

## Strong winds and heavy rain from storms Ali and Bronagh

Storm Ali brought very strong winds and heavy rain to Scotland and Northern Ireland on 19 September 2018. Storm Bronagh brought further strong winds and very heavy rain across England and Wales overnight 20 to 21 September. The storms tracked rapidly eastward across the UK, driven by a powerful Atlantic jet stream, and continued to deepen as they moved into the North Sea. Storm Ali brought widespread gusts in excess of 60 Kt (69mph) across the north of the UK, making this one of the most notable storms at this time of year in recent decades. Storm Bronagh brought some very wet weather with well over 50mm of rain recorded across upland areas of Wales and the south Pennines. The storms marked an emphatic transition from the fine summer of 2018 to autumn.

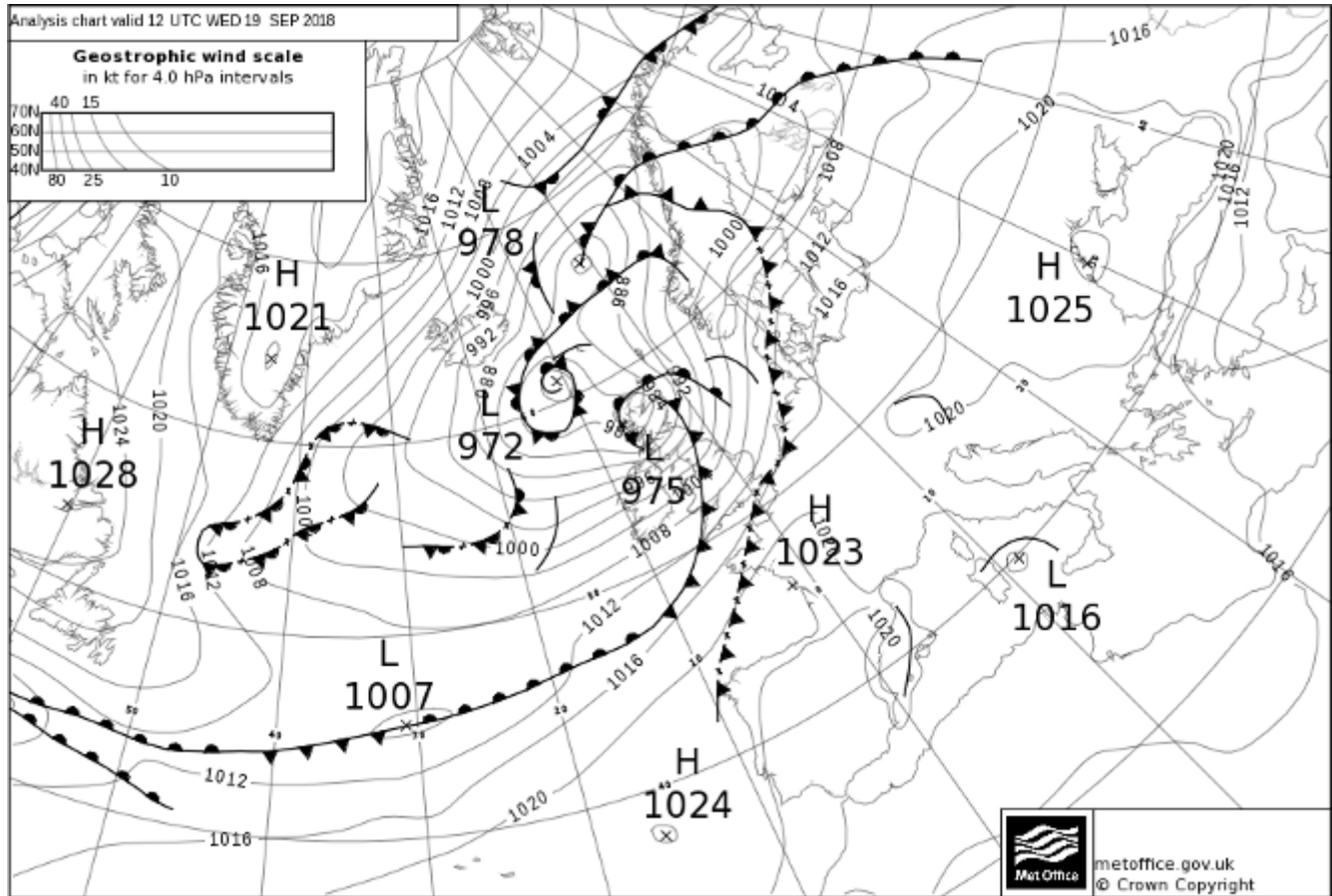
### Impacts

Storm Ali caused extensive power outages and travel disruption in Northern Ireland and Scotland, including the closure of exposed bridges. There were rail cancellations due to fallen trees on the line. Thousands of homes and business in Scotland, Northern Ireland and northern England experienced power outages. There was also damage to buildings and vehicles alongside many fallen trees across the northwest of the UK. Unfortunately, two people lost their lives as a result of the storm, in County Armagh and County Galway (Irish Republic). Five hundred cruise passengers and crew were stranded in Greenock after severe weather broke their ship's mooring lines.

