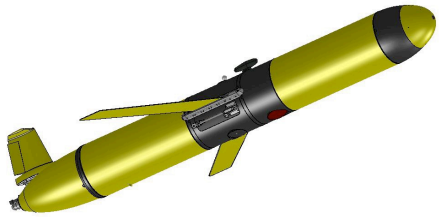
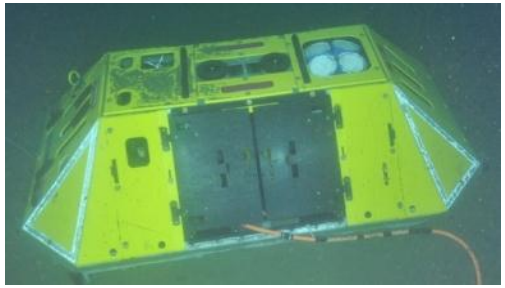
Ocean Observatories Initiative



May 7, 2018



The Endurance Array

Jack Barth (Project Scientist), Ed Dever (Project Manager/Principal Investigator),
Jon Fram (Systems Engineer), Bob Collier (former Project Manager/Principal Investigator)

Chris Wingard, Craig Risien, Linda Fayler, Tully Rohrer, Stuart Pearce, David Neiman, Russ Desiderio, Johna Winters, Jeff Woods, Jonathan Whitefield, Ian Black

… in collaboration with our WHOI (buoys, design, etc.), UW (cabled infrastructure) and Rutgers/Raytheon (CyberInfrastructure) colleagues

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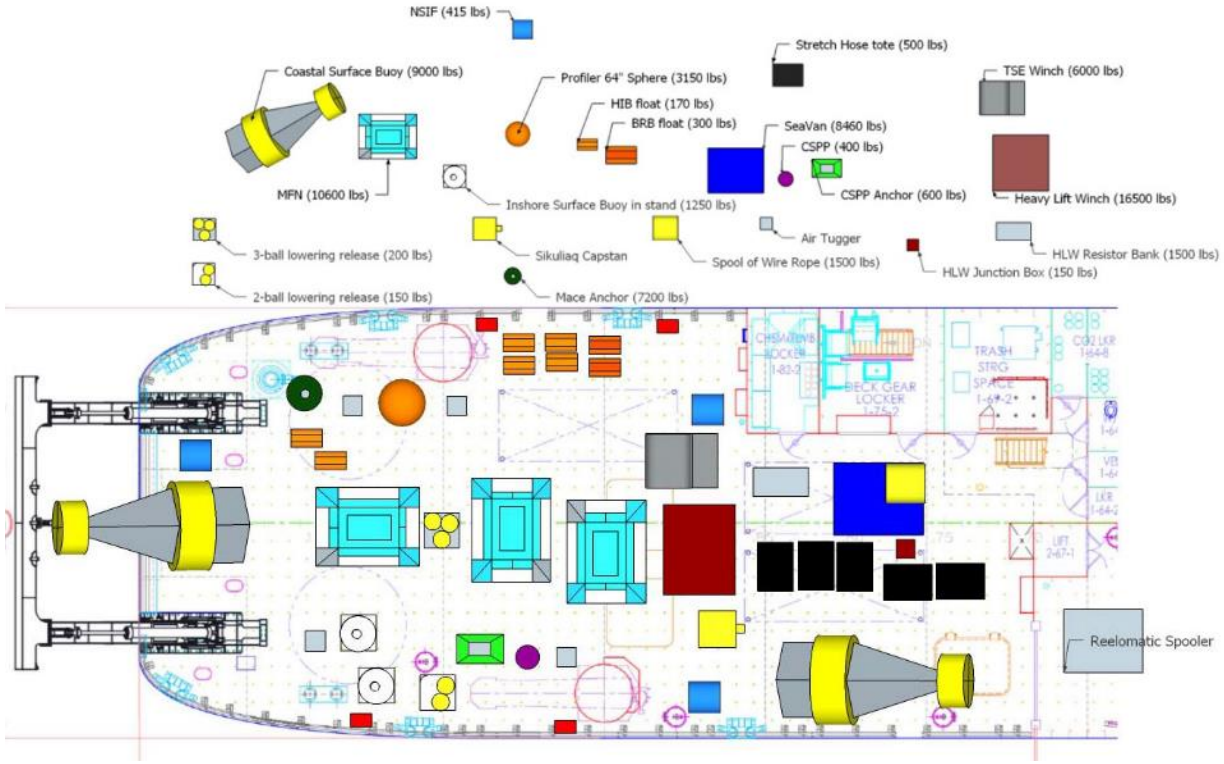
Endurance Array Turn Cruise

