

Note

Meteorological Observations in 1996 at the Arctic Station, Qeqertarsuaq (Godhavn), Central West Greenland

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In October 1990 an automatic weather station was established at the Arctic station (65°15'N, 53°31'W), Qeqertarsuaq (Godhavn), Central West Greenland. The Station register parameters each 20 min., and the parameters have been described in an earlier paper in this journal by Nielsen et al. (1995). The present paper summarises main points of the climate during 1996.

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Outlines of the Meteorological parameters in 1996

The mean annual air temperature for 1996 was -3.6°C (Table 1, page), which is nearly 3°C higher than 1992 - the coldest year in the period 1991-1996. The lowest air temperature (-32.9°C) occurred on 22 March, while the highest air temperature (14.8°C) was measured on 29 June. The high annual air temperature is primarily caused by numerous foehn gales during the spring and autumn (Fig. 1, page).

Liquid precipitation was registered on 69 days covering all 12 months, and an annual total of 155.5 mm was only 33 % of normal. On the other hand the snow accumulation during the winter 1995/1996 was rather high, 30-40 cm water equivalent, so in general the precipitation in 1996 is supposed to be just above normal. The highest daily precipitation (14.7 mm) was registered on the 11 December.

The relatively thick snow cover in the spring with maximum thickness of 80 cm lasted until the end of May, while a persistent but thinner snow cover started as usual in the end of September. A total of 244 days mostly with

a thick isolating snow cover resulted in relatively high subsurface temperatures than normal. At 5 cm the temperature only dropped to -11.5°C in March, while -30.2°C and -25.5°C were reached the two previous years when the snow cover was thinner. At lower depths, the temperature was 3-4°C above normal in the spring when the snow cover was thickest.

In general the wind directions at Arctic Station, as all other places in Greenland, are dominated by orographic conditions. At Godhavn the prevailing wind is dominated by an easterly drainage of cold air down slope of the Greenland Ice Sheet. This cold katabatic flow takes place all year around (Fig. 2, page), but dominates during nighttime and in the period October to December. In the rest of the months "warm" winds blowing from westerly directions can occur, when maritime air masses reach the area, and in the summer season a westerly sea breeze dominates in the daytime.

The wind speeds are highest in the winter and from easterly directions (Fig. 2, page). Maximum gust was 28.1 m/sec measured during a Foehn situation on 26 December, but maximum wind speeds of 20-25 m/sec are normal during Foehn situations. The mean wind is normally lowest in April (2.9 m/sec), and in this month calms occur with the highest frequency, 11.5 %.

Qeqertarsuaq is characterized by continuous darkness during the polar night from 28 November to 13 January and continuous daylight from 29 May to 14 July with maximum solar radiation of approximately 850 W/m² at noon on cloud free summer days (Table 1, page).

Meteorological data measured at the meteorological station at the Arctic Station are validated at the Institute of Geography and stored in databases and standard spreadsheet formats. The data are available for scientists. Applications for data should be directed to: Arctic Station, the Secretary, c/o Institute of Ecological Botany, Øster farimagsgade 2D, DK-1353 Copenhagen K., Denmark, and should inform about both postal- and e-mail addresses.

Humlum, O. Nielsen, N., Rasch M. & Hansen B.U. (1996): Meteorological Observations at Arctic Station, Qeqertarsuaq (Godhavn), Central West Greenland. *Danish Journal of Geography*, 96: 119-122.

Nielsen, N., Hansen B.U., Humlum O. & Rasch M. (1995): Meteorological Observations at Arctic Station, Qeqertarsuaq (Godhavn), Central West Greenland. *Danish Journal of Geography*, 95: 97-104.

Table 1: Monthly maximum, mean and minimum values of wind speed, air temperature, relative humidity, incoming and reflected radiation, precipitation (liquid), snow, depth, number of days with snow and ground temperature at various depths (5, 60, 175 and 300 cm).

