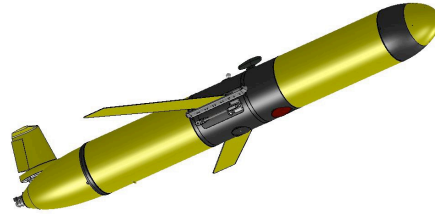
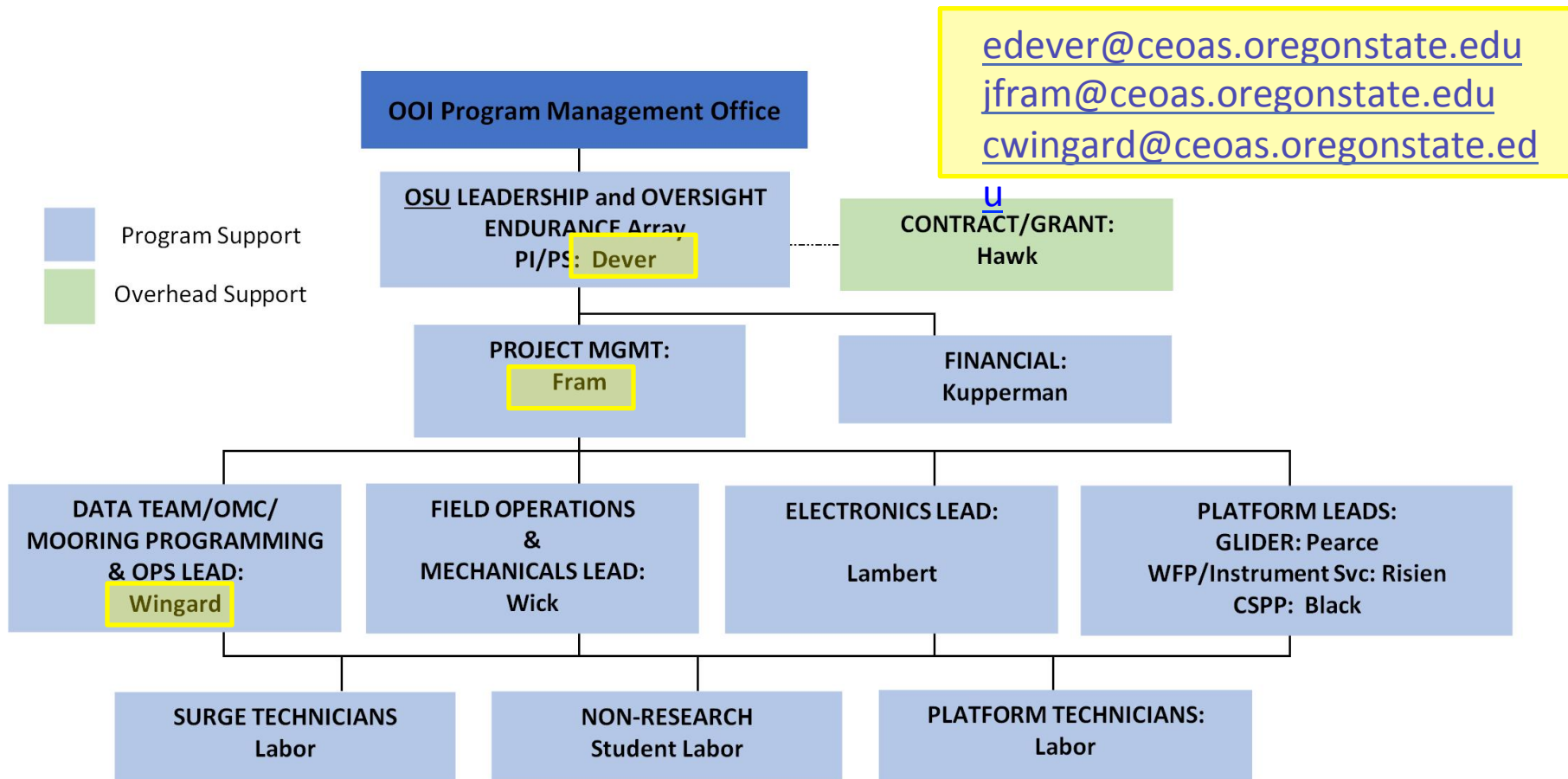




