



DESCRIPTION

The flagship Numerical Weather Prediction model developed and used at the Met Office, is the Unified Model, the same model is used for both weather and climate prediction. For weather forecasting the Met Office runs several configurations of the Unified Model as part of its operational Numerical Weather Prediction suite.

The Global deterministic model is a global configuration of the Met Office Unified Models providing the most accurate short range deterministic forecast by any national meteorological service covering a six-day period. It can produce selected hourly data covering the first 48 hours at surface level and at standard pressure levels twice a day. The model's initial state is kept close to the real atmosphere using hybrid 4D-Var data assimilation. Uncovering 2 years' worth of historical data, updated regularly with a 4-hour time delay. Formatted via NetCDF.

NetCDF (Network Common Data Form) is an interface for array-orientated data access and a library that supports the interface. Composed of 3 components; variable, dimensions, and attributes. Variables store the data; dimensions give relevant dimension information for the variables and attributes provide auxiliary information about the variables or dataset itself.

NetCDF is used within the atmospheric and oceanic science communities and is network transparent, allowing for it to be accessed by computers that store integers characters and floating-point numbers.

Iris supports NetCDF files through reading, writing and handling. Iris implements a model based on the CF conventions, giving a format-agnostic interface for working with data.

Further support on using Iris with NetCDF file: [User Guide — Iris 3.8.0 documentation \(scitools-iris.readthedocs.io\)](https://scitools-iris.readthedocs.io)

UPDATE FREQUENCY

Available time steps: every hour from 0 to 54 hours, every 3 hours between 57 to 144 hours and every 6 hours between 150 to 168 hours. Full runs (up to 168 hours): 00:00, 12:00. Shortened runs (up to 66 hours): 06:00, 18:00.

PARAMETERS

Parameter	Description	Units	Precision	Levels
cloud_amount_of_total_cloud	Fraction of horizontal grid square occupied by cloud as diagnosed by the model cloud scheme. This is for the whole atmosphere column as seen from the surface or the top of the atmosphere.	1	0.01	None
cloud_amount_of_high_cloud	Fraction of horizontal grid square occupied by cloud in the high-level cloud height range; from 5,574m (~18,000ft) to 13,608m (~44,500ft).	1	0.01	None
cloud_amount_of_medium_cloud	A fraction of horizontal grid square occupied by cloud in the mid-level cloud height range; from 1,949m (~6,500ft) to 5,574m (~18,000ft).	1	0.01	None
cloud_amount_of_low_cloud	Fraction on horizontal grid square occupied by cloud in the low-level cloud height range: from 111m (~350ft) to 1,949m (~6,500ft).	1	0.01	None
cloud_amount_below_1000ft_AS_L	Fraction of horizontal grid square occupied by cloud cover below 1,000 feet above sea level.	1	0.01	None
fog_fraction_at_screen_level	Fog means a visibility of 1000 m or lower. The reduction in visibility is caused by water droplets or minute ice crystals forming close to the surface. This quantity represents the fraction of horizontal grid square occupied by fog. An alternative interpretation is that this represents the fractional probability of fog being present at any location in the grid square.	1	0.1	Height: 1.5m
visibility_at_screen_level	Distance at which a known object can be seen horizontally from screen level (1.5m).	m	1.0	Height: 1.5m
pressure_at_tropopause	Air pressure at tropopause.	Pa	0.1	None
pressure_at_mean_sea_level	Air pressure at mean sea level which is close to the geoid in sea areas. Air pressure at sea level is the quantity often abbreviated as MSLP or PMSL.	Pa	1	None
precipitation_rate	Instantaneous rate at which liquid water (as a depth) is being deposited on the surface.	m s-1	1e-09	None
rainfall_rate_from_convection	Instantaneous rate at which rain, produced by the model convection scheme, is being deposited on the surface.	m s-1	1e-09	None
rainfall_rate_from_convection_max-PT01H	Maximum instantaneous rate at which rain, produced by the model convection scheme, is being deposited on the surface in the previous hour.	m s-1	1e-09	None
rainfall_rate_from_convection_max-PT03H	Maximum instantaneous rate at which rain, produced by the model convection scheme, is being deposited on the surface in the previous 3 hours.	m s-1	1e-09	None
rainfall_rate_from_convection_max-PT06H	Maximum instantaneous rate at which rain, produced by the model convection scheme, is being deposited on the surface in the previous 6 hours.	m s-1	1e-09	None
rainfall_accumulation-PT01H	Implied depth of the rain produced by the model precipitation scheme which has been deposited on the surface in the previous hour. For the Global models (which run a convection scheme) the "rainfall accumulation from convection" must be added to this to get the total rainfall accumulation.	m	1e-06	None

