

Model Inter-comparison for Flood Forecasting in Semi-Arid Moroccan Catchments (Oral)

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ABSTRACT

Flood forecasting in semi-arid catchments remains challenging due to strong rainfall variability, limited data availability, and the difficulty of reproducing accurate forecasted discharge. This study evaluates the performance of different types of hydrological models for flood forecasting in Moroccan catchments at hourly time steps. The different models that are compared include the lumped model GR4H, the spatially distributed model SMASH, and different machine learning algorithms. The models are calibrated using hydro-meteorological data, from rain gauges, satellite rainfall and reanalysis data, and its performance is assessed under different hydrological conditions. Then the model is assessed for flood forecasting using Application of Research to Operations at Mesoscale (AROME) meteorological model. Focus is given to the robustness of models' parameters and their ability to reproduce high-flow events. Preliminary results highlight limitations in capturing peak flows and quick runoff dynamics, which are critical for flood forecasting in semi-arid environments. These findings provide a basis for future research exploring hybrid modeling approaches that integrate data-driven methods to enhance predictive performance.

Keywords: flood forecasting; peak flows; quick runoff; Lumped model; Distributed model; GR4H; SMASH; AROME