JP Balmonte, UNC Chapel Hill
balmonte@unc.edu

Key words: extracellular enzymes, bacterial communities, Arctic Ocean

1. Which extracellular enzymes relevant to polysaccharide and peptide hydrolysis are active in the Arctic?
   - How does this vary with site and depth?
   - Bulk seawater and particle-associated bacterial communities?
2. Do differences in substrate hydrolysis patterns parallel variations in bacterial community composition?
   - Or functional redundancy – same functional capability (ie. same substrate hydrolysis patterns) but with different bacterial community structure?

*What are the controls of extracellular enzymatic activity: bacterial community composition, differential gene expression, both? Environmental conditions, temp, productivity, phytoplankton community structure?***

*****please visit my poster (plenty of good information and pretty colors)*

JP Balmonte, UNC Chapel Hill
balmonte@unc.edu

Key words: education, digestibility diverse audience

1. How do we best teach oceanographic concepts so that they are digestible to a diverse (most broadly defined) audience?
2. What is the perfect balance between lectures, hands-on activities, solitary vs. group assignments?
3. Can a FLIPped classroom setting be effective for marine sciences/oceanography courses?
4. How do we get the [insert audience here] to appreciate the fine work and global importance of bacteria?
5. What are ways in which we can engage the public in marine science/oceanographic research?

Sarah Bercovici

Advisor: Dennis Hansell

- Graduate research interests:
  - Biogeochemistry of Antarctic shelf systems (Ross Sea)
  - Impact of water mass mixing on biogeochemistry
  - Molecular and isotopic signatures of refractory dissolved organic matter

Poster session: Advances in our Understanding of the Role of Sea Ice in the Global Carbon Cycle

Biogeochemical modifications of water masses on the Ross Sea Shelf

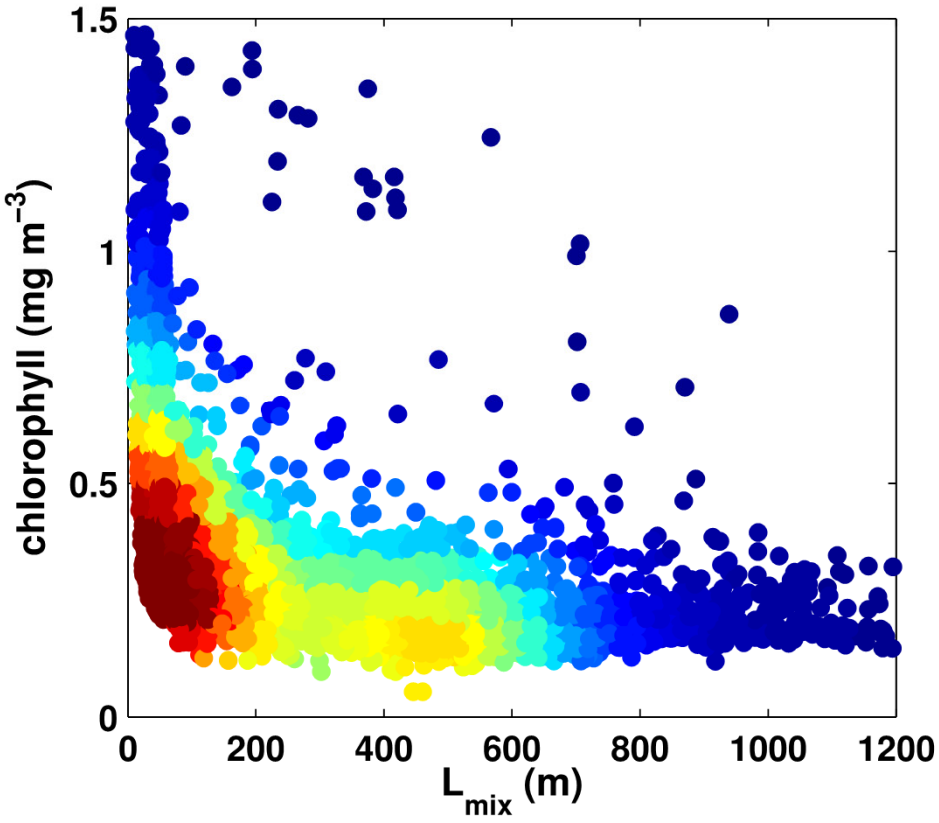
Sarah Brody, Duke University

- Research topic: determining the upper ocean physics controlling the timing of the subpolar spring phytoplankton bloom

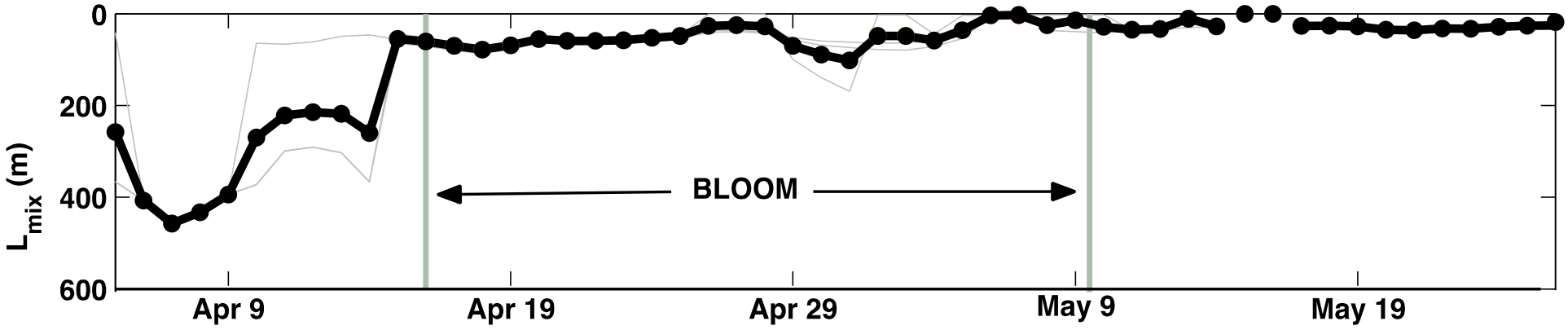
- Theory: decreases in the depth of active mixing, driven by a shift from buoyancy-driven to wind-driven turbulence, drive the spring bloom

- This presentation: an examination of this theory at large and small scales

Large scales (subpolar N. Atlantic basin; satellite data)



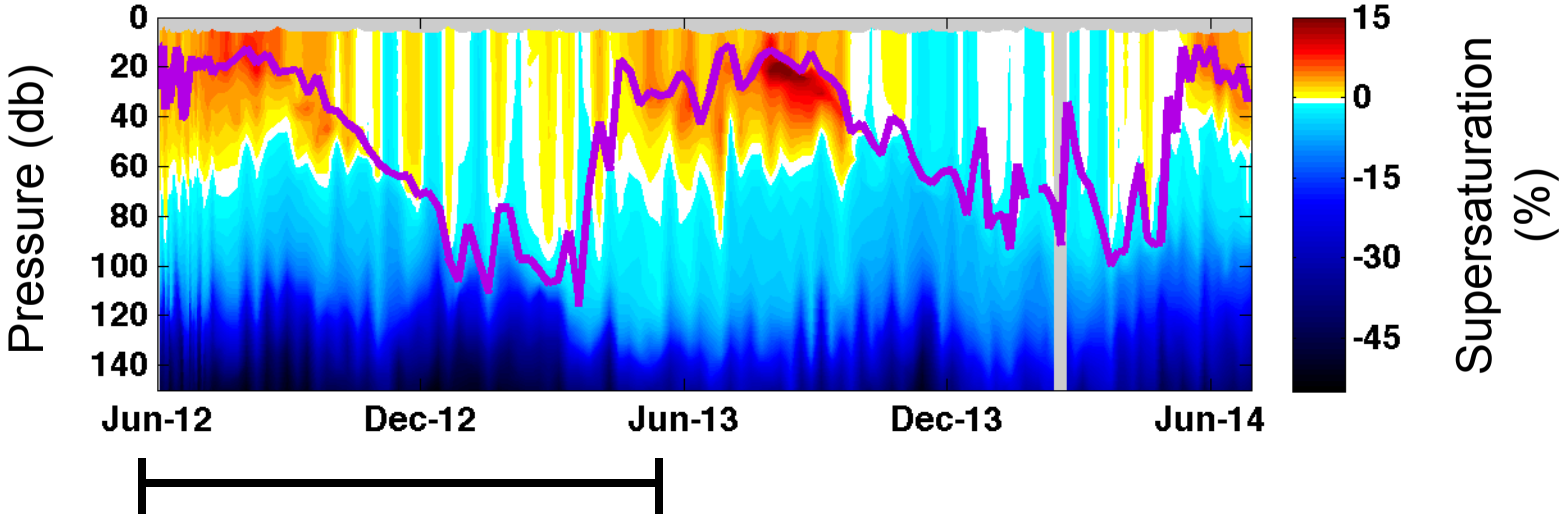
Small scales (North Atlantic Bloom 2008 Experiment, *in situ* data)



