A new approach to estimate the grazing pressure in Mongolian grassland, based on MODIS-EVI and the ger movements data.

\# Reiichiro ISHII[1]

[1] FRCGC,JAMSTEC

Wide range of steppe vegetation in Central Asia is declining and faces the danger of desertification. Its two main drivers are climate change (drought) and over-grazing by livestock. To quantify the contribution of each factor on the vegetation degradation, we need to compare the vegetation status under different climate and livestock density. In most case, however, the spatio-temporal distribution of grazing pressure is quite difficult to estimate quantitatively at fine scales. Especially in Mongolia, it is because livestock moves around under nomadic pastoralism.

Although for a limited extent of space and time, we could compare the monthly values of satellite sensed vegetation index (MODIS-EVI) and climate (precipitation and temperature) and livestock distribution at 250m mesh scale for rectangular area (N47.0-N48.1, E91.0-E92.0). The data of nomadic family (ger) distribution and movement in Hovd prefecture, Mongolia, was precisely collected by social investigation conducted during 2001-2003. The number of livestock of each family was also obtained. Corresponding climate data was obtained by spatial-interpolation of the data the stations. EVI values are converted into biomass using [Live Biomass (DM g m-2)]=18.352 Exp(5.860 [MODIS-EVI]) (Kawamura et al. 2005).

The correlation between precipitation and estimated biomass in potential growing season in livestock-absent meshes is used to model the plant monthly growth as a function of precipitation as: dBiomass= -0.0661357 + 0.00112735Precipitation (r2= 0.17). To eliminate large scale noises derived from social and topographical factors, we featured a smaller rectangular area used for the summer time pasturage and it resulted a higher r2 value. By assuming a concentric livestock distribution around gers (maximum radius=2km), we are analyzing the difference of biomass against the gradient of livestock density to estimate the grazing pressure. These results of this trial will be shown with future perspective of its application to whole Mongolia.