

Grassland Ecosystems and Societal Adaptations under Changing Grazing Intensity and Climate on the Mongolian Plateau

Abstract

We will evaluate the interactions between grassland ecosystems and herder communities at multiple scales, and the role of climate variability in determining changes in grassland productivity and human adaptations. Our study is set in the Mongolian Plateau, covering substantial portions of the Inner Mongolia Autonomous Region of China (IMAR) and the country of Mongolia. Our specific objectives are to: 1) analyze and map grassland productivity over time (1975-2005) at three nested spatial scales/resolutions based on field, remotely sensed and climate data; 2) develop a conceptual and quantitative understanding of societal responses to variability in climate and grasslands productivity at the household and village scales; and 3) analyze regional-scale relationships between ecosystem productivity and human adaptation, over time, across ecological gradients and between the IMAR & Mongolia. We will use a combination of field sampling and remotely sensed imagery to observe grassland productivity and its relationship with climate variability and change, a survey of herder households and an analysis of regional demographic data to examine household to regional scale social dynamics and policy implications, and a framework of adaptation strategies to guide our integrated analysis of relationships and trends in these data. Our team is comprised of researchers in the US, China, and Mongolia with expertise in ecology, geography, remote sensing and spatial analysis, and the social sciences. In addition to good access to the necessary field data and sites, this team will leverage research facilities and resources from several countries, universities and institutions. The proposed study will enhance our understanding of the dynamics of the grassland system in this region; equally importantly, it will contribute to a more general understanding of contemporary human responses to the dynamics of grassland productivity and to understanding long term adaptation to regional climate change.