

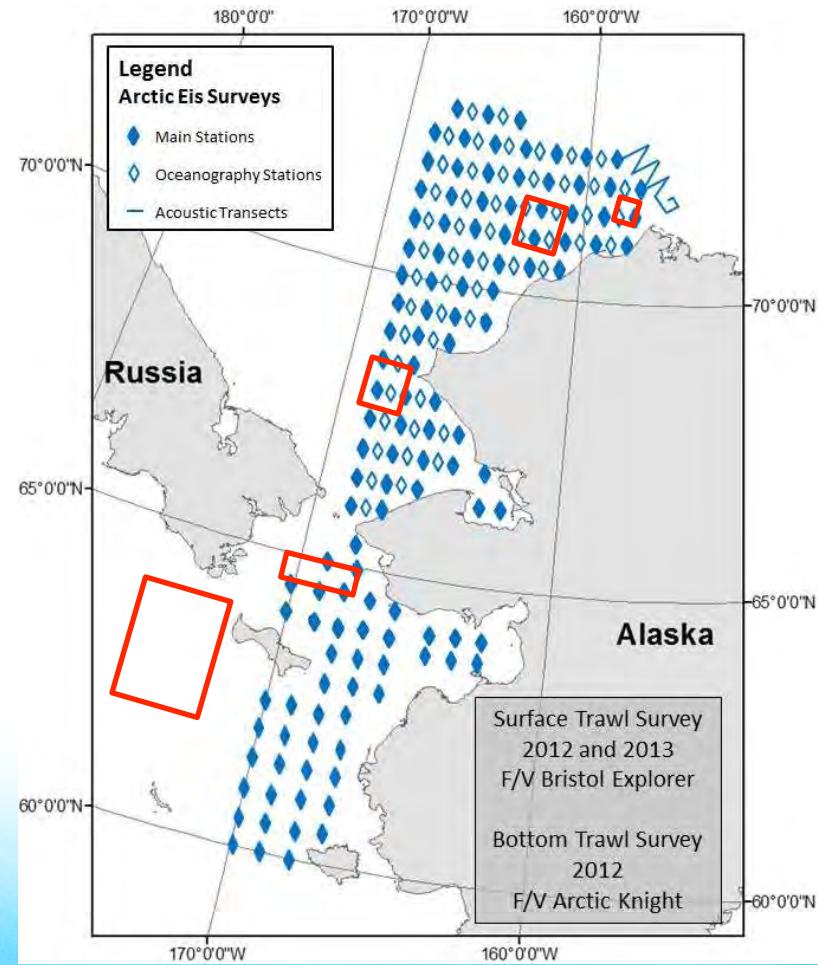
# Arctic Ecosystem Integrated Survey

2012 and 2013: 7 Aug to 24 Sep

**How:** Three surveys sampling a 30x30 mile grid:

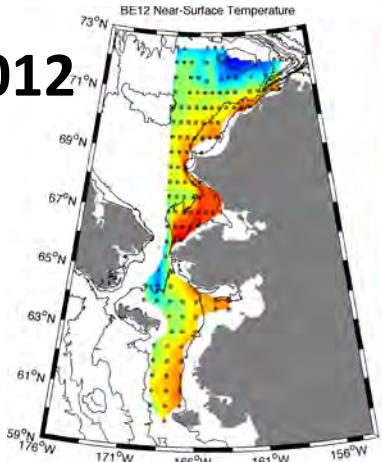
- 2012 and 2013 - The F/V *Bristol Explorer*, conducts surface trawl (top 65'), mid-water trawl, and acoustic surveys to collect data on ocean circulation and physics, water chemistry, plankton, and fishes
- 2012 – The F/V Alaskan Knight, conducted bottom trawl surveys in the Chukchi Sea only to collect demersal fishes and invertebrates
- All surveys collect tissue samples and whole fish to study the biology of salmon, Arctic cod, saffron cod, snow crab, capelin, and other fish & invertebrates

Climate impacts on the marine ecosystem, what do we expect in the future (in terms of fish distribution and fishery potential).

