

DEPARTMENT OF TRANSPORT AND POWER - METEOROLOGICAL SERVICE

CLIMATOLOGICAL NOTE No. 4

SEA WATER TEMPERATURES AT MALIN HEAD

by

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and F.E. Dixon

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A tide gauge station is maintained by the Irish Ordnance Survey at Portmore Pier, Malin Head, Co. Donegal. (See Fig. 1). Check readings of the recorder are made twice each day by the staff of the nearby meteorological station. The times of the readings are controlled by the state of the tide but are all between 08 and 18h GMT. In association with these check readings of the water level observations are made of the temperature of the water within the recorder well. Until November 1971 the thermometer was within a sea-thermometer protector. More recent measurements were made using instead the standard meteorological sea bucket. The purpose of this note is to present the sea water temperatures obtained during the period 1959 to 1974. The assistance of Mr. J. O'Hagan (Ordnance Survey Office, Phoenix Park, Dublin) in supplying some of the data is much appreciated. There are, however, some small gaps, resulting mainly from the impossibility of reaching the tide gauge in stormy weather. From the nature of the data it is reasonable to interpolate for these occasions, and such estimated figures have been used in calculating the monthly, seasonal and annual means.

Table 1 includes the mean sea temperature for each month and year, together with the extreme values. The last line of the table shows the mean monthly air temperature for the same 16 years. Only in June is the air warmer than the sea, and the largest difference between sea and air temperatures occurs in November. In Figure 2 are plotted the monthly mean values of both the sea and the air temperatures, together with the first harmonic components derived from them. The lag between the two curves is only 14 days, the dates of the winter minimum being 2nd and 16th February respectively.

It is fashionable to seek evidence of "climatic change", which may be apparent as a persistent trend, up or down, or by an abrupt discontinuity. Figure 3 plots the mean sea temperature for each season and for the whole year. The seasons were not the conventional ones of meteorology but Winter = January to March, the three coldest months, etc. The data are too few for any confident assessment of the "reality" of any changes, but there is a suggestion that the cold of 1963 was the culmination of a downward trend. The subsequent warming is most apparent for Winter and Spring. There is a slight suggestion in the Summer and Autumn plots that the periodicity of about two years length is present. Periodogram analysis assesses the period length to be 2.375 years. The range is however, only $\frac{1}{2}^{\circ}\text{C}$, too small to have any prognostic value.

TABLE 1.

