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Traditional knowledge of Mongolian pastoralists and scientific evidence—a case study at a forest-steppe in northern Mongolia

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Key words : mobile pastoralists, traditional knowledge, Global Positioning System, meteorological elements, seasonal camp

Introduction Due to 3 consecutive years of drought and *dzud* (snow and cold disaster) from 1999/2000, about 30% of livestock were lost in Mongolia. Development of an early warning system of drought and *dzud* has been going on since 2005 in the Institute of Meteorology and Hydrology of Mongolia using the ground based and remote-sensing data of meteorological elements and pasture conditions. Since the health conditions of livestock are strongly affected by the pastoralists' livestock management skill, it is also necessary to include the mobile pastoralists' traditional knowledge into the system (Fernandez-Gimenez 2000). We are comparing such knowledge with data taken by modern techniques such as Global Positioning System (GPS) and the automatic weather station. As the first step, we report the temperature of summer and winter camps.

Study area and methods The study area is located in the forest-steppe region of Bulgan prefecture, in the north-central part of Mongolia. Observations were conducted with a Mongolian counter-part for the research. Mr. Chuluun has been a pastoralist since 1998 in Bulgan after his retirement from the prefecture's meteorological station. Hourly temperature and humidity were observed at 10 cm height from the ground level at summer and winter camps from August 25 of 2007 to January 6 of 2008.

Results Locations of Mr. Chuluun's seasonal camps are shown in Figure 1. The observed daily minimum temperature was generally higher in the winter camp at a hill foot (1492 m) than in the summer camp at a valley (1300 m), and the difference became greater from fall to winter. Diurnal temperature difference was greater in night-time and smaller in daytime, indicating the larger effect of radiative cooling in the summer camp (Figure 2).

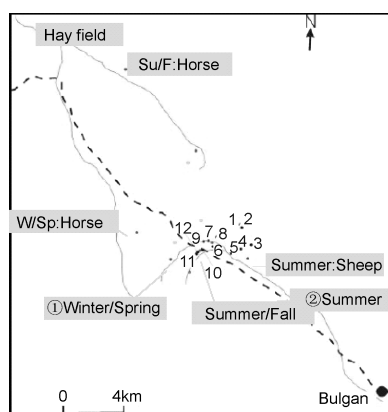


Figure 1 Summer camp ① and Winter camp ② in Bulgan. (Center of town: $48^{\circ}49'$, $103^{\circ}31'$, 1220m).

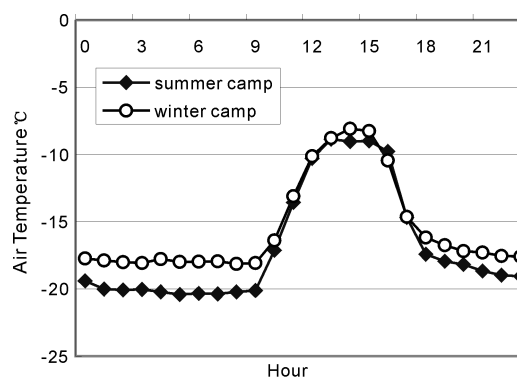


Figure 2 Diurnal air temperature at 10 cm height, Nov. 25, 2007-Jan. 6, 2008 at the summer (black) and the winter camp (white).

Conclusions It is said that Mongolian pastoralists settle winter camps at hill foot to avoid coldness, and summer camp near the river where sufficient water is available. Our results support the traditional knowledge to select winter camp sites is reasonable.

Reference

Fernandez-Gimenez, M. E. (2000) The role of Mongolian nomadic pastoralists' ecological knowledge in rangeland management. *Ecological Applications*, 10(5), 1318-1326.