

# Update on the DBO Pilot Program in Barrow Canyon

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## Outline

- Quick look at hydrographic coverage and results
- Construction of website for PO component of DBO

USCGC Healy breaking ice in the Beaufort Sea  
Photo by Rachel Fletcher

## Present DBO Sites

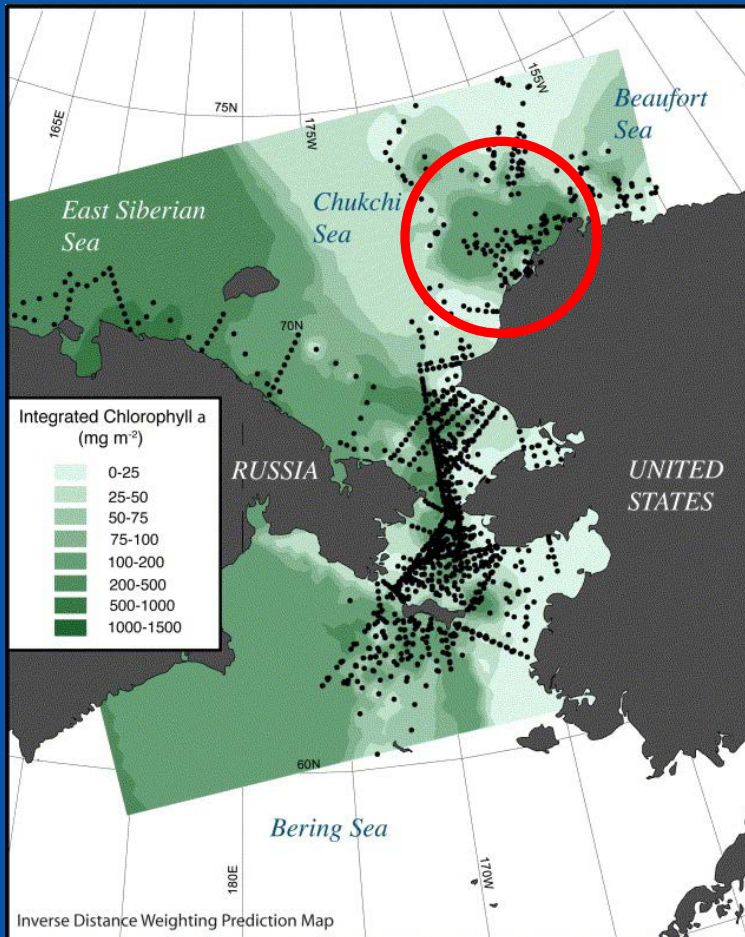




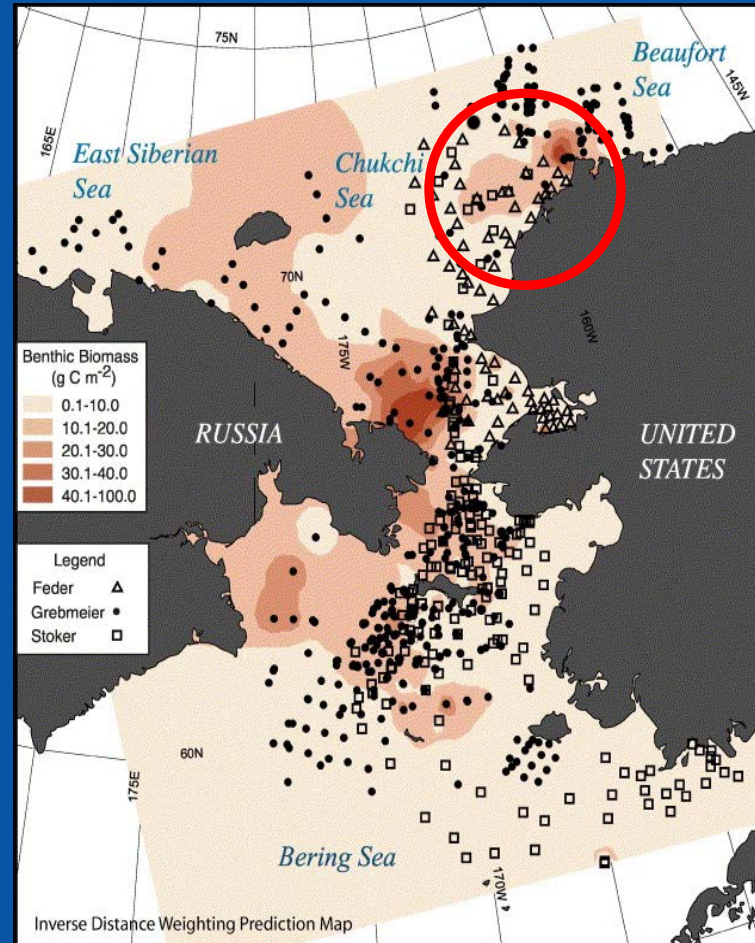
# DBO Site 5: Barrow Canyon

It was decided to start a timeseries of vertical sections across Barrow Canyon, since this region is considered a biological “hotspot”.

Integrated chlorophyll



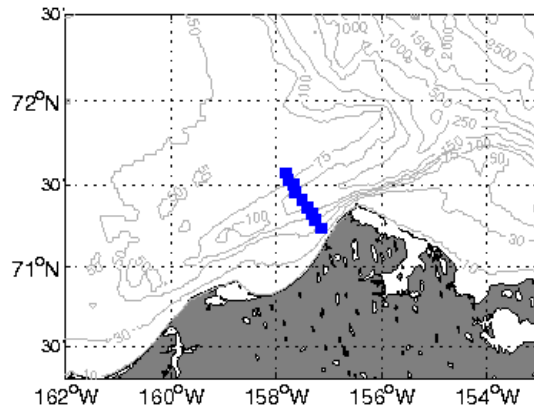
Benthic biomass



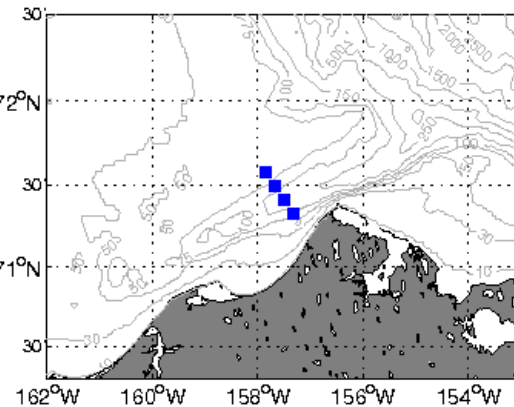
From Grebmeier et al. (2005)

