



## **Pixel-level spatiotemporal analyses of vegetation fractional coverage variation and its influential factors in desert steppe: A case study in Inner Mongolia, China**

Yifan Song (1), Yajing Lu (2), Zilong Liao (1), Yingjie Cui (1), and Huiwen Liu (3)

(1) China Institute of Water Resources and Hydropower Research (IWHR), Department of Water Resources Science of Pasturing Area, China (songyf@iwhr.com), (2) Beijing Water Science and Technology Institute, (3) Power China Beijing Engineering Corporation Limited

**Abstract:** Figuring out vegetation variation and its influential factors in desert steppe under the impacts of climate change and human activities is crucial and meaningful for improving the understanding of desertification and taking targeted measures in ecological restoration. As compared to a large spatial scale such as a region or a whole catchment, which was more common in published studies, a micro perspective at pixel level was providing in this study to investigate the vegetation coverage dynamics and build the correlations between vegetation coverage and its multiple influential factors, including precipitation, temperature, soil water, groundwater and human activities in a desert steppe region in the Inner Mongolia Autonomous Region, China. The average vegetation coverage in August for the years 2000-2011 was 0.38 in the study area. The interaction of rain ( $R=0.80$ ) and heat ( $R=-0.76$ ) significantly determines the growth and distribution of the vegetation in the study area; besides, the effects of some other factors on vegetation coverage should not be neglected, including groundwater ( $R=0.04$ ), available water content of soil ( $R=0.23$ ) and livestock density ( $R=0.28$ ). From the perspective of centre dynamics for the years 2000-2011, the annual precipitation centre had better synchronism with the vegetation centre, while the movement of temperature centre was more stable.