NOAA OAP: US Arctic and Alaska

Current monitoring efforts, trends, and areas of highest concern

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NOAA/PMEL
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D. Naber

AOOS

NOAA — National Oceanic and Atmospheric Administration — U.S. Department of Commerce

The Seal of the State of Alaska

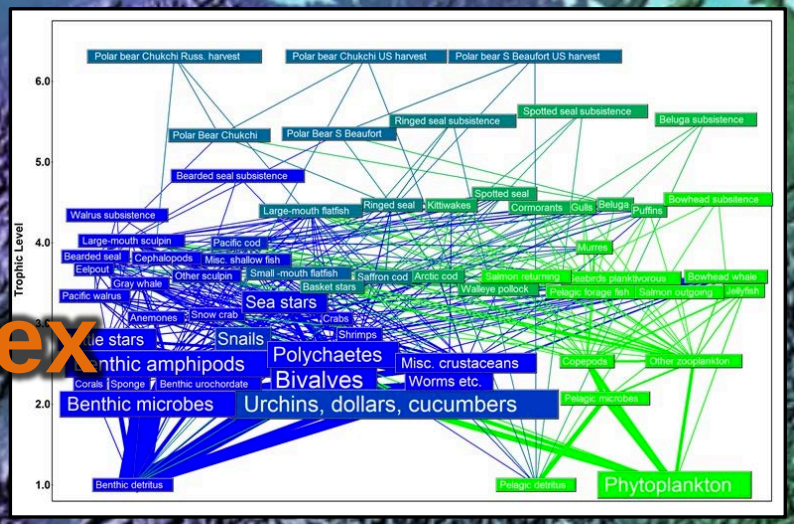
UAF University of Alaska Fairbanks

NOAA OAP
Alaska Enterprise

'Three-Legged Stool'

- Ocean Chemistry (PMEL/OARC)
- Species-specific response studies:
  - Snow, Red King, Tanner Crab (AFSC Foy)
  - Red Tree Coral (AFSC Stone)
  - Cod, pollock, sand dab (AFSC Hurst)
- Bioeconomic forecast modelling (AFSC Dalton)

#ArcticChallenges



Complex

Vast

MA

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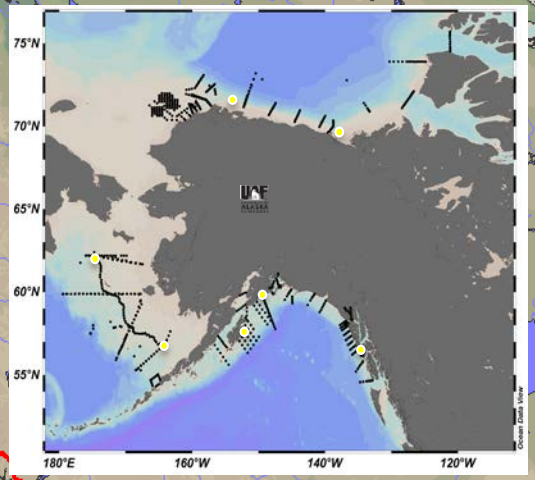
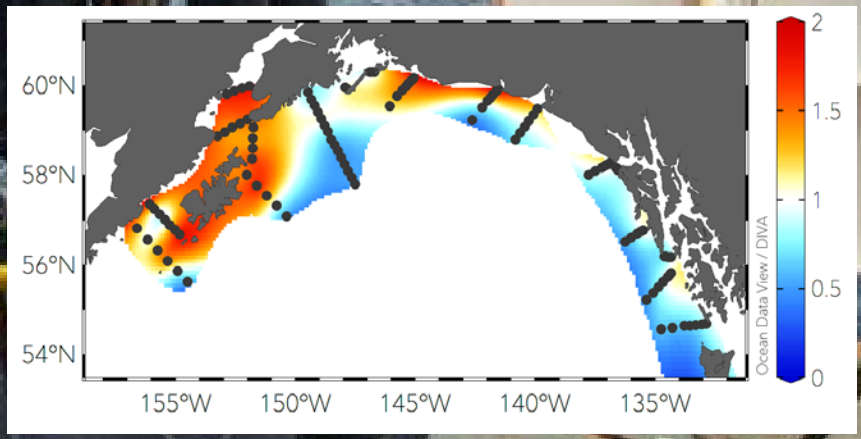
Hazardous