# Ocean Observatories Initiative



May 21, 2019



# Endurance Array Turn Cruises 11A, 11B

R/V Sikuliaq and R/V Oceanus

April 19-28 and May 3-7, 2019

- Mooring operations on cruises completed successfully
- Quick Look Reports in review, full reports in prep.
- Cruise data on Alfresco
- Telemetered data from Endurance 11 in process of ingestion into CI
- Recovered instrument data from Endurance 10 being assembled, estimated ingest mid-June
- Recovered instruments being stripped, cleaned and sent to manufacturers for refurbishment and calibration
- Endurance 12 R/V Sikuliaq Oct 9-24, 2019

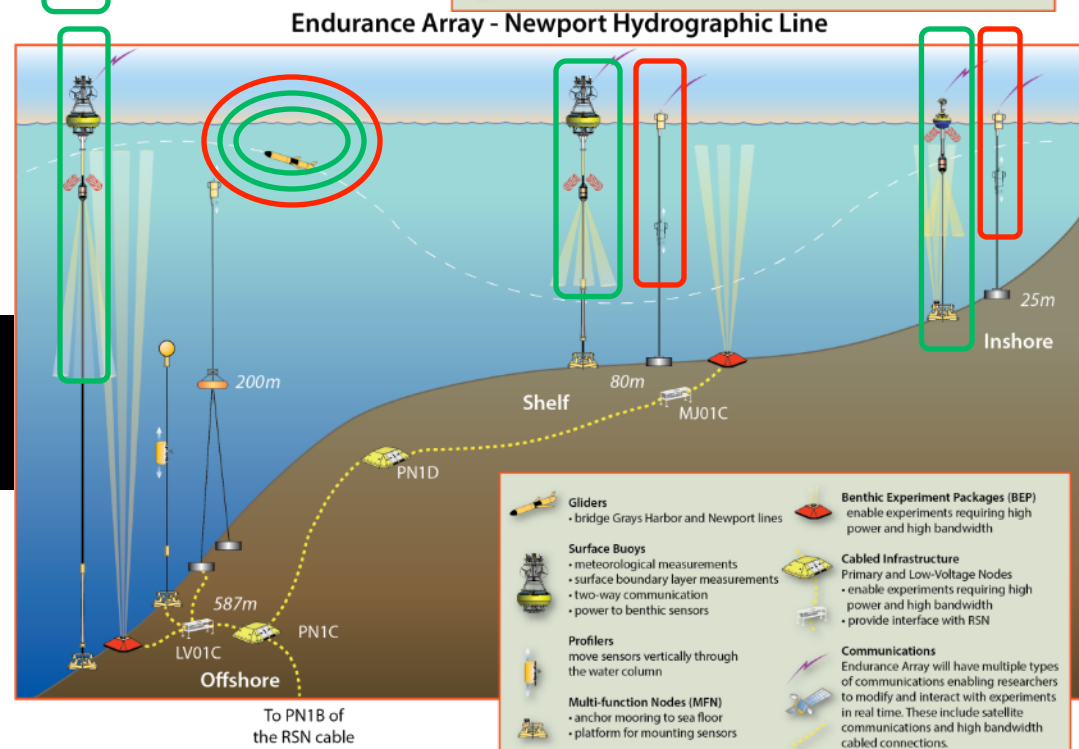
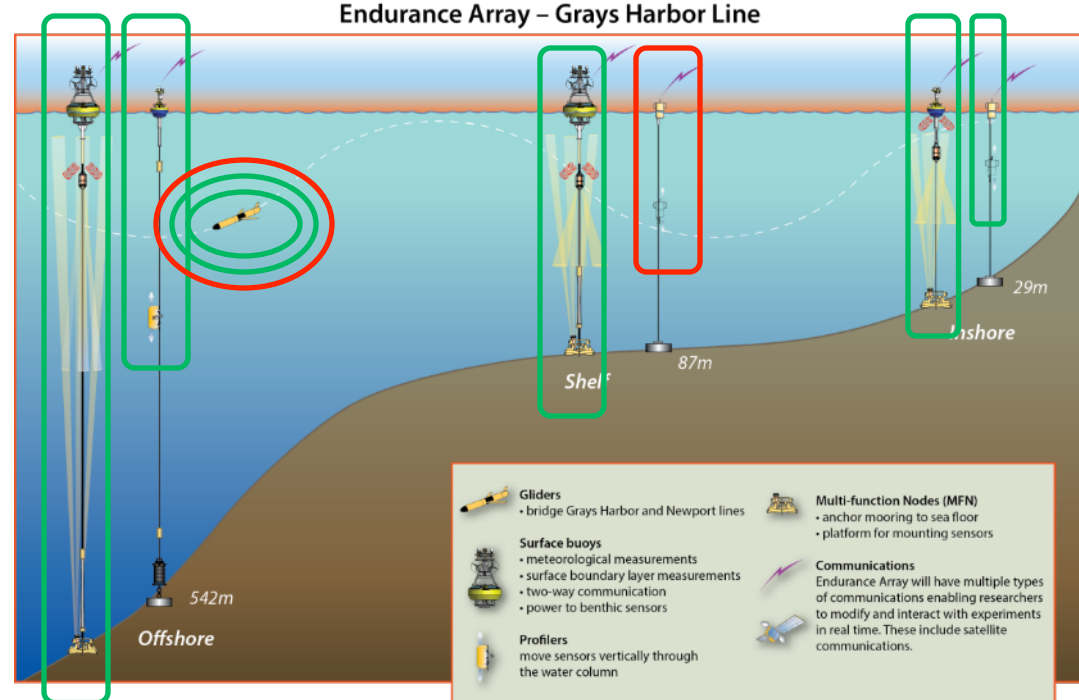
# Endurance Array Platform Status