R/V Sikuliaq

March 24 – April 8, 2018



Endurance Array Platform Status

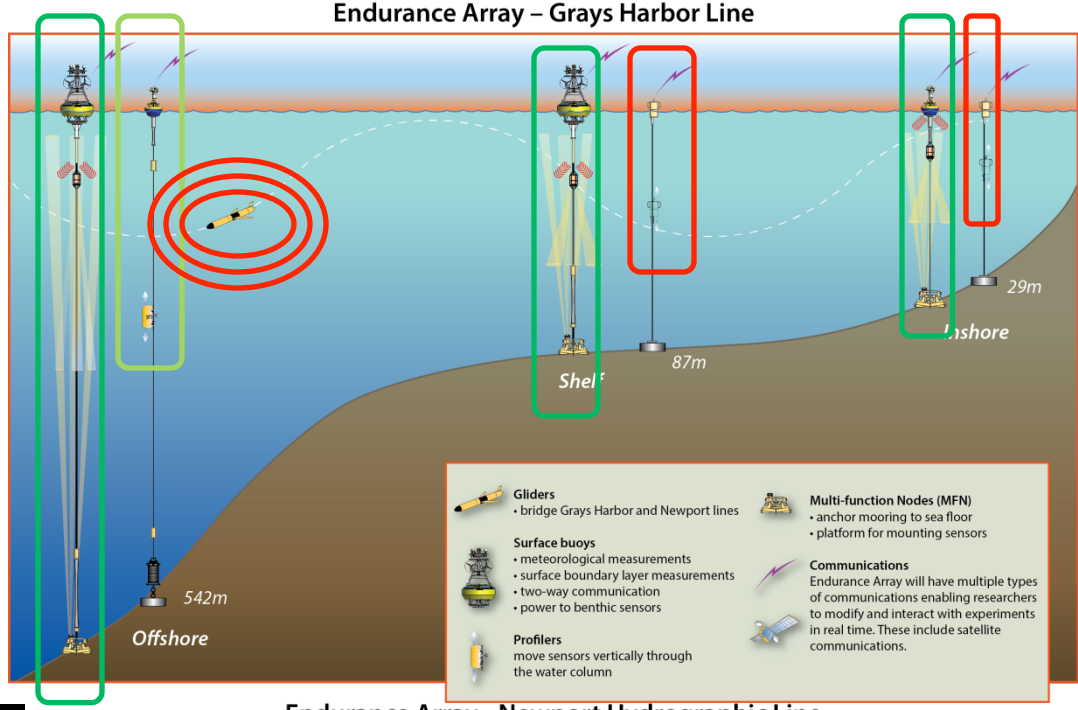
Operating
Not telemetering, but sampling
Not deployed or not working

