



Exceptional weather events

Type of event:

Storm- Hurricane Charley

Date:

August 1986

Monthly Weather Bulletin

- Supplement to August 1986

August Storms



The scene during the night of August 25th/26th on the bridge over the Dodder at Ballsbridge in Dublin, (Photograph Matt Kavanagh - courtesy Irish Times)

- Heavy rain on 5th causes flooding in Cork and Kerry
- Off shoot of Hurricane Charley hits Ireland on 25th
- Worst flooding in Dublin for 100 years
- New rainfall records

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Gales and heavy rain on Tuesday 5th

The summer of '86 was a real wash-out. June was thundery, July was the dullest in over 30 years and August brought a succession of storms that caused flooding in many areas.

A WET AND WINDY START

August made its unpleasant intentions clear right from the start. On Friday the 1st of the month gales and heavy rain swept the country. Rainfall amounts for the day ranged from 6 to 32mm, with the south end west worst hit. Gale gusts were reported from all stations, including one gust of 62 knots measured at Malin Head, the strongest gust of the month.

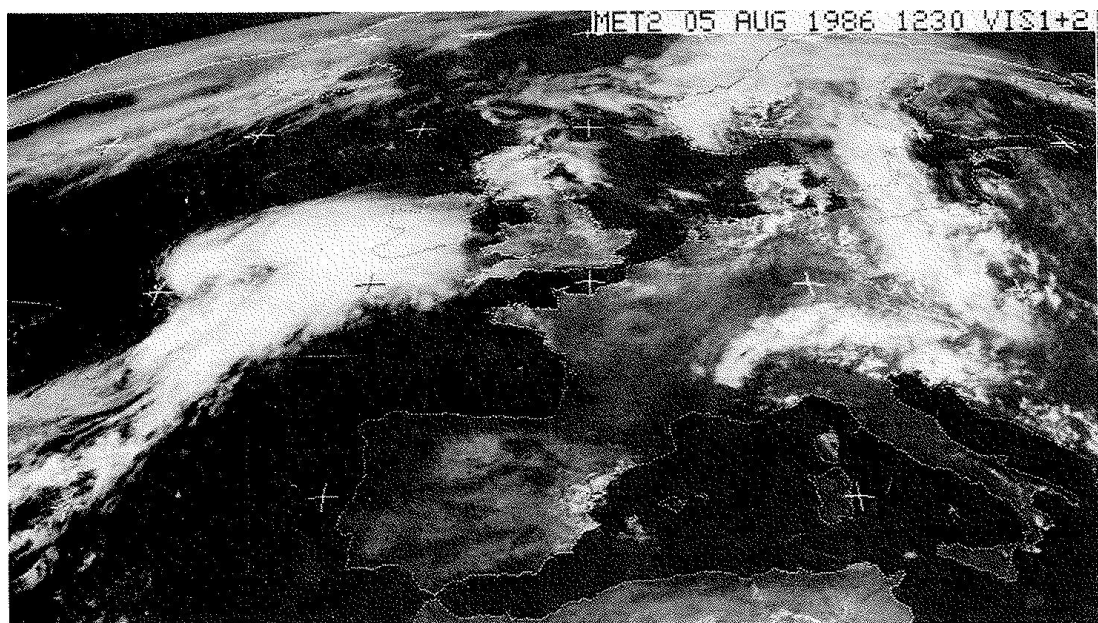
It was the early hours of Saturday 2nd before the depression and fronts that had caused the storm cleared the north coast. The rest of that holiday weekend was fairly unsettled with rain, showers, fog and some thunderstorms occurring from time to time. On the morning of Tuesday 5th, however, a vigorous depression approached from the southwest and moved northeastwards, preceded by active rainbelts.

