



## Weather Front.

June 2023/1923

June 2023

### Observers Notes.

**Mickleover:** This has been the warmest June on the station record, and locally since 1952, beating June 1976 (17.5 C). The diurnal range of 19.4 C, on the 10<sup>th</sup>, was the highest on the June record.

**Derby:** The overall mean for the month was 17.8 C and beat the previous June record set in 1976 (17.5 C), however looking back on local records June 1846 appears to have been equal with 2023! Instrument maker John Davis of Derby recorded a mean of 64 F (17.8 C) in June 1846, the CET for June 1846 was 18.0 C. The “warm” spell appears to occupy the period 10<sup>th</sup> to 25<sup>th</sup> inclusive, the mean for that sixteen day period was 20.3 C. Eleven days had maxima of 25 C or more, compared to fourteen in June 1976.

**Middleton:** The warmest June on record since 1963, 0.4 C warmer than 1976. The highest maximum for June of 28.5 C on the 11<sup>th</sup> was the highest since the 29<sup>th</sup> June in 1976.

**Coton-in-the-Elms:** Overall, this was the warmest June on record with a mean of 16.9 C, the previous highest being 16.5 C in June 2006. Daytime maxima averaged 23.2 C which is 3.5 C higher than the long term average. After an initial dry spell, it became wet at times later, with 4 days of thunder.

**Mountsorrel:** It was the warmest June on the 21-year station record. After a cool and dry first week it then became hot and sunny on the 10<sup>th</sup> with a warm spell lasting 16 days until the 26<sup>th</sup>. Six days had temperatures above 27 C.

**Bablake:** The warmest June since before 1892. There have been only four Junes with more sunshine since 1976.

**Ely:** The second warmest June since 1976 for maxima and the second warmest June after 2017 for mean temperatures. Winds were from the NE every day from the 1<sup>st</sup> to 10<sup>th</sup>, which led to a number of cold nights, only offset later in the month.

**Desford:** Cool with below average temperatures for the first 10 days. Then sustained heat with a few unusual thunderstorms followed until near month end.

11<sup>th</sup> The warmest day of the month at 29.5C created a dramatic thunderstorm, approaching from the SE at 1755BST, developing very locally. Preceded by very strong and gusty winds for about 10 minutes, then large hail measuring 7mm just before the onset of heavy rain. Near continuous thunder from 1755 to 2000BST, before moving away west but lightning still visible for a while. This rain was a welcome relief since the previous wettest day with 10mm was May 10<sup>th</sup>.

12<sup>th</sup> An almost identical situation to the day before after a very warm day (27.4C) thunder broke out widely at 1650BST as storm developed locally and approached from the SE preceded by a 20-minute period of strong and gusty sustained winds before the rain arrived. Storm moving away by 1830BST after periods of heavy rain, less thunder than the previous day and no hail this time but on both occasions the winds preceding the storms were extremely unusual in their strength and longevity in the very warm air.

10<sup>th</sup> – 16<sup>th</sup> Sustained high temperatures not falling below 25C each day. The very warm weather continued until 25<sup>th</sup> with further days exceeding 25C,

**Lowdham:** The mean maximum temperature was the highest for June on the station record (1991), and in the local area since 1976. The mean temperature was also the highest for June on the station record, and in the local area, again, since 1976. There were 237.1 hours of sunshine (137% of the 1991-2020 average) recorded at Radcliffe-on-Trent. This is provisionally the sunniest June since 1960.<sup>i</sup>

**Pitsford:** Initially dry and warm with little change from May, becoming hot around the middle part of the month. Torrential downpours then marked a transition to another dry and warm period, although it became cooler in the final week. Overall temperatures well above average.<sup>ii</sup>

### UK overview<sup>iii</sup>

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.

### **Europe and the Rest of the World.**

Finland, potentially, recorded its lowest June temperature after the station at Saana, in Lapland, reported a minimum of -7.7 C. The last time a minimum temperature of -7 C was recorded was in June 1962. The unseasonable cold was caused by an anticyclone centred to the west of Finland and blocking the usual west to south-west flow from the Atlantic and North Sea.

June marked the start of the 2023 hurricane season. Tropical Storm Arlene developed in the Gulf of Mexico, but winds only reached 40 mph (35 kt) before weakening and making landfall in Cuba.<sup>iv</sup>

Wildfires continue to rage in Quebec province of Canada after a drier and warmer than normal spring. More than 150 fires were active across the province during the previous week and more than 400 across the whole of Canada. It is understood that this may be the worst wildfire season so far. Plumes of smoke moved south across the east coast of the USA delaying thousands of flights. The US National Weather Service issued air quality alerts for many states.