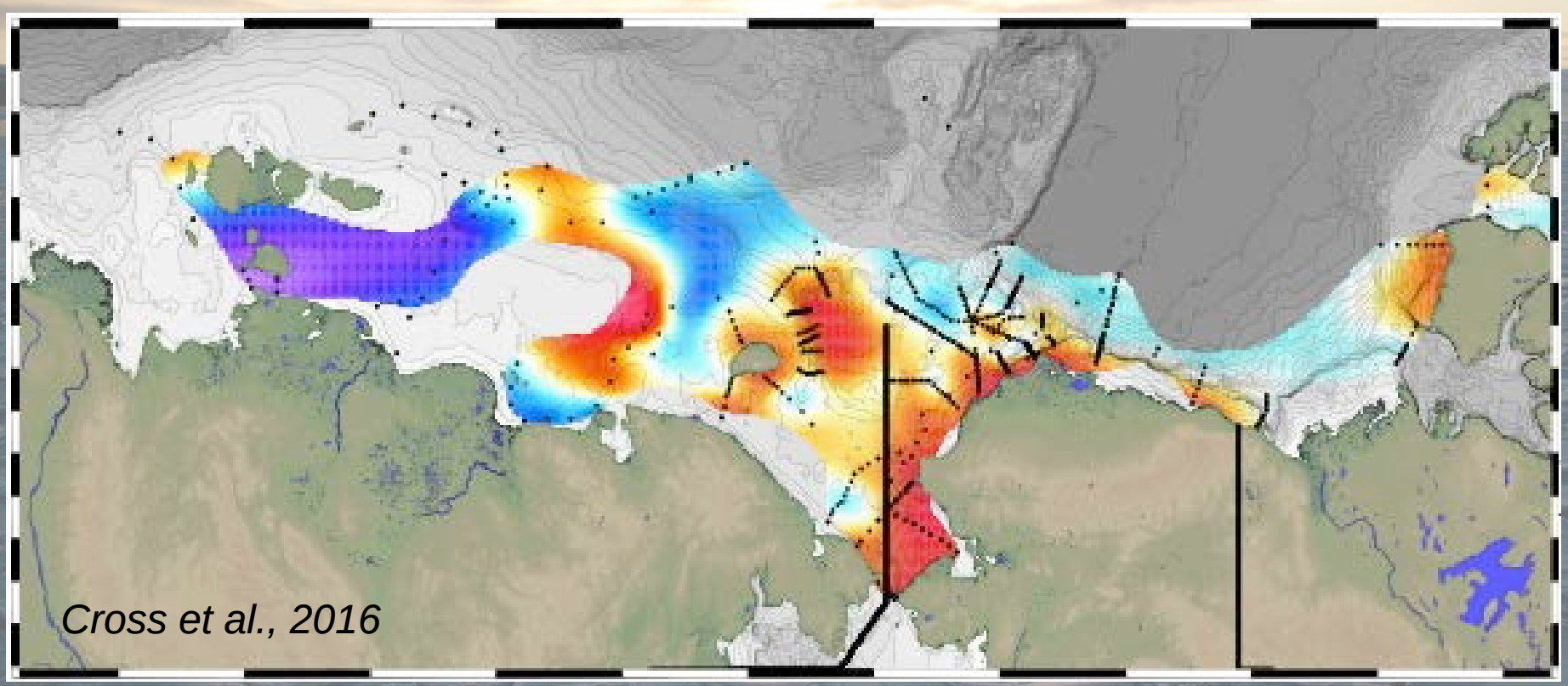


2015 – 2017 NOAA OAP Alaska Enterprise Field Missions

Sub-Surface Waters are highly vulnerable in the Gulf...



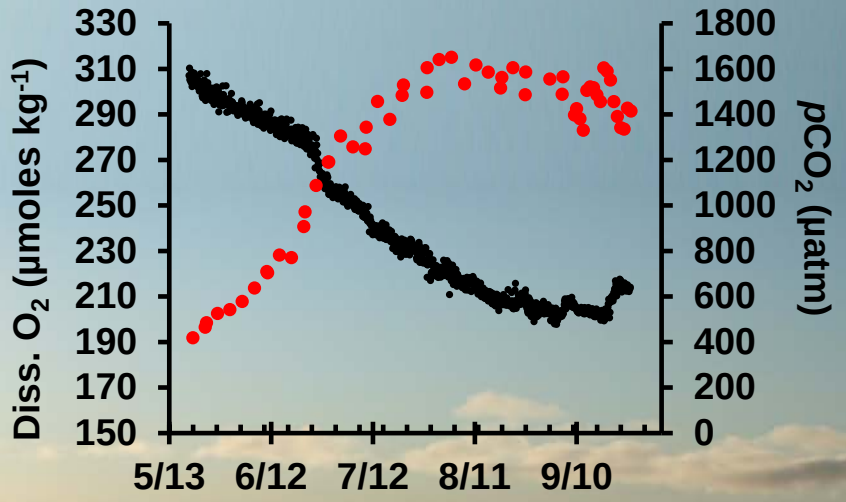
Sub-Surface Waters are highly vulnerable in the Arctic…

