



Assessing changes of runoff estimates along the river network

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Statistical estimation of streamflow characteristics where no data is available is often approached by means of regional statistical models. However, this approach does not preserve the information related to the natural hierarchy between gauged stations due to their location along the river network. This information is particularly important when one wants to estimate runoff at a site located upstream or downstream a gauged station. In this case, the variable could also be estimated directly on the basis of the statistics calculated for the gauged station. The closer the estimation point is to the gauged station, the greater is the expected quality of the estimation. This approach, referred to as "local estimation" in the following, is developed and its performances are compared with those of a regional model previously developed for that area. The first step is to identify a suitable formula to compute the local estimate, that can be based on basin characteristics, or, in alternative, on the regional estimate (local estimation coupled with regional model). Then, the accuracy of each approach is evaluated through the assessment of the standard deviation of the estimates. In this way it is possible to compare the variance of the local estimates against the variance of other models, and thus to choose the most accurate method (or to combine different estimates).

The local estimation method has been applied to a set of basins located in the Northwestern part of Italy to estimate the index-flood, the L-CV and the L-CA, that are useful for the reconstruction of the flood frequency curve. For each gauging station, the local estimate variance is mapped upwards and downwards along the river. Results show that this procedure can be easily used to improve the performances of regional models or replace them in certain areas.