

## **Evaluation of hydroclimatic variables from IPCC-AR5 climate models using observation, reanalysis, and land data assimilation system**

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The objective of this study is to make a comprehensive assessment of IPCC-AR5 climate models for land surface hydroclimatic variables. The present day monthly climatology of precipitation, 2m air temperature, evapotranspiration, runoff, and soil moisture are prepared for 1979-2005 period. Besides using observation, reanalysis products for precipitation and temperature, and land data assimilation system products (e.g. GLDAS) and/or offline land surface model outputs (e.g. CLM3.5) for evapotranspiration, runoff, and soil moisture are also used. The methodology involves performing global analysis in six latitudinal bands (50S - 30S, 30S - 10S, 10S - 10N, 10N - 30N, 30N - 50N, and 50N - 70N, in degrees, S-South, N-North) and regional analysis over three major river basins: (1) Mississippi [3.2 million km<sup>2</sup>], (2) Mackenzie [1.7 million km<sup>2</sup>], and the (3) Ganga-Brahmaputra-Meghana [GBM, 1.6 million km<sup>2</sup>]. The analysis will involve: (1) comparison of multi-model ensemble climate model outputs with the observations/reanalysis, (2) quantification of multi-model ensemble mean spatial skill score, (3) studying the effect of ensemble sample size on ensemble mean performances. Results from both global and regional analysis showing the comparison of climate model outputs and observations/reanalysis for hydroclimatic variables, including the spatial variability in climate model ensemble performances will be presented.