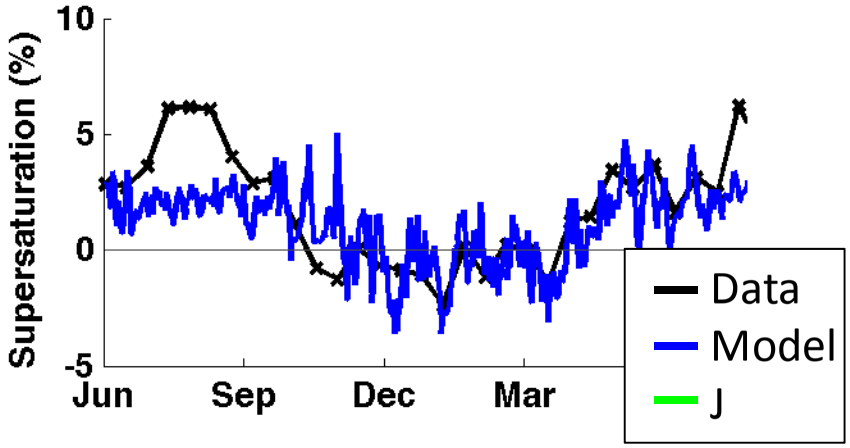
Annual Net Community Production from Self-Calibrating Argo Oxygen floats in the North Pacific

Seth Bushinsky
University of Washington
Adviser: Steven Emerson

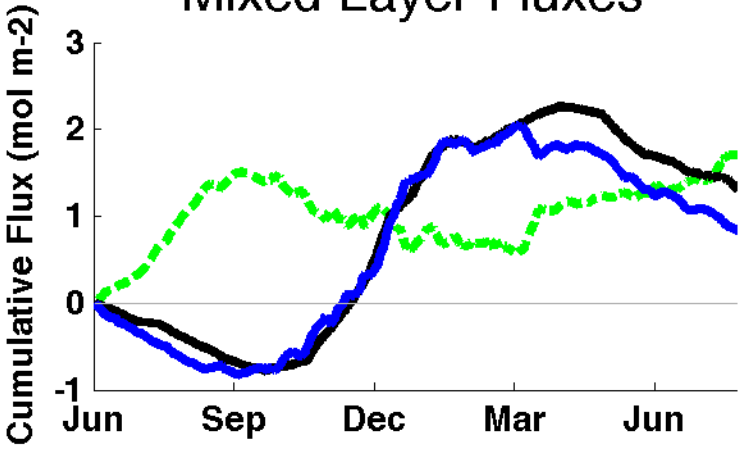
Calibrated Argo oxygen data: Ocean Station Papa



