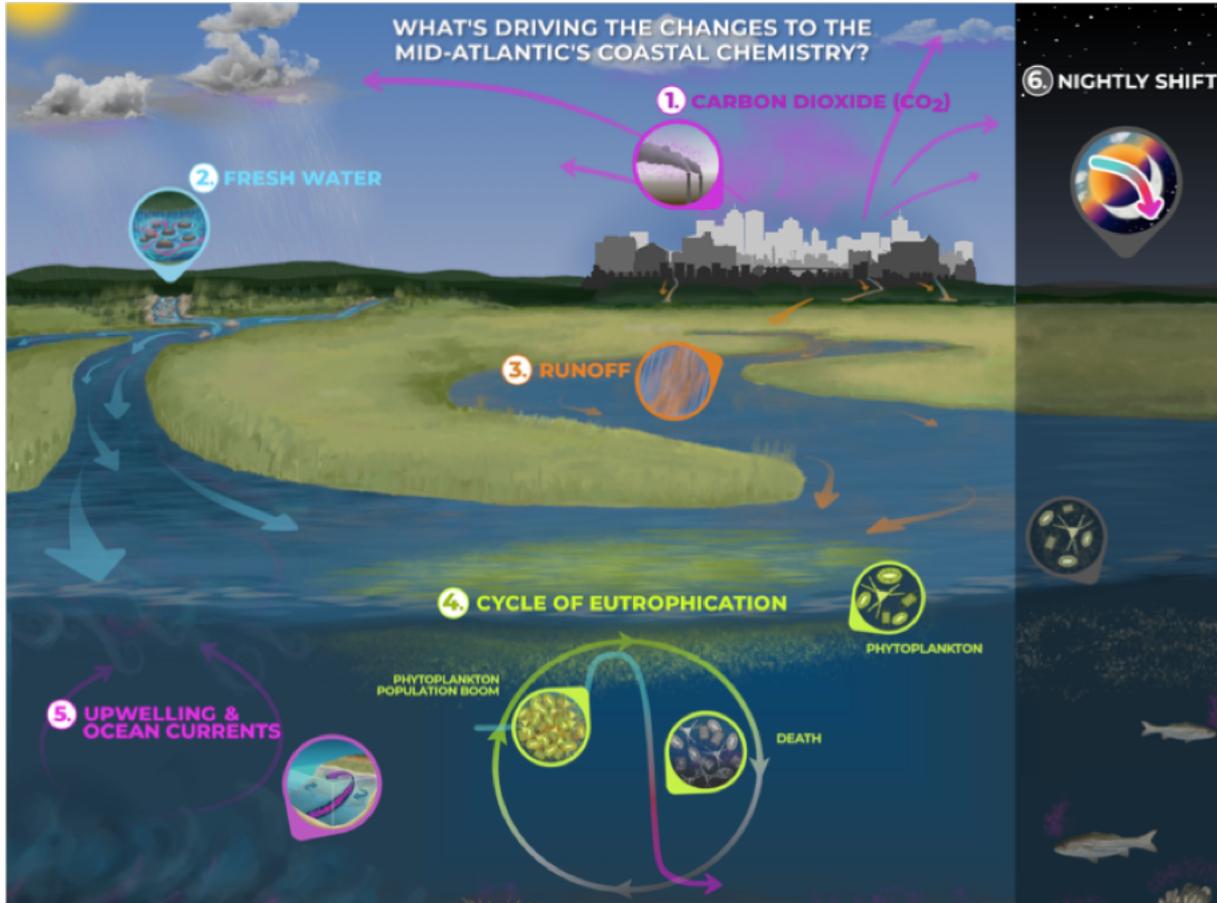


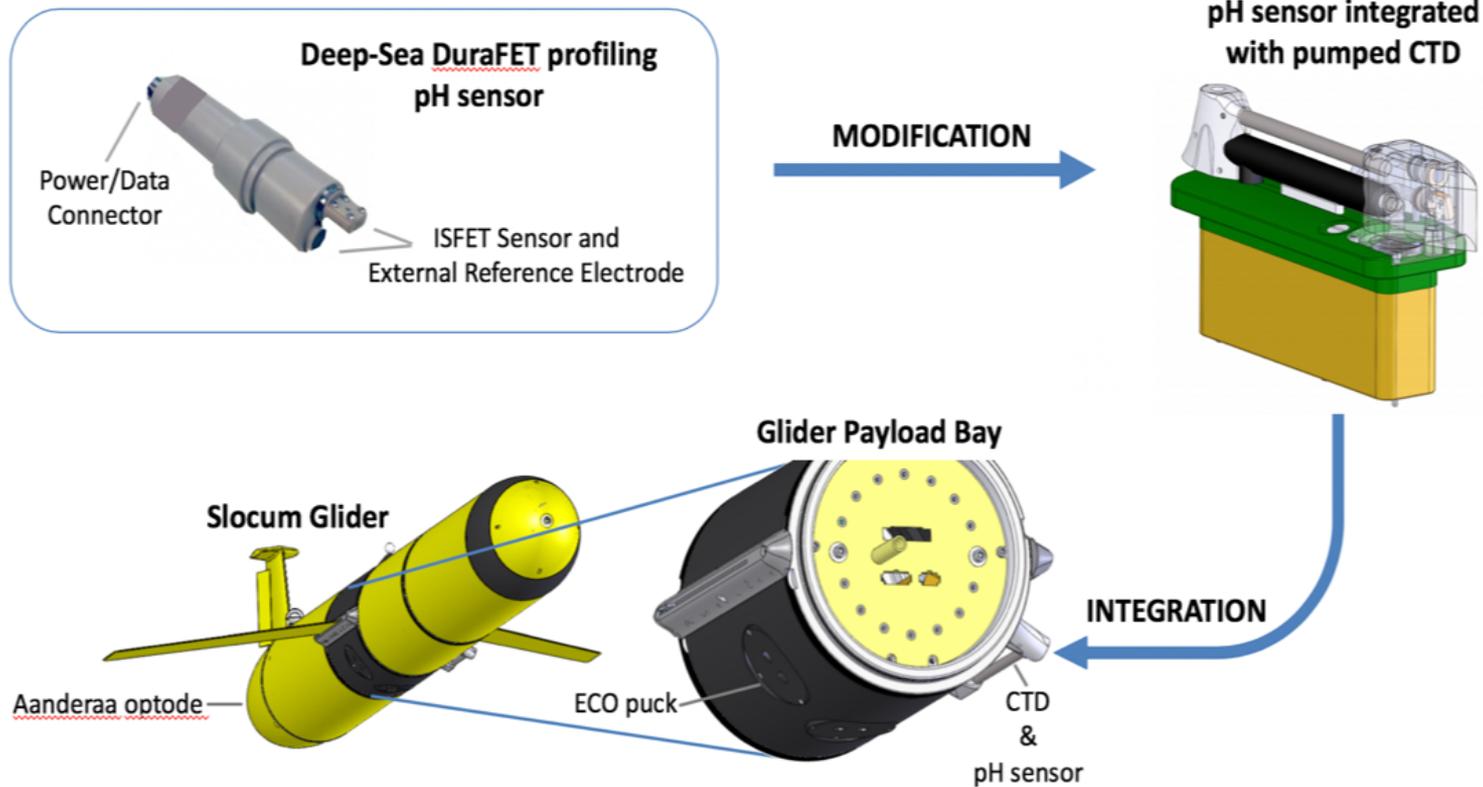
Glider-based observations of seasonal
carbonate chemistry dynamics in
Mid-Atlantic shellfishery
management zones