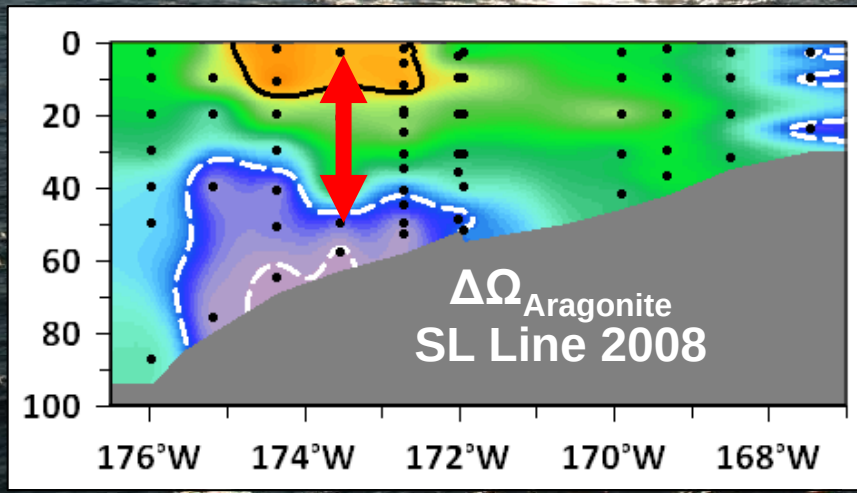


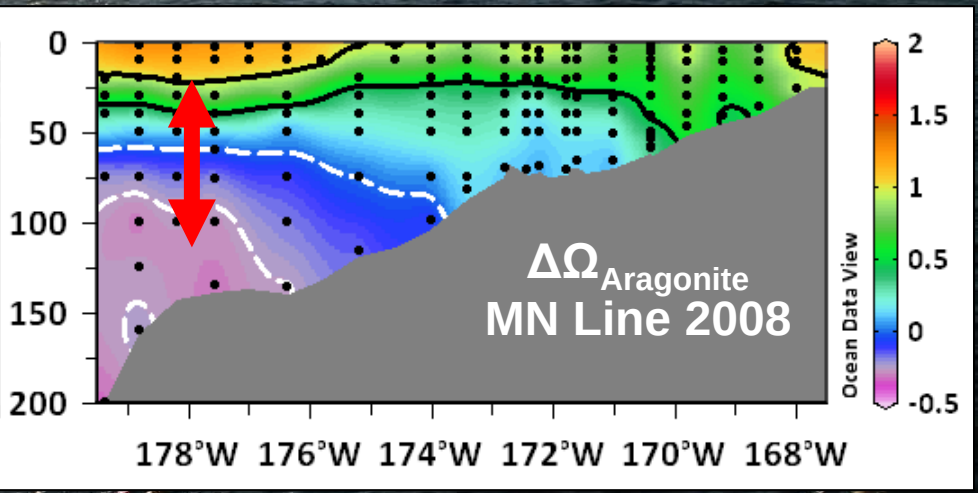
At least 40% of the Chukchi Sea benthos is exposed to bottom waters that are corrosive to $CaCO_3$ during summertime.

Bates et al., 2015

…and in the Bering Sea.

