Ocean Observatories Initiative Facilities Board

Town Hall

Lightning Talks

February 20, 2020

OCEAN OBSERVATORIES INITIATIVE FACILITY BOARD

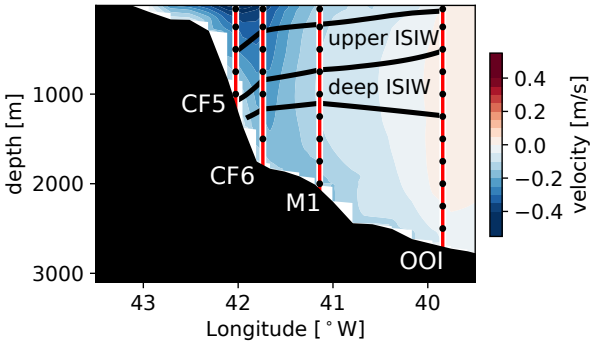
OOIFB

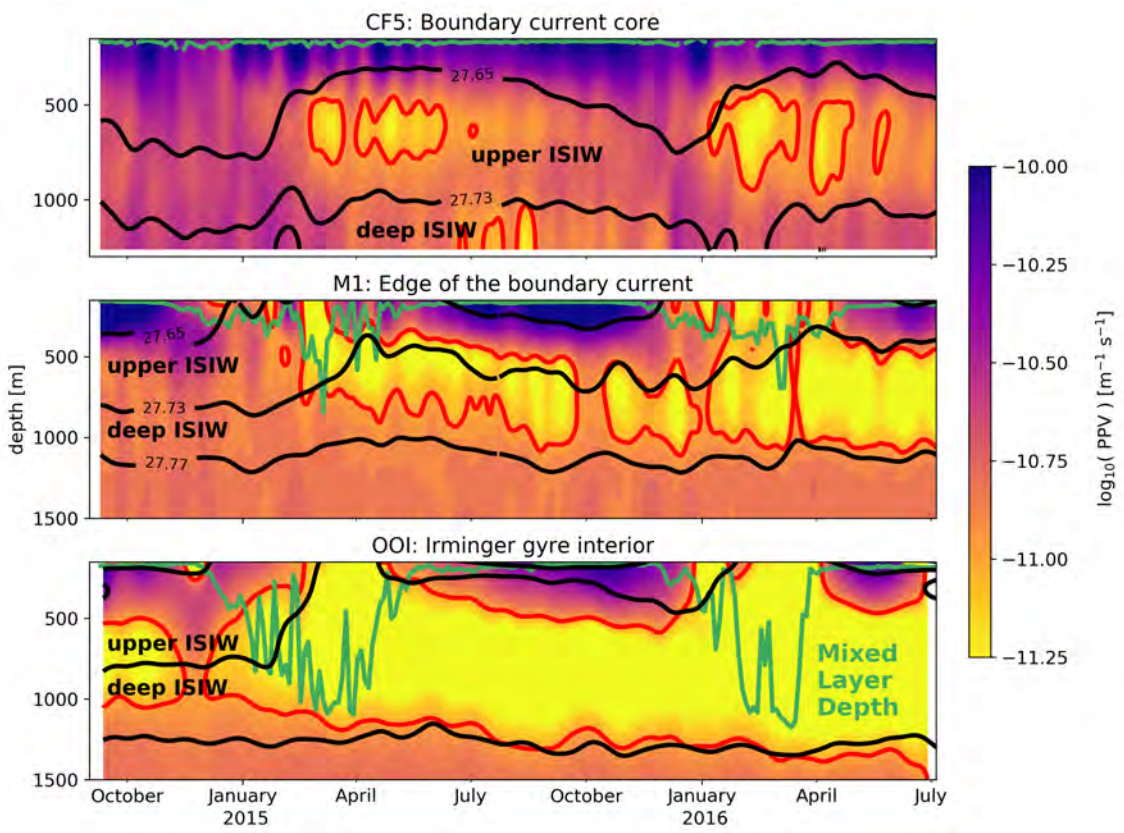
Lightning Talks
one slide, one minute

- Isabela Le Bras, Scripps Institution of Oceanography
- Hilary Palevsky, Boston College
- Elias Hunter (presenter) & John Wilken, Rutgers University
- Adrienne Silver, University of Massachusetts Dartmouth
- Weifeng Gordon Zhang, Woods Hole Oceanographic Institution
- Liz Ferguson, Ocean Science Analytics
- Kristen Fogaren & Clare Reimers, Oregon State University
- Wu-Jung Lee, Applied Physics Lab, University of Washington
- Mitchell Scott, Applied Physics Lab, University of Washington
- Cheryl Greengrove, University of Washington Tacoma
- Sage Lichtenwalner, Rutgers University
- Matthew Iacchei, Hawai'I Pacific University
- Sam Urmy, Monterey Bay Aquarium Research Institute
- Veronica Tamsitt, University of New South Wales

Rapid export of waters formed by convection near the Irminger Sea's western boundary

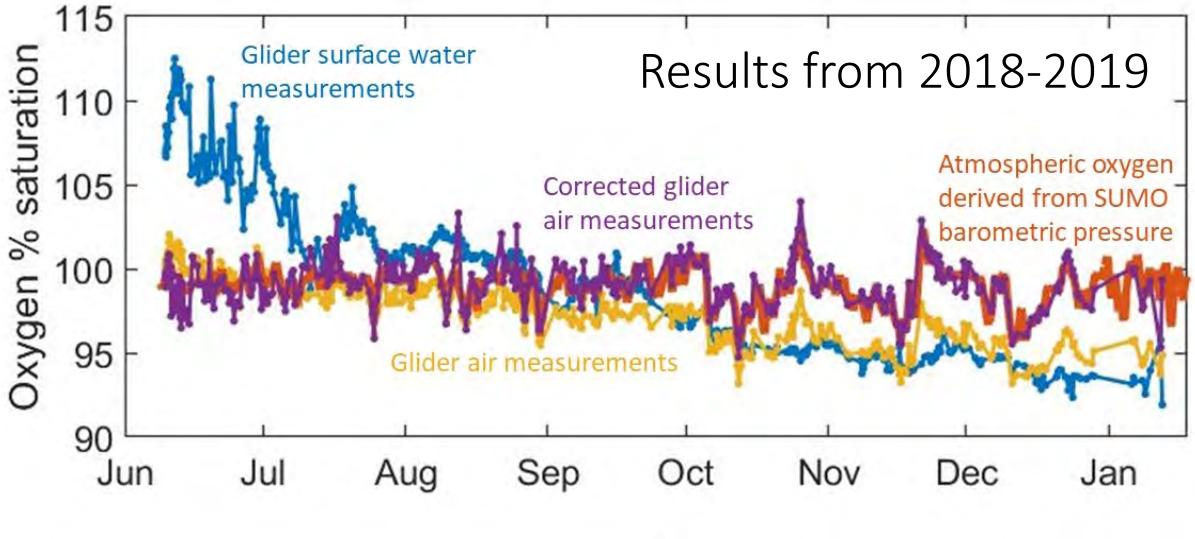
Isabela Le Bras (ilebras@ucsd.edu)
with F. Straneo, J. Holte, M.F. de Jong, and N.P. Holliday *GRL (2020)*

