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Evaluation of seasonal ensemble forecasts in Norway

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Throughout the winter and spring season, seasonal forecasts are used by the Norwegian Water Resources and Energy Directorate (NVE) in order to assess the probability for sever floods or for low seasonal runoff volumes. The latter is especially important for hydropower production.

The seasonal forecasts are generated by a set of 145 lumped, elevation distributed HBV models distributed all over Norway. The observed weather is used to establish the initial snow cover, soil moisture and groundwater levels in the HBV model. Subsequently, scenarios are created by using time series of observed weather the previous 50 years, creating a total of 50 ensembles. The predictability of this seasonal forecasting system depends therefore on the importance of the initial conditions, and in Norway the seasonal snow cover is especially important.

The aim of this study is to evaluate the performance of the seasonal forecasts of flood peaks and seasonal runoff volumes and especially to evaluate of the predictability depends on (i) catchment climatology and (ii) issue dates and lead times. For achieving these aims, evaluation criterions assessing reliability and sharpness were used. The results shows that the predictability is the highest for catchments where the spring runoff is dominated by snow melt. The predictability is the highest for the shortest lead times (up to 1 months ahead).The predictive performance is higher for runoff volumes than for the flood peaks.