



Davis Strait

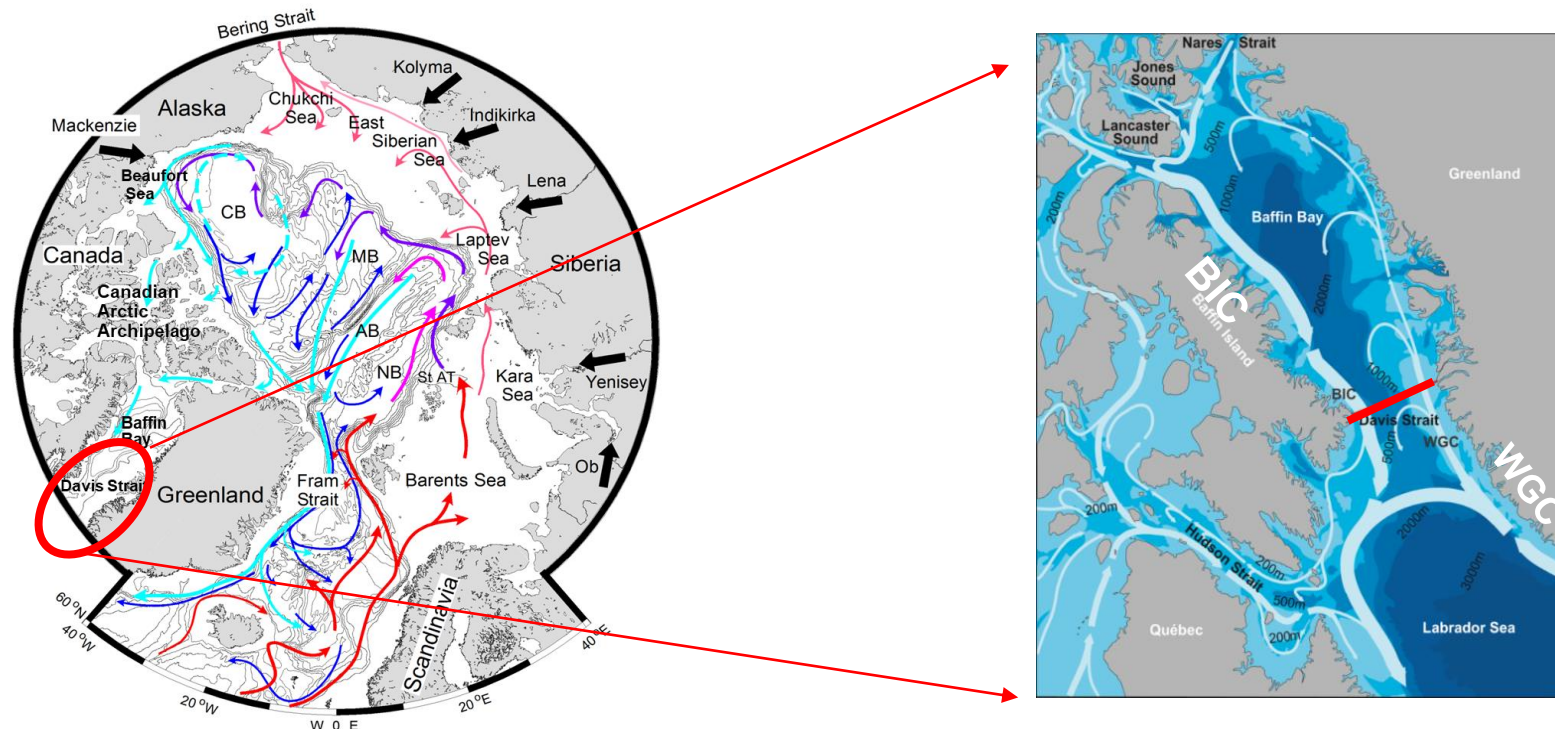
(Canada-USA-Denmark-Greenland collaboration)