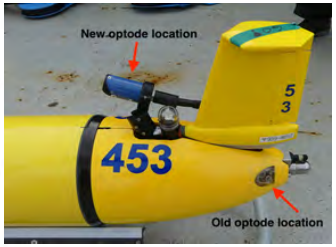


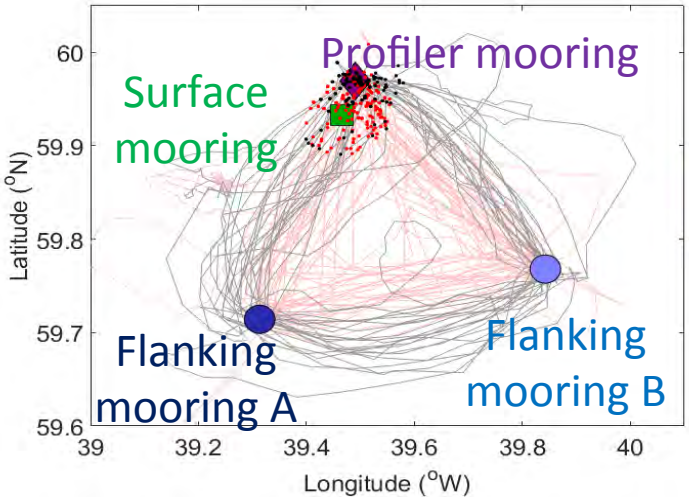


Air-calibrated Glider and Mooring Oxygen Data from the OOI Irminger Sea Array

Hilary I. Palevsky, Boston College & David P. Nicholson, WHOI





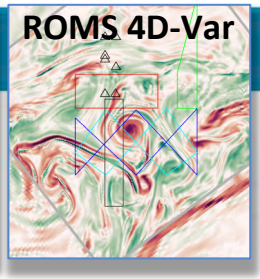


- Air calibration improves accuracy and utility of glider oxygen data
- Provides means to intercalibrate with moored oxygen sensors
- Request submitted to implement oxygen air calibration on all gliders across all OOI arrays

Supported by award #1946072 from NSF-OCE-Chemical Oceanography

Eli Hunter hunter@marine.rutgers.edu
John Wilkin jwilkin@rutgers.edu
Rutgers University

Not Secure http://myroms.org:8080/erddap/info



Brought to you by NOAA NMFS SWFSC ERD

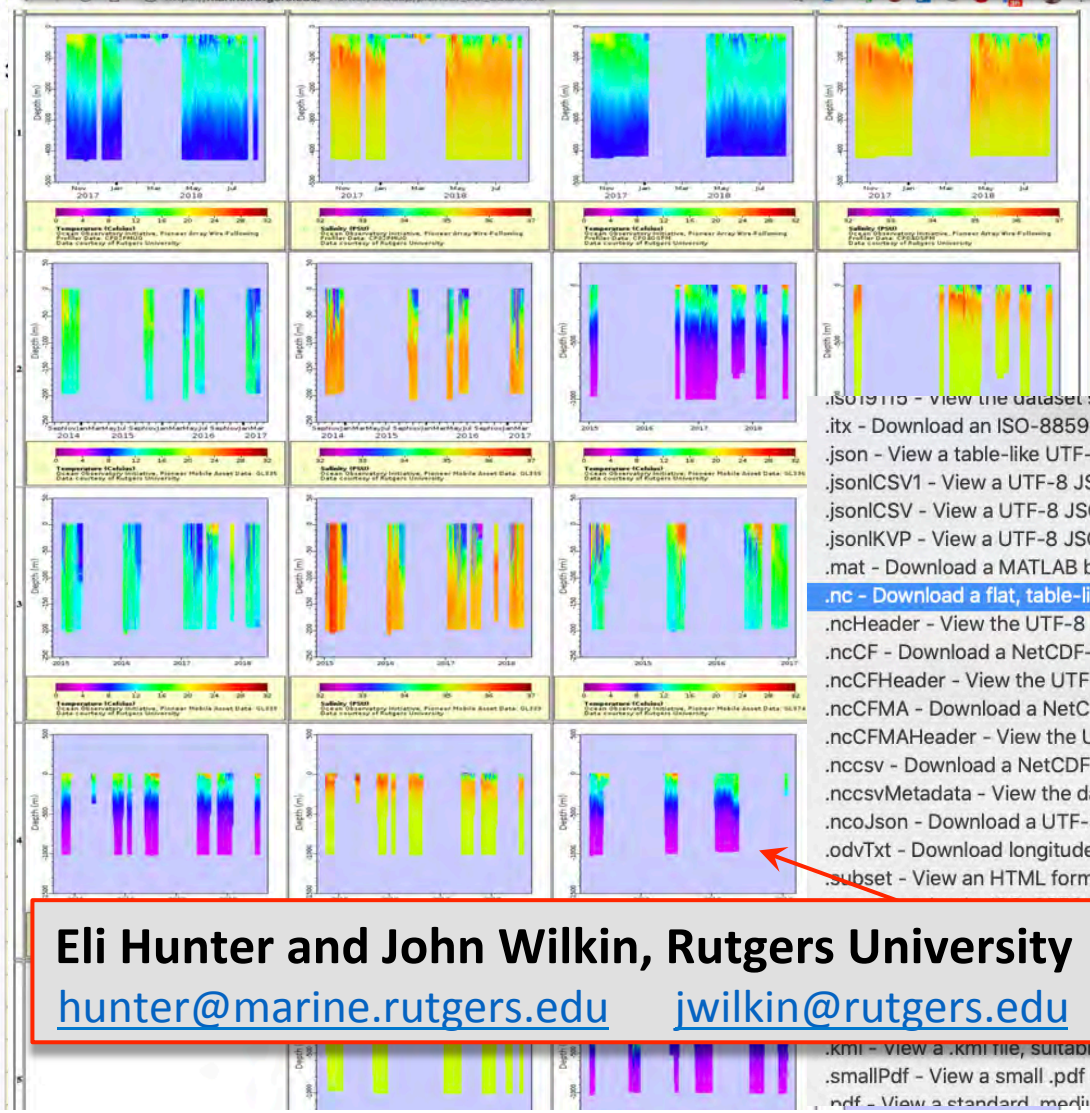
Or, Do a Full Text Search for Datasets:

Search

Or, Search for Datasets by Category:
cdm_data_type, institution, ioos_category, keywords, long_name, standard_name, variableName

Or, Search for Datasets with Advanced Search

Sum-mary	FGDC, ISO, Metadata	Back-ground Info	RSS	Institution



.itx - Download an ISO-8859-1
.json - View a table-like UTF-8
.jsonlCSV1 - View a UTF-8 JSON
.jsonlCSV - View a UTF-8 JSON
.jsonlKVP - View a UTF-8 JSON
.mat - Download a MATLAB bina
.nc - Download a flat, table-like,
.ncHeader - View the UTF-8 hea
.ncCF - Download a NetCDF-3 C
.ncCFHeader - View the UTF-8 H
.ncCFMA - Download a NetCDF-
.ncCFMAHeader - View the UTF-
.nccsv - Download a NetCDF-3-
.nccsvMetadata - View the datas
.ncoJson - Download a UTF-8 N
.odvTxt - Download longitude,lat
.subset - View an HTML form which uses faceted search to simplify picking subsets of t
.kml - View a .kml file, suitable for Google Earth.
.smallPdf - View a small .pdf image file with a graph or map.
.pdf - View a standard, medium-sized .pdf image file with a graph or map.