Liza Wright-Fairbanks
Ph.D. Candidate, Rutgers University
February 2020

Drivers of MAB Acidification

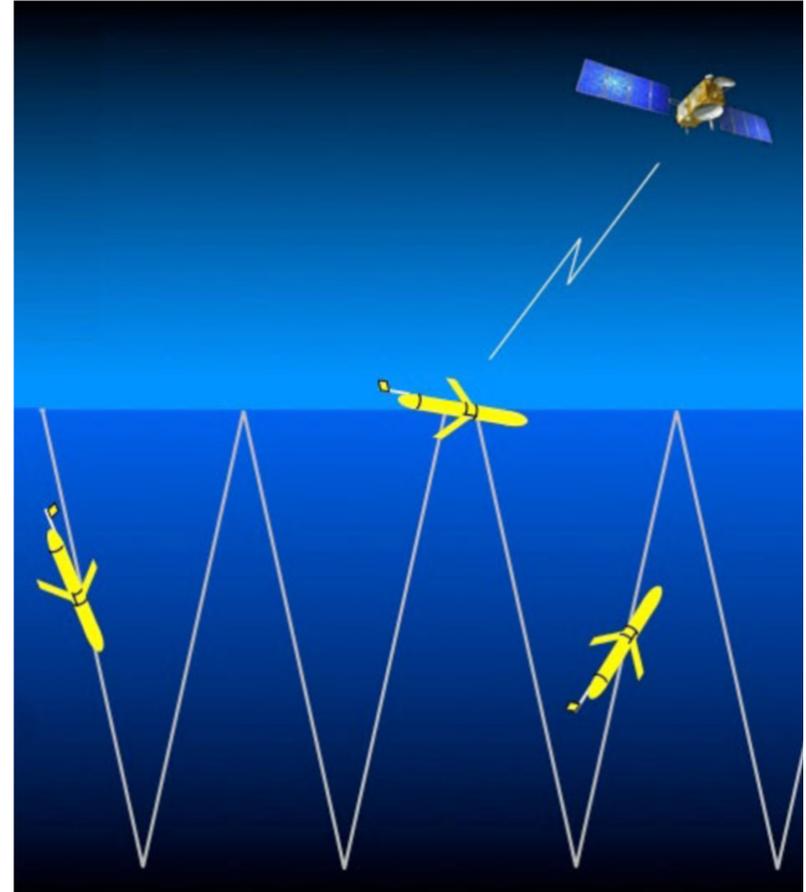


pH Glider Development

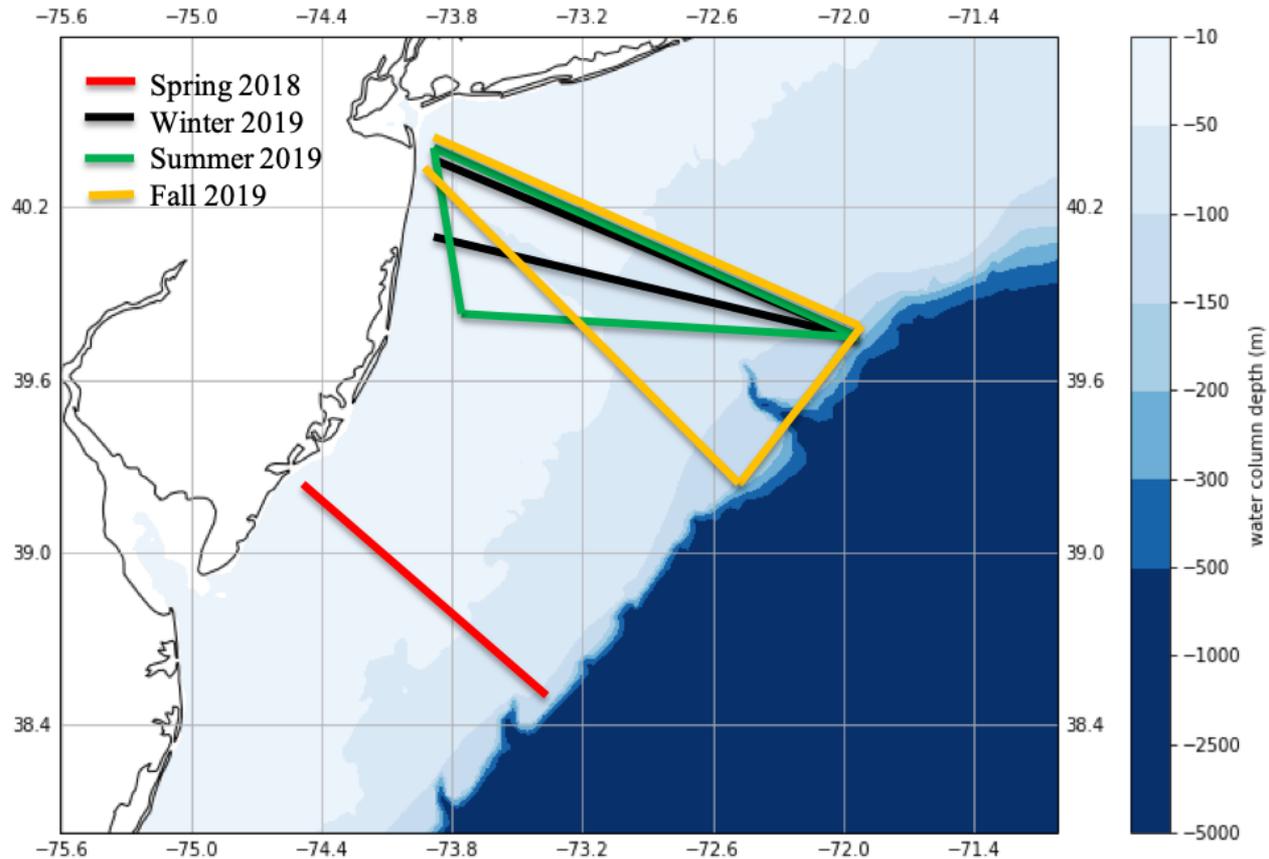


Slocum Glider Operations

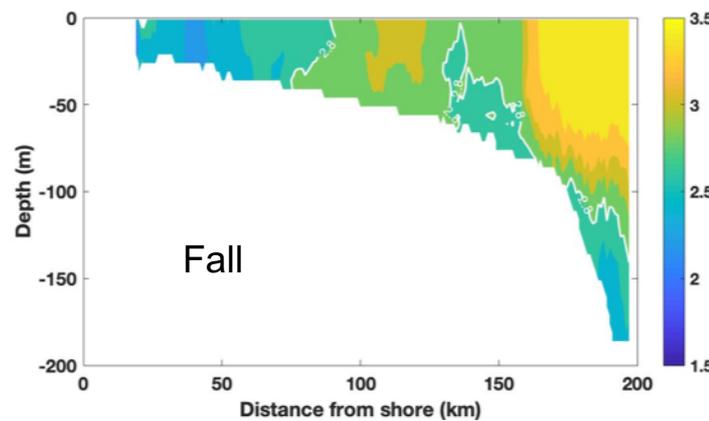
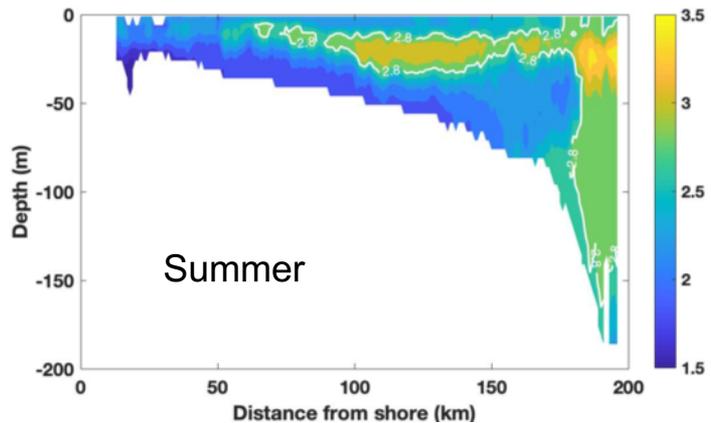
