



Verification of ESP forecast skills for pre- and post-ESP re-sampling schemes: Application to the South Saskatchewan River Basin

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Abstract

This study compares the performance of two K-nearest neighbor (K-NN) re-sampling schemes for producing ensemble streamflow forecasts using a conceptual hydrologic model. In the first scheme, the weather input data to the hydrologic model (precipitation and temperature) for each day of the forecast year are stochastically generated from historical observations by conditioned re-sampling from the K-NN. In the second scheme, ensemble members are conditionally re-sampled from candidate ensemble traces which were generated by assuming that each historical year in the record has an equal likelihood of occurrence in the forecast year. In both schemes, the conditioning vectors for selecting the nearest neighbors comprise large-scale climate information and antecedent precipitation. The methods were applied to two watersheds located in the headwaters of the South Saskatchewan River basin in the province of Alberta, Canada. Forecasts produced by the two schemes exhibited only marginal differences in terms of overall skill measures such as correlation coefficient, relative root-mean-squared error and ranked probability skill score. However, notable differences were observed between forecasts issued during some months when the relative operating characteristic curve was evaluated for below-normal and above-normal flow categories separately.