

Storm Bert, 22 to 25 November 2024 and storm Conall, 26 to 27 November

A deep Atlantic low pressure system, named Storm Bert, brought a spell of extremely wet and windy weather in late November. The weekend of Saturday 23rd to Sunday 24th was exceptionally wet across South Wales and south-west England with over 150mm falling in the wettest upland areas. Around three-quarters of the whole-month average rain fell in a swathe from Gwent to Wiltshire to Northamptonshire. Storm Bert also brought some very strong winds, particularly across south-west England with gusts exceeding 60Kt (69mph), even for some inland locations. On 23 November the UK recorded its wettest calendar day – as an average across the whole country – since 3 October 2020.

Storm Conall brought a further 30 to 50mm of rain falling on already very wet ground in a swathe along the South Coast from south Devon to Surrey and Kent, accompanied by some strong winds.

Impacts

Storm Bert was a multi-hazard storm which brought heavy rain, strong winds and snow across many parts of the UK. Tragically a number of deaths were reported over the of the weekend as Storm Bert impacted the UK. Although some impacts were reported from the strong winds and snow, the heavy rain brought the greatest impacts with localised flooding in all regions of the UK.

In South Wales, Pontypridd was affected by severe flooding from the River Taff while at Cwmillery, Blaenau Gwent, a landslide brought deep sludge and mud into a local street. The Welsh Government reported 433 properties were flooded, the majority of these in South Wales.

The centre of Tenbury Wells, Worcestershire was flooded when a wall collapsed under pressure from a local brook. Other locations affected included Lydney and Frampton Cotterell, both Gloucestershire and Chippenham town centre and the River Avon burst its banks in Bradford-on-Avon, Wiltshire. A major incident was declared in Northamptonshire when a holiday park was inundated from the River Nene. The Environment Agency estimated 35,700 properties had been protected in England, with heavy rain leading to at approximately 680 properties being flooded.

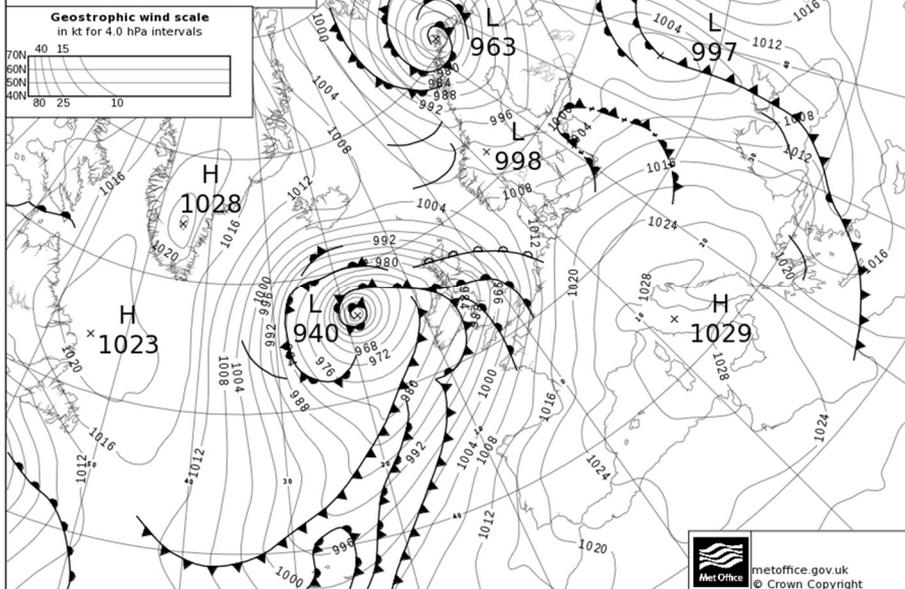
Flooding and strong winds also caused disruption to road and rail transport. Northampton railway station was flooded and the line from Newport to Shrewsbury closed due to a landslide. Great Western Railway advised against travel on any of its routes, and over 50 children were rescued from a school bus stuck in a flooded ditch near Evesham, Worcestershire. In Scotland, many ferry services were delayed or cancelled and the Queensferry Crossing across the Firth of Forth was closed for the first time since 2021 due to the threat of falling ice. 350,000 homes in England lost power during the storm and 300 flights were cancelled.

Overall impacts from storm Conall were mostly fairly minor but there was travel disruption to roads and rail services from flooding, with rain falling on already very wet ground following storm Bert.

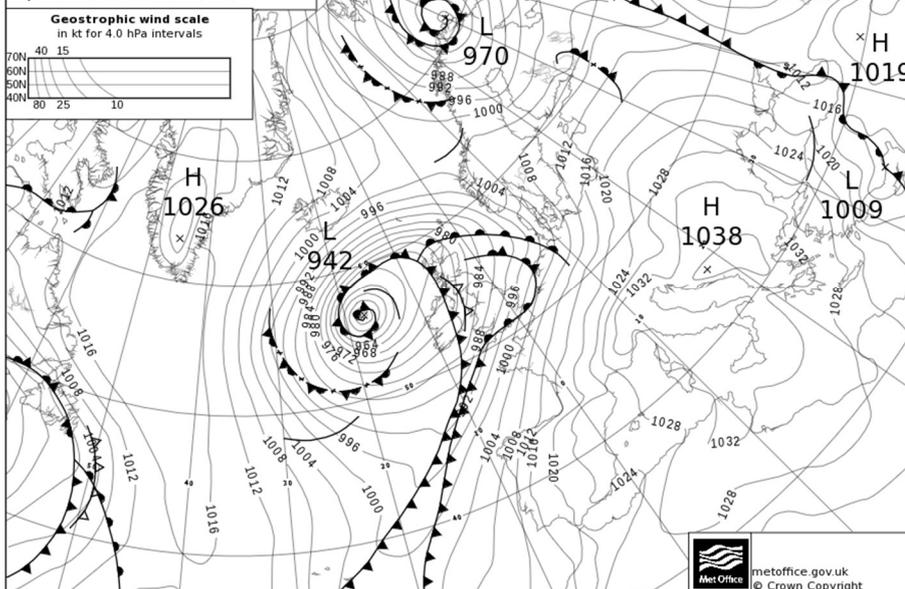
Weather data

The analysis charts at 1200 UTC 23 November, 0000 UTC and 1200 UTC 24 November 2024 show storm Bert centred to the west of Scotland with associated slow-moving fronts stretched across the UK bringing persistent heavy rainfall.

