

## **Storm Éowyn, 24 January 2025**

**Storm Éowyn, the fifth storm of the 2024/2025 season so far, hit the UK in late January. Northern Ireland and Scotland's Central Belt experienced the brunt of this storm with winds gusting widely at well over 70Kt (81mph), and in places over 80Kt (92mph). The highest wind gust in the UK was 87Kt (100mph) at Drumalbin, Lanarkshire. The Met Office issued a red warning for wind, meaning danger to life, with a wider amber warning area covering the northern half of the UK. Overall, this was the UK's most powerful wind storm for over a decade, and for Northern Ireland the most significant since the Boxing Day Storm of 26 December 1998. A weather station on Tiree, Inner Hebrides, recorded the UK's lowest pressure reading since storm naming was introduced in autumn 2015.**

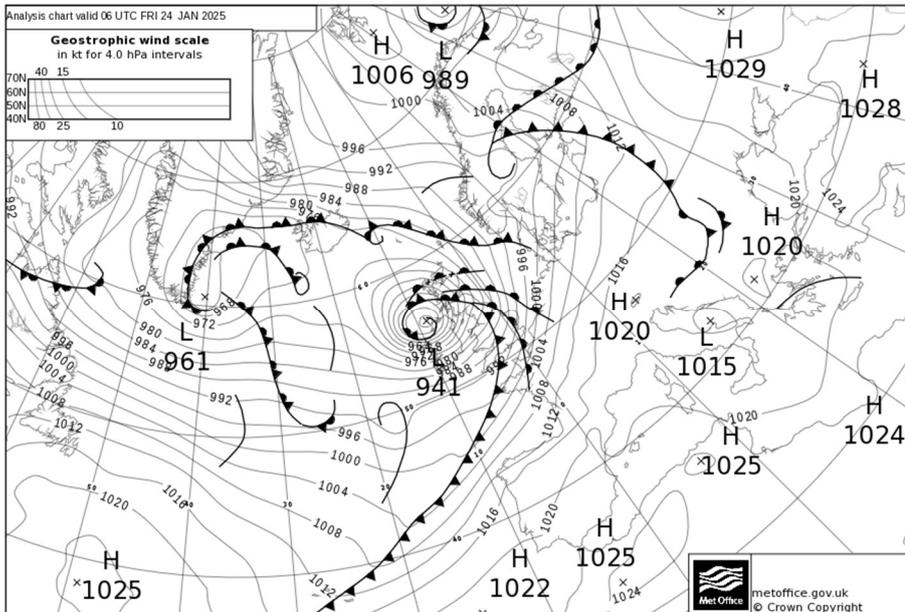
### **Impacts**

In the red warning area, including all of Northern Ireland and Scotland's Central Belt, members of the public were advised to stay at home and all schools were closed. The storm caused significant transport disruption. Trunk roads were closed, all rail services halted in Scotland and the West and East Coast Main Lines closed. A section of the M9 was closed in both directions and part of the A1 closed due to overturned vehicles. Ferry services and over 1000 flights were reported to be cancelled, and some shops and supermarkets were closed.

Around a million homes were reported to be without power at the peak of the storm as trees and strong winds brought down power lines – with several thousand remaining without power in Scotland and Northern Ireland for a number of days. There were widespread reports of damage to properties from strong winds, with trees and debris blocking roads and rail lines – ScotRail reported extensive damage to the network including overhead lines. The roof of a leisure centre in Helensburgh was torn off by the strong winds. Huge waves made conditions along the coast extremely dangerous. In Scotland, one fatality was reported in Ayrshire as a result of a falling tree. There was also a fatality reported from the storm in County Donegal, Republic of Ireland from the storm. 15 trees were reported uprooted or broken in Scotland's national botanical collection at the Royal Botanic Garden in Edinburgh, with a further 25 badly damaged.