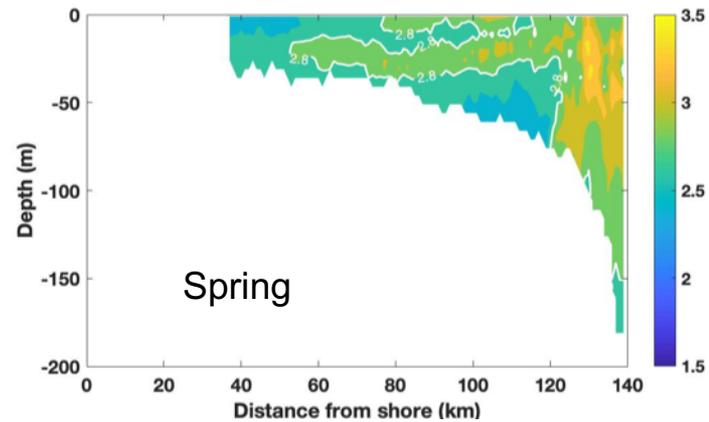
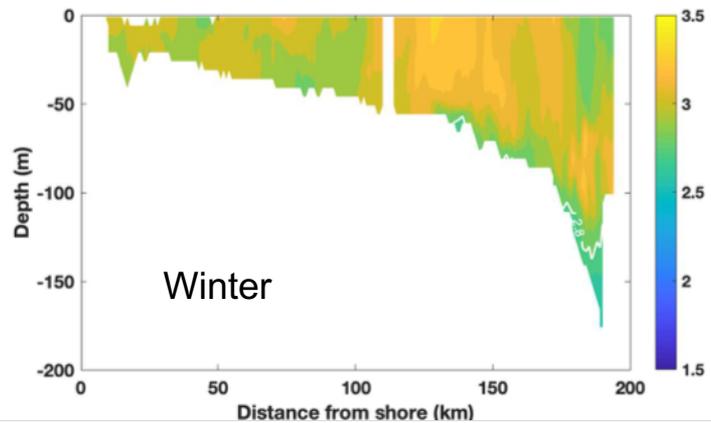
- ▣ 30-60 day deployments
- ▣ Horizontal speed: 20 km/day
- ▣ Vertical profiling: 10-15 cm/s
- ▣ Sampling frequency: 0.5 Hz
- ▣ Measurements every 20-30 cm vertically
- ▣ pH, conductivity, temperature, depth, chlorophyll, oxygen



