

Selecting an optimal climatic dataset for integrated modelling of the Ebro hydrosystem

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Abstract This study aims at defining a method for selecting an optimal interpolated climatic dataset in the context of an integrated modelling of the Ebro (85 000 km², Spain) hydro-system. Two different sets of temperature and precipitation were chosen according to data availability criteria, and each set was interpolated on an 8 × 8 km grid covering the basin, with and without a monthly or annual altitudinal gradient applied by geographical area (Pyrenees, Cantabrian and Iberian ranges) over 1000 m a.m.s.l. Seven basins (464 to 2975 km²) representing different flow regimes of the Ebro catchment were chosen to evaluate the performance of 24 different climatic datasets for modelling water resources. We used a conceptual model (GR4j) at a daily time step to test the sensitivity of hydrological modelling to the different sets of precipitation and temperature. A global score was attributed to each dataset according to the different hydrological modelling criteria in order to discriminate the best-performing dataset.

Key words climatic datasets; interpolation; rainfall-runoff modelling; Ebro basin; hydro-system modelling; selection method