

## Evaluation of the impact of nomadism and settlement on grassland based on GPS observation data

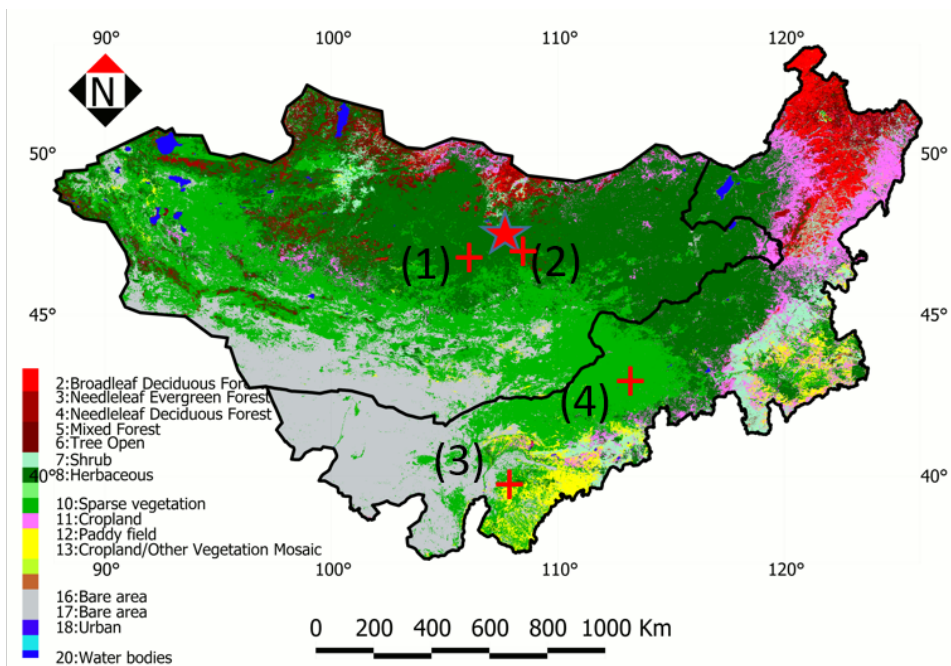
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In grassland ecosystems in Mongolian Plateau, pastoral industry has been implemented since long ago. However, the system of land use differs across national borders, and the management method of pastoralism in the grassland ecosystem of China and Mongolia has greatly changed. In Inner Mongolia Autonomous Region of China, the market economy has progressed since 1978, and the settlement has advanced with the introduction of grassland contracting system in the "grassland law". Meanwhile, in Mongolia, the livestock numbers greatly increased with the introduction of market economy in 1990, and the traditional nomadic system has been greatly changed. Under such conditions, it is necessary for us to evaluate quantitatively the influence of different systems of grassland utilization on grassland productivities. In this study, we use the active sensor and GPS track to monitor both intensity and area of livestock activity as well as its influence on vegetation index of grassland in Inner Mongolia Autonomous Region with the settlement system and Mongolian country with the traditional nomadic system. We selected two sites in each country, and a long-term monitoring for about one year has been done, and high-resolution data with an interval of 20-minute have been collected. In addition, we analyzed the fluctuation of MODIS vegetation index (NDVI) and evaluated the influence of nomadism and settlement on grassland productivity.

The results show that farmers with 1,100 livestock grazing in Mongolia moved in all seasons from spring to winter, so that the range of livestock's activity exceeds about 30 km<sup>2</sup> in one year (Fig.1 (1)). Compared with this, two sites in Inner Mongolia Autonomous Region of the settled farmer grazed 300-400 livestock in the fence range, which was about 1/30 of the nomadic range (Fig.1 (3, 4)). It was showed that the range of activity and the frequency of feeding was greatly different under the different systems of nomadism and settlement (Fig. 1). In settled areas, the annual access frequency around wells was large. In comparison, nomadism camped along the river during the summer, camped along the mountains during the winter, and camped somewhere very shortly in the spring and autumn. Finally, long-term MODIS vegetation index (NDVI) data analysis showed a change in long-term trend of grassland vegetation, suggesting the different effects of nomadism and settlement on grassland productivity.

