

THE CLIMATE OF NORTHERN IRELAND

Climatological Memorandum 143



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The front cover shows a view of Northern Ireland from the satellite Tiros N taken at 0844 GMT on Friday 20 April 1981 — photograph by courtesy of the Department of Electrical Engineering and Electronics, University of Dundee.

An anticyclone centred to the north-west of Ireland gave a dry day with long sunny periods, some 8 to 12 hours, and afternoon temperatures up to 15 °C. The patches of cloud are at medium or high altitudes.



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Meteorological Office, Belfast
June 1988

INTRODUCTION

This brief description of the climate of Northern Ireland has been compiled for the general reader and with the requirements of the tourist in mind. Further detailed information about the climate or analyses of data for specific purposes such as design or planning requirements may be obtained from:

The Principal Meteorological Officer
Meteorological Office
1 College Square East
Belfast BT1 6BQ

A fee may be charged, depending on the amount of staff effort needed to supply the information.

Weather information and forecasts can be obtained, on payment, from:

Meteorological Office
Belfast International Airport
Telephone: Crumlin (08494) 22339

Weather forecasts available for Northern Ireland obtainable by telephone:

A 24-hour forecast with two-day outlook — 0898 500 427.
A 3-5 day period United Kingdom forecast — 0898 500 430.
Forecast for Northern Ireland coastal waters — 0898 500 465.

Requests for climatological information for other parts of the United Kingdom should be addressed to:

FOR ENGLAND AND WALES

The Director-General
Meteorological Office (Met O 3b)
London Road
Bracknell
Berkshire RG12 2SZ
Telephone: Bracknell (0344) 420242

FOR SCOTLAND

The Superintendent
Meteorological Office
Saughton House
Broomhouse Drive
Edinburgh EH11 3XQ
Telephone: 031-244 8362

Giant's Causeway.

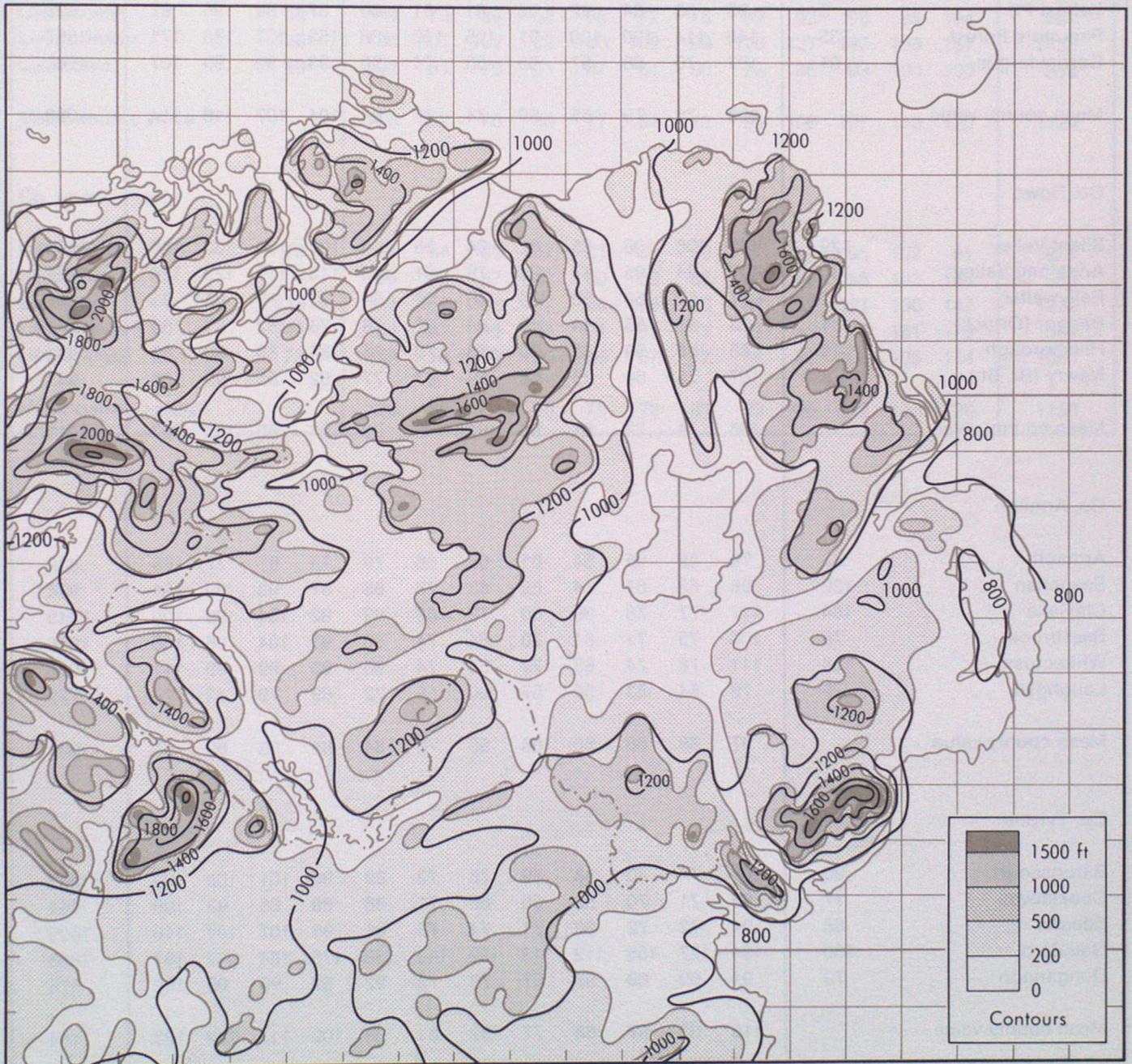


RAINFALL

The area of Northern Ireland consisting of six counties, namely Antrim, Armagh, Londonderry, Down, Fermanagh and Tyrone, is 14 153 square kilometres or 5462 square miles. Within this region there is a wide variety of topographical features and coastal types. Around the inland basin centred on Lough Neagh (the largest lake in the British Isles) are encircling belts of uplands. The Antrim Plateau slopes upwards to front the North Channel with impressive cliffs.

In the north-west the Sperrin Mountains have several peaks above 600 metres and to the south the Mourne Mountains, together with Slieve Croob and Slieve Gullion, are predominant. Together with the intervening valleys and estuaries these upland areas exert a strong influence on the distribution of rainfall (Figure 1). Amounts range from 1700-1800 millimetres a year to less than 800 millimetres in the vicinity of Strangford Lough in the extreme east of the Province.

FIGURE 1 Northern Ireland annual rainfall



In addition to topographical effects, greater exposure to the prevailing south-westerly rain-bearing winds results in generally higher amounts of rainfall in the more western parts of Northern Ireland (Table 1). Thus counties Londonderry, Fermanagh and Tyrone are wettest and, for example,

Aldergrove, County Antrim (altitude 68 m) has 837 millimetres annual rainfall whereas considerably more (1108 millimetres) falls at Castle Archdale Forest (altitude 66 m) in County Fermanagh.

TABLE 1 Monthly and annual averages (1951–80) of rainfall in millimetres for a selection of stations in each county of Northern Ireland

Location	Altitude (metres)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Co. Antrim														
Aldergrove	68	81	56	55	48	56	64	71	79	81	81	80	85	837
Ballymena	38	97	63	76	53	65	67	69	79	91	97	106	94	957
Ballypatrick	152	129	87	89	73	77	82	86	109	118	122	142	131	1245
Belfast PS	5	93	63	64	52	58	61	61	80	87	84	96	97	896
Parkmore Forest	235	148	114	120	100	91	105	112	138	152	157	186	171	1597
Carrickfergus	61	102	70	68	57	65	65	74	90	93	99	99	107	989
Mean county value		109	75	79	64	69	74	79	96	104	107	118	114	1088
Co. Down														
Silent Valley	129	142	106	108	85	87	84	96	114	127	130	132	150	1361
Annalong Valley	130	129	94	95	77	83	79	91	106	113	119	123	129	1238
Ballywalter	12	87	57	58	50	50	56	62	81	81	82	85	83	832
Bangor (Orlock)	4	83	53	55	44	53	54	62	78	76	82	81	80	801
Hillsborough	116	85	58	59	55	60	63	70	86	85	88	86	89	884
Newry (Br. St.)	5	107	75	64	53	65	59	67	77	82	95	93	108	945
Mean county value		106	74	73	61	66	66	75	90	94	99	100	107	1010
Co. Armagh														
Armagh	62	79	59	55	54	61	63	66	79	73	81	77	85	832
Seagahan	122	98	69	67	64	69	63	78	85	87	93	90	101	964
Claylake	184	117	77	78	69	80	72	68	89	92	104	99	100	1045
Bessbrook	76	108	75	71	61	70	64	74	86	93	104	96	106	1008
Whitecross	128	111	78	74	63	72	65	74	90	90	99	99	111	1026
Loughgall	25	72	54	53	50	57	60	59	72	69	79	72	76	773
Mean county value		97	69	66	60	68	65	70	84	84	93	89	97	941
Co. Tyrone														
Baronscourt	90	102	74	70	58	69	76	72	89	96	101	106	109	1022
Cookstown	77	96	71	70	52	65	66	71	86	89	96	93	106	961
Edenfel	88	94	72	72	60	71	74	78	91	95	107	101	110	1025
Glenderg	180	194	127	156	112	113	122	113	138	175	184	217	187	1838
Dungannon	73	91	69	69	57	67	73	72	92	89	98	96	102	975
Mean county value		115	83	87	68	77	82	81	99	109	117	123	123	1164

Northern Ireland is, however, screened from winds from the south-west to some extent by the Donegal Highlands to the west and other upland areas of the Republic of Ireland to the south. As a result, even the wettest parts of the Province are drier than the hilly areas of the Republic of Ireland where annual amounts reach more than 3000 millimetres (Figure 2).

