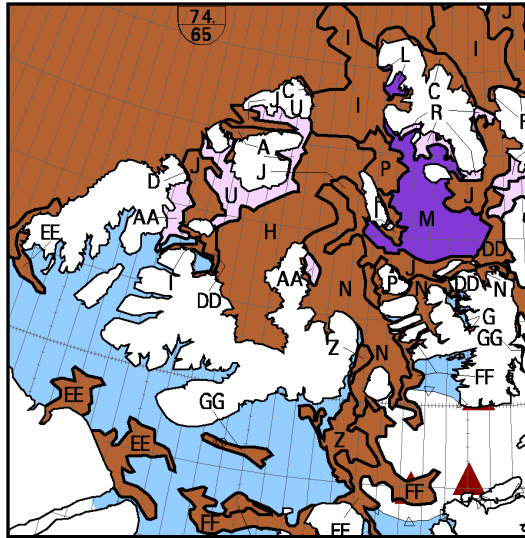


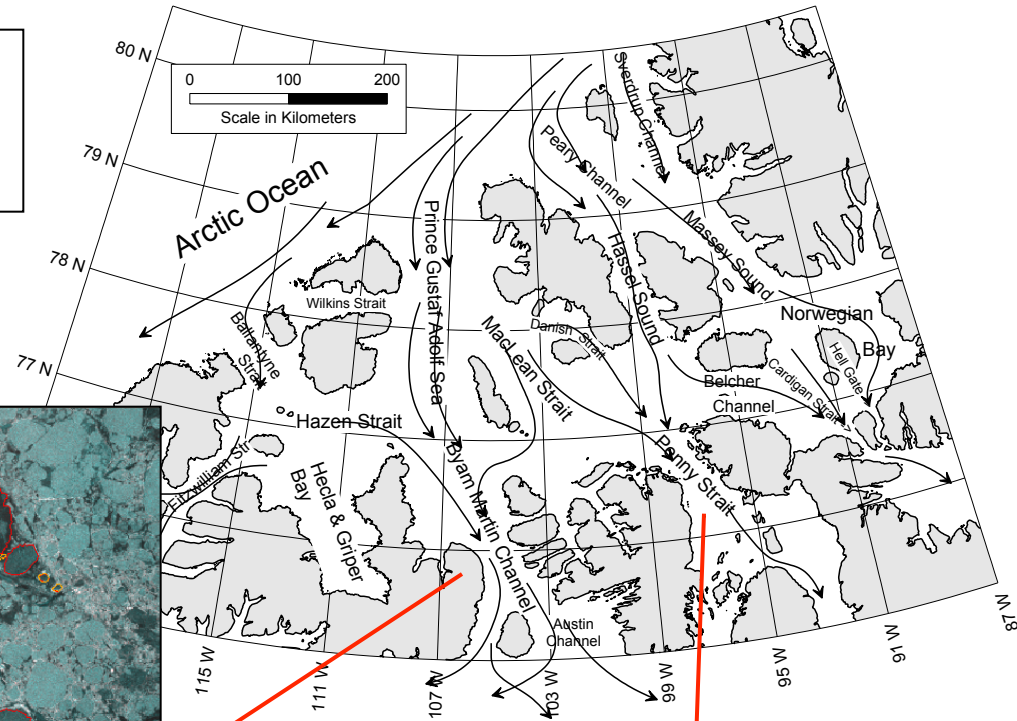
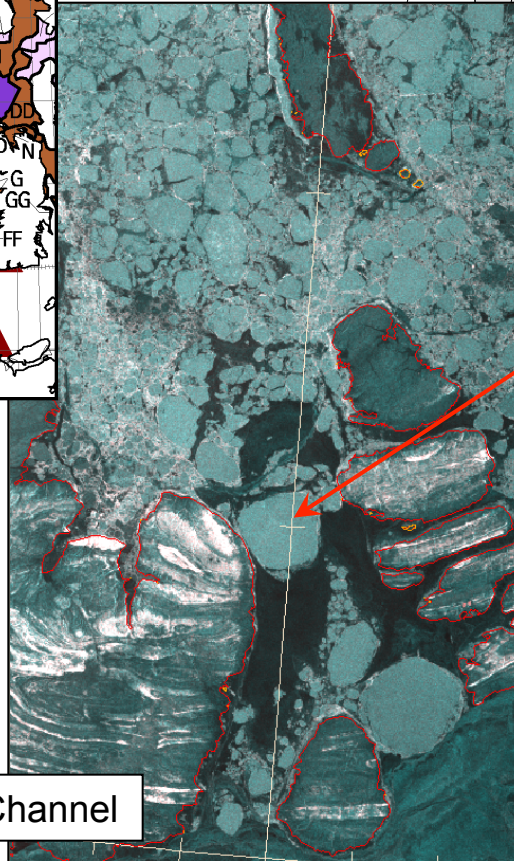
Multi-year Ice of the Canadian Polar Shelf, April 2012

Measure old ice leaving the Sverdrup Basin.
Observations by sonar on submerged moorings.
1st update in 35 years.

