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# Prediction of streamflow regimes over large geographical areas: interpolated flow-duration curves for the Danube region and Europe

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We first analysed the relationships existing between selected indices of streamflow-regime and catchment descriptors in Europe and the Danube region using a dataset compiled by European Joint Research Centre (JRC) for ∼3000 discharge measurement points, highlighting the limited accuracy of streamflow-regime predictions resulting from multiregression models. Second, we considered geostatistical interpolation of streamflow regime, which we summarized by means of flow-duration curves (FDCs). We focused on the Danube region and applied the recently developed method Total Negative Deviation Top-Kriging (TNDTK). The main goal of the second part of our study is twofold: (1) to test the viability of TNDTK for predicting FDCs over large geographical areas; (2) to identify an indicator of the reliability of geostatistically interpolated FDCs. Interpolated FDCs show a high accuracy for the entire Danube region (overall Nash-Sutcliffe efficiency computed on log-flows, LNSE, using a leave-p-out cross-validation procedure is equal to 0.938, 0.935, and 0.923, with p equal to 1 site, one third and half of the sites, in this order). Third, we performed a leave-one-out cross-validation of TNDTK across Europe, obtaining an overall LNSE equal to 0.918 for the ∼3000 measurement points belonging to the JRC dataset. Finally, we generated two data-layers reporting interpolated FDCs in the Danube region and Europe (c.a. 4000 and 21400 prediction nodes, respectively), and we attached a measure of uncertainty based on kriging variance of TNDTK to each interpolated curve.