June 2023 Monthly Weather Report

This document provides a summary of the UK's weather and climate statistics for June 2023.

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UK overview

June began fine and settled, with temperatures around average, but from the 9th it became warm and humid, and rather less settled, with thunderstorms breaking out in many areas. It remained very warm or hot for most of the rest of the month, but cooled down again in the final few days. It also became rather unsettled generally towards the end of the month.

Temperatures were above average in all areas, with daytime temperatures well above normal, most especially in western areas, parts of western Scotland having mean maximum temperatures as much as 4 °C above average. The provisional UK mean temperature for June was 15.8 °C, which is 2.5 °C above average, making it the warmest June in a series from 1884. Rainfall was slightly above average in parts of the English Midlands and some north-western areas, but below normal in most other areas, with East Anglia and south Wales particularly dry, and for the UK overall rainfall was 68% of average. Sunshine was above normal everywhere, especially in northern and western areas, with 144% of average overall, making it provisionally the fourth sunniest June in a series since 1910, and the sunniest since 1957.

Reference climatology used for calculating anomalies is the period 1991-2020 unless otherwise stated.

Weather impacts

- **Very warm between the 9th and the 25th; the UK's warmest June on record.**
- **Periods of thunderstorms, heavy rain and flooding.**

After an uneventful spell of settled, anticyclonic conditions, high pressure moved away and warmer, more humid air arrived which gave rise to rainfall and thunderstorms for some areas between the 10th and the 13th. The second half of the month was progressively more unsettled, with some impacts from heavy rainfall for a time.

Heavy showers and thunderstorms developed in numerous areas during the 10th to 13th. Activity was focussed on the West Midlands and NW England on the 10th, when a tree and an adjacent power cable were brought down during a storm in the village of Holt Fleet near Worcester, closing the main road through the village. Some main roads in this area suffered surface water flooding, whilst on Merseyside lightning damage to overhead wires was reported, causing disruption to train services in and out of Liverpool. In Rhewl, Denbighshire, a lightning strike hit the local church, blowing a hole in one of the walls. Further thunderstorms on the 11th caused flooding on roads in Market Harborough and hail exceeding 1cm in diameter. Meanwhile lightning damage affected rail infrastructure in the Inverness area. On the 12th thunderstorm activity was again quite widespread across the UK and impacts were many. Surface water flooding was seen on the North Circular Road in NW London in the afternoon, with additional reports from roads around Heathrow Airport and in the Watford area, whilst on the M6 near Coventry traffic was halted for a time by flash flooding. The emergency department at Luton & Dunstable Hospital was affected by surface water flooding, with a similar experience besetting a hospital in Stroud, Gloucestershire where marble-size hail was reported in addition to torrential rain. In Scotland flooding was reported on the line between Inverness and Carrbridge and also on the West Highland line between Fort William and Crianlarich, the latter resulting in a closure of several days, while on the roads several landslides closed the A86 between Spean Bridge and Newtonmore and a further landslide blocked the B863 near Kinlochleven.

After a gap of several days with settled but still very warm weather, further convective weather developed between the 16th and the 22nd, again with thundery downpours and heavy rain in many areas. Thunderstorm activity was widespread on the 18th, with impacts reported across the UK. Surface water flooding arose on several roads around Wrexham, along with some flood damage to the football stadium. In Radcliffe, Greater Manchester, an elderly woman was evacuated from her flooded home after an intense downpour caused surface water issues in the town, and in Sheffield a woman was rescued from her partly-submerged car. Further reports from Hunstanton in Norfolk and Crediton, Devon, told of roads and properties impacted by excess surface water following torrential downpours.

Heavy rain and thunderstorms again developed on the 20th, causing surface water-based impacts in various locations. SE England saw flooding on rail lines and at a few business premises in Brighton. The West Coast main line between London and Liverpool experienced delays due to flooding, as did the line between Derby and Matlock. The picture was repeated on the 22nd with rail disruption in and around Glasgow, and roads flooded in the Leicester area with several dozen properties suffering a degree of internal flooding.

After this, though it remained changeable until the end of the month, impacts were fewer, despite some heavy downpours on the 25th which brought a brief resurgence of very warm, humid weather to an end.

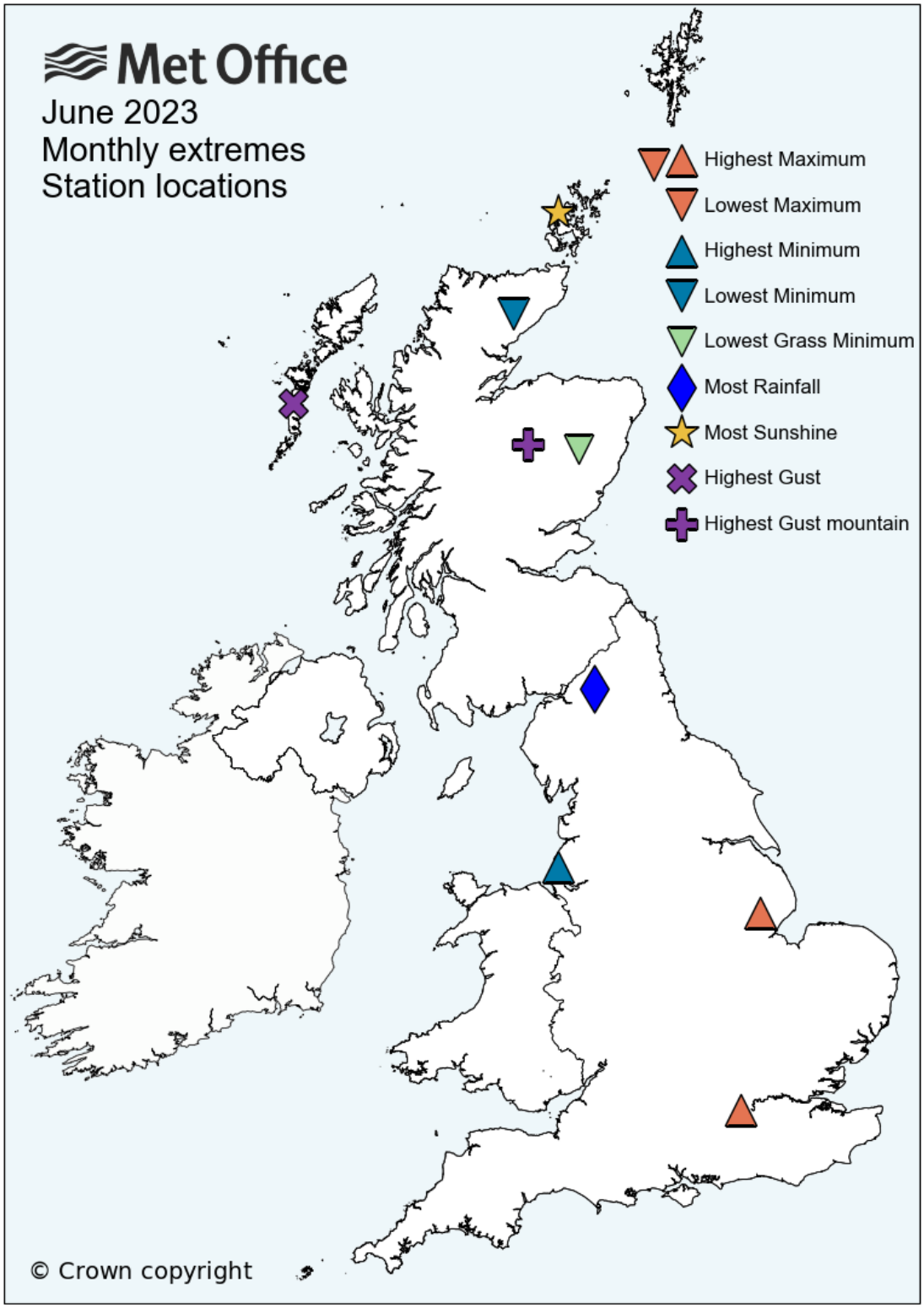
Monthly extremes

The table below lists UK monthly weather extremes recorded at individual weather stations during June 2023 from data available on 04/07/2023. The map shows the location of these stations.