KERRY AND WEST CORK HARDEST HIT

The heaviest rain from this weather system was in the very moist air from lower latitudes ahead of the depression centre. Again the south was the area worst affected. The rain began in earnest in Cahirciveen, Co. Kerry, around noon and continued without respite till after midnight. There were 7 consecutive hours of continuous heavy rain (heavy rain is defined as rain falling at a rate of 6mm an hour or more). A total of 85.6mm fell there that day, which is not far short of the station's normal rainfall for the whole month of August. 56mm of that total fell in the 6 hours between 1 o'clock and 7 o'clock. New records were set for 6 and 12 hour falls of rain.

As the rainfall map across shows, Kerry and west Cork were hardest hit. An underground river overflowed in Tralee and flooded part of the town. In Bantry the town centre was under 3 feet of water. Macroom, Skibereen, Millstreet and Bandon were among the many other towns in the area also flooded that day. Many roads in the region were affected and a number of bridges were swept away. Other parts of the country were hit too, with flooding in Ennis, Co. Clare, Cappamore, Co. Limerick, and as far north as Co. Sligo.

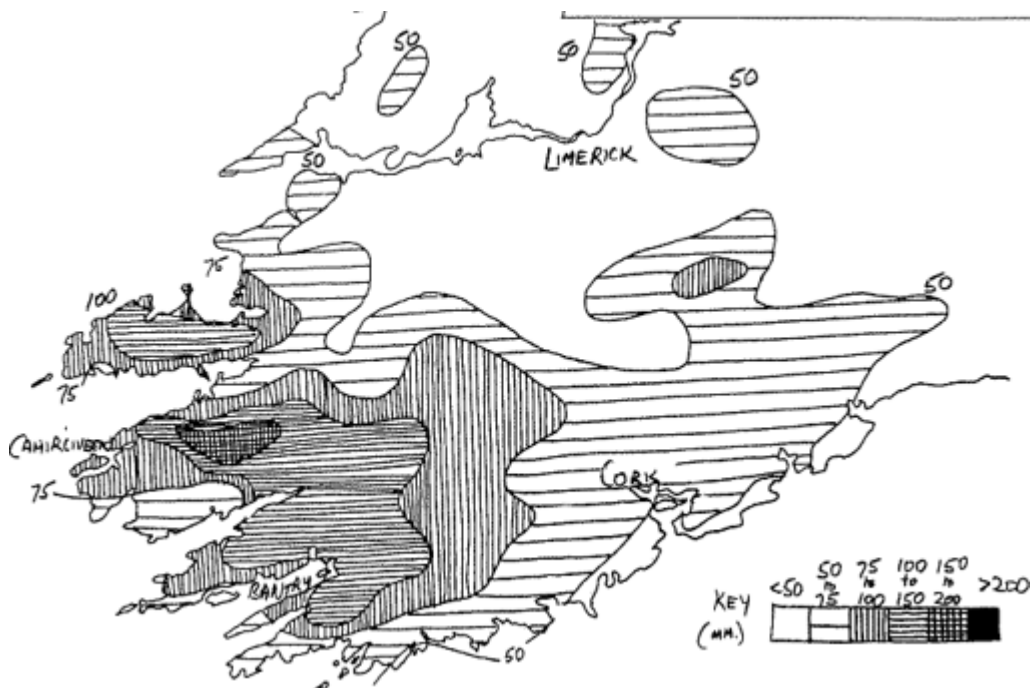
The table across shows some of the rainfall amounts measured on the 5th. Totals such as these, which are fairly typical of the amounts recorded throughout the southwest on the 5th, would be expected not more than once every 50 years, on average. Elsewhere in the country 24-hour rainfall totals ranged from 30mm to 50mm. The rain was driven by strong winds gusting up to 50 knots in the southwest.



