THE CLIMATE OF
AUYUITTUQ NATIONAL PARK RESERVE:
A REVIEW

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ABSTRACT

The climate of Auyuittuq National Park Reserve is extremely harsh, complex, and variable. The long, cold winters are characterized by short days, light precipitation, and strong winds. Summers are short with moderate temperatures and long days.

The climate is influenced by a number of regional and local controlling factors. The high latitude location of Auyuittuq, major air masses, and pressure systems govern weather patterns on a regional scale. Cyclonic (low pressure) activity affecting regional and local weather occurs year-round, but is most frequent in summer. Storms bring significantly greater amounts of precipitation in late summer and fall than at any other time of the year. Peak precipitation occurs in October as snowfall.

Local weather patterns are affected by the ruggedness of the mountains which often scatter storm systems and frequently cause cloud formation and precipitation. Vast areas of snow and ice cause temperature inversions, and extensive areas of open water moderate temperatures along coastal areas. Winds passing through narrow valleys, mountain passes, and fiords are subject to a channelling and intensifying effect. The wind channelling effect of fiords, and wind disturbances associated with inversions often restrict access to the Park by sea and air.

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INTRODUCTION

This report summarizes information on the climate of Auyuittuq National Park Reserve and serves as a general guide to seasonal changes in local weather conditions. Due to the incompleteness of meteorological data and the variable and often extreme nature of weather in the area, climatic conditions and controlling factors are discussed in broad terms.

General Characteristics

Auyuittuq National Park Reserve is characterized by an extremely harsh and potentially hostile environment. Weather patterns are complex and vary greatly from day to day and year to year. The long, cold winters are characterized by short days, light precipitation, and strong winds. Summers are typified by moderate temperatures, long days, and frequent storms that bring precipitation in the form of rain and snow. The high latitudinal location, steep-walled fiords, and rugged glaciated mountains all contribute to the unpredictability of the climate. As well, Auyuittuq is situated near a major storm track. Cyclone activity (low pressure activity), originating either off the coast of Newfoundland or in the Rocky Mountains, is carried by prevailing winds northwards through Davis Strait into Baffin Bay. The effect of these frequent storms on Cumberland Peninsula is dependent upon their size, strength upon arrival, and proximity to Baffin Island.

Data Sources and Problems

No weather stations have operated in the park over a long period of time; however, five meteorological stations in the general vicinity provide relatively long-term climatological data. Dewar Lakes is located in the lowland west of Auyuittuq; Pangnirtung is on the southern coast; and Broughton Island, Cape Dyer, and Cape Hooper are on the northeastern coast (Figure 1). Weather data, obtained by Environment Canada for Pangnirtung, are incomplete due to inconsistent operation of the weather station; they are included in the report because the town is a major point of access to the park. Weather stations established in or near the Park by various researchers have resulted in short-term or seasonal data collection (Andrews and Barry 1972, Jacobs 1974, Jacobs et al. 1974, McKenna-Neuman 1985). For example, Jacobs (1974) and Jacobs et al. (1974) discuss radiation, ice characteristics, and general climatic conditions for Broughton Island for the period 1971-1973.

Other data sources described in the text (i.e., Masterton and Findlay 1976; Maxwell 1980, 1982) provide a detailed review of weather patterns, atmospheric circulation, storm systems, and physical characteristics of the Park.

Because of the variable nature of daily and annual weather patterns, it is not possible to describe a typical climate for the area. The major controlling factors (latitude, altitude, proximity of large water bodies and ice fields, topography, and storm tracks) determine, individually and collectively, a network of complex local and regional climatic regimes. Because of the variability in local weather patterns, data from weather stations do not always reflect conditions a short distance away. For example, weather records obtained in Pangnirtung do not indicate the presence of strong fiord winds that exist in the vicinity (Masterton and Findlay 1976). For these reasons, the present summary should be used only to evaluate the general weather conditions for any given time or location.

CLIMATIC REGIONS

An area is said to have an arctic climate if the mean monthly temperature for the warmest month is less than 10°C (United States Central Intelligence Agency 1978). Maxwell (1981) recognizes five climatic regions in the Canadian Arctic based on the effects of major climatic controls (Figure 2). The regions are further divided into sub-regions based on major local variations in climate.

Region IV is the the largest of the five regions recognized by Maxwell (1981) and includes Baffin Island. The most distinguishing characteristics of the region are a high incidence of cyclone activity and the highest recorded precipitation levels in the arctic islands (Maxwell 1982). Other characteristics are mountainous terrain, variability of weather patterns, and the formation of first-year sea ice each winter. Two climatic sub-regions occur in the vicinity of Auyuittuq. Sub-region IVc encompasses the western portion and is characterized by mountainous terrain, glaciers, and a variety of local weather conditions. Sub-region IVd encompasses the eastern portion of the Park and is characterized by a high incidence of fog and low cloud, steep-walled fiords, strong winds, and milder winters than the other arctic islands.

CLIMATIC CONTROLS

Local and regional climate is governed by various climatic controls including latitude, altitude, topography, distance from the sea, nature of the earth's surface, semi-permanent high- and low-pressure systems, air masses, and storm tracks (paths usually followed by storm systems). Interacting and operating at various intensities and combinations, these controls produce fluctuations in precipitation and temperature (Crowe 1976, Masterton and Findlay 1976, Maxwell 1980).

Certain controls exert a regional influence on climate and general weather patterns, while others affect more localized areas. The former are termed predominant influences and include latitude, air masses, atmospheric circulation, and weather systems. The latter are local influences and include topography, slope, aspect, proximity to the ocean, and temperature inversions (a layer of surface air in which temperature increases with altitude).

Predominant Influences

Latitude

The most important climatic factor in the Arctic is the amount of incident radiation (energy) received from the sun (Crowe 1976, Maxwell 1980). Due to the low angle of the sun at high latitudes, the amount of energy received is small and the temperature cool when compared to areas at lower latitudes. At northern latitudes the rays of the sun pass through a thicker layer of atmosphere and much heat is absorbed, scattered, or reflected (Crowe 1976, Masterton and Findlay 1976). Further, the low angle of the sun means that the remaining heat is spread over a larger surface (Crowe 1976).

Long summer days, resulting from the tilt of the earth's axis and the annual revolution of the earth around the sun, compensate somewhat for the low angle of radiation. However, this compensation is largely nullified by the extensive areas of ice, snow, and open water which reflect much of the radiation back into space (Crowe 1976, Masterton and Findlay 1976, Maxwell 1980). Masterton and Findlay (1976) suggest that extensive cloud layers and ice-congested water reflect as much as 50% of the incident radiation. Under extreme conditions of snow and ice, 80% of the sun's energy can be reflected (Crowe 1976).

Air Masses

An air mass is a large body of air in which temperature and moisture conditions are similar throughout (Matthews and Morrow 1985). Air masses reflect the conditions of the earth's surface over which they form. An air mass over the Baffin area in winter will be cold and dry but in summer it will be warmer and moister.