GO-SHIP high frequency line since 2004

**Kumiko Azetsu-Scott
Bedford Institute of Oceanography
Fisheries and Oceans, Canada**

Davis Strait

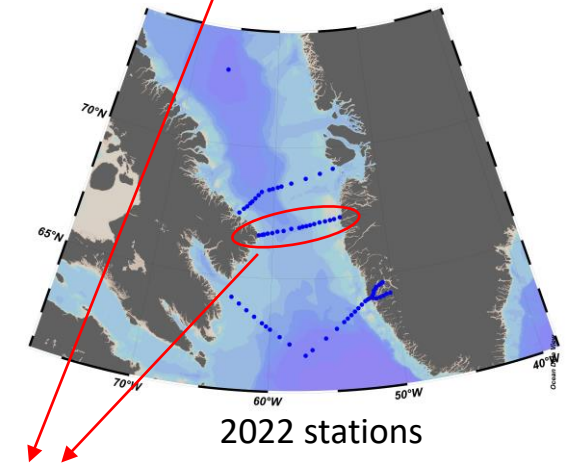
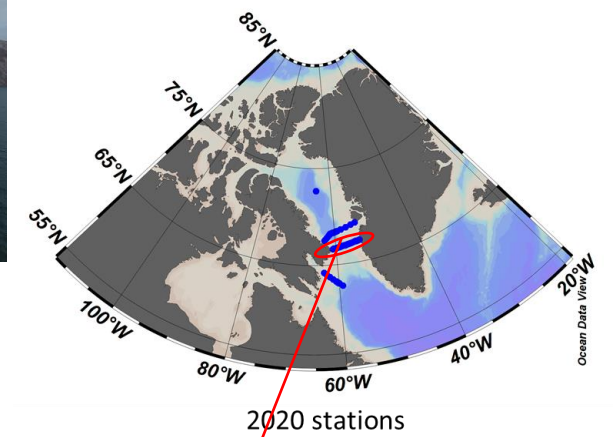
- One of two export gateways of the Arctic Water (both sides of Greenland, Davis Strait and Fram Strait)
- It is an ideal location to observe the propagation of changes from the Arctic to the Northwest Atlantic (integration of narrow channels in Canadian Arctic Archipelago)
- To monitor the intrusion of the warm and saline Atlantic water into Baffin Bay – influence the stability of glacier terminus
- Evaluating the influence of glacial meltwater from the Greenland Icesheet



2020 (Aug 22 - Sep 29)

- R/V Dana (DTU)
- Chief Scientist: Craig Lee (UW)
- 12 scientists (3 students) from 5 institutions (USA, Canada, Greenland and Denmark)

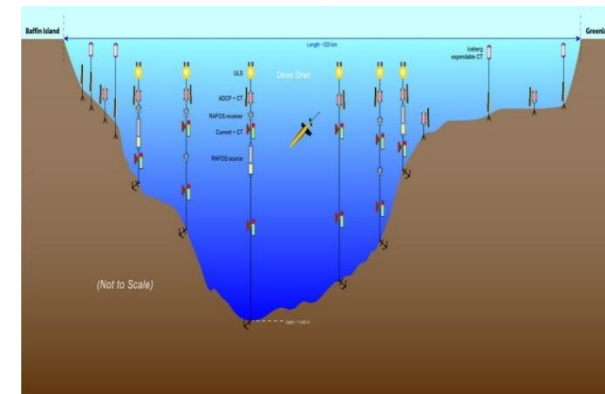
(2 Canadians could not participate in the cruise due to the COVID travel restriction by the Government - reduced chemistry program)



2022 (Sep 30- Oct 22)

- R/V N. Armstrong (WHOI)
- Chief Scientist: Craig Lee (UW)
- 19 scientists (6 students, 2 post-docs) from 10 institutions (USA, Canada, UK, Greenland, Denmark, Switzerland,) and one artist from Ireland