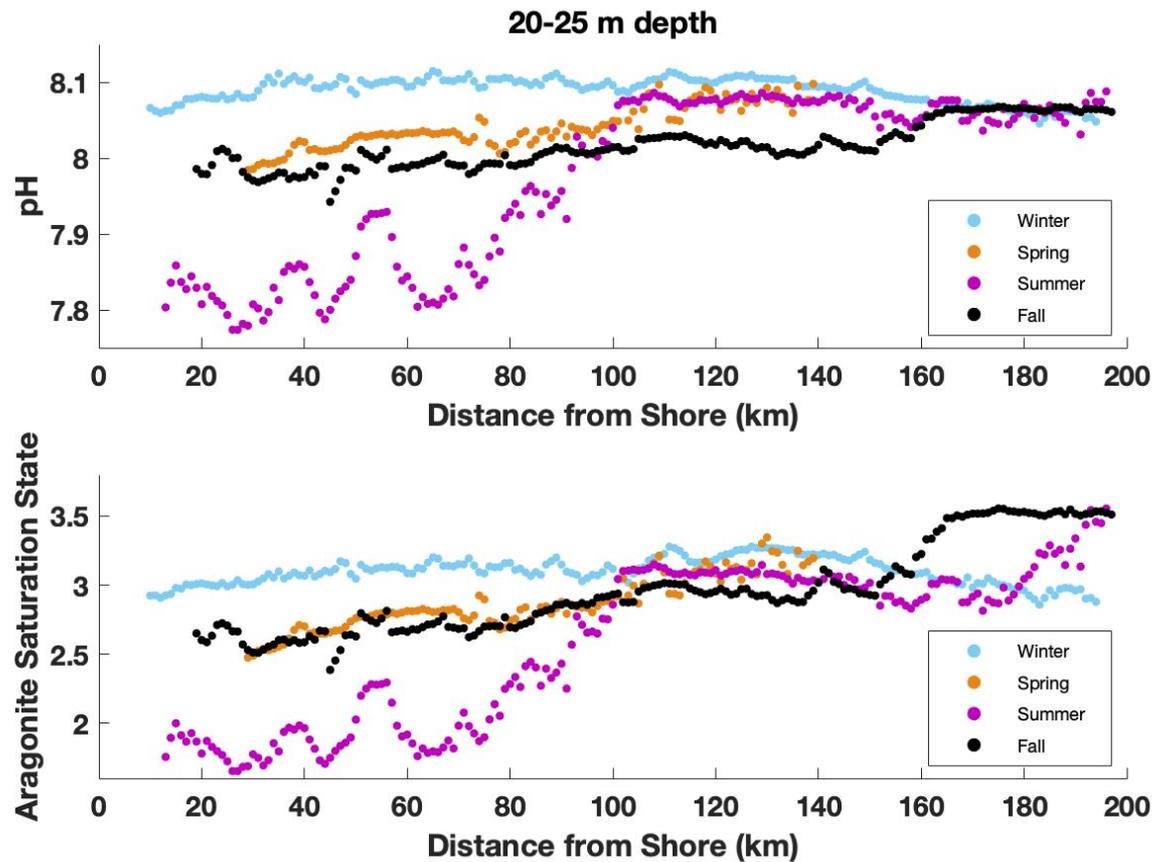
Seasonal pH Glider Deployments



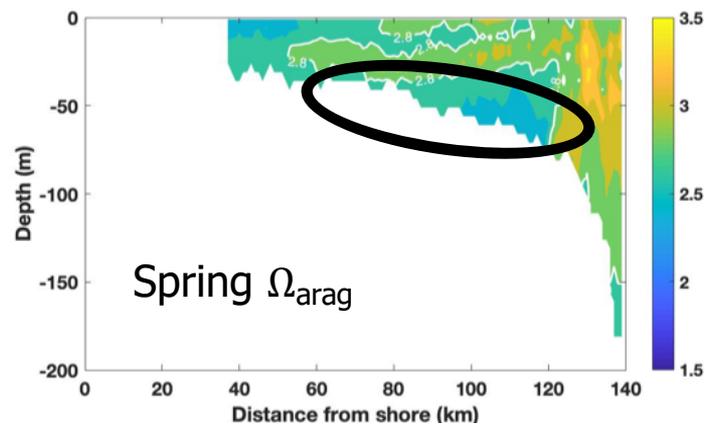
Seasonal Ω_{arag}



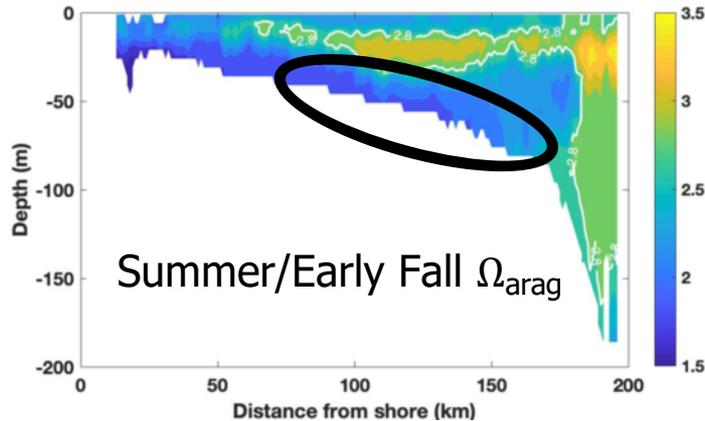
Seasonal Changes in the MAB



Scallop Spawning Season Conditions



- Average pH: 8.014
- Average Ω_{arag} : 2.73



- Average pH: 7.906
- Average Ω_{arag} : 2.17



\$486 million!

Future Work

- ▣ Larval scallop experiments
 - pCO₂ (410 ppm, 600 ppm, 1200 ppm)
 - Food concentration (aquaculture standard, 1/4 standard)
 - Mortality rate, growth rate, lipid accumulation
- ▣ Modeling work
 - Larval dispersal in MAB



Acknowledgements

Saba Lab Group: Grace Saba, Emily Slesinger, Lori Garzio, Brandon Grosso, Laura Wiltsee, Kasey Walsh

Rutgers COOL group

Glider Technicians: Dave Aragon, Chip Haldeman, Nicole Waite

Collaborators: University of Delaware (Wei-Jun Cai, Baoshan Chen), Sea-Bird Scientific/WET Labs (Andrew Barnard, Charlie Branham), Teledyne Webb Research (Clayton Jones), Atlantic Capes Fisheries (Peter Hughes), NJ Aquaculture Innovation Center (Sean Towers)

Funding: NSF OTIC Program (OCE #1634520), NOAA OAP/NJSCG (#NA18OAR4170087)



