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# Impacts of uni- and multivariate bias adjustment methods on simulations of hydrological signatures in high latitude catchments

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Climate models are used to generate future hydroclimatic projections for exploring how climate change may affect water resources. Their outputs, however, feature systematic errors due to parametrization and simplification of processes at the spatiotemporal scales required for impact studies. To minimize the adverse effects of such biases, an additional bias adjustment step is typically required.

Over the past decade, adjustment methods with different levels of complexity have been developed that consider one or several variables at a time, consequently adjusting one or multiple features of climate model simulations. Despite attempts in developing such methods and the growing use of some, the selection of methods for accurate simulation of streamflow remains subjective and still highly debated. In this study, we seek to answer whether sophisticated multivariate bias adjustment methods outperform simple univariate methods in the simulation of streamflow signatures.

To this end, we systematically investigated the ability of two simple univariate and two advanced multivariate methods to accurately represent various hydrological signatures relevant for water resources management in high latitudes. We offer practical guidelines for choosing the most suitable bias adjustment methods based on the objective of each study (i.e., hydrologic signatures of interest) and the hydroclimatic regime of the study catchments.