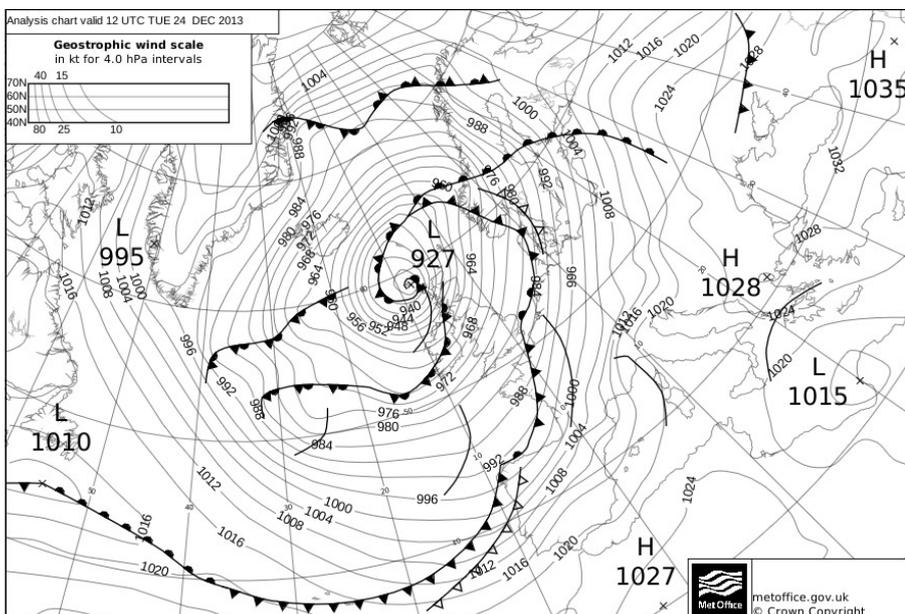
### **Weather data**

The analysis chart at 0600 UTC 24 January 2025 shows Storm Éowyn centred off the coast of County Donegal, with associated fronts swathed across the UK. The exceptionally tight isobars indicating the area with the strongest winds to the south of the low pressure centre. The storm rapidly deepened as it interacted with a powerful jet stream – referred to as 'explosive cyclogenesis'. The central pressure fell by 50hPa within 24 hours, from 991hPa at 0000 UTC 23rd to 941hPa at 0000 UTC 24th. This is more than double the formal definition of this term (24hPa in 24 hours). In common with other severe storms such as Isha on 22 January 2024, the jet stream was intensified by a large temperature contrast across the North American continent. Much of the United States experienced severe winter weather in early January with a cold plunge of air moving southwards.

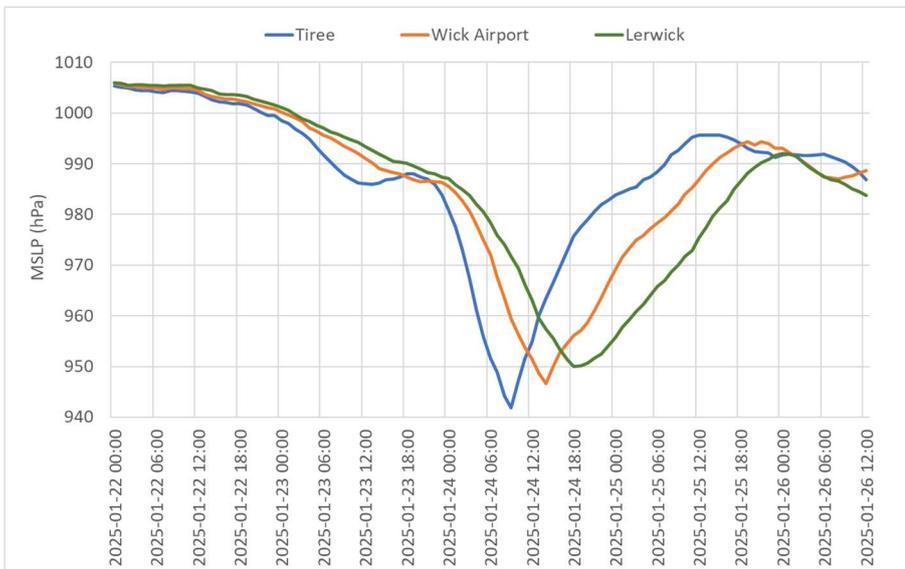


This was an exceptionally deep low pressure system. During storm Éowyn, the lowest pressure recorded was 941.9hPa on the Isle of Tiree, Inner Hebrides, the UK's lowest value since 936.8hPa on 24 December 2013 at Stornoway Airport, Western Isles - and since storm naming was introduced in autumn 2015. The latter was UK's lowest pressure recorded since 1886 (Burt, 2007).\* The analysis chart at 1200 UTC 24 December 2013 shows this low pressure system for comparison, with a central pressure of 927hPa.

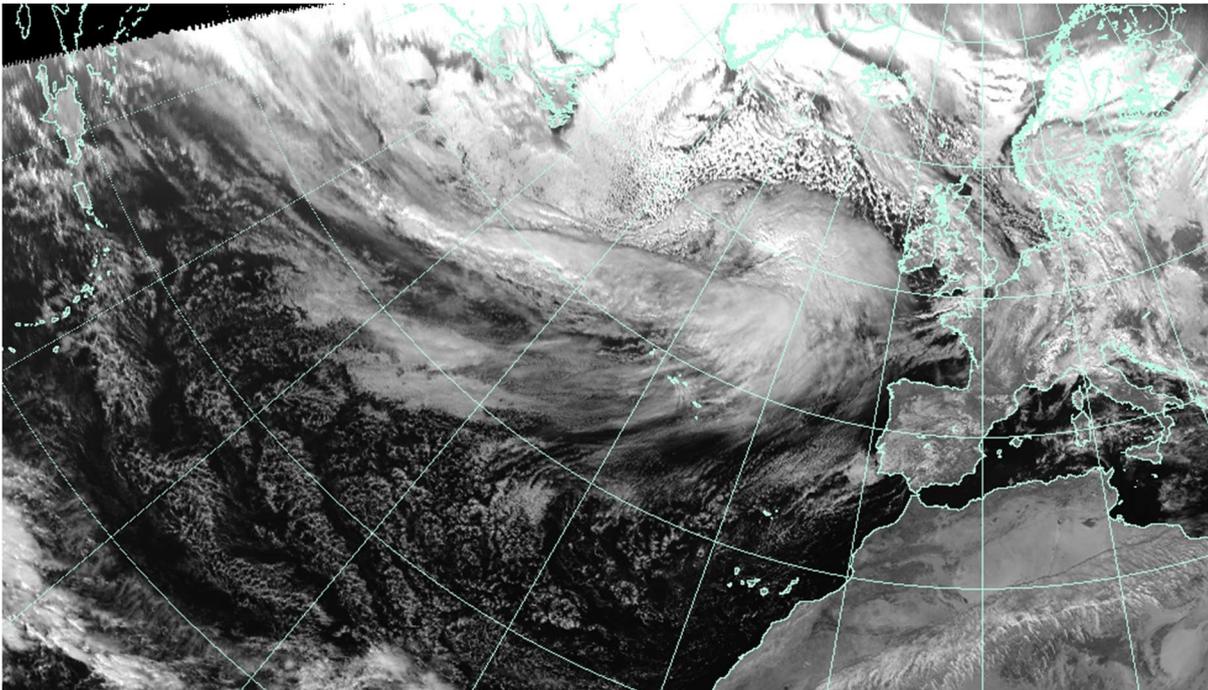
\* Burt, 2007: The Lowest of the Lows ... extremes of barometric pressure in the British Isles, part 1 - the deepest depressions. *Weather*, 62, pp. 4-14