Mixed Layer Supersaturation

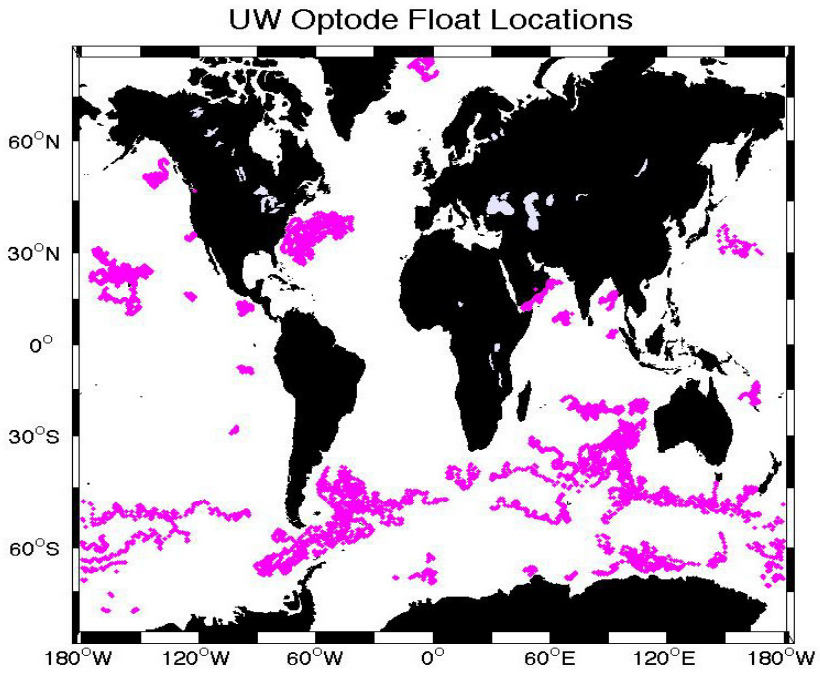


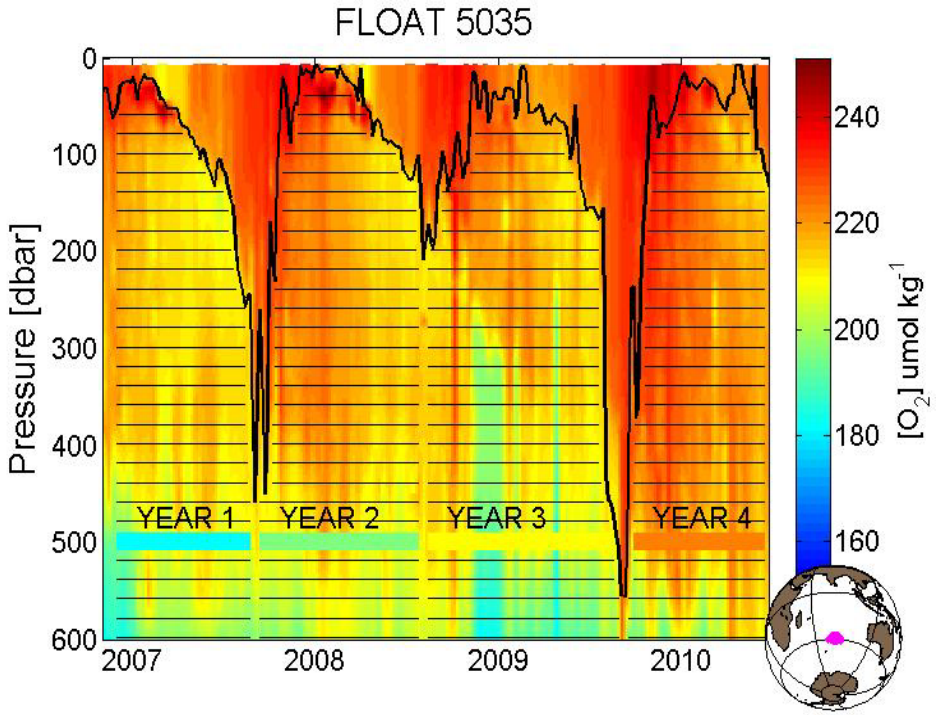
Mixed Layer Fluxes



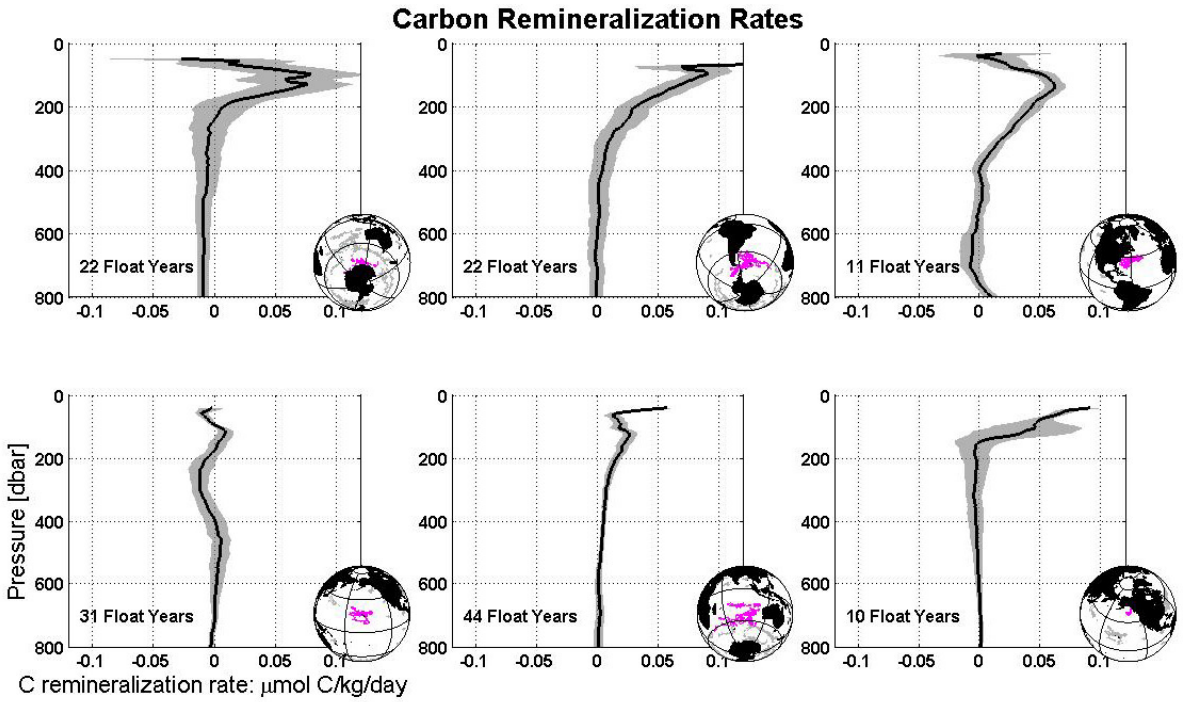
Observations of Net Community Production by Argo Floats

Tyler D. Hennon
University of Washington

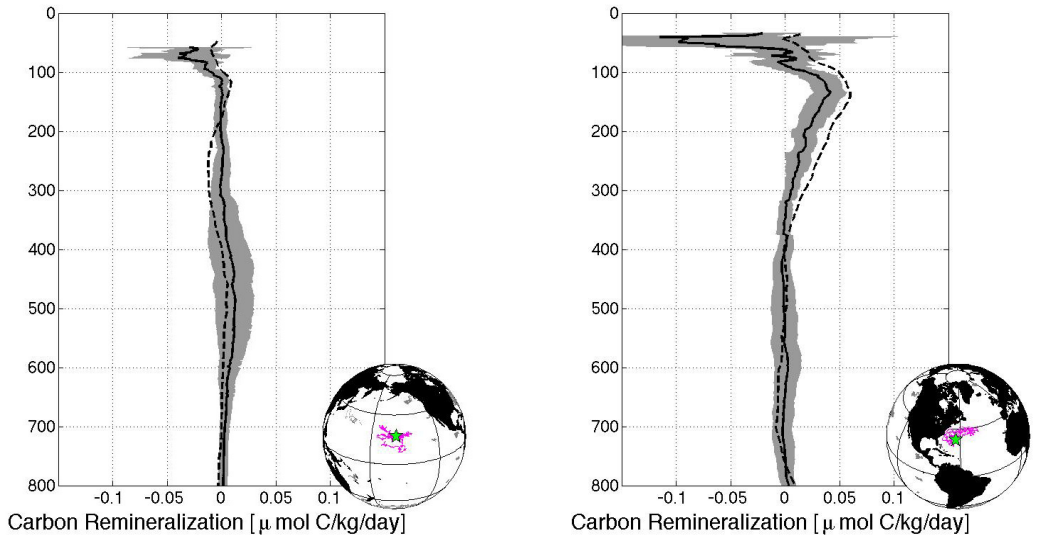




Optode floats are used to estimate NCP and carbon remineralization for different regions.



HOT and BATS data corroborate estimates from Argo floats.



UNIVERSITY OF MIAMI

Meredith Jennings

Advisor: Dennis Hansell

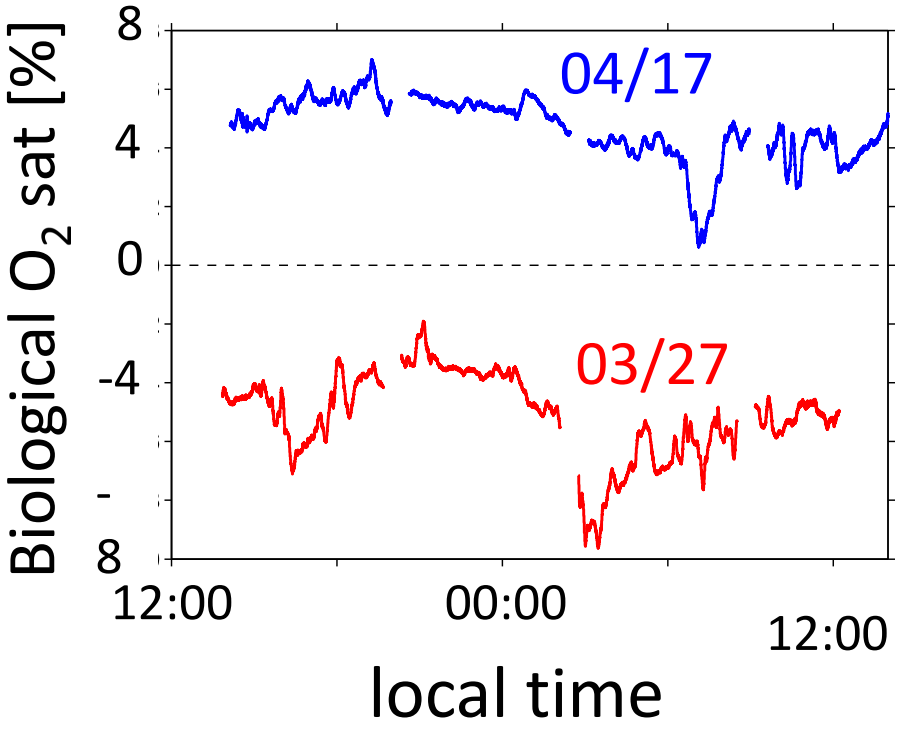
RSMAS — Rosenstiel School of Marine and Atmospheric Science · University of Miami

Research Interests:

- Marine biogeochemistry of DOC and nutrients
- Marine polymer gel dynamics
- Role of microgels and TEP in carbon cycle
- Organic enrichment in sea surface microlayer and marine aerosols

- **Poster Title:** Distribution of Transparent Exopolymer Particles Across an Organic Carbon Gradient from a North Atlantic Bloom to the Sargasso Sea

Poster: Quantifying biological production during seasonal ice melt in the Bras d'Or Lakes, an inland sea in Nova Scotia, Canada



For one month, we collected measurements for quantifying

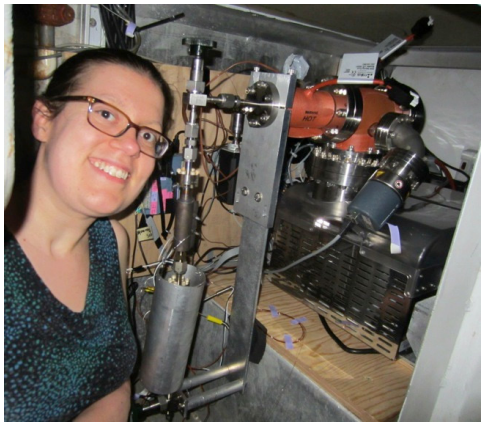
- **Net community production**
  via O_2/Ar (continuous)

- **Gross primary production**
  via triple oxygen isotopes (discrete)

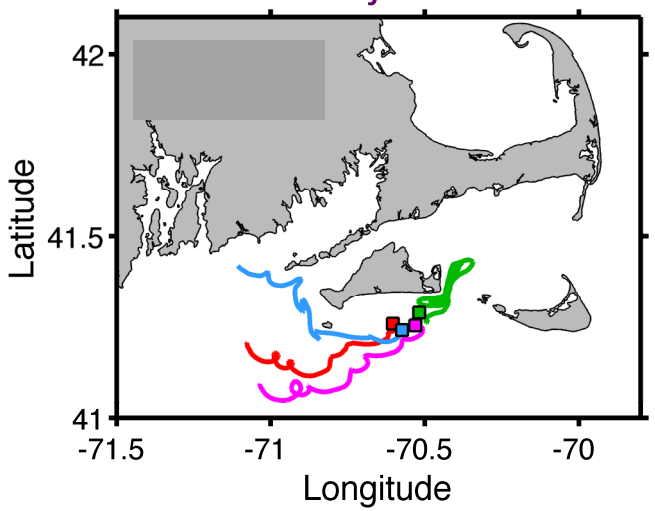
Cara Manning (MIT-WHOI) *cmanning@whoi.edu*
Advisors: Rachel Stanley and David (Roo) Nicholson

