



## **Contributions of small river basins to large-scale hydrology**

Lebing Gong

Uppsala University, Department of Earth Sciences, Uppsala, Sweden (lebing@gmail.com)

Data from small river basins can provide useful information to improve our understanding of hydrology of large regions. For instance, climate and hydrology of a large river basin can be well resembled by a number of small river basins. Those small river basins contain sufficient information, not only on climate and land surface, but also on hydrological characteristics for the large region. Extrapolation of annual discharge was first tested in the Baltic Sea drainage basin (Gong 2014). Result showed that selected sub-basins that cover 2-4% of the gauged area gave the best resemblance of discharge of the gauged basin area. 200 ensemble estimations from the extrapolation method estimates annual discharge for gauged area consistently well with on average 6% error. Further tests using Mopex dataset in Australia and the U.S., as well as a global-scale application using the GRDC dataset also showed promising results. There are strong correlation of climatic and land surface data between the small basins and large area which share similar discharge dynamic as the small basins. This would help to develop a systematic way to identify those small basins and their link to large-scale hydrological variability. Discharge data all around the world collected from basins of various scales are inter-connected because of the similarities of climate and land surface across scales. This inter-connectivity is evolving over time as a result of the change of climate. Understanding it will not only help with filling data gap in un-gauged regions, but also help to improve our understanding of the change of the hydrological system.

Gong, L.: Data-driven scale extrapolation: estimating yearly discharge for a large region by small sub-basins, *Hydrol. Earth Syst. Sci.*, 18, 343-352, doi:10.5194/hess-18-343-2014, 2014.