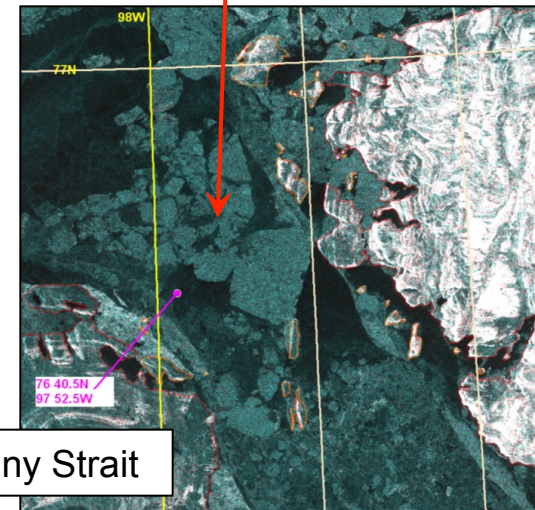


Moorings reached by
aircraft & serviced
through the ice
April 2012

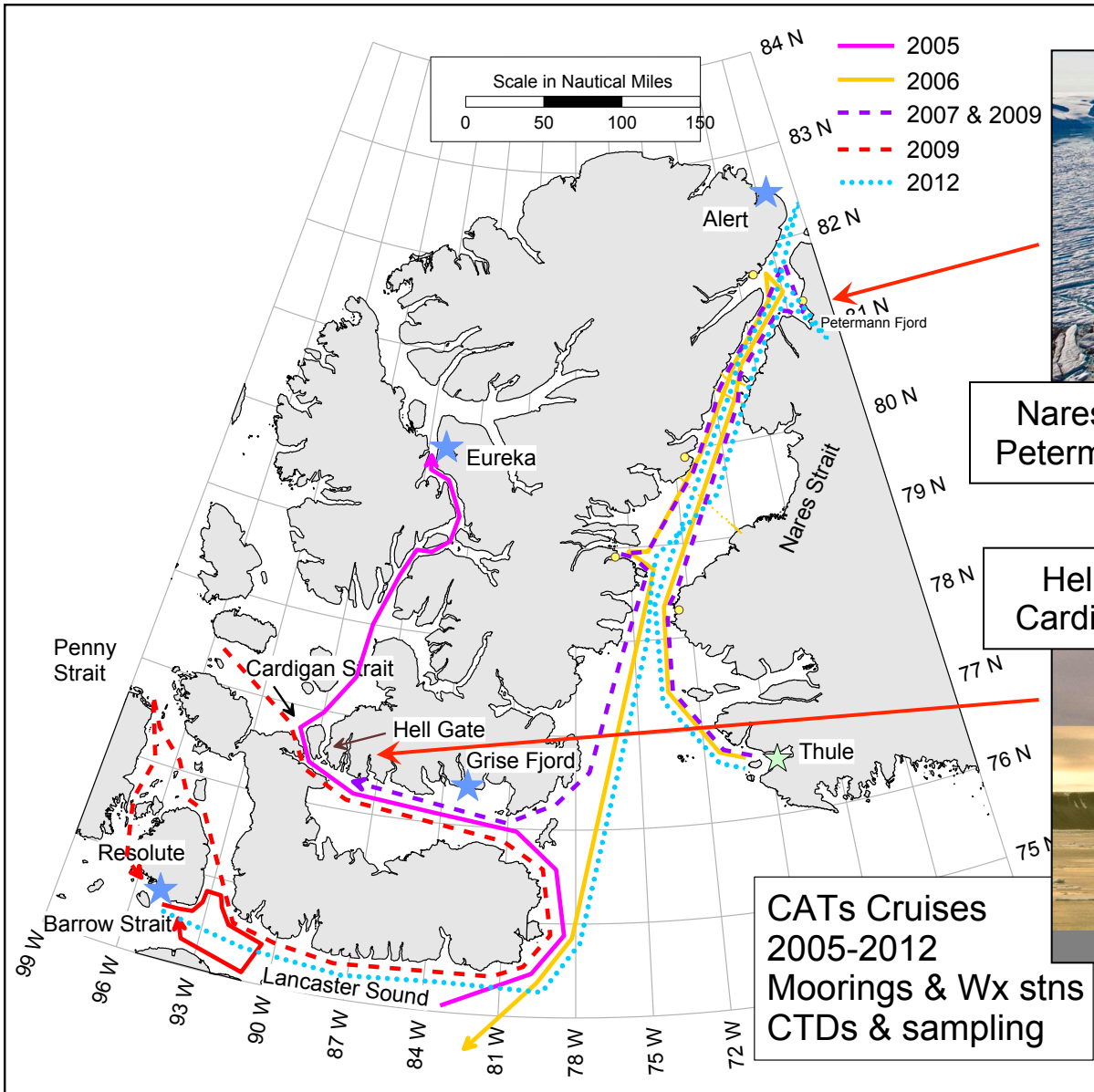
Byam Martin Channel



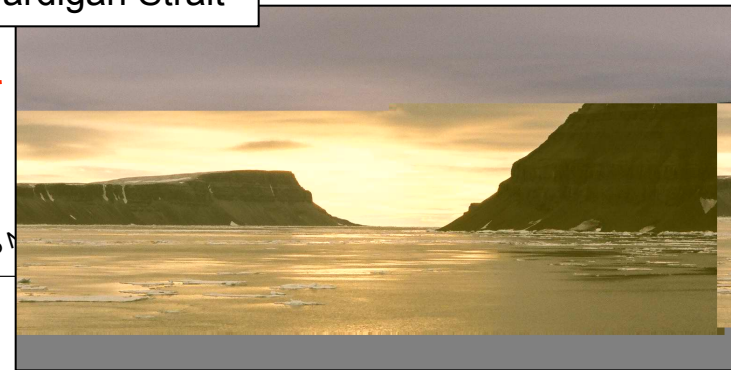
Penny Strait



Canadian Arctic Through-flow: 2003-2012



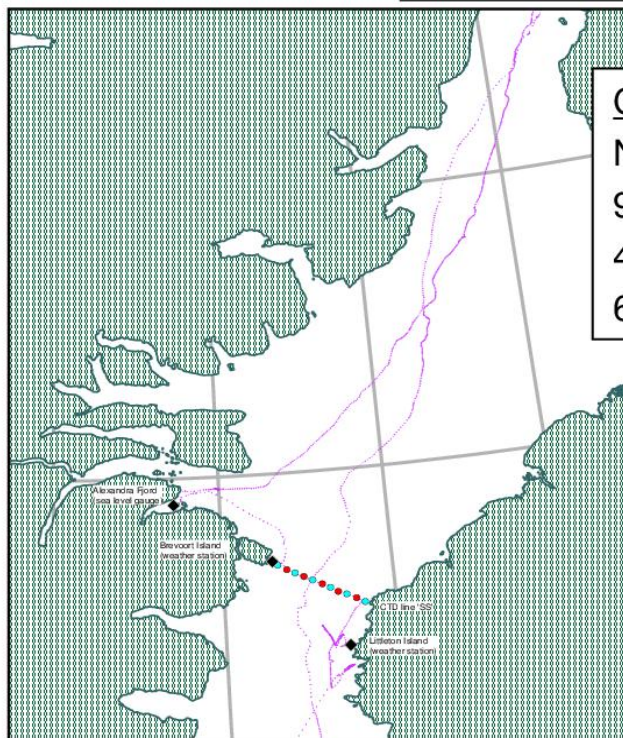
Nares Strait & Petermann Fjord



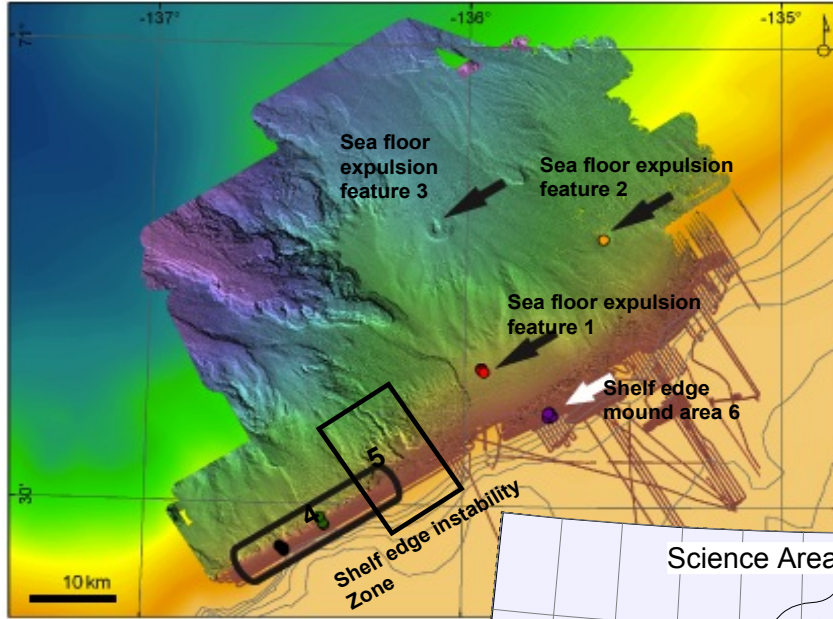
Hell Gate & Cardigan Strait

Peter New

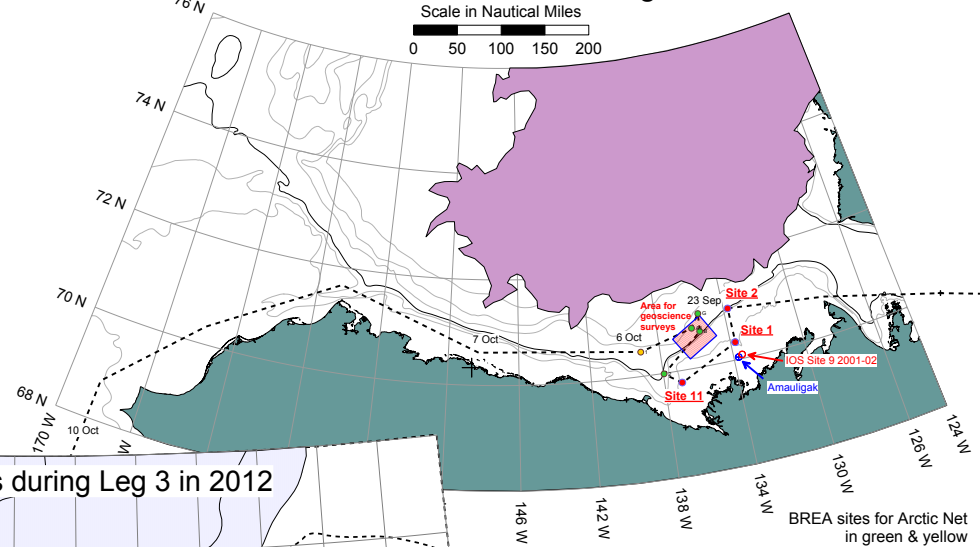
6 CTD-rosette sections



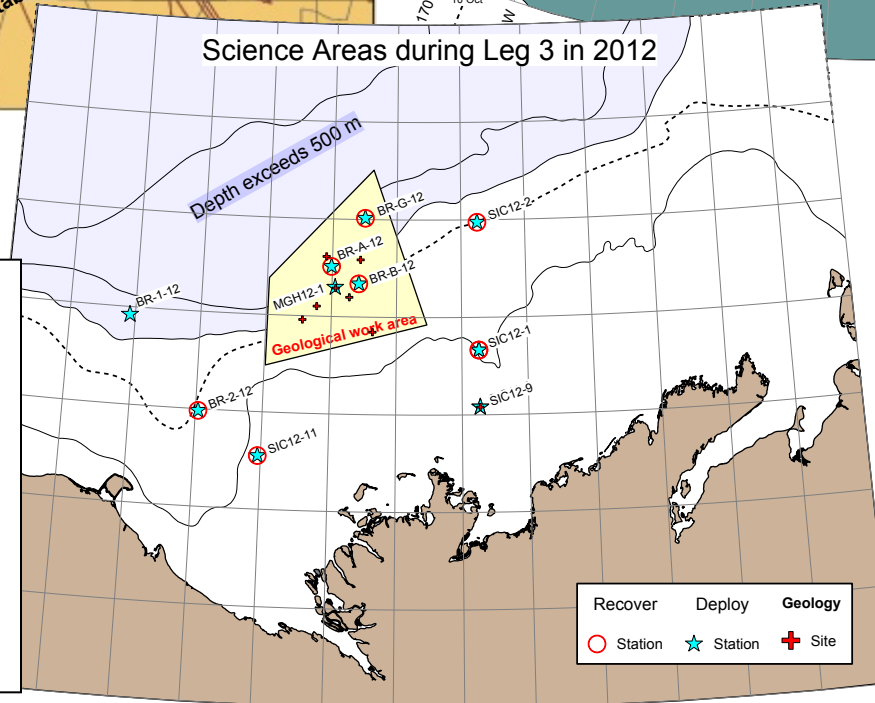
Beaufort Marine Hazards, Sep-Oct 2012



CCGS Sir Wilfrid Laurier, 2012 Arctic Patrol
Science stations on Leg 3



Science Areas during Leg 3 in 2012



CCGS Sir Wilfrid Laurier

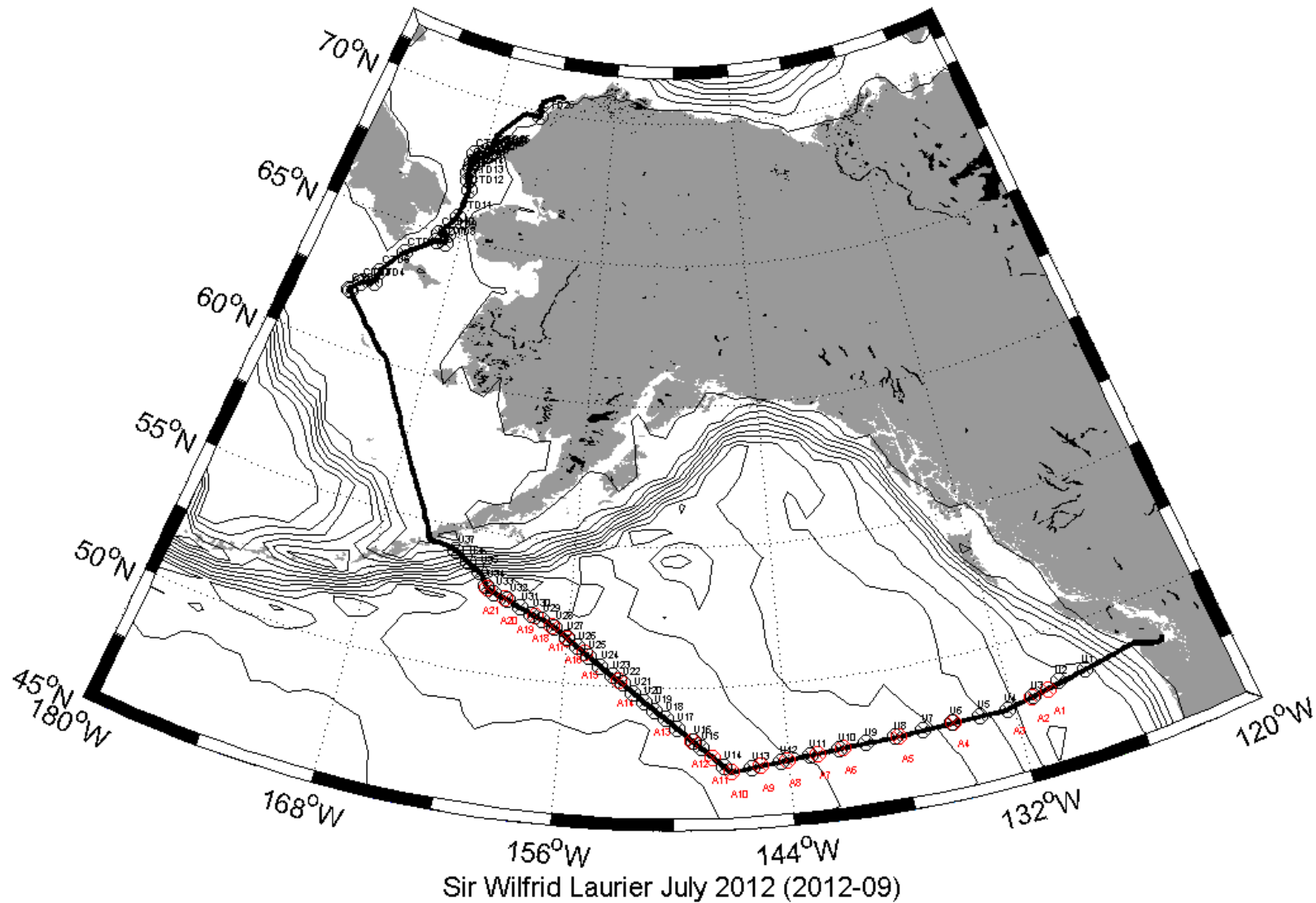
9 moorings
Huntec shallow seismic
Mapping of gas plumes
ROV seabed recce to 800 m (HD video)
Gas sampling
Piston coring

