Meteorology and soil temperatures, Hot Weather Creek, Ellesmere Island, NWT, Canada, Version 1

USER GUIDE

How to Cite These Data

As a condition of using these data, you must include a citation:

Altl, B.T. 1998. *Meteorology and soil temperatures, Hot Weather Creek, Ellesmere Island, NWT, Canada, Version 1.* [Indicate subset used]. Boulder, Colorado USA. NASA National Snow and Ice Data Center Distributed Active Archive Center. https://doi.org/10.7265/6ke3-k469. [Date Accessed].

FOR QUESTIONS ABOUT THESE DATA, CONTACT NSIDC@NSIDC.ORG

FOR CURRENT INFORMATION, VISIT https://nsidc.org/data/GGD220

National Snow and Ice Data Center

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Notice: This data set was first published on the 1998 CAPS CD.

The text for this document was taken unchanged from that CD.

1 DETAILED DATA DESCRIPTION

1.1 Hot Weather Creek Autostation Calculated Daily Files

- File: all data files
  rhwc88cb.dat
  rhwc89ca.dat
  rhwc89cb.dat
  rhwc90ca.dat
  rhwc90cb.dat
  rhwc91ca.dat
  rhwc91cb.dat
  rhwc92ca.dat
  rhwc92cb.dat
  rhwc93ca.dat
  rhwc93cb.dat
  rhwc94ca.dat
- Location: Hot Weather Creek
- Time period: 06/24/1988 - 06/17/1994
- Missing or bad data are indicated by -9999.0

Table 1. Data Column

Columns:	Format:
year	yyyy
month	mm
day	dd
julian day(one day ahead of date)	nnn
time(0600utc)	hhmm
average air temperature	nnn.nnn
average air R.H. (%)	nnn.nnn
average wind speed - km/hr	nnn.nnn
maximum surf/veg temperature	nnn.nnn
maximum 10 cm. temperature	nnn.nnn
maximum 20 cm. temperature	nnn.nnn
maximum 50 cm. temperature	nnn.nnn
maximum 100 cm. temperature	nnn.nnn
average surf/veg temperature	nnn.nnn
average 10 cm. temperature	nnn.nnn

Columns:	Format:
average 20 cm. temperature	nnn.nnn
average 50 cm. temperature	nnn.nnn
average 100 cm. temperature	nnn.nnn
minimum surf/veg temperature	nnn.nnn
minimum 10 cm. temperature	nnn.nnn
minimum 20 cm. temperature	nnn.nnn
minimum 50 cm. temperature	nnn.nnn
minimum 100 cm. temperature	nnn.nnn

1.2 Station Site Description (HWC.STN)

1.2.1 Regional Setting and Representativeness

The Hot Weather Creek field camp is located on the Fosheim Peninsula 30 kilometres east of the permanent weather station at Eureka (Figure 1, I.1.2 pv.). The automatic weather station site is positioned about 20 metres from the western edge of the narrow strike valley cut by the north-south oriented Hot Weather Creek (Figure 2a, I.1.2 pv.). The creek is small and ephemeral. East of the instrument site the valley slopes down over an old slump and several terraces to the creek bed 30 metres below. The creek meanders to the east just south of the instrument site. The area within a 20- to 25-kilometre radius of the site is characterized by gently rolling terrain dissected by numerous creeks. The elevation of this lowland is around 100 metres and valleys are typically 30 metres deep except to the northwest where a series of ridges rise to move them 150 metres. The site was chosen to represent this roughly 1000 square kilometre gently rolling inland lowland area. This is in contrast to the coastal fiord location of the Eureka station. There may be some minor local effects due to with the site's proximity to the edge of the creek valley and the definite north-south orientation of the valley these would be mainly in terms of altering the wind regime. The cross-section in Figure 2b (I.1.2 pv.) illustrates the greatest relief differences in the area. Beyond the 20-kilometre radius (area ca. 1000 mÖ) mountain barriers about 1000 m. high fill the central part of the NW and S quadrants and all the SE quadrant. In the remaining quadrants the terrain slopes down to ice filled fiords (Figure 1. I.1.2 pv.) beyond which, at a distance of 60 to 80 kilometres, mountain ranges dominate the terrain.

1.2.2 Regional Description by Quadrant

To the east beyond the creek valley the 100 m asl lowland continues as gently rolling terrain cut by the Slidre River and a number of creeks until it reaches the foothills of the Sawtooth Mountains 25

kilometres to the east and southeast. The Sawtooth Mountains run in a northeast-southwest direction and rise to heights of 1200 metres 35 kilometres southeast of the site. To the northeast the terrain rises gently and then falls to Canon Fiord 20 kilometres northeast of the site. Beyond that, Agassiz Ice Cap is visible on clear days.

