

Record breaking heat-wave July 2019

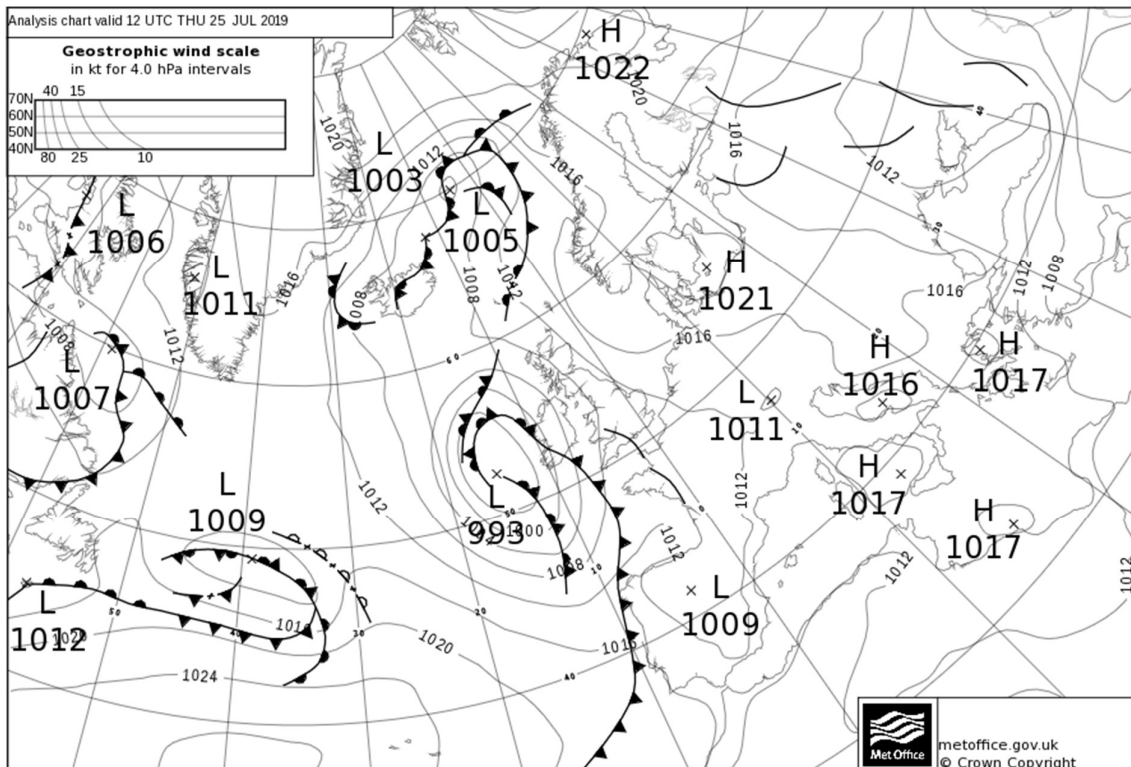
The UK experienced a short but exceptional heatwave in late July. On 25th, temperatures across eastern England widely reached 35 to 36 °C and a temperature of 38.7 °C was recorded at Cambridge Botanic Garden, setting a new all-time UK temperature record, exceeding 38.5 °C at Faversham, Kent on 10 August 2003. Two other stations, including Faversham, also exceeded 38 °C and a further 10 stations across the south-east, Midlands and East Anglia exceeded 37 °C.

Impacts

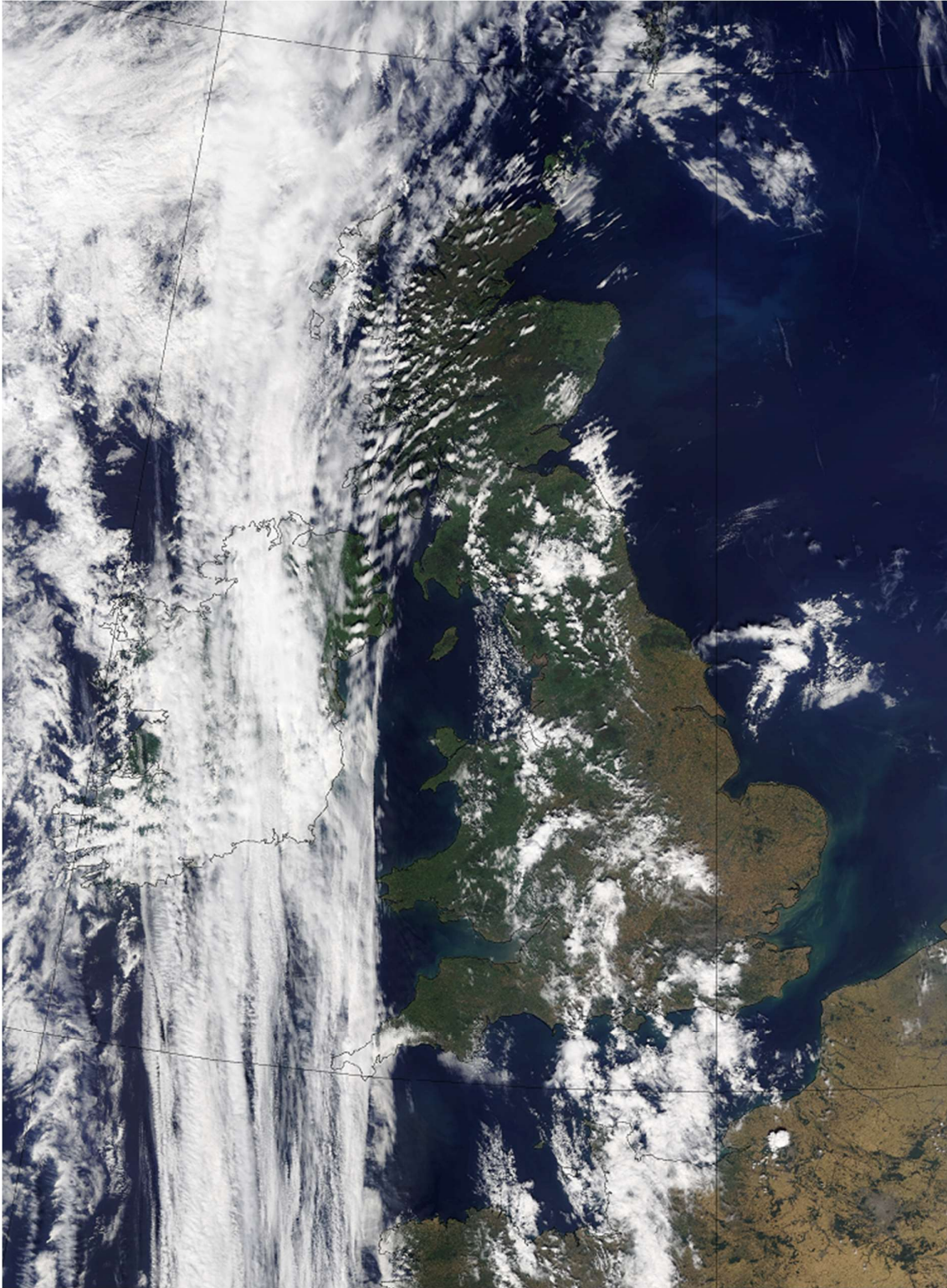
The rail network was severely affected across south-east England with train cancellations and main lines closed out of London due to concerns with rail buckling. Damage occurred to overhead electric wires as they sagged in the heat, and trackside vegetation caught fire in several locations. The exceptionally hot weather made conditions difficult, particularly for the frail and elderly.