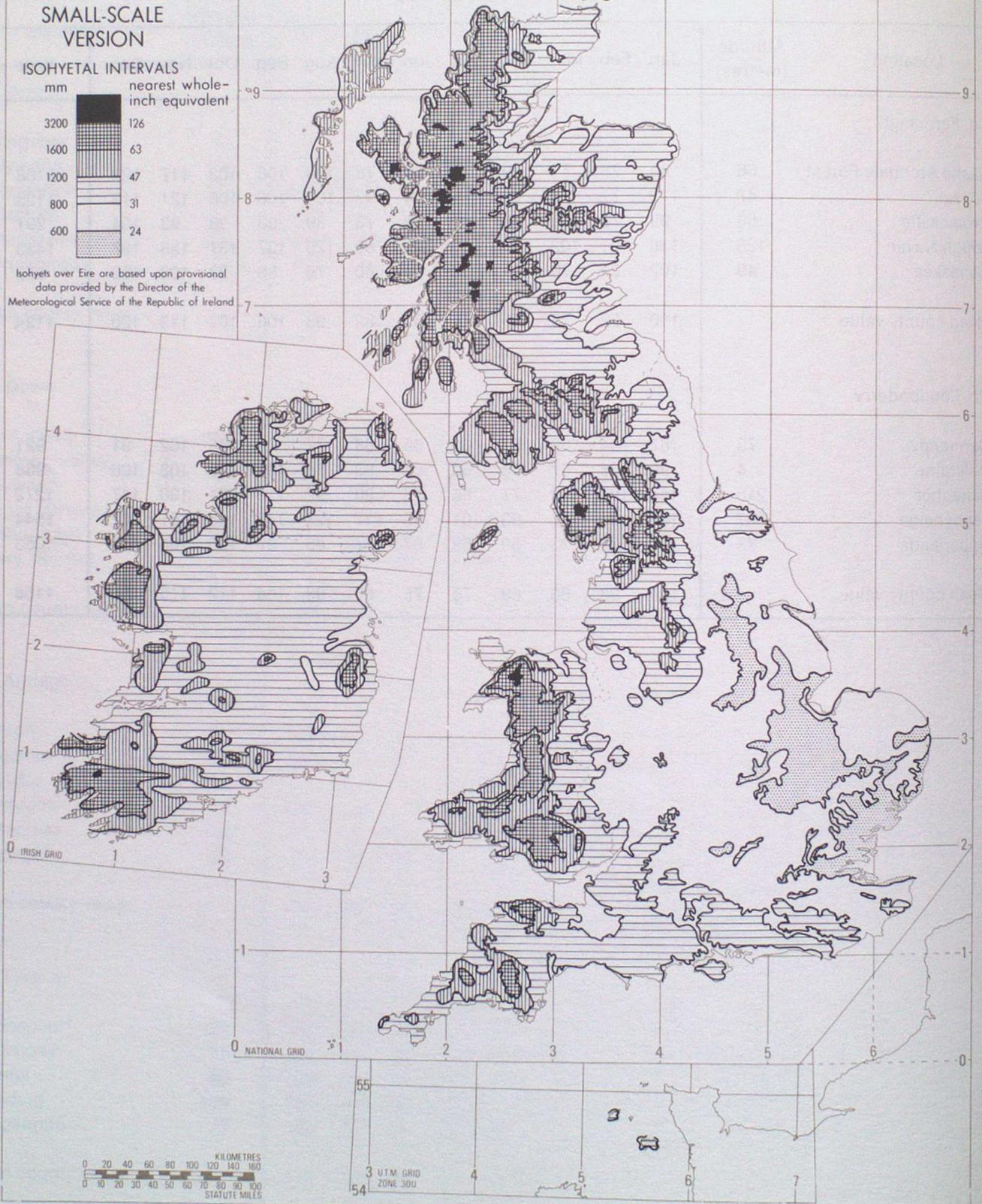
Similarly the exposed upland areas of Scotland, England

and Wales are considerably wetter than any part of Northern Ireland. On the other hand the protected areas of eastern England, with annual rainfall in the range of 500–600 millimetres, are much drier than the driest zones of Northern Ireland. In general terms, therefore, the rainfall of Northern Ireland is about 'average' for the British Isles, being less than that for Scotland and Wales, but slightly more than that for England.

TABLE 1 (continued)

Location	Altitude (metres)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Co. Fermanagh														
Castle Archdale Forest	66	99	76	71	69	79	83	78	103	108	103	117	122	1108
Belleek	47	112	77	70	66	76	84	97	101	106	106	121	119	1135
Cromcastle	58	99	73	69	58	65	72	78	89	93	98	93	104	991
Lough Navar	126	138	101	102	82	100	102	99	120	137	137	158	157	1433
Lisnaskea	49	102	81	70	51	67	64	60	79	86	93	100	100	953
Mean county value		110	82	76	65	77	81	82	98	106	107	118	120	1124
Co. Londonderry														
Carmoney	73	87	64	66	57	61	65	68	77	88	95	102	91	921
Coleraine	4	99	68	67	58	60	69	83	88	92	95	103	106	988
Banagher	216	144	107	93	77	85	76	90	92	110	121	130	147	1272
Labbyheige	347	163	121	115	93	101	99	117	121	143	148	151	172	1544
Upperlands	73	109	78	73	59	69	67	77	85	97	100	105	114	1053
Mean county value		120	88	83	69	75	75	87	93	106	112	118	126	1156