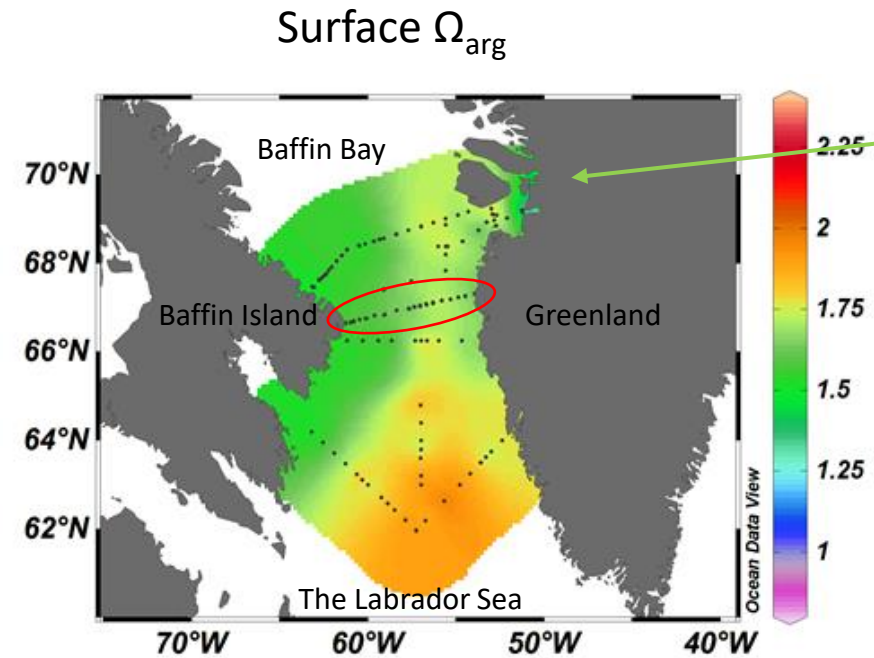
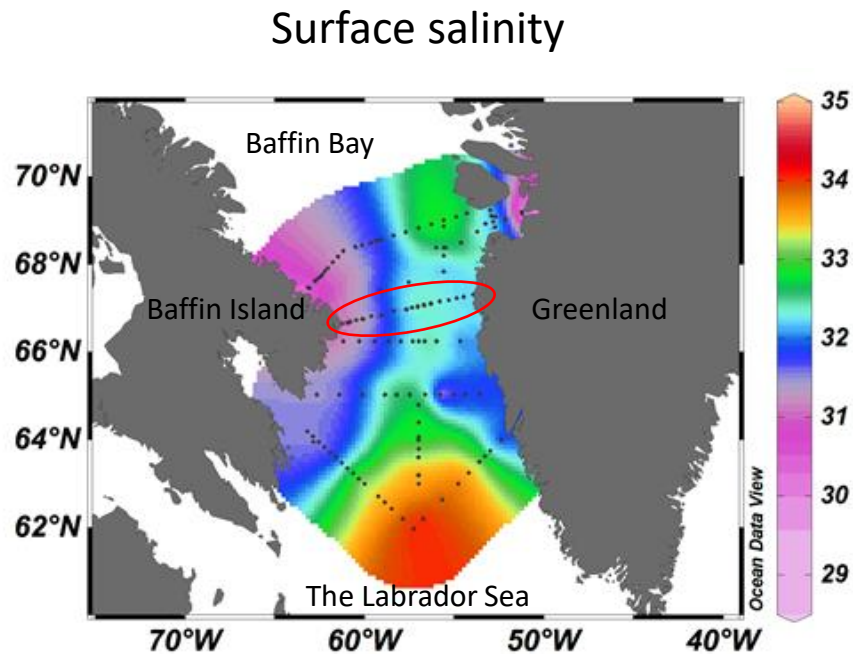
(two people needed to be isolated on board due to COVID)



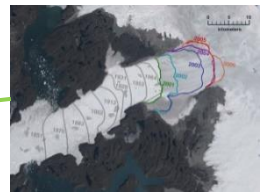
Mooring Array - 14 moorings across Davis Strait and one at the central Baffin Bay Deployed in 2020 and turned around in 2022

Davis Strait

climatology (2004-2021)



