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Supplement of

A 305-year continuous monthly rainfall series for the island of Ireland (1711–2016)

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Monthly and Annual Rainfall for Ireland, 1711-1977

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1. Introduction

A table of monthly and annual rainfall for Ireland, 1711 to 1977 is given at the end of this paper. The years 1881 to 1977 have been compiled mainly from published official records, and are added for completeness to the series for the years 1711 to 1880, which has been derived from individual station records, some of them published. This early series may be regarded as an initial essay on the earlier rainfall climate of Ireland.

2. Reduction of the data2.1 Analysis of monthly falls

In any year, monthly and annual rainfalls for a given station in a region are usually expressed as percentages of the annual average rainfall (AAR) for a normal period. Table 1 shows an example of the analysis, for 5 Irish stations for 1839, with AAR for the normal period 1792-1839.

Table 1. Monthly and annual rainfall for 1839, as percentage of AAR for the normal period 1792-1839.

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Year
Belfast	7.8	7.2	8.9	4.2	2.7	10.4	11.7	11.2	16.1	11.3	11.9	10.5	114
Markree	9.5	7.2	7.6	5.9	2.4	7.4	5.4	8.6	14.6	6.9	9.6	4.9	90
Cork	4.4	9.2	8.7	7.1	0.3	9.8	17.2	7.6	11.3	12.5	9.7	17.1	115
Dublin	8.2	4.7	7.8	4.0	2.7	7.2	19.6	14.0	19.3	12.6	13.1	10.7	124
Armagh	2.1	3.7	5.1	4.2	2.1	12.3	12.2	10.9	14.3	17.3	9.3	14.6	108
Mean	6.4	6.4	7.6	5.1	2.0	9.4	13.2	10.5	15.1	12.1	10.7	11.5	110
Internal percentages	5.8	5.8	6.9	4.6	1.8	8.6	12.0	9.6	13.7	11.0	9.7	10.5	100

The sum of the mean monthly percentages of AAR is identical with the mean of the annual percentages of AAR. This result can be surmised by noting the annual percentage of AAR, 110 percent, and by recording the mean monthly percentages as internal percentages of the annual fall, as in the last line of Table 2.

Very nearly the same results are obtained by meaning the internal percentages for each station. These are shown in Table 2.

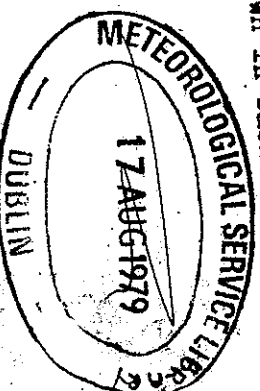


Table 2. Monthly falls for 1839 as internal percentages of the annual fall for

	<u>each station</u>												
	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	
Belfast	6.8	6.3	7.8	3.7	2.4	9.1	10.3	9.8	14.1	9.9	10.4	9.2	100
Markeere	10.6	8.0	8.4	6.6	2.7	8.2	6.0	9.6	16.2	7.7	10.7	5.4	100
Cork	3.8	8.0	7.6	6.2	0.3	8.5	15.0	6.6	9.8	10.9	8.4	14.9	100
Dublin	6.6	3.8	6.3	3.2	2.2	5.8	15.8	11.3	15.6	10.2	10.6	8.6	100
Armagh	1.9	3.4	4.7	3.9	1.9	11.4	11.3	10.1	13.2	16.0	8.6	13.5	100
Mean	5.9	5.9	7.0	4.7	1.9	8.6	11.7	9.5	13.8	10.9	9.7	10.3	100

There are several advantages in this procedure:

- (1) If monthly falls are processed in this way, year by year, only the annual falls remain to be analysed, and full attention can be given to the difficulties caused for example by unrepresentative changes at a given station, e.g. changes in site or exposure or gauge etc, none of which are likely to affect materially the internal percentages in any year.
- (2) Stations which have only a few years of record, even a single year, can be processed at once in the internal percentage analysis, leaving the estimation of AAR for the station to the time when annual falls are analysed.
- (3) The annual rainfall analysis may show that a station record must be regarded (usually for one or other of the causes in (1)) as comprising two or more discontinuous periods each with appropriate AAR. In this case the analysis of annual rainfall is best done by regarding these periods as being from different stations at the same location; but once again this does not affect the internal percentage analysis.

Glasspool (1931) used the internal percentage method in producing his well-known regional series for England and Wales, 1727 to 1931. Glasspool (1924) also gave monthly and annual values for Scotland and Ireland for 1881 to 1924; and also produced the series of annual percentage maps (normal period 1881-1915) for the British Isles for 1868 to 1923, published in 1926 by the Royal Meteorological Society.

2.2 Analysis of annual falls

The first step in the analysis is to take a period of 20 to 50 years, half of it overlapping with the Glasspool series for Ireland, 1881-1924; and to continue this overlapping back to earliest records. The periods taken may be varied according to the rate of change of stations, with the longer period taken as optimum.

