Met Office

Global Seasonal Forecast System version 6 (GloSea6)

GloSea6 forecast data

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This state-of-the-art monthly to seasonal ensemble prediction system was developed at the Met Office and uses our coupled model to make global forecasts for the next 7 months. Unlike many other centres, our forecasts are made each day from the very latest observations to give the most up-to-date information. Historical forecasts (hindcasts) are also calculated each week to help remove any remaining biases in the model.

Met Office Global Coupled Model

The coupled model is comprised of 4 component models:

- Atmosphere - Met Office Unified Model (UM)
- Land surface - Joint UK Land Environment Simulator (JULES)
- Ocean - Nucleus for European Modelling of the Ocean (NEMO)
- Sea-ice - Los Alamos Sea Ice model (CICE)

All of these components are initialised from latest observations. These four component models are coupled and run concurrently with information passing between them to model the coupled evolution of the earth system.

The atmospheric model (UM) uses a resolution of approximately 0.83 x 0.56 degrees and extends from the surface to the mesosphere in order to include stratospheric processes in our forecasts. The ocean and sea-ice (NEMO and CICE) models use a tripolar 0.25 degree grid which is relatively high resolution compared to many forecast systems and includes interactive sea-ice which is absent from some forecast systems.

The model's initial state is started close to the real atmosphere, ocean and sea-ice using hybrid 4D-Var data assimilation (atmosphere) and 3D-Var data assimilation for the ocean and sea-ice.

Parameter frequency

The following diagnostics are available as daily and monthly mean values. Both daily and monthly mean values are available from the whole length of a model integration.

Surface Level Parameters

1. Surface temperature
2. Daily min and max 1.5m temperatures
3. Sea-ice concentration
4. 10m u-wind component
5. 10m v-wind component
6. 1.5m temperature
7. Precipitation rate
8. Soil moisture content
9. Pressure at mean sea level

Pressure Level Parameters

1. Geopotential height
2. U-wind component
3. V-wind component
4. Temperature
5. Specific Humidity

Standard Pressure Levels

1.	925
2.	850
3.	500
4.	300
5.	200
6.	100
7.	50
8.	10

Forecast ensemble members

Each day forecast members are initialised from 00UTC analysis:

- 2 x 216-day integrations
- 2 x 64-day integrations

Hindcast ensemble

Each day we run new ensemble members of the hindcast. One week of hindcast members are combined to create the ensemble for one hindcast start date.

Hindcasts

There are 4 hindcast start dates each month: 1, 9, 17 and 25.

For each start date hindcasts are run for 24 past years from 1993 to 2016.

For each year and each start date 7 ensemble members are run.

For each start date (e.g. 1 May) there is a total 24 years x 7 members = 168 hindcast ensemble members.

The hindcasts can be used to calibrate the forecasts and assess forecast skill.
Calibration of the forecasts is discussed in more detail on
https://www.metoffice.gov.uk/research/climate/seasonal-to-decadal/gpc-outlooks/user-guide/calibration

Examples of use of the hindcasts to assess skill are published at:
https://www.metoffice.gov.uk/research/climate/seasonal-to-decadal/gpc-outlooks/glob-seas-prob-skill

Domains

Global domain.

Lat. 90.0° S to 90.0° N Long. 180° W to 180° E

Resolution

1° (~112 km). Area weighted interpolation is used to convert the native 0.83° x 0.56° to the 1° grid.

Format

NetCDF4

Delivery

File transfer protocol (FTP)

Met Office
FitzRoy Road, Exeter
Devon, EX1 3PB
United Kingdom

Tel: +44 (0)1392 885680
Fax: +44 (0)1392 885681
DPT@metoffice.gov.uk
www.metoffice.gov.uk

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