Marine Hazards

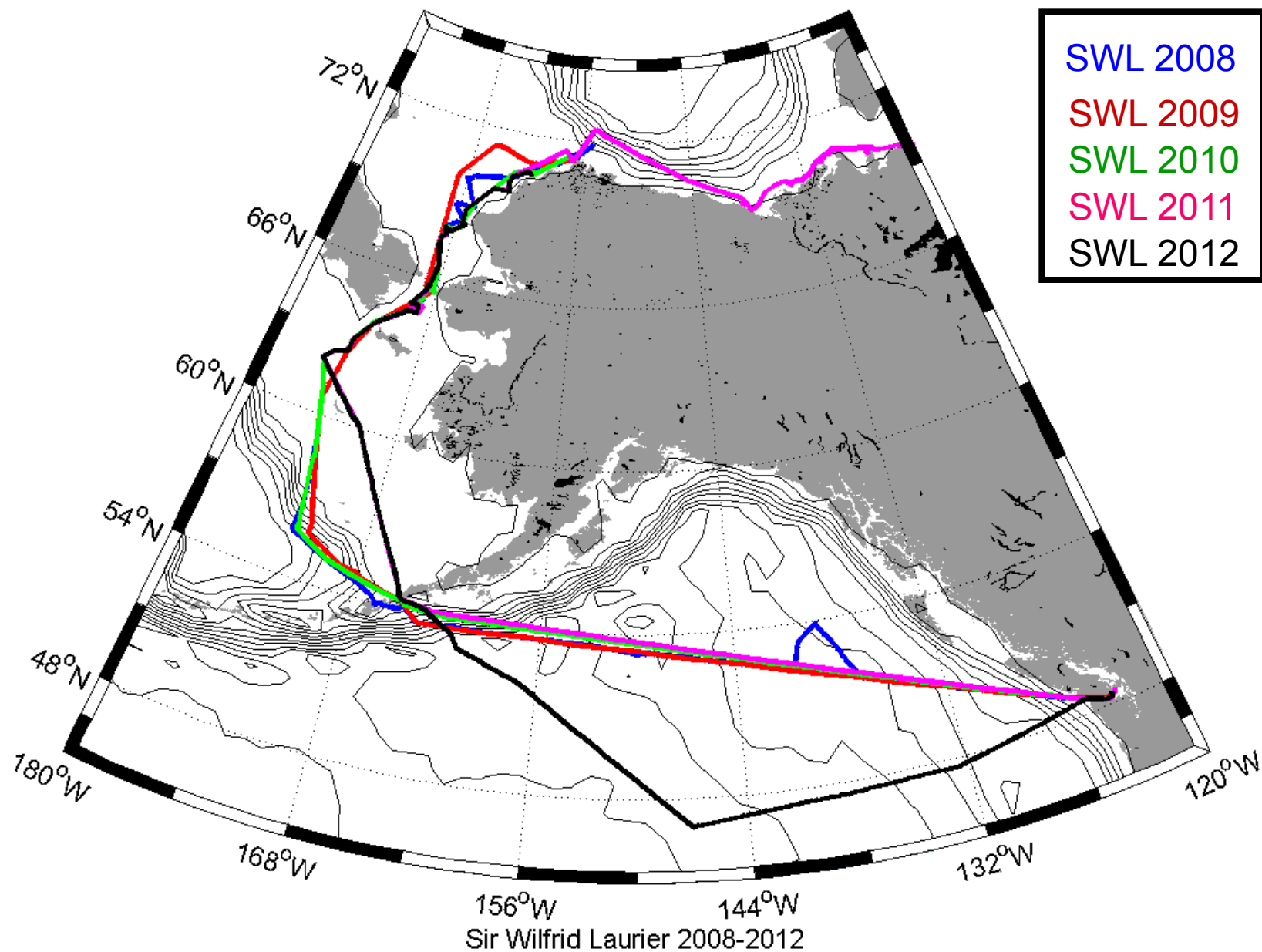
Sea ice
Waves & surge
Shallow gas
Subsea permafrost
Land slips
Unique habitat

C3O West

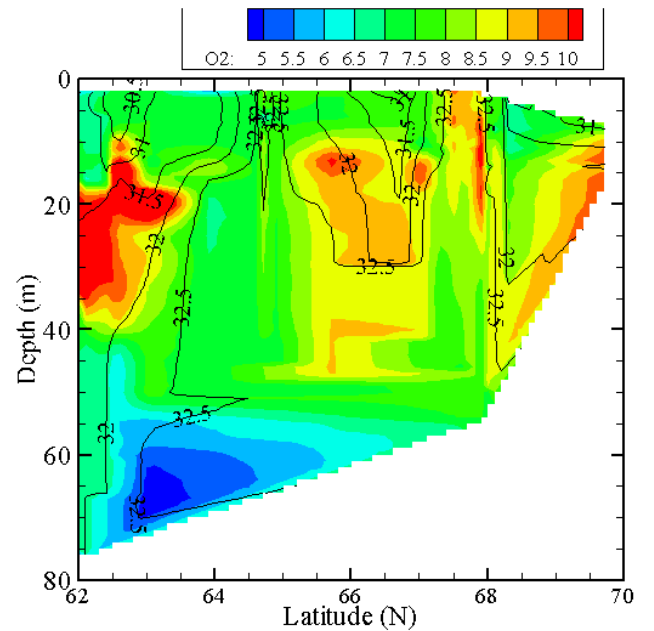
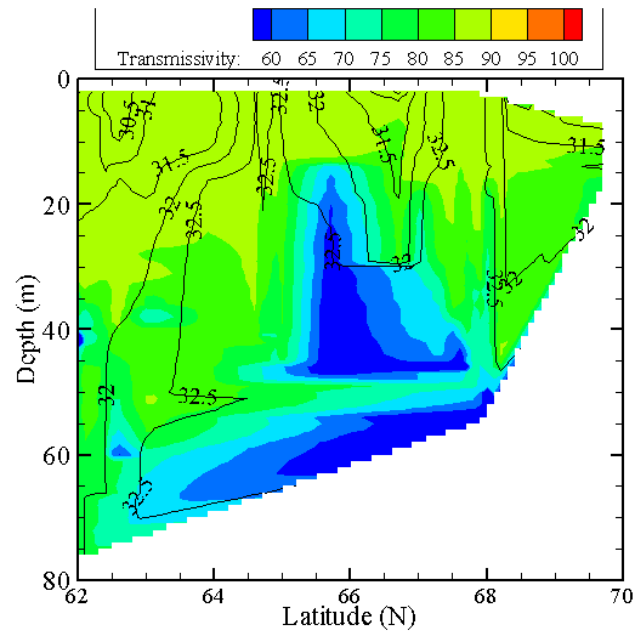
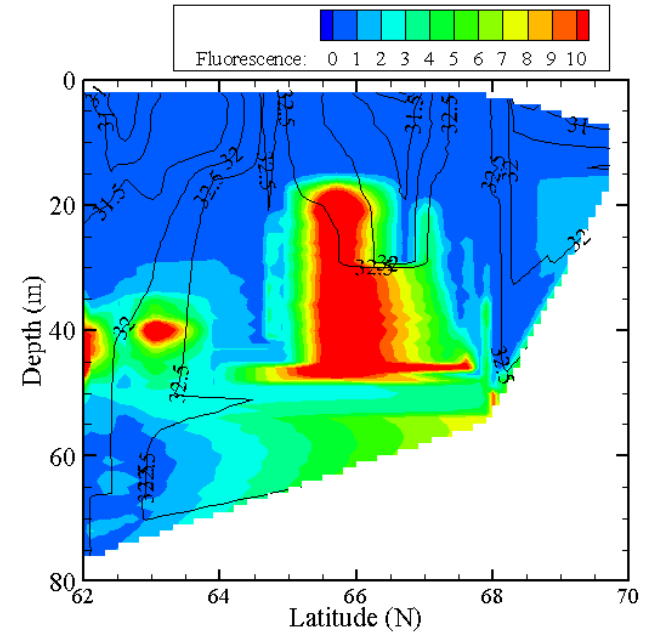
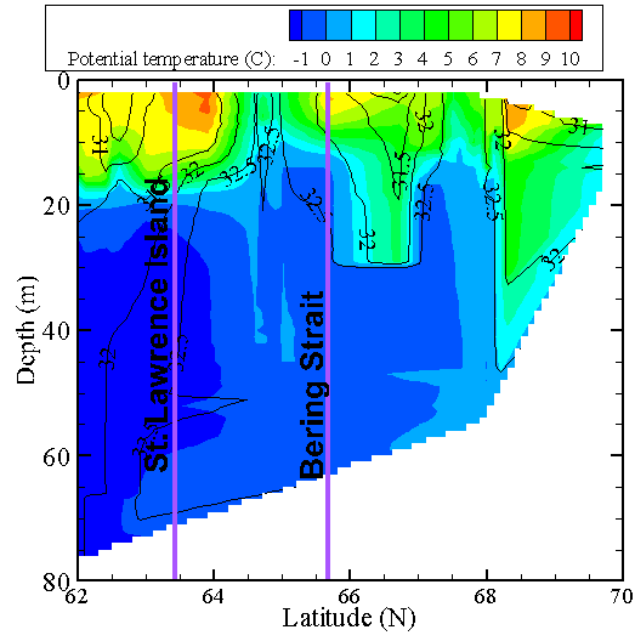
Sir Wilfrid Laurier ship track July 2012



