Name

Met Office UK Land Surface Observations

Description

Land surface weather observations for 31 parameters from over 250 locations across the Met Office UK land observation network. The data is available as CSV files. You can use it to monitor the latest weather affecting a specific location so you can plan for your business or operations.
The observations are produced every minute and transmitted to the Amazon Registry of Open Data every hour. They're available for a rolling 7-day period (168 hours).

About the Met Office UK land observation network

All locations in the network are within the bounding box:

- -15 (West)
- 48 (South)
- 5 (East)
- 62 (North)

On average they are about 40km apart, which makes it possible to record the weather associated with typical low-pressure and frontal systems that cross the UK. The locations are distributed uniformly to detect as many weather features as possible.
Find out more about the Met Office UK land observation network.

How the data is produced

Each observation location produces data at 1-minute intervals. Measurements are converted to standard meteorological formats before rigorous checks verify the integrity of the data. The data is then transmitted to users worldwide as CSV files.
Periods of missing data may be due to:

- scheduled maintenance of observation instrumentation
- unexpected issues with instrumentation, sensor failure or network disruption

Such issues may cause delays in data being transmitted. If this happens we will try to retrieve observations for up to the past 7 days to provide as complete a dataset as possible.

Business needs

Met Office UK land surface observations are used across a variety of industries, including:

- Supply Chain & Logistics
- Agriculture and Food Industry
- Energy & Utilities
- Insurance
- Retail & Marketing

- Transportation & Aviation
- Construction
- Public Services (Fire, Police etc)

You can use Met Office UK land surface observations for:

- situational awareness of the latest weather affecting a specific location or specific business asset
- supplementing existing environmental observations collected by your business
- verifying historic weather forecasts against observed data

Parameters

The dataset includes 31 meteorological parameters, as well as timestep, latitude and longitude data. It also includes a series of quality control parameters, which have a 'qc' suffix. Observations are classified as 'Good', 'Suspect' or 'Erroneous':

- 'Good' observations have passed all automatic quality control checks.
- 'Suspect' observations meet a lower threshold of automatic quality control checks and should be used with caution. 'Suspect' records are routinely used operationally in real time but may be deemed as erroneous by subsequent quality control checks.
- 'Erroneous' observations have failed to meet automatic quality control checks and are not included in the dataset.

Parameter	Description	Units
TIMESTEP	UTC time observation was produced	TIMESTAMP_NTZ
LATITUDE	Latitude component of coordinate where observation was produced	Degrees
LONGITUDE	Longitude component of coordinate where observation was produced	Degrees
ACCUMULATED_PRECIPITATION_1_MINUTE_TOTAL	Total accumulated precipitation over the proceeding minute	Millimetres
AIR_PRESSURE_NEAR_SURFACE_1_MINUTE_MEAN	Mean air pressure near the surface over the proceeding minute	Hectopascals
AIR_PRESSURE_NEAR_SURFACE_MEAN_SEA_LEVEL_1_MINUTE_MEAN	Mean air pressure near the surface reduced to mean sea level over the proceeding minute	Hectopascals
AIR_TEMPERATURE_NEAR_SURFACE_1_MINUTE_MEAN	Mean air temperature, near surface in a Stevenson screen, over the proceeding minute. Measurement taken at 1.25 metres	Degrees Celsius
AIR_TEMPERATURE_NEAR_SURFACE_SECONDARY_1_MINUTE_MEAN	Mean air temperature, near surface in a screen, over the proceeding minute taken from humidity sensor	Degrees Celsius
AIR_TEMPERATURE_NEAR_SURFACE_SENSOR2_1_MINUTE_MEAN	Mean air temperature, near surface in a screen, over the proceeding minute taken from check sensor	Degrees Celsius
CLOUD_BASE_HEIGHT_LAYER1_1_MINUTE_30_MINUTE_ROLLING_MIN	The minimum height of the base of the first cloud layer over the previous 30 minutes inclusive	Feet
CLOUD_BASE_HEIGHT_LAYER2_1_MINUTE_30_MINUTE_ROLLING_MIN	The minimum height of the base of the second cloud layer over the previous 30 minutes inclusive	Feet
CLOUD_BASE_HEIGHT_LAYER3_1_MINUTE_30_MINUTE_ROLLING_MIN	The minimum height of the base of the third cloud layer over the previous 30 minutes inclusive	Feet
CLOUD_COVER_LAYER1_1_MINUTE_30_MINUTE_WEIGHTED_MEAN	The weighted mean cloud cover of the first cloud layer over the previous 30 minutes inclusive	Oktas