In progress: Parameterizing coastal air-sea gas exchange using an equilibrator inlet mass spectrometer for noble gases

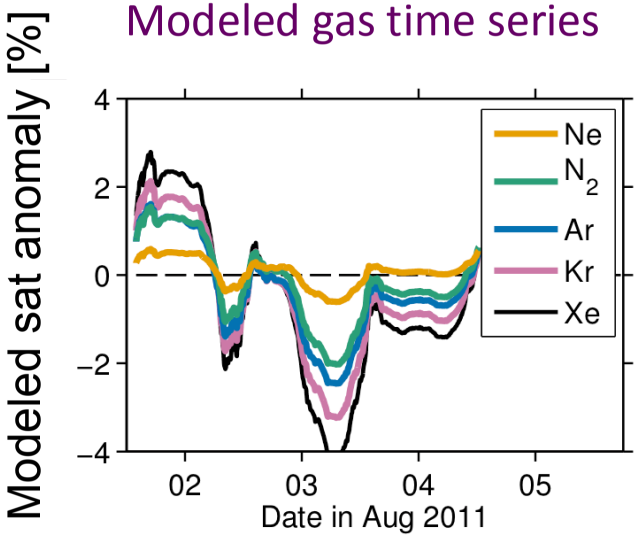
Instrument development



Drifter trajectories



Modeled gas time series

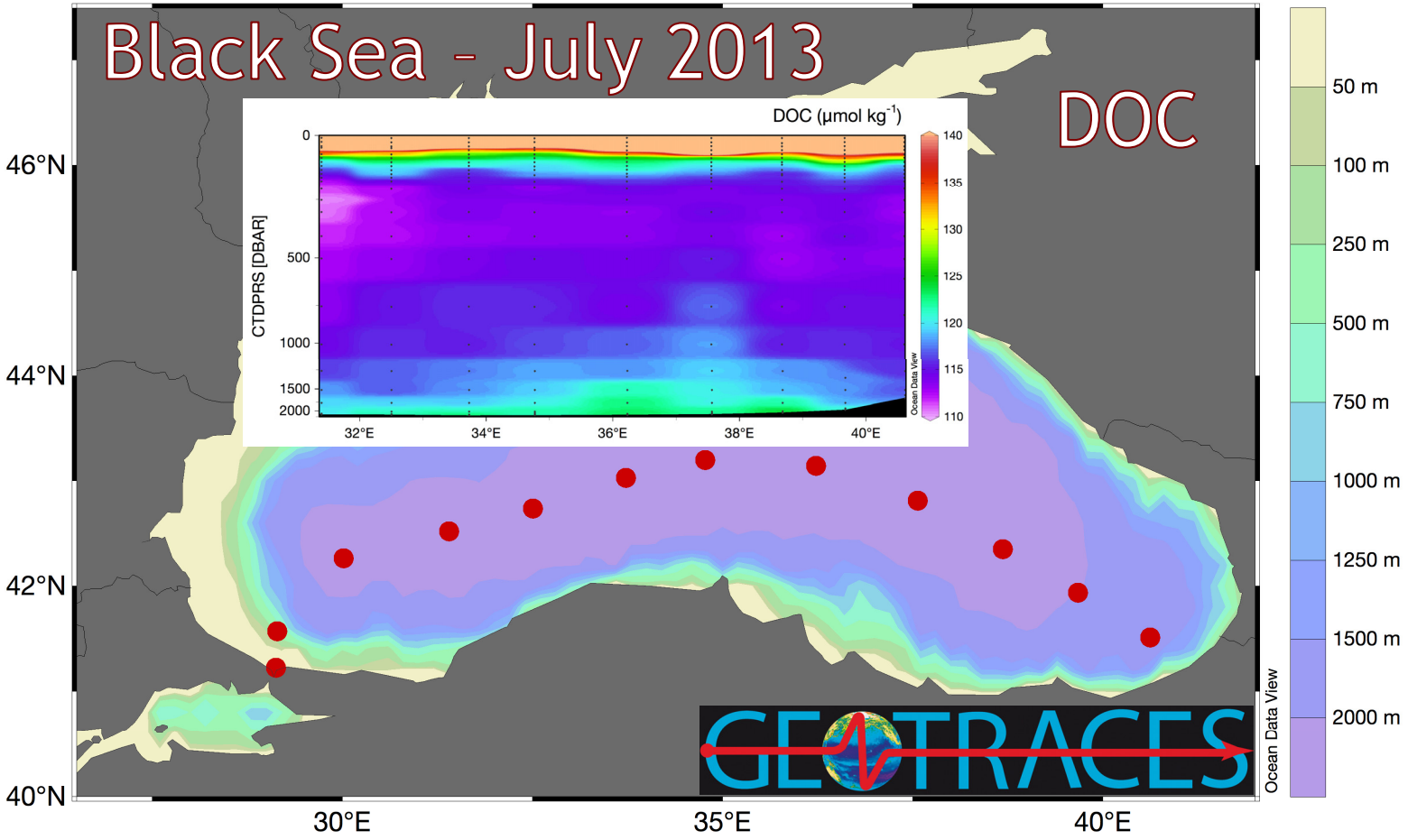


If you have ideas for other field or laboratory applications of this instrument, please contact me!

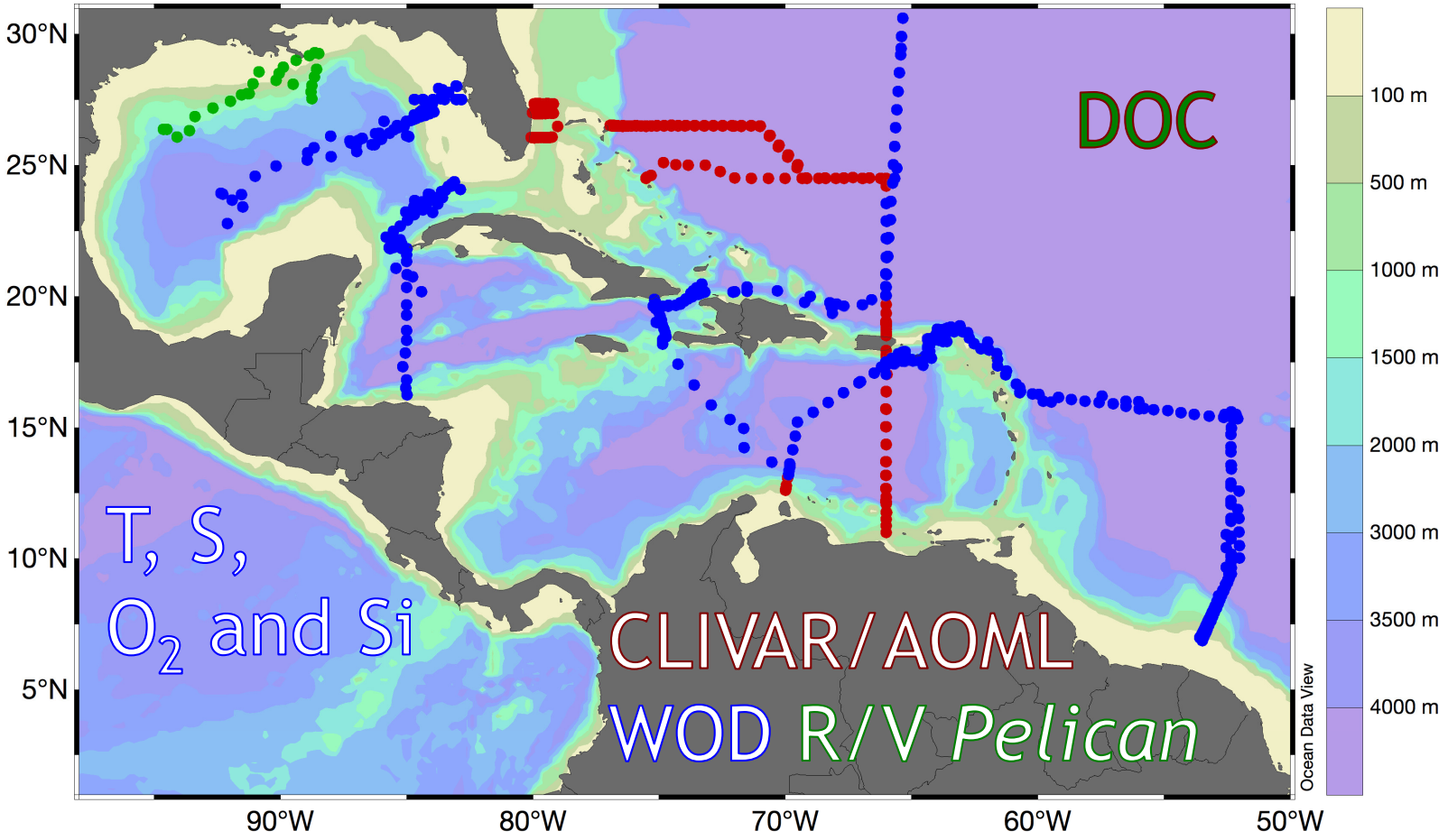
Cara Manning (MIT-WHOI) *cmanning@whoi.edu*
Advisors: Rachel Stanley and David (Roo) Nicholson