Weather data

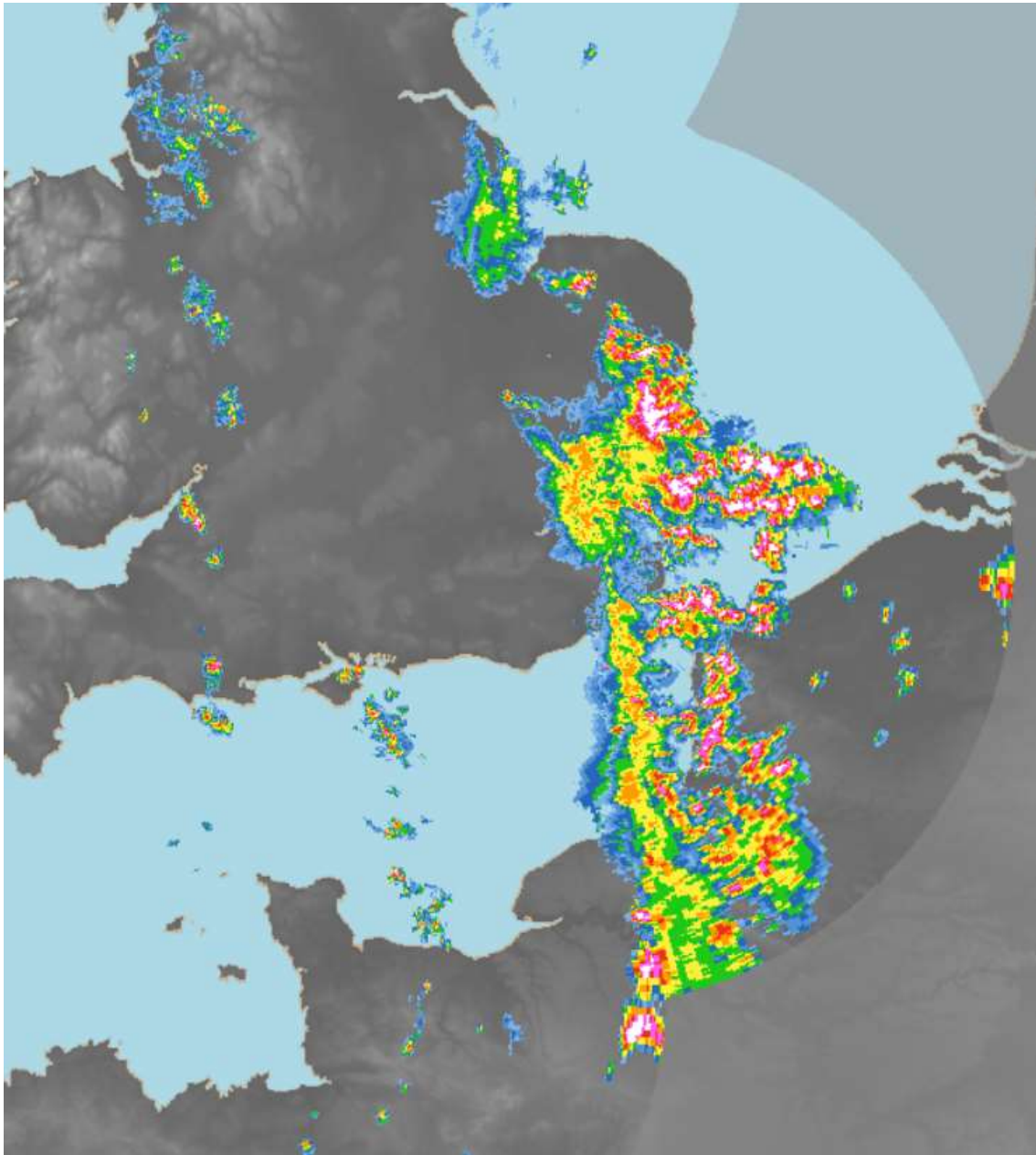
The analysis charts at 1200 UTC 25 July 2019 shows much of the UK in a light southerly flow drawing exceptionally hot air from the near continent, where temperatures reached the low 40s. New national temperature records were set in Belgium, the Netherlands and Germany, and in Paris the temperature reached 42.6 °C.