In the (50 year) period, a first estimate of AAR for a station may be taken as the arithmetic mean of the available annual falls, and the individual years recorded as percentages of this AAR. The mean of the station percentage values for a given year is taken as the estimate of the

regional percentage of AAR for that year. Returning now to an individual station, a new estimate of AAR can be obtained from each year with data, using the regional percentage for that year; then the mean for all data years gives the next estimate of AAR.

Three iterations of these two computational steps will give final estimates of (1) Station AAR (2) Station annual percentages of AAR (3) Regional annual percentages of AAR.

The station annual percentages are mapped for each year, or an equivalent computer analysis performed, e.g. as in the U.K. Flood Studies Report (Vol II, Jenkinson and Jackson, 1975). This will show up discontinuities or other errors. Stations with discontinuities are best treated as two (or more) different records, and individual errors amended by the usual elementary methods. The whole process is now repeated.

A similar analysis is done for each overlapping period, and the regional annual percentages combined into a long series which was then further calibrated against relevant established series, e.g. Glaspoole's England and Wales series. The individual station records may also be combined into long series, with missing observations, and annual maps drawn.

These methods were used to produce the final Ireland series of annual falls, and these were expressed as percentages of AAR for 1826-1975. But the nature of the data necessitated other forms of analysis, and these will be discussed in a general account of the data used in different periods.

3. An account of the data used

3.1 Derry, 1711-1725. Dixon (1959) analysed the weather diary of Thomas Neve, kept at Ballyneil, County Derry, and published monthly and annual totals, together with days of reported precipitation. These have been processed to give internal percentages for each year; but it has been found impossible to calibrate the annual falls, and annual days of precipitation were used in their place to represent the year to year variation of annual rainfall.

3.2 Crosby, 1711-15, 1718-27. Nicholas Blundell's Diurnal (1968, 1970, 1972) includes for the years 1710 to 1727 monthly and annual weather summaries, mainly for London or Flanders for the years 1716 and 1717, but otherwise at Crosby, near Liverpool.

In view of the strong correlations between Ireland rainfall and that of (1) NW England (2) SW Scotland, especially with eastern and northern Ireland respectively, it has been the practice in compiling the Ireland series, in the period before 1840 when data were relatively scarce, to include regional values for both NW England and SW Scotland as single stations in the Ireland analysis. This applies to the period 1792-1839 for SW Scotland, and 1757-1839 for NW England; but the Crosby data were also used as a NW England series for 1711-15, 18-27. The Crosby data were analysed in the same way as the Dublin weather summaries published by Rutty (see section 3.4).

3.3 Castle Dobbs, Antrim, 1726-27. M.S. monthly and annual falls available in the Meteorological Office. An internal monthly analysis was made. The annual falls were not used.

3.4 Dublin, 1716-65. Rutty (1770) published a chronological history of the weather in Dublin for 1716-65, including brief monthly and seasonal weather

summaries. The summaries were read completely through twice, to become familiar with his expressions. Then they were assessed, giving for each month a ranking for rainfall on a scale 1 (exceptionally dry) to 9 (exceptionally wet); these were made to accord with the corresponding seasonal summaries. This analysis was destroyed, and the assessment done again, and also destroyed. A third assessment was taken as final. For the month of December the frequencies of rankings are given in Table 3.

Table 3. Frequencies of rankings of December rainfall, Dublin, December 1716-65

Rank	1	2	3	4	5	6	7	8	9
Frequency	0	2	8	9	8	15	6	1	1
									50

A comparable period of 50 years was sought, and 1840-89 was chosen. Internal percentage falls for each month were ranked. For December, these are given in Table 4.

Table 4. Correspondence of Dublin rankings for December 1716-65 with rankings of

<u>Internal percentages for Ireland, December 1840-89</u>										
Dublin ranks	2	3	4	5	6	7	8	9		
Frequencies	2	8	9	8	15	6	1	1		
Ranked percentages (as per mille)	32	37	63	83	100	132	182	187		
	36	43	65	89	103	136				
		51	66	91	105	139				
		53	68	93	108	145				
		54	71	96	108	157				
			55	74	96	109	172			
			61	75	97	111				
			61	82	99	112				
				83		113				
										113
										114
										117
										119
										120
										128
Mean percentage	3.4	5.2	7.2	9.3	11.2	14.7	18.2	18.7		

These values were then used, as percentage of AAR, for each December ranking; and other months were treated in the same way. This ensured that the mean annual percentage of AAR for the 50 years 1716-65 was 100; and

that the block of estimated annual rainfalls would need only minor re-calibration in the final annual rainfall analysis. The assessments for 1723 and 1756 are given in Table 5.

Table 5. Dublin, assessed percentages of AAR for 1716-65

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Year
1723	8.8	9.0	6.5	5.8	2.1	3.4	4.6	4.7	2.3	4.6	12.3	7.2	71.3
1756	14.0	6.8	6.5	14.3	11.0	13.1	9.3	13.2	8.6	14.2	5.1	5.2	121.3

The whole set of monthly and annual percentages were processed to give internal percentages for each year; and the annual percentages were put as a station data set for the analysis of annual falls.