Operating

[Not telemetering, but sampling]

Not deployed or not working

- Platforms deployed with full complement of instruments except
  - CAMDS on CE06ISSM (failed pre-deployment testing)
  - ZPLSC on CE09OSSM (repeated pressure housing flooding)
- Of telemetering mooring instruments, 2 of 127 (including MOPAK) deployed instruments not working properly



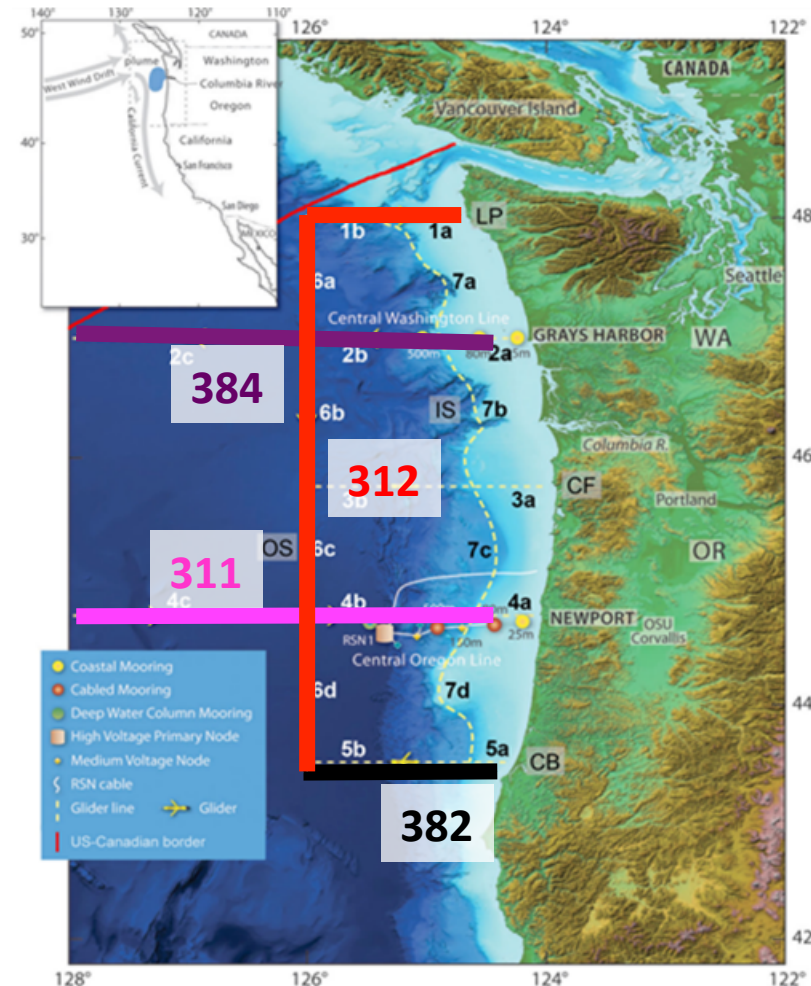
Deployed, failed

- CE04OSSM NSIF OPTAA
- CE07SHSM MFN PHSEN, METBK rain gauge

# Endurance Array Glider Coverage

## Since Oct 2018 meeting:

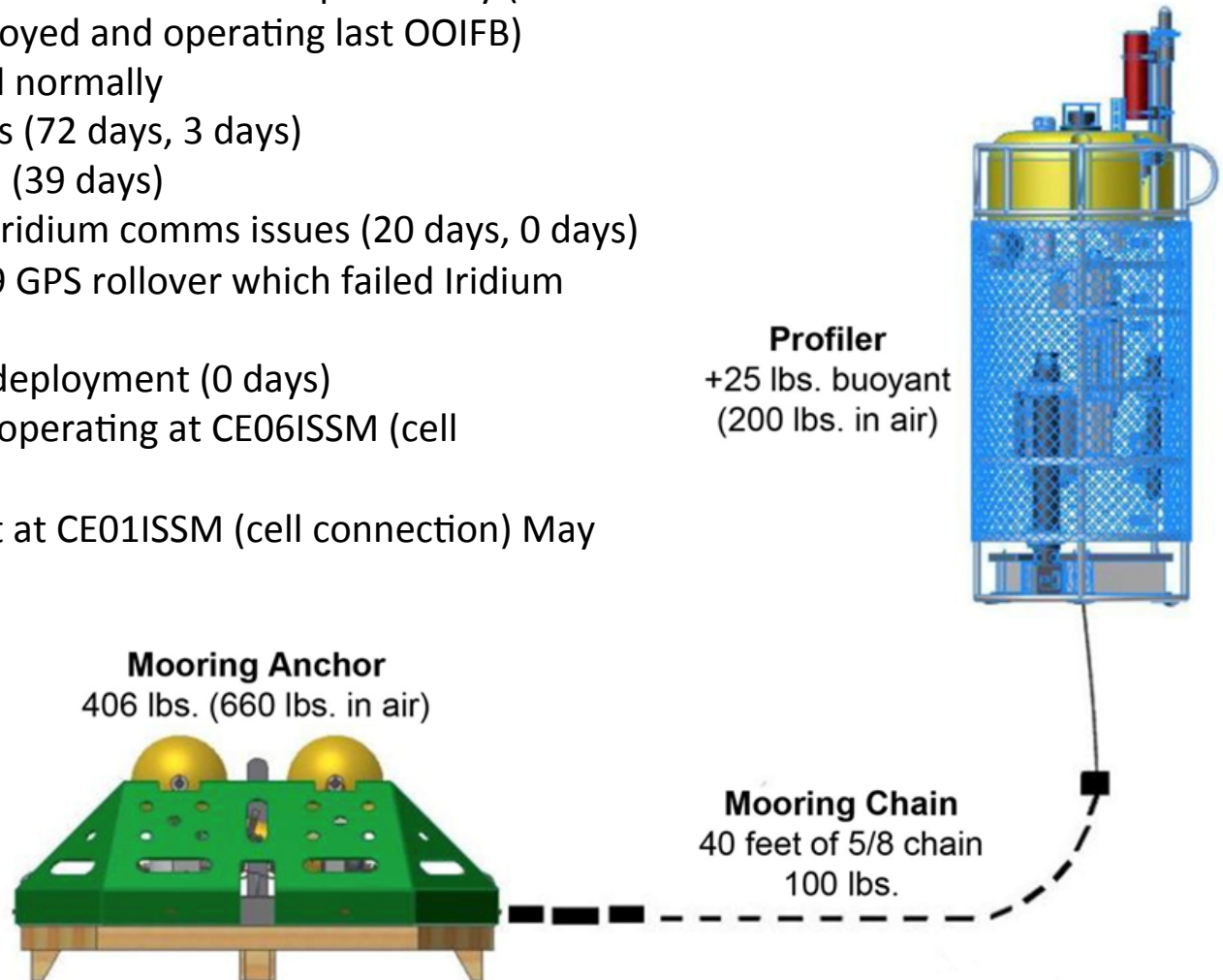
- 9 gliders deployed between 1 Nov and 15 May (12 per scope)
- 3/5 deployments to full duration
- 1/5 gliders leaked (58 days) – leak in air bladder seam
- 1/5 gliders recovered slightly early (74 days) due to weather/ship availability in mid-Jan
- 4/4 current deployments operating normally (all current deployments are 1000 m pumps)
- Based on 2018 leaks
  - Service schedule on 200 m pump shortened
  - Additional inspection and cleaning of 200 m pump
- 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, one glider lost 2018



