National Meteorological Library and Archive

A guide to our data collections

The National Meteorological Library and Archive

Many people have an interest in the weather and the processes that cause it and the National Meteorological Library and Archive is a treasure trove of meteorological and related information.

WE ARE OPEN TO EVERYONE

The Library and Archive are vital for maintaining the public memory of the weather, storing meteorological records and facilitating learning, just go to **www.metoffice.gov.uk/learning/library**

OUR COLLECTIONS

We hold a world class collection on meteorology which includes a comprehensive library of published books, journals and reports as well as a unique archive of original meteorological data, weather charts, private weather diaries and much more. These records provide access to historical data and give a snapshot of life and the weather both before and after the establishment of the Met Office in 1854 when official records began.

ONLINE CATALOGUE

Details of all our holdings are catalogued and online public access to this is available at **https://library.metoffice.gov.uk**. From here you will also be able to directly access any of our electronic content.

FACTSHEETS

The Met Office produces a range of factsheets which are available through our webpages **www.metoffice.gov.uk/research/library-and-archive/publications/factsheets.**

DIGITAL LIBRARY AND ARCHIVE

The Met Office Digital Library and Archive provides access to a growing collection of born digital content as well as copies of some our older publications and unique archive treasures.
Just go to **https://digital.nmla.metoffice.gov.uk/archive**. Our content is for your own private use. Please contact the library for any other terms of use or for further information.

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National Meteorological Archives — a guide to using our collections

INTRODUCTION

The Met Office archive collections hold a vast range of historical weather information. You can use and understand many of the types of record held in our collections without extensive meteorological knowledge or an expert on hand to help you but they can seem complicated because of the specialised terminology that is used. There are a number of standard record formats which you will find in all of our collections and some of these are easier to use and understand than others.

This guide is intended to help you understand what each of these record types is, decide which records would be most useful to you for the research you want to carry out and discover what you need to do next in order to see the records themselves. Images of different record types have been included to help you understand what you might expect to see.[1]

Please note this guide is not intended to be an exhaustive list of all the materials in the collections. The Exeter archive in particular holds a wide variety of other specialist data sets and collections ranging from an extensive archive of rare books to polar expedition data. There are also some specialised collections in our Scottish archive including data from the Northern Lighthouse Board. You can search our online catalogue (**https://library.metoffice.gov.uk**) to view details of our full collection for England, Scotland and Wales. Note that the archives for Scotland are held in Edinburgh at either the Met Office, Saughton House or the National Records of Scotland (NRS). See 'Next Steps' below for further details.

In addition to records for England and Wales the archive in Exeter also holds a large amount of International Data. This relates mainly but not exclusively to countries which have, or have had, an element of British Governmental involvement. For further details see the catalogue or contact us.

Useful contact details are provided at the end of this brochure.

Be aware of the units of measurement.

Much historic data is recorded in imperial units. Most commonly rainfall may be in inches and temperature in Fahrenheit. In order to compare historic data with more recent data in metric units you will need to convert the data. There are various online tools which can help you to do this and conversion tables can also be provided from the National Meteorological Library and Archive by email.

[1]Please note images are examples only. All types of record change format over time.

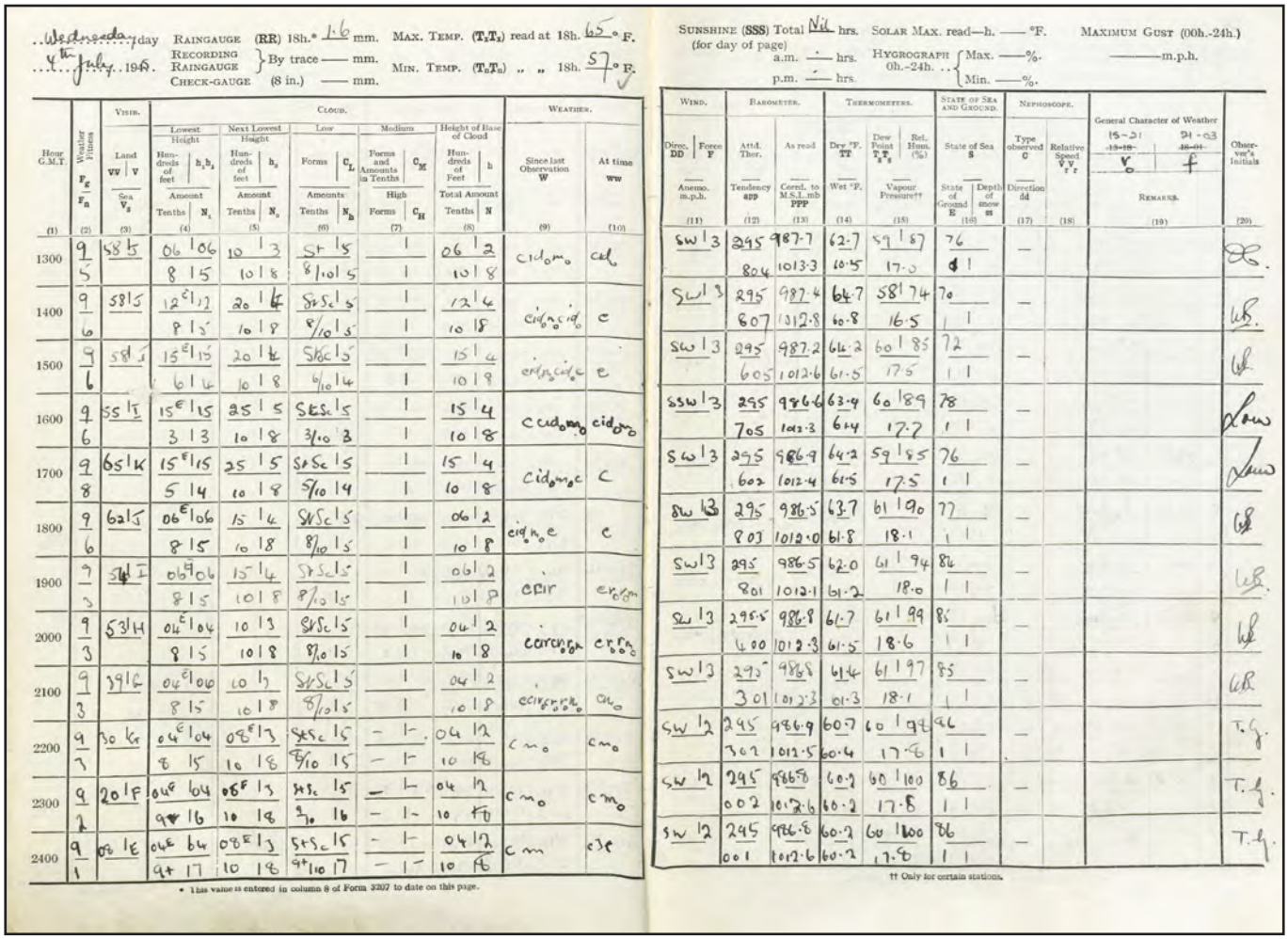
Main record types

1. RETURNS, REGISTERS, LOGS AND SUMMARIES — COLLATED DATA

1.1 Daily registers

These are specially printed notebooks, varying from pocket size to A3 over time. The registers were completed by trained observers and were produced at locations with a manned Met Office station in the UK and overseas. A station was any location at which meteorological observations were taken either by a member of Met Office staff or by one of the many volunteer observers that assisted us in the past. Registers provide observation data for a range of weather 'elements' such as temperature, rainfall or wind direction. Typically registers will provide the following elements: temperature, pressure, wind direction and force, cloud type, height and amount, visibility and weather and daily maximum and minimum temperature, rainfall totals and general remarks. 'Decodes' are often present in the front of the registers to help you interpret the information and further assistance will be found in our factsheet 17 'Weather Observation on Land' which is freely available from the Met Office website.[2]

The number of observations (obs) per day varies depending upon the strategic importance of a station at any one time. Registers for early periods, usually before World War Two, will have fewer regular observations but in general the minimum number of observations will be one every three hours during the day and many stations will have more frequent observations than this.



The image above shows a page from a daily register.

[2]Our factsheets are available for free at: **www.metoffice.gov.uk/research/library-and-archive/publications/factsheets**

Most useful for

The registers are extremely useful if you want detailed information on the meteorological characteristics of a day or a short period for or close to a specific location.

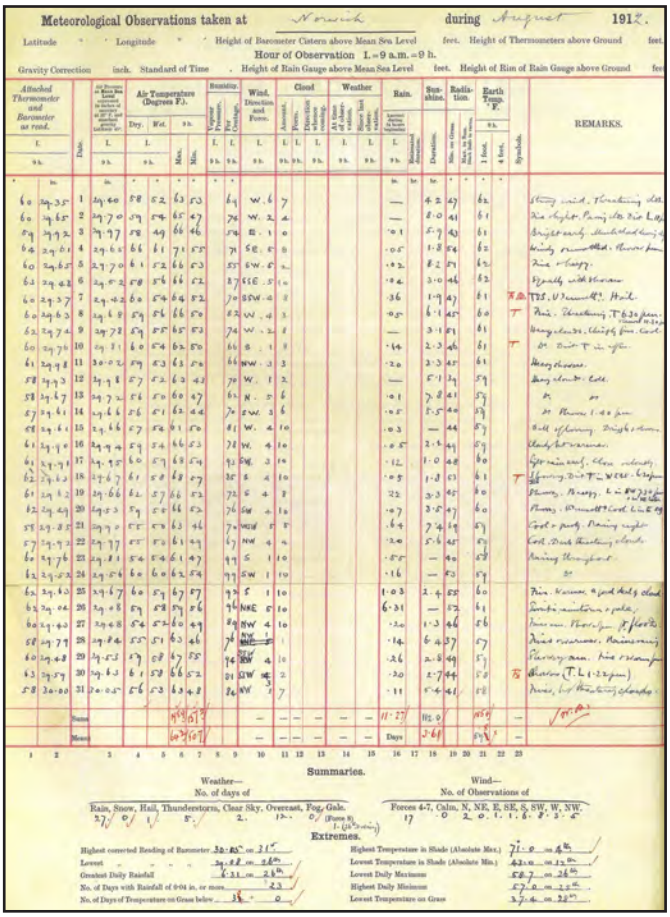
Things to bear in mind

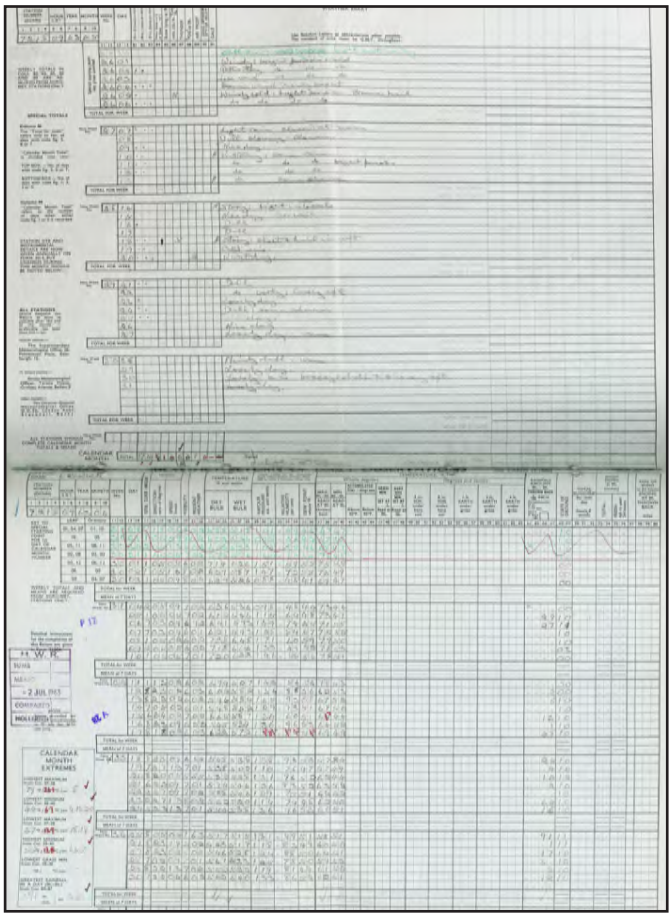
The station network has changed dramatically in extent over time and you may not always find a station very close to the location you want to know about. The number of elements recorded and the regularity of observations also varies greatly between stations and also can vary over the life of an individual site.

Regular observations every day fill books quickly therefore there are quite a number of books for each station. If you request to view registers from several stations for an extended period this will equate to a large volume of material and may be difficult to bring from storage. You might be better to look at the Climatological returns instead.