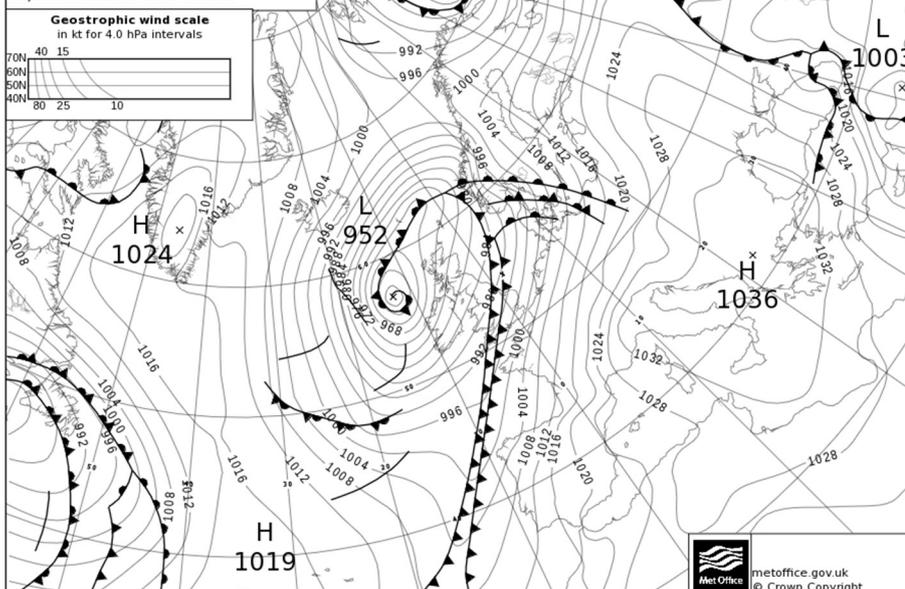
Analysis chart valid 12 UTC SAT 23 NOV 2024



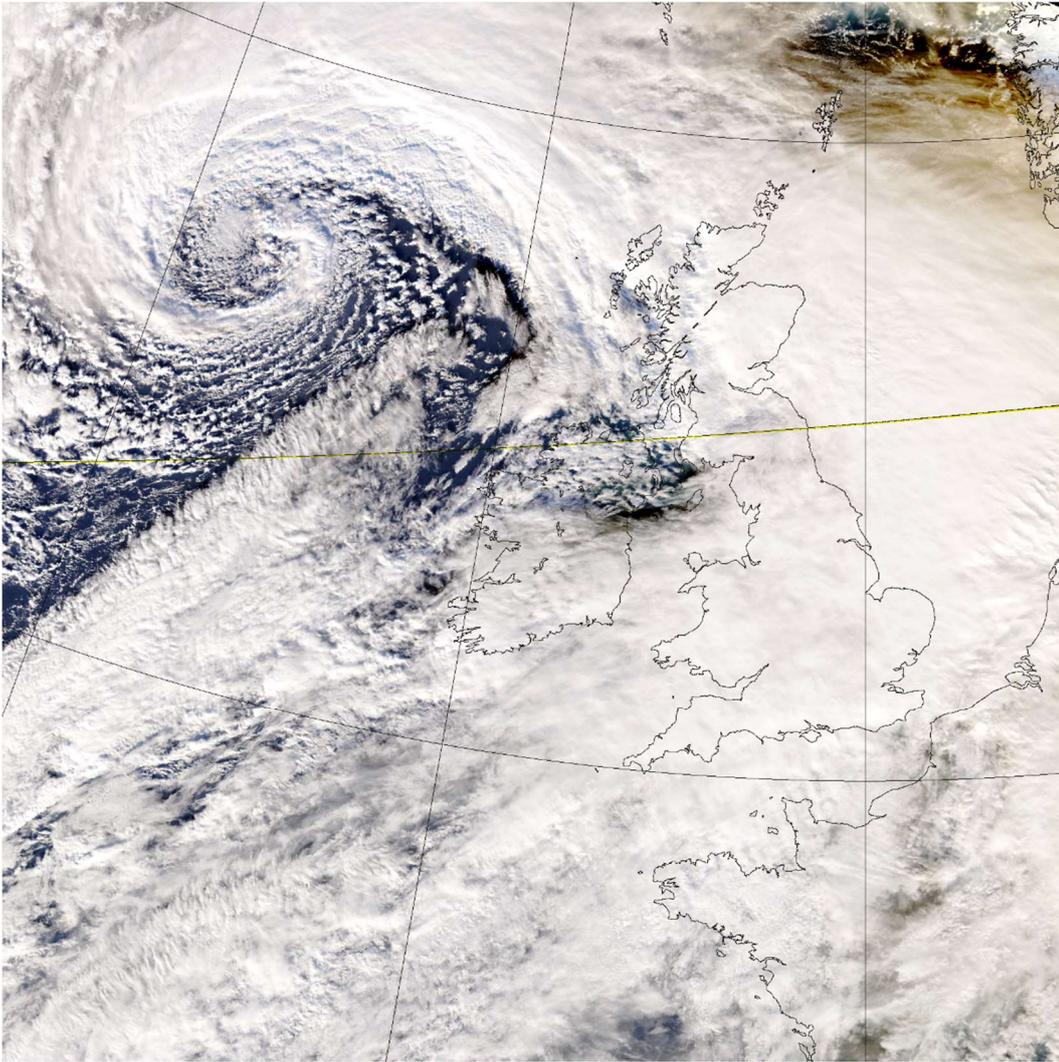
Analysis chart valid 00 UTC SUN 24 NOV 2024



Analysis chart valid 12 UTC SUN 24 NOV 2024



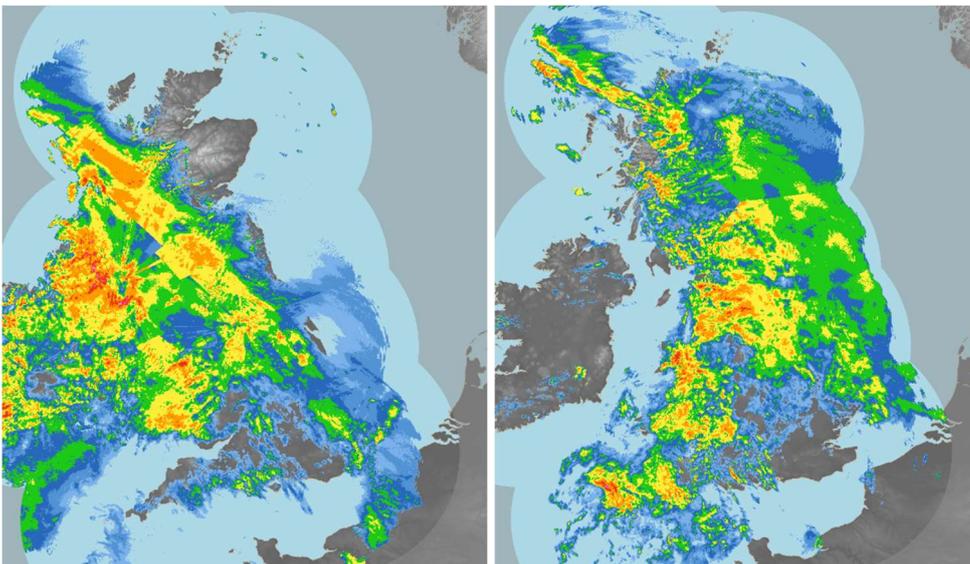
The satellite image on 23 November 2024 shows the low pressure centre in the North Atlantic and the UK almost entirely swathed in cloud from associated fronts. Image copyright Met Office / NOAA / NASA.