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niversity PIONEER_MOA

ERDDAP:

Advanced search: All available data in a time interval is quickly identified and downloaded

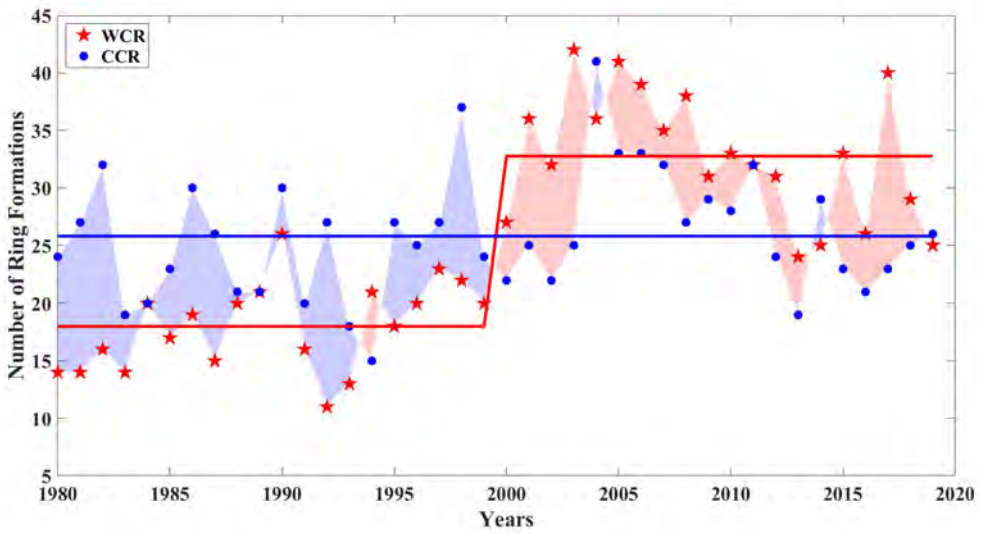
Download formats: netcdf, geotiff, mat, excel, png, pdf, …

Back-end to scripted full data ingest for ROMS nested 4D-Var data assimilation analysis

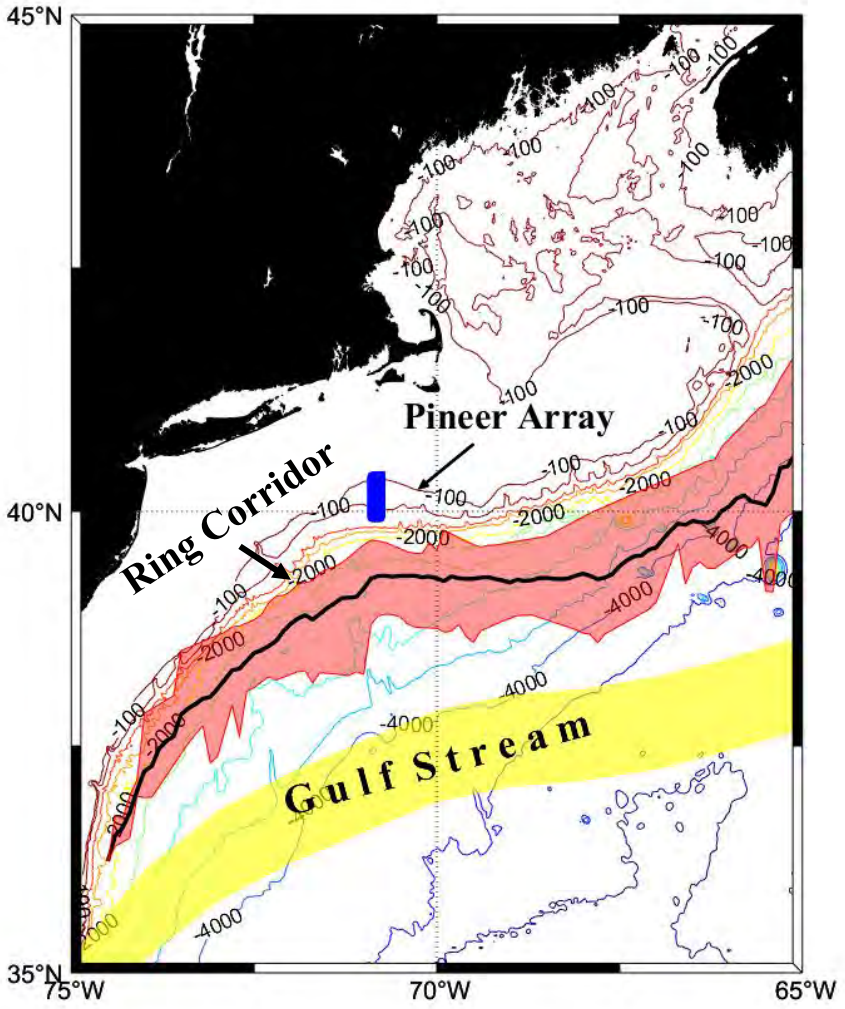
Eli Hunter and John Wilkin, Rutgers University
hunter@marine.rutgers.edu jwilkin@rutgers.edu

Quick look browse with ERDDAP *Slide Sorter*

Adrienne Silver
University of Massachusetts Dartmouth
asilver@umassd.edu



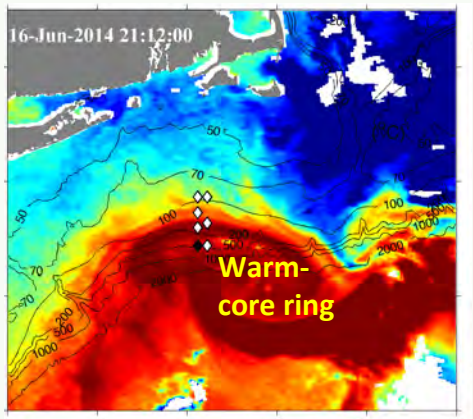
- WCR regime shift in 2000 from 18 to 33 rings
- No regime shift in CCRs
- Impact of WCR salinity intrusions across the shelf

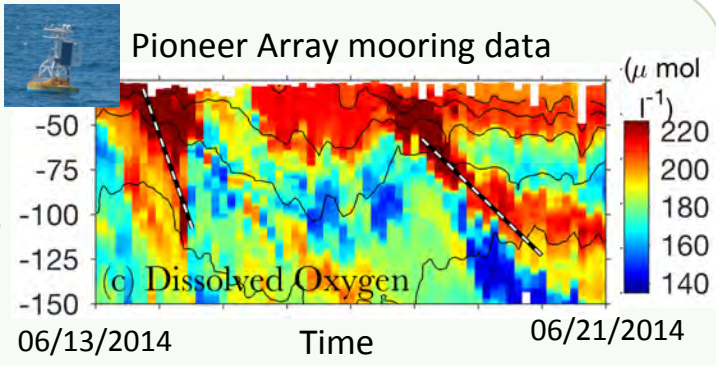


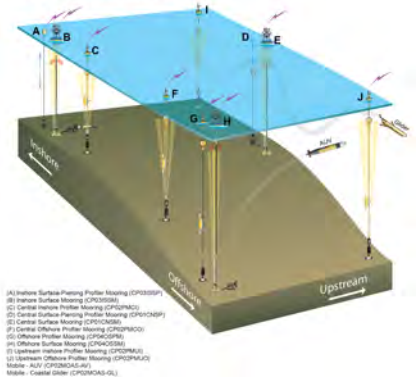
Fine-scale Frontal Processes Revealed by OOI Pioneer Array

