Calibration at regional scale for rainfall-runoff modeling in ungauged catchments.

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The objective of this study is to explore one possible solution to optimise the parameters of rainfall-runoff models in ungauged catchments. We propose a cross-calibration procedure based on the adoption, for selected pairs of catchments, of a unique, space- invariant parameter set, which can be identified by using information that refers to gauged catchments in the same region.

A basin in turn in the study region is selected and identified as target catchment and treated as ungauged. We will refer to all the remaining catchments in the same region as the donors. The R-R model is calibrated on each donor in turn, therefore identifying the donor which provides the most reliable parameter set. Then, a similarity measure is elaborated to assist in the selection of the most performing donor catchment, therefore proposing a quantitative criteria to identify the most appropriate information to be used in ungauged conditions. The similarity measure, which depends on geomorphoclimatic behaviours, can be used to identify more than one donor catchment in the case one needs to increase the consistency of the available data-base.

We want to analyse the trade-off between assuming the parameters homogeneous in space and adding new information as the cross-calibration evolves.

The analysis is performed by referring to the case study of a set of 7 catchments located in Northern Italy.