# 6 occupations of Barrow Canyon transect in 2010

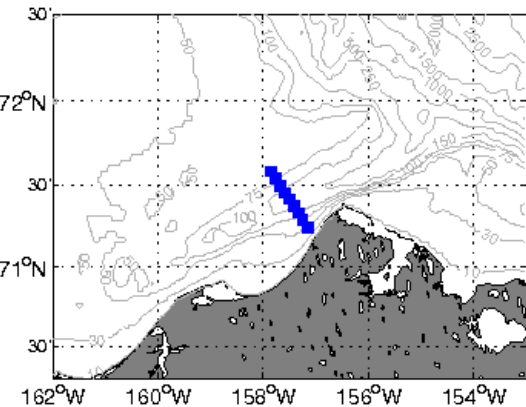
*Healy 12 July*



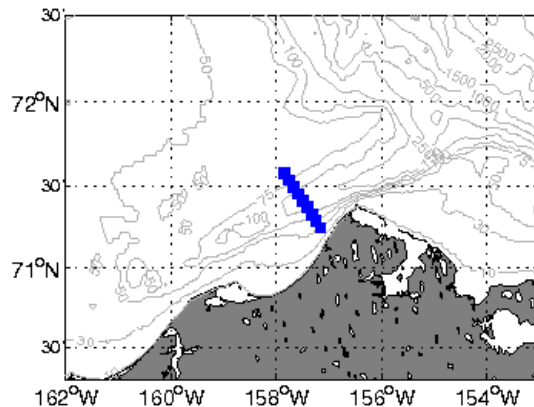
*Laurier 19 July*



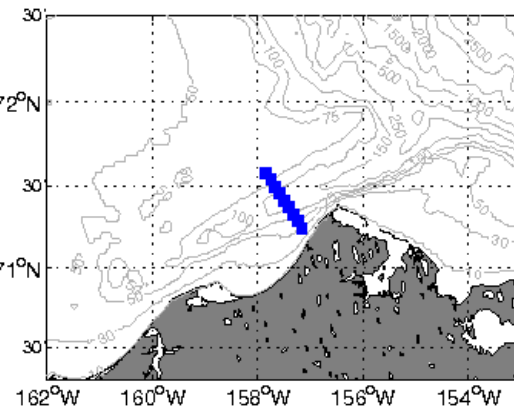
*Xuelong 25 July*



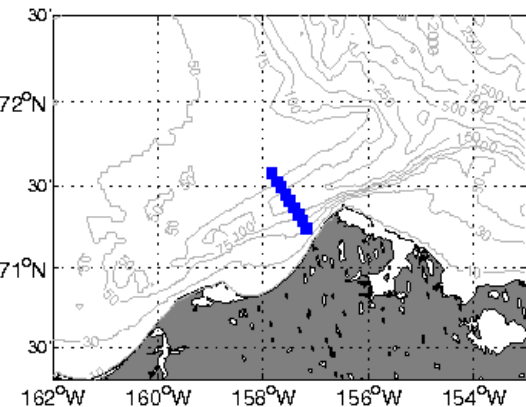
*Annika Marie 25 Aug*

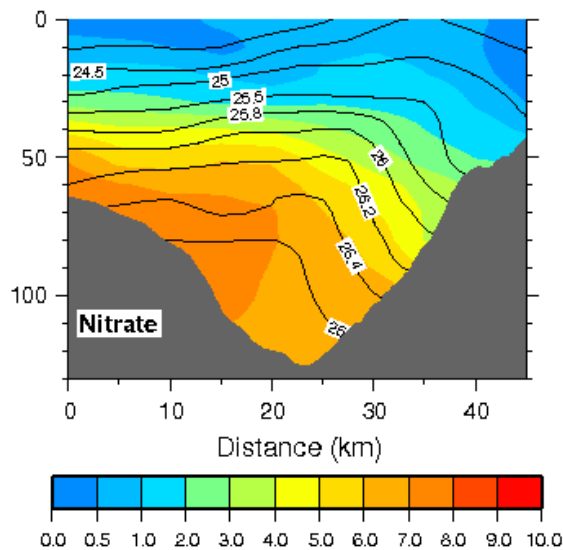
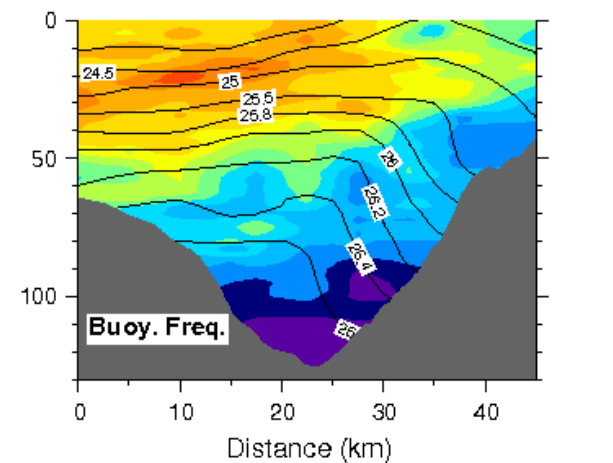
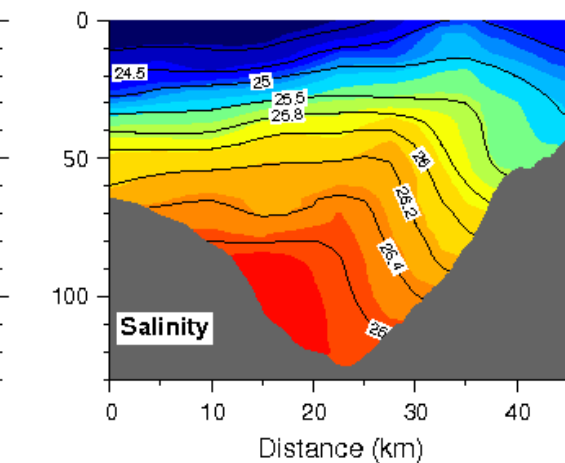
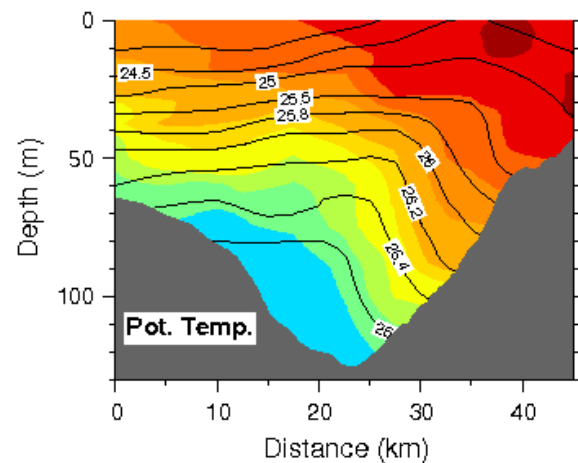


