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Predicting daily streamflow with uncertainty using parsimonious rainfall-runoff models finalised to water resources management in a Cypriot catchment

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This paper presents the results of the comparisons of two models for river flow forecasting at daily scale in the framework of uncertainty analysis. More in detail, the models used are the IHACRES (Identification of Hydrographs And Components from Rainfall Evaporation and Streamflow), a lumped continuous conceptual model that allows flexible schematizations of both surface and groundwater flow by combining channels and reservoirs in different ways using a conceptual parsimonious and not over-parameterised approach and the UBC which is a semi-distributed continuous conceptual hydrologic model which conceptualizes the watershed as a number of elevation zones. The model was designed primarily for the calculation of streamflow from mountainous watersheds where streamflow consists of snowmelt, rain and glacier outflow. The UBC model is made up of several sub-routines: the sub-routine for the distribution of the meteorological data, the soil moisture accounting sub-routine, and the flow routing sub-routine.
Both models calculates daily streamflow using as input data precipitation, maximum and minimum temperature data. The parameters of the two models were calibrated using GLUE procedure which allowed to perform uncertainty analysis and evaluate predictive uncertainty of the two models .
The study aims to explore the influence of the model structure and of the number of parameters on the final forecasted values of the river flows when applied to forecasting river flows of Yermasoyia River, a 160 km2 catchment in Cyprus.