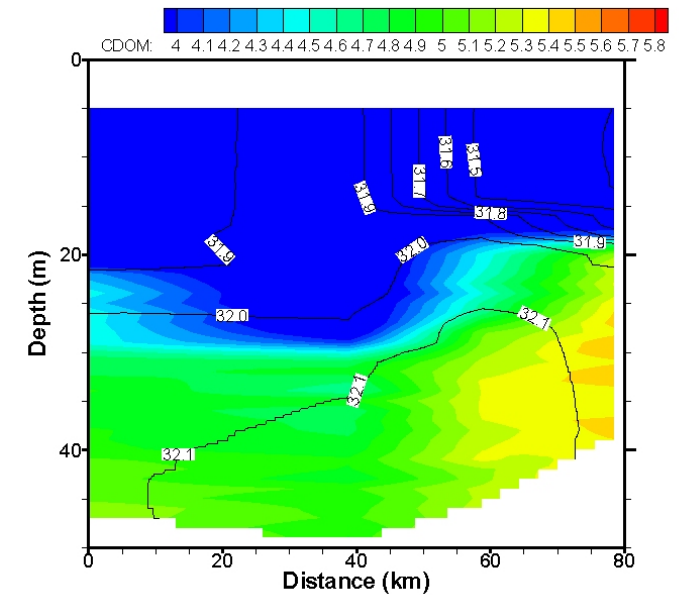
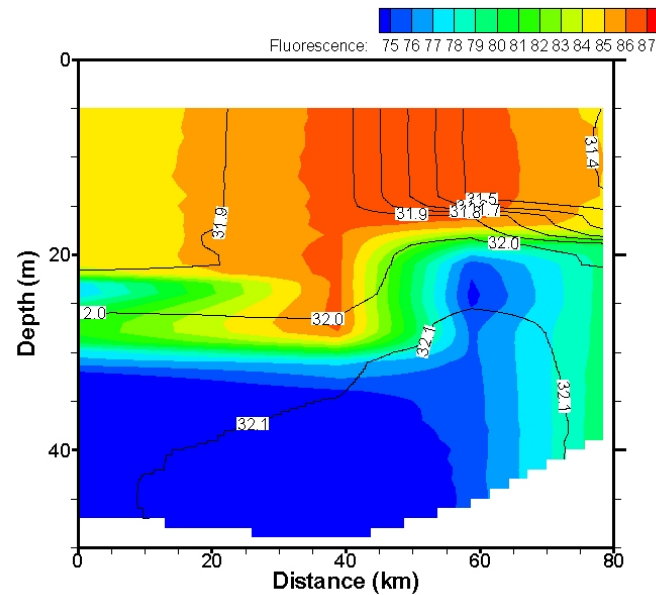
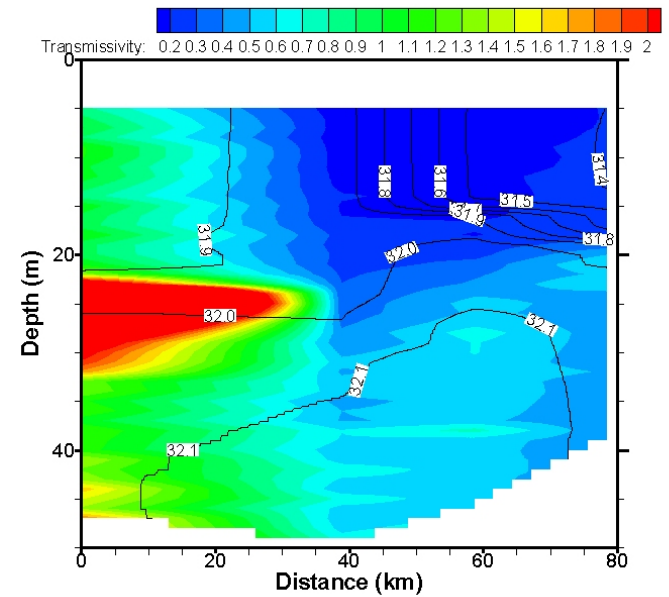
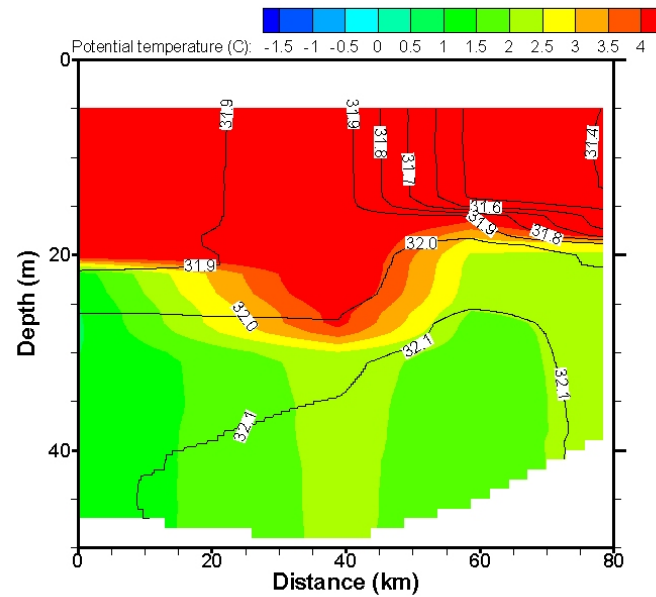
Sir Wilfrid Laurier ship tracks 2008-2012



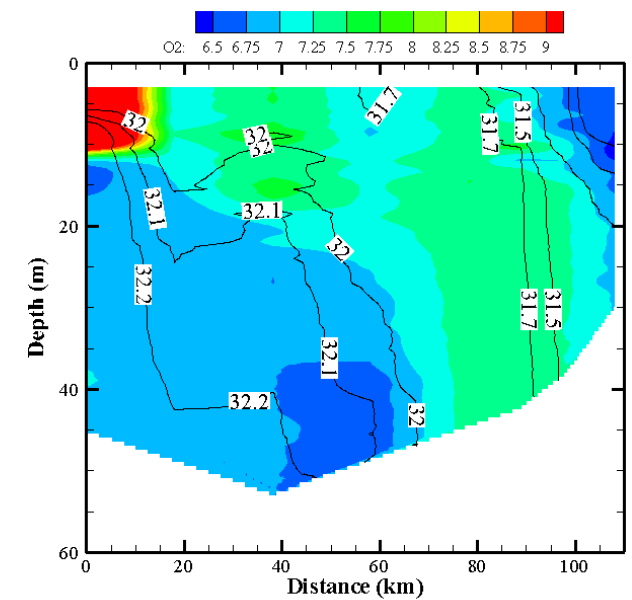
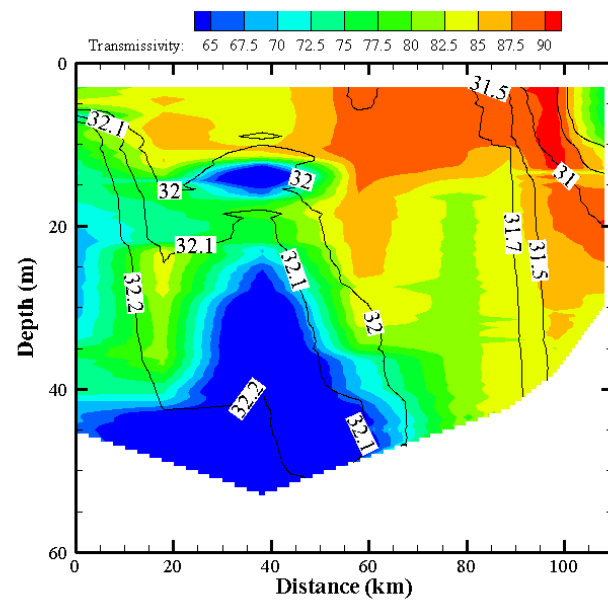
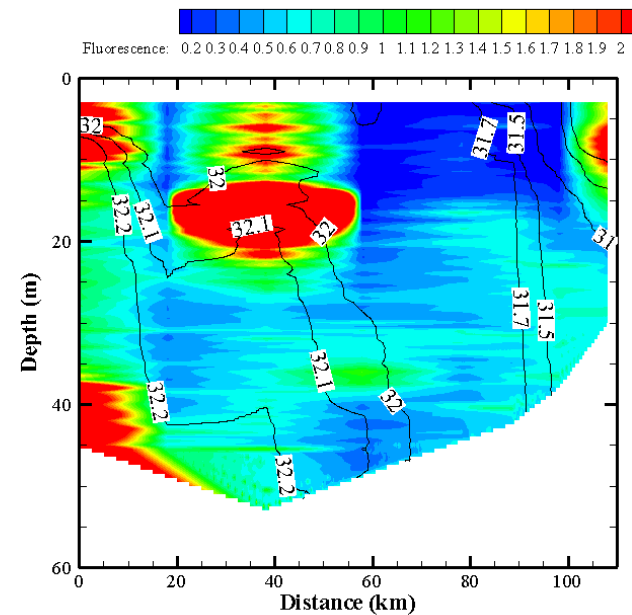
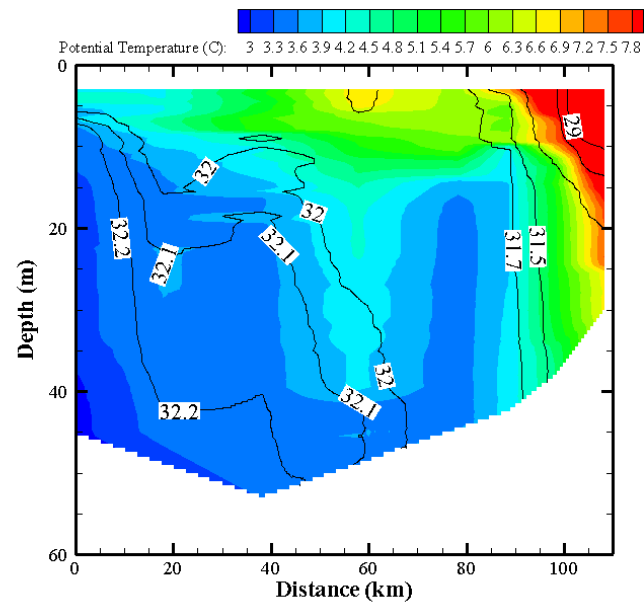
SWL CTD data July 2012 Bering and Chukchi Seas



