



Data-based scale-extrapolation: estimating regional water resources using data from small river basins

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Estimation of world water resources under a changing climate is a key scientific issue for many environmental research areas with profound socio-economic significance. A new data-based scale-extrapolation method (Gong 2012) is proposed to estimate continental and regional water resources. The new method builds upon the assumption (Gong 2012) that, the dynamic interaction between climate and hydrology of a large river basin can be equally well resembled by multiple small regions, each characterized by a number of small river basins, which are typically two-orders-of-magnitude smaller than the large basin. Those small river basins contain sufficient information, not only on climate and land surface, but also on hydrological characteristics of the large region. Therefore, those multiple small regions can provide an ensemble of water resource estimations for the large basin. The new method makes it possible for regional water resource estimations to benefit from a multitude of readily available measurements from small river basins. The scale-extrapolation methods also made it possible to study the interaction between climate and hydrology, and the climate change impact in un-gauged or partially gauged large river basins from data alone. The method offers ensemble predictions that bracket the estimation uncertainty. Because the scale-extrapolation uses different data and method compared to the modelling approach, it provides a unique opportunity to be compared with modelling results.

Gong L., 2012. Data-based discharge extrapolation: estimating annual discharge for a partially gauged large river basin from its small sub-basins. *Hydrol. Earth Syst. Sci. Discuss.*, 9, 6829-6856, 2012. doi:10.5194/hessd-9-6829-2012.