FIGURE 2.
British Isles average
annual rainfall
Period 1941-70



TEMPERATURE AND HUMIDITY

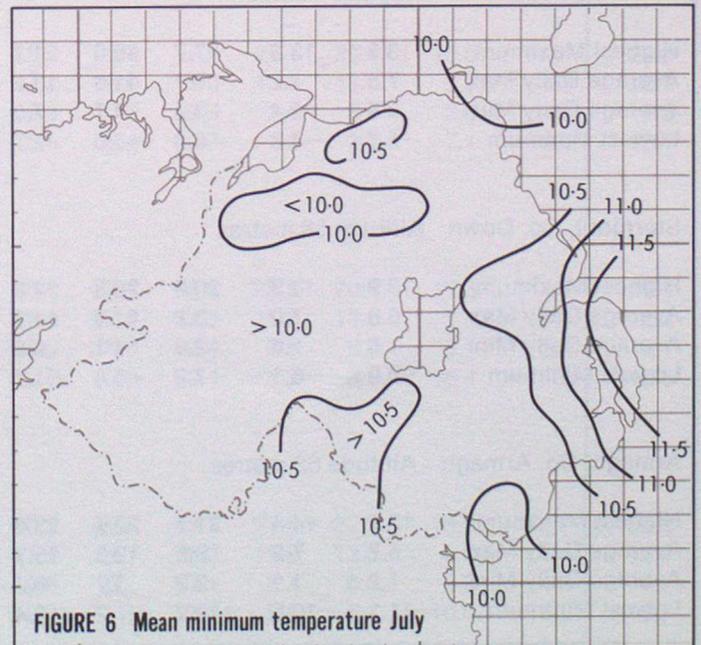
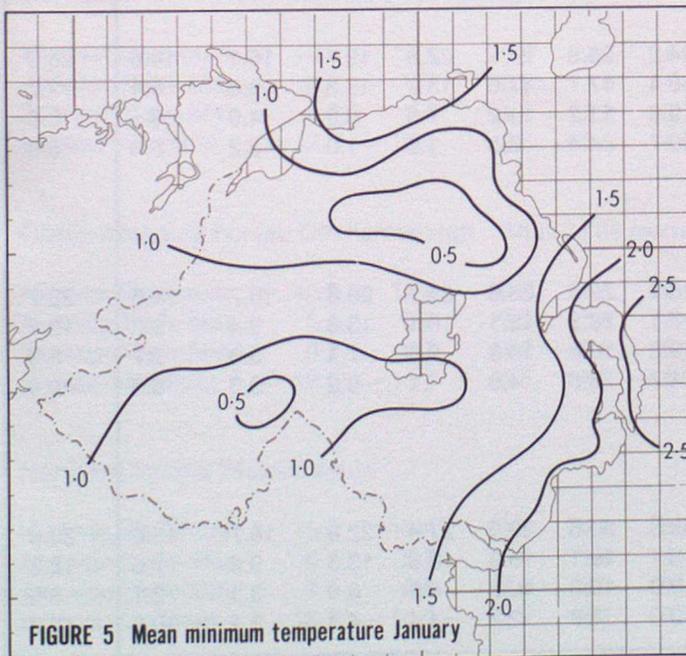
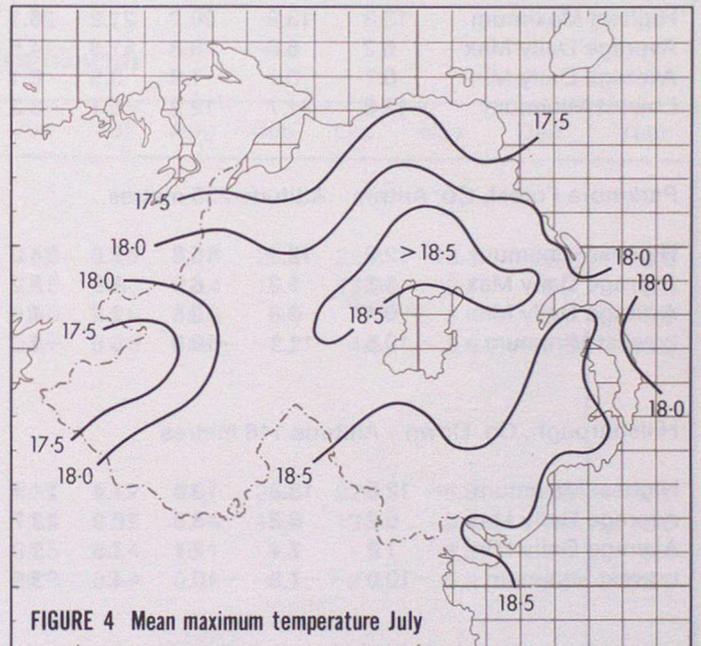
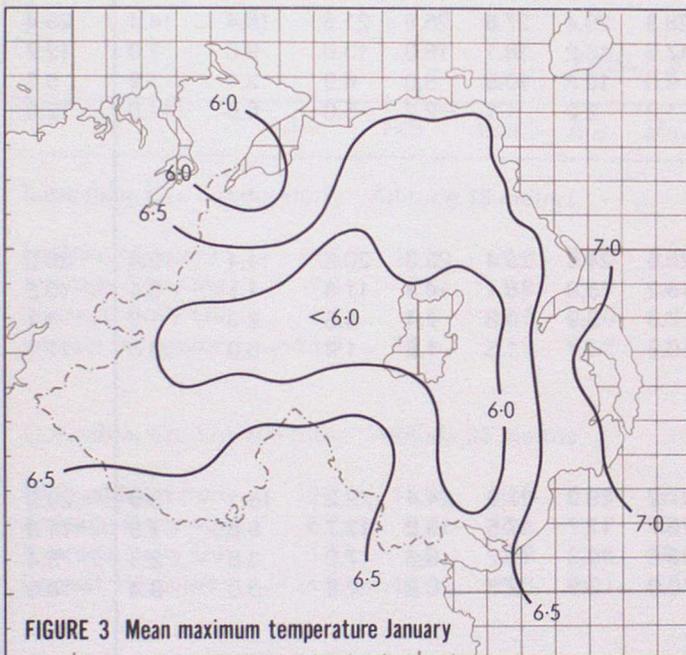
Temperature and humidity, together with wind speed, determine how warm or cold the weather feels to the individual. Owing to the influence of the surrounding sea (which remains relatively warm in winter) Northern Ireland experiences few very cold days in winter. Conversely, in summer, since no part of the Province is very far from the sea, cooler sea-breezes tend to limit the day-time maximum temperatures. The overall change, therefore, in temperature levels from winter to summer is much less than that which occurs in central Europe (where oceanic influences are small) and is also somewhat smaller than the typical variation experienced in central southern England or the Highlands of Scotland.

The variation in January mean maximum temperatures across Northern Ireland is given in Figure 3. Those areas most protected from the influence of the surrounding sea are a degree or so colder than the coastal fringe. In summer (Figure 4), since the most important factor is heating of the

ground by the sun, inland regions become warmer than those near the coast. However, the overall range is not large, being about 1 °C.

Overnight cooling plays a major role in determining minimum temperatures so that, in January, the mean minimum temperatures in the south-west and north-east approach freezing point (Figure 5). These two zones of lowest temperatures are separated by the Lough Neagh basin, which suggests that the relatively high water temperatures in January (about 4 °C) determine minimum temperatures in the vicinity. The coastal fringe of County Down has the highest minimum temperatures, which exceed 2.5 °C in places. July minimum temperatures are rather less variable (Figure 6) but, overall, the central areas are cooler at night than the coastal areas.

Values of highest maximum temperature, average daily maximum, average daily minimum and lowest minimum for



a selection of stations throughout Northern Ireland are given in Table 2. These illustrate the decrease in maximum temperatures with height (compare, for example, Aldergrove, 68 m, and Parkmore Forest, 235 m) but indicate little variation with height in the lowest minimum temperatures,

which depend more on local topographical influences, i.e. the presence of 'hollows' and other sheltered places where cold air can collect. The lowest minimum recorded in Northern Ireland is -17.5°C (see Appendix 3) and the highest maximum is 30.8°C .

TABLE 2 Averages (1951-80) and extremes of temperature ($^{\circ}\text{C}$) for a selection of stations in Northern Ireland

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Aldergrove, Co. Antrim Altitude 68 metres													
Highest Maximum	13.3	13.9	20.2	21.2	26.1	28.3	29.4	27.8	25.6	21.8	16.4	14.4	29.4
Average Daily Max	6.2	6.6	8.8	11.6	14.5	17.3	18.2	18.1	16.0	13.0	9.0	7.3	12.2
Average Daily Min	0.7	0.7	1.9	3.5	6.1	9.0	10.8	10.5	9.0	6.9	3.1	1.9	5.3
Lowest Minimum	-12.8	-11.7	-12.2	-5.1	-3.3	-1.2	2.2	1.1	-2.2	-5.0	-6.6	-11.0	-12.8
Parkmore Forest, Co. Antrim Altitude 235 metres													
Highest Maximum	12.2	12.1	18.8	19.6	24.0	25.5	24.8	25.4	23.3	20.6	14.4	12.4	25.5
Average Daily Max	5.3	5.2	6.9	9.5	12.2	15.2	15.9	16.1	14.3	11.6	7.7	6.1	10.5
Average Daily Min	-0.1	-0.3	0.8	2.2	4.6	7.3	8.9	8.8	7.4	5.8	2.3	1.2	4.1
Lowest Minimum	-10.5	-11.1	-10.0	-5.6	-4.0	-0.8	1.7	1.6	-1.6	-1.9	-6.0	-10.6	-11.1
Hillsborough, Co. Down Altitude 116 metres													
Highest Maximum	12.8	13.3	19.4	21.4	24.4	27.2	29.0	27.0	24.4	22.2	16.1	13.9	29.0
Average Daily Max	6.2	6.3	8.3	10.9	13.7	16.7	17.7	17.5	15.6	12.7	8.8	7.3	11.8
Average Daily Min	1.2	1.1	2.1	3.5	5.9	8.6	10.3	10.2	8.9	7.0	3.5	2.3	5.4
Lowest Minimum	-10.0	-7.8	-10.0	-4.6	-3.3	0.0	3.9	2.8	-0.2	-2.8	-5.0	-9.4	-10.0
Kilkeel, Co. Down Altitude 18 metres													
Highest Maximum	13.3	13.3	17.7	19.0	21.7	24.2	25.0	24.7	22.8	19.7	16.1	14.6	25.0
Average Daily Max	7.3	7.2	8.7	11.0	13.6	16.4	17.7	17.6	15.9	13.3	9.8	8.4	12.2
Average Daily Min	2.5	2.4	3.4	4.7	7.0	9.6	11.2	11.2	9.9	8.0	4.6	3.5	6.5
Lowest Minimum	-5.7	-4.8	-6.3	-3.0	-2.7	-0.7	4.4	3.5	1.9	-1.0	-3.2	-5.9	-6.3
Stormont, Co. Down Altitude 56 metres													
Highest Maximum	13.9	13.9	20.0	20.8	22.8	26.1	29.7	26.6	24.7	20.6	16.7	14.6	29.7
Average Daily Max	6.8	7.0	8.8	11.5	14.3	17.1	18.3	18.1	16.1	13.3	9.4	7.8	12.4
Average Daily Min	1.6	1.6	2.6	4.1	6.5	9.2	10.8	10.8	9.3	7.4	3.9	2.7	5.9
Lowest Minimum	-9.9	-6.1	-7.2	-5.6	-1.7	1.7	5.6	4.9	1.1	-0.2	-3.0	-6.9	-9.9
Armagh, Co. Armagh Altitude 62 metres													
Highest Maximum	13.9	14.4	21.7	22.7	25.6	29.0	30.6	29.0	27.8	22.8	16.7	15.0	30.6
Average Daily Max	6.7	7.2	9.5	12.5	15.3	18.1	19.1	18.9	16.6	13.5	9.2	7.6	12.8
Average Daily Min	1.2	1.1	2.3	3.7	6.2	9.0	10.8	10.5	8.9	6.9	3.3	2.1	5.5
Lowest Minimum	-11.1	-10.6	-12.2	-7.2	-2.4	-0.6	3.9	2.2	-4.4	-4.4	-8.4	-10.0	-12.2

The humidity is a measure of the amount of moisture in the atmosphere. It can be expressed in absolute terms by, for example, the water vapour concentration (that is, the mass water vapour per unit volume of moist air). The relative humidity is the ratio of the actual vapour concentration to the maximum concentration of water which could be held by the air at the given temperature, and is expressed as a percentage. Another measure of the humidity is the dew-point, the temperature at which cooling air becomes saturated. Further cooling below this temperature leads to

condensation, either as droplets suspended in the air or as dew on cold surfaces. The combination of high relative humidity and high temperatures produces uncomfortable 'close' conditions, whilst low humidities and moderate temperatures give the right environment for outdoor work. Changes in the relative humidity can be brought about by the changes in air temperature as well as by changes of air-mass type, air of maritime origin being generally more humid than air of continental origin.