rainfall_accumulation-PT03H	Implied depth of the rain produced by the model precipitation scheme which has been deposited on the surface in the previous 3 hours. For the Global models (which run a convection scheme) the “rainfall accumulation from convection” must be added to this to get the total rainfall accumulation.	m	1e-06	None
rainfall_accumulation-PT06H	Implied depth of the rain produced by the model precipitation scheme which has been deposited on the surface in the previous 6 hours. For the Global models (which run a convection scheme) the “rainfall accumulation from convection” must be added to this to get the total rainfall accumulation.	m	1e-06	None
precipitation_accumulation-PT01H	Implied depth of the layer of liquid water which has been deposited on the surface in the previous hour. This included rain, snow, and hail with the ice phase precipitation being considered as a liquid water equivalent (lwe) value. It includes the contribution from the model convection scheme if this is invoked (true for Global models but not the UK models) as well as that from the model precipitation scheme.	m	1e-06	None
precipitation_accumulation-PT03H	Implied depth of the layer of liquid water which has been deposited on the surface in the previous 3 hours. This includes rain, snow and hail with the ice phase precipitation being considered as a liquid water equivalent (lwe) value. It includes the contribution from the model convection scheme if this is invoked (true for Global models but not the UK models) as well as that from the model precipitation scheme.	m	1e-06	None
precipitation_accumulation-PT06H	Implied depth of the layer of liquid water which has been deposited on the surface in the previous 6 hours. This includes rain, snow and hail with the ice phase precipitation being considered as a liquid water equivalent (lwe) value. It includes the contribution from the model convection scheme if this is invoked (true for Global models but not the UK models) as well as that from the model precipitation scheme.	m	1e-06	None
snowfall_rate_from_convection	Rate at which liquid water equivalent (LWE) snow, produced by the model convection scheme, is being deposited on the surface in previous hour.	m s-1	1e-09	None
snowfall_rate_from_convection_mean-PT01H	Mean rate at which liquid water equivalent (LWE) snow, produced by the model convection scheme, is being deposited on the surface in previous hour.	m s-1	1e-09	None
snowfall_rate_from_convection_mean-PT03H	Mean rate at which liquid water equivalent (LWE) snow, produced by the model convection scheme, is being deposited on the surface in previous 3 hours.	m s-1	1e-09	None
snowfall_rate_from_convection_mean-PT06H	Mean rate at which liquid water equivalent (LWE) snow, produced by the model convection scheme, is being deposited on the surface in previous 6 hours.	m s-1	1e-09	None
snowfall_rate_from_convection_max-PT01H	Maximum instantaneous rate at which liquid water equivalent (LWE) snow, produced by the model convection scheme, is being deposited on the surface in previous hour.	m s-1	1e-09	None

snowfall_rate_from_convection_max-PT03H	Maximum instantaneous rate at which liquid water equivalent (LWE) snow, produced by the model convection scheme, is being deposited on the surface in previous 3 hours.	m s-1	1e-09	None
snowfall_rate_from_convection_max-PT06H	Maximum instantaneous rate at which liquid water equivalent (LWE) snow, produced by the model convection scheme, is being deposited on the surface in previous 6 hours.	m s-1	1e-09	None
latent_heat_flux_at_surface_mean-PT01H	Exchange of heat between the surface and the air by motion of air; also called “turbulent” heat flux. In accordance with common usage in geophysical disciplines “flux” implies per unit area called “flux density” in physics. Upwards is positive; negative is downward. Mean in the previous hour.	W m-2	1	None
latent_heat_flux_at_surface_mean-PT03H	Exchange of heat between the surface and the air on account of evaporation (including sublimation). In accordance with common usage in geophysical disciplines “flux” implies per unit area called “flux density” in physics. Upwards is positive; negative is downward. Mean in previous 3 hours.	W m-2	1	None
latent_heat_flux_at_surface_mean-PT06H	Exchange of heat between the surface and the air on account of evaporation (including sublimation). In accordance with common usage in geophysical disciplines “flux” implies per unit area called “flux density” in physics. Upwards is positive; negative is downward. Mean in previous 6 hours.	W m-2	1	None
radiation_flux_in_uv_downward_at_surface	Ultraviolet radiation at the surface from above directed at the ground. In accordance with common usage in geophysical disciplines flux implies per unit area called “flux density” in physics.	W m-2	0.01	None
temperature_at_screen_level	Air temperature at screen level (1.5m).	K	0.01	Height: 1.5m
temperature_at_tropopause	Temperature at tropopause.	K	0.1	None
temperature_at_surface	Temperature at the surface interface between the air and the ground.	K	0.1	None
temperature_at_screen_level_max-PT01H	Maximum instantaneous air temperature at screen level (1.5m) in the previous hour.	K	0.01	Height: 1.5m
temperature_at_screen_level_max-PT03H	Maximum instantaneous air temperature at screen level (1.5m) in the previous three hours.	K	0.01	Height: 1.5m
temperature_at_screen_level_max-PT06H	Maximum instantons air temperature at screen level (1.5m) in the previous six hours.	K	0.01	Height: 1.5m
temperature_at_screen_level_min-PT01H	Minimum instantaneous air temperature at screen level (1.5m) in the previous hour.	K	0.01	Height: 1.5m
temperature_at_screen_level_min-PT03H	Minimum instantaneous air temperature at screen level (1.5m) in previous three hours.	K	0.01	Height: 1.5m
temperature_at_screen_level_min-PT06H	Minimum instantaneous air temperature at screen level (1.5m) in previous six hours.	K	0.01	Height: 1.5m