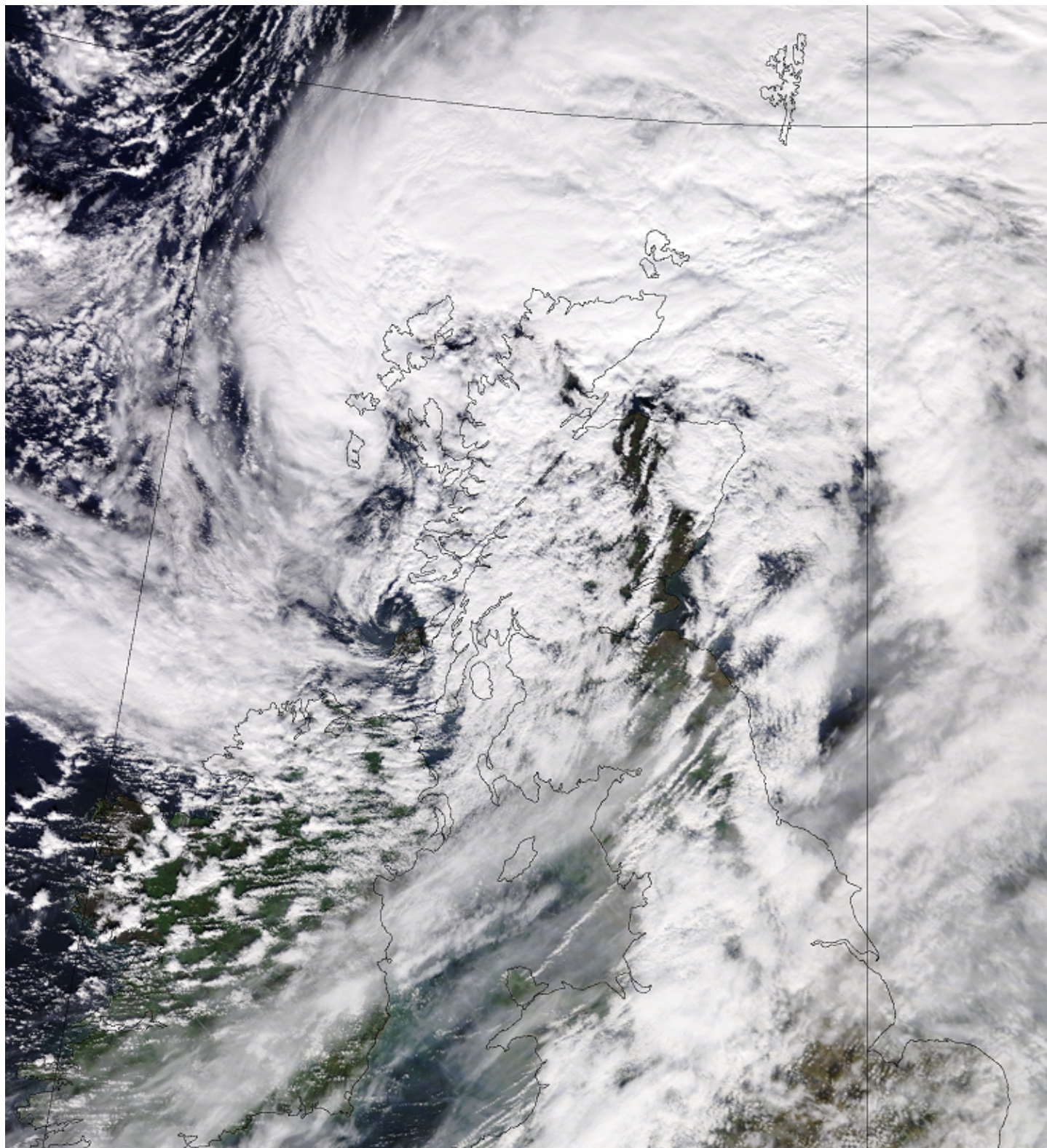
Storm Bronagh brought further travel disruption and localised flooding in the Sheffield area and mid-Wales. Ferry services from Holyhead to Dublin and some flights from Cardiff Airport were cancelled, while debris and fallen trees blocked some roads and railway lines. The following links from BBC news provide some indication of impacts experienced through this period.

# Weather data

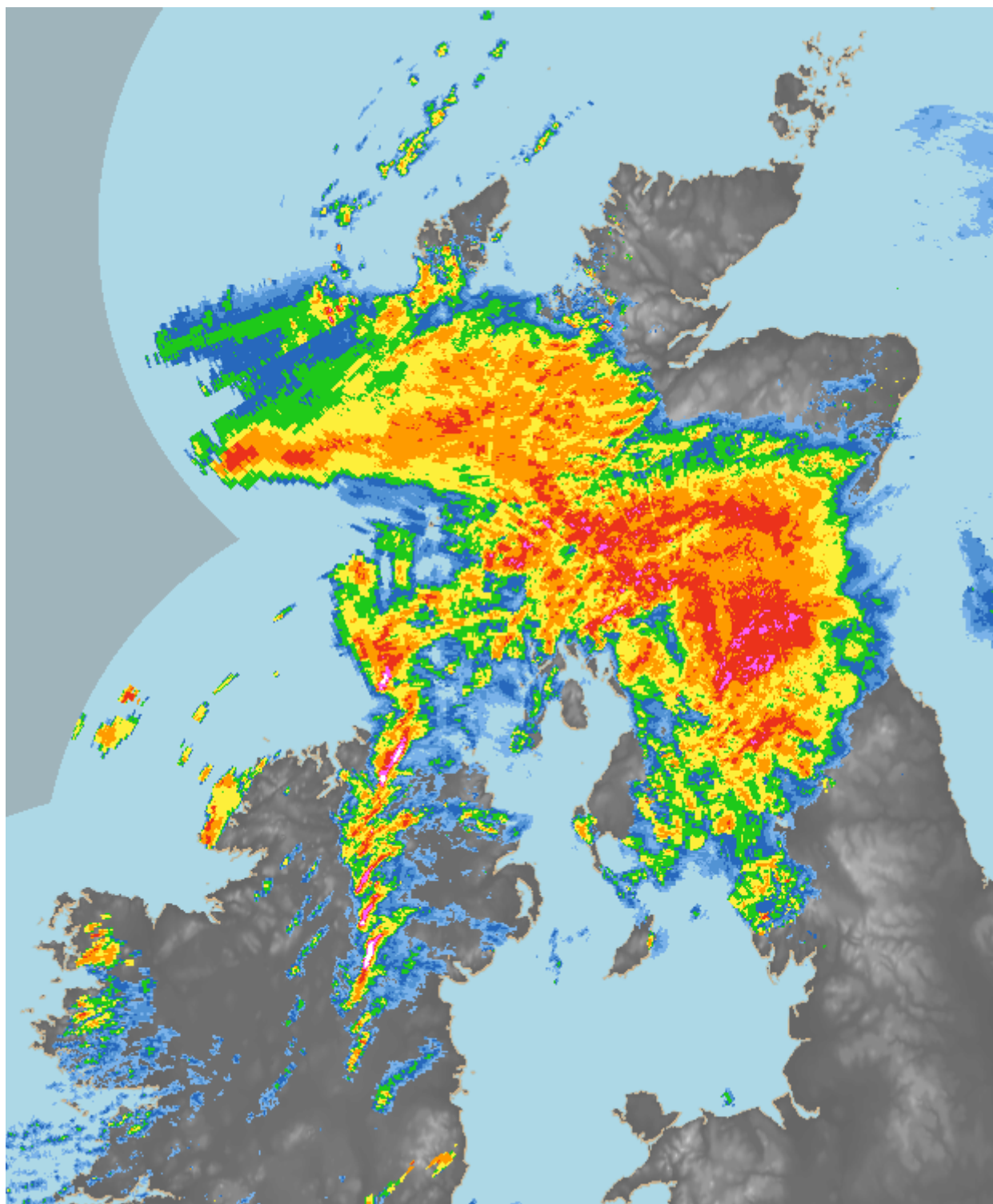
The analysis chart at 1200 UTC 19 September 2018 shows storm Ali and associated fronts tracking rapidly eastward across the UK. The low's centre continued to deepen as it moved toward Shetland and Norway.