*Healy 8 Sept*

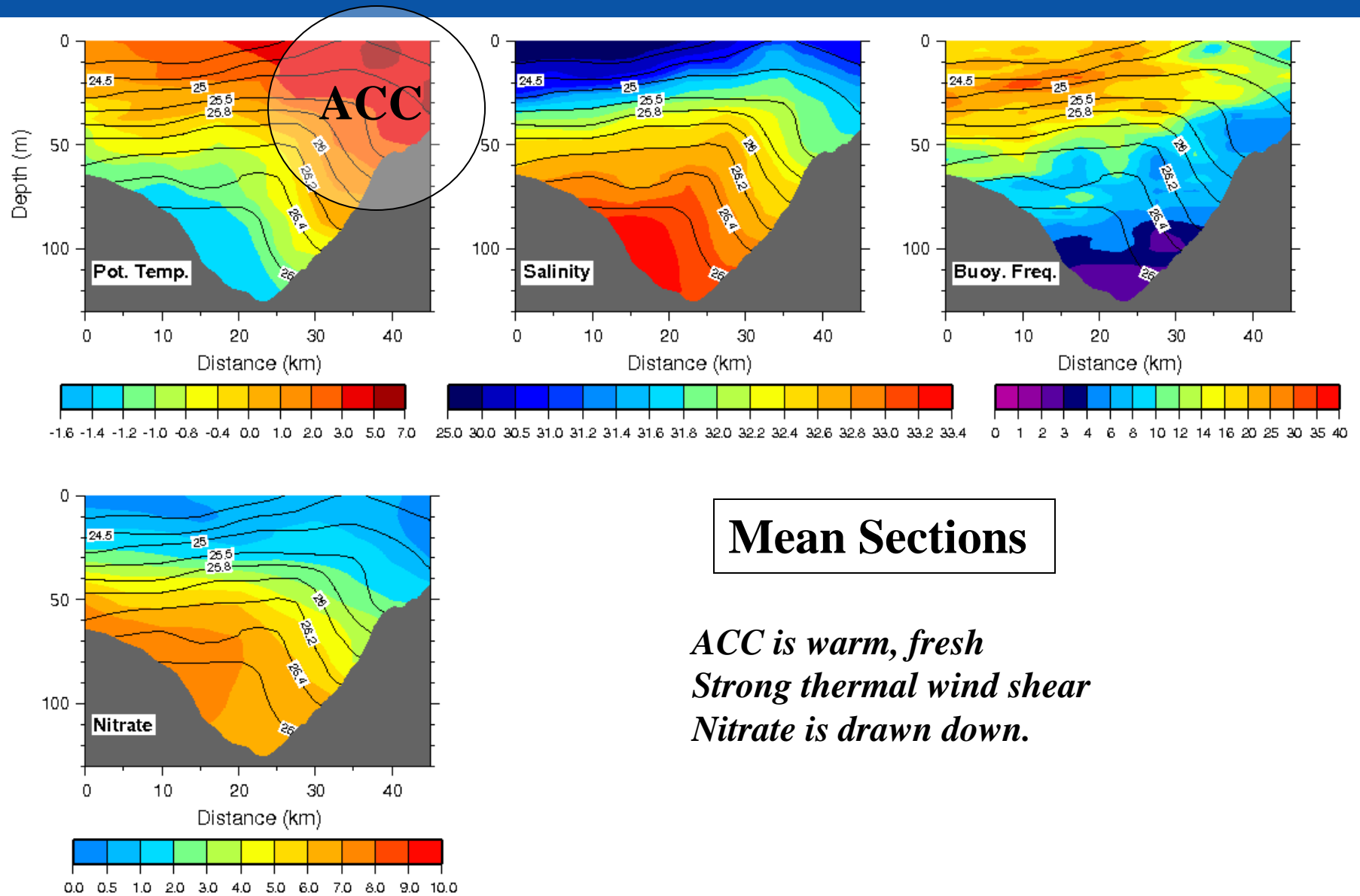


*Mirai 28 Sept*



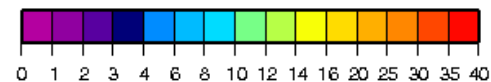
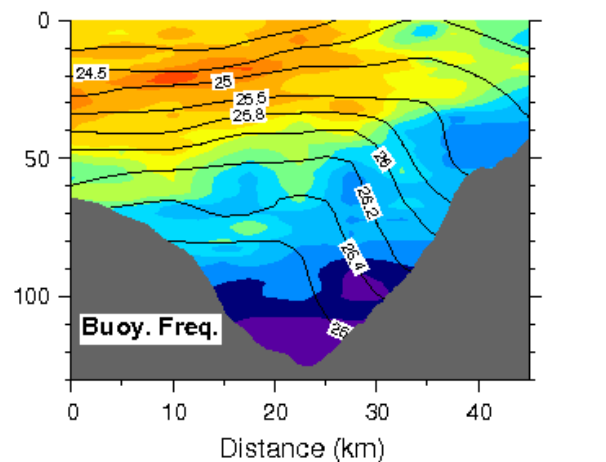
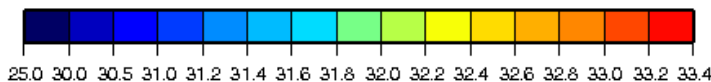
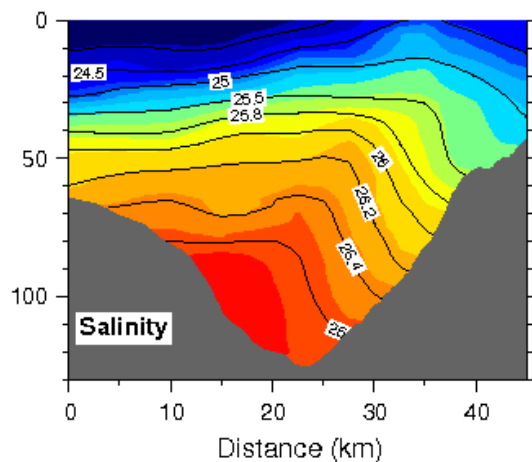
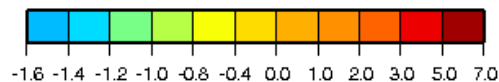
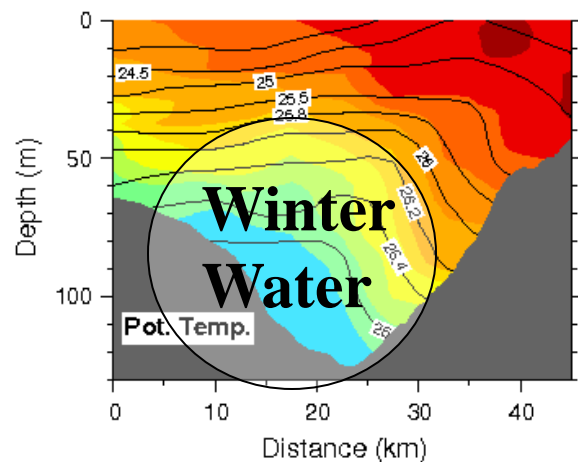


## Mean Sections



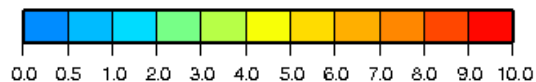
