

**AGU Fall Meeting 2009**

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**Changes of Ecosystems and Societies on the Mongolian Plateau: Coupled Regulations of Land Use and Changing Climate (*Invited*)***J. Chen*<sup>1</sup>; *R. John*<sup>1</sup>; *N. Lu*<sup>1</sup>; *B. Wilske*<sup>1</sup>; *C. Shao*<sup>1,2</sup>; *L. Li*<sup>1,2</sup>; *L. Zhen*<sup>3</sup>

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The semi-arid region of the NEESPI domain on the Mongolian plateau lies within the jurisdictions of two governments, with similar geographical settings but contrasting socioeconomic systems - Inner Mongolia (IM) of China and Mongolia (MG). With respect to future temperatures and precipitation, this already water-limited region will experience: (1) a warming trend above the global warming mean (3.3°C by 2100), (2) longer, more intense, and more frequent summer heat waves, (3) altered summer and winter precipitation patterns, and (4) more extreme precipitation events, likely due to the combination of high latitude and altitude. The climate records in IM showed trends of warmer and drier conditions in the region. The annual daily mean, maximum, and minimum temperature increased whereas the diurnal temperature range decreased. On the decadal scale, the warming and drying trends were more significant in the last 30 years than the preceding 20 years. From land use perspective, the dominant land cover, grassland and barren, 0.47 and 0.27 million km<sup>2</sup> respectively (41.21 and 23.58%) have increased proportionally. Cropland and urban land use also increased to 0.15 million km<sup>2</sup> and 2197 km<sup>2</sup> respectively (13.10% and 0.19 %). However, the results further indicated increases in both the homogeneity and fragmentation of the landscape. Increasing homogeneity was mainly related with the reduction in minority cover types such as savanna, forests and permanent wetlands and increasing cohesion, aggregation index and clumpy indices. The combined changes play the central role in determining species distribution and ecosystem function such as water and carbon. Our team is organized to examine and model the interactive changes of the natural and human systems at different temporal and spatial scales for use in recommending plans to increase the success of ecosystem and human adaptation to the changing climate and land use on the plateau.

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