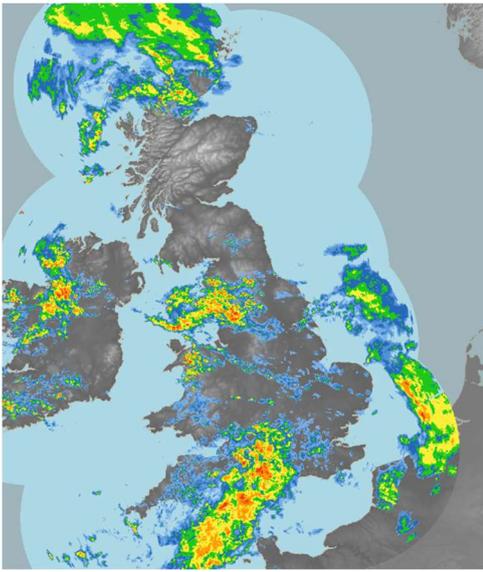
The rain-radar images at 6 hourly intervals from 1200 UTC 23 November to 1800 UTC 24 November illustrate the persistent and extensive nature of the rainfall, particularly across England and Wales.

0600 UTC 23rd

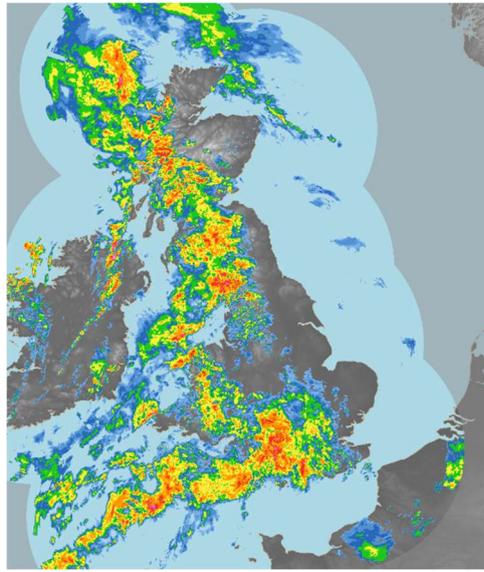
1200 UTC 23rd



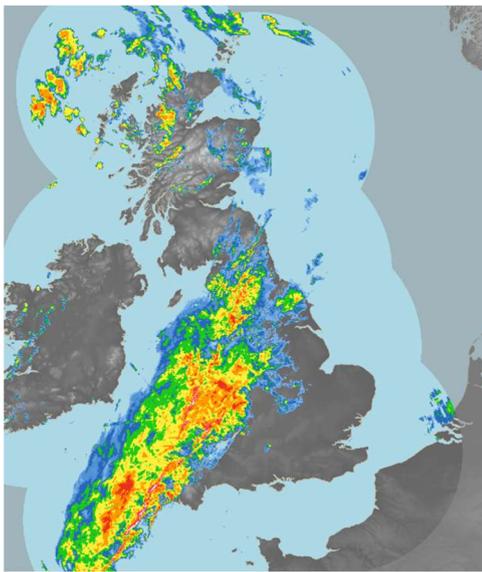
1800 UTC 23rd



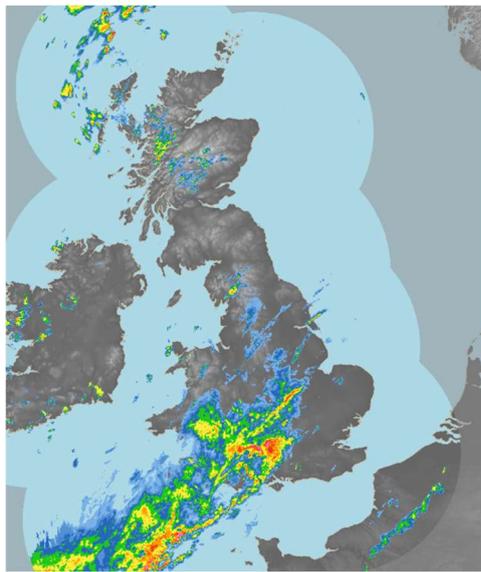
0000 UTC 24th



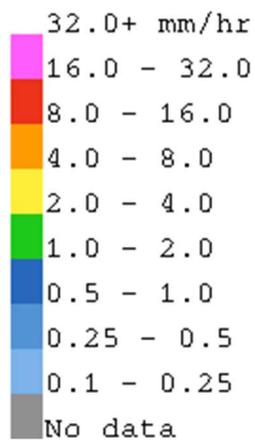
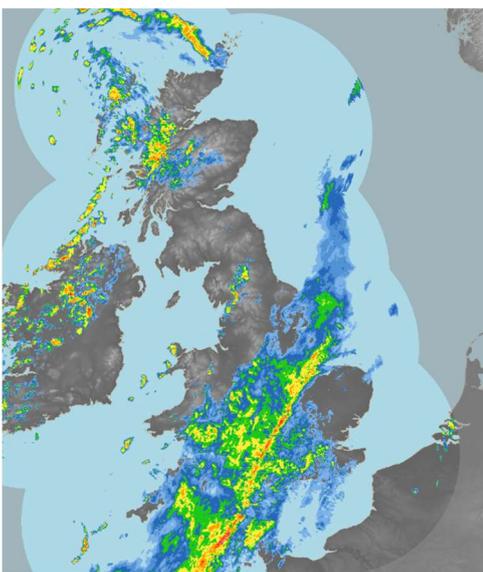
0600 UTC 24th



