Physical and biogeochemical results: Pilot DBO

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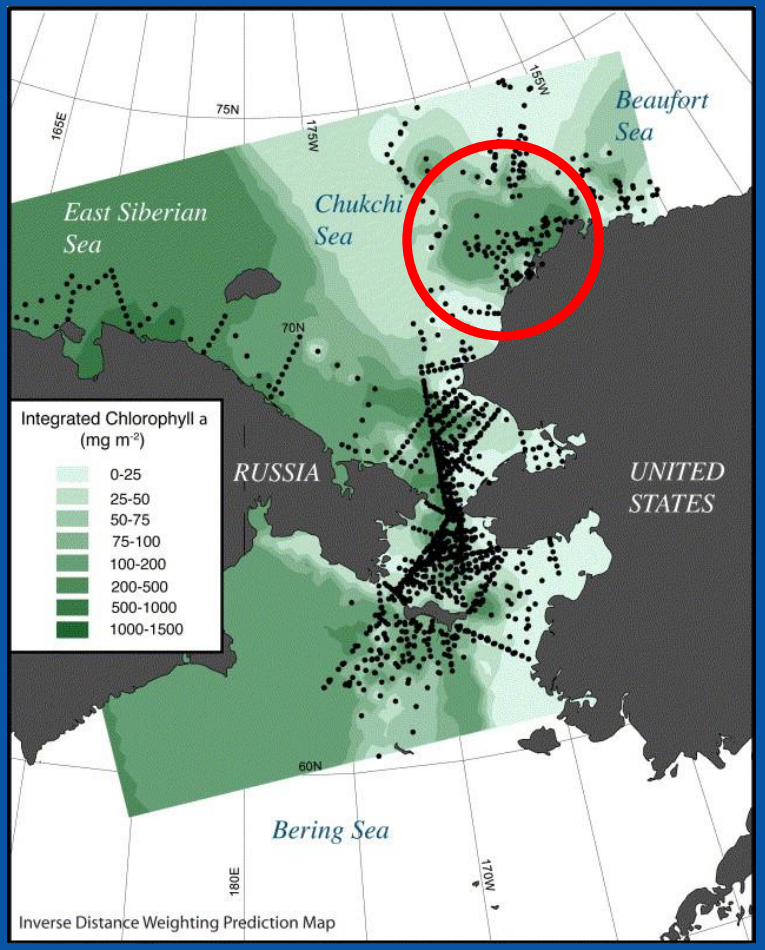
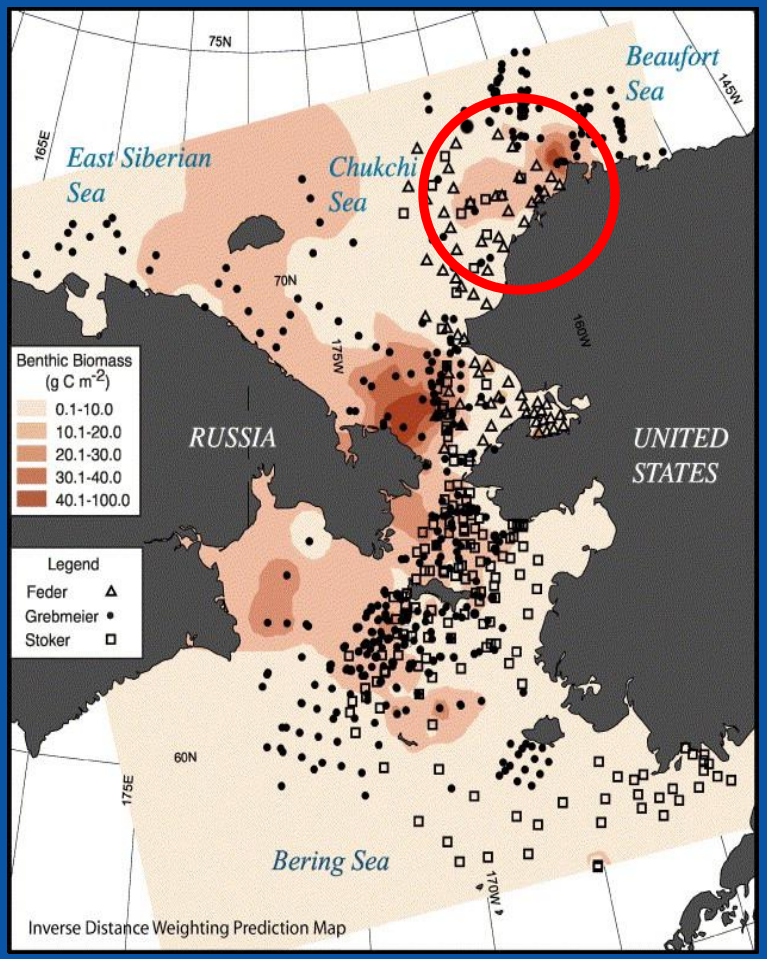
Barrow Canyon: One of the highest levels of primary productivity and benthic biomass in the western Arctic

