

# Motivating OceanObs'19

by

Meghan Cronin (NOAA PMEL)

*motivating discussion at  
Ocean Carbon Hot Spot Workshop  
&  
helping to make dreams come true*

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#### Scientific and technical groups for network contributions

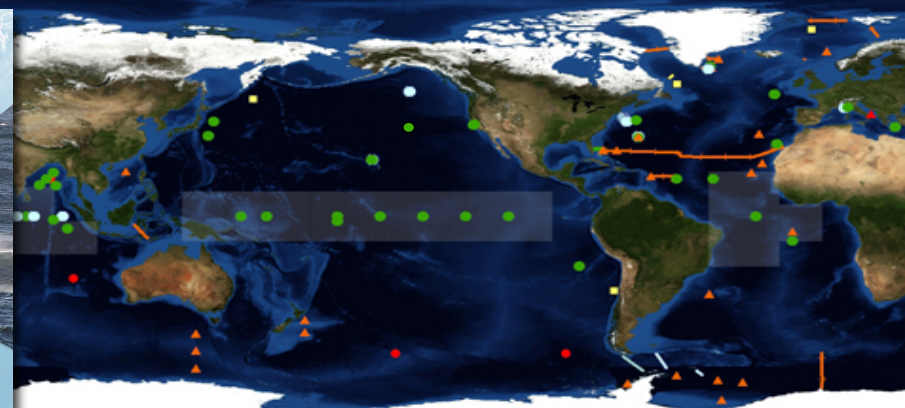
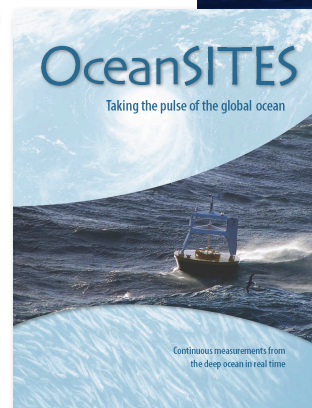
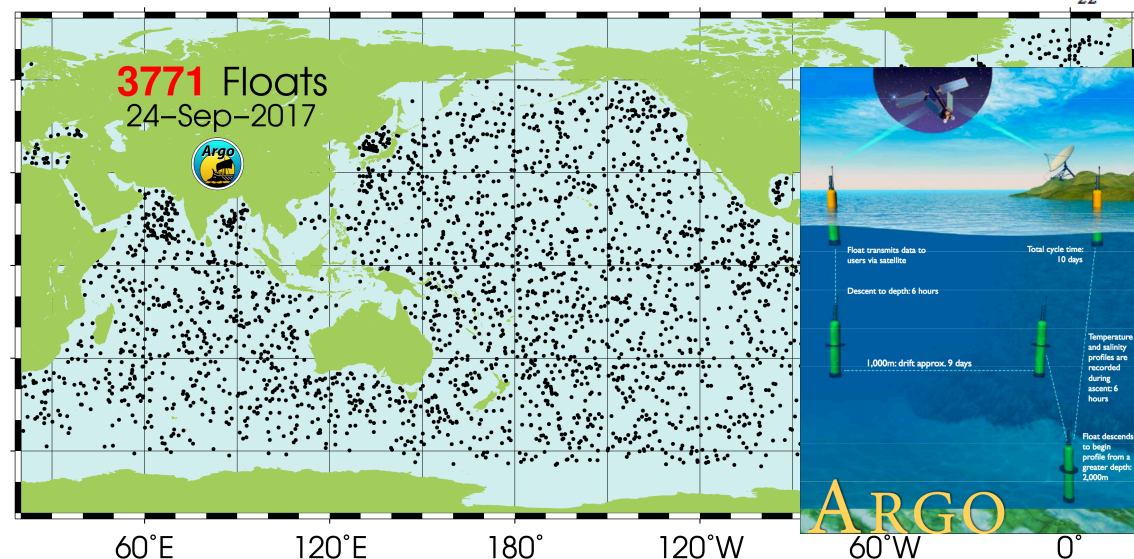
#### al and global

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#### s and data assimilation

#### al needs



Mark your calendars! More information to come.



**September 16-20, 2019**

Hawai'i Convention Center

1801 Kalakaua Avenue, Honolulu, HI 96815, USA

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## FRAMEWORK

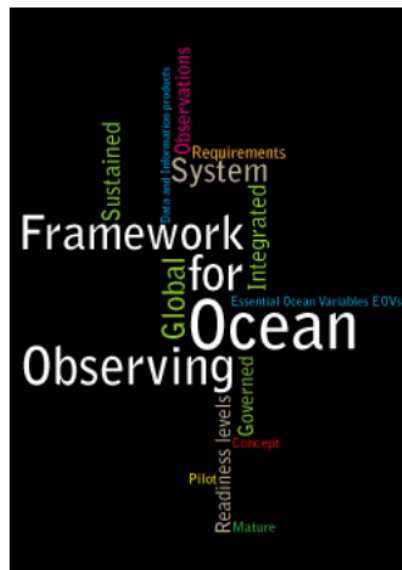
doi:10.5270/OceanObs09-F00

### A Framework for Ocean Observing

The international sponsors of OceanObs'09, all with a stake in the development of the sustained ocean observing system, pledged at the conference to work together towards an integrated system. They decided to convene a limited-lifetime post-conference working group (the Integrated Framework for Sustained Ocean Observations task team) that, in broad consultation: *recommended a framework for moving global sustained ocean observations forward in the next decade, integrating feasible new biogeochemical, ecosystem, and physical observations while sustaining present observations, and considering how best to take advantage of existing structures.*

At the conference the international sponsors were joined in pledging to work together towards an integrated system by many regional and national organizations, among them the [sponsors of the OceanObs'09 conference](#).

