ANNUAL SUMMARY TABLES OF SURFACE METEOROLOGICAL OBSERVATIONS AT BRITISH ANTARCTIC SURVEY STATIONS

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THIS note introduces a new series of meteorological tables to be published in the *British Antarctic Survey Bulletin*. The tables will be accompanied by weather notes outlining the salient features of the year and making comparisons with earlier years. Station notes will also be given.

Details of past and present British Antarctic Survey stations are given in Table I. Details are also given for Orcadas. This station, established in 1903 by the Scottish National Antarctic Expedition and maintained since 1904 by Argentina, has the longest meteorological record of any site south of lat. 60°S.

The annual tables give monthly means and extremes of pressure, temperature and wind speed, a seasonal analysis of wind speed by quadrants, and monthly frequencies of types of weather. Monthly means of vapour pressure and of relative humidity are given when available. Unless otherwise stated in the station notes, all means and frequencies have been derived from 3 hourly observations made at 00 GMT, 03 GMT, etc. The following remarks apply generally:

1. *Extreme pressures* have been taken from the 3 hourly observations. Slightly higher or lower values may have occurred.
2. *Extreme temperatures* are true extremes, referred to GMT days. Maximum and minimum thermometers are read at 00 and 12 GMT at stations making 3 hourly observations.
3. Humidity measurements with wet- and dry-bulb thermometers become less reliable as temperature decreases. It has been the practice to assume saturation with respect to ice when the dry-bulb temperature was less than −35° C, giving relative humidities of, for example, 71 per cent at −35° C and 68 per cent at −40° C. The vapour pressures at such temperatures are very small, less than $\frac{1}{2}$ mbar, and usually have little effect on monthly means.
4. *Extreme mean wind speed* refers to the mean over 1 hr. This value and the *highest gust* have been extracted from anemograph records.
5. *Wind analyses* have been compiled from the winds reported in the 3 hourly observations (averages over 10 min.). Months are grouped as follows:

Summer:	December, January, February
Autumn:	March, April, May
Winter:	June, July, August
Spring:	September, October, November.

6. In the derivation of *percentage sunshine*, account has been taken of instrument exposure. Indications of the extent of shading effects are given in the station notes. Percentages in parentheses indicate that potential recorded sunshine for that month was less than 100 hr.
7. The *net snow depth* is the value on the last day of the month. See station notes for datum levels.
8. *Precipitation totals* are given as water equivalents. They have the status of estimates rather than measurements, but they should be reliable except possibly in months when drifting or blowing snow were prevalent.

   Weather frequency tables will be found in *Meteorology of the Falkland Islands and Dependencies, 1944–50* (Pepper, 1954) and in the *Annual meteorological tables* issued by the Falkland Islands and Dependencies Meteorological Service (FIDMS) for 1951–63, the latter giving much the more detail. The present series of tables returns to a shorter form quite close to that used by Pepper. Some differences are noted below.
9. Forms of precipitation: the categories used are *rain or drizzle, snow or sleet, hail* > *5 mm. in diameter*, and *prisms, grains, etc.* Pepper used the first two of these, and hail, unqualified. FIDMS listed eight different forms of precipitation.