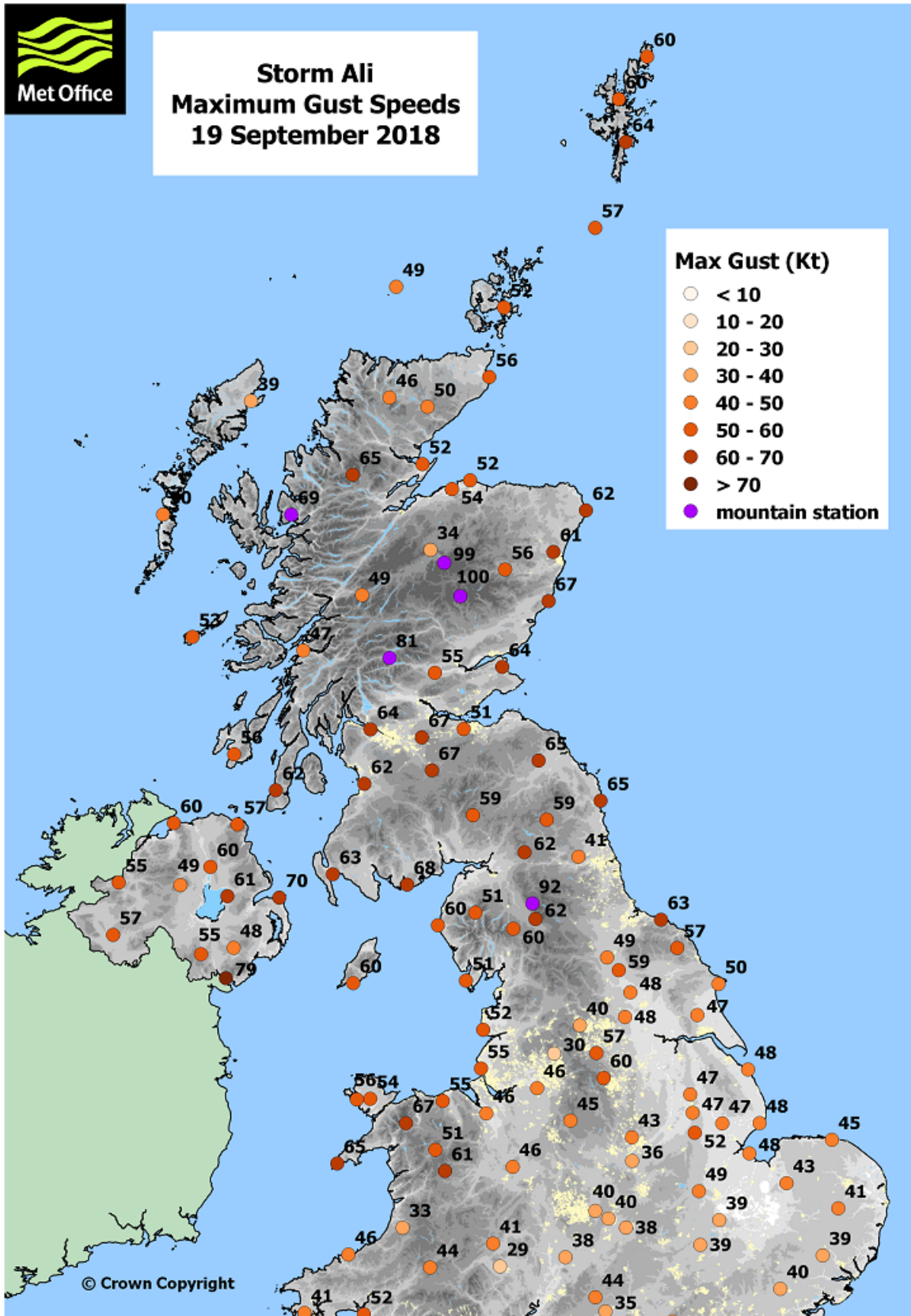
The satellite image on 19 September 2018 shows a swirl of cloud associated with the centre of storm Ali across northern Scotland. Image copyright Met Office / NOAA / NASA



