

# Meteorological Observations at Arctic Station, Qeqertarsuaq (Godhavn), Central West Greenland

N. Nielsen, B.U. Hansen, O. Humlum & M. Rasch

N.Nielsen, B.U.Hansen & O.Humlum: Institute of Geography: University of Copenhagen, Øster Voldgade 10, DK-1350 Copenhagen K., Denmark.

M.Rasch: Arctic Station, DK-3953 Qeqertarsuaq/Godhavn, Greenland.

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*In October 1990 a new automatic meteorological station was established at the Arctic Station, Qeqertarsuaq (Godhavn), managed by the University of Copenhagen. It is the purpose of this note to draw the attention to the existence of this meteorological station, the character of climate parameter monitored and to the environment in which the station is functioning.*

*Examples of climate data measured during 1994 are presented, and general trends in the fluctuation of the selected parameters are annotated. Furthermore, it is mentioned how users may obtain the climate data. In the years to come we plan to publish a similar status of the climatic development at the Arctic Station in this periodical.*

Keywords: Meteorological station, climate, arctic, permafrost, Greenland, Disko Island.

## Physical Environment of the Climate Station

The Arctic Station is situated at the south coast of Disko Island about one km east of the town Qeqertarsuaq (69° 15' N.lat., 53° 34' W.lon.). The town stands on a small rocky promontory and due to the western position of Disko Island (Fig.1) the area is exposed to an arctic maritime climate.

From Qeqertarsuaq the bay, Disko Bugt, stretches towards south to Aasiaat (60 km) toward southeast to Qasigiannuit (105 km) and toward east to Ilulissat (90

