

Do late open water season storms enhance food supply to Arctic food webs?



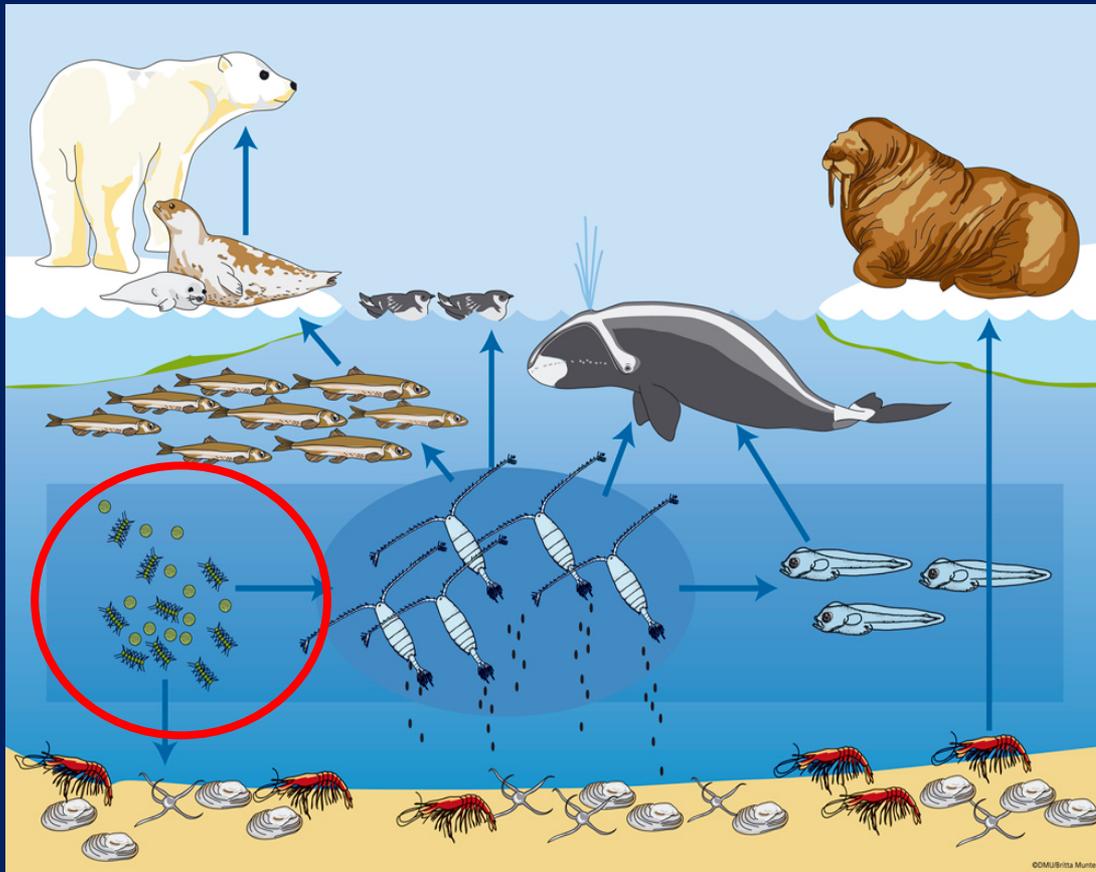
College of Earth, Ocean,
and Atmospheric Sciences



Dr. Lauren Juranek
Oregon State University



Motivation: Is there enhanced productivity at base of food chain in late summer?



Tiny microscopic plants that make up the base of the food chain are limited by light and nutrients (fertilizer)