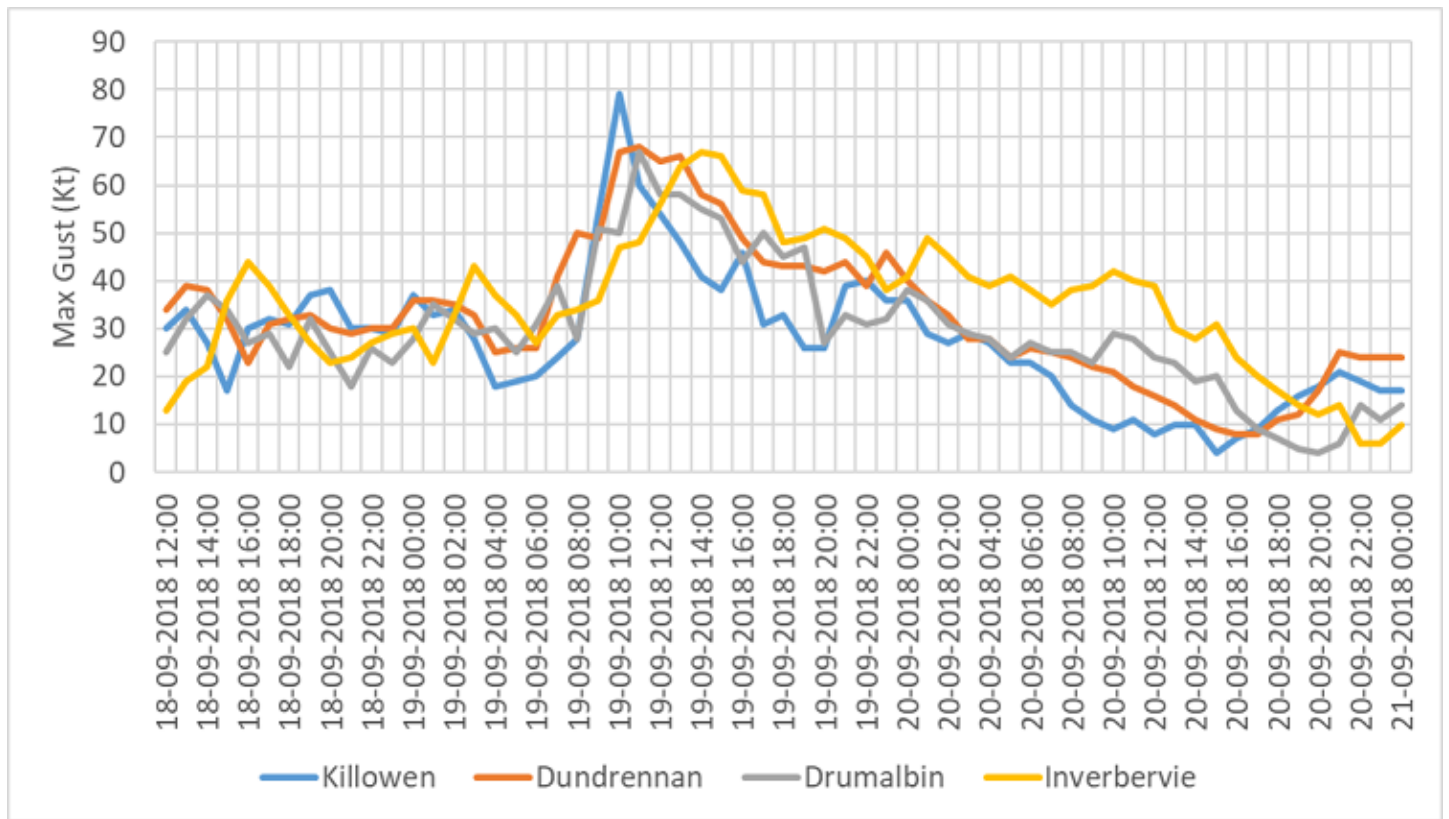
The rain-radar image at 0800 UTC 19 September 2018 shows widespread heavy rain associated with storm Ali across much of Scotland, with bands of intense rainfall also affecting Northern Ireland. Parts of Highland Scotland recorded over 50mm of rain, for example 66.6mm at Cluanie Inn from 0900 UTC 19 to 0900 UTC 20 September.



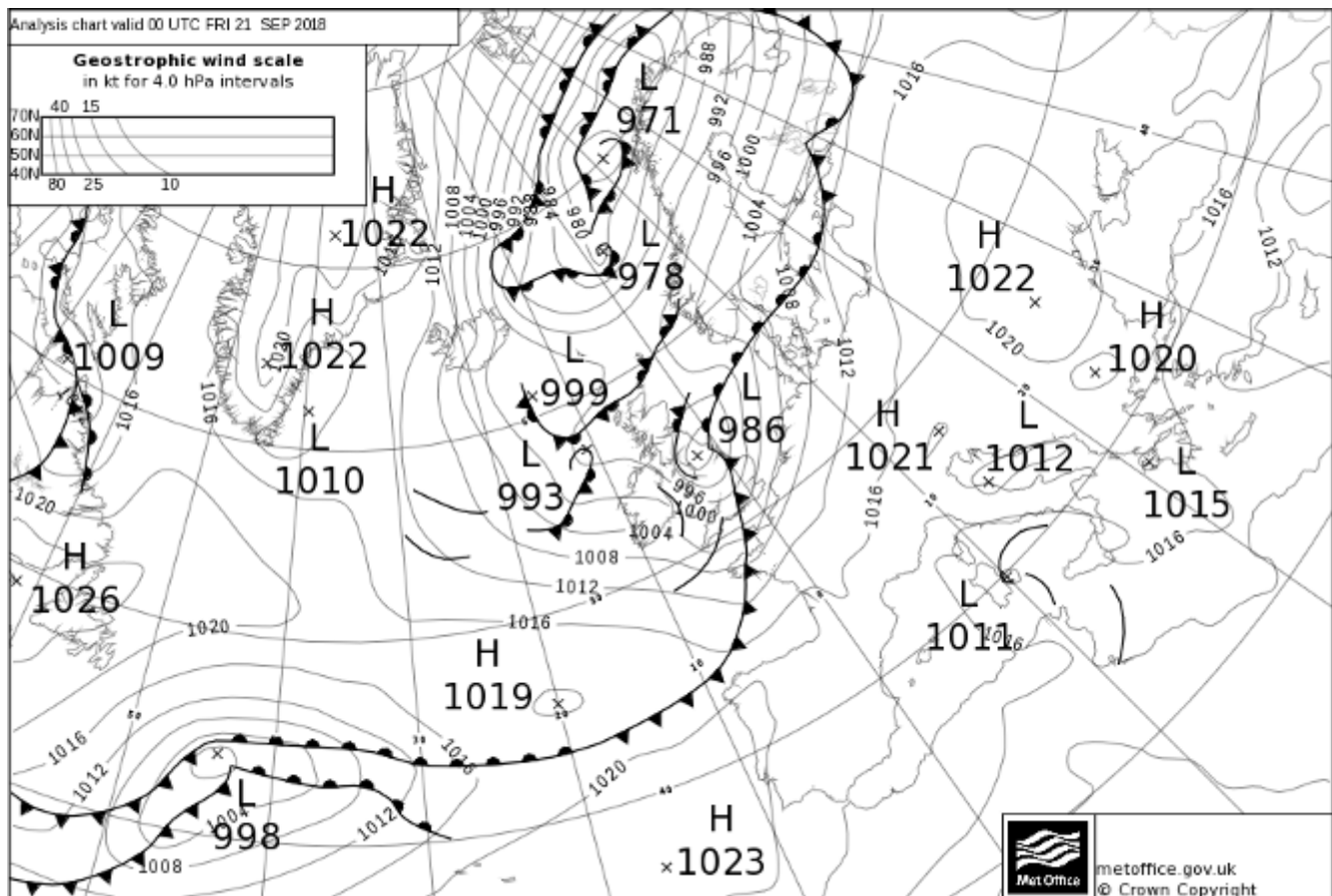
The map below shows maximum gust speeds from storm Ali. The strongest winds in excess of 60 Kt were in a swathe across Northern Ireland, southern, central and eastern Scotland. Killowen (County Down) recorded 79 Kt (91 mph) and gusts across Scotland's Central Belt were typically around 65 Kt (75 mph). Maximum gusts were 50 to 60 Kt (58 to 69 mph) across northern England and Wales with 67 Kt (77 mph) at Capel Curig (Conwy) and 63 Kt (72 mph) at Loftus (Cleveland). Across the mountain summits of Scotland and northern England, winds gusted at over 87 Kt (100 mph).