CLOUD_COVER_LAYER2_1_MINUTE_30_MINUTE_WEIGHTED_MEAN	The weighted mean cloud cover of the second cloud layer over the previous 30 minutes inclusive	Oktas
CLOUD_COVER_LAYER3_1_MINUTE_30_MINUTE_WEIGHTED_MEAN	The weighted mean cloud cover of the third cloud layer over the previous 30 minutes inclusive	Oktas
CLOUD_COVER_TOTAL_1_MINUTE_30_MINUTE_WEIGHTED_MEAN	The weighted mean cloud cover of the total cloud layer over the previous 30 minutes inclusive	Oktas
DEW_POINT_TEMPERATURE_1_MINUTE_MEAN	Mean dew point temperature over the proceeding minute	Degrees Celsius
DIRECT_SOLAR_IRRADIANCE_1_MINUTE_60_MINUTE_TOTAL	Total amount of direct solar irradiance over the previous 60 minutes inclusive. Solar irradiance is the amount of solar energy received per unit area	Kilowatt per square metre
DIRECT_SOLAR_IRRADIANCE_1_MINUTE_BINARY	Mean amount of direct sunshine. If the 'sunny' threshold is met or passed, the resultant value is 1	Kilowatt per square metre
DIRECT_SOLAR_IRRADIANCE_1_MINUTE_MEAN	Mean amount of direct solar irradiance over the proceeding minute. Solar irradiance is the amount of solar energy received per unit area	Kilowatt per square metre
DIRECT_SOLAR_IRRADIANCE_SECONDARY_1_MINUTE_MEAN	Derived sunshine from radiation sensor by applying a radiation slope correction method. If the 'sunny' threshold is met or passed, the resultant value is 1	Kilowatt per square metre
GLOBAL_RADIATION_1_MINUTE_MEAN	Mean amount of shortwave radiation from direct solar radiation and diffuse radiation over the proceeding minute	Kilowatt per square metre
LAND_SURFACE_TEMPERATURE_CONCRETE_1_MINUTE_MEAN	Mean land surface temperature over concrete for the proceeding minute	Degrees Celcius
LAND_SURFACE_TEMPERATURE_GRASS_1_MINUTE_MEAN	Mean land surface temperature over grass for the proceeding minute	Degrees Celcius
METEOROLOGICAL_OPTICAL_RANGE_HORIZONTAL_1_MINUTE_MEAN	Mean visibility for the proceeding minute	Metres
PRECIPITATION_INTENSITY_1_MINUTE_ROLLING_ALGORITHM	The amount of precipitation in the previous 60 minutes inclusive	Millimetre per hour
PRESENT_WEATHER_1_MINUTE_10_MINUTE_WEIGHTED_MEAN	Mean present weather code for the previous 10 minutes inclusive	Code
RELATIVE_HUMIDITY_NEAR_SURFACE_1_MINUTE_MEAN	Mean relative humidity near surface in a Stevenson screen, over the previous minute. Measurement taken at 1.25 metres.	Percent
SNOW_DEPTH_1_MINUTE_MEAN	Mean snow depth over the proceeding minute	Centimetres
SOIL_TEMPERATURE_100CM_1_MINUTE_MEAN	Mean soil temperature at 100cm depth over the proceeding minute	Degrees Celsius
SOIL_TEMPERATURE_10CM_1_MINUTE_MEAN	Mean soil temperature at 10cm depth over the proceeding minute	Degrees Celsius
SOIL_TEMPERATURE_30CM_1_MINUTE_MEAN	Mean soil temperature at 30cm depth over the proceeding minute	Degrees Celsius
WIND_DIRECTION_NEAR_SURFACE_1_MINUTE_MEAN	Mean wind direction near surface over the previous minute. Predominantly measured at a height of 10 metres	Degrees
WIND_SPEED_NEAR_SURFACE_1_MINUTE_MEAN	Mean wind speed near surface over the previous minute. Predominantly measured at a height of 10 metres	Knots

About present weather codes

The PRESENT_WEATHER_1_MINUTE_10_MINUTE_WEIGHTED_MEAN parameter records the Meteo rological Aerodrome Report (METAR) mean present weather code for the previous 10 minutes (inclusive). This code provides an indicative classification of the predominant atmospheric weather conditions observed.

