

Hydrometeorological modelling for Poyang Lake region, China

S. WAGNER¹, B. FERSCH¹, H. KUNSTMANN^{1,2}, F. YUAN³, C. YANG³ & Z. YU^{3,4}

*1 Karlsruhe Institute of Technology (KIT), Institute of Meteorology and Climate Research (IMK-IFU), Germany
sv.wagner@kit.edu*

2 Institute of Geography, University of Augsburg, Germany

3 State Key Laboratory of Hydrology-Water Resources and Hydraulic Engineering, Hohai University, 1 Xikang Road, Nanjing 210098, China

4 Department of Geoscience, University of Nevada, Las Vegas, Nevada, USA

Abstract Feedback mechanisms among the atmosphere, land surface and subsurface are important to understanding changes in the hydrological cycle due to climate and land-use changes. The quantification of these feedback mechanisms requires coupled modelling systems describing both the atmosphere and terrestrial hydrosphere. In our approach we couple the atmospheric model WRF and the hydrological model HMS. The research area is Poyang Lake basin (about 160 000 km²) in China. For the coupled WRF-HMS simulations, first stand-alone WRF simulations were performed to identify a suitable set-up for the target region. The bias is –0.5°C for temperature and –26% for precipitation on the annual scale. Second, the performance of the newly implemented hydrological part of the model is investigated showing reasonable results. Third, coupled simulations were performed showing, so far, significant underestimations of observed streamflows. The potential of coupled atmospheric–hydrological modelling for investigations of the hydrometeorological fluxes due to climate and land-use changes at regional scales are discussed.

Key words coupled atmospheric hydrological modelling; Poyang Lake, China; WRF; HMS