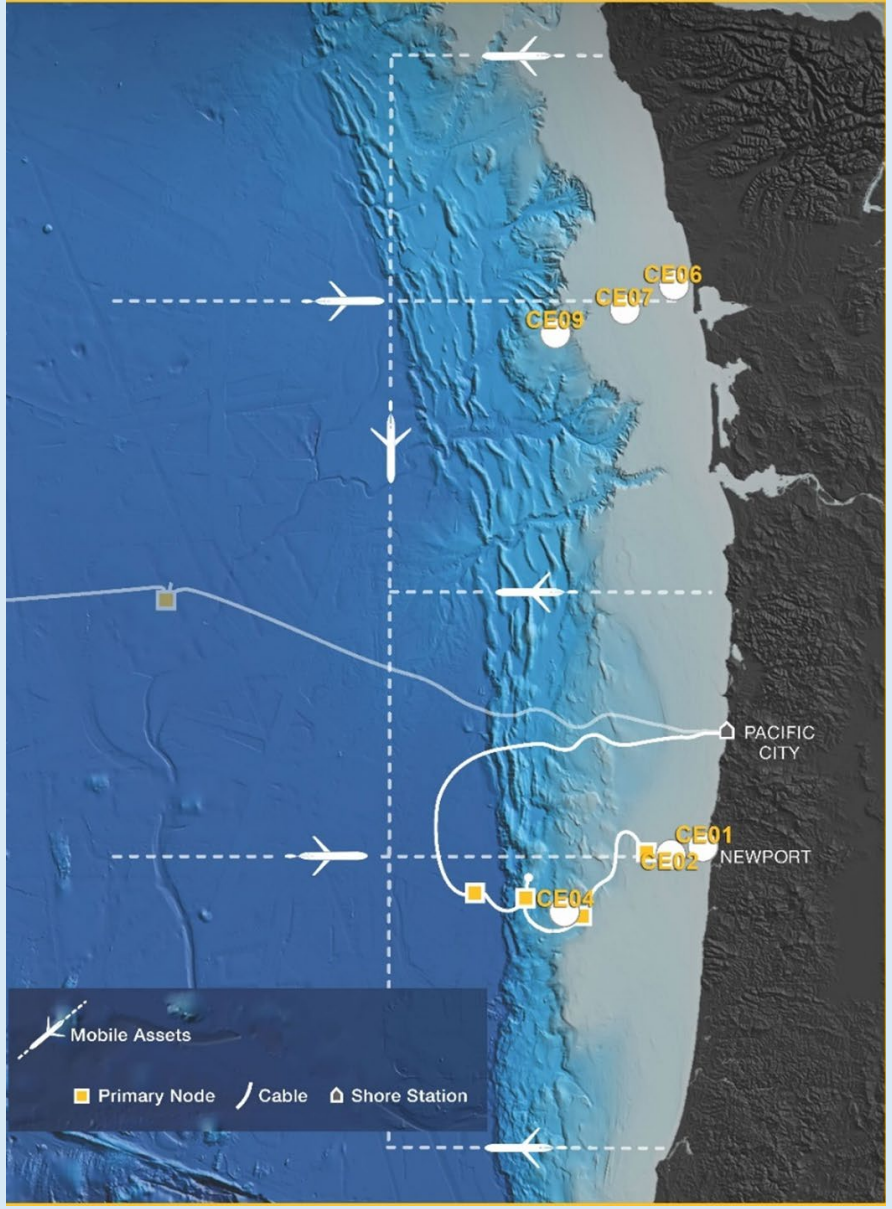
Coastal Endurance Array

- Long-term observations of fundamental scientific and societally relevant processes including ocean heat waves, hypoxia and ocean acidification
- New insights into interpretation of satellite measurements
- Insights into impacts of Columbia River, California Current System, wind, El Niño, Pacific Decadal Oscillation
- Multi-year records of pH and air-sea pCO_2



Operated by OSU (uncabled, PI Ed Dever) and UW (cabled, PI Deb Kelley)