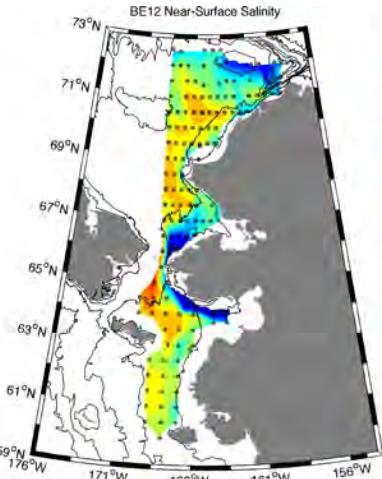


# Arctic Eis: T and S: 2012, 2013

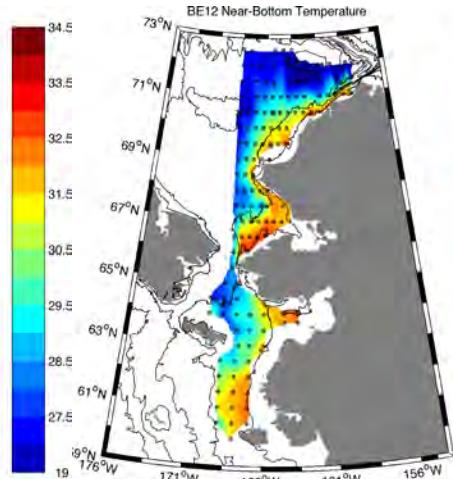
Surf T



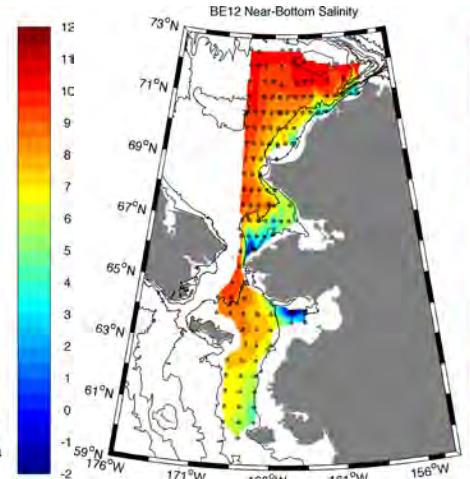
Surf S



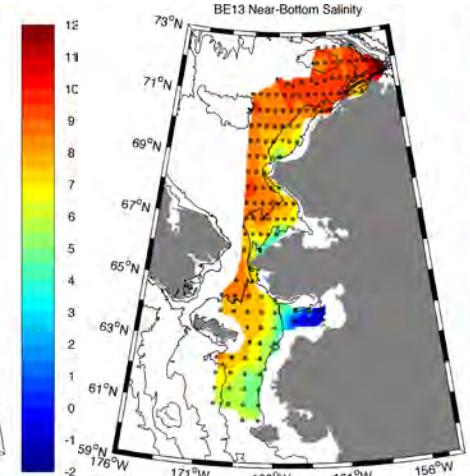
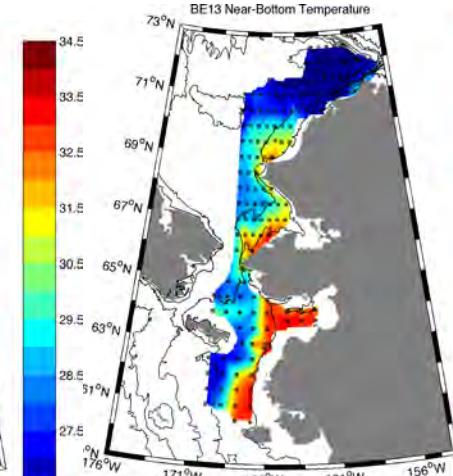
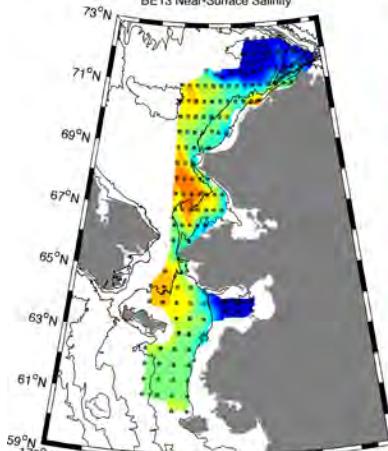
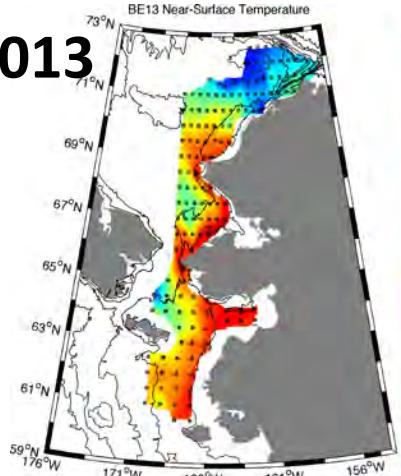
Bott T



