

# **Global Perspective on the Water Balance and its Variability in the Huang He Basin**

**Taikan Oki, Shinjiro Kanae**

Research Institute for Humanity and Nature, Kyoto, Japan  
Institute of Industrial Science, University of Tokyo, Tokyo, Japan

Huang He River basin has approximately 750,000 km<sup>2</sup> of watershed and located in the Northern part of China. Mean annual precipitation is estimated as approximately 420mm/y and annual discharge at Sanmenxia station, which has drainage area of approximately 680,000 km<sup>2</sup>, corresponds to 55mm/y. Therefore partitioning of precipitated water into evapotranspiration should be more than 85% on average. This dry regime of water balance infers the importance of irrigation for agricultural production, and the atmospheric water vapor divergence/convergence field shows divergence near the river mouth on annual time scale. It implies that the annual precipitation is less than annual evapotranspiration. Such a situation over land can be realized only by irrigation by either river water from upstream or ground water is put in the field for further evapotranspiration. Therefore evapotranspiration process should be relatively important for accurate estimates of water balance in the Huang He river basin rather than the runoff generation process in numerical models. Therefore land surface models (LSMs), which are believed to have better representation in evapotranspiration processes which couples energy and water balances, are expected to be used in the current project, and the LSMs will be coupled with river routing model (RRM). Irrigation model will be also developed and coupled with the LSM and the RRM. Uncertainties associated with the LSM and RRM, forcing data for LSM, model parameters, and the temporal and spatial scales used for estimations will be examined during the project. The impact of the irrigation activity on the regional climate through the feedback mechanism of land-atmosphere interactions will also be investigated.