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Implementation of a coupled land-atmosphere modeling system within a northwestern Mexican river basin

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Fully coupled modelling of atmospheric and hydrological processes is of growing interest among the hydrometeorology community. Understanding multi-time scale processes within a land-atmosphere modelling system is of importance for improving forecast between medium-range and seasonal forecasts. Improving forecast capabilities between sub-seasonal to seasonal forecasting, can help shape the design of strategies and programs for water resource management, flood risk management, water supply and irrigation design. In this study, we conduct coupled land-atmosphere simulations within a large river basin in northwest México, for an extreme hidro-meteorological event that occurred in September 2018, simulating precipitation and runoff during the extreme event, through the use and implementation of the fully coupled WRF/WRF-Hydro modeling system. Firstly, the WRF-Hydro modelling system is tested as a stand-alone hydrological model for parameter calibration and validation using observed streamflow data, and purposely assessing model reliability for the study area. Secondly, fully coupled land-atmosphere simulations are conducted during a 1 year long simulation in the Sinaloa Hydrologic Region. Performance assesment is accomplished by comparing observed and simulated variables: precipitation, runoff and soil moisture. Lastly, for uncertainty assessment we perfome simulations after perturbing model input data and initial conditions, within an ensamble bayesian forecasting system framework.

Which session would you like to present in?

1. Impacts of hydrological uncertainty, hydrological forecasting and modelling

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