

Poster #4

Diversity of High and Low Arctic Vegetation in Alaska

Amy Breen¹, Victoria Sloan^{2,3}, Colleen Iversen², Holly Vender Stel², Verity Salmon² and Stan Wullschleger²

¹ International Arctic Research Center, University of Alaska Fairbanks

² Ecosystem Science Group, Environmental Studies Division, Oak Ridge National Laboratory

³ Department of Engineering, University of Bristol

Contact: Amy Breen [albreen@alaska.edu]

The Next-Generation Ecosystem Experiments (NGEE Arctic) is a 10-year project to reduce uncertainty in Earth System Models through developing a predictive understanding of carbon-rich Arctic system processes and feedbacks to climate. In the first two phases of the project, disparate landscapes in the high and low Arctic in Alaska were chosen to represent the two extremes along environmental gradients. The high Arctic landscape near Barrow, Alaska represents a cold, continuous permafrost region on the Coastal Plain of the north slope of the Brooks Range, while in contrast the low Arctic landscape near Nome, Alaska represents a warm, discontinuous permafrost in a mountainous landscape with strong topographic gradients.

The variation in structure and organization of these two landscape extremes allows for the assessment of how predicted warming and permafrost thaw affect above- and belowground plant functional traits, and ultimately what the consequences will be for ecosystem carbon, water, and nutrient fluxes. In order to accurately make this assessment, the vegetation must first be surveyed and described, and the vegetation-environment relationships must be analyzed and understood.

Here, we describe the vegetation at the high and low Arctic field sites. We include 78 vegetation plots in our analysis that were subjectively sampled from homogeneous plant communities from the high (48 plots) and low (30 plots) Arctic field sites. Plant communities were differentiated and vegetation-environment relationships analyzed using cluster analysis and ordination. We compare and contrast species, functional type, and habitat diversity within plant communities, and between sites. We also report on the main environmental gradients that differentiate the observed diversity.