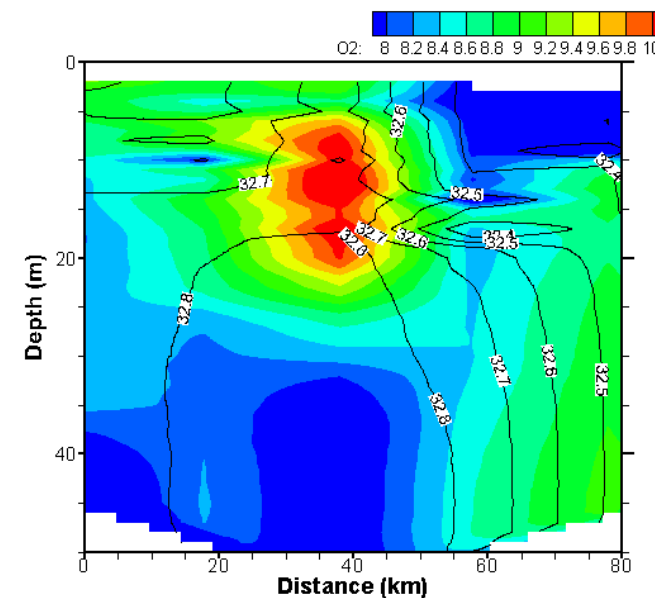
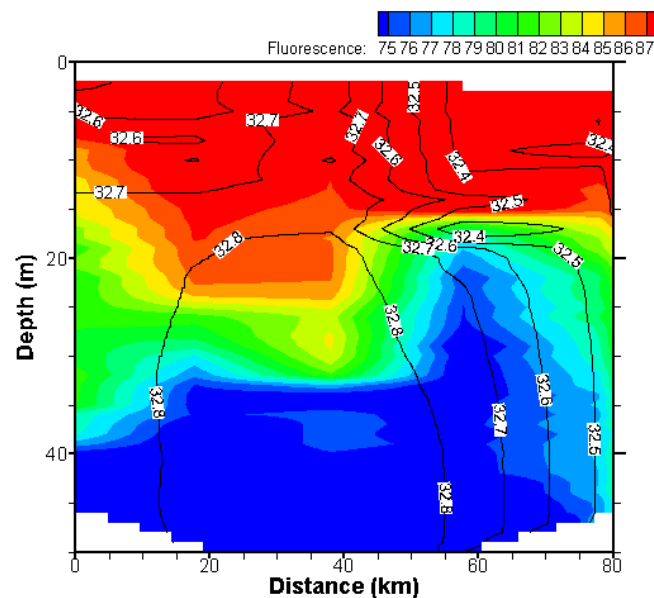
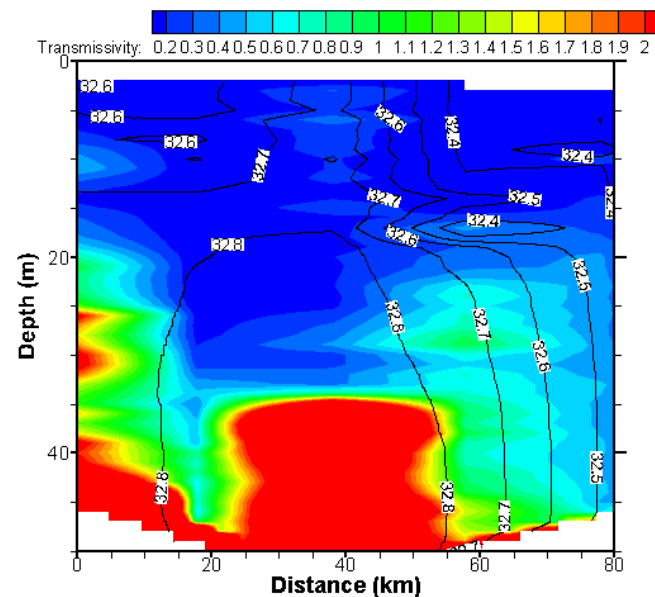
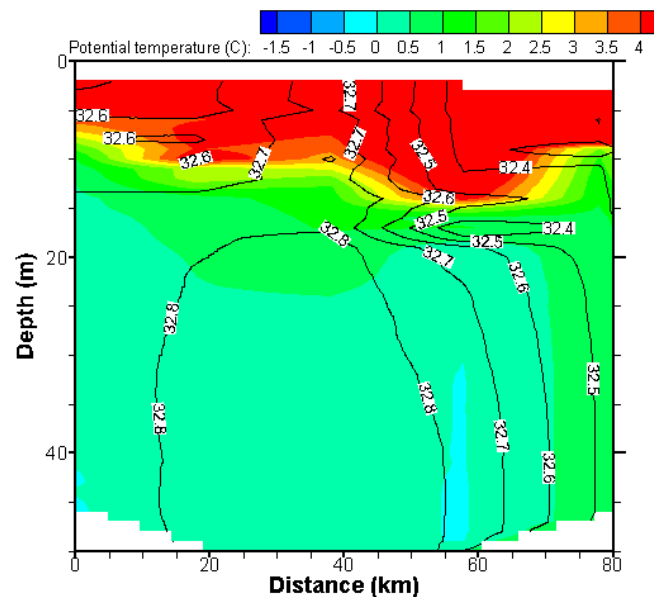
Southern Chukchi Sea (SCS) Transect SWL 2010-05



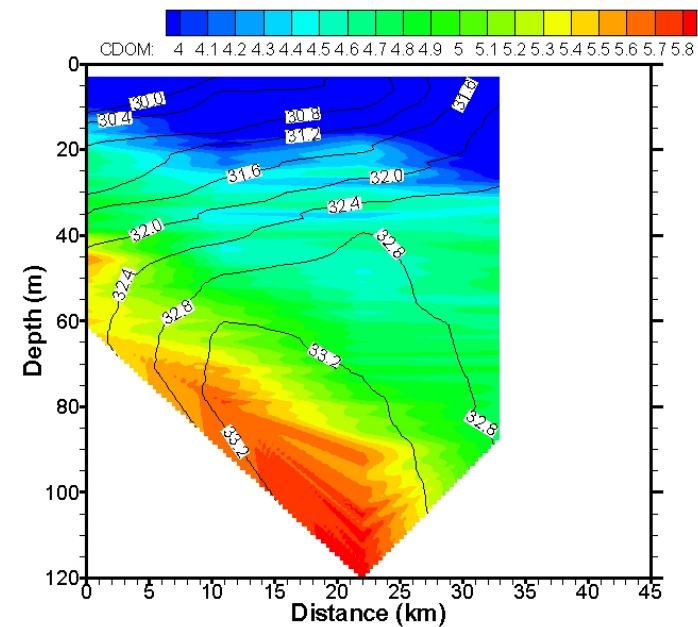
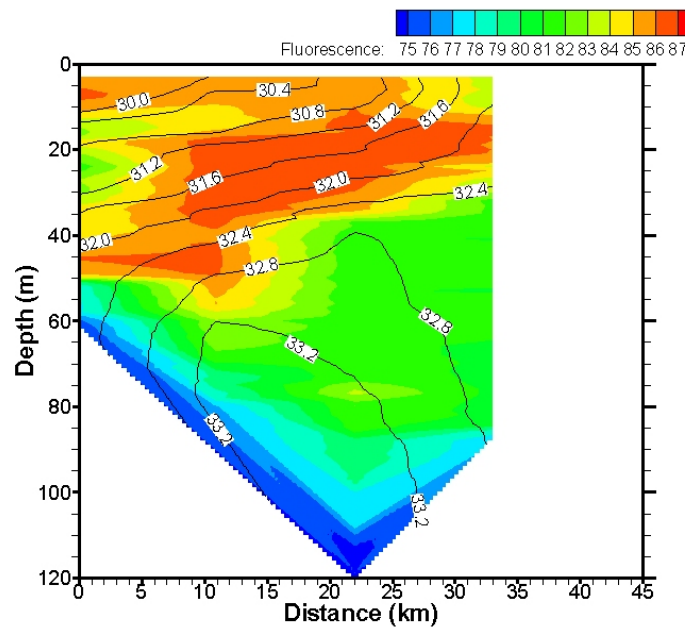
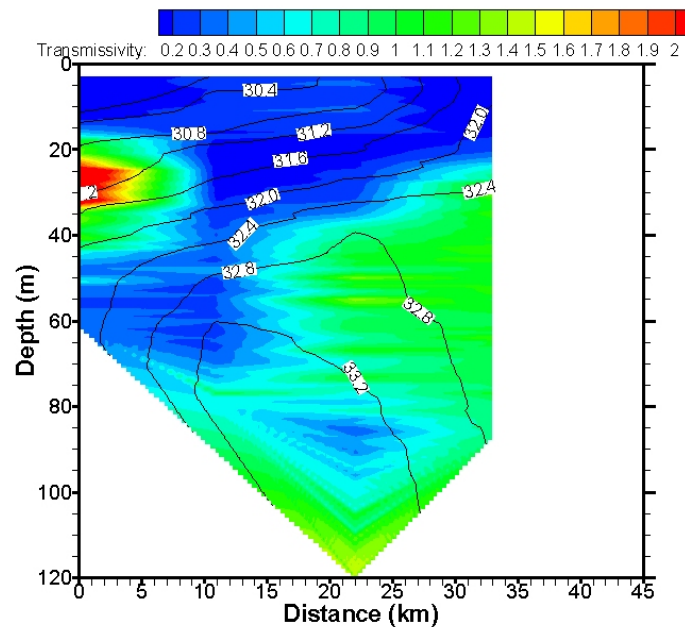
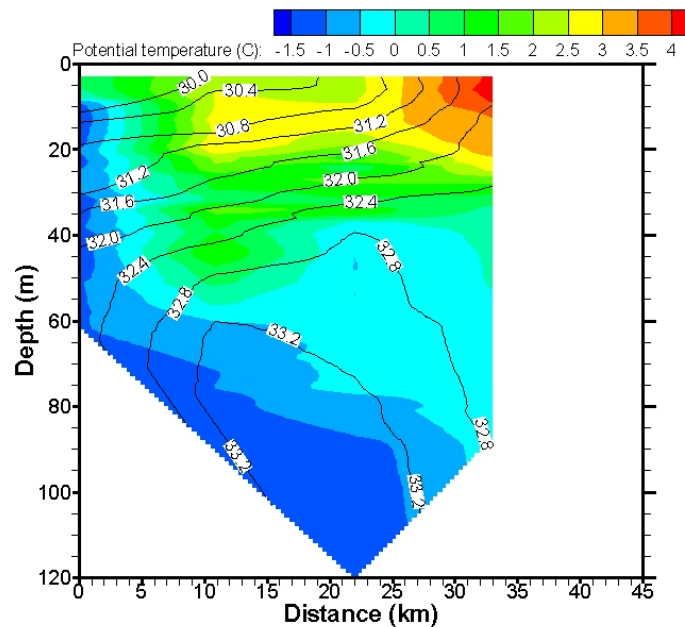
SE Chukchi Sea Transect SWL 2011-18, July 18