Referring now to the Crosby data (3.3 above), the same procedure was adopted, but for the rankings the months were grouped into six pairs, January and February, and so on; and the Ireland internal percentage set for the same years were used in the comparison procedures.

3.5 NW England, 1757-1839. Only actual rainfall data were used, and all MS data in the possession of the Meteorological Office were re-assessed and analysed as in 2.1 and 2.2. The regional set was used as a single Ireland station for the period 1757-1839. For the period 1766-1791 it was in fact the only series to represent Ireland.

3.6 Scotland, 1757-1977. All MS data of monthly and annual falls for the period up to 1870 were gathered together and re-assessed by the methods of 2.1 and 2.2, and for completeness combined with the (enlarged) Glasspool series for the years 1868 onwards. For the period before 1870 however, regional analyses were due for SW Scotland, N Scotland and E Scotland, and the SW Scotland series for 1792-1839 was used as a single Ireland station.

The series described in 3.5 and 3.6 will be given in a subsequent publication.

3.7 Irish stations, 1792-1839. Dixon (1953) gives Dublin annual rainfall, and the monthly data are either given in the references quoted by Dixon or are available as MS data in the Meteorological Office. Observations are available for somewhere in the city of Dublin for the whole of this period; and in addition monthly and annual falls are available for: Castlecomer, Kilkenny, 1813-30; Malahide, 1823-24; Derry, 1795-1801; Belfast, 1814-15, 1818 onwards; Armagh, 1836 onwards; Cork, 1825-32, 1836 onwards; Markree, 1833 onwards.

3.8 From 1840 the number of stations increases, rapidly from 1845 onwards, all available as MS data. Monthly and annual station falls for 1840-1880 were processed as in 2.2 to give internal percentages, to add on to Glasspool's data from 1881 onwards. The annual falls up to 1899 were analysed as in 2.3, and additional analyses were done to establish the ratio of AAR 1870-99 to the Glasspool AAR 1881-1915.

3.9 1881-1939 for monthly internal percentages 1900-1939 for annual percentages: from Glasspool's data to 1924, with continuation in British Rainfall.

3.10 1940-48. Annual rainfall maps (with percentage isopleths) are available in British Rainfall for 1940-45, and in the annual publications of the Irish Meteorological Service for 1946-48. A grid of 16 points over Ireland gave values of AAR. The internal percentages for 1940-48 were got from the data of the ten long-period stations available from 1845 onwards; Markree, Valentia, Shannon, Birr, Dublin, Cork, Waterford, Armagh, Londonderry, Belfast. These data for 1940-48 were made available from the study of Tabony (1979).

3.11 1949-77. The series was readily compiled from the monthly and annual series published by the Irish Meteorological Service, taking due account of updating of normal periods.

4. Further data

4.1 The British Rainfall series for Ireland terminated in 1939. The Ireland series published by the Irish Meteorological Service began, so far as is known to the authors, in 1949. The makeshift series given by the authors for 1940-48 will be of use until it is replaced by an official Irish series.

4.2 Dixon (1953) refers to Irish weather diaries for 1716-34 and 1786-1810. Perhaps an analysis of these can be made as for the Ruttly and Blundell weather summaries.

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MONTHLY AND ANNUAL RAINFALL, IRELAND 1711 - 1977

Monthly rainfall for each year is given as per mille of the rainfall for the year. Annual rainfall is given as per cent of 1826-1975. The number of stations used is given for each year up to 1880.