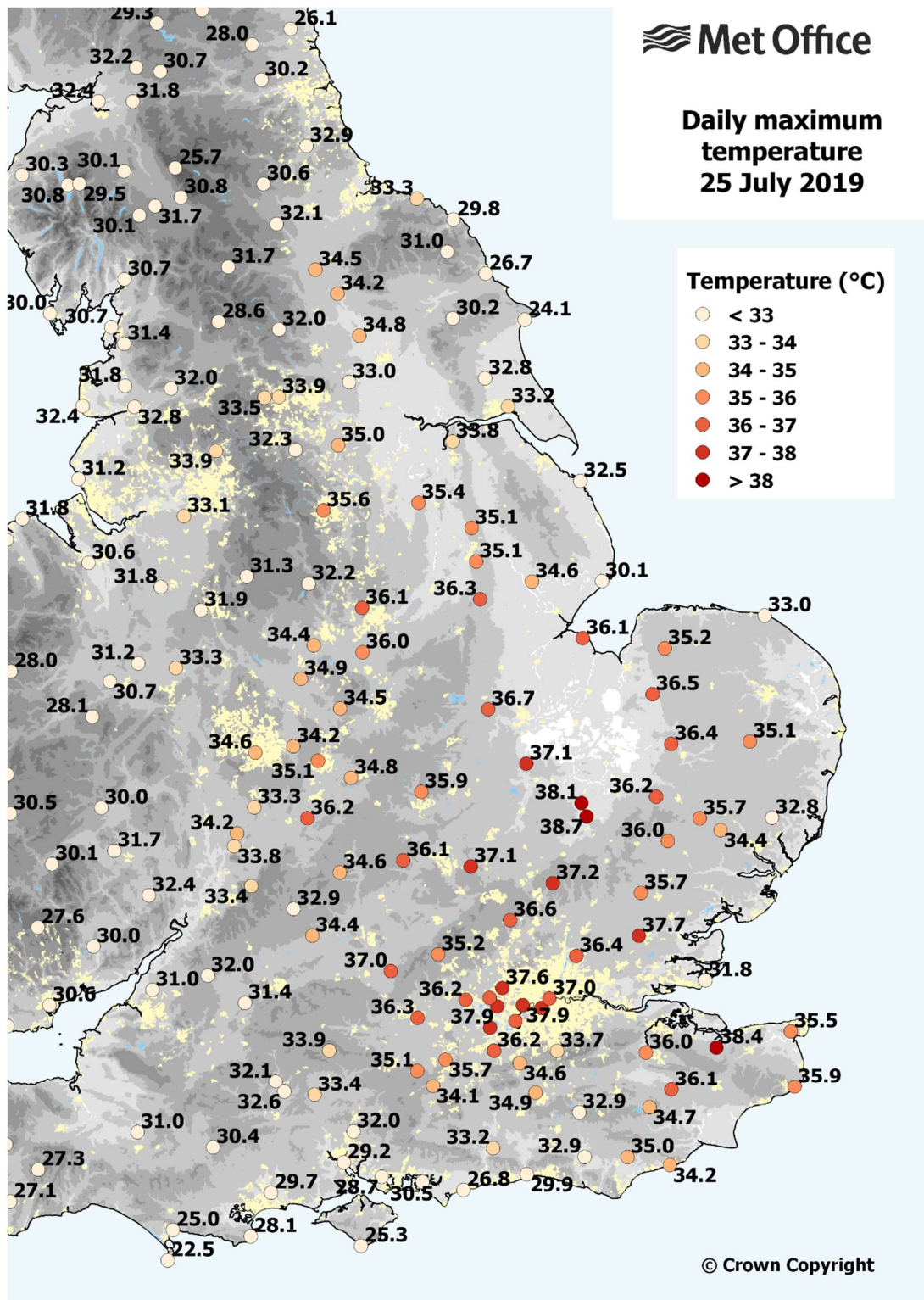
The satellite image on 25 July 2019 shows the British Isles largely cloud-free, but with weather fronts bringing cooler, fresher air to the west, and an area of cloud pushing north into central southern England during the afternoon. Without the presence of this cloud temperatures might plausibly have reached 39 °C. Image copyright Met Office / NASA / NOAA