### Framework for Ocean Observing final document



[Framework for Ocean Observing](#) » (pdf, 3 MB)

The new [Global Ocean Observing System](#) Steering Committee (GOOS SC) is using the Framework as the guiding document for its work with partners.

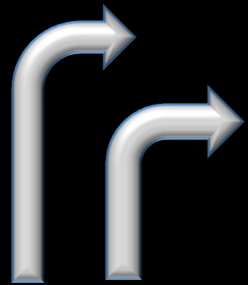


# Framework for Ocean Observing

## Example of use: TPOS-2020

### Issues

Fit for purpose?  
Evaluation Feedback



**Requirements Setting**  
What to Measure  
Essential Ocean Variables



**Issue Impact**

**Data Products Creation**

**Data Assembly**



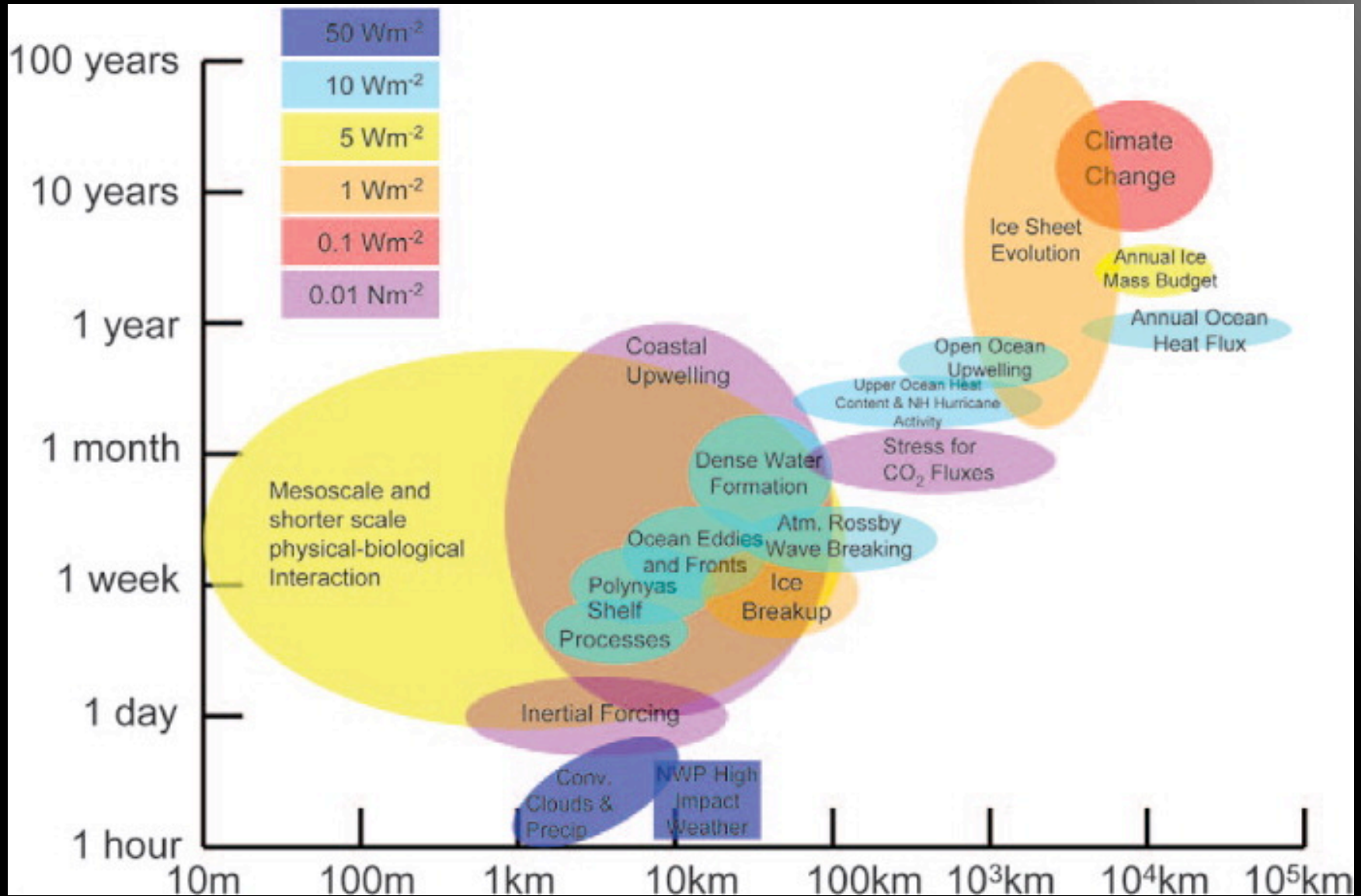
# Essential Ocean Variables

CONCEPT PILOT MATURE

Physics	Biogeochemistry	Biology & Ecosystem
Sea state	Oxygen	Phytoplankton biomass & diversity
Ocean surface stress	Nutrients	Zooplankton biomass & diversity
Sea ice	Inorganic carbon	Fish abundance & distribution
Sea surface height	Transient tracers	Marine turtles, birds, mammals abundance & diversity
Sea surface temperature	Particulate matter	Live coral
Subsurface temperature	Nitrous oxide	Seagrass cover
Surface currents	Stable carbon isotopes	Macroalgal canopy
Subsurface currents	Dissolved organic carbon	Mangrove cover
Sea surface salinity	Ocean colour	Microbe biomass & diversity (emerging)
Subsurface salinity		Benthic invertebrate abundance & distribution (emerging)
Ocean surface heat flux		