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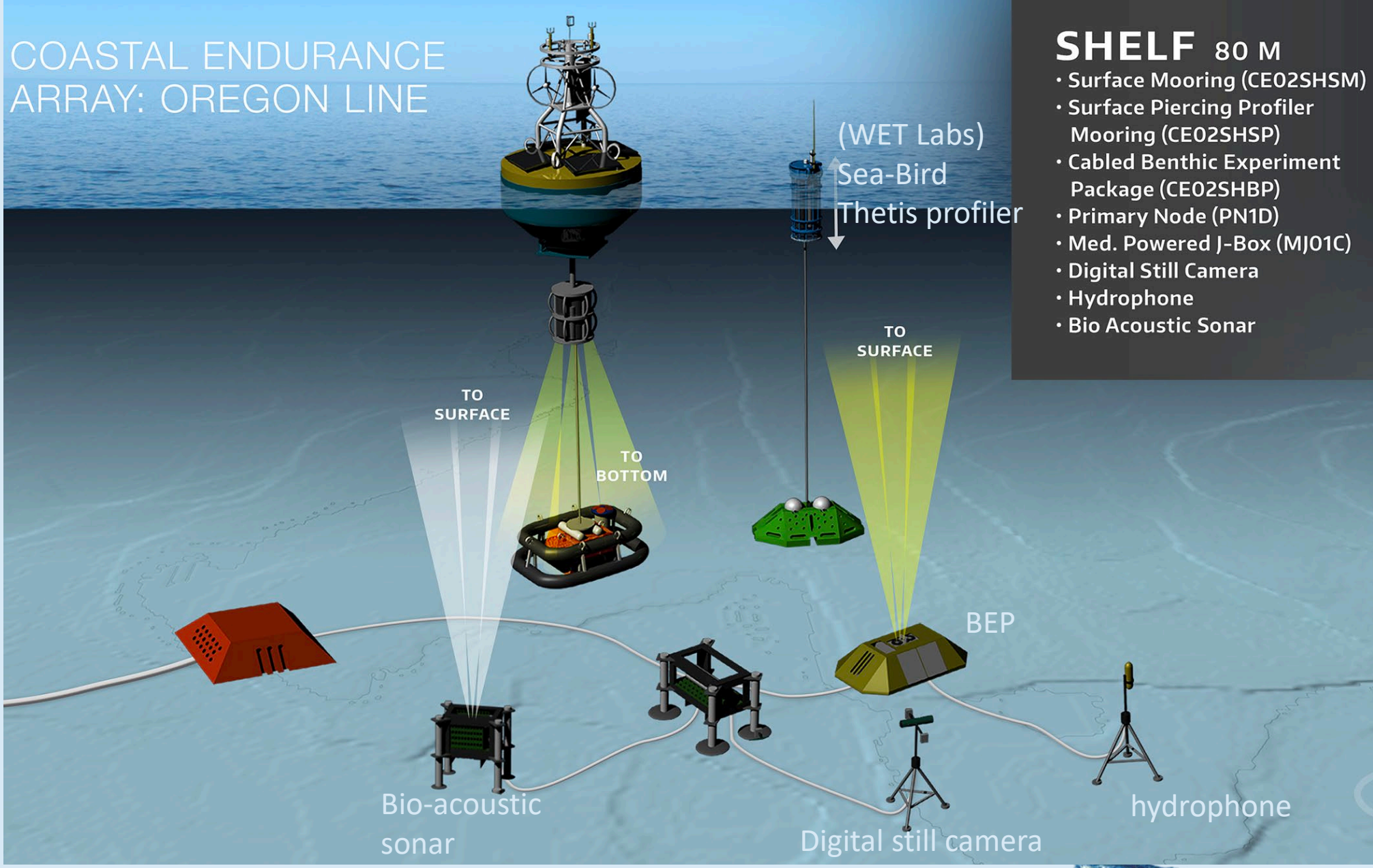
Surface Profiler instruments include:

- CTD
- Dissolved O_2
- Nitrate
- PAR
- Single point velocity (Nortek Aquadopp)
- Spectral irradiance
- spectrophotometer

Bottom (BEP) instruments include:

- Water property instruments
- Bio-acoustic sonar (Kongsberg EK-60)
- Digital still camera
- hydrophone