There are two main air masses affecting the Baffin region (Maxwell 1980). The predominant Continental Polar air mass originates in the polar area and is characterized by scattered cloud, low temperature, and low humidity (Masterton and Findlay 1976, Maxwell 1980). The Maritime Arctic air mass usually originates over the North Atlantic and occasionally over Hudson Bay (Maxwell 1980). It is warmer and contains more moisture than the Continental Polar air mass.

The Continental Polar air mass dominates the Baffin region during winter but in spring it retreats northward to the permanent ice pack (beyond the northern coasts of Greenland and Canada's northernmost islands). As the Continental air mass retreats, the Maritime air mass advances and settles over Baffin Island. In fall the Maritime air mass is again replaced by the Continental air mass.

Atmospheric Circulation and Weather Systems

The behavior of atmospheric circulation and weather systems in the Baffin region is extremely complex and interactive. For this reason, circulation and weather systems will be described in a general sense and on a seasonal basis with emphasis on mean positions of major pressure systems, prevailing winds, and storm tracks.

Winter: December to March

With the coming of winter, a major high pressure system advances from the west of Baffin Island towards a major low pressure system situated over Baffin Bay and Davis Strait. The merging of these two systems creates strong temperature gradients along coastal areas, and strong northerly (Masterton and Findlay 1976, Maxwell 1980) to northwesterly flows of very cold, dry, arctic air over Baffin Island (Masterton and Findlay 1976, Jacobs et al. 1985).

Storm tracks from an off-shoot of the major cyclone trajectory toward Iceland, pass through Davis Strait into Baffin Bay (Maxwell 1982, Jacobs et. al. 1985). In winter, these tracks are forced south by the strong high pressure system (Maxwell 1980). An important trough over the Davis Strait region is instrumental in the "general steering of surface cyclones" (Barry 1981:42).

Spring: April to June

By the end of March, a shifting of the two systems allows the pressure gradient to weaken which in turn allows the storm tracks in Davis Strait to penetrate further north. Increased daylight hours during March and April cause a warming trend which restricts a build-up of arctic air (Maxwell 1980).

From April to June, high pressure systems (anticyclone systems) typically produce cold, clear, dry weather on the Cumberland Peninsula (Masterton and Findlay 1976). Development of cyclones is not common during this period, although the frequency of gales and a secondary maximum of snowfall in nearby areas in May, suggest that low pressure activity may be significant at times (Maxwell 1982). Percentages of precipitation originating from anticyclone systems are greater during April than in January and February but absolute quantities are relatively small (Masterton and Findlay 1976).

Summer: July to August

June to September are the wettest months (Maxwell 1982), partially due to an increase in low pressure systems advancing from the west and along storm tracks from the south (which by now have been displaced north of their winter routes) (Masterton and Findlay 1976, Maxwell 1982). More than 50% of the precipitation during July and August results from low pressure systems moving through Davis Strait toward Baffin Bay (Masterton and Findlay 1976). Another significant factor influencing precipitation is that water vapor in the atmosphere is greatest at this time of year. Although snow does occur, drizzle and occasional moderate rains comprise two-thirds of the precipitation. Chances of snow increase with increased elevation (Maxwell 1982), and low cloud or sea fog occurs frequently (Masterton and Findlay 1976).

Fall: September to November

By fall, the deep winter trough over Davis Strait has begun to reintensify, the coastal temperature gradient strengthens, and cold air moves southward (Maxwell 1980). The season is characterized by increased winds, regular light snows, and extensive cloud (Masterton and Findlay 1976, Maxwell 1982). Storm tracks gradually recede southwards, but low pressure systems following them deepen and become more active (Masterton and Findlay 1976).

Local Influences

The physical characteristics of a given location greatly influence daily weather conditions. Wind effects and precipitation levels are enhanced by fiords, glaciers, and ice-laden waters. Inversions are created by temperature differences between land and sea, and storm systems are fragmented by mountain ranges.

Topography

The physical geography of the arctic islands is an important climatic control, particularly where mountain barriers and oceans are prominent features. Mountain ranges promote changes in the form and behaviour of pressure systems, frequently enhancing cloud formation and precipitation on windward slopes. The frequency of high and low pressure systems governs prevailing surface winds and both are closely influenced by local topography. Winds passing through constricting passages such as narrow straits, mountain passes, and valleys are prone to a channelling and intensifying effect. (Masterton and Findlay 1976, Maxwell 1980). Additionally, because of the combination of a widened airstream and advection of cold, stable air, long downward slopes may create higher wind speeds than short downward slopes (Maxwell 1980).

Slope and Aspect

Slope and aspect strongly influence local climate. There is generally less precipitation and more sunshine on the lee side of a mountain range than on the windward side, and winds descending the leeward side are often chinook-like in comparison with those on the windward side (Crowe 1976). Because of the decreased amount of sunlight on north-facing slopes, temperatures are cooler, and the snow- and ice-line is lower there than on south-facing slopes (Crowe 1976). The degree of slope has an important effect on local temperatures. An increase in slope causes the sun's rays to strike the earth's surface on a more direct angle, allowing more of the sun's energy to be absorbed.

Ocean

The ocean acts as a "heat sink" - a source of relatively cold air in summer and relatively warm air in winter (Crowe 1976, Masterton and Findlay 1976, Maxwell 1980). In the southern part of Davis Strait, there is adequate open water to cause a warming effect over eastern Baffin Island in January (Crowe 1976). Even when the ocean is completely ice-covered, the heat flux through the sea ice will warm the surface air to some extent (Masterton and Findlay 1976, Maxwell 1980).

Icy waters significantly influence the climate of Baffin Island. In summer, warm air extending northward from Davis Strait is cooled by icy waters. When this air penetrates inland through the fiords, low temperatures are prolonged, and cloud and fog formations are widespread (Masterton and Findlay 1976). The cooling effect of Davis Strait is particularly noticeable along the coast where windward areas are often a few degrees cooler than inland locations (Maxwell 1980, Zoltai et al. 1983). The cooling effects of the ocean in the spring and summer are reversed in the fall and winter.

Arctic Inversion

An inversion is a layer of surface air that shows an increase of temperature with an increase of altitude. This is the reverse of the normal situation where temperatures decrease with increasing altitude. The height of an inversion can range from a few to over a thousand metres (Maxwell 1982). The presence of cold surfaces, especially snow and ice, is responsible for the arctic inversion.

Two types of temperature inversions - "nocturnal" and "marine" - are common to Auyuittuq (Masterton and Findlay 1976). Nocturnal inversions form on calm, clear nights when the air is relatively dry. The earth cools rapidly after sunset and the layer of surface air is cooled by the earth. The effect is particularly noticeable over snow- and ice-covered surfaces. The thickness and duration of the inversion is dependent on season and topography. Inversions lasting several days are not uncommon. Cold air which flows by gravity from higher elevations may become trapped in valleys, coastal areas, fiords, and depressions, thereby lengthening the time span of the inversion (Masterton and Findlay 1976, Maxwell 1980).