the calving front of the Jakobshavn Glacier since 1851

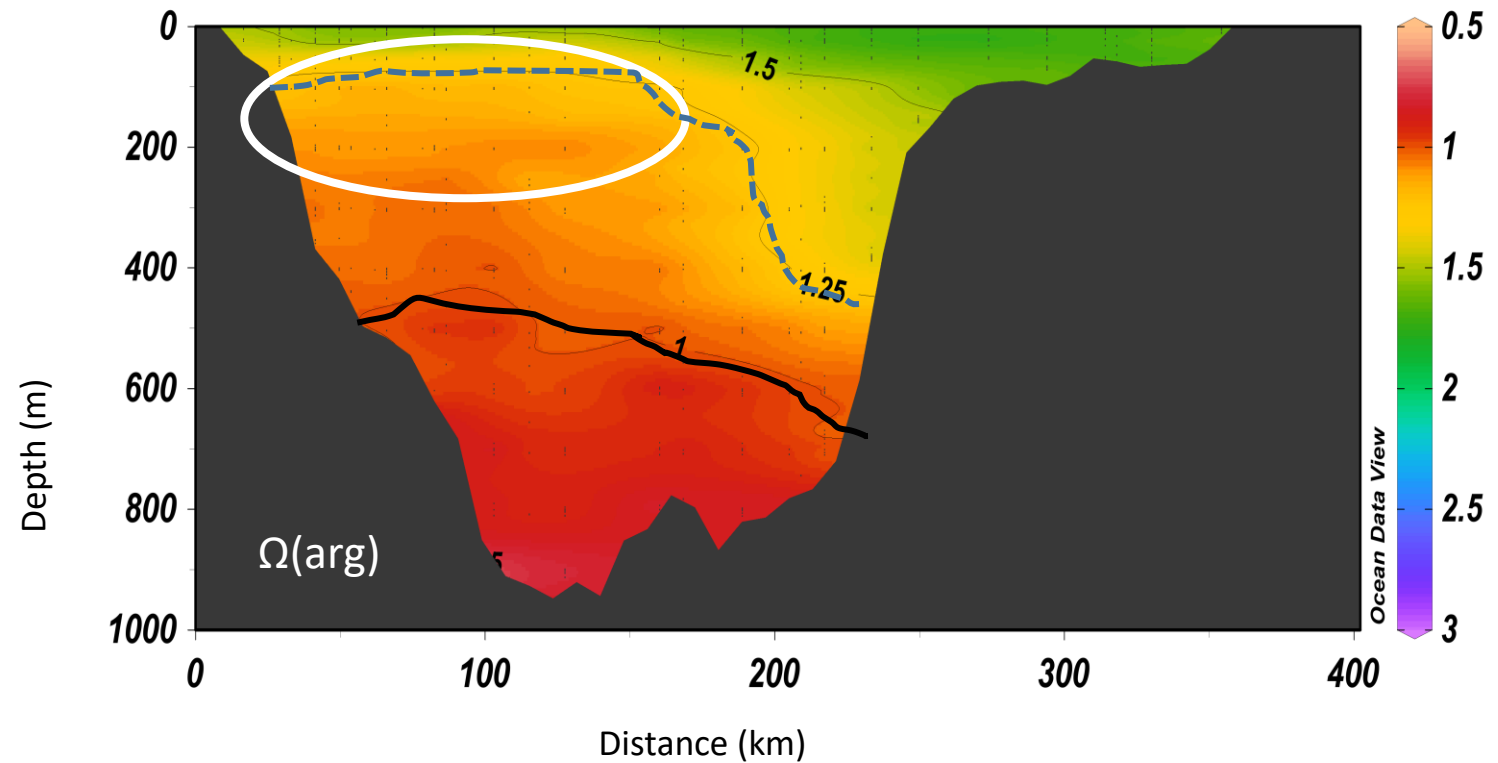
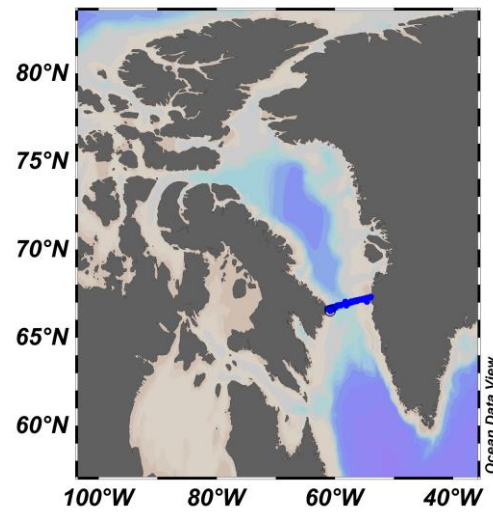


