

# Simulation of blue and green water resources in the Wei River basin, China

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**Abstract** The Wei River is the largest tributary of the Yellow River in China and it is suffering from water scarcity and water pollution. In order to quantify the amount of water resources in the study area, a hydrological modelling approach was applied by using SWAT (Soil and Water Assessment Tool), calibrated and validated with SUFI-2 (Sequential Uncertainty Fitting program) based on river discharge in the Wei River basin (WRB). Sensitivity and uncertainty analyses were also performed to improve the model performance. Water resources components of blue water flow, green water flow and green water storage were estimated at the HRU (Hydrological Response Unit) scales. Water resources in HRUs were also aggregated to sub-basins, river catchments, and then city/region scales for further analysis. The results showed that most parts of the WRB experienced a decrease in blue water resources between the 1960s and 2000s, with a minimum value in the 1990s. The decrease is particularly significant in the most southern part of the WRB (Guanzhong Plain), one of the most important grain production basements in China. Variations of green water flow and green water storage were relatively small on the spatial and temporal dimensions. This study provides strategic information for optimal utilization of water resources and planning of cultivating seasons in the Wei River basin.

**Key words** blue water; green water; SWAT; SUFI-2; Wei River, China