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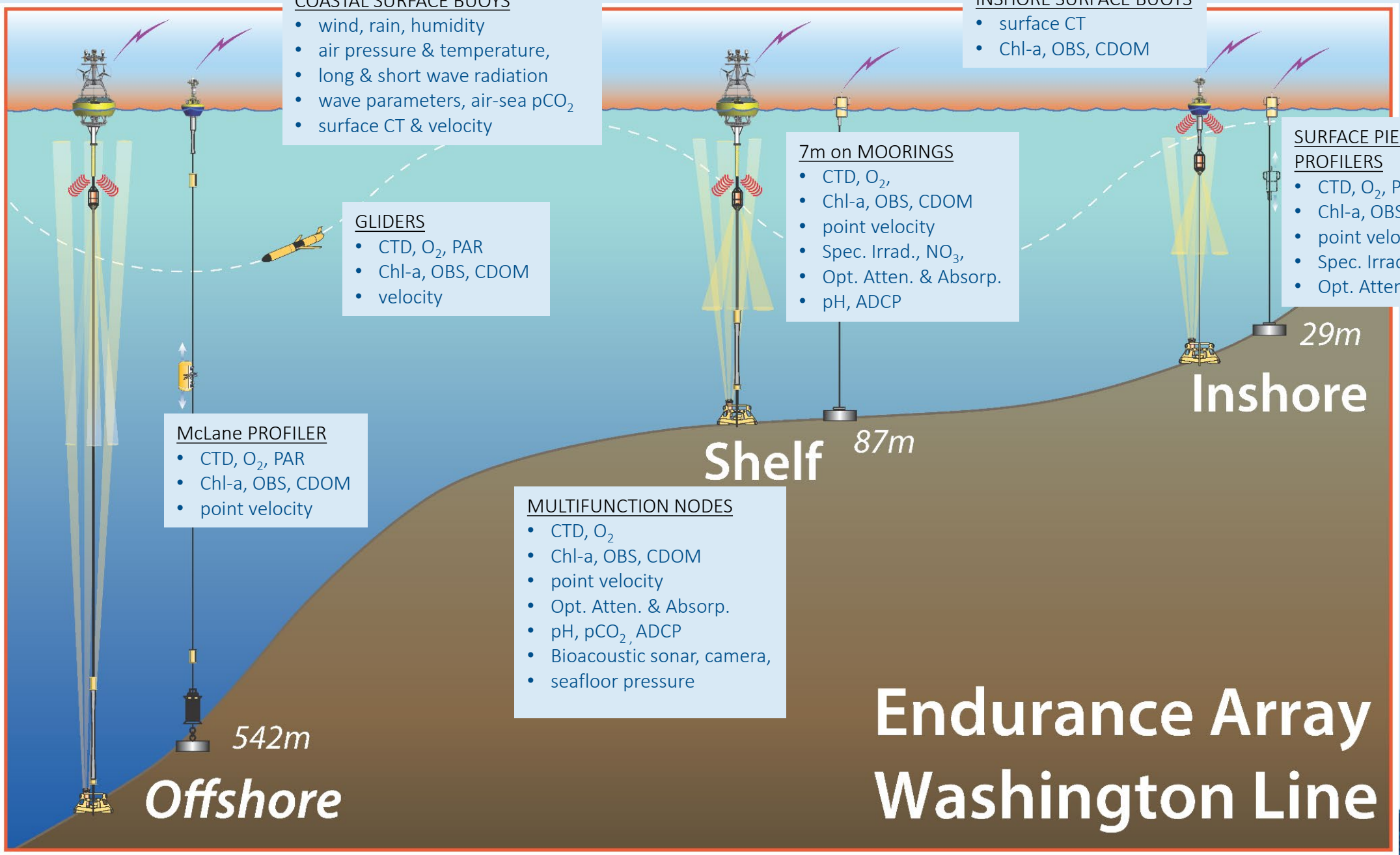
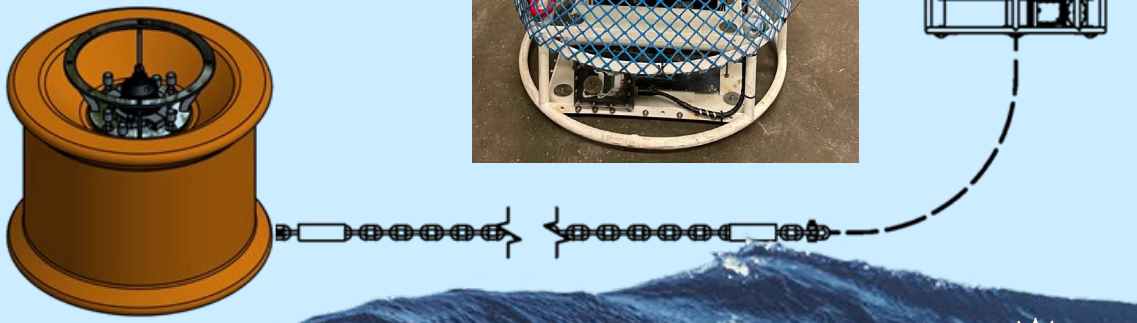


Technology Highlight: Coastal Surface Piercing Profilers

- Based on commercial technology developed by WET Labs with internally developed anchoring system
- Large sensor suite designed to resolve the ocean surface boundary layer
- Oregon shelf, inshore, Washington shelf, inshore. Shelf sites attempt to collect data year round, inshore sites spring through fall (approximately 6 months).
- Incremental design updates include software, flotation, anchor system
- OSU has taken over servicing for this platform following WET Labs acquisition by Sea-Bird. Technical support from Sea-Bird continues.
- Users include Chris Edwards and Miles Miller (UCSC). Miles completed MS thesis. Andrew Scherer (originally Cleveland State REU, now OSU MS student) using data to look at nitrate balance over shelf.
- Difficult to maintain especially at WA shelf sites (vessel access) and over winter (waves)
  - 83% Q1 data return (Oct – Dec 2021)
  - 7% Q2 data return (Jan – Mar 2022)
  - 55% Q3 data return (Apr – Jun)
  - 39% Q4 data return (Jul – Sep)