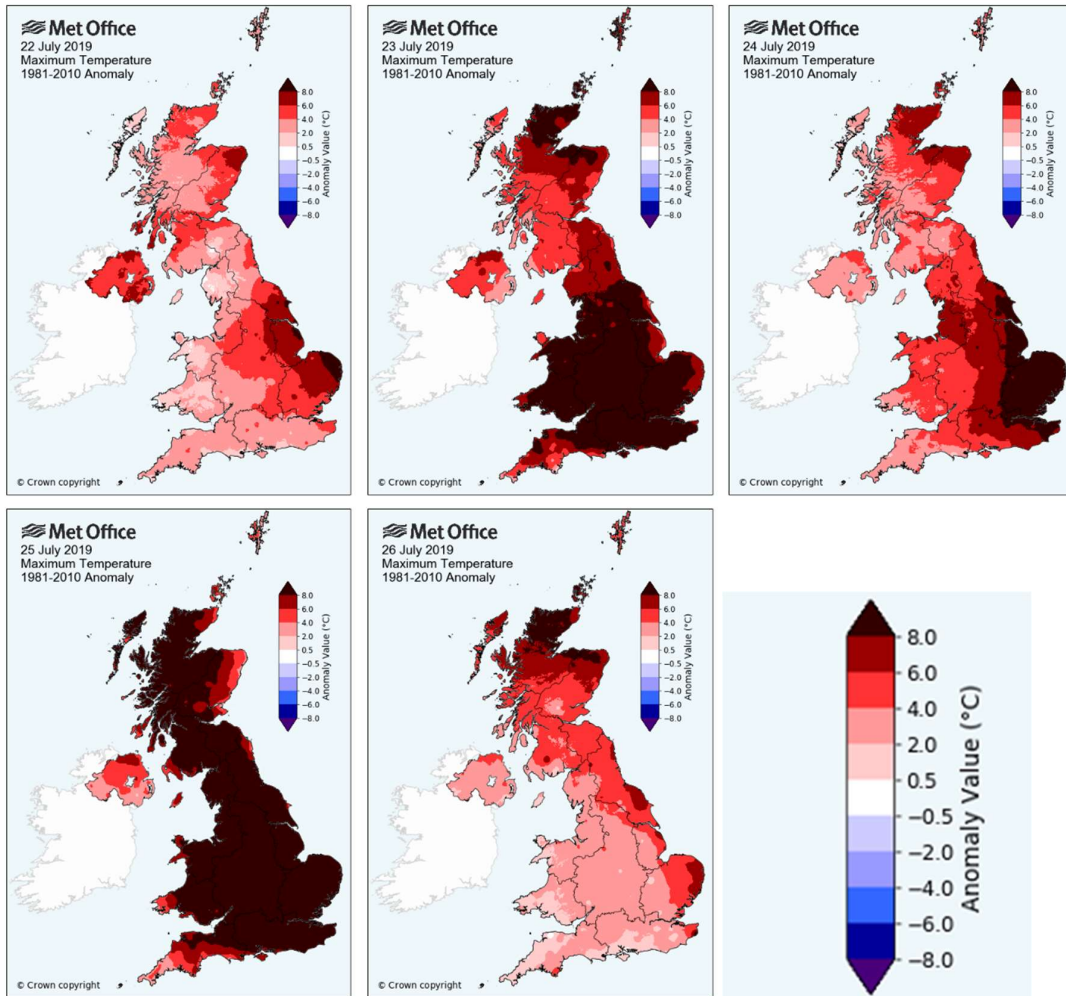
Thunderstorms brought torrential downpours during the evening to parts of East Anglia and the far south-east. The rain-radar image below at 2000 UTC 25 July 2019 shows this area of intense downpours moving north.



The map below shows daily maximum temperatures on 25 July 2019. 38.7 °C at Cambridge Botanic Garden set a new all-time UK record, beating 38.5 °C at Faversham, Kent on 10 August 2003. It also broke the UK July record of 36.7 °C on 1 July 2015. Temperatures reached 36 °C as far north as Lincolnshire, where 36.3 °C was recorded at Cranwell, setting a new record for the climate district of England E & NE.



