



A comparison between modelling for spatial distribution of thaw depths using MODIS datasets and observational data of permafrost in Mongolia

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Thaw and freezing depth and the related variation in the top of the active layer of the permafrost are important variables for studying runoff production in permafrost regions. In this study we provide data on spatially distributed thawing depths in Mongolia based on Kudryavtsev approach. This approach requires land surface temperature (LSTs) and soil physical characteristics for estimating thaw depths. Measured data of ground land surface temperatures is lacking in Mongolia. Therefore, we estimated the LST based on satellite images of surface temperatures. Monthly values of the LSTs were obtained from the Moderate Resolution Imaging Spectroradiometer (MODIS) data. Soil physical characteristics are defined by reference values from previous studies (Tumurbaatar, 2004; Anarmaa, 2006). We validated the results by comparing them with the observational data of permafrost boreholes in Mongolia in 2002-2009 CALM, 2009. The results indicate that thaw depths range between 0-14.5 m from southern to northern parts of Mongolia. This study shows that distribution of thaw depths using the MODIS LSTs can indicate a general overview of thaw depths distribution throughout the country.