Highest Maximum	**32.2°C** on **10th** at Chertsey, Abbey Mead P Sta (Surrey, 12mAMSL) also on **25th** at Coningsby (Lincolnshire, 6mAMSL)
Lowest Maximum	**10.2°C** on **1st** at Fair Isle (Shetland, 57mAMSL)
Highest Minimum	**19.4°C** on **25th** at Crosby (Merseyside, 9mAMSL)
Lowest Minimum	**-2.6°C** on **2nd** at Kinbrace, Hatchery (Sutherland, 103mAMSL)
Lowest Grass Minimum	**-4.9°C** on **2nd** at Aboyne No 2 (Aberdeenshire, 140mAMSL)
Most Rainfall	**70.4mm** on **18th** at Wiley Sike No 2 (Cumbria, 230mAMSL)
Most Sunshine	**16.9hr** on **15th** at Orkney: Loch Of Hundland (Orkney, 28mAMSL)
Highest Gust	**47Kt 54mph** on **24th** at South Uist Range (Western Isles, 4mAMSL)
Highest Gust (mountain*)	**66Kt 76mph** on **25th** at Cairngorm Summit (Inverness-shire, 1237mAMSL)
Greatest Snow Depth at 0900 UTC	No non-zero values.

mAMSL refers to station elevation in metres above mean sea level.

*Mountain stations are above 500mAMSL.


Met Office
June 2023
Monthly extremes
Station locations
Highest Maximum
Lowest Maximum
Highest Minimum
Lowest Minimum
Lowest Grass Minimum
Most Rainfall
Most Sunshine
Highest Gust
Highest Gust mountain
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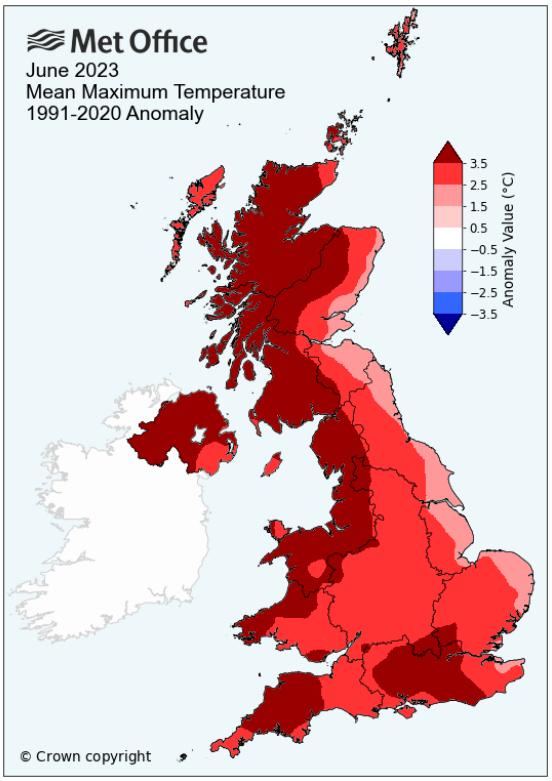
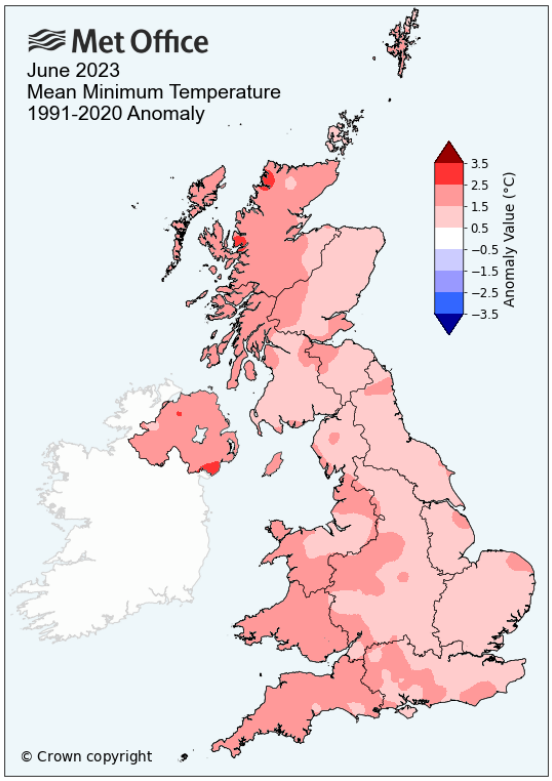
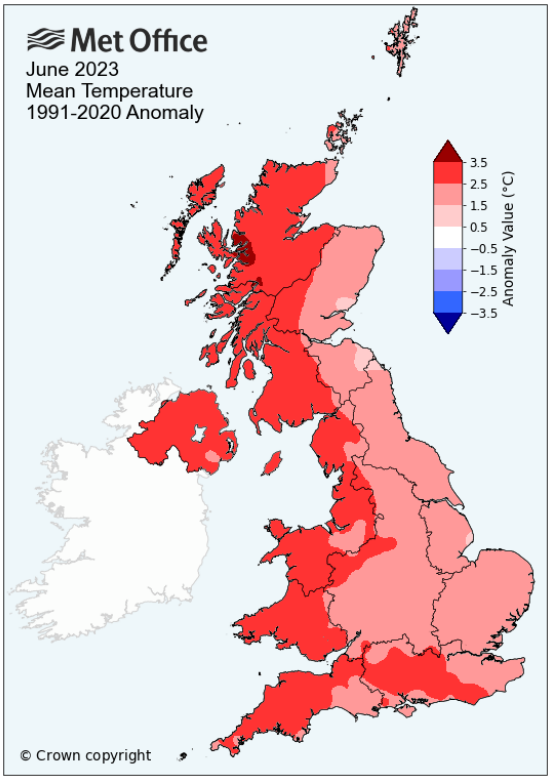
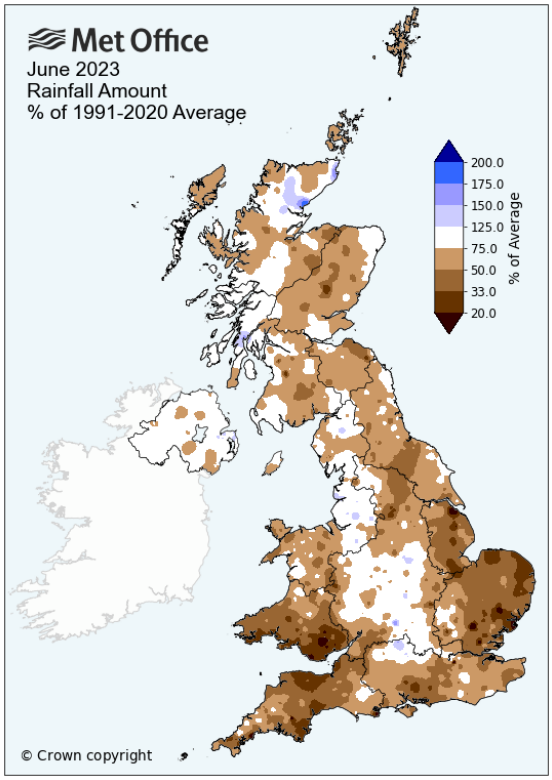
Monthly maps

These maps show monthly average daily maximum, monthly average daily minimum and monthly mean temperature and monthly rainfall for June 2023 as anomalies relative to the June 1991-2020 long term average.