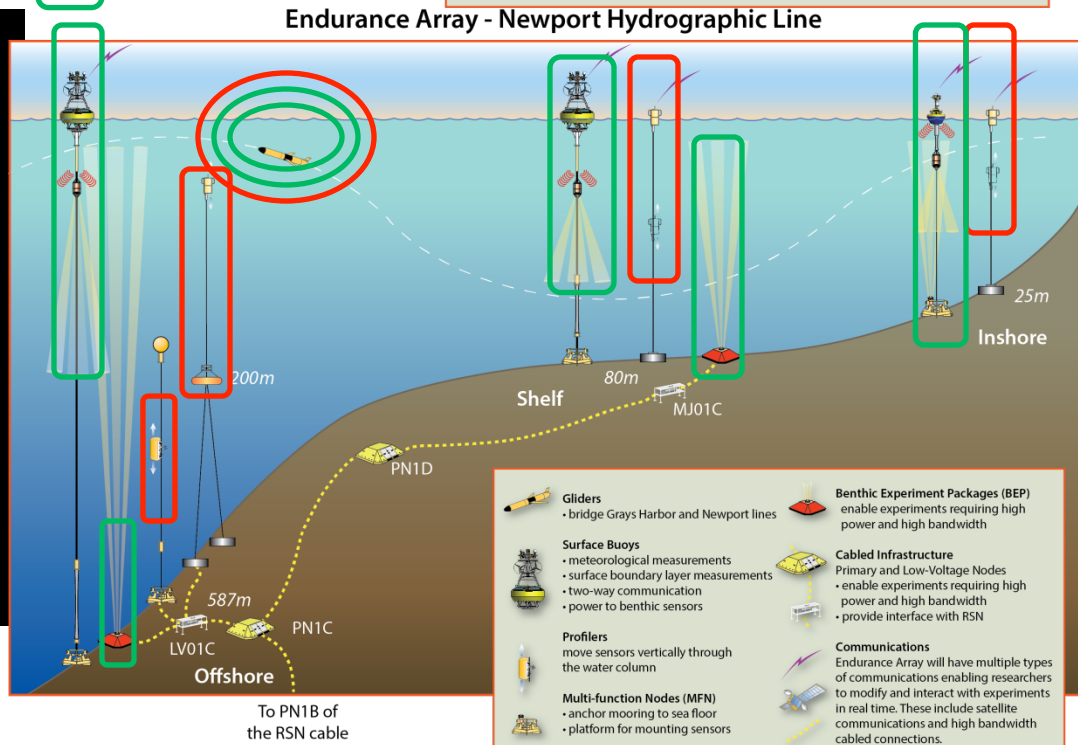
- All deployed platforms deployed with full complement of instruments.
- Of telemetering uncabled platforms, 10 of 159 instruments not working.

Not telemetering, but sampling
- CE01ISSM NUTNR, NSIF VELPT, ZPLSC, VEL3D, buoy CTD, FLORT, MFN ADCP, PCO2W, PHSEN, PRESF
- CE06ISSM buoy CTD, FLORT, ZPLSC, ADCP, PCO2W, PHSEN, PRESF, VEL3D
- CE09OSPM all

Reduced sampling
- CE09OSSM, CE07SHSM

Deployed, failed
- CE01ISSM SPKIR
- CE02SHSM FDCHP
- CE09OSPM FLORT
- CE09OSSM WindSonic (all METBK out)



