Storm Ciara

Storm Ciara was the third named storm of the 2019/2020 season and the most severe storm of the winter season so far. Amber warnings were issued for both strong wind and heavy rain. Winds gusted at over 60Kt widely across England and Wales and in terms of gust speeds this was the most significant storm across England and Wales overall since 12 February 2014. Ciara also brought persistent heavy rain, particularly focussed across upland areas of north-west England. Over a month's rain fell across parts of West Yorkshire in around 18 hours with several hundred properties affected by flooding.

Impacts

The storm caused widespread disruption throughout the UK. Hundreds of flights were cancelled, and rail passengers advised not to travel. Ferry services were cancelled and the Port of Dover was closed. There were difficult driving conditions on roads and an overturned lorry on the M1; the Humber Bridge was closed for only the second time in its history and the Dartford Crossing also closed. Part of the M11 was also closed due to the risk of a damaged aircraft hangar blowing onto the road. A man died in Hampshire when a tree fell on his car.

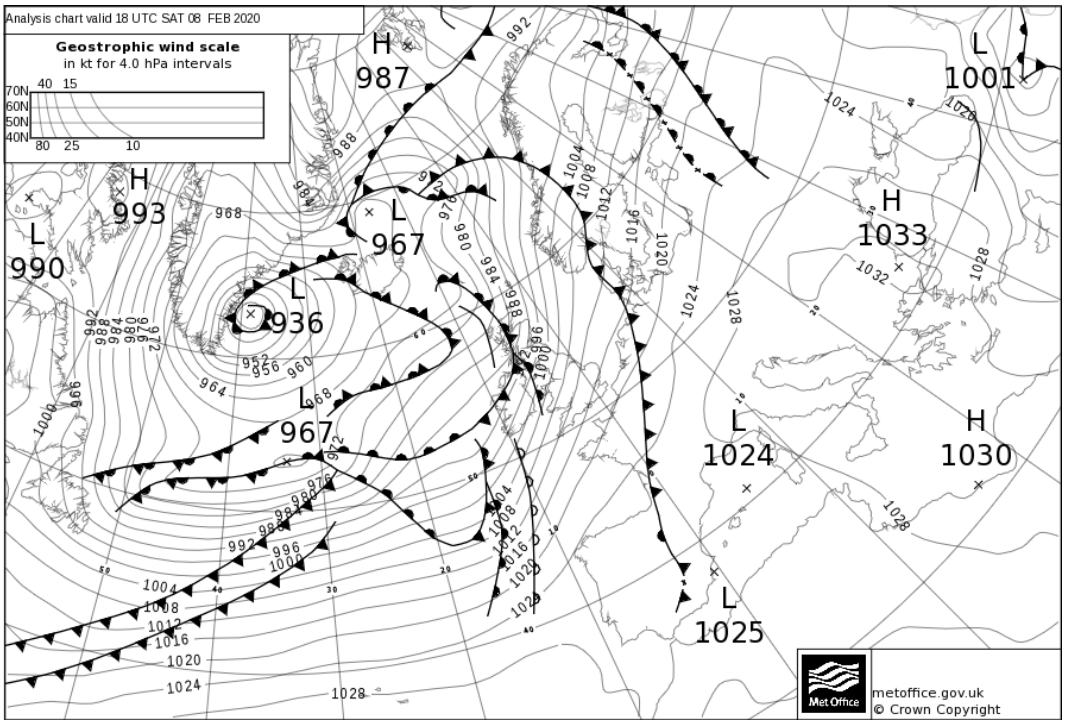
Power cuts affected over 675,000 homes. Huge waves battered exposed coastlines with waves overtopping sea defences. Hastings lifeboat nearly capsized as it answered an emergency call at the height of the storm. There were reports of fallen trees and flying debris, and numerous sporting events were cancelled. Strong winds buckled a construction crane in north London and tore the sails off a historic windmill in Burgh Le Marsh, Lincolnshire. London's eight royal parks were closed.

Some of the worst impacts were from flooding. There was significant flooding in North Wales at Llanrwst in the Conwy valley. However, the worst affected areas were across the Pennines, where flooding affected several hundred homes. In West Yorkshire, properties were flooded in the Calder valley including Mytholmroyd and Hebden Bridge, which was previously severely flooded in December 2015. Flooding affected the Yorkshire Dales and Cumbria, with Appleby badly affected from the River Eden.

