

## PRESS RELEASE

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# EUROPEAN MEDIUM-RANGE WEATHER FORECAST MODEL UPGRADED TO BEST EVER

- **More accurate global weather predictions at record-breaking resolution**
- **Number of grid points tripled to 900 million, evenly distributed around the globe**
- **Gain in predictability of up to half a day at same level of quality**

Years of scientific and technical work came to fruition today as the European Centre for Medium-Range Weather Forecasts (ECMWF) launched a significant set of upgrades, dramatically increasing the quality of both its high-resolution and its ensemble forecasts.

The changes nearly halve the distance between global weather prediction points, substantially increasing the effective resolution of the final forecast. As a result, ECMWF's numerical weather predictions, which are widely used by Europe's meteorological services, are more accurate than they have ever been before.

These model upgrades represent a huge leap forward for ECMWF's 34 Member and Co-operating States, giving National Meteorological Services access to higher resolution and improved data to help them deliver weather forecast services. Europe's weather can now be predicted with more detail, with greater accuracy, and as a result, up to half a day further ahead.

The upgrades are set to offer improved range, reliability and accuracy to provide earlier warnings of adverse conditions and extreme weather to help protect property and vital infrastructure, and to aid long-term planning for weather-dependent industries.

Speaking for Météo-France, Nicole Girardot commented:

*“The ECMWF upgrade to its model resolution represents a significant step. The advances brought by this new version will allow Météo-France to improve the quality of its own forecasts and the wind forcing for warnings of poor air quality and dangerous conditions at sea. It will also more specifically help with the prediction of extreme and severe weather in*

*French overseas territories: better estimates of cyclonic phenomena, at medium-range and monthly timescales, and the provision of coupling data for the French Arome model run at very high resolution in these regions.”*

These upgrades are taking place at several levels of the numerical prediction process, all leading to a substantial improvement in the accuracy of ECMWF forecasts.

One of the main changes – one of only a handful of its kind in 40 years of European weather cooperation – increases the number of global points where a weather prediction is made to more than 900 million. This reduces the average distance between points from 16 km to 9 km in the highest-resolution forecasts. Ensemble forecasts describing the range of possible scenarios and their likelihood are moving from 32 and 64 to 18 km up to forecast day 15. There are up to 137 layers of these prediction points, forming a network of grid points from near the Earth’s surface up to the stratosphere.

As well as the resolution upgrade, the new cycle includes many improvements to the assimilation of observations making it possible to extract more valuable information from data. There is also extended observation coverage: microwave data is being used in more challenging situations such as mountain areas and snow-covered land surfaces, and the coverage of satellite-derived winds is being improved in the mid-latitudes. These improvements lead to a better assessment of the current state of the atmosphere and improved forecast quality.

A further change arranges the prediction points so they are distributed more efficiently across the Earth’s surface, saving computing time. The pattern is built up starting from an octahedron enclosing the globe, giving rise to an ‘octahedral grid’. Further substantial efficiency gains have been made in the processing of observations and other areas, making the task of continually improving the weather forecast more sustainable.

ECMWF Director-General Florence Rabier said:

*“The impact of the weather and its potentially deadly extremes is one of the key challenges facing emergency response services, policymakers, and industry. This makes the role of the National Meteorological Services that we serve critical to society.*

*“Our ability to predict the weather accurately has in the past improved by around 24 hours every ten years, so this jump of up to twelve hours is a big step forward.*

*“These upgrades launched today not only increase the detail of our global operational forecast, its range and accuracy, but do so in a sustainable way, clearing the way for further improvement. This was only achievable through the work ECMWF and its partners are conducting in the field of coding and computing efficiency.*

*“By continuing to drive improvements in global numerical weather prediction, ECMWF is contributing to Europe’s resilience and sustainability.”*

## Ends

### Notes to editors:

1. ECMWF is an intergovernmental organisation supported by 34 European States. It provides weather services with medium-range forecasts of global weather to 15 days ahead as well as with monthly and seasonal forecasts. ECMWF's computer system at its headquarters in Reading, United Kingdom, is one of the largest for meteorology worldwide and contains the world's largest archive of numerical weather prediction data. It runs a sophisticated medium-range prediction model of the global atmosphere and oceans. The National Meteorological Services of Member States and Co-operating States use ECMWF's products for their own national duties, in particular to give early warning of potentially damaging severe weather.
2. The upgrades to the forecast model will give 34 National Meteorological Services access to higher resolution and improved data to help them deliver improved weather forecast services. These are:

### Member States

Austria, Zentralanstalt für Meteorologie und Geodynamik (ZAMG)

Belgium, Royal Meteorological Institute of Belgium (RMI/KMI)

Croatia, Meteorological and Hydrological Service of Croatia (DHMZ)

Denmark, Danmarks Meteorologiske Institut (DMI)

Finland, Ilmatieteen Laitos / Finnish Meteorological Institute (FMI)

France, Météo-France

Germany, Deutscher Wetterdienst (DWD)

Greece, Hellenic National Meteorological Service (HNMS)

Iceland, Icelandic Meteorological Office (IMO)

Ireland, Met Éireann

Italy, Stato Maggiore Aeronautica, Ufficio Generale Spazio Aereo e Meteorologia (USAM)

Luxembourg, Service Météorologique - MeteoLux, Administration de la navigation aérienne

Netherlands, Royal Netherlands Meteorological Institute / Koninklijk Nederlands Meteorologisch Instituut (KNMI)

Norway, Meteorologisk Institutt / Norwegian Meteorological Institute

Portugal, Instituto Português do Mar e da Atmosfera (IPMA)

Serbia, Republički Hidrometeorološki Zavod Srbije / Republic Hydrometeorological Service of Serbia

Slovenia, Meteorological Office, Slovenian Environment Agency (SEA)

Spain, Agencia Estatal de Meteorología / State Meteorological Agency (AEMET)

Sweden, Väder Väderprognoser Klimat- & Vädertjänster i Sverige/Swedish Meteorological and Hydrological Institute (SMHI)

Switzerland, Federal Office of Meteorology and Climatology MeteoSwiss

Turkey, Meteoroloji Genel Müdürlüğü

United Kingdom, Met Office

### Co-operating States

Bulgaria, National Institute of Meteorology and Hydrology

Czech Republic, Czech Hydrometeorological Institute (CHMI)

Estonia, Estonian Environment Agency

Former Yugoslav Republic of Macedonia, National Hydrological Institute of Macedonia

Hungary, Hungarian Meteorological Service (HMS)

Israel, Israel Meteorological Service

Latvia, Latvian Environmental, Geological and Meteorological Centre  
Lithuania, Lithuanian Hydrometeorological Service  
Montenegro, Institute of Hydrometeorology and Seismology of Montenegro (IHMS)  
Morocco, Météorologie Nationale, Royaume du Maroc  
Romania, National Meteorological Administration  
Slovakia, Slovenský hydrometeorologický ústav / Slovak Hydrometeorological Institute (SHMÚ)

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