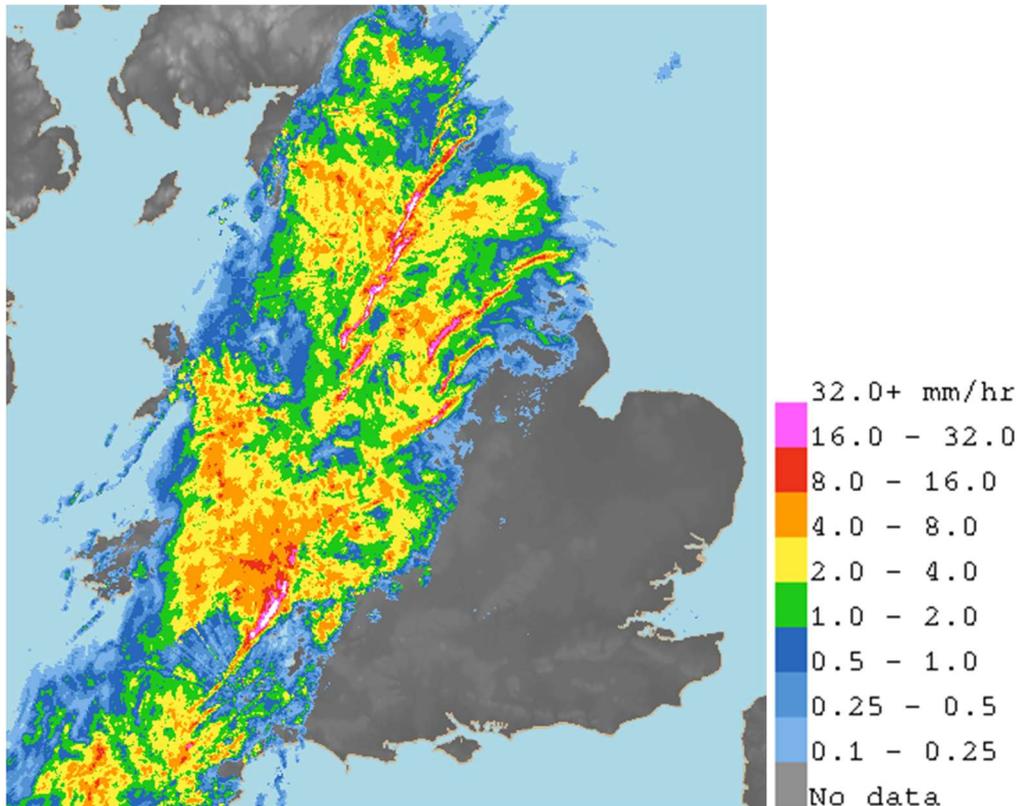
1200 UTC 24th



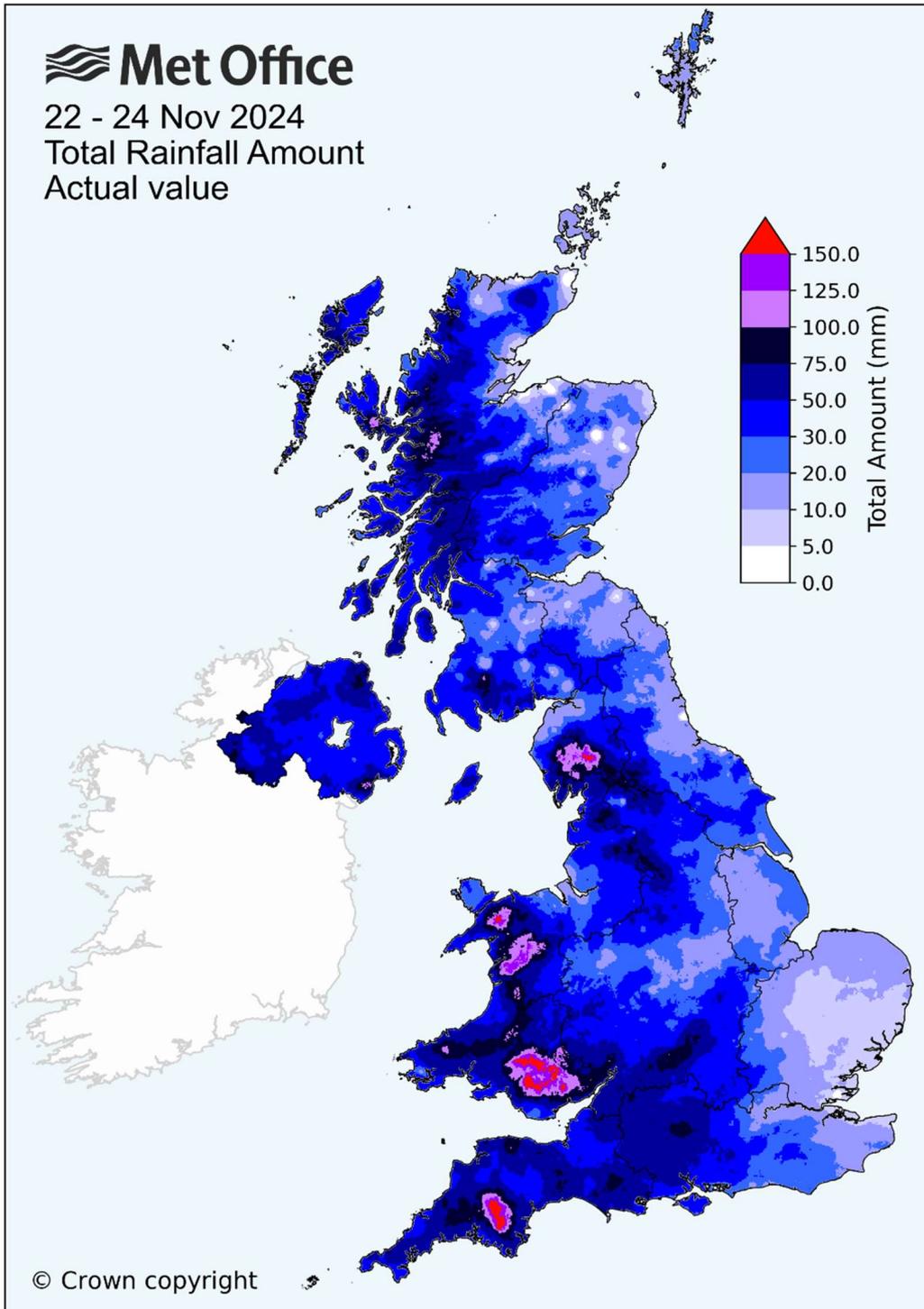
1800 UTC 24th



The rain radar image at 0730 UTC on 24 November shows embedded convection within the weather fronts; instantaneous rain-rates in places exceeded 32mm per hour. There was also some snow on the leading edge of the storm as the fronts pushed into colder air, snow depths at 0900 UTC on 23rd included 18cm at Middleton Hillside, Derbyshire, 11cm at Bingley, West Yorkshire, 21cm at Copley, County Durham and 10cm at Redesdale Camp, Northumberland although this then melted as the colder air was displaced.



The maps below show rainfall totals across the UK for the 3 consecutive rain-days 22 to 24 November 2024 (0900 UTC 22nd to 0900 UTC 25th). Upland areas of Dartmoor, Wales and the Lake District fells received over 100mm of rain. Locally, the wettest locations, particularly the hills of South Wales, received over 150mm. Many western areas of the UK received over 50mm more widely.

