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Statistical Properties and Quality of some Operational Inflow Forecasts at Hydro-Québec over Different Temporal Scales

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Hydro-Québec's inflow forecasting system produces daily ensemble forecasts over a horizon of 200 days for more than 90 watersheds. An inflow forecasts verification system was deployed in the operational process to help forecasters and planners use the forecasts, and researchers improve the process. Here, we present the results of a detailed investigation on the statistical properties and forecast quality of ensembles on short and mid term time scales. Using a variety of graphical and numerical tools, we verified the calibration of the ensembles, and the presence of bias. We compared the quality of operational forecasts to a reference model to assess system's skill. We also studied if the system issues the right number of members, and if its non-exceedance scenarios were properly representing uncertainty. We compared the system's performance over different seasons, and a number of years. Finally, we studied the behavior of different numerical scores. The results of that analysis will help choose which improvements should be made to the system, and which modifications should be brought to the operational forecasting process. This experiment will give some guidelines to our forecasters on how should be performed a complete verification analysis of Hydro-Québec's probabilistic forecasting system.