Integrated chlorophyll

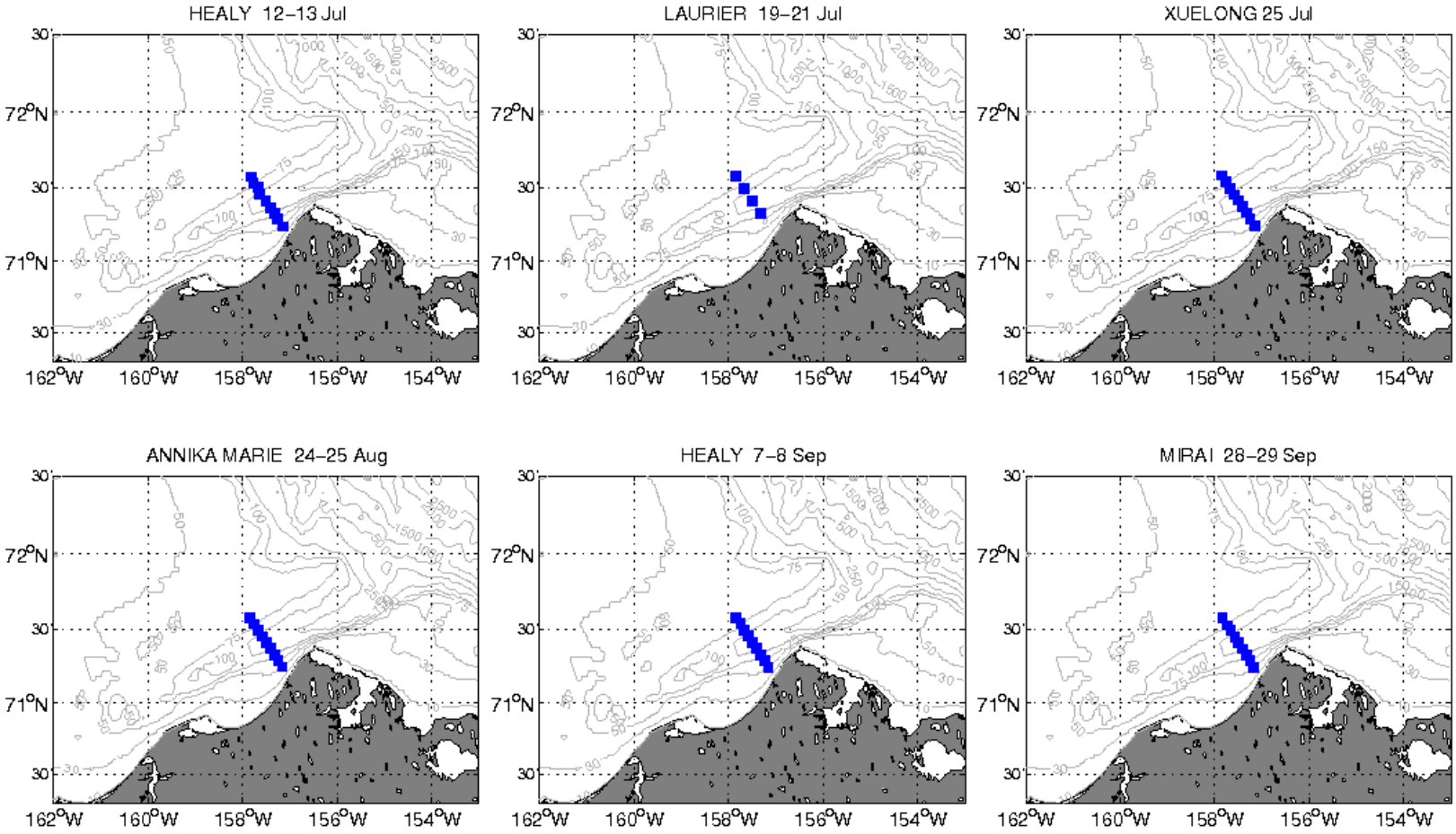


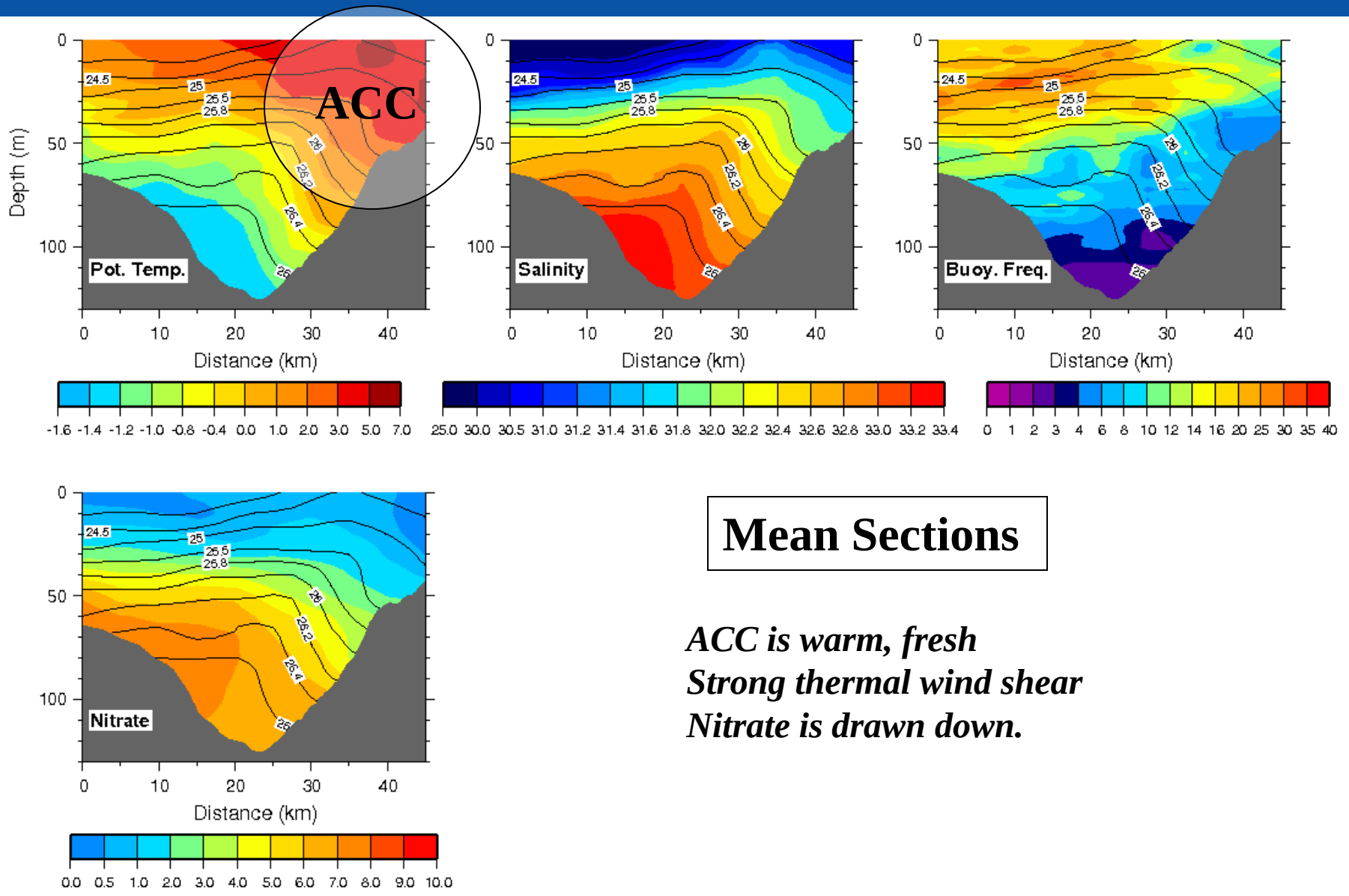
Benthic biomass



From Grebmeier et al. (2005)

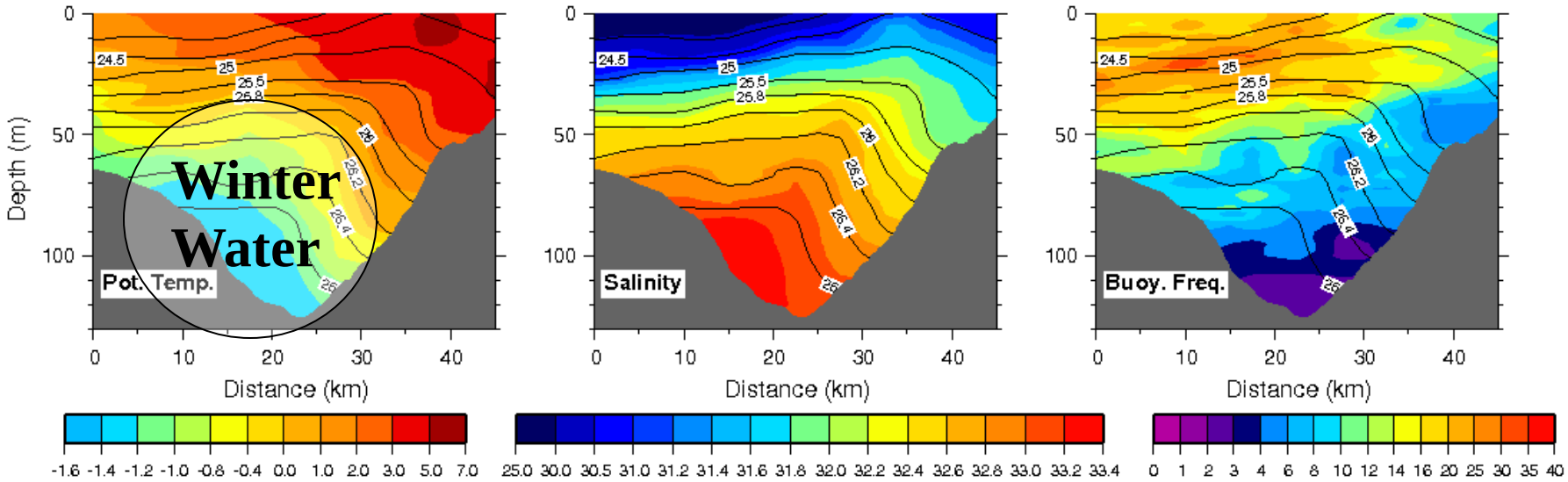
6 occupations of Barrow Canyon transect in 2010

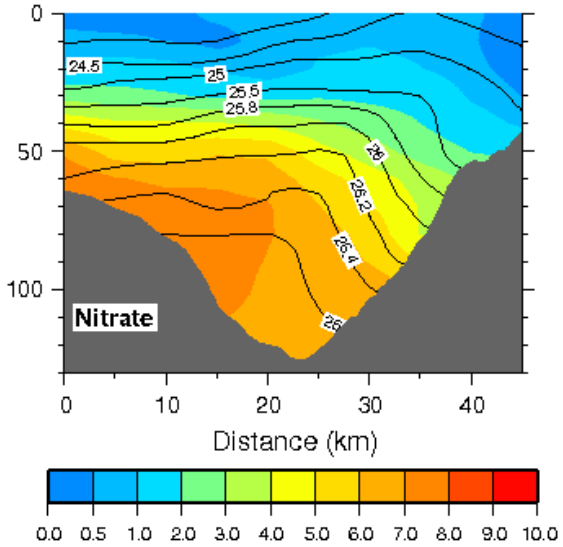




Mean Sections

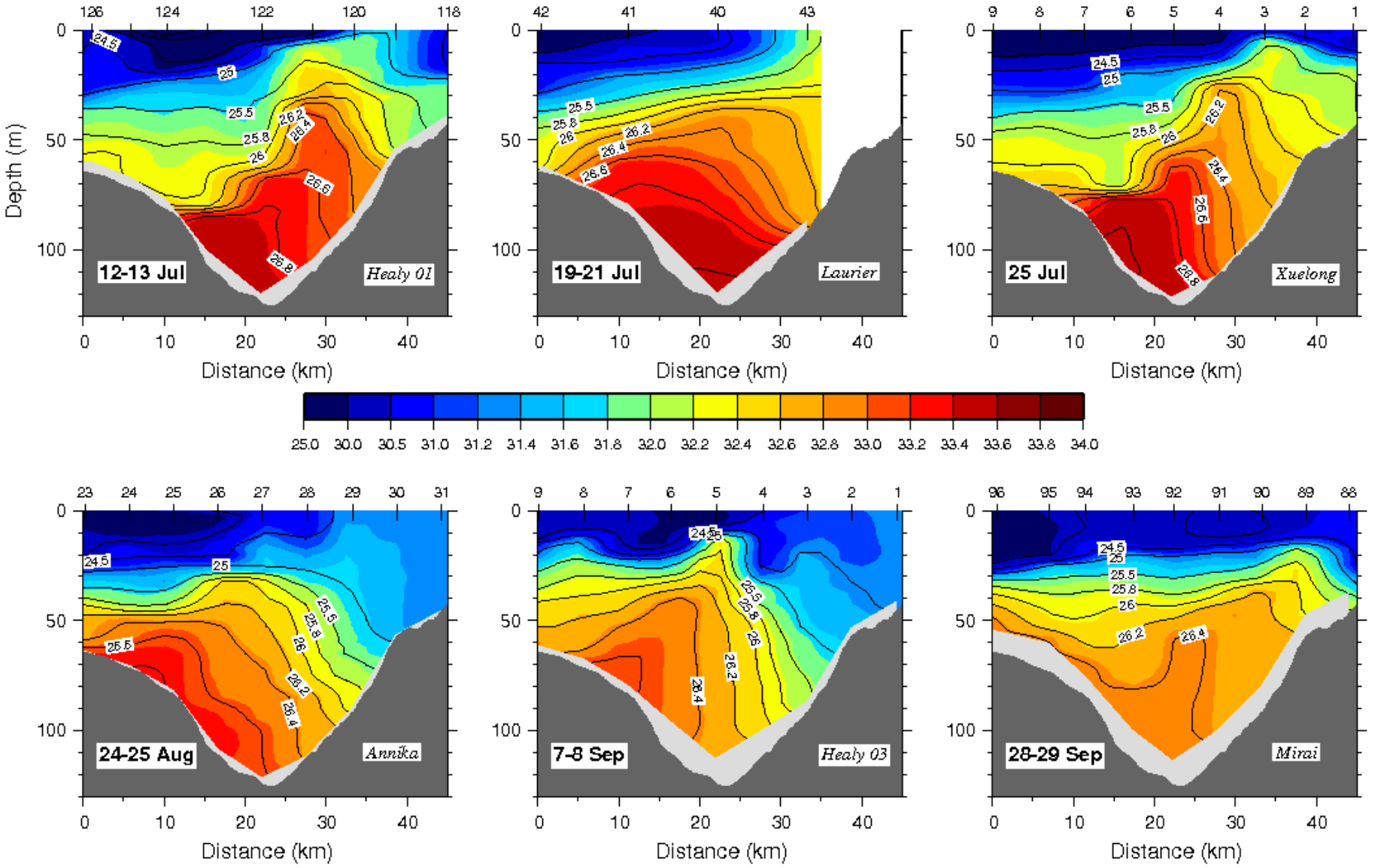
ACC is warm, fresh
Strong thermal wind shear
Nitrate is drawn down.



