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Seamless hydrological predictions for Europe

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The sub-seasonal hydrological forecasts within the European Flood Awareness System (EFAS) provide an opportunity to assess the meteorological and hydrological predictability on time-scales beyond the first two weeks. The meteorological forcing of the system is the ECMWF extended-range ensemble prediction system (ENS-ER), which runs a 46-day forecast integration issued twice weekly, in combination with the seasonal forecasting system (SEAS5), which runs up to 7 months issued monthly. The system uses the hydrological model LISFLOOD to produce a 5x5 km output of several variables, such as runoff, discharge, snow, soil moisture and ground water storage. This study investigates the 20-year hindcast of the system to evaluate 1) the limits of predictability of the meteorological and hydrological variables and 2) assess the applicability of the system for a number of historical low flows in Europe over the hindcast period. The results show that the system does provide useful information and is therefore potentially useful for decision makers. The skill varies with geographical location and season. The results also show the uncertainty in the model system which needs to be considered when communicating the forecasts.