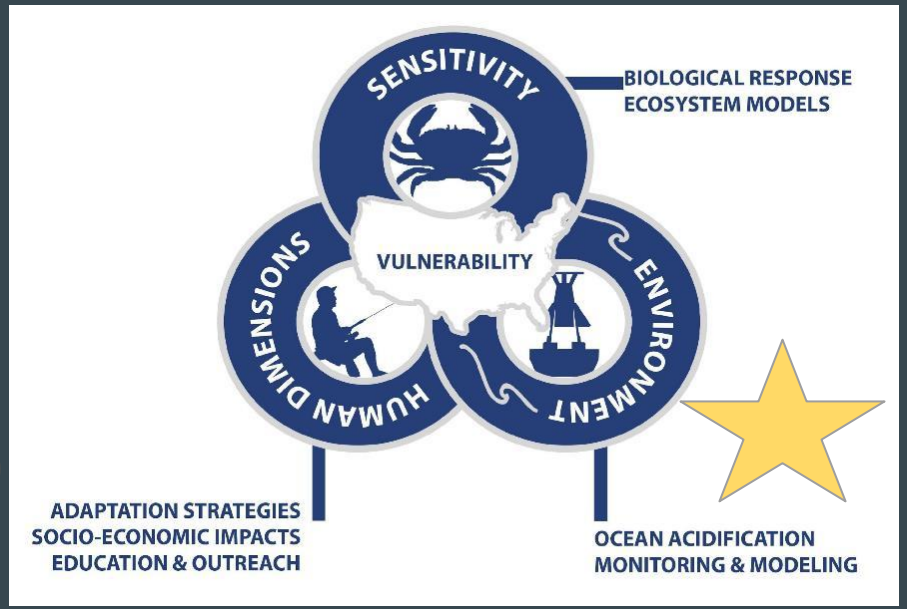
NOAA Ocean Acidification And OOI Data

Dr. Liza Wright-Fairbanks
Field Operations Manager
NOAA Ocean Acidification Program

NOAA OCEAN ACIDIFICATION PROGRAM

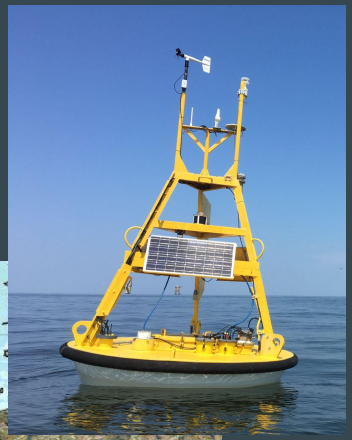
NOAA's Ocean Acidification Program seeks **to better prepare society to respond** to ocean, coastal and Great Lakes acidification **by fostering transdisciplinary research, education and outreach.**



What does our observing network look like?

PMEL
Pacific Marine Environmental Laboratory

& Local Partners



American Samoa

What sensors are being used?

NOAA PMEL

- MAPCO2 (Li-COR gas analyzer based; PMEL);
- SAMI pH;
- CTD (SBE16 or similar);
- Oxygen (SBE 43 or similar),
- Chlorophyll (ECO fluorometer or similar);
- Turbidity,
- CDOM, and
- Meteorology

Teledyne-Webb

- ISFET-based pH sensors
- CTD
- Oxygen optodes
- BB2FL EcoPuck

NOAA OMAO

- Discrete, Niskin or net samping
  - Benchtop climate-quality pCO2, pH, total alkalinity, and dissolved inorganic carbon
  - Biological parameters
- Underway
  - pCO2 (Li-COR analyzer)
  - Oxygen (SBE 43)
  - Optics (Wetlabs chlorophyll and DOM fluorometers; Wetlabs c-star beam attenuation)
- Profiling
  - CTD and oxygen (SBE 9+ CTD, SBE3, SBE4, SBE 43)
  - Seapoint fluorometers and Biospherical QSP-2300 irradiance

