Optimizing Ocean Acidification Observations for Model Parameterization in the Coupled Slope Water System of the U.S. Northeast Large Marine Ecosystem

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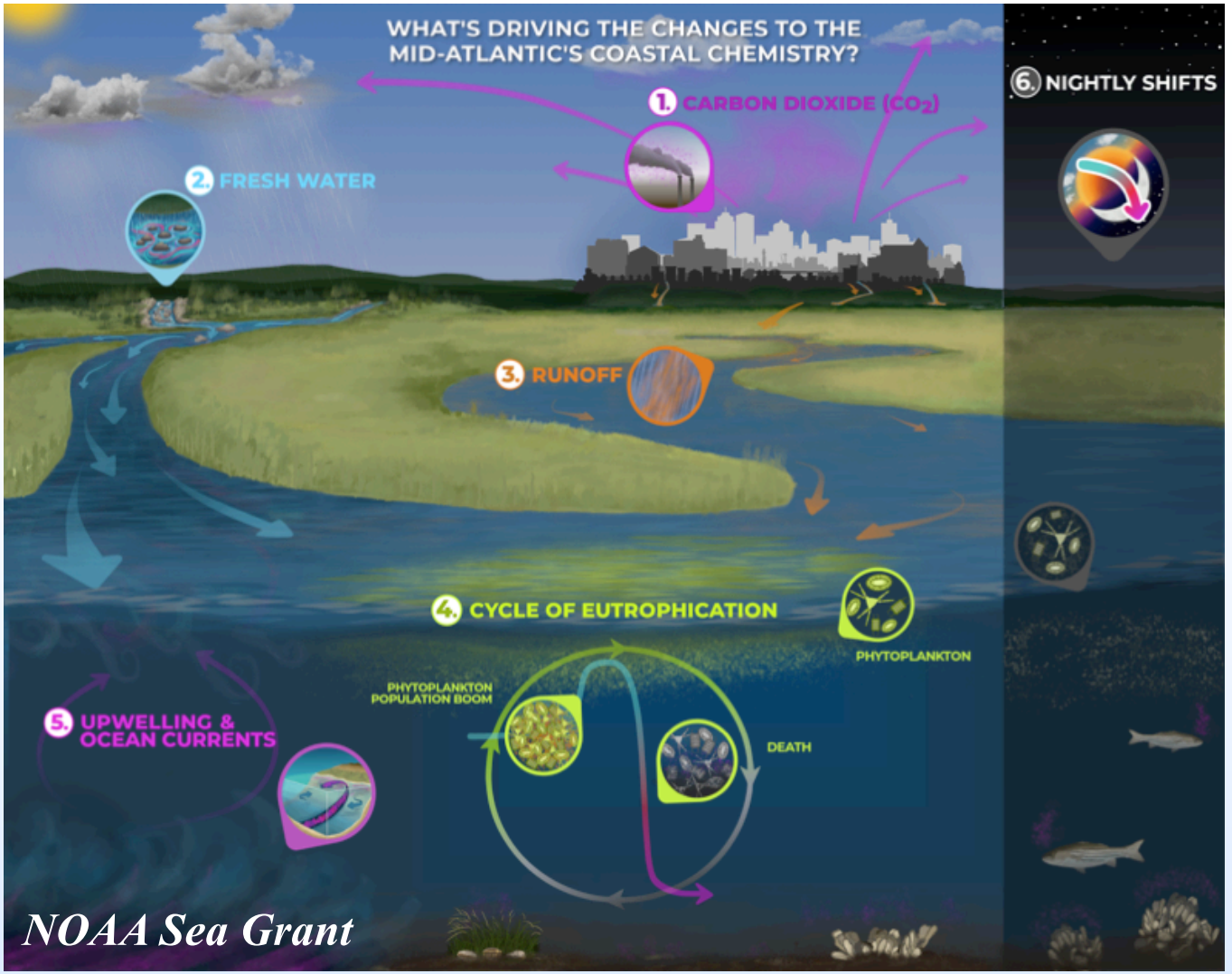
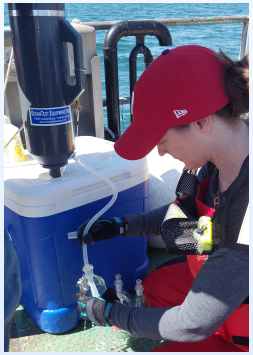
NOAA OCEAN ACIDIFICATION PROGRAM

