



Hydrologic Evaluation of Satellite Precipitation Products in Mountainous Basins

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Recent advancements in space-based precipitation estimation have opened up new horizons in hydrological applications at global scale. Utilization of satellite-based products is of particular importance for complex terrain regions where in-situ observations are inexistent or sparse. As we now stand at the doorstep of a global-scale precipitation mission, named Global Precipitation Measurement (GPM), a comprehensive investigation/evaluation of the use of current satellite products in hydrologic applications appears mandatory and can serve as a valuable reference to the mission's designers as well as highlight its usefulness to society. This study focuses on the hydrologic evaluation of a number of available quasi-global satellite precipitation products over the mountainous region of eastern Italian Alps. Specifically, TMPA 3B42, CMORPH and PERSIANN products are used to force a semi-distributed hydrologic model. The model is part of the Adige River Flood Forecasting System (ARFFS) and simulates runoff response for a number of mountainous basins ranging in scale from 200 to ~ 7000 km². Runoff simulations for the period 2002 – 2010 generated based on the different satellite products are analyzed and compared to reference runoff simulations driven with dense raingauge rainfall measurements. Results highlight the differences between the products examined and the overall performance of satellite-based hydrologic simulations in this region. Dependence of results on a) season and b) basin scale is analyzed to further delineate the performance of the various products.