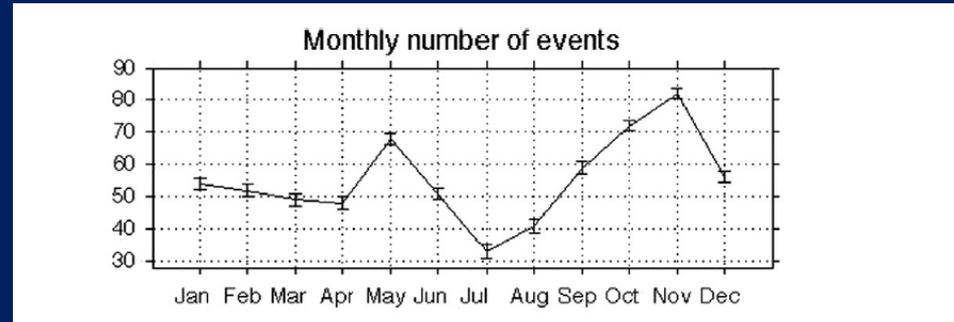
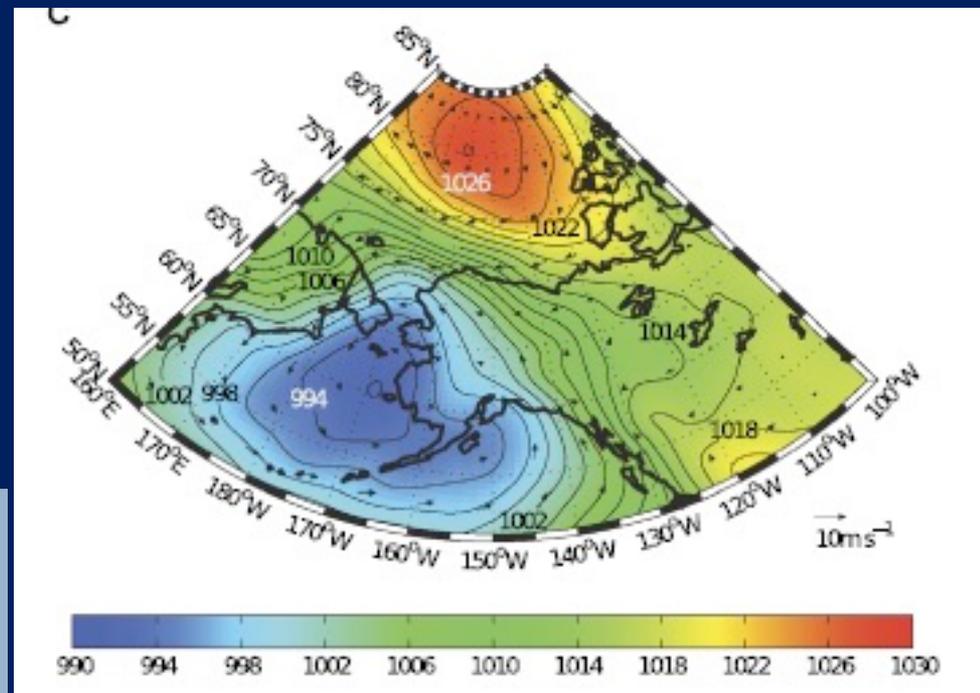
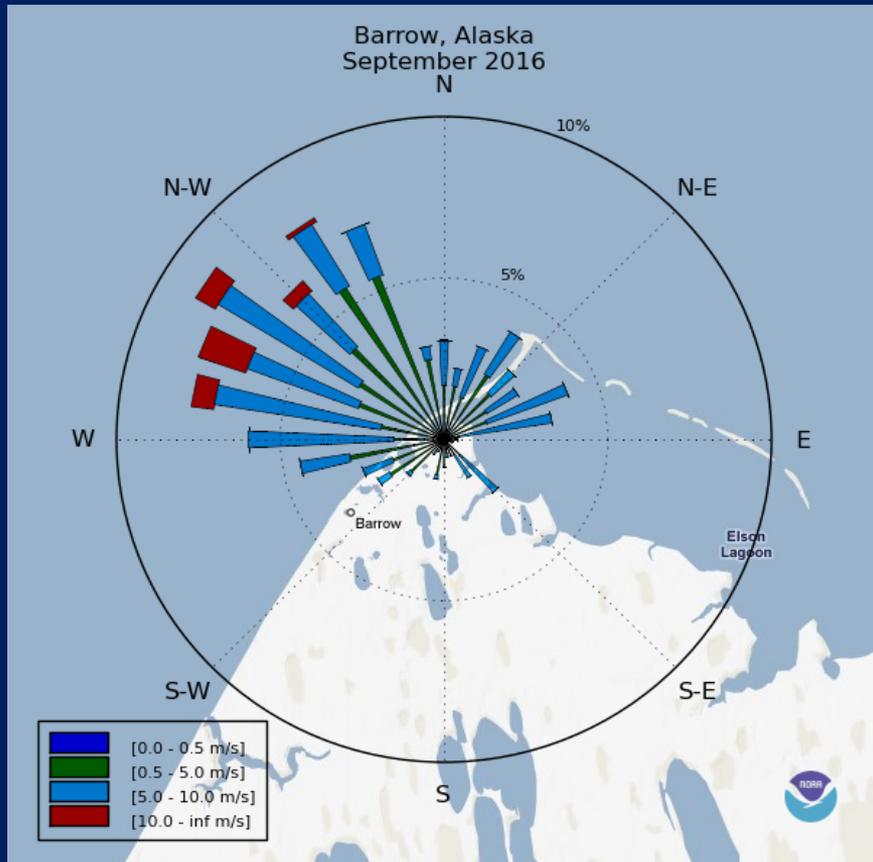
Both light and nutrient availability are potentially changing due to ice – what is the net effect?