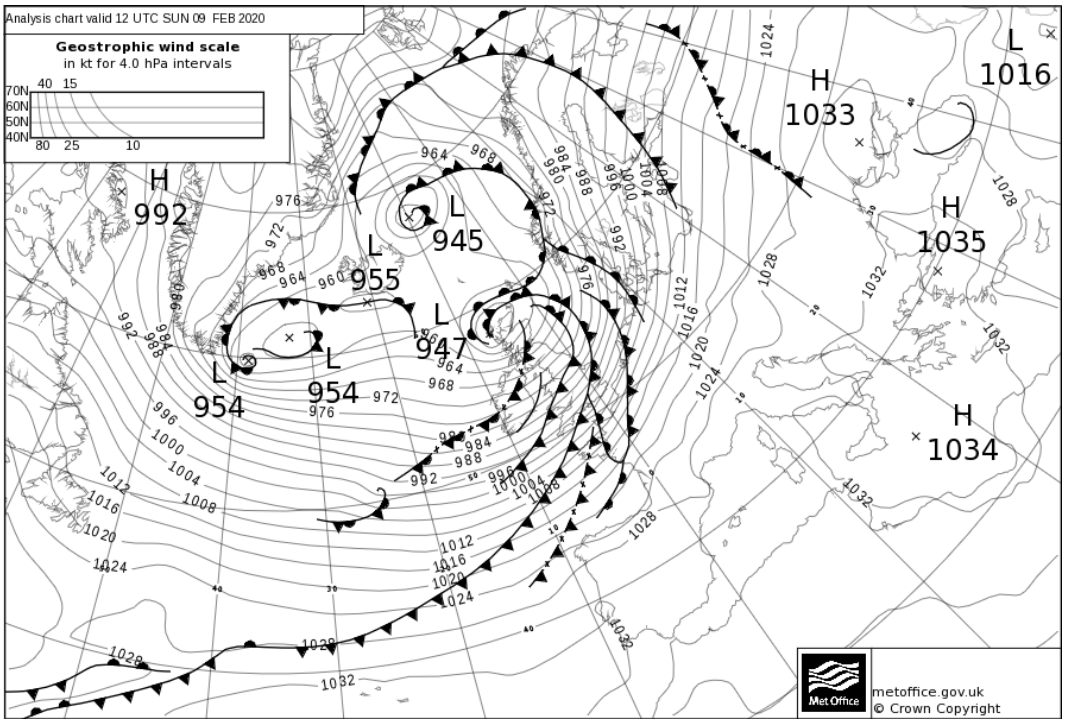
A British Airways flight was reported to have made the fastest subsonic New York to London journey, making use of powerful jet stream winds exceeding 250 mph.

Weather data

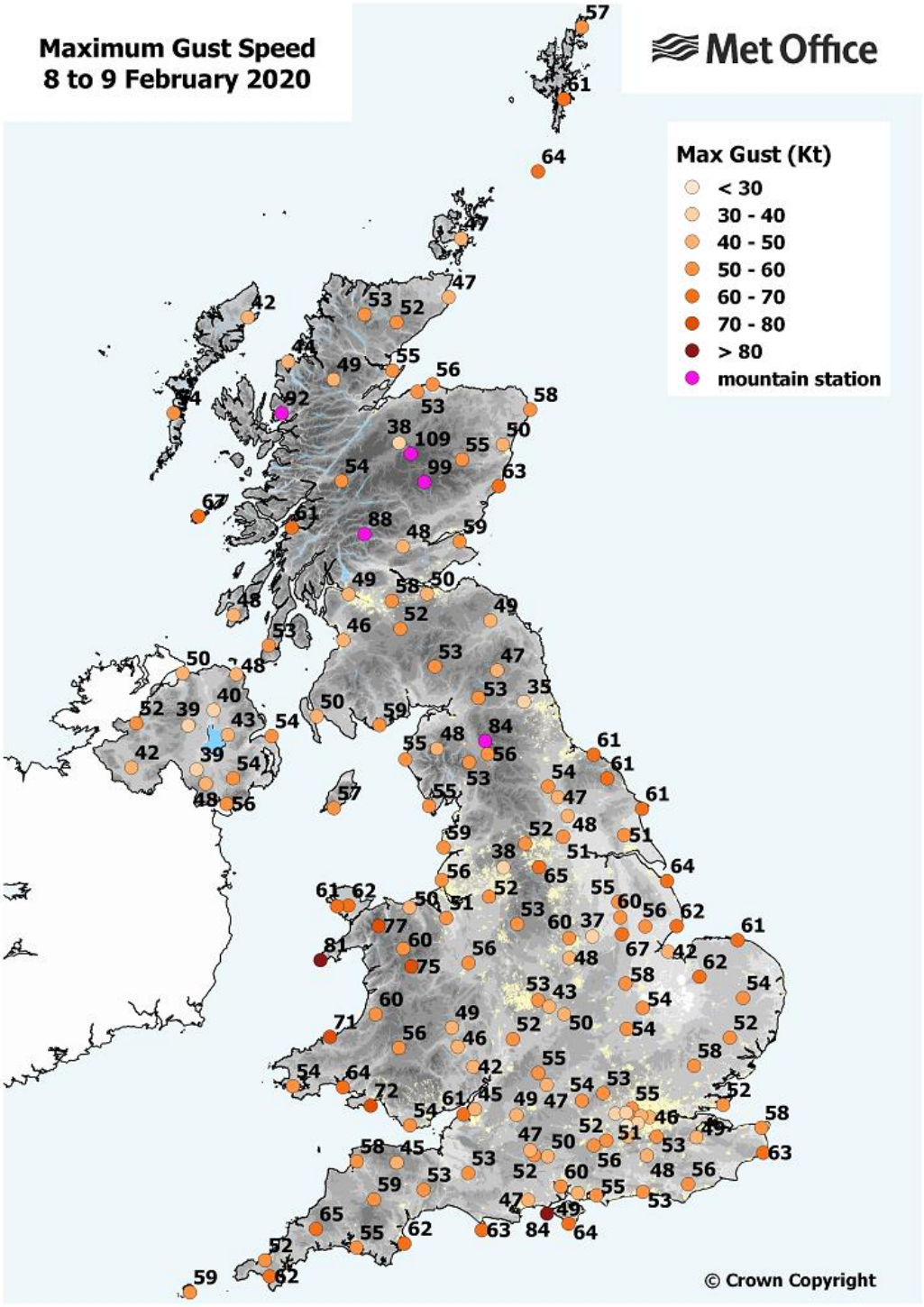
The analysis chart at 18 UTC 8 February 2020 shows frontal systems bringing heavy rainfall across north-western parts of the UK ahead of storm Ciara approaching rapidly from the west.



