



Representation by Global Climate Models of the Seasonal Cycle of Precipitation in Major Asian River Basins: Present Climate and Future Climate Projections

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The assessment of the performance of global climate models in representing the hydrological cycle at basin scale is a crucial aspect of climate models auditing and is a necessary step before attempting any statistical or dynamical downscaling of the models output. For reasons of both basic relevance in hydroclimatological terms and of practical importance in terms of water management and water related-hazards, South and South East Asian river basins represent extremely interesting target areas. We present the results of an extensive investigation of how about 20 state-of-the-art climate models represent the hydrological cycle in the Indus, Gange, Brahmaputra, and Mekong basins for present and future projected climate conditions. We shall focus here on the seasonal cycle of precipitation (and evaporation) and shall present the serious inconsistencies among models in the representation of the phase and intensity of monsoonal precipitation and resulting runoff. The obtained results agree with recent findings obtained when looking at atmospheric indicators of the monsoonal circulation. Moreover, in the especially interesting case of the Indus, we shall also analyze how models represent the secondary precipitation peak corresponding to the winter-spring precipitations resulting from the southern flank of the storm track. We also discuss discrepancies and points of agreements among models in the projected future changes in the seasonal cycle of the precipitation and of other hydrologically-relevant quantities.