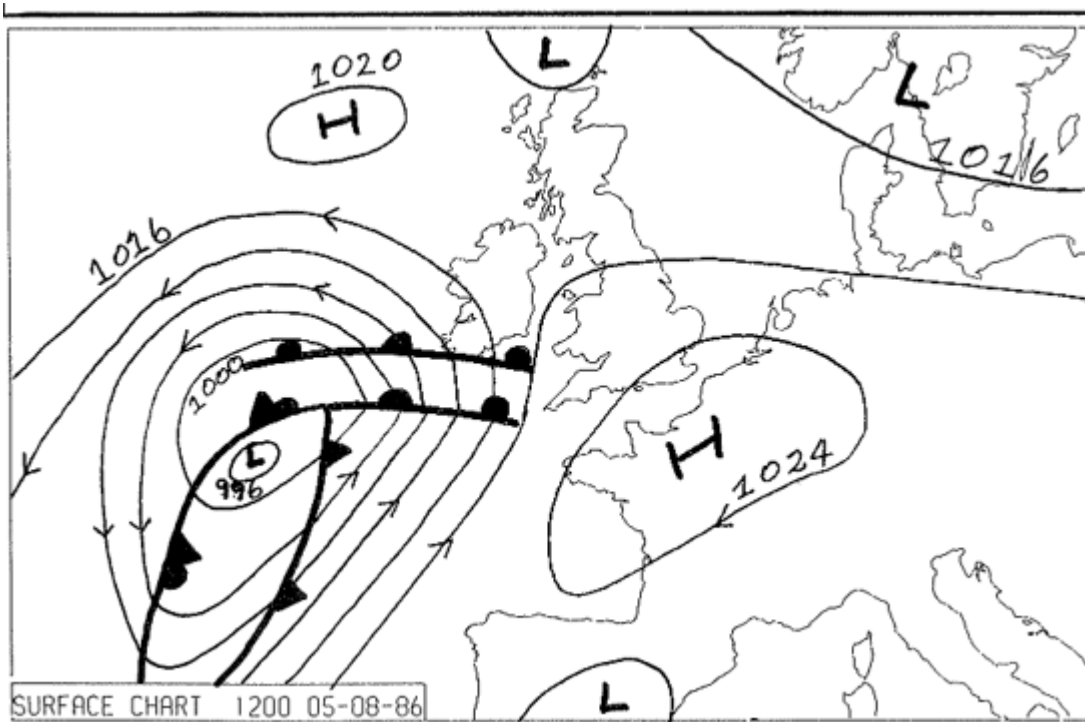
This picture from the European satellite METEOSAT shows the situation at 1230 GMT on the 5th as the first of the warm fronts reaches the Irish coast.

Station	6-hour	12-hour	24-hour
Cahirciveen	56.1	79.9	88.7
Tralee	N/A	103.0	106.0
Killarney	59.0	89.0	101.0
Cork Airport	41.0	55.1	63.3
Roches Point	32.6	46.3	49.6
Glengariff	59.0	90.0	102.4

Figure 1 Maximum falls of rain (mm)