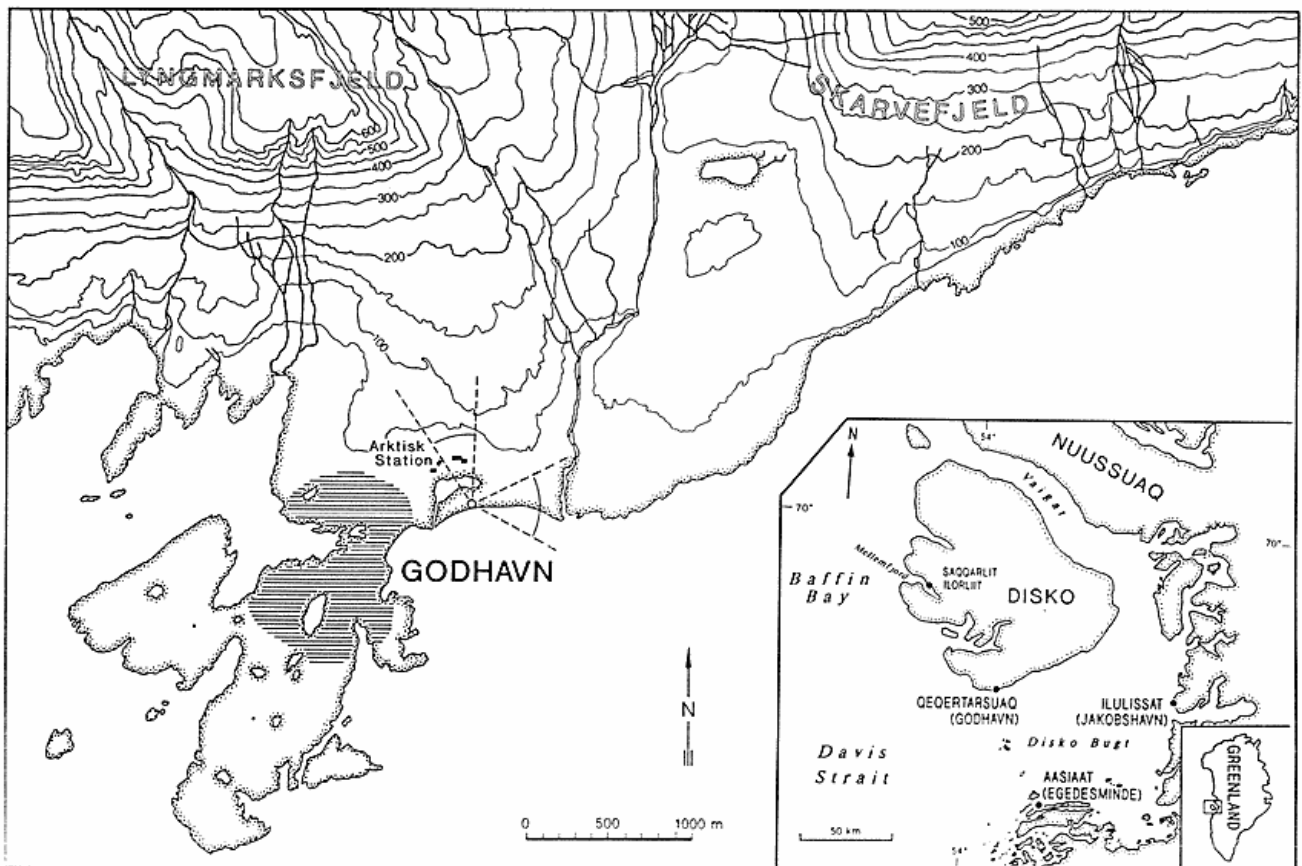


Figure 1: The location of the climate station at the Arctic Station.

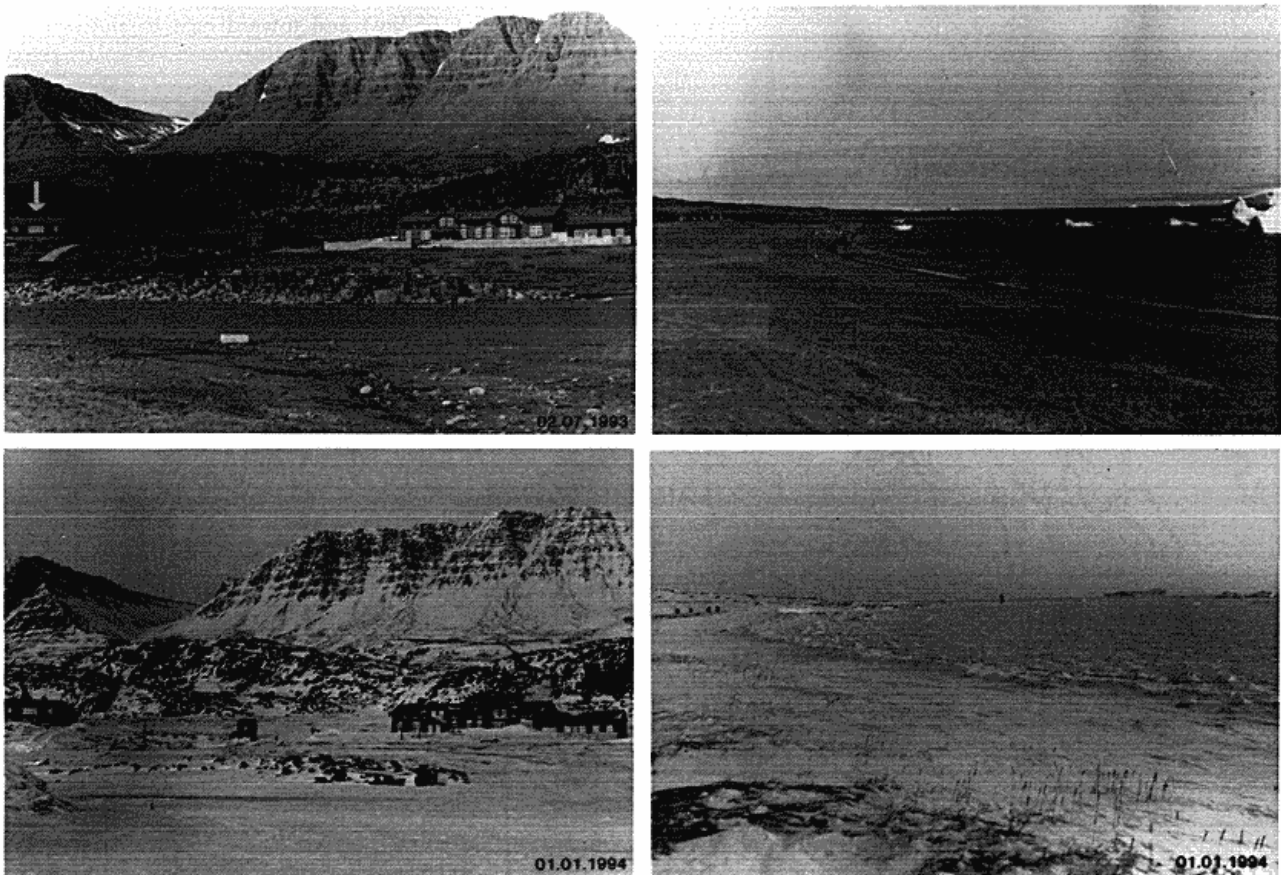
km). Winds from west pass the Davis Strait and cross an open sea surface for about 600 km. The largest fetch is found in a SSW direction with an extension of more than 2000 km.