Weifeng (Gordon) Zhang, Woods Hole Oceanographic Institution, wzhang@whoi.edu
Collaborators: Glen Gawarkiewicz, Dennis McGillicuddy

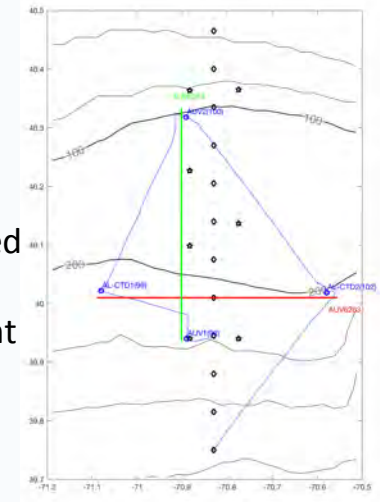
1) Subsurface offshore intrusion of the shelf water

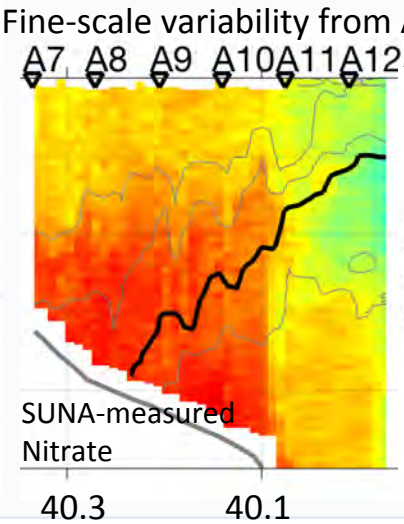


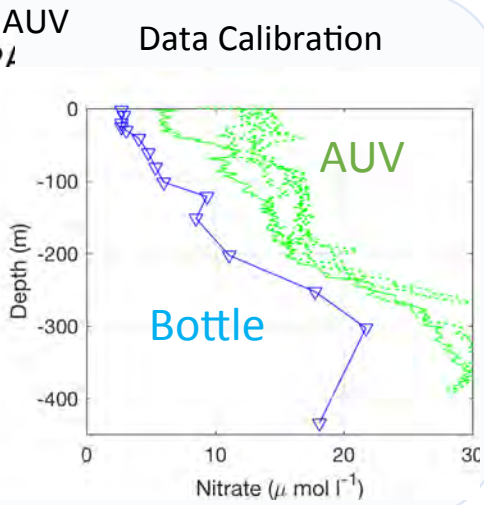




2) OOI-SPIROPA Coordinated AUV deployment





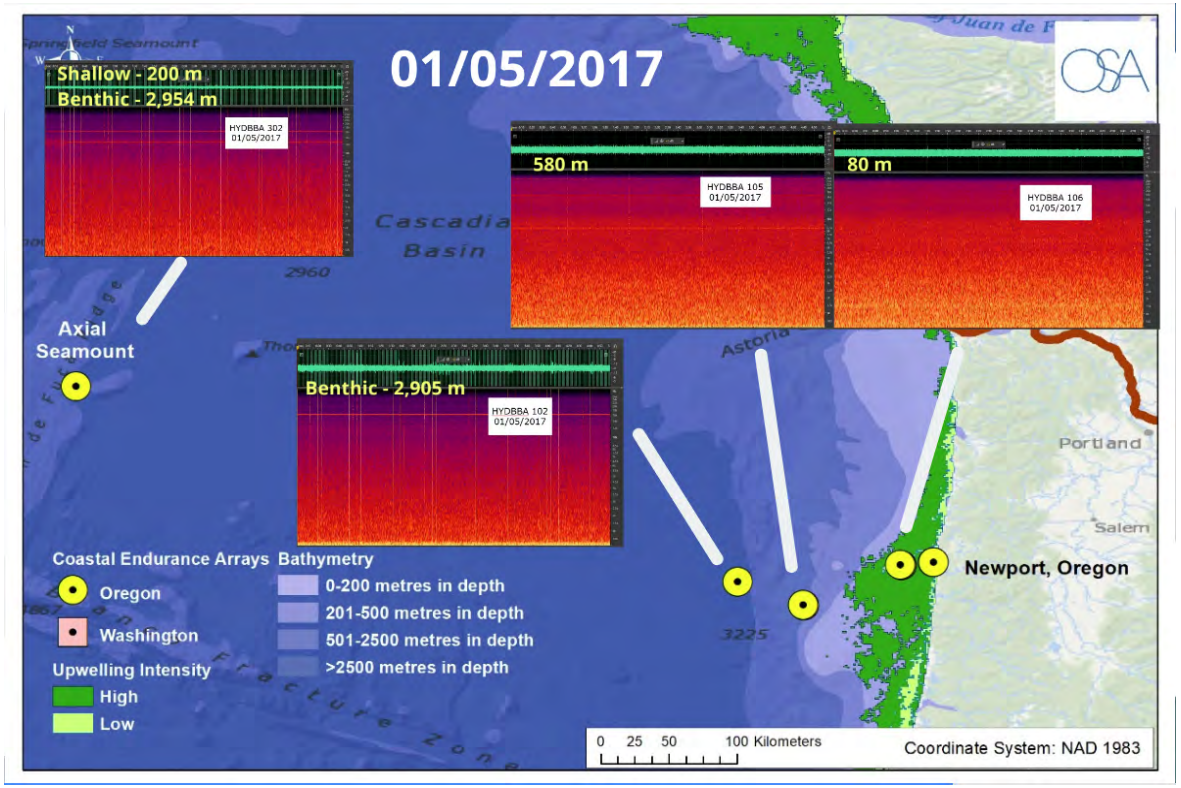


A view of Warren Jr. from R/V Neil Armstrong

Pioneer Array data – i) revealed fine-scale variability of the frontal processes
ii) provided the density distribution for dynamical analysis of the mechanisms
iii) helped quantifying the cross-shelf transport

Publications: Zhang and Gawarkiewicz, *GRL*, 2015; Gawarkiewicz, et al, *Oceanography*, 2018; Zhang and Partida, *JGR*, 2018

Ocean Science Analytics



Liz Ferguson,
CEO & Founder
eferguson@oceanscienceanalytics.com

RESEARCH: Continuously characterize marine mammal habitat use using bioacoustic occurrence and cross-platform oceanographic variables; utilize information as an indicator of ecosystem health