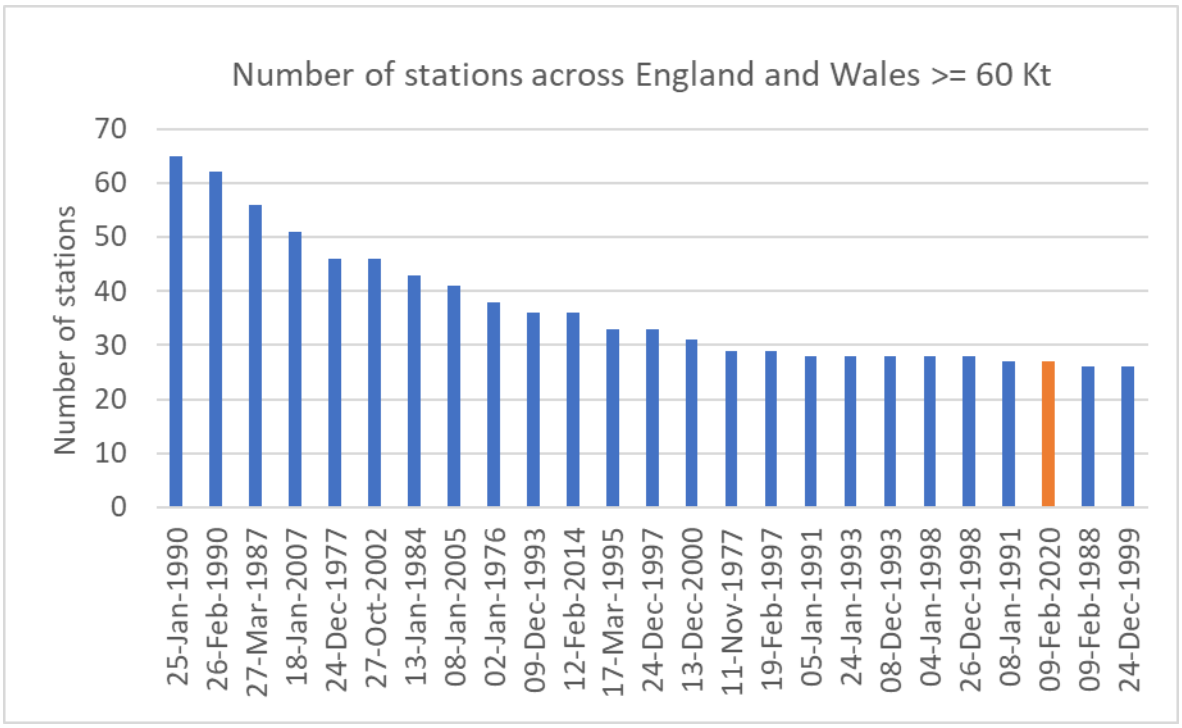
The analysis chart at 12 UTC 9 February 2020 shows the centre of storm Ciara across northern Scotland, driven by a powerful jet stream, with frontal systems and very strong winds sweeping across the UK.