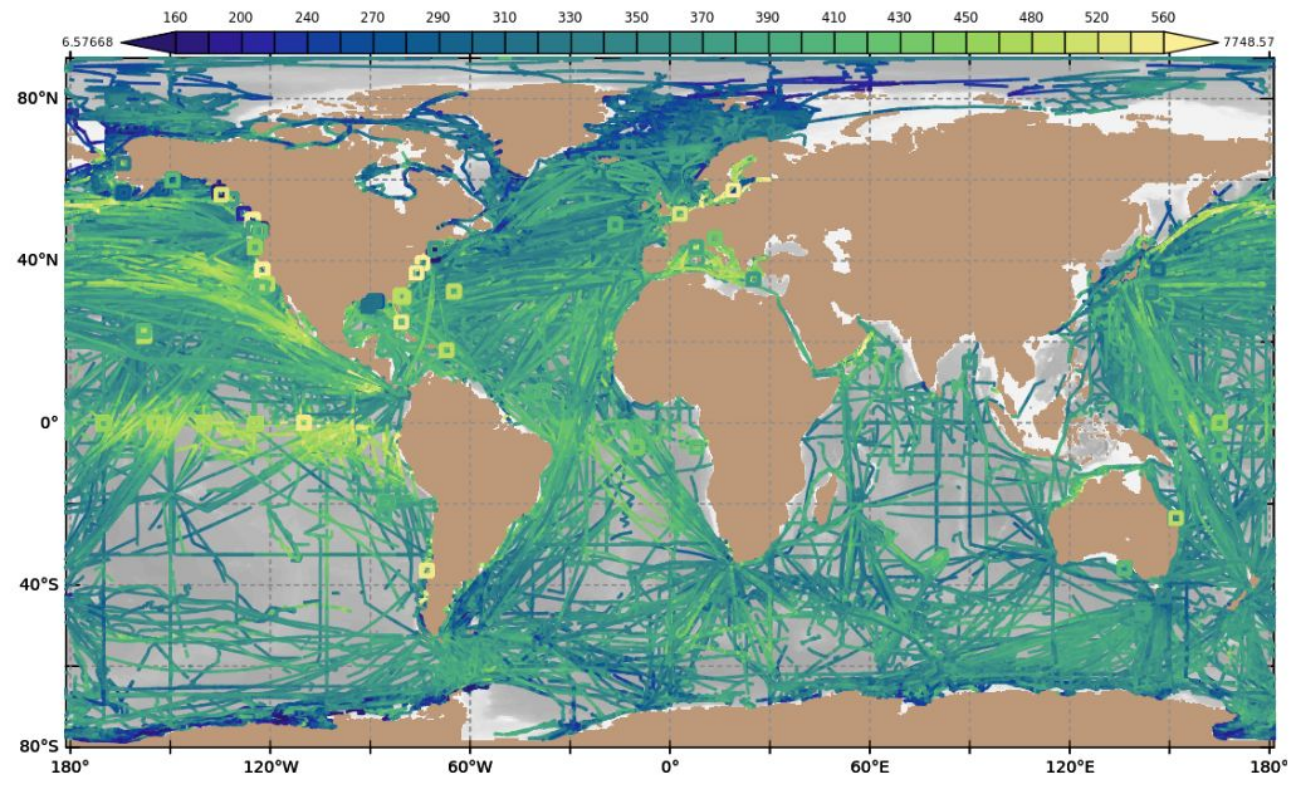
Further carbon observing interest from NOAA

- NOAA Global Ocean Monitoring and Observing program (GOMO)
  - Air-sea gas exchange
  - GO-SHIP cruises
  - Argo and BGC Argo floats
  - Global Tropical Moored Buoy Array (PIRATA, RAMA, TAO Array)
- NOAA OAP Marine Carbon Dioxide Removal Portfolio
  - OAP manages NOAA's mCDR research projects
  - Monitoring, Measuring, Reporting, and Verifying carbon changes/removal is critical to developing this field
  - Need reliable baseline carbon measurements

Where does our observing data go?

https://socat.info/index.php/data-access/
https://www.ncei.noaa.gov/products/ocean-carbon-acidification-data-system

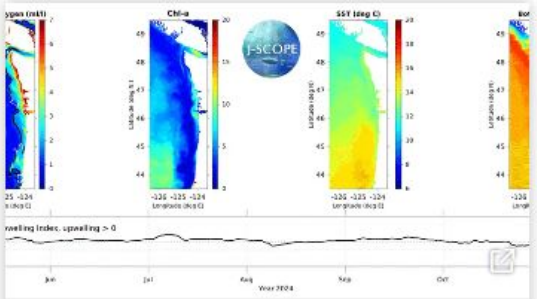
Surface Ocean CO2 Atlas (SOCAT)



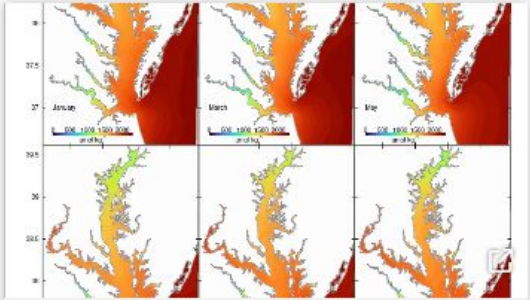
Where does our observing data go?