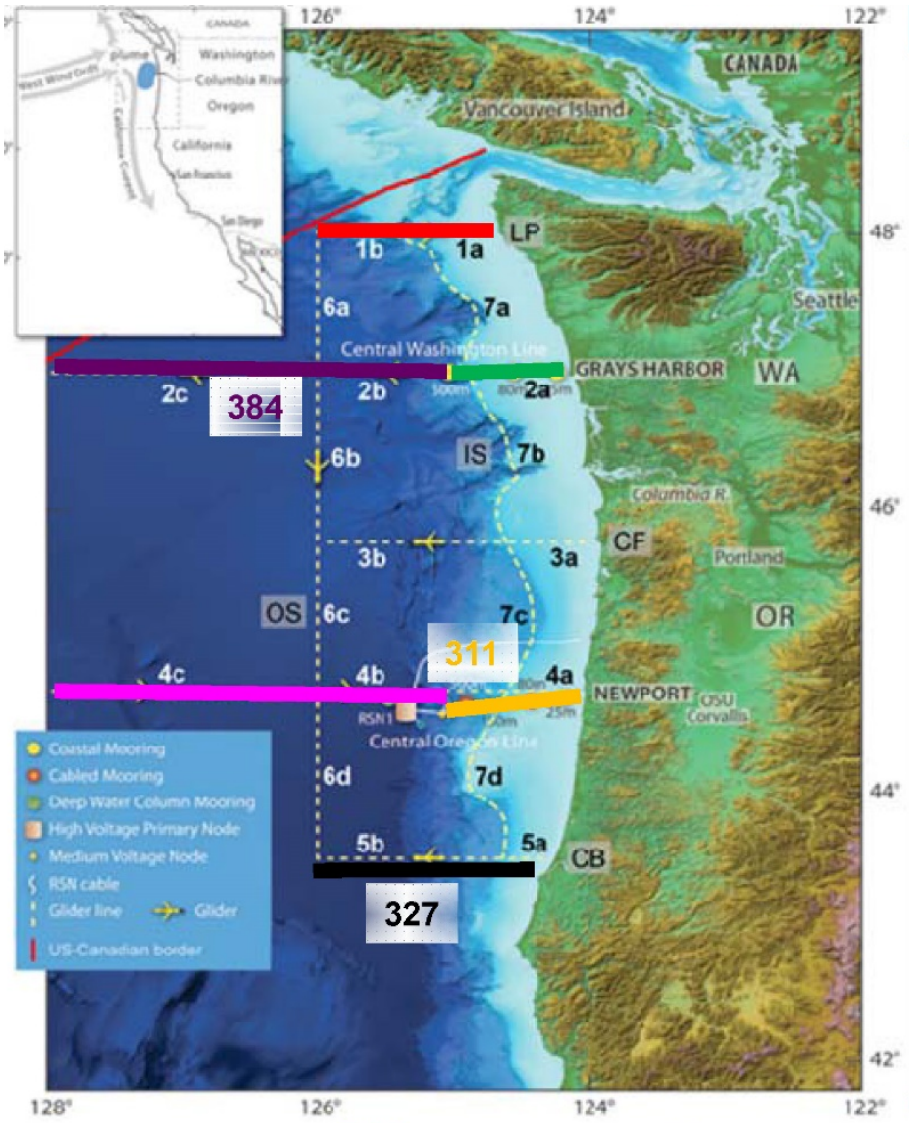


Endurance Array Glider Coverage

Since Sep 2017 meeting:

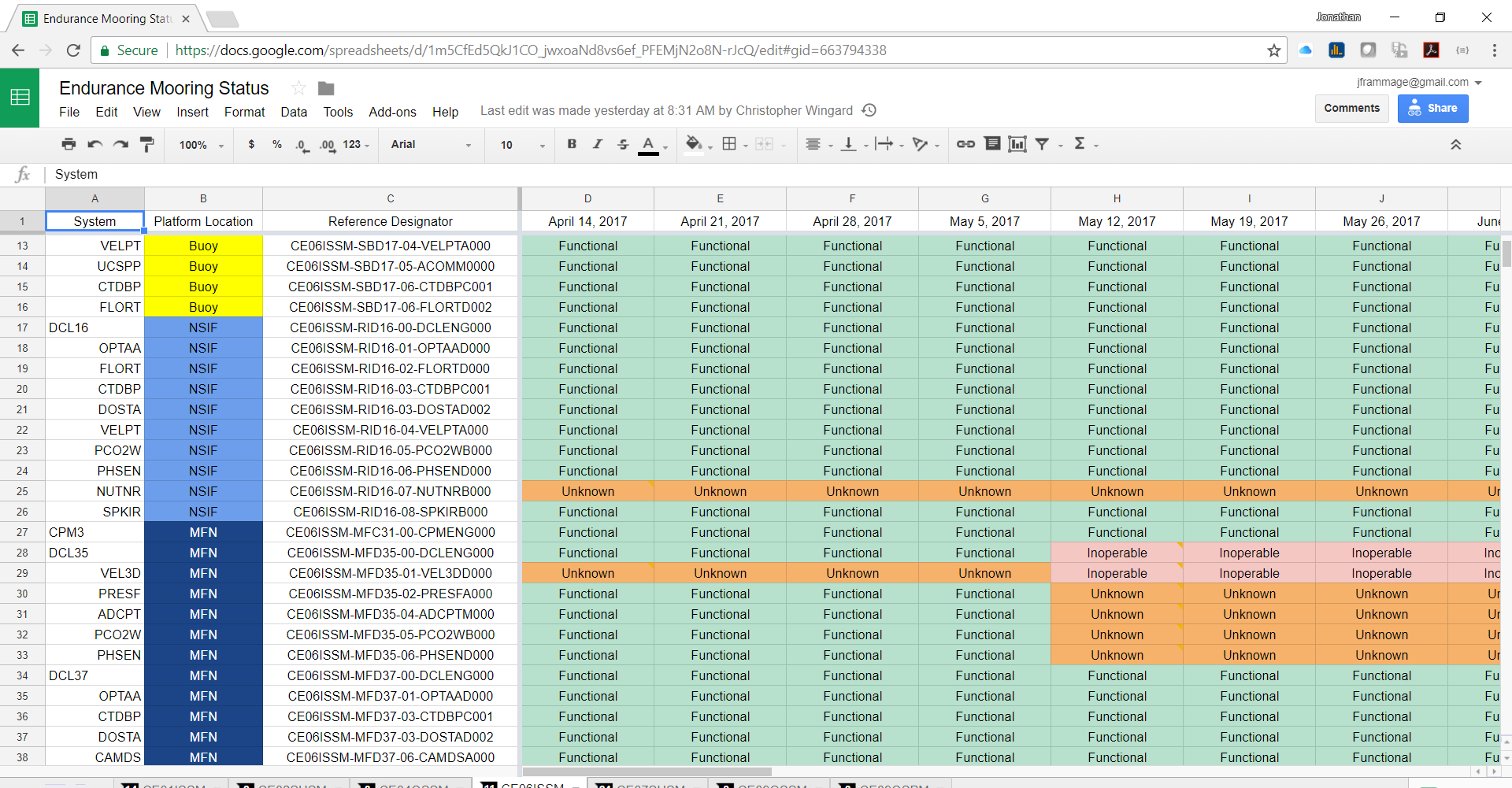
- One partial deployment (3 gliders) starting 7 Dec 2017
- Glider deployments scaled back while memorandum of negotiation (MoN) was prepared by OSU and approved by COL and NSF. This MoN was necessary to continue glider refurb by TWR
- Two gliders presently deployed and at sea operating normally
- Two gliders to be deployed this week (10 May 2018)