Met Office

Code	Description
NSW	NIL SIGNIFICANT WEATHER
FU VA	SMOKE OR VOLCANIC ASH
HZ	HAZE
DU	WIDESPREAD DUST
BLSA	BLOWING SAND
BLDU	BLOWING DUST
DRSA	LOW DRIFTING SAND
DRDU	LOW DRIFTING DUST
PO	DUST DEVIL
+PO	WELL DEVELOPED DUST DEVIL
VCDS	DUSTSTORM IN THE VICINITY
VCSS	SANDSTORM IN THE VICINITY
BR	MIST
MIFG	SHALLOW FOG
VCSH	SHOWER IN THE VICINITY
TS	THUNDERSTORM
SQ	SQUALL
FC	FUNNEL CLOUD
[REFG]	RECENT FOG
[REDZ]	RECENT DRIZZLE
[RERA]	RECENT RAIN
[RESN]	RECENT SNOW
[RERASN]	RECENT RAIN & SNOW
[REFZRA]	RECENT FREEZING RAIN
[RETS]	RECENT THUNDERSTORM
-DS	DUSTSTORM
DS	MODERATE DUSTSTORM
-SS	SANDSTORM
SS	MODERATE SANDSTORM
+SS	HEAVY SANDSTORM
+DS	HEAVY DUSTSTORM
DRSN	DRIFTING SNOW
-BLSN	BLOWING SNOW
BLSN	MODERATE BLOWING SNOW
+BLSN	HEAVY BLOWING SNOW
VCFG	FOG IN THE VICINITY
BCFG	FOG PATCHES
PRFG	FOG BANK
FG	FOG
FZFG	FREEZING FOG
-DZ	LIGHT DRIZZLE
DZ	MODERATE DRIZZLE
+DZ	HEAVY DRIZZLE

-FZDZ	LIGHT FREEZING DRIZZLE
FZDZ	MODERATE FREEZING DRIZZLE
+FZDZ	HEAVY FREEZING DRIZZLE
-RADZ	LIGHT RAIN AND DRIZZLE
RADZ	MODERATE RAIN AND DRIZZLE
+RADZ	HEAVY RAIN AND DRIZZLE
-RA	LIGHT RAIN
RA	MODERATE RAIN
+RA	HEAVY RAIN
-FZRA	LIGHT FREEZING RAIN
FZRA	MODERATE FREEZING RAIN
+FZRA	HEAVY FREEZING RAIN
-RASN	LIGHT RAIN AND SNOW
-DZSN	DRIZZLE AND SNOW
RASN	MODERATE RAIN AND SNOW
DZSN	MODERATE DRIZZLE AND SNOW
+RASN	HEAVY RAIN AND SNOW
+DZSN	HEAVY DRIZZLE AND SNOW
-SN	LIGHT SNOW
SN	MODERATE SNOW
+SN	HEAVY SNOW
IC	DIAMOND DUST
SG	SNOW GRAINS
PL	ICE PELLETS
-SHRA	LIGHT RAIN SHOWER
SHRA	MODERATE RAIN SHOWER
+SHRA	HEAVY RAIN SHOWER
-SHRASN	RAIN AND SNOW SHOWER
SHRASN	MODERATE RAIN AND SNOW SHOWER
+SHRASN	HEAVY RAIN AND SNOW SHOWER
-SHSN	LIGHT SNOW SHOWER
SHSN	MODERATE SNOW SHOWER
+SHSN	HEAVY SNOW SHOWER
-SHGS	LIGHT SHOWER OF SMALL HAIL
SHGS	MODERATE SHOWER OF SMALL HAIL
+SHGS	HEAVY SHOWER OF SMALL HAIL
-SHGR	LIGHT HAIL SHOWER
SHGR	MODERATE HAIL SHOWER
+SHGR	HEAVY HAIL SHOWER
-RA [RETS]	RAIN
-SHRA [RETS]	RAIN SHOWER
RA [RETS]	MODERATE RAIN
SHRA [RETS]	MODERATE RAIN SHOWER
+RA [RETS]	HEAVY RAIN