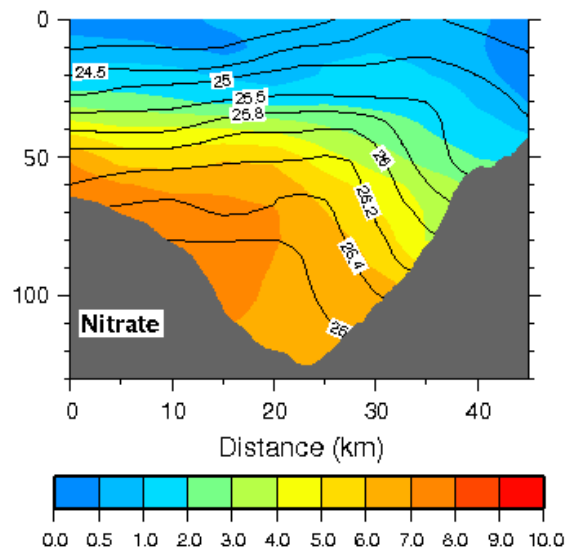
## Mean Sections

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



## Mean Sections

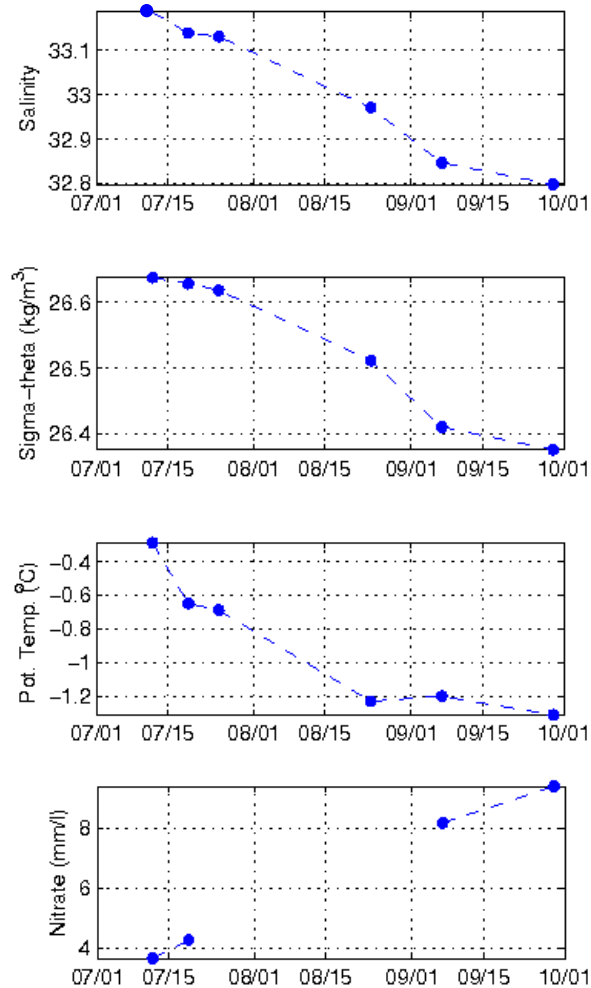
*Winter water is cold, weakly stratified*  
*High in nitrate*  
*On opposite side of canyon as ACC*



First-ever top-to-bottom timeseries  
across the canyon.