Bott S

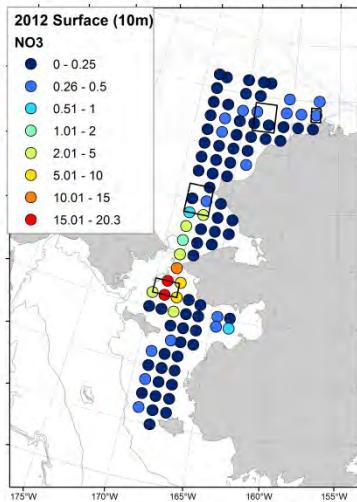


2013

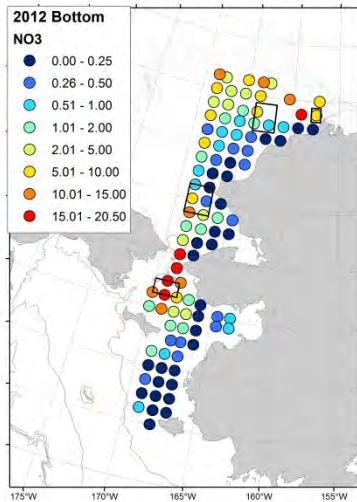


# Arctic Eis Nitrate and Chla: 2012, 2013

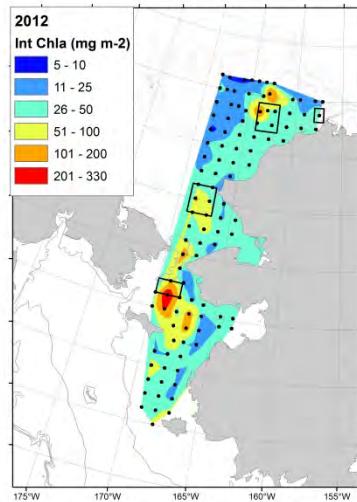
Surf NO<sub>3</sub>  
( $\mu\text{M}$ )



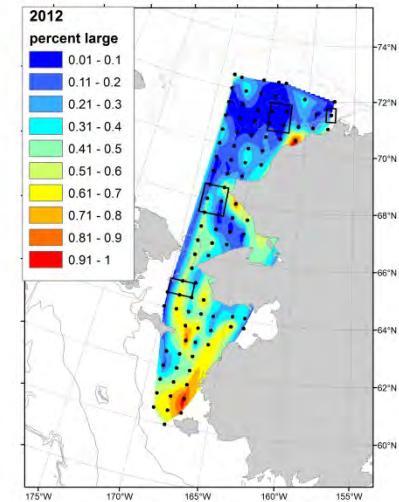
Bott NO<sub>3</sub>  
( $\mu\text{M}$ )



Int Chla  
( $\text{mg m}^{-2}$ )

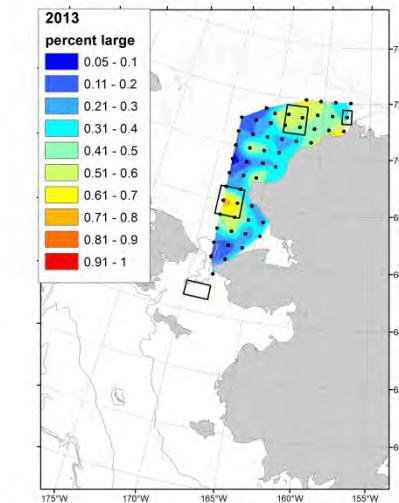
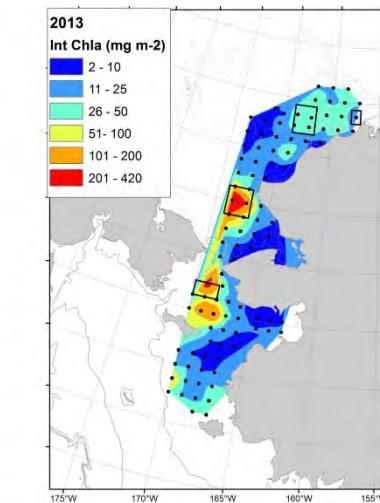
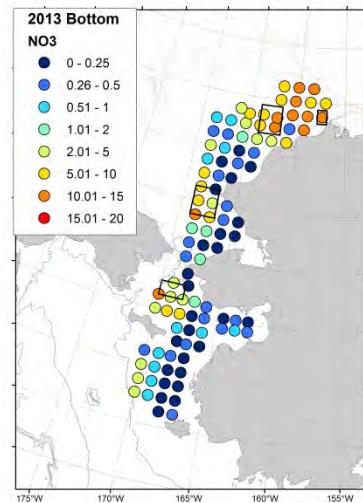
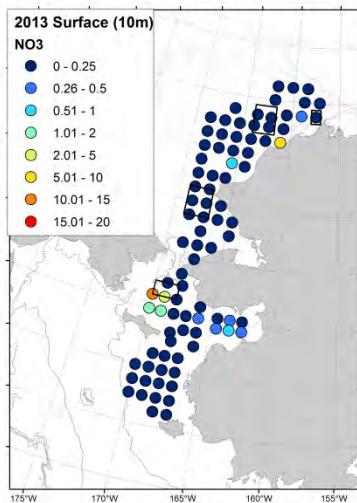


% large Chla  
(> 10  $\mu\text{m}$ )



