

UNIVERSITY OF BOLOGNA
Subject: 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 km² 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:

<http://distart119.ing.unibo.it/alberto/site/files/data/portate.txt>

<http://distart119.ing.unibo.it/alberto/site/files/data/rain-evapo.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 m³/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 <http://distart119.ing.unibo.it/alberto/site/files/codes/hymod.r>.