IMPROVER – the new probabilistic post-processing system at the Met Office

Ken Mylne, Nigel Roberts, and Jonathan Flowerdew
Met Office, Weather Science, Exeter, United Kingdom (ken.mylne@metoffice.gov.uk)

The effective construction and use of ensembles along with the need to provide seamless continuity across spatial scales and temporal evolution have become major challenges for weather forecasting through to climate prediction in recent years. Real tangible benefits are expected if we get this right. In terms of ensemble forecasting, the Met Office has invested hugely in the development of the convection-permitting ensemble for the UK (MOGREPS-UK) and the global ensemble MOGREPS-G, as well as in exploiting the ECMWF ENS. The challenge now is how to use all this information, along with forecasts from elsewhere, in a way that doesn't overwhelm Operational Meteorologists, provides useful automated outputs that contain meaningful uncertainty, and produces seamless continuity between different models or forecast systems. To this end a new post processing system called IMPROVER is being developed which will run in an operational framework from 2020. It ingests both deterministic and ensemble forecasts at a variety of resolutions and converts to probabilities; "neighbourhood" methods are used extensively with the convection permitting models. This allows the construction of a seamless probabilistic blend and the capability to generate a wide variety of probability-based outputs and condensed information about potentially high-impact weather conditions. IMPROVER is built with verification incorporated at every stage of processing, and can be run both in real-time (operational) mode and in trial mode to test model and system upgrades. For the UK, IMPROVER is being implemented for both a UK grid at 2km resolution and a global grid at 10km resolution. IMPROVER was introduced at EMS 2018 in two presentations by Gavin Evans and Fiona Rust. This presentation will provide an update on IMPROVER progress including new science capabilities, real-time running and latest trial results.