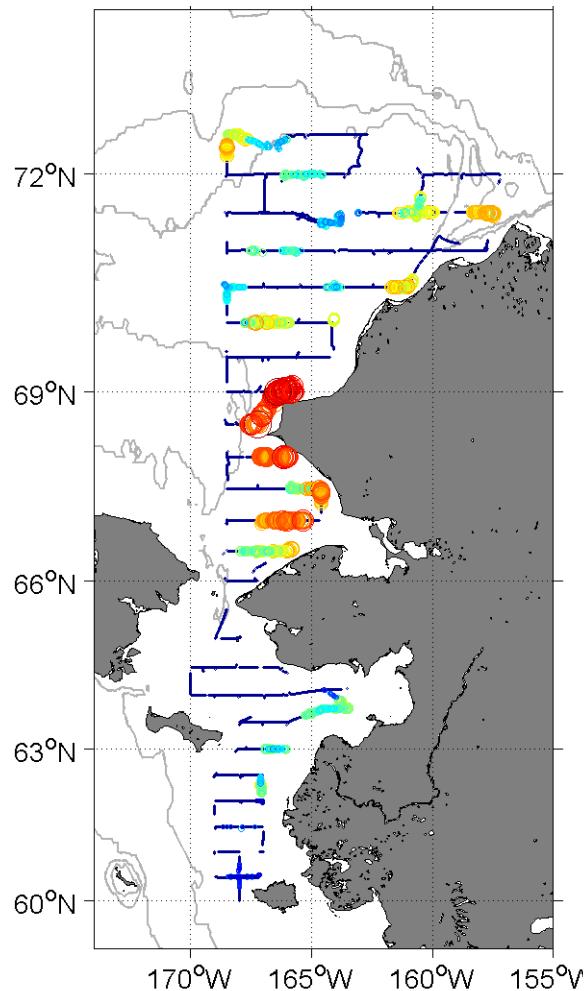
2012

2013

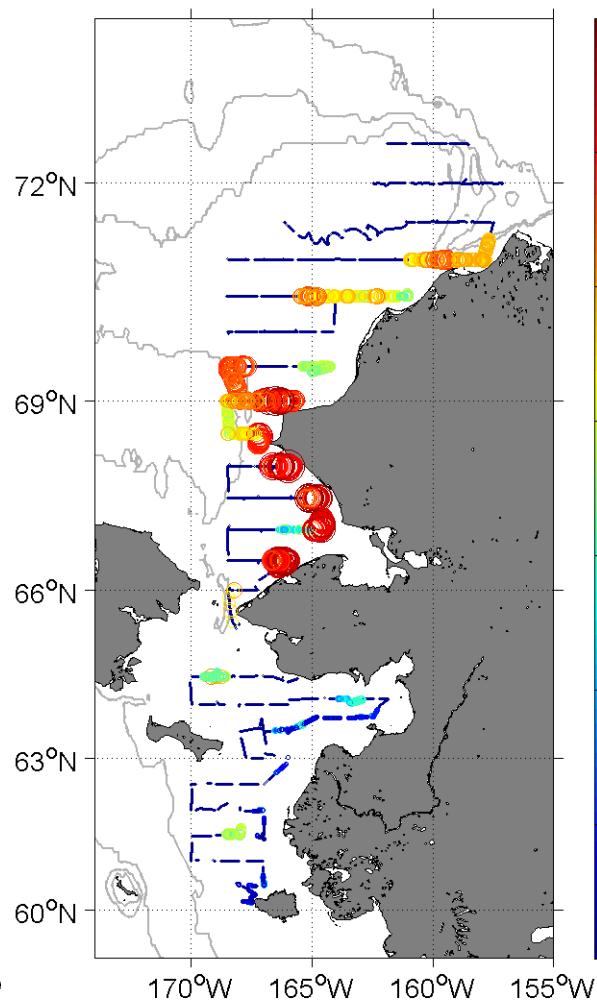


# Arctic EIS Acoustic-trawl survey (Chukchi Sea): Age-0 saffron cod

2012 –  $1.7 \cdot 10^9$  fish



