

Storm Dennis

Saturday 15 and Sunday 16 February 2020

Sixth named storm of the season, named by the Met Office on Tuesday 11 February 2020.

The formation and path of Storm Dennis was similar synoptically to the setup which occurred a week before for Storm Ciara. A very cold polar air mass plunged southwards into the US, from Arctic Canada, which collided with very warm air off the East coast of North America, creating a large temperature gradient, causing the jet stream to strengthen.

Storm Dennis, which had started to develop off the East coast of the US on Thursday the 3th February, intensified rapidly as it interacted with the left exit of the jet stream on its way across the Atlantic towards north-western Europe.

ATLANTIC CHARTS - AIRMASS

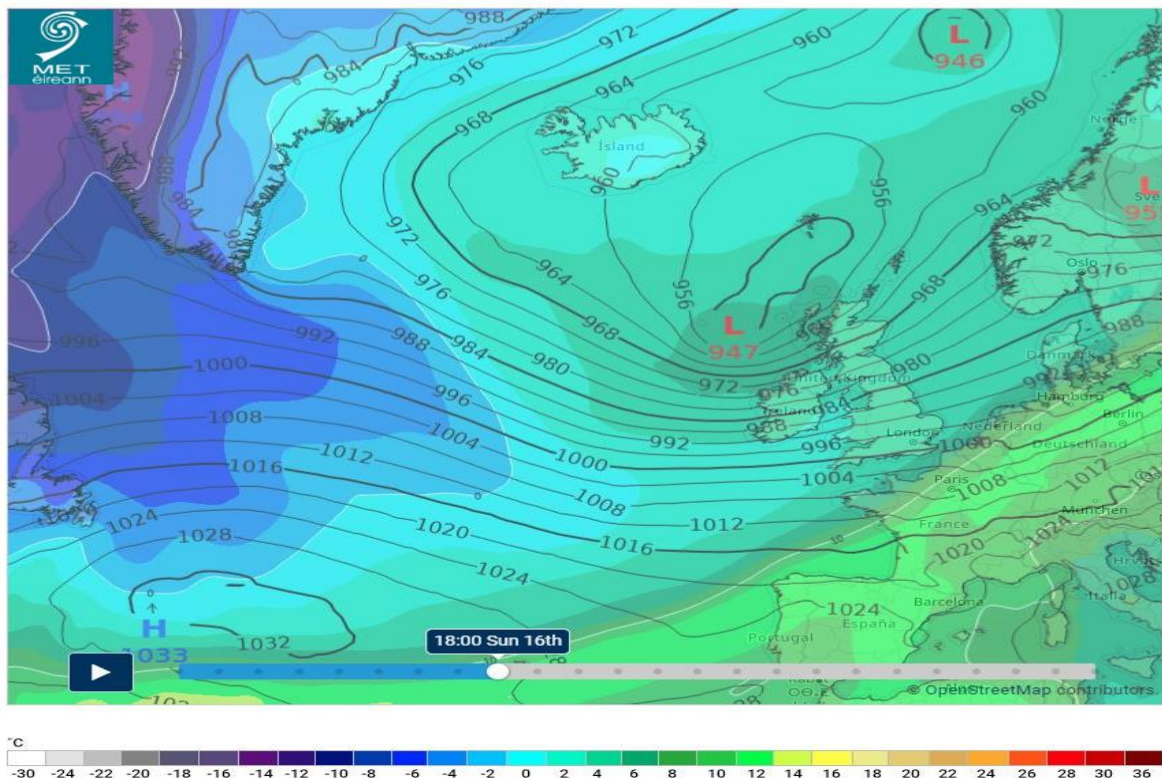


Figure 1. Atlantic chart for Sunday 16th February at 1800 utc.

The centre of Storm Dennis took a slightly different path, compared with Storm Ciara, staying further out in the Atlantic as it swung northwards towards Iceland on Saturday the 15th. It brought a swath of very strong winds and heavy rain across Ireland on the 15th, associated with active weather fronts, which caused some inland river flooding.

Storm Dennis became one of the deepest mid latitude cyclones ever observed in the North Atlantic, deepening to around 920hPa on the 15th, while south of Iceland, where it stalled and merged with another storm system which had developed in the North Atlantic a few days before.

The strongest winds in Ireland were felt on Sunday the 16th, when the storm centre started moving east south-eastwards towards the north of Scotland and filling. The wind field for Storm Dennis was very large and winds remained strong throughout Sunday the 16th and Monday the 17th in a cool, showery, polar maritime air mass.

Storm Dennis caused major flooding in the UK as the weather fronts that passed over Ireland on Saturday the 15th stalled over the UK and several wave features ran along the stalled front, intensifying and prolonging the rainfall there.

Impacts:

- Up to 18,000 homes and businesses without power in Ireland.
- Some flights cancelled, and some ferries cancelled or postponed.
- Coastal erosion flooding in parts of the West coast.
- Fluvial flooding close to the river Shannon and other rivers bursting their banks.
- An abandoned ship washed up on the Cork coast after being adrift for over a year in the Atlantic.