The meteorological station is installed at one of the Arctic Station's buildings, situated about 300 m from the coast, 20 m a.s.l. Generally the terrain rises to an altitude of 200 m about 1.5 km N of the coast. Further N altitudes increase rapidly to the edge of a mountain plateau at 600-800 m above sea level. The orientation of this steep slope extends for several kilometres both E and W, only interrupted by valley mouths (Fig. 1). The Arctic Station and Qeqertarsuaq stand on a low bench of bedrock (gneiss), but the main frame of the landscape is shaped in Tertiary basalt breccia and plateau lava.

#### Meteorological Data.

The meteorological data are monitored by AANDERAA instruments and consist of 12 sensors connected with a scanning unit and a storage unit. The following parameters are logged:

- wind speed
- maximum gust speed
- wind direction
- air temperature
- relative humidity
  - all mounted on a mast, 9.5 m above terrain
- pluviograph
- pyranometer (incoming solar radiation)
- pyranometer (reflected solar radiation)
  - all mounted on a mast, 2 m above terrain



*Figure 2: Examples of monitoring photos from 1993 and 1994. Position and direction are shown in figure 1. The left photos show the mountain "Lyngmarksfjeld" behind the Arctic Station. Among other observations the pattern of snow cover and snowdrifts and development of the tallus can be studied. The right photos show the barrier beach. Variations of the fore- and backshore forms and growth and decay of the icefoot are documented. The arrow on the upper left photo shows the location of the automatic meteorologic station.*

temperature (5 cm below ground surface - sediments)  
temperature (60 cm below ground surface - sediments)  
temperature (175 cm below ground surface - sediments)  
temperature (300 cm below bedrock surface)

The thermistors measuring ground temperatures are inserted into Early Holocene marine stratified sediments, coarsening-up downward from medium sand and gravel layers to a mixture of hand and head size stones. Groundwater with a temperature of  $-0.01\text{ }^{\circ}\text{C}$  was found 160 cm below the surface (early October 1990) and is assumed to superimpose frozen sediments permanently. The bedrock is gneiss.

The scanning frequency for all sensors is 30 minutes. Once a month data from the storage unit is downloaded to a hard disk, a tape backup system and a floppy disk respectively. The scientific director of the Arctic Station makes the following supplementary visual observations of:

snow depth and cover  
sea ice occurrence

Snow depth is measured in centimetres on a pole situated on an even terrain north of the Arctic Station. Snow cover and sea ice occurrence are estimated in percent.

Each month two monitoring photographs are taken from a fixed position (shown in figure 1); one photo demonstrating the mountain slope north of the Arctic Station and one covering the beach south of the station. Examples of these photos are shown in figure 2.

#### The Weather in 1994

The winter of 1993/94 ended rather early, in the end of April. In January, February and March the lowest daily mean air temperatures varied from  $-15\text{ }^{\circ}\text{C}$  to about  $-25\text{ }^{\circ}\text{C}$ ; the lowest air temperature was  $-31.6\text{ }^{\circ}\text{C}$  registered in the evening of 4 March, while the highest air temperature  $1.6\text{ }^{\circ}\text{C}$  was registered on 8 February during a Foehn situation. During the winter three Foehn situations occurred with positive daily mean temperatures (Fig. 3). The coldest month was March with a mean air temperature of  $-20.5\text{ }^{\circ}\text{C}$ .

The spring of 1994 came very early; usually positive air temperatures are frequent from the end of May, but in 1994 this was the case from the end of April (Fig. 3). The summer of 1994 was rather cold and humid. The warmest month was August with  $6.3\text{ }^{\circ}\text{C}$  and the highest air tempe-

perature was  $17.4\text{ }^{\circ}\text{C}$  measured in the afternoon on 7 July. The mean temperature for the three summer months June, July and August was about  $5.2\text{ }^{\circ}\text{C}$  and no negative air temperatures were registered in the period 20 June - 2 September.

The autumn and winter of 1994 started rather late, and positive air temperatures dominated into October. Usually negative daily values are frequent from the latter half of September. The highest autumn/winter temperature was  $9.0\text{ }^{\circ}\text{C}$  measured at 4:45 pm on 10 November during a Foehn situation, while the lowest air temperature was  $-22.4\text{ }^{\circ}\text{C}$  measured on 8 December.