Type	Geographic Description
Shallow	Newport Shelf (4a)
~~Deep~~	~~Newport Offshore (4b, 4c)~~
Shallow	Coos Bay (5a, 5b)
~~Shallow~~	~~Grays Harbor Shelf (2a)~~
Deep	Grays Harbor Offshore (2b, 2c)
~~Deep~~	~~La Push (1a, 1b)~~



Weekly Status Logging Started Spring 2017

- CI is reporting status of what is getting through to the GUI
- Monthly historic EA status delivered to OOIFB
- Need OOI-wide agreement on status
- OOI-wide operator log should be in one searchable place



Endurance Mooring Stat

Secure | https://docs.google.com/spreadsheets/d/1m5CfEd5QkJ1CO_jwxoaNd8vs6ef_PFEMjN2o8N-rJcQ/edit#gid=663794338

Endurance Mooring Status

File Edit View Insert Format Data Tools Add-ons Help Last edit was made yesterday at 8:31 AM by Christopher Wingard

jframmage@gmail.com

Comments Share

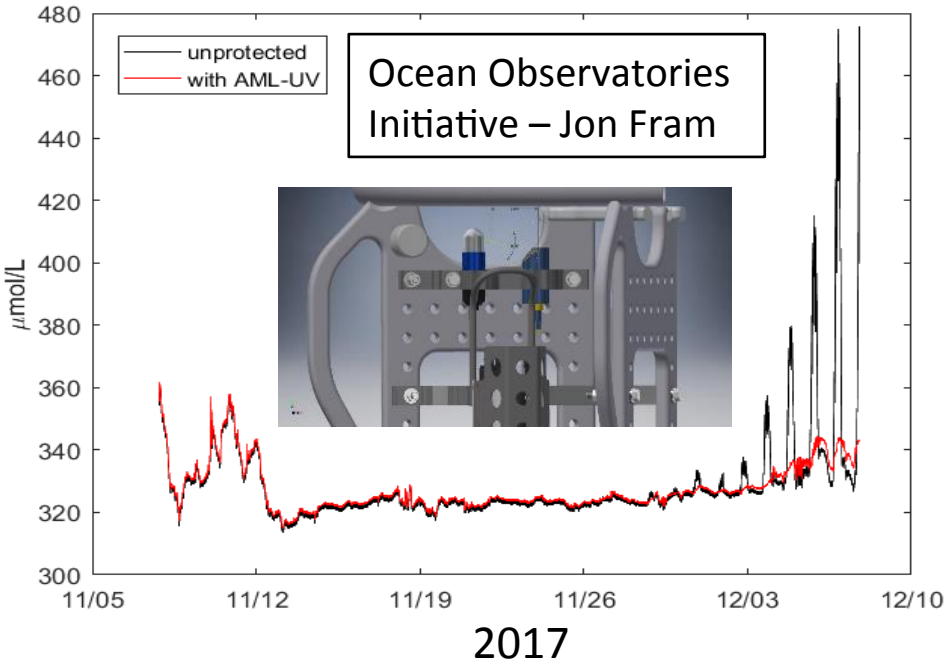
System

	A	B	C	D	E	F	G	H	I	J
1	System	Platform Location	Reference Designator	April 14, 2017	April 21, 2017	April 28, 2017	May 5, 2017	May 12, 2017	May 19, 2017	May 26, 2017
13	VELPT	Buoy	CE06ISSM-SBD17-04-VELPTA000	Functional	Functional	Functional	Functional	Functional	Functional	Functional
14	UCSPP	Buoy	CE06ISSM-SBD17-05-ACOMM0000	Functional	Functional	Functional	Functional	Functional	Functional	Functional
15	CTDBP	Buoy	CE06ISSM-SBD17-06-CTDBPC001	Functional	Functional	Functional	Functional	Functional	Functional	Functional
16	FLORT	Buoy	CE06ISSM-SBD17-06-FLORTD002	Functional	Functional	Functional	Functional	Functional	Functional	Functional
17	DCL16	NSIF	CE06ISSM-RID16-00-DCLENG000	Functional	Functional	Functional	Functional	Functional	Functional	Functional
18	OPTAA	NSIF	CE06ISSM-RID16-01-OPTAAD000	Functional	Functional	Functional	Functional	Functional	Functional	Functional
19	FLORT	NSIF	CE06ISSM-RID16-02-FLORTD000	Functional	Functional	Functional	Functional	Functional	Functional	Functional
20	CTDBP	NSIF	CE06ISSM-RID16-03-CTDBPC001	Functional	Functional	Functional	Functional	Functional	Functional	Functional
21	DOSTA	NSIF	CE06ISSM-RID16-03-DOSTAD002	Functional	Functional	Functional	Functional	Functional	Functional	Functional
22	VELPT	NSIF	CE06ISSM-RID16-04-VELPTA000	Functional	Functional	Functional	Functional	Functional	Functional	Functional
23	PCO2W	NSIF	CE06ISSM-RID16-05-PCO2WB000	Functional	Functional	Functional	Functional	Functional	Functional	Functional
24	PHSEN	NSIF	CE06ISSM-RID16-06-PHSEND000	Functional	Functional	Functional	Functional	Functional	Functional	Functional
25	NUTNR	NSIF	CE06ISSM-RID16-07-NUTNRB000	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
26	SPKIR	NSIF	CE06ISSM-RID16-08-SPKIRB000	Functional	Functional	Functional	Functional	Functional	Functional	Functional
27	CPM3	MFN	CE06ISSM-MFC31-00-CPMENG000	Functional	Functional	Functional	Functional	Functional	Functional	Functional
28	DCL35	MFN	CE06ISSM-MFD35-00-DCLENG000	Functional	Functional	Functional	Functional	Inoperable	Inoperable	Inoperable
29	VEL3D	MFN	CE06ISSM-MFD35-01-VEL3DD000	Unknown	Unknown	Unknown	Unknown	Inoperable	Inoperable	Inoperable
30	PRESF	MFN	CE06ISSM-MFD35-02-PRESFA000	Functional	Functional	Functional	Functional	Unknown	Unknown	Unknown
31	ADCPT	MFN	CE06ISSM-MFD35-04-ADCPTM000	Functional	Functional	Functional	Functional	Unknown	Unknown	Unknown
32	PCO2W	MFN	CE06ISSM-MFD35-05-PCO2WB000	Functional	Functional	Functional	Functional	Unknown	Unknown	Unknown
33	PHSEN	MFN	CE06ISSM-MFD35-06-PHSEND000	Functional	Functional	Functional	Functional	Unknown	Unknown	Unknown
34	DCL37	MFN	CE06ISSM-MFD37-00-DCLENG000	Functional	Functional	Functional	Functional	Functional	Functional	Functional
35	OPTAA	MFN	CE06ISSM-MFD37-01-OPTAAD000	Functional	Functional	Functional	Functional	Functional	Functional	Functional
36	CTDBP	MFN	CE06ISSM-MFD37-03-CTDBPC001	Functional	Functional	Functional	Functional	Functional	Functional	Functional
37	DOSTA	MFN	CE06ISSM-MFD37-03-DOSTAD002	Functional	Functional	Functional	Functional	Functional	Functional	Functional
38	CAMDS	MFN	CE06ISSM-MFD37-06-CAMDSA000	Functional	Functional	Functional	Functional	Functional	Functional	Functional