Regional Ocean Acidification Forecasts

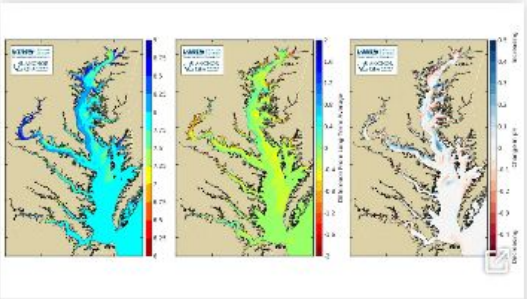
Forecasting Models



J-SCOPE Seasonal Coastal Ocean Predictions



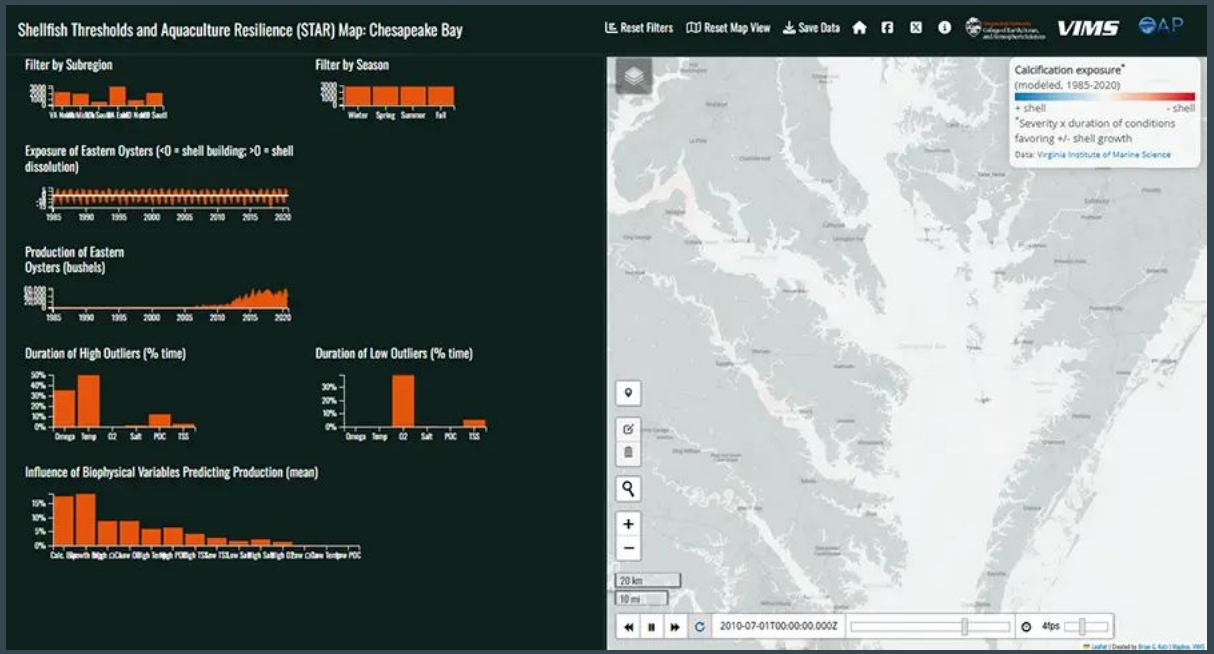
Chesapeake Bay Atlas for Physical and Biogeochemical Conditions

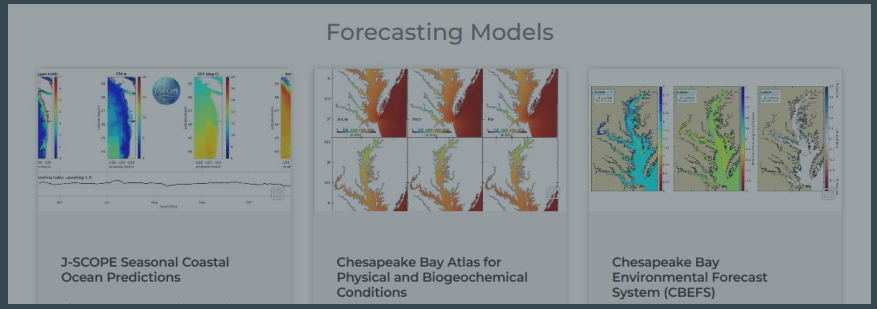


Chesapeake Bay Environmental Forecast System (CBEFS)

Where does our observing data go?

