



How do Oceanographic Characteristics in the Northern Bering Sea Relate to Juvenile Salmon Biomass?



Jeanette Gann, Lisa Eisner and Seth Danielson
Jeanette.gann@noaa.gov

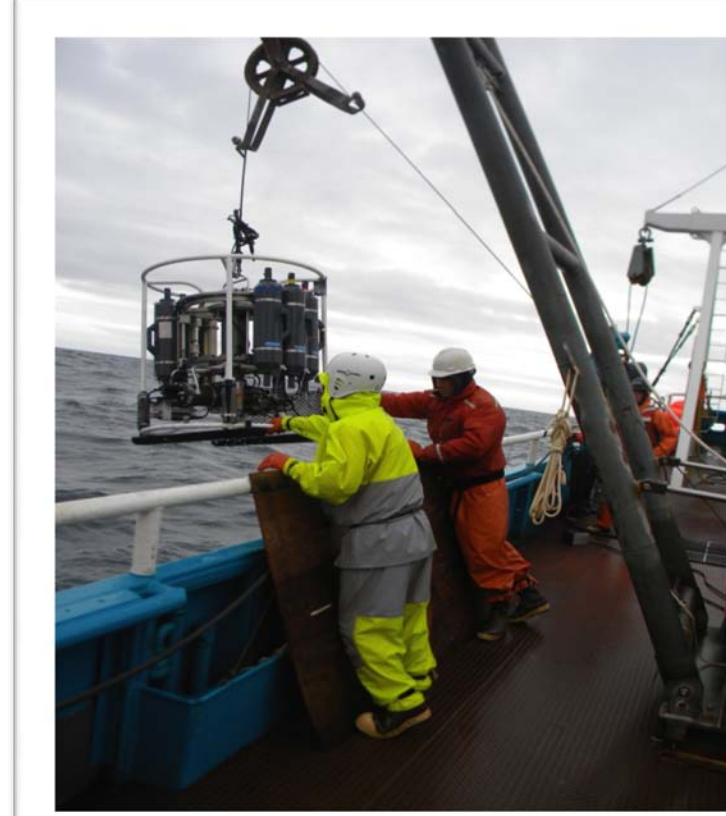
Overview:

We describe spatial and temporal variations in oceanography and fisheries for the northeastern Bering Sea shelf, and highlight relationships between parameters.



Oceanography

Data collected from CTD casts (2002-2011), moorings (1987-2006), and the World Ocean Database (WOD, 1975- present).



