Geophysical Research Abstracts
Vol. 14, EGU2012-303, 2012
EGU General Assembly 2012

Evaluating effects of DEM resolution on distributed Grid-Xinanjiang model response

C. Yao, K. Liu, and Z. Li

College of Hydrology and Water Resources, Hohai University, Nanjing, China (yaocheng@hhu.edu.cn)

Digital elevation model (DEM) resolution is a sensitive issue in distributed hydrologic modeling. Assessing the impact of adaptive resolution on rainfall-runoff response is important for determining the level of detail required in a spatially distributed model.

The Grid-Xinanjiang model is utilized in this study to examine how sensitive the distributed model was to the varied DEM resolutions while simulating hydrologic processes and forecasting flood events in watersheds. The model parameters are *a priori* estimated by employing a physically, empirically based approach using geographically based information. The Grid-Xinanjiang model is applied at five different grid cell sizes ranging from 90 m to 1 km to the Tunxi watershed located in Anhui province, China. Comparison with available observations indicates that the flow routing parameters of this model are indeed sensitive to the spatial resolutions. However, the runoff generation parameters do not show the same trend, which demonstrate that the a priori estimation of these parameters are less scale dependent.

In addition, through the use of two distribution curves, we analyze the rainfall-runoff response within each grid cell taking consideration of spatial variability of tension and free water storage; however, simulations do not exhibit better hydrologic performance in this case.