+SHRA [RETS]	HEAVY RAIN SHOWER
-SN [RETS]	LIGHT SNOW
-SHSN [RETS]	SNOW SHOWER
-RASN [RETS]	RAIN AND SNOW
-SHRASN [RETS]	RAIN AND SNOW SHOWER
-SHGR [RETS]	HAIL SHOWER
-SHGS [RETS]	SHOWER OF SMALL HAIL
SN [RETS]	MODERATE SNOW
SHSN [RETS]	MODERATE SNOW SHOWER
RASN [RETS]	MODERATE RAIN AND SNOW
SHRASN [RETS]	MODERATE RAIN AND SNOW SHOWER
SHGR [RETS]	MODERATE HAIL SHOWER
SHGS [RETS]	MODERATE SHOWER OF SMALL HAIL
+SN [RETS]	HEAVY SNOW
+SNSH [RETS]	HEAVY SNOW SHOWER
+RASN [RETS]	HEAVY RAIN AND SNOW
+SHRASN [RETS]	HEAVY RAIN AND SNOW SHOWER
+SHGR [RETS]	HEAVY HAIL SHOWER
+SHGS [RETS]	HEAVY SHOWER OF SMALL HAIL
-TSRA	THUNDERSTORM AND RAIN
-TSRASN	THUNDERSTORM AND RAIN AND SNOW
-TSSN	THUNDERSTORM AND SNOW
TSRA	THUNDERSTORM AND MODERATE RAIN
TSRASN	THUNDERSTORM AND MODERATE RAIN AND SNOW
TSSN	THUNDERSTORM AND MODERATE SNOW
TSGR	THUNDERSTORM AND HAIL
TSGS	THUNDERSTORM AND SMALL HAIL
+TSRA	THUNDERSTORM AND HEAVY RAIN
+TSRASN	THUNDERSTORM AND HEAVY RAIN AND SNOW
+TSSN	THUNDERSTORM AND HEAVY SNOW
TS DS	THUNDERSTORM WITH DUSTSTORM
TS SS	THUNDERSTORM WITH SANDSTORM
TSRA DS	THUNDERSTORM AND RAIN WITH DUSTSTORM
TSRA SS	THUNDERSTORM AND RAIN WITH SANDSTORM
TSRASN SS	THUNDERSTORM AND RAIN AND SNOW WITH SANDSTORM
TSRASN DS	THUNDERSTORM AND RAIN AND SNOW WITH DUSTSTORM
TSSN DS	THUNDERSTORM AND SNOW WITH DUSTSTORM
TSSN SS	THUNDERSTORM AND SNOW WITH SANDSTORM
+TSGR	HEAVY THUNDERSTORM AND HAIL
+TSGS	HEAVY THUNDERSTORM AND SMALL HAIL
-FZUP	LIGHT FREEZING UNIDENTIFIED PRECIPITATION
FZUP	MODERATE FREEZING UNIDENTIFIED PRECIPITATION
+FZUP	HEAVY FREEZING UNIDENTIFIED PRECIPITATION
REUP	RECENT UNIDENTIFIED PRECIPITATION

REFZUP	RECENT FREEZING UNIDENTIFIED PRECIPITATION
-UP	LIGHT UNIDENTIFIED PRECIPITATION
UP	MODERATE UNIDENTIFIED PRECIPITATION
+UP	HEAVY UNIDENTIFIED PRECIPITATION

Update frequency and latency

60 minutes of new data for all locations is ingested into the Amazon Registry of Open Data every hour. For example, at 12:00 new data will arrive for observations collected between 10:00-1100. This is due to the quality checks required to verify data for public consumption.

Archive length

Observations are available for a rolling 7-day period (168 hours).

Usage examples

A query that returns the latest data for a specific parameter for all locations. Optionally excludes NAN values if data for a parameter wasn't recorded.

```
import glob
import pandas as pd
 specific_parameter = "accumulated_precipitation_1_minute_total"
 # Load the files in to a Pandas DataFrame.
all_files = glob.glob("land_obs/*.csv")
df = pd.concat((pd.read_csv(f, delimiter="|") for f in all_files))
 # Convert timesteps to datetimes to ensure proper filtering
df['timestep'] = pd.to_datetime(df['timestep'])
 # Exclude NAN values for the given parameter (optional)
df = df[df[specific_parameter].notna()]
 # Get the latest record for each lat/lon pair for the given parameter
latest_idx = df.groupby(['latitude', 'longitude'])['timestep'].idxmax()
result = df.loc[latest_idx][['timestep', 'latitude', 'longitude', specific_parameter]]
print(result)
```

License/terms and conditions and compliance

Contact

servicedesk@metoffice.gov.uk. Service desk is only available Mon – Fri, 09:00 until 17:00 UTC (-1 hour during BST). As a non-operational service we aim to respond to any service support enquiries within 3-5 business days.

How to cite

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