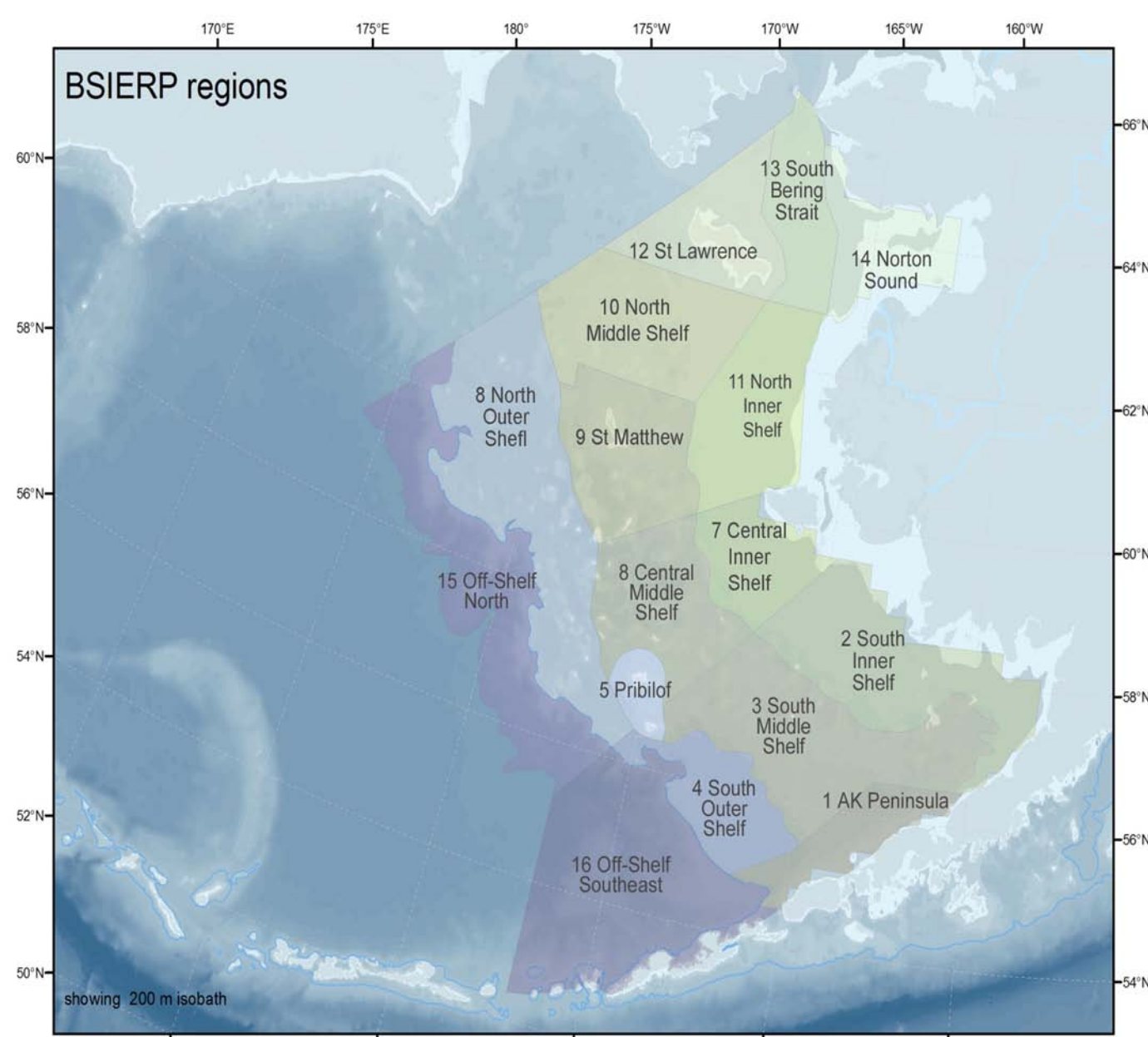
Zooplankton

Large and small taxa collected with oblique bongo-net tows (505 um) and vertical Juday-net tows (168 um).