Notable Technical Progress

- NUTNR: ISUS replaced with SUNA V2 for all deployments starting spring 2018.
- UV antifouling on DOSTA & CAMDS testing fall 2017, worked, reported on at Ocean Sciences 2018, procured for DOSTA and CAMDS, and will be procured for SPKIR

- All telemetered data available on internal ERDDAP server (will be utilized by OMS++

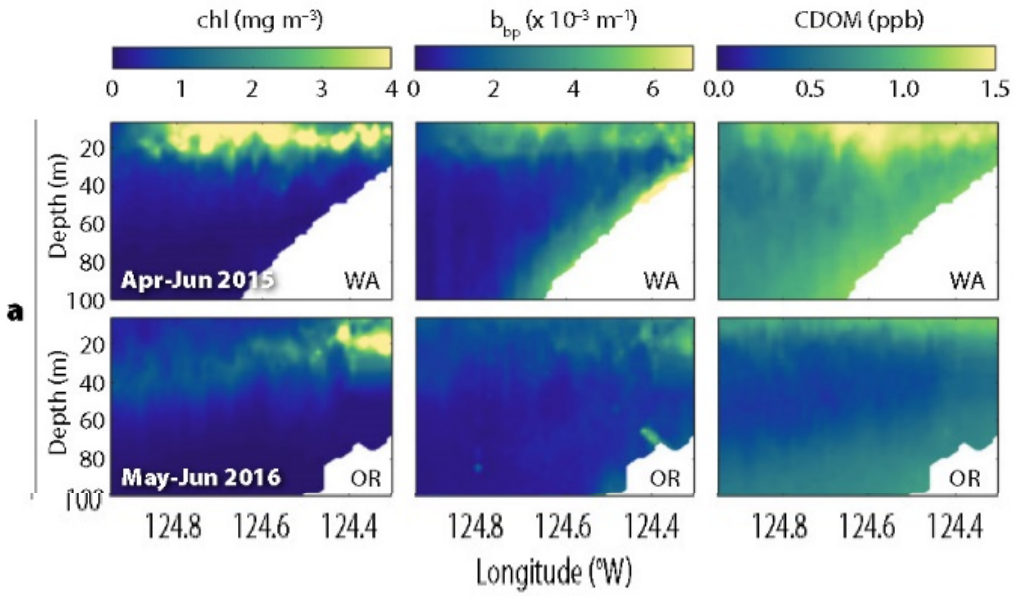


Challenges

- Instruments
  - Continued CAMDS problems. Only one working.
  - OPTAA service continues to be slow. Will be three short this fall. SeaBird recently hired additional technicians.
  - Problems with other instruments mitigated or on path to resolution
- Heavy Lift Winch Repaired. Spare parts procured. Used successfully on Fall 2017 and Spring 2018 cruises. Some continuing issues with lineout readouts.
- power constraints. May need to adjust sampling.
- Transition
  - Need clarity on long-lead item & service purchases that cross transition time boundaries

Ancillary/data verification activities

Using multi-frequency hull-mounted acoustic sensors to do bioacoustic surveys near moorings (Mei Sato – U. British Columbia with EA group)



Science Results

Three articles in *Oceanography* OOI special issue:

Temporal and Spatial Dynamics of Physical and Biological Properties along the Endurance Array of the California Current Ecosystem (*Henderikx Freitas, et al.*)

Warm Blobs, Low-Oxygen Events, and an Eclipse: The Ocean Observatories Initiative Endurance Array Captures Them All (*Barth et al.*)

Power from Benthic Microbial Fuel Cells Drives Autonomous Sensors and Acoustic Modems (*Reimers et al.*)

Issues for OOIFB

- We are making progress with technical advances through the OOI ECR process … but we need to be planning a "tech refresh" strategy (sensors, instruments, platforms, …)
- Now that field operations are becoming more "routine" we need to turn more eyes to performance metrics across the OOI and data quality
- Engaging external subject matter experts, students, and ancillary projects is extremely valuable and a win-win-win; we need to keep working to make this happen