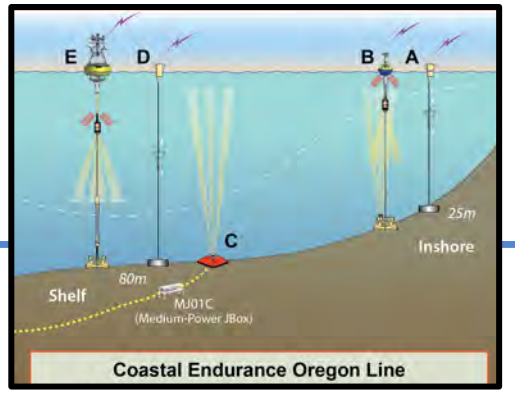
TRAINING: Develop online analytical training courses using OOI datasets

www.oceanscienceanalytics.com

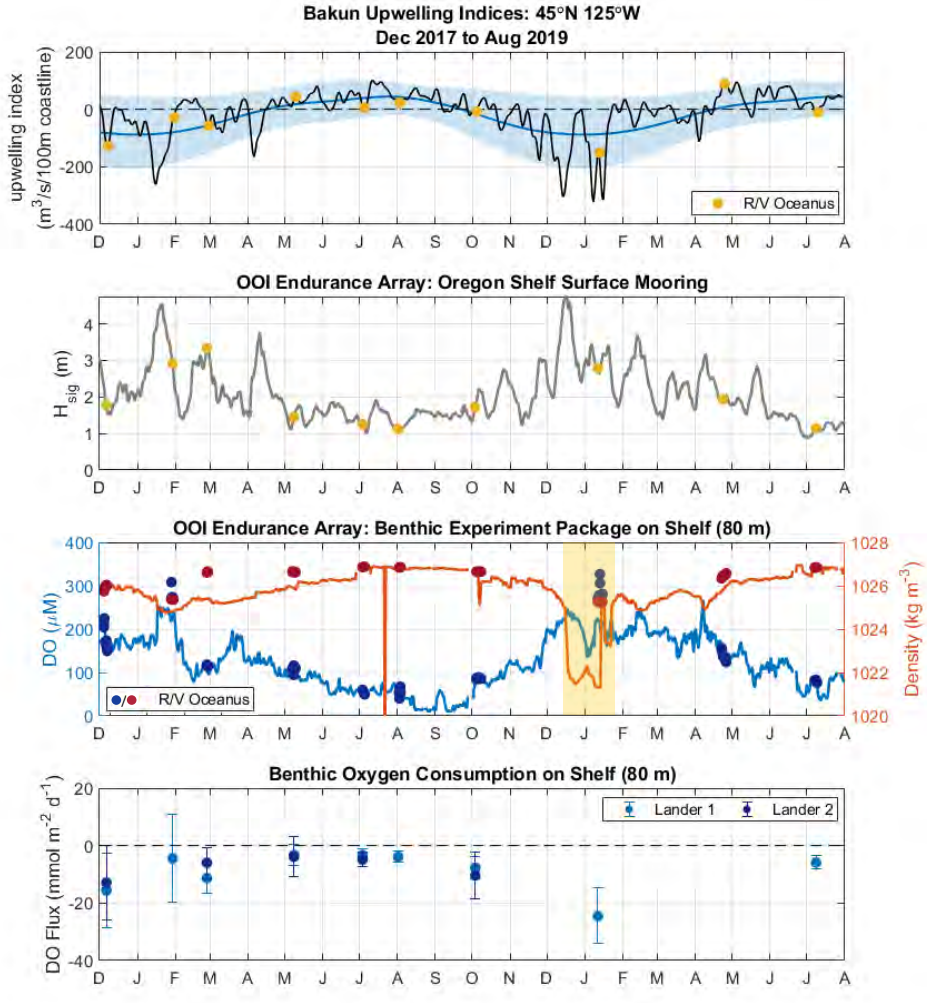
Benthic Biogeochemical Exchange Dynamics on the Oregon Shelf

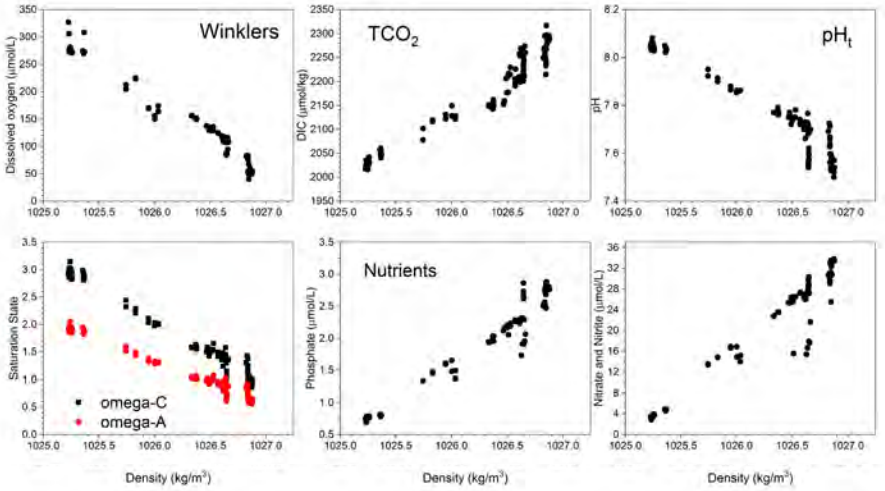
Oregon State University
College of Earth, Ocean, and Atmospheric Sciences

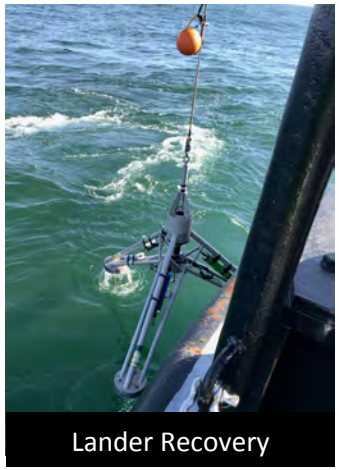
Clare E. Reimers (clare.reimers@oregonstate.edu)
Kristen E. Fogaren (kristen.fogaren@oregonstate.edu)

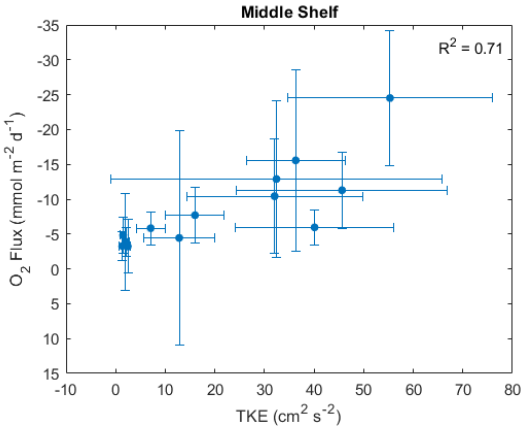


Using Aquatic Eddy Covariance to measure benthic oxygen consumption seasonally on the Oregon Shelf