Lessons I've Learned

Liza Wright-Fairbanks
Ph.D. Candidate, Rutgers University

Mentors

Dr. Grace Saba



Assistant Professor, Rutgers
University Dept. of Marine and
Coastal Science

Peter Hughes



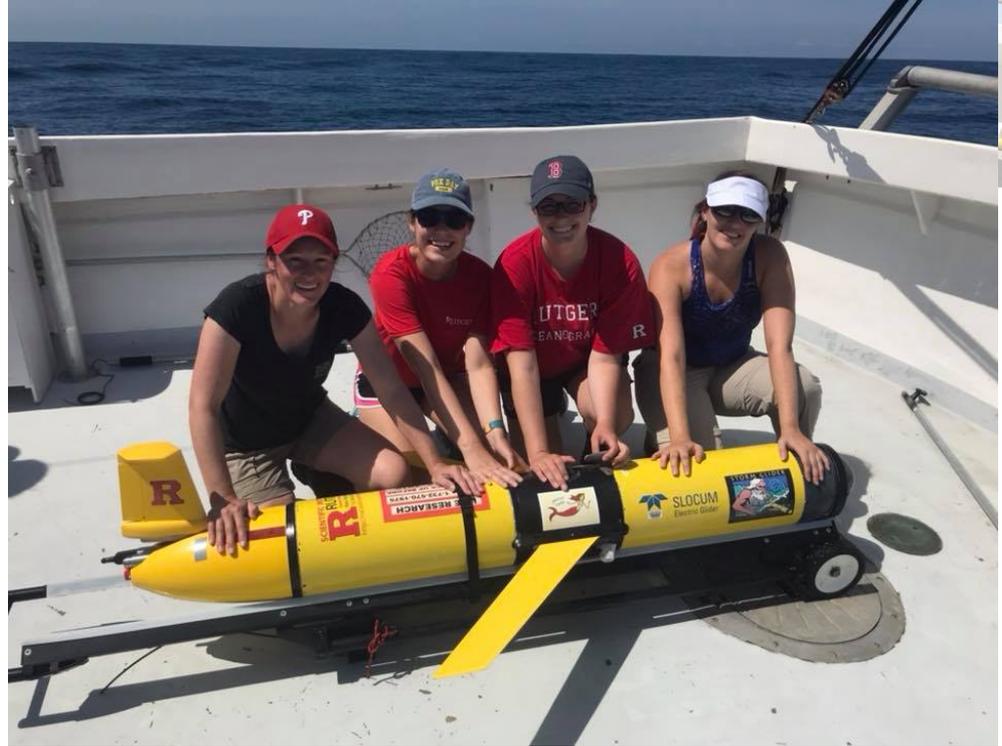
Sustainability Director, Atlantic
Capes Fisheries

Lessons from Grace



Lessons from Grace

- ▣ Gliders Rule!



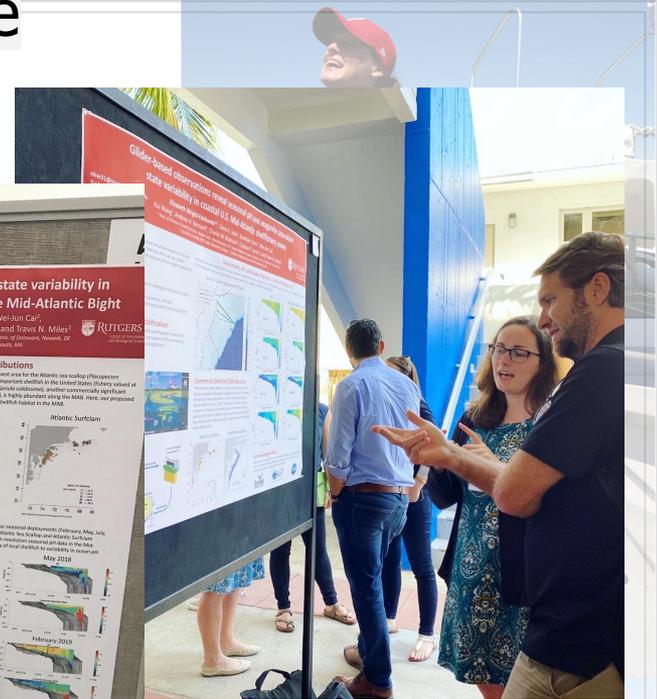
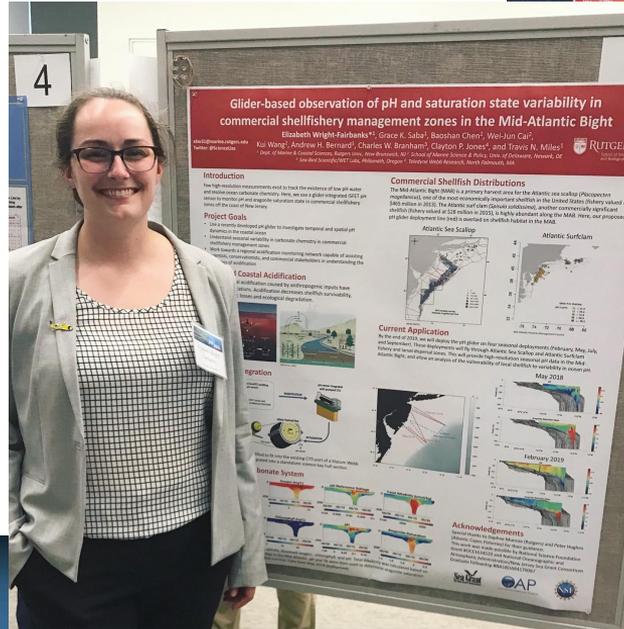
Lessons from Grace

