



Top-kriging – interpolation of streamflow related variables

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Geostatistical methods are appealing for interpolation purposes, as they can be described as the best linear unbiased estimator (BLUE). Still, with a few exceptions, geostatistical methods have not been taken into use for interpolation of streamflow related variables. Contrary to ordinary kriging, the measurements on a river will be representative for different catchment areas and that the catchments will be nested.

We will here present top-kriging, or topological kriging, a method that takes both area and the nested nature of catchments into account. The concept builds on the work of Sauquet et al. (2000) and extends it in a number of ways. We test the method for the case of the specific 100- year flood for two Austrian regions. The method provides more plausible and, indeed, more accurate estimates than Ordinary Kriging.

Top-kriging also provides estimates of the uncertainty of the variable of interest. On the main stream the estimated uncertainties are smallest and they gradually increase as one moves towards the headwaters. The method as presented here is able to exploit the information contained in short records by accounting for the uncertainty of each gauge.

We suggest that Top-kriging can be used for spatially interpolating a range of streamflow-related variables including mean annual discharge, flood characteristics, low flow characteristics, concentrations, turbidity and stream temperature.