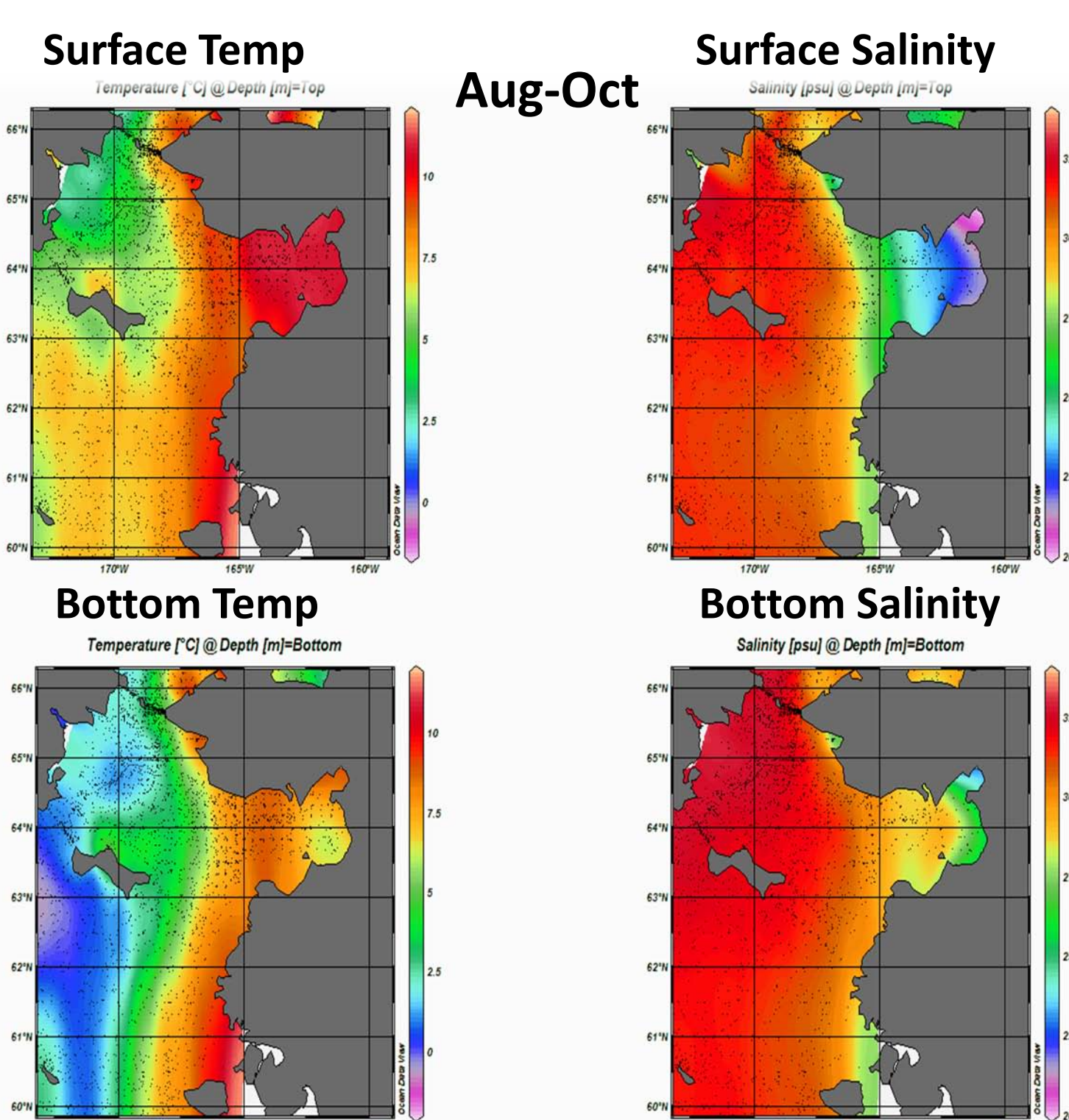


Juvenile Salmon

Salmon collected with a surface rope net (Can trawl model 400 580): spread 60 m (width) by 15 m (depth).