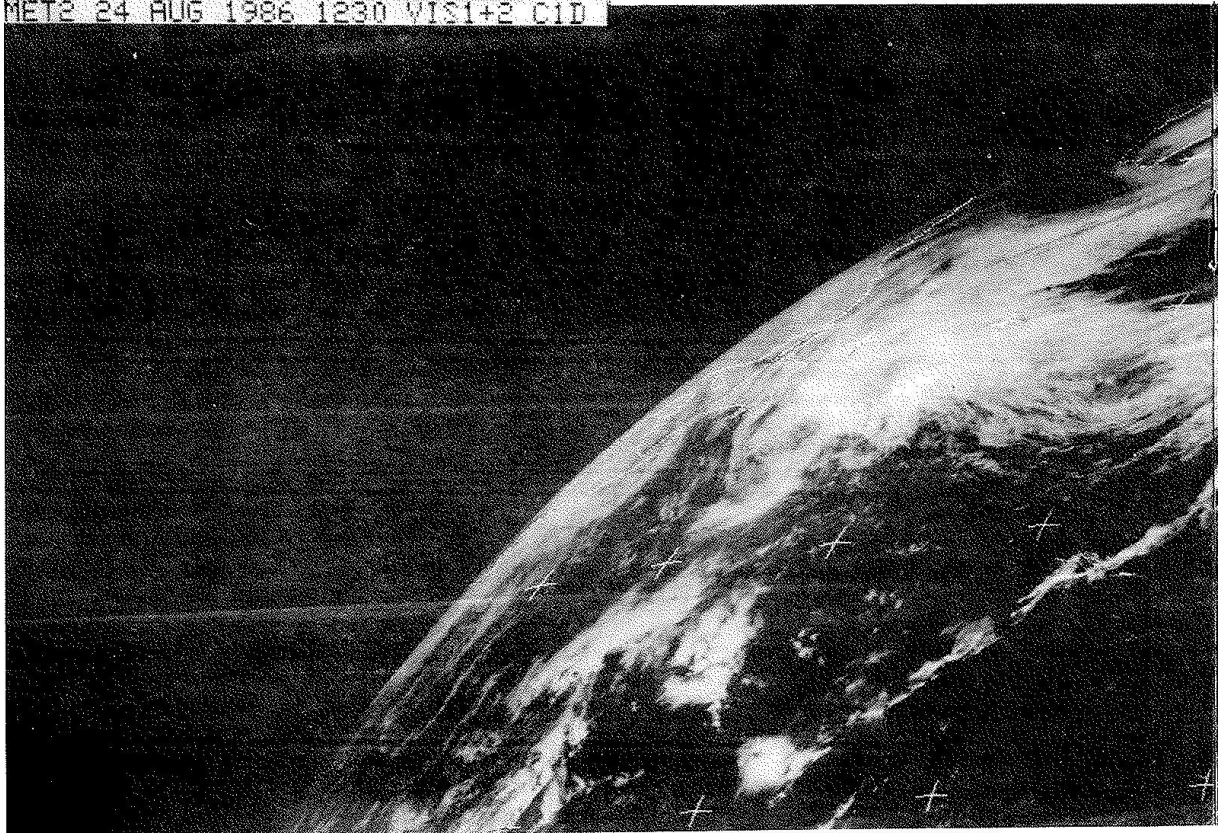


Rainfall mm for the 24-hour period beginning 10AM on 5th August

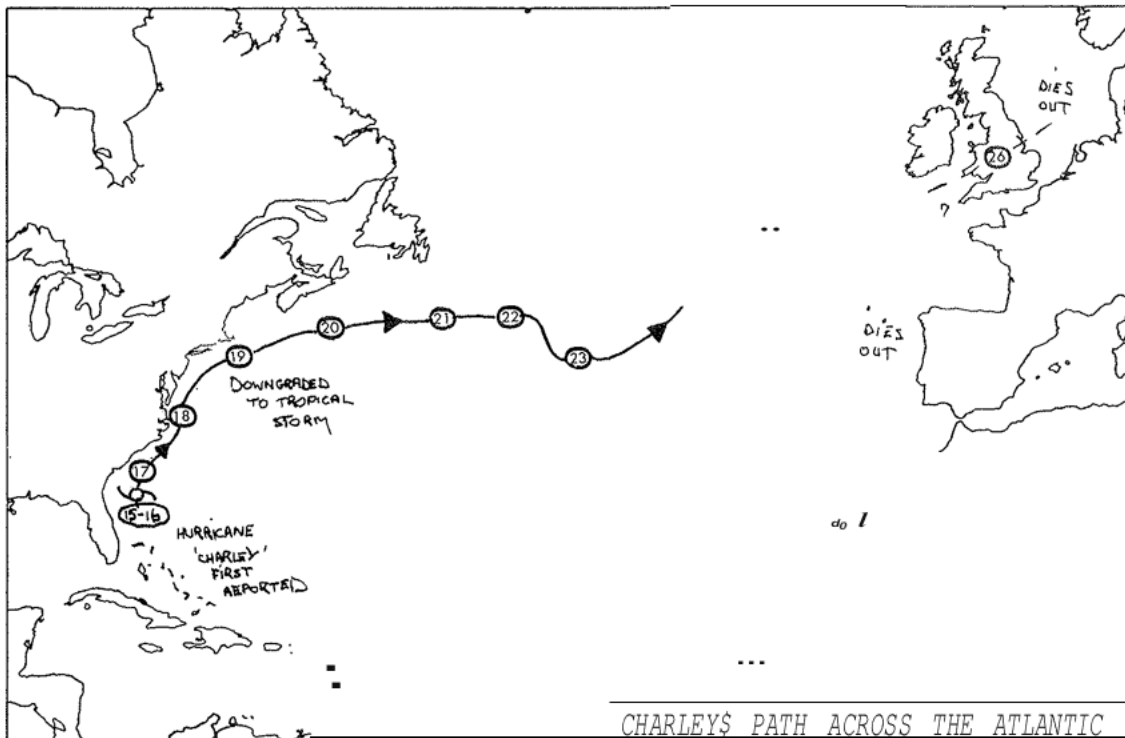


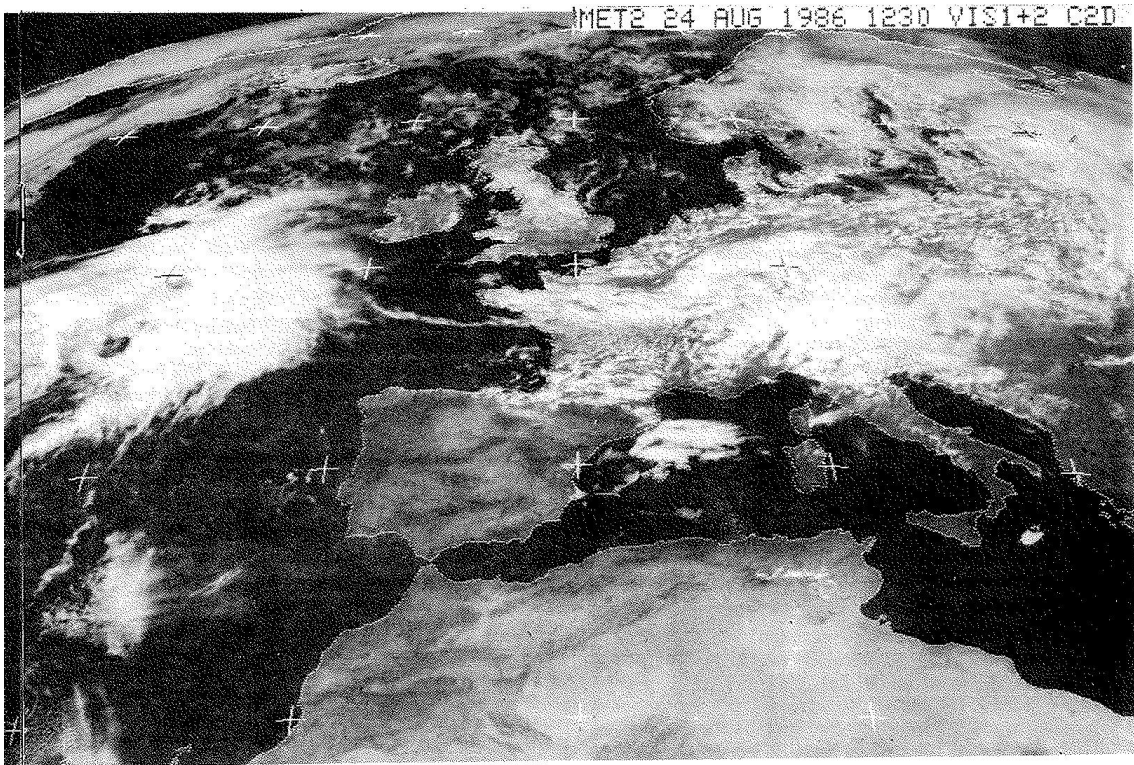
Surface chart 1200 05-08-86

MET2 24 AUG 1986 1230 VIS1+2 CID



A dramatic view from METEOSAT at 1230 GMT on the 24th shows Ireland enjoying a sunny Sunday while the storm approaches from the southwest





Hurricane Charley and the storm of the 25th

Hurricane Charley first appeared as a tropical storm off the South Carolina coast on Friday 15th August. With its centre about 30 miles out to sea it tracked north-northeast along the American coast. Charley intensified over the next couple of days till it was formally designated a hurricane on Sunday 17th. Wind speeds were up to 65 knots and rainfall amounts of 125mm were forecast.