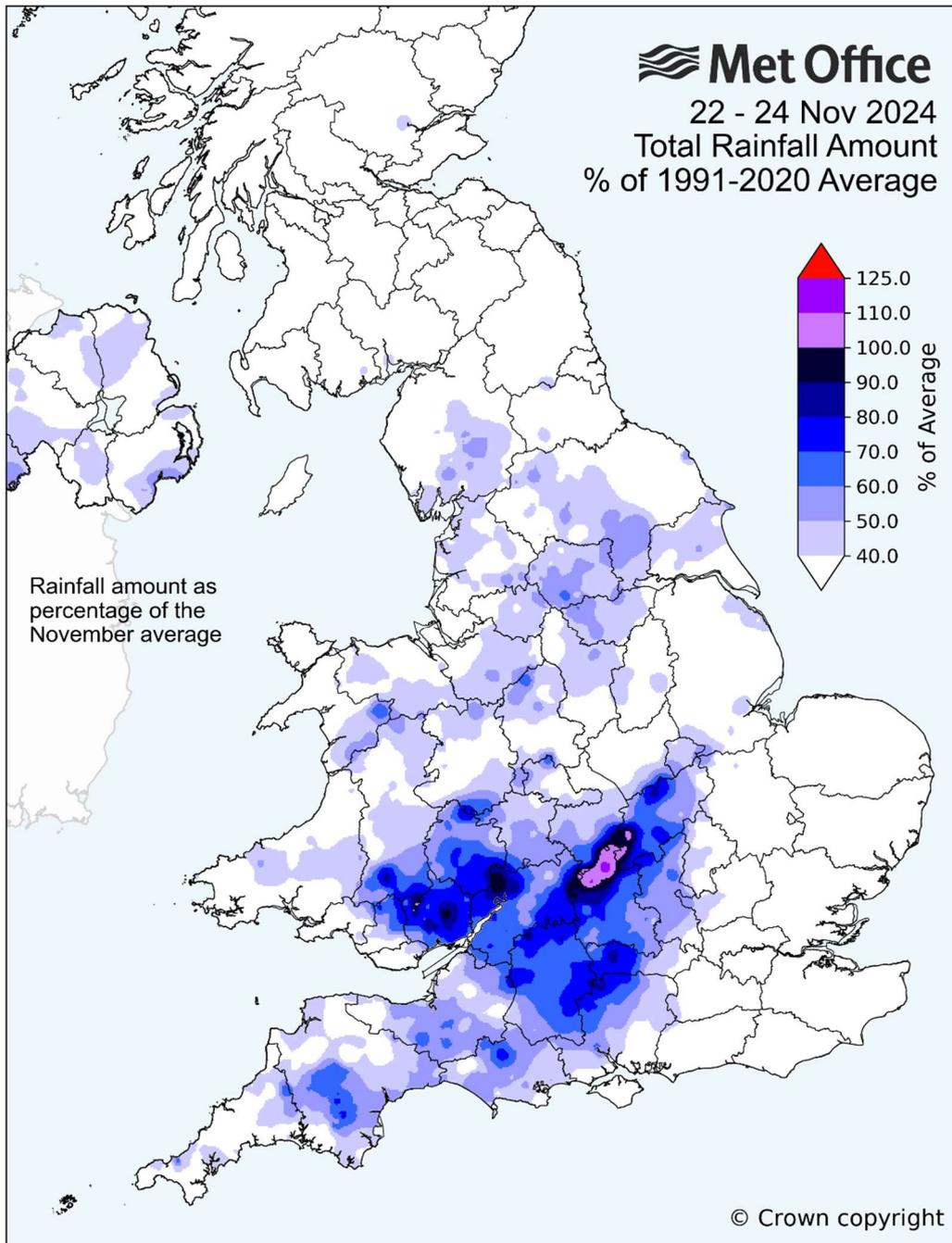


The table below shows 3-day rainfall totals for selected rain-gauges in the wettest areas of Dartmoor and South Wales. Several locations received well over 150mm of rain. The rainfall map and the relatively higher elevation of the majority of these locations (mostly 250 to 400 masl) illustrates the influence of the hills on increasing the rainfall ('orographic enhancement'). Data are provisional and subject to change.

Station	Elevation (masl)	Total 22-24 November 2024	November 1991-2020 average	% of average
Treherbert, Mid Glamorgan	259	175.4	294.2	59.6
Nant-Yr-Ysfa, Mid Glamorgan	260	173.4	246.9	70.2
Nantyglo, Gwent*	395	168.4	-	-
Crai Resr, Powys	270	162.6	229.3	70.9
Holne, Priddons Farm, Devon*	280	161.5	-	-
Maerdy W Wks, Mid Glamorgan	295	160.2	272.1	58.9
Aberdare, Hirwaun, Powys South	200	159.8	219.9	72.7
Dartmoor Training Centre, Devon	320	157.3	215.2	73.1
Bellever, Dartmoor, Devon	320	152.5	210.3	72.5
Trelewis, South Glamorgan	167	149.6	184.7	81.0
Carno Resr, Gwent	400	149.2	186.6	80.0
Cwmbran, Maes-Y-Rhiw, Gwent	159	145.4	166.6	87.3
Pontsticill W Wks, Powys South	348	144.2	198.8	72.5

*Long term averages not available for these stations

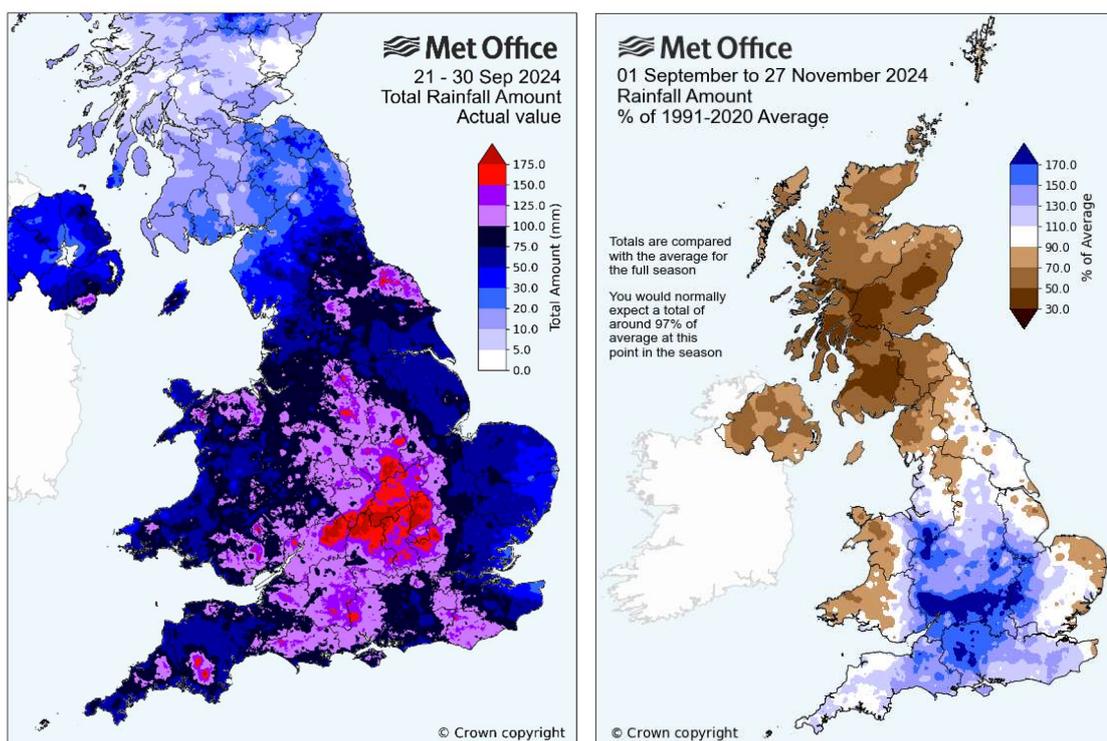
The map below shows rainfall totals across England and Wales for this same 3-day period as a percentage of the November whole-month average. The difference in the location of the wettest areas on the rainfall total map and the rainfall anomaly map are due to differences in the climatology; the hills of South Wales and Dartmoor being on average around three times as wet as central southern England, for example. Approximately three-quarters of the whole-month November average rainfall fell fairly widely in a swathe from Gwent to Wiltshire to Northamptonshire, while the Oxfordshire / Northamptonshire border area received the whole month average rainfall, or more. The map shows county boundaries.