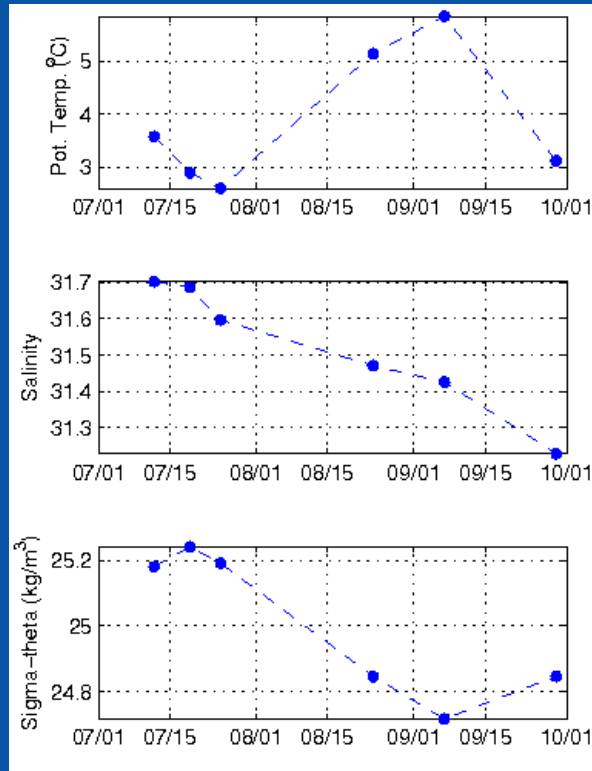


## Winter water layer



*As the season progresses, the winter water gets fresher, lighter, colder, and higher in nitrate.*

## Alaskan Coastal water layer



Note: Not enough spatial coverage to quantify the nitrate in the ACC

*The temperature of the ACC peaks in September, but the current gets progressively fresher throughout the summer.*

Immediate questions arise...for example:

Why does the winter water get *colder* as the summer progresses and become *higher* in nitrate?

# Occupations of Barrow Canyon transect in 2011

In 2011 there were 5 occupations

July (Laurier)

July (Healy)

September (Annika Marie)

October (Healy)

November (Healy)

# Occupations of Barrow Canyon transect in 2012

In 2012 there were 6 occupations

August (Healy)

August (Aquila)

August (Fairweather)

September (Annika Marie)

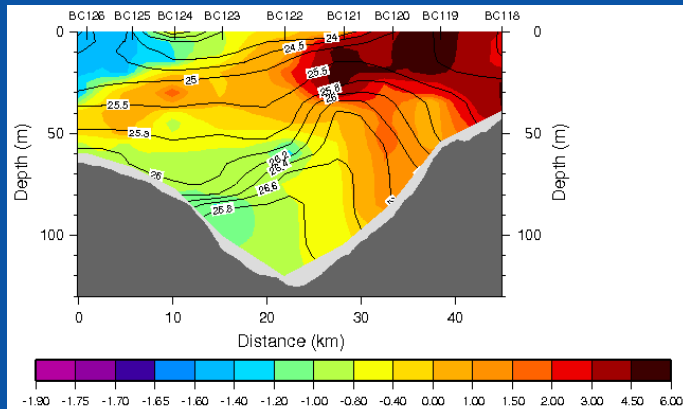
September (Mirai)

October (Healy)



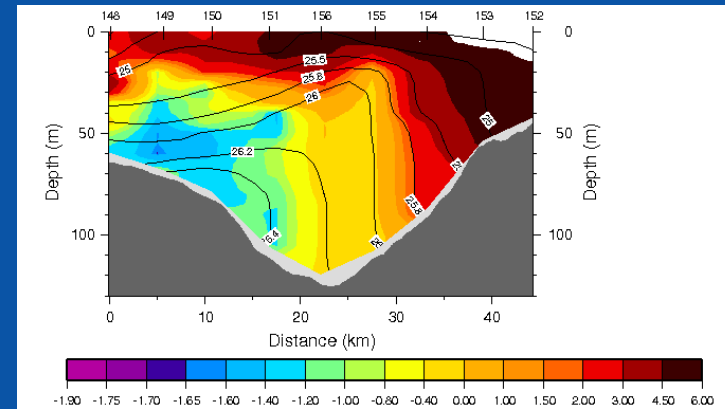
# Comparison between July 2010 and July 2011

2010

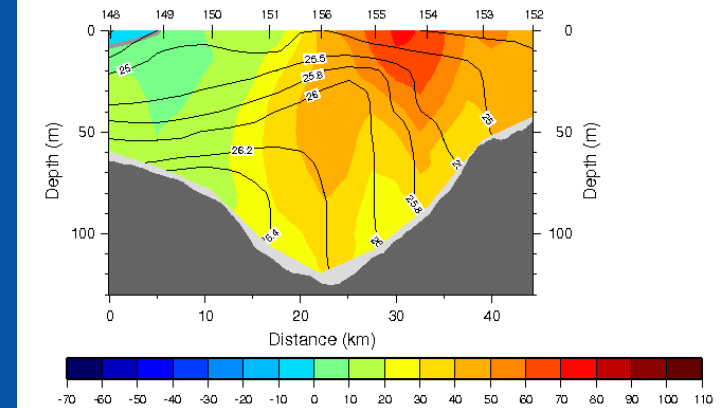
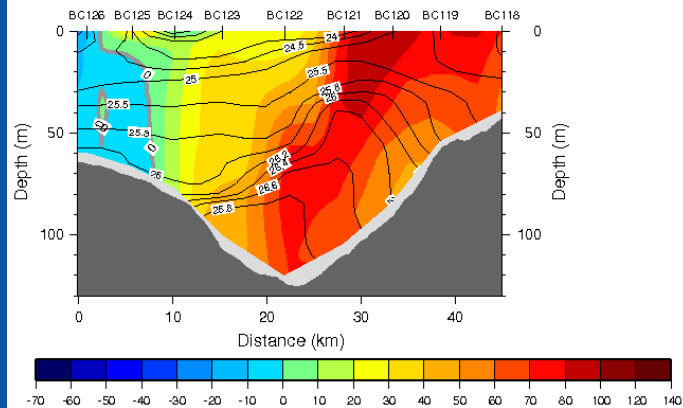