In general the wind directions in Greenland are greatly influenced by orographic conditions, and at Godhavn the prevailing wind is dominated by an easterly drainage of cold air down slope of the Greenland Ice Sheet. The cold katabatic flows are dominating in the winter period, only interrupted by "warm" winds blowing from westerly directions, when maritime air masses reach the area. During the summer season a westerly sea breeze dominates in the daytime, while an easterly cold down-slope wind dominates in the night-time.

The wind speeds are highest in the winter and from easterly directions (mean wind =  $7.1\text{ m/sec}$  from E in December), while minimum wind speed occurs in April ( $2.8\text{ m/sec}$ ), and in this month calms occur with the highest frequency, 7.4 %. In general the frequency of calms are high in Greenland, 20-30% on an average, but the dominating katabatic winds force this frequency down to 1.2 % on an yearly basis at Godhavn.

Measuring precipitation in the Arctic is difficult and the used rainfall sensor has proven to be very influenced by wind as the sampling area is only  $50\text{ cm}^2$ . Furthermore, the sensor has no built-in heating to melt snow eventually captured in the funnel. Therefore, no precipitation has been registered in the months of January-March and November-December, because these months are dominated by solid precipitation. Liquid precipitation was registered from the end of April to the beginning of October with a maximum of  $54.9\text{ mm}$  in July spread over 13 days -  $19.3\text{ mm}$  on 30 July.

Mean annual precipitation (1950-1990) from a nearby weather station run by the Danish Institute of Meteorology is  $477\text{ mm}$  at Godhavn. In 1994 it was  $398\text{ mm}$ . Most of the precipitation (75 %) usually falls during the period June to December in connection with advection of moist, maritime air masses coming from the south and