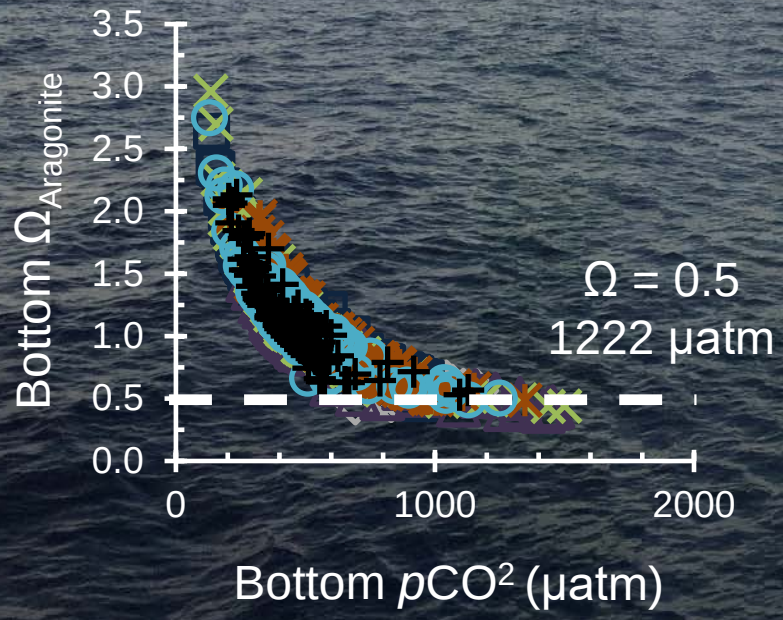




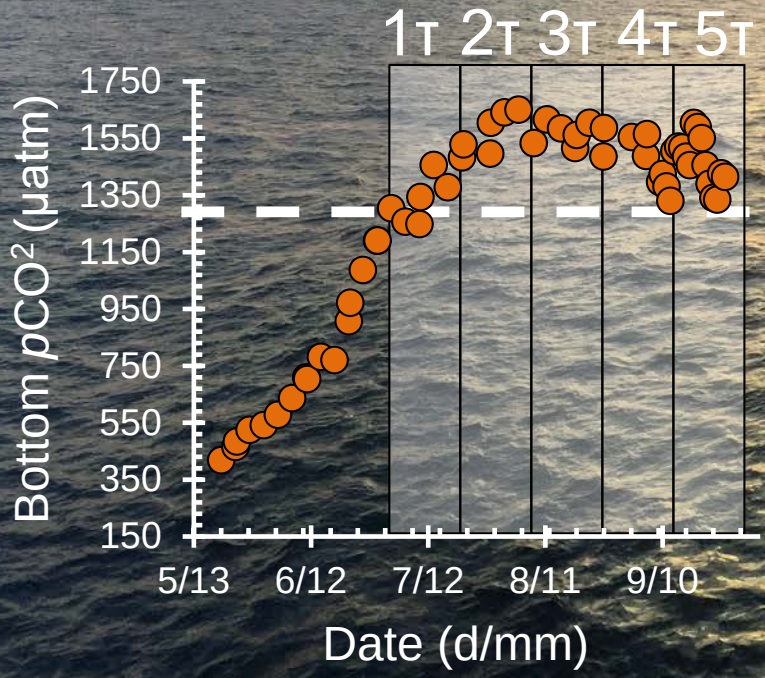


Can we see present-day impacts of Ocean Acidification (like dissolution?)

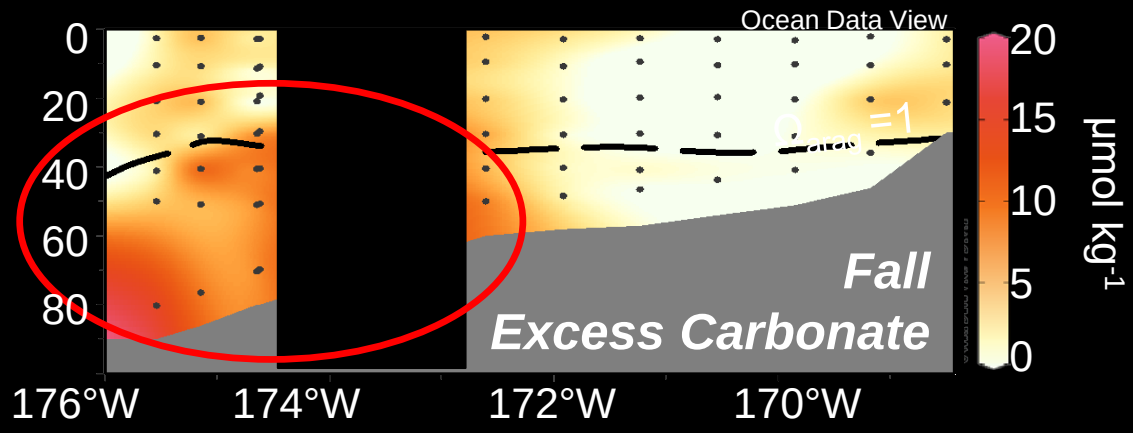
TIME SERIES RECORDS OF THE DURATION AND INTENSITY OF CORROSIVE CONDITIONS CAN SHOW IF DISSOLUTION IS POSSIBLE.



2011



Corrosive conditions persist for nearly five months in the southern part of the Bering Sea.