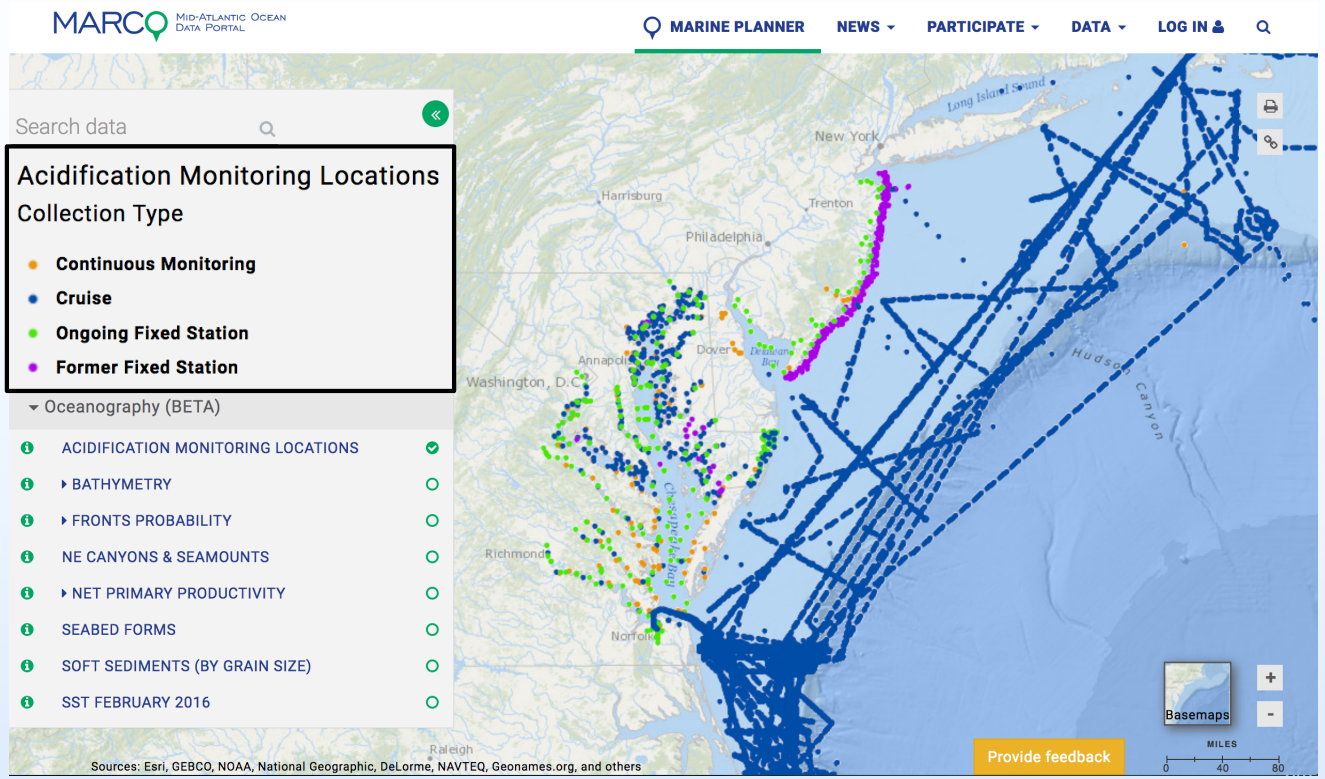
IOOS Integrated Ocean Observing System

High Variability and Complexity on the Northeast Shelf



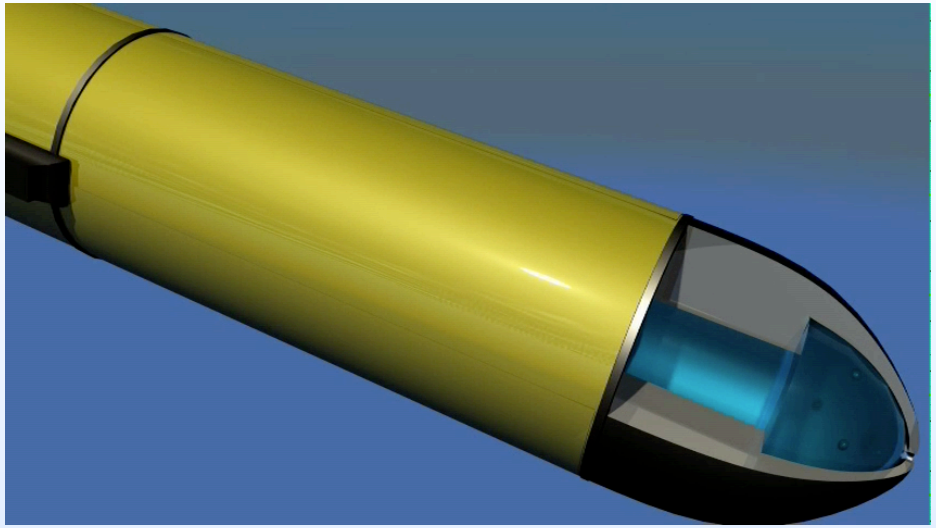
But low spatial and temporal