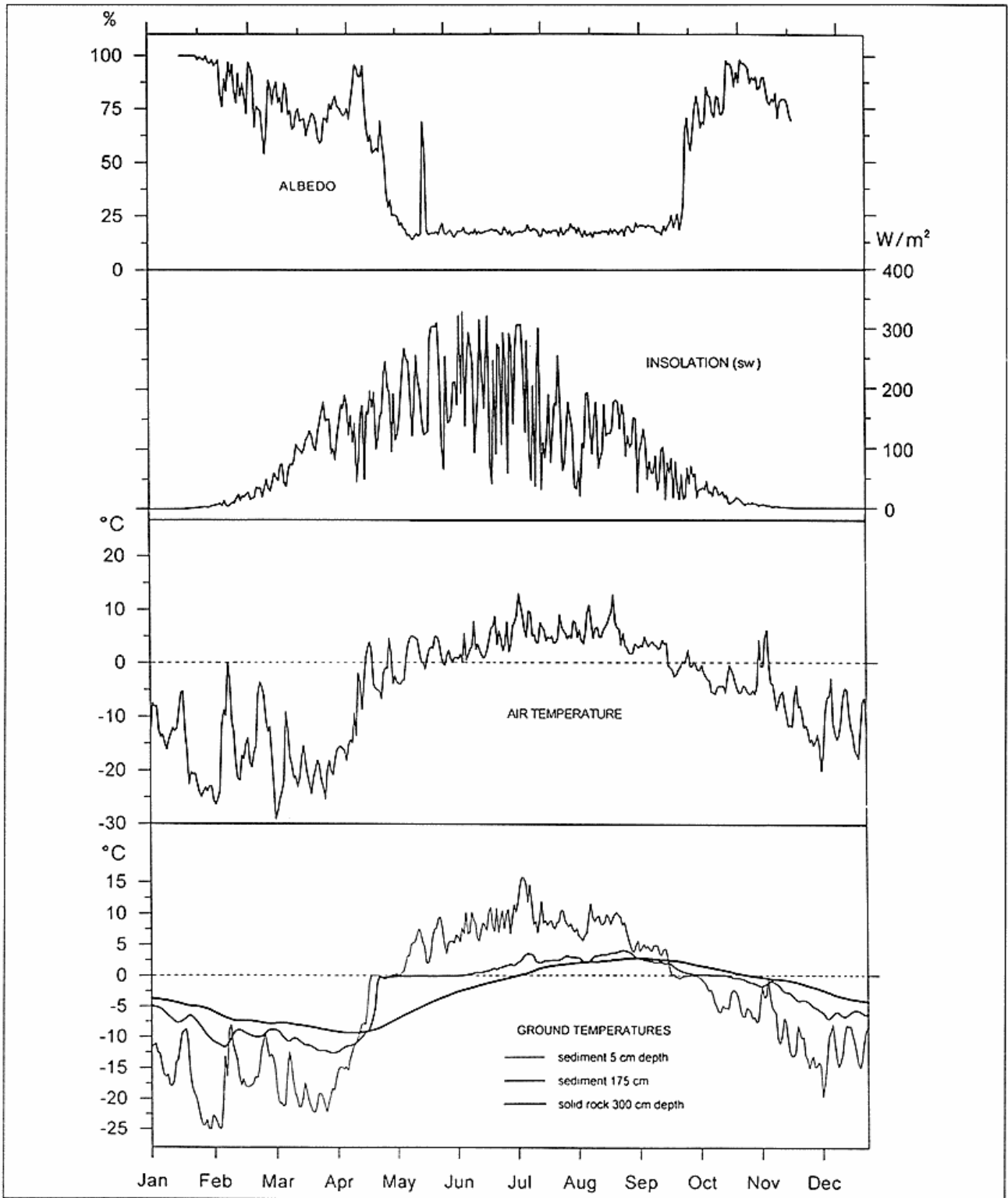


Figure 3: Composite diagram showing insolation, air- and ground temperatures at the Arctic Station in 1994.

southwest along Davis Strait. The remaining period is comparatively dry, as it is dominated by cold and dry continental polar air masses from the Inland Ice and the central highmountains of Disko Island.

Approximately 60-70 % of the mean annual precipitation is falling as snow and in Godhavn persistent snow cover is registered from late September to late May. Due to the dry climate in the winter season the snow cover around the station is comparatively shallow with an average in 1994 of 7.9 cm in January to 24 May and 2.3 cm from 30 September to December with maximum values of 25-30 cm. Snow coverage of 90-100 % only occurred during and shortly after snowfall and in January. During the rest of the winter season the snow coverage was below 90% as strong and frequent easterly wind redistributes the snow cover to form snowdrifts on the westfacing sides of hills and drainages, leaving thin or no snow cover on the windswept

eastfacing slopes. At the end of the winter of 1993/94 the depletion of the snow cover is easily seen in Fig 3. The albedo of the surface slowly decreases from 100 % in January to below 20 % at the end of May as the snow coverage decreases from 100 % to 0 % only interrupted by a brief increase in mid April and mid May caused by short-lasting snowfall.

#### **Data**

At the Institute of Geography, University of Copenhagen, all data are rearranged into series covering calendar months, using standard spreadsheet formats. Interested readers should send a written application to: Arctic Station, the Secretary, c/o Institute of Ecological Botany, Øster Farimagsgade 2D, DK-1353 Copenhagen K, Denmark, to obtain data from the meteorological station at the Arctic Station.

#### **Tables**

**Table 1.** Frequency, %, of calm, mean wind and maximum gust speeds (m/sec) for each month in 1994. Frequency, %, of the various wind directions distributed by force in Beaufort. Frequency, %, of various wind forces. Frequency, %, of the various directions and mean wind speed for each direction. \* = Frequency (%) larger than 0.0 and less than 0.05.

**Table 2.** Monthly maximum, mean and minimum values for: air temperature, relative humidity, incoming and reflected radiation, precipitation (liquid) and ground temperatures. TEMP -5 cm, -60 cm and -175 cm indicates temperature sensor depths below surface (in sediments); TEMP -300 cm is recorded in bedrock.