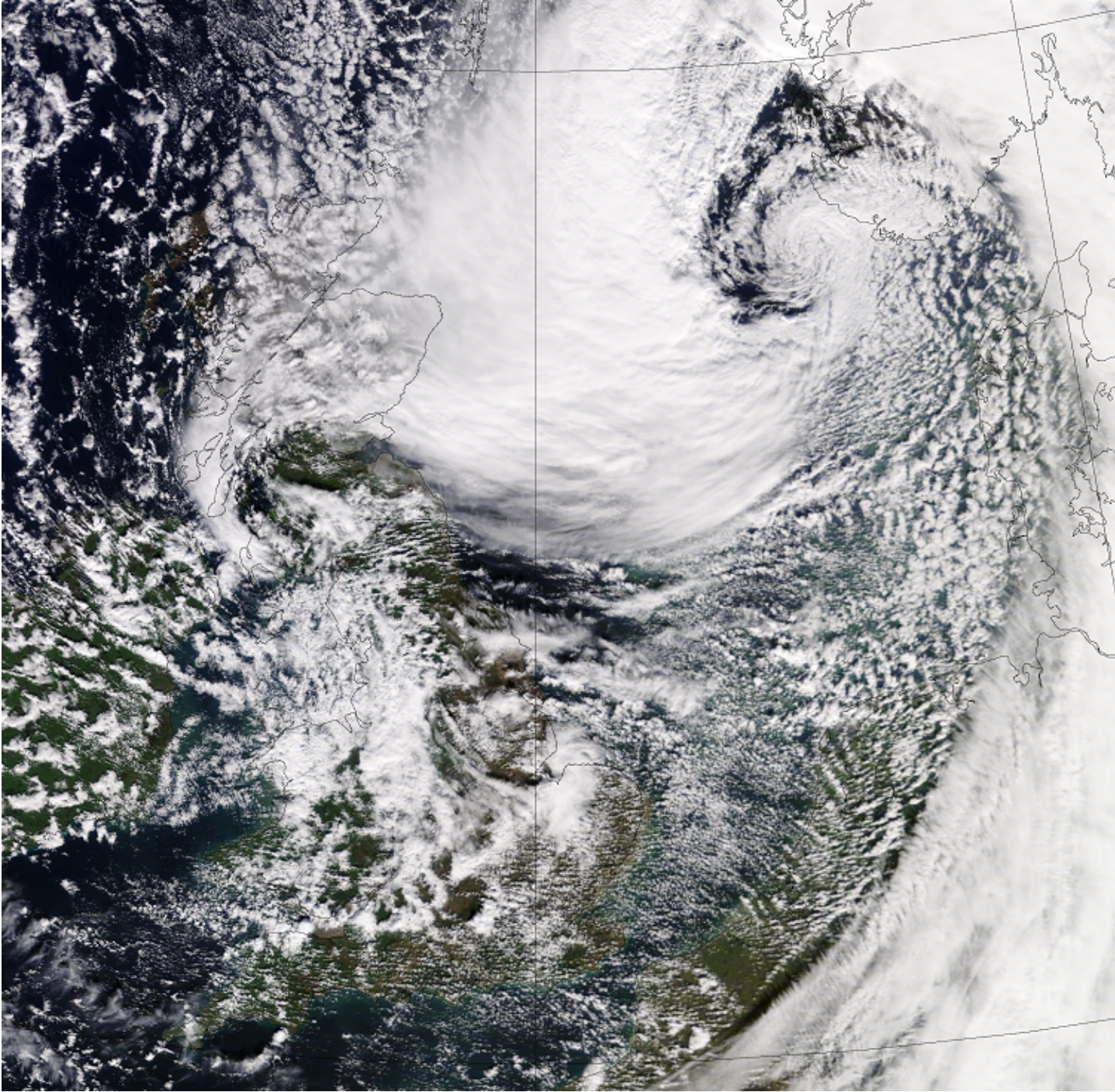
The time-series below shows hourly maximum gust speeds at Killowen (County Down), Dundrennan (Dumfries & Galloway), Drumalbin (Lanarkshire) and Inverbervie (Aberdeenshire) as storm Ali moved eastwards across Northern Ireland and Scotland.



