

Understanding drivers of changing arthropod communities on the tundra as Arctic warming facilitates woody deciduous shrub expansion

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Abstract: In northern Alaska, warming is causing an increase in the dominance of woody deciduous shrubs. There has been much focus on how this shift in vegetation covers impacts snow dynamics, nutrient cycling, and energy budgets, while hardly any studies have considered how the shift might impact organisms higher up in the foodweb. In an ongoing NSF study, Boelman et al. are finding significant differences in the size and composition of arthropod communities between non-shrub dominated, and shrub-dominated tundra. This reveals an ongoing shift at the base of the Arctic food web that may well reverberate throughout the trophic hierarchy. In order to understand the micro-environmental and biological mechanisms driving these differences in arthropod communities, I propose to quantify arthropod forage quality characteristics (canopy carbon, nitrogen and fiber content) and canopy light attenuation in tundra canopies that span a wide range in shrub stature/dominance and that continue to be monitored annually for arthropod community size and composition.