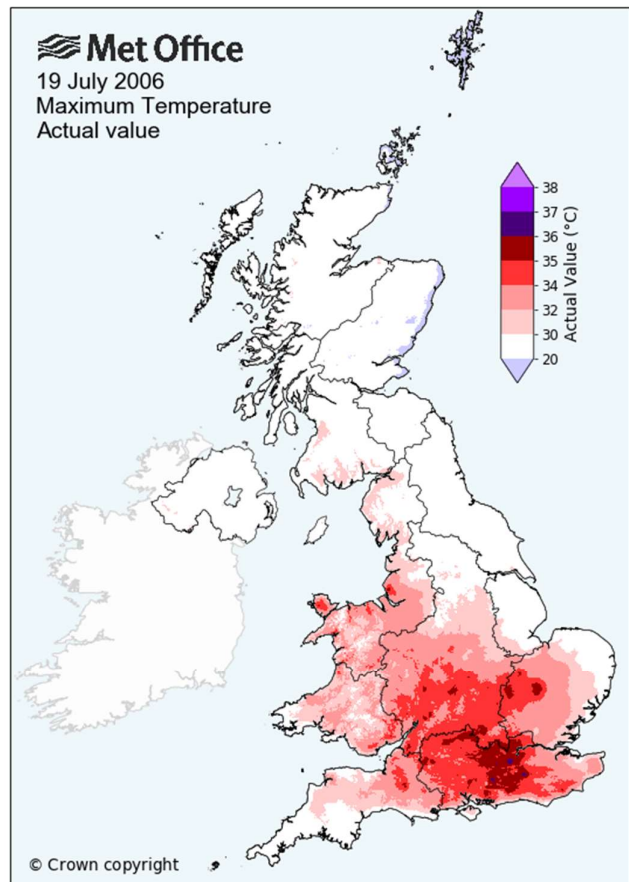
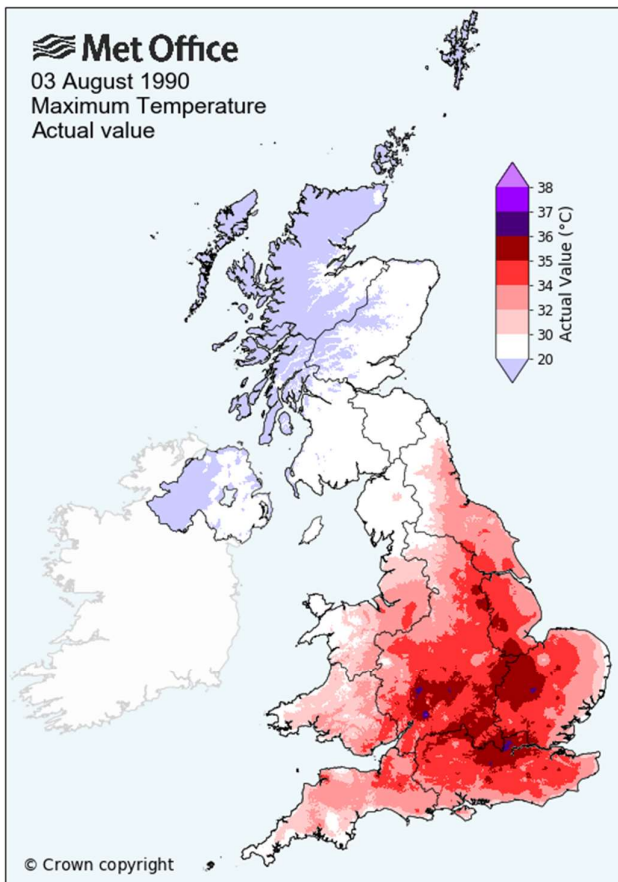
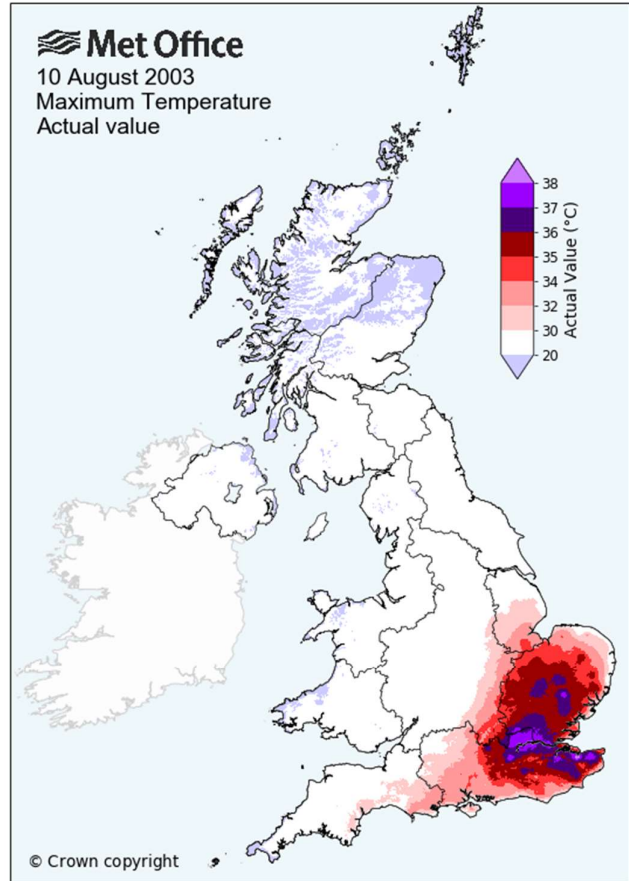
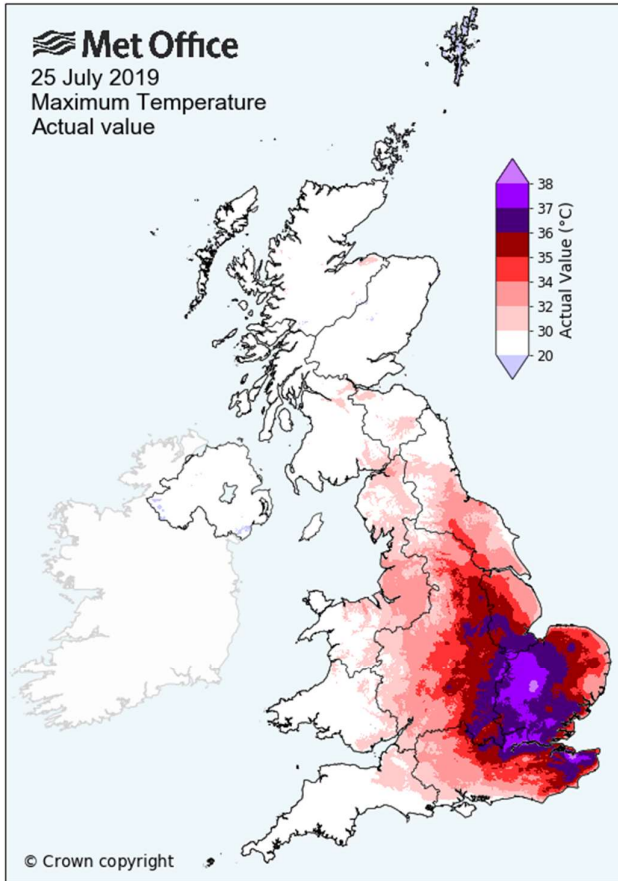
The panel of maps below show daily maximum temperatures from 22 to 26 July 2019, indicating the duration and spatial extent of the heatwave. Temperatures exceeded 30 °C widely across much central and southern England on the 23rd, and across the south and east on the 24th, but the 25th was by far the hottest day with 30 °C recorded widely as far west as Somerset and East Wales, also much of northern England, Edinburgh, and parts of the Highlands and Moray.



