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Title: Sensitivity study of the skill of the CPC Week-2 Reforecast Tool to Reforecast Sampling

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Abstract:

The Climate Prediction Center (CPC) currently uses a calibrated NCEP medium-range forecast model (Global Ensemble Forecast System (GEFS)) reforecast tool that significantly contributes to the skill of operational 6-10 and week-2 forecasts. Therefore, CPC requires a set of reforecasts to be generated with each model upgrade, including the major GEFS upgrade planned for early 2014. The reforecasts currently used in CPC's tool were produced by ESRL but is expected to be transferred to NCEP in 2014. It is understood that available resources will limit the configuration of the upgraded GEFS reforecasts. Therefore, CPC has performed a sensitivity study to provide feedback to NCEP to ensure that any reduction of reforecast data does not significantly reduce the skill of CPC operational forecasts. These reforecast datasets are planned to be used for producing real-time 6-10 day and week-2 temperature and precipitation forecasts and week-2 probabilistic hazard outlooks at CPC.

This study assess the impact of reducing the number of years, number of ensemble members, and frequency of reforecasts on the skill of week-2 GEFS calibrated surface temperature and precipitation forecasts using the current GEFS model reforecasts. The model evaluated in this study is the GEFS model with physics operational during 2012. CPC evaluated skill using three types of skill scores - Heidke, RPSS, and reliability from February 2012 to June 2013. Results indicate that the decrease in number of reforecast years causes the greatest decrease in nearly all skill measures, and the drop in number of ensemble members results in the least reduction in skill.

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