The table below shows 3-day rainfall totals for selected rain-gauges which experienced the highest totals as a percentage of their November 1991-2020 whole-month average. Data are provisional and subject to change.

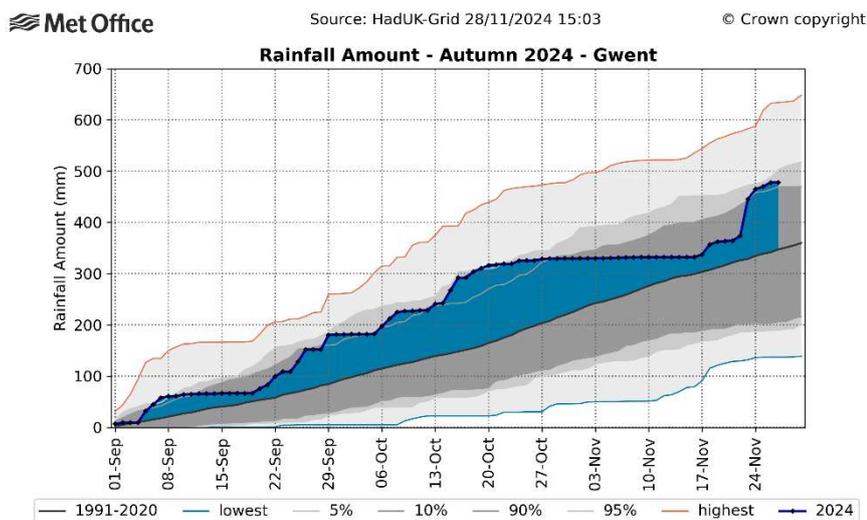
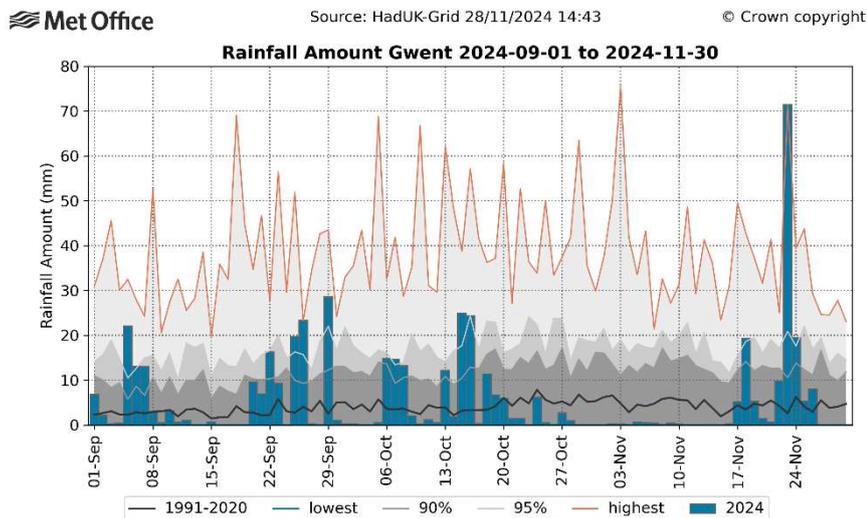
Station	Elevation (masl)	Total 22-24 November 2024	November 1991-2020 average	% of average
South Newington, Oxfordshire	105	89.8	80.4	111.7
Banbury, Grimsbury P Sta, Oxfordshire	87	72.4	68.6	105.5
Chipping Norton S Wks, Oxfordshire	140	78.2	75.6	103.5
Usk, Monmouthshire	25	110.2	115.8	95.2
Byfield S Wks, Northamptonshire	136	64.6	67.8	95.2
Taynton, Black House Farm, Gloucestershire	73	83.4	88.8	93.9
Minster Lovell S Wks, Oxfordshire	96	69.6	77.6	89.7
Little Rissington, Gloucestershire	210	75.8	85.4	88.8
Cwmbran, Maes-Y-Rhiw, Gwent	159	145.4	166.6	87.3
Ty Fry, Mid Glamorgan	275	134	154.7	86.6
Stowell Park Resr, Gloucestershire	206	76.5	88.6	86.4
Chieveley S Wks, Berkshire	104	68.1	79.5	85.7
Shipton Moyne P Sta, Gloucestershire	95	75.5	89.8	84.0

The area with the highest anomalies coincided by chance with the wettest locations at the end of September, as illustrated in the left hand map below. The right map shows autumn 2024 rainfall totals from 1 September to 27 November as a percentage of the 1991-2020 autumn average – which includes both of these events. The total for Oxfordshire for this period is 344.6mm, 170% of the 1991-2020 autumn average. It looks likely to be the second wettest autumn on record in the Oxfordshire series from 1836, exceeded only by autumn 1960 (351.5mm).



The charts below show daily rainfall totals and accumulations for autumn 2024 so far for the counties of Gwent and Oxfordshire. 23 November 2024 was the third wettest day on record for Gwent in a daily county series from 1891, with 71.4mm; the only two wetter days being 30 December 1900 (80.9mm) and 3 November 1931 (75.6mm). The charts for Oxfordshire compare the extreme rainfall at the end of September 2024 with that from storm Bert. Totals from Bert were less extreme but show the surplus rainfall compared to average for the season overall – despite a prolonged dry spell from late October to mid November.

