

Storm Ciara

Sunday 9 and Monday 10 February 2020

Fifth named storm of the season, named by Met Office in the United Kingdom on Wednesday 5 February 2020.

A powerful jet stream helped to further intensify the storm as it rapidly crossed the Atlantic towards North-western Europe on Saturday 8 February 2020. An extremely large and intense wind field developed around the storm as it crossed the Atlantic. On Saturday afternoon ahead of Storm Ciara, another frontal trough associated with an extremely deep cyclone between Greenland and Iceland brought heavy rain and strong winds across the country. A deep trough dominated the whole North Atlantic at the time in a strongly positive North Atlantic Oscillation setup.

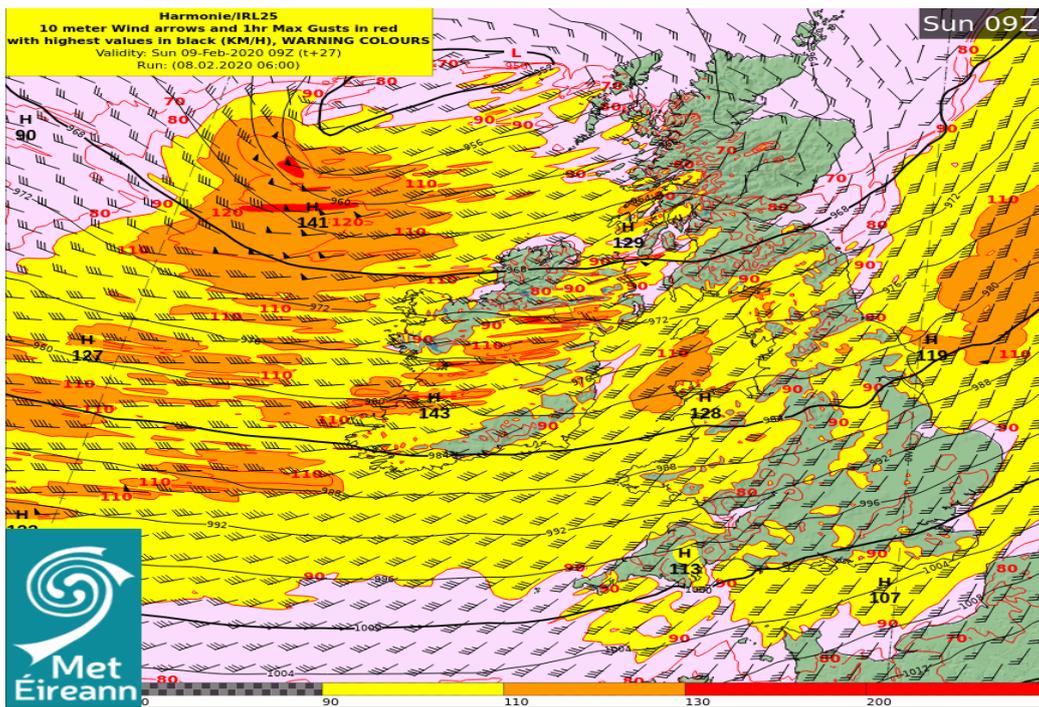


Figure 1. Harmonie 10m winds with warning colours

The storm centre passed to the north of Ireland and then Scotland, while still intensifying. The strongest winds occurred in Ireland and the UK on Sunday 9th ahead of and along an intense frontal system associated with the storm, which crossed from west to east in the morning, and brought bands of heavy, squally and sometimes thundery rain. The winds remained very strong behind the frontal system.

Peak sustained wind speed was 83 km/h (strong gale) at Mace Head on Sunday 9 February around 6 am (6 UTC) and following the storm 89 km/h (storm force 10) was observed again at Mace Head on Sunday 10 February around 2 am (2 UTC).

Peak gust wind speed was 126 km/h at Mace Head at 6:28 am (06:28 UTC). The highest UK gust was 134 km/h at their Isle of Wight station. Thirteen wind stations (59% of total) observed gusts \geq 48 knots in Munster (5 stations) and Connacht (4 stations), Leinster (2 stations) and Ulster (2). Remaining stormy during Monday 10 February 2020.

Rainfall accumulations

Ireland's average rainfall for the period 1-7 February was 11% of its monthly LTA, after the event the average for the period 1-12 February 2020 rose to 189% of monthly normal.

Prior to the event, Casement Aerodrome, Co Dublin observed the lowest Feb 2020 total of 3.9 mm which is 8% of its monthly LTA, after the event the station measured 47 mm which is 97% of its monthly LTA. After the event, the lowest monthly total was at Johnstown Castle, Co Wexford with 34.6 mm (46% of its monthly LTA). Knock Airport, Co Mayo measured a total of 16.6 mm (16% of its monthly LTA) in the week prior to the event. After the event this total rose to 85.1 mm (83% of its monthly LTA).