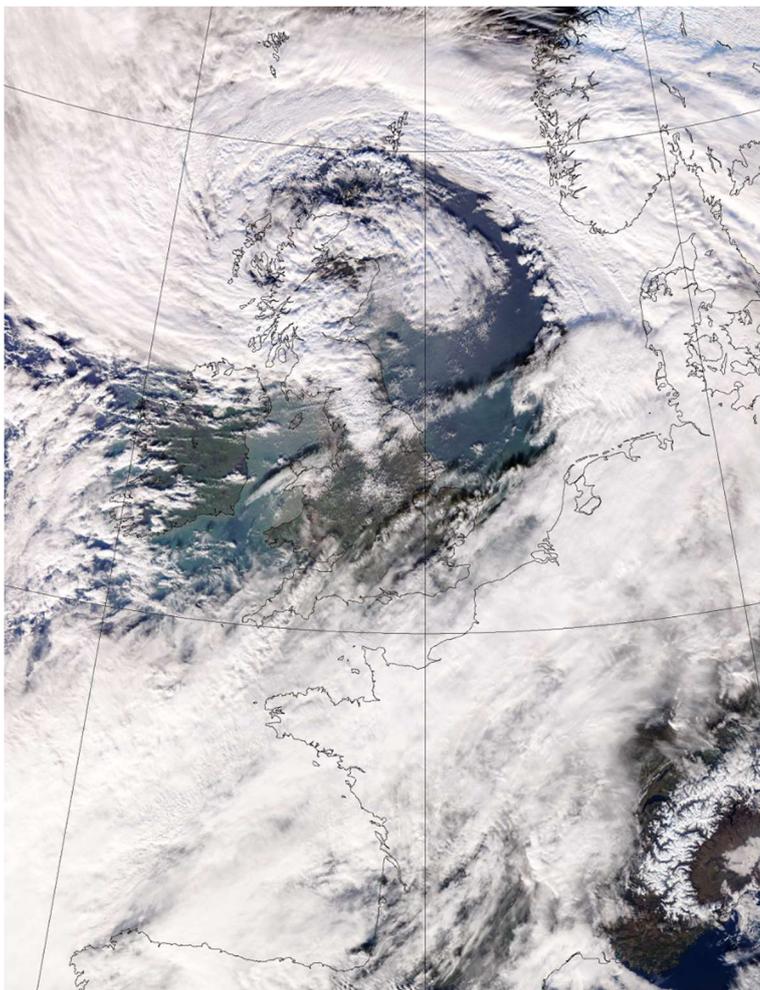
The chart below shows hourly mean sea level pressure at Tiree, Wick Airport (Caithness) and Lerwick (Shetland), illustrating the north-easterly track of storm Éowyn. The strongest winds tend to coincide with the steepest pressure gradient. The time of the lowest pressure was at 0900 UTC, 1400 UTC and 1800 UTC on 24th at each of these respective stations as the storm moved through.



The visible satellite image on 23 January 2025 shows Storm Éowyn in the eastern Atlantic rapidly approaching the UK. Image copyright Met Office / NOAA / NASA.



The visible satellite image on 24 January 2025 shows fronts from Storm Éowyn clearing much of the UK into the North Sea, with a well-defined clear slot behind. The low pressure is centred over northern Scotland with the strongest winds across Northern Ireland and Scotland's Central Belt. Image copyright Met Office / NOAA / NASA.



The image below shows the Met Office Shipping Forecast issued on 23 January 2025 for the area of Shannon, immediately south-west of Ireland. The forecast hurricane forecast winds (sustained winds of over 64Kt (74mph) and phenomenal sea state (peak to trough significant wave height 14.0m or more) are each at the top of their respective scales, illustrate the exceptional severity of this storm.

## Shannon

### GALE WARNING

Issued: 03:53 (UTC) on Thu 23 Jan 2025

Westerly gale force 8 increasing severe gale force 9 soon, then hurricane force 12 later

### WIND

West backing south, 7 to severe gale 9, becoming cyclonic storm 10 to hurricane 12 later.

### SEA STATE

Very rough, becoming very high or phenomenal later.