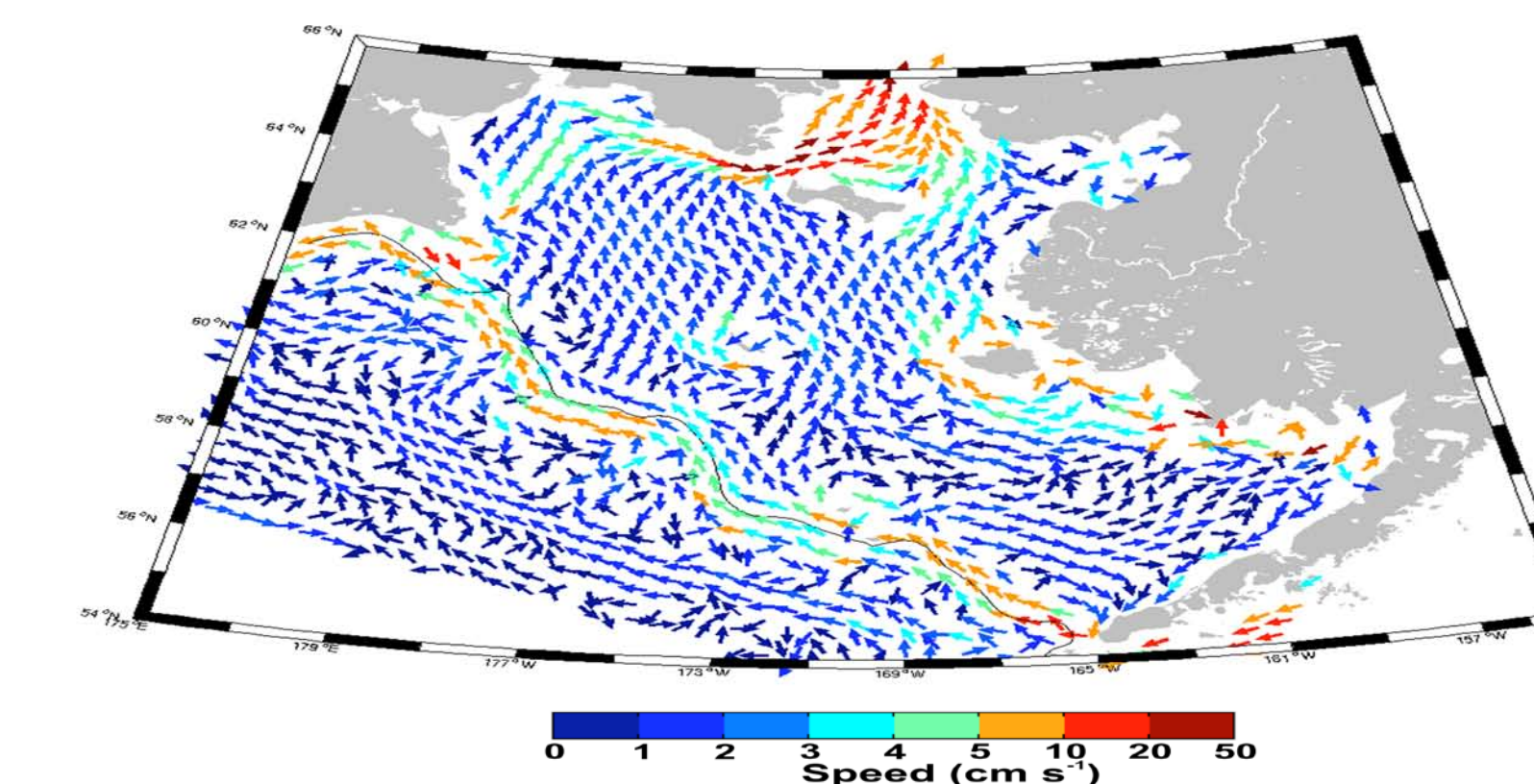


Region delineations (Ortiz et al 2013). Regions between 60- 65 °N latitude were used for analyses.



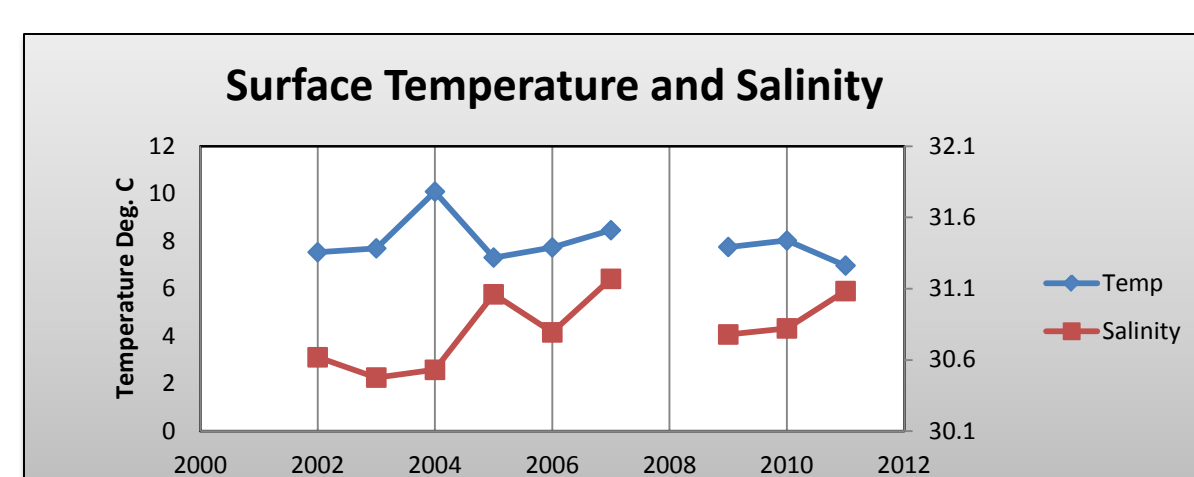
- ❖ Highest temperatures (T) and lowest salinities (S) in Norton Sound, with T ↓ and S ↑ E to W.
- ❖ Lowest S in Norton Sound due to large fresh water inputs coastal discharge.
- ❖ Low bottom T observed below St Lawrence I. shows cold pool location (<2 °C, formed during previous winter freezing.).