Marginal Sea Biogeochemistry

Andrew R. Margolin, Dennis A. Hansell
Rosenstiel School (RSMAS) – University of Miami, FL



Biogeochemistry of the Intra-Americas Seas



Modeling the impacts of organic macromolecules and chlorophyll on sea ice

Oluwaseun Ogunro[1], Oliver Wingenter[1,2], Scott Elliott[3]

[1]New Mexico Tech, [2]Geophysical Research Center, NMT, [3]Los Alamos National Laboratory

- Map areas of soot and biological absorption dominance
- Compare absorption by anthropogenic materials with that of natural pigments
- Then couple into a full radiation transfer scheme to attribute the various contributions to polar climate change amplification

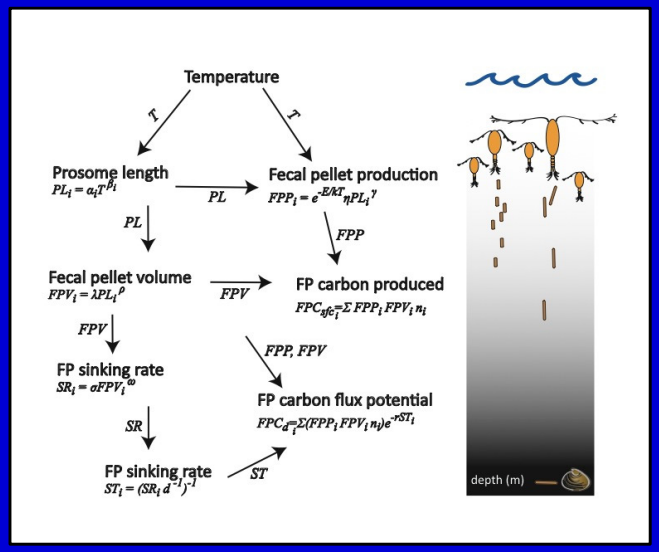
INTERESTS:

- Pelagic ecosystem ecology
- Trophic dynamics – top down and bottom up
- Drivers of ecosystem change
- The role of zooplankton in the Biological Carbon Pump (current dissertation research)

Field work and observation

Experimentation

Modeling

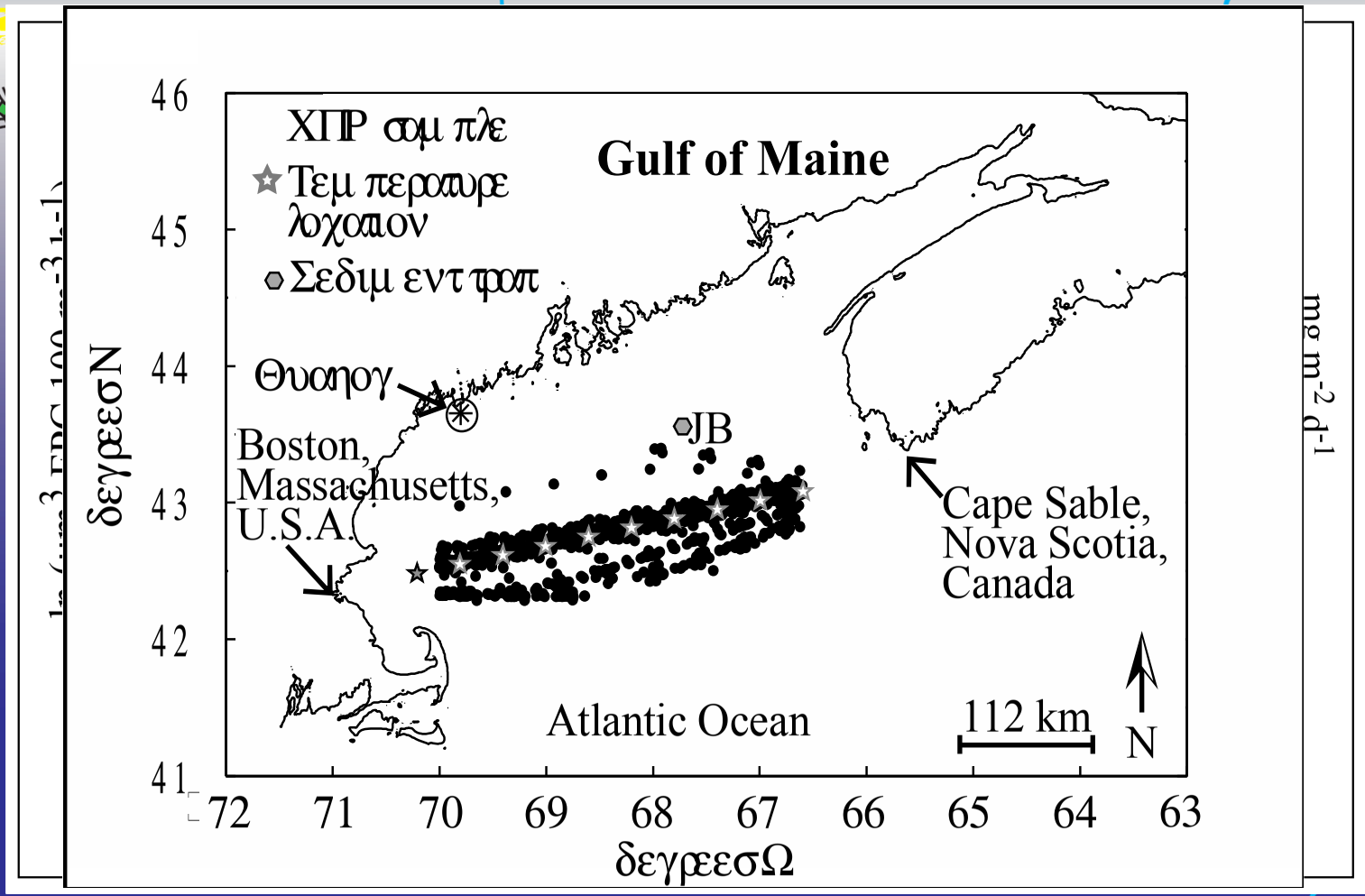


KAREN STAMIESZKIN

School of Marine Sciences, University of Maine

Contact: karen.stamieszkin@maine.edu

COPEPODS AND THE BIOLOGICAL CARBON PUMP



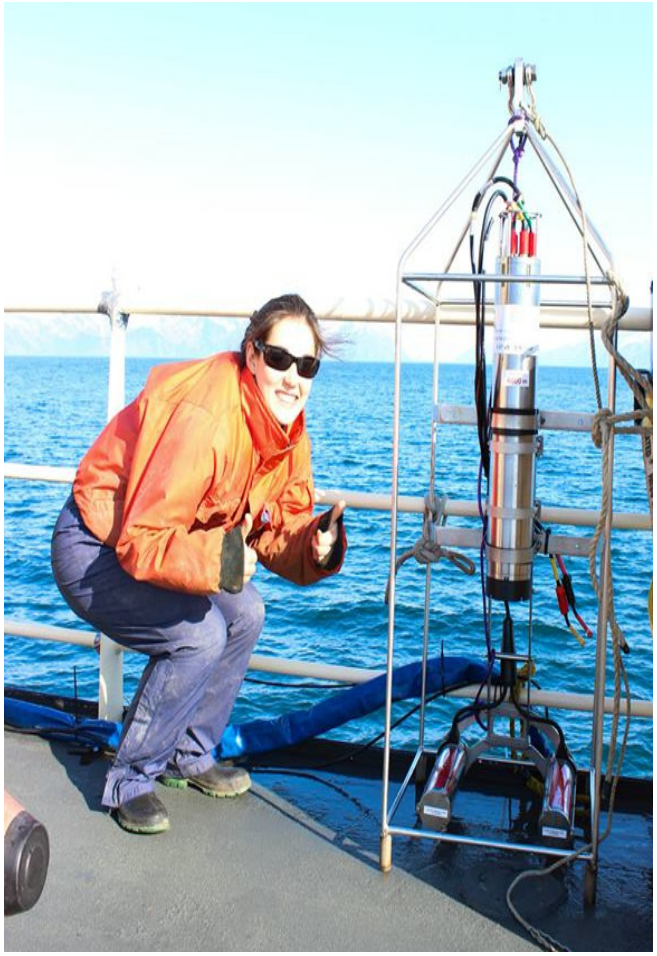
KAREN STAMIESZKIN
School of Marine Sciences, University of Maine
Contact: karen.stamieszkin@maine.edu