*Without anthropogenic CO_2, these OA events are **too weak** and **too short** to cause dissolution.*

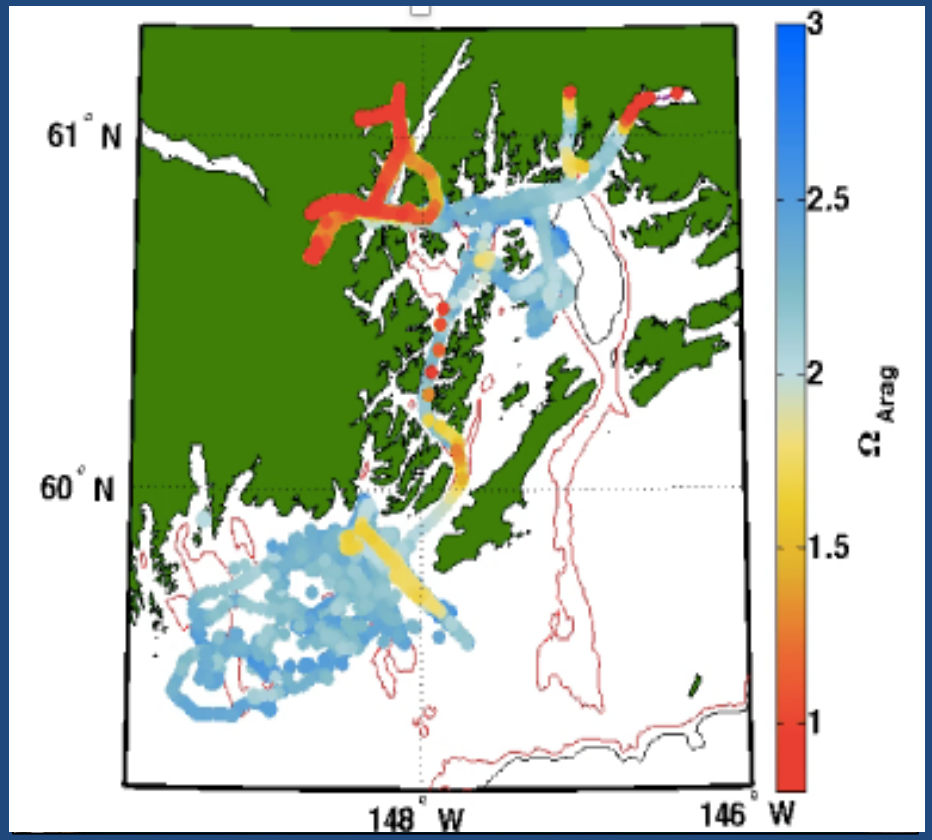
GLACIER TO GULF:

Multi-platform Ocean Acidification Monitoring in Prince William Sound

PMEL
Pacific Marine Environmental Laboratory

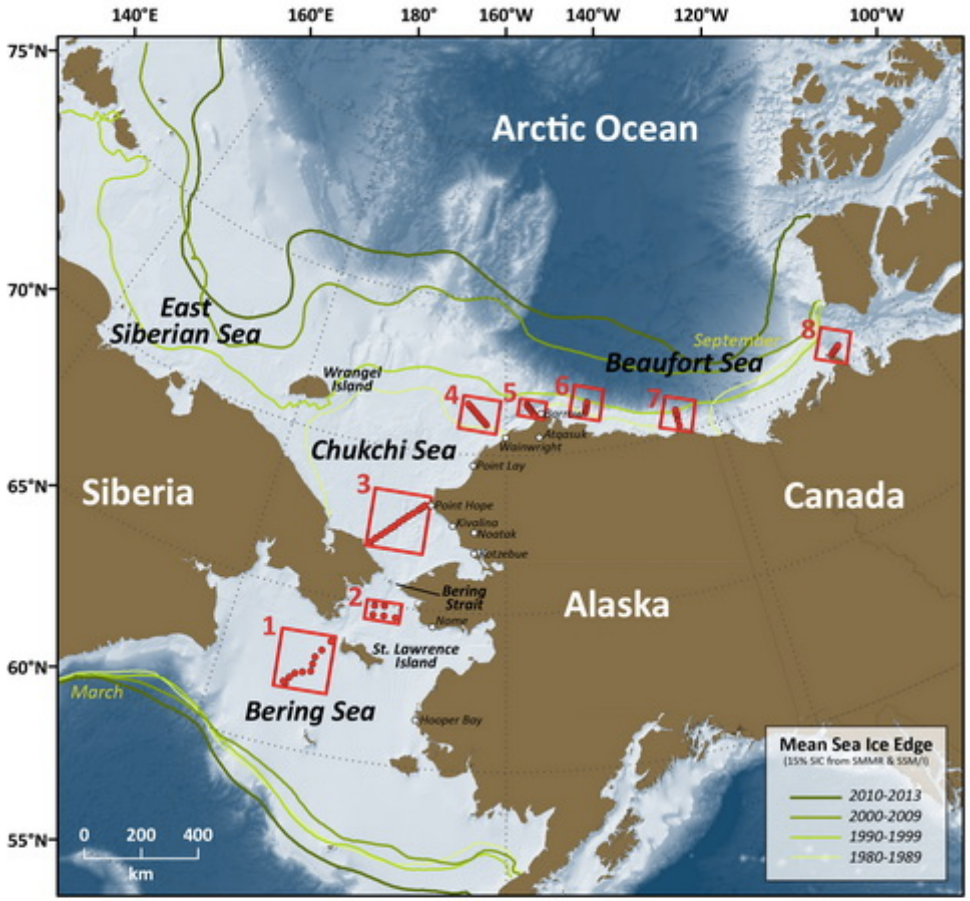
Department of Commerce Silver Medal for Exceptional Service, 2014