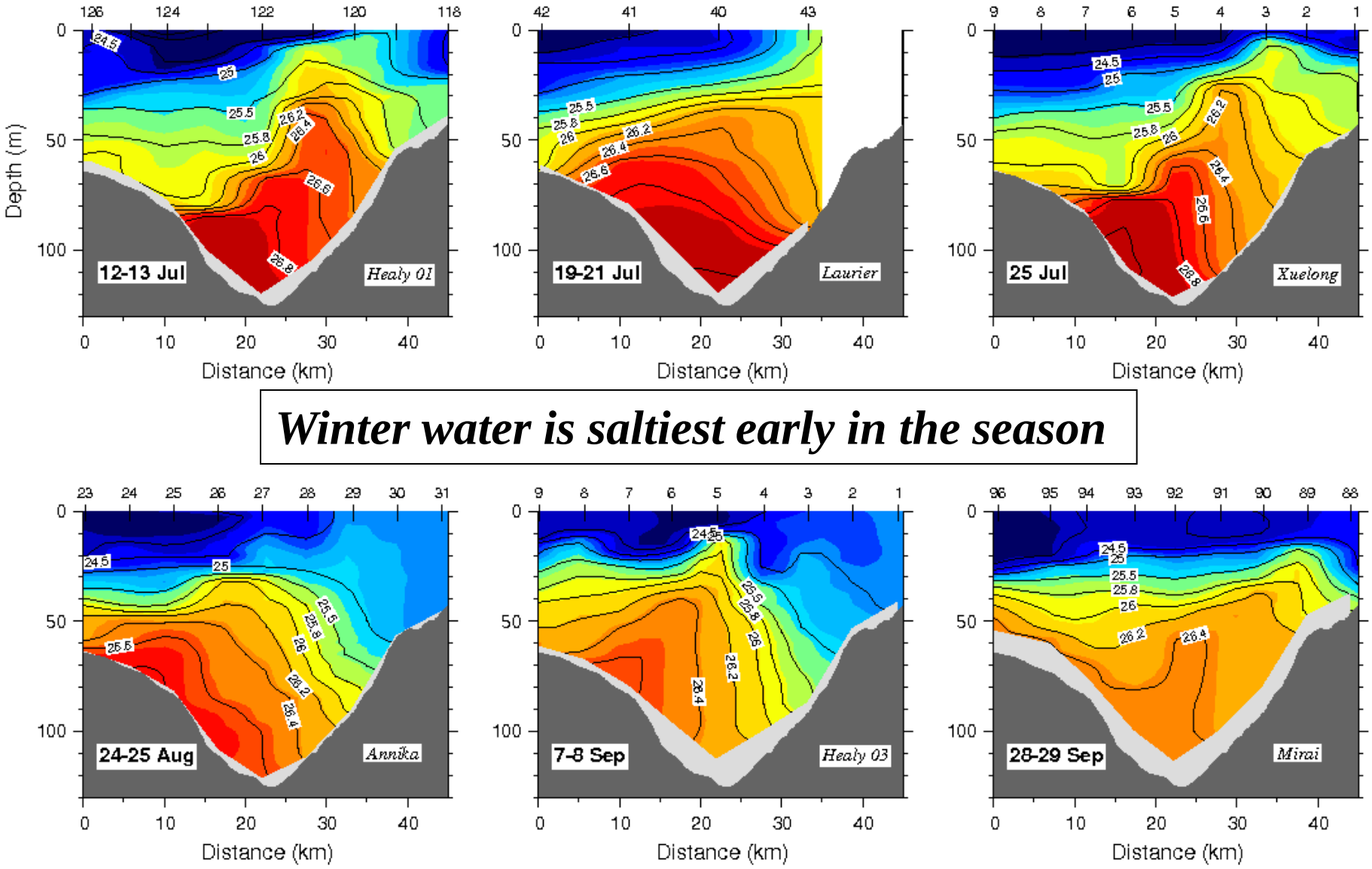


Mean Sections

Winter water is cold, weakly stratified
High in nitrate
On opposite side of canyon as ACC