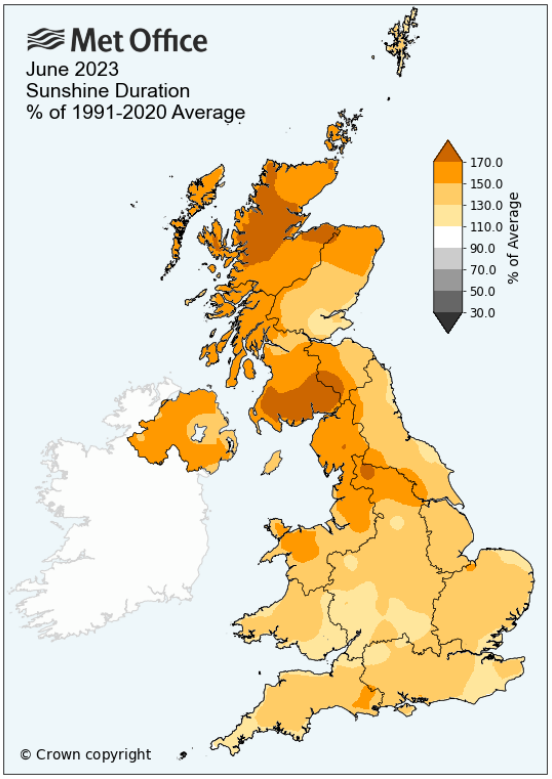


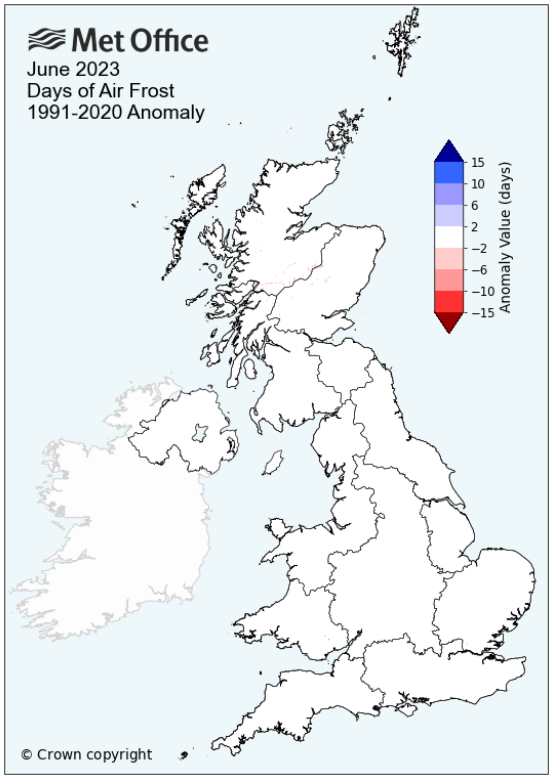


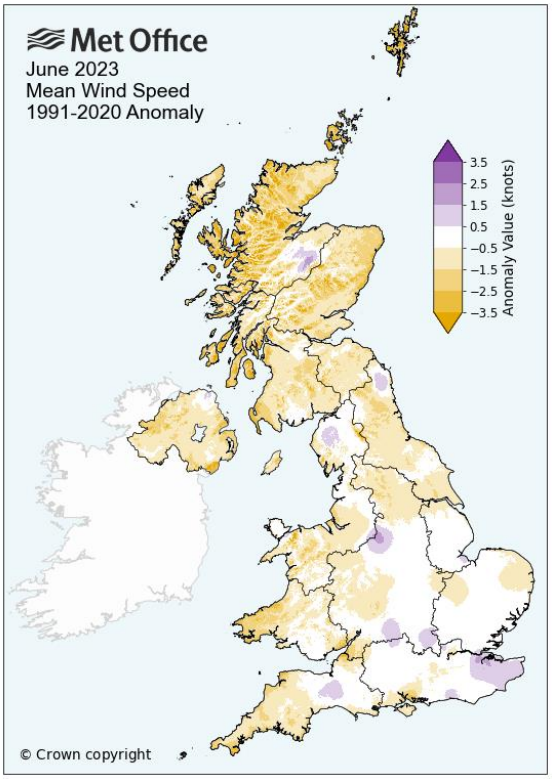


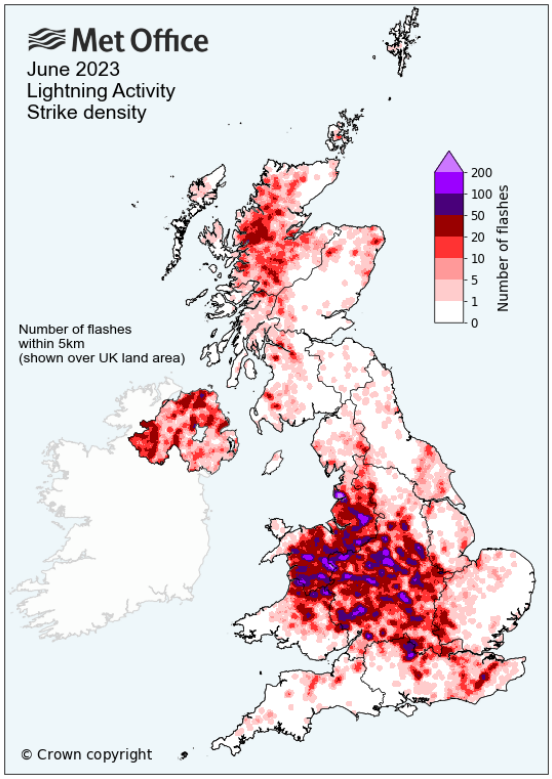


These maps show monthly sunshine, monthly air frost and monthly windspeed for June 2023 as anomalies relative to the June 1991-2020 long term average, plus a map showing lightning activity as the number of strikes within a 5km radius of any land location.









Monthly climate statistics - actuals and anomalies

These tables show the UK and national climate statistics for June 2023 for max, min and mean temperature, rainfall, sunshine and windspeed as actual values and anomalies relative to the June 1991-2020 long term average. The position of the value within the full series (in both ascending and descending order) is shown in the two 'Rank' columns. Central England Temperature (CET) and England & Wales Precipitation (EWP) are also included.

Mean maximum temperature

Region	Maxtemp (°C)	1991-2020 Anomaly (°C)	Rank - warmest	Rank - coldest	Series length (yrs)
UK	21.2	3.5	1	140	140
England	22.2	3.2	1	140	140
Wales	21.3	3.6	1	140	140
Scotland	19.4	3.8	1	140	140
Northern Ireland	21.0	3.9	2	139	140
Central England	22.6	3.4	1	146	146

Mean minimum temperature

Region	Mintemp (°C)	1991-2020 Anomaly (°C)	Rank - warmest	Rank - coldest	Series length (yrs)
UK	10.6	1.5	1	140	140
England	11.2	1.4	2	139	140
Wales	11.2	1.8	1	140	140
Scotland	9.5	1.6	1	140	140
Northern Ireland	11.0	2.1	1	140	140
Central England	11.3	1.3	4	143	146

Mean temperature

Region	Meantemp (°C)	1991-2020 Anomaly (°C)	Rank - warmest	Rank - coldest	Series length (yrs)
UK	15.8	2.5	1	140	140
England	16.7	2.3	1	140	140
Wales	16.2	2.7	1	140	140
Scotland	14.3	2.7	1	140	140
Northern Ireland	16.0	3.0	1	140	140
Central England	17.0	2.4	5	361	365

Rainfall

Region	Rainfall (mm)	% of 1991-2020 Average	Rank - wettest	Rank - driest	Series length (yrs)
UK	52.2	68	141	48	188
England	40.8	63	135	54	188
Wales	46.7	51	158	31	188
Scotland	69.2	74	132	57	188
Northern Ireland	72.1	89	87	102	188
EWP (England and Wales)	46.5	66	180	79	258

Sunshine

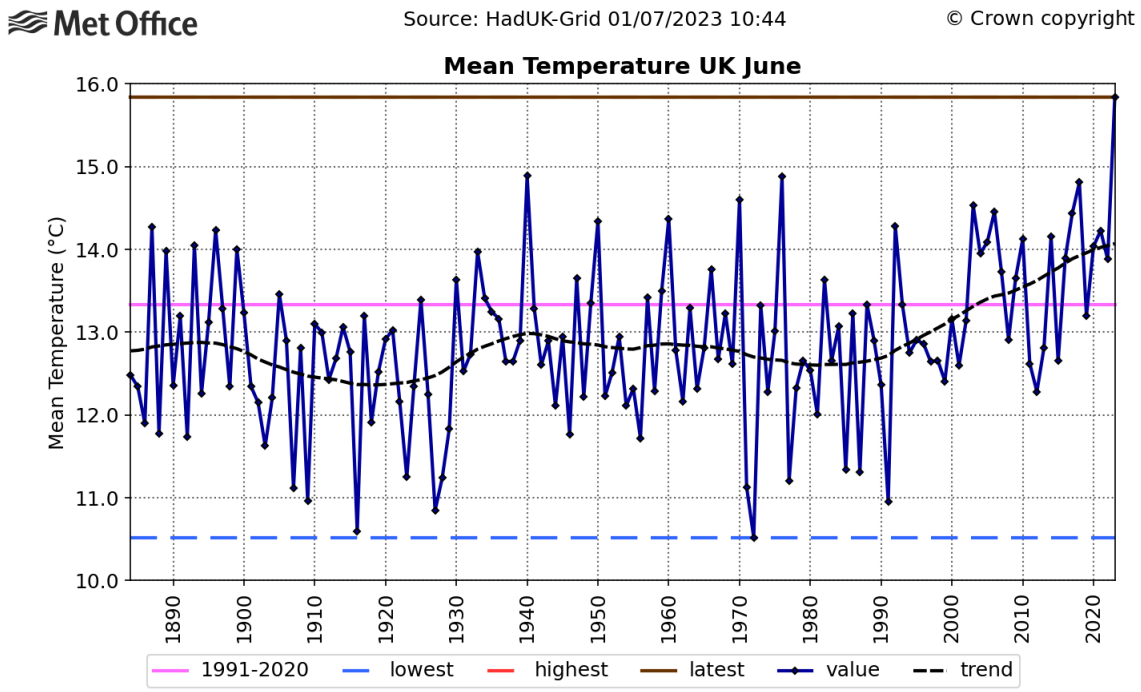
Region	Sunshine (hours)	% of 1991-2020 Average	Rank - sunniest	Rank - dullest	Series length (yrs)
UK	247.5	144	4	111	114
England	259.8	138	4	111	114
Wales	242.8	136	9	106	114
Scotland	231.4	158	3	112	114
Northern Ireland	228.7	152	8	107	114