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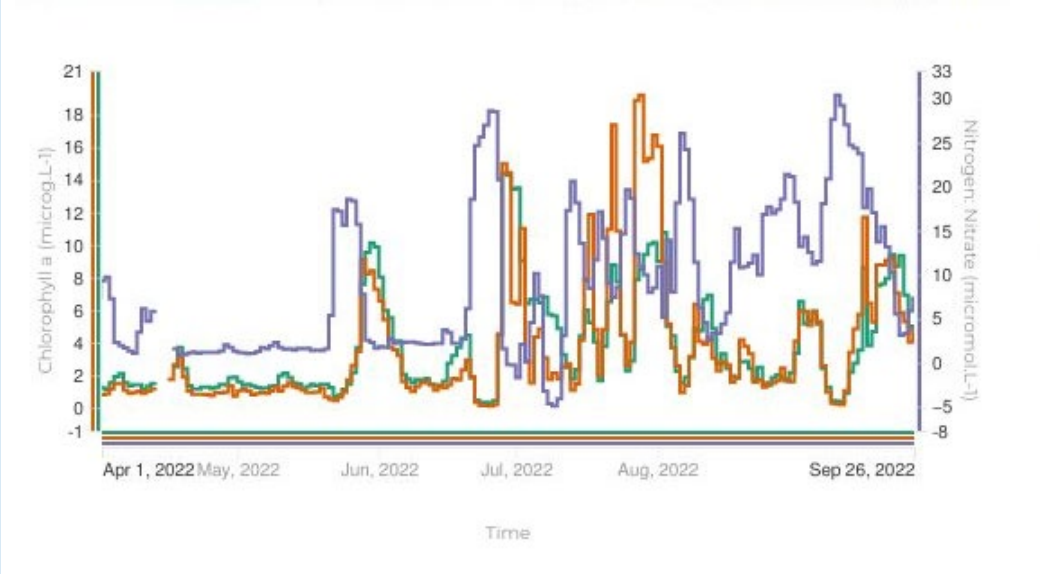
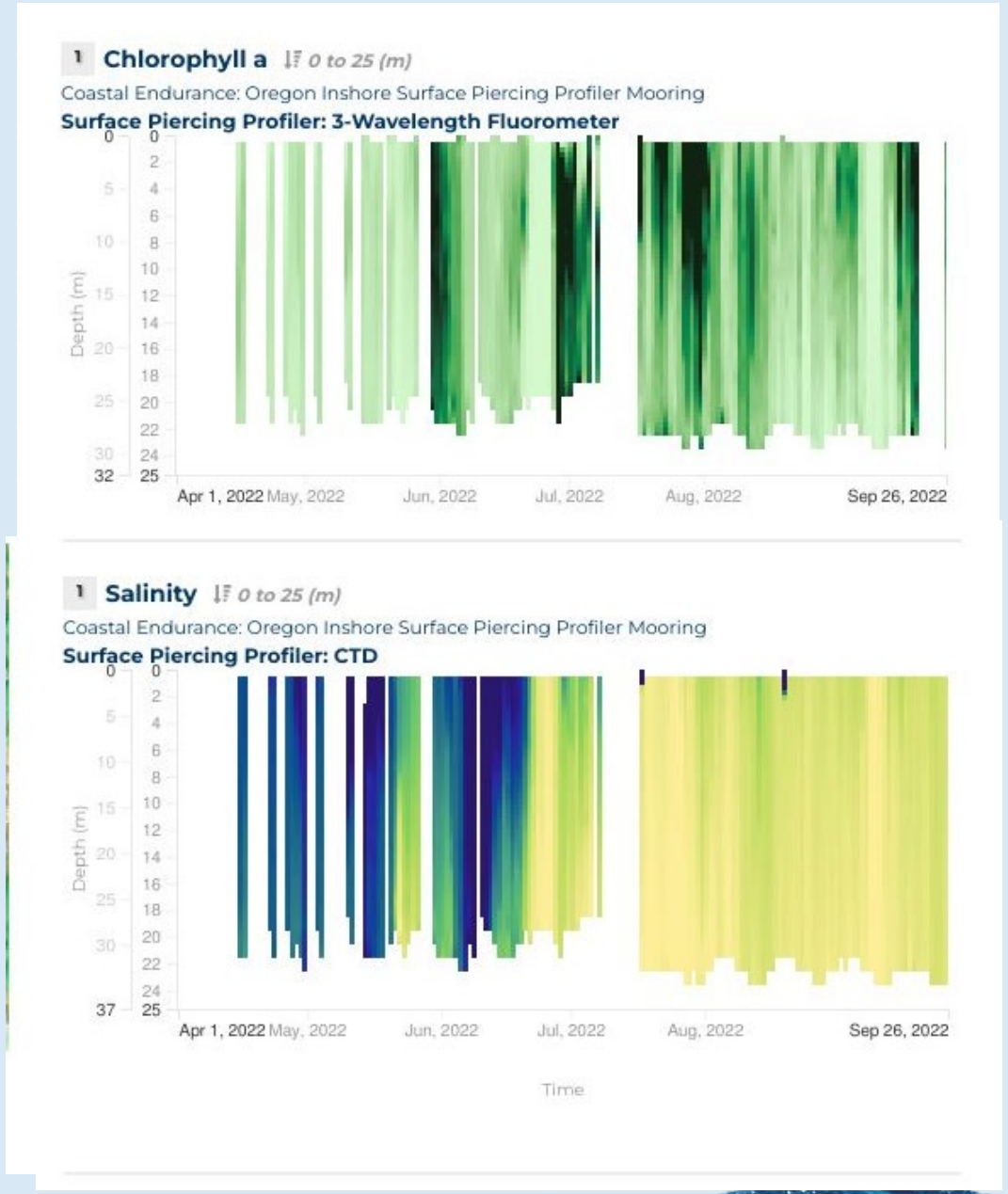
Oregon Inshore Mooring and CSPP chlorophyll compared

