

GROUND TEMPERATURE MEASUREMENTS IN WEST GREENLAND

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As part of the UNESCO International Hydrological Decade programme three stations for ground temperature measurements were established in West Greenland during the summer of 1967. One station was established in Holsteinsborg where a similar station has already been in operation since September 1964. The other two stations were established in the Søndre Strømfjord area near the air base, that is almost due east of Holsteinsborg and about 135 km inland.

Each station consists of a small prefabricated wooden hut about 1 x 1.5 x 2 m where the measuring instrument, a Wheatstone bridge, is situated, and 21 or 12 thermistores permanently embedded nearby in boreholes in the ground at different levels. The measuring bridge is powered by a small 4.5 volt battery and calibrated for direct reading of the temperature in degrees C with an accuracy of $\pm 0.1^{\circ}\text{C}$; the measuring range is from $+10$ to -10°C . The thermistores are of the platinum wire resistivity type with a resistance of 100.00 ± 0.1 ohms at 0°C . They are mounted in pertinax tubes, each tube holding three thermistores at different levels. In the stations with 21 thermistores (main stations) the thermistores are installed at depth intervals of 25 cm to a depth of 2 m, at 50 cm intervals between 2 and 5 m, at 1 m intervals between 5 and 9 m, and thereafter at 2 m intervals to a depth of 15 m. In the small stations the lowest thermistore is at 4.00 m depth; otherwise the intervals are the same as in the main stations.

The station set up at Holsteinsborg is a main station but because of the shallow depth of the loose deposits only 18 thermistores were installed of which the three deepest are in bedrock.

At Søndre Strømfjord one station is a main station while the other is a small station. The stations are placed not far from each other but in quite different vegetational environments.

At all stations the thermistores will be measured once a day, preferably around midday, by local observers. It is the intention that the main stations should continue to operate on the same site for the duration of the Hydrological Decade while the small stations should be dismantled after two years and moved to other localities. In this way it will be possible to cover a rather big area and a variety of physicographical settings during the decade programme.

The object of this programme is to delimit the permafrost areas of West Greenland both horizontally and vertically. Another objective is the study of permafrost behaviour under the influence of different environmental factors, e.g. exposure, soil, moisture content and moisture movement, plant cover, as well as under different meteorological conditions.

To fulfil this programme another four stations (two main and two small) will be established as soon as possible. The sites will be at Godhavn and probably Christianshåb. In the following years the small stations will be moved every second year to cover as wide an area as possible within the quadrangle Holsteinsborg - Søndre Strømfjord - Christianshåb - Godhavn. According to our present knowledge the boundary between continuous and discontinuous permafrost lies within this quadrangle which is why this area is of special interest. Apart from this it is hoped that contemporary climatic changes will show themselves in variations in the permafrost table or in the formation of new permafrost areas during the period of observation.