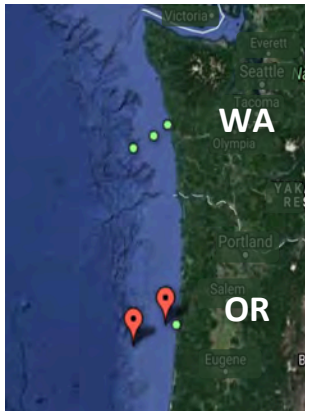



Lander Recovery



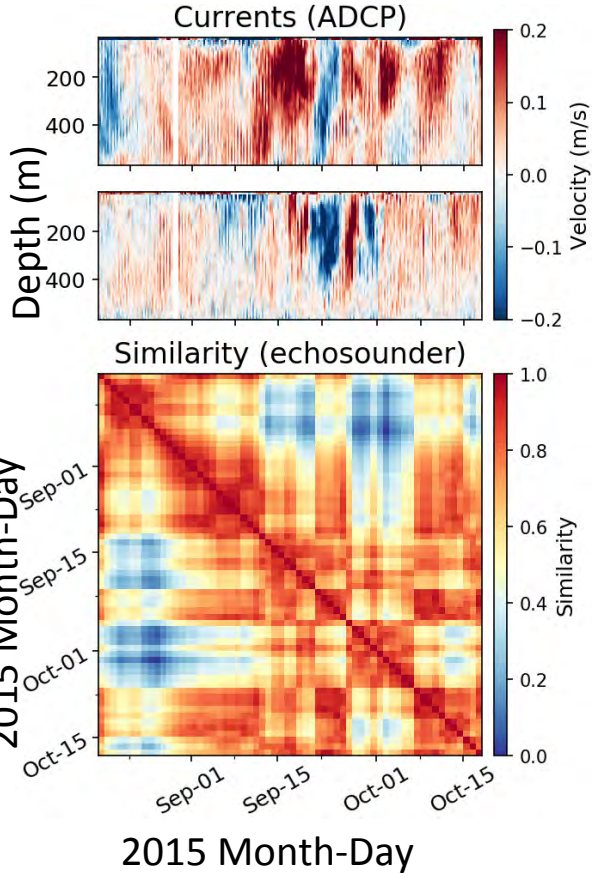
Wu-Jung Lee, Senior Oceanographer,
Applied Physics Lab, Univ Washington

Acoustics, Data Science, Oceanography

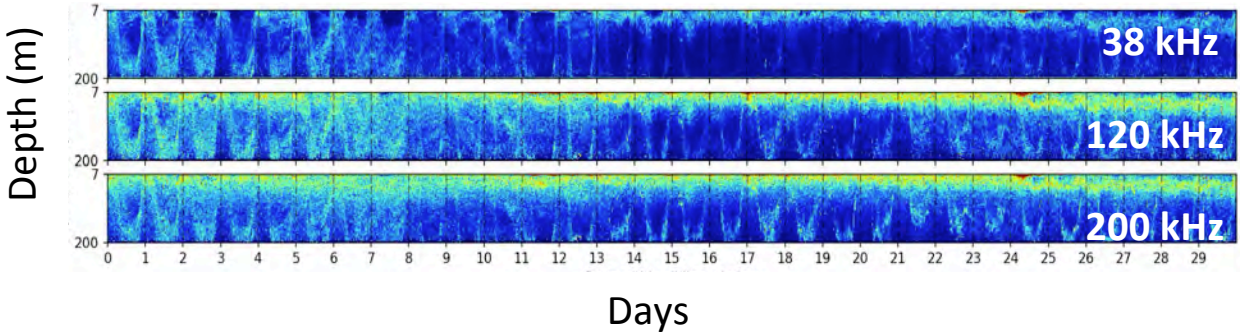


Cabled ○ Uncabled

- Sensor network ⇨ **???** ⇨ Hypotheses
- High-throughput sonar data analysis
  - Unsupervised pattern discovery
  - Correlation with environmental data



Rolling echogram for 12 months

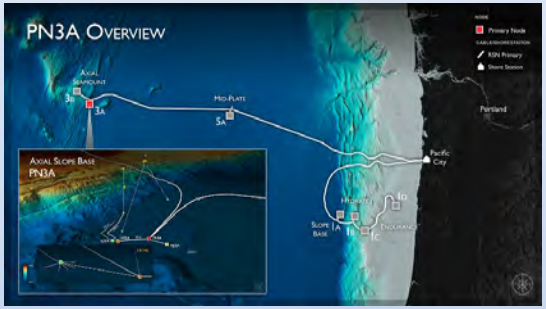


- **Echopype** (open-source software) **OD52A-06**, Friday 11:45 AM

Macrofauna Detection at *Mushroom*

Mitchell Scott
University of Washington Applied Physics Laboratory
miscott@uw.edu

Axial Caldera



Mushroom
Hydrothermal Vent

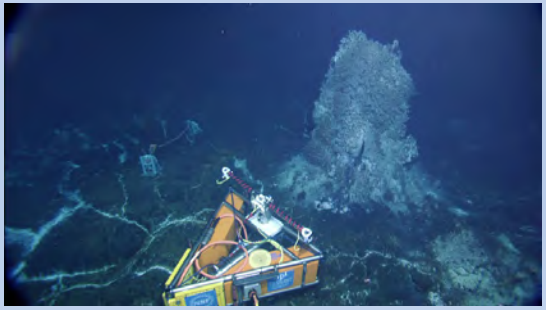


Image Credits: UW/NSF-OOI

Scale worm detection [1]

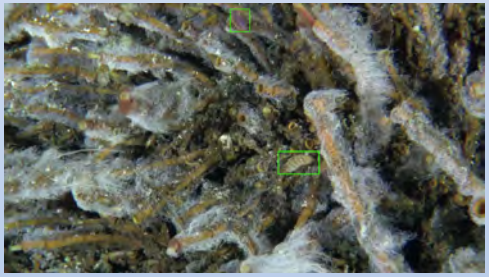


Image Credit: UW/NSF-OOI

[1] Malladihalli Shashidhara, M. Scott, and A. Marburg. "Instance Segmentation of Benthic Scale Worms at a Hydrothermal Site". *Winter Conference on Applications of Computer Vision*. IEEE 2020.

Using Authentic Data from NSF's Ocean Observatories Initiative in Undergraduate Teaching: An Invitation

Cheryl Greengrove, C. Sage Lichtenwalner, Hilary I. Palevsky, Anna Pfeiffer-Herbert, Silke Severmann, Dax Soule, Stephanie Murphy, Leslie M. Smith, and Kristen Yarincik

	Introductory →	Upper level →	Undergraduate research
Oceanography concepts: Bloom's understand/remember	Primary Productivity Submarine Volcanism Salinity/Stratification	Primary Productivity	Opportunity
Data skills: Bloom's apply/analyze	Primary Productivity Submarine Volcanism Salinity/Stratification	Primary Productivity	Opportunity
Integrated applications: Bloom's evaluate/create	Opportunity	Opportunity	Opportunity

Well Developed Teaching Activities	Some Teaching Materials Developed	Opportunity to Develop Teaching Activities, Resources & Best Practices

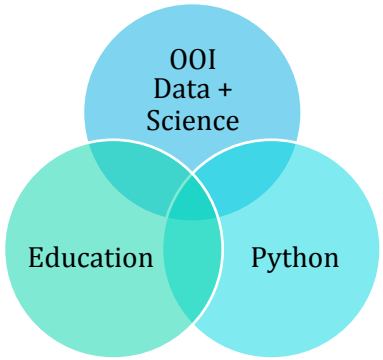
https://datalab.marine.rutgers.edu **cgreen@uw.edu**

