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An alternative scheme in generating the forcing data ensemble for improved ensemble streamflow prediction

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As part of the Advance Hydrologic Prediction Service (AHPS) of the US National Weather Service, improvements are being made to produce ensemble (probabilistic) streamflow prediction (ESP) production. Currently probabilistic hydrologic forecasting in this operational setting is made by relying on the basin initial condition resulted from running the model up to the forecast period and then running the model into the future by means of ensemble climate forecast or by using the resampling method for creating synthetic ensemble climate forecast from historical years. In these procedures precipitation ensemble members are treated equally from the historical time series, however, there is no strong reason that such precipitation or temperature ensemble properly represents the forcing data uncertainty. In this presentation, we present a weighting method to give preference to historical precipitation time series which resemble the hydrologic conditions preceding the current watershed state. To investigate the effectiveness of this weighting scheme on improving the ESP, different skill scores are used and the results are compared with the current NWS strategy in generating the ESP.