Plotted using Data Explorer





Buoy and **7 m** chlorophyll track well. **Nitrate** peaks at 7 m precede blooms. Note nitrate data has glitch at beginning of July

CSPP and 7 m chlorophyll peaks track in time and magnitude

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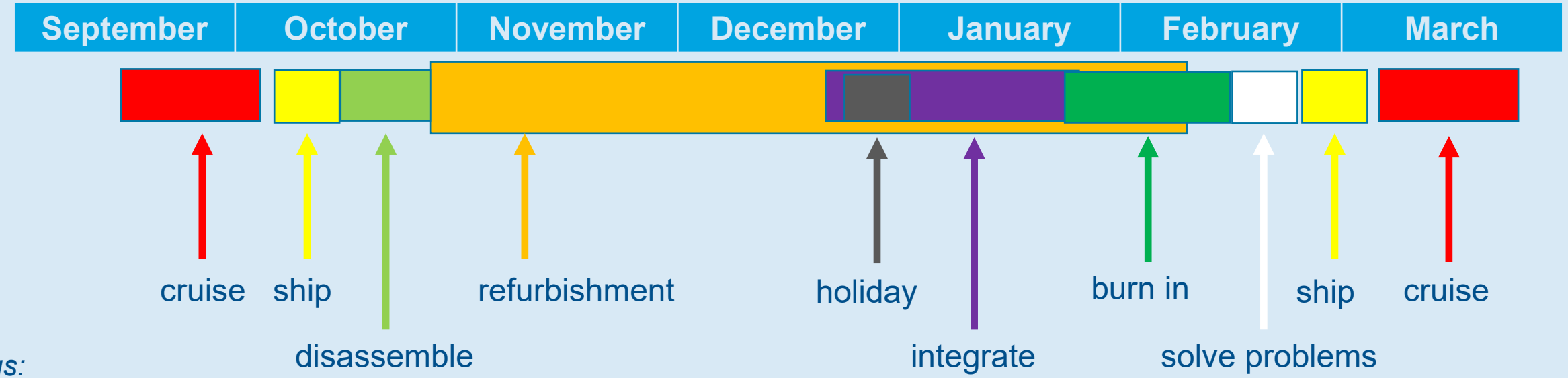
Cruise to cruise rhythm of activities



Plus:

- *cruise report preparation*
- *small boat work (glider and CSPPs twice per month)*
- *monitoring of instruments and infrastructure*
- *data QC – annotations, user responses, QARTOD implementation*
- *conference presentations, workshops*
- *cruise planning*

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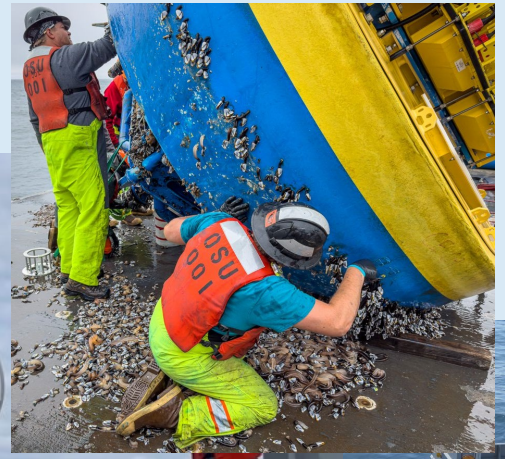

