



The verification of seasonal precipitation forecasts for early warning in Zambia and Malawi

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In this study we assess probabilistic seasonal forecasts of precipitation forecasts issued by Regional Climate Outlook Forum (RCOF) for the two southern African countries Malawi and Zambia from 2002 to 2013. Forecasts are for early season (October-December) and late season (January-March) summer rainfall accumulations in three categories (above normal, normal, and below normal).

First, suitable observations for the climatology and the time of forecasts are needed. However, different data sets can have clear substantial differences in precipitation levels. But in principle, absolute values need not to be exact, if the relative values are consistent. Use of more than one data set can help in determining the uncertainty of results. We also explore other methods, such as bootstrapping, in calculating the confidence intervals for verification measures.

The well-known decomposition of Brier score into three terms (Reliability, Resolution, and Uncertainty) shows that forecasts are very reliable or well-calibrated, but have very low resolution; that is, they are not able to discriminate different events. Forecasts also lack sharpness as forecasts for one category are rarely higher than 40% or less than 25%.

The verification results lay a basis for the discussion on the usability and value of seasonal forecasts for the early warning process in the region, as the forecast is heavily used in the two countries and the potential benefits of the forecast are high. But should verification concentrate in validating the past performance or be more future-oriented and estimate how forecasts will perform in the future? Our verification is based on historical data (what was really forecasted), not on reprocessed data (what would have been forecasted, if the present system had been available then). Therefore the results can be somewhat too pessimistic, and for a more optimistic outlook, we compare our results with results using forecasts from the Climate-system Historical Forecast Project (CHFP).