*(See the following three pages)*

**Table 1: Arctic Station, Queqertarsuaq - Godhavn, Greenland. 1994**

Bf	1	2	3	4	5	6	7	8	9	10	11	12	ALL FORCES	MEAN WIND
<b>JANUARY</b>														
			CALM: 0.3 %			MEAN WIND: 3.0 m/sec					MAX. GUST: 17.3 m/sec			
N	13.3	8.8	1.6	0.7	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24.6	1.8
NE	5.0	14.2	7.3	1.7	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	28.8	3.0
E	1.8	4.2	8.1	6.5	3.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0	24.1	5.1
SE	0.5	0.2	1.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	3.8
S	0.3	0.1	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	3.3
SW	0.3	0.4	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	2.3
W	1.7	2.4	1.1	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.6	2.6
NW	5.8	6.7	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.8	1.6
ALL	28.8	37.1	19.6	9.9	4.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0		
<b>FEBRUARY</b>														
			CALM: 0.5 %			MEAN WIND: 3.9 m/sec					MAX. GUST: 22.7 m/sec			
N	7.7	3.3	0.2	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.6	1.6
NE	4.6	6.3	2.6	1.3	0.8	0.2	0.0	0.0	0.0	0.0	0.0	0.0	15.8	3.0
E	3.1	6.3	10.6	8.3	6.0	5.4	1.4	0.0	0.0	0.0	0.0	0.0	41.1	6.4
SE	1.8	0.5	0.4	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	2.1
S	0.8	0.2	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	1.5
SW	0.6	0.7	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	2.0
W	4.9	3.2	1.3	1.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.1	2.6
NW	9.2	4.8	0.1	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14.4	1.5
ALL	32.7	25.2	15.3	11.6	7.5	5.7	1.4	0.0	0.0	0.0	0.0	0.0		
<b>MARCH</b>														
			CALM: 2.7 %			MEAN WIND: 3.1 m/sec					MAX. GUST: 19.1 m/sec			
N	8.6	2.4	0.1	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.4	1.3
NE	2.8	7.2	6.3	0.7	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	17.1	3.0
E	3.2	11.4	15.8	9.4	3.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	43.5	4.5
SE	2.3	2.4	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.4	2.0
S	1.3	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7	1.4
SW	1.5	0.5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.1	1.4
W	4.5	3.1	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.3	1.9
NW	4.4	2.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.7	1.4
ALL	28.6	29.4	25.1	10.4	3.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0		
<b>APRIL</b>														
			CALM: 7.4 %			MEAN WIND: 2.8 m/sec					MAX. GUST: 17.0 m/sec			
N	2.1	0.4	0.2	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.3	2.3
NE	3.3	4.0	1.7	0.8	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.0	2.8
E	6.8	10.1	11.2	5.1	3.1	0.3	0.0	0.0	0.0	0.0	0.0	0.0	36.5	3.9
SE	6.0	3.3	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.7	1.5
S	1.6	0.4	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.2	1.3
SW	1.9	0.8	0.6	0.6	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.0	2.7
W	4.3	9.9	6.2	0.6	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	21.3	2.8
NW	3.0	2.5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.6	1.6
ALL	28.9	31.5	20.5	7.8	3.6	0.3	0.0	0.0	0.0	0.0	0.0	0.0		
<b>MAY</b>														
			CALM: 0.6 %			MEAN WIND: 3.1 m/sec					MAX. GUST: 15.5 m/sec			
N	3.1	0.5	0.3	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.4	1.9
NE	1.5	2.4	2.9	0.7	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.6	3.3
E	2.1	6.0	11.9	6.7	1.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	28.2	4.5
SE	3.0	5.8	2.2	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.5	2.5
S	4.1	1.5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.7	1.3
SW	1.7	2.4	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.3	2.4
W	4.7	15.3	10.6	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	31.0	2.8
NW	2.4	2.5	0.7	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.7	2.1
ALL	22.4	36.3	29.9	9.0	1.6	0.1	0.0	0.0	0.0	0.0	0.0	0.0		
<b>JUNE</b>														
			CALM: 0.3 %			MEAN WIND: 3.4 m/sec					MAX. GUST: 20.0 m/sec			
N	0.8	0.6	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	1.4
NE	0.9	1.3	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.8	2.4
E	0.9	4.7	8.8	4.0	2.3	0.6	0.0	0.0	0.0	0.0	0.0	0.0	21.3	5.0
SE	1.7	7.5	3.9	1.7	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.1	3.3
S	3.4	4.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.4	1.9
SW	0.7	1.8	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.1	2.5
W	5.2	18.1	15.8	3.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	42.6	3.3
NW	1.8	2.6	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.0	2.0
ALL	15.4	41.0	30.9	9.2	2.6	0.6	0.0	0.0	0.0	0.0	0.0	0.0		
<b>JULY</b>														
			CALM: 0.3 %			MEAN WIND: 2.8 m/sec					MAX. GUST: 14.3 m/sec			
N	0.9	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	1.3
NE	1.1	1.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.7	1.9
E	2.9	8.7	7.5	2.9	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23.1	3.6
SE	2.5	7.1	3.6	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13.8	2.8
S	5.0	5.8	0.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.3	1.8
SW	2.8	3.7	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.9	1.8
W	5.0	16.3	11.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	34.3	3.0
NW	3.1	3.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.3	1.7
ALL	23.3	46.2	23.3	5.7	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0		