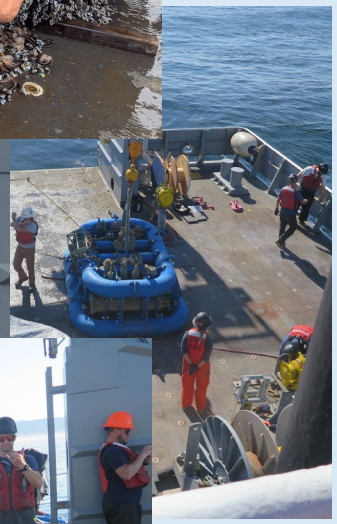

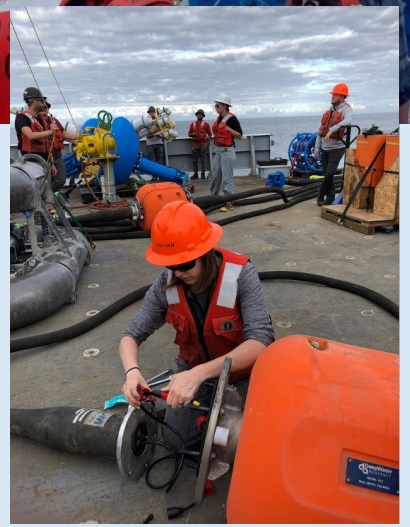

Sep 21 – Oct 4

October 21 – 24

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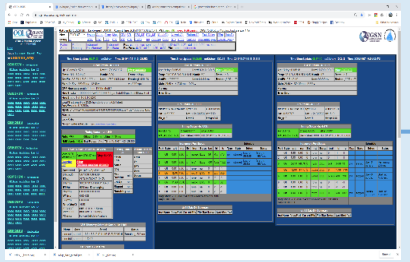
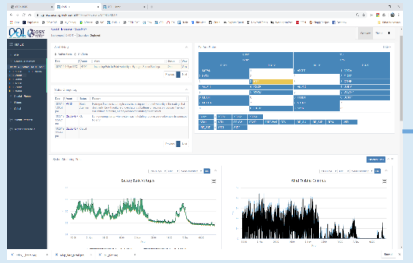
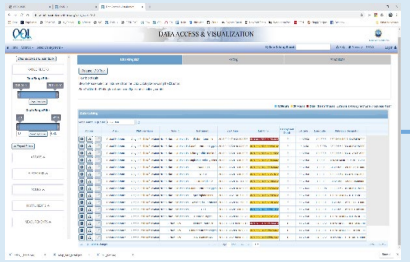
Operational Data Flow

Chris Wingard for Oct 7 OOI 2.0 PY4 Q4 Sensor Quality Table Review







Review deployed infrastructure and instrumentation

Issue?

No

Update daily status summary

Yes

Data impact ?

No

Address as needed

Yes

Failure ?

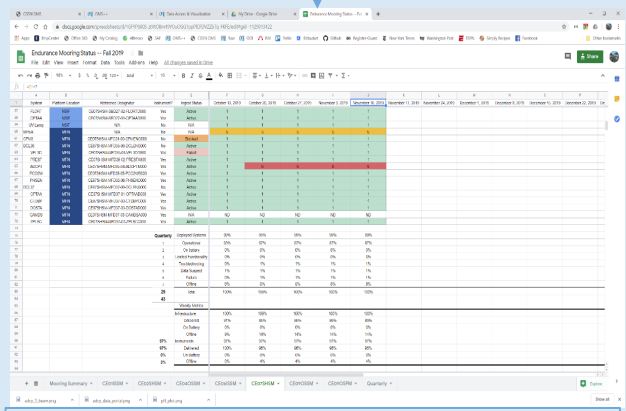
No

Create/update annotations

Yes

Create Redmine ticket

Weekly statistics feed into quarterly reports



- Operational (1)
- On battery (2)
- Limited Functionality (3)
- Troubleshooting (4)
- Data Suspect (5)
- Failure (6)
- Offline (7)
- Not Deployed (ND)