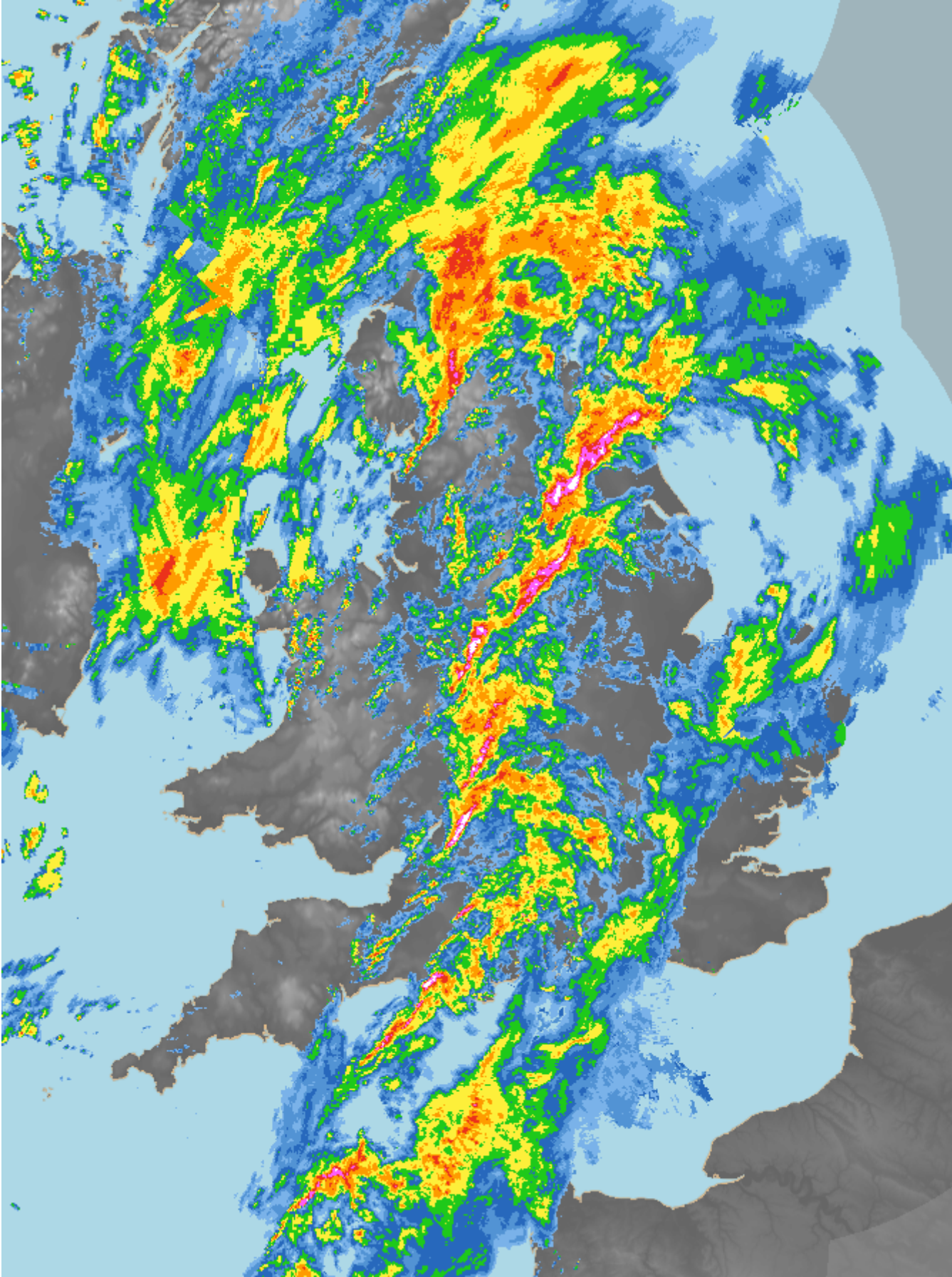
The analysis chart at 0000 UTC 21 September 2018 shows storm Bronagh centred across northern England. This storm continued to deepen rapidly as it moved eastward into the North Sea.



Having moved across the UK overnight, the satellite image shows the centre of storm Bronagh approaching Denmark the following day, 21 September 2018. Image copyright Met Office / NOAA / NASA