### WEATHER

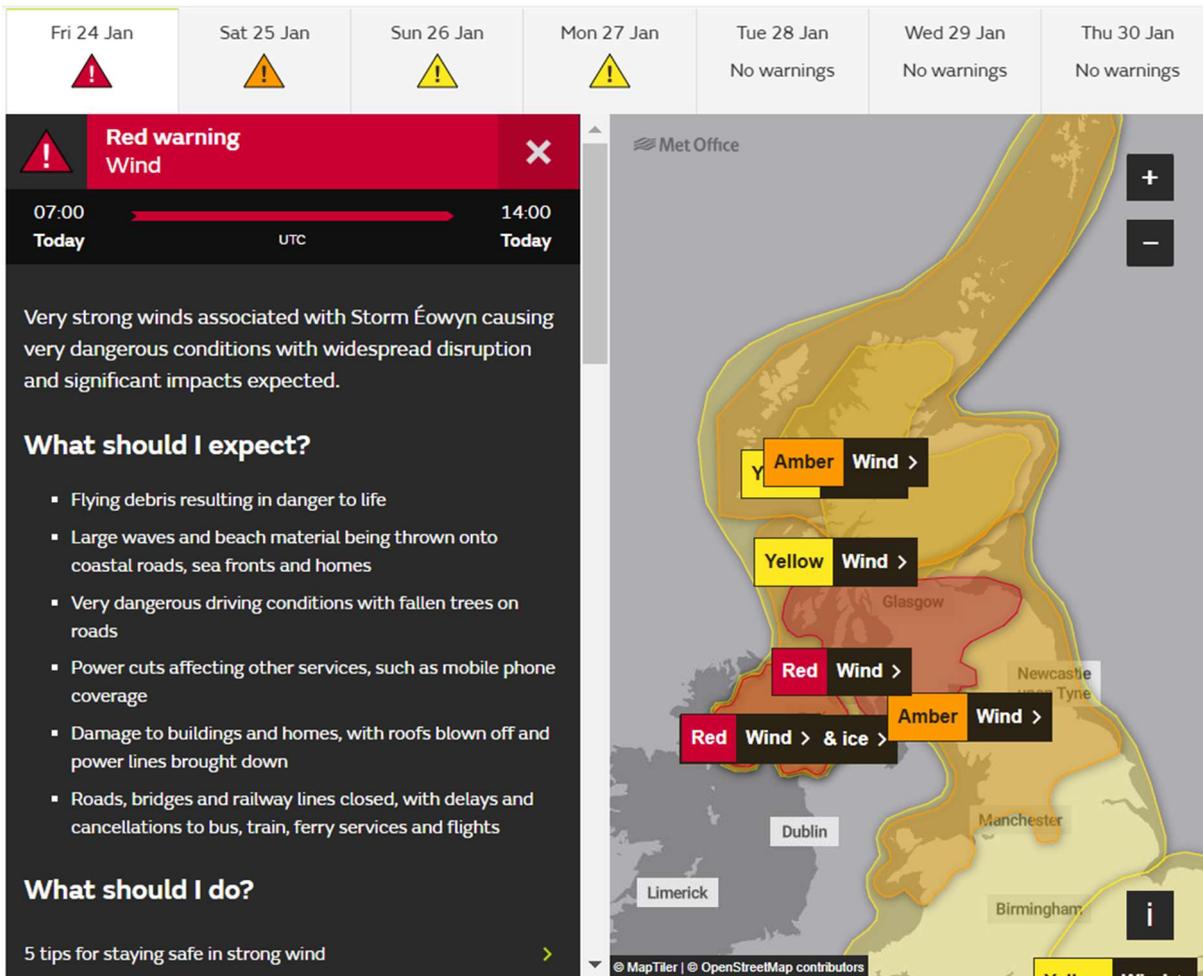
Rain or squally showers.

### VISIBILITY

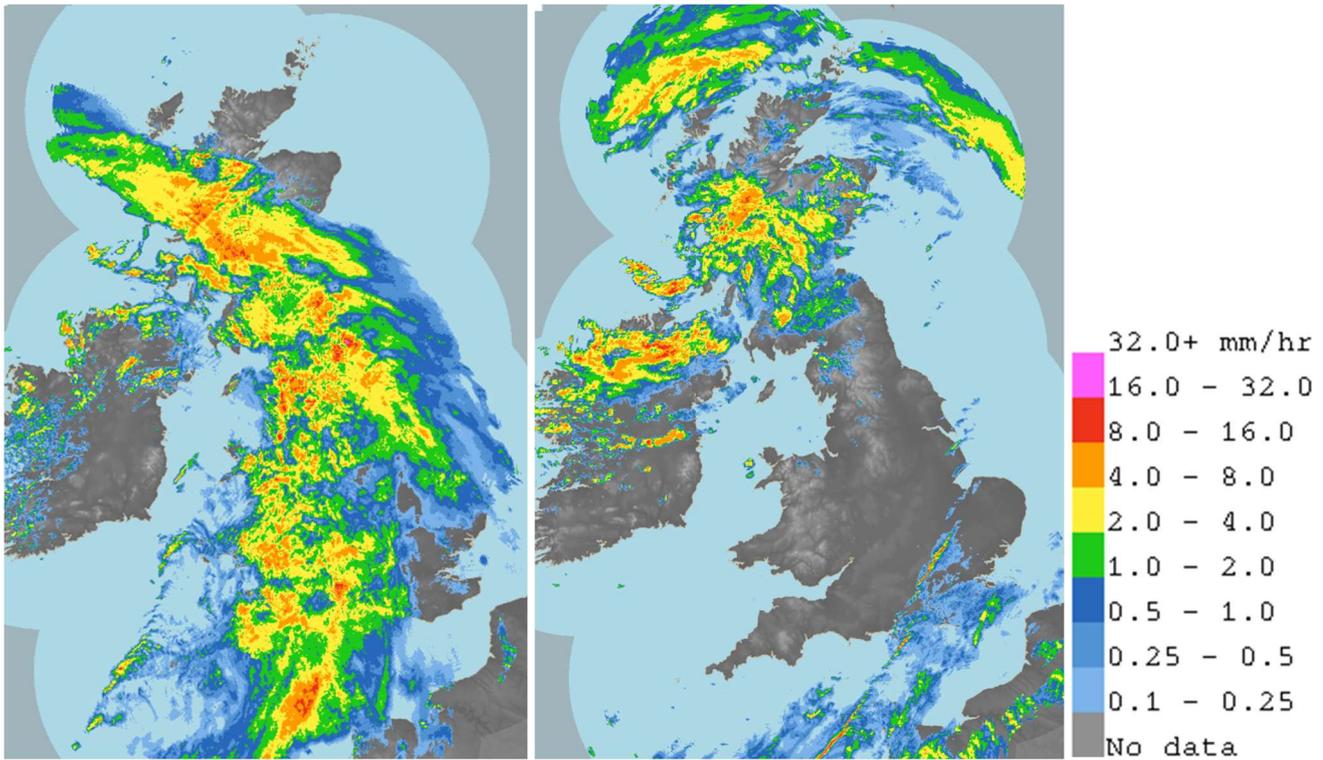
Good, occasionally poor.