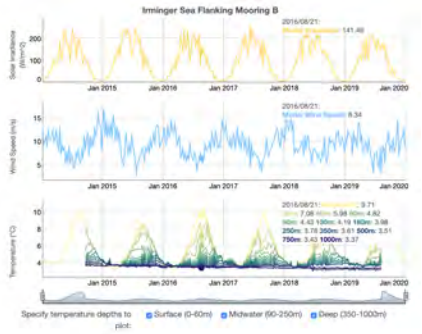
- 2020 Ocean Sciences – Tuesday - ED21A & D Teaching with Data: Engaging Students in Learning Ocean Sciences Through Large Data Sets

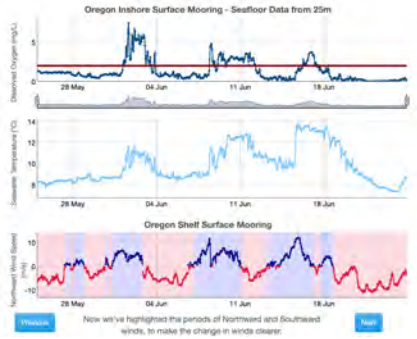
- The Oceanography Society Journal – https://doi.org/10.5670/oceanog.2020.103

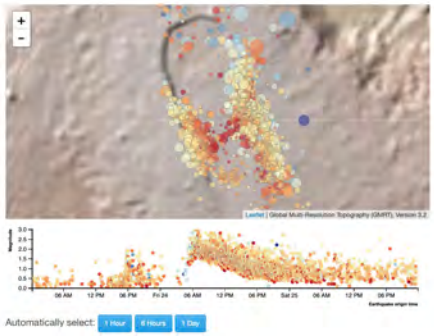
OOI Ocean Data Labs Project

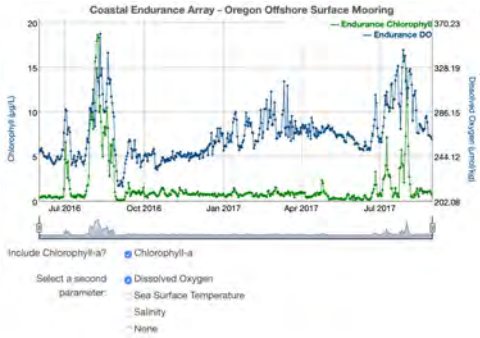
Building a community of professors interested in tapping into the firehose of OOI ocean data to support undergraduate education.











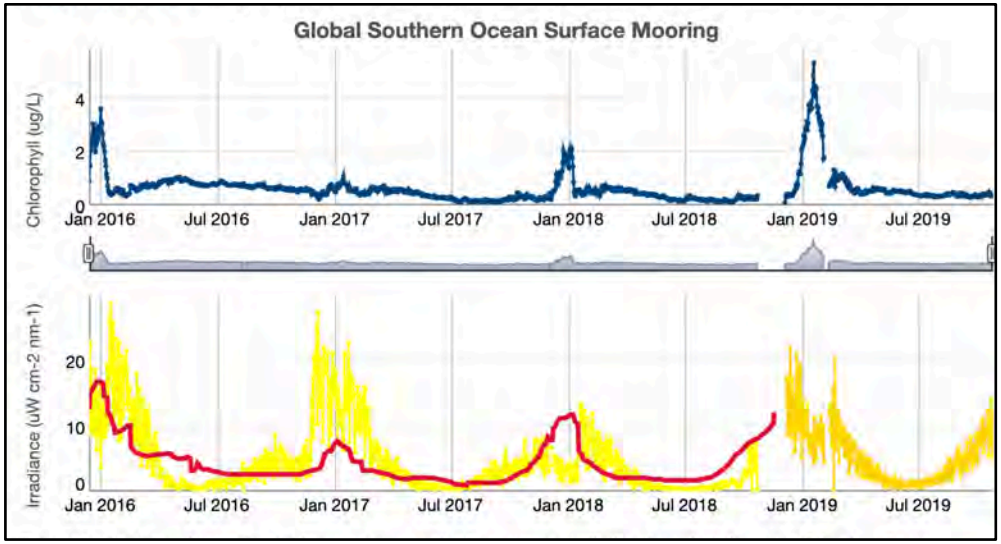
Community Resources

33+ "Data Explorations"
9 Workshops (to date)
10 Webinars (more planned)
11 Fellows Projects
Blog Posts & Tutorials
31+ Python Notebooks
207 Current Members

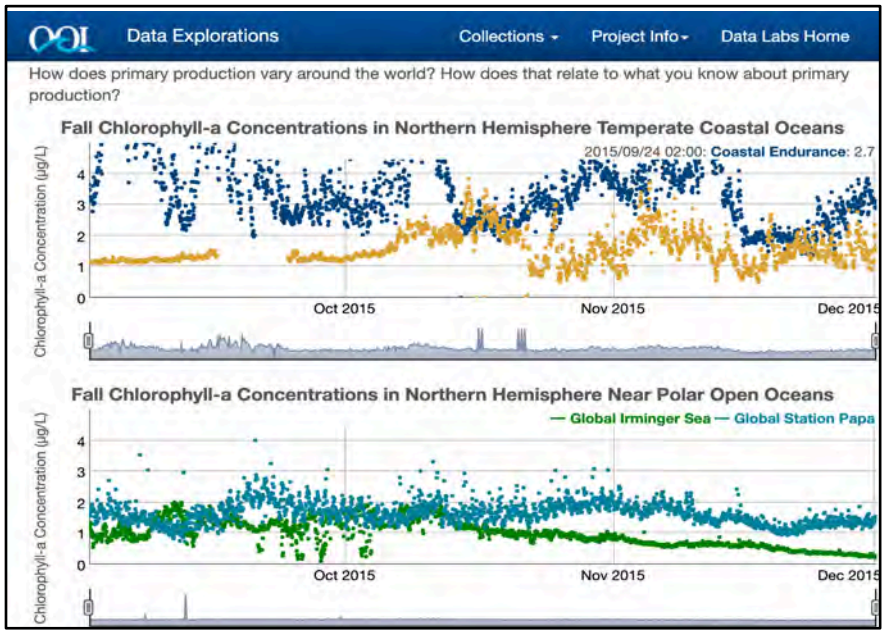
Join today:
https://datalab.marine.rutgers.edu