There were major impacts in the UK from the heavy prolonged rainfall associated with the storm, causing rivers to burst their banks with extensive flooding.

Station Name	Rainfall (mm)	Highest 10-minute mean wind speed (km/h).	Highest Gust (km/h)	Wind Direction (degree)	Hour of occurrence (utc)
MACE HEAD	16.8	83 (45 kt)	109 (59 kt)	230	2200
SHERKIN ISLAND	12.4	81 (44 kt)	109 (59 kt)	190	1000
BELMULLET	23.0	81 (44 kt)	117 (63 kt)	180	0700
MALIN HEAD	8.0	76 (41 kt)	106 (57 kt)	170	0800
ROCHES POINT	15.7	72 (39 kt)	96 (52 kt)	200	1400
CASEMENT	15.8	67 (36 kt)	102 (55 kt)	200	1000
SHANNON AIRPORT	15.5	65 (35 kt)	109 (59 kt)	220	2400
FINNER	20.6	63 (34 kt)	107 (58 kt)	180	0700
CORK AIRPORT	22.0	63 (34 kt)	94 (51 kt)	200	1200
VALENTIA OBSERVATORY	23.4	61 (33 kt)	100 (54 kt)	220	2100
NEWPORT	13.2	61 (33 kt)	98 (53 kt)	200	0900
OAK PARK	18.2	56 (30 kt)	87 (47 kt)	230	2300
GURTEEN	14.2	54 (29 kt)	85 (46 kt)	230	2300
DUNSANY	12.4	54 (29 kt)	80 (43 kt)	190	1300
CLAREMORRIS	29.5	54 (29 kt)	89 (48 kt)	210	2200
DUBLIN AIRPORT	10.0	50 (27 kt)	83 (45 kt)	200	1200
MOORE PARK	18.3	48 (26 kt)	85 (46 kt)	190	1200
JOHNSTOWN CASTLE	14.6	48 (26 kt)	89 (48 kt)	200	1100
ATHENRY	19.7	48 (26 kt)	78 (42 kt)	220	2200
KNOCK AIRPORT	22.6	48 (26 kt)	81 (44 kt)	260	1500
BALLYHAISE	18.7	44 (24 kt)	91 (49 kt)	220	2300
MT DILLON	21.6	44 (24 kt)	76 (41 kt)	220	2300
MULLINGAR	12.4	41 (22 kt)	67 (36 kt)	180	1000

Figure 2. Synoptic station data for 15th February 2020

Station Name	Rainfall (mm)	Highest 10-minute mean wind speed (km/h).	Highest Gust (km/h)	Wind Direction (degree)	Hour of occurrence (utc)
MACE HEAD	2.5	93 (50 kt)	122 (66 kt)	230	0700
MALIN HEAD	4.0	87 (47 kt)	122 (66 kt)	220	1900
CASEMENT	5.9	87 (47 kt)	113 (61 kt)	250	1500
SherkinIsland	2.8	83 (45 kt)	109 (59 kt)	240	1400
ROCHES POINT	5.1	76 (41 kt)	107 (58 kt)	230	1400
BELMULLET	8.6	74 (40 kt)	113 (61 kt)	230	1900
VALENTIA OBSERVATORY	7.8	74 (40 kt)	111 (60 kt)	260	1800
SHANNON AIRPORT	5.2	69 (37 kt)	115 (62 kt)	230	1200
FINNER	5.7	67 (36 kt)	96 (52 kt)	240	1400
NEWPORT	6.0	63 (34 kt)	104 (56 kt)	200	0900
DUNSANY	4.1	61 (33 kt)	94 (51 kt)	220	1400
CORK AIRPORT	6.4	59 (32 kt)	102 (55 kt)	230	1400
GURTEEN	7.8	56 (30 kt)	83 (45 kt)	220	1400
KNOCK AIRPORT	1.1	56 (30 kt)	93 (50 kt)	260	2000
OAK PARK	3.3	54 (29 kt)	87 (47 kt)	210	0200
CLAREMORRIS	2.7	54 (29 kt)	93 (50 kt)	220	1100
MT DILLON	4.4	50 (27 kt)	91 (49 kt)	240	1200
ATHENRY	6.9	50 (27 kt)	85 (46 kt)	220	1200
DUBLIN AIRPORT	10.3	48 (26 kt)	83 (45 kt)	260	0100
JOHNSTOWNII	6.0	46 (25 kt)	83 (45 kt)	230	2300
MOORE PARK	7.0	44 (24 kt)	81 (44 kt)	240	1900
BALLYHAISE	4.4	44 (24 kt)	74 (40 kt)	240	1400
MULLINGAR	6.8	43 (23 kt)	74 (40 kt)	220	1300

Figure 3. Synoptic tation data for 16th February

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)