The image below shows the Met Office warning areas for Storm Éowyn on 24 January 2025. The red warning area covered Northern Ireland, Scotland's Central Belt and much of south-west Scotland, with amber warnings extending across the northern half of the UK. This red warning came only seven weeks after a previous red warning for wind for Storm Darragh in early December 2024; the last red warning for Scotland was from Storm Isha in January 2024. Red

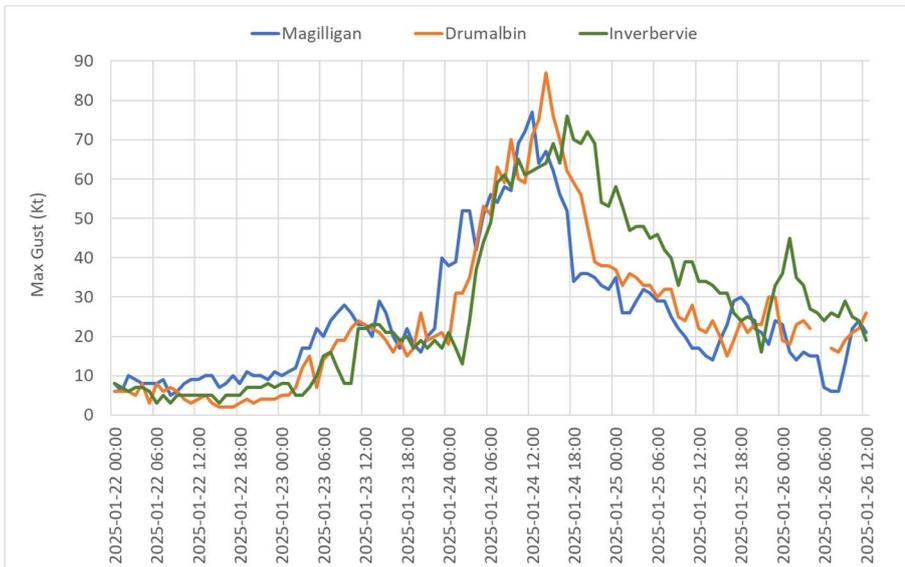
warnings were also issued by the Met Éireann, the Irish National Meteorological Service, and the Isle of Man Government.

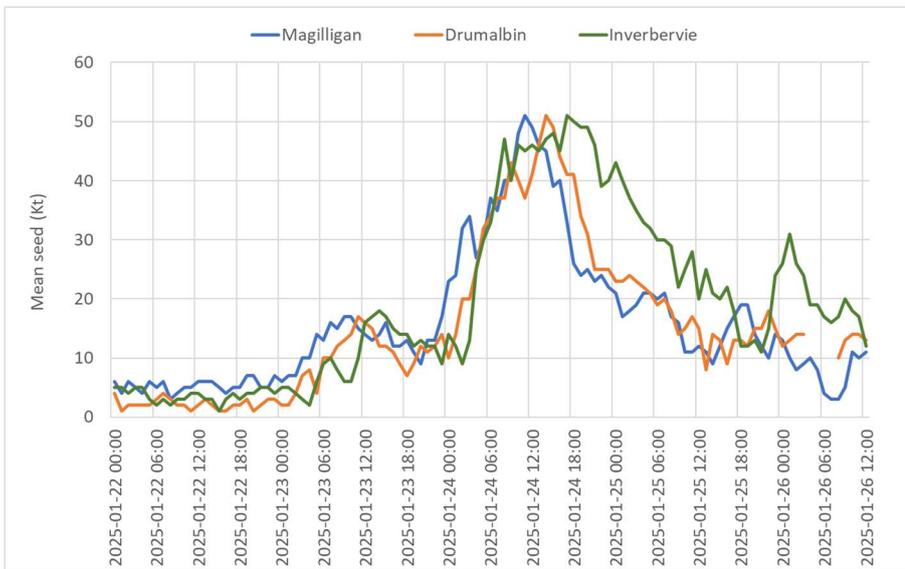


The rain-radar images at 0300 UTC below left show heavy rain across the western half of the UK as fronts from Storm Éowyn swept through. The image at 0800 UTC below right shows heavy rain across central Scotland and Northern Ireland from the occluded front wrapping around the storm centre (over Argyll). While the main impacts from the storm were due to the wind, it also brought some very wet weather with over 50mm of rain falling across western upland areas. From 23 to 24 January, 2-day totals (mostly from storm Éowyn) included for example 82.4mm at Achnagart (West Highlands), 62.5mm at Holne (Devon - Dartmoor), 57.0mm at Mickleden (Cumbria – Lake District), 54.2mm at Treherbert (mid-Glamorgan – South Wales), and 52.2mm at Bethesda (Gwynedd – Eryri, formerly Snowdonia).