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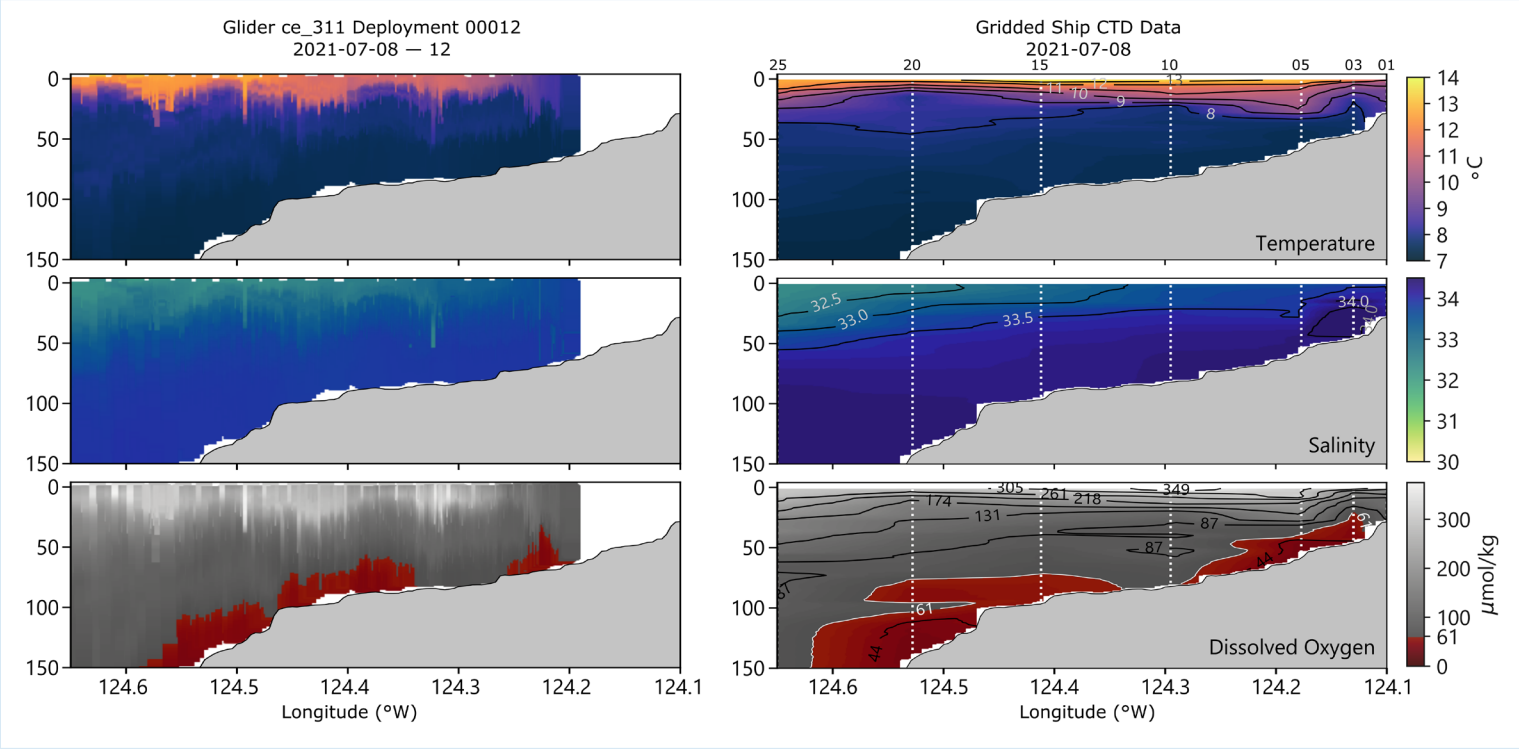
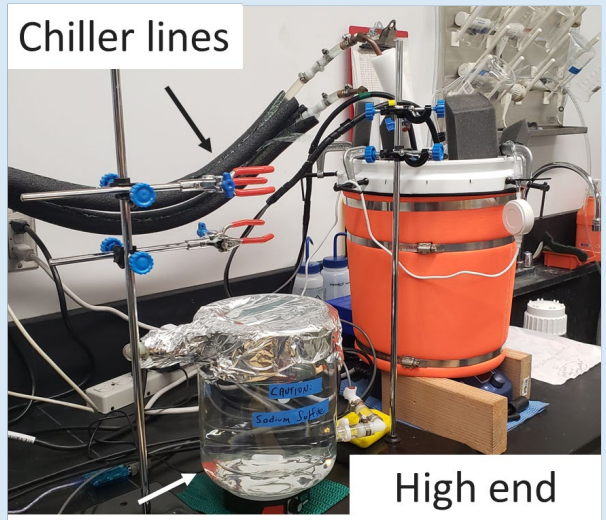
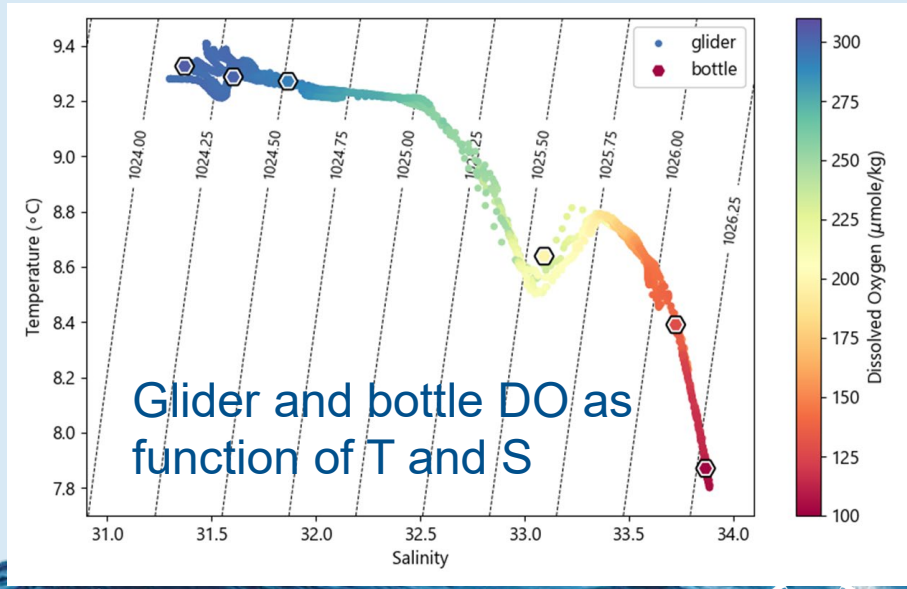
Performance Highlights – Ocean Acidification and Hypoxia (OAH)

From Sep 20-22 Underwater Glider Users Meeting



Glider – CTD transect comparison along Newport line July 2021 – CTD data from Risien et al. (2022)