Jessie Turner

M.S. Student, School of Fisheries and Ocean Sciences,
University of Alaska Fairbanks

Research Interests:

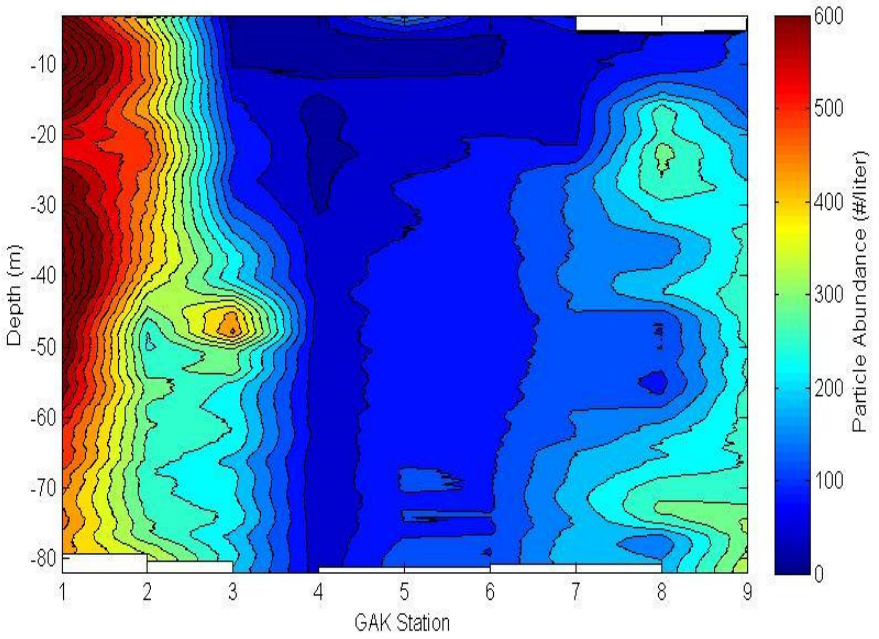
- Sinking particle fluxes in Alaskan waters
  - abundances
  - size distributions
  - relationships with chl *a* and zooplankton
- Underwater imaging technology
  - Underwater Vision Profiler
  - LISST devices

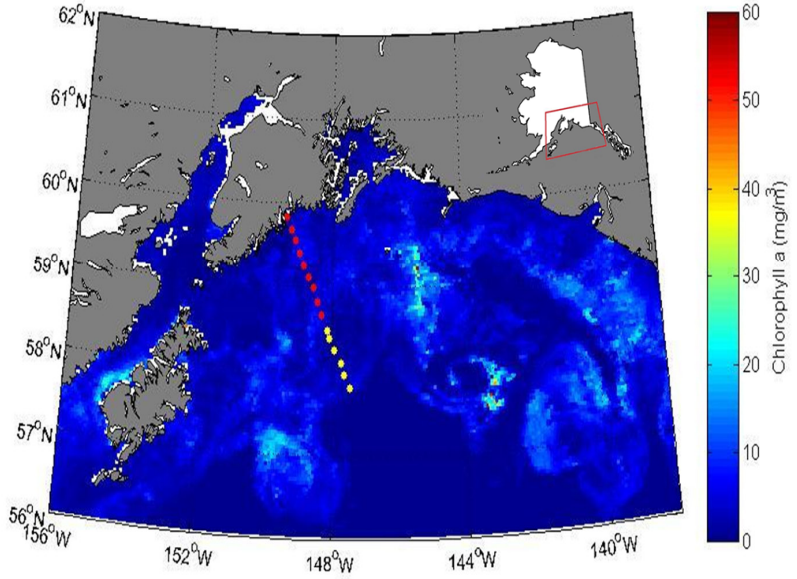


Particle abundances and chl *a* concentrations in the northern coastal Gulf of Alaska

- May 2014: 1 of 4 cruises
- Particle abundances did not resemble chl *a* or beam attenuation
- Future: UVP mounted on CTD rosette with LISST-deep

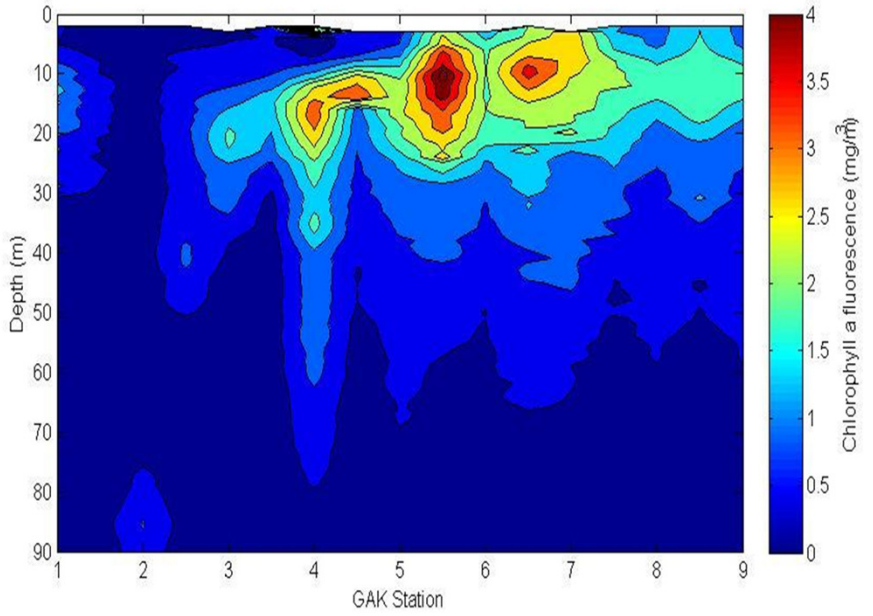
Particle Abundances





Seward Line Gulf of Alaska stations. Red: UVP was deployed

Chlorophyll *a* concentrations



About Weilei Wang-----?

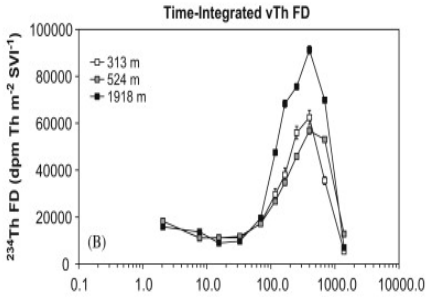
Work with Dr. Robert A. Armstrong at Stony Brook University

Research interest: I am interested in using mathematical models and radioactive tracers to find the mysteries of sinking particles in the ocean.