Daily rainfall totals and accumulations for the county of Gwent for autumn 2024

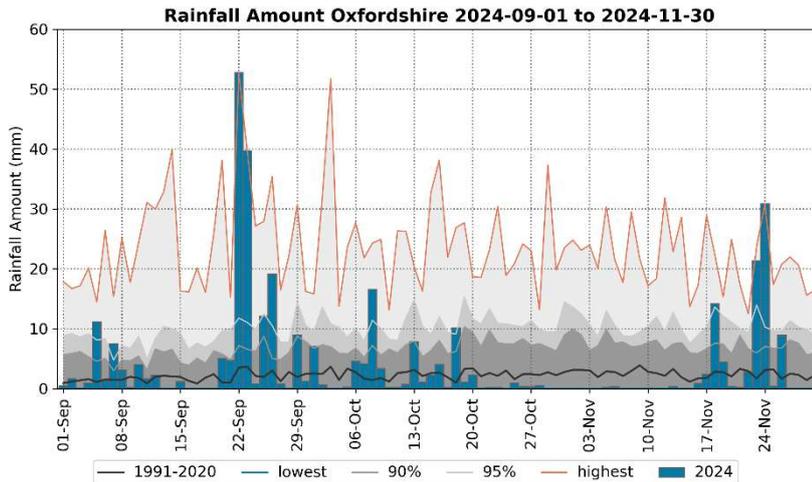


Daily rainfall totals and accumulations for the county of Oxfordshire for 2024



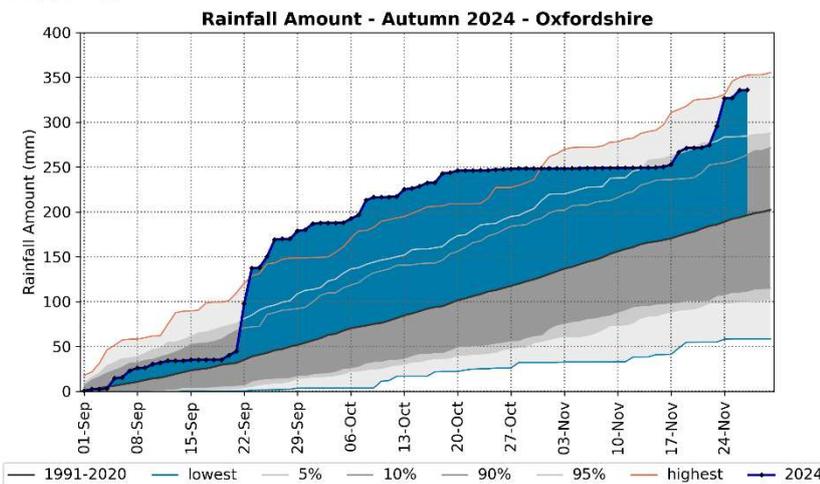
Source: HadUK-Grid 28/11/2024 14:48

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Source: HadUK-Grid 28/11/2024 15:00

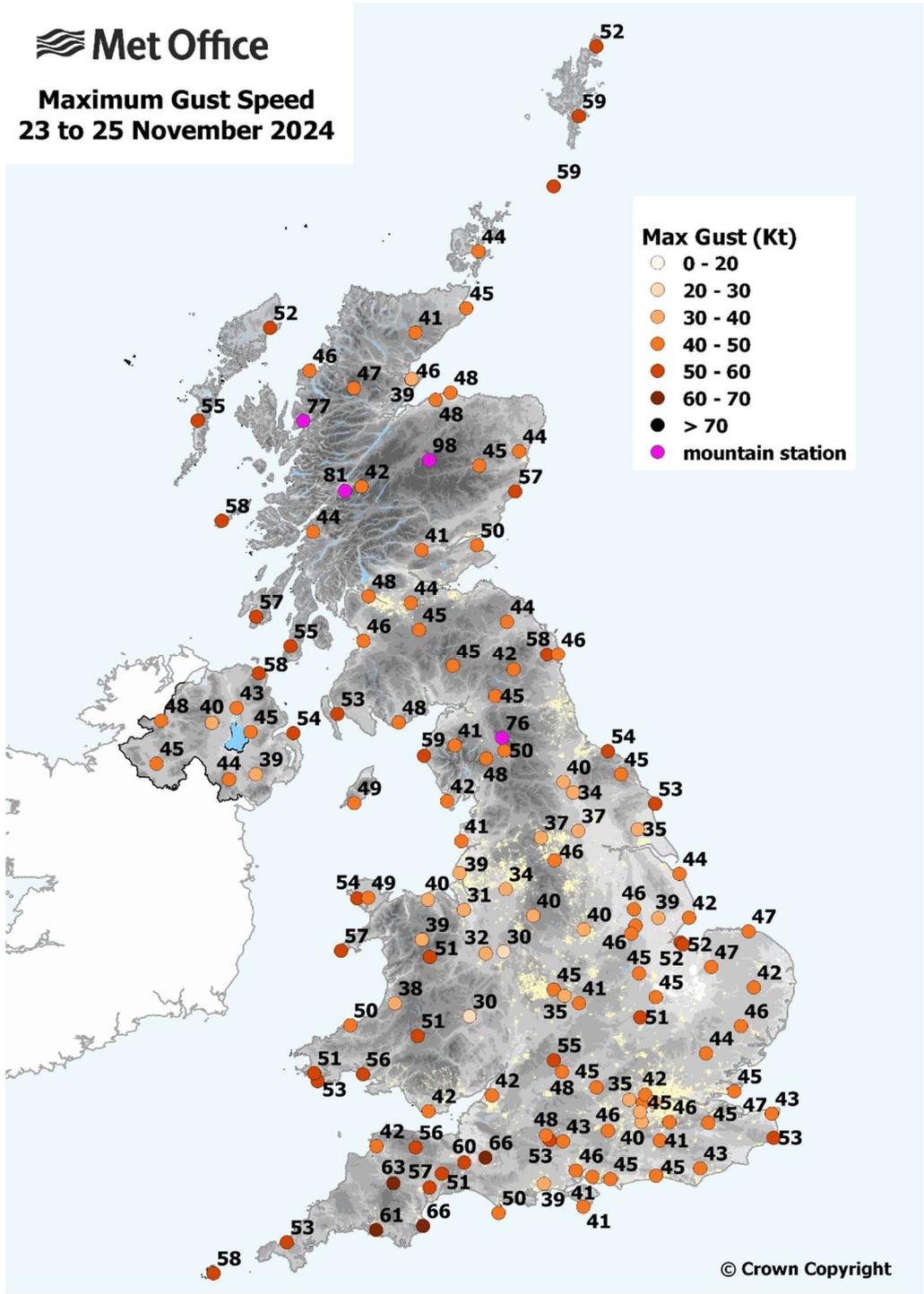
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On 23 November 2024, the UK recorded 24.0mm of rain as an area-average, making this provisionally the wettest day since 3 October 2020 and 12th wettest in the UK series from 1891 (comprising 48,908 days to 27 November). On 22 November, Northern Ireland recorded 37.7mm, provisionally its wettest day since 6 September 2010 and 9th wettest in the Northern Ireland series from 1891. A significant number of stations recorded their wettest November day on record on 23 November 2024, including Chivenor, Devon (40.2mm, 66 years), Bala, Gwynedd (69.6mm, 65 years), Nettlecombe, Somerset (47.0mm, 51 years), Camborne, Cornwall (58.0mm, 46 years), Linkenholt, Hampshire (42.6mm, 36 years), Shap, Cumbria (88.2mm, 36 years), Libanus, Powys (95.4mm, 32 years)*. *The previous record November record being exceeded here by over 40mm.

