ECMWF
EUROPEAN CENTRE FOR
MEDIUM-RANGE WEATHER FORECASTS

Europäisches Zentrum für mittelfristige Wettervorhersage | Centre européen pour les prévisions météorologiques à moyen terme

PRESS RELEASE

New seasonal prediction system SEAS5 brings better El Niño forecasts

The European Centre for Medium-Range Weather Forecasts (ECMWF) today launches its latest seasonal prediction system, SEAS5. The system brings a substantial improvement in forecast skill, especially for El Niño/La Niña events. Forecasts are also more detailed thanks to much greater horizontal resolution. An immediate application is the use of SEAS5 by the Global Flood Awareness System (GloFAS) to create the first ever operational global long-range river-flow forecasting system. This could mean much earlier awareness of floods and droughts than has previously been possible.

Seasonal forecasts help to give an idea of large-scale weather patterns up to seven months in advance at the moment. ECMWF's strategic goal is to extend this to a year by 2025. The forecasts can support decision-making for users ranging from governments and aid agencies to businesses, in areas such as water and energy management, health, agriculture and financial services.

ECMWF has been providing seasonal forecasts for 20 years. The forecasts are best known for successful predictions of El Niño and La Niña events. These periods of anomalous warming or cooling in the tropical eastern Pacific have a strong impact on the weather locally, but also influence global weather patterns. SEAS5 brings noticeable improvements in forecast skill for El Niño/La Niña and for the tropics more generally. Predictions of Arctic sea ice and near-surface temperature in the northern hemisphere are also improved, notably as a result of including an interactive sea-ice model in SEAS5.

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Horizontal resolution has more than doubled both in the ocean model (from 1 degree to 0.25 degrees) and in the atmospheric model (from 80 km to 36 km), enabling much more detailed forecasts.

ECMWF project lead Tim Stockdale said: *"SEAS5 uses a version of ECMWF's state-of-the-art Integrated Forecasting System (IFS) and represents six years of model development. The resolution upgrade is a huge step forward, particularly in the accuracy of representing the global ocean. The influences of the land surface are also better represented. For the future, a major goal is to improve predictions for the stratosphere to make the maximum use of all sources of predictability."*

SEAS5 represents an important step towards ECMWF's goal of seamless forecasting across all time ranges. The model and initialisation methods are almost identical to those used for ECMWF's medium- and extended-range ensemble forecasts (ENS). This greatly facilitates model development and maintenance.

ECMWF Member States and licensed users can access SEAS5 forecasts on the 5th day of each month. The forecasts are made available more widely on the ECMWF website (www.ecmwf.int) on the 10th of each month. The forecasts can also be accessed on the 10th of each month through the EU-funded, ECMWF-run Copernicus Climate Change Service (C3S) (http://climate.copernicus.eu/). C3S is developing a seasonal forecast service which also includes forecasts from other centres and multi-system forecasts.

The Global Flood Awareness System (GloFAS) is co-developed by ECMWF and the Joint Research Centre of the European Commission as part of the Copernicus Emergency Management Service (EMS). The new seasonal GloFAS model, developed in collaboration with researchers from the University of Reading, takes long-range forecasts from SEAS5 and runs a hydrological model to simulate how the predicted conditions will impact river flow across the globe up to four months in advance.

Initial pre-implementation tests indicate that the new model has the potential to save lives by allowing authorities and aid agencies around the world to plan and prepare flood relief efforts earlier than ever before. Other potential uses include water resource management, agriculture and disaster risk reduction.

Project lead Rebecca Emerton, a flood forecasting PhD researcher at the University of Reading and visiting scientist at ECMWF, said: *"This new model could be a game-changer in that it provides hydrologically relevant forecasts out to several months for the whole globe – something that has never been possible before. It has the potential to provide earlier indications of both floods and droughts, which could be invaluable for disaster risk reduction efforts around the world, helping vulnerable communities become more resilient to the threat of flooding."*

The forecasts will be publicly available via the existing GLoFAS interface (www.globalfloods.eu).

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Notes to editors

1. The European Centre for Medium-Range Weather Forecasts (ECMWF) is an independent intergovernmental organisation supported by 34 states. ECMWF is both a research institute and a 24/7 operational service, producing and disseminating numerical weather predictions to its Member and Co-operating States as well as licensed users. The organisation was established in 1975 and now employs around 350 staff from more than 30 countries. ECMWF is based in Reading, UK.

2. Copernicus is a European Union Programme aimed at developing European information services based on satellite Earth observation and in situ (non-space) data. The Programme is coordinated and managed by the European Commission. ECMWF operates two of the six Copernicus services on behalf of the EU: the Copernicus Climate Change Service (C3S) and the Copernicus Atmosphere Monitoring Service (CAMS). ECMWF is also the computational centre for European flood awareness and forest fire information systems which are part of the Copernicus Emergency Management Service (EMS).

3. The Global Flood Awareness System (GloFAS), jointly developed by the Joint Research Centre of the European Commission and ECMWF, is independent of administrative and political boundaries. It couples state-of-the-art weather forecasts with a hydrological model and with its continental-scale setup it provides downstream countries with information on upstream river conditions as well as providing continental and global overviews.