The map below shows maximum gust speeds from storm Ciara. The storm brought winds gusting at over 50Kt (58 mph) across the UK. Gusts of 60 Kt (69 mph) were recorded widely not just around the coast, but also at inland locations, notably North Wales, the south Pennines and parts of Lincolnshire and Norfolk. The highest gusts were 84 Kt (97 mph) at Needles Old Battery, Isle of Wight and 81 Kt (93 mph) at Aberdaron, Gwynedd. Inland gusts included 77 Kt (89 mph) at Capel Curig, Conwy, 75 Kt (86 mph) at Lake Vyrnwy, Powys, 67 Kt (77 mph) at Cranwell, Lincolnshire, 65 Kt (75 mph) at Cardinham, Bodmin, Cornwall and 65 Kt at Emley Moor, West Yorkshire. Winds gusted at over 100 mph across Scotland's mountain summits with 109 Kt (125 mph) on Cairngorm Summit.

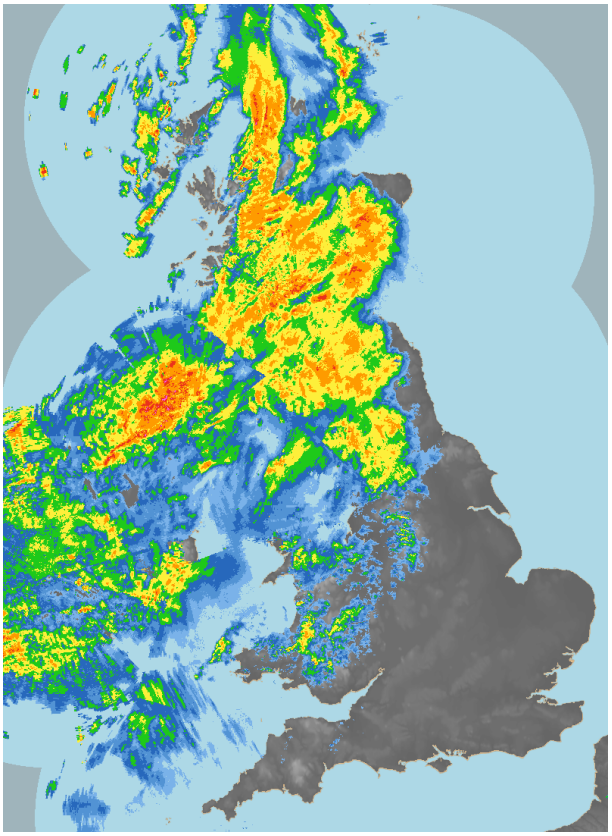


The focus of the strongest winds was across England and Wales. In terms of gusts exceeding 70Kt, this was the most significant storm across England and Wales since storm Doris on 23 February 2017 (which locally brought gusts of 60 to 70Kt or more in a swathe from Snowdonia to Norfolk). However, around 25 stations across England and Wales recorded gusts exceeding 60 Kt on 9 February 2020 compared to 15 stations for storm Doris and by this metric Ciara was the most severe storm to affect England and Wales since 12 February 2014. The significance of a storm when making historical comparisons such as this will inevitably vary depending on the basis for this comparison (location, spatial extent, severity, duration).

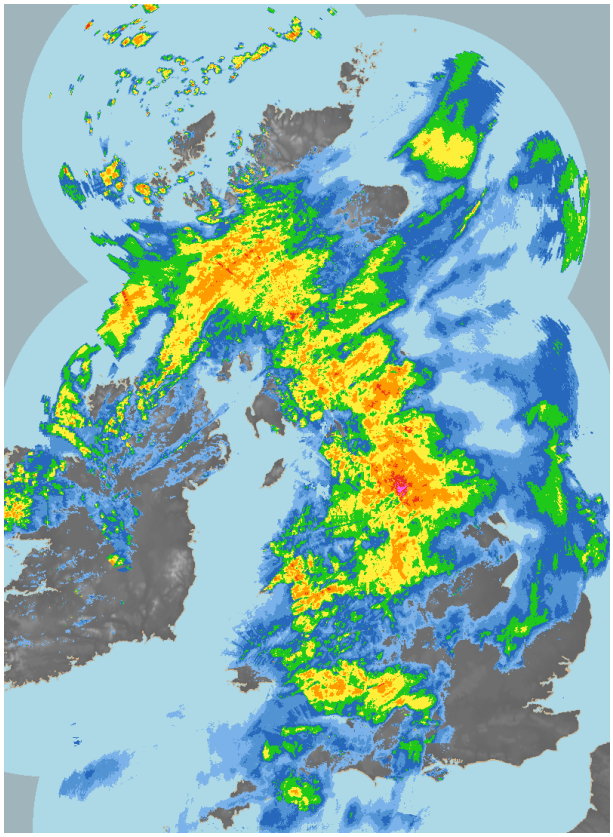


The sequence of rain-radar images at 6-hourly intervals shows sustained heavy rainfall across north-western parts of the UK ahead of storm Ciara. This fell as snow across the high ground of Scotland. The fronts from Ciara then pushed south-east across England and Wales.

