UNIVERSITY OF BOLOGNA

Subiect: Sustainable Design of Water Resources Systems

Exercise - Calibration and validation of the Hymod rainfall-runoff model

In a river cross section draining a catchment whose area is 1214 km^2 river flow data have been observed at hourly time step for a period of 1 year. At the same time, precipitation and potential evapotranspiration have been estimated. The related observations can be downloaded at the web address:

https://www.albertomontanari.it/sites/default/files/didattica/dischargesynt.txt
https://www.albertomontanari.it/sites/default/files/didattica/rain-evaposynt.txt

By using the above data set, the Hymod model should be calibrated by using sum of squares as objective function. The initial value of the river flow is set to 15 m^3/s. A comparison should be made by using the sum of absolute errors as objective function.

Furthermore, model validation should be performed by calibrating the model on the first 6 months of data and verifying the model by using the last six months.

Explain in a brief report the above elaborations with the required graphs.

An example code for the Hymod model can be downloaded at https://www.albertomontanari.it/sites/default/files/didattica/sustainabledesign/hymod-full.r