Southern and western Japan experienced significant rainfall from the remnants of Typhoon Mawar, which had affected Guam, the northern Philippines, and Taiwan. Mawar had weakened to a tropical storm on approach to Japan but collided with rain moving across the country on the 3<sup>rd</sup>. the warm, moist air intensified the rainfall and brought a spectacular start to the rainy season.<sup>v</sup>

During the week ending 13 June a tropical disturbance over the Arabian Sea intensified rapidly to become a category 1 storm by the Friday of that week with winds reaching 70 to 80 kt.

The Tropical Cyclone Biparjoy continued to deepen towards a category 2 storm and moved northwards on the Sunday of the same week. Although it was predicted to weaken when it made landfall between Gujarat, in western India, and south-east Pakistan, there was still the potential for torrential rain, high waves, and strong winds.

In South America, cold conditions affected much of Argentina as a blast of southerly winds pushed north. This cold air reached Paraguay, Bolivia, and southern parts of Brazil, behind a

strong cold front that produced much needed rain. The cold air was expected to move further north into Brazil with temperatures 10 C to 15 C below average.<sup>vi</sup>

China experienced torrential rainfall in southern and eastern regions marking the arrival of summer rains known as “dragon boat water”.

The city of Yulin, in Guangxi region, experienced 35 hours of non-stop rain on the 8<sup>th</sup> and 9<sup>th</sup>, while nearby Beikai was flooded after 614.7 mm of rain fell in 24 hours, roughly a third of the average annual precipitation, and a June record for rainfall in 60 years.

Other parts of China recorded high temperatures. Much of northern China experienced temperatures in the high 30's Celsius and rising to over 40 C during the preceding weekend.

These high temperatures were part of an ongoing heatwave across Asia. Several record maxima were reported in Siberia, and monthly record maxima were also broken in Hong Kong and Vietnam, while Japan declared March to May its warmest quarter on record.<sup>vii</sup>

Sea temperatures off the north-east coast of England and the west coast of Ireland are several degrees above average, smashing the records for late spring and early summer. The North Sea and north Atlantic are also experiencing higher temperatures. NOAA has categorised parts of the North Sea as being a category 4 marine heatwave, which is considered “extreme”, with areas off the English coast up to 5 C above normal.<sup>viii</sup>

## June 1923

### Observers Notes.

**Leyland (Lancashire):** The driest June yet recorded here since January 1910.

**Meltham (Yorkshire):** The temperature of the one foot and 2-foot thermometers in the ground was lower than in any other June since the record began in June 1885.

**Southport (Lancashire):** A June of unprecedentedly strong and persistent north-westerly winds and low day-time temperatures. It was also one of the driest Junes on record. The mean daily range of temperatures had the smallest value in the 52-year history of the Observatory.

**Ipswich (Suffolk):** Sun and rain are both badly needed in this part of the world for almost every purpose.

**Walton-on-Naze (Essex):** An extra dry month, great absence of sunshine, an excessive amount of overcast days, and temperature much below normal.

**Wakehurst (Sussex):** Cold, dry, and dull month.

**Newquay (Cornwall):** Very cold.

**Dublin:** A sunless June with almost constant north-westerly winds, scant and infrequent rainfall, and a small mean diurnal range of temperature – only [5.7 C].

**Derby/Burton-on-Trent:**<sup>ix</sup> A very dry month, but rather cool. All local gages received less than 20 mm of rain, and most were closer to 10 mm. Only six days with rain were recorded at Byrkley Gardens. Temperatures ranged between a chilly 3 or 4 C on several mornings (3<sup>rd</sup> - 5<sup>th</sup>/17<sup>th</sup>/25<sup>th</sup>) to between 19 and 24 C on the 9<sup>th</sup>/23<sup>rd</sup>/28<sup>th</sup> and 29<sup>th</sup>. The monthly mean was about 12.7 C, being about 1.5 C or so below the average. The coolness of June 1923 was not repeated until the early 1970s. Buxton rainfall was 49.0 mm (60%), Max temp 13.3 C, Min temp 7.3 C, and the mean 10.3 C (-2.1 C)

**Coventry:** June rainfall 1923 was 8.9 mm (44%).<sup>x</sup>

**Louth (Westgate):** June rainfall 1923 was 19.6 mm (36%).

**Mickleover (Clyde House):** June rainfall 1923 was 16.0 mm (26%)

### **Overview of June 1923.**<sup>xi</sup>

The cool, dull weather, which dominated the last weeks of May 1923 continued into June. Pressure remained high over the Azores, and to the west of the British Isles, and low over Scandinavia. Winds were moderate to fresh from the north or north-west which gave generally cool, cloudy, and showery weather alternating with bright periods. Up to the 24<sup>th</sup> a series of depressions tracked east, consequently winds backed towards the south-west and produced cloudy weather with frequent showers or drizzle. With the passage of these depressions the Azores anticyclone spread north and brought spells of, temporary, fair weather with winds from the north-west. During the last week the anticyclone moved east over Britain and gave, mainly, fair to fine weather, although it remained cool and dry. However, in the north a series of secondary depressions continued the dull, cloudy weather which was accompanied by the drizzle which had dominated the start of the month.