About five kilometres northwest of the site the terrain rises to 200 metres at the top of an corrugation in the rolling terrain. These roughly 100 meter high undulations extend for 20 kilometres to the base of Black Top Ridge (ca. 770 metres). This ridge runs from due west of the site filling the northwest quadrant of the horizon. Slidre Fiord cuts 25 kilometres eastward into the Fosheim Peninsula reaching to within 15 kilometres of the site to the south of the Blacktop Ridge. Eureka the permanent AES weather station lies 30 kilometres directly to the west on Slidre Fiord (west of Black Top Ridge).

North of the site the rolling terrain rises gently for 20 kilometres to the head of Hot Weather Creek at an elevation of 140m and then falls off for another 20 kilometres to ice filled Greely Fiord. Less than 5 kilometres south of the site Hot Weather Creek joins the Slidre River which drains west into Slidre Fiord. The rolling terrain continues to Eureka Fiord in the southwest, while 30 kilometres to the south an unnamed mountain rises to 700 metres. To the southeast the terrain rises to over 300 metres some 20 kilometres from the site.

1.2.3 General Site and Instrumentation Information

The instrument site was chosen to be representative of the vegetation and surface conditions of the broad area of gently rolling terrain (100 m asl); not of the valleys or the ridge tops. This terrain is covered by earth hummocks 10-100 cm in diameter and large networks of high-centre, frost fissure polygons 20 to 30 m in diameter. Salix-Dryas hummocky tundra is the most common plant community found on almost all moderately drained, neutral to moderately alkaline soils of the silty lowlands.

The automatic weather station is located near the centre of a large polygons with the typical Salix-Dryas broken tundra vegetation cover.

The instrumentation was installed (June 1988) and has been maintained by the Arctic Adaptation Division CCC AES with field support by GSC. It consists of a Campbell Scientific CR10 micrologger with meteorological sensors for air temperature and relative humidity, wind speed and direction, and solar incoming radiation. It also supports a ultrasonic snow depth sensor, an experimental vegetation temperature and four ground temperatures. It is powered by a 25 AH, 12 volt gel cell (a second gel cell was added in 1989) charged by a 10 watt solar panel.

The instrumentation and sampling rates do not meet those set out in the fourth draft of the AES autostation guidelines (1992 AES) due to power and storage limitations. It must therefore still be classed as a field camp autostation. Upgrades will proceed in the directions set out by the standards but some of these are unnecessary or impossible under these remote conditions. The station is carefully maintained and serviced every spring. At this time any sensors which have been damaged or have malfunctioned during the winter are replaced. In addition, each season, the wind speed and direction sensors and the pyranometer(s) are replaced so the sensors can be calibrated annually.

1.2.4 SENSOR DESCRIPTION AND CONDITIONS (HWC.NST)

1. Radiation:
   Eppley pyranometer for shortwave incoming radiation, uses a thermopile sensing element. The sensor is calibrated and replaced every year.

2. Temperature:

   a) CSCC Thermistor (207C) for air temperature housed in a small Gill self-ventilating radiation shield.

   b) CSCC Thermistors (107B) are also used for the temperature of the near surface and the ground temperatures.

3. Relative Humidity:
   A Phys-Chem polysulfanated styrene chip which is part of the air (207C) temperature and humidity probe.

4. Wind Speed:
   A Met-One 013A Heavy duty three cup anemometer.

5. Wind Direction:
   A Met-One 023A Heavy Duty wind vane.

6. Snow Depth:
   An ultrasonic distance sensor, the CSMAL01. (CSCC)

In June of 1992, the following changes were made to the sensor configuration.

1. The main anemometer Met-One wind speed and direction sensors were replaced with an R.M. Young Wind Monitor which measures both speed and direction. The 023A Met-One Wind Direction sensor was removed and the Met-One 013A Wind Speed Sensor was moved to the west side of the station at a height of 3 meters.

2. The snow depth sensor was changed from a CSMAL01 sensor to a UDG01 sensor. Both sensors use the same type of ultrasonic device. The UDG01 performs the temperature correction using the station's temperature sensor while the CSMAL01 had an internal but poorly shielded, temperature sensor.

3. An Eppley pyranometer was added to measure reflected shortwave radiation.

4. A standard A.E.S. tipping bucket rain gauge was added.

2 DOCUMENT INFORMATION

2.1 Publication Date

1998

2.2 Date Last Updated

2021