Table 1: Arctic Station, Qeqertarsuaq - Godhavn, Greenland, 1994

Bf	1	2	3	4	5	6	7	8	9	10	11	12	ALL FORCES	MEAN WIND
<b>AUGUST</b>														
	CALM: 0.5 %				MEAN WIND: 3.1 m/sec					MAX. GUST: 15.5 m/sec				
N	1.9	0.5	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	1.8
NE	1.5	3.2	1.3	1.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.3	3.1
E	2.5	7.2	6.5	6.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	25.3	4.6
SE	2.8	6.3	2.5	0.5	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.4	2.7
S	5.6	3.9	0.6	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.1	1.7
SW	1.2	2.4	1.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.9	2.5
W	5.0	12.6	9.8	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	28.6	3.0
NW	3.6	3.8	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.0	1.8
ALL	24.2	39.9	22.8	9.2	3.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
<b>SEPTEMBER</b>														
	CALM: 1.7 %				MEAN WIND: 3.0 m/sec					MAX. GUST: 12.8 m/sec				
N	5.1	2.6	0.3	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.4	1.8
NE	3.0	10.3	4.1	3.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.7	3.2
E	2.2	9.4	9.9	8.8	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	30.9	4.2
SE	2.4	4.4	2.0	1.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.1	3.0
S	3.0	2.6	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.6	1.6
SW	1.5	2.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.0	2.0
W	3.4	6.9	1.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.3	2.2
NW	3.5	2.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.4	1.5
ALL	24.0	41.0	18.8	13.7	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
<b>OCTOBER</b>														
	CALM: 0.4 %				MEAN WIND: 3.6 m/sec					MAX. GUST: 14.6 m/sec				
N	6.3	9.3	1.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	17.3	2.0
NE	2.3	17.1	14.1	5.7	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	40.1	3.7
E	0.9	6.4	10.6	7.3	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	29.0	5.0
SE	1.1	0.7	0.2	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.3	2.2
S	0.1	0.5	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	2.7
SW	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.7
W	1.1	1.0	1.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.5	3.1
NW	2.3	3.6	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.5	1.9
ALL	14.0	38.8	27.7	14.4	4.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
<b>NOVEMBER</b>														
	CALM: 0.1 %				MEAN WIND: 4.1 m/sec					MAX. GUST: 22.1 m/sec				
N	5.3	7.8	1.1	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14.8	2.0
NE	2.7	12.2	19.5	6.9	1.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	43.1	4.1
E	0.5	5.0	8.1	7.1	2.9	1.3	0.8	0.0	0.0	0.0	0.0	0.0	25.7	5.8
SE	0.1	0.3	1.3	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.2	4.4
S	0.1	0.4	0.6	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	3.8
SW	0.2	0.7	0.8	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.8	3.4
W	1.0	1.7	1.7	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.1	3.3
NW	2.2	2.7	0.8	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.0	2.2
ALL	11.9	30.8	33.8	16.4	4.8	1.3	0.8	0.0	0.0	0.0	0.0	0.0		
<b>DECEMBER</b>														
	CALM: 0.0 %				MEAN WIND: 5.8 m/sec					MAX. GUST: 19.4 m/sec				
N	2.4	3.5	0.5	1.0	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	7.9	2.9
NE	0.9	6.8	13.8	7.5	6.7	1.7	0.2	0.0	0.0	0.0	0.0	0.0	37.6	5.7
E	0.3	2.6	9.1	10.5	15.1	2.2	0.0	0.0	0.0	0.0	0.0	0.0	39.7	7.1
SE	0.0	0.4	1.3	0.8	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.8	5.1
S	0.1	1.2	0.7	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.4	3.6
SW	0.1	0.6	0.7	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7	3.5
W	0.1	1.0	1.8	1.2	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.4	4.8
NW	0.5	1.1	1.4	0.5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.6	3.7
ALL	4.4	17.2	29.4	22.1	22.6	4.1	0.2	0.0	0.0	0.0	0.0	0.0		
<b>YEAR</b>														
	CALM: 1.2 %				MEAN WIND: 3.5 m/sec					MAX. GUST: 22.7 m/sec				
N	4.8	3.3	0.5	0.5	*	*	0.0	0.0	0.0	0.0	0.0	0.0	9.1	1.9
NE	2.4	7.2	6.2	2.5	1.0	0.2	*	0.0	0.0	0.0	0.0	0.0	19.5	3.8
E	2.3	6.8	9.8	6.9	3.8	0.9	0.2	0.0	0.0	0.0	0.0	0.0	30.6	5.0
SE	2.0	3.3	1.7	0.5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.5	2.8
S	2.1	1.8	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.3	1.8
SW	1.0	1.3	0.5	0.1	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	2.3
W	3.4	7.6	5.4	1.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	17.4	2.9
NW	3.4	3.2	0.5	0.1	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.2	1.8
ALL	21.5	34.6	24.8	11.6	5.0	1.0	0.2	0.0	0.0	0.0	0.0	0.0		

