Geophysical Research Abstracts,
Vol. 10, EGU2008-A-11559, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-11559
EGU General Assembly 2008

Estimation of seasonal to annual water demand by wetland vegetations with MODIS data in the Yellow River Delta area

L. Jia (1)(2), G. Xi (2) and S. Liu (2)

(1) Alterra, Wageningen University and Research Centre, The Netherlands, (2) State key Laboratory of Remote Sensing Science, School of Geography, Beijing Normal University, Beijing, China (Li.Jia@wur.nl)

Water demand by the wetland of the Yellow River Delta (YRD), presented by evapotranspiration (ET), is one of the important components in the water cycle, which represents the water consumption by the plants and evaporation from the water and the non-vegetated surfaces. Reliable estimates of the total amount of water required to protect this natural environment are necessary. Due to the heterogeneity of the vegetation types and canopy density and of soil water content over the wetland (specifically over the natural reserve area), it is difficult to estimate the regional evapotranspiration by extrapolating measurements or calculations done locally for a specific land cover type. Remote sensing can provide observations of land surface conditions with high spatial and temporal resolution and coverage. In this study, a model based on the Energy Balance method was used to calculate daily ET using instantaneous observations of land surface reflectance and temperature from MODIS when the data were available on clouds-free days. A time series analysis algorithm is then applied to generate a time series of daily ET over a year period by filling the gaps in the time series due to clouds. A detailed vegetation classification map is used to help identifying areas of various wetland vegetation types in the YRD wetland. Such information is also used to improve the parameterizations in the energy balance model to improve the accuracy of ET estimates. This study shows that spatial variation of ET is significant over the same vegetation class at a given time and over different vegetation types in different seasons in the YRD wetland. Finally, we analyzed ecological water demand by reeds

which is dominant wetland vegetation and the amount of water supply to maintain reeds in a good growth condition. The results can provide indicative information for administrators to allocate water effectively for reeds wetland recovery.