1996 ARCTIC STATION, QEQERTARSUAQ - GODHAVN, GREENLAND											
	WIND SPEED m/sec	AIR TEMP °C	REL. HUMI %	Si W/m ² (albedo)	Su W/m ²	PRECIP mm H ₂ O (normal)	SNOW cm (day)	TEMP 0 cm °C	TEMP 60 cm °C	TEMP 175 cm °C	TEMP 300 °C
JANUARY											
MAX	25.7	2.7	-	39.8	38.3		80	-3.5	-2.2	0.5	-2.8
MEAN	4.7	-11.6	-	0.9	0.7		62.3	-5.4	-2.6	-0.9	-3.1
MIN	0.3	-27.9	-	0.0	0.0			-8.1	-3.6	-1.5	-3.4
SUM				(84.8)		1.7 (19)	(31)				
FEBRUARY											
MAX	25.1	6.6	-	274.3	231.6		80	-4.3	-3.3	-1.5	-3.4
MEAN	3.5	-13.3	-	15.7	13.9		56.4	-7.1	-3.9	-2.0	-3.7
MIN	0.1	-25.0	-	0.0	0.0			-9.3	-4.6	-2.4	-4.0
SUM				(88.9)		3.3 (19)	(29)				
MARCH											
MAX	21.8	4.1	-	508.5	474.7		70	-6.3	-4.3	-2.4	-4.0
MEAN	5.7	-14.5	-	71.6	61.2		47.4	-8.7	-5.1	-2.8	-4.5
MIN	0.0	-32.9	-	0.0	0.0			-11.5	-5.8	-3.4	-5.0
SUM				(85.5)		15.9 (19)	(31)				
APRIL											
MAX	16.7	5.8	-	676.3	638.6		80	-0.6	-2.7	-2.9	-4.8
MEAN	2.9	-7.2	-	144.1	123.1		71.7	-4.8	-4.3	-3.2	-5.0
MIN	0.0	-23.7	-	0.0	0.0			-6.3	-5.7	-3.4	-5.0
SUM				(87.5)		19.7 (25)	(30)				
MAY											
MAX	17.9	9.5	-	855.2	634.5		60	-0.1	0.0	0.0	-3.5
MEAN	3.1	-0.1	-	234.9	150.2		21.0	-0.4	-1.1	-1.7	-4.3
MIN	0.1	-8.9	-	0.0	0.0			-0.9	-2.7	-2.9	-4.8
SUM				(63.9)		13.6 (30)	(22)				
JUNE											
MAX	14.3	14.8	-	849.1	214.2		0	17.3	1.2	-0.5	-0.8
MEAN	3.0	3.0	-	229.4	37.9		0	4.7	0.3	-0.6	-2.3
MIN	0.0	-2.9	-	0.0	0.0			-0.1	0.0	-0.6	-3.5
SUM				(16.5)		19.5 (41)	(0)				
JULY											
MAX	14.3	13.1	-	848.1	169.5		0	23.9	5.0	-0.1	2.0
MEAN	3.1	6.1	-	216.3	37.9		0	10.5	3.1	-0.3	0.7
MIN	0.2	0.6	-	0.0	0.0			2.9	1.1	-0.6	-0.9
SUM				(17.5)		29.0 (57)	(0)				
AUGUST											
MAX	14.9	10.8	-	737.6	168.8		0	16.9	4.4	0.2	2.5
MEAN	3.3	5.4	-	171.2	32.6		0	8.5	3.8	0.0	2.2
MIN	0.0	1.3	-	0.0	0.0			3.6	3.1	0.1	2.0
SUM				(19.1)		12.1 (40)	(0)				
SEPTEMBER											
MAX	16.7	11.3	-	596.5	314.4		20	10.7	3.9	0.3	2.6
MEAN	3.0	2.3	-	80.5	22.7		2.4	3.0	2.3	0.2	2.3
MIN	0.0	-4.3	-	0.0	0.0			-0.5	0.7	0.1	1.8
SUM				(28.1)		13.8 (80)	(9)				
OCTOBER											
MAX	20.3	3.2	91.6	312.3	284.6		17	0.2	0.7	0.2	1.8
MEAN	3.9	-3.1	61.4	23.9	19.4		5.2	-0.2	0.1	0.0	0.9
MIN	0.1	-8.4	26.8	0.0	0.0			-4.9	-0.2	0.0	-0.2
SUM				(81.3)		3.9 (46)	(31)				
NOVEMBER											
MAX	24.5	4.5	93.3	73.9	73.2		34	-2.9	-0.2	0.0	-0.1
MEAN	5.0	-5.7	64.3	2.7	2.3		21.1	-4.2	-0.9	0.0	-0.9
MIN	0.4	-12.2	27.7	0.0	0.0			-7.0	-1.2	0.0	-1.6
SUM				(85.7)		5.0 (46)	(30)				
DECEMBER											
MAX	28.1	8.6	94.6	0.0	0.0		35	-0.1	0.0	0.1	-1.6
MEAN	6.0	-5.2	64.1	0.0	0.0		26.2	-2.0	-0.6	0.0	-1.9
MIN	0.0	-12.6	22.4	0.0	0.0			-5.2	-1.4	0.0	-2.1
SUM				(-)		18.1 (55)	(31)				
YEAR											
MAX	28.1	14.8	-	849.1	638.6		80	23.9	5.0	0.3	2.6
MEAN	3.7	-3.6	-	99.3	41.9		26.0	-0.6	-0.7	-0.9	-1.6
MIN	0.0	-32.9	-	0.0	0.0			-11.5	-5.8	-2.9	-5.0
SUM				(58.6)		155.5 (477)	(244)				