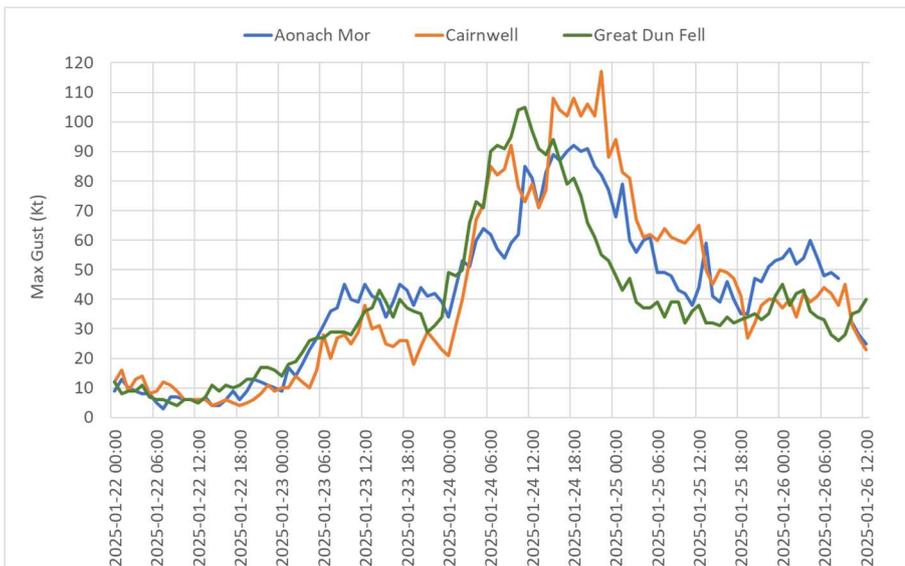
The chart below shows hourly maximum gust speeds at Magilligan (County Londonderry), Drumalbin (Lanarkshire) and Inverberrie (Kincardineshire) as the storm moved through. Numerous stations in the areas most affected by Storm Éowyn recorded gusts of 70 to 80Kt (81 to 92mph) when winds were at their peak strength. The second chart shows hourly mean wind speeds for these three same stations, with the highest hourly mean speeds each over 50Kt (58mph).



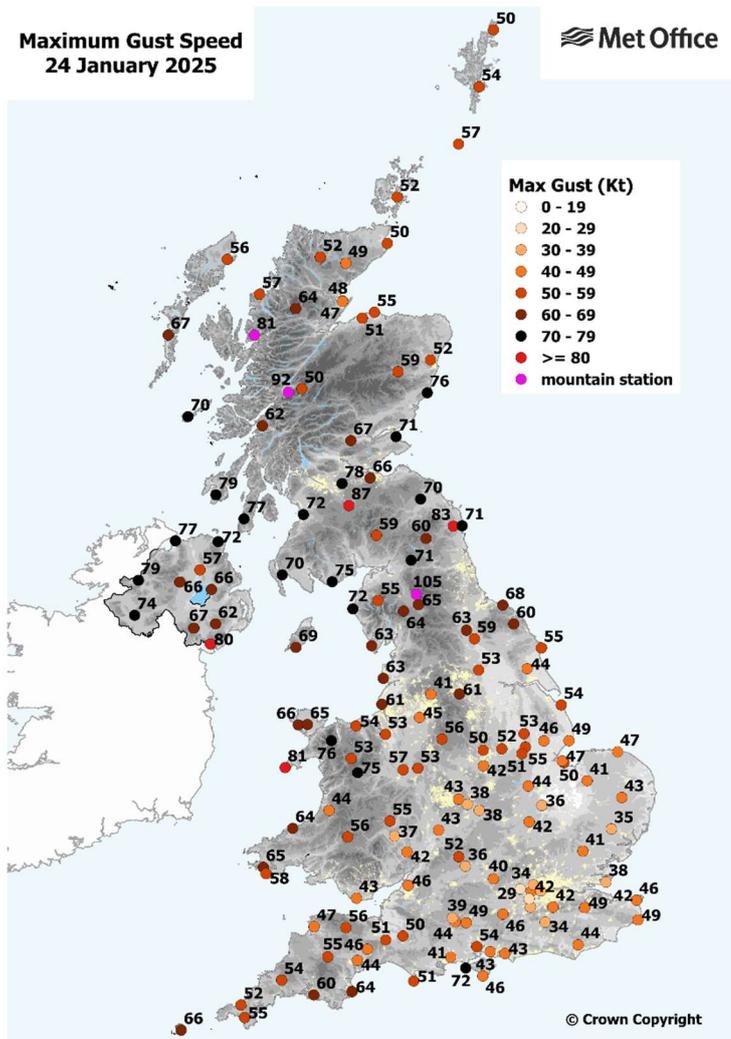


Winds were exceptionally strong across upland areas. The chart below shows hourly maximum gusts at three of the Met Office mountain weather stations: Aonach Mor (Inverness-shire, 1130masl), Cairnwell (Aberdeenshire, 928masl) and Great Dun Fell (Cumbria, 847masl), each recording gusts of 90 to 100Kt or more (104 to 115mph). The highest gust recorded at Cairnwell was 117Kt (135mph), while Great Dun Fell recorded an hourly mean wind speed of 84Kt (97mph) in the hour ending at 1100 UTC on 24th, at the peak of the storm.\*

\*It is probable wind gusts at Cairngorm summit exceeded those at Cairnwell but data are unfortunately not available.