1.2 Climatological returns

The climatological returns are large volumes of bound forms sent in to the Met Office by observers. There are more climatological stations than stations producing daily registers because observations were only required once a day at 0900 therefore the site could be operated by a volunteer observer instead of being manned more of the time. Each form contains one month of observations. The forms provide an observation taken at 0900, generally giving temperature, pressure, weather, wind direction and force. The forms will also give daily maximum and minimum temperature, rainfall and, for those sites with the required instrumentation, sunshine totals. Some sites will also provide a brief summary of the weather for each day noting its main characteristics. A number of sites will also provide a reading at 2100 and a few will give more frequent observations. For much of the period covered by the returns the front of each form provides a 'decode' which will help you to interpret the observations but outside of this period you may need some assistance. Factsheet 17 'Weather Observation on Land' available on the Met Office website should be able to help you[3]. If you are viewing archive materials at NRS or PRONI it would be advisable to bring a copy of this with you when you visit.


Meteorological Observations taken at Norwich during August 1912.



Example pages from Climatological returns.

Most useful for

Climatological returns can give a good indication of the weather for a specific location over a longer period of time. One volume of a climatological return can hold a much longer period of observations than the daily register so if you wanted to compare several places over a period of several years these are more practical.

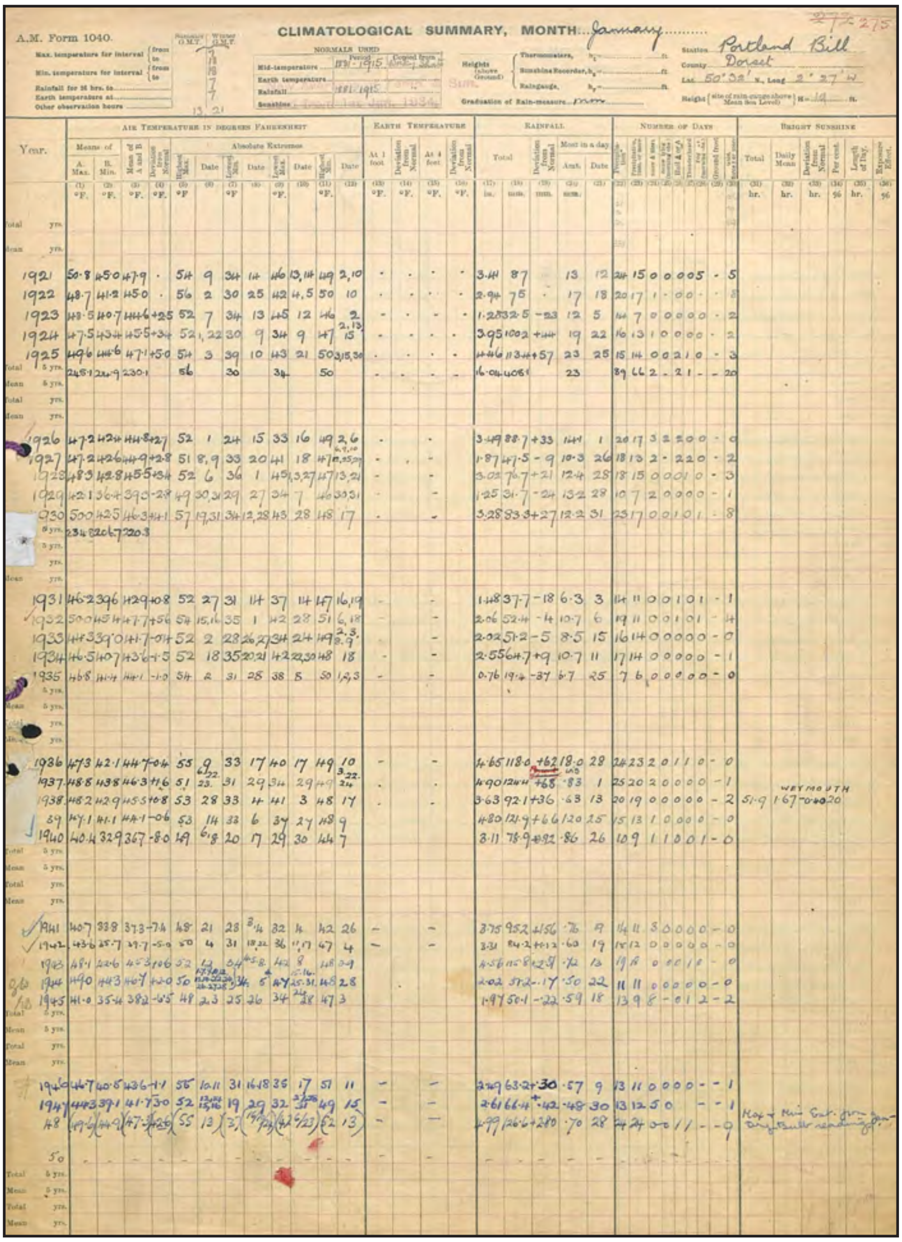
Things to bear in mind

Climatological returns are large and heavy. It may not be practical to provide too many in a reading room at any one time. The earliest Scottish returns have been digitised for preservation purposes (the originals are too fragile to handle) and you will not be able to view the originals.

[3]Our factsheets are available for free at: **www.metoffice.gov.uk/research/library-and-archive/publications/factsheets**

1.3 Lustrum forms

Lustrum forms record monthly extremes and monthly totals for certain elements of which the most widespread and useful are temperature and rainfall. Wind and sunshine are also widely recorded. Lustrum forms were used as a quick way to access data before the dawn of the database but they have largely been superseded by electronic data manipulation tools.


A.M. Form 1040.
CLIMATOLOGICAL SUMMARY, MONTH January
Station Portland Bill
County Dorset

A lustrum form collating various types of recorded data.

Most useful for

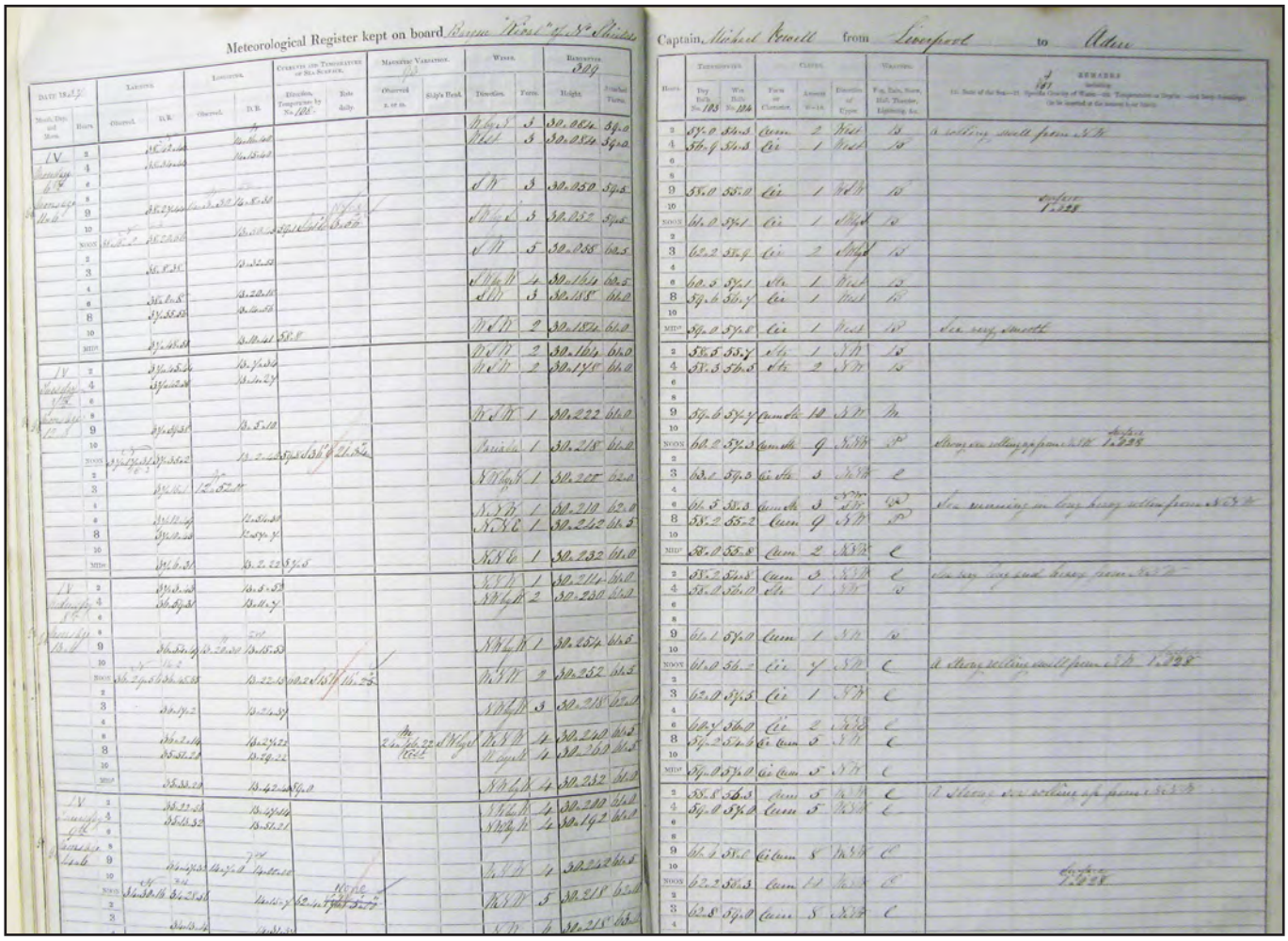
The forms provide many years of data on one page — a quick way to see which month was the coldest or driest in a series.

Things to bear in mind

There was a very limited network of stations recording data on lustrum forms and sending these onto the office therefore this type of data is only available for a small number of locations.

1.4 Ship, light vessel and lighthouse logs

We have a significant collection of meteorological logs completed onboard ships and a smaller number from light vessels and lighthouses around the world. In general these provide the same data as would be found in daily registers and observations are taken at regular intervals, sometimes as often as every three hours. Additional information will include latitude and longitude references and a remarks column which often provides fascinating insights into the flora, fauna and weather phenomena observed.



Example of a ship log book.

Most useful for

Lighthouse logs are useful for researching weather and climate at specific locations around the world. They are often among the longest running data series available for locations outside of the UK. Ocean weather ship logs are also useful for researching particular locations because they were stationed at important fixed positions in the North Atlantic.

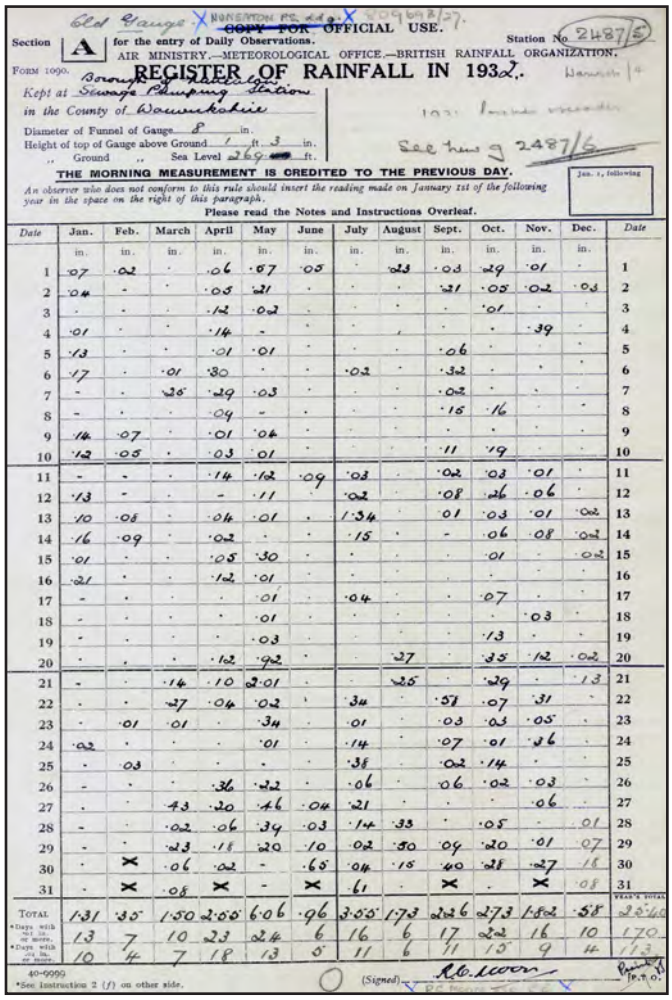
Things to bear in mind

With the exception of some light vessel data in Edinburgh the whole collection of logs is kept in Exeter. The logs are not catalogued but we do have index books which can help to locate them. It is best if you request either lighthouse logs or ship logs for a particular ship or ships over a reasonably short period of time e.g. ten to fifteen years. The more information you can give us about precisely what you are looking for the better and you should allow at least five days notice on this material.