Temp (°C)

2011



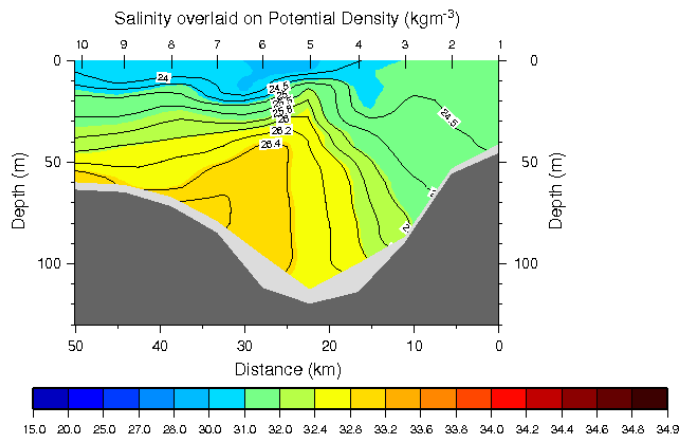
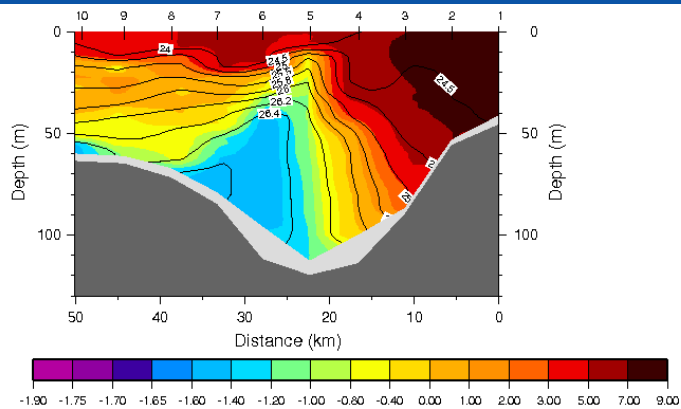
Absolute  
Geostrophic  
Velocity (cm/s)



**In early summer 2011 the ACC was warmer and the subsurface winter-remnant water was colder. However, the northward flow in the canyon was significantly weaker. Why ??**

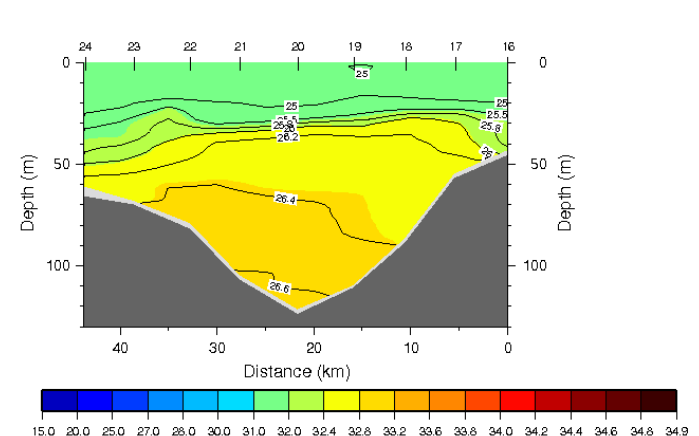
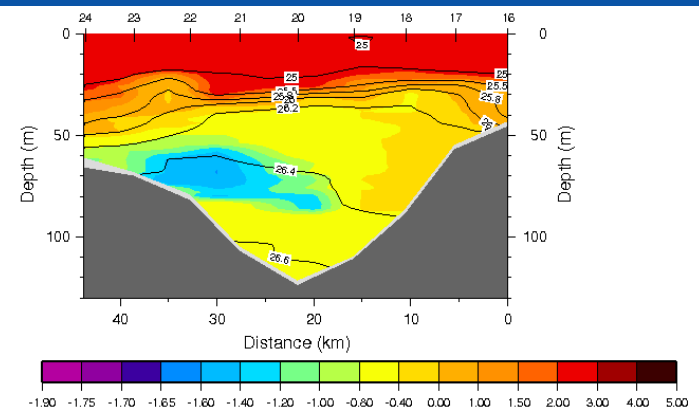
# Comparison between Sep 2010 and Oct 2011

8 Sep 2010



Temp (°C)

7 Oct 2011

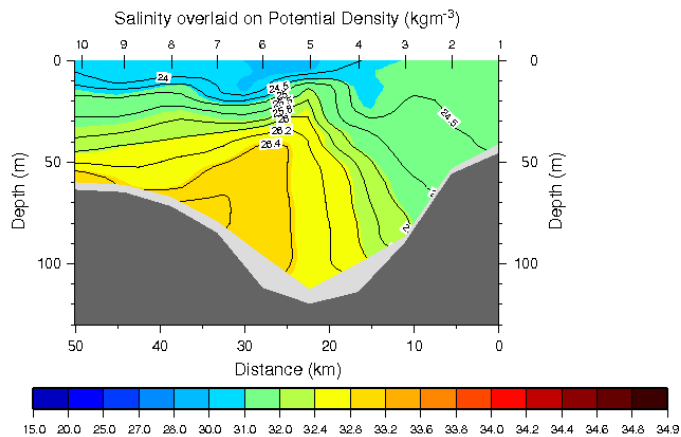
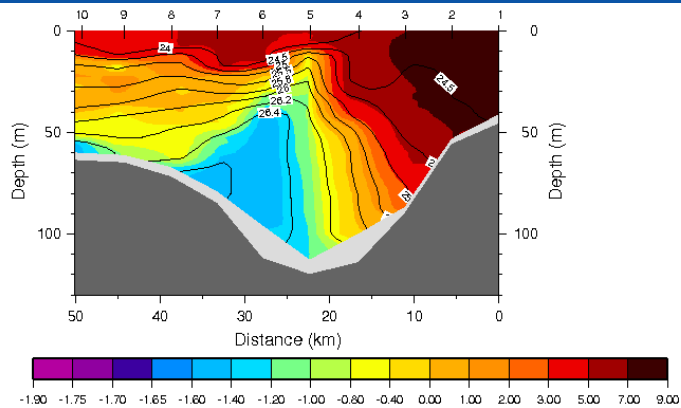