Windspeed

Region	Windspeed (knots)	1991-2020 Anomaly (knots)	Rank - windiest	Rank - calmest	Series length (yrs)
UK	7.3	-0.9	47	9	55
England	7.1	-0.4	37	19	55
Wales	7.5	-0.9	43	13	55
Scotland	7.8	-1.6	53	3	55
Northern Ireland	6.4	-1.2	53	3	55

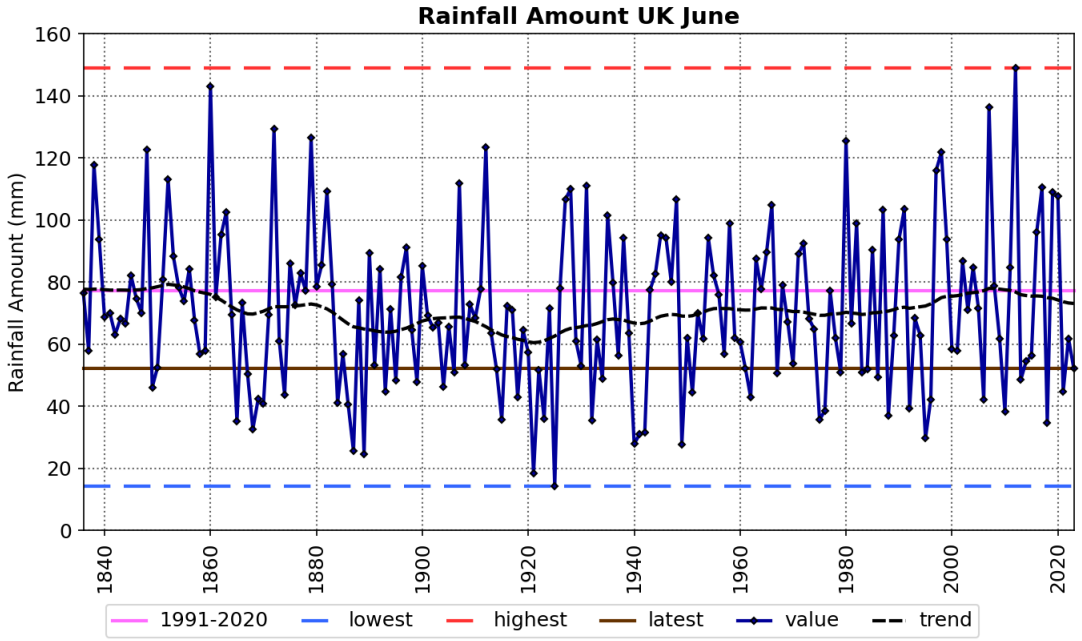
Monthly time-series

These charts show time-series for the UK for June for monthly mean temperature (from 1884), monthly rainfall (from 1836) and monthly sunshine (from 1919). The brown line shows the latest (2023) value. The hatched black line is a smoothing filter which shows the long-term trend. The tables below show statistics for the latest year, latest 10 years 2014-2023, the most recent 30-year climate reference period 1991-2020 and the 30-year baseline climate reference period 1961-1990.



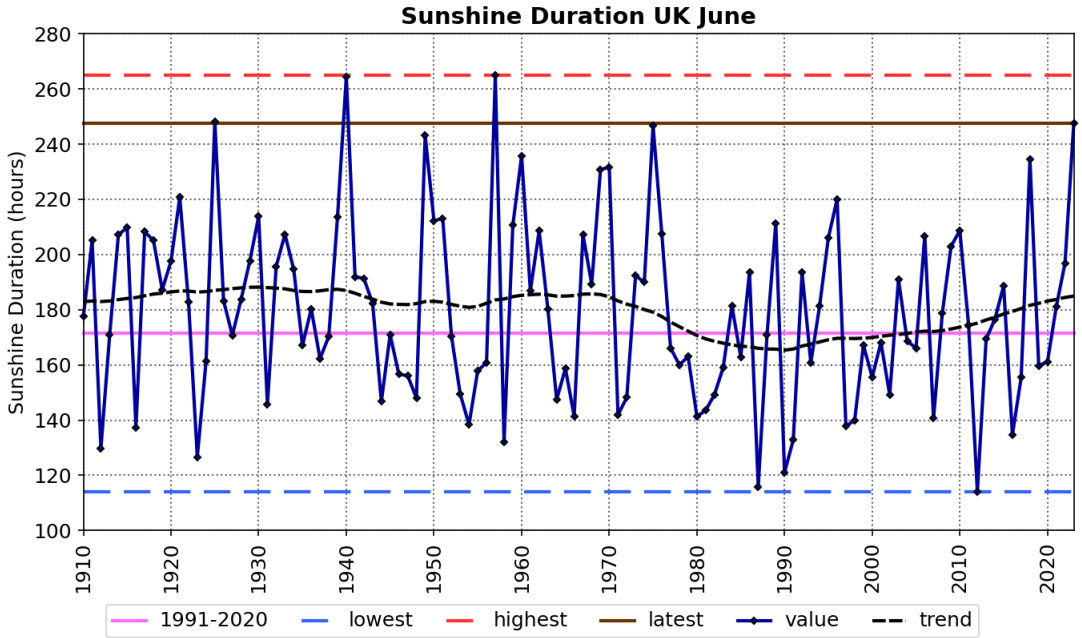
Period	1961-1990	1991-2020	2014-2023	2023
Meantemp (°C)	12.7	13.3	14.1	15.8