Charley's strength began to decline during the evening of the 18th as it swung out into the Atlantic heading eastwards. At 1600 GMT, with the storm centre more than 100 miles off the coast, all coastal hurricane warnings were discontinued, and Charley was returned to tropical storm status at midnight that night. It passed south of Nova Scotia on the 19th giving up to 116mm of rain in places and gusts of over 55 knots.

By late Friday 22nd what was left of Charley was in mid-Atlantic, having weakened further so that it was no more than an ordinary depression with its associated occluding frontal system. However on the following day, the 23rd August, rapid deepening began to occur at the occlusion point and by midday on Sunday 24th this had developed into a separate depression, clearly visible on the satellite picture above. This depression moved quickly towards Ireland. At midnight on Sunday its centre was about 300 miles southwest of Kerry and it was still deepening.

RAIN REACHES IRELAND

Rain began to fall in the southwest around 9 o'clock on Sunday evening. The wind was light from a southeasterly direction. By 6 o'clock next morning light rain had reached a line from Mayo to Wexford and the rain in the south and southwest was moderate in intensity and falling steadily. The south coast got the worst of the storm during the morning with heavy rain and strong onshore winds. In the hour between 9 and 10 o'clock more than 12mm (half an inch) fell in Cork city. The Central Analysis and Forecast Office, having issued warnings since early morning, issued the following severe weather alert at midday:

"Extremely heavy rainfall will cause local flooding today especially in Munster and Leinster. Strong gusty easterly winds will back northerly by tonight and increase with violent gusts in exposed places."

About noon the centre of the depression was just south of the Cork coast. It was raining steadily all over the country at that stage, with the notable exception of Malin Head in the extreme north. By early evening however, it had eased off considerably in Cork and Kerry but Dublin and other eastern areas were experiencing continuous heavy rain and gale force winds blowing in from the Irish Sea.

HURRICANES

Hurricanes are among the most destructive of natural phenomena. It is estimated that the 80-100 tropical cyclones (a term that includes hurricanes, typhoons and cyclones) that occur each year cause an average of 20,000 deaths and damage worth many billions of pounds.

Hurricanes develop over the warm oceans near the equator. They are characterised by violent winds - by definition, hurricanes contain sustained winds of 64 knots or more - very large amounts of rainfall, and the dramatic 'eye' at the centre of the storm where conditions are relatively calm and cloud-free. The eye can extend from 15 to 60 kms across and it's surrounded by a towering mass of swirling cloud up to 10 kms high.

A hurricane will usually cover an area less than 1,000km across, whereas a mature mid-latitude depression - the sort that regularly affects Ireland would have a diameter of some 2,500km. The range of pressure between the centre and edges of both are similar however, which is why the winds and weather associated with a hurricane are so much more intense.

Heat and moisture are the power sources of a hurricane, so that when it reaches land, where