Keywords: GPS, Nomadism, Settlement



(1): Hustai site (2): Nalaikh site (3): Ordos Site (4): Xilingol site

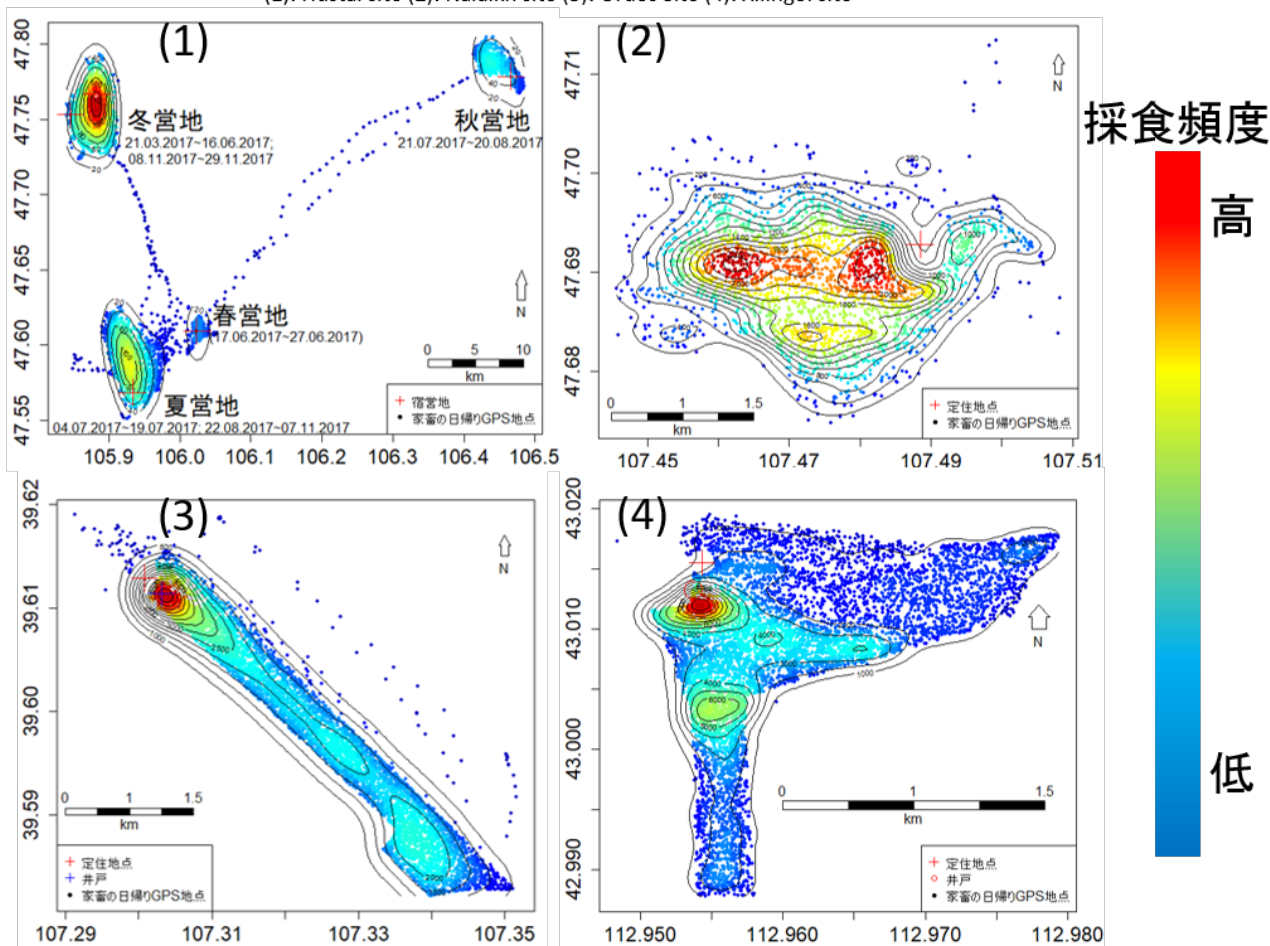


図-1 遊牧と定住化による放牧圧の相違

(1): Hustai site (2): Nalaikh site (3): Ordos Site (4): Xilingol site