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Prediction of water resources in the Chao Phraya River Basin, Thailand

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Abstract This study aimed to predict change in water resources in the Chao Phraya River Basin using outputs of the super-high-resolution general circulation model version MRI-AGCM3.2S for three different climate experiments: the present climate (1979–2008), near future climate (2015–2044), and future climate (2075–2104). In this study we used a regional distributed hydrologic model based on the concept of the variable infiltration capacity to generate runoff intensity in each computational grid. For flow routing, a kinematic wave model including effects of dam operation and inundation, was used. The C.2 gauging station at Nakhon Sawan was selected to monitor changes in the river discharge. The results showed water availability to considerably increase in the future climate experiment and drought risk to increase in the near future climate experiment. A statistical analysis of peak discharges was suggested for further study on evaluation of flood risk in the basin.

Key words runoff prediction; water resources projection; flow routing model; dam operation model; inundation model; Chao Phraya River Basin