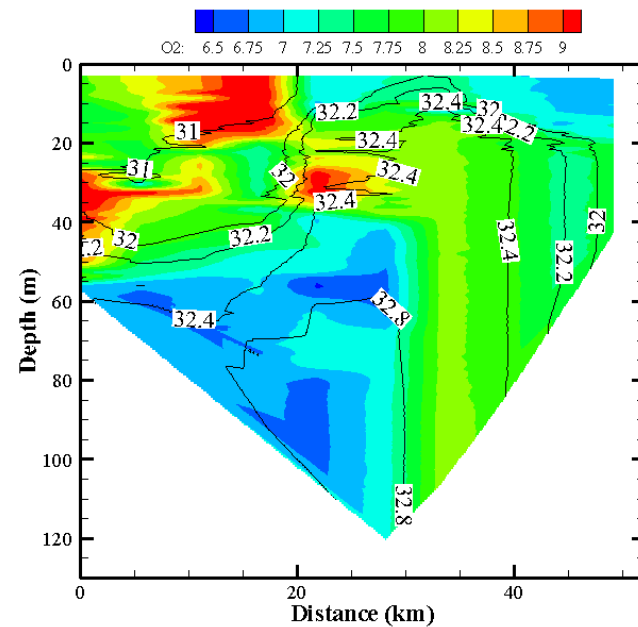
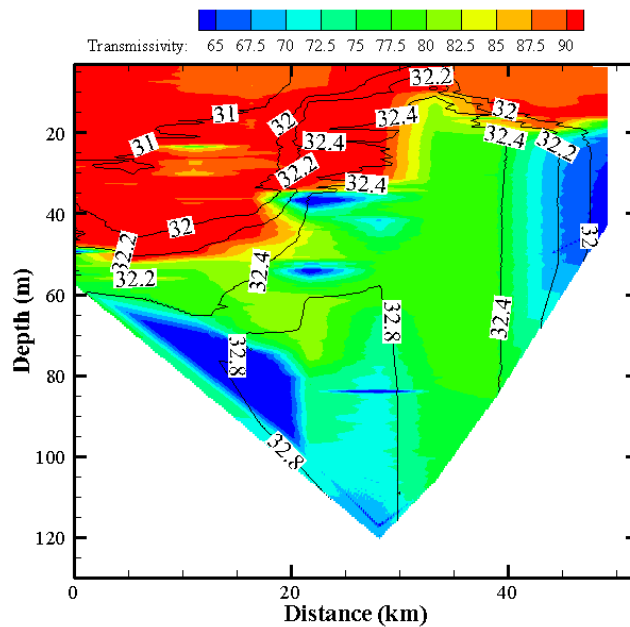
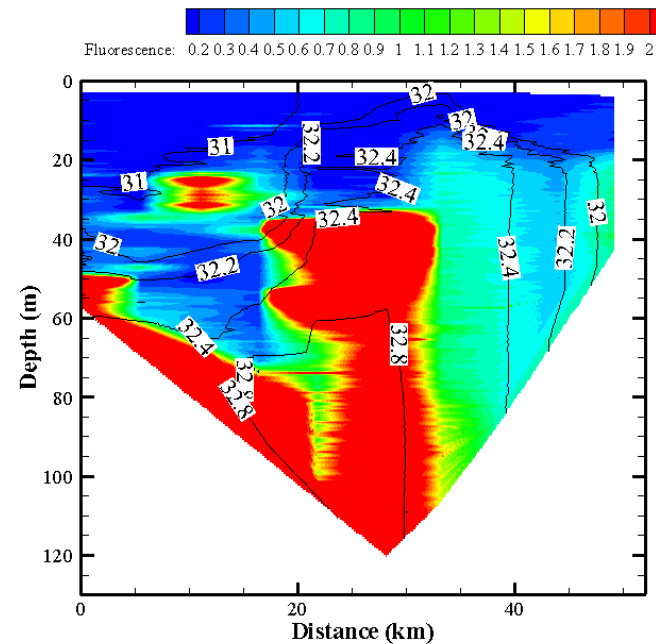
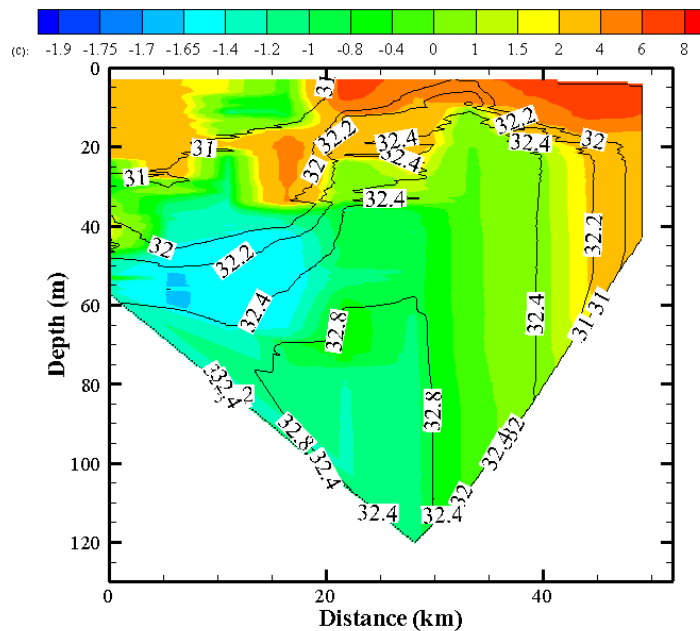
Southern Chukchi Sea (SCS) SWL 2012-09 July 18

