R in Hydrological Modelling: Why we should try it ?

Mauricio Zambrano-Bigiarini*

Dep. of Civil and Evironmental Engineering, Università degli Studi di Trento, Trento, Italy, I-38100
* Contact author: mauricio.zambrano@ing.unitn.it

Keywords: Hydrological modelling, application fields

Abstract

R and some of its packages are presented as powerful tools in pre-processing and analysing input data of hydrological models and post-processing its results. Hydrological modelling practitioners spent large amount of time in pre and post-processing data and results with traditional tools. This talk describes how R has been used in almost all the stages of a typical hydrological modelling process on a basin of around 85000 km2, and for 30 years, saving time that can be better spent in doing analysis. Operations made cover the analysis of thousands of raw files with time series of precipitation, temperature and streamflow which are read and organized. Gauging stations to be used in the modelling process are selected according the amount of days with information, missing time series data are filled in using spatial interpolation; time series on the gauging stations are summarized through daily, monthly and annual plots. Input files in dbase format are automatically created in a batch process; results of the hydrological model are read, filtered and compared with observed values through plots and numerical goodness of fit indexes. At the end, the R environment has proved being an effective and promising tool in hydrological modelling.