# Endurance Array CSPP deployment summary

## Since Oct 2018 meeting:

- 8 operational CSPP deployments between Sep and May (8 planned per scope, 2 deployed and operating last OOIFB)
- 0 deployments completed normally
- 2 broke free during storms (72 days, 3 days)
- 1 power connector failure (39 days)
- 2 affected by unresolved Iridium comms issues (20 days, 0 days)
- 1 affected by April 6, 2019 GPS rollover which failed Iridium comms (0 days)
- 1 vessel winch failure on deployment (0 days)
- 1 currently deployed and operating at CE06ISSM (cell connection)
- 1 planned for deployment at CE01ISSM (cell connection) May 29, 2019



# Endurance 11 Status

| Platform | Infrastructure % | Instruments % | Delivered XMIT % | Data Collected % |
|----------|------------------|---------------|------------------|------------------|
| CE01ISSM | 86%              | 96%           | 96%              | 96%              |
| CE02SHSM | 85%              | 96%           | 96%              | 96%              |
| CE04OSSM | 85%              | 95%           | 95%              | 95%              |
| CE06ISSM | 93%              | 100%          | 100%             | 100%             |
| CE07SHSM | 86%              | 91%           | 91%              | 91%              |
| CE09OSSM | 86%              | 100%          | 100%             | 100%             |
| CE09OSPM | 78%              | 100%          | 100%             | 100%             |

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

# Endurance 11 Status

| Platform | Infrastructure % | Instruments % | Delivered XMIT % | Data Collected % |
|----------|------------------|---------------|------------------|------------------|
| CE01ISSM | 93%              | 100%          | 100%             | 100%             |
| CE02SHSM | 100%             | 100%          | 100%             | 100%             |
| CE04OSSM | 100%             | 95%           | 95%              | 95%              |
| CE06ISSM | 100%             | 100%          | 100%             | 100%             |
| CE07SHSM | 100%             | 94%           | 94%              | 94%              |
| CE09OSSM | 100%             | 100%          | 100%             | 100%             |
| CE09OSPM | 100%             | 100%          | 100%             | 100%             |

% does not include electronics intentionally turned off (e.g., acoustic modems, FreeWave etc.)

# Notable Technical Progress

- New solar panels in test configuration
- Updated buoy halo positioning for FDCHP, METBK wind
- UV antifouling now deployed on all DOSTA on NSIF or inshore MFN ( $< 30$  m) including inshore CSPP's.

# Ancillary/data verification activities

Continued to add biofouling settling plates to Endurance moorings (post-doc Linsey Haram of the Marine Invasions Lab at the Smithsonian Environmental Research Center) as part of a NASA project to explore biofouling. OOI personnel (including volunteer students) photograph, remove and preserve plates on recovery and send to her for analysis.

Participating in UNOLS cruise volunteer program. Had one student (VIMS) on Spring 2019 cruise. Very successful and looking to add another student berth (for a total of 2) to upcoming cruises.

In response to user concerns raised about quality of O2 data, we are adding additional oxygen verification procedures to deployments.

Taking additional oxygen samples for comparison to gliders.

Sending recovered DOSTA sensors to Aanderaa for full multipoint calibration.

## Science Results

- Contributions to Three articles in OceanObs 19 collection of white papers published
- After meeting with and talking to Jan Newton (UW-APL) at Feb-March ASLO meeting, working with Global Ocean Acidification Observing Network (GOA-ON) to pull OOI measurements to GOA-ON data portal.

## AWP 1 Budget notes

- Working on estimated cost to complete, should complete AWP1 on budget
- Budget management reducing small ship costs by not going to Grays Harbor
- ECR 1303-01869, Mid-PY1 OSU Rebudget, passed NSF board:
  - rebudget to reflect actual and projected PY1 spending, most of the rebudgeting is between non-labor Cost Areas within each Control Account
  - deobligate budget for DISA telemetry subscriptions
  - transfer budget to WHOI to support June ROV cruise to recover EA anchors on Oregon line

# Challenges

- CSPP failures
  - Iridium communications issues
  - Power issues
- Instruments
  - No CAMDS servicing, but successful deployment of three of four cameras on Endurance 11
  - 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.
  - For DOSTA UV biofouling mitigation, had a bad batch of bulbs, replaced by AML, but as a result the last two deployments were not as successful as they should have been.
  - 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
- Heavy Lift Winch used successfully on 2017, 2018, and Spring 2019 cruises. Some continuing issues with lineout readouts.