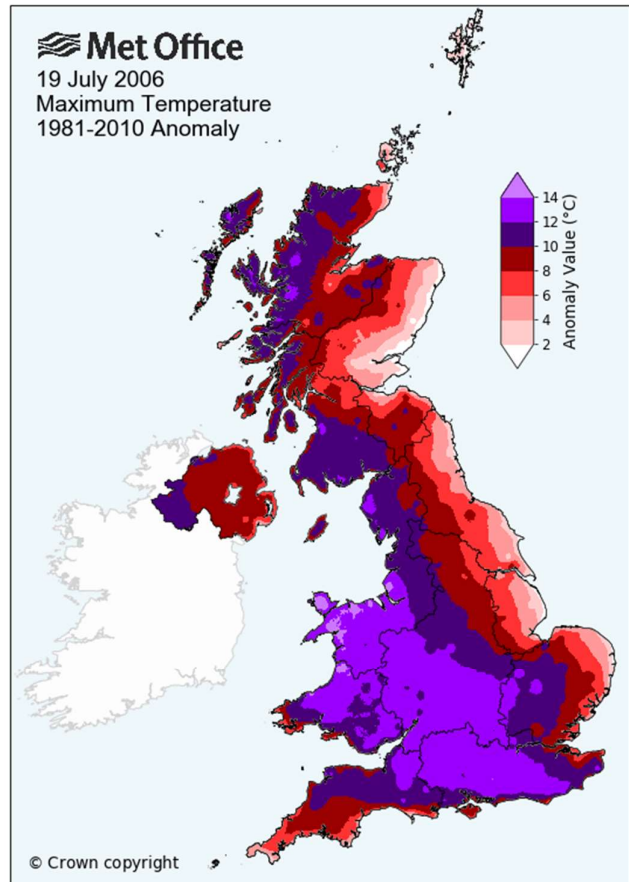
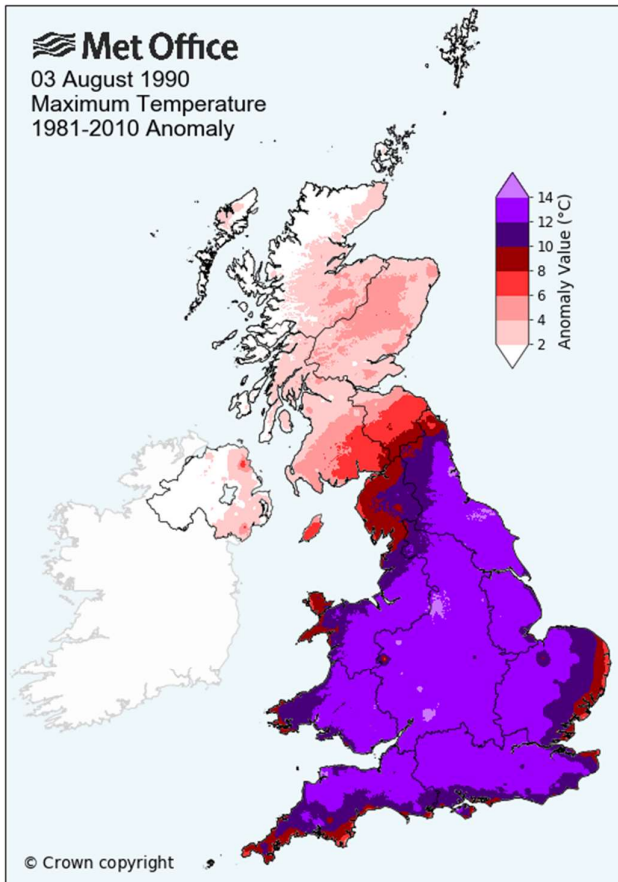
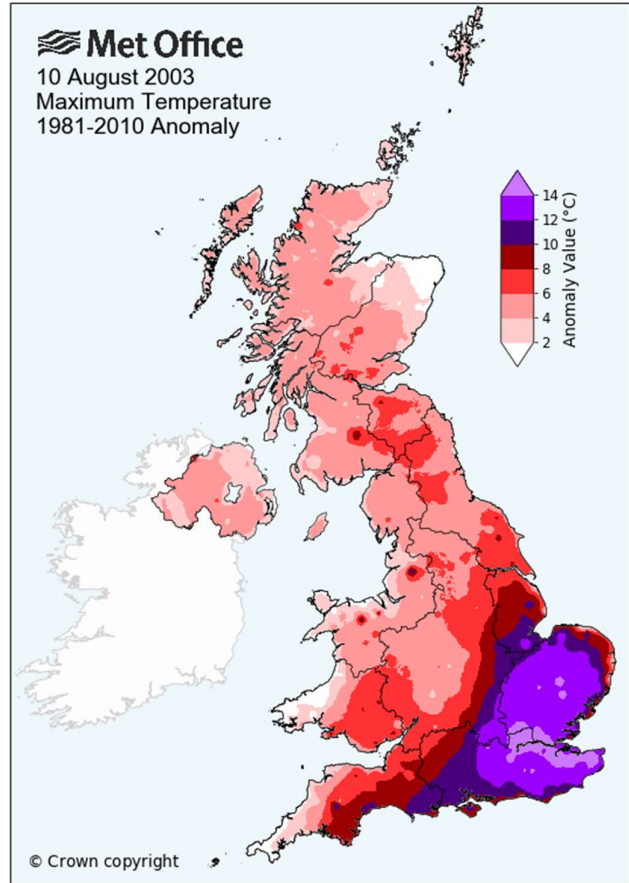
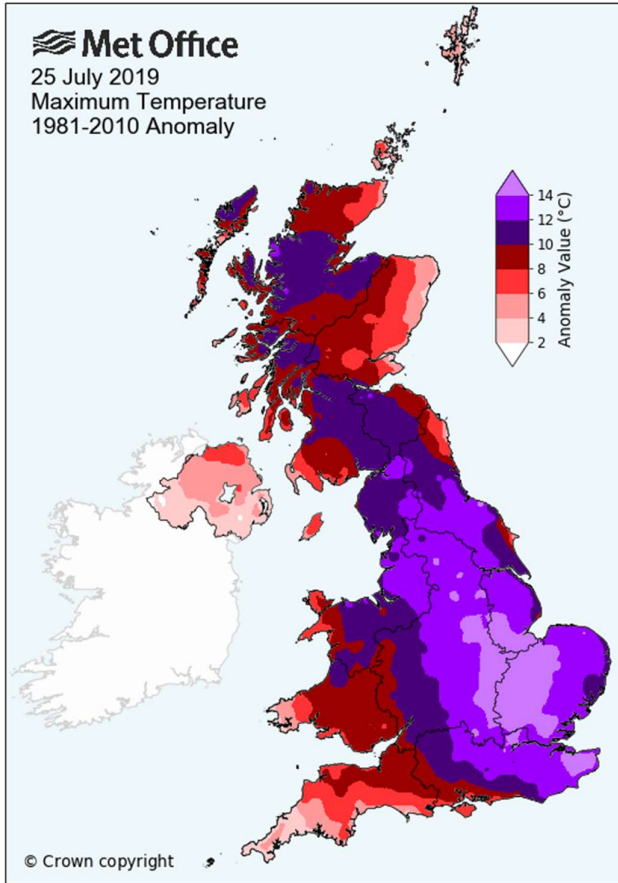
The further panel of maps below shows daily maximum temperatures across the UK on the hottest days in observational records (with at least 50 stations recording maximum temperatures ≥ 34 °C). The spatial extent of the hottest area ≥ 37 °C was significantly greater on 25 July 2019 than 10 August 2003, while temperatures were generally more extreme than previous heatwaves on 19 July 2006 and 3 August 1990.