- ▣ Gliders Rule!
- ▣ Embrace the dirty work



Lessons from Grace

- ❑ Gliders Rule!
- ❑ Embrace the dirty work
- ❑ Present your findings



MACAN Webinar 3/5/19: Profiling Glider

Today

- Presentation: 30-40 minutes
- Elizabeth Wright-Fairbanks, Ph.D. Student at Rutgers University



Lessons from Grace

- ▣ Gliders Rule!
- ▣ Embrace the dirty work
- ▣ Present your findings
- ▣ Become a mentor

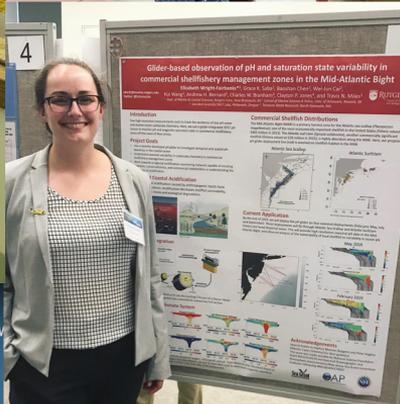


MACAN Webinar 3/5/19: Profiling Glider

Today

- Presentation: 30-40 minutes
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Thank you, Grace!



MACAN Webinar 3/5/19: Profiling Glider

Today

- Presentation: 30-40 minutes
- Elizabeth Wright-Fairbanks, Ph.D. Student at Rutgers University

Lessons from Peter



Lessons from Peter

- Understand why your science matters



Lessons from Peter

- ▣ Understand why your science matters
- ▣ Hands-on experience is invaluable



1

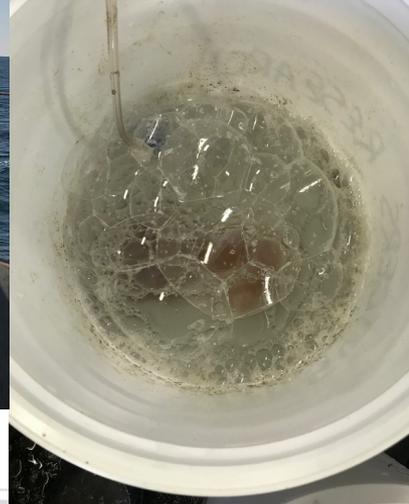


Lessons from Peter

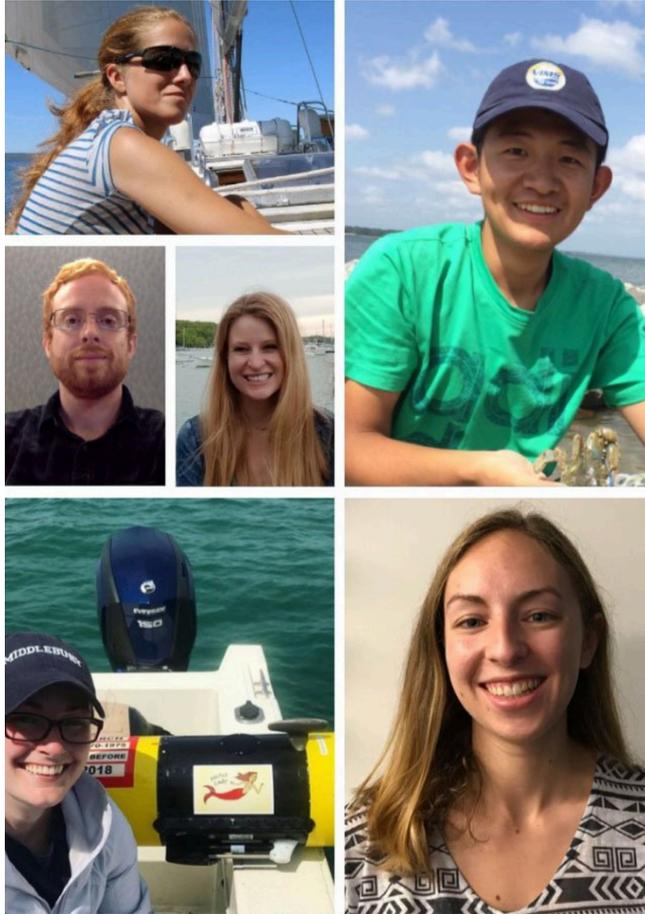
- Understand why your science matters
- Hands-on experience is invaluable
- Stakeholders drive action



Thank you, Peter!



Thanks to NOAA OAP and Mid-Atlantic SeaGrant



OAP Community Meeting 2020