# Essential Ocean Variables

## Surface Fluxes



GOOS separation of responsibility for disciplines (ocean variables)

**Physics**      **Biogeochemistry**      **Biology**

**GOOS Application Areas**

**Climate**

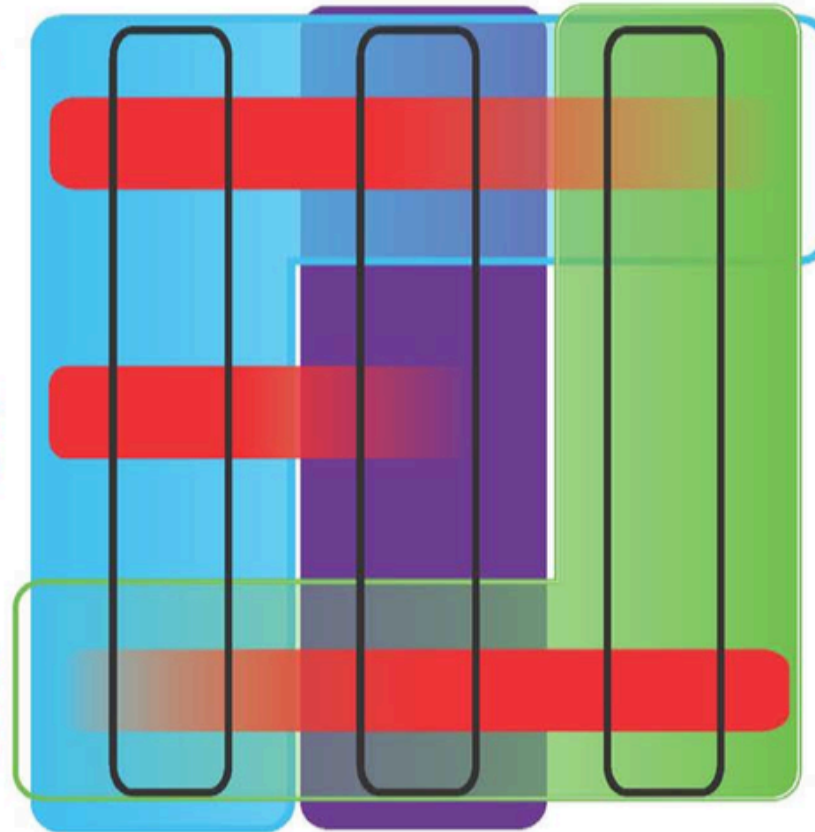
(through **GCOS** for IPCC, UNFCCC, GFCS and national monitoring, mitigation, adaptation)

**Real-time Services**

(through JCOMM services, GODAE OV to specific benefit areas)

**Ocean Health**

(with GEO BON and others for IPBES, WOA, CBD, and national applications)



Strength of disciplinary contribution to application area

**GCOS-GOOS-WCRP**

**OOPC:** Panel for Physics variables, and Climate Theme Lead  
RT Services Theme Lead.  
Ocean Health Theme Support

**GOOS Biogeochemistry:** Panel for Biogeochemical Variables and Climate Theme Support  
Ocean Health Theme Support

**GOOS Biology:** Panel for Biology Variables, and Ocean Health Theme Lead  
Climate Theme Support





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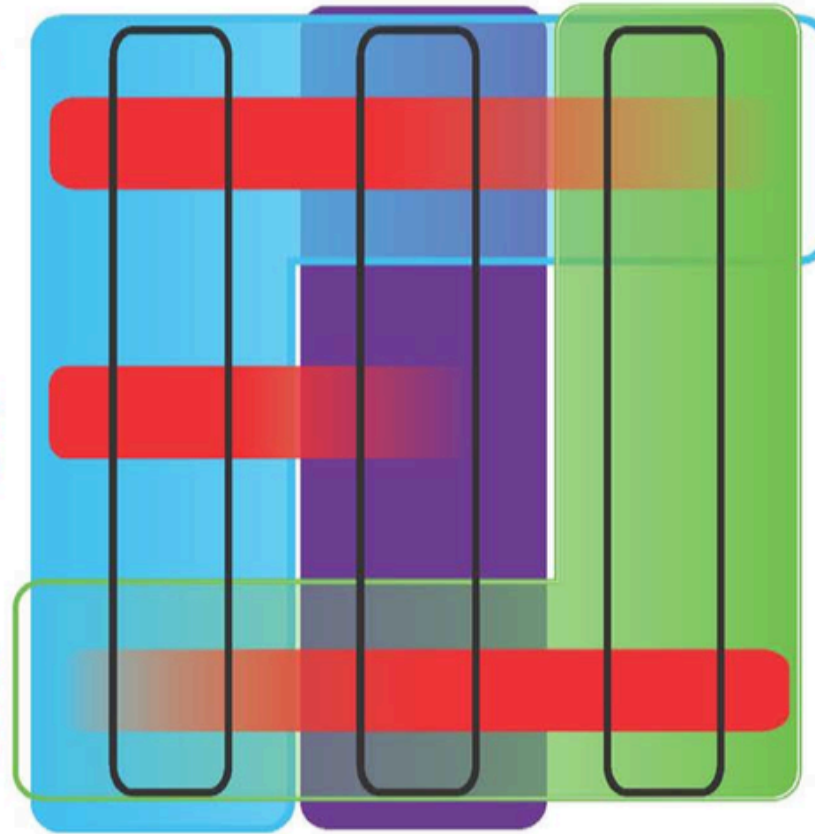
**GOOS Application Areas**