Currents (1987-2007 mean)

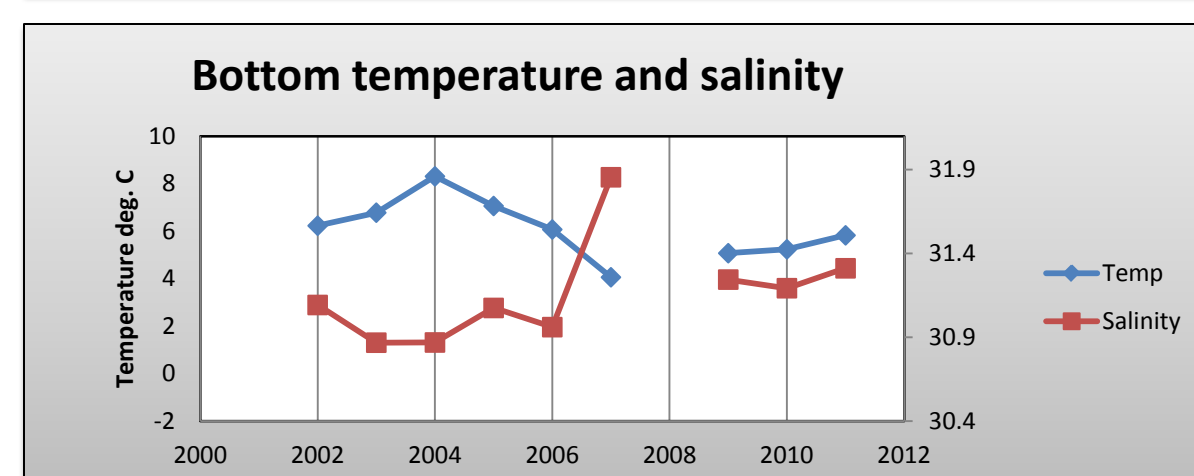


- ❖ Surface flow generally northward at ~2-3 cm s⁻¹ over northern Bering Sea.
- ❖ Current speeds increase around St. Lawrence I. and the Bering Strait.