sampling to resolve variability and inform models



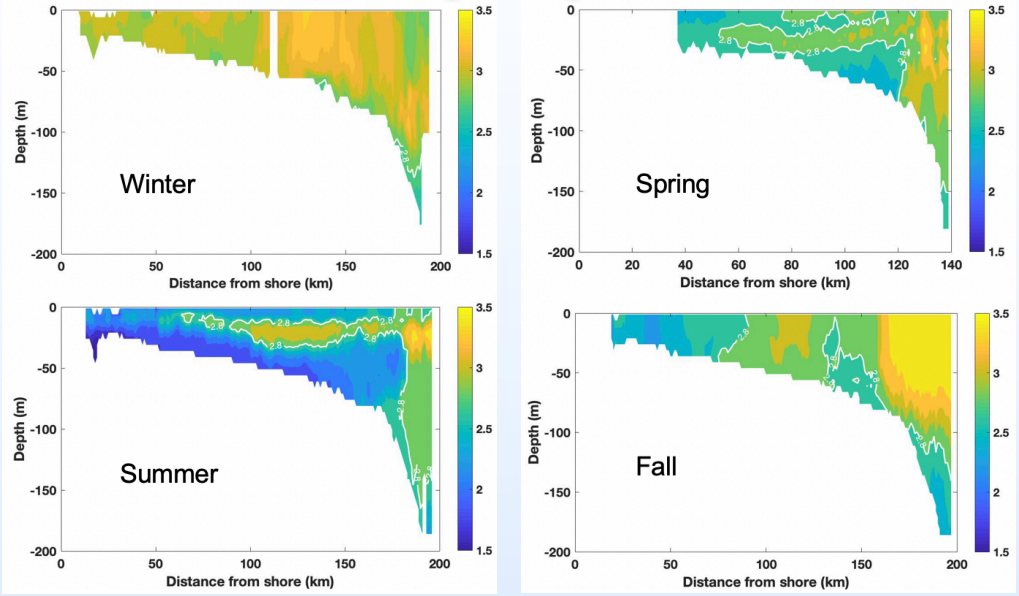


Optimizing OA Observations

1. *Employ seasonal deployments with gliders integrated with deep ISFET-based pH sensors*