**Climate**

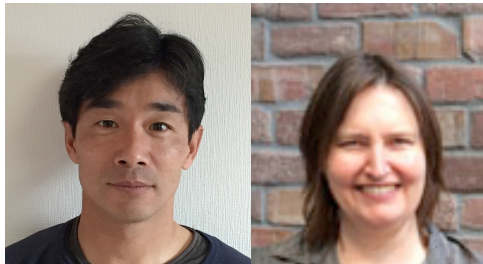
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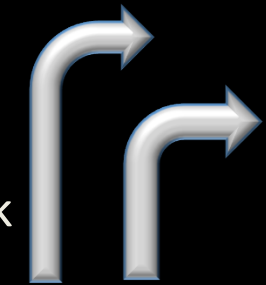


# Framework for Ocean Observing

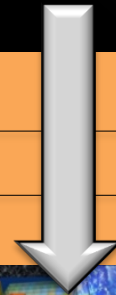
**Process Studies → Pilot Studies → Sustained Observing**

## Issues

Fit for purpose?  
Evaluation Feedback



**Requirements Setting**  
What to Measure  
Essential Ocean Variables



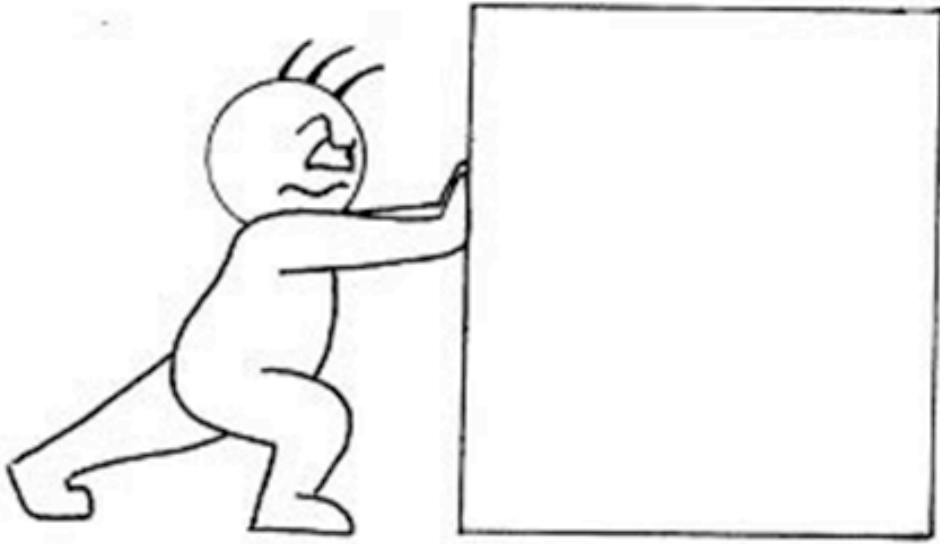
**Issue Impact**

**Data Products Creation**

**Data Assembly**



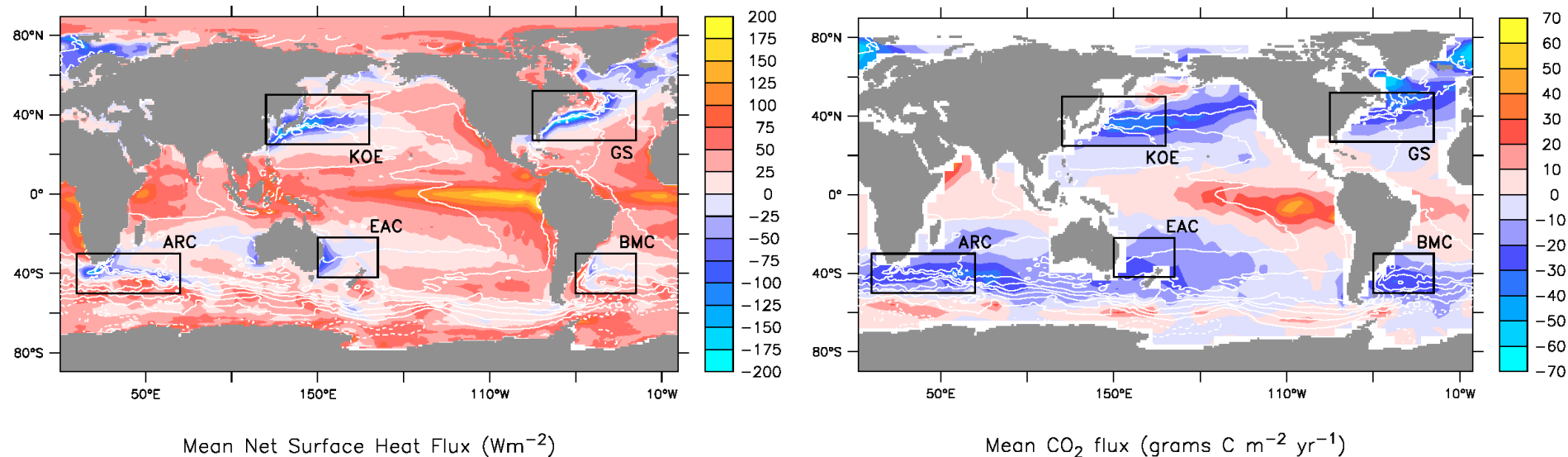
# Big ideas need to be both Pushed & Pulled