TABLE 2 (continued)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Limavady, Co. Londonderry Altitude 18 metres													
Highest Maximum	14.4	13.9	20.9	24.0	24.6	27.8	28.9	27.8	25.6	22.2	18.3	16.7	28.9
Average Daily Max	7.0	7.6	9.2	11.7	14.4	17.0	18.3	18.4	16.1	13.0	9.7	8.3	12.6
Average Daily Min	1.4	1.5	2.6	4.0	6.1	9.0	11.0	10.6	9.1	7.1	3.6	2.7	5.7
Lowest Minimum	-13.0	-12.8	-7.9	-5.2	-5.0	-0.7	0.5	0.4	-2.2	-4.5	-8.6	-12.0	-13.0
Coleraine, Co. Londonderry Altitude 23 metres													
Highest Maximum	14.2	13.9	20.8	21.9	26.0	26.7	27.2	27.7	25.3	22.3	16.8	14.9	27.7
Average Daily Max	6.7	6.9	8.8	11.2	13.9	16.4	17.2	17.4	15.7	13.1	9.4	7.8	12.0
Average Daily Min	1.1	1.0	2.3	3.6	6.0	8.5	10.4	10.1	8.8	7.0	3.5	2.3	5.4
Lowest Minimum	-11.7	-10.6	-8.8	-4.1	-3.8	-0.3	2.4	1.1	-2.1	-2.9	-5.9	-12.5	-12.5
Carrigans, Co. Tyrone Altitude 113 metres													
Highest Maximum	12.7	12.5	20.0	22.0	24.2	28.2	29.8	27.6	23.1	20.7	15.3	14.1	29.8
Average Daily Max	6.2	6.7	8.9	11.8	14.6	17.2	18.0	18.0	15.9	13.0	8.9	7.2	12.2
Average Daily Min	0.5	0.5	1.8	3.3	5.7	8.5	10.2	9.9	8.4	6.5	2.8	1.8	5.0
Lowest Minimum	-13.0	-12.5	-8.8	-5.5	-4.0	-0.5	2.4	0.7	-1.2	-3.2	-7.1	-13.1	-13.1
Castle Archdale Forest, Co. Fermanagh Altitude 66 metres													
Highest Maximum	12.9	12.8	20.6	22.1	24.4	29.1	28.8	28.1	22.9	20.1	15.3	14.7	29.1
Average Daily Max	6.5	6.9	8.9	11.6	14.4	16.9	17.8	17.8	15.8	13.0	9.1	7.5	12.2
Average Daily Min	0.7	0.7	1.9	3.2	5.7	8.5	10.3	10.0	8.6	6.7	3.1	2.0	5.1
Lowest Minimum	-12.5	-11.1	-9.5	-7.0	-4.0	0.2	2.0	0.4	-1.2	-3.3	-6.4	-11.5	-12.5
Northern Ireland District Value													
Highest Maximum	15.0	15.4	21.7	24.0	26.2	30.8	30.8	29.7	27.8	22.8	18.5	16.7	30.8
Average Daily Max	6.3	6.7	8.8	11.6	14.4	17.2	18.1	18.0	15.9	13.0	9.0	7.4	12.2
Average Daily Min	0.9	0.8	2.0	3.3	5.8	8.6	10.4	10.1	8.7	6.8	3.2	4.7	5.2
Lowest Minimum	-16.7	-15.5	-13.9	-8.2	-6.5	-2.2	-1.1	-1.1	-5.6	-6.7	-10.0	-15.9	-16.7

The higher the temperature the more water vapour the air is capable of holding so the relative humidity has a characteristic daily cycle, with a maximum in the early morning and a minimum in the afternoon, which is directly opposite to the typical diurnal temperature variation. This is clearly demonstrated in Table 3 which gives the relative humidities at Ballykelly and Aldergrove at 03, 09, 15 and 21 GMT, on a monthly basis. The main departures from this general rule occur during misty or foggy weather, when rain is falling or when a change of air mass occurs during the day.

Variations from place to place in the British Isles are most in evidence in the afternoon, at the time of minimum relative humidity. The value of the minimum relative humidity is largely controlled by the temperature, but distance from the coast is important, partly by affecting the maximum

temperature and partly by determining the amount of available moisture.

In the six months October to March, minimum values of relative humidity show only small variations throughout the British Isles, averaging 75 per cent to 85 per cent. In mid-summer the afternoon relative humidities in central and southern England are rather lower than in Northern Ireland, but the difference is not great, being 60-65 per cent as against 70-75 per cent.

High humidities (up to 100 per cent, which corresponds to saturation) can occur at times on hills which may be enveloped in low cloud, on cold nights when mist and fog may form in sheltered places, and also in precipitation.

TABLE 3 Averages of relative humidity (per cent) for Northern Ireland, 1961-70

Ballykelly
National Grid Reference 24/624234 Altitude 2 metres

Time (GMT)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
03	87	85	86	86	87	88	91	90	88	87	87	86	87
09	87	86	83	79	77	77	80	82	85	86	86	86	83
15	82	77	73	69	69	70	73	72	75	78	81	83	75
21	86	84	84	83	82	81	86	85	87	86	86	85	85

Belfast/Aldergrove Airport
National Grid Reference 33/147798 Altitude 68 metres

Time (GMT)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
03	90	87	88	89	89	89	89	91	91	91	89	89	89
09	90	88	87	82	80	78	82	85	87	89	89	89	85
15	85	79	74	69	70	69	71	74	76	80	82	85	76
21	89	86	85	84	83	81	83	86	88	89	88	88	86



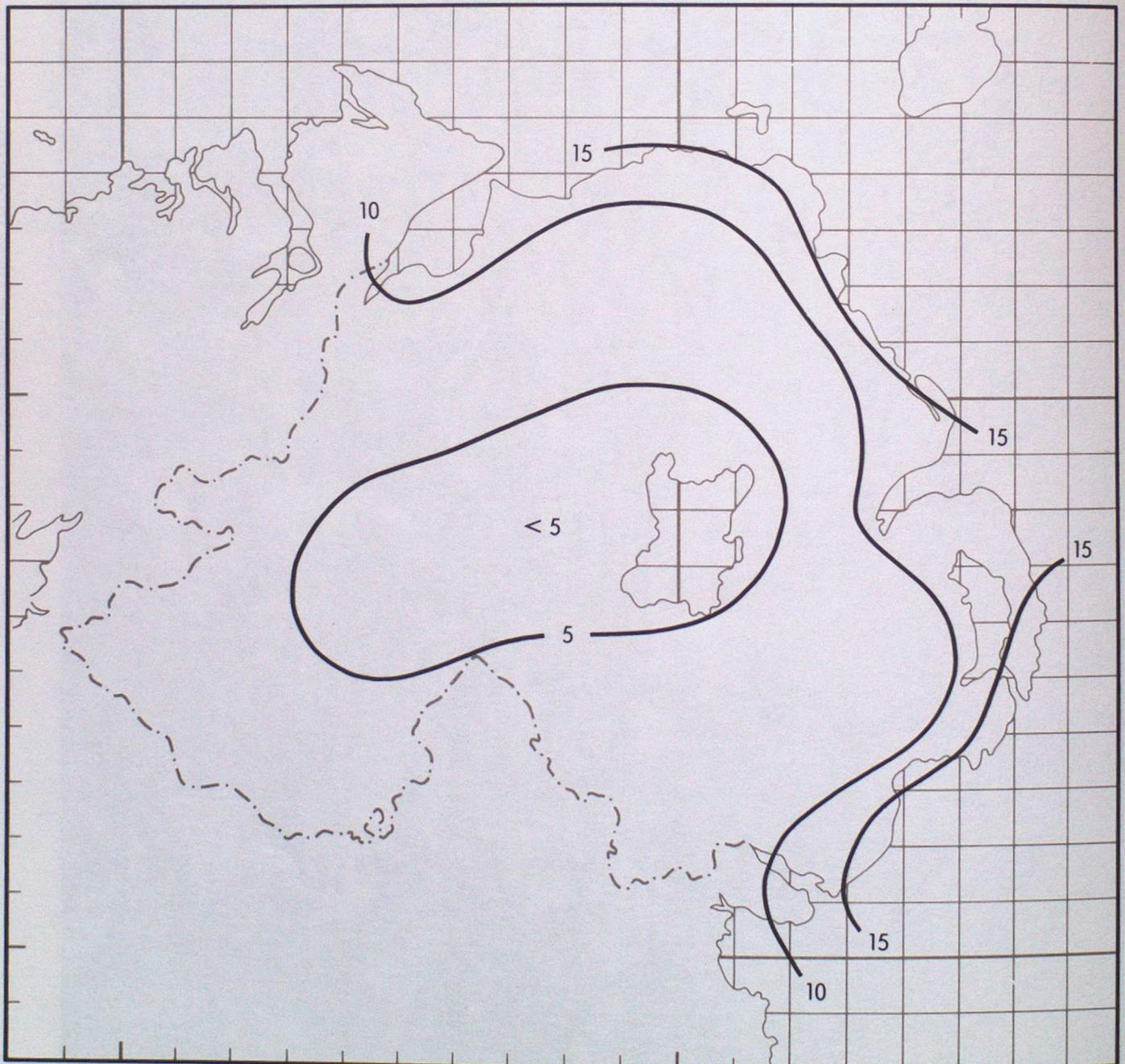
Lurigethan — Glens of Antrim.