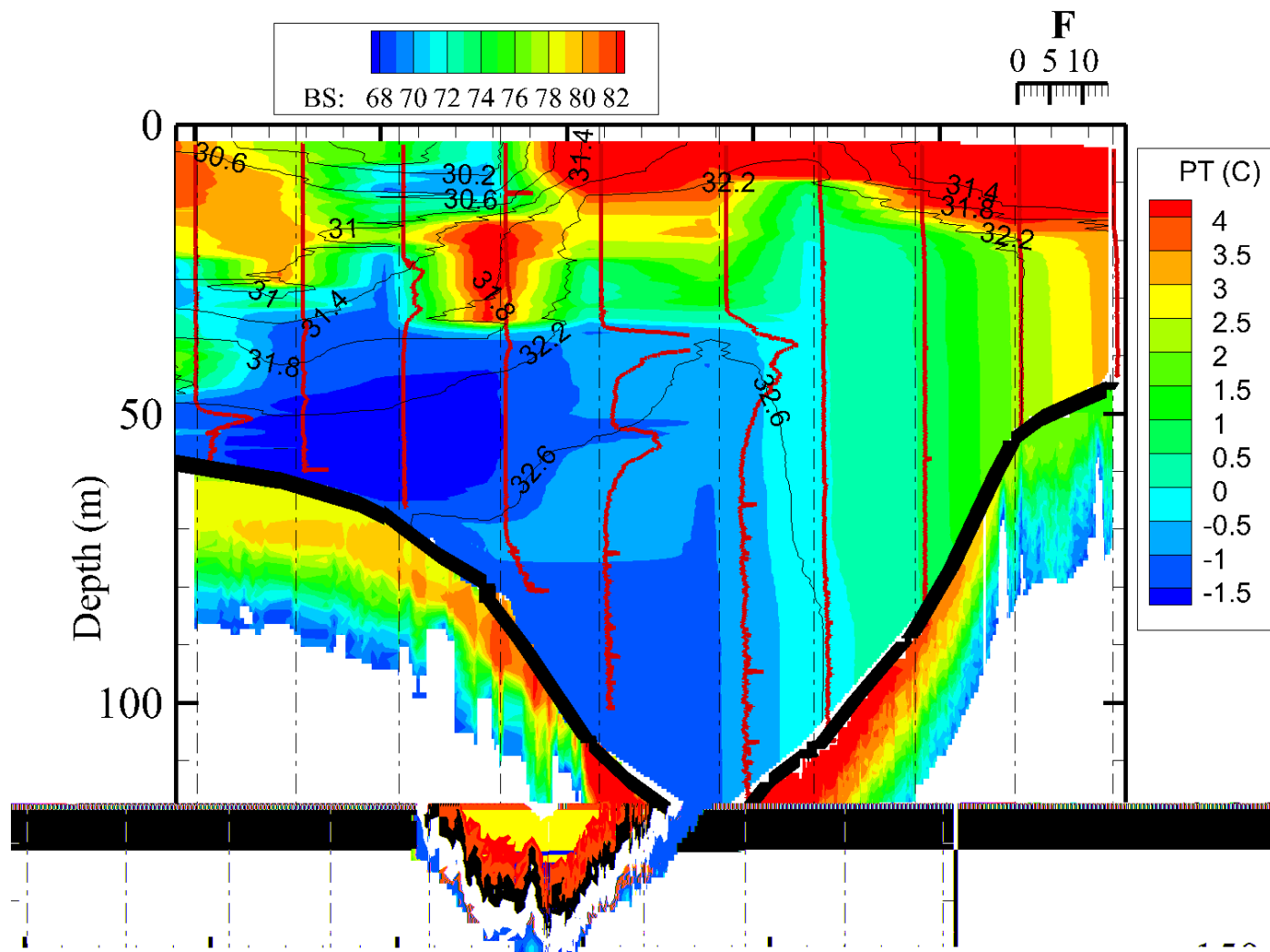


Barrow Canyon Transect SWL 2010-05

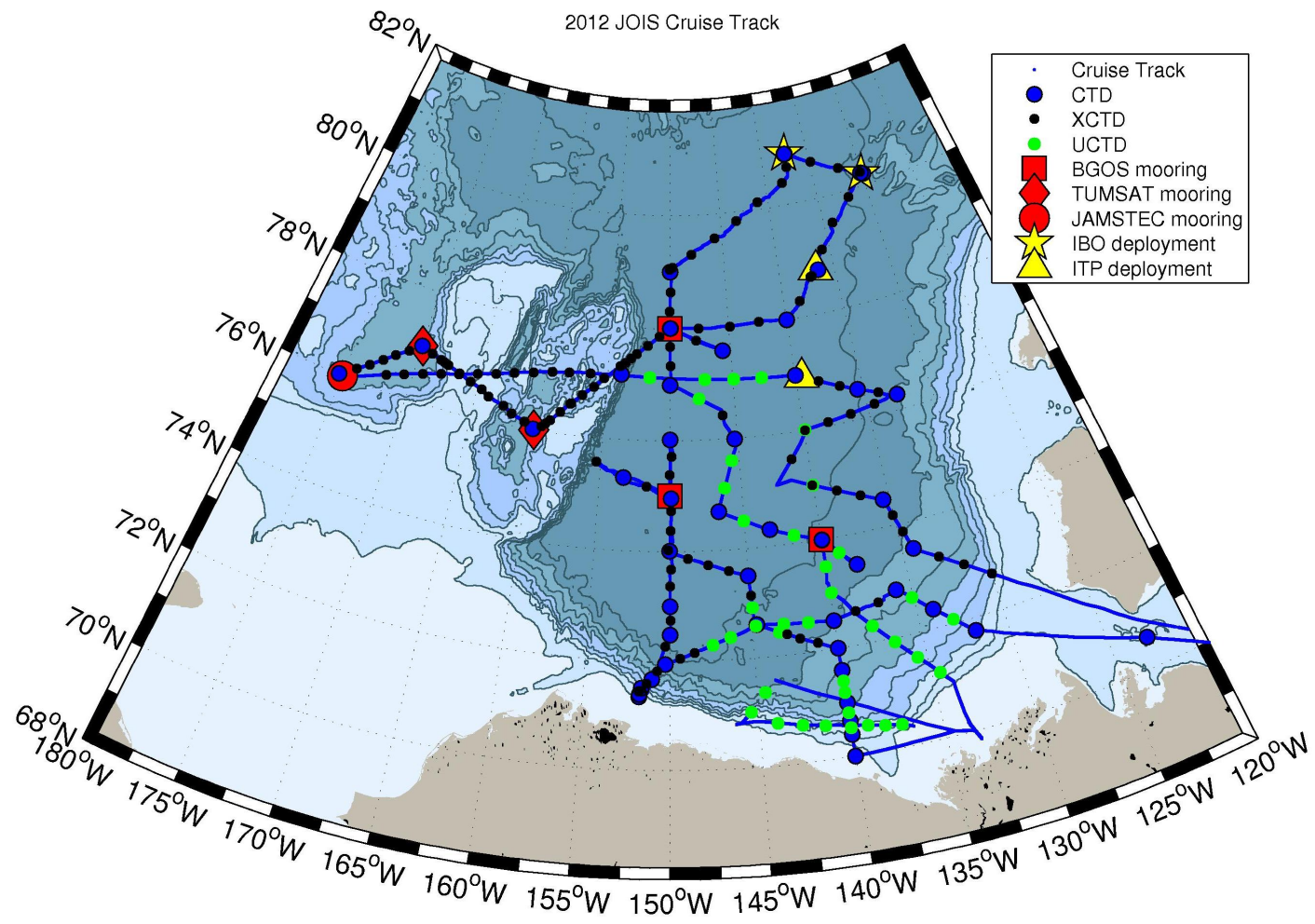


Barrow Canyon Transect SWL 2011-18, July 20-21

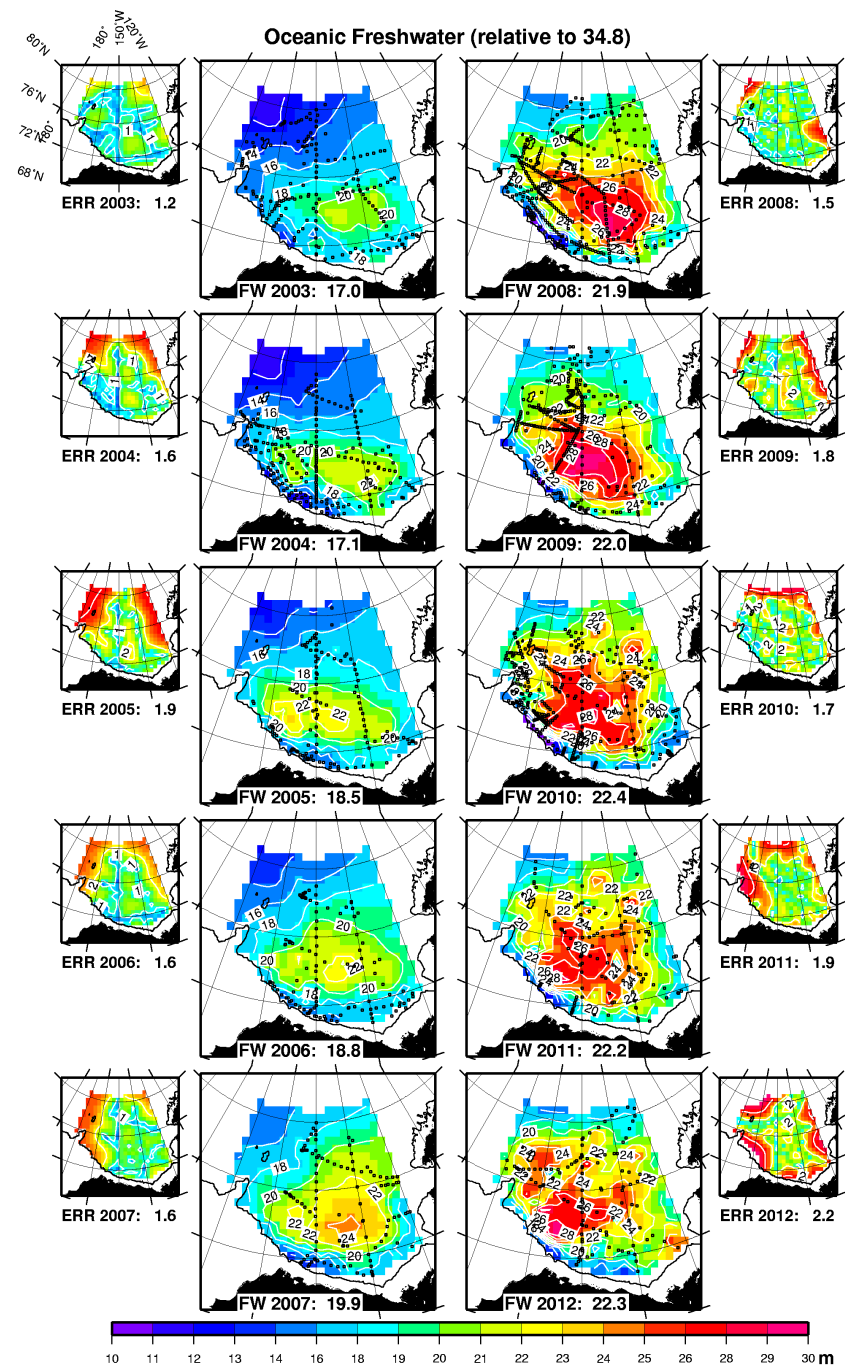




JOIS 2012

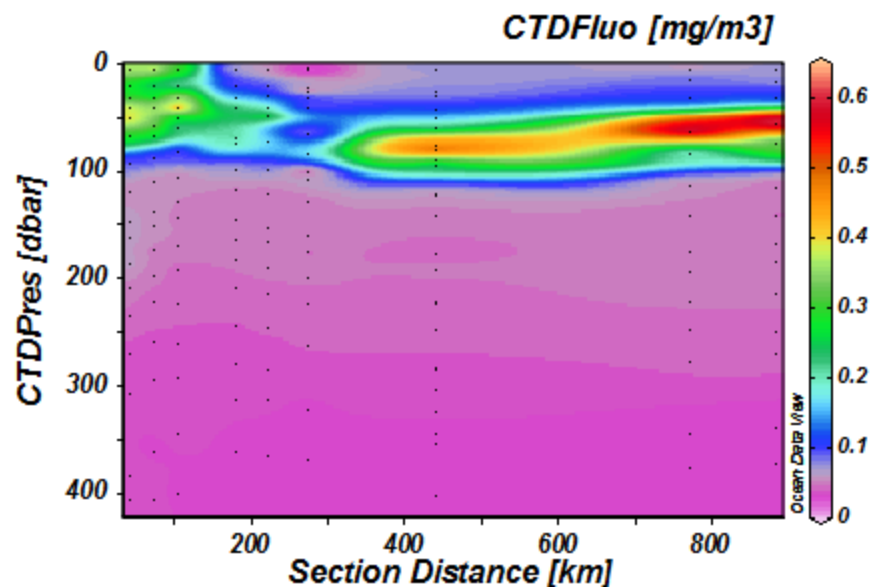
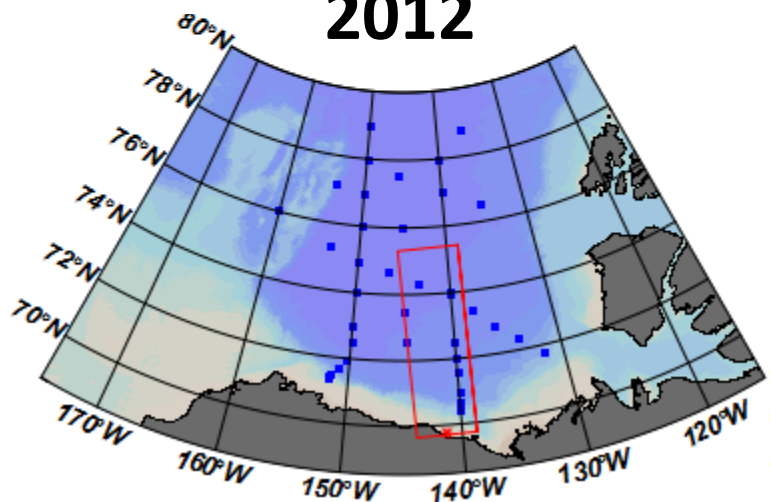