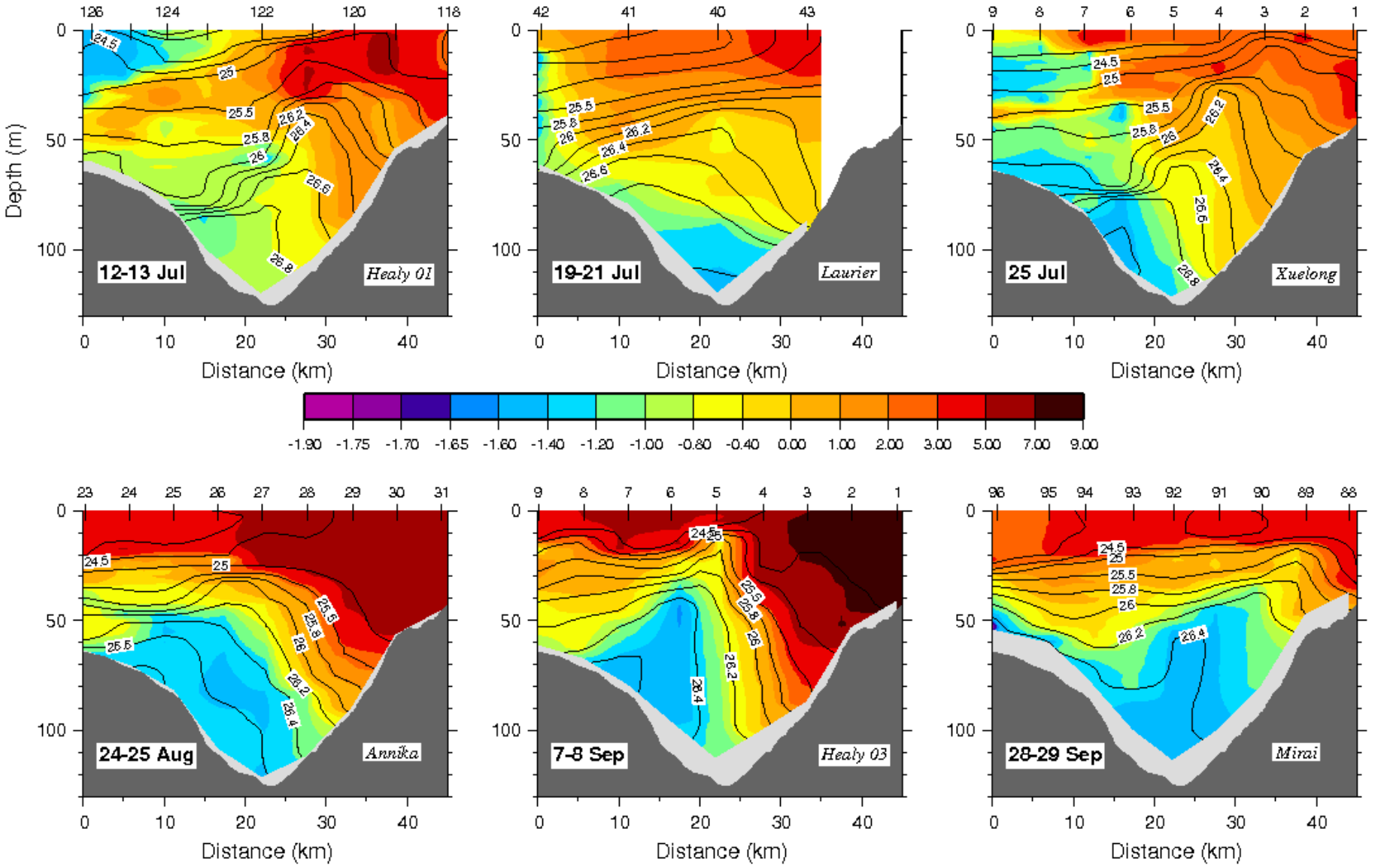


Individual Sections: *Salinity*

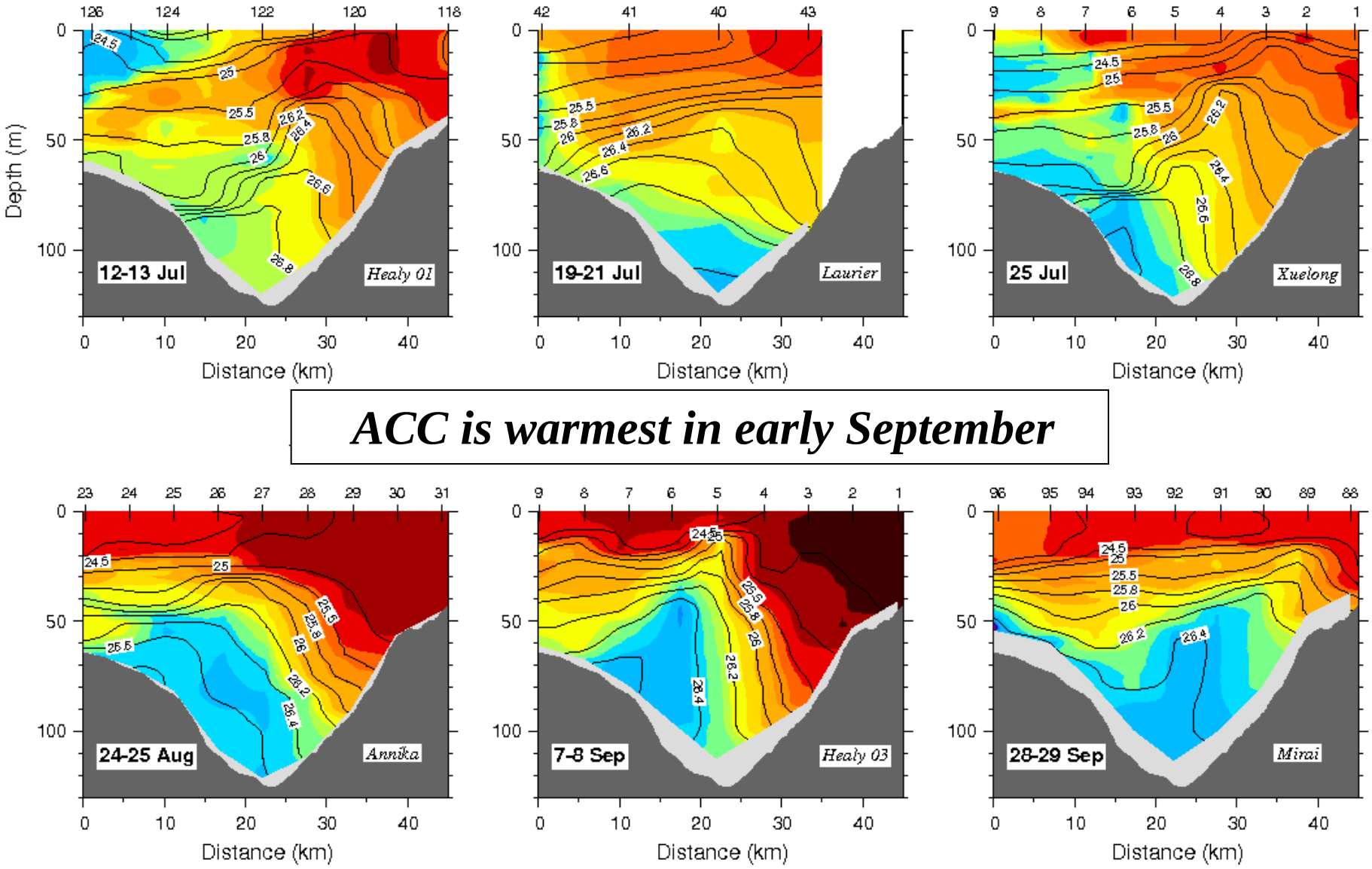


Winter water is saltiest early in the season

Individual Sections: *Salinity*

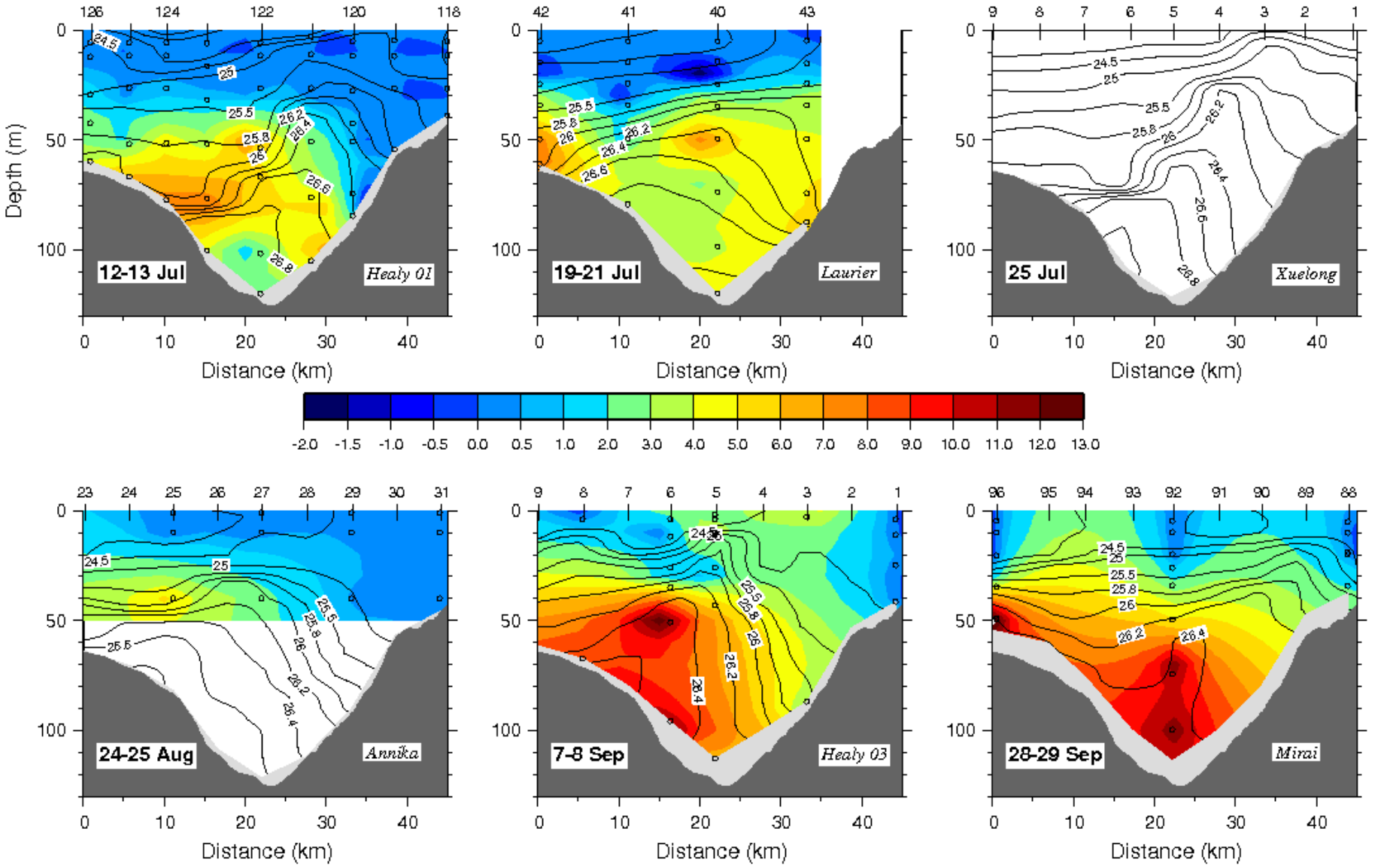


Individual Sections: *Potential Temperature (°C)*

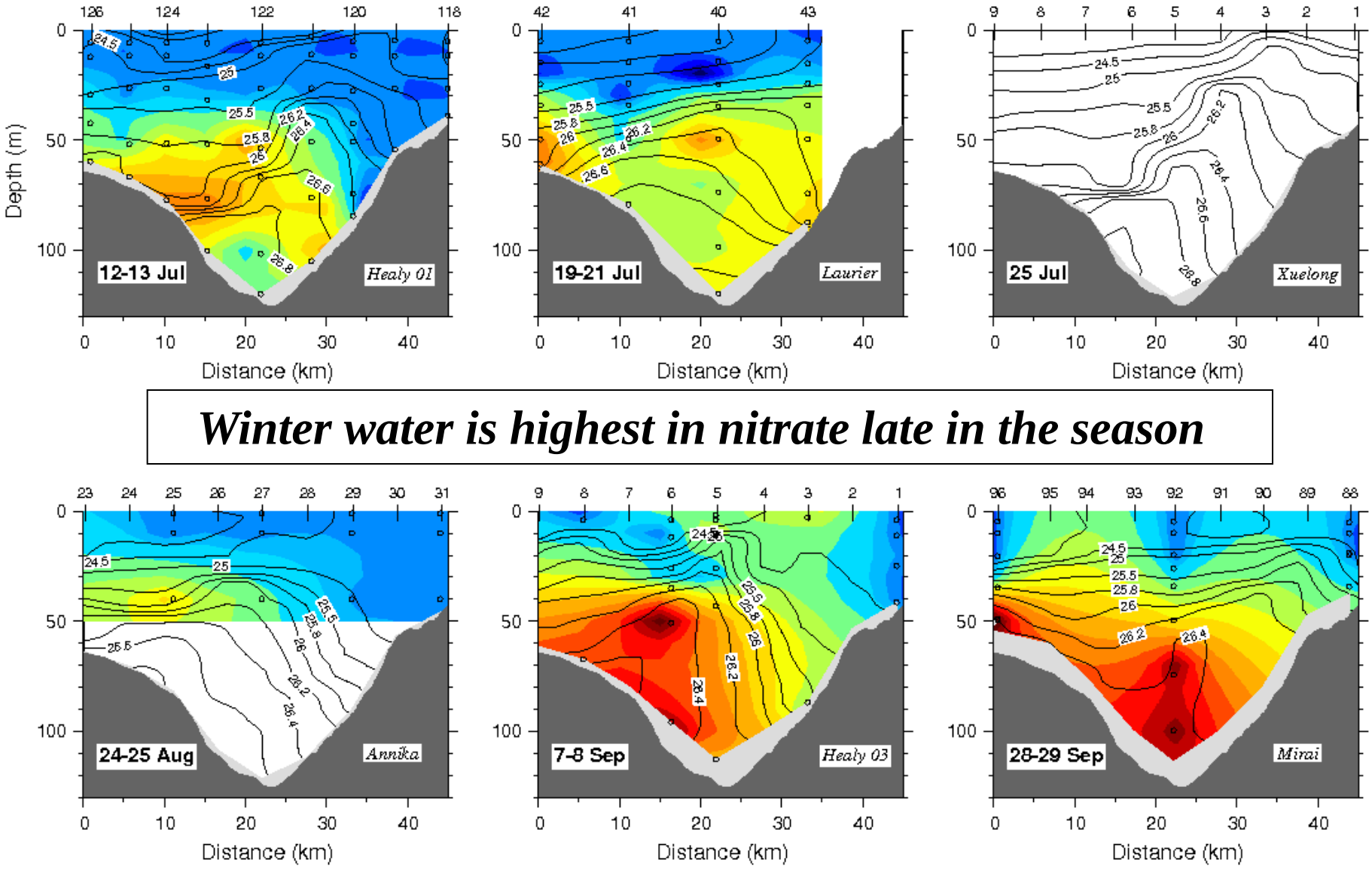


ACC is warmest in early September

Individual Sections: *Potential Temperature (°C)*



Individual Sections: *Nitrate (μm/kg)*



Winter water is highest in nitrate late in the season

Individual Sections: *Nitrate (μm/kg)*