1.5 Rainfall cards

Rainfall cards are forms, varying between one per month and a year depending on location and time period. They were completed by the observer tasked with emptying the rain gauge.

They record a variety of daily, weekly and monthly totals depending on how often the gauge was emptied. The cards are held in decadal boxes within which they are then arranged by location and year.



COPY FOR OFFICIAL USE.

Section A for the entry of Daily Observations. Station No 2487/5

AIR MINISTRY.—METEOROLOGICAL OFFICE.—BRITISH RAINFALL ORGANIZATION.

FORM 1090.

REGISTER OF RAINFALL IN 1932.

Kept at Stwaje Pumping Station in the County of Warwickshire

Diameter of Funnel of Gauge 8 in.

Height of top of Gauge above Ground 1 ft. 3 in.

" Ground " Sea Level 269 ft.

See Nos 2487/6

THE MORNING MEASUREMENT IS CREDITED TO THE PREVIOUS DAY.

An observer who does not conform to this rule should insert the reading made on January 1st of the following year in the space on the right of this paragraph.

Please read the Notes and Instructions Overleaf.

Date	Jan.	Feb.	March	April	May	June	July	August	Sept.	Oct.	Nov.	Dec.	Date
	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	
1	.07	.02	·	.06	.67	.05	·	.23	.03	.29	.01	·	1
2	.04	-	·	.05	.21	·	·	·	.21	.05	.02	.03	2
3	·	·	·	.12	.02	·	·	·	·	.01	·	·	3
4	.01	·	·	.14	-	·	·	·	·	·	.39	·	4
5	.13	·	·	.01	.01	·	·	·	.06	·	·	·	5
6	.17	·	.01	.80	·	·	.02	·	.32	·	·	·	6
7	-	·	.36	.29	.03	·	·	·	.02	·	·	·	7
8	-	·	·	.04	-	·	·	·	.15	.16	·	·	8
9	.14	.07	·	.01	.04	·	·	·	·	·	·	·	9
10	.12	.05	·	.03	.01	·	·	·	.11	.19	·	·	10
11	-	-	·	.14	.12	.09	.03	·	.02	.03	.01	·	11
12	.13	-	·	-	.11	·	.02	·	.08	.26	.06	·	12
13	.10	.08	·	.04	.01	·	1.34	·	.01	.03	.01	.02	13
14	.16	.09	·	.02	·	·	.15	·	-	.06	.08	.02	14
15	.01	·	·	.05	.30	·	·	·	·	.01	·	.02	15
16	.21	·	·	.12	.01	·	·	·	·	·	·	·	16
17	-	·	·	·	.01	·	.04	·	·	.07	·	·	17
18	·	·	·	·	.01	·	·	·	·	·	.03	·	18
19	·	·	·	·	.03	·	·	·	·	.13	·	·	19
20	·	·	·	.12	.92	·	·	.27	·	.35	.12	.02	20
21	-	·	.14	.10	2.01	·	·	.26	·	.29	·	.13	21
22	·	·	.27	.04	.02	·	.34	·	.57	.07	.31	·	22
23	·	.01	.01	·	.34	·	.01	·	.03	.03	.05	·	23
24	.02	·	·	·	.01	·	.14	·	.07	.01	.36	·	24
25	·	.03	·	·	·	·	.38	·	.02	.14	·	·	25
26	-	·	·	.36	.22	·	.06	·	.06	.02	.03	·	26
27	·	·	.43	.20	.46	.04	.21	·	·	·	.06	·	27
28	-	·	.02	.06	.34	.03	.14	.33	·	.05	-	.01	28
29	-	·	.23	.18	.20	.10	.02	.30	.04	.20	.01	.07	29
30	·	×	.06	.02	-	.65	.04	.15	.40	.28	.27	.18	30
31	·	×	.08	×	-	×	.61	·	×	·	×	.08	31
TOTAL	1.31	.35	1.50	2.00	6.06	.96	3.00	1.73	2.26	2.73	1.82	.58	YEAR'S TOTAL
*Days with .01 in. or more.	13	7	10	23	24	6	16	6	17	22	16	10	170
*Days with .04 in. or more.	10	4	7	18	13	5	11	6	11	15	9	4	113

40-9999

*See Instruction 2 (f) on other side.

(Signed) R.G. Lucas

P.T.O.

Left: Example of a rainfall card. Right: Standard rain gauge (used for collecting and measuring rainfall).

Most useful for

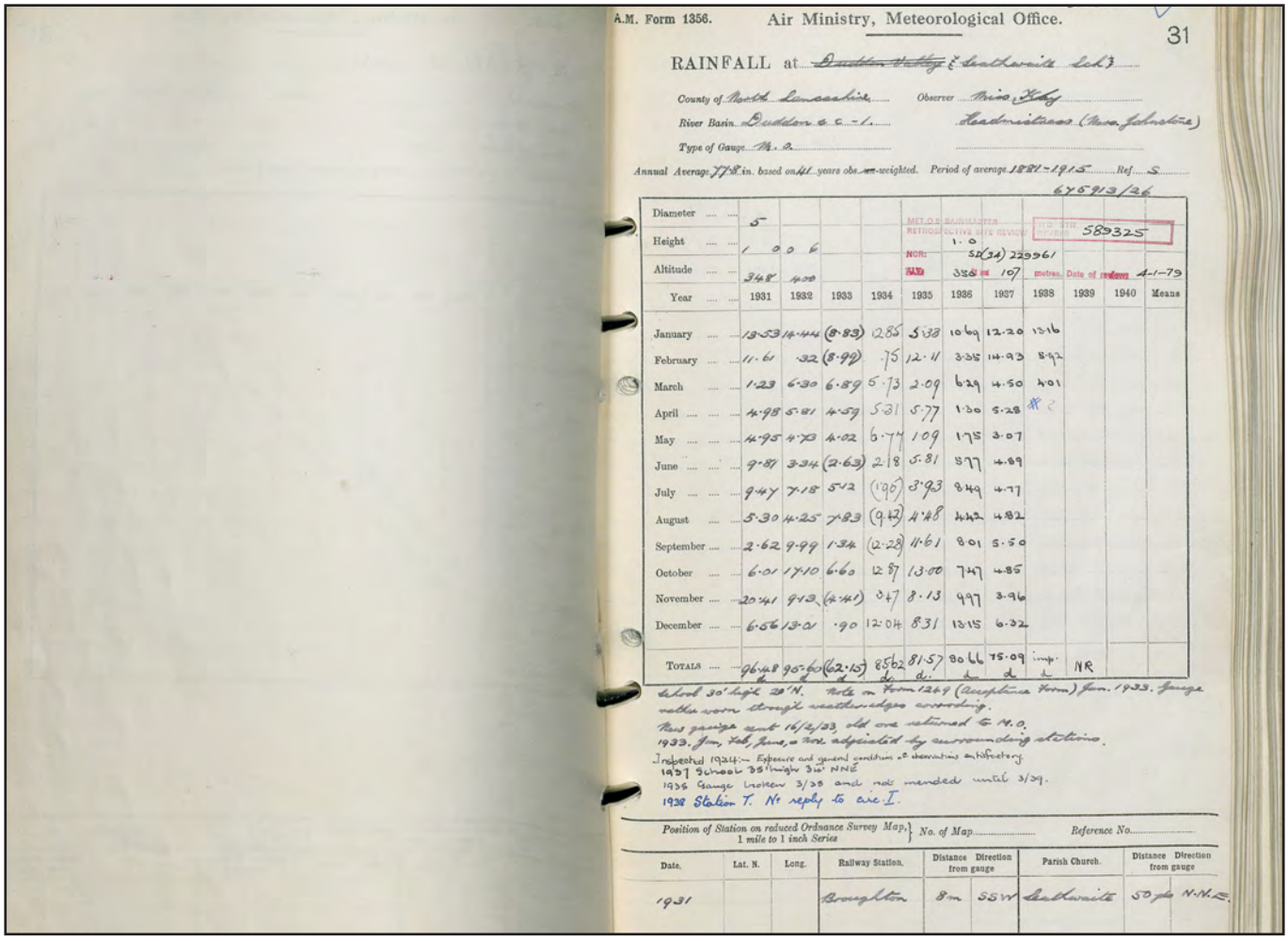
Rainfall cards are the original source of information for specific rainfall totals and will show Quality Control measures if these were applied once the form had been returned to the Met Office. A small minority of rainfall cards may also include notes on significant weather events.

Things to bear in mind

Although a reasonable amount of data can be recorded on each form this can still amount to a large number of bundles. You should bear this in mind if you are considering using these as a source of information for rainfall over a long period of time.

1.6 Ten year rainfall books

These are folders holding a series of forms. There is one folder per ten years for each location, giving monthly rainfall totals. The data has been transcribed from a variety of sources including the rainfall cards. The arrangement of forms varies across the series but is essentially by geographical area i.e. county or rain number (a rain number is allocated to each Met Office rain gauge).



A.M. Form 1356. Air Ministry, Meteorological Office. 31

RAINFALL at ~~Braithwaite~~ & Braithwaite Lch3

County of North Lancashire Observer ~~Miss Kirby~~ Headmistress (Miss Johnstone)

River Basin Derwent & C. - 1

Type of Gauge M. O.

Annual Average 77.8 in. based on 41 years obs. ~~un~~-weighted. Period of average 1881-1915 Ref. S

6X5913/26

589325

	Diameter	Height	Altitude	Year	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	Means
	5"	1 00 6	348 400												
									NCR:	1.0	52(34) 22996/				
									NLD	328 ft	107 metres	Date of readings 4-1-79			
January					13·53	14·44	(8·83)	1·85	5·38	10·69	12·20	13·16			
February					11·61	·32	(8·99)	·75	12·11	3·35	14·93	8·92			
March					1·23	6·30	6·89	5·73	2·09	6·29	4·50	4·01			
April					4·98	5·81	4·59	5·31	5·77	1·30	5·28				
May					4·95	4·73	4·02	6·74	1·09	1·75	3·07				
June					9·87	3·34	(2·63)	2·18	5·81	5·77	4·89				
July					9·47	7·18	5·12	(1·90)	3·93	8·49	4·77				
August					5·30	4·25	7·83	(9·47)	4·48	4·42	4·82				
September					2·62	9·99	1·34	(2·28)	11·61	8·01	5·50				
October					6·01	17·10	6·60	12·87	13·00	7·47	4·85				
November					20·41	9·43	(2·41)	·47	8·13	9·97	3·96				
December					6·56	13·01	·90	12·04	8·31	13·15	6·32				
				Totals	96·48 in.	90·60	(62·15)	85·62 in.	81·57 in.	90·66 in.	75·09 in.	imp.	NR		

Sited 30' light 20°N. Note on Form 1249 (Acceptance Form) Jan. 1933. Gauge rather worn through weatherdges overdrip.
Rain gauge sent 16/2/33, old one returned to M.O.
1933. Jan, Feb, June, a few adjusted by surrounding stations.
Inspected 1934:- Exposure and general condition of observations satisfactory.
1937 Screen 35' height 3½' NNE
1938 Gauge broken 3/38 and not mended until 3/39.
1938 Station T. No reply to circ I.

Position of Station on reduced Ordnance Survey Map, 1 mile to 1 inch Series } No. of Map Reference No.

Date.	Lat. N.	Long.	Railway Station.	Distance from gauge	Direction from gauge	Parish Church.	Distance from gauge	Direction from gauge
1931			Broughton	8 m.	SSW	Braithwaite	50 yds	N.N.E.

Page from one of the ten year rainfall books.

Most useful for

These books are a very useful source if you want to look at rainfall for a location over a long period of time.

Things to bear in mind

The forms are not always logically arranged and it can take some time to find the location you are seeking. For earlier periods (pre 20th century) stations cannot always be precisely located and often only the town will be given although there is far greater accuracy after this time.