Why do we care about *late summer* production?

- We suspect that fall 'blooms' of marine plant growth are becoming more common, possibly contributing more food supply to Arctic food webs .
- Understanding WHY this is occurring is important – are storms in fall supplying fertilizer for continued late season growth, enhancing the food supply?

Impact of late summer storms...

Late summer storm tracks tend to induce winds that can bring cold, nutrient-rich water at depth to the surface



Number of storm events likely to cause upwelling peaks in late summer

Two field seasons on R/V Sikuliaq

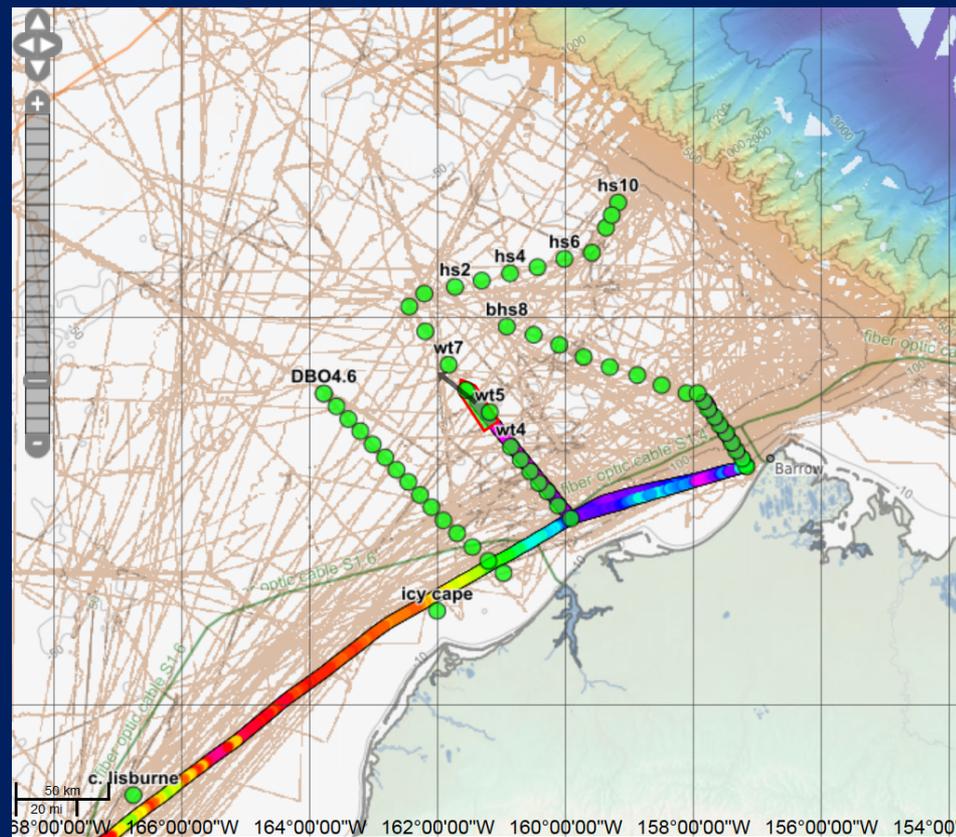
September 2016 and August 2017

Primary area of focus:
Chukchi Sea, west of
Utqiagvik

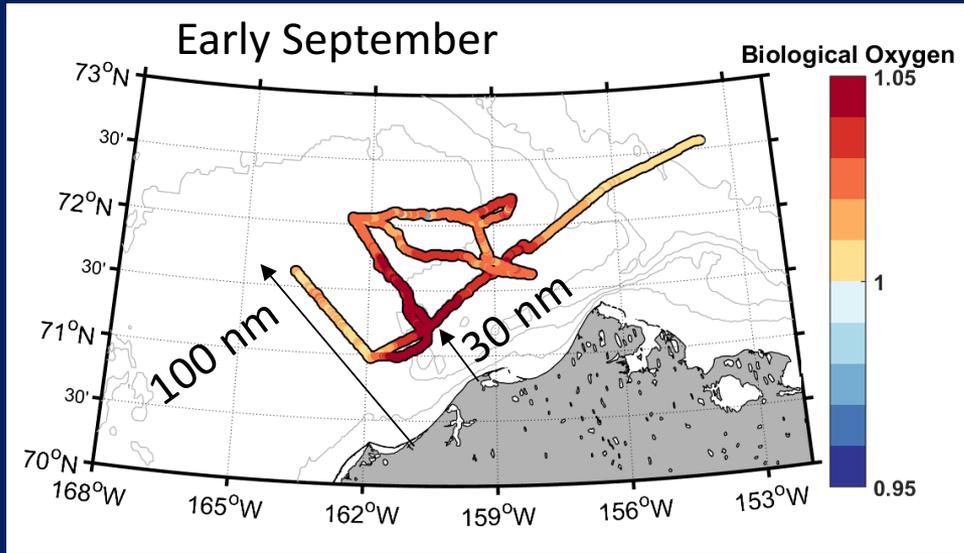
Water sampling in surface
and along vertical sections