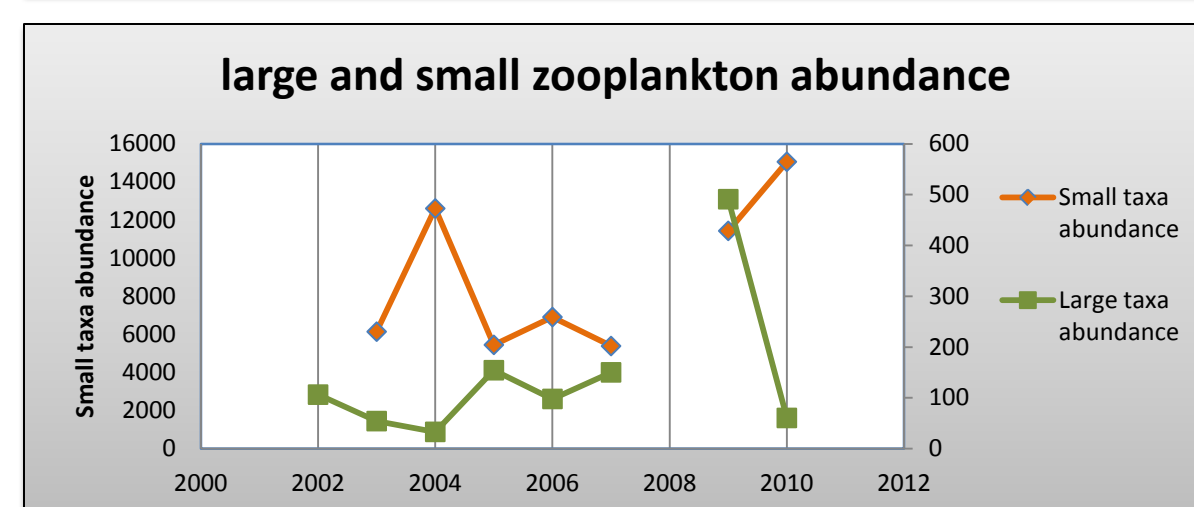
N Inner + S Bering Strait Combined



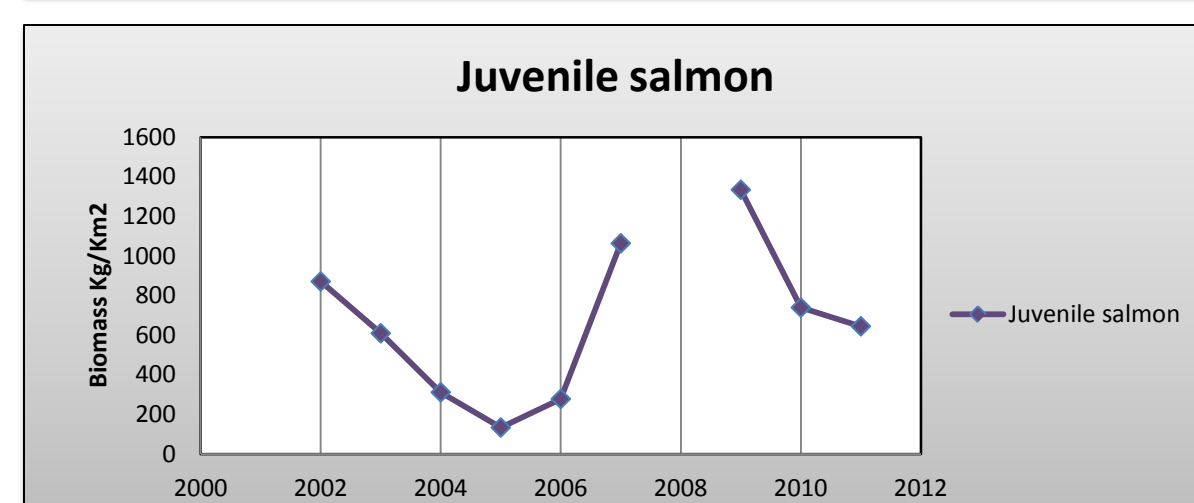
- ❖ Surface S and large zooplankton show a positive relationship until 2009-2010.