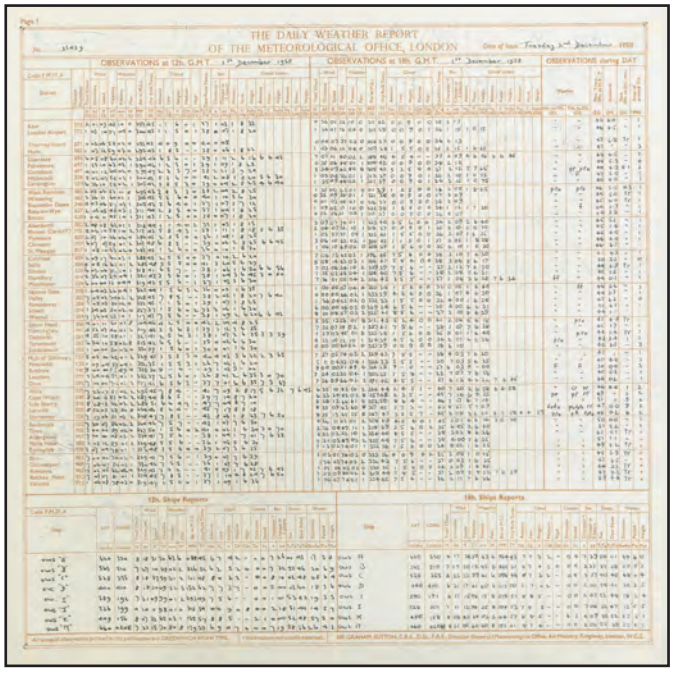
Data can also start and stop at any time so you may have to combine information from several locations in order to put together longer series of information.

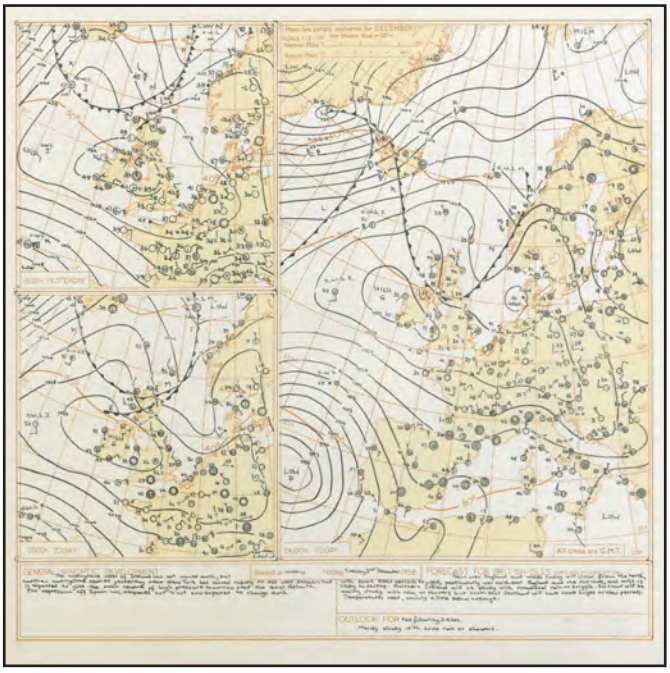
Data sets are not always complete, particularly for early periods and you may find an absence of data for several months or even years at a time.

1.7 Daily weather summaries

The daily weather summaries are brief accounts of the weather as published by the Met Office. We have duplicate copies in the library and the archive and the series has also been scanned. The summaries have changed in both name and format over time and were originally known as the 'Daily Weather Report' until December 1980 when they were renamed the 'Daily Weather Summary'.

In general they will contain a synoptic chart of the UK showing the weather situation, a textual description of the weather during the day and other information indicating daily extremes of temperature, rainfall and sunshine. For much of the series the information also includes 'selected station' data which provides temperature, rainfall, visibility, pressure, wind direction and force, sunshine (where available) and weather for a number of stations around the UK. Daily weather summaries for the period up to 1980 also contain a brief written summary of the forecast for the following day and an outlook for the 24 hour period after this.


THE DAILY WEATHER REPORT
OF THE METEOROLOGICAL OFFICE, LONDON



Example pages from daily weather summaries.

Most useful for

The summary is most useful for a quick and accessible way to see the predominant weather situation over the UK on any day from September 1860 onwards. If you are interested in a specific location there is also often data to indicate the general weather conditions at a site relatively close by.

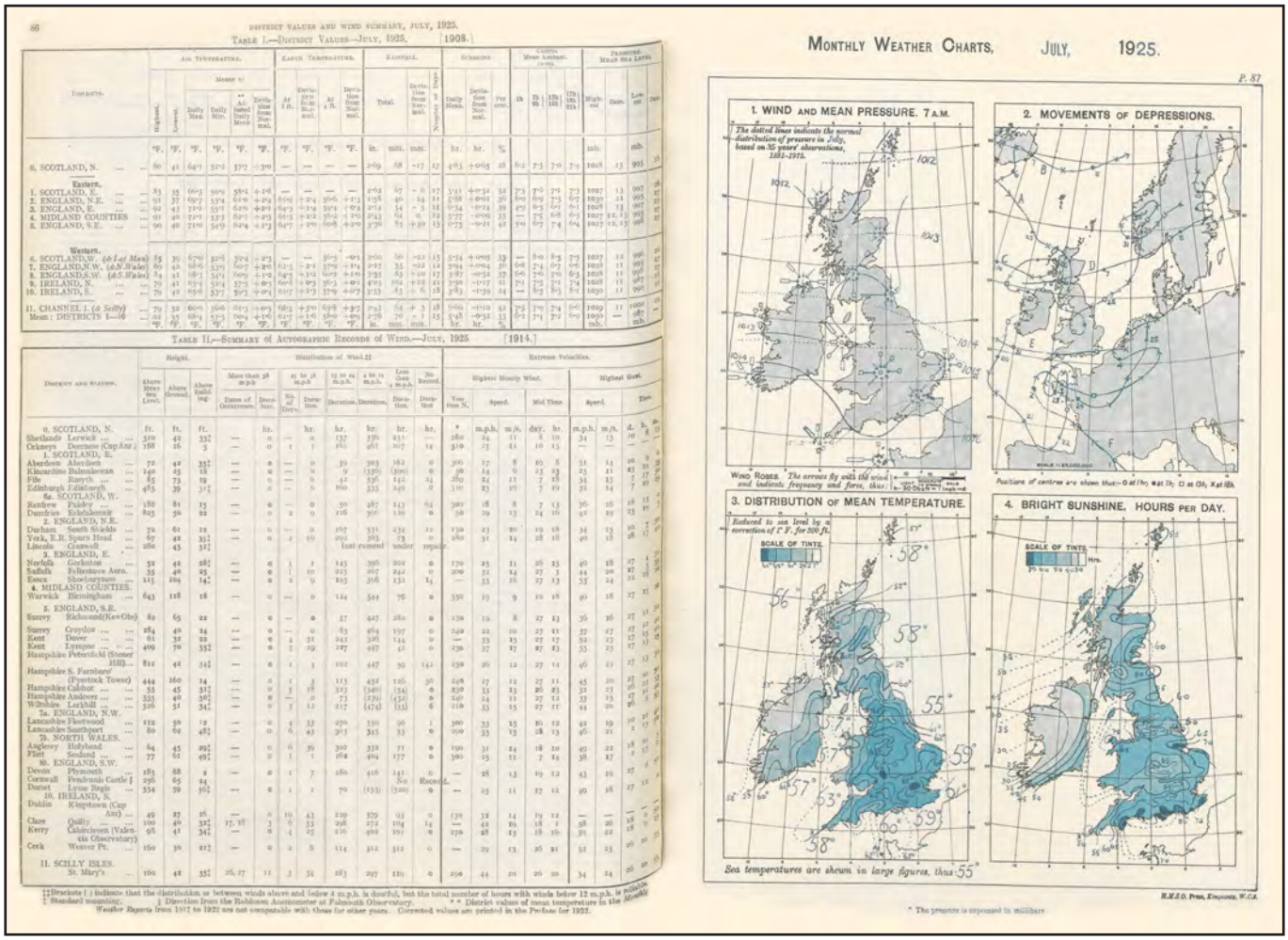
Things to bear in mind

From March 1960 the information provided in the selected stations section is written in code and you will need an aid in order to understand what it means. Do not panic there is a thorough explanation which will enable you to decode the information in the 'Introduction' pages which can be found at the start of each quarter e.g. for April–June 1960 look at the start of April. With this decode it should be reasonably straightforward to interpret the numbers. For the period before March 1872 there are no charts and you will only be able to see data.

The summaries were generally produced ahead of any quality control (QC) input and therefore the data values you see may differ from values quoted later on in other publications or databases. The early summaries did often include some corrections in a supplement and sometimes you may see red ink where an entry has been amended but for the majority of summaries the data is the first cut prior to any QC. This remains the case for the summaries that are currently produced. The summaries have been scanned and are available to view in the Observations collection in our digital archive at: **https://digital.nmla.metoffice.gov.uk/archive**

1.8 Monthly weather summaries

Monthly weather summaries provide a monthly analysis of means and extremes for a range of elements from stations in the climatological network. The front page gives a textual summary of the overall weather for the month and significant weather events such as storms and floods. Depending on the period, summaries will also include maps showing movement of depressions, rainfall, temperature and sunshine. The front pages of the summaries have been scanned and are available to view in the observations collection in our digital archive at: **https://digital.nmla.metoffice.gov.uk/archive**



MONTHLY WEATHER CHARTS, JULY, 1925.

1. WIND AND MEAN PRESSURE. 7 A.M.

2. MOVEMENTS OF DEPRESSIONS.

3. DISTRIBUTION OF MEAN TEMPERATURE.

4. BRIGHT SUNSHINE. HOURS PER DAY.

Example inside pages from a monthly weather summary.

Most useful for

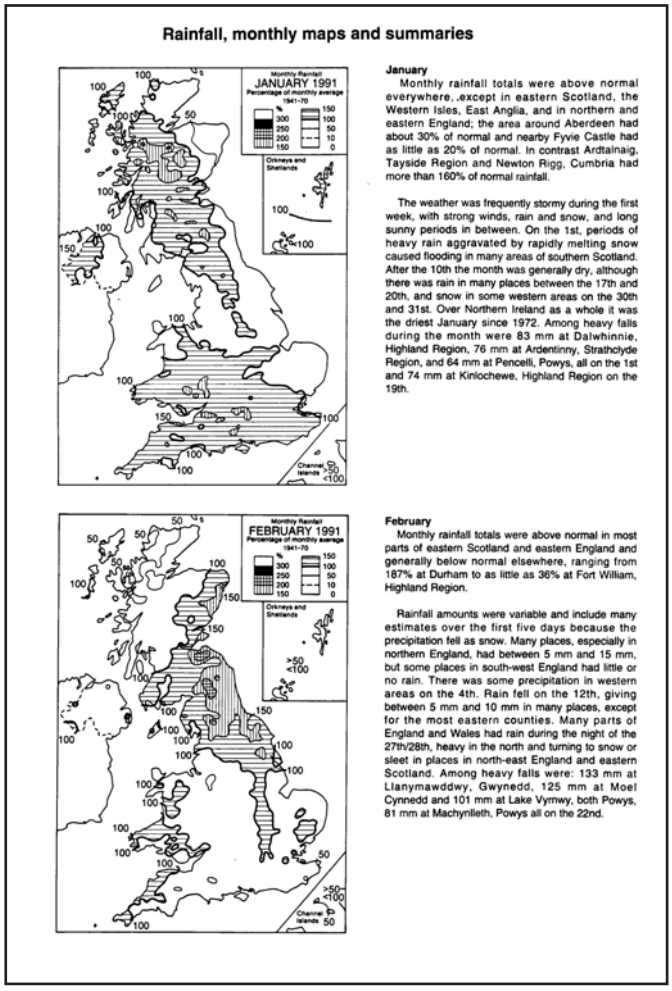
They are useful for a quick overview of the weather characteristics for any month in the series.

Things to bear in mind

Although the later summaries provide data from every station in the climatological network the early part of the series includes only a small selection. If the station you are looking for is not included in the monthly weather summary you will need to request the relevant climatological return instead. The summaries are intended to give monthly data. If you need daily data you will need to use another source.

1.9 British rainfall

British rainfall is the most commonly used title for a series of published books which have gone under a variety of names over the years. The series was published from 1860 until 1991 and provides monthly and annual rainfall totals for sites across the United Kingdom. Earlier volumes also include reports on specific events and information on the rainfall observers. British rainfall has been scanned and is available to view in the observations collection in our digital archive at: **https://digital.nmla.metoffice.gov.uk/archive/**



Rainfall, monthly maps and summaries

January

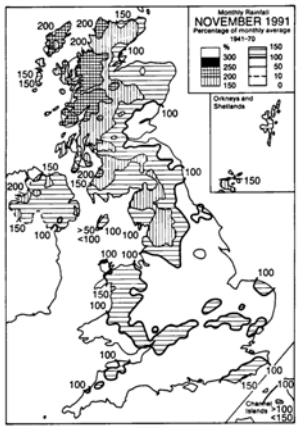
Monthly rainfall totals were above normal everywhere, except in eastern Scotland, the Western Isles, East Anglia, and in northern and eastern England; the area around Aberdeen had about 30% of normal and nearby Fyvie Castle had as little as 20% of normal. In contrast Ardtalnaig, Tayside Region and Newton Rigg, Cumbria had more than 160% of normal rainfall.