Marine inversions occur in spring. Warm air is cooled by the cold ocean waters and pack ice, resulting in the surface air being much cooler than the warm strata above (Masterton and Findlay 1976, Maxwell 1982). The cold, moist air often forms dense fog along the coast. Life spans of marine inversions are dependent on the time it takes for the waters of Davis Strait to warm up and the proximity of the pack ice. In a cold year, the ice pack may remain close to shore allowing the inversion to recur frequently (Masterton and Findlay 1976).

TEMPERATURE

Seasonal variations in temperature in the Auyuittuq area are summarized in Tables 1 to 5. Daily, monthly, and annual temperature fluctuations are generally regulated by the same climatic controls that govern regional and local climate (i.e., surface winds, latitudinal location, altitude, mountain ranges, storm tracks, proximity to large water bodies, slope, and aspect).

Winter

Persistent rather than extreme cold is characteristic of winter. February is usually the coldest month, but the coldest month of any given year can vary from December to March (Crowe 1976, Masterton and Findlay 1976, Maxwell 1980, Zoltai et al. 1983).

Arctic temperature inversions are strongest during winter (Maxwell 1980, Jacobs et al. 1985) with the lowest temperatures occurring in non-vegetated hollows and the highest temperatures occurring on open, windy, or south-facing slopes (Maxwell 1980). The cold temperatures affecting the coastal areas are modified to some extent by onshore winds that have been warmed by open water (Crowe 1976, Masterton and Findlay 1976, Maxwell 1980). Estimated mean daily temperatures within the park are between -23°C and -26°C (Masterton and Findlay 1976). Of the four seasons, the greatest temperature ranges occur during winter (Maxwell 1980).

Spring

By May the strong winter inversion has weakened (Masterton and Findlay 1976, Maxwell 1980), but even by June, mean daily temperatures do not often rise above freezing (Figure 3). At this time of year, solar radiation and duration of sunlight is reduced by cloud cover, and much of the available heat energy is absorbed in melting snow and ice (Anders 1967, Maxwell 1980). As on-shore temperatures rise to near the temperature of the ocean, the moderating effect of Davis Strait is lessened. Masterton and Findlay (1976) indicate that the greatest monthly temperature variation occurs in April.

They further suggest that "migrating" storms and air masses are responsible for the wide temperature fluctuations.

Summer

Summer temperatures are greatly influenced by altitude, aspect, and proximity to the coast (Crowe 1976, Masterton and Findlay 1976, Jacobs et al. 1985). Icy sea waters stabilize temperatures in coastal regions; they can also cause significant day-to-day fluctuations depending on location and wind direction (Masterton and Findlay 1976, Maxwell 1980, Zoltai et al. 1983). Average temperatures in the interior (7°C) are somewhat higher than in coastal areas (5°C) and temperatures on south-facing and west-facing slopes tend to be several degrees higher than on north-facing and east-facing slopes (Masterton and Findlay 1976, Maxwell 1980, Jacobs et al. 1985). For example, Jacobs et al. (1985) indicate that temperatures on the leeward side of south-facing slopes can be 8°C higher than temperatures on opposite north-facing slopes.

Growing Season

Masterton and Findlay (1976:13) defined the growing season as the time period between the last five consecutive days in spring with a mean daily temperature less than 5°C and the first five such days in autumn. The growing season at Broughton Island averages only 20 days, while at Dewar Lakes it is 46 days (Masterton and Findlay 1976).

The short growing season is partially compensated for by longer daylight hours (Porsild 1951, Masterton and Findlay 1976). Porsild (1951) suggests that, due to heat absorption by some types of arctic vegetation, a "microclimate" is sometimes created at ground level. The surface soil and air surrounding the vegetation may be 14° to 22°C warmer than air a few feet above ground level. This microclimate effect enables arctic plants to grow when air temperatures average a few degrees below freezing.

Fall

From late August until early September, the uniformity of the summer temperatures breaks down, and by mid-October near-winter conditions prevail (Maxwell 1980). The daily temperature differences between inland and coastal regions are greatest during September, varying as much as 10°C (Masterton and Findlay 1976). With the exception of Pangnirtung, mean daily temperatures in September are below freezing at all weather stations.

PRECIPITATION

Precipitation (Tables 6 to 10) is generally greatest in September and October and least in February and March (Figure 4) (Maxwell 1980). Mean annual precipitation ranges from 245 mm (Dewar Lakes) to 663 mm (Cape Dyer).

Winds associated with frontal and cyclonic activity tend to bear the highest percentage of precipitable water vapour (Crowe 1976, Masterton and Findlay 1976, Maxwell 1980, Zoltai et al. 1983, Jacobs et al. 1985). Local precipitation levels vary with slope, aspect, elevation, and proximity to the ocean. The areas of heaviest precipitation occur along the eastern coast of Baffin Island, with north-facing windward slopes and valleys receiving appreciably higher levels than leeward, usually south- and west-facing slopes (Barry 1972, Crowe 1976, Maxwell 1980). Because the local source of moisture (the ocean) and increases in elevation are significant in promoting precipitation, the eastern coast of Baffin Island receives more precipitation (mostly snow) than the other arctic islands (Andrews and Barry 1972, Crowe 1976, Maxwell 1980).

Rainfall

Rainfall varies locally and annually. Mean annual rainfall ranges from 38 mm (Broughton Island) to 174 mm (Pangnirtung). Although rain may occur during any month, most falls as light drizzle during June through September. August is usually the wettest month (Maxwell 1980).

Snowfall

The amount of snowfall varies from year to year. Snowfall may occur in any month with the greatest amount occurring in October and November (Maxwell 1980). In the southern end of the Park, rugged terrain, high elevation, and low winds result in snow accumulations of 200 cm in some areas. Snow depths are usually less than 125 cm in the far northwest and less than 75 cm in the interior basins (Masterton and Findlay 1976).

Snowfall accounts for roughly 60% of the annual precipitation at low elevations. The percentage increases with elevation and approaches 90% in some areas. For example, in the summer of 1953, snowfall accounted for 79% of the total precipitation on the Penny Ice Cap (elevation 2050 m above sea level), and in the summer of 1970 snowfall accounted for 78% of the total precipitation on the Boas glacier (elevation 1140 m) (Jacobs et al. 1985).

WIND

Katabatic (downslope) and anabatic (upslope) winds occur where there are significant slopes. Anabatic winds, which originate over heated ice-free land, are usually light, but can reinforce prevailing upslope winds (Maxwell 1980). The more obvious effects are those of downslope winds. Air over extensive ice bodies (i.e., glaciers) is subject to intense cooling and moves downhill. Katabatic winds can cause severe turbulence in the lower atmosphere when the slopes are long and steep, or when temperature inversions, which intensify the flow of downslope winds, occur (Maxwell 1980).