Year	Dec.	Nov.	Oct.	Sept.	Aug.	July	June	May	April	March	Feb.	Jan.	n
101.0	104	190	118	68	84	43	61	61	78	111	67	15	2
115.9	44	140	144	89	85	160	82	48	82	82	25	34	2
90.9	82	92	42	40	130	163	78	72	31	62	109	99	2
81.8	102	93	129	75	90	170	30	47	64	61	91	48	2
116.4	38	52	83	102	86	98	85	132	108	61	55	100	2
96.8	74	117	138	185	64	72	51	80	70	36	53	17	2
91.6	91	85	127	97	134	64	29	72	95	75	74	100	2
87.6	174	145	101	36	94	71	47	70	74	57	80	66	2
88.7	105	145	101	59	73	83	59	47	52	85	124	75	3
112.9	101	90	139	75	97	90	94	72	74	57	70	118	3
105.2	46	46	86	41	55	128	77	64	116	64	52	86	3
104.9	131	101	58	50	70	104	92	160	42	89	40	63	3
79.9	118	112	106	91	147	86	42	21	57	75	159	106	3
113.2	163	90	94	99	113	86	108	52	90	39	42	93	3
102.0	91	56	84	139	69	80	92	74	56	45	76	108	3
107.9	78	94	106	102	59	80	74	67	90	46	90	84	2
110.2	101	110	79	93	68	69	118	58	79	78	44	103	1
102.3	83	165	85	60	73	83	116	98	24	63	47	100	1
111.3	106	90	108	80	67	55	40	56	30	77	106	61	1
83.1	133	146	126	80	90	88	32	56	55	32	107	105	1
104.0	106	49	116	99	72	44	50	19	51	83	86	109	1
112.1	160	108	78	92	96	108	81	100	38	77	61	80	1
109.1	133	70	79	94	87	96	72	38	70	77	72	92	1
123.4	90	125	98	83	79	48	20	97	91	67	94	146	1
94.9	117	79	92	70	105	45	55	45	85	84	115	135	1
102.4	108	73	85	65	105	38	75	92	74	54	57	117	1
118.4	93	84	119	87	110	114	86	62	55	43	86	110	1
103.4	50	97	63	130	104	88	47	90	34	62	68	45	1
71.9	99	104	91	143	129	88	86	62	34	35	64	45	1
76.4	93	137	137	111	80	83	74	27	32	31	77	133	1
87.1	106	115	161	76	70	87	65	53	28	68	95	131	1
93.7	55	106	112	71	49	98	36	69	93	68	95	148	1
105.0	32	116	134	128	124	73	54	44	55	90	85	65	1
92.6	91	75	140	23	130	63	88	128	57	44	48	113	1
75.6	120	108	70	92	50	156	96	22	45	93	38	110	1
82.5	44	67	86	136	61	60	75	85	55	59	89	183	1
83.9	62	61	127	80	91	111	41	111	70	104	59	83	1
93.7	61	60	78	101	111	91	40	55	104	77	57	165	1
	76	106	112	71	139	98	95	22	44	69	95	73	1

Values of *Monthly and annual rainfall, Ireland*
1711-1977

Year	n	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1751	1	97	64	90	55	61	18	138	103	126	83	95	68	104.9
52	1	114	48	45	25	109	89	145	131	65	65	75	51	99.8
53	1	100	115	93	57	96	76	90	106	50	64	50	109	101.7
54	1	143	70	67	59	67	154	95	84	52	59	109	95	96.5
55	1	29	32	90	107	83	80	106	109	121	117	42	43	111.0
56	1	115	56	53	118	91	108	45	78	59	117	42	43	119.9
57	2	71	38	95	110	75	49	104	168	38	72	111	73	95.6
58	2	63	94	74	54	48	49	169	100	63	78	90	118	101.9
59	2	85	32	124	73	59	115	51	90	84	139	80	68	82.6
60	2	88	85	22	29	49	95	36	98	105	147	129	89	106.6
61	2	26	84	73	67	70	82	50	89	81	164	125	39	92.4
62	2	93	53	99	59	34	30	62	117	101	227	86	56	81.7
63	2	40	81	39	79	46	90	137	105	73	90	92	69	113.5
64	2	164	93	45	43	49	67	120	91	77	175	67	56	106.3
65	2	130	61	111	123	24	44	28	101	78	112	69	56	89.2
66	1	08	83	28	88	147	141	95	62	100	112	128	53	83.6
67	1	28	109	91	21	38	16	180	96	86	60	117	79	98.5
68	1	48	137	28	59	53	133	115	58	113	75	72	79	130.2
69	1	55	71	36	46	53	144	76	136	97	53	192	79	93.6
70	1	37	43	64	60	63	100	64	90	69	80	83	103	108.1
71	1	73	36	39	44	59	59	93	136	206	206	137	47	83.1
72	1	71	74	69	38	58	42	39	70	148	99	119	100	107.4
73	1	81	53	23	58	125	92	106	90	165	125	62	70	110.4
74	1	112	87	44	66	76	42	137	128	154	41	92	55	115.5
75	1	76	99	60	28	27	39	125	147	138	67	91	64	95.9
76	1	46	112	47	30	40	109	108	103	50	170	101	49	95.4
77	1	45	60	65	74	66	81	146	42	66	151	110	128	111.0
78	1	67	34	61	33	81	80	154	35	144	139	84	141	97.0
79	1	19	33	24	68	79	80	77	35	178	158	97	19	81.8
80	1	39	80	70	110	77	60	72	135	102	24	168	76	90.2
81	1	66	109	17	69	60	108	71	159	122	93	47	47	112.7
82	1	95	24	64	112	117	49	87	130	137	82	82	35	100.5
83	1	97	80	53	15	104	98	117	119	63	19	95	65	86.8
84	1	86	52	58	93	79	154	117	218	140	137	114	76	83.4
85	1	72	24	19	26	40	48	86	135	182	76	86	107	89.6
86	1	93	33	37	26	86	73	66	94	47	189	97	110	103.6
87	1	23	66	74	39	46	62	153	98	171	76	61	26	64.5
88	1	97	92	82	74	53	64	166	98	111	76	61	26	112.6
89	1	72	94	24	59	79	113	119	23	91	127	80	119	112.6
1790	1	93	32	21	35	74	93	126	94	101	69	100	162	97.7

