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Implementing medium to long range hydrological forecasting in the Czech Republic

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Longer lead-time hydrological forecast demands for probabilistic approach. Proposed method was inspired by ESP procedure of NWSRFS. The aim was to develop technique using already applied deterministic forecasting system (1h time step, limited number of computed variants). LARS-WG stochastic weather generator was used to produce 1000 years time series of daily MAP, min & max temperature. Series corresponding to forecast period (Julian date) make potential 1000 variants of input series better representing the probable distribution of extreme values through the year. There is also a potential for taking into account the seasonal forecast by change of generated time series characteristics. Selection of limited number (12) of ensemble members was based on first 10 days precipitation total (random member from different exceedance probability intervals). Spatial distribution of temperature was made using common vertical gradient. Modified Shaake shuffle approach was applied for distribution of precipitation using historical observed precipitation distribution patterns (sub-basins proportion of MAP total). Daily MAP is distributed in time using 3 step generator randomly selecting 6h interval of highest precipitation and its amount. Next step is random distribution of rest of precipitation to other 6h intervals of the day. Equal distribution from 6 to 1h interval was applied. Two study basins (Otava River, Teplá Vltava River) were selected. AquaLog forecasting system produced experimental 30days runoff forecasts based on its operational settings and initial conditions. Evaluation of probabilistic forecast skill could be done only in longer time scale. Concerning single made forecasts (with the respect to flood occurrence in simulated period) observed total runoff reached expected probability of exceedance (2-10 %) and cumulated runoff fitted well in probability plumes. Larger ensemble must be use to represent properly

the probability of 5days mean flow and peak exceedance in future.