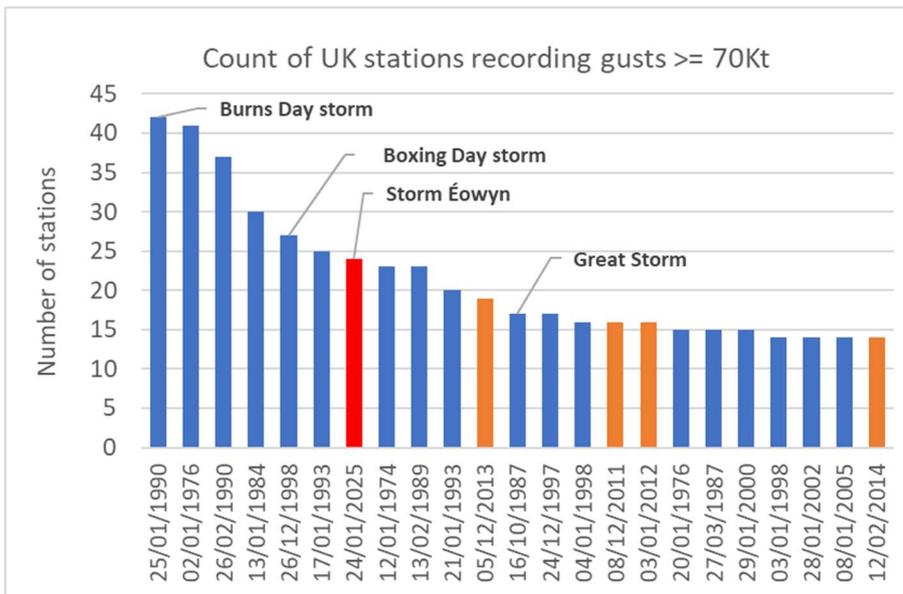
The map below shows maximum gust speeds on 24 January 2025 from Storm Éowyn. Several stations recorded gusts of 80Kt (92mph) or more, including 87Kt (100mph) at Drumalbin, Lanarkshire, 83Kt (96mph) at Brizlee Wood, Northumberland, 81Kt (93mph) at Aberdaron, Gwynedd and 80Kt (92mph) at Killowen, County Down. Around 20 stations further stations recorded 70Kt (81mph) or more in Northern Ireland, central and southern Scotland, northern England, and North Wales.



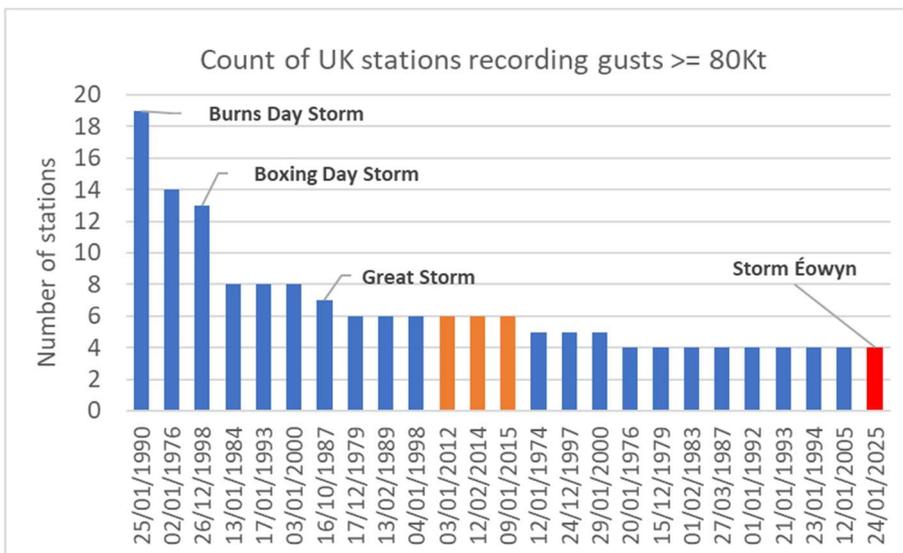
Overall, 15 stations in the UK wind network with 10+ year record lengths set new January maximum gust speed records. In Northern Ireland these included Ballypatrick Forest (County Antrim), Glenanne (County Armagh), Katesbridge and Killowen (both County Down), Castleberg (County Tyrone) and Lough Fea (County Londonderry) – these all having 25+ year records, indicating the severity of the storm across the province. Other stations recorded their highest January maximum gust speed for at least 10 years; for many since 3 January 2012 (the most comparable storm in recent observational records), but in some cases other notable historical storms including 9 January 2015, 8 January 2005 and 17 January 1993.

Highest hourly mean wind speeds included 59Kt (68mph) at Aberdaron, Gwynedd and Brizlee Wood, Northumberland, 55Kt (63mph) at Port Ellen, Isle of Islay (Argyll), 54Kt (62mph) at Dundrennan, Kirkcudbrightshire and 53Kt (61mph) at Machrihanish, Argyll.