WIND

The windiest areas are the coastal fringes of counties Antrim and Down. This is because wind speeds over the sea are usually higher than over adjacent land areas, simply because the sea is smoother than the land and the effect of friction is correspondingly less. Topographical effects near or over land can also be very important and, in the vicinity of hills, localities can be found where wind speeds may be much higher than the general average for the area. Figure 7 shows the distribution of the annual average number of days with gales and illustrates the relatively protected central area with less than 5 occurrences each year. (A day with gale is defined as one on which the mean wind speed at the standard measuring height of 10 m above ground attains a value of 34 knots, that is 39 miles per hour or 17.2 metres per second, or more, over any period of 10 minutes

during the 24 hours.) Around the coastal fringe the number of days with gales exceeds 15. Table 4 illustrates the monthly variation in these figures and indicates that November, December and January are the windiest months whilst July and August are the least windy. Since the prevailing wind direction in Northern Ireland is between south and west the whole area is protected by the Republic of Ireland, so even the coastal areas are much less windy than exposed areas in Scotland and England. For example, Shetland and the Hebrides experience, on average, about 43 and 35 days, respectively, with gales each year and the extreme south-west of England experiences about 30. However, the protected inland areas of Northern Ireland experience more gales than similar areas in southern England.

FIGURE 7 Mean annual number of days with gales



Extreme wind speeds are important since they may cause widespread damage. Table 5(a)–(d) gives the maximum winds (with directions) at a selection of localities in Northern Ireland. Unlike the frequency of occurrences of days with gales the maximum hourly wind speeds and gusts are fairly evenly distributed throughout the year. There is also little variation in the value of the maximum hourly wind speed from place to place.

time. As well as influencing wind speed, topography can have a marked local effect on wind direction with, for example, the wind direction tending to be aligned along well-defined valleys. Over most of Northern Ireland the average wind speed is in the range 8–10 knots, which is similar to that experienced in other parts of the British Isles.

Although the most common wind direction is south-westerly, in fact the wind only blows from between south and west for about one-third of the time and for only about half of the time does it have a westerly component. Calm or light winds occur about one-tenth of the time and winds with an easterly component blow for the remainder of the

TABLE 4 Monthly and annual average number of days with gales, 1951–80

	Altitude (metres)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Co. Antrim														
Aldergrove	68	0.9	0.3	0.2	0.1	0.1	0.1	0.0	0.1	0.3	0.3	0.4	0.6	3.4
Belfast	32	1.8	0.7	1.6	0.4	0.3	0.3	0.0	0.2	0.6	0.7	1.8	1.6	10.0
Ballycastle	152	2.1	1.6	1.9	0.5	0.5	0.3	0.1	0.1	0.9	2.4	3.2	5.2	18.8
Co. Down														
Bangor	15	2.2	1.7	2.2	0.5	0.8	0.0	0.0	0.3	0.8	0.5	1.7	1.1	11.8
Kilkeel	18	3.8	1.9	1.9	0.9	0.4	0.2	0.2	0.5	1.0	1.3	2.8	2.7	17.6
Hillsborough	116	0.8	0.6	0.2	0.5	0.1	0.1	0.0	0.2	0.5	0.5	0.5	1.0	5.0
Co. Armagh														
Armagh	62	1.0	0.9	0.4	0.6	0.1	0.2	0.1	0.2	0.7	0.7	1.0	1.4	7.3
Co. Derry														
Ballykelly	2	2.1	2.6	1.1	1.1	0.5	0.3	0.1	0.3	0.7	0.5	1.0	2.0	10.0
Coleraine	23	0.6	1.4	0.2	0.2	0.0	0.0	0.0	0.0	0.4	0.6	0.8	0.6	4.8
Co. Tyrone														
Carrigans	113	0.9	0.6	0.8	0.6	0.3	0.0	0.0	0.0	0.2	0.4	0.3	0.2	4.3
Co. Fermanagh														
Castle Archdale	66	0.8	0.5	0.3	0.5	0.1	0.0	0.0	0.1	0.5	0.3	0.9	1.1	5.0

TABLE 5 Extreme wind speeds and directions at specified locations in Northern Ireland

(a) Belfast (Aldergrove) Airport 1927-1987

Wind directions are in degrees true and wind speeds in knots.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Highest Mean Hourly Wind Speed	43	45	37	37	36	45	30	36	49	42	47	44	49
Wind Directions	240	180	240	230	300	230	160	160	190	230	150	330	190
Year of Occurrence	1954	1957	1986	1960	1954	1960	1964	1959	1961	1961	1959	1966	1961
Highest Gust Speed	72	71	61	65	61	67	50	56	76	71	73	69	76
Wind Directions	240	190	260	220	160	250	230	310	200	310	240	330	200
Year of Occurrence	1984	1957	1986	1943	1934	1938	1932	1957	1961	1938	1928	1966	1961

(b) Carrigans (near Omagh) 1964-1987

Wind directions are in degrees true and wind speeds in knots.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Highest Mean Hourly Wind Speed	45	32	47	33	33	29	27	26	30	34	43	39	47
Wind Directions	290	190	240	320	330	320	330	250	180	250	260	330	240
Year of Occurrence	1965	1966	1986	1965	1987	1975	1978	1966	1964	1970	1965	1966	1986
Highest Gust Speed	76	62	64	57	56	49	45	46	51	64	81	72	81
Wind Directions	280 200	190	270	300 270	330	320	230	220 250	250	240	260	350	260
Year of Occurrence	1965 1974	1966	1966	1973 1977	1987	1975	1986	1965 1966	1973	1970	1965	1966	1965

TABLE 5 (continued)

(c) Castle Archdale Forest 1964-1987

Wind directions are in degrees true and wind speeds in knots.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Highest Mean Hourly Wind Speed	48	36	38	29	31	24	27	29	34	32	43	36	48
Wind Directions	180	170	240	120	250	170	210	180	200	180	220	170	180
Year of Occurrence	1974	1966	1966	1966	1966	1965	1964	1965	1964	1982	1965	1966	1974
Highest Gust Speed	87	62	68	52	53	45	45	46	56	59	71	68	87
Wind Directions	180	280	280	290	250 320	170	210	180	200	180	230	300	180
Year of Occurrence	1974	1984	1986	1969	1966 1987	1965	1964	1965	1964	1982	1965	1966	1974

(d) Belfast Harbour 1964-1987

Wind directions are in degrees true and wind speeds in knots.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Highest Mean Hourly Wind Speed	46	39	43	43	45	36	31	38	37	38	40	47	47
Wind Directions	300	260	260	040	290	340	310	280 360	160	220	280	330	330
Year of Occurrence	1976	1973	1967	1981	1966	1975	1968	1970 1986	1973	1984	1975	1966	1966
Highest Gust Speed	80	60	70	62	66	57	49	51	61	69	65	70	80
Wind Directions	300	280	260	290	280	290	290	360	160	230	def. 300	330	300
Year of Occurrence	1976	1967	1987	1973	1966	1975	1968	1986	1973	1984	1970 1977	1966	1976

def. denotes defective record



Mountains of Mourne.

SUNSHINE

Northern Ireland as a whole has, on average, about 1300 hours of bright sunshine each year, compared to favoured places in southern England (around 1700 hours) and Majorca (2800 hours). The sunniest area is the County Down coast where, in some years, over 1500 hours of sunshine have been recorded. Table 6 gives values of the mean daily sunshine (on a monthly basis) for a selection of stations. The sunniest month is generally May with over 6 hours a day whilst the dulllest month is December with just

over 1 hour a day. A significant decrease in sunshine occurs in July, corresponding to the marked increase in rainfall and associated cloudiness in this month. It is worth noting that although the coastal areas are cooler in summer than places further inland they do tend to get more bright sunshine; this is the result of sea-breezes which, while bringing cooler air off the sea, do at the same time often disperse cloud near the coast.