Severe winds and blowing snow occur during winter but seasonal differences in mean daily wind speeds are not significant (Table 11). Blowing snow is usually greatest in January but this can vary from October to April (Maxwell 1982).

EFFECTS OF WEATHER ON OUTDOOR ACTIVITY

Based on seasonal weather characteristics, Crowe (1976) outlined three main factors limiting outdoor activities: duration of daylight, temperature, and wind.

The most significant factor is length of day, as most outdoor activities are affected by the hours of available daylight. Crowe (1976) suggests that six hours per day is the minimum acceptable amount of daylight and 12 or more hours is ideal for outdoor activities.

Hours of daylight in Auyuittuq vary greatly depending on the time of year (Figure 5). The northern limits of the Park experience complete darkness in mid-December and 24 hours of daylight from early May to mid-July. Hours of daylight in the southern portion of the Park range from approximately 2.75 hours in mid-December to 24 hours in mid-June. The first day with six hours of daylight occurs in early February in the northern portion, and near the end of January in the southern portion of the Park. The last day with six hours of daylight occurs in the first part of November in the north and mid-November in the south. Thus, according to the criteria of Crowe (1976), sufficient daylight for outdoor activity occurs for eight to nine months of the year.

Temperature and wind are important individually and collectively as indicators of personal comfort. Temperature is the second most important factor affecting outdoor activity (Crowe 1976). Combined with the effects of wind, snow, and rain, low temperatures can become hazardous and possibly fatal, especially when people are unprepared for such conditions.

Wind chill, the combined effect of wind and temperature, is particularly adverse when accompanied by rain or snow. Air at 0°C has a wind chill factor of about 700 watts/m^2 and is considered comfortable for a person dressed for skiing. Exposed flesh begins to freeze when the wind chill factor reaches 1400 watts/m^2. This can occur at temperatures as high as -3°C if the wind speed reaches 26 km/hr.

Winds can also restrict air and sea access to the Park. Wind disturbances associated with inversions cause turbulence in the lower atmosphere, especially during the winter months. Winds of 40 km/hr can make conditions uncomfortable for air travel and prevent small boats from travelling the fiords. Wind speed, direction, and duration affect ice conditions along the coastline. Steady onshore winds can cause ice flows to drift into fiords and along shorelines, thereby restricting the passage of small boats. These conditions may persist until the ice is removed by off-shore winds and ocean currents.

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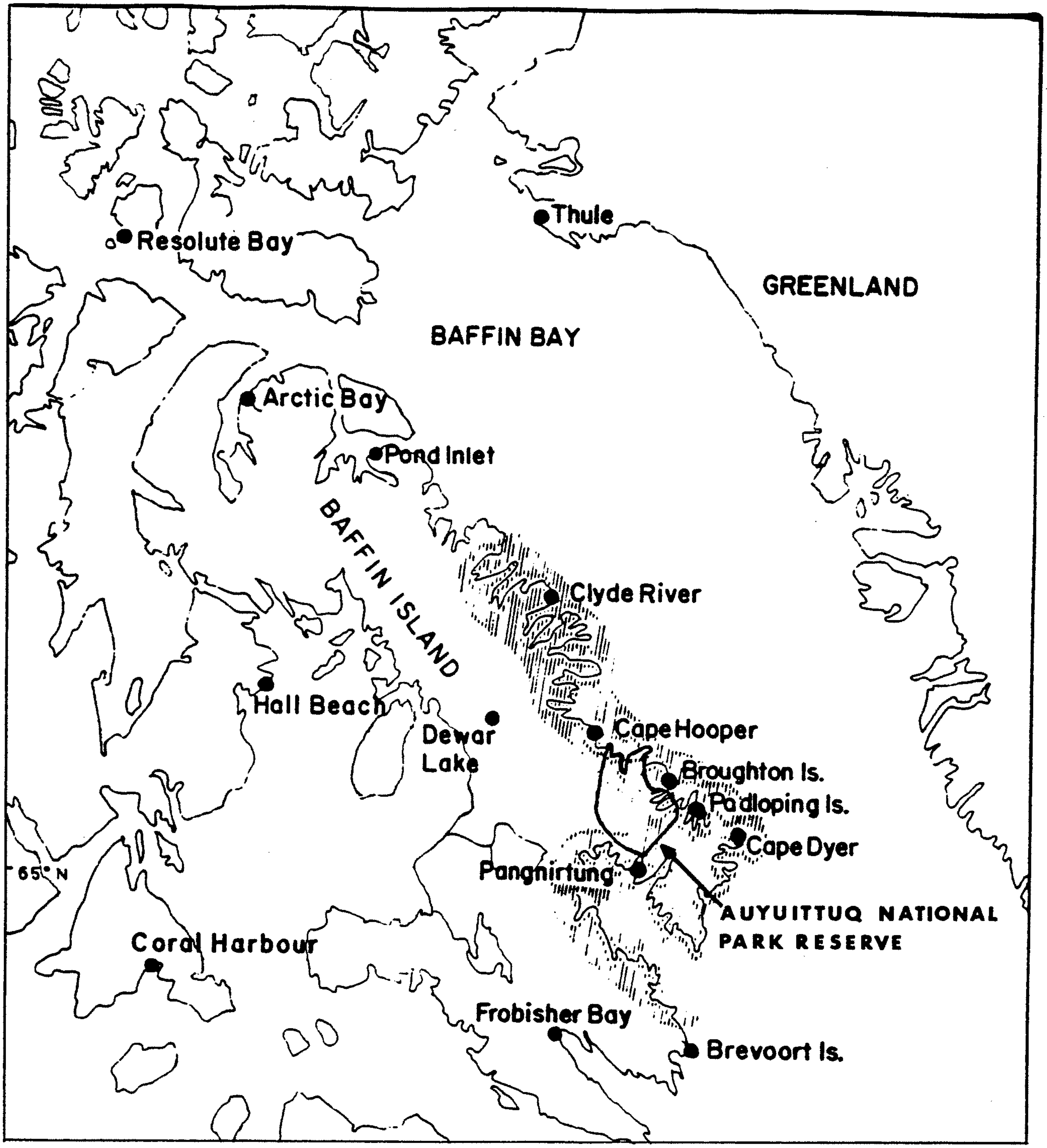

FIGURE 1. Location of weather stations in the vicinity of Auyuittuq National Park Reserve, Baffin Island (source: Anders 1967).