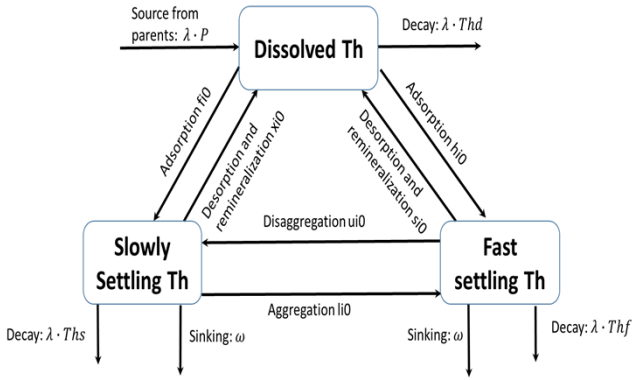
Expected graduation time: next spring

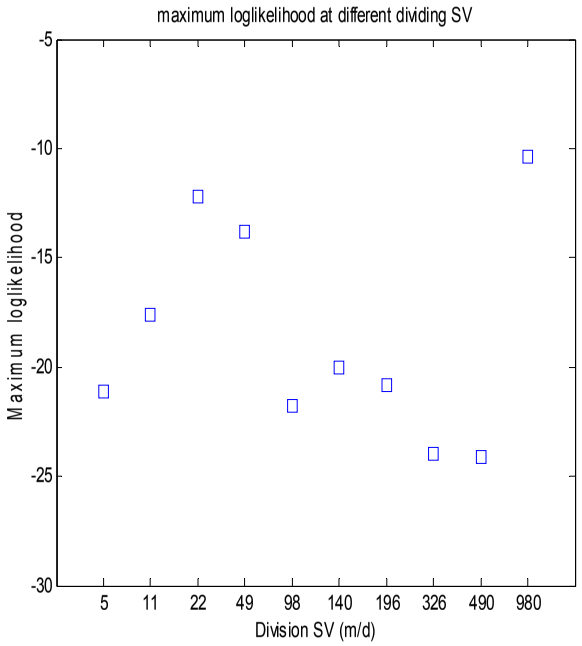
Research Highlight:

1). Using coupled thorium isotopes to investigate particles cycling



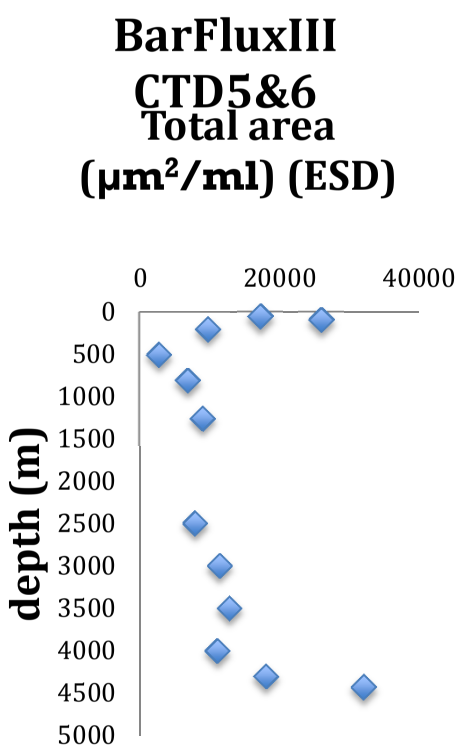
Time-integrated flux density versus depth (Szlosek et al., 2009)

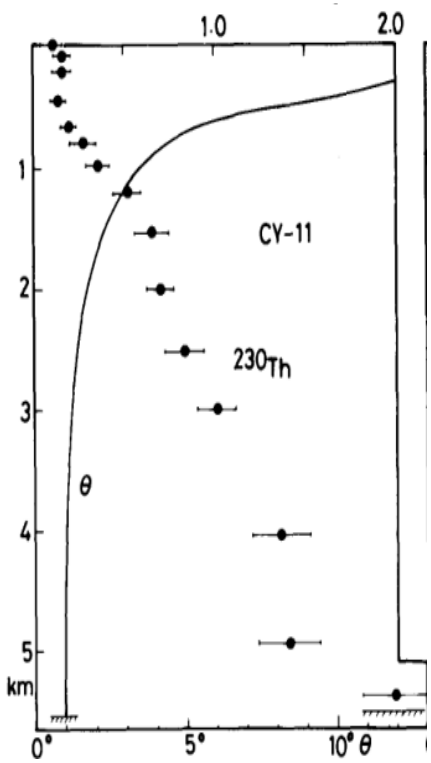




Maximum likelihood versus division settling velocity. The numbers on x axis mean the settling velocity where the particles should be split into slowly and fast sinking classes

2). Particle surface area and thorium adsorption rate.



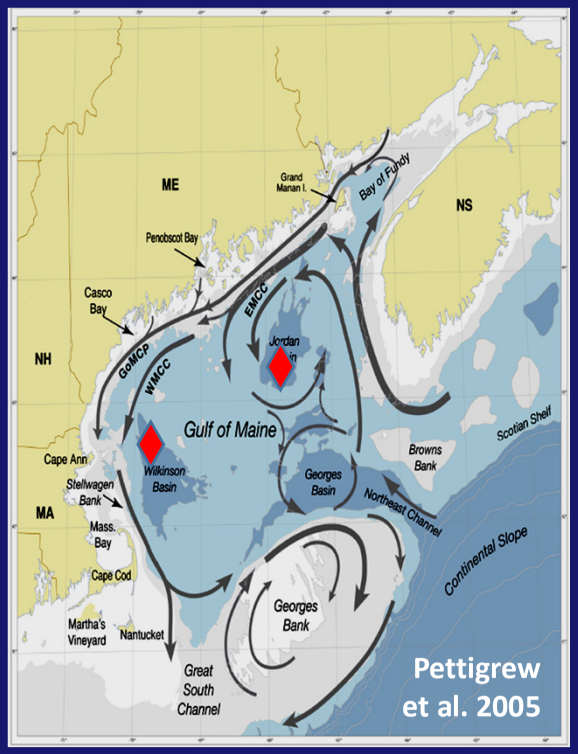


Particulate ^{230}Th depth profile (Bacon and Anderson, 1982)

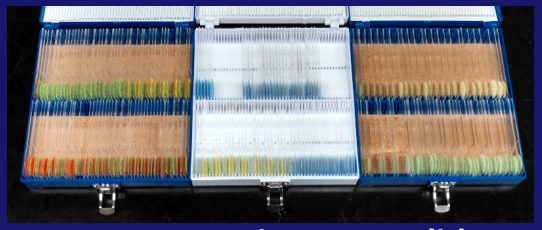
Diatom Flux and Deposition in the Gulf of Maine: Indicators of Seasonal to Decadal Environmental and Production Variability

Elissa Bond Ward

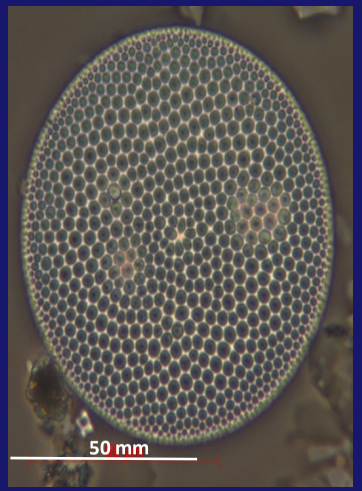
Overall Goal: To examine the relationship of seasonal to decadal diatom fluxes and burial as a proxy for time-varying primary production, hydrography, biogenic silica, and particulate organic carbon accumulation in the Gulf of Maine.



Red diamonds: Sampling sites in Wilkinson & Jordan Basins



Permanent microscope slides for light microscopy



Coscinodiscus radiatus

Funding: NOAA/ECOHAB: GOMTOX Program

Advisor

Dr. Cynthia Pilskaln, School for Marine Science and Technology (SMAST)

Committee members:

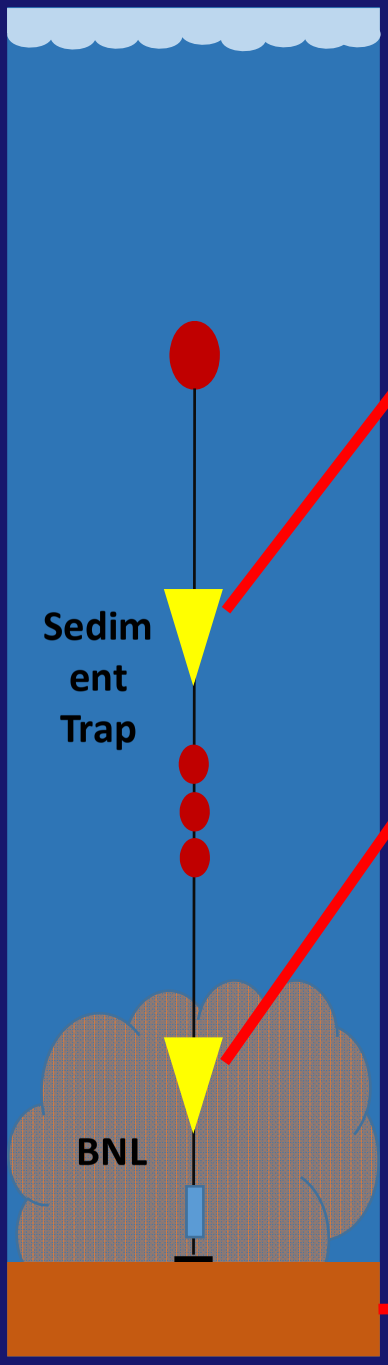
Dr. James Bisagni, School for Marine Science and Technology (SMAST)