Salinity

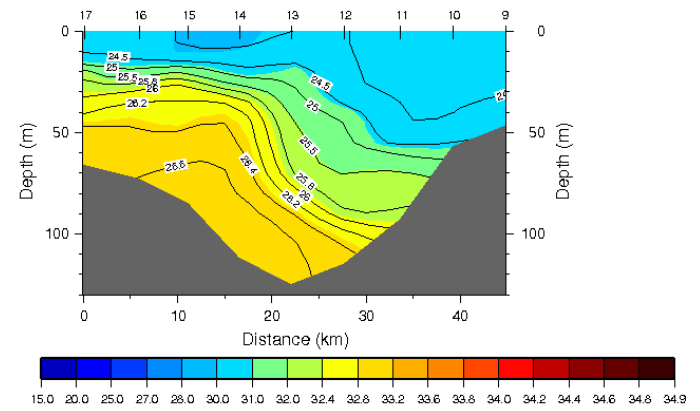
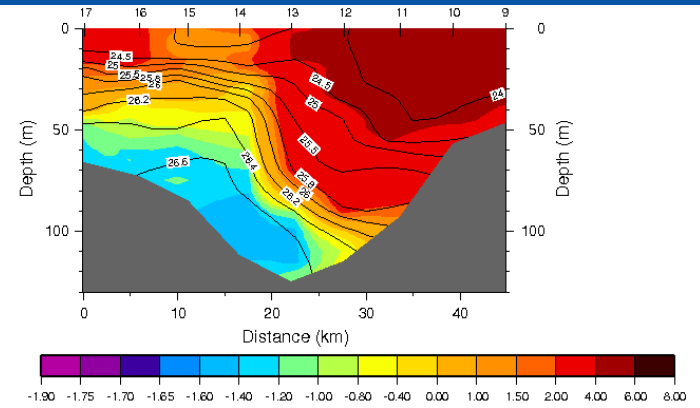
**The ACW is absent in the 2011 crossing. Is this a seasonal difference or an inter-annual change (or both)?**

# Comparison between Sep 2010 and Oct 2012

8 Sep 2010



11 Oct 2012



# What have we learned so far from the DBO Pilot Study?

## Positives

The concept can work! (17 occupations by 4 nations since 2010).

Immediate data sharing is advantageous.

The more occupations the better to help sort out seasonal versus interannual variability.

The information can help with the interpretation of individual studies by providing temporal context.

# What have we learned from the DBO Pilot Study?

## Challenges

Requires coordination and commitment (e.g. might have had two additional occupations in 2010) .

Need for spatial resolution of water sample variables (e.g. nitrate).

Data quality, processing, submission.



Website for the PO component of DBO  
is nearly finished



# DISTRIBUTED BIOLOGICAL OBSERVATORY

Linking Physics and Biology

- Home
- Cruises
- Data Format
- Contact

## Welcome to the DBO Cruise Database

Here you will find CTD, ADCP, and Water Sample data for all the [DBO](#) cruises since 2010.

- Search cruises by several criteria in the [Cruises](#) section,
- Read about the [Data Formats](#) for each data type,
- [Get in touch with us](#) if you have any questions.

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- Cruises
- Data Format
- Contact

### Cruise Database Search

- Use the filters below to narrow down cruises by 1 or more criteria
- Clicking on a cruise id will take you directly to that cruise page.
- Clicking on a column header will sort the table according to that parameter.

Transect  Vessel  Chief Scientist  Bio Parameters Sampled  Year  Month

Show  entries

Search:

Transect	Cruise ID	Vessel	Chief Scientist	Cruise Date
- Barrow Canyon -	<a href="#">AON</a>	Annika Marie	- Carin Ashjan -	Aug.22 - Sep.15 2012
- Barrow Canyon -	<a href="#">AON</a>	Healy	- Robert Pickart -	Oct.5 - Oct.25 2012
- Barrow Canyon -	<a href="#">BOWFEST</a>	Annika Marie	- Carin Ashjan -	Aug 2011
- Barrow Canyon -	<a href="#">CHAOZ</a>	Mystery Bay	- Catherine Berchok - Phyllis Stabeno - Jeff Napp - Sue Moore -	Aug - Sep 2011
- Barrow Canyon -	<a href="#">Shell - Conoco Phillips Environmental Program</a>	Westward Wind	- Tom Weingartner - Bob Day - John Burns -	Aug - Oct 2011
- Barrow Canyon -	<a href="#">AON</a>	Healy	- Robert Pickart -	Oct 2011
- Central Chukchi Sea -	<a href="#">Conoco Phillips - Shell - StatOil Environmental Program (CSESP)</a>	Westward Wind	- Bob Day -	Sep.13 - Sep.30 2012
- Central Chukchi Sea - Barrow Canyon -	<a href="#">HLY1201 - COMIDA Hanna Shoal</a>	USCGC Healy	- Jackie Grebmeier -	Aug.5 - Aug.25 2012
- Southern Chukchi Sea -	<a href="#">RUSALCA-Leg1</a>	Khromov	- Rebecca Woodgate -	Jul.13 - Jul.21 2012
- Southern Chukchi Sea -	<a href="#">Korean Expedition (KOPRI)12</a>	Araon	- Kyungho Chung -	Jul.29 - Aug.? 2012

Transect

Cruise ID

Vessel

Chief Scientist

Cruise Date

Showing 1 to 10 of 22 entries

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## Cruise Database Search

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- Clicking on a cruise id will take you directly to that cruise page.
- Clicking on a column header will sort the table according to that parameter.