NASA Earth Observatory

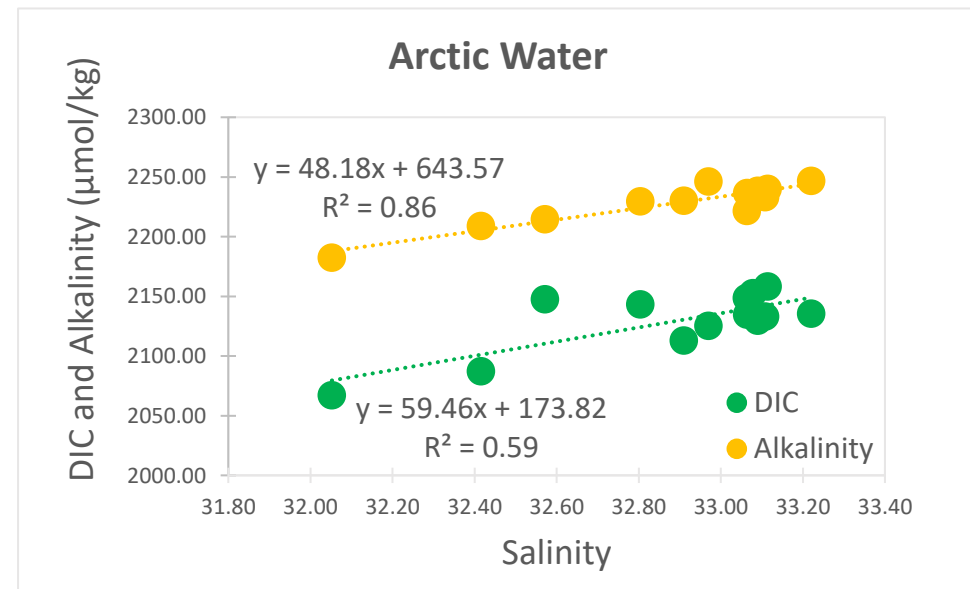
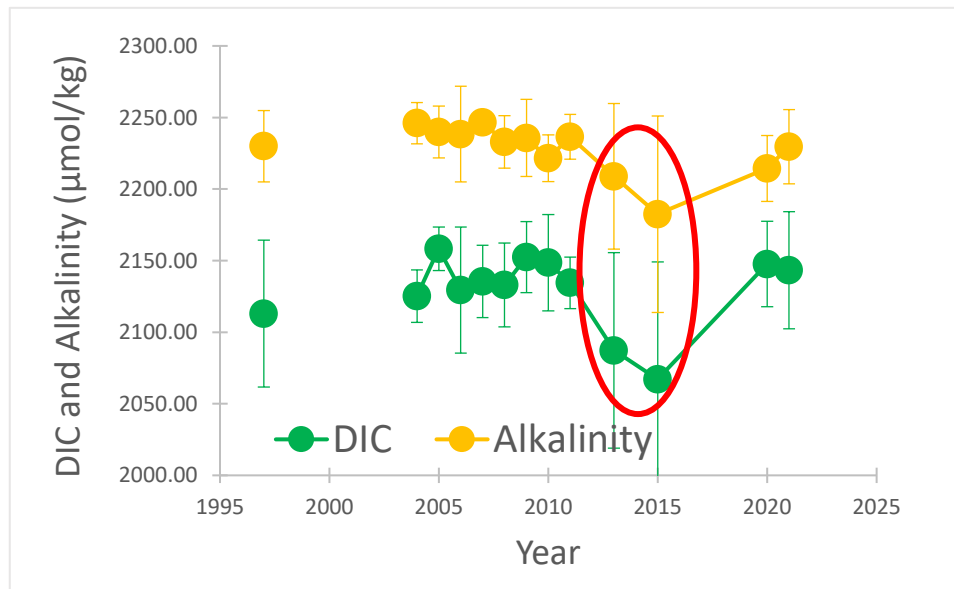
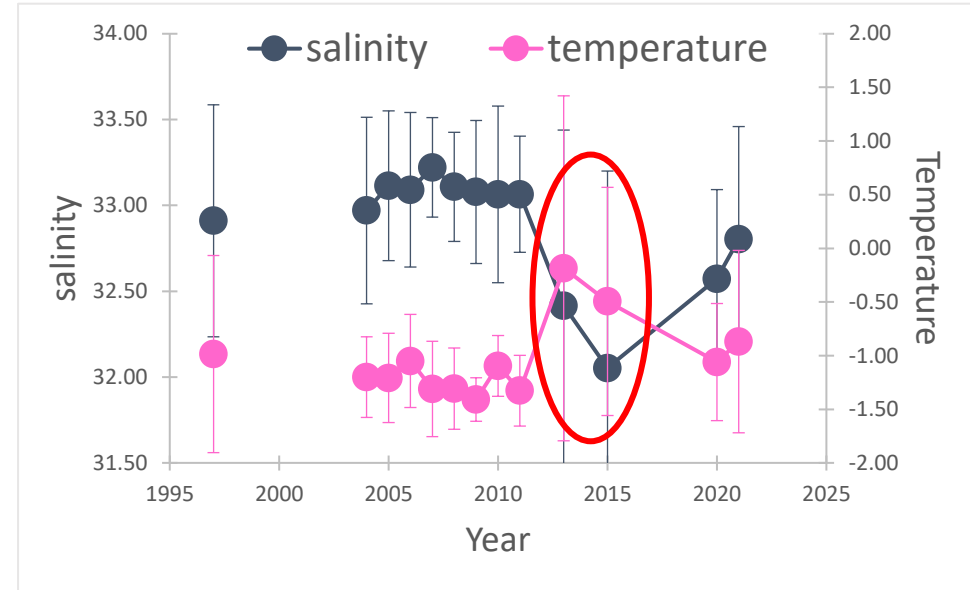