# Breakout Group Questions

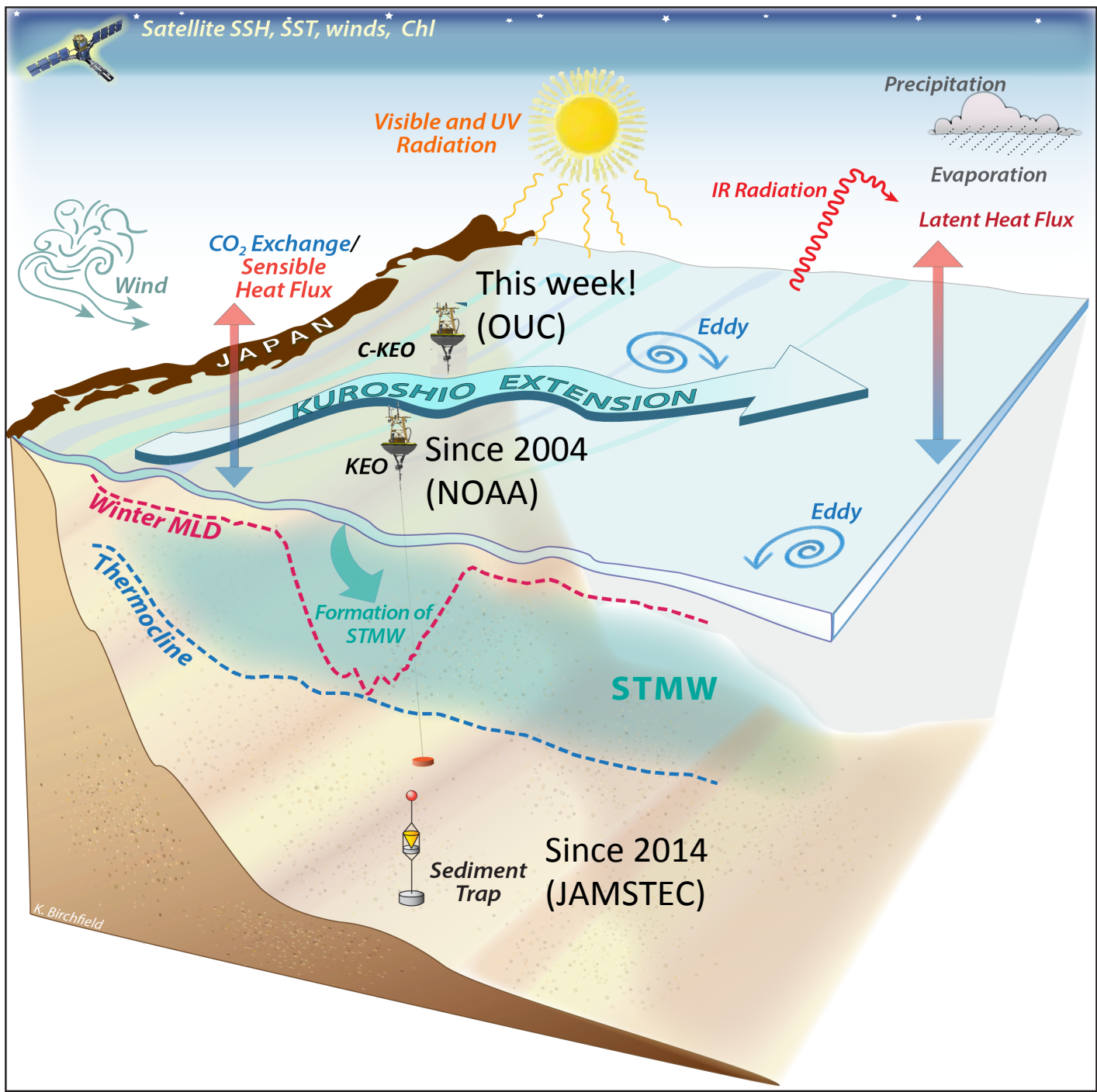
- What is the state of our mechanistic understanding, what remains to be studied, and how best can we use observations and models to make progress (specific recommendations welcome)?
  - WBC biogeochemical cycling and carbon export
  - WBC physics
  - WBC physical-biogeochemical interactions
- What are the Essential Ocean Variable requirements for WBCs and how are these being met by the present observing system? What are recommendations for sustained and limited lifetime observations in WBC regions (recommendations for OceanObs19)?

## Monitoring ocean-atmosphere interactions in western boundary current extensions, OceanObs'09 Community White Paper by *Cronin, Bond, Booth, Ichikawa, Joyce, Kelly, Kubota, Qiu, Reason, Rouault, Sabine, Saino, Small, Suga, Talley, Thompson, Weller*



**Provided recommendations for satellite, OceanSITE moorings, Argo, underway VOS, & repeat sections in WBCE.**

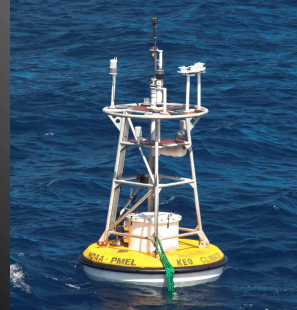
**The biogeochemical and physical observing systems should be coordinated to serve the broad community!**