The maximum daily rainfall rate was 18.0 mm/hr at Knock Airport (201m), Co Mayo on Saturday 8th at 18 UTC. The highest rolling 12-hour total was 39.3 mm at Markree, Co Sligo in the 12 hours leading up to 01 UTC on Sunday 9 February 2020. The highest rolling 24-hour (or 1-day) total was 53.6 mm at Markree, Co Sligo in the 24 hours leading up to 12 UTC on Sunday 9 February 2020. The highest 2-day total was 68.5 mm at Knock Airport, Co Mayo during Saturday and Sunday.

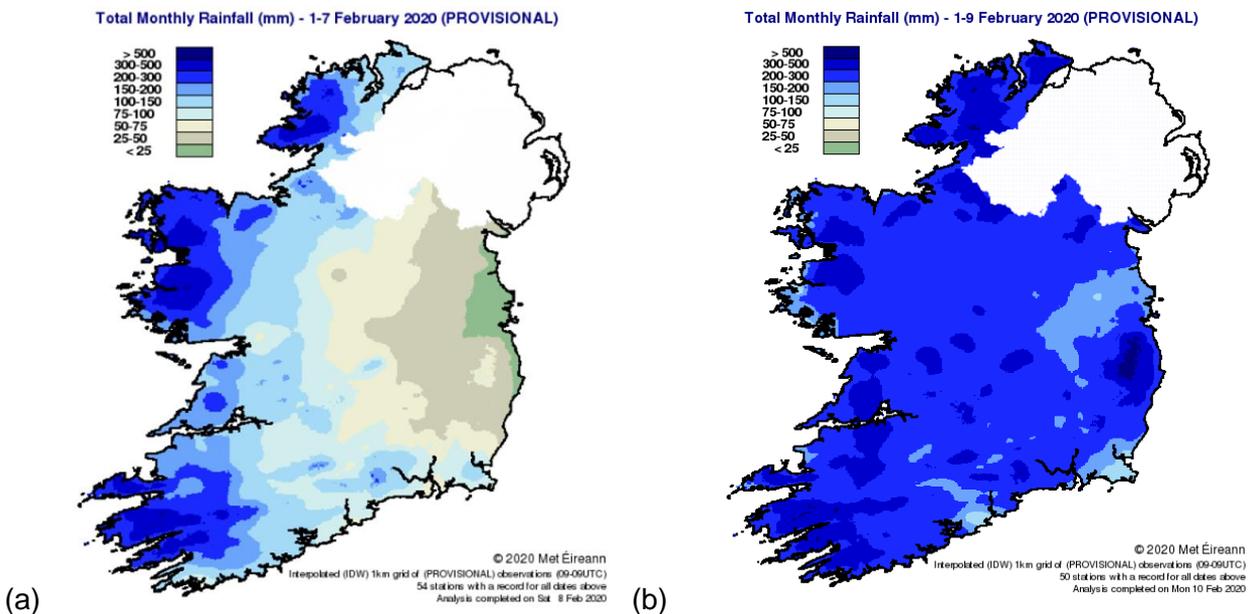


Figure 2. (a) Total rainfall before event 1-7 Feb (b) Total rainfall after event 1-9 February 2020

Over two days, approximately 1,600 sferic (lightning detections) were observed in the Irish area. Nearly 600 were detected on Sunday 9 February 2020.

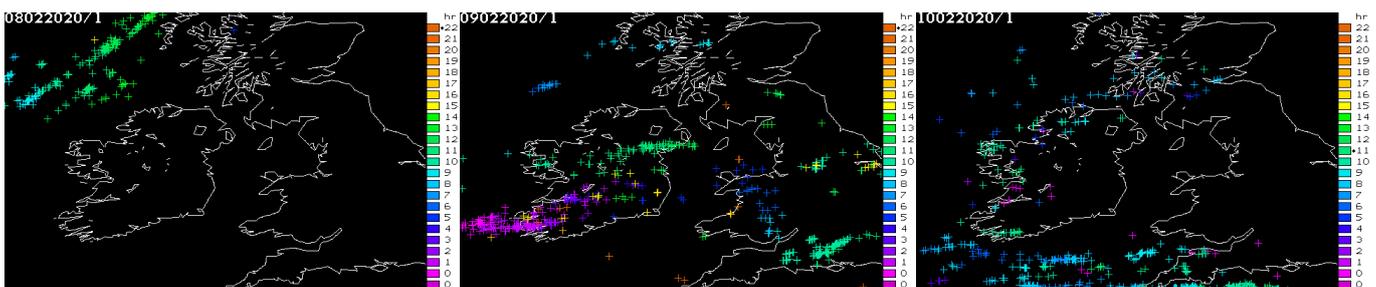


Figure 3. Sferics/Lightning detections mapped (a) (b) (c)

Impacts:

- Up to 30,000 homes and businesses without power in Ireland.
- Roads closed with reports of fallen trees and other debris
- Some flights cancelled at Shannon Airport, and some ferries cancelled or postponed.
- Coastal flooding in parts of the West coast.
- Major impacts in the UK and across large parts of mainland Europe with a number of deaths blamed on the storm.