temperature_of_dew_point_at_screen_level	Dew point temperature (temperature at which a parcel of air reaches saturation upon being cooled at constant pressure and specific humidity) at screen level.	K	0.01	Height: 1.5m
wind_direction_at_10m	Mean wind direction is equivalent to the mean direction observed over the 10 minutes preceding the validity time. In meteorological reports the direction of the wind vector is given as the direction from which it is blowing. 10m wind is the considered surface wind.	degrees	0.1	Height: 10.0m
wind_gust_at_10m	The gust speed is equivalent to the maximum 3 second mean wind speed observed over the 10 minutes preceding validity time. 10m wind is the considered surface wind.	m s-1	0.1	Height: 10.0m
wind_gust_at_10m_max-PT01H	Maximum diagnosed instantaneous wind gust at 10m in the previous hour. This can be considered as the extreme wind speed that might be experienced in this period.	m s-1	0.1	Height: 10.0m
wind_gust_at_10m_max-PT03H	Maximum diagnosed instantons wind gust at 10m in the previous three hours. This can be considered as the extreme wind speed that might be experienced in this period.	m s-1	0.1	Height: 10.0m
wind_gust_at_10m_max-PT06H	Maximum diagnosed instantaneous wind gust at 10m in the previous six hours. This can be considered as the extreme wind speed that might be experienced in this period.	m s-1	0.1	Height: 10.0m
relative_humidity_at_screen_level	Fractional relative humidity (ratio of the partial pressure of water vapour to the equilibrium vapour pressure of water) at screen level (1.5m above the surface.)	1	0.001	Height: 1.5m
radiation_flux_in_shortwave_direct_downward_at_surface	Shortwave radiation at the surface from above directed at the ground. "Direct" means that the radiation has followed a direct path from the sun and is alternatively known as "direct insolation". In accordance with common usage in geophysical disciplines "flux" implies per unit area called "flux density" in physics.	W m-2	0.01	None
radiation_flux_in_longwave_downward_at_surface	Longwave radiation at the surface from above directed at the ground. In accordance with common usage in geophysical disciplines "flux" implies per unit area called "flux density" in physics.	W m-2	0.01	None
wet_bulb_potential_temperature_on_pressure_levels	Wet bulb potential temperature (temperature that a parcel of air at any level would have if starting at the wet bulb temperature, it was brought at a saturated adiabatic lapse rate, to the standard pressure of 1000hPa) on pressure levels.	K	0.1	Pressure: 92500.0 85000.0 70000.0 Pa
snow_depth_water_equivalent	Liquid water equivalent (LWE) depth of the snow lying on the surface (ground). Typically, water is 10 times as dense as snow so multiplying by 10 gives an approximate depth of the snow, although wet snow can be significantly denser and powder snow much less dense. A scaling factor of 1000 is used to convert m to kg m-2 (GRIB2 units).	m	0.0001	None