Transect  Vessel   Bio Parameters Sampled  Year  Month

Robert Pickart

Show  entries

Search:

Transect	Cruise ID	Vessel	Chief Scientist	Cruise Date
- Barrow Canyon -	<a href="#">AON</a>	Healy	- Robert Pickart -	Oct.5 - Oct.25 2012
- Barrow Canyon -	<a href="#">AON</a>	Healy	- Robert Pickart -	Oct 2011
- Southern Chukchi Sea - Barrow Canyon -	<a href="#">Healy 1101</a>	Healy	- Robert Pickart - Kevin Arrigo -	Jul.15 - Jul.25 2011
- Southern Chukchi Sea - Barrow Canyon -	<a href="#">Healy 1001</a>	Healy	- Robert Pickart - Kevin Arrigo	Jun 15. - Jul 25 2010
- Southern Chukchi Sea - Barrow Canyon -	<a href="#">Healy 1001</a>	Healy	- Robert Pickart - Kevin Arrigo	Jun 15. - Jul 25 2010

Transect	Cruise ID	Vessel	Chief Scientist	Cruise Date
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Showing 1 to 5 of 5 entries (filtered from 22 total entries)

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## Cruise Database Search

- Use the filters below to narrow down cruises by 1 or more criteria
- Clicking on a cruise id will take you directly to that cruise page.
- Clicking on a column header will sort the table according to that parameter.

Vessel
  Chief Scientist
  Bio Parameters Sampled
  Year
  Month

Barrow Canyon

2011

Show  10  entries

Search:

Transect	Cruise ID	Vessel	Chief Scientist	Cruise Date
- Barrow Canyon -	<a href="#">BOWFEST</a>	Annika Marie	- Carin Ashjian -	Aug 2011
- Barrow Canyon -	<a href="#">CHAOZ</a>	Mystery Bay	- Catherine Berchok - Phyllis Stabeno - Jeff Napp - Sue Moore -	Aug - Sep 2011
- Barrow Canyon -	<a href="#">Shell - Conoco Phillips Environmental Program</a>	Westward Wind	- Tom Weingartner - Bob Day - John Burns -	Aug - Oct 2011
- Barrow Canyon -	<a href="#">AON</a>	Healy	- Robert Pickart -	Oct 2011
- Southern Chukchi Sea - Barrow Canyon -	<a href="#">Healy 1101</a>	Healy	- Robert Pickart - Kevin Arrigo -	Jul.15 - Jul.25 2011
- Southern Chukchi Sea - Barrow Canyon -	<a href="#">C30</a>	Sir Wilfrid Laurier	- Jackie Grebmeier - Svein Vagle -	Jul.6 - Jul.21 2011

Transect	Cruise ID	Vessel	Chief Scientist	Cruise Date
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Showing 1 to 6 of 6 entries (filtered from 22 total entries)

Previous Next



- [Home](#)
- [Cruises](#)
- [Data Format](#)
- [Contact](#)

transect: Barrow Canyon

**cruise id : HL1101**

vessel: Healy

chief scientist: Robert Pickart

contact:rpickart@whoi.edu

dates: Jul 15 - Jul 25 2011

### CTD Data

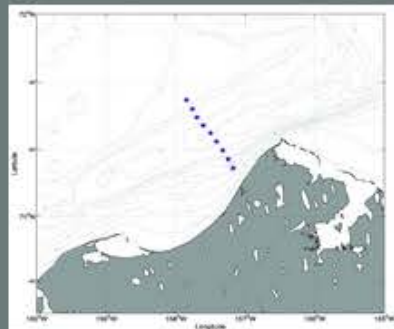
- [SeaBird format \(.zip\)](#)

### ADCP Data

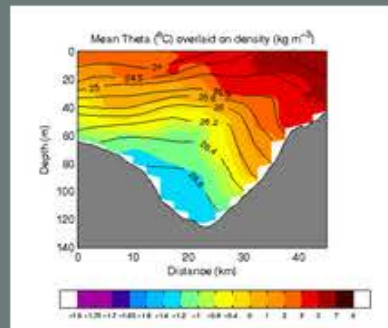
- Matlab Format (.mat)
- ASCII format (.txt)

### Bottle Data

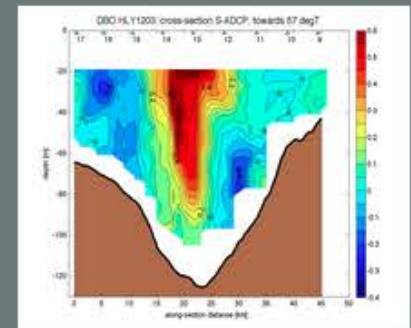
- Salinity (.SAL)
- Oxygen (.OXY)



STATION POSITIONS



CTD TRANSECTS



ADCP TRANSECTS

## Data Formats

- All CTD data is provided in the standard SeaBird format (.cnv files)
- ADCP data is provided in both Matlab (.mat) and ASCII format (.txt)



### CTD DATA FORMAT

#### SeaBird (.cnv)

- Header with the metadata
- Sensor info from the cast
- SeaBird Processing Modules applied along with parameters used



READ MORE



### ADCP DATA FORMATS

#### Matlab (.mat)

- vm\_data
- ctd\_nominal
- ctd\_thissect

#### ASCII (.txt)

- time (in GMT)
- cross-section v
- along-section v



READ MORE

# Questions?

Chukchi Sea September 2010  
Photo by Rachel Fletcher