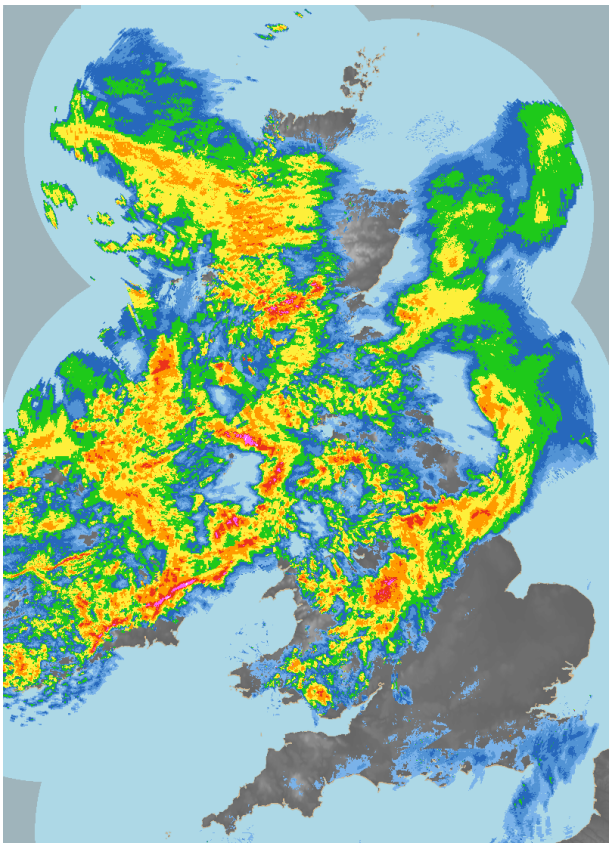
a) 1800 UTC 8 February 2020



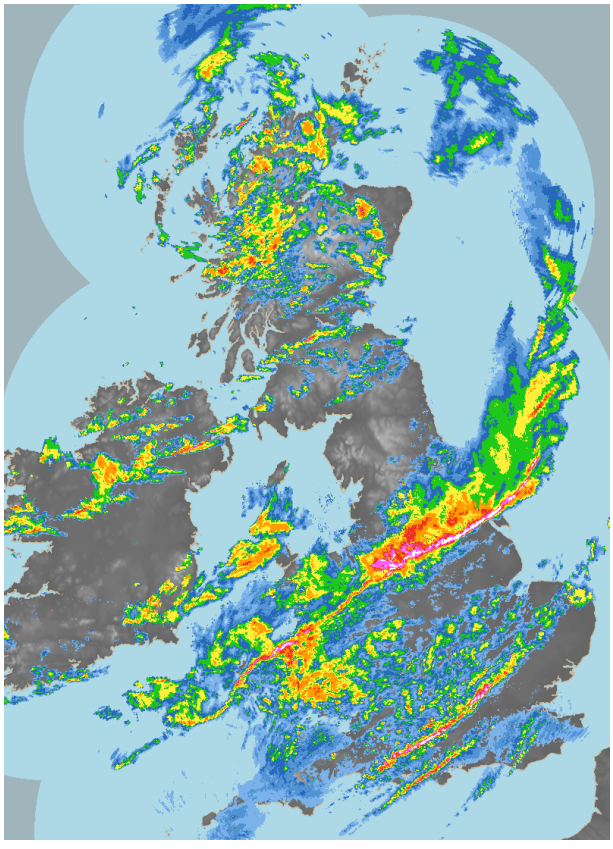
b) 0000 UTC 9 February 2020



c) 0600 UTC 9 February 2020