The weather was frequently stormy during the first week, with strong winds, rain and snow, and long sunny periods in between. On the 1st, periods of heavy rain aggravated by rapidly melting snow caused flooding in many areas of southern Scotland. After the 10th the month was generally dry, although there was rain in many places between the 17th and 20th, and snow in some western areas on the 30th and 31st. Over Northern Ireland as a whole it was the driest January since 1972. Among heavy falls during the month were 83 mm at Dalwhinnie, Highland Region, 76 mm at Ardentinny, Strathclyde Region, and 64 mm at Pencelli, Powys, all on the 1st and 74 mm at Kinlochewe, Highland Region on the 19th.

February

Monthly rainfall totals were above normal in most parts of eastern Scotland and eastern England and generally below normal elsewhere, ranging from 187% at Durham to as little as 36% at Fort William, Highland Region.

Rainfall amounts were variable and include many estimates over the first five days because the precipitation fell as snow. Many places, especially in northern England, had between 5 mm and 15 mm, but some places in south-west England had little or no rain. There was some precipitation in western areas on the 4th. Rain fell on the 12th, giving between 5 mm and 10 mm in many places, except for the most eastern counties. Many parts of England and Wales had rain during the night of the 27th/28th, heavy in the north and turning to snow or sleet in places in north-east England and eastern Scotland. Among heavy falls were: 133 mm at Llanymawddwy, Gwynedd, 125 mm at Moel Cynnedd and 101 mm at Lake Vyrnwy, both Powys, 81 mm at Machynlleth, Powys all on the 22nd.



November

Monthly rainfall amounts were generally above normal north of a line from Preston, Lancashire to Scarborough, North Yorkshire, apart from some places around the Firth of Forth, the Firth of Tay, and Tyneside, Tyne and Wear, where rainfall was below normal. South of the line most places except South Wales, the south Midlands, and parts of East Anglia and Kent were generally dry. Amounts ranged from 198% of normal at Prestwick, Strathclyde Region to 56% of normal at Sparsholt, Hampshire.

Most places had some rain every day until the 6th, although amounts in many eastern areas were small and central southern England remained dry from the 4th to 6th. The 10th was particularly wet over southern Scotland with over 47 mm of rain measured at Eskdalemuir, Dumfries & Galloway. Most of the United Kingdom had little or no rain during the last ten days of the month, although western Scotland continued to have some spells of heavy rain. Among heavy falls were 72 mm at Clatteringshaws, Dumfries & Galloway on the 10th, 67 mm at Isle of Rum, Highland Region on the 20th and 63 mm at Brodick Castle, Strathclyde Region on the 12th.

December

Monthly rainfall amounts were below normal over the United Kingdom as a whole, and much of southern England and South Wales had less than half the normal rainfall amount, with as little as 14% of average falling at Odiham, Hampshire. In contrast, 144% of average rainfall fell at Holme Moss, West Yorkshire.

The month was very dry over much of England and Wales and parts of eastern Scotland. The provisional rainfall value for England and Wales for the month makes it the driest December since 1988. Northern Ireland, however, had the wettest December since 1986, ending a sequence of five dry Decembers. Moist Atlantic air moved over all parts during the 16th and 17th, bringing rain to many places, with much of England and Wales having the first significant rainfall of the month. Heavy rain on the 21st accompanied by gale force winds washed away bridges, flooded roads and blocked railways, particularly in the area of Sheffield, Manchester and the Welsh Marches; during the next 36 hours occasional rain continued to affect many areas, often accompanied by strong winds. Among heavy falls were 116 mm at Holme Moss, West Yorkshire, 80 mm at Malham Tarn, North Yorkshire, 78 mm at Moel Cynnedd, Powys, 68 mm at Clatteringshaws, Dumfries and Galloway and 67 mm at Slaidburn, Lancashire on the 21st, 62 mm at Widdybank Fell, Co. Durham on the 20th and 58 mm at Loch Bradan, Co. Tyrone on the 18th.

Examples from Met Office british rainfall 1991.

Most useful for

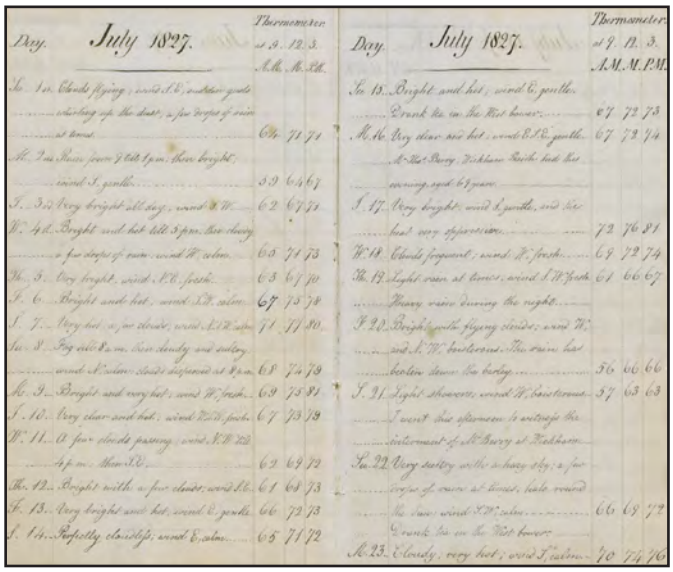
This publication is a very useful way to research rainfall if you do not need daily totals.

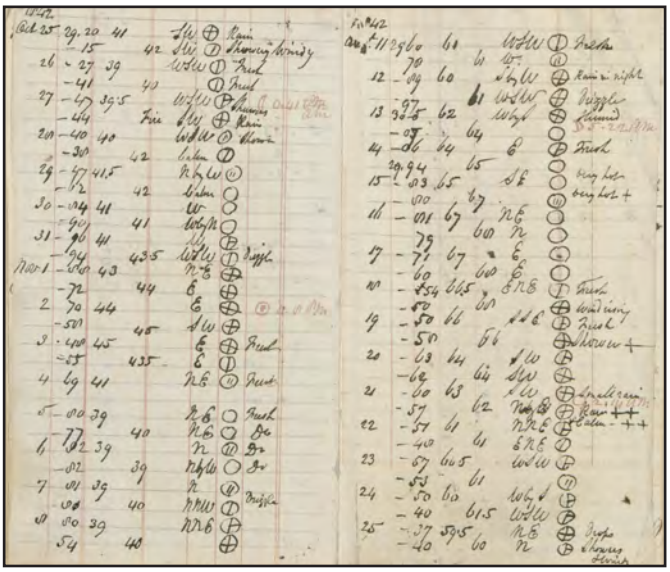
Things to bear in mind

The rainfall reporting network includes many additional sites to those producing climatological returns and daily registers. This is because rainfall totals can vary dramatically across a relatively small area so you need more reporting stations to show these variations as clearly as possible. If you want to search for a station reporting the full range of meteorological elements (in addition to rainfall) you may find it easier to search for these independently rather than using locations in British rainfall.

2. PRIVATE WEATHER DIARIES

The large collection of private weather diaries, dating from the late 17th century onwards, is held mainly in Exeter with some in Edinburgh. These diaries cover periods before and after the foundation of the office and are usually the only source of data for the period before 1854. Some also provide a unique source on social history, phenology (observations of nature), and gardening. The diaries vary greatly in size, number of elements covered and regularity of observations and also in the period covered; some may cover several decades whilst others are only for a few months.





Examples showing the widely differing nature of private weather diaries.

Most useful for

The diaries are useful for research covering periods before 1854 or shortly after — when the official network was still being established.

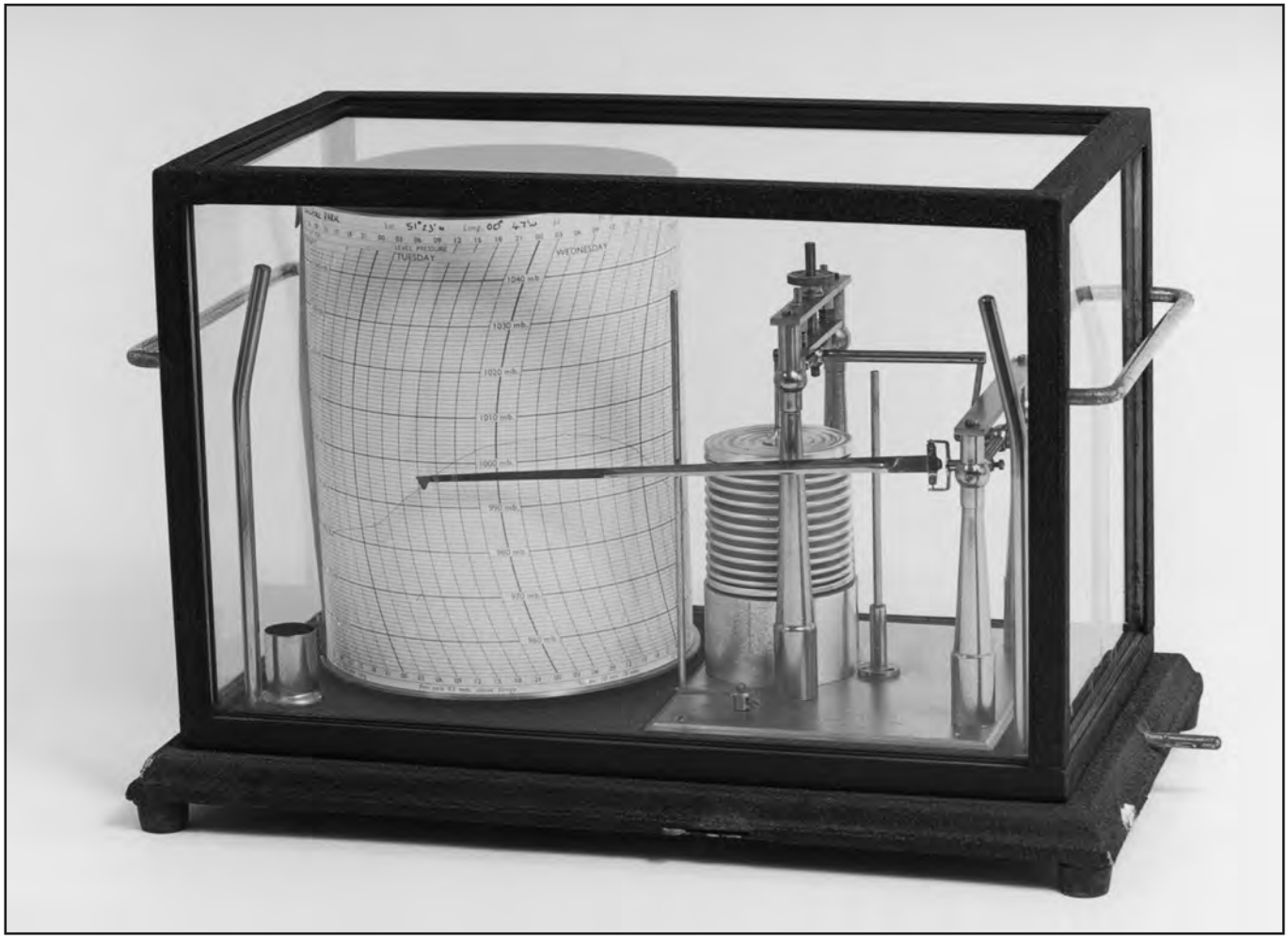
Things to bear in mind

Whilst many diaries comprise observations taken with great care the sites were not official and therefore accuracy of readings can be affected by poorly positioned instruments and use of non-standard instruments which may not have been calibrated accurately. There tend to be more diaries for heavily populated areas, such as London with large gaps in rural areas like Wales. In addition, the earlier the period you are interested in the fewer diaries will be in the collection and depending on your research you may find the nearest available location may be a considerable distance from that in which you are interested.

3. AUTOGRAPHIC RECORDS

Autographic records are, in most cases, types of output produced by instruments recording data about specific elements. For example a barogram is produced by a barograph and is a continuous trace of changes in pressure.

The barograph measures pressure and then records it onto a sheet of specially printed graph paper wrapped around a drum using a pen.



