application of remote sensing data for estimation of pasture biomass

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In the last decade applications of remote sensing in Asia are rapidly developed. Application of remote sensing data is very important in Mongolia because of few populations to monitor or manage the huge territory with.

To estimate the above-ground biomass over domain areas-sums using NOAA satellite data that available in the Institute of Meteorology and Hydrology (IMH) and Information and Computer Center (ICC) of NAMHEM there are collected ground biomass from 5 to 10 sites of each 16 sums on August 10-20, 2001-2003. Also NDVI derived from NOAA satellite data was estimated at corresponding date of biomass measurements. NDVI data was maximized within 10 days to remove cloud effects. Fig.1 presented the domain sites for this study.

Results

Biomass data of the years were varied from 0.05 to 10c/ha in 2001, from 0.012 to 7.5 c/ha in 2002 and from 0.1 to 8.9 c/ha in 2003 and corresponding NDVI values converted to 8 bits (0-255) are from 123 to 191 in 2001, from 126 to 189 in 2002 and from 129 to 195 in 2003 [3]. The driest summer was in 2002, which is more than 70% of all territory of Mongolia under abnormal drought condition during summer season.

According to the aboveground biomass and NDVI values we have calculated the correlation coefficients between them. In Figure 2, 3 presented the general dynamics of biomass and NDVI of all sites and clear that the 2002 were driest than other years. The correlation coefficients between ground biomass and NDVI values are quite close as we expected and it ranged from **0.63 to 0.74**. In scattered diagram (fig.4) there are presented the relationship between biomasses of each year and corresponding NDVI values. This relation would be better when will use the vegetation cover in per sent and height in cm following [5]. The correlation coefficients R^2 equal to **0.59** of these two parameters are reasonable to determine the pasture biomass over Mongolia.

Discussions

From these analyzed results it is clear that relationship between ground biomass and NDVI values is close and very reasonable to use the remote sensing results to determine the biomass over large pasture areas. This kind estimation of pasture biomass determination is valuable and contributes much more to monitor the summer pasture

eatable condition and to assess the pasture capacity of each year for the coming winter.

According to the pasture capacity of 2001-2003 made in IMH the pasture capacity is determined in sum level only. Using the remote sensing data we can determine the biomass in each “bag” level overlapping the DEM (DIGITAL ELEVATION MODEL), vegetation and soil maps. Also the estimation and assessment of pasture biomass and migration routines using NOAA/AVHRR would be applied for the operational use in agro-meteorological services of IMH and included to the pasture condition in each 10 –days agro-meteorological and environmental bulletin.