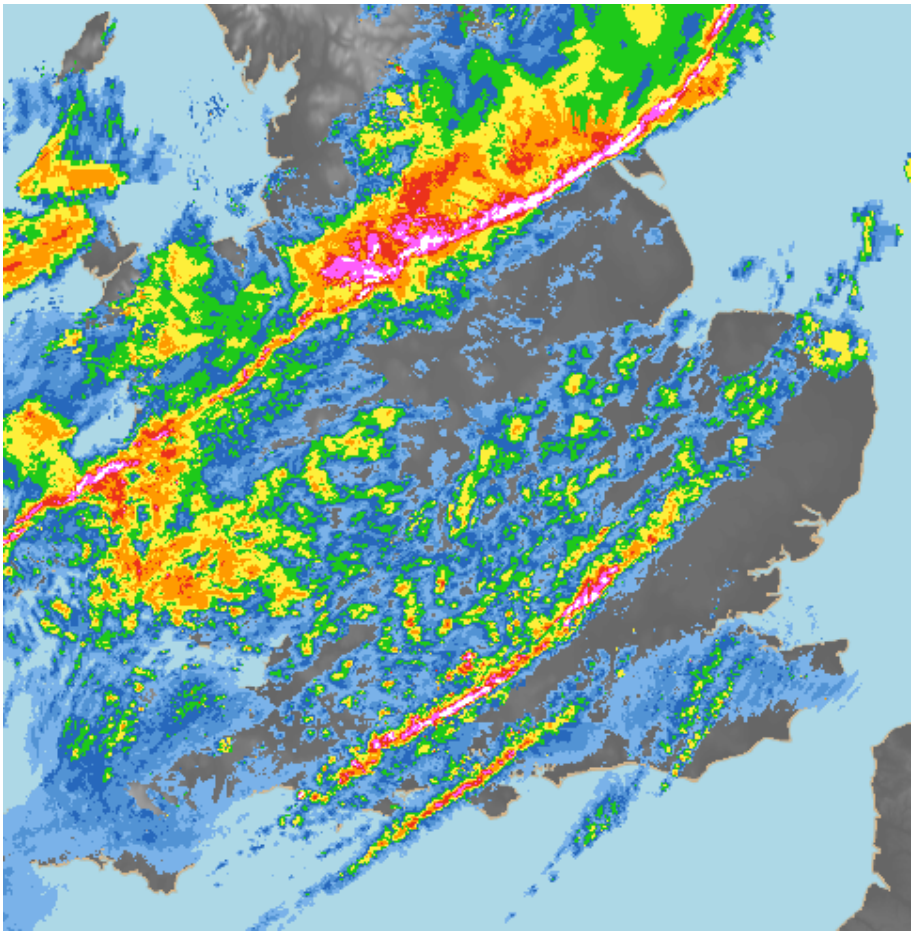


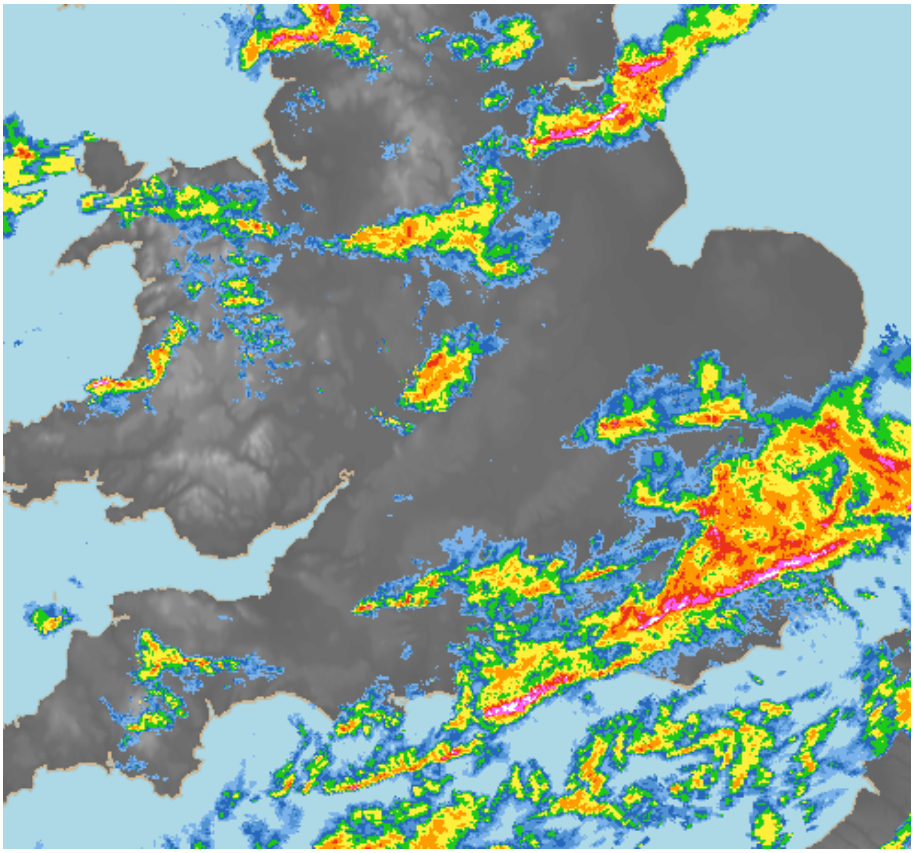
d) 1200 UTC 9 February 2020



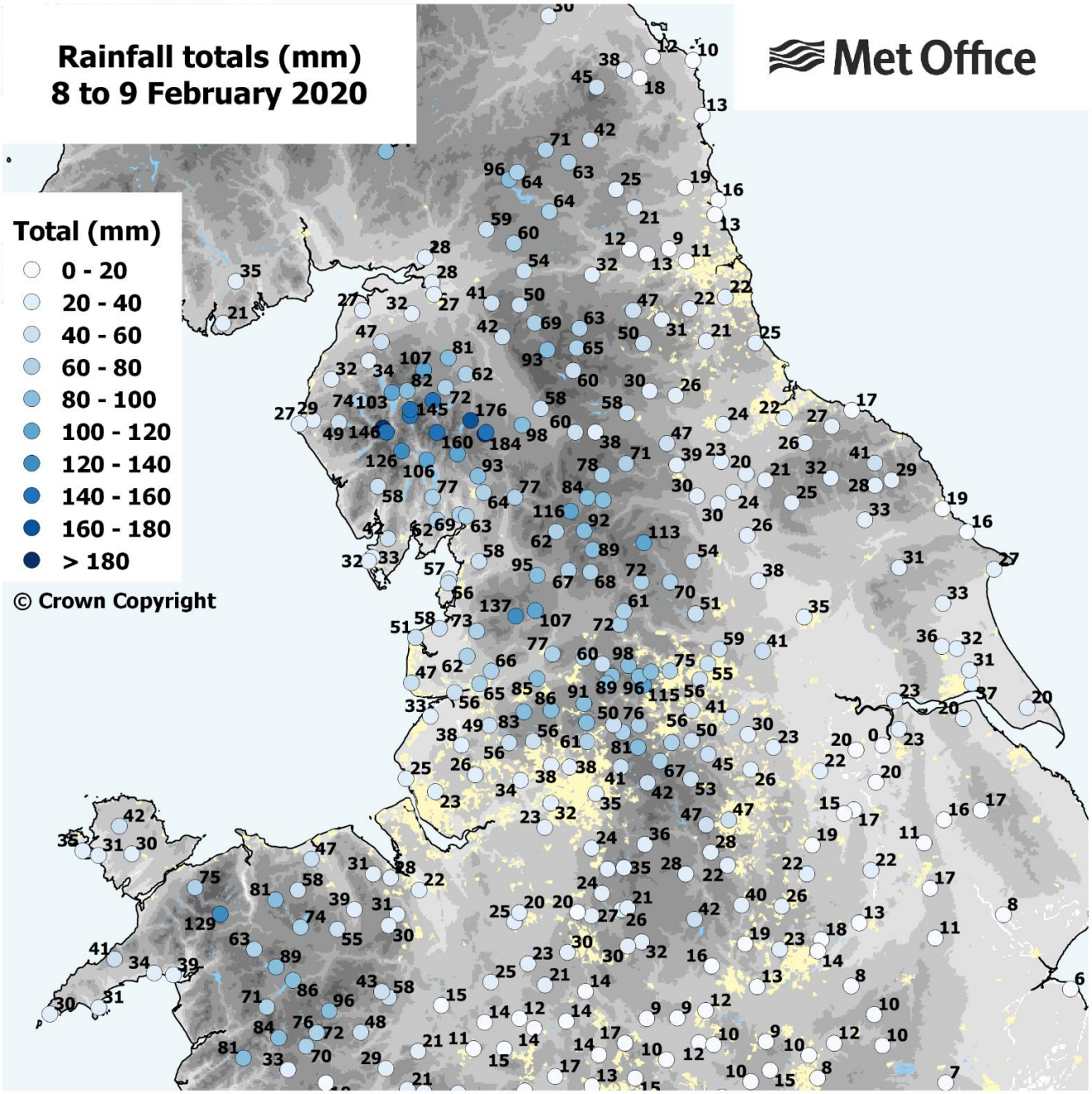
The rain-radar images below show the bands of intense rainfall with rain-rates exceeding 32mm/hour. These were associated with some extremely strong wind gusts, with the fronts finally clearing the south-east during the evening of 9 February.