Values of Monthly and annual rainfall, Ireland
1711-1977

Year	n	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1791	1	135	82	44	80	54	29	97	109	42	96	126	109	102.9
1792	3	67	66	78	91	80	46	84	128	119	90	39	112	121.0
1793	3	79	127	99	62	42	73	60	118	78	72	93	98	88.3
1794	2	39	103	52	88	48	26	82	83	90	107	183	99	114.4
1795	2	65	94	78	83	26	93	52	59	15	203	125	107	101.4
1796	3	137	80	33	45	145	66	141	23	113	61	63	93	83.3
1797	3	59	20	64	54	92	49	90	144	118	94	93	123	98.4
1798	3	116	50	36	70	38	51	165	74	127	87	129	57	91.5
1799	4	63	104	52	111	55	43	69	132	102	120	94	55	99.5
1800	3	136	48	45	130	78	28	28	29	129	130	106	106	91.7
01	3	111	76	85	26	65	71	146	22	58	137	67	135	94.0
02	3	62	84	43	66	25	78	160	92	109	130	106	96	99.7
03	3	72	91	64	70	88	55	72	94	67	36	124	171	76.0
04	3	138	30	110	51	80	58	38	117	32	40	89	78	106.2
05	3	121	81	81	38	66	34	145	110	101	43	28	128	84.2
06	3	114	73	39	32	80	34	90	97	76	66	155	144	107.2
07	3	62	70	23	46	103	51	96	117	155	126	84	67	160.5
08	3	70	54	17	65	84	62	132	147	57	137	103	72	95.0
09	3	109	85	35	57	72	74	51	174	114	48	60	121	107.7
10	3	71	56	88	44	26	42	122	107	73	91	139	141	92.9
11	3	64	107	66	82	111	49	55	104	42	116	104	100	107.6
12	3	55	123	82	38	90	77	76	78	75	158	108	40	99.8
13	5	81	135	43	57	112	48	83	38	101	147	104	51	94.6
14	5	28	54	42	96	48	55	73	77	37	130	181	178	98.0
15	5	47	87	107	38	92	79	51	97	117	129	80	76	96.0
16	4	63	37	59	53	89	66	140	78	117	126	55	117	107.8
17	4	77	160	77	08	53	95	142	141	32	39	126	110	103.4
18	5	126	70	128	113	42	57	66	31	101	108	92	66	111.1
19	5	139	106	45	60	83	90	67	57	72	97	77	107	105.7
20	5	76	44	80	41	145	69	52	129	89	98	72	108	89.7
21	5	53	16	108	100	55	11	51	92	114	94	144	162	100.8
22	5	44	93	106	60	47	30	165	90	46	130	141	48	107.1
23	6	70	81	73	74	108	38	144	99	77	75	45	119	108.2
24	6	71	52	73	55	20	54	35	58	89	189	153	151	93.9
25	5	84	47	64	51	86	71	20	86	102	142	127	120	94.9
26	5	87	181	68	57	20	10	77	113	82	123	86	94	82.1
27	5	75	40	148	53	86	87	63	88	67	88	62	143	97.3
28	5	103	83	51	93	51	55	126	98	53	58	98	131	112.9
29	5	42	61	43	114	44	74	112	187	85	119	64	58	90.6
1830	5	40	72	68	79	80	61	105	81	130	63	120	101	92.7

Values of *Monthly and annual rainfall, Ireland*
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yr	n	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
131	4	40	81	97	38	19	63	75	66	75	130	173	143	104.2
32	4	49	59	84	60	44	99	44	42	42	119	134	152	88.3
33	4	21	118	30	60	41	109	61	44	101	102	137	176	107.4
34	4	182	97	65	14	45	100	112	81	78	87	77	62	93.7
35	4	75	132	80	27	96	35	76	69	125	104	125	56	102.0
36	6	89	43	105	51	08	76	130	54	116	114	127	87	102.1
37	7	63	119	36	64	54	94	103	72	57	101	110	122	92.2
38	7	52	81	83	73	46	78	111	96	80	82	139	79	95.7
39	7	66	68	80	45	20	75	94	110	85	53	132	91	106.5
40	6	146	79	13	31	91	65	78	96	90	133	100	100	84.8
41	7	64	67	87	50	62	61	106	104	94	58	159	75	96.2
42	7	90	96	62	17	99	78	80	51	94	127	106	43	91.7
43	9	83	54	84	104	08	106	109	73	47	151	122	66	91.2
44	9	75	110	47	41	43	83	83	115	61	114	125	96	100.0
45	12	130	43	94	61	52	46	75	47	65	84	110	37	109.5
46	13	106	52	53	114	108	46	38	144	65	132	102	157	95.2
47	12	110	66	53	86	32	46	80	144	132	101	87	111	109.7
48	12	67	122	79	82	76	83	97	96	67	57	116	108	99.9
49	12	106	42	35	96	64	18	80	144	132	121	154	36	93.6
50	13	111	87	31	136	42	59	97	86	48	121	45	65	90.6
51	16	196	55	94	55	52	100	91	88	39	70	154	157	126.1
52	17	125	74	30	31	42	133	48	79	64	167	100	113	94.3
53	19	161	38	68	78	31	69	108	63	54	94	81	113	83.5
54	20	150	41	42	15	111	84	125	123	56	133	58	97	79.5
55	17	20	67	94	44	99	63	60	96	103	80	49	112	88.7
56	19	108	86	33	80	130	90	64	67	88	83	91	68	89.3
57	19	97	60	100	129	62	39	91	70	91	89	65	145	88.6
58	18	63	67	54	143	82	42	67	92	132	71	114	113	88.3
59	19	89	53	96	113	18	150	60	132	48	70	68	74	107.5
60	18	141	43	77	45	88	82	143	122	132	73	90	61	109.2
61	28	67	85	101	31	13	78	91	63	55	110	69	105	112.7
62	31	134	36	88	85	83	82	143	109	104	173	104	83	94.8
63	36	107	37	81	43	55	80	24	109	120	113	128	82	84.4
64	48	86	50	94	49	54	82	36	61	18	124	78	114	104.4
65	53	106	93	68	31	100	23	83	111	120	68	132	103	100.3
66	58	136	82	90	59	38	91	41	95	68	132	30	54	94.4
67	59	105	87	97	99	117	32	103	77	120	68	74	172	104.9
68	59	104	68	88	61	58	40	32	123	90	74	90	132	98.8
69	59	136	90	72	66	102	28	49	39	144	47	96	83	86.3
1870	60	111	92	75	39	82	34	41	64	88	222	69	83	86.3