Sage Lichtenwalner
Rutgers University
sage@marine.rutgers.edu

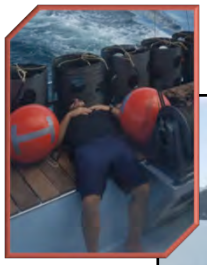
Teaching With OOI Data

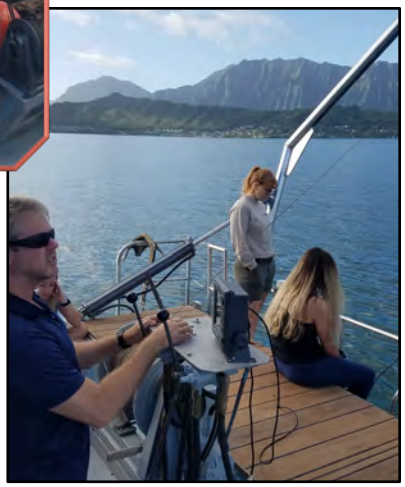


Expand



Extrapolate



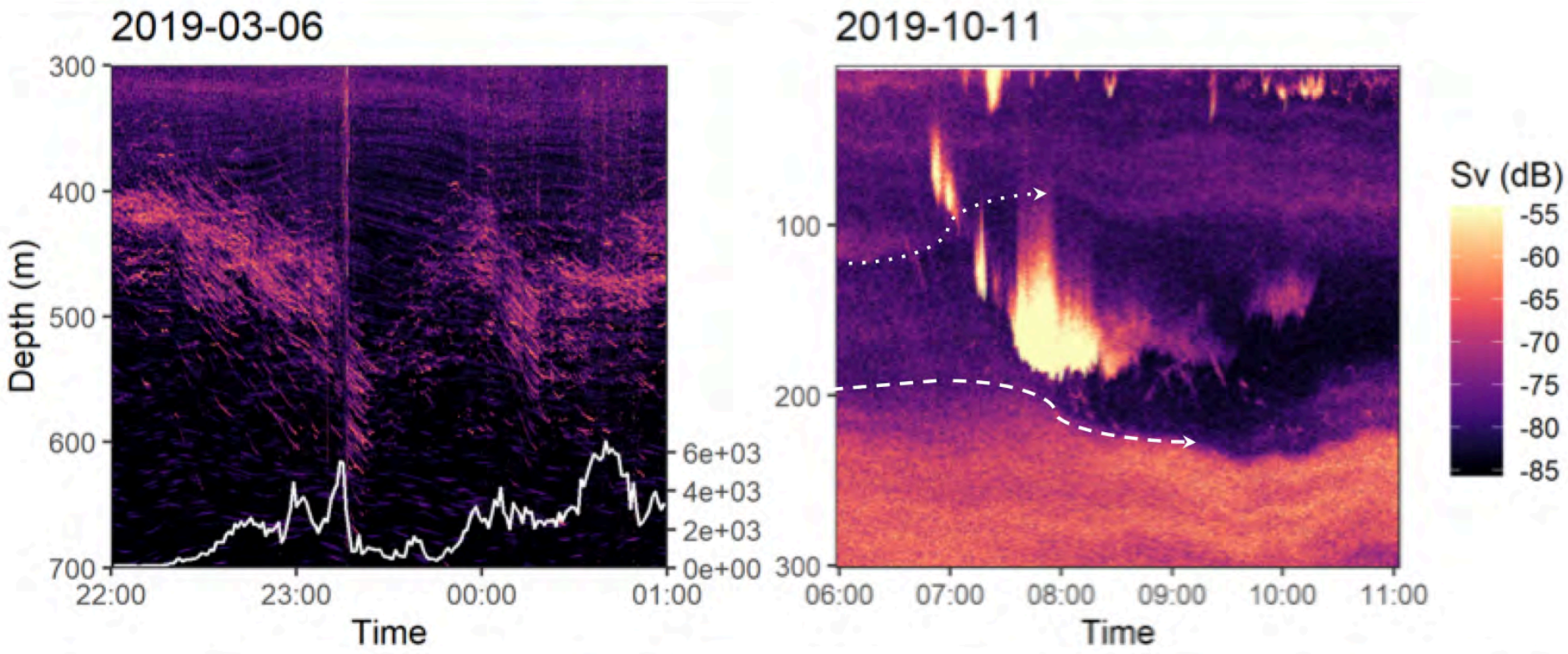


Matthew Iacchei
Miacchei@hpu.edu

HAWAIʻI PACIFIC UNIVERSITY

Observing predator-prey drama in the pelagic zone

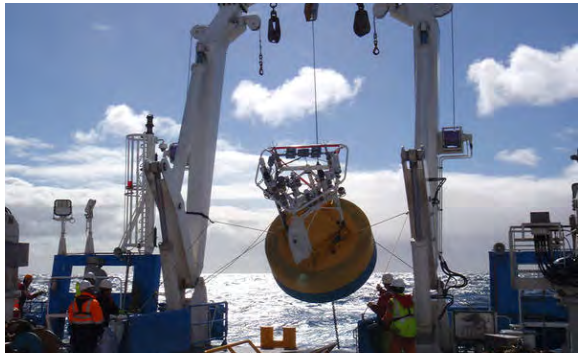
Sam Urmy, MBARI (urmy@mbari.org)



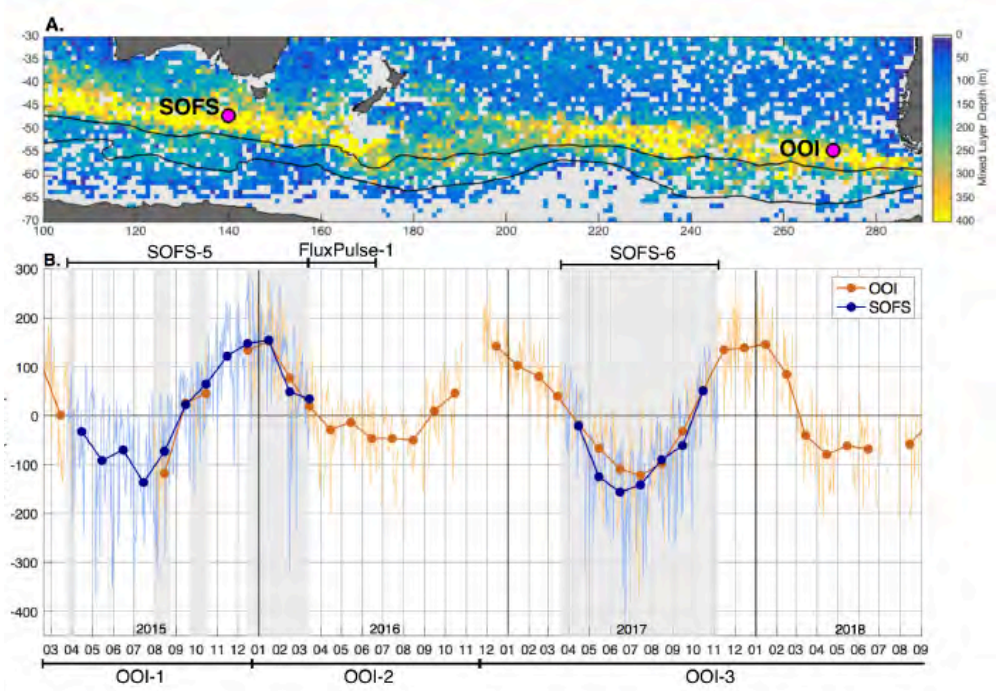
Full story: Friday 9:45 (*Beyond Just Discovery in the Ocean's Midwater*, SDCC3 UL)

Using moorings to understand Southern Ocean air-sea interaction and water mass formation

SOFS mooring credit: MNF



OOI Southern Ocean flux mooring



Ogle et al. 2018 Tamsitt et al. 2020

Summary:

- OOI SO mooring southernmost multi-year flux mooring every deployed, in key region of mode water formation
- Comparison with SOFS mooring (Australia) shows stronger heat loss south of Australia and different atmospheric regimes drive ocean heat loss events
- Interannual variations in winter heat loss tends to co-vary at two moorings as part of basin-scale dipole

Future work:

- drivers/role of extreme heat loss events to interannual variability in heat loss and mode water formation
- characterising DIC, pH, and oxygen variability and estimating carbon fluxes at OOI Southern Ocean mooring

Veronica Tamsitt, UNSW/Centre for Southern Hemisphere Oceans Research (CSHOR), veronica.tamsitt@gmail.com