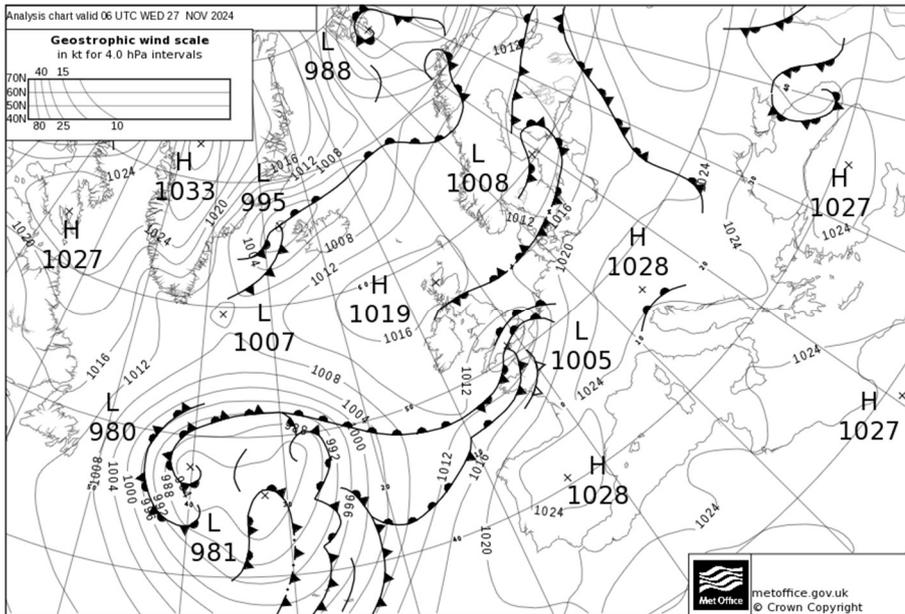
The map below shows maximum gust speeds across the UK from 23 to 25 November 2024 from storm Bert. Winds were particularly strong across south-west England with gusts of 66Kt (76mph) at Berry Head, Devon and 61Kt (70mph) at Plymouth, Mountbatten, Devon. However inland stations also recorded very high gusts including 66Kt (76mph) at Yeovilton, Somerset, 63Kt (72mph) at North Wyke, Devon, and 60Kt (69mph) at Merryfield (Somerset). Capel Curig (Gwynedd) recorded a gust of 71Kt (82mph) while many coastal areas recorded gusts exceeding 50Kt (58mph). Cairngorm Summit (1237masl) recorded 98Kt (113mph).

**Maximum Gust Speed
23 to 25 November 2024**

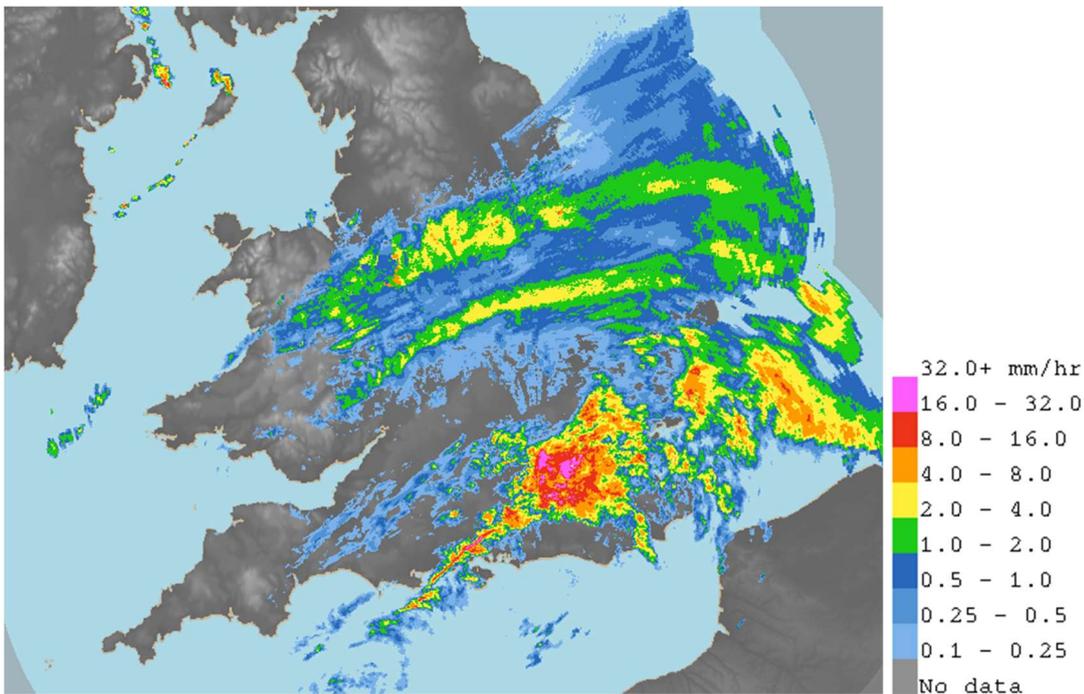


Storm Bert was followed by storm Conall which tracked through the English Channel overnight 26 to 27 November. This storm was named by the Dutch Meteorological Service KNMI, deepening and strengthening as it cleared the UK to the east. A further 20 to 30mm or more of rain fell across southern coastal counties of the UK.

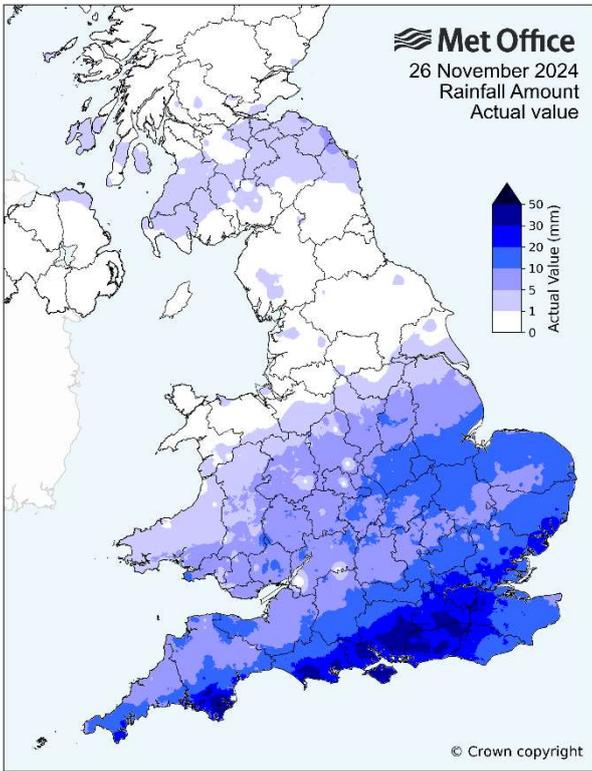
The analysis chart at 0600 UTC 27 November 2024 shows storm Conall with the low centre over the South Coast.



The rain-radar image at 0600 UTC shows rainfall from storm Conall, with localized intense rainfall exceeding 16mm per hour.



The map below shows daily rainfall totals across England and Wales on 26 November 2024 (0900 UTC 26th to 0900 UTC 27th) which would have included storm Conall. 30 to 50mm fell in a swathe along the South Coast from south Devon to the Hampshire to Surrey and Kent, with the highest totals including 48.0mm at Harbertonford, Devon, 39.8mm at Sutton Poyntz, Dorset, 45.7mm at Calbourne, Isle of Wight, 40.8mm at Chiddingfold, Surrey and 37.0mm at Westerham, Kent. The heavy rain was also combined with strong winds with a gust of 51Kt (59mph) at Needles Old Battery, Isle of Wight.



Met Office National Climate Information Centre

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