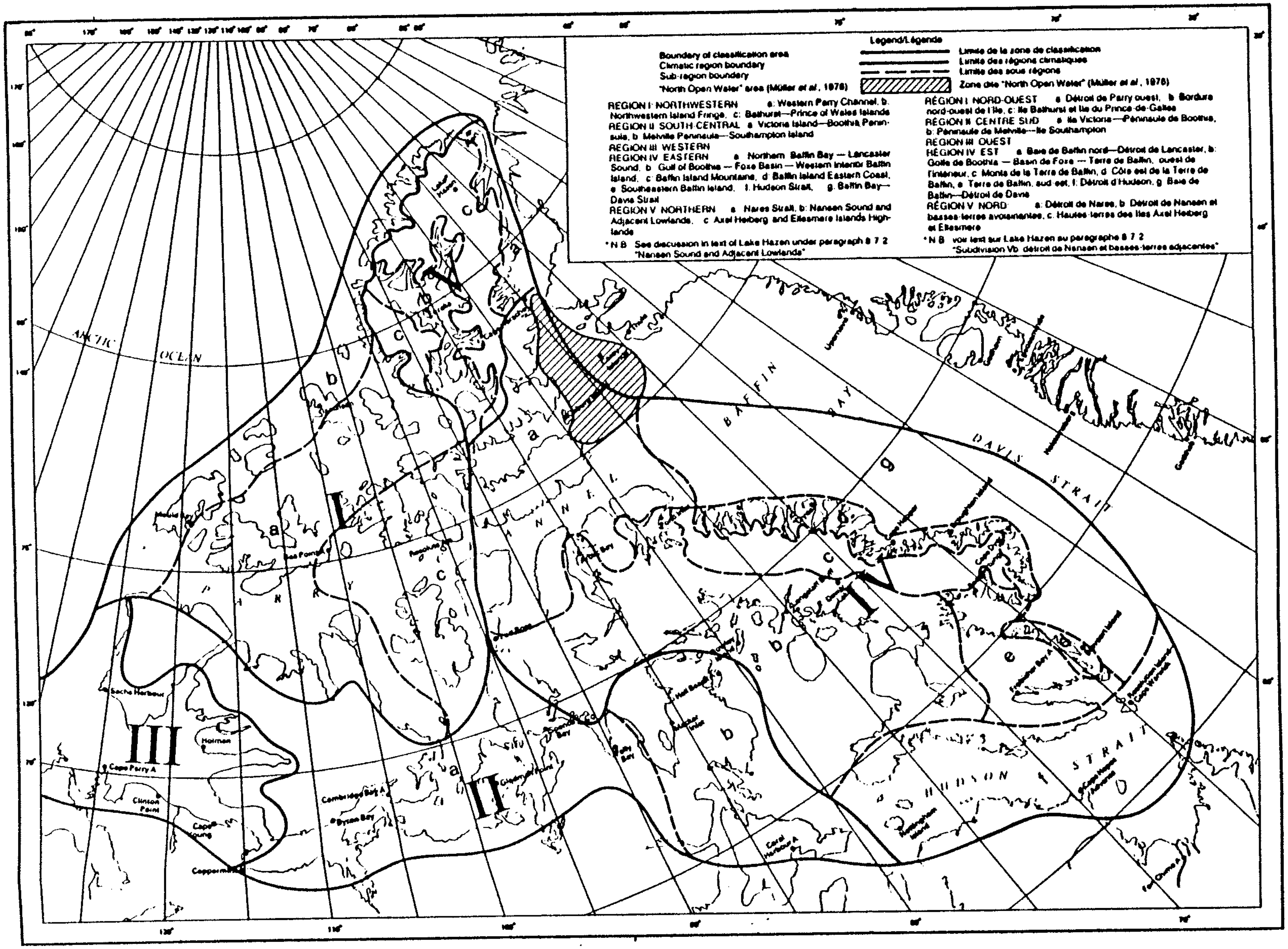

FIGURE 2. Climatic regions in the Canadian Arctic (source: Maxwell 1980).

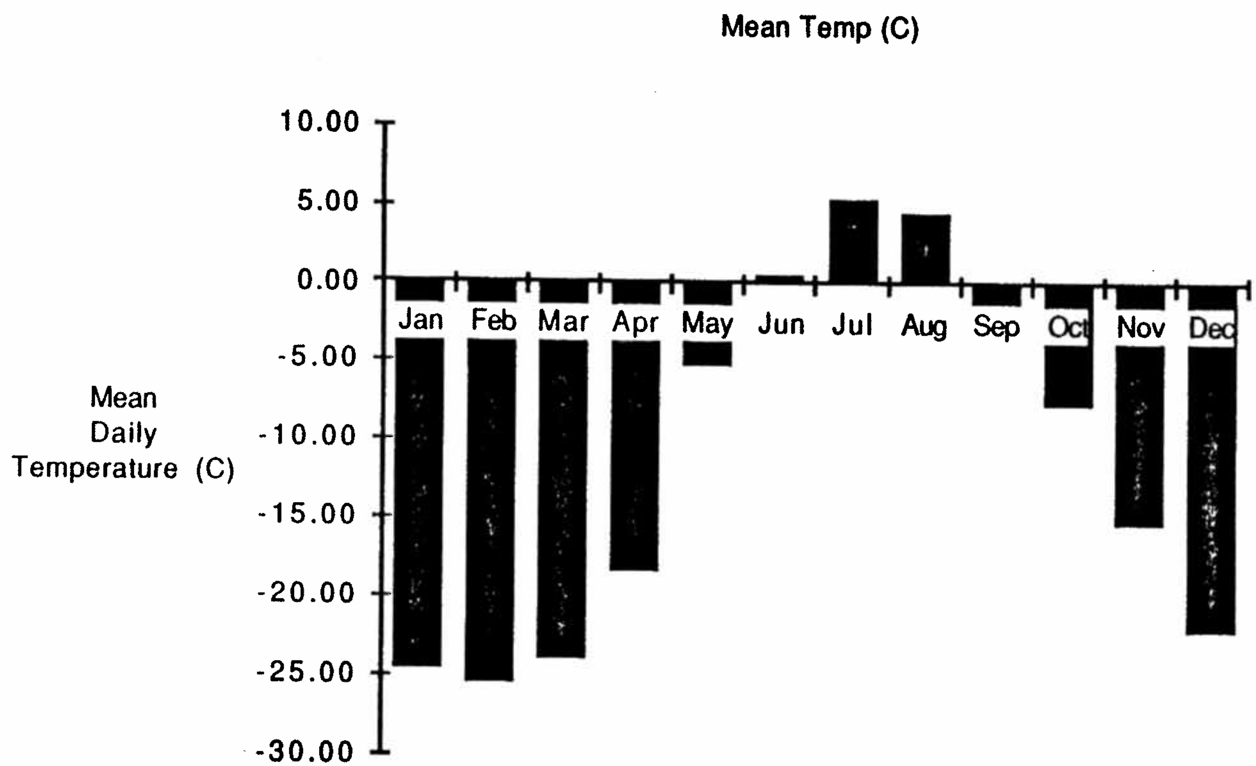

FIGURE 3. Mean daily temperatures (°C) for weather stations in the vicinity of Auyuittuq National Park Reserve, Baffin Island (source: Environment Canada 1982a).