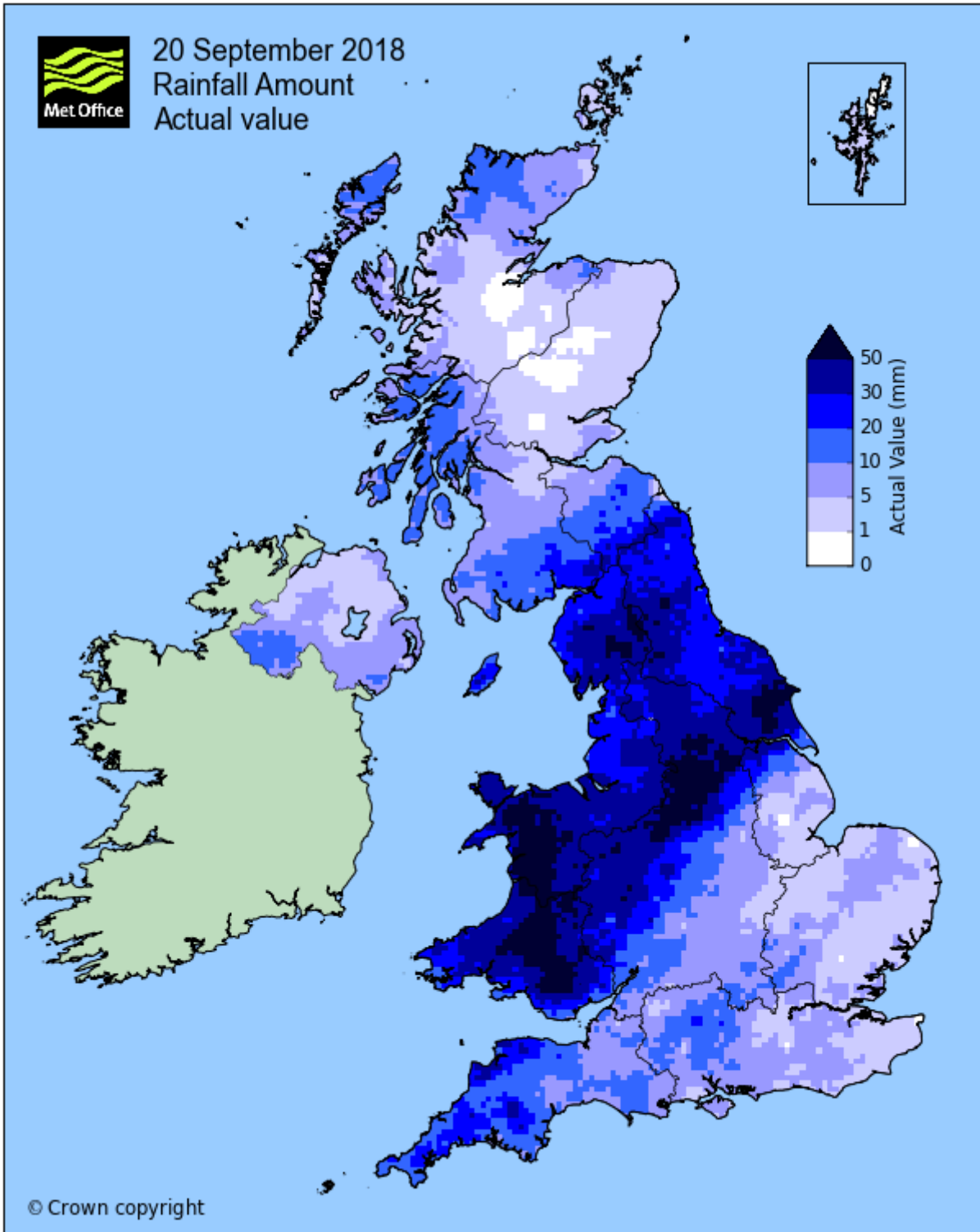


The rain-radar image at 2230 UTC 20 September 2018 shows rainfall associated with storm Bronagh, with several bands of intense convection embedded within the fronts bringing torrential rainfall at times.

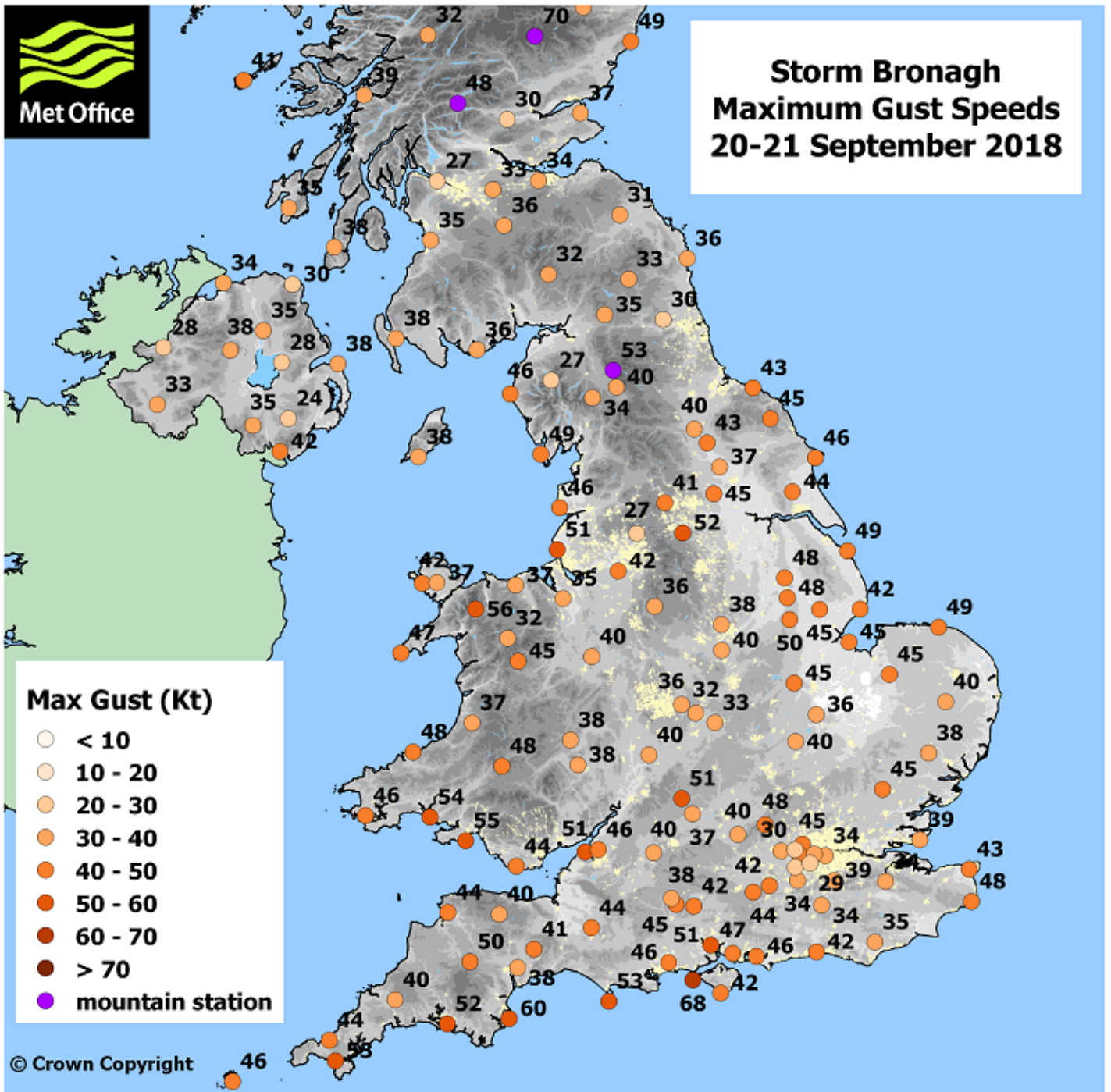




The map below shows the daily rainfall totals 0900 UTC 20 to 0900 UTC 21 September 2018 from storm Bronagh. Upland areas of Wales, the southern Pennines and North York Moors recorded over 50mm of rain, with 78.6mm at Capel Curig (Conwy) and 71.6mm at Middleton (Derbyshire). Both mid-Wales and the Sheffield area experienced localised flooding.