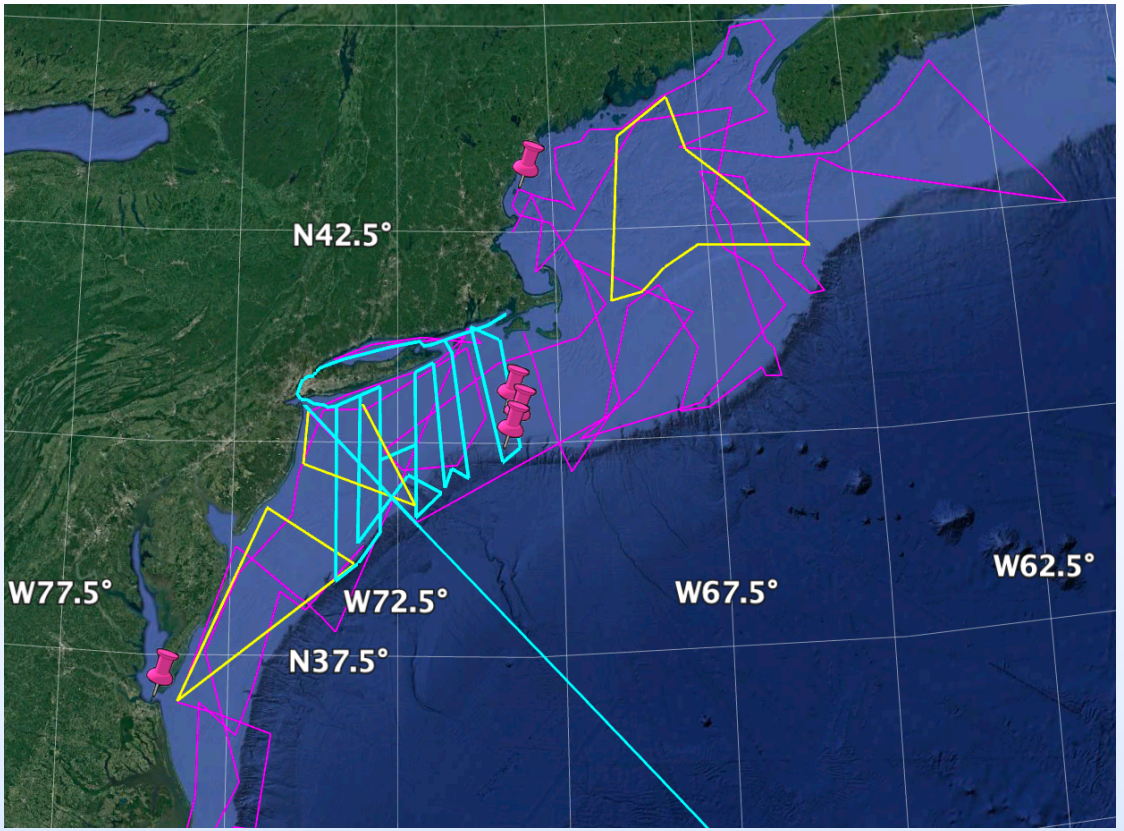
Glider-derived $\boldsymbol{\Omega_{Arag}}$ along a New Jersey cross-shelf transect