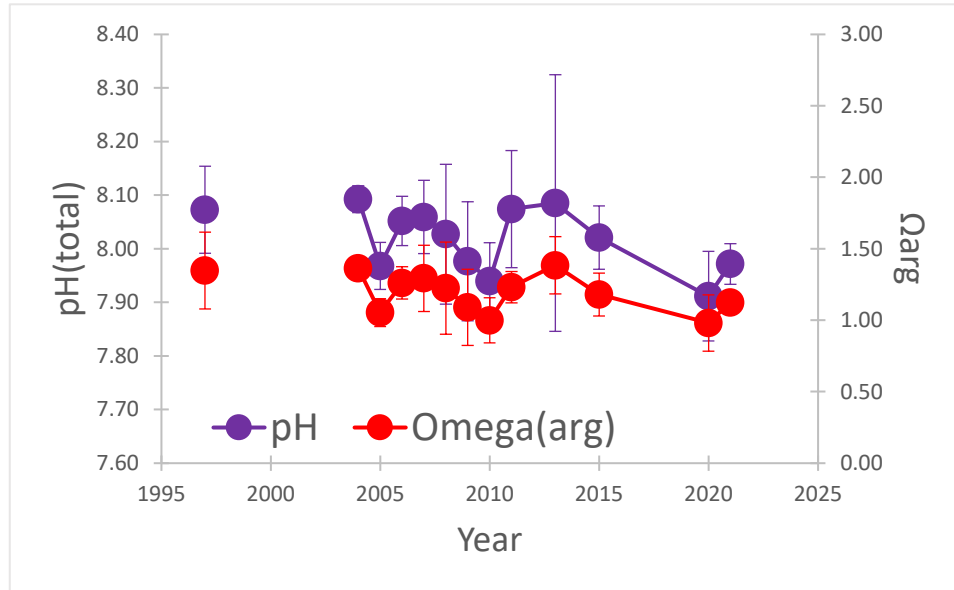
OA state amplification by FW (Glacial meltwater, sea ice meltwater, Arctic outflow, River water)