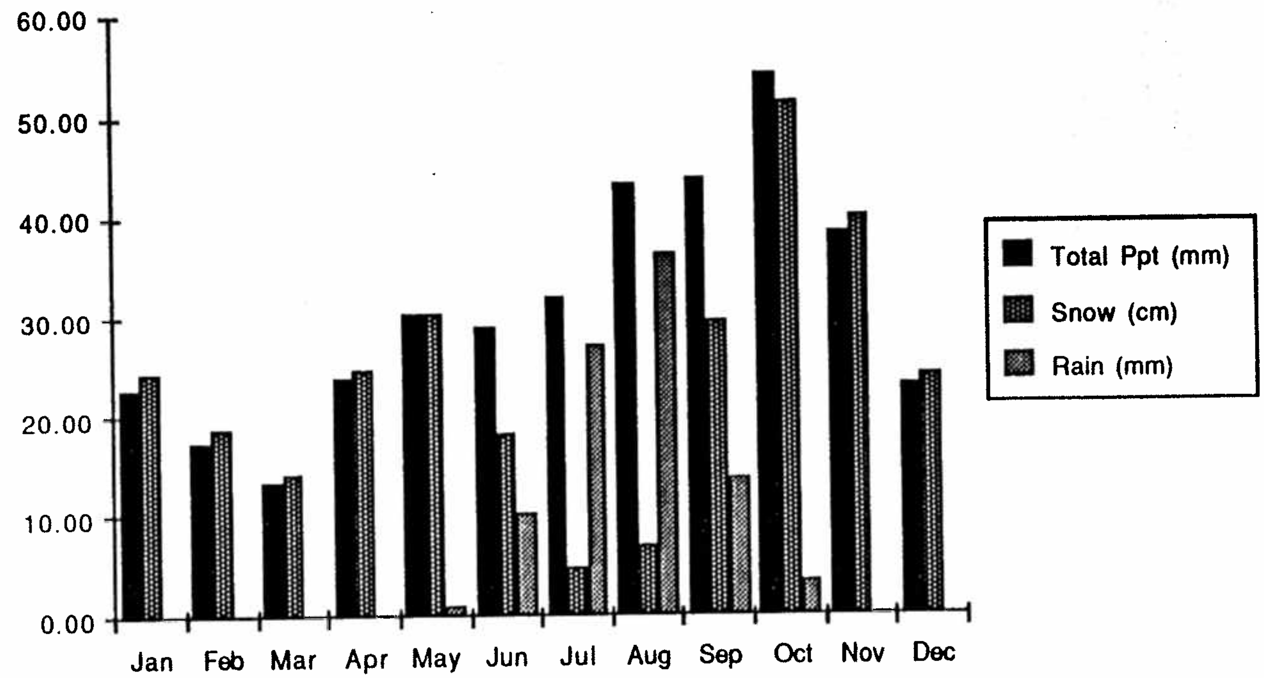

FIGURE 4. Mean monthly rainfall (mm), mean monthly snowfall (cm), and mean monthly precipitation (mm) for weather stations in the vicinity of Auyuittuq National Park Reserve, Baffin Island (source: Environment Canada 1982b).

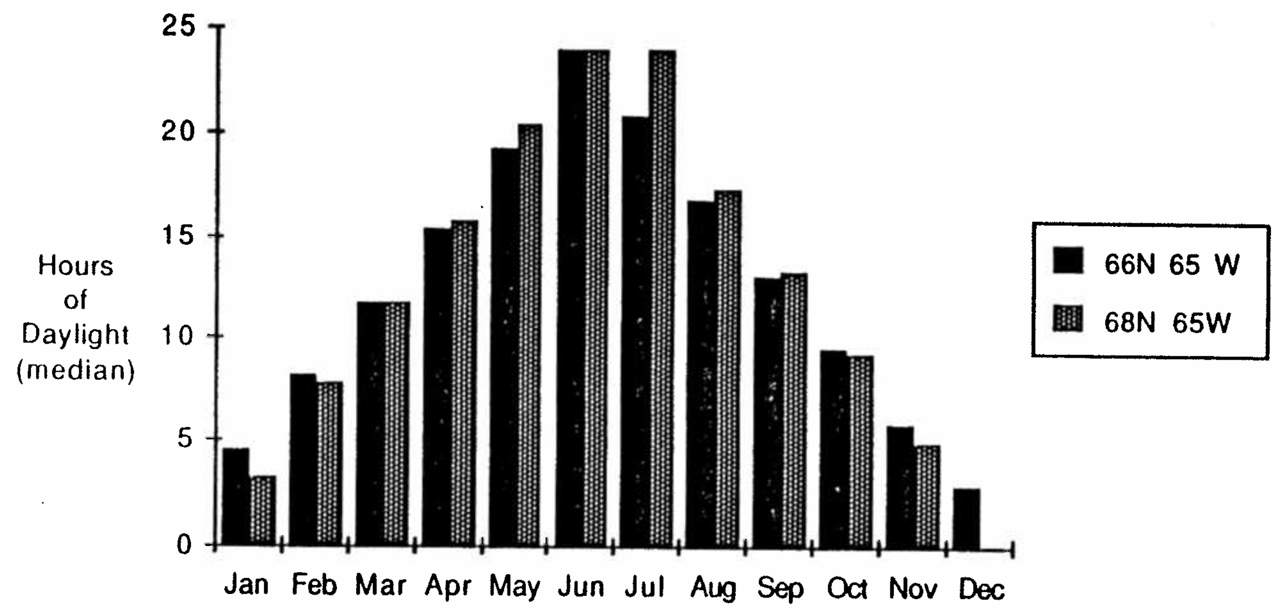

FIGURE 5. Median daily hours of daylight in Auyuittuq National Park Reserve, Baffin Island (source: Prusak 1987).

TABLE 1. Mean minimum, mean maximum, and mean daily temperatures (°C) for Broughton Island, 1951-1980. Extreme temperatures (°C) are also indicated (source: Environment Canada 1982a).

MONTH	MEAN MIN	MEAN MAX	MEAN	MIN	NO. YEARS RECORDED	MAX	NO. YEARS RECORDED
January	-26.4	-19.9	-23.1	-41.7	22	2.6	21
February	-27.7	-21.4	-24.6	-42.8	23	1.1	22
March	-27.0	-20.7	-24.0	-39.4	23	4.0	22
April	-20.3	-13.3	-16.7	-33.3	23	7.8	22
May	-10.7	-4.6	-7.7	-26.1	23	8.3	23
June	-3.6	1.6	-1.0	-12.2	22	17.8	22
July	1.4	7.4	4.4	-8.9	22	18.3	22
August	0.7	6.1	3.5	-7.8	23	18.9	22
September	-4.4	-0.2	-2.3	-13.9	22	14.4	22
October	-10.2	-5.8	-8.0	-23.3	23	6.7	22
November	-18.0	-12.7	-15.2	-31.1	23	3.3	23
December	-24.1	-18.3	-21.2	-37.2	23	5.0	23

TABLE 2. Mean minimum, mean maximum, and mean daily temperatures (°C) for Cape Dyer, 1951-1980. Extreme temperatures (°C) are also indicated (source: Environment Canada 1982a).