Met Office Source: HadUK-Grid 01/07/2023 10:44 © Crown copyright



Period	1961-1990	1991-2020	2014-2023	2023
Rainfall (mm)	70.5	77.2	72.7	52.2

Met Office Source: HadUK-Grid 01/07/2023 10:44 © Crown copyright

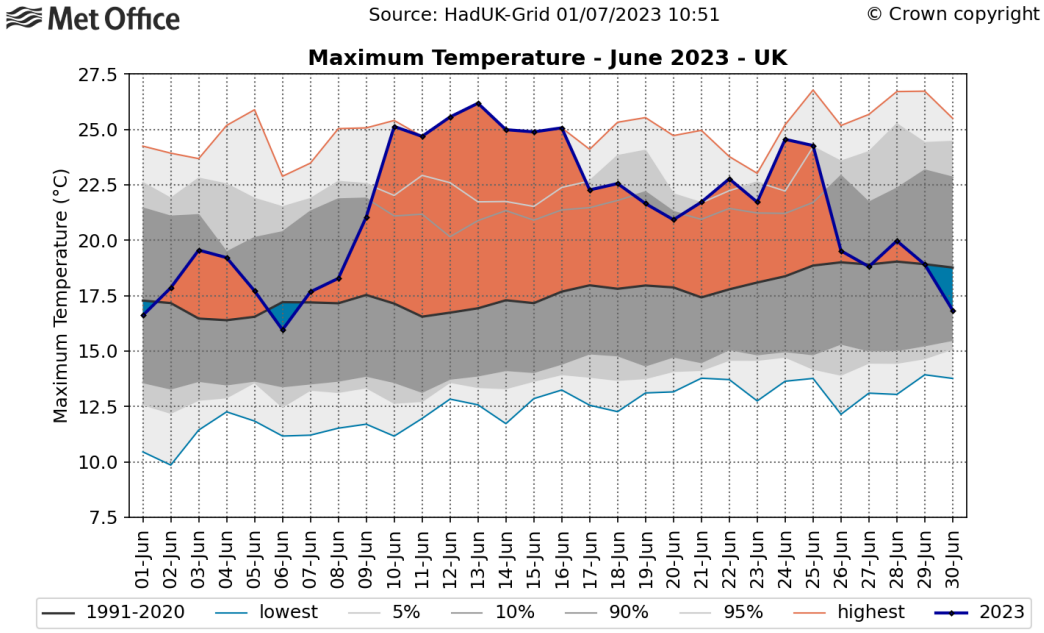


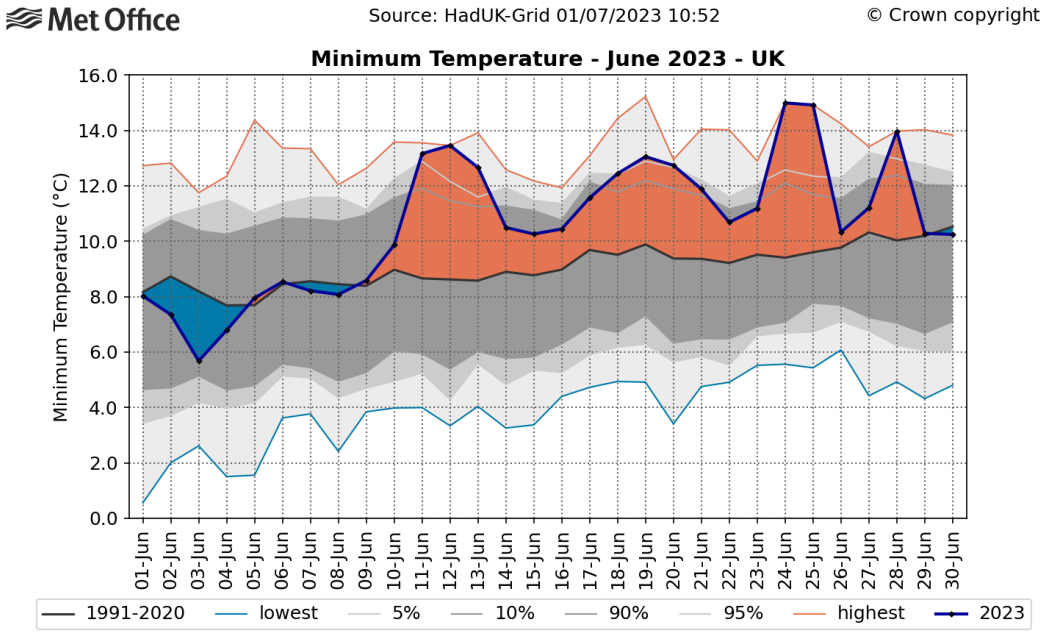
Period	1961-1990	1991-2020	2014-2023	2023
Sunshine (hours)	174.9	171.5	183.6	247.5

Daily time-series

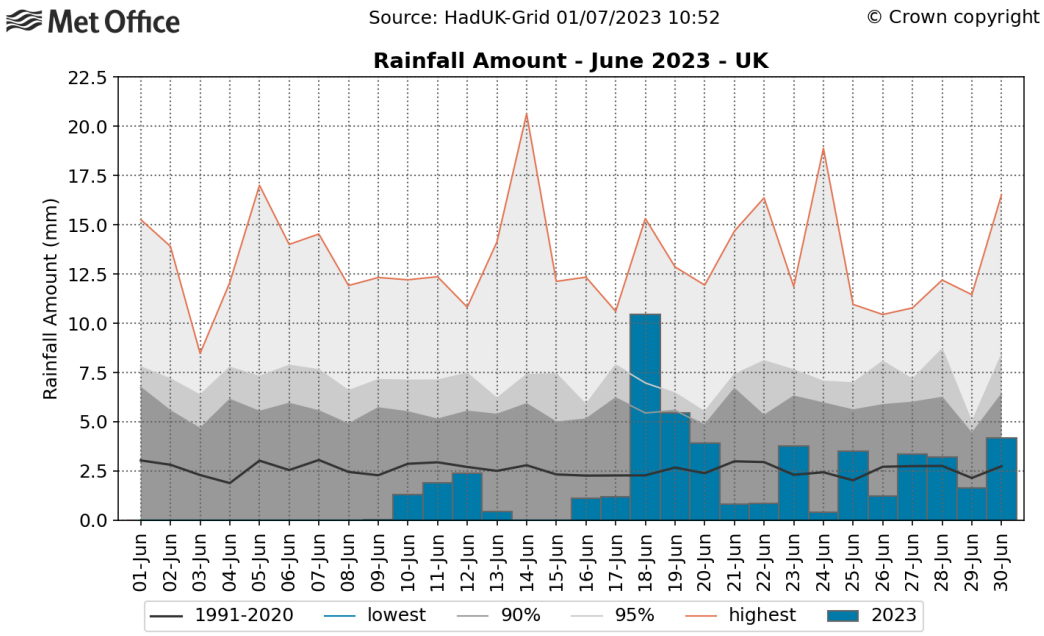
These charts show time-series of UK area-average daily maximum and daily minimum temperature and daily rainfall for each day of June 2023. The areas shaded in grey show the highest and lowest values in the daily temperature series (from 1960) and daily rainfall series (from 1891) together with percentiles and the 1991-2020 long term averages for each day. The rainfall accumulation chart shows the daily rainfall series as an accumulation through the month.

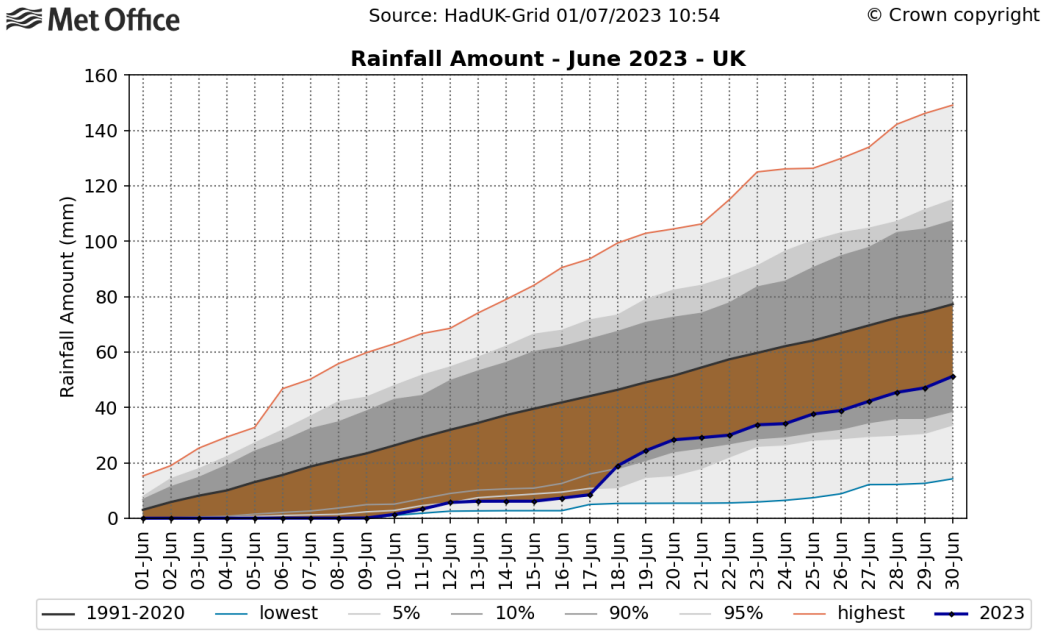
Daily maximum and daily minimum temperature