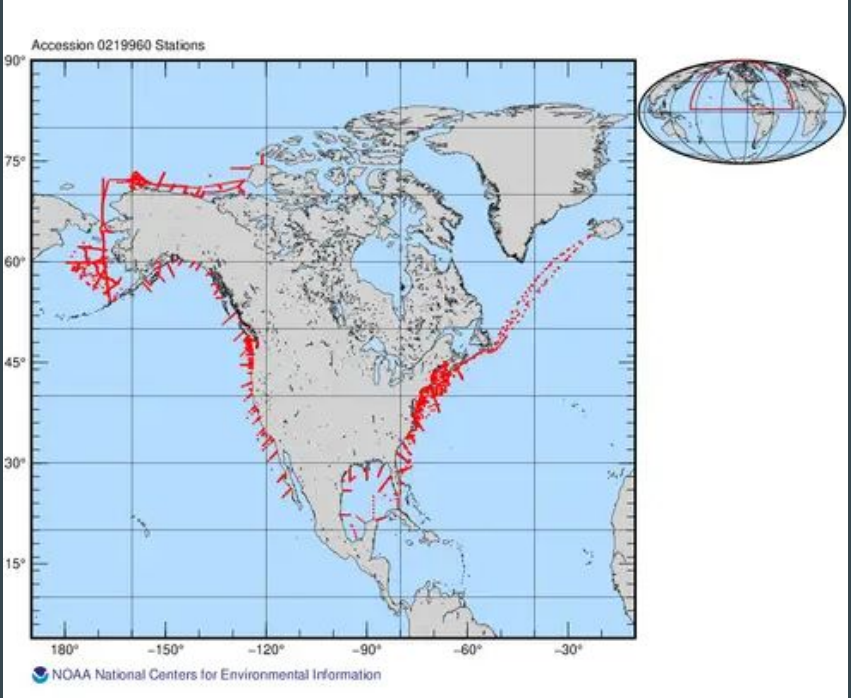
Shellfish Thresholds & Aquaculture Resilience Chesapeake Bay Map

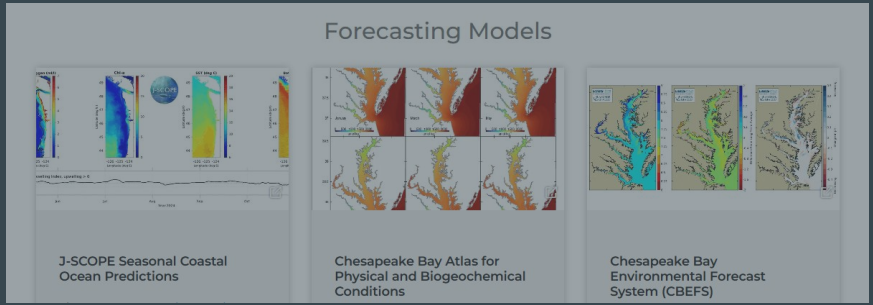


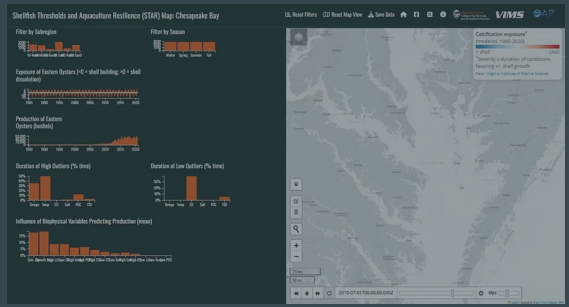


Where does our observing data go?