TABLE 6 Averages of sunshine for Northern Ireland, 1951-80

Values in mean hours per day

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Aldergrove	1.45	2.37	3.25	5.28	5.96	5.91	4.54	4.57	3.60	2.62	1.89	1.18	3.56
Armagh	1.51	2.31	3.23	4.82	5.61	5.38	4.10	4.26	3.50	2.67	1.90	1.19	3.38
Coleraine	1.31	2.22	3.18	4.98	5.59	5.47	3.96	4.12	3.21	2.29	1.59	0.96	3.24
Helen's Bay	1.72	2.52	3.44	5.36	6.19	6.21	4.86	4.84	3.85	2.86	2.13	1.38	3.28
Castle Archdale	1.46	2.30	3.26	4.78	5.36	5.22	3.87	4.06	3.38	2.51	1.73	1.08	3.25
Cookstown	1.54	2.36	3.29	4.85	5.45	5.20	3.91	4.08	3.28	2.53	1.88	1.17	3.29
Hillsborough	1.48	2.32	3.24	5.03	5.87	6.00	4.58	4.69	3.72	2.80	1.98	1.19	3.57
Lough Bradan	1.35	2.17	3.22	5.00	5.59	5.57	4.08	4.28	3.45	2.43	1.68	1.04	3.32
Stormont Castle	1.60	2.39	3.27	5.14	5.90	5.96	4.60	4.67	3.62	2.68	1.94	1.29	3.59
Newcastle	1.92	2.62	3.52	5.29	6.10	6.21	5.09	4.99	4.10	3.03	2.32	1.55	3.89
Strabane	1.37	2.30	3.28	4.91	5.58	5.39	3.88	4.22	3.39	2.48	1.64	0.88	3.28
Ballymena	1.43	2.39	3.40	5.34	6.13	6.07	4.66	4.67	3.67	2.63	1.86	1.16	3.62
Carrigans	1.43	2.12	3.33	4.93	5.81	5.33	4.17	4.33	3.27	2.55	1.77	1.11	3.35
Ballywalter	1.62	2.54	3.49	5.57	6.43	6.45	5.06	5.10	4.07	2.99	2.07	1.25	3.89
Northern Ireland	1.45	2.31	3.23	4.98	5.68	5.60	4.21	4.23	3.48	2.58	1.82	1.12	3.39

Sperrin mountains.



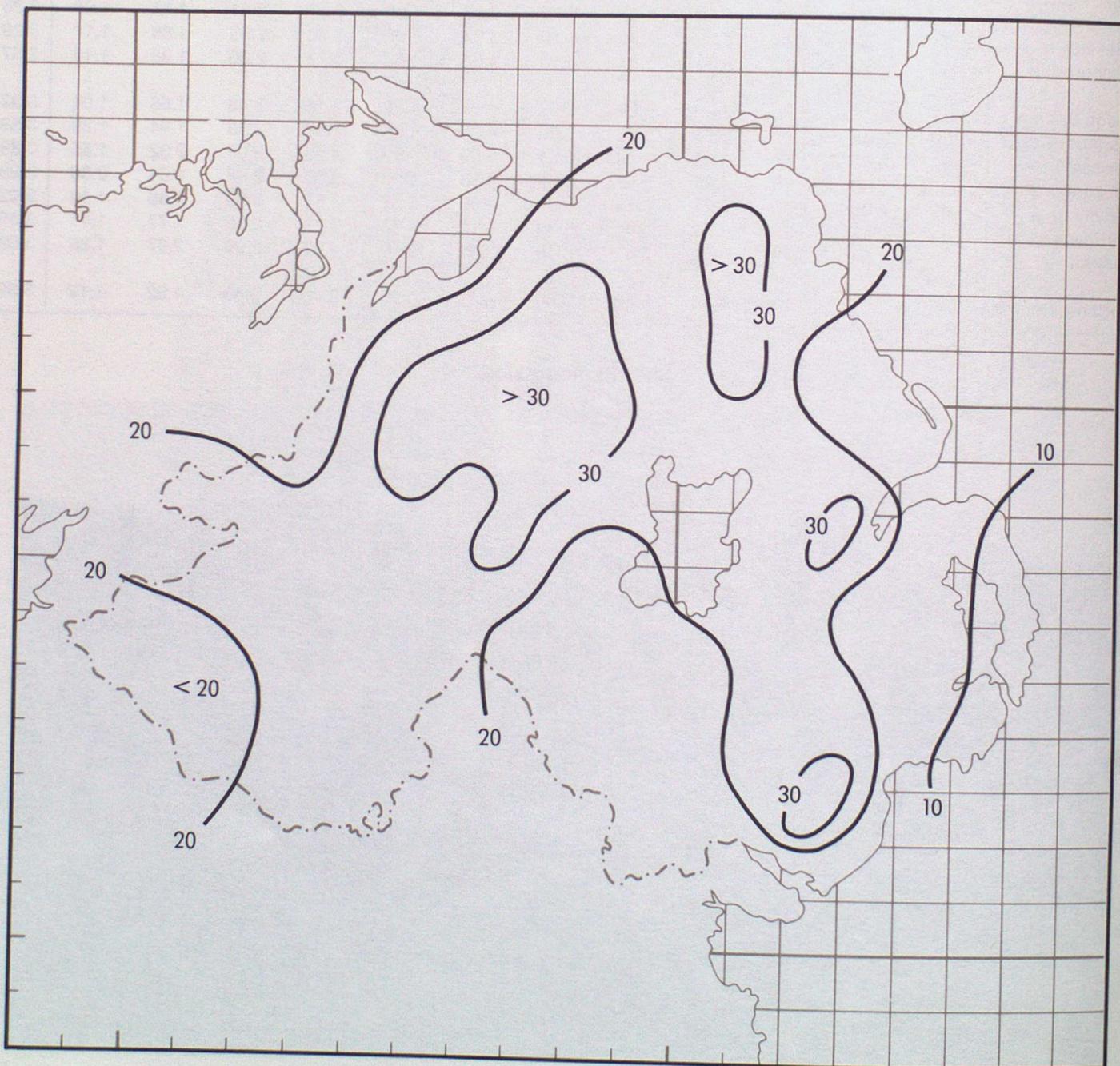
SLEET AND SNOW

Snowfall is one of the most variable of meteorological elements both in amount and duration. There can be winters when little or no snow falls on low ground and others such as 1962/63 and 1981/82 when snow lay for a considerable period. In most years snowfall is not a great problem in Northern Ireland but, on occasions, heavy falls accompanied by drifting in strong winds can hamper transport for a short time. Height above sea level is an important factor governing whether precipitation will be in the form of rain, sleet or snow and can also strongly influence the persistence of snow cover. Similarly, distance from the coast is relevant so that the average annual number of days with snow or sleet falling is at a maximum over high ground inland (Figure 8). The maximum number of days with snow falling (a little over 30) is much less than that which occurs in the Highlands of Scotland where snow

falls on about 70 days each year. It is unusual for snow to fall outside the period November to May and the highest frequencies of occurrence are in January and February.

A day with snow lying is defined as one when more than half of the ground is covered by snow at 09 GMT. For Northern Ireland the average annual number of days with snow lying for the period 1951–80 varies from more than 30 days on the high ground inland to less than 10 around the coastal fringe. This compares with more than 60 days in central Scotland and the high ground of northern England. Of course, in mountainous areas, snow beds (local hollows filled by drifting snow) may survive for a considerable period which bears no relation to the number of days with snow lying in the immediate vicinity or even to exposed areas at much higher levels.

FIGURE 8 Mean number of days each year with sleet or snow falling, for the period 1951–80





Slemish mountain in winter.

