



Evaluation Of Statistical Models For Forecast Errors From The HBV-Model

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Three statistical models for the forecast errors for inflow to the Langvatn reservoir in Northern Norway have been constructed and tested according to how well the distribution and median values of the forecasts errors fit to the observations. For the first model observed and forecasted inflows were transformed by the Box-Cox transformation before a first order autoregressive model was constructed for the forecast errors. The parameters were conditioned on climatic conditions. In the second model the Normal Quantile Transformation (NQT) was applied on observed and forecasted inflows before a similar first order autoregressive model was constructed for the forecast errors. For the last model positive and negative errors were modeled separately. The errors were first NQT-transformed before a model where the mean values were conditioned on climate, forecasted inflow and yesterday's error. To test the three models we applied three criterions: We wanted a) the median values to be close to the observed values; b) the forecast intervals to be narrow; c) the distribution to be correct. The results showed that it is difficult to obtain a correct model for the forecast errors, and that the main challenge is to account for the auto-correlation in the errors. Model 1 and 2 gave similar results, and the main drawback is that the distributions are not correct. The 95% forecast intervals were well identified, but smaller forecast intervals were over-estimated, and larger intervals were under-estimated. Model 3 gave a distribution that fits better, but the median values do not fit well since the auto-correlation is not properly accounted for. If the 95% forecast interval is of interest, Model 2 is recommended. If the whole distribution is of interest, Model 3 is recommended.