Session: C11 Poster: M140A

Understanding recent Arctic tundra vegetation changes

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Linkages between diminishing Arctic sea ice and changes in Arctic terrestrial ecosystems have been demonstrated using remotely sensed Arctic Normalized Difference Vegetation Index (NDVI) (a measure of vegetation photosynthetic capacity), near-coastal sea ice, and summer tundra land surface temperatures (Bhatt et al. 2010). The trends in NDVI, coastal sea ice and summer tundra land temperatures are notably heterogeneous throughout the Arctic, with both positive and negative values. Understanding the climate drivers of these patterns both local and large-scale is important for documenting the regional manifestations of climate variability and change. Weekly quantities of remote sensing data (sea-ice concentration, Normalized Vegetation Difference Index, and land surface temperatures) have been analyzed for trends and variability to document potential seasonal drivers of recent Arctic greening trends. This will be augmented with weather station data, gridded climate data (e.g. reanalysis type) to investigate the influence of atmospheric circulation changes and large-scale climate patterns (e.g. ENSO or PDO) on the Arctic vegetation trends. The role of sea ice decline as a driver will be explored using the above data sets. The climate analysis focuses on Alaska and Northern Eurasia (Yamal), where warming trends are positive in Northern Alaska and negative in parts of Eurasia. These two regions are of particular interest since they are at the intersection of climate change, oil and gas development and an indigenous subsistence lifestyle. REFERENCES Bhatt, U.S., 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, 2010: Circumpolar Arctic tundra vegetation change is linked to sea-ice decline, Earth Interactions. August 2010, Vol. 14, No. 8: 1-20. doi: 10.1175/2010EI315.1.