



## **Making large amounts of meteorological data accessible through visualisation**

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The European Centre for Medium-Range Weather Forecasts (ECMWF) is an international organisation providing its member organisations with forecasts in the medium time range of 3 to 15 days. As part of its mission, ECMWF generates an increasing number of forecast data products for its users. To support the work of forecasters and researchers and to let them make best use of ECMWF forecasts, the Centre also provides tools and interfaces to visualise their products. This allows users to make use of and explore forecasts without having to transfer large amounts of raw data. This is especially true for products based on ECMWF's 50 member strong ensemble forecast. Users can choose to explore ECMWF's forecasts from the web or through visualisation tools installed locally or at ECMWF.

ECMWF's new in-house developed web service, ecCharts, displays recent numerical forecasts to forecasters in national weather services. The functions that ecCharts provides are beyond standard web charts, in that forecasters can use the service to create bespoke charts on demand and do this themselves as and when they need to using an intuitive web interface. With ecCharts they are able to explore ECMWF's medium-range forecasts in far greater detail than has previously been possible on the web.

Beside the interactive user interface built using jQuery the service also offers a machine-to-machine web map service based on the OGC Web Map Service (WMS) standard. The WMS service is primarily intended to be used by forecaster workstations to integrate maps generated at ECMWF. The main challenge was to achieve fast response times even though the data volume and processing effort is quite high. PNG is the main format served but SVG is being investigated as a vector alternative.

This talk will present examples of complex meteorological maps and graphs which show new possibilities users have gained by using the web as a medium. More advanced possibilities are available directly to users of the meteorological desktop software Metview. The ecCharts webframework and Metview both use the Magics++ library for plotting. Magics++ and Metview are developed by ECMWF and are now available as Open Source.