Values of *Monthly and annual rainfall, Ireland* 1711-1977

yr	n	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
371	60	114	92	59	106	21	74	147	69	83	97	67	71	97.8
72	66	109	84	66	53	43	80	48	84	90	101	103	139	127.4
73	69	157	38	92	33	55	46	125	153	87	111	71	32	93.5
74	66	78	70	51	61	40	41	76	121	160	133	109	120	96.7
75	62	143	43	36	27	58	43	74	73	136	150	111	63	102.1
76	65	42	109	90	64	16	63	42	88	104	116	104	182	109.2
77	60	134	59	67	87	59	43	71	100	58	96	117	89	122.0
78	56	95	61	46	69	130	132	34	118	92	104	58	61	94.2
79	55	83	101	57	61	70	143	121	115	122	44	30	89	98.0
80	56	39	94	86	44	57	85	148	48	82	79	117	69	98.3
81		32	113	84	87	55	113	54	116	66	88	124	109	102.4
82		62	73	72	51	50	77	110	73	105	87	130	55	116.2
83		136	125	40	43	64	55	91	96	70	73	94	119	108.2
84		140	127	100	81	70	25	93	52	147	114	87	51	94.9
85		93	117	70	43	33	36	56	81	89	123	75	128	109.4
86		96	74	88	51	94	17	84	62	106	90	121	117	71.5
87		125	64	56	57	53	118	88	106	29	56	125	136	96.5
88		75	26	97	80	104	22	72	148	84	137	170	108	90.6
89		89	81	59	54	71	79	85	85	79	61	139	157	93.5
90		137	39	89	47	68	66	57	160	101	91	91	68	99.0
91		54	09	50	61	75	79	85	154	79	139	134	157	94.3
92		68	69	27	32	105	22	77	137	67	93	70	147	76.8
93		103	124	32	38	52	60	96	71	15	115	97	94	100.9
94		128	104	56	95	72	57	112	137	26	103	129	142	96.4
95		106	24	95	52	21	73	145	58	58	100	36	161	92.8
96		46	55	125	35	11	100	52	124	86	74	105	109	112.1
97		57	65	125	89	42	73	145	155	58	100	105	109	95.4
98		73	83	35	99	80	71	36	121	75	112	115	91	98.7
99		120	88	46	90	77	56	62	70	41	50	85	181	94.9
1900		101	79	20	57	66	102	63	106	41	118	134	113	113.7
01		112	44	82	78	46	70	35	90	141	94	89	119	94.9
02		81	87	69	75	76	67	78	69	80	75	59	78	90.9
03		121	81	122	35	49	46	92	114	88	115	74	79	122.6
04		115	127	71	63	66	49	92	114	88	62	74	79	99.8
05		90	60	152	77	43	63	46	157	55	52	118	87	88.0
06		147	90	70	56	101	50	62	86	36	133	75	94	91.9
07		43	66	83	73	101	107	66	88	34	128	91	120	97.9
08		93	71	109	66	71	48	67	92	145	52	68	118	94.9
09		90	53	97	122	60	50	79	39	64	159	51	136	91.9
1910		97	131	60	57	59	99	78	135	24	61	96	103	107.7