TABLE I

Station	*Meterological number*	*Latitude*	*Longitude*	*Zone time*	*Meteorological data*
Grytviken, South Georgia	88903	54°16′S.	36°30′W.	GMT−2	From 1905 (record intermittent 1905–17)
Signy Island	88925	60°43′S.	45°36′W.	GMT−3	From March 1947
Admiralty Bay, King George Island	88934	62°03′S.	58°24′W.	GMT−4	February 1948 to December 1960
Deception Island	88938	62°59′S.	60°34′W.	GMT−4	February 1949 to November 1967
Hope Bay	88940	63°24′S.	56°59′W.	GMT−4	March 1945 to December 1959
Port Lockroy	88949	64°50′S.	63°31′W.	GMT−4	February 1944 to January 1947
Argentine Islands	88952	65°15′S.	64°16′W.	GMT−4	From January 1947 (B.G.L.E. 1935–36)
Loubet Coast	88956	66°54′S.	66°48′W.	GMT−4	July 1956 to December 1958
Adelaide Island	88958	67°46′S.	68°55′W.	GMT−5	From May 1962
Horseshoe Island	88959	67°48′S.	67°19′W.	GMT−4	November 1955 to December 1959
Marguerite Bay	88961	68°11′S.	67°01′W.	GMT−4	April 1946 to February 1950
Fossil Bluff	88962	71°20′S.	68°17′W.	GMT−5	Intermittently from 1961
Halley Bay	89022	75°31′S.	26°40′W.*	GMT−2	From March 1956
Orcadas, Laurie Island	88968	60°44′S.	46°44′W.	GMT−3	From 1903

* Mean position; varies from 26°35′ to 26°50′W.

10. A count is given of days with *visibility less than 1,000 m*. The poor visibility may be due to fog, precipitation or blowing snow, singly or in combination. Such days were designated "fog days" by Pepper (1954)—the data available to him did not permit differentiation. FIDMS split their corresponding count into two exclusive categories, fog if this were present, pseudo-fog otherwise. The sum should be taken for comparisons.
11. Separate counts are now given for *fog* and for *blowing snow*. They are not mutually exclusive. *Drifting snow* is also listed. Blowing snow reduces visibility at eye-level (1·8 m. nominal) to less than 4 km., drifting snow does not affect visibility at eye-level. Neither term implies the absence of precipitation.
12. A *gale day* is one on which the wind speed was 34 kt or more for at least 10 min. Gales of short duration are not necessarily recorded in the analysis of the winds reported at the 3 hourly observations.
13. If the sum of the total cloud amounts reported at 06, 12, 18 and midnight GMT exceeds 23 oktas, the day is called *cloudy*; if the sum is less than 9 oktas, the day is *clear*. In Pepper (1954) and the FIDMS tables, the corresponding limits were 19 and 5 oktas, using the sums for 12, 18 and midnight GMT only.
14. References to station notes will be found in column headings, e.g. a superscript 2 indicates that station note 2 should be consulted.
15. Brackets ( ) draw attention to values which probably have less than the reliability expected at the station. This is normally due to missing data; non-standard observing practice (e.g. full observations at less than three synoptic hours per day); abnormally large corrections (e.g. for drifting snow or freezing rain); or suspect equipment.

    See also specialist use in note 6 (percentage sunshine).

The summary, chapter 8, in Pepper (1954) remains useful. Some comparisons of data from British Antarctic Survey stations and data from Orcadas are given there. Temperature variations have been discussed by Limbert (1974).

For a broad and up-to-date survey, see *Meteorology of the Southern Hemisphere* (Newton, 1972). Synoptic situations are discussed by Taljaard in chapter 8 of this reference, on which the following remarks are based.

Over the Antarctic Peninsula the circum-polar trough of low pressure is found near lat. 67°S. in summer and near lat. 70°S. in winter. Maximum cyclonic frequency is found at about these latitudes at long. 100°W., and trends northward to about lat. 55°S., long. 40°W. with little seasonal variation. This is consistent with the west-south-west–east-north-east alignment of surface isobars and isotherms. Cyclones following this path are typically about 1,500 km. in diameter and move at speeds of about 25 kt. The Antarctic Peninsula stations, Signy Island and South Georgia usually see the same (large) weather systems, subject to such development as may occur in transit. Cyclonic frequency in the Weddell Sea is low in summer, but in winter a secondary maximum crosses the Antarctic continent from the Ross Sea to the Weddell Sea, trending northward to about lat. 70°S., long. 40°W. and thence turning eastward to follow the 70° parallel around the continent. (It is not common for Halley Bay to see weather systems which have passed over the other British Antarctic Survey stations.)

MS. received 28 May 1975

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