MALIN HEAD SEA TEMPERATURE ($^{\circ}\text{C}$) 1959-1974 - MEANS AND EXTREMES

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Year	Maximum	Minimum
1959	7.2	6.9	7.9	8.9	10.8	13.6	15.0	15.6	15.2	14.1	10.9	8.9	11.2	16.1	6.1
1960	7.9	6.9	7.2	8.7	11.0	(13.7)	14.8	15.3	14.8	12.6	10.2	8.4	11.0	15.6	6.1
1961	7.1	7.4	8.5	9.2	11.2	12.7	13.7	14.3	14.0	12.4	10.3	8.2	10.7	15.2	6.5
1962	6.9	7.2	6.6	7.6	9.9	12.1	13.2	14.4	13.8	12.6	10.5	8.6	10.3	14.9	6.2
1963	5.8	4.9	5.9	7.5	9.2	12.1	13.4	14.2	13.6	12.1	10.3	8.1	9.8	14.4	4.2
1964	7.6	7.1	6.9	8.3	10.6	12.2	13.9	14.7	14.2	12.6	11.0	8.9	10.7	15.2	5.8
1965	7.4	6.9	6.6	8.1	9.9	11.9	13.9	14.3	13.2	12.3	9.9	7.9	10.2	14.7	5.9
1966	6.8	6.4	7.4	7.2	9.8	12.3	14.6	14.5	14.3	12.7	9.9	8.1	10.4	15.1	5.5
1967	7.6	7.3	7.3	8.4	9.8	12.4	13.9	14.7	14.2	12.1	9.6	8.4	10.5	15.1	6.7
1968	7.4	6.7	7.3	8.2	9.2	12.0	13.9	14.3	14.6	13.3	10.3	8.7	10.5	15.2	6.2
1969	7.6	6.1	5.9	7.6	9.3	11.9	14.3	15.2	14.6	13.4	10.4	8.4	10.5	15.6	5.3
1970	7.3	6.6	6.7	7.6	10.0	12.6	13.2	14.2	13.8	12.3	10.1	8.9	10.3	14.4	6.2
1971	7.9	7.4	7.8	8.8	10.5	11.8	13.9	14.0	14.8	13.3	10.6	9.4	10.9	15.6	6.7
1972	7.7	6.7	6.8	8.2	9.8	11.2	13.1	13.4	13.3	12.6	10.0	8.2	10.1	14.5	5.9
1973	7.7	7.4	7.6	8.3	9.7	12.2	14.2	14.6	14.6	12.3	10.2	8.4	10.6	15.4	6.4
1974	7.6	7.3	7.4	9.1	10.3	12.4	13.9	14.9	13.7	11.5	9.1	8.4	10.5	15.2	6.4
Mean	7.3	6.8	7.1	8.2	10.1	12.3	13.9	14.5	14.2	12.6	10.2	8.5	10.5		
Maximum	8.8	8.2	8.9	10.1	12.4	14.9	15.4	16.1	15.8	15.3	13.1	10.2			
Minimum	4.5	4.2	4.3	6.3	8.2	10.2	11.7	13.0	12.4	9.9	8.3	6.8			
Mean Air Temperature	5.6	5.3	6.4	7.9	10.0	12.5	13.4	13.8	12.8	11.0	7.6	6.5	9.4		