The mean temperature of the country was 53.7 F [12.1 C]. Each district was however below average, the differences ranging from -3.3 F [-1.6 C] in eastern England, (the mean being 53.8 F [12.1 C]), to -0.7 F [-0.3 C] in southern Ireland, (the mean here being 55.9 F [13.3 C]).

In Scotland very cold weather was reported from the 3<sup>rd</sup> to the 18<sup>th</sup>. At Braemar, and Balmoral, the minima recorded on the 15<sup>th</sup> were 26 F [-3 C] and 27 F [-2.8 C] respectively. At Nairn the maximum temperature, again recorded on the 15<sup>th</sup>, reached only 50 F [10 C]. From the 18<sup>th</sup> onwards temperatures recovered. The MWR noted that the period April to June was, in Scotland, the coldest in any year since 1879. In England, for much of the month, temperatures remained below average. With the warmer weather arriving in the latter part of the month, temperatures improved with the 23<sup>rd</sup>, 28<sup>th</sup>, and 29<sup>th</sup>, being the warmest days. At London (Camden Square) the maximum of 80 F [26.7 C] was recorded on the 23<sup>rd</sup>, and 78

F [25.6 C] at Scarborough and Clacton on the same day. A maximum of 78 F was also recorded at Crieff, on the 28<sup>th</sup>, and in the Thames Valley on the 29<sup>th</sup>.

### **Extremes for the month.**

England and Wales: Maximum, 80 F [26.7 C] at London on the 23<sup>rd</sup>.

Minimum, 30 F [-1 C] at Luton and Porton on the 3<sup>rd</sup>.

Scotland: Maximum, 80 F [26.7 C] at Perth on the 28<sup>th</sup>.

Minimum, 26 F [-3 C] at Braemar on the 15<sup>th</sup>.

Ireland: Maximum, 73 F [22.8 C] at Lisburn on the 23<sup>rd</sup>.

Minimum, 34 F [1 C] at Dublin on the 2<sup>nd</sup>.

Ground frost was recorded at several places during the month and, in some places, very low ground temperatures for the time of year. At Cambridge, on the 3<sup>rd</sup>, the grass minimum was 26 F [-3 C], at Balmoral, a grass minimum of 20 F [-6.7 C] on the 15<sup>th</sup>, while at Eskdalemuir 23 F [-5 C] was noted on the 17<sup>th</sup>.

Rainfall was below average everywhere, except for northern Scotland where totals were significantly above average. Loch More (Sutherland) had over twice the average, while Glenquoich and Fort William (both in Inverness) had 190% and 110% of average respectively. Amongst the highest daily totals were Onich (Inverness) with 25 mm on the 7<sup>th</sup>, and Ford (Argyll) with 20 mm on the 7<sup>th</sup> and 12<sup>th</sup>.

In central and southern England rainfall amounts were only 20% to 30% of average while, along the east coast only 30% to 40% of average was noted. In the west, Dolgelly (Merioneth) had 76% of average, and in Cumberland, Seathwaite had 77% but, in the north of England only 40% to 50% of average rainfall was reported.

In Ireland, only one station, Derry/Londonderry reported above average rainfall (103%). The south of Ireland was drier than the north, and around Cork the monthly total was less than 5% of average.

Rainfall totals were notable for their lack of rain. At Torquay rain fell on only four days and, with the monthly total of 5.6 mm, only once since 1892, during summer 1921, was the monthly total below 6 mm. At Ipswich the total for the first six months was 208 mm, which was lower than any previous record, except for 1921. In thirty-one years, Newquay had only one drier June (1921), while during the previous fifty years only twice (1895 and 1921) had the June rainfall total at Kew been as low as 6 mm. Southport had one of the driest Junes on record with a total of 14 mm, while Southampton (Calshot) and Liverpool (Bidston) had totals of 7 mm and 8 mm respectively.

The MWR noted that there was a slight fall of snow on the Cairngorms on the 11<sup>th</sup>. The MWR also noted that conditions were unfavourable for thunderstorms.

Sunshine was below average throughout the country, ranging from -2.89 hours in Northern Ireland to -0.34 hours in the Channel Isles and the Isles of Scilly.

Thick fog was reported at the entrance to the English Channel on the 9<sup>th</sup> and 15<sup>th</sup>, and at Shoeburyness on the 27<sup>th</sup>.

A month that was cool, dull, and dry.