Daily rainfall and rainfall accumulation

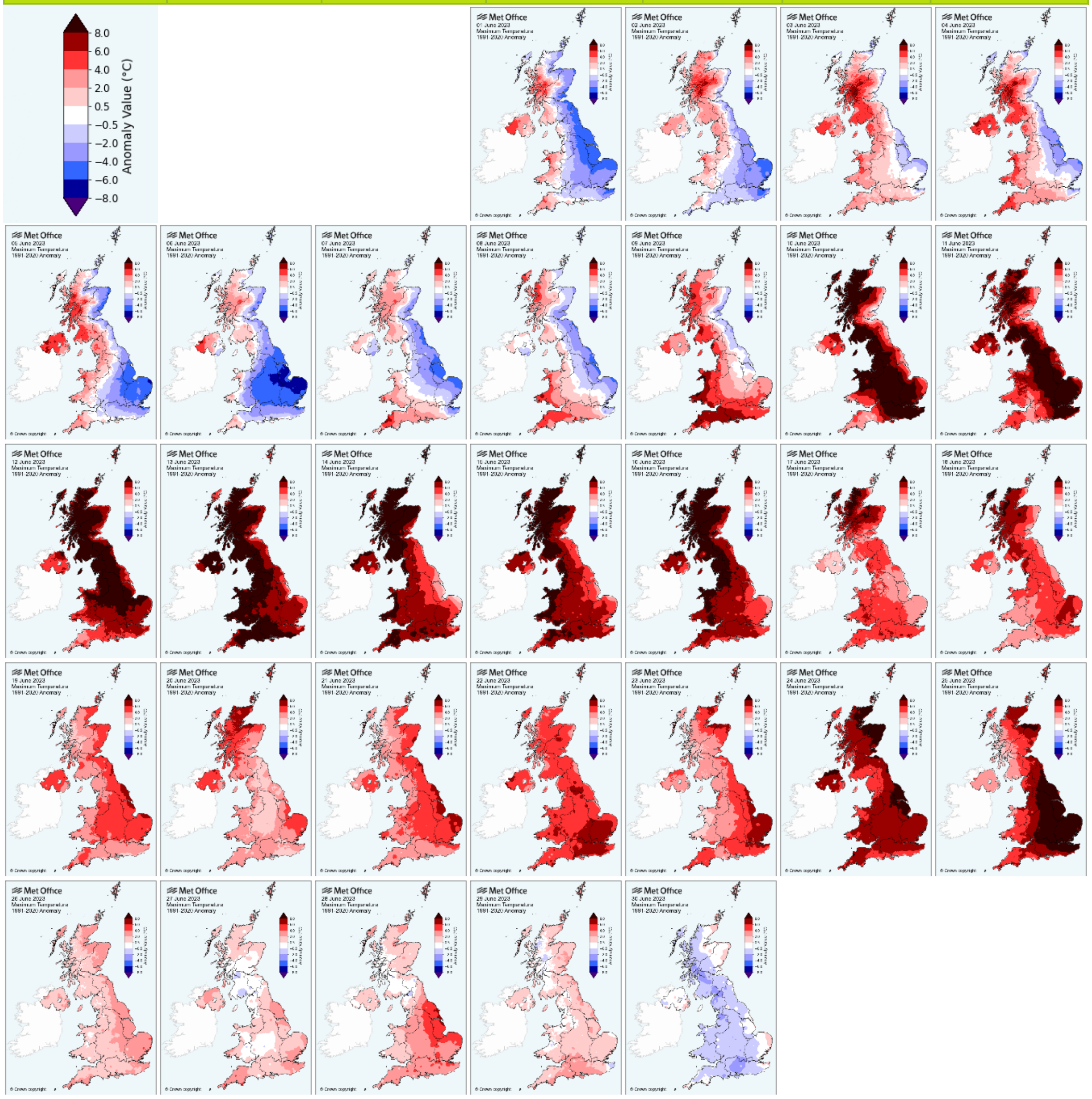




Daily maximum temperature maps - calendar view

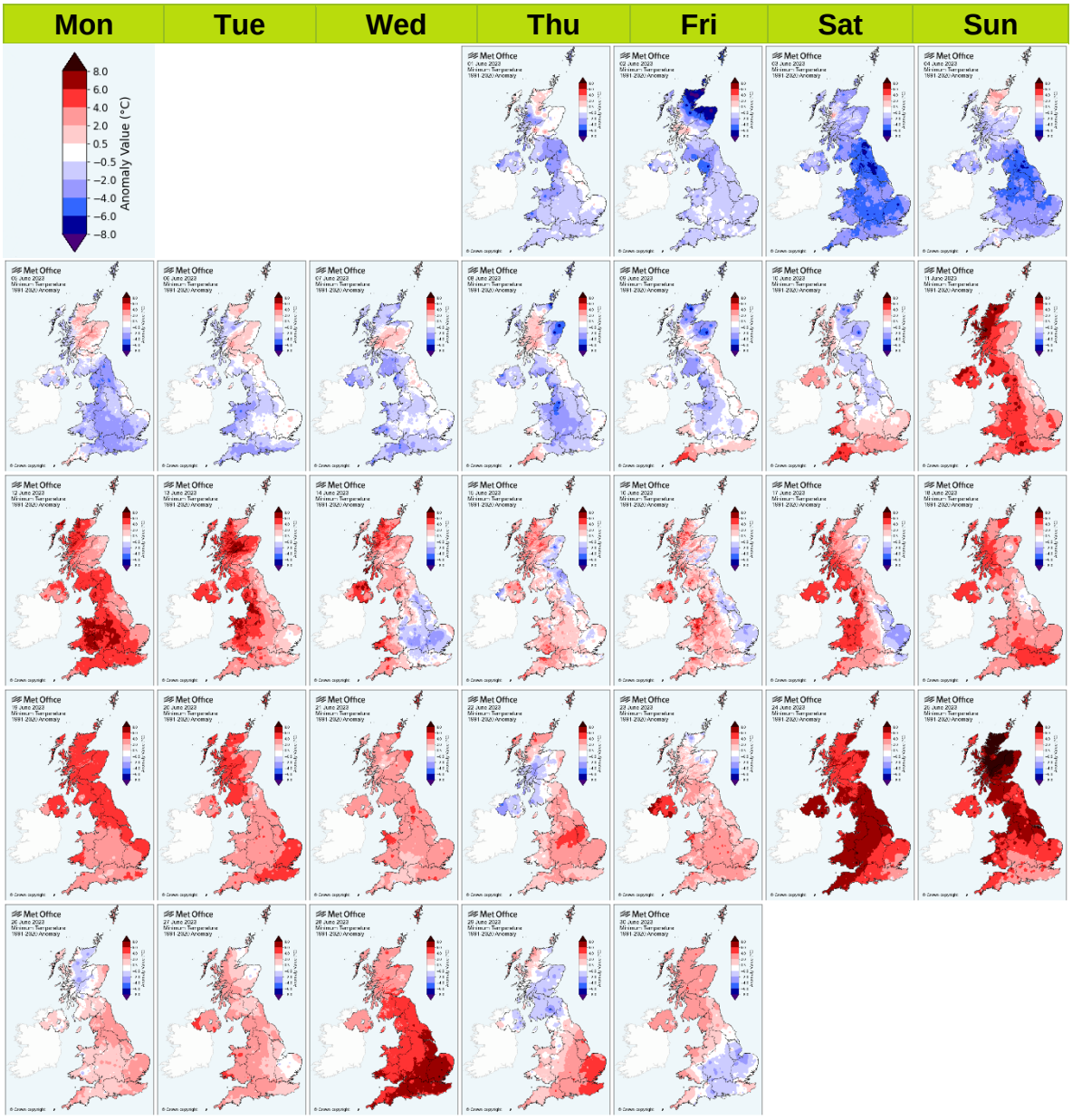
These maps show daily maximum temperatures for each day of June 2023 as anomalies relative to the June 1991-2020 long term average. The daily maximum temperature is the maximum from 0900UTC on the day in question to 0900UTC the following day. Normally, the maximum occurs in the early afternoon.