Values of *Monthly and annual rainfall, Ireland*
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Year	Dec.	Nov.	Oct.	Sept.	Aug.	July	June	May	April	March	Feb.	Jan.
1971	178	130	108	60	63	87	65	51	62	58	86	52
1972	127	77	81	24	109	91	120	36	31	117	89	98
1973	83	104	101	93	36	25	64	94	94	104	47	155
1974	159	83	109	58	72	73	53	46	42	113	137	54
1975	83	123	142	46	70	45	56	102	58	31	105	102
1976	74	106	109	35	174	60	57	56	84	50	128	70
1977	128	95	109	144	72	85	37	57	33	45	110	59
1978	192	83	96	84	83	34	76	77	51	91	55	89
1979	91	116	106	64	52	93	52	86	83	86	65	128
1980	113	113	106	44	117	109	14	63	32	110	45	131
1981	125	49	44	93	108	97	50	42	85	58	120	120
1982	88	87	107	129	128	86	81	84	80	59	148	79
1983	87	136	133	28	113	80	100	30	39	43	35	111
1984	35	91	92	59	86	91	75	77	57	31	81	111
1985	82	136	83	116	112	79	76	39	39	100	128	170
1986	106	169	106	66	128	88	81	77	57	90	88	116
1987	146	164	105	85	72	88	102	40	49	100	68	127
1988	73	64	133	90	113	91	54	63	32	19	101	48
1989	81	42	117	143	105	49	43	36	76	81	20	127
1990	118	132	115	145	73	28	128	30	46	63	81	77
1991	103	96	106	85	64	117	102	94	83	57	06	125
1992	76	64	67	41	73	91	41	61	66	103	108	115
1993	77	56	67	100	42	151	75	51	69	85	125	131
1994	101	133	152	63	70	110	48	79	05	41	45	115
1995	83	191	76	56	49	111	57	33	48	81	94	121
1996	105	127	150	63	19	97	35	37	89	83	108	87
1997	65	168	97	36	102	79	26	75	50	97	110	95
1998	125	23	66	113	125	92	11	109	59	94	39	144
1999	70	77	118	82	115	58	82	102	53	29	54	160
2000	112	147	124	128	77	93	62	44	62	15	34	102
2001	125	31	103	89	57	119	111	102	44	39	96	84
2002	113	110	54	135	130	75	81	48	28	46	73	107
2003	85	113	60	70	21	76	95	94	86	135	61	104
2004	157	76	84	76	82	58	80	51	56	58	54	168
2005	128	113	166	61	96	69	29	55	74	59	73	77
2006	84	81	81	137	135	97	56	26	68	48	127	60
2007	94	178	130	108	63	87	65	51	62	58	86	52
2008	127	77	81	24	109	91	120	36	31	117	89	98
2009	83	104	101	93	36	25	64	94	94	104	47	155
2010	159	83	109	58	72	73	53	46	42	113	137	54
2011	83	123	142	46	70	45	56	102	58	31	105	102
2012	74	106	109	35	174	60	57	56	84	50	128	70
2013	128	95	109	144	72	85	37	57	33	45	110	59
2014	192	83	96	84	83	34	76	77	51	91	55	89
2015	91	116	106	64	52	93	52	86	83	86	65	128
2016	113	113	106	44	117	109	14	63	32	110	45	131
2017	125	49	44	93	108	97	50	42	85	58	120	120
2018	88	87	107	129	128	86	81	84	80	59	148	79
2019	87	136	133	28	113	80	100	30	39	43	35	111
2020	35	91	92	59	86	91	75	77	57	31	81	111
2021	82	136	83	116	112	79	76	39	39	100	128	170
2022	146	164	105	85	72	88	102	40	49	100	68	116
2023	73	64	133	90	113	91	54	63	32	19	101	48
2024	81	42	117	143	105	49	43	36	76	81	20	127
2025	118	132	115	145	73	28	128	30	46	63	81	77
2026	103	96	106	85	64	117	102	94	83	57	06	125
2027	77	56	67	100	42	151	75	51	69	85	125	131
2028	101	133	152	63	70	110	48	79	05	41	45	115
2029	83	191	76	56	49	111	57	33	48	81	94	121
2030	105	127	150	63	19	97	35	37	89	83	108	87
2031	65	168	97	36	102	79	26	75	50	97	110	95
2032	125	23	66	113	125	92	11	109	59	94	39	144
2033	70	77	118	82	115	58	82	102	53	29	54	160
2034	112	147	124	128	77	93	62	44	62	15	34	102
2035	125	31	103	89	57	119	111	102	44	39	96	84
2036	113	110	54	135	130	75	81	48	28	46	73	107
2037	85	113	60	70	21	76	95	94	86	135	61	104
2038	157	76	84	76	82	58	80	51	56	58	54	168
2039	128	113	166	61	96	69	29	55	74	59	73	77
2040	84	81	81	137	135	97	56	26	68	48	127	60
2041	94	178	130	108	63	87	65	51	62	58	86	52
2042	127	77	81	24	109	91	120	36	31	117	89	98
2043	83	104	101	93	36	25	64	94	94	104	47	155
2044	159	83	109	58	72	73	53	46	42	113	137	54
2045	83	123	142	46	70	45	56	102	58	31	105	102
2046	74	106	109	35	174	60	57	56	84	50	128	70
2047	128	95	109	144	72	85	37	57	33	45	110	59
2048	192	83	96	84	83	34	76	77	51	91	55	89
2049	91	116	106	64	52	93	52	86	83	86	65	128
2050	113	113	106	44	117	109	14	63	32	110	45	131
2051	125	49	44	93	108	97	50	42	85	58	120	120
2052	88	87	107	129	128	86	81	84	80	59	148	79
2053	87	136	133	28	113	80	100	30	39	43	35	111
2054	35	91	92	59	86	91	75	77	57	31	81	111
2055	82	136	83	116	112	79	76	39	39	100	128	170
2056	146	164	105	85	72	88	102	40	49	100	68	116
2057	73	64	133	90	113	91	54	63	32	19	101	48
2058	81	42	117	143	105	49	43	36	76	81	20	127
2059	118	132	115	145	73	28	128	30	46	63	81	77
2060	103	96	106	85	64	117	102	94	83	57	06	125
2061	77	56	67	100	42	151	75	51	69	85	125	131
2062	101	133	152	63	70	110	48	79	05	41	45	115
2063	83	191	76	56	49	111	57	33	48	81	94	121
2064	105	127	150	63	19	97	35	37	89	83	108	87
2065	65	168	97	36	102	79	26	75	50	97	110	95
2066	125	23	66	113	125	92	11	109	59	94	39	144
2067	70	77	118	82	115	58	82	102	53	29	54	160
2068	112	147	124	128	77	93	62	44	62	15	34	102
2069	125	31	103	89	57	119	111	102	44	39	96	84
2070	113	110	54	135	130	75	81	48	28	46	73	107
2071	85	113	60	70	21	76	95	94	86	135	61	104
2072	157	76	84	76	82	58	80	51	56	58	54	168
2073	128	113	166	61	96	69	29	55	74	59	73	77
2074	84	81	81	137	135	97	56	26	68	48	127	60
2075	94	178	130	108	63	87	65	51	62	58	86	52
2076	127	77	81	24	109	91	120	36	31	117	89	98
2077	83	104	101	93	36	25	64	94	94	104	47	155
2078	159	83	109	58	72	73	53	46	42	113	137	54
2079	83	123	142	46	70	45	56	102	58	31	105	102
2080	74	106	109	35	174	60	57	56	84	50	128	70
2081	128	95	109	144	72	85	37	57	33	45	110	59
2082	192	83	96	84	83	34	76	77	51	91	55	89
2083	91	116	106	64	52	93	52	86	83	86	65	128
2084	113	113	106	44	117	109	14	63	32	110	45	131
2085	125	49	44	93	108	97	50	42	85	58	120	120
2086	88	87	107	129	128	86	81	84	80	59	148	79
2087	87	136	133	28	113	80	100	30	39	43	35	111
2088	35	91	92	59	86	91	75	77	57	31	81	111
2089	82	136	83	116	112	79						

