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Recent developments in high-impact weather forecasting capabilities within the Met Office

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The Met Office Weather Impacts Team develops probabilistic forecast tools based on output from ensembles to summarise the risk of high-impact weather, both globally and in the UK.

Firstly, at the global scale, the "Global Hazard Map" forecasts probabilities of high-impact weather over the coming week. It is a GIS web map service allowing users to select a variety of hazards, vulnerability and exposure layers, as well as providing symbol-based summary maps to give an "at-a-glance" assessment of the week ahead. Forecast layers include tropical cyclone activity, named tropical cyclone tracks, heatwaves and coldwaves. Precipitation, wind gust and snowfall layers are calculated based on the probability of exceeding the 99th centile in the climatology.

Moving to the European scale, the Met Office has recently updated its "Decider" weather regime forecast tool, which visualises a range of possible weather scenarios at both medium-range and monthly time scales. The updated tool is based around a new set of 30 objectively derived weather regimes over Europe. These new regimes are used as an alternative to Grosswetterlagen (GWL) and are defined in terms of their pressure anomalies, allowing easy identification of severe weather types. Research is ongoing into how these new regimes can be used in specific high-impact applications. This includes provision of a rapid assessment of the risk of volcanic ash originating over Iceland being transported into UK airspace and provision of first-guess probabilities of severe wave and surge events.

Finally, at the UK scale, the Ensemble Prediction System First-Guess Warning (EPS-W) tool provides support to the National Severe Weather Warnings Service (NSWWS). Here, ensemble data is processed into a format which mimics the NSWWS weather impact matrix. First guess warnings from EPS-W are designed to be used alongside other forecast output before warnings are issued. Latest verification results show benefit from the use of high resolution ensembles when forecasting severe weather.