Growth experiments

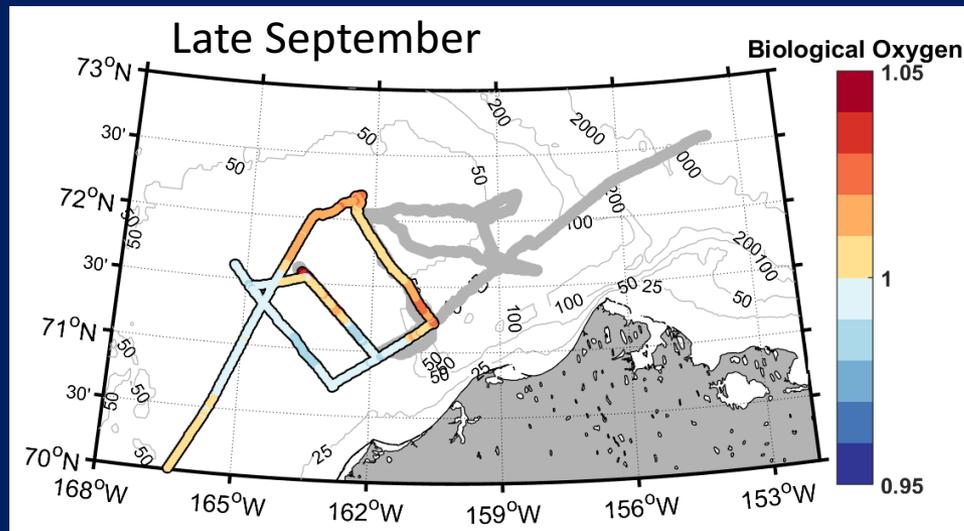
Surface sediment sampling



Some results from 2016 research cruise

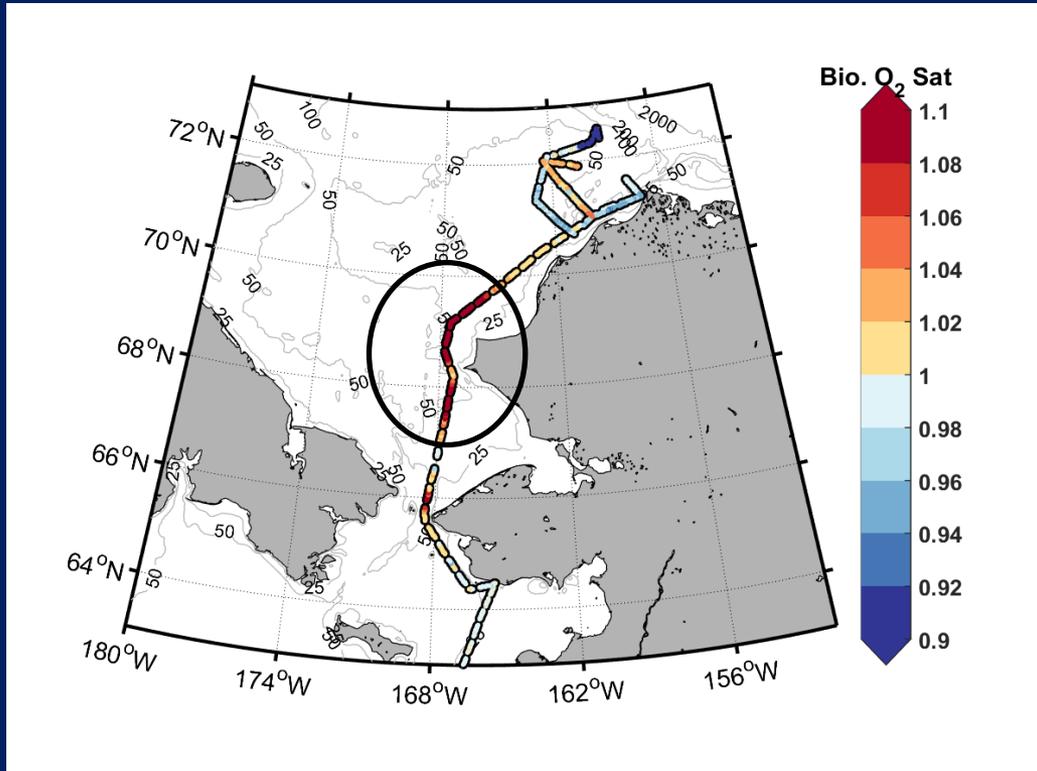


This plot shows *'hotspots'* of biological activity at the base of the food chain: the more red, the more potential food availability



Blue colors would mean no new growth, less food availability

August, 2017 field season

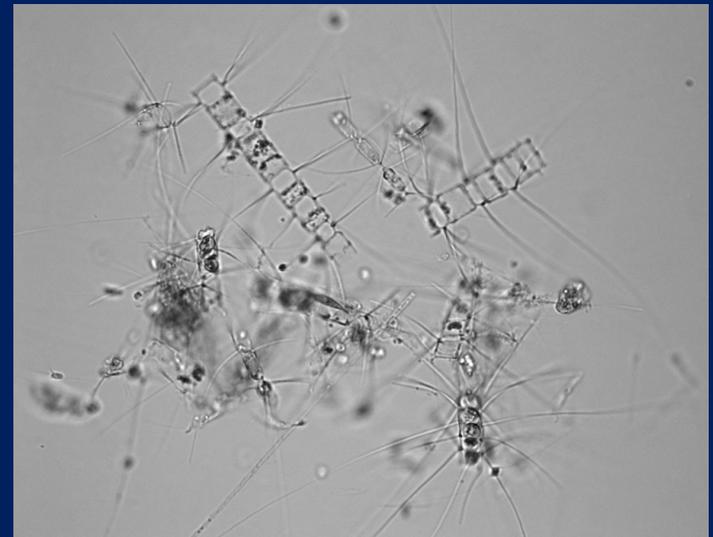


An enormous bloom was evident near Pt. Hope

Otherwise, less productive than observations from Sept 2016

Other sampling of interest...

1. We took over 100 samples for analysis of harmful algal bloom toxins
2. We also conducted experiments for oil biodegradation rates
3. We also have other plankton, nutrient, and water chemistry samples



We will keep you updated as we learn more...

Thank you!!

Questions?