a) 1200 UTC and b) 1800 UTC 9 February 2020

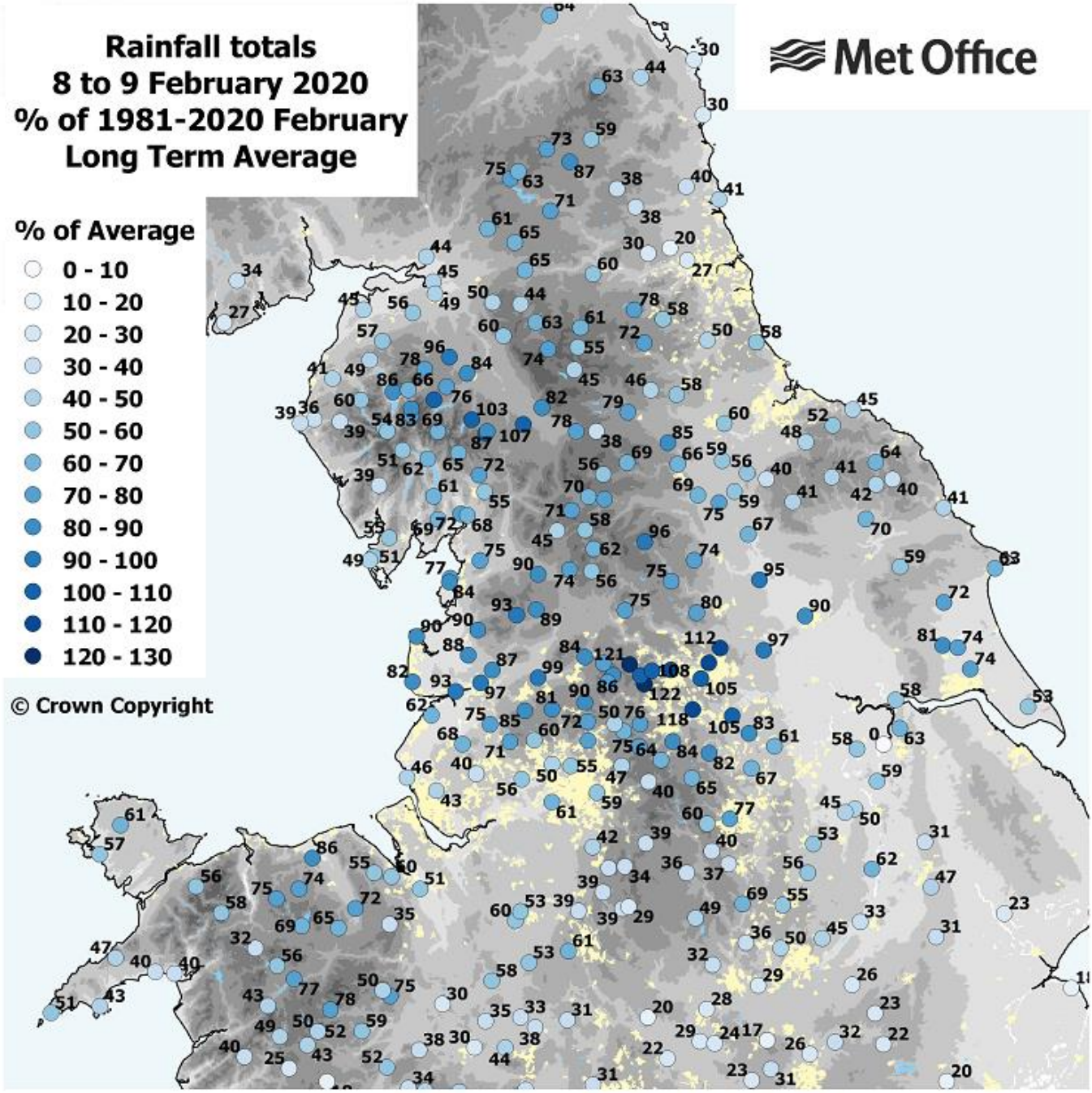




The map below shows rainfall totals for 8 to 9 February 2020 (0900 UTC 8th to 0900 UTC 10th). 100 to 150mm of rain fell across the Lake District fells with a few locations up to 180mm. Across Snowdonia and the Pennines totals exceeded 80mm fairly widely with a few locations here also exceeding 100mm. This rain fell over an 18-hour period from around 1800 UTC on 8th to 1200 UTC on 9th with rain-rates typically around 5mm per hour (but up to 10mm per hour in the wetter locations).



The map below shows rainfall totals for 8 to 9 February 2020 (0900 UTC 8th to 0900 UTC 10th) as a percentage of the 1981-2010 February long term average. 50 to 75% or more of the February long-term average rain fell widely across Snowdonia and the Pennines during this event – mainly in 18 hours. The whole-month average or more fell in a few locations, notably around Kendal and the areas worst affected by flooding in West Yorkshire, with ten stations exceeding 100%.



Several long-running stations recorded their wettest February day. Examples included Eskdalemuir, Dumfriesshire (79.4mm, 109 years), Newton Rigg, Cumbria (50.2mm, 98 years), Auchincruive, Ayrshire (39.4mm, 81 years), Edinburgh Royal Botanic Garden (34.4mm, 78 years) and Kielder Castle (86.8mm, 65 years).

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Met Office