VISIBILITY

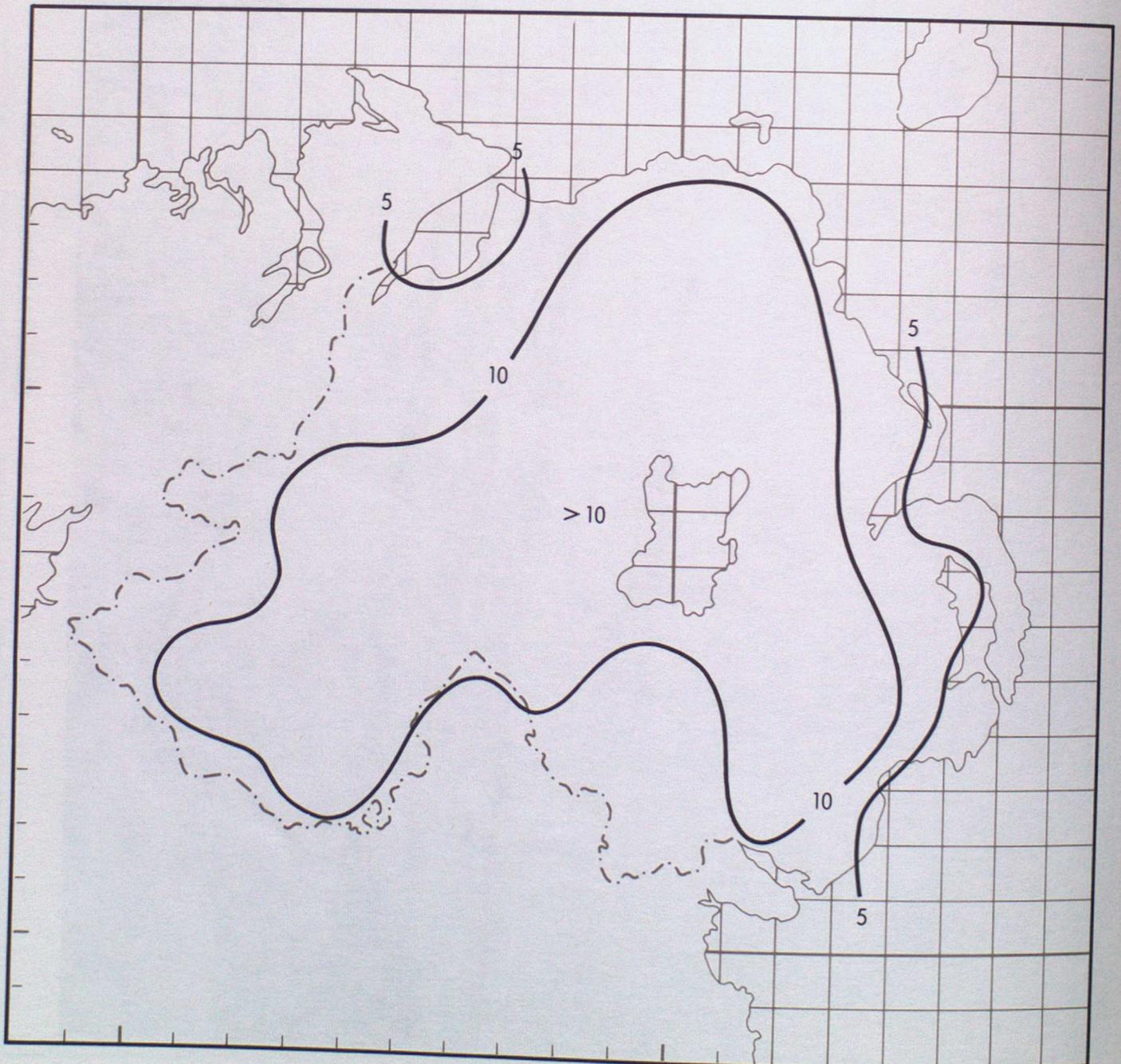
Northern Ireland enjoys generally good visibility compared to the industrialized areas of central England and the Forth-Clyde valley of Scotland. The visibility can range from a few tens of metres in fog to upwards of 50 km on very clear days. This section is mainly concerned with the occurrence of visibilities of less than 200 metres, roughly the limit below which disruption can be caused to road traffic.

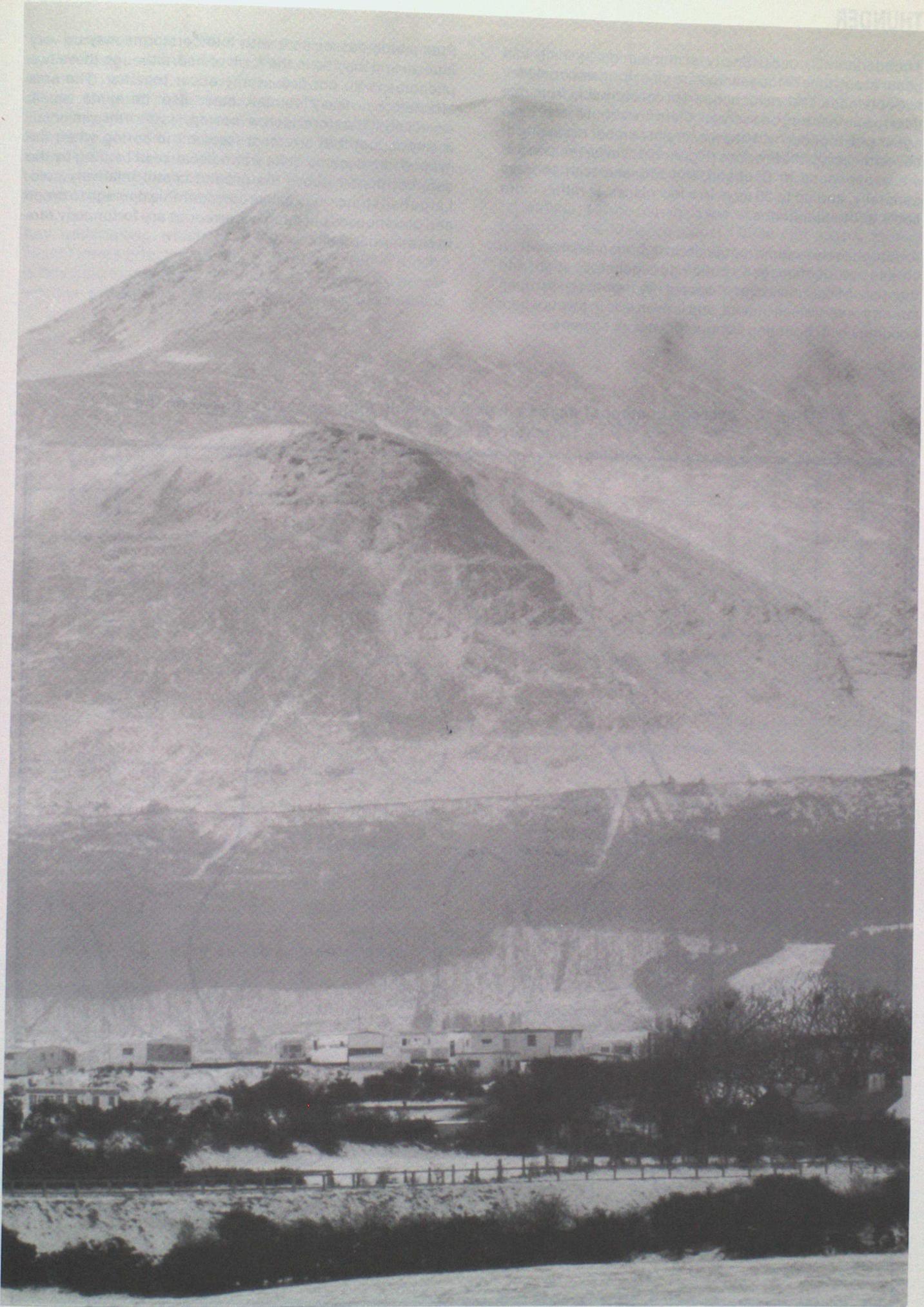
Fog is formed when air is cooled below its dew-point and water droplets remain suspended in the atmosphere in sufficient concentrations to cause marked reductions in the visibility. This cooling can occur when air is forced to rise over hills, thereby forming cloud which can be at ground level (hill fog), or by contact with the cooling land surface on clear nights (radiation fog). Cooling can also be caused by the passage of warm moist air over a relatively cold sea

surface (advection fog). This creates sea fog which is particularly prevalent in the spring. Near industrial areas the visibility can also be reduced by solid particles of pollution suspended in the air producing smoke haze. Reduction of visibility by smoke haze sometimes occurs in the Belfast area and Northern Ireland is occasionally affected by the transport of pollution from the industrial areas of England in a prolonged spell with south-easterly winds.

Figure 9 gives the distribution of the average number of days each year with fog throughout Northern Ireland. The highest values occur in central areas with frequencies in the range 10–15 days each year. Coastal areas of counties Down and Antrim have less than 5. The figures compare favourably with those from other parts of the British Isles.

FIGURE 9 Annual average number of days with fog 1951–80





Slieve Donard (840 m), the highest mountain in Northern Ireland, in winter.