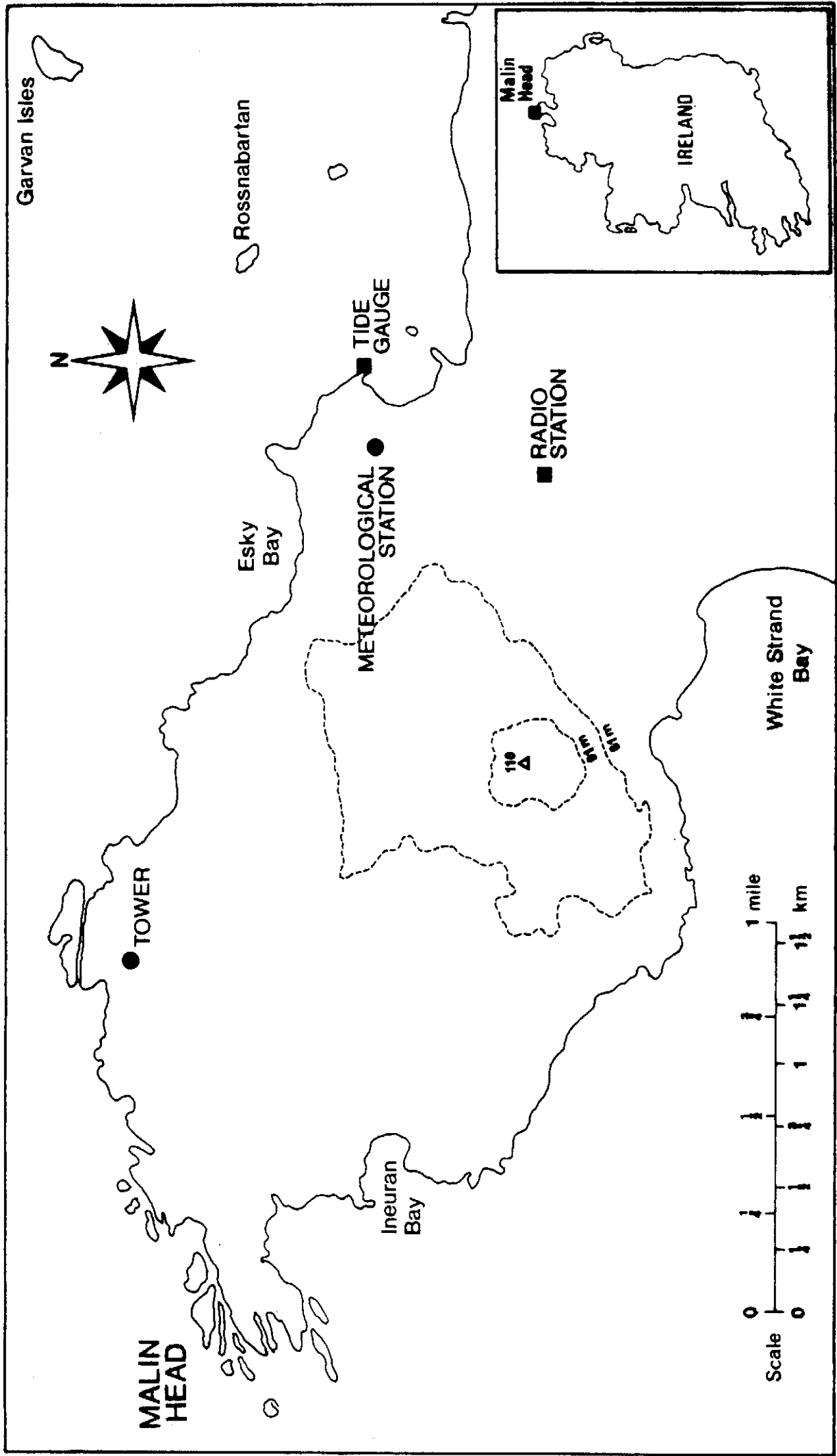


Fig. 1. Location of Malin Head and the Tide Gauge.

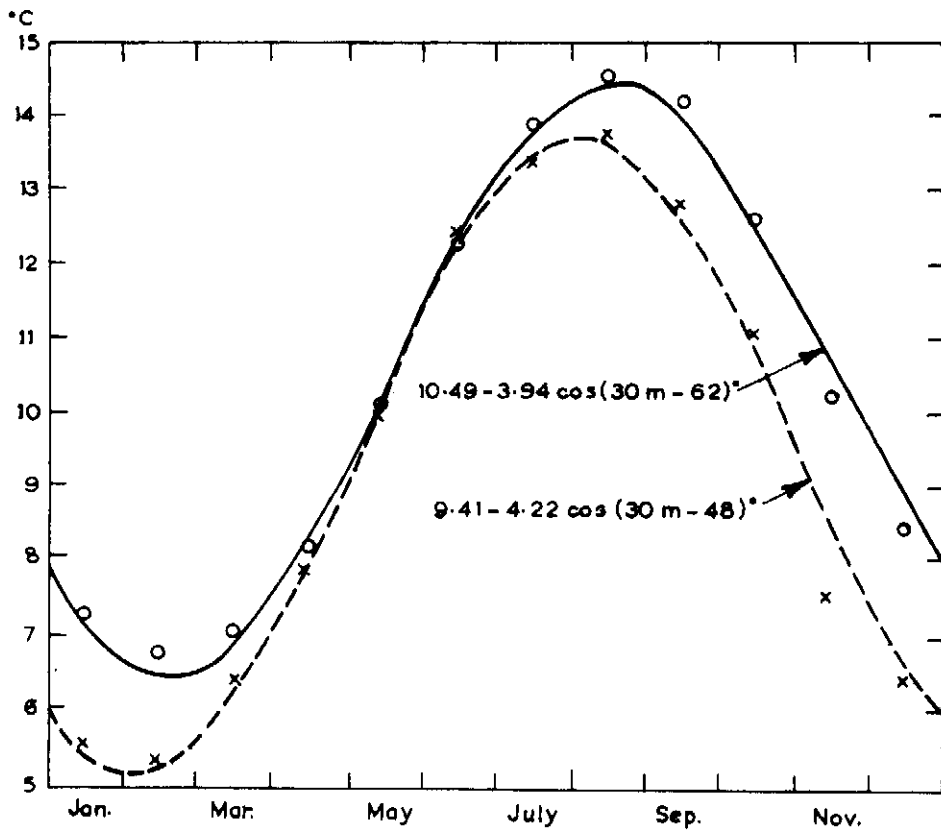


Fig. 2. Monthly mean sea (o) and air (x) temperatures 1959 - 1974, at Malin Head.