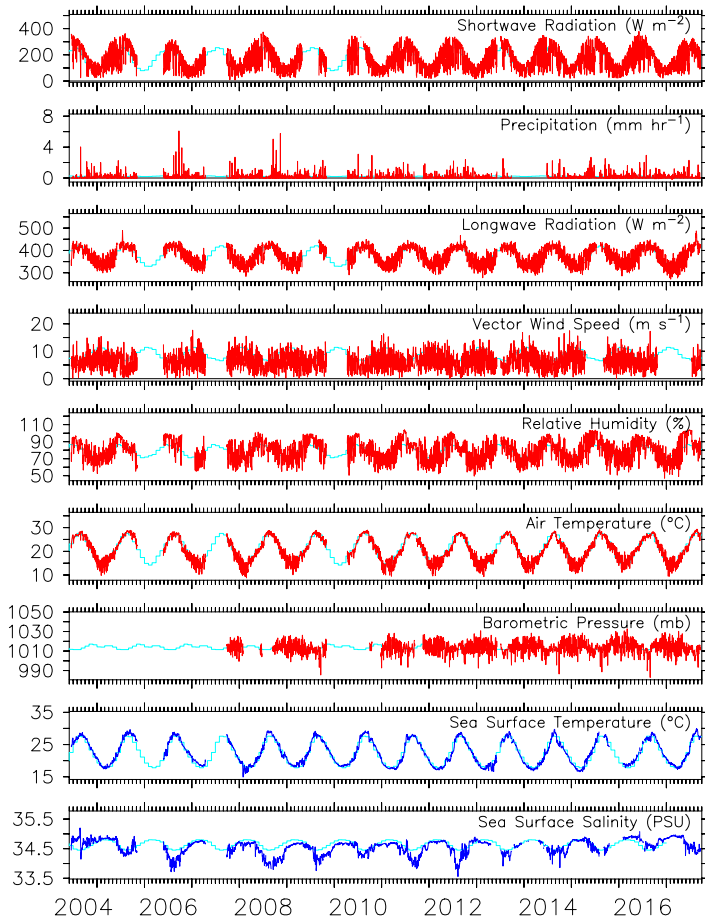


# KEO Data Display and Delivery

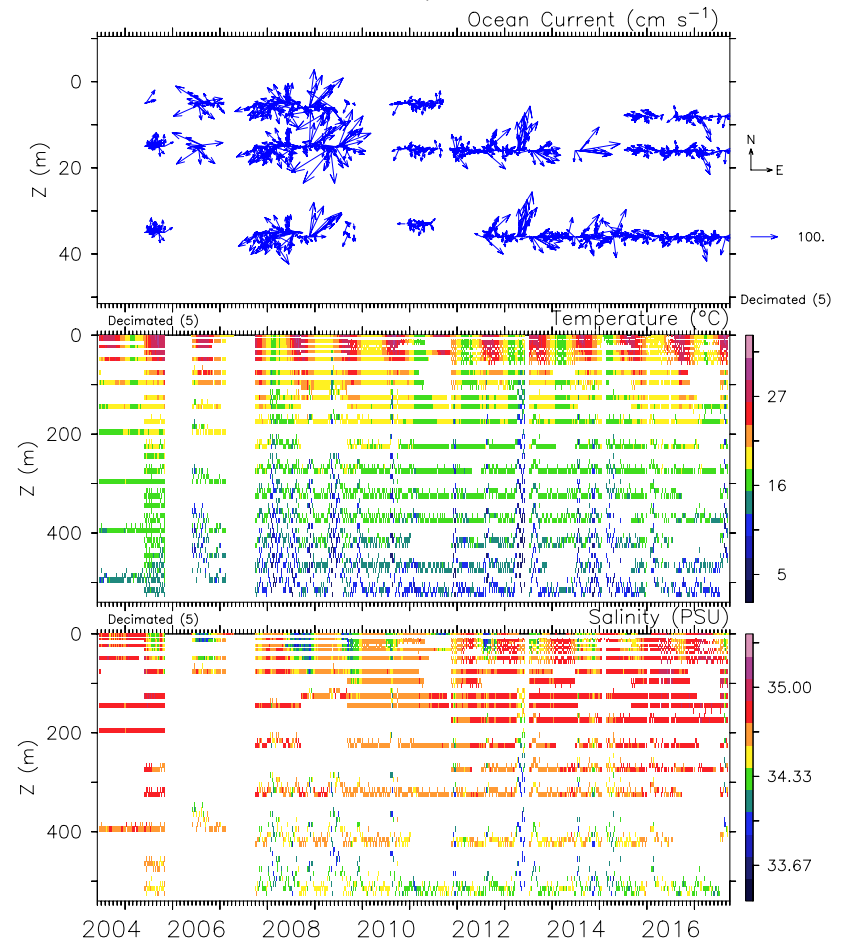
<http://www.pmel.noaa.gov/ocs/data/disdell/>  
Provides the “best available” data for selected period



