***High Altitude Soil Testing: Increasing the Availability of Data in Remote Alpine Locations, Jamison Ehlers (Electrical Engineering), K. Negus (PhD, Electrical Engineering), M. Apple (PhD, Biological Sciences)***

Currently, the biological sciences department at Montana Tech uses temperature sensors to collect data at Goat Flat in the Pintler Mountains of south-western Montana. The data is used by the biology department to investigate plant species located in alpine conditions. A big issue is, that to retrieve the data, hikes must be made to the sensor site after the snow melts. The sensors are located via line-of-site photography and GPS coordinates, which makes retrieval somewhat difficult. To combat this and other issues, the Biological Sciences and Electrical Engineering departments at Montana Tech have been working with ESIP (Earth Science Information Partners) to create an improved sensor system. The proposed sensor box will utilize sensors that can record humidity along with temperature, satellite communication to make remote data retrieval possible and a power management system to ensure that the system can operate for years at a time. This summer, a prototype for the sensor box, as well as a custom printed circuit board, has been designed. A future plan is to modify the system to work with LoRa (Long Range), a radio communication protocol, to help minimize costs.