Values of Monthly and annual rainfall, Ireland 1711-1977

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1951	99	81	75	44	44	48	57	102	97	47	170	136	708.7
52	151	32	67	66	71	70	34	99	64	142	81	123	86.0
53	45	56	24	79	64	36	140	117	126	94	118	101	85.0
54	64	93	77	26	77	55	75	62	110	143	113	105	118.6
55	118	98	39	71	46	129	20	52	86	65	88	137	89.2
56	114	31	86	24	54	67	117	115	127	76	57	140	104.5
57	130	79	92	29	93	40	92	67	169	118	33	97	105.6
58	123	89	49	25	47	89	102	104	115	60	55	96	122.1
59	80	30	87	87	59	59	60	33	42	145	123	207	101.4
60	88	67	55	61	58	58	107	84	94	91	132	108	125.1
61	150	94	27	114	45	45	67	68	103	113	72	80	99.3
62	133	48	80	67	73	47	70	110	135	52	81	107	97.3
63	28	52	135	73	82	68	72	100	66	124	160	50	93.1
64	49	56	103	70	74	75	70	97	70	106	74	146	101.4
65	123	09	78	71	74	90	47	78	82	58	124	143	113.8
66	89	132	47	116	74	92	70	64	68	111	59	101	116.5
67	76	102	56	33	124	27	48	89	123	167	69	66	105.2
68	115	30	72	64	57	60	34	73	49	116	112	138	105.2
69	186	61	42	74	99	75	44	58	129	59	125	123	87.7
70	110	115	52	90	32	53	82	72	104	80	155	55	103.1
71	116	75	71	54	62	93	83	104	55	105	120	62	79.4
72	131	91	80	90	104	68	62	47	13	61	131	122	180.0
73	101	83	35	48	99	41	73	104	106	65	135	110	94.9
74	180	94	40	31	75	36	87	90	143	54	83	87	109.3
75	195	49	49	75	28	24	91	49	150	130	105	55	85.6
76	117	61	89	31	99	49	72	12	113	162	91	103	93.8
1977	90	133	89	74	23	53	41	79	61	147	108	102	108.0