MONTH	MEAN MIN	MEAN MAX	MEAN	MIN	NO. YEARS RECORDED	MAX	NO. YEARS RECORDED
January	-26.8	-17.3	-22.1	-43.9	21	1.1	21
February	-27.3	-18.0	-22.7	-42.2	21	2.2	21
March	-27.9	-17.8	-22.9	-47.2	21	2.8	21
April	-20.4	-10.4	-15.4	-38.6	21	10.0	21
May	-9.6	-2.4	-6.0	-28.3	21	9.4	21
June	-2.7	3.1	2.0	-13.9	21	17.8	21
July	1.7	8.4	5.1	-5.5	21	19.4	21
August	1.4	7.7	4.6	-9.8	21	18.9	21
September	-4.3	1.7	-1.4	-18.9	22	15.6	22
October	-11.3	-4.0	-7.7	-31.1	22	8.3	22
November	-19.1	-10.3	-14.7	-39.4	22	2.8	22
December	-25.0	-15.5	-20.3	-45.0	22	5.6	22

TABLE 3. Mean minimum, mean maximum, and mean daily temperatures (°C) for Cape Hooper, 1951-1980. Extreme temperatures (°C) are also indicated (source: Environment Canada 1982a).

MONTH	MEAN MIN	MEAN MAX	MEAN	MIN	NO. YEARS RECORDED	MAX	NO. YEARS RECORDED
January	-27.3	-21.9	-24.6	-40.6	24	-1.7	24
February	-28.2	-22.8	-25.5	-43.0	24	-0.6	24
March	-27.2	-21.9	-24.5	-40.6	24	2.3	23
April	-20.3	-14.5	-17.4	-33.9	24	3.9	24
May	-10.5	-5.0	-7.8	-27.8	23	11.1	23
June	-3.3	1.8	-0.8	-10.6	22	17.8	22
July	1.0	7.0	4.0	-7.8	23	18.9	21
August	0.4	5.5	3.0	-9.5	24	17.2	24
September	-3.8	-0.3	-2.1	-16.2	24	12.8	24
October	-9.8	-5.8	-7.8	-26.0	24	5.0	24
November	-18.4	-13.6	-16.0	-31.1	24	2.2	24
December	-24.7	-19.3	-22.0	-41.1	24	19.0	24

TABLE 4. Mean minimum, mean maximum, and mean daily temperatures (°C) for Dewar Lakes, 1951-1980. Extreme temperatures (°C) are also indicated (source: Environment Canada 1982a).

MONTH	MEAN MIN	MEAN MAX	MEAN	MIN	NO. YEARS RECORDED	MAX	NO. YEARS RECORDED
January	-29.8	-23.2	-26.5	-49.4	22	-0.6	22
February	-31.1	-24.0	-27.4	-50.7	23	0.0	23
March	-30.3	-23.7	-27.1	-48.3	23	-3.3	23
April	-22.6	-16.0	-19.3	-38.9	23	-1.1	23
May	-12.1	-6.1	-9.1	-29.4	22	8.0	22
June	-3.4	1.7	-0.9	-17.2	22	17.2	22
July	2.2	8.3	5.3	-6.3	22	20.0	22
August	1.2	6.9	4.1	-7.2	23	20.6	23
September	-5.3	-1.2	-3.3	-17.2	23	11.1	22
October	-13.5	-8.0	-10.8	-33.0	23	3.3	22
November	-22.2	-15.3	-18.7	-40.6	22	-0.6	22
December	-27.5	-21.3	-24.5	-45.0	23	0.0	22

TABLE 5. Mean minimum, mean maximum, and mean daily temperatures (°C) for Pangnirtung for various periods 1925-1950. Extreme temperatures (°C) are also indicated (source: Yorke 1972).

MONTH	MEAN MIN	MEAN MAX	MEAN	MIN	NO. YEARS RECORDED	MAX	NO. YEARS RECORDED
January	-30.2	-22.5	-26.4	-43.3	11	8.8	11
February	-30.8	-23.2	-27.0	-43.3	11	3.3	11
March	-26.0	-16.8	-21.4	-42.7	11	6.1	11
April	-17.4	-7.5	-23.1	-35.5	10	11.1	9
May	-7.0	0.6	-3.5	-26.1	10	15.0	10
June	0.2	6.3	3.2	-6.1	9	20.5	10
July	4.5	11.2	7.8	-1.1	9	26.7	10
August	4.4	10.0	7.2	-0.5	7	19.4	7
September	0.5	5.4	3.0	-11.1	6	16.7	6
October	6.8	-1.2	-4.0	-17.2	9	13.3	9
November	-14.3	-8.4	-11.3	-30.0	9	11.1	10
December	-24.9	-17.8	-21.6	-41.1	11	12.2	10

TABLE 6. Mean monthly rainfall (mm), mean monthly snowfall (cm), and mean monthly precipitation (mm) for Broughton Island, 1951-1980. Maximum rainfall (mm) and maximum snowfall (cm) are also indicated (source: Environment Canada 1982b).

MONTH	MEAN RAIN	MEAN SNOW	TOTAL PRECIP	24 HR. RAIN	NO. YEARS RECORDED	24 HR. SNOW	NO. YEARS RECORDED
January	-	11.1	11.1	-	22	31.8	21
February	-	9.4	9.4	-	22	14.0	21
March	-	5.9	5.9	-	21	7.0	20
April	-	14.7	14.7	-	22	22.6	21
May	0.4	32.8	33.2	8.6	21	23.6	21
June	5.4	23.0	28.4	35.6	22	35.6	21
July	12.1	6.4	18.2	15.0	21	12.7	20
August	15.5	8.9	24.4	25.4	22	17.8	22
September	4.0	32.9	37.0	14.5	21	33.0	21
October	0.3	53.9	54.3	5.1	24	38.4	24
November	-	37.1	37.1	-	23	33.0	22
December	-	13.9	13.9	T	22	22.4	22
Annual	37.7	250.0	287.6	-	-	-	-

T indicates rainfall < 0.1 mm, total precipitation < 0.1 mm, or snowfall < 0.1 cm.

TABLE 7. Mean monthly rainfall (mm), mean monthly snowfall (cm), and mean monthly precipitation (mm) for Cape Dyer, 1951-1980. Maximum rainfall (mm) and maximum snowfall (cm) are also indicated (source: Environment Canada 1982b).