*In 2014, this award-winning study used **six types of technology** to track glacial melt signals for **five months**, finding strong ocean acidification events near glacial plumes.*




Ocean Acidification could threaten Alaskan fishing and food security.
JTM

Distributed Biological Observatory



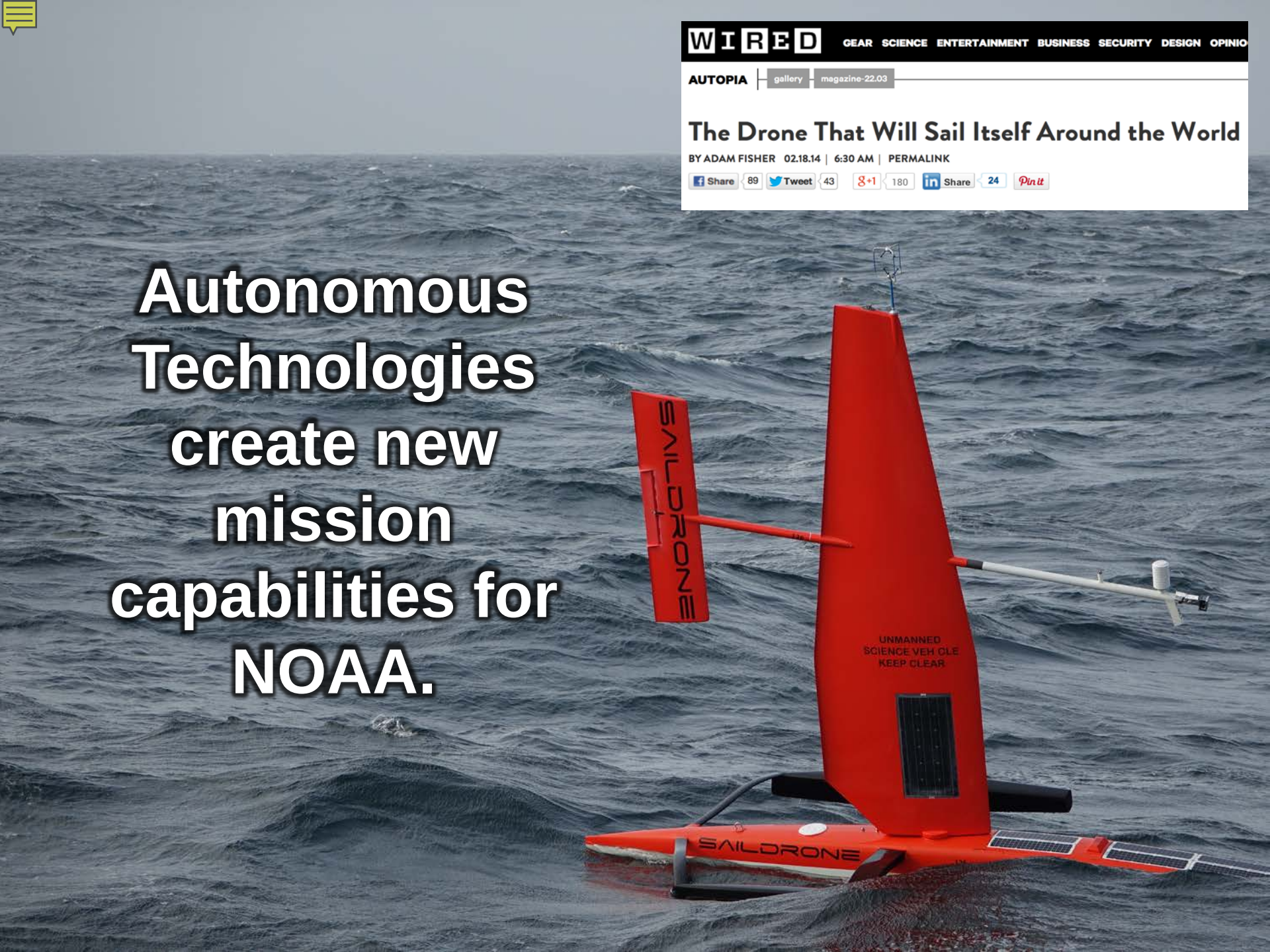
DBO sites (red boxes) are

- regional "hotspot" transect lines and stations located along a latitudinal gradient
- considered to exhibit high productivity, biodiversity, and overall rates of change

DBO sites will

- serve as a change detection array for the identification and consistent monitoring of biophysical responses
- be occupied by national and international entities with shared data plan