Table 2: Arctic Station, *Queqertarsuaq* - Godhavn, Greenland. 1994

	AIR TEMP °C	REL. HUMI %	Si W/m <sup>2</sup>	Su W/m <sup>2</sup>	PRECIP mm H <sub>2</sub> O	TEMP -5 cm °C	TEMP -60 cm °C	TEMP -175 cm °C	TEMP -300 cm °C
JANUARY									
MAX	-0.9	86.0	35.1	33.7		-7.7	-5.2	-4.9	-3.7
MEAN	-15.9	37.6	0.9	0.9		-16.6	-7.7	-7.3	-4.6
MIN	-26.3	10.9	0.0	0.0		-25.5	-11.5	-10.9	-6.0
SUM					0				
FEBRUARY									
MAX	1.6	82.6	257.5	153.3		-7.0	-9.2	-8.9	-6.0
MEAN	-14.3	50.1	18.0	14.2		-16.0	-10.5	-10.1	-7.2
MIN	-28.1	15.2	0.0	0.0		-25.5	-12.4	-11.8	-7.9
SUM					0				
MARCH									
MAX	-3.9	78.5	555.6	337.9		-11.8	-9.2	-8.9	-7.8
MEAN	-20.5	50.7	93.3	65.6		-19.1	-11.3	-10.9	-8.2
MIN	-31.6	9.3	0.0	0.0		-25.1	-13.2	-12.7	-9.1
SUM					0				
APRIL									
MAX	6.2	85.8	704.9	587.0		-0.0	0.0	-0.3	-7.7
MEAN	-8.9	60.5	144.1	101.8		-8.2	-8.4	-8.2	-9.0
MIN	-24.1	25.9	0.0	0.0		-21.9	-13.2	-12.7	-9.4
SUM					34.6				
MAY									
MAX	9.9	84.8	749.7	284.6		16.6	0.0	-0.1	-3.2
MEAN	1.1	57.5	196.3	41.2		4.0	0.0	-0.2	-5.3
MIN	-5.4	26.3	0.0	0.0		-0.2	-0.1	-0.3	-7.7
SUM					14.3				
JUNE									
MAX	12.2	76.8	903.9	191.7		18.7	1.9	1.6	-0.5
MEAN	2.9	58.6	205.8	35.4		7.7	0.7	0.5	-1.7
MIN	-1.8	24.8	0.0	0.0		1.7	0.0	-0.1	-3.2
SUM					25.4				
JULY									
MAX	17.4	79.0	834.2	153.0		24.1	4.0	3.5	1.8
MEAN	6.3	57.0	174.1	30.4		10.2	2.8	2.5	0.9
MIN	0.9	29.3	0.0	0.0		4.5	1.8	1.5	-0.5
SUM					54.9				
AUGUST									
MAX	14.5	78.0	680.1	141.3		17.2	4.4	4.0	2.7
MEAN	6.3	55.2	125.7	21.8		8.2	3.5	3.1	2.3
MIN	1.6	30.1	0.0	0.0		3.7	2.4	2.1	1.8
SUM					22.4				
SEPTEMBER									
MAX	7.4	84.3	570.5	129.2		11.1	4.2	3.7	2.8
MEAN	1.8	52.0	72.9	14.1		2.8	2.2	1.9	2.5
MIN	-3.5	19.9	0.0	0.0		-1.2	0.3	0.3	1.9
SUM					20.7				
OCTOBER									
MAX	6.2	81.0	362.9	222.1		0.0	0.4	0.3	1.9
MEAN	-3.1	53.4	27.4	19.9		-3.3	-0.2	-0.2	0.9
MIN	-7.4	28.9	0.0	0.0		-7.3	-1.2	-1.1	-0.1
SUM					2.7				
NOVEMBER									
MAX	9.0	76.5	79.9	73.6		-0.3	-1.0	-0.9	-0.1
MEAN	-5.7	50.6	2.9	2.5		-8.0	-2.6	-2.4	-0.8
MIN	-14.1	19.1	0.0	0.0		-14.2	-4.8	-4.4	-1.7
SUM					0				
DECEMBER									
MAX	-1.4	76.3	0.0	0.0		-6.6	-4.5	-4.4	-1.7
MEAN	-11.8	53.3	0.0	0.0		-12.4	-6.5	-6.1	-3.2
MIN	-22.4	22.5	0.0	0.0		-20.9	-7.6	-7.1	-4.3
SUM					0				
YEAR									
MAX	17.4	86.0	903.9	587.0		24.1	4.4	4.0	2.8
MEAN	-5.1	53.0	88.4	29.0		-4.2	-3.1	-3.1	-2.8
MIN	-31.6	9.3	0.0	0.0		-25.5	-13.2	-12.7	-9.4
SUM					175.0				