KEO Daily Data



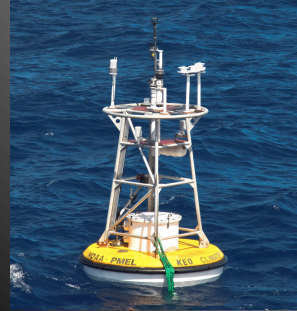
KEO Daily Data



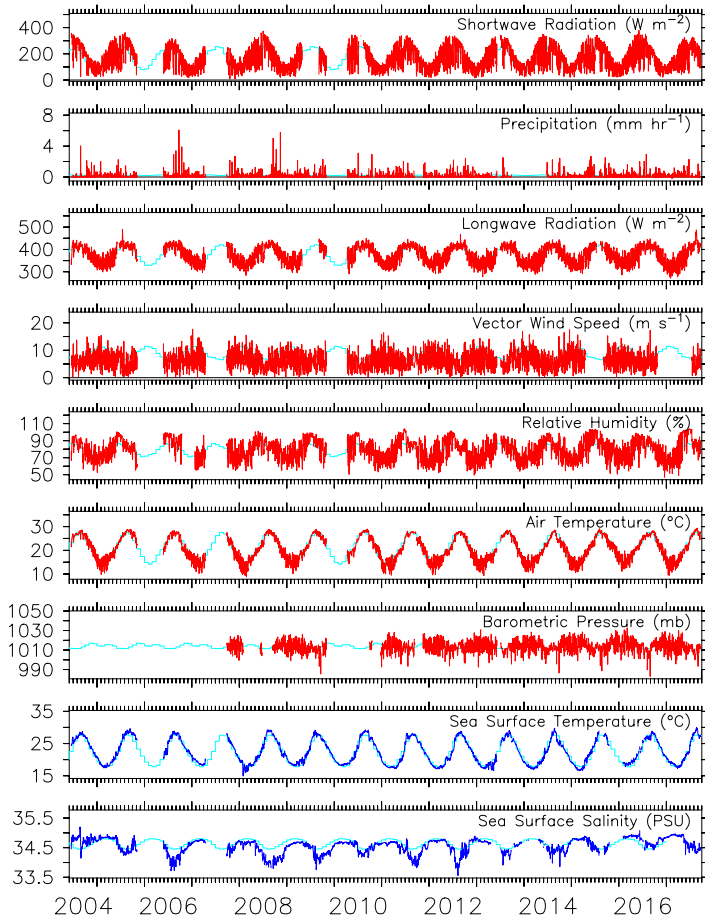
# KEO Flux Data Display and Delivery

<http://www.pmel.noaa.gov/ocs/data/fluxdisdel/>

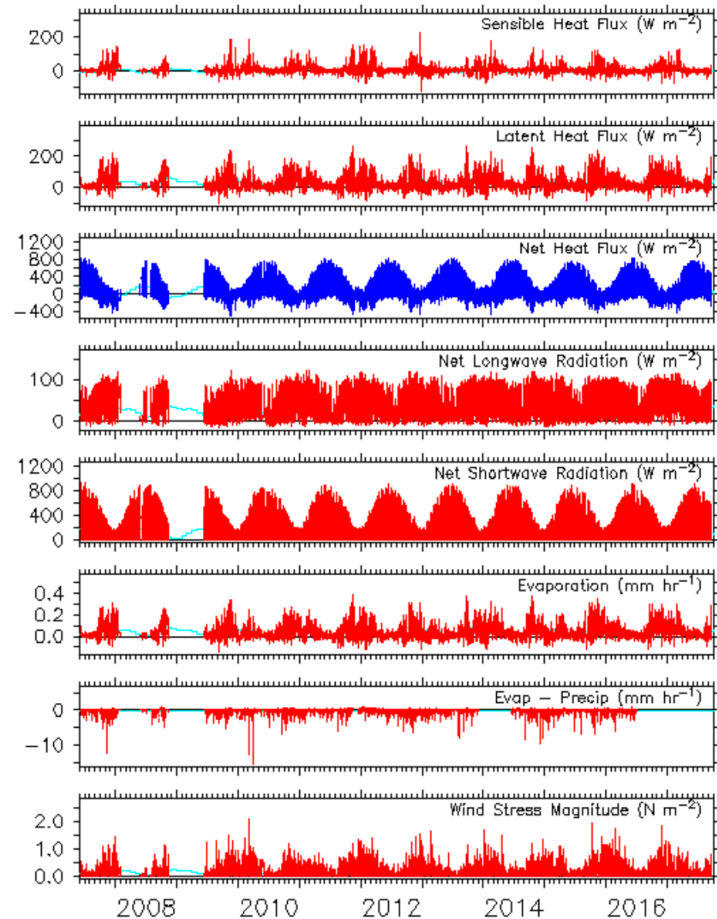
## Turbulent fluxes computed with COARE v3.0 algorithm



KEO Daily Data

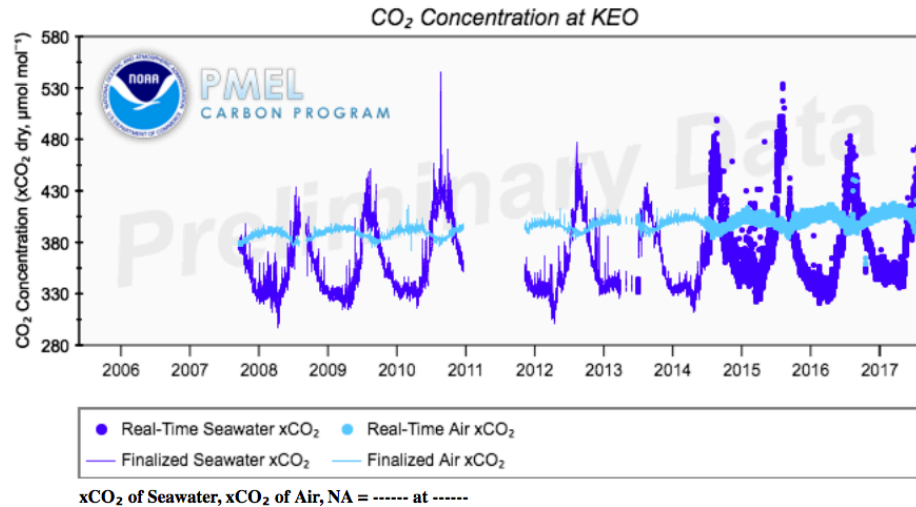
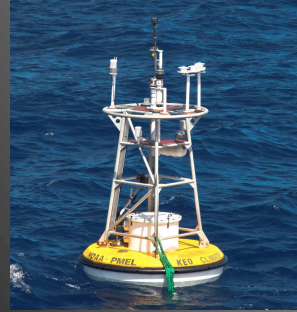