Coordinates for Bounding Boxes
Sampling Station Coordinates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Autonomous Technologies create new mission capabilities for NOAA.
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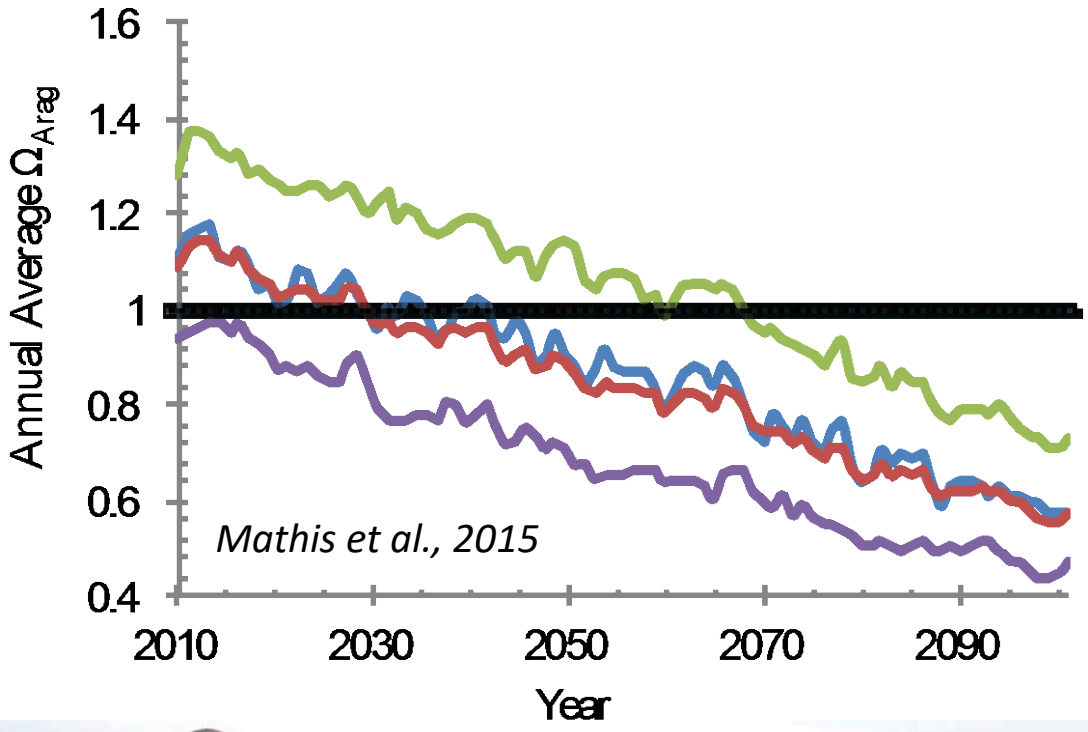
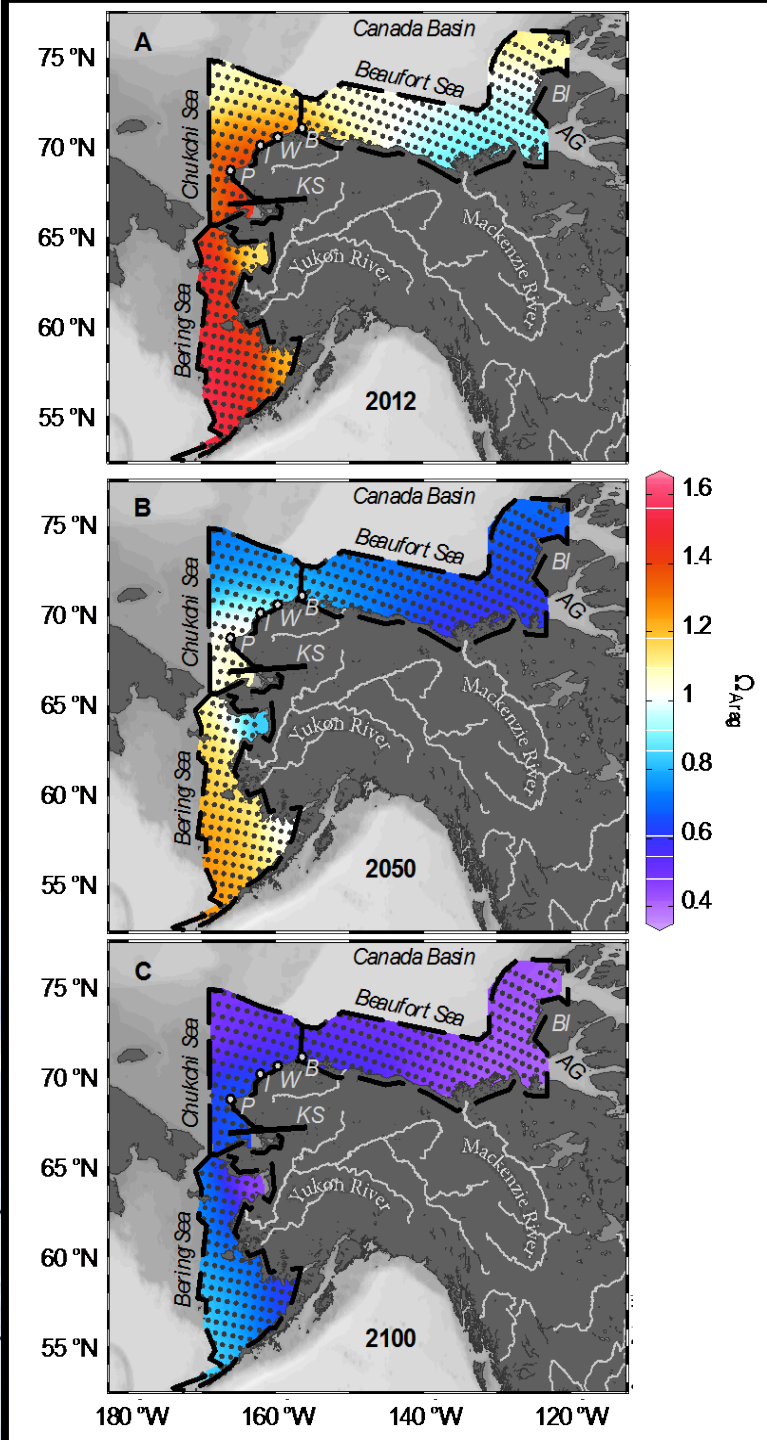
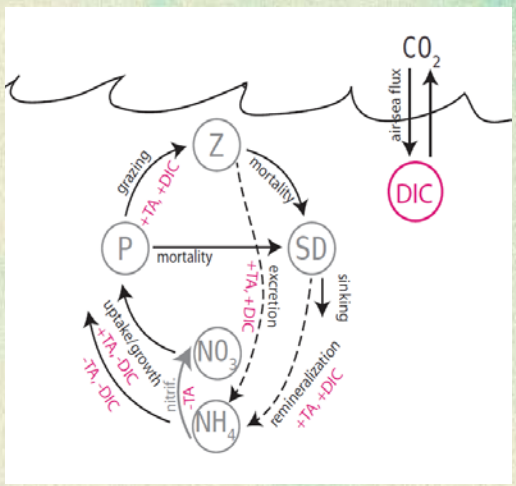
Projecting OA in the PAR







S. A. SIEDLECKI, D. PILCHER, A. J. HERMANN, K. COYLE, MATHIS J. (*in prep*) The importance of freshwater to spatial variability of aragonite saturation state in the Gulf of Alaska

PMEL
Pacific Marine Environmental Laboratory

UAF
UNIVERSITY OF ALASKA FAIRBANKS

AOOS
Alaska Ocean Observing System

Looking Forward:

More from Bob Foy