Occupations of Barrow Canyon transect in 2011

In 2011 there have been 4 occupations so far, and a 5th will be done in approximately two weeks by the *Healy* (C. Ashjian, PI).

18 July (Vagle, PI)

23 July (Arrigo/Pickart PIs)

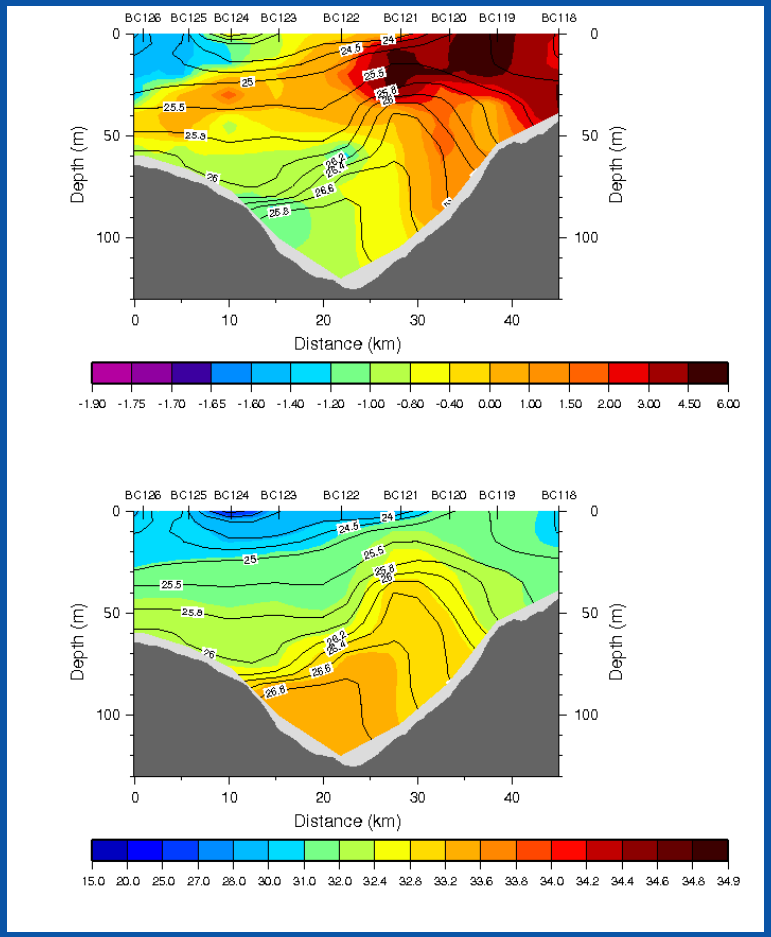
1 September (Ashjian, PI)

7 October (Pickart, PI)

Late November (Ashjian, PI)

Comparison between July 2010 and July 2011

2010

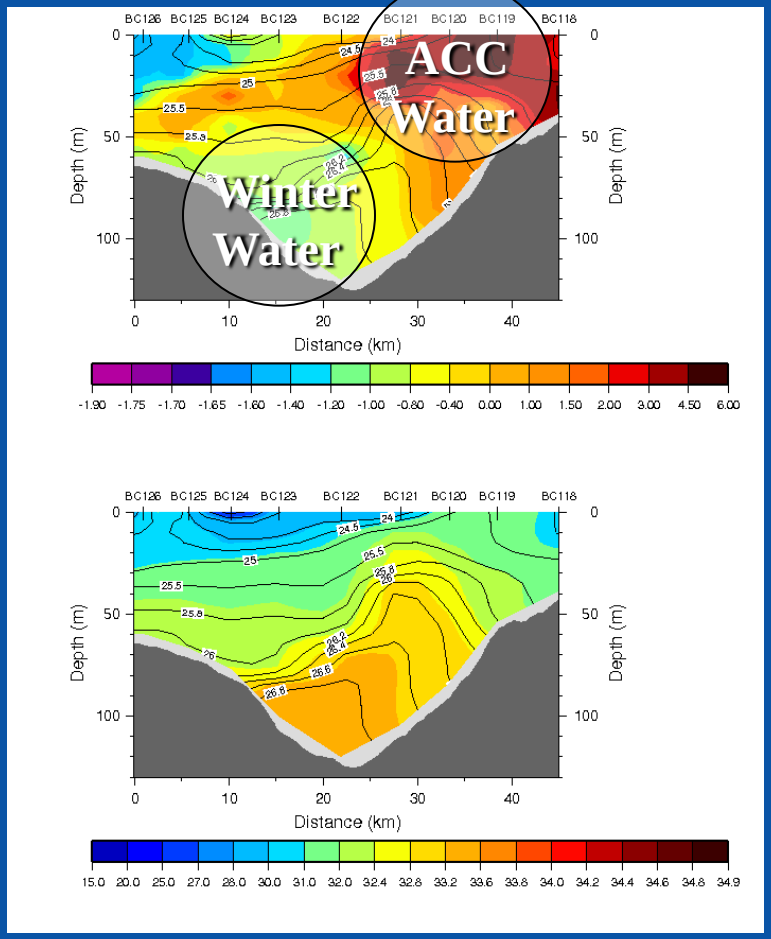


Temp (°C)

Salinity

Comparison between July 2010 and July 2011

2010

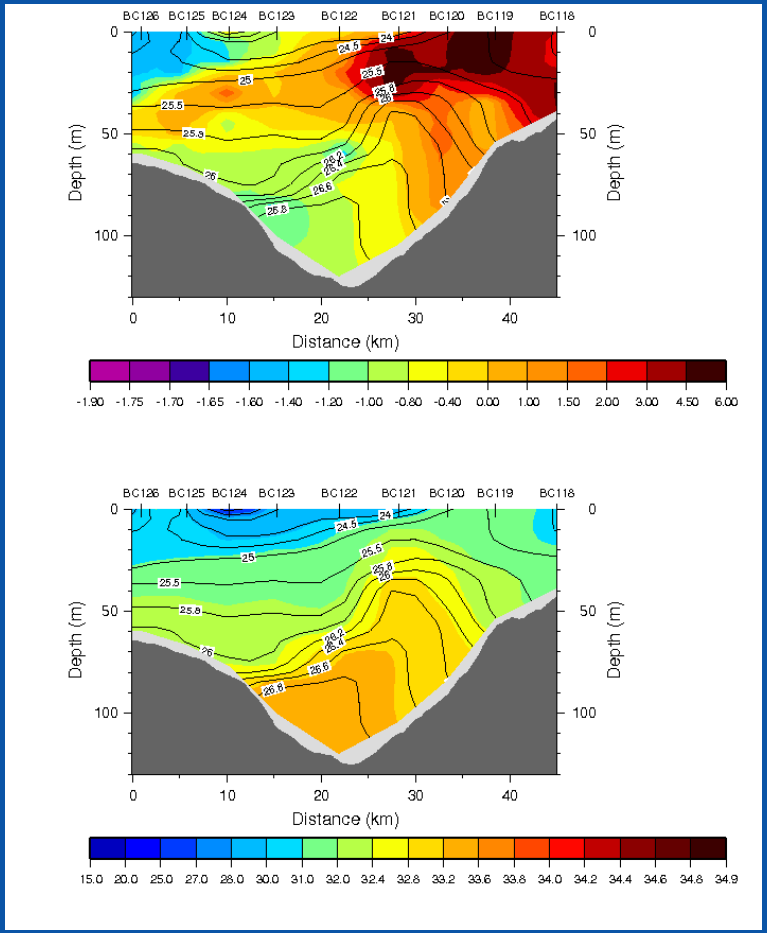


Temp (°C)

