

Activity Report of the Arctic Ecology Laboratory, Michigan State University

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This year has been very busy for the Arctic Ecology Laboratory. The Laboratory hosted the ITEX (International Tundra Experiment) group in January and has taken a major role in the organization of the ITEX data sets. This summer was the 6th year of ITEX work in Barrow and the 6th annual collection of plant canopy temperature, active layer dynamics, plant phenology, plant growth, and plant species composition data. Analysis continues as you read.

This year was one of the most productive of the 6 years, due primarily to the quality of REU assistants. The REU ongoing projects are: Observations of mycorrhizal concentrations under open top chambers – Katie Wilkinson; Effects of ITEX chambers on seed weight and germinability – Steve Rewa; Herbivory within the ITEX sites in Atqasuk, Alaska – Frank Lepera; Chamber effects on vascular plant stature – Brandon Baker; and Growth patterns of tundra plant species along a natural climate gradient – Elise Poole. We also sampled many of the former IBP plots for changes in species composition. Although the data have not been analyzed the general observations were that most of the changes in species composition were due to hydrological changes due to geomorphological activity associated with polygon dynamics and stream erosion.

The Laboratory has been actively collaborating with the newly funded NATEX (North American Tundra Experiment) project. Chamber bases for future CO₂ flux measurements were placed in the experimental and control plots at both the Wet Meadow and Dry Heath sites in Barrow and Atqasuk. Measurements should begin next summer and will be comparable with the more detailed work being done by the Oberbauer group in Toolik and the Oechel group in Barrow. Members of our Laboratory are adding a new dimension to their approach as they include physiological aspects of plant response to warming. Bob Hollister attended a graduate seminar on Physiological Plant Ecology in Lund, Sweden this past May. These new aspects of the project will make linkages with other LAII projects more fruitful.

The Laboratory is beginning a newly funded LAII project "Forecasting Arctic Vegetation (FAV)," which will focus on the linkages and potential synergies and feedback between surface disturbance and vegetation change associated with climate change. FAV has some HARC-like elements since it tracks the effects of human induced surface disturbance. In January we expect to be joined by Postdoctoral Fellow Craig Tweedie from University of Queensland and by doctoral student Whitney Herbert. Dr. Tweedie has worked with ITEX on Macquarie Island and Ms. Herbert is experienced with GIS and landscape modeling. We look forward to a productive winter and future collaborations with other LAII investigators.