



Reliability of predicting the number of frost days in the MiKlip decadal prediction system

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As decadal predictions are gaining more and more attention among for decision makers, it is essential that these predictions are reliable, i.e. that they “mean what they say”. A popular prediction setting for the decadal scale is the probability of exceedances of threshold, e.g. the probability for the number of frost days (days with minimum temperature below 0°C) in a certain region exceeding the climatological median or the 2nd tercile. These probabilistic forecasts of dichotomous events (e.g., the probability of exceeding a threshold) are typically verified with the Brier Score. Its decomposition leads to the attributes diagram, an elegant graphical representation of the essential information needed for verification, such as the reliability. Within the frame of Germany’s national initiative for decadal predictions (MiKlip), we analyze the reliability of ensemble hindcasts for the number of frost days. The ensemble hindcasts stem from the Max-Planck-Institute’s Earth System Model in a low-resolution configuration (MPI-ESM-LR). Hindcast verification is carried out for different setups of the model initialisation. Apart from investigating various spatial and temporal aggregation scales for the number of frost days, we compare different ways to quantify and communicate reliability to stakeholders using a discrete set of categories (e.g., reliable, skillful, potential useful, etc.)