2013 –  $6.5 \cdot 10^9$  fish

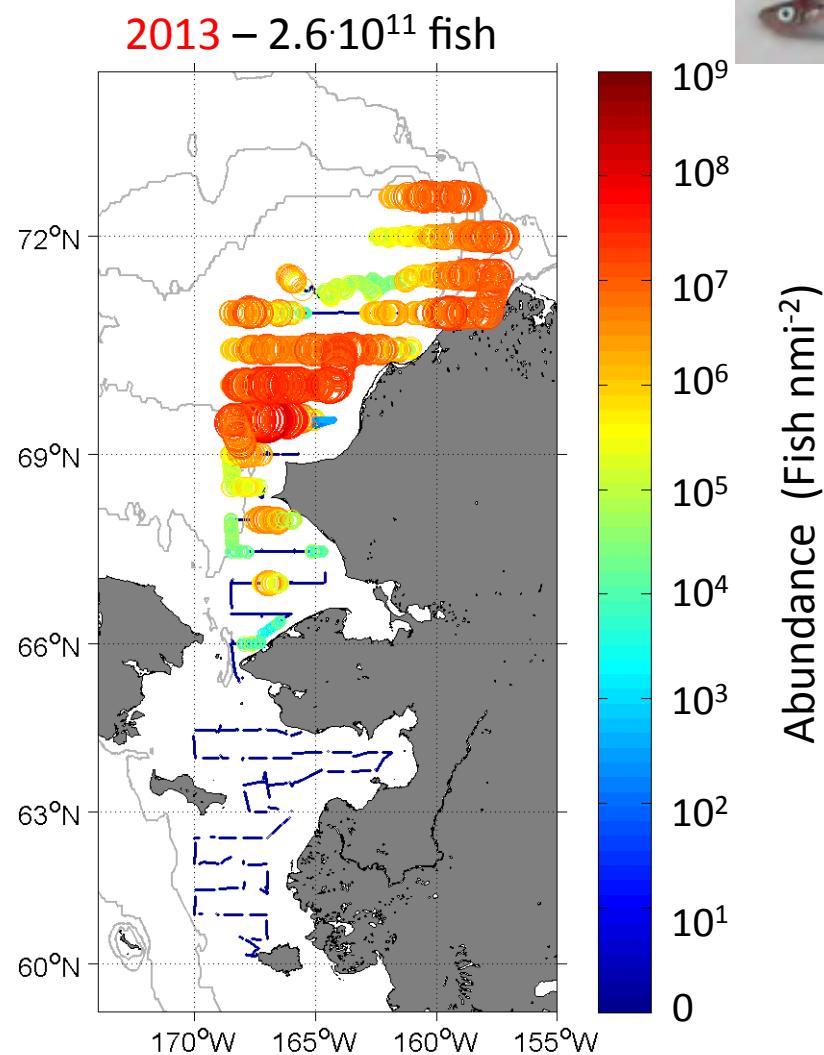
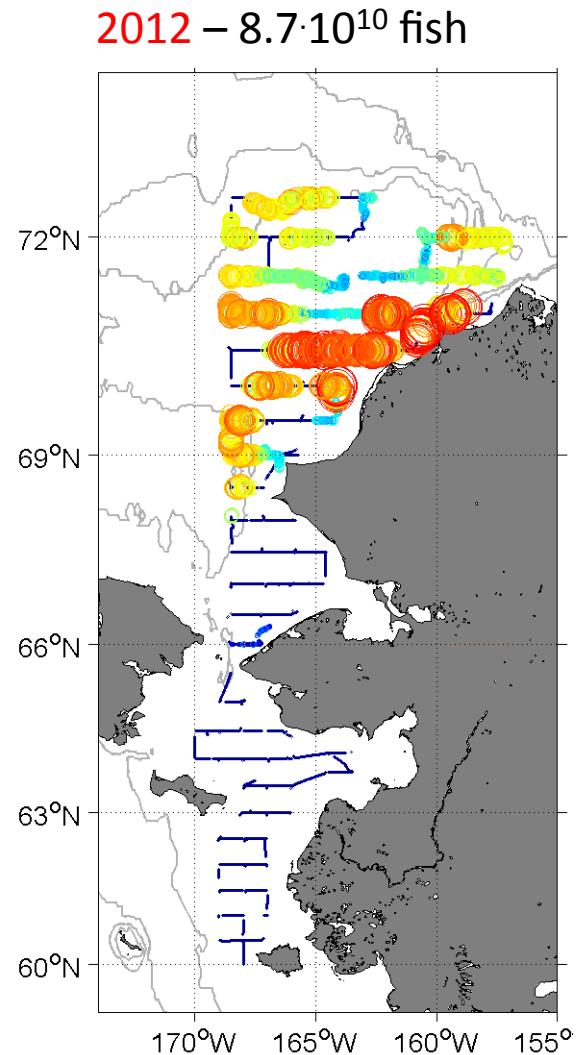


Abundance (Fish nmi<sup>-2</sup>)