Optimizing OA Observations

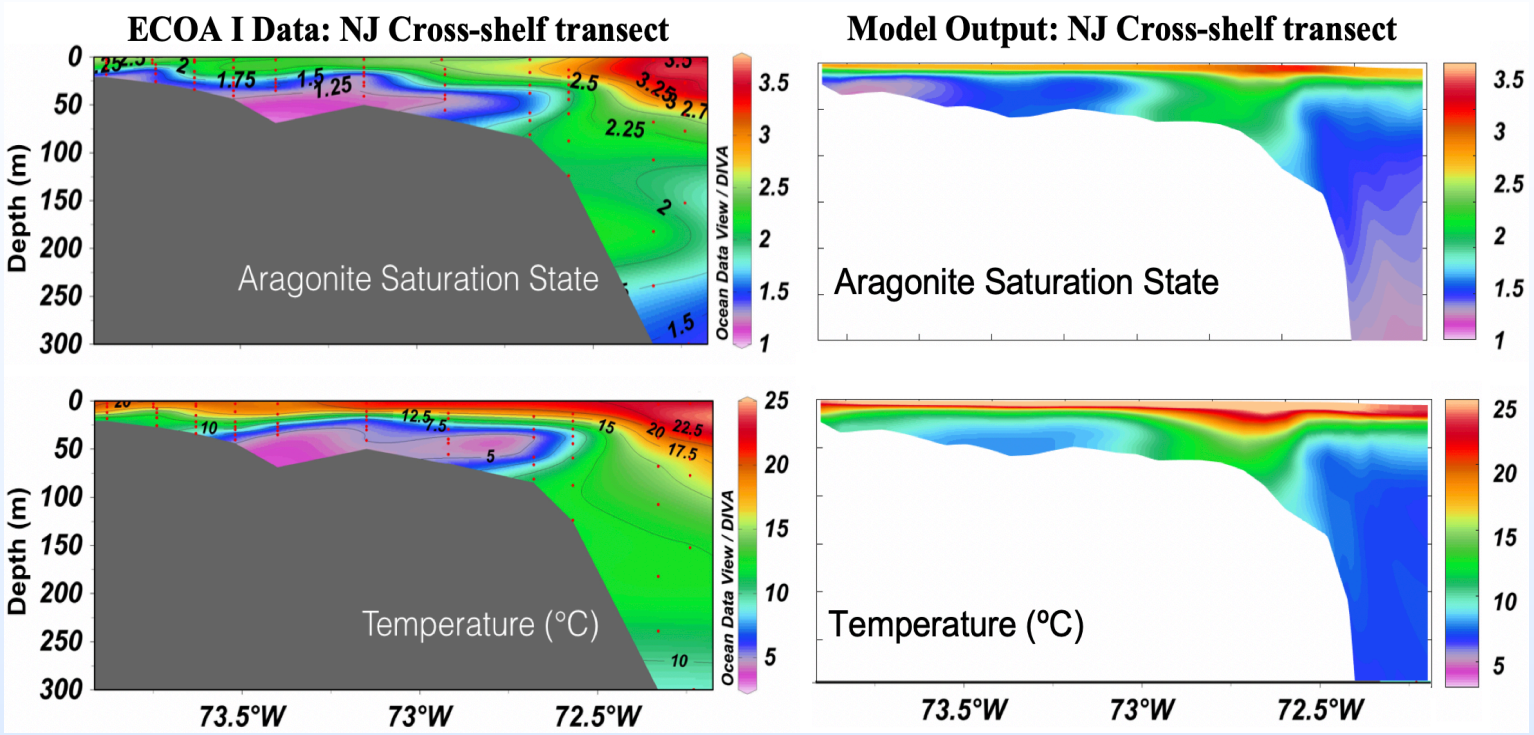
2. *Add carbonate chemistry measurements to existing cruises for optimization (cyan)*

- *Contros™ A_T system on ships*
- *Expand bottle sampling on existing cruises*



Optimizing OA Observations

3. *Optimize an ecosystem biogeochemical (BGC) model that simulates carbonate chemistry*



Optimizing OA Observations

4. *Integrate existing and new observations into regional databases for user access through two U.S. IOOS Regional Associations*