rainfall_rate	Instantaneous rate at which rain (as a depth) which has been produced by the model precipitation scheme is being deposited on the surface. For the Global models (which run a convection scheme) the “rainfall rate from convection” must be added to this to get the total rainfall rate.	m s-1	1e-09	None
snowfall_rate	Instantaneous rate at which liquid water equivalent (LWE) snow (as a depth) which has been produced by the model precipitation scheme is being deposited on the surface. For the Global models which run a convection scheme) the “snowfall rate from convection” must be added to this to get the total snowfall rate.	m s-1	1e-09	None
cloud_amount_of_total_convective_cloud	Fraction of horizontal grid squares occupied by convective cloud as diagnosed by the model convection scheme. This is for the whole atmosphere column as seen from the surface or the top of the atmosphere.	1	0.01	None
CAPE_surface	Value of CAPE (Convection Available Potential Energy) calculated for a surface based parcel, where a surface based parcel is defined as a parcel initiated with thermodynamic properties at screen level height (1.5m) i.e. the parcel is launched from screen level.	J kg-1	0.1	None
CAPE_mixed_layer_lowest_500m	Convective Available Potential Energy (CAPE) calculated for a parcel with the thermodynamic properties of the density-weighted mean of the lowest 500 m above ground level.	J kg-1	0.1	None
CAPE_most_unstable_below_500hPa	CAPE (Convective Available Potential Energy) calculated for the most unstable parcel where the most unstable parcel is defined as the parcel with the highest fixed level CAPE launched from any level (including screen-level = 1.5m) within 500hPa of the surface pressure.	J kg-1	0.1	None
CIN_surface	Any additional energy required to lift a surface-based parcel (i.e. a parcel launched from screen-level (1.5m)) to its level of free convection.	J kg-1	0.1	None
CIN_mixed_layer_lowest_500m	Abt additional energy required to lift a mixed-layer parcel to its level of free convection. Where a mixed layer parcel is defined as a parcel with thermodynamic properties of the density weighted mean of the lowest 500 m above ground level (AGL).	J kg-1	0.1	None
CIN_most_unstable_below_500hPa	Any additional energy required to lift the most unstable parcel to its level of free convection. Where most unstable parcel is defined as the parcel with the highest fixed-level CAPE launched from any level (including screen-level) within 500 hPa of the surface pressure.	J kg-1	0.1	None
wind_speed_at_10m	Mean wind speed is equivalent to the mean speed observed over the 10 minutes preceding the validity time. 10m wind is the considered surface wind.	m s-1	0.1	Height: 10.0m
wind_vertical_velocity_on_pressure_levels	Speed of the vertical component of the air motion at a pressure level. Upwards is positive and downwards is negative.	m s-1	0.001	Pressure: 70000.0 Pa

wind_speed_on_pressure_levels	Wind on a pressure level is defined as a two-dimensional (horizontal) air velocity with no vertical component. The speed is the magnitude of velocity.	m s-1	0.1	Pressure: 100000.0 97500.0 95000.0 92500.0 90000.0 85000.0 80000.0 75000.0 70000.0 65000.0 60000.0 55000.0 50000.0 45000.0 40000.0 37500.0 35000.0 32500.0 30000.0 27500.0 25000.0 22500.0 20000.0 17500.0 15000.0 12500.0 10000.0 7000.0 5000.0 4000.0 3000.0 2000.0 1000.0 Pa
wind_direction_on_pressure_levels	Wind on a pressure level is defined as a two-dimensional (horizontal) air velocity vector with no vertical component. In meteorological reports the direction of the wind vector is given as the direction from which it is blowing.	degrees	0.1	Pressure: 100000.0 97500.0 95000.0 92500.0 90000.0 85000.0 80000.0 75000.0 70000.0 65000.0 60000.0 55000.0 50000.0 45000.0 40000.0 37500.0 35000.0 32500.0 30000.0 27500.0 25000.0 22500.0 20000.0 17500.0 15000.0 12500.0 10000.0 7000.0 5000.0 4000.0 3000.0 2000.0 1000.0 Pa

relative_humidity_on_pressure_levels	Fractional relative humidity (ration of the partial pressure of water vapour to the equilibrium vapour pressure of water) on pressure levels.	1	0.001	Pressure: 100000.0 97500.0 95000.0 92500.0 90000.0 85000.0 80000.0 75000.0 70000.0 65000.0 60000.0 55000.0 50000.0 45000.0 40000.0 37500.0 35000.0 32500.0 30000.0 27500.0 25000.0 22500.0 20000.0 17500.0 15000.0 12500.0 10000.0 7000.0 5000.0 4000.0 3000.0 2000.0 1000.0 Pa
height_AS�_on_pressure_levels	Height above mean sea level or altitude of the pressure levels. This is considered approximately equivalent to geopotential height. Geopotential is the sum of the specific gravitational potential energy relative to the geoid and the specific centripetal potential energy. Geopotential height is the geopotential divided by the standard acceleration due to gravity.	m	1	Pressure: 100000.0 97500.0 95000.0 92500.0 90000.0 85000.0 80000.0 75000.0 70000.0 65000.0 60000.0 55000.0 50000.0 45000.0 40000.0 37500.0 35000.0 32500.0 30000.0 27500.0 25000.0 22500.0 20000.0 17500.0 15000.0 12500.0 10000.0 7000.0 5000.0 4000.0 3000.0 2000.0 1000.0 Pa

temperature_on_ pressure_levels	Air temperature on pressure levels.	K	0.1	Pressure: 100000.0 97500.0 95000.0 92500.0 90000.0 85000.0 80000.0 75000.0 70000.0 65000.0 60000.0 55000.0 50000.0 45000.0 40000.0 37500.0 35000.0 32500.0 30000.0 27500.0 25000.0 22500.0 20000.0 17500.0 15000.0 12500.0 10000.0 7000.0 5000.0 4000.0 3000.0 2000.0 1000.0 Pa
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