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Effects of management practices and grazing intensities in a steppe environment on soil moisture (Xilin River Catchment, Inner Mongolia/China)

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The steppe of the Inner Mongolian Grasslands has traditionally been used as rangeland. Over the last decades the region has been severely overgrazed. As a consequence of the grazing pressure the grassland has been degraded and wind and water erosion dramatically increased, resulting in desertification of large areas.

As part of the research project “Matter Fluxes in grasslands of Inner Mongolia as influenced by stocking rate, MAGIM” the first task of the ILR is to investigate the regional water fluxes. Relevant hydrological processes in the Xilin river watershed are analysed based on field measurements, remote sensing techniques and modelling with the eco-hydrological model SWAT (Soil and Water Assessment Tool).

The main focus of this study is the quantification of soil moisture variability on the field scale. The main question is if different management practices (i.e. heavy grazing, moderate grazing, no grazing, haymaking) have an impact on spatial and temporal changes of soil moisture. A sampling scheme on differently managed fields was set up to measure soil moisture weekly in the upper 7 cm soil layer. The data are analysed with multivariate statistics and geostatistical techniques (i.e. variogram estimation and kriging). Ultimately, the results of this study will be combined with local scale estimates of H20 exchange by eddy covariance and remote sensing data on soil moisture and evapotranspiration to allow calibration and validation of the hydrological model SWAT at multiple scales.