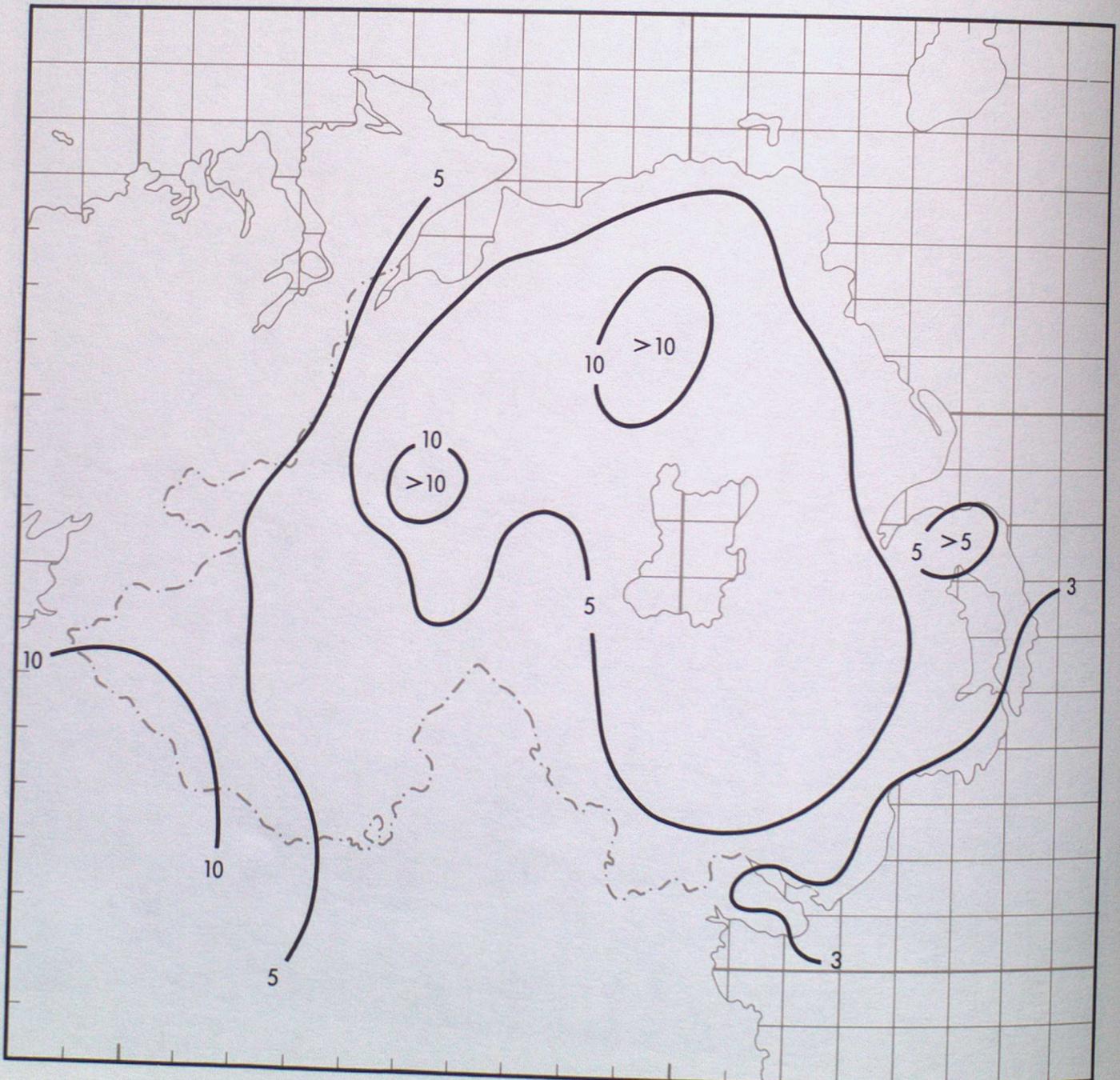
THUNDER

Thunderstorms, occasionally accompanied by hail, can occur at any time of the year but are most frequent from May to September. The incidence varies considerably from one year to another but, on average, there are about 5 to 10 days a year with thunder, with the maximum number occurring in the north-west of the Province (Figure 10). Similar frequencies are experienced in Scotland, but England with 15 days generally, and up to 20 days in a few places, is rather more liable to thunderstorms.

Although there is some danger from lightning flashes which strike to earth, damage to buildings is generally slight and the risk of serious injury caused by lightning in open country is very small indeed, and is even less in towns where buildings with lightning conductors act as screens.

Precipitation associated with thunderstorms may be very intense and may be in the form of hail, although these two phenomena do not necessarily occur together. The area affected by heavy rainfall may also be quite small, especially if the storm is slow moving. Hailstorms can occur in any month, but are most frequent in spring when the ground can become quite warm because of heating by the sun, but the air above the ground is still relatively cold. Large hail stones may cause considerable damage to crops and glasshouses but such occurrences are fortunately rare in Northern Ireland.

FIGURE 10 Average number of days each year on which thunder occurs, based on the period 1951-80



FURTHER INFORMATION

The Meteorological Office collects and archives, on a routine basis, weather reports from a national network of observing stations, consisting of both meteorological offices manned by professional staff and co-operating stations operated by interested organizations and individuals. Reporting stations are inspected and all these data are subjected to close scrutiny before being archived, in order to ensure consistency of standards. They are then available to meet the needs of the community.

Any undertaking which is at all weather-sensitive can benefit from a prior knowledge of the climate within which it is expected to operate. The building industry can use past-weather statistics to estimate likely delays on contracts,

architects and civil engineers need to know the extremes of weather which a structure may have to withstand, and many industrial processes are dependent on atmospheric conditions for their success. The agricultural industry uses such information for a variety of purposes, many relating to the viability of new crops and weather-related incidence or spread of pests and diseases.

In addition to special analyses of weather data for these purposes, the Meteorological Office can supply factual statements on weather conditions for legal and insurance purposes. Enquiries on all aspects of past weather should be directed to the appropriate address on page 4.

APPENDIX 1 Climatological stations used in this publication



APPENDIX 2 Climatological data for a selection of places in England, Wales and Scotland
(averages over the 30-year period 1941–70)

	Altitude	Average annual rainfall	Average daily maximum temperature		Average annual duration of bright sunshine
			Jan	Jul	
	m	mm	°C		h
Aberystwyth (Dyfed)	136	1049	6.7	17.7	1474
Ambleside (Cumbria)	46	1902	5.8	19.2	1179
Blackpool (Lancashire)	10	862	5.8	18.8	1551
Bournemouth (Dorset)	40	839	7.1	20.7	1747
Cardiff (South Glamorgan)	62	1085	6.8	20.4	1525
Clacton-on-Sea (Essex)	16	573	5.5	20.4	1656
Colwyn Bay (Clwyd)	36	751	7.5	18.7	1525
Douglas (Isle of Man)	87	866	6.7	17.2	1575
Durham (Durham)	102	650	5.4	19.3	1332
Folkstone (Kent)	39	720	6.3	20.2	1749
Ilfracombe (Devon)	8	1047	8.2	18.6	1631
London – Kew (Greater London)	6	599	6.1	21.6	1529
Lowestoft (Suffolk)	25	602	5.7	20.1	1594
Manchester Airport (Greater Manchester)	75	819	5.5	19.6	1334
Oxford (Oxfordshire)	63	659	6.2	21.5	1517
Penzance (Cornwall)	19	1098	9.4	19.5	1720
Shrewsbury (Salop)	56	627	6.2	20.5	1361
Skegness (Lincolnshire)	5	596	5.6	19.6	1523
Southampton (Hampshire)	3	801	7.4	21.8	1633
Weston-super-Mare (Avon)	9	806	7.1	20.6	1578
Glasgow Airport (Strathclyde)	5	982	5.5	18.6	1266
Edinburgh (Lothian)	26	661	5.9	18.6	1332
Braemar (Grampian)	339	879	3.5	17.1	1120
Wick (Highland)	36	788	5.1	15.4	1264
Lerwick (Shetland)	82	1172	4.7	14.0	1067
Stornoway (Western Isles)	3	1094	6.5	15.5	1244

APPENDIX 3 Weather extremes in Northern Ireland

<p align="center">Rainfall</p> <p align="center"><i>Maximum fall in a day (09–09 GMT):</i></p> <p>158.7 mm (6.25 inches) at Tollymore Forest, Co. Down on 31 October 1960.</p> <p align="center"><i>Maximum fall in less than 1 hour:</i></p> <p>97.0 mm in 45 minutes at Orra Beg, North Antrim, 1 August 1980 (Record for UK).</p>	<p align="center">Bright Sunshine</p> <p align="center"><i>Maximum duration in one month:</i></p> <p>295.3 hours at Aldergrove, Co. Antrim, May 1946.</p> <p align="center"><i>Minimum duration in one month:</i></p> <p>12.2 hours at Castle Archdale, Co. Fermanagh, in December 1977.</p>
<p align="center">Air Temperature</p> <p align="center">(Measured under standard conditions at 1.25 m above ground)</p> <p align="center"><i>Highest recorded:</i></p> <p>30.8 °C at Knockarevan near Belleek, Co. Fermanagh on 30 June 1976, and at Shaw's Bridge, Belfast, Co. Antrim on 12 July 1983.</p> <p align="center"><i>Lowest recorded:</i></p> <p>–17.5 °C at Magherally, near Banbridge, Co. Down, 1 January 1979.</p>	<p align="center">Wind Speed</p> <p align="center">(Measured under standard conditions at 10 m above ground)</p> <p align="center"><i>Highest mean hourly wind:</i></p> <p>56 kn at Orlock Head, Co. Down, 29 January 1978.</p> <p align="center"><i>Highest Gust recorded:</i></p> <p>108 kn at Kilkeel, Co. Down, 12 January 1974.</p>

APPENDIX 4 Conversion Tables

RAINFALL 1 inch = 25.4 mm

Millimetres	Inches	Millimetres	Inches	Millimetres	Inches	Millimetres	Inches
0	0	30	1.2	200	7.9	800	31.5
5	0.2	35	1.4	300	11.8	900	35.4
10	0.4	40	1.6	400	15.7	1000	39.4
15	0.6	45	1.8	500	19.7	1500	59.1
20	0.8	50	2.0	600	23.6	2000	78.7
25	1.0	100	3.9	700	27.6	4000	157.5

TEMPERATURE degrees Celsius (centigrade) to degrees Fahrenheit °F = (°C x 9/5) + 32

°C	°F	°C	°F	°C	°F	°C	°F
–18	0	–2	28	14	57	30	86
–16	3	0	32	16	61	32	90
–14	7	2	36	18	64	34	93
–12	10	4	39	20	68	36	97
–10	14	6	43	22	72	38	100
–8	18	8	46	24	75	40	104
–6	21	10	50	26	79	42	107
–4	25	12	54	28	82	44	111

APPENDIX 5 Location of Belfast Climate Office