Coastal Ocean Data Analysis Product in North America

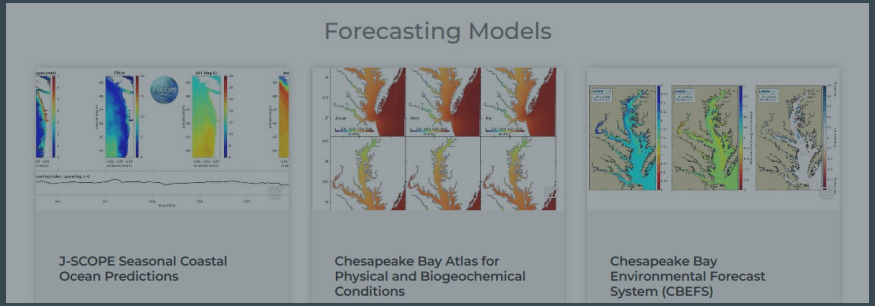


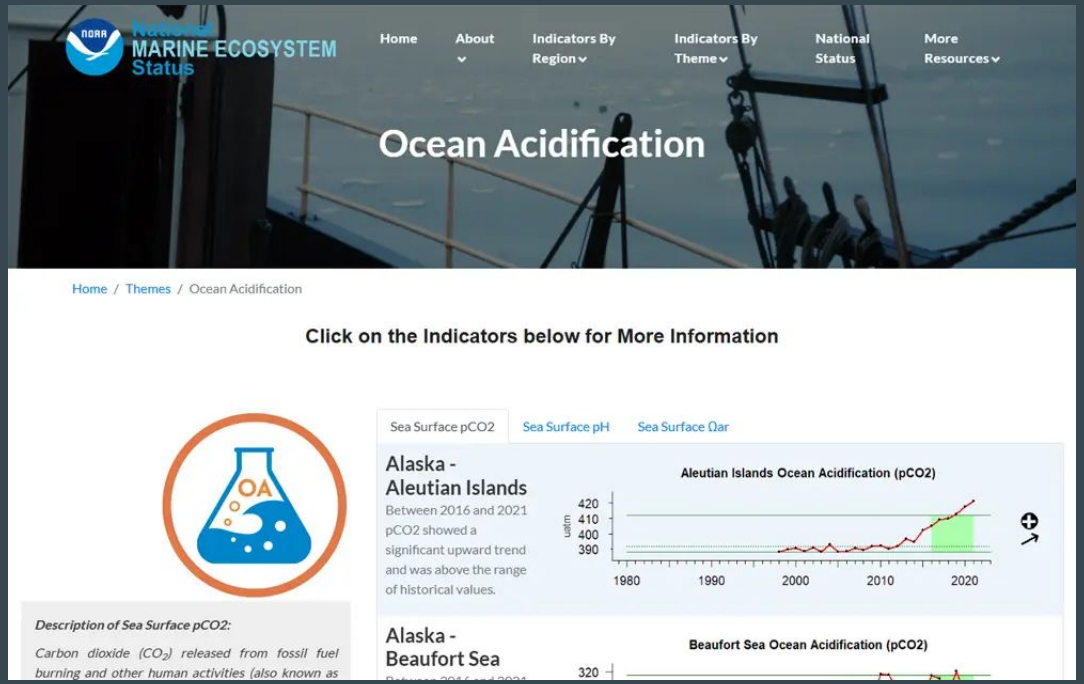


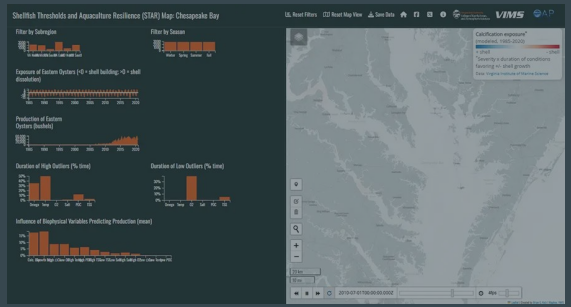


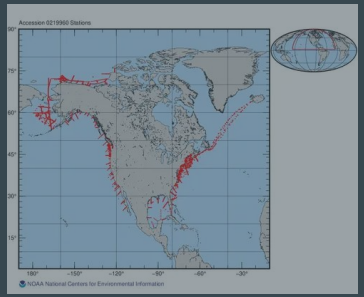
Where does our observing data go?

NaMES OA Indicators









Where does our observing data go?

https://oceanacidification.noaa.gov/ocean-acidification-data/

OAP
NOAA OCEAN ACIDIFICATION PROGRAM

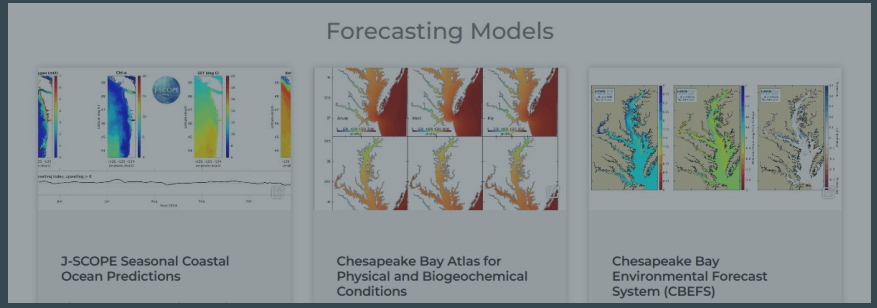
Advanced tools for researchers and resource managers