Dr. Bethany Jenkins, University of Rhode Island

Experimental design and sampling elements

McLane Time-Series Sediment Traps : Subsurface/Bottom -mounted

Multi Corer



95 and 150 m time-series trap samples
-Well below euphotic zone at both sites

180 and 250 m time-series trap samples
-Within benthic nepheloid layer (BNL) at both sites & 20-30 m above bottom

Sediment Core Samples

Objectives:

I. Measure Seasonal Fluxes

- Particulate Organic Carbon
- Biogenic Silica
- Diatom species
- *Alexandrium* cysts

II. Quantify Recent Accumulation

- Particulate Organic Carbon
- Biogenic Silica
- Diatom species
- *Alexandrium* cysts

Emma Wear

PhD Candidate, Carlson lab, UC Santa Barbara

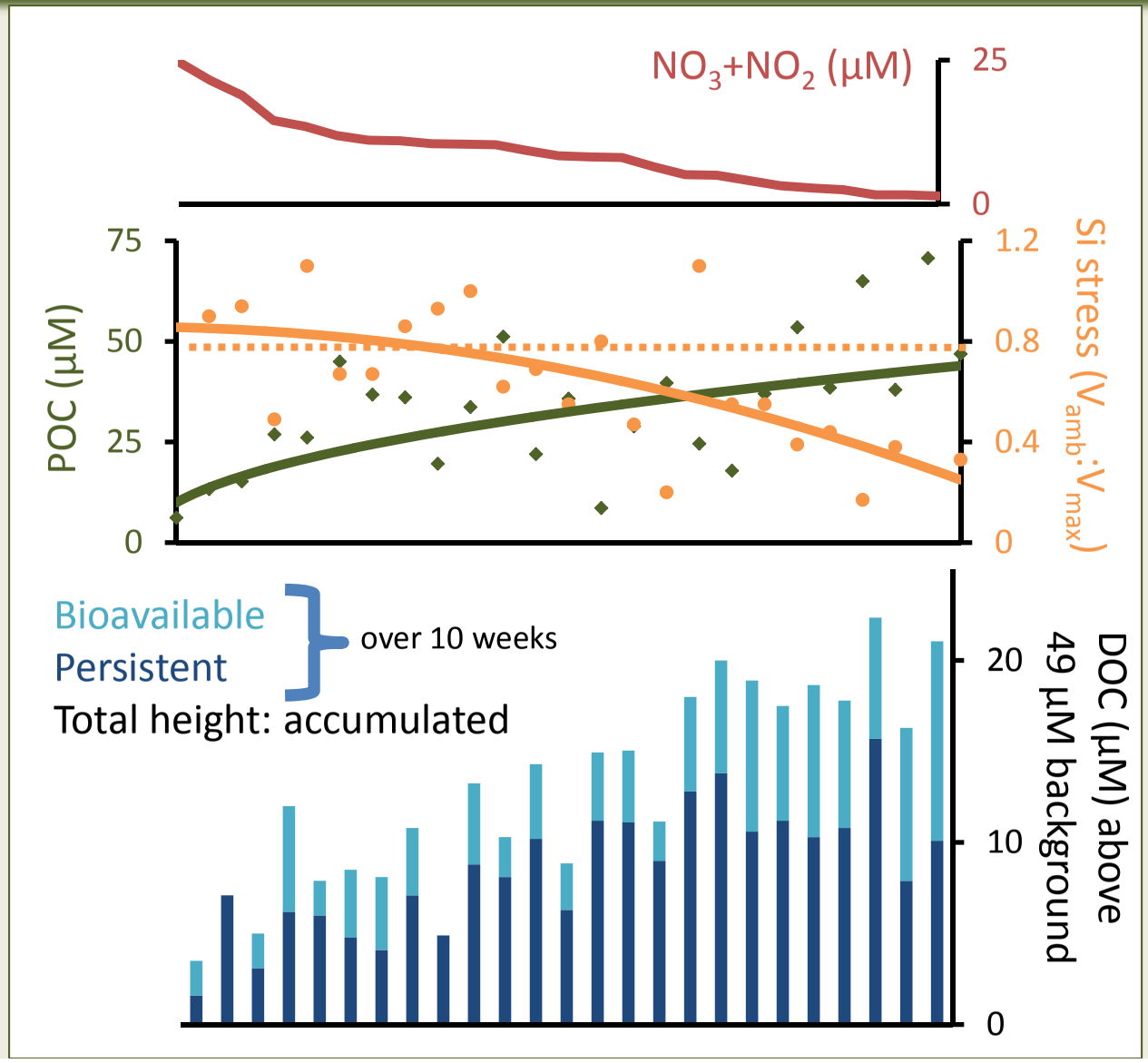
Research interests:

- How DOC source, composition, and processing affect its availability to bacterioplankton, vs. its persistence in the dissolved phase
- How DOC quality and composition in turn affect bacterial community composition

DOC bioavailability over phytoplankton bloom in the Santa Barbara Channel

- Sampled SBC, and set up 25 dilution bioassay experiments, over 5 days
- Covered recently upwelled water, healthy diatom and *Phaeocystis* bloom, and bloom under Si stress
- Both bioavailable and persistent DOC accumulated over the bloom

Wear et al., in review; see also Nelson & Wear *PNAS* 2014

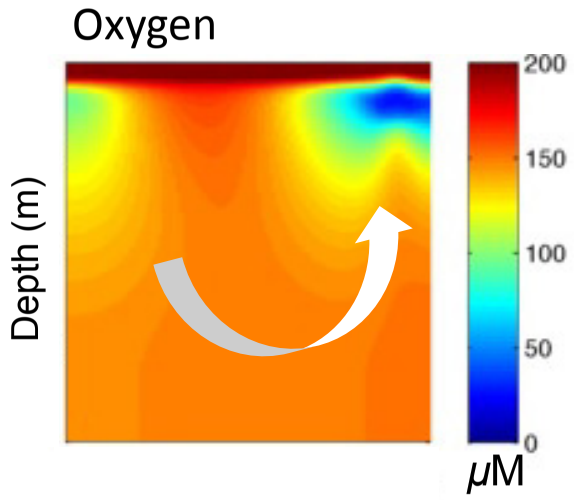


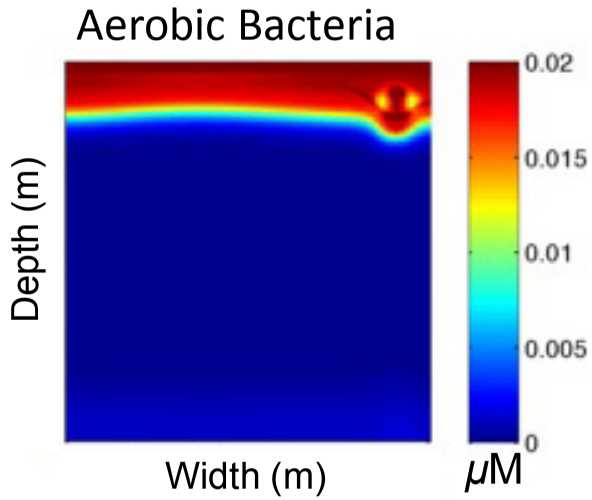
Linking microbes to climate:
Modeling bacteria and archaea explicitly

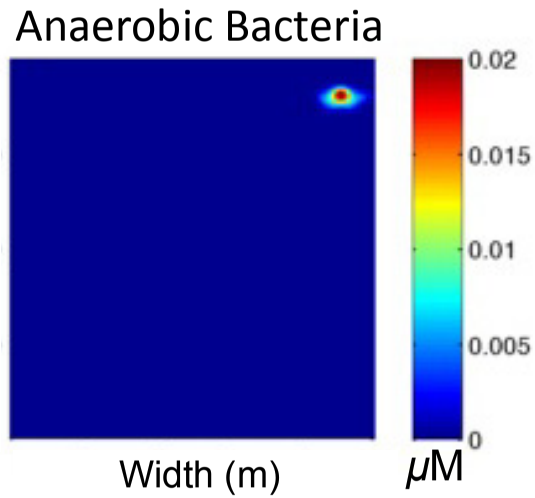
Emily Zakem, MIT
Advisor: Mick Follows

Metabolisms defined by redox reactions.

- Growth yields from thermodynamics.
- Growth rates from uptake limitations.







Linking microbes to climate:
Modeling bacteria and archaea explicitly

Emily Zakem, MIT
Advisor: Mick Follows

Metabolisms defined by redox reactions.

- Growth yields from thermodynamics.
- Growth rates from uptake limitations.

Goal: Bacterial biogeography emerges from competition of metabolisms.