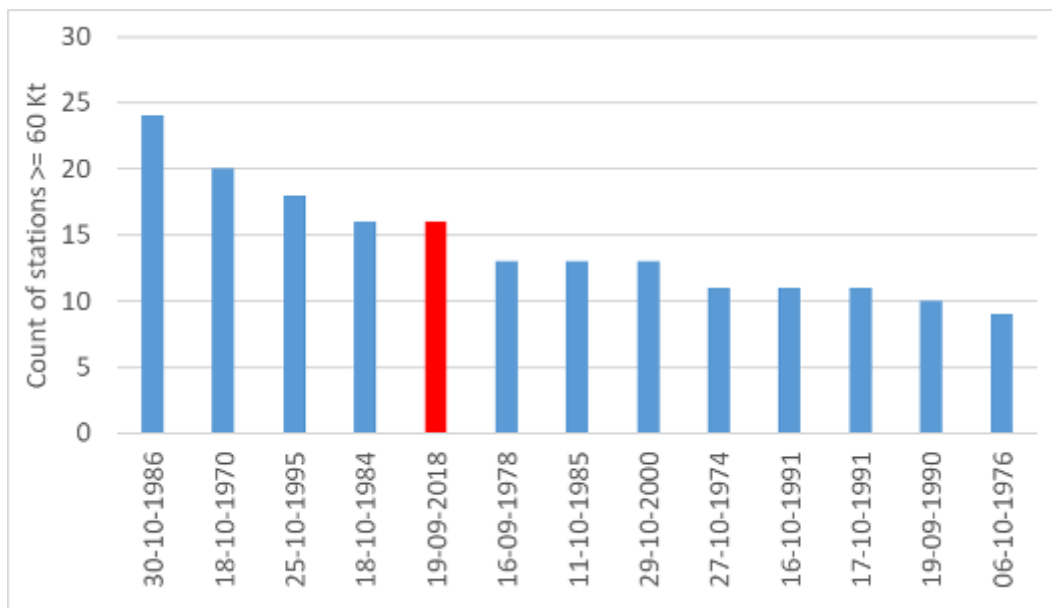
The map below shows maximum gust speeds from storm Bronagh. The strongest winds were across southern England and Wales with gusts of 40 to 50 Kt (46 to 58 mph). Exposed coastal locations recorded 50 to 60 Kt or more.



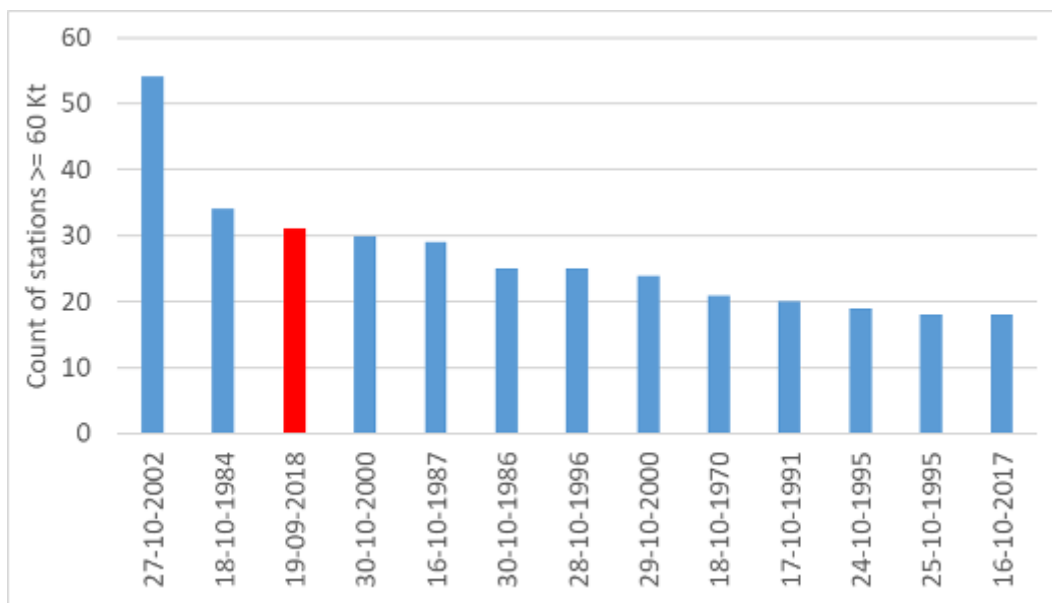
## Historical context

Deep areas of low pressure are to be expected at this time of year, for example storm Aileen brought strong winds to southern England and Wales on 12 to 13 September 2017. However, the strongest autumnal Atlantic storms tend to be later in autumn - more typically October than September. Storm Ali was a particularly powerful storm in terms of the number of stations in the observing network which recorded gusts in excess of 60 Kt (69 mph). The figure below provides a count of the number of stations in the wind network which recorded gusts  $\geq 60$  Kt for a) Scotland and b) UK

a)



b)



For Scotland, 16 stations (approaching half the network) and for the UK overall 31 stations (approaching a quarter of the network) recorded over 60 Kt. In terms of the area affected by gusts exceeding this threshold, this was one of the most notable storms to affect the UK in recent decades. (However, other storms, while less extensive, may have been much more severe - such as 16 October 1987). One of the most notable autumn storms of recent decades was 27 October 2002, while ex-hurricane Ophelia on 16 October 2017 also brought some very strong winds to western parts of the UK and Ireland.

Last updated: 25 September 2018