Salinity

Comparison between July 2010 and July 2011

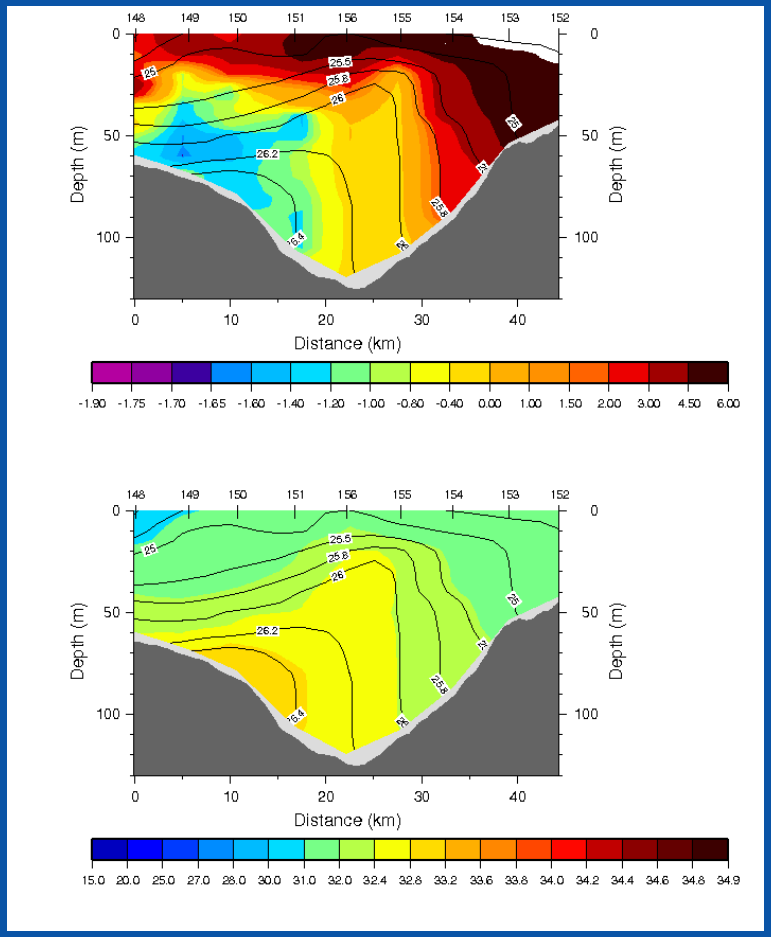
2010



Temp (°C)

Salinity

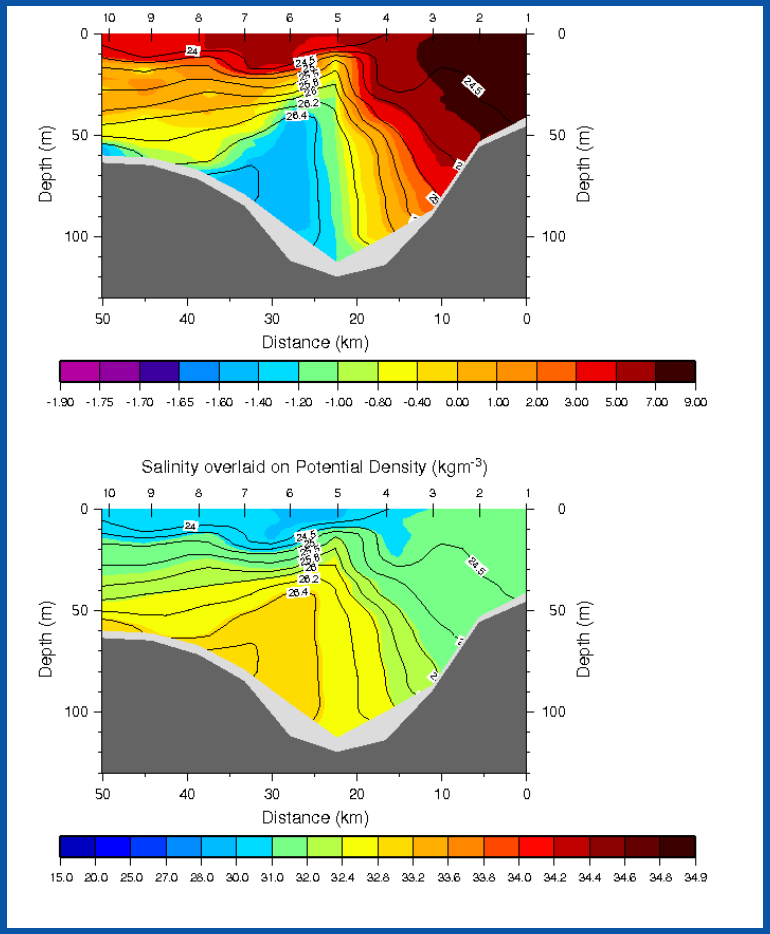
2011



In early 2011 the ACC was warmer and the subsurface winter-remnant water was colder. However, the winter water was pronouncedly less dense. *Why* ??

Comparison between Sep 2010 and Oct 2011

8 Sep 2010 **2011**

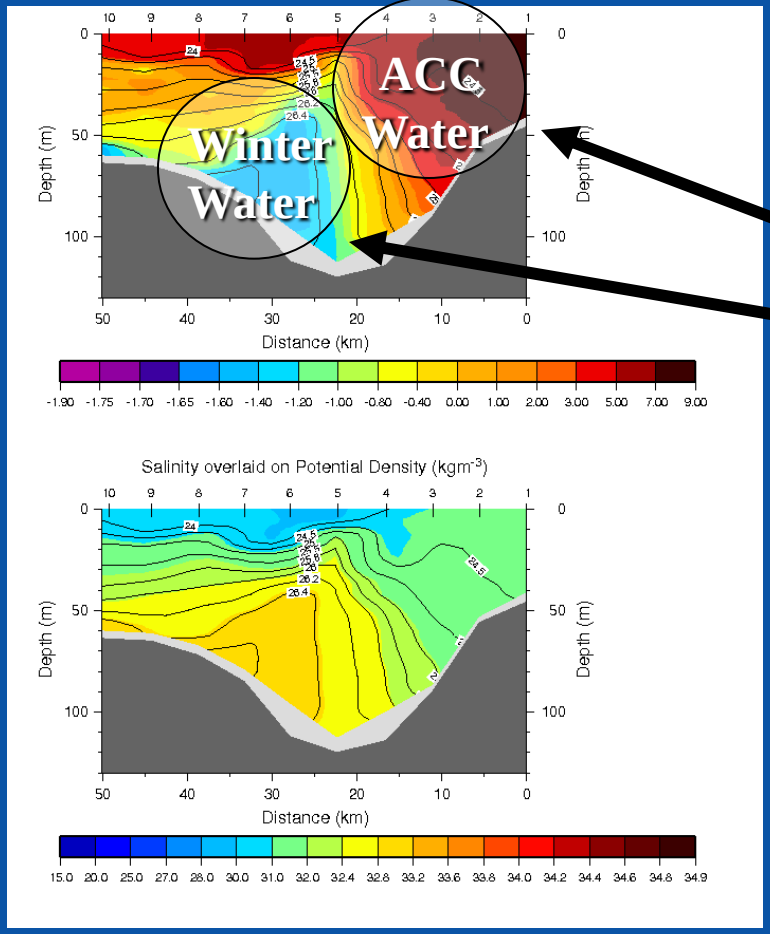


Temp (°C)

Salinity

Comparison between Sep 2010 and Oct 2011

8 Sep 2010 **2011**



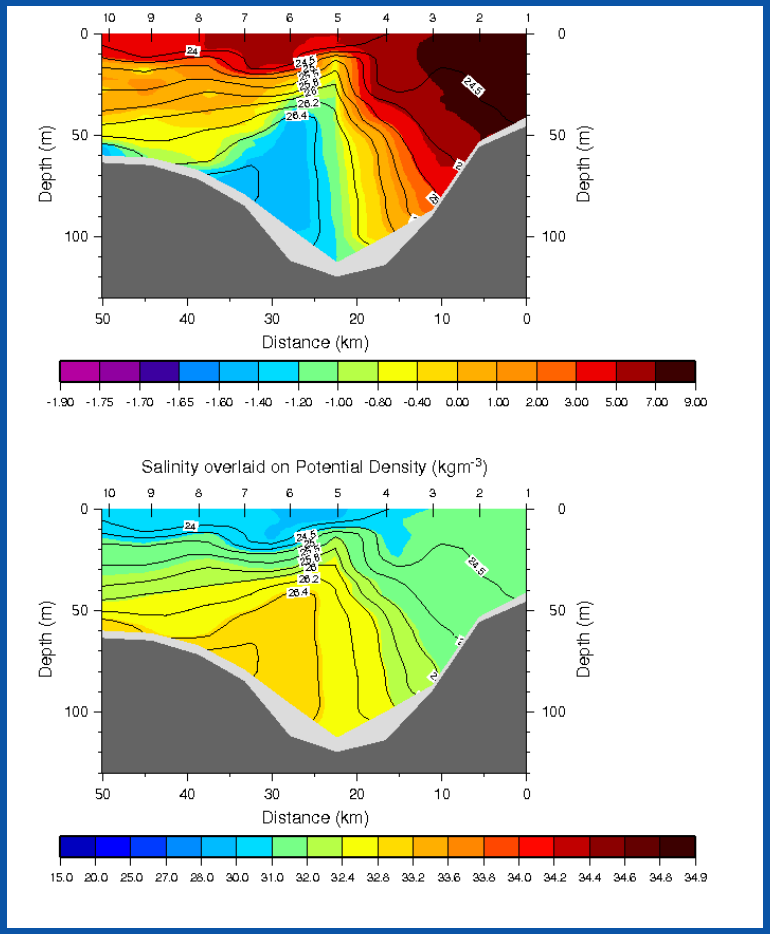
Temp (°C)

Same two features: warm ACC, cold winter water.

