

# SOIL TEMPERATURES, MARBLE POINT, McMURDO SOUND, ANTARCTICA

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In the interval from 14 November 1958 to 25 January 1959, the highest air temperature at Marble Point was  $+5.17^{\circ}\text{C}$ . and the highest soil temperature 2.5 cm. below the surface was  $+20.56^{\circ}\text{C}$ . The lowest air temperature was  $-16.67^{\circ}\text{C}$ . and the lowest soil temperature was  $-7.78^{\circ}\text{C}$ . (Fig. 1).

Extrapolating from the data, it seems likely that between 1 November 1958 and 1 November 1959 the daily minimum air temperature never rose above  $0^{\circ}\text{C}$ . During this interval the daily maximum air temperature was above  $0^{\circ}\text{C}$ . for perhaps 39 days. The air temperature, therefore, crossed  $0^{\circ}\text{C}$ . a minimum of 78 times from 1 November 1958 to 1 November 1959. Extrapolating from the data, the soil temperature 2.5 cm. below the surface crossed  $0^{\circ}\text{C}$ . at least 104 times during the same interval (Fig. 1).

On 15 December 1958 a thermocouple string extending downward approximately 10 m. was installed in a hole which had been drilled in bedrock the previous field season. Readings were made on 18 December 1958, 7 and 27 January 1959, and 5 February 1959 (Fig. 2). At a depth of 3 m., due to the seasonal wave of heat moving downward, the temperature increased  $5.7^{\circ}\text{C}$ . between 18 December 1958 and 5 February 1959, whereas at a depth of 6 m. the increase was only  $2.15^{\circ}\text{C}$ . At a depth of 9 m., due to the preceding winter's seasonal wave of cold moving downward, the temperature decreased  $0.85^{\circ}\text{C}$ . between 18 December 1958 and 27 January 1959.

Based on thermocouple data, the maximum depth of thaw in till for the 1958-59 season was 40.6 cm. (Fig. 3). The depth of thaw as determined from six test pits ranged from 42.7 cm. to 67.1 cm. with an average of 54.9 cm. The maximum depth of thaw in till during the 1957-58 season averaged 67.1 cm. A comparison of weather data shows that the 1957-58 season was considerably warmer than the 1958-59 season.

The data on which this note is based were provided by the Commanding Officer, U.S. Naval Construction Battalion Reconnaissance Unit.

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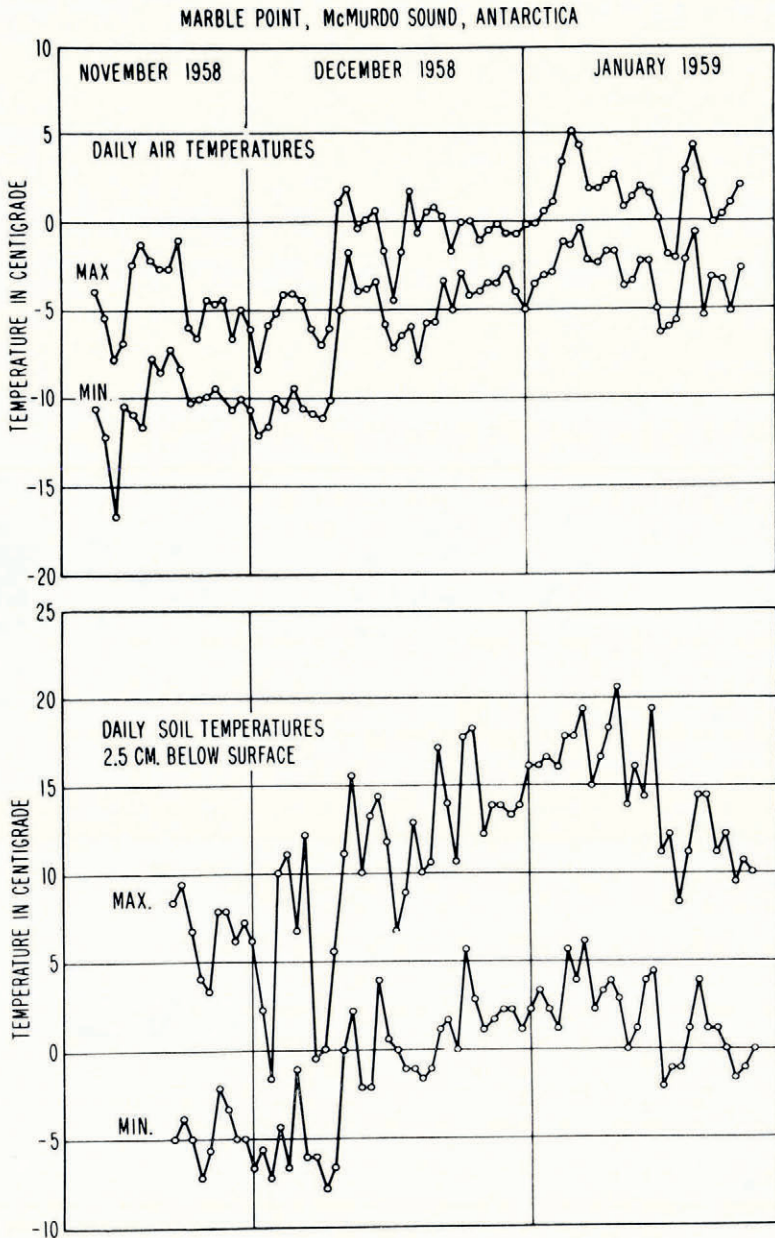


Fig. 1. Daily maximum and minimum soil and air temperatures at Marble Point, McMurdo Sound, Antarctica

