



Predicting high-impact weather using medium-range ensemble forecasts

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As part of its contribution to THORPEX, the Met Office is running an experimental 15-day global ensemble prediction system. Research is being undertaken both to compare the Met Office ensemble with other ensembles, and on the combination of ensembles from different forecast models within the TIGGE framework in a multi-model ensemble, with an emphasis on the prediction of high-impact weather.

One of the key steps in this process is to highlight to forecasters, via a range of carefully tailored ensemble-based products, the risk of high-impact weather. A new range of probability charts aim to summarise the risk of high-impact weather over the 0-5, 5-10, and 10-15 day forecast periods, including events within the 5-day spell (e.g. the risk of heavy rain or a cold snap). Innovative feature-based ensemble post-processing is also carried out to objectively identify tropical and extra-tropical fronts and cyclones at all life-cycle stages. This is currently implemented over the Atlantic for the Met Office and ECMWF ensembles, and will also run over the Pacific during the T-PARC period. The features are tracked over time to show at short-range how each ensemble member is predicting the track and intensity of a particular cyclone to develop. At longer forecast ranges strike probability plots show the risk of a high-impact storm in a certain time window.

The benefits of multi-model ensembles and tailored ensemble-based products, within the end-to-end process of high-impact weather forecasting, are demonstrated using case studies. It is shown that the multi-model ensemble is very useful for capturing the overall risk of high-impact weather events (as it is not possible to identify the 'best' model for a particular event at the time), and that the high-impact products are

able to communicate effectively the relevant information to the user.