Probabilistic forecasts of near-term climate change: verification for temperature and precipitation changes from years 1971-2000 to 2011-2020

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Räisänen and Ruokolainen (2006) proposed a resampling ensemble technique for probabilistic forecasting of near-term climate change and used it to generate forecasts of temperature and precipitation change from the years 1971-2000 to 2011-2020. Following the completion of the latter period, these forecasts have become verifiable. The results are encouraging particularly for temperature. The temperature change forecasts are reliable in a statistical sense, with just 9% and 10% of the local annual and monthly mean changes falling outside the 5-95% forecast range. The verification statistics for temperature change represent a large improvement over the statistics for a surrogate no-forced-change forecast, and they are largely insensitive to the observational data used. The improvement for precipitation changes is much smaller, to a large extent due to the much lower signal-to-noise ratio of precipitation than temperature changes. Furthermore, observational uncertainty is a major complication in verification of precipitation changes. For the main source of precipitation data chosen in the study, 20% and 15% of the local annual and monthly mean precipitation changes fall outside the 5-95% forecast range. This research was reported in more depth by Räisänen (2022).

References:

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