

## WATER TEMPERATURES IN GRAND LAKE, NOVA SCOTIA.

A. H. LEIM.

Fisheries Exp. Sta. (Atlantic), Halifax, N. S.

(Received August 20, 1934).

## ABSTRACT.

A report of certain temperature records for Grand Lake, N. S. One of these shows an unusually sharp temperature change between the upper and deeper layers during the summer months, the temperature changing by over 5°C. in one metre.

Some records of temperature of the surface and deeper layers of water in Grand Lake, Nova Scotia, were made in the years 1927-1930. While the series is not complete the improbability of further observations being made soon renders it desirable to record the main features of those obtained.

The outline of Grand Lake is shown in Figure I. Soundings were taken on lines run across the lake at the points "A", "B" and "C", the lines being roughly perpendicular to the long axis of the lake. The greatest depths observed were 41 metres at "A", 33 metres at "B" and 34 metres at "C". Some sporadic soundings were taken at other points where deeper water was reported to occur but only lesser depths were found. Creditable reports indicate greater depths than the writer found, but it seems reasonably certain that such deeper areas are restricted in extent and that most of the lake is less than 35 metres deep.

The temperature records taken at points "A" and "B" were obtained from an anchored rowboat by means of Negretti and Zambra reversing thermometers. The principal data obtained are shown in Tables 1 and 2.

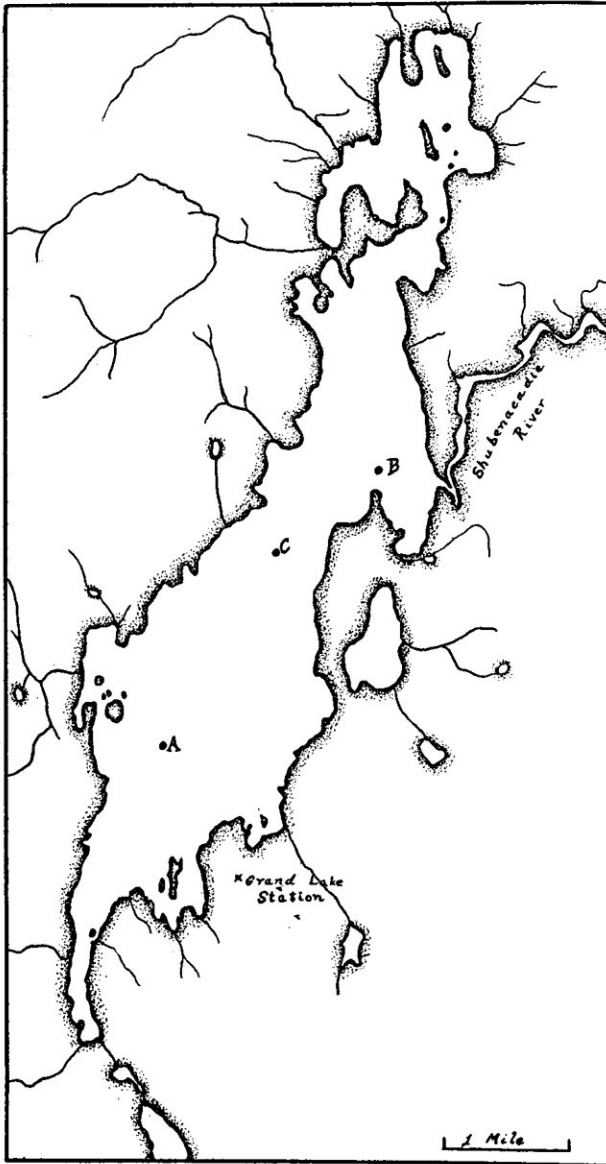


Fig. I.—Map of Grand Lake.

TABLE I.  
*Temperatures observed at Station "A" (°C.)*

Depth (metres)	Aug. 20 1927	Oct. 1 1927	May 26 1929	June 23 1929	July 28 1929
0	21.5	16.0	8.8	17.3	20.7
10	18.9	15.9	8.2	10.9	16.0
15	12.7	15.4		9.0	9.9
25	10.2		8.0	8.4	8.9
35	10.0	10.2	8.0	8.4	8.8

TABLE II.  
*Temperatures observed at Station "B" (°C.)*

Depth (metres)	Sept. 22 1929	Oct. 20 1929	June 8 1930	Aug. 3 1930	Sept. 1 1930	Sept. 28 1930	Oct. 12 1930	Nov. 10 1930
0	18.0	13.0	15.5	22.8	22.5	17.5	14.8	9.6
10	17.3	12.6	13.8	16.6	19.7	17.6	14.1	9.7
15	17.2	12.6	9.8	10.4	11.0	10.6	13.9	
20	10.0	12.6	9.4	9.9	10.0	9.9	12.0	9.6
30	9.5	9.9	9.2	9.6	9.7	9.8	10.6	9.6

As would be expected from the depth of the lake in relation to its surface area the water becomes stratified in summer with the thermocline occurring at a depth of 10 to 15 metres. Above this level the surface waters become quite warm in summer, while the deep layers below the thermocline rarely reach a temperature of 10°C. Probably this deep water which remains cool all summer is a refuge for the salmon (local "grayling") which appear to remain in the lake during their entire life. By combining the records for stations "A" and "B" for 1929 the progress of the temperature changes in the spring, summer and fall months is apparent.

The thermocline was observed to be sharply delimited at certain times. This is shown by the following data taken on a very calm day when the depth of the readings could be accurately determined.

	<i>Depth</i>	<i>Temperature</i>
Sept. 28, 1930.....	12.5 metres	17.6°C.
	14 "	17.6
	15 "	10.6
	16 "	10.6
	20 "	9.9

It will be noted that at this time the temperature changed 7°C. in one metre.

The writer is indebted to Mr. R. Frank Eagar of Halifax for assistance in the provision of a map of Grand Lake from Geological Survey sources as well as for information on the depths of water, and to the Biological Board of Canada for the use of a reversing thermometer.