Salinity

Comparison between Sep 2010 and Oct 2011

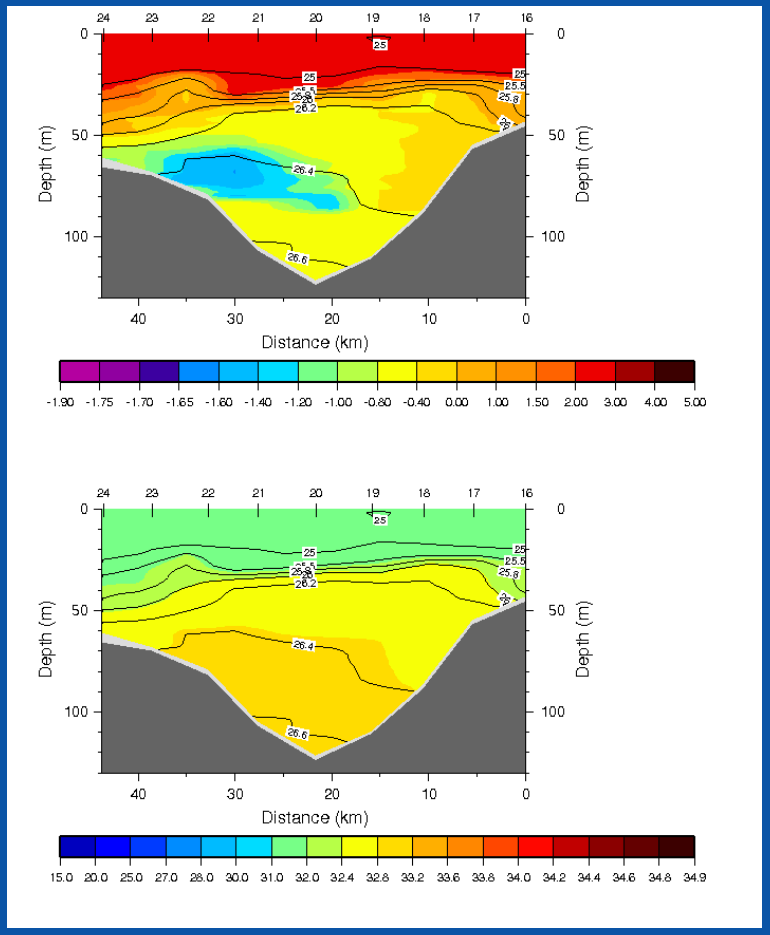
8 Sep 2010



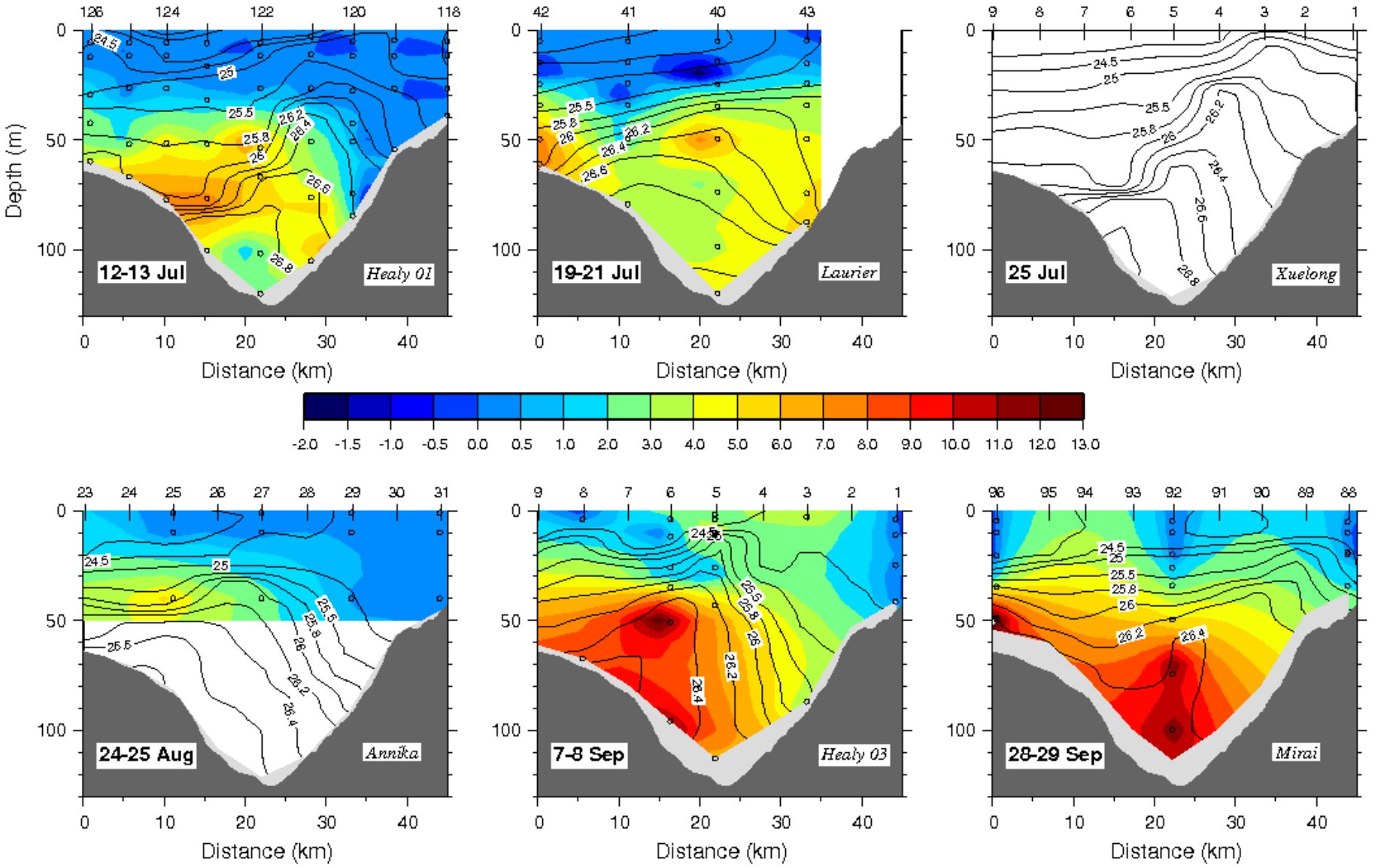
Temp (°C)

Salinity

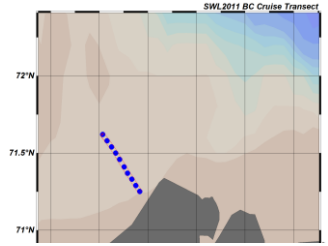
7 Oct 2011



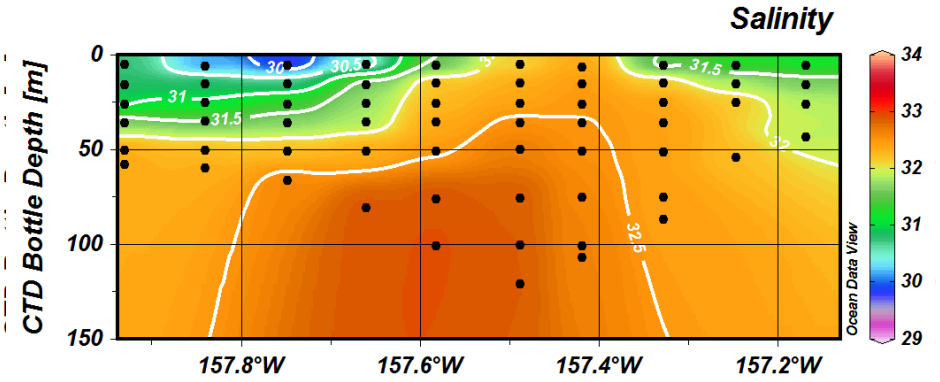
The ACC is absent in the 2011 crossing. Is this a seasonal difference or an inter-annual change (or both)? ***We need more data to sort out such issues!***