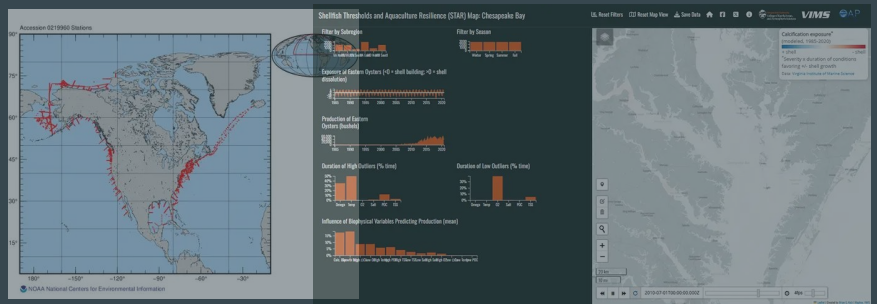
Information for Everyone

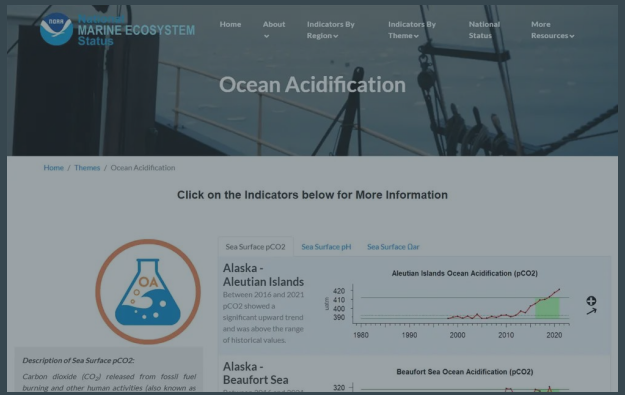
How data helps us understand ocean acidification

Access quality ocean acidification data

- NaMES OA Indicators
- PMEL Buoy and Mooring Data
- IOOS Regional Data
- OCADS Data Portal
- International Data from GOA-ON
- CODAP-NA Data Product
- UCSC OAH Online Tool
- Shellfish Thresholds and Aquaculture Resilience (STAR) Map: Chesapeake Bay
- J-SCOPE Seasonal Coastal Ocean Predictions
- Chesapeake Bay Atlas for Physical and Biogeochemical Conditions
- Chesapeake Bay Environmental Forecast System







How can OOI arrays fit in?

- BGC data are key to improving coastal OA data products
- But, data must meet advanced data processing standards to achieve best practice quality control requirements for BGC data (i.e. QARTOD Recommendations)

How can OOI arrays fit in?

OOI Biogeochemical Sensor Data:
Best Practices & User Guide

Version Number: 1.1.1
July 2023

Hilary I. Palevsky[1*], Sophie Clayton[2†*], Dariia Atamanchuk[3], Roman Battisti[4], Jennifer Batryn[5], Annie Bourbonnais[6], Ellen M. Briggs[7], Filipa Carvalho[8], Alison P. Chase[9], Rachel Eveleth[10], Rob Fatland[11], Kristen E. Fogaren[1], Jonathan Peter Fram[12], Susan E. Hartman[8], Isabela Le Bras[5], Cara C. M. Manning[13], Joseph A. Needoba[14], Merrie Beth Neely[15], Hilde Oliver[5], Andrew C. Reed[5], Jennie E. Rheuban[5], Christina Schallenberg[16], Michael F. Vardaro[17], Ian Walsh[18], Christopher Wingard[12]

- Data processing efforts should ideally meet recommendations of Palevsky et al. (2023)
  - This user guide helps ensure BGC data are processed thoroughly enough to meet data quality needs for integration into OA data products
  - Currently being implemented at Global Station Papa and Irminger Sea Array
- OAP focuses specifically on U.S. coastal regions
  - What would it take for Palevsky et al. recommendations be implemented at Coastal Pioneer and Coastal Endurance Arrays?

Thank you!

I look forward to further discussion!

liza.wright-fairbanks@noaa.gov