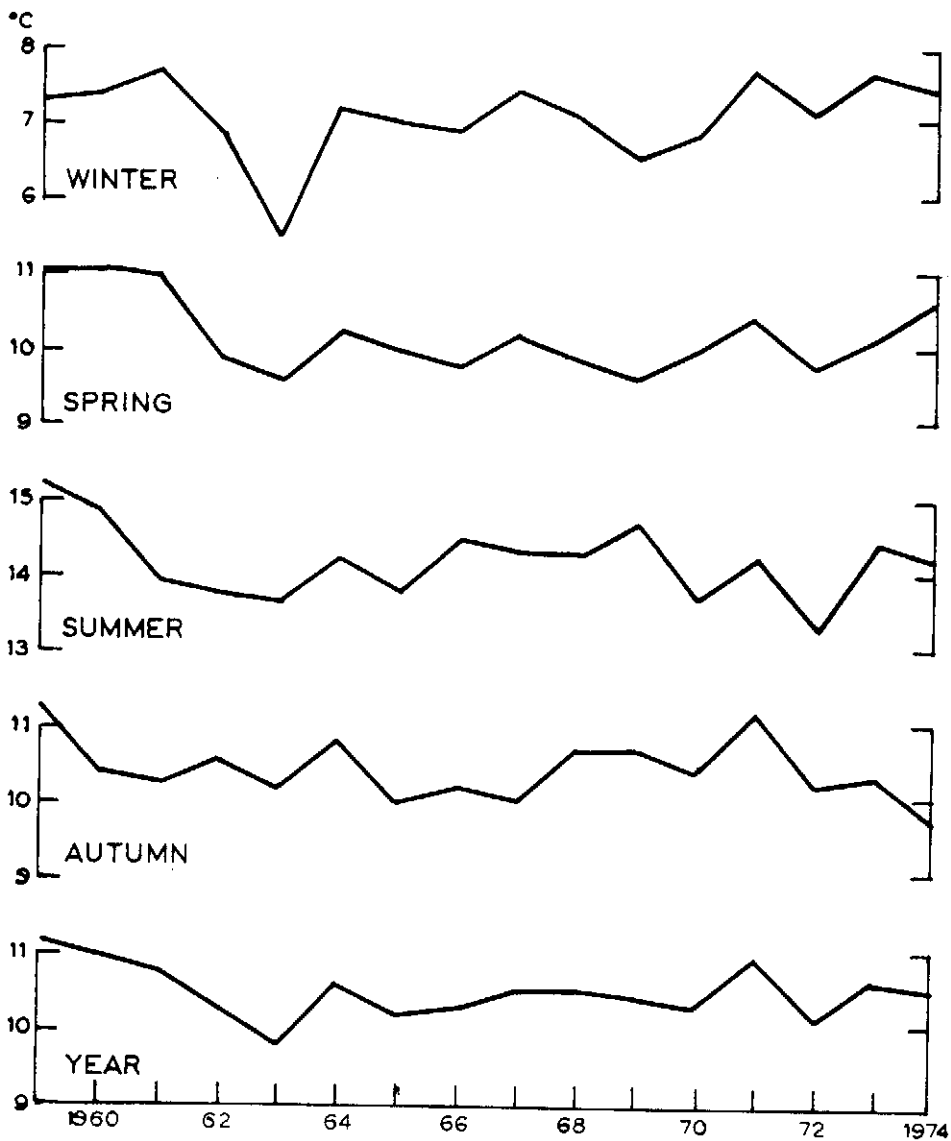


Fig. 3. Seasonal and annual mean sea temperatures, at Malin Head.