$10^7$   
 $10^6$   
 $10^5$   
 $10^4$   
 $10^3$   
 $10^2$   
 $10^1$   
0

Saffron cod 4 times more abundant in 2013 than in 2012

# Arctic EIS Acoustic-trawl survey (Chukchi Sea): Age-0 arctic cod

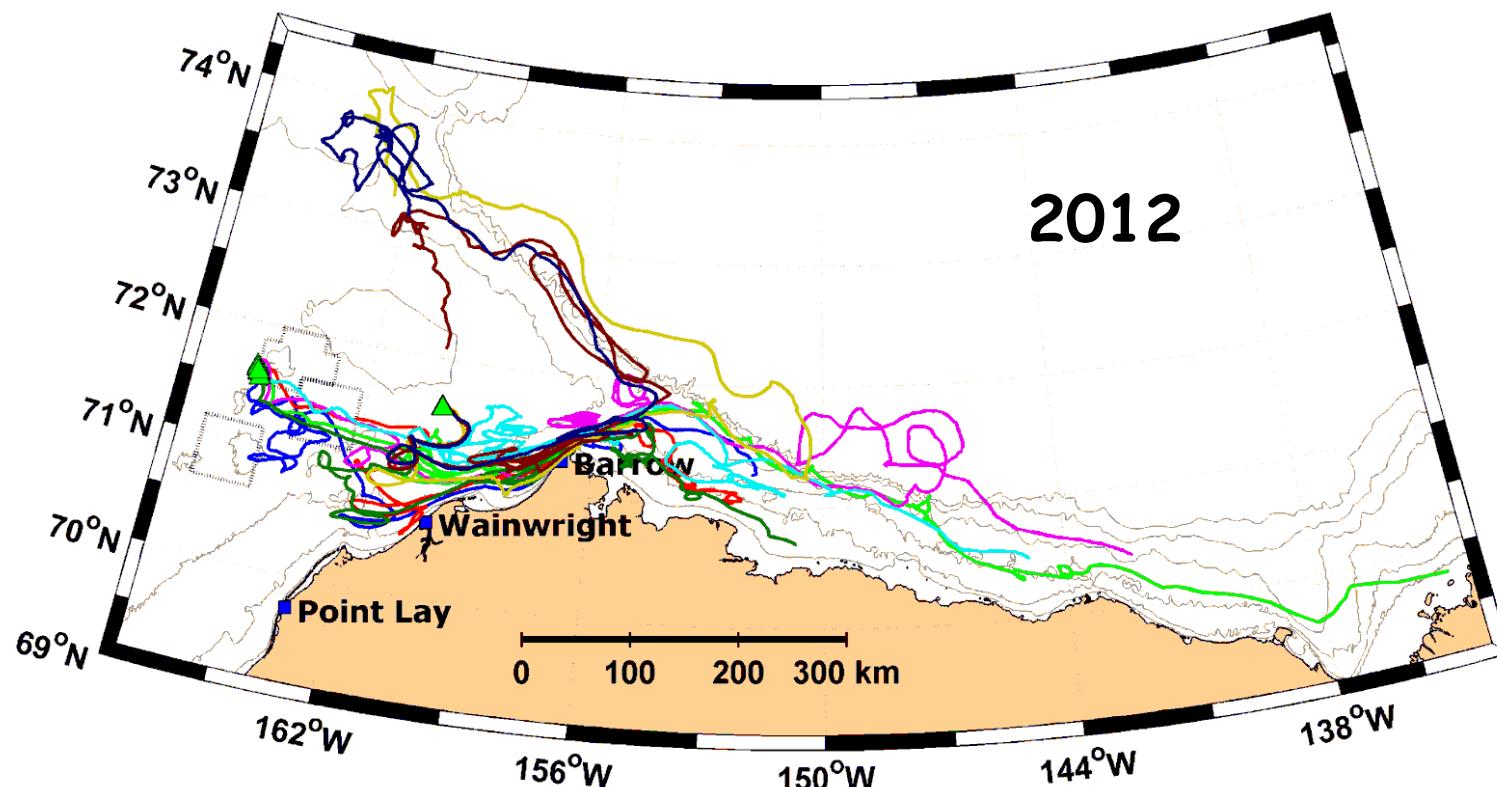


Abundance (Fish nmi<sup>-2</sup>)

