

## **Effects of the South–North Water Transfer Project on surface water and groundwater resources in Haihe River basin in a climate changing world**

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**Abstract** This paper addresses the effects of the South–North Water Transfer Project (SNWT) in China on surface water and groundwater resources in Haihe River basin under conditions of climate change. An integrated model of SWAT with a simplified groundwater model was developed. Impacts on groundwater and surface-water of the Haihe River basin are calculated under different climate change scenarios. Nine types of scenario are assumed in this paper, consisting of combinations of climate change scenarios and water transfer schemes of the SNWT Project. The application shows that: (1) under current and changing climate scenarios, transferring 122 and 143 billion m<sup>3</sup> of water, respectively, are the best ways to relieve water shortage; (2) nearly 90% of the water transferred from the south is consumed by evapotranspiration under current land use conditions; (3) even when the full diversion capacity is used to transfer water, water shortages will still be acute under the worst case climate scenario.

**Key words** integrated surface-water and groundwater model; Haihe River basin, China; climate change; South-to-North Water Transfer Project