Submitted Abstract

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Abstract

We set up WRF with three nested domains using initial and lateral boundary conditions from ERA-Interim (ERA-I) data. Model was initialized with the conditions of 01 October 2002 and run until 01 January 2004. The lateral boundary conditions were updated every 6 hours. We performed six experiments using three microphysics (MP3, MP8, and WSM6) and two cumulus (KF, and BMJ) schemes. During DJF, MP8 $_{K}$F, MP3 $_{B}$MJ, and MP8 $_{B}$MJ showed relatively lesser precipitation, however, WSM6 $_{K}$F (~6.4 mm day-1) and WSM6 $_{B}$MJ (~6.2 mm day-1) were found to have maximum precipitation. MP8 $_{K}$F (4.6 mm day-1) had the average value closer to the observation (1.75 mm day-1) than the rest of the experiments, though overestimated by a large amount. MP8 $_{K}$F was found to have the least normalized standard deviation, along with a higher skill score than most of the experiments. Overall, MP8 $_{K}$F could be considered reasonable because of its lesser deviation and better skill score

Afterwards, we performed the WRF-Hydro calibration using the WRF downscaled meteorological forcing (MP8KF, and WSM6 $_{B}$MJ). The model was calibrated for the year 2003 and validated for 2004-2005. The station observed discharge at the basin outlet was used to perform the calibration and validation. We found JJAS discharge was underestimated for MP8KF, possibly due to underestimation in the JJAS precipitation in MP8KF simulations. WSM6BMJ did reasonably well for the JJAS, but it showed some erroneous high peaks for the non-JJAS. We also designed two simulations using the JJAS observation instead of the complete annual cycle, forced by the WSM6 $_{B}$MJ meteorological forcing.