



Evaluation of the Indian monsoon generated by four regional climate models during the period 1981-2000

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The EU project Water and Global Change (WATCH) is coming to an end. The main objectives of this project are to analyze, quantify and predict the components of the current and future global water cycles and evaluate their uncertainties. As part of this project, regional climate model (RCM) simulations over Europe and South Asia were generated to feed several different hydrological models. This work presents the results of 4 different RCMs over South Asia driven with ERA-40 reanalysis. The analysis focuses on the ability of the RCMs to simulate the Indian monsoon.

Generally, the RCMs are able to simulate the characteristics and processes of the Indian monsoon. The better definition of the topography, due to the higher horizontal resolution, allows RCMs to develop a spatial distribution of precipitation, which is closer to the observation than for ERA40. However, at the regional scale, many differences between the RCM simulations can be observed. The RCMs are in general too warm in Northern India and this has an impact on the large scale circulation as shown by the wind spatial distribution. Using a precipitation index to determine the monsoon onset and withdrawal, the RCMs are able to determine well the beginning of the monsoon but have more difficulties capturing the end of the monsoon season compared with observations. While the spatial distribution of precipitation shows some mismatches with observations, the annual cycle of the water budget over 5 basins compares well with observations. Finally, the assessment of added value, investigated using a spatial filter, shows similar small scales features between the RCMs.