



Main Results

- Vegetation productivity increases have occurred at different times of the growing season throughout the Arctic.
- Sea ice declines are largest during spring and fall consistent with the periods of largest variability.
- North America displays large year round warming while Eurasia displays largest warming in fall/winter.
- Eurasia displays largest NDVI increases in spring and fall while N. America has largest increases in spring.

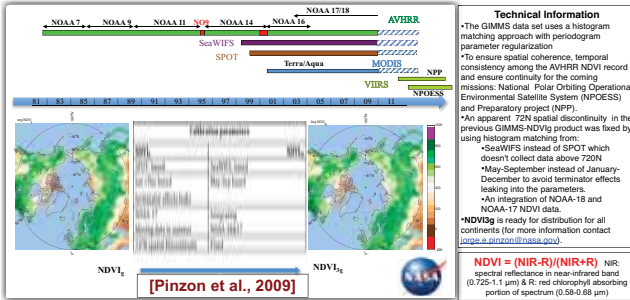
Motivation and Methods

Goal: Investigate the role of seasonality in current understanding of tundra-climate relationships

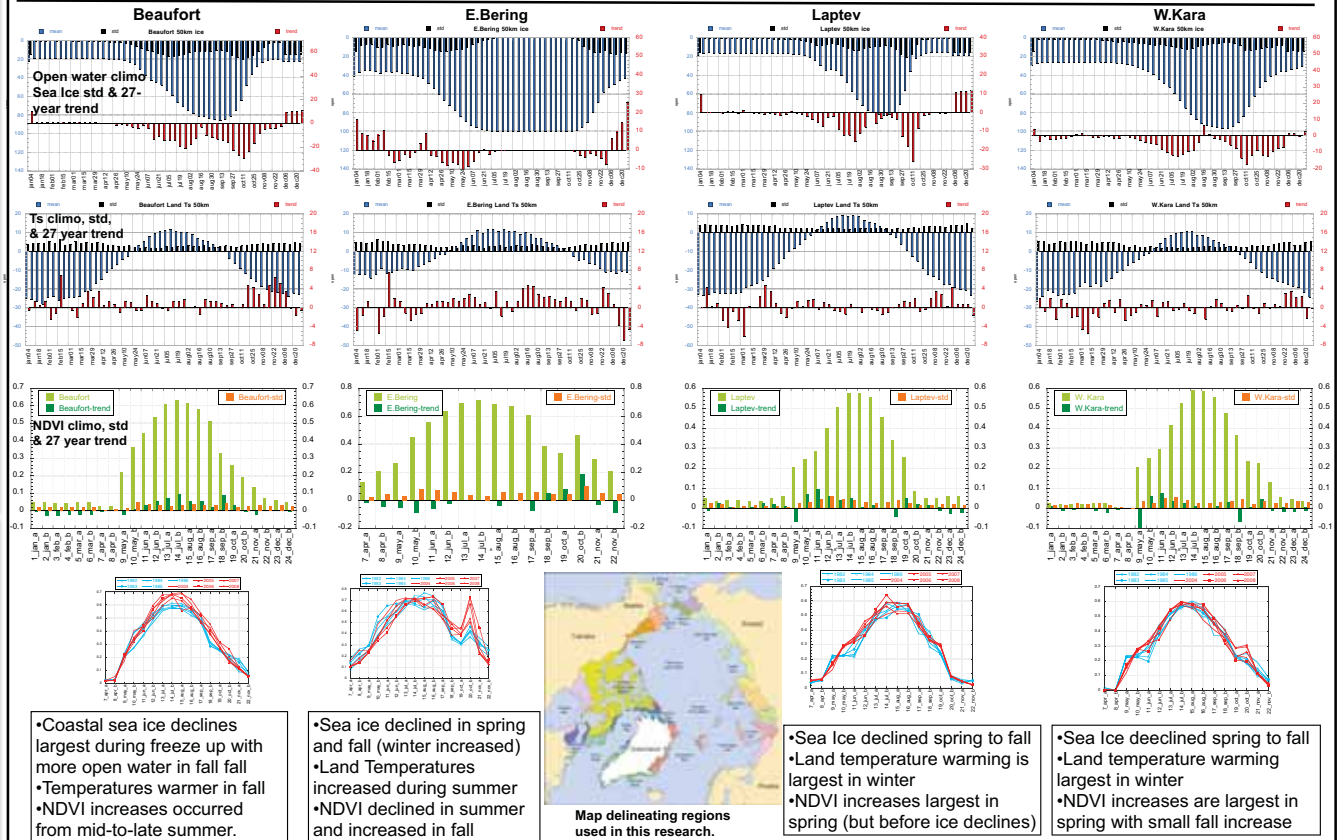
Data: Use 25 km resolution SSM/I passive microwave Bootstrap Sea Ice Concentration (SIC), AVHRR Surface Temperature (T_s), and new GIMMS NDVI_{3g} for the Arctic over the 1982-2008 period.

Methods: Standard climate analysis techniques applied to regional time series constructed using data within 50-km of Arctic coastlines (ocean & land).

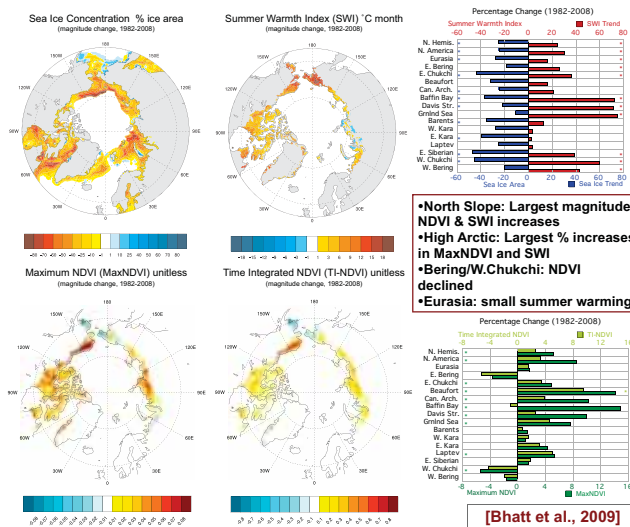
New GIMMS-NDVI_{3g} for the Arctic



Weekly & Biweekly Trends in the Arctic Coastal Zone for the Beaufort, E. Bering, Laptev and W. Kara Seas



Sea ice declines are driving vegetation increases



References

- Pinzon, J. E., E. Pak, C.J. Tucker, 2009 (submitted), A revised AVHRR 8-km NDVI Data Set - Compatibility with MODIS and SPOT Vegetation NDVI Data, American Geophysical Union EOS Transactions.
- U.S. Bhatt, D.A. Walker, M.K. Raynolds, J.C. Comiso, H.E. Epstein, G. Jia, R. Gens, J.E. Pinzon, C.J. Tucker, C.E. Tweedie, and P.J. Webber, 2009 (submitted 12/2009): Circumpolar Arctic tundra vegetation change is linked to sea-ice decline, Earth Interactions.

Acknowledgements

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Points Requiring Further Thought

- NDVI declined during first half of May throughout the Arctic: Is this due to some phenomena (late snowfall) that leads to delayed greening?
- What is the cause of the secondary NDVI fall peak (e.g. E. Bering)?
- Why are NDVI increases larger in North America than Eurasia?
- What role is played by the local atmospheric circulations in these results?