Mon	Tue	Wed	Thu	Fri	Sat	Sun



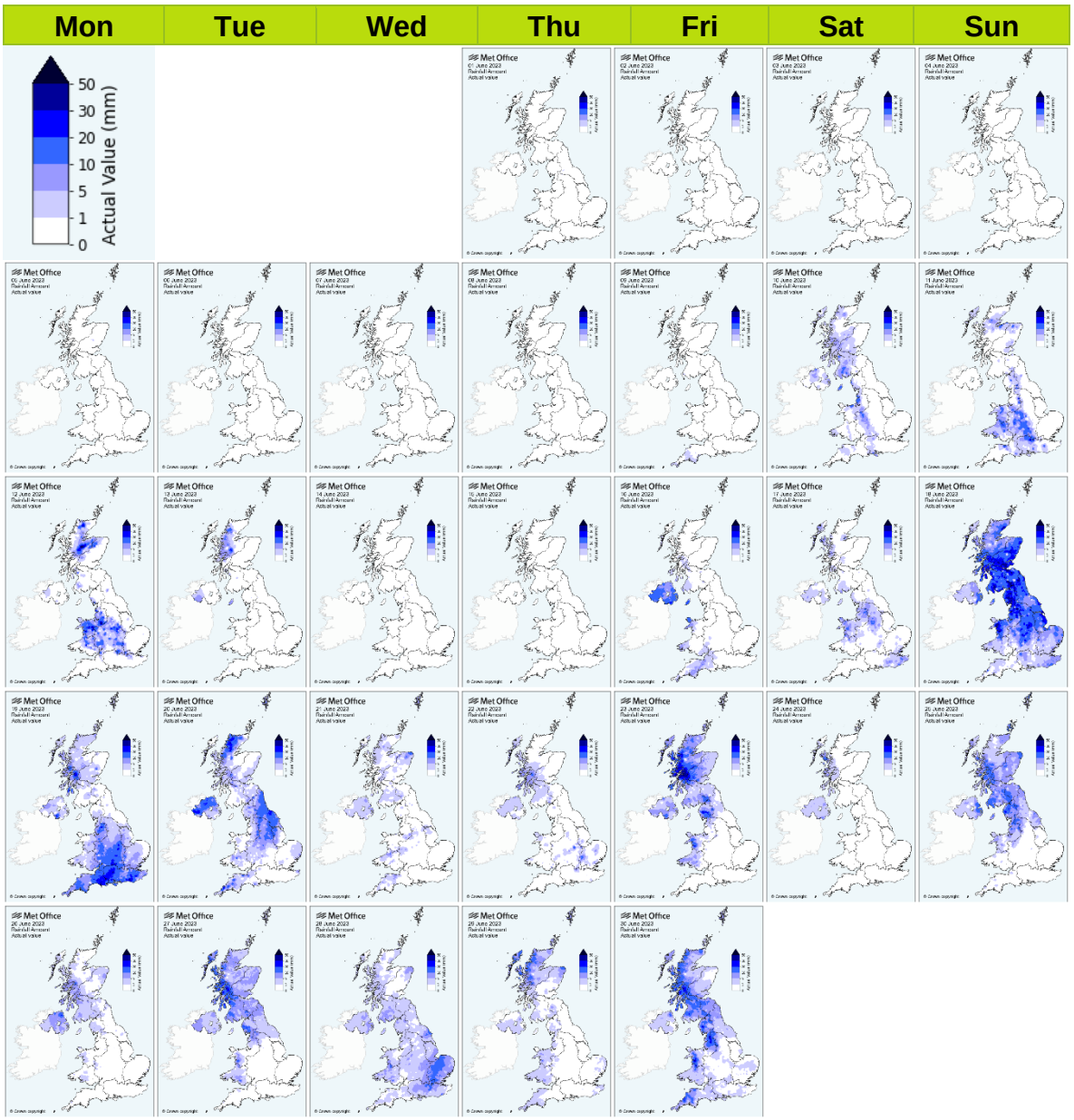
Daily minimum temperature maps - calendar view

These maps show daily minimum temperatures for each day of June 2023 as anomalies relative to the June 1991-2020 long term average. The daily minimum temperature is the minimum from 0900UTC the previous day to 0900UTC on the day in question. Normally, the minimum occurs in the early morning.



Daily rainfall maps - calendar view

These maps show daily rainfall for each day of June 2023 as daily totals. The daily rainfall is the total from 0900UTC on the day in question to 0900UTC the following day.

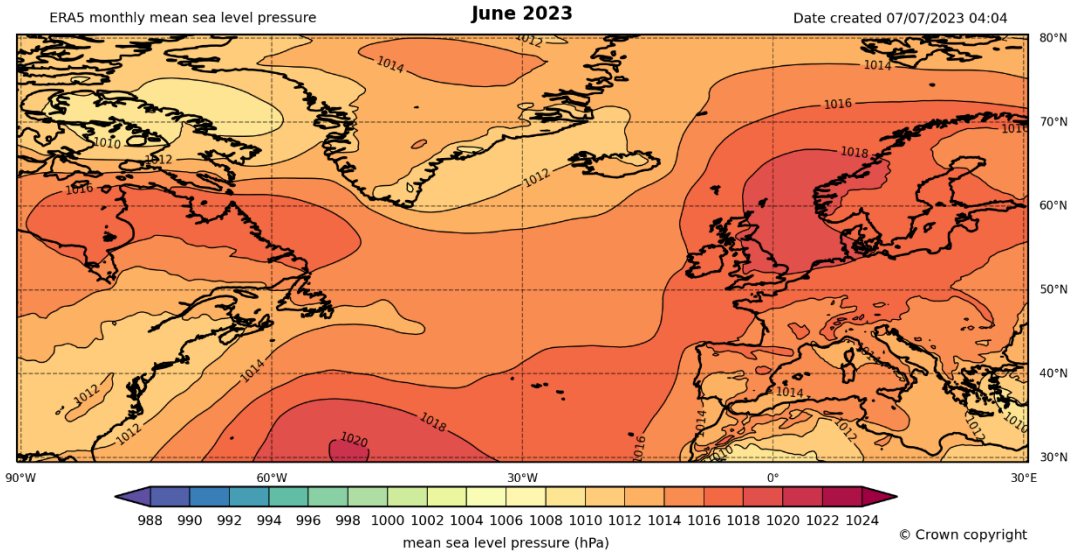


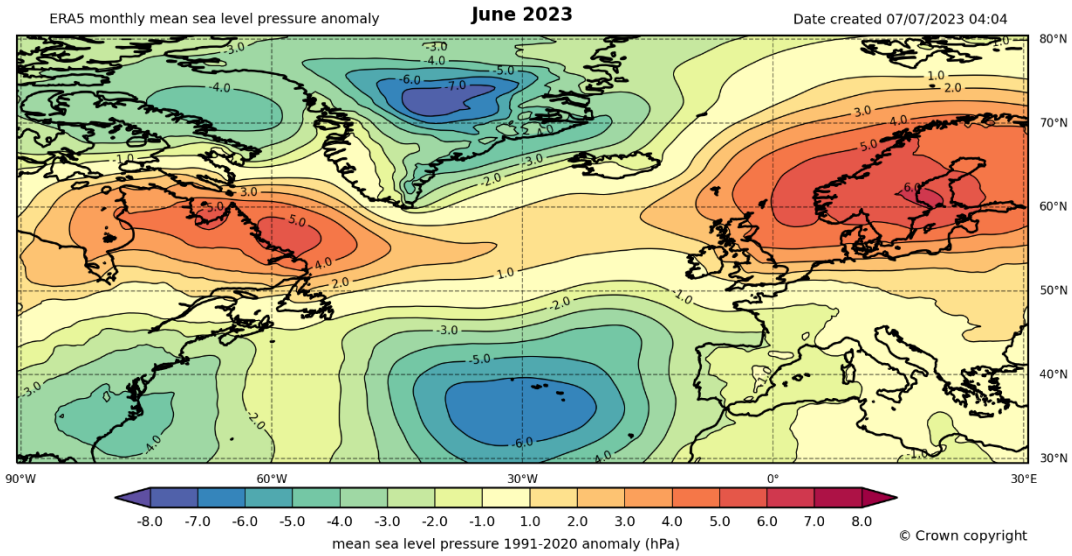
Monthly atmospheric circulation

Mean sea level pressure

These charts show the monthly mean sea level pressure for June 2023 for the UK and north Atlantic, based on the ERA5 reanalysis (Hersbach et al, 2019), both as actual values and as an anomaly relative to the June long term average. These charts provide an indication of the weather characteristics of the month overall i.e. whether the weather type has been generally settled (high pressure) or unsettled (low pressure) during the month.

In early June an area of high pressure was centred to the north-west of the UK, after which pressure was lower for much of the time, especially to the west. Mean pressure for the month was above average over Scandinavia and below normal around the Azores, with an anomalous easterly flow over the UK.