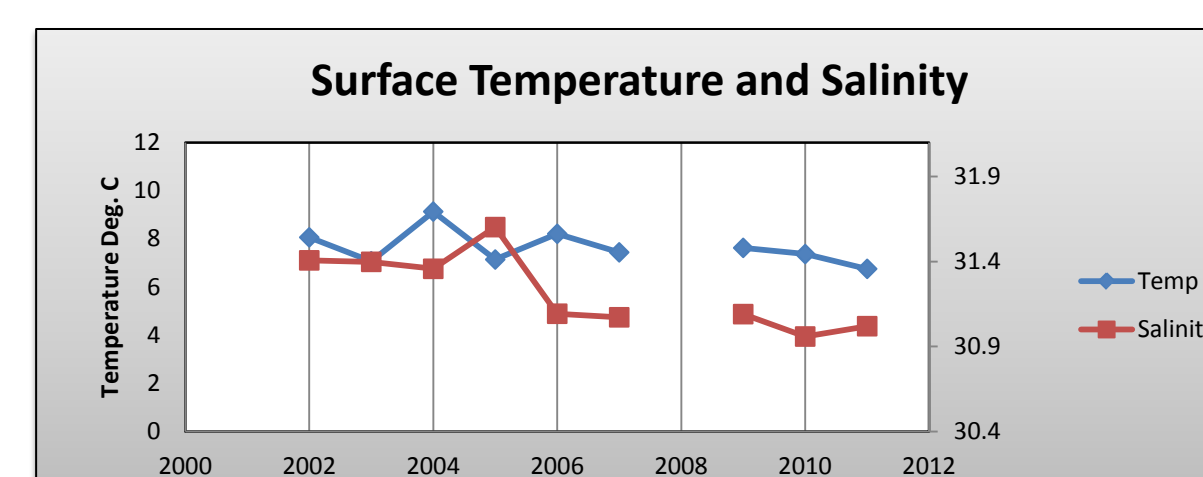
- ❖ Large and small zooplankton have an inverse relationship.



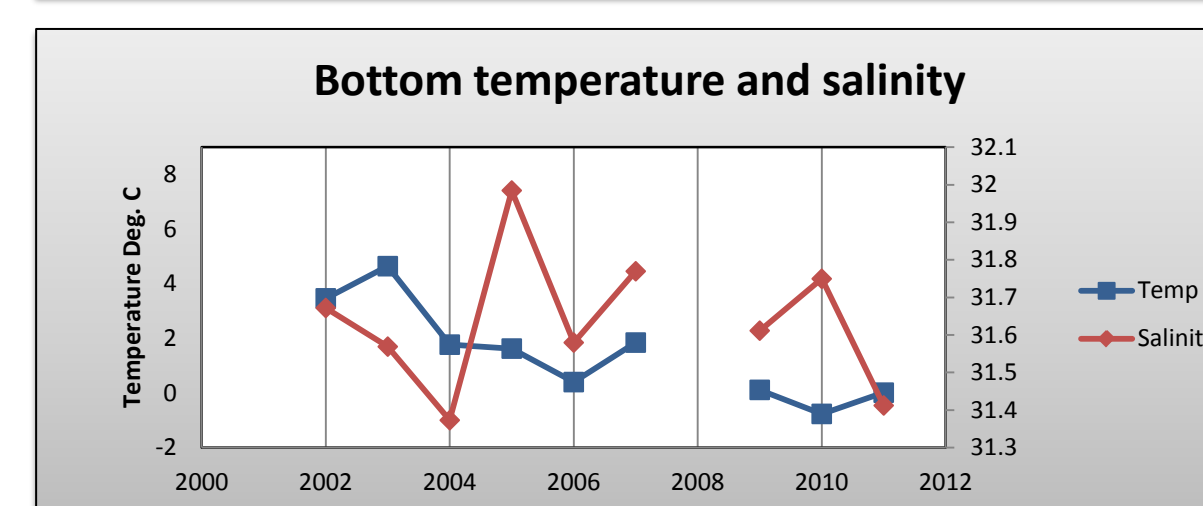
- ❖ Juvenile salmon biomass associated positively with bottom S and negatively with bottom T.