All four of these days saw daily maximum temperatures more than 14 °C above the 1981-2010 long-term average for the month, with the greatest spatial extent on 25 July 2019 across central and eastern England, while on 10 August 2003 the highest anomalies were focussed across the south-east. On 3 August 1990 the heat extended further west to cover most of England and Wales, whereas on 19 July 2006 western areas were more affected.

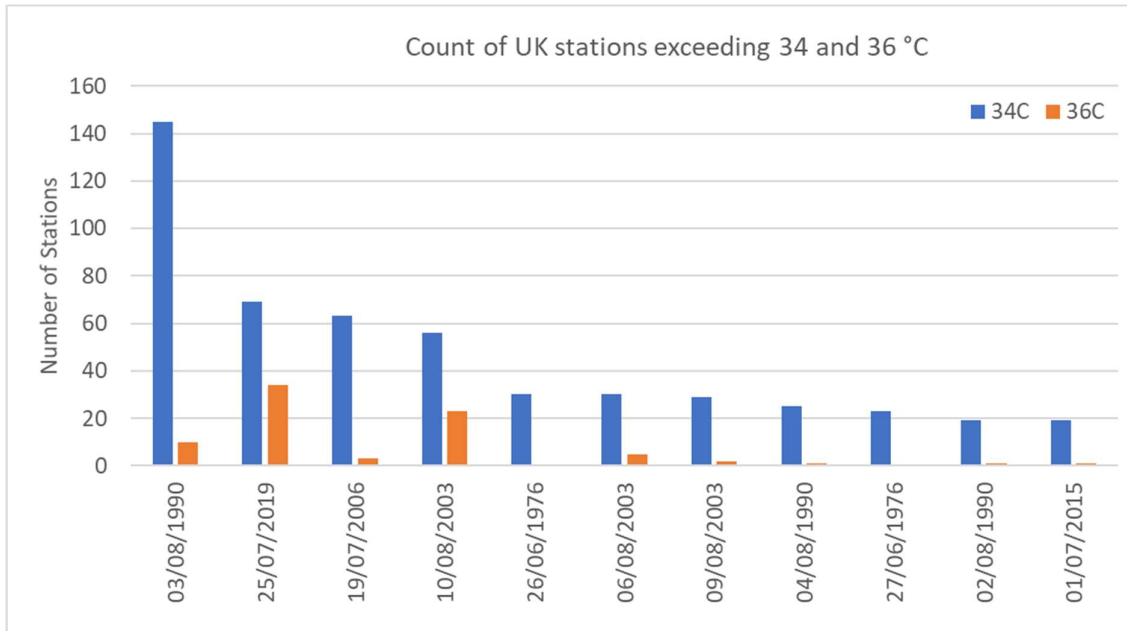
The four maps below show daily maximum temperatures on 25 July 2019, 10 August 2003, 3 August 1990 and 19 July 2006 (actual values)



The four maps below show daily maximum temperatures on 25 July 2019, 10 August 2003, 3 August 1990 and 19 July 2006 (anomaly values – compared to 1981-2010 long-term average)



The chart below shows a count of the number of stations in the UK where daily maximum temperatures have exceeded 34 °C and 36 °C, by date. The largest number of stations exceeding 34 °C occurred on 3 August 1990, reflecting the large spatial extent of the heat, but this is also influenced by a denser station network in the 1990s compared to the 2010s. 25 July 2019 is ranked first in terms of the number of stations exceeding 36 °C, followed by 10 August 2003.