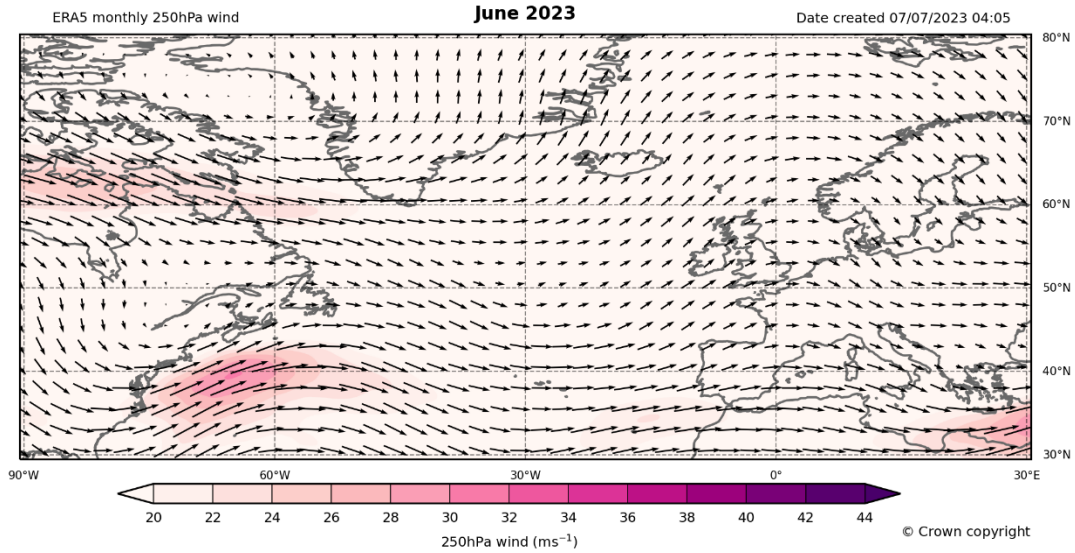


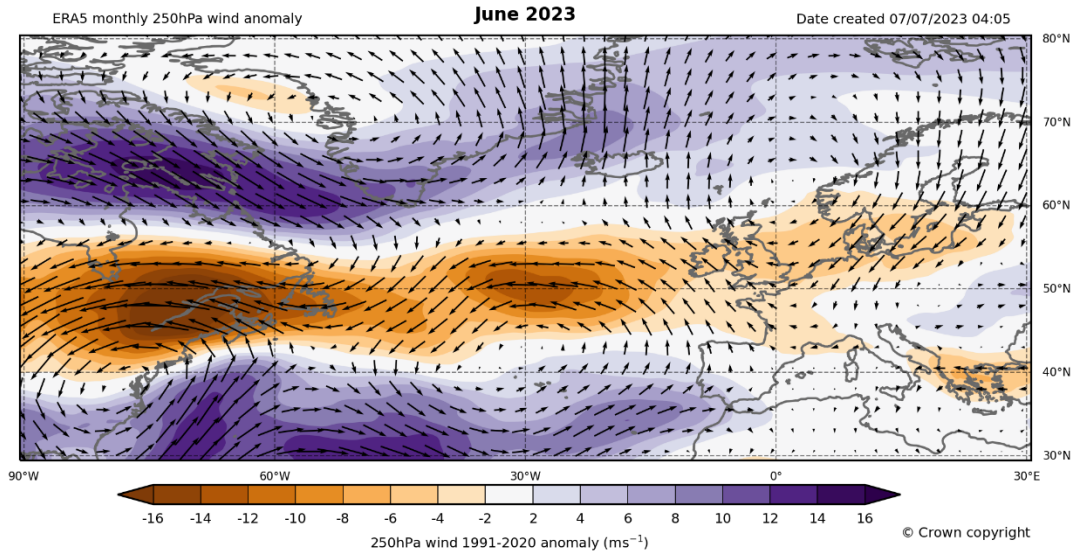


250hPa wind speed and direction

These charts show the monthly 250hPa wind speed and direction for June 2023 for the UK and north Atlantic, based on the ERA5 reanalysis (Hersbach et al, 2019), both as actual values and as an anomaly relative to the June long term average. This provides an indication of the mean strength and position of the jet stream compared to normal. The wind anomaly map shows shaded (scalar) wind speed anomalies with arrows as (vector) wind anomalies.

During June the mean jetstream flow was weaker than usual in the latitude of the United Kingdom, and was rather stronger further to the south. A weak anomalous easterly flow was seen over the UK.





Weather diary

- **Dry, sunny and warm first half, wet and windy second half**

High pressure dominated for the first half of the month, leading to mean, maximum, and minimum temperature records being broken across all regions, from Culdrose in Cornwall to Baltasound on the northern shores of the Shetland Islands. Chertsey Abbey Mead (Surrey) and Coningsby (Lincolnshire) were the hottest, with maxima of 32.2 °C on 10th and 25th respectively. Sunshine was also in plentiful supply, again, with sites all over the UK recording at least 150% of their long-term average.

With the area of high pressure situated to the north of the UK, there was a noticeable east-west split in temperatures from the 1st to the 9th. A feed off the North Sea restricted maxima to the low teens along the coast, but into the 20s further west. From the 10th, the centre of the anticyclone moved into central Europe, resulting in a dry, very warm, continental airflow affecting all parts. The heat began to spark off some showers and thunderstorms, particularly through central and western parts. By the 13th, all regions were experiencing their highest temperatures with maxima hitting 30 °C, and the high 20s Celsius in Northern Ireland. Many sites especially over the eastern half of the UK had seen almost no rainfall by this time.

By the 17th, high pressure had dissipated, and an Atlantic depression developed to the west of Cornwall, introducing wetter conditions. As this depression drifted east, it introduced a more mobile westerly airstream with just transient ridges affecting the UK through to the end of the month. Frontal systems brought some significant rainfall with them, including some substantial daily rainfall totals. The 18th saw many parts recording 24-hour totals in excess of 35mm, with Wiley Sike in Cumbria experiencing double that with 70.4mm. It also became much cooler from the 26th onwards.

Notes

The Met Office National Meteorological Library and Archive holds a near-continuous record of monthly weather reports from 1884, and this report forms a continuation of that series. The purpose of each report is to provide an overview of the weather conditions across the UK for that month. The emphasis is mainly based on observations from the surface network of weather stations. Climate series based on from data from these stations are used to provide long term context.

This summary was produced on 07/07/2023 06:56. The statistics are a provisional assessment of the observational data available at the time of production. Ongoing data receipt and quality assurance processes may result in subsequent updates to the statistics presented.

If you have any questions or feedback about this product, spot any data errors or omissions, or wish to obtain further data, please contact the Met Office.

For historical monthly weather reports please visit the Library and Archive.

- The land-surface observations presented in this report are from the Met Office official weather station network which includes both automatic weather stations and manual climate stations operated by volunteer observers. Rainfall data are from the official registered rain-gauge network which includes rain-gauges operated by a number of key partners including the Environment Agency, Scottish Environmental Protection Agency and Northern Ireland Water.
- The observations are carefully managed such that they conform to current best-practice observational standards as defined by the World Meteorological Organization (WMO). The observations also pass through a range of quality assurance procedures at the Met Office before application for climate monitoring.
- Daily and monthly maps, monthly statistics and monthly time-series are primarily based on the HadUK-Grid dataset of 1km resolution UK gridded climate data (Hollis et al, 2019). Monthly statistics from the monthly Central England temperature series 1659 (Manley, 1974) and England and Wales precipitation series from 1766 (Wigley et al, 1984) provide long term context.
- The monthly lightning activity map is based on data from the Met Office ATDnet (Arrival Time Difference Network) system. This is an automatic lightning location network comprising around ten lightning outstation sensors located across Europe.
- The monthly maps of mean sea level pressure and 250hPa wind speed and direction are based on the ERA5 reanalysis (Hersbach et al, 2019). ERA5 is the fifth generation ECMWF reanalysis for the global climate and weather for the past 4 to 7

decades. Reanalysis combines model data with observations from across the world into a globally complete and consistent dataset using the laws of physics.

Hersbach, H., Bell, B., Berrisford, P., Biavati, G., Horányi, A., Muñoz Sabater, J., Nicolas, J., Peubey, C., Radu, R., Rozum, I., Schepers, D., Simmons, A., Soci, C., Dee, D., Thépaut, J-N. (2019): ERA5 monthly averaged data on single levels from 1959 to present. Copernicus Climate Change Service (C3S) Climate Data Store (CDS). https://doi.org/10.24381/cds.f17050d7

Hollis, D, McCarthy, MP, Kendon, M, Legg, T, Simpson, I. HadUK-Grid - A new UK dataset of gridded climate observations. Geosci Data J. 2019; 6: 151-159. https://doi.org/10.1002/gdj3.78

Manley, G. (1974), Central England temperatures: Monthly means 1659 to 1973. Q.J.R. Meteorol. Soc., 100: 389-405. https://doi.org/10.1002/qj.49710042511

Wigley, T.M.L., Lough, J.M. and Jones, P.D. (1984), Spatial patterns of precipitation in England and Wales and a revised, homogeneous England and Wales precipitation series. J. Climatol., 4: 1-25. https://doi.org/10.1002/joc.3370040102