Papa Hourly Data

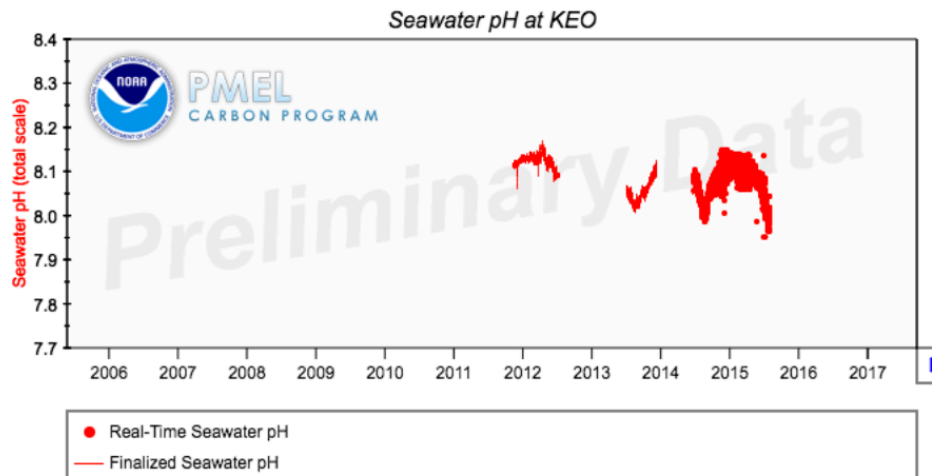


# KEO Carbon Data

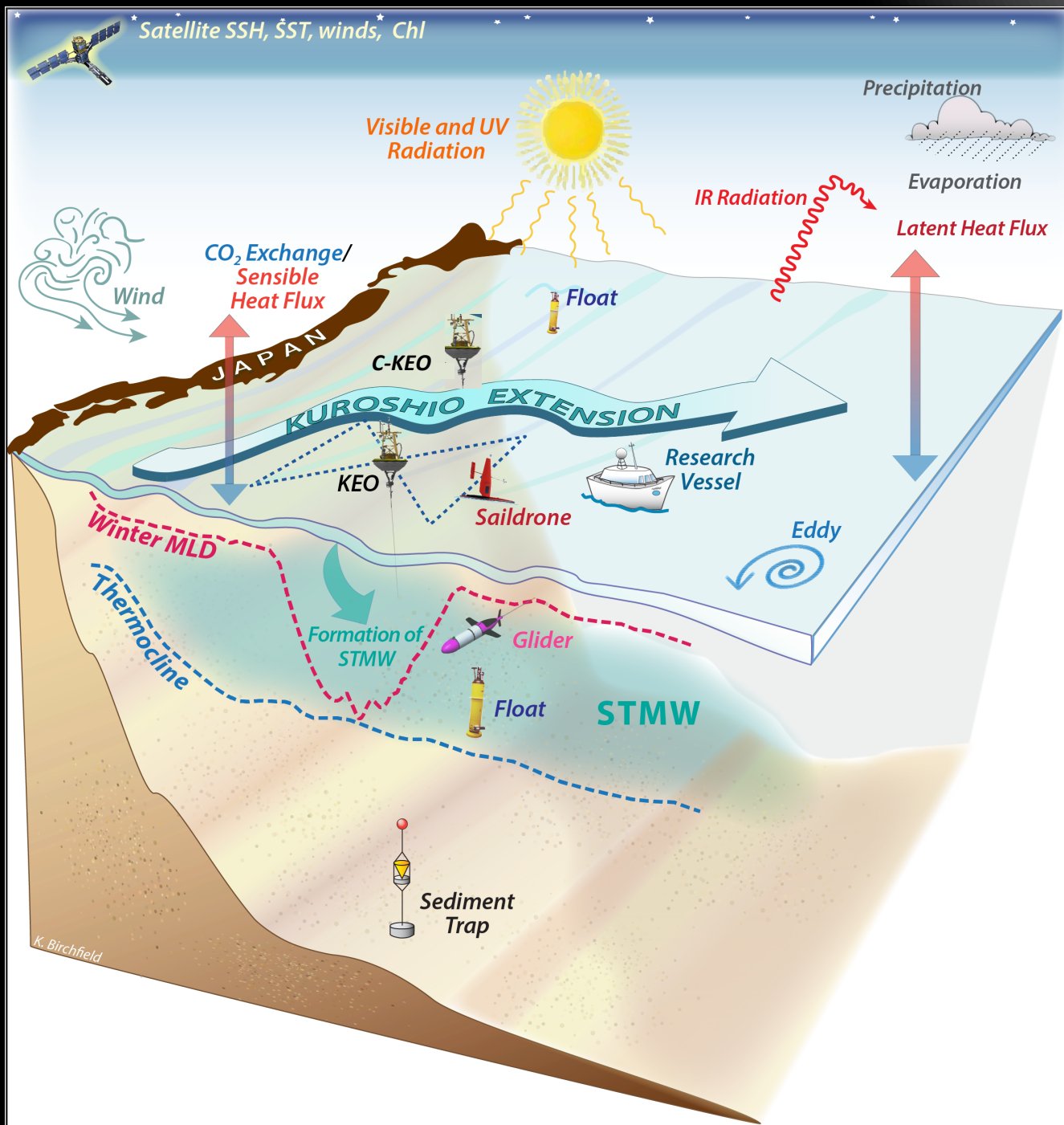
<http://www.pmel.noaa.gov/co2/story/KEO>



One Week One Month One Year Full Record



One Week One Month One Year Full Record





[www.saildrone.com](http://www.saildrone.com)





# What are going to be the Big Ideas for OceanObs'19?

- Call for Abstracts “shortly”
- Will invite papers after abstracts reviewed
- Ocean Sciences Town Hall Meeting
- Will likely encourage peer-reviewed papers

September 16-20, 2019

[www.oceanobs19.net](http://www.oceanobs19.net)