Freshwater in the Beaufort Gyre from 2003 - 2012

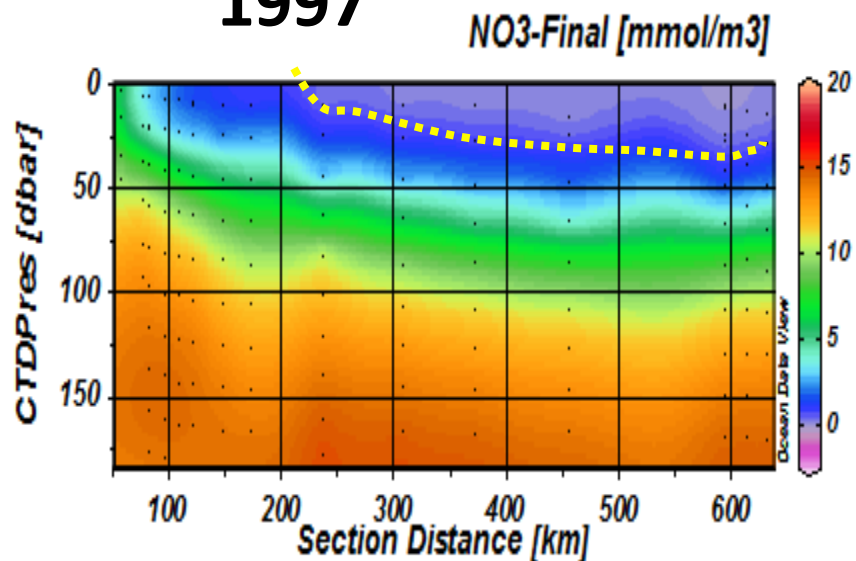


.....thanks to Rick Krishfield

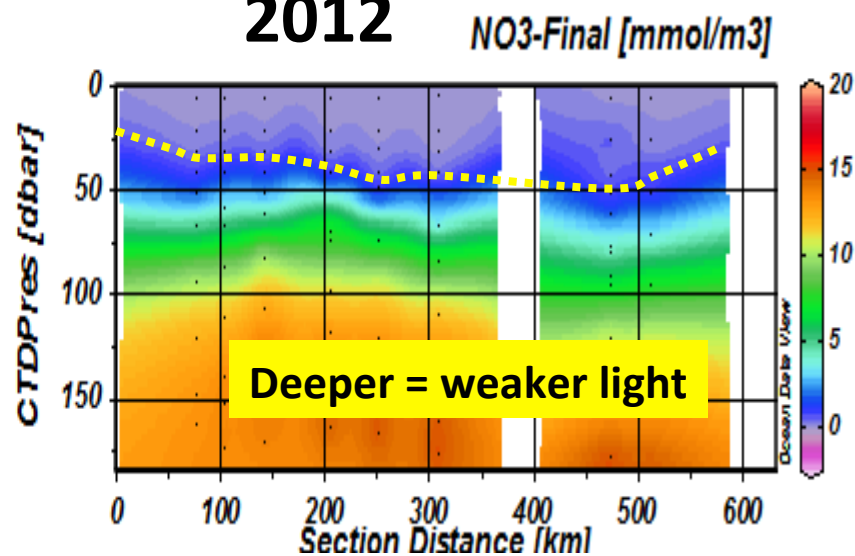
2012



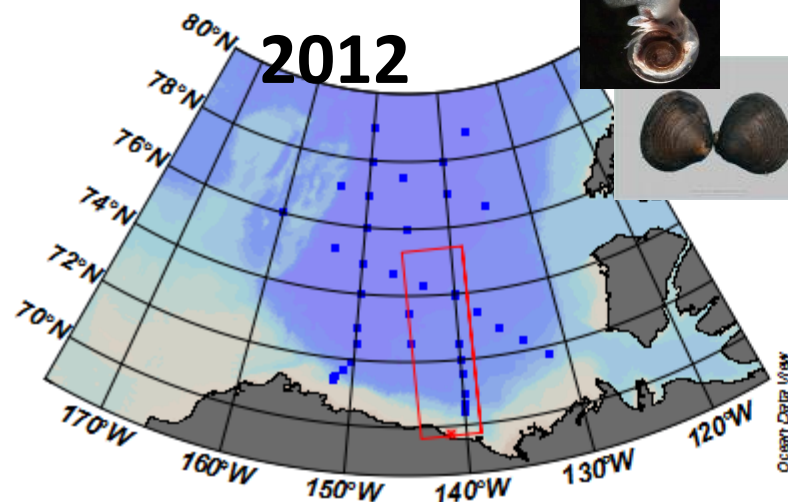
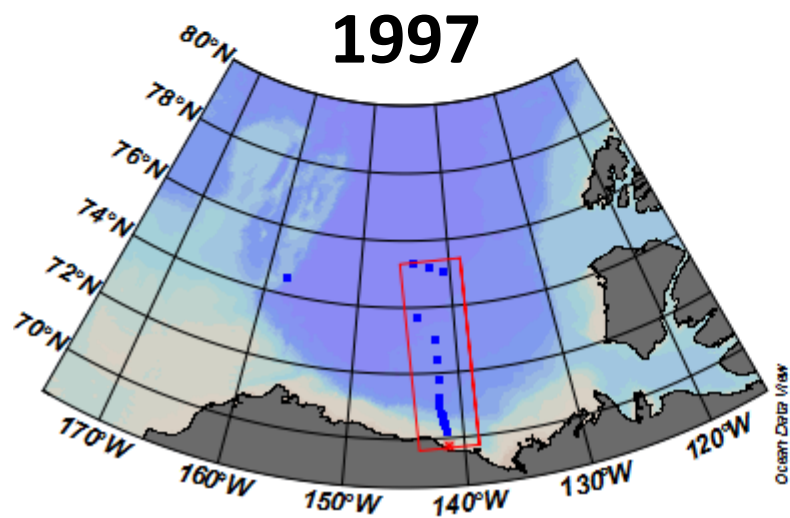
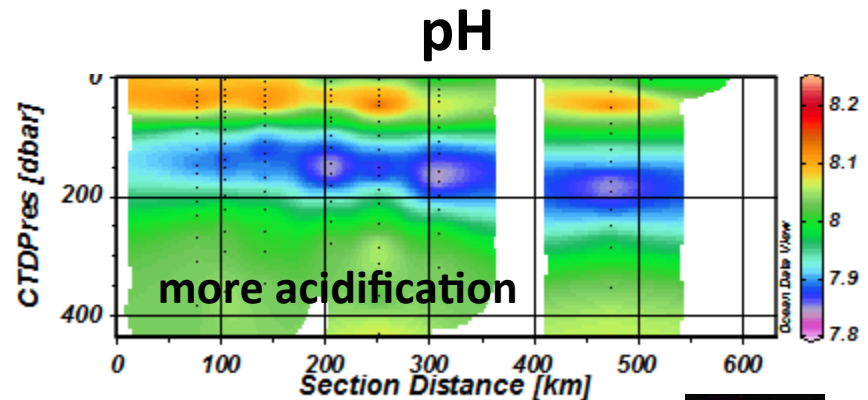
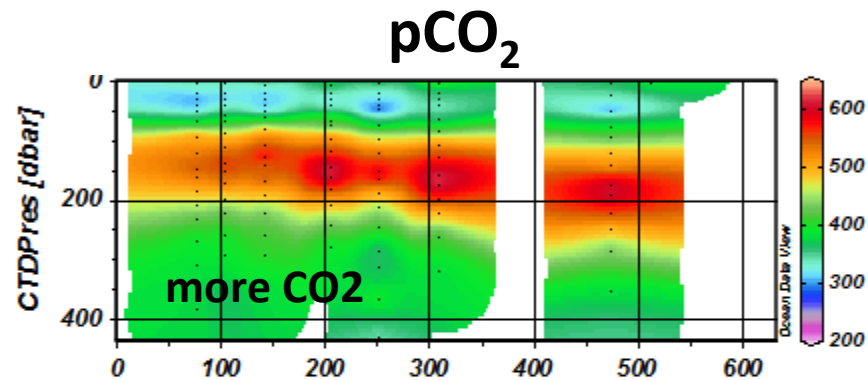
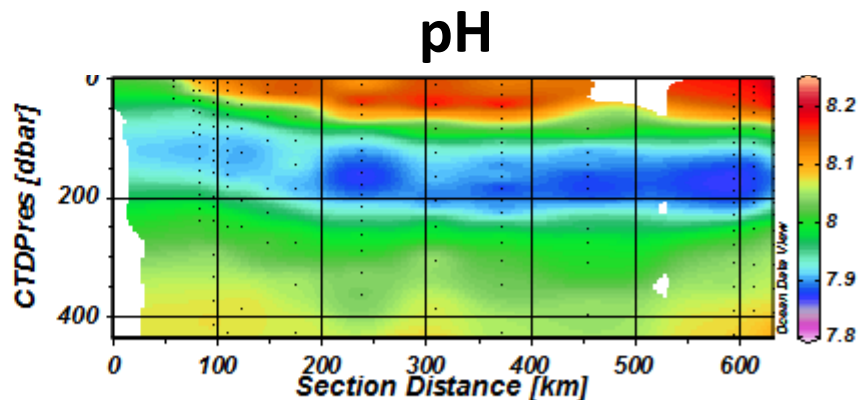
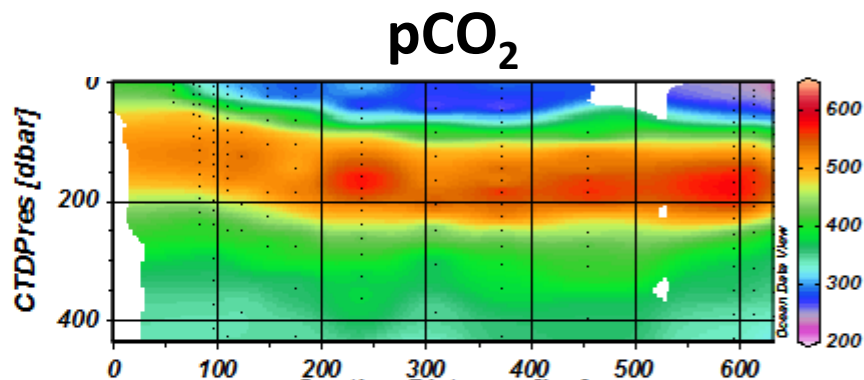
1997



2012



.... thanks to Michiyo Yamamoto-Kawai

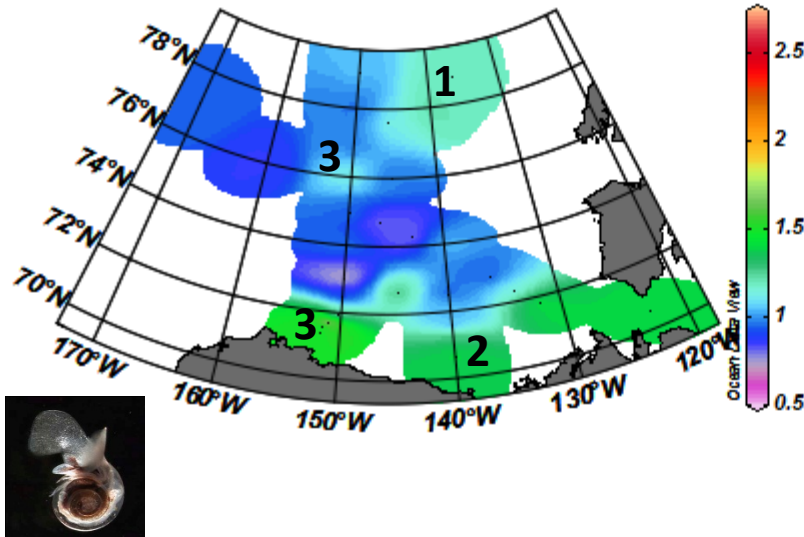


.... thanks to Michio Yamamoto-Kawai

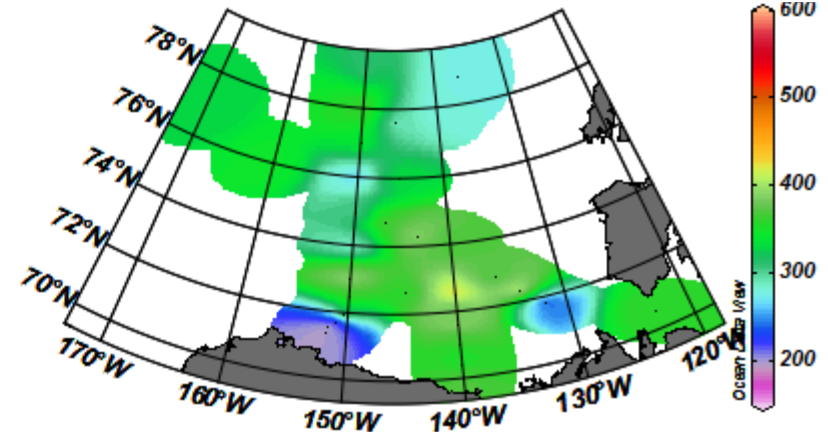
recovery in some regions?

2012

Calcium carbonate saturation



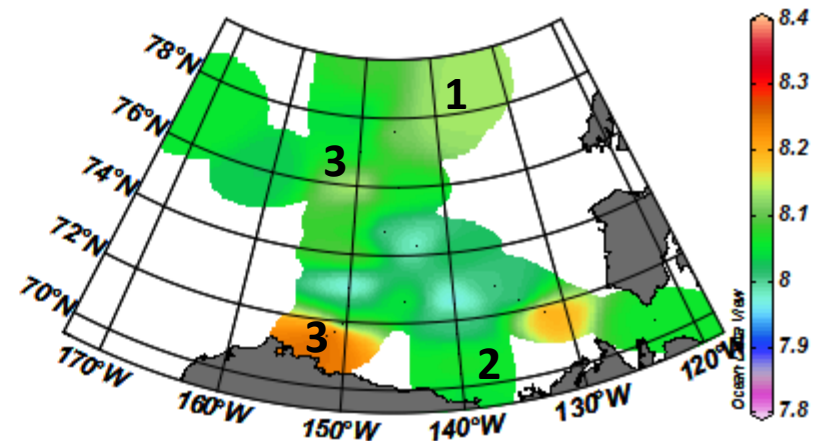
pCO₂



Ocean Acidification

- + anthropogenic CO₂
- + sea ice melt
- ice cover (1)
- Warming (2)
- Photosynthesis (3)

pH



Need to continue observations and quantify each effect for future predictions

.... thanks to Michio Yamamoto-Kawai

Plans for 2013:

From Humfrey Melling:

- 1) Return to Byam Martin Channel in April
- 2) Normal Beaufort work in Sep-Oct
- 3) Supplementary work with Araon in the Beaufort (seismic at 134 W) & with Laurier in collaboration with KOPRI

JOIS:

Regular JOIS grid, moorings and stations (transit to ice for ice-buoy work as needed)
+ possible 4-day extension over the Northwind Ridge in collaboration with TUMSAT to recover GRENE moorings

C3O:

- Continuation of *shiptime-free* C3O East aboard the Louis
- Continuation of C3O West aboard the Laurier with DBO work in collaboration with Jackie Grebmeier