Station Name	Rainfall (mm)	Highest 10-minute mean wind speed (km/h).	Highest Gust (km/h)	Wind Direction (degree)	Hour of occurrence (utc)
MALIN HEAD	17.2	83 (45 kt)	113 (61 kt)	240	0900
MACE HEAD	18.7	83 (45 kt)	126 (68 kt)	240	0600
SHERKIN ISLAND	10.6	80 (43 kt)	115 (62 kt)	250	1300
ROCHES POINT	9.8	80 (43 kt)	104 (56 kt)	210	0500
VALENTIA	17.6	76 (41 kt)	115 (62 kt)	250	0800
SHANNON AIRPORT	34.2	74 (40 kt)	113 (61 kt)	240	0800
CASEMENT	35.6	74 (40 kt)	107 (58 kt)	260	1200
FINNER	12.9	69 (37 kt)	104 (56 kt)	290	2300
BELMULLET	13.2	69 (37 kt)	106 (57 kt)	200	0200
CORK AIRPORT	22.0	67 (36 kt)	94 (51 kt)	220	0600
KNOCK AIRPORT	17.0	65 (35 kt)	107 (58 kt)	250	1200
DUNSANY	25.9	61 (33 kt)	89 (48 kt)	260	0800
OAK PARK	23.0	59 (32 kt)	85 (46 kt)	220	0800
MOORE PARK	15.4	57 (31 kt)	91 (49 kt)	250	0800
DUBLIN AIRPORT	25.6	56 (30 kt)	89 (48 kt)	270	0900
GURTEEN	37.6	56 (30 kt)	93 (50 kt)	250	1000
JOHNSTOWN CASTLE	12.4	56 (30 kt)	94 (51 kt)	220	0900
NEWPORT	17.4	54 (29 kt)	94 (51 kt)	240	1100
CLAREMORRIS	20.4	52 (28 kt)	87 (47 kt)	250	1100
BALLYHAISE	28.3	48 (26 kt)	87 (47 kt)	240	0700
ATHENRY	26.2	46 (25 kt)	78 (42 kt)	230	0500
MT DILLON	26.5	43 (23 kt)	76 (41 kt)	230	0700
MULLINGAR	26.2	43 (23 kt)	76 (41 kt)	250	0800

Figure 4. Station data for 9 February 2020

Station Name	Rainfall (mm)	Highest 10-minute mean wind speed (kt).	Highest Gust (kt)	Wind Direction (degree)	Hour of occurrence (utc)
MACE HEAD	3.0	91 (49 kt)	122 (66 kt)	270	1700
MALIN HEAD	10.4	87 (47 kt)	111 (60 kt)	260	1900
SHERKIN ISLAND	5.8	87 (47 kt)	115 (62 kt)	270	1500
FINNER	8.4	78 (42 kt)	113 (61 kt)	260	1800
ROCHES POINT	5.4	76 (41 kt)	111 (60 kt)	290	1400
SHANNON AIRPORT	23.8	74 (40 kt)	100 (54 kt)	280	1500
VALENTIA	8.1	72 (39 kt)	106 (57 kt)	270	1400
KNOCK AIRPORT	5.9	65 (35 kt)	107 (58 kt)	270	2000
NEWPORT	8.4	63 (34 kt)	102 (55 kt)	270	1300
CORK AIRPORT	4.9	61 (33 kt)	106 (57 kt)	260	0500
BELMULLET	4.4	59 (32 kt)	94 (51 kt)	270	1600
GURTEEN	11.7	57 (31 kt)	93 (50 kt)	290	1400
CLAREMORRIS	7.2	57 (31 kt)	98 (53 kt)	260	1300
CASEMENT	1.2	57 (31 kt)	80 (43 kt)	230	0900
OAK PARK	13.5	54 (29 kt)	78 (42 kt)	260	1600
DUBLIN AIRPORT	3.1	48 (26 kt)	72 (39 kt)	290	1500
DUNSANY	3.2	48 (26 kt)	76 (41 kt)	240	0200
JOHNSTOWN CASTLE	3.7	48 (26 kt)	80 (43 kt)	260	1600
ATHENRY	5.9	48 (26 kt)	81 (44 kt)	270	0700
MOORE PARK	6.6	46 (25 kt)	89 (48 kt)	260	1600
MT DILLON	6.1	44 (24 kt)	87 (47 kt)	260	2200
BALLYHAISE	4.6	35 (19 kt)	65 (35 kt)	240	0500
MULLINGAR	4.1	28 (15 kt)	57 (31 kt)	260	1800

Figure 5. Station data for 10 February 2020

DEFINITIONS

Sustained wind speeds are an average of 10-minute wind speeds.

Gust wind speeds are an average of 3-second wind speeds.

For observations of sustained (10-min mean) wind speeds:

- Storm Force 10 \geq 89 km/h (48 kt)
- Violent Storm Force 11 \geq 103 km/h (56 kt)
- Hurricane Force 12 \geq 117 km/h (64 kt)