### **Europe and the Rest of the World<sup>xii</sup>**

In Switzerland and Italy cold, stormy weather was experienced. On the 16<sup>th</sup> a violent thunderstorm damaged crops, and snow was reported in many places. The Senlis observatory noted a fall of over 3 feet [over 90 cm]. Over the next few days falls of up to 1 foot [30 cm] were being reported down to 2,400 ft. The minimum temperature at Geneva, on the 18<sup>th</sup>, was 15 F [-9 C]. In northern Italy, heavy falls of snow were reported, temperatures were unusually low, and rainstorms, accompanied by cold winds, were frequent. On the 22<sup>nd</sup> heavy snow delayed trains in Asturias, and low temperatures were noted in Ternuel [about 100 miles NW of Valencia]. However, in south-western Spain the weather was very hot.

In Canada and the USA storms and floods again produced serious financial loss. The rivers rose rapidly in Western Canada resulting in considerable damage to roads and property. By the 5<sup>th</sup> the floods had receded, the rain however, was welcomed by the farmers. Forest and bush fires caused considerable damage in northern Ontario and Quebec and, on the 27<sup>th</sup>, a cyclone passed over Toronto during which lives were lost, and orchards and farm buildings were severely damaged.

A "heatwave" was reported in the north-eastern USA in the first week of June and many deaths occurred. On the 6<sup>th</sup> a severe storm was reported from New York City, resulting in many casualties and considerable damage to property. On the 27<sup>th</sup> the heat was broken by a violent storm which affected some parts of the city, but left others untouched. During the second week low lying areas of Kansas, Oklahoma, and Texas were flooded after three days of torrential rain; the Trinity River in Texas rose at the rate of 7 in [18 cm] per hour.

In India the monsoon started badly and was still weak at the end of the month. It had reached Bombay [Mumbai] by the 12<sup>th</sup> and steady, moderate, rain had set in. A very hot spell was noted at Calcutta [Kolkata] during the middle of the month. On the 13<sup>th</sup> the temperature was 110 F [43 C], the highest recorded in the fifty-five years of observations.

Rain fell in the month in the farming areas of southern and eastern Australia. By the 14<sup>th</sup> a report from Adelaide [Southern Australia] stated that the heavy rains had brought drought conditions to a close.



In Brazil rainfall in the north of the country was scarce, averaging about 24 mm below normal, but in the south the average was 23 mm above normal. In the centre, rainfall distribution was irregular. The temperature was generally a little above average, but slight frosts had occurred in the south. The prospect for the coffee crop was continuing to be good.

**Central England Data.<sup>xiii</sup> (Averaging period is 1891 to 1920.)**

Mean Maximum Temperature: 16.1 C. Average: 19.3 C.

Mean Minimum Temperature: 8.8 C. Average: 9.6 C.

Mean Temperature: 12.5 C. Average: 14.1 C.

England and Wales Rainfall: 19.4 mm. Average: 63.3 mm. (31%).

**Midlands Data. (Averaging period is 1911 to 1920).**

Midlands Mean Maximum Temperature: 16.1 C. Average: 18.7 C.

Midlands Mean Minimum Temperature: 7.9 C. Average: 8.3 C.

Midlands Mean Temperature: 12.0 C. Average: 13.5 C.

Midlands Rainfall: 16.1 mm. Average: 53.7 mm. (30%).

**2023 (Provisional)**

**Central England (Averaging period is 1991-2020).**

Mean Maximum Temperature: 22.6 C. Average: 19.2 C.

Mean Minimum Temperature: 11.3 C. Average: 10.1 C.

Mean Temperature: 17.0 C. Average: 14.7 C.

England and Wales Rainfall: 46.5 mm. Average: 70.5 mm. (66%).

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<sup>i</sup> Courtesy of T Scholey, by email.

<sup>ii</sup> Pitsford Monthly Weather Summary, June 2023, Pitsford Weather Centre, July 2023, pp. 5 and 6.

<sup>iii</sup> Monthly Summary June 2023, Meteorological Office, July 2023.

<sup>iv</sup> The Guardian, 6/6/2023.

<sup>v</sup> The Guardian, 10/6/2023.

<sup>vi</sup> The Guardian, 13/6/2023.

<sup>vii</sup> The Guardian, 17/6/2023.

<sup>viii</sup> The Guardian, 20/6/2023.

<sup>ix</sup> D J Stanier, by email, 1 July 2023.

<sup>x</sup> Monthly Weather Report, June 1923, Meteorological Office, HMSO, July 1923.

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<sup>xi</sup> Monthly Weather Report, June 1923, Meteorological Office, HMSO, July 1923.

<sup>xii</sup> The Meteorological Magazine, July 1923, Meteorological Office, July 1923.

<sup>xiii</sup> Hadley Centre, Central England and Midlands, Meteorological Office.