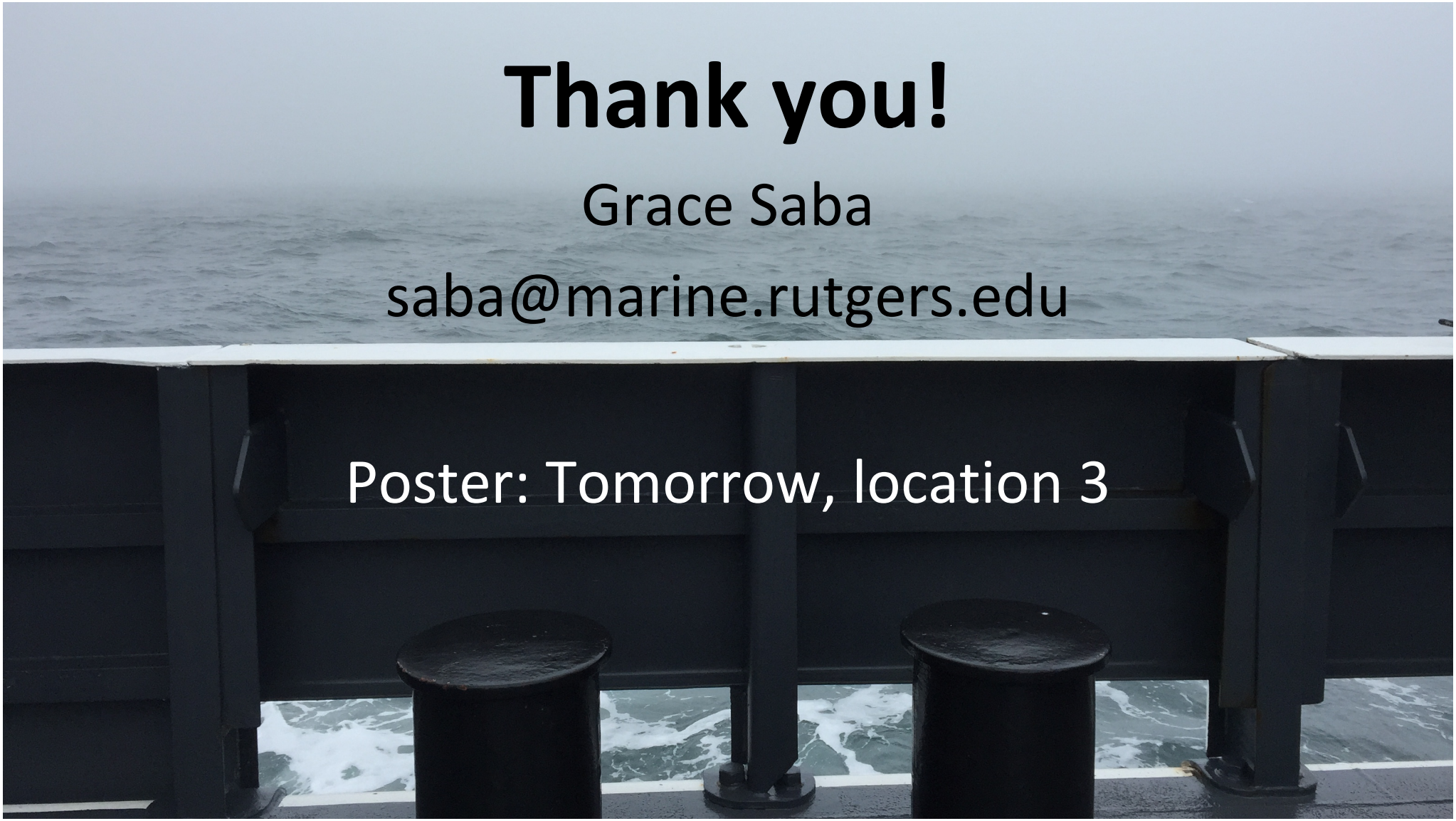
Optimizing OA Observations

5. *Hypothesis Testing*

H1: Biological activity drives pH/Ω_{Arag} variability in shelf waters, while physical advection and mixing processes are the most dominant driver of pH/Ω_{Arag} variability in slope waters.

H2: Mid-Atlantic Cold Pool pH/Ω_{Arag} is lowest in summer and fall prior to winter/storm mixing, and pH/Ω_{Arag} minima are associated with high stratification index and surface chlorophyll.

H3: Processes impacting the relative proportions or rate of supply of these different source waters likely drives large-scale



Thank you!

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Poster: Tomorrow, location 3