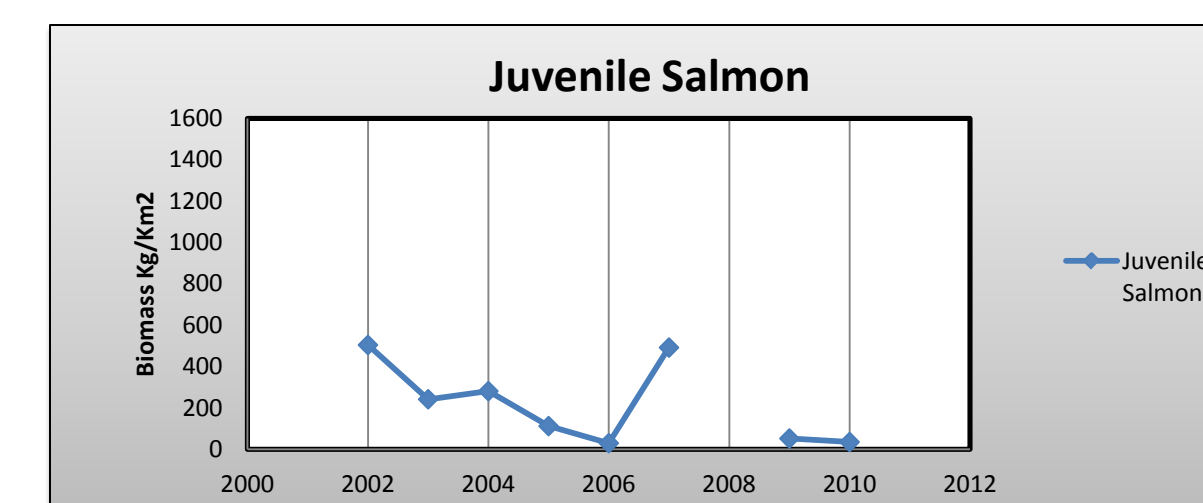
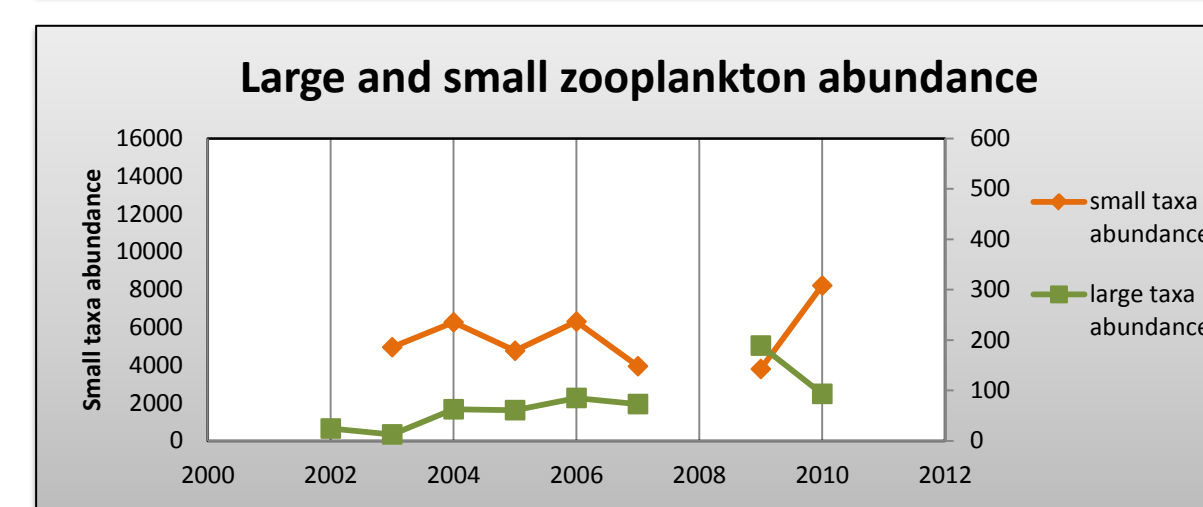
N Middle + St. Mathews Combined



- ❖ Large and small zooplankton trend weakly in the same direction until 2009-2010.



- ❖ Juvenile salmon biomass and bottom T show a positive relationship.



Findings:

Juvenile salmon and zooplankton vary by oceanographic region:

- ❖ The highest juvenile salmon biomass is found in S Bering Strait and N Inner regions
- ❖ The highest large zooplankton abundance is found in S Bering Strait.
- ❖ The highest small zooplankton abundance is found in N Inner region.