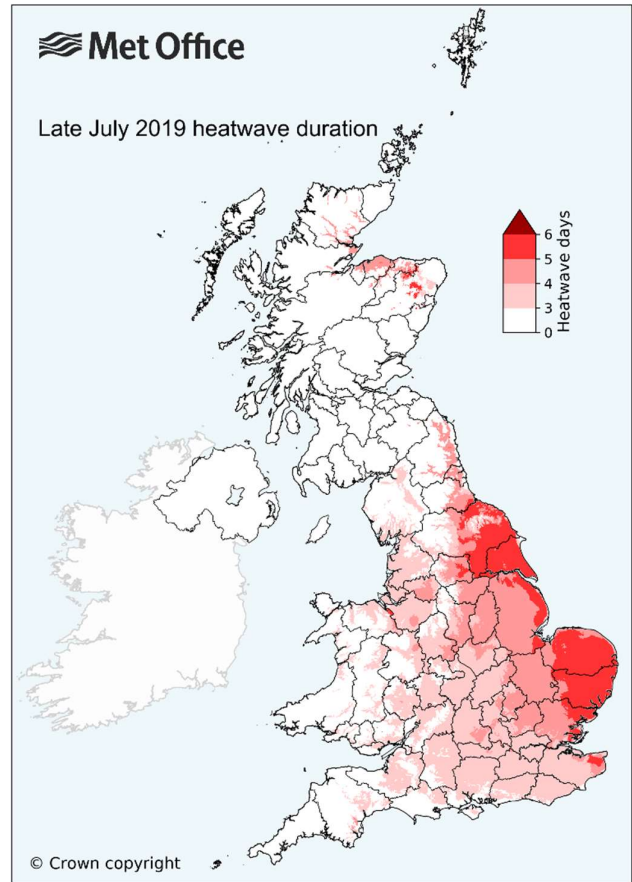
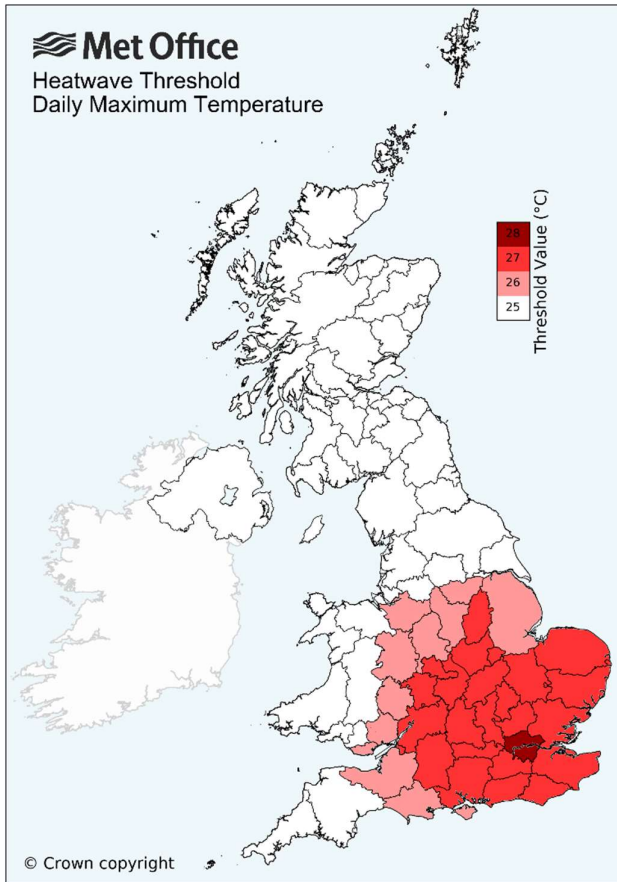
The heatwave set a very large number of temperature records at individual stations. New all-time records for any month were set at Durham (32.9 °C, 138 years), Sheffield (35.6 °C, 135 years), Bradford (33.9 °C, 111 years), Rothamsted, Hertfordshire (36.6 °C, 105 years), Cranwell, Lincolnshire (36.3 °C, 105 years), Woburn, Bedfordshire (37.1 °C, 102 years), and numerous other maximum temperature records were set at other stations with shorter records.

Daily minimum temperatures on 26 July (0900 UTC 25th to 0900 UTC 26th) were also very mild across eastern England, remaining above 20 °C across parts of Kent, East Anglia, Lincolnshire and Yorkshire (with 21.1 °C at Linton-on-Ouse). Minimum temperatures were also 18 °C or more across parts of western Scotland with 20.9 °C at Achnagart (Highland) setting a new Scotland daily minimum temperature record for any month – exceeding 20.5 °C at Creebridge (Wigtownshire) on 2 August 1995.

In 2019 the Met Office launched a new heatwave definition for the UK. A UK heatwave threshold is met when a location records a period of at least three consecutive days with daily maximum temperatures meeting or exceeding thresholds which vary by UK county between 25 and 28 °C as shown. The map alongside shows the duration of time meeting heatwave conditions during this event. The longest duration was five days (Monday 22 to Friday 26 July) across parts of East Anglia and eastern England. For other regions Thursday 25th marked the end of heatwave conditions, and for many northern and western regions the heatwave criteria was not reached.

a) UK heatwave definition threshold

b) Duration of time meeting threshold in July 2019



The heatwave of 25 July 2019, although brief, stands out in UK observational records both for setting a new all-time UK temperature record, and as a reminder of the changing nature of the UK's climate.

Last updated 31/07/2019