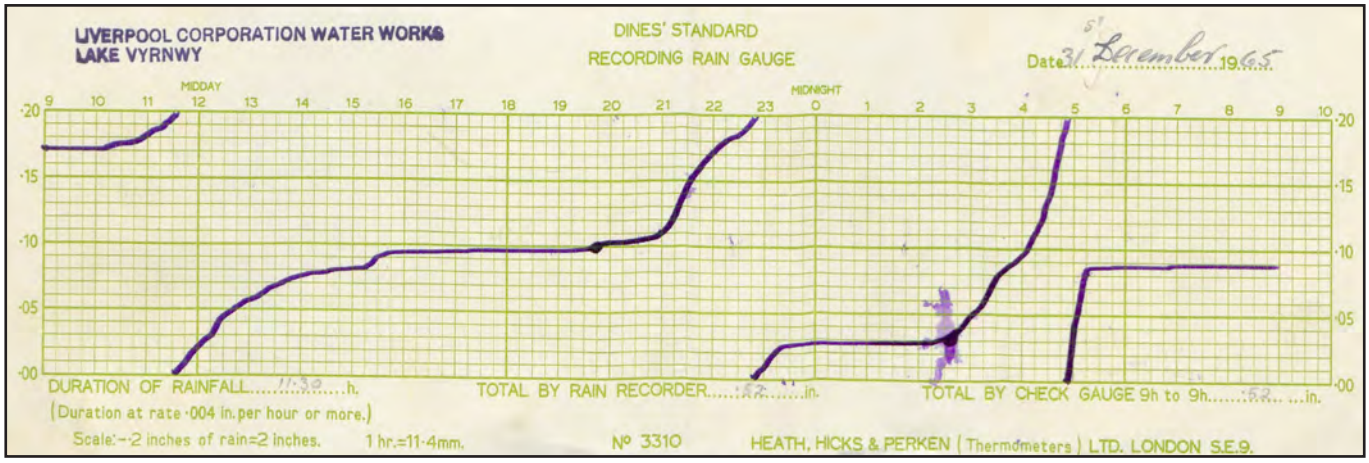
Example of an autographic instrument, (a barograph).

Many of the other autographic devices work in a very similar way although one significant exception are sunshine cards where the mark left on the card is produced by a Campbell Stokes sunshine recorder which focuses sunlight through a glass sphere and uses the resulting beam to burn a line into the card during the period when the sun is shining.

The length of time covered by each record type varies greatly. For example sunshine cards will only cover one day, barograms can cover a week and anemogram may include as much as a complete month on a roll.

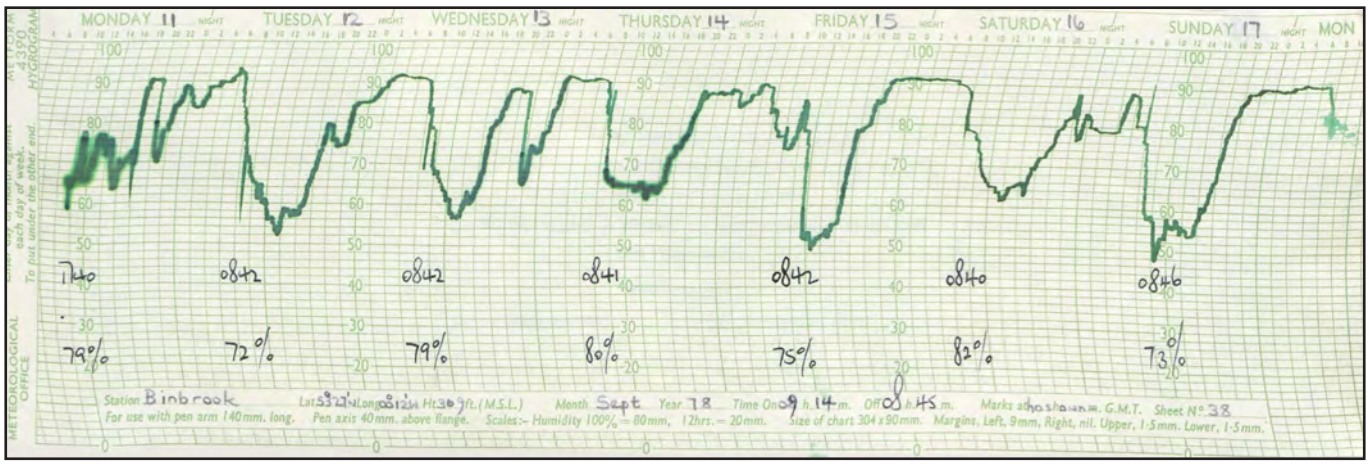
Autographic records are regarded as the original data record for each element however they are harder to read and understand than the data types in the section above. Those marked with an asterisk (*) are more likely to require you to have subject specific knowledge, or request assistance from someone who has.

(i) Hyetograms* – duration of periods of rainfall, intensity and amount



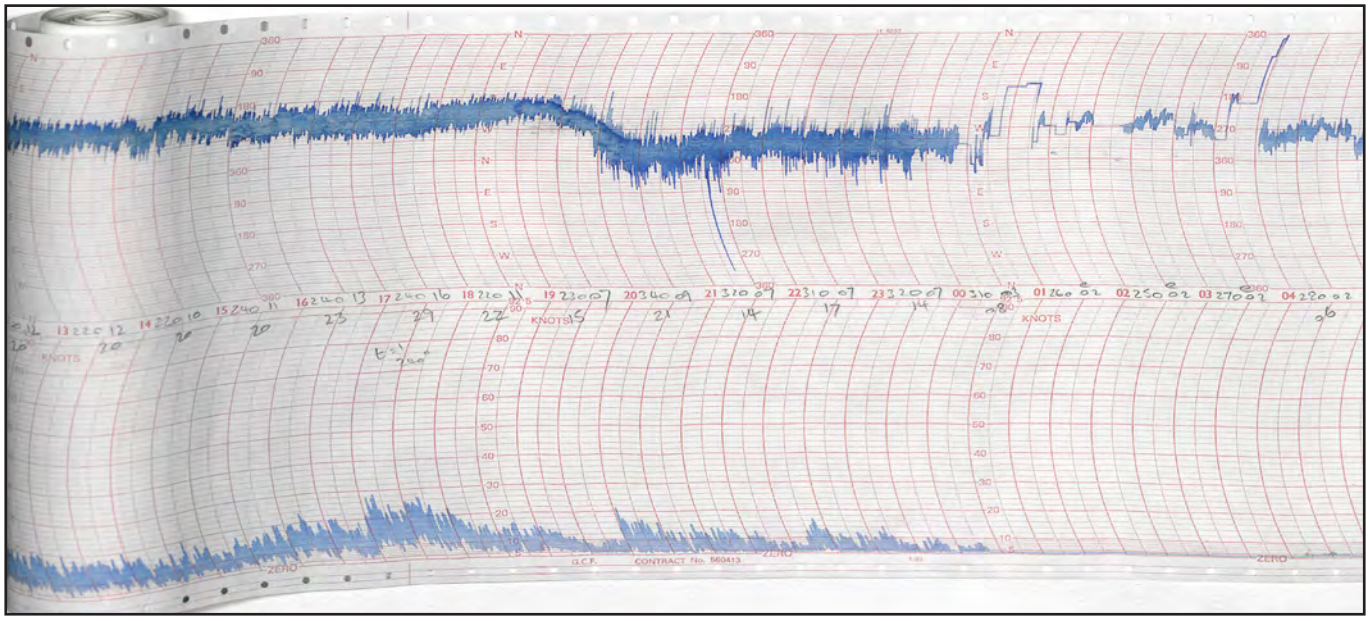
Hyetogram showing rainfall periods of, intensity (gradient of line), and total.

(ii) Hygrograms – humidity rise and fall



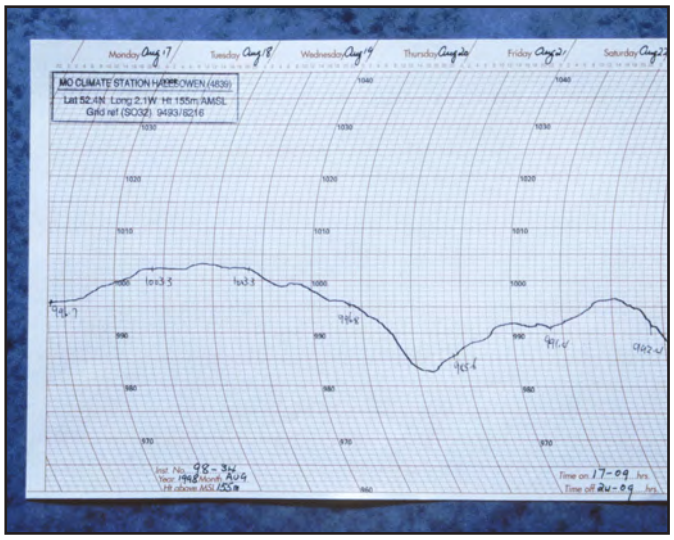
Hygrogram showing variations in humidity.

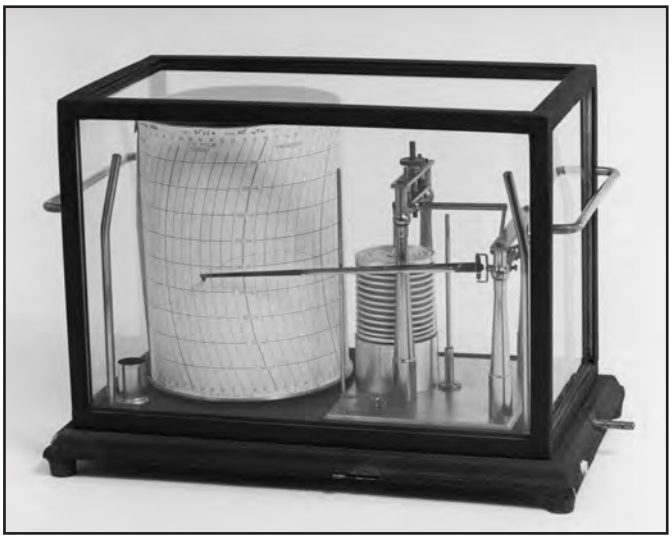
(iii) Anemograms* (rolls) – change of wind speed and direction



Anemogram roll. Top = wind direction in degrees. Bottom = wind speed in knots.

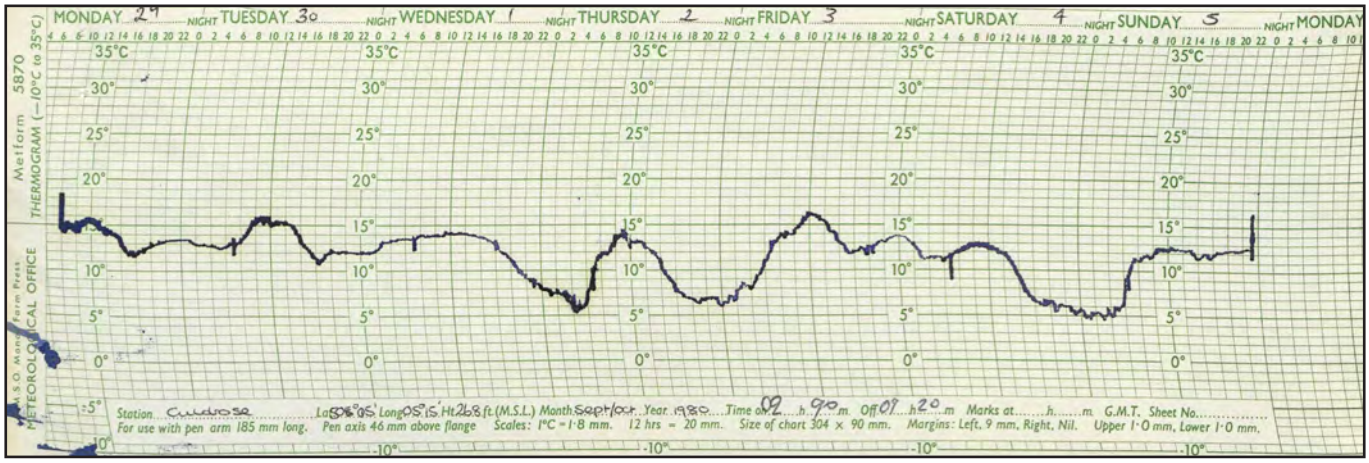
(iv) Barograms – pressure rise and fall





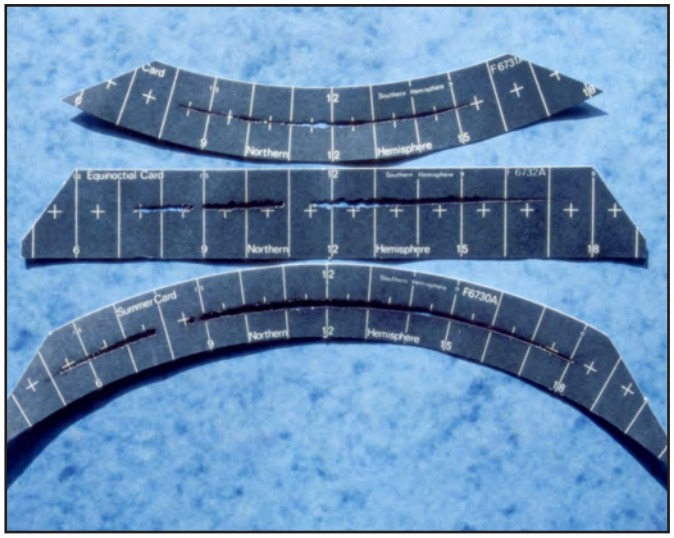
Left: Barogram, also known as a “barograph trace”. Right: Barograph showing pen and rotating drum.