Arctic cod 3 times more abundant in 2013 than in 2012

# 2012 (& 2011) Drifters

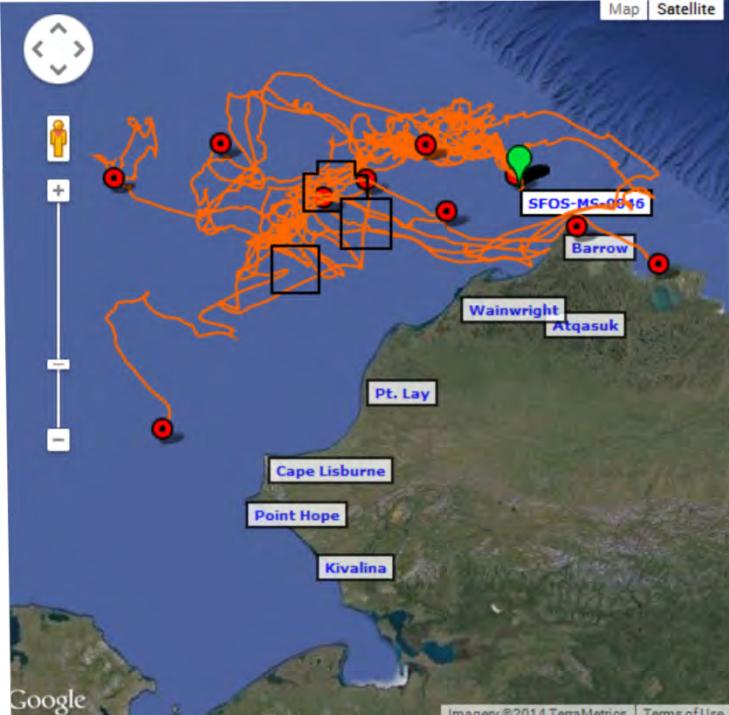
- Exited through Barrow Canyon
- Most entered the shelfbreak flow  
(either eastward or westward)



Satellite-tracked  
drifters  
(UAF, NSB,  
NOAA;  
Weingartner/  
Danielson, de  
Sousa,  
Stabeno)