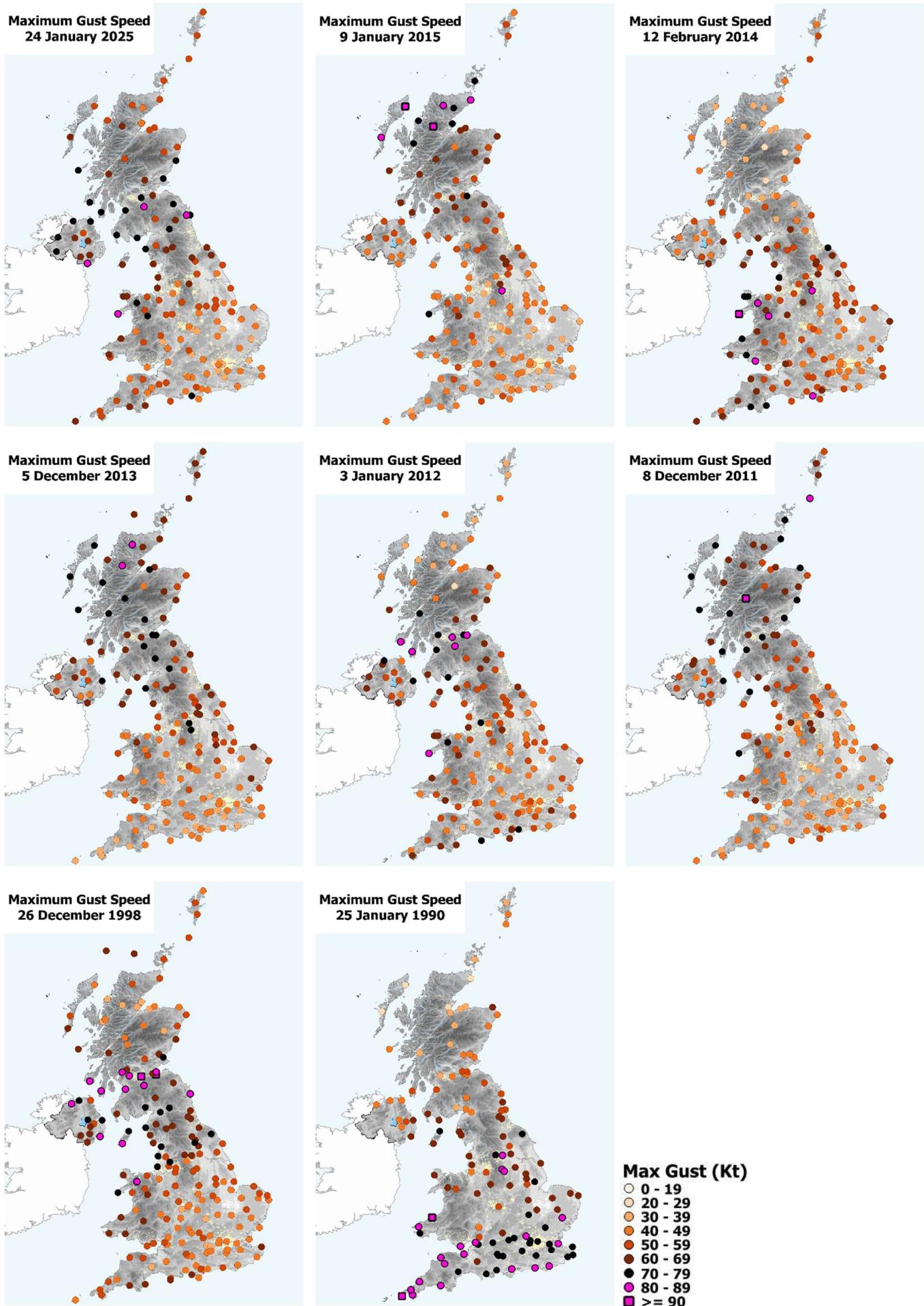
The chart below counts the number of stations in the UK by day with a maximum gust  $\geq 70$ Kt (81mph) in observational records from the early 1970s. The counts are indicative because the station network changes over time and stations may be affected by data outages, particularly during periods of severe weather. Storm Éowyn is shown in red, with other storms since 2010 in orange. Storm Éowyn was one of the most notable wind storms in the UK in the 21st century so far in terms of widespread gusts exceeding this threshold. However, there are much more severe wind storms in the UK's observational record, and this UK-wide metric does not take into account regional detail (for example, 12 February 2014 was more severe across the southern half of the UK).



The chart below repeats the analysis for counts >= 80Kt (92mph), with other notable storms since 2010 being 8 December 2011, 3 January 2012 and 5 December 2013. In addition to the above dates, for Scotland another fairly recent storm with comparatively similar numbers for 70Kt was 9 January 2015 (this was much more severe across the far north-west of Scotland (98Kt, 113mph at Stornoway Airport, Western Isles). There is no single definitive measure for the overall severity of a UK storm, but it is reasonable to consider Éowyn as overall the UK's most severe wind storm for over a decade. For Northern Ireland, with widespread gusts of 70 to 80Kt (81 to 92mph), this was the most severe wind storm since Boxing Day 26 December 1998.



The maps below compare maximum gust speeds from Storm Éowyn against some of these other dates, and illustrate how every storm is different in terms of spatial extent and severity. Arguably the most comparable of these storms to Éowyn is 3 January 2012, but with other notable storms affecting Scotland on 9 January 2015, 5 December 2013 and 8 December 2011. However, none of these compare with the Boxing Day storm of 1998 or the Burns Day storm of 1990 – two of the most severe and damaging storms in observational records. Overall, what the observations do clearly show is storms of the severity of Éowyn are to be expected as part of the UK's climate on a reasonably regular basis.



Last updated 30/01/2025