(v) Thermograms – temperature rise and fall



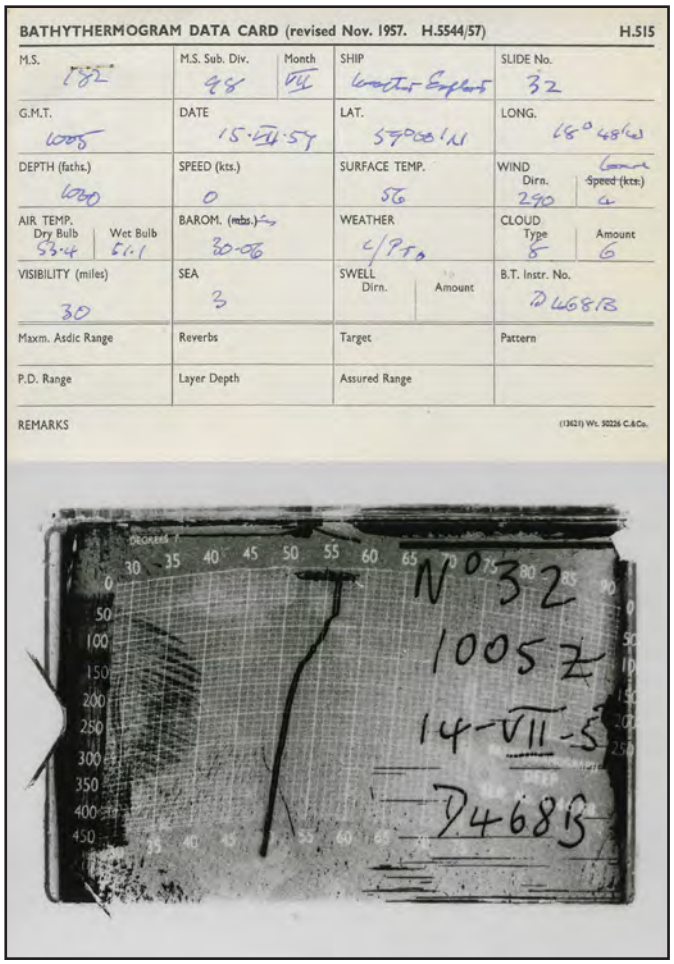
Example of a thermogram also known as a “Thermograph Trace”.

(vi) Sunshine cards – duration of periods of sunshine and total amount (per day)



Left: Sunshine cards – different shapes are used during winter, spring/autumn and summer.
Right: A Campbell-Stokes sunshine recorder.

(vii) Bathythermograph – sea temperature variation with depth



BATHYTHERMOGRAM DATA CARD (revised Nov. 1957. H.5544/57) H.515

M.S.	M.S. Sub. Div.	Month	SHIP	SLIDE No.
182	98	VII	[illegible]	32
G.M.T.	DATE		LAT.	LONG.
1005	15·VII·57		57°08'N	18° 48'W
DEPTH (faths.)	SPEED (kts.)		SURFACE TEMP.	WIND Dirn. / Speed (kts.)
1080	0		56	290 / 4
AIR TEMP. Dry Bulb / Wet Bulb	BAROM. (mbs.)		WEATHER	CLOUD Type / Amount
53·4 / 51·1	30·06		C/PTo	8 / 6
VISIBILITY (miles)	SEA		SWELL Dirn. / Amount	B.T. Instr. No.
30	3			D4685
Maxm. Asdic Range	Reverbs		Target	Pattern
P.D. Range	Layer Depth		Assured Range	

REMARKS

(13621) Wt. 30226 C.&Co.

Left: Bathythermograph, also known as “Bathythermogram data card”.
Right: A Bathythermograph probe.

Most useful for

Autographic records are useful for accessing the primary data source in order for example to check a specific value or look at the values recorded on specific days of interest for a particular element such as maximum gust speed, rainfall rate or periods of sunshine during a day.

Things to bear in mind

Many of these record types are on large format documents such as anemograms which are on rolls of paper several metres long. If you need to look at a number of these types of record it may be best to consider whether another type of record can answer your question more easily. For example some of the record types are also available as tabulated data e.g. wind tabulations, which you may find more suitable for your requirements.

If you need assistance from a subject specialist and you are planning to view records held at Belfast or Edinburgh you will need to arrange this in advance of your visit. Please note that it may be at least a week before a member of Met Office staff can attend the archive to provide assistance so make sure you plan ahead if this is required.

4. CHARTS

Meteorological charts are contained in bound volumes – each volume covering either a three or six month period. The chart collection is held at the National Meteorological Archive in Exeter.

The volumes vary in size but are rarely smaller than A1 and are therefore large and heavy items which require care to handle. The frequency with which they were produced varies depending on the type of chart but at a minimum there will be one chart per day and usually at least four. By their nature charts are generally drawn to show a large area and therefore the UK will usually only appear as a relatively small part of a larger whole. Charts have been produced for a wide variety of purposes and cover a range of areas. The majority of the charts are synoptic charts (these show the position of weather fronts and other weather systems) but charts can also show other elements such as sea temperature and sea ice.

The main chart series are as follows:

(i) Synoptic working charts

This is the main chart series and generally shows northern Europe including the UK and parts of the north Atlantic but occasionally includes more of the northern hemisphere. The synoptic working charts are the longest unbroken chart series held by the office and originals are held from 1871 to 2003 when paper copies ceased to be produced.

(ii) British Isles

This series focuses in more detail on the British Isles but may be less useful because it does not show the weather systems approaching. The synoptic working charts (above) although showing the British Isles in less detail are usually more helpful. The series runs from October 1940 to August 2003 when paper copies ceased to be produced.

(iii) ASXX charts (Actual Surface Analysis Charts)

These charts provide the observed pressure information and position of fronts and are produced every six hours. They provide a graphical representation of the weather without the addition of plotted data and are most useful for general research into the weather situation on any given day. The series runs from 1995.

(iv) Northern Hemisphere, Southern Hemisphere

These charts are the best way to investigate the weather in a location outside of northern Europe and include the Polar regions. The Northern Hemisphere series runs from July 1922 to August 2003 and the Southern Hemisphere series runs from March 1982 to August 2003 when paper copies ceased to be produced.

(v) Upper air charts

This series is largely held on microfilm. These charts provide information on pressure, temperature and weather systems at levels in the upper atmosphere and can be useful if researching particular weather events or meteorological factors relating to aviation. The series runs from January 1943 to May 2000.

Upper air charts and data can also be found in the upper air section reports later known as the daily aerological records (DARs) which is a series that follows a similar format to the daily weather report and cover the period 1919 to 1980.

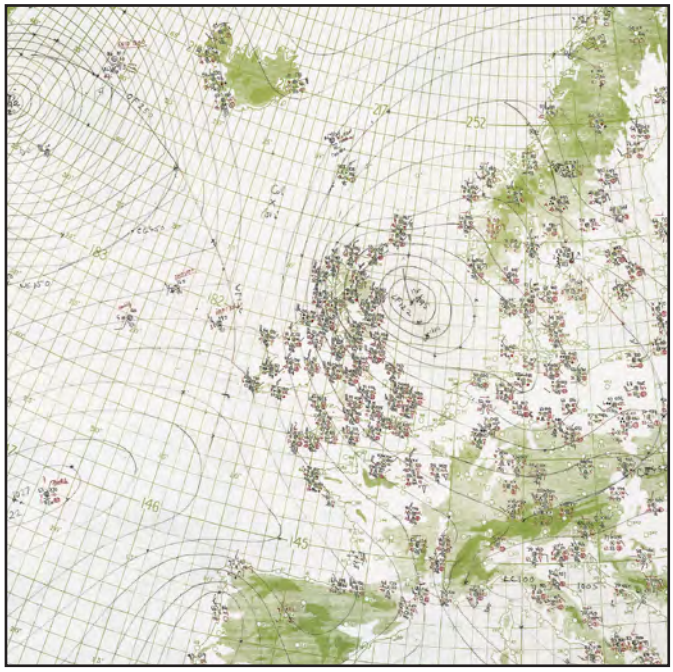
(vi) Sea-ice charts

These charts show sea surface temperature, the position of pack ice and the limits of various other ice types. The series runs from January 1966 to January 1997.

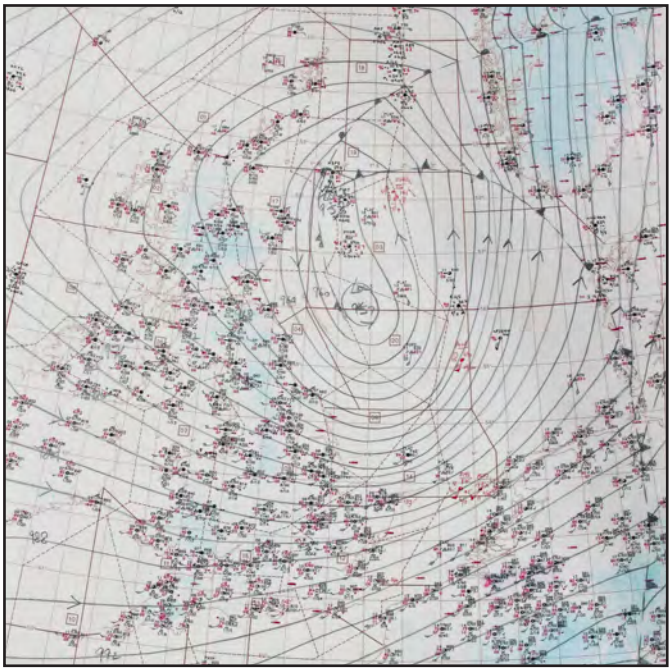
(vii) Sea-surface temperature charts

These tend to cover the area around the UK. The series runs from December 1964 to January 2004.

Examples of charts:

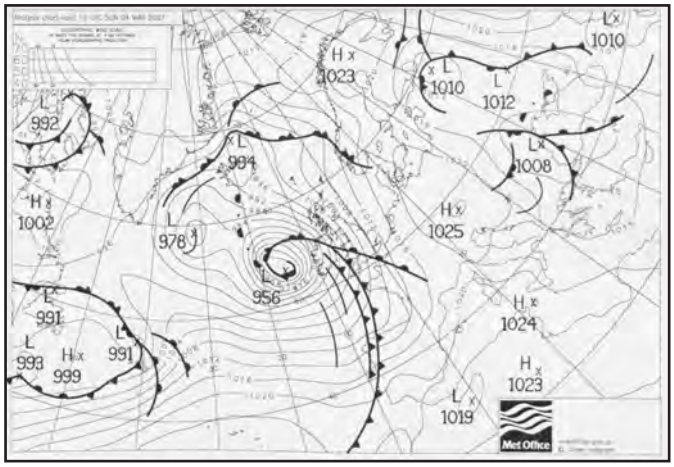


Synoptic working chart (above).



British Isles Chart (above).

ASXX Chart (below).



Most useful for

Charts are most useful for a graphical illustration of the weather situation on any given day.
The British Isles charts, although smaller in area, can sometimes be hourly and can therefore add to the picture if you are researching a specific day or weather event.

Things to be aware of

The charts above show actual observations as opposed to forecasted data.

The chart volumes are almost without exception extremely large and heavy. You may need to ask for assistance when moving them and due to their scale only a relatively small number can be provided at any one time.