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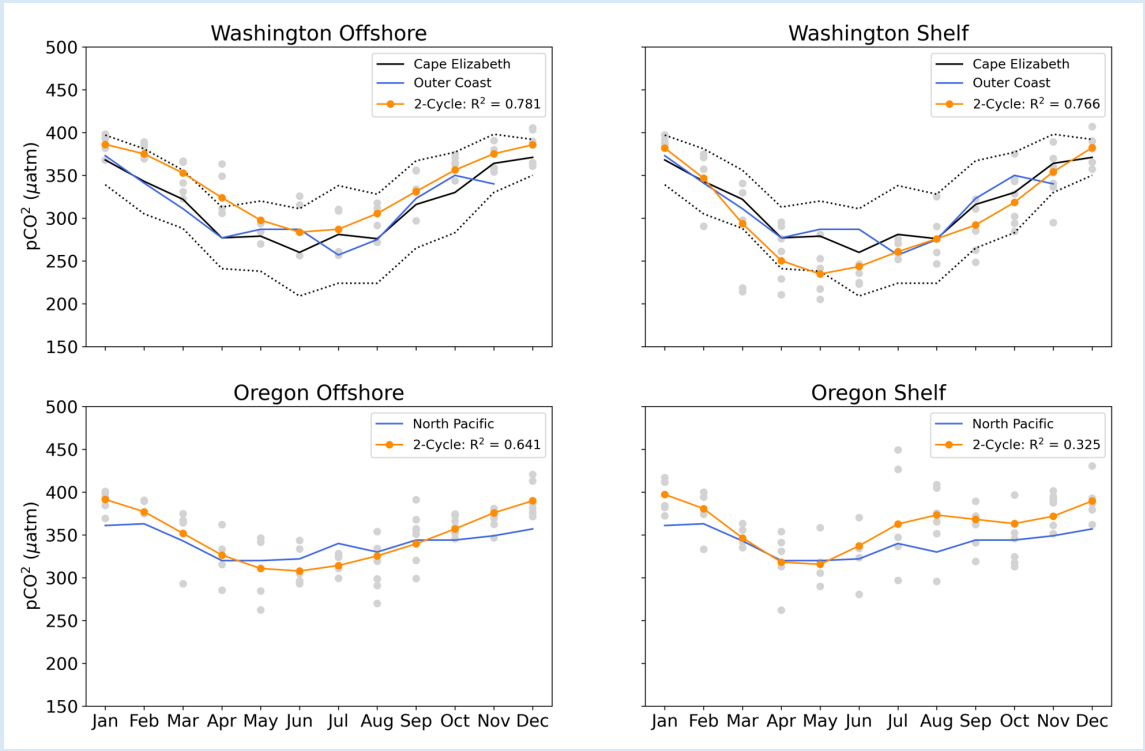
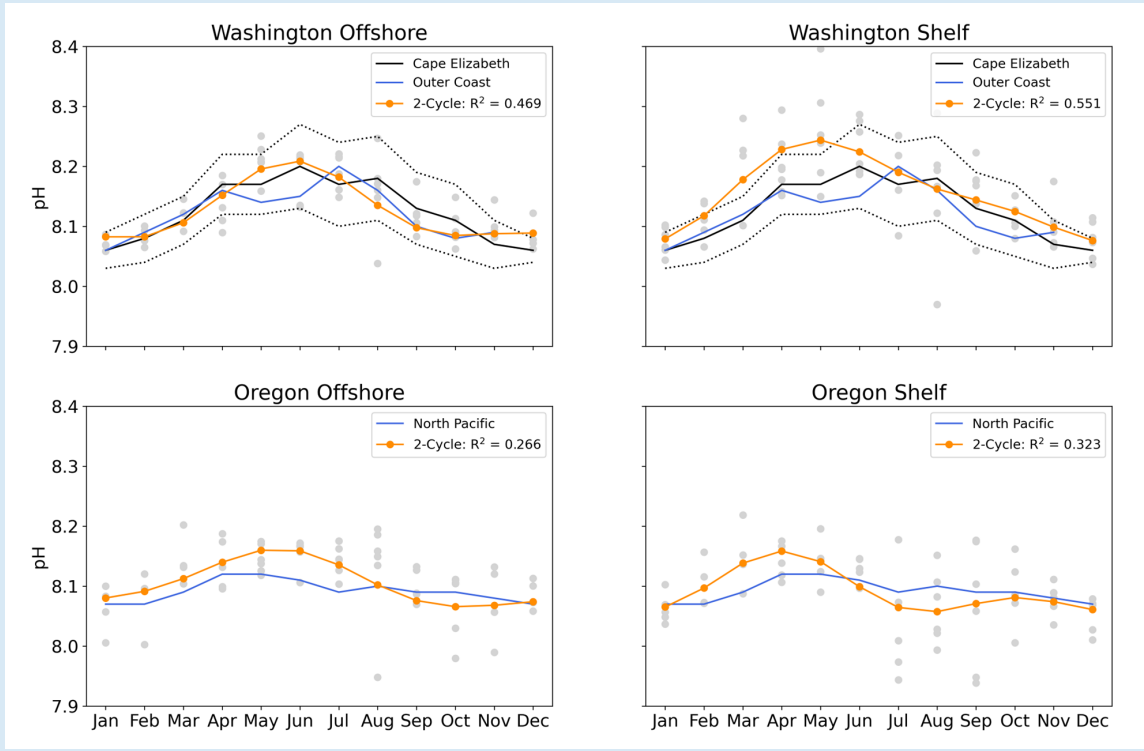
Performance Highlights – Ocean Acidification and Hypoxia (OAH)





pCO2 (left) and pH (right) seasonal cycle comparison of OOI (▬)

with published (▬, ▬) values from Fassbender et al. (2018)

From UCSC seminar Jan 14, Mar 1 Ocean Sciences, and Jun 8 NE Pacific Data Workshop

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Questions?