pH(total) and aragonite saturation state (Ω_{arg}) in Arctic Water ($S < 33.7$, $T < 2$) in Davis Strait

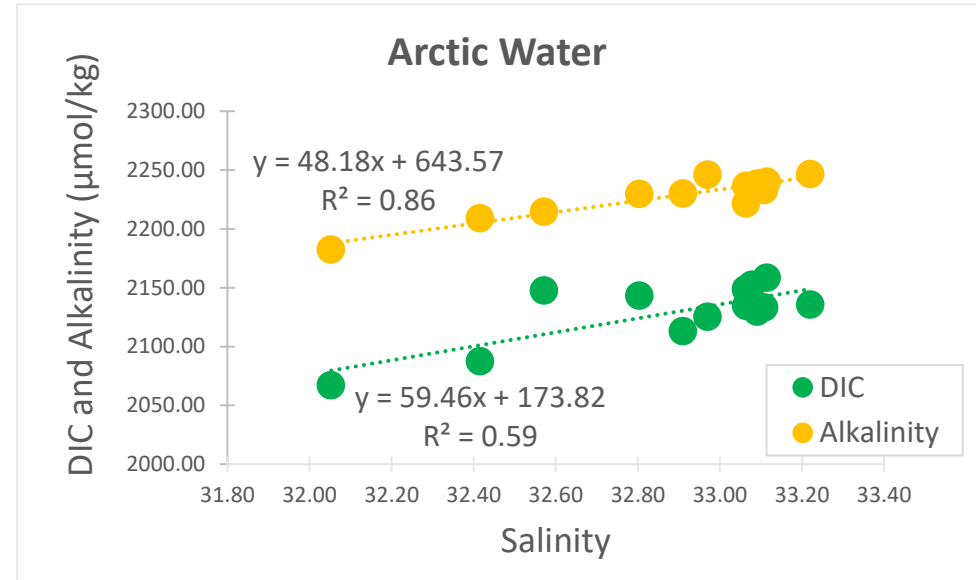
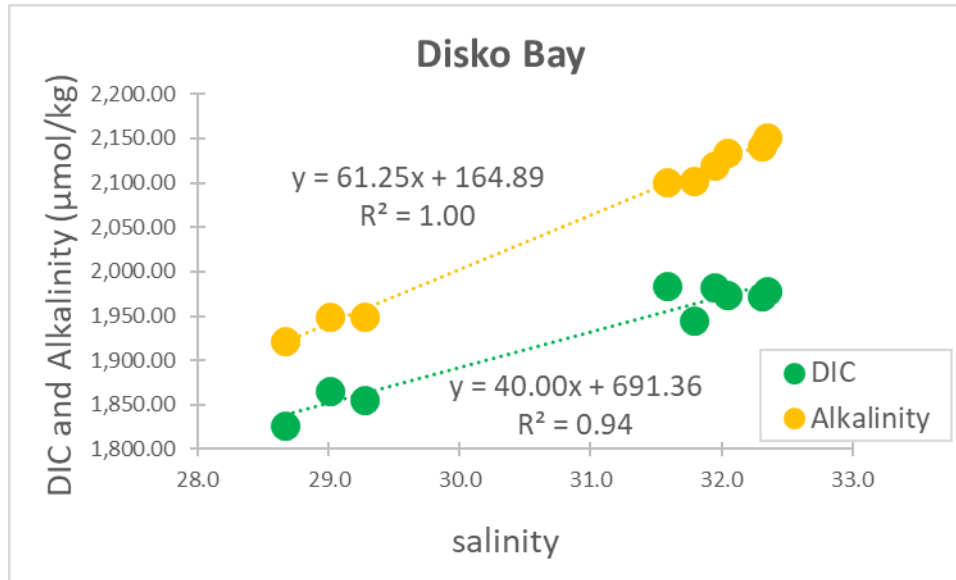
Davis Strait Section