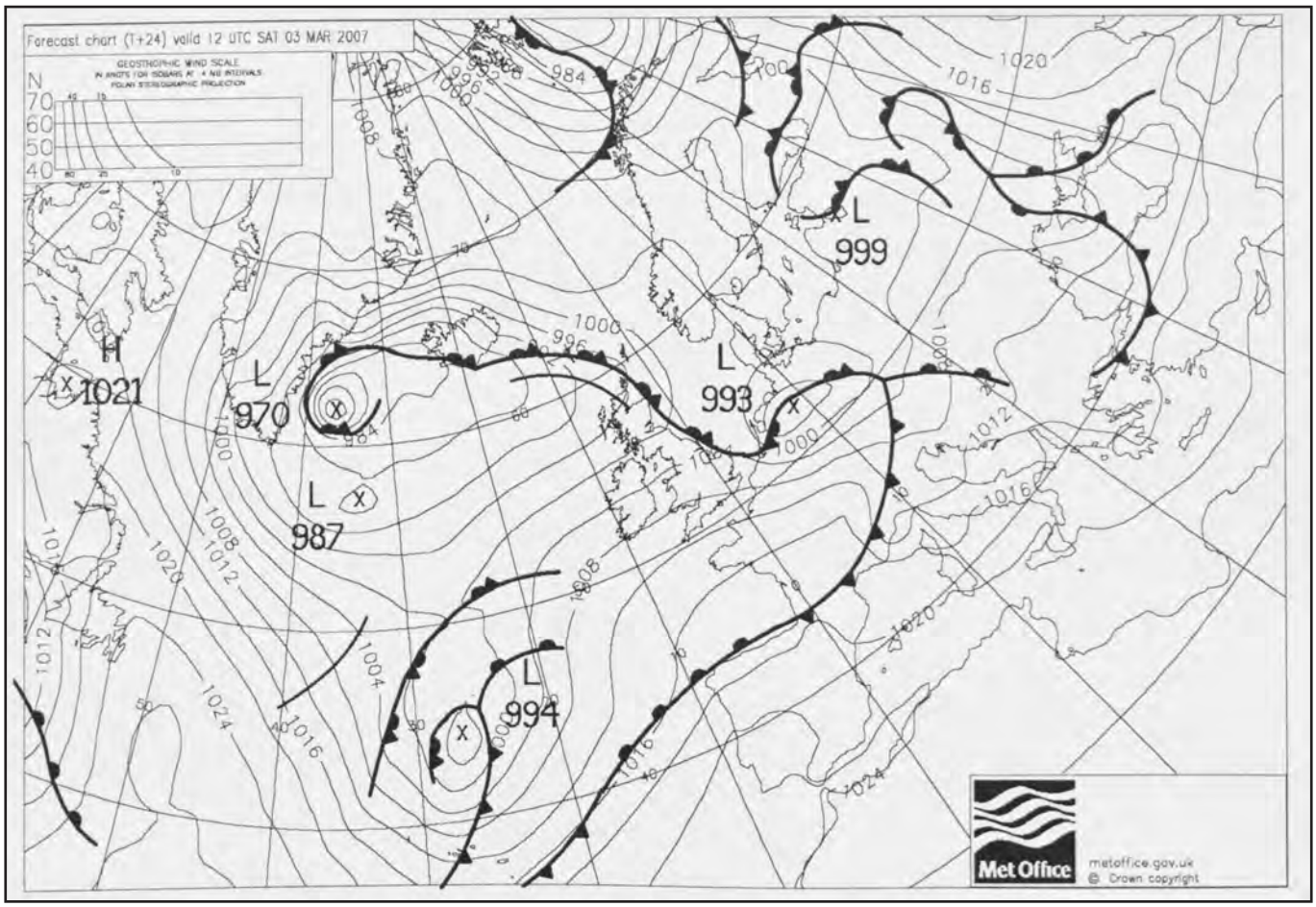
Almost without exception the charts will contain plotted station observations which you will need assistance to interpret. You should also note that the method of plotting also changes over time.

Factsheet 11 "Interpreting weather charts" will help you to decode observations from all of the periods covered[4]. You may also need assistance to interpret some of the more specialist charts such as the Upper air charts.

[4]Our factsheets are available for free at: **www.metoffice.gov.uk/research/library-and-archive/publications/factsheets**

5. FORECAST DATA

Forecast data is held only in the National Meteorological Archive in Exeter and is very limited in its nature and extent as the purpose of the archive is to record observations rather than predictions. The only forecast data types retained are a range of forecast surface charts covering the north Atlantic and Europe (known as FSXX and MSXX charts). These are synoptic charts showing the forecast position of weather systems at 12, 24, 36, 48, 60, 72, 84, 96 and 120 hours from the actual situation at noon or midnight on any given date. The series runs from 2003.



Example FSXX chart.

Note: For text based forecast data see note in the daily weather summary section above.

Most useful for

Forecast charts show how the computer models predicted the developing weather situation and how this has changed and increased in detail and accuracy over time.

Things to bear in mind

The information is forecast data and will not provide actual observations. For actual observations you should consider the other types of data described here.

Some charts are produced for every day of every year and therefore can equate to a large amount of data. If you want to look at charts covering a long period of time you should be aware of the potential quantity of material this will represent and you may need to reduce the scope of your enquiry to a more manageable level.

All the forecast charts in the archive date from the period after the introduction of computer modelling.

6. NEXT STEPS

Having identified the type of data most useful to your research you will need to contact the archive in which it is held. Please note that in all cases prior appointment is required. Records in Exeter are held on-site and can be provided reasonably quickly however records in Scotland and Ireland are held in off-site archival storage facilities and will therefore take some time to arrive. As a general guide you should allow at least seven days between ordering your items and visiting the reading room to view them.

England and Wales

Records relating to England and Wales are held in Exeter and you can check all of our holdings using our online catalogue at **https://library.metoffice.gov.uk**

Scotland

Scottish records are undergoing a transfer process and may be held at either the Met Office or Saughton House or National Records of Scotland (NRS). The NRS catalogue can be searched at **www.nrscotland.gov.uk** and the website will also provide you with details on how to request records to view. If the records you want to see don't appear on this catalogue you should contact **metlib@metoffice.gov.uk** and we will help you with where and how to view the records.

Northern Ireland

For records relating to Northern Ireland you should use this guide to identify the type of records you would like to use and then contact the Public Records Office Northern Ireland (PRONI) providing the location, dates and specific type of record you are interested in.

The meteorological records do not appear in detail on the PRONI catalogue. If you know or believe the records you want are in the collection you can contact PRONI directly and arrange to view them keeping in mind that the records will normally available not less than seven days after ordering. If you need to check whether the type of record you would like to view is held for the location and period you require you should contact **metlib@metoffice.gov.uk** in the first instance. We can then advise on what is available and how to request this from PRONI directly.

FAQs

Q1 "I just want to know what the weather was like on a certain day, is there an easy source for me to use?"

We would recommend you use the daily weather summaries (these are all available to view in our library and archive in Exeter and you can also request electronic scans for up to five selected days) via email.

Q2 "I'm a student and I need access to a lot of data, how can I get to it?"

Students and members of academic communities with '.ac.uk' email addresses can register with the British Academic Data Centre (BADC) for access to large amounts of data for academic research purposes. If you are an undergraduate and require support in using the data you have extracted you should email **metlib@metoffice.gov.uk** for assistance. Postgraduates and other researchers should contact BADC for help.

Before the 1950s there are only a small number of stations for which data has been digitised and added to the BADC database. If you need additional data for periods before this you will need to visit the archive or archives where the paper records you require are held and extract the information you need from the documents. Lifting data from paper records takes time and you should factor this into your calculations when planning your research. Rules on copying, photographing records will vary according to each archive you visit so make sure you check the relevant terms and conditions.

Q3 "What date do your holdings go up to?"

Over the last 20 years the Met Office has collected and stored an increasing amount of data in electronic format. As a general guide the physical archives (in Exeter, Belfast and Edinburgh) will hold records up to the early 1990s although some series stop earlier than this and series held in Exeter may extend later. For data after this date records are generally held in electronic format only and you should contact the archive for further assistance.

Q4 "Do you have any monthly and annual information that will give me a general view?"

The National Climate Information Centre (NCIC) based at the Met Office create a wide range of climatological statistics, summaries and other supporting information which you can view here **www.metoffice.gov.uk/climate**. In addition various documentary sources which might help you have been digitised and made available through our web pages. These include the summary pages of the monthly weather reports, the snow survey of Great Britain and British rainfall which provides monthly rainfall data for the UK for the period 1860–1991. You can visit our Digital Library and Archive at **https://digital.nmla.metoffice.gov.uk/archive**.

Q5 "I want to understand more about the site where the observations were made how do I do this?"

Most stations have a 'Station History File' which provides more detailed information (metadata) about the station. Some are more detailed than others but they will generally contain inspection reports and other documents relating to the history of an observation station. These are invaluable resources for learning about changes to a site over time both in terms of instrumentation and actual position.

Q6 "If I want more detail than is available in the daily weather summaries, or more specific detail from a location closer to my home which record type should I choose?"

We would advise that non-specialists wanting to look at historic weather data should focus on the climatological returns and the private weather diaries (the latter are particularly useful if the period in question is before 1900).

Q7 "What advice can you give me in researching the weather before the foundation of the office?"

The Met Office was founded in 1854 but took some time to establish a wide network of stations. For the period before 1854 and indeed the early years of the Met Office we would advise customers to see if our private weather diaries can help. We have an extensive collection of private weather diaries dating back to the late 1600s. Most are located in Exeter but it is also advisable to check the NRS catalogue for further diaries relating to Scotland. The diaries are an invaluable source on historic weather but you should be aware that they by no means cover every area of the country at all times and depending on the nature of your research you may have to compromise quite significantly on location.

Q8 "I can't get to the archives to look at material, can you help?"

The National Meteorological Archive in Exeter, which holds information for England and Wales has an enquiry service whereby we can spend up to thirty minutes investigating your query. Please contact us using the details below. A limited service along similar lines may also be available for Scottish records still held at Saughton House. Please email **metlib@metoffice.gov.uk** with your enquiry and we will see if it is possible to help you. For records which have already been transferred to other National Archive services (NRS and PRONI) we do not have direct access to this material and therefore any available remote enquiry service will be operated by the archive in question.

Contact details

Met Office

For more information about the Met Office, please contact the Customer Centre on:
Tel: 0370 900 0100 Fax: 0370 900 5050
email: **enquiries@metoffice.gov.uk**

If you are outside the UK:
Tel: +44 (0)1392 885680 Fax: +44 (0)1392 885681

Library:

National Meteorological Library
Met Office
FitzRoy Road
Exeter
EX1 3PB
email: **metlib@metoffice.gov.uk**
Tel: 01392 884841

Archives:

England and Wales records
National Meteorological Archive
Great Moor House
Sowton Industrial Estate
Exeter
EX2 7NL
email: **metlib@metoffice.gov.uk**
Tel: 01392 360987

Scottish records

National Meteorological Archive
Great Moor House
Sowton Industrial Estate
Exeter
EX2 7NL
email: **metlib@metoffice.gov.uk**
Tel: 01392 360987

If you are informed that records have been transferred to NRS you will need to contact National Records of Scotland (NRS). Please note that there is a request limit of 12 items per day.

National Records of Scotland (NRS)

General Register House
2 Princes Street
Edinburgh
Scotland
EH1 3YY
Tel: 0131 535 1314
www.nationalrecordsofscotland.gov.uk/about-us/contact-us

Northern Ireland records

Public Record Office of Northern Ireland (PRONI)
2 Titanic Boulevard
Titanic Quarter
Belfast
BT3 9HQ
email: **proni@dcalni.gov.uk**
Tel: (+44) 028 90 534800

Met Office factsheets

The Met Office produces a range of factsheets which are available through our webpages **https://www.metoffice.gov.uk/research/library-and-archive/publications/factsheets:**

- Number 1 Clouds
- Number 2 Thunderstorms
- Number 3 Water in the atmosphere
- Number 4 Climate of the British Isles
- Number 5 White Christmases
- Number 6 The Beaufort Scale
- Number 7 Climate of South West England
- Number 8 The Shipping Forecast
- Number 9 Weather extremes
- Number 10 Air Masses and Weather Fronts
- Number 11 Interpreting weather charts
- Number 12 National Meteorological Archive
- Number 13 Upper air observation and the tephigram
- Number 14 Microclimates
- Number 15 Weather radar
- Number 16 World climates
- Number 17 Weather observations

DIGITAL LIBRARY AND ARCHIVE

The Met Office Digital Library and Archive provides access to a growing collection of born digital content as well as copies of some our older publications and unique archive treasures.
Just go to **https://digital.nmla.metoffice.gov.uk/archive**. Our content is for your own private use. Please contact the library for any other terms of use or for further information.

Our online catalogue can be found at: **https://library.metoffice.gov.uk**

All of the fact sheets in this series are available to download from our website
The full list can be found at: **https://www.metoffice.gov.uk/research/library-and-archive/publications/factsheets**

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