Tallgrass prairies are among the world’s most endangered ecosystems, with <1% remaining from pre-European settlement in North America. In an effort to conserve Minnesota’s natural prairie, 160 acres in northwestern Minnesota is being restored by collaboration between MSU-Moorhead, Minnesota Department of Natural Resources, and The Nature Conservancy, with one goal being long term monitoring (e.g., soil microbes, plants, and mammals) with the expected result of increase in species diversity post-restoration.

This study includes two areas currently under restoration: the first is a former monoculture golf course (approx. 50 years; low plant and mammal diversity), and an abandoned field that has been previously exploited for agriculture (unmanaged for >20 years; moderate plant and animal diversity). Three reference sites were also included: a remnant prairie and two prairies restored over 20 years ago (dry and mesic). This study was designed to monitor the soil bacteria & archaea by assessing spatial autocorrelation of taxonomic diversity between samples in each site and differences between sites. Samples were collected in summer and fall 2016. Soil chemistry differed in pH and CEC (p<0.0001 and p=0.0024, respectively). Sequencing of the 16S rRNA gene was used for taxonomic identification, and community level physiological profiling approximated functional diversity. While alpha diversity within some sites was similar, ANOVA by permutation revealed that taxonomic composition among all sites was significantly different (p<0.001). Sequencing to date has been through an external service, but early progress of Nanopore MinION application for undergraduates will be discussed.