# 2013 Drifters

Stayed on  
the shelf

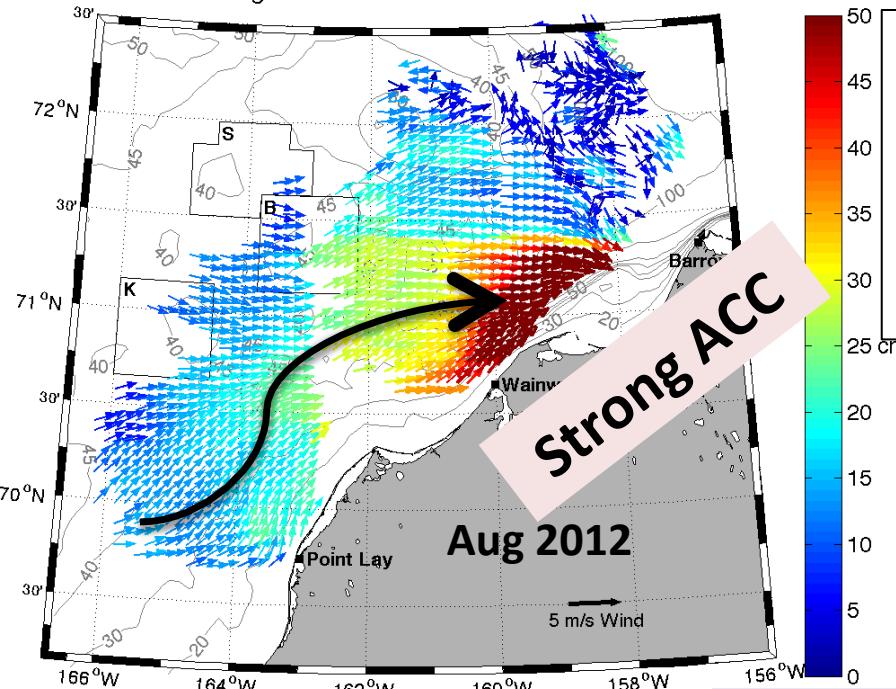


Westward  
motions

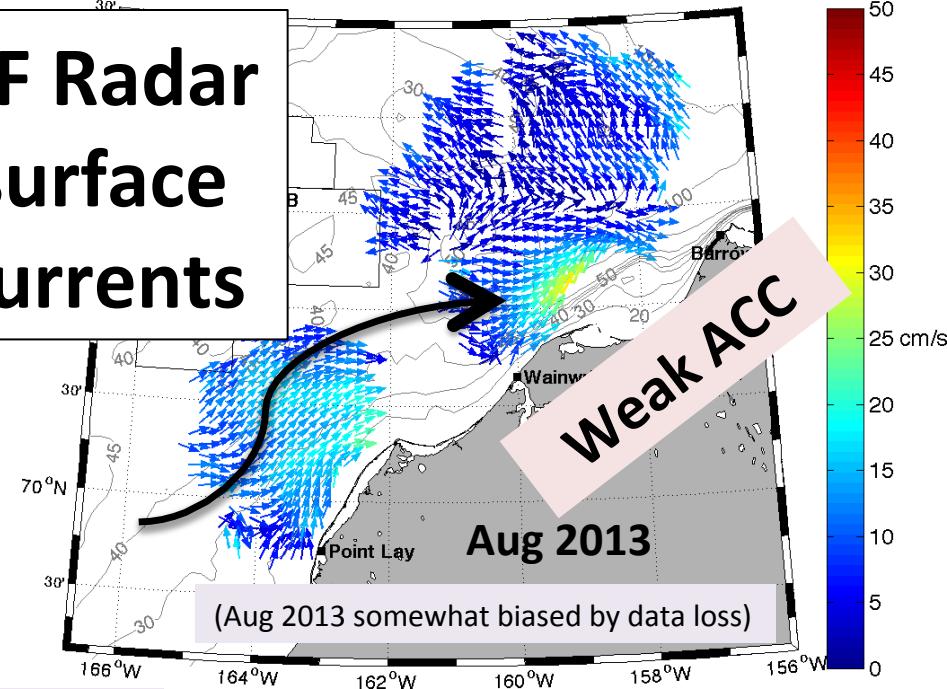


Satellite-tracked  
drifters  
(UAF, NSB,  
NOAA;  
Weingartner/  
Danielson, de  
Sousa,  
Stabeno)

August 2012 Mean Surface Currents



August 2013 Mean Surface Currents



HF Radar  
surface  
currents

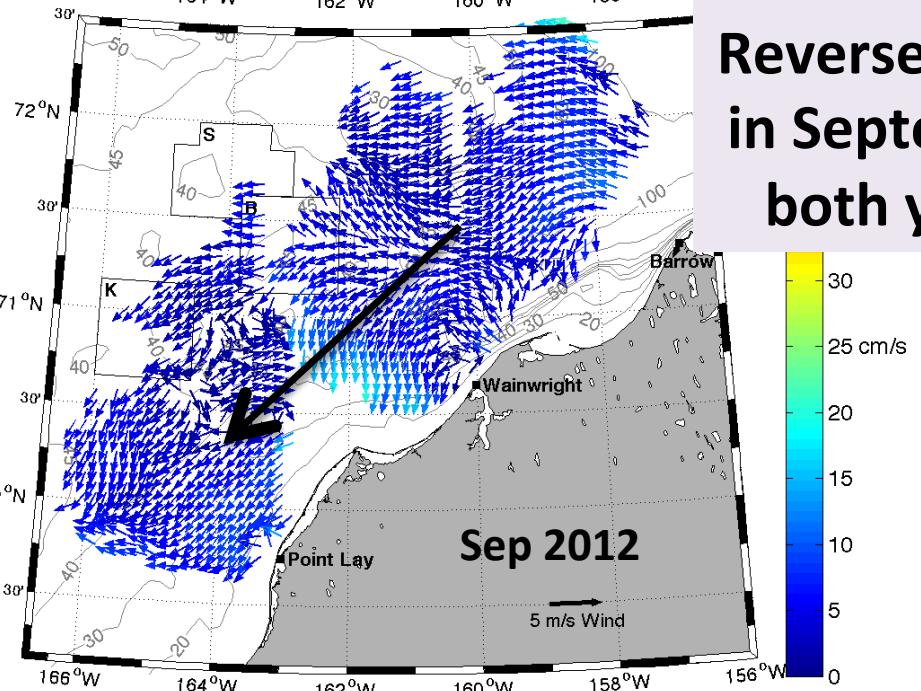
Strong ACC

Weak ACC

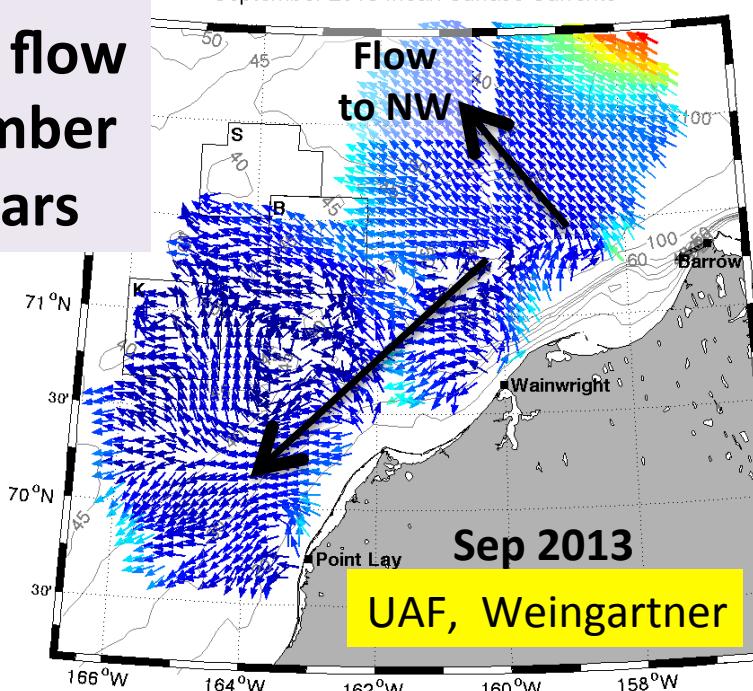
Aug 2012

Aug 2013

Reversed flow  
in September  
both years



Sep 2012



Sep 2013

UAF, Weingartner