MONTH	MEAN RAIN	MEAN SNOW	MEAN PRECIP	24 HR RAIN	NO. YEARS RECORDED	24 HR SNOW	NO. YEARS RECORDED
January	0.4	73.5	64.8	6.5	21	68.0	21
February	0.3	58.4	52.0	4.1	21	55.4	21
March	T	34.2	29.3	0.8	21	54.9	21
April	0.1	50.6	44.9	1.4	21	41.7	21
May	0.5	53.7	49.1	2.8	21	80.5	21
June	8.3	28.7	39.4	20.8	21	40.8	21
July	35.7	6.8	42.9	51.0	21	13.2	21
August	40.0	10.6	51.2	43.7	21	21.6	21
September	14.6	56.7	73.6	30.2	22	58.9	22
October	4.6	99.1	100.3	28.6	22	72.1	22
November	1.1	68.1	59.1	14.5	22	38.9	22
December	0.2	62.0	56.6	1.5	22	48.2	22
Annual	105.8	602.4	663.2	-	-	-	-

T indicates rainfall < 0.1 mm, total precipitation < 0.1 mm, or snowfall < 0.1 cm.

TABLE 8. Mean monthly rainfall (mm), mean monthly snowfall (cm), and mean monthly precipitation (mm) for Cape Hooper, 1951-1980. Maximum rainfall (mm) and maximum snowfall (cm) are also indicated (source: Environment Canada 1982b).

MONTH	MEAN RAIN	MEAN SNOW	MEAN PRECIP	24 HR. RAIN	NO. YEARS RECORDED	24 HR SNOW	NO. YEARS RECORDED
January	-	8.2	8.2	T	23	22.9	23
February	-	10.5	10.5	0.0	23	22.4	23
March	-	6.3	6.3	0.0	22	14.7	22
April	-	21.5	21.5	0.0	23	22.9	23
May	T	29.5	29.4	T	22	19.1	22
June	4.2	21.7	25.8	32.5	22	21.6	22
July	16.2	6.4	22.8	20.3	22	15.7	22
August	18.0	9.6	27.6	26.4	24	17.8	24
September	8.1	28.2	36.3	17.8	24	19.1	24
October	0.5	36.9	37.4	8.6	24	25.4	24
November	0.0	33.6	33.6	0.0	23	24.1	23
December	0.0	12.5	12.5	T	23	22.9	23
Annual	47.2	224.9	271.9	-	-	-	-

T indicates rainfall < 0.1 mm, total precipitation < 0.1 mm, or snowfall < 0.1 cm.

TABLE 9. Mean monthly rainfall (mm), mean monthly snowfall (cm), and mean monthly precipitation (mm) for Dewar Lakes, 1951-1980. Maximum rainfall (mm) and maximum snowfall (cm) are also indicated (source: Environment Canada 1982b).

MONTH	MEAN RAIN	MEAN SNOW	MEAN PRECIP	24 HR. RAIN	NO. YEARS RECORDED	24 HR. SNOW	NO. YEARS RECORDED
January	-	5.4	5.4	0.0	22	13.2	22
February	-	3.2	3.2	T	22	10.9	22
March	-	5.5	5.5	-	23	11.8	23
April	-	12.4	12.4	-	22	16.0	22
May	0.6	23.5	24.1	10.2	22	20.3	22
June	6.2	13.5	19.7	19.8	22	11.0	22
July	37.0	4.2	41.3	36.3	21	15.2	21
August	44.6	5.9	50.5	46.0	23	8.9	23
September	10.2	24.2	34.3	21.8	23	17.8	23
October	T	27.7	27.8	0.3	23	26.7	23
November	-	12.5	12.5	0.0	23	11.0	23
December	-	6.9	6.9	T	23	11.4	23
Annual	98.6	144.9	243.6	-	-	-	-

T indicates rainfall < 0.1 mm, total precipitation < 0.1 mm, or snowfall < 0.1 cm.

TABLE 10. Mean monthly rainfall (mm), mean monthly snowfall (cm), and mean monthly precipitation (mm) for Pangnirtung for various periods, 1925-1950. Maximum rainfall (mm) and maximum snowfall (cm) are indicated (Source: Yorke 1972).

MONTH	MEAN RAIN	MEAN SNOW	MEAN PRECIP	24 HR RAIN	NO. YEARS RECORDED	24 HR SNOW	NO. YEARS RECORDED
January	0.3	24.6	24.9	2.0	11	12.7	7
February	-	12.4	12.4	-	11	36.8	8
March	1.0	19.8	20.8	12.4	11	20.3	6
April	1.0	25.1	26.1	7.9	11	15.2	7
May	4.1	12.7	16.8	13.7	11	12.7	10
June	26.4	5.1	31.5	29.2	10	7.6	9
July	35.1	0.3	35.4	24.9	11	0.8	11
August	63.3	0.3	63.6	37.8	8	0.8	9
September	31.2	6.4	37.6	37.3	6	8.4	6
October	11.4	39.1	50.5	20.6	7	30.5	8
November	0.3	49.5	49.8	2.3	10	22.9	8
December	-	25.7	25.7	-	11	30.5	8
Annual	174.0	221.0	394.5	-	-	-	-

T indicates rainfall < 0.1 mm, total precipitation < 0.1 mm, or snowfall < 0.1 cm.

TABLE 11. Mean daily and extreme wind speeds (km/hr) for weather stations in the vicinity of Auyuittuq National Park Reserve, Baffin Island (source: Maxwell 1980).[a]

	BROUGHTON IS.		CAPE DYER		CAPE HOOPER		DEWAR LAKES	
MONTH	MEAN	EXT	MEAN	EXT	MEAN	EXT	MEAN	EXT
January	11.1	72.0	18.0	129.0	18.2	137.0	18.8	129.0
February	9.7	97.0	15.3	113.0	15.9	153.0	17.2	145.0
March	7.9	72.0	12.6	105.0	16.6	105.0	16.6	97.0
April	8.8	60.0	13.0	113.0	17.1	129.0	17.9	105.0
May	9.2	77.0	14.2	92.0	15.6	105.0	20.6	97.0
June	8.0	64.0	12.6	97.0	14.8	89.0	19.1	81.0
July	7.1	121.0	10.9	69.0	13.0	89.0	20.4	97.0
August	7.7	56.0	11.4	74.0	13.2	97.0	20.6	105.0
September	10.0	81.0	15.4	77.0	19.1	113.0	18.8	100.0
October	9.5	82.0	16.9	105.0	21.9	113.0	17.7	113.0
November	8.5	105.0	15.0	89.0	19.8	129.0	18.2	113.0
December	9.0	74.0	16.3	121.0	17.4	185.0	15.1	129.0

[a] Wind data for Pangnirtung are not available.