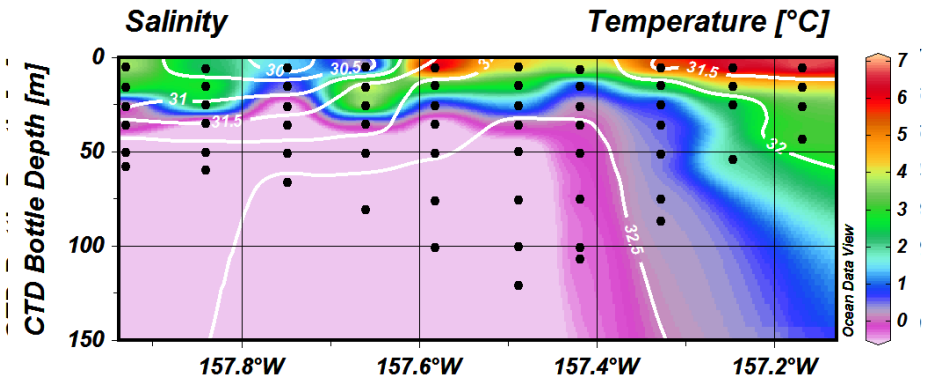


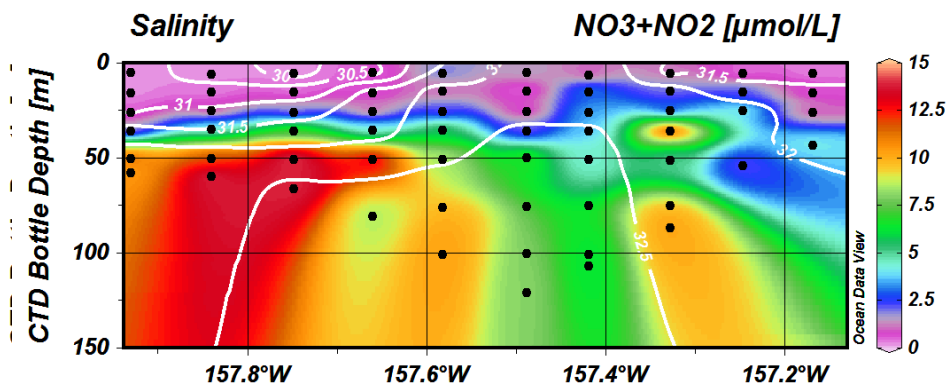
BC Individual Sections: *Nitrate (µm/kg)*

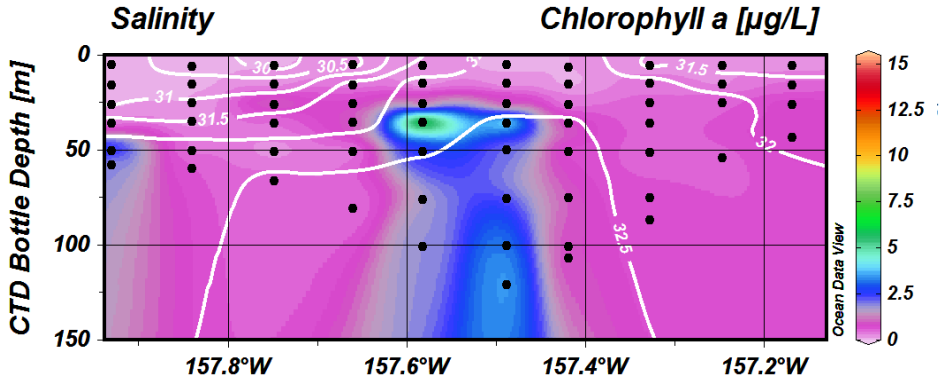


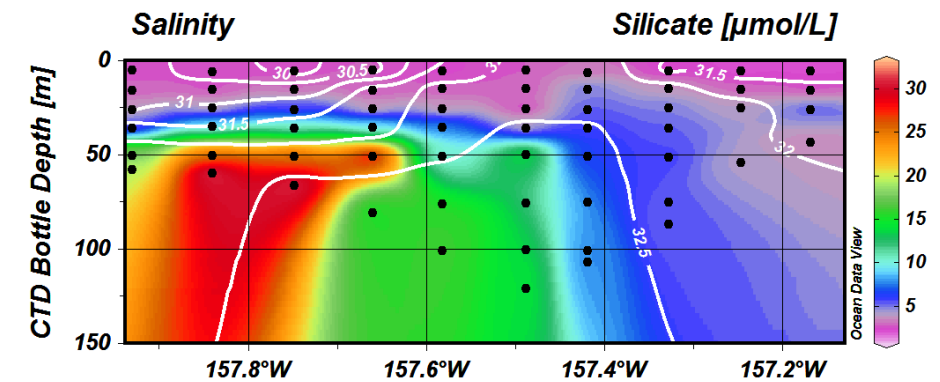
SWL2011 Barrow Canyon

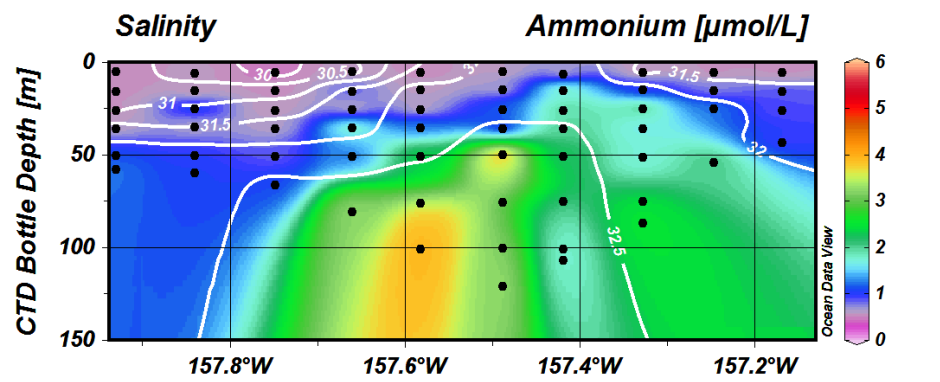




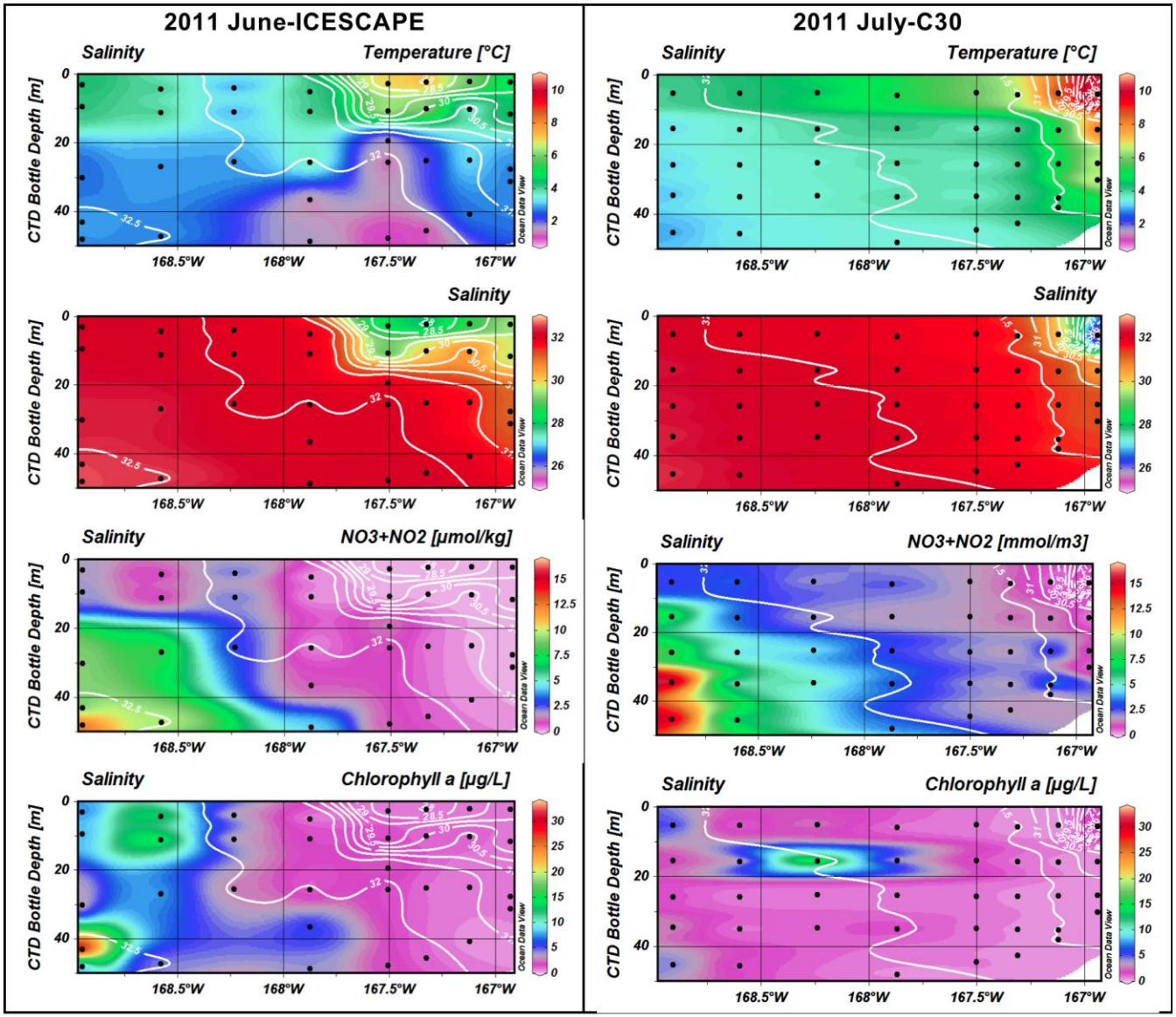








T, S, nutrient and chlorophyll profiles collected in 2011 on the DBO-SCS line



data courtesy ICESCAPE program (Kevin Arrigo) and the C30 program (Jackie Grebmeier/Lee Cooper)

Thank You