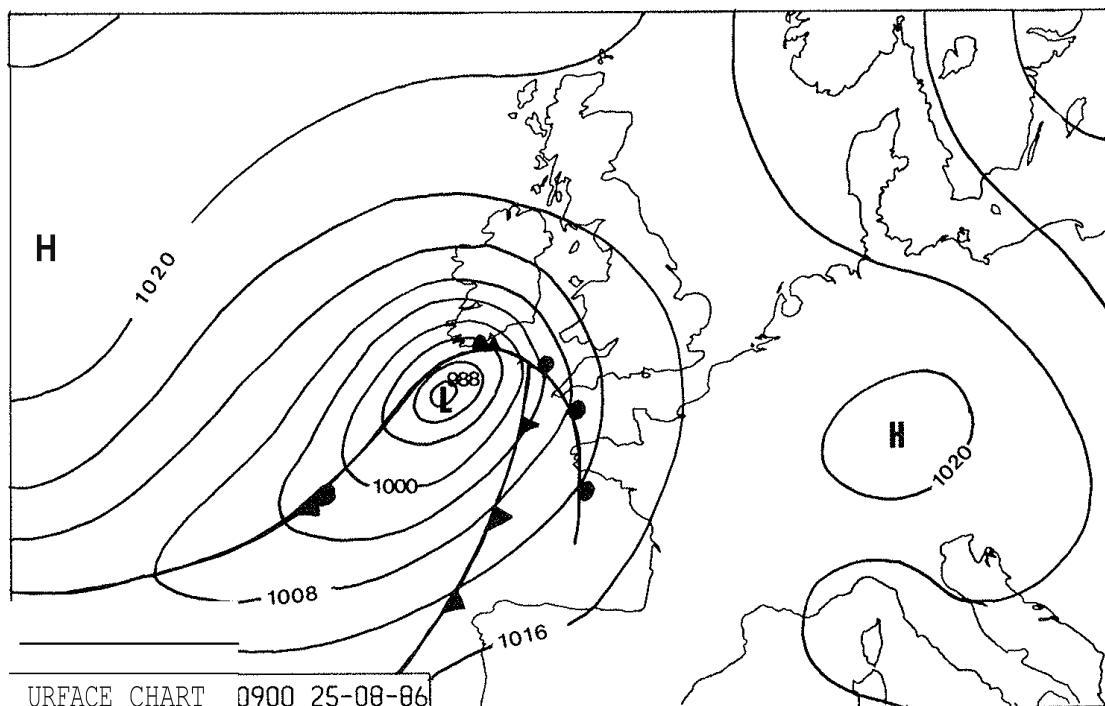
Its supply of moisture is cut off, or moves over cooler seas, it begins to decay. It sometimes happens that a decaying hurricane will spawn a further storm in higher latitudes, as happened in the case of 'Charley', but by this time the storm cannot be considered to have tropical characteristics and so it's not a proper hurricane.

The depression continued to track along the south coast during the evening. At Rosslare the wind died away for a time as the storm centre passed just to the south. Over the country as a whole the wind backed around gradually to the northeast but there was no let-up in its strength: at 11 o'clock that night the Kish and Wicklow lighthouses reported winds of 55 knots - storm force 10 - and Roche's Point had a force 9 strong gale blowing during the early hours of the morning. By midnight all stations in the south and east had reported gusts of 50 knots or over.

As the night of the 25th/26th wore on, the rain slowly eased off. It was lunchtime on Tuesday 26th before it finally stopped however, and by that stage it was clear that Dublin, Bray and many other places, particularly in the east and south of the country, had just been through one of the worst storms in living memory.

JUST HOW BAD WAS IT?

The heaviest rain fell on the mountains south of Dublin. At Kippure, which is 750 metres high, an estimated 280mm fell, which is about double the normal rainfall in that area for the whole month of August. Kilcoole, south of Greystones, was remarkable among lowland stations: it measured some 200mm and thereby set a new record for the greatest fall of rain in a day in Ireland; the previous record was 184.2mm which occurred during a violent thunderstorm in the Mount Merrion area of Dublin on the 11th June 1963. (Mountain stations are not representative of the conditions most people experience and so they are not considered in determining such records.)



The weather situation on the morning of the 25th as shown by the synoptic chart for 0900 GMT and the picture from METEOSAT at 0930. The depression is moving

Cleaning up after the floods of August 25th.....



Bray after Hurricane Charley. Photograph courtesy Irish Times.



Bray in 1905. Photograph from 'British Rainfall 1905'