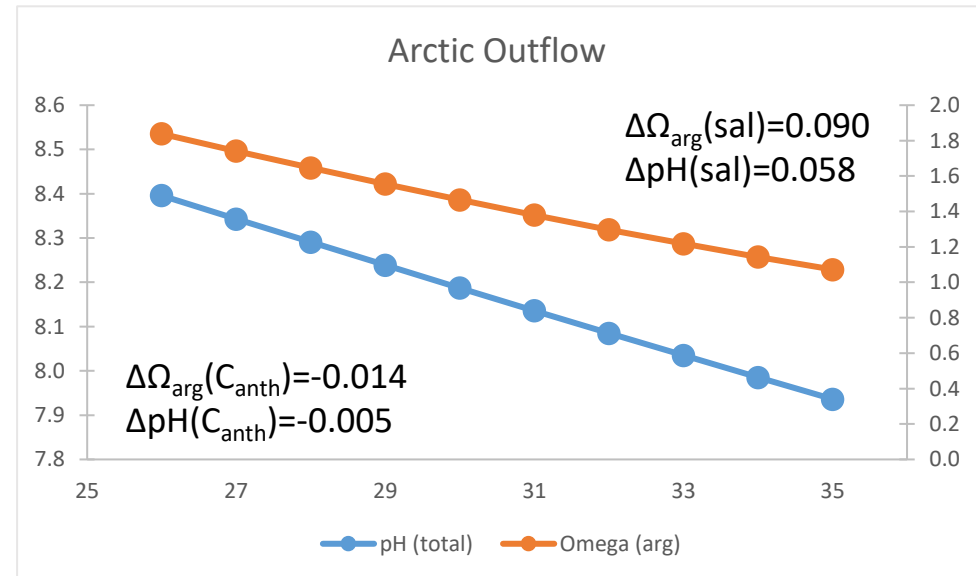
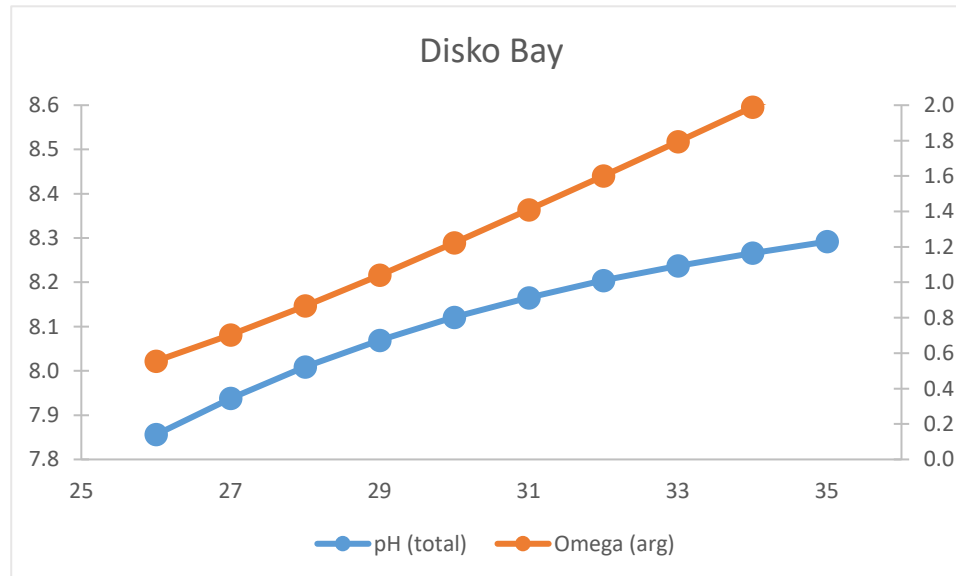
Temporal variation of carbonate chemistry during 2013 - 2021 in Arctic Water along Davis Strait



Freshwater with varying DIC and TA influences the large scale and local ocean acidification



(condition in the Arctic Water before 2011 as a control, $S=33.1$, $T=-1.24^\circ\text{C}$, $P=100\text{dbr}$, $\text{Alk}=2240 \mu\text{mol}/\text{kg}$, $\text{DIC}=2150 \mu\text{mol}/\text{kg}$)



Questions:

What papers do your cruise participants envision?

fluxes of freshwater, carbon, nutrients, control mechanisms, Regional oceanography (such as Greenland Icesheet influence vs. Arctic outflow), spatial and temporal variability, modelling

What synthesis papers do you see coming out of your cruise? (SAS synthesis papers?)

Budget estimates (Freshwater, carbon, nutrients, O₂, etc.), comparison among gateways, propagation of changes from upstream to downstream, Pan-Arctic TA vs. Sal compilation, pCO₂ integration (SOCAT-Arctic (updated Yasunaka et. al.'s work?)), how many cruises have underway pCO₂?)

What parameters outside of the core parameters were measured on your cruise? (please look at the cruise matrix on the SAS website)

CDOM / FDOM / DOM characterization

I-129, U-236 and C-14

Nd, Ba, REE

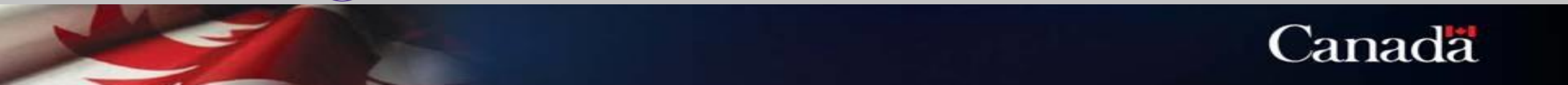
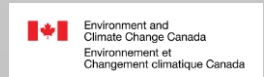
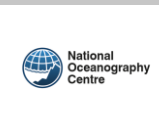
DON, DOP

mooring array - T&S, current, bottom pressure, marine mammal acoustics, O₂, automated seawater sampler

modelling



Davis Strait team, R/V Armstrong 2022



2022 surface salinity and temperature

