NOGAP B2; Data on *In Situ* Water Irradiance, Temperature and Fluorescence, Solar Irradiance, and Ice Algae and Related Physical Parameters from the Canadian Beaufort Sea Shelf, 1985 to 1988

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PREFACE

This study was funded by the Northern Oil and Gas Action Program (NOGAP), through the Department of Fisheries and Oceans, Central and Arctic Region. It is one of a series of projects executed under NOGAP B.2, to provide background data for assessing the implications of hydrocarbon development and production on critical estuarine and marine habitats of the Canadian Arctic Coastal Shelf. This document constitutes NOGAP Report B2.53.

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Hopky, G.E., M.J. Lawrence, D.B. Chiperzak, and S.M. McRae. 1994. NOGAP B2; Data on in situ water irradiance, temperature and fluorescence, solar irradiance, and ice algae and related parameters from the Canadian Beaufort Sea shelf, 1985 to 1988. Can. Data Rep. Fish. Aquat. Sci. 934: v + 112 p.

Between 1985 to 1988, the Canadian southern Beaufort Sea shelf and coastal bays were sampled for a suite of oceanographic variables. In 1985, 41 stations were occupied between 21 July to 12 August. In 1986, 63 stations were sampled between 23 March and 20 September. In 1987, 59 stations were sampled between 05 March and 30 August. In 1988, 20 stations were sampled between 07 and 24 March. Throughout 1986 to 1988 continuous irradiance (PAR) data were recorded at Tuktoyaktuk. During open water, water column PAR and relative fluorescence measurements were made on the Beaufort Sea shelf and in Tuktoyaktuk Harbour, and continuous sea surface temperature data are reported for Kugmallit Bay. During ice cover Tuktoyaktuk Harbour and Mason Bay were sampled for water column fluorescence and PAR; and on the shelf stations were sampled for ice algae species composition and abundance, ice chlorophyll a concentration, total suspended solids and PAR data in relation to snow depth.

Key words: Beaufort Sea; Mackenzie River; estuaries; bays; irradiance; temperature; fluorescence; ice algae; taxa; biomass; chlorophylls.

RÉSUMÉ

Hopky, G.E., M.J. Lawrence, D.B. Chiperzak, and S.M. McRae. 1994. NOGAP B2; Data on in situ water irradiance, temperature and fluorescence, solar irradiance, and ice algae and related parameters from the Canadian Beaufort Sea shelf, 1985 to 1988. Can. Data Rep. Fish. Aquat. Sci. 934: v + 112 p.

Entre les années 1985 et 1988, des échantillons ont été prélevés sur le plateau continental canadien situé dans le sud de la mer de Beaufort et dans les baies côtières afin d'obtenir une série de données océanographiques. En 1985, 41 stations ont été échantillonnées entre le 21 juillet et le 12 août. En 1986, 63 stations ont fait l'objet d'un échantillonnage du 23 mars au 20 septembre. En 1987, des échantillons ont été recueillis dans 59 stations entre le 5 mars et le 30 août. En 1988, 20 stations ont été échantillonnées du 7 au 24 mars. Au cours de ces périodes, de 1986 à 1988, on a enregistré les données sur l'irradiation solaire à Tuktoyaktuk. Pendant la période d'eau libre, on a mesuré le RPA (rayonnement photosynthétiquement actif) et la fluorescence relative dans la colonne d'eau sur le plateau continental de la mer du Beaufort et dans le port de Tuktoyaktuk. On a également relevé, de façon continue, la température de la surface de la mer dans la baie Kugmallit. Au cours de la période des glaces, des échantillons ont été prélevés dans le port de Tuktoyaktuk et dans la baie de Mason afin de déterminer la fluorescence et le RPA dans la colonne d'eau. D'autres échantillons ont été prélevés dans les stations sur le plateau continental afin de déterminer l'abondance et la composition des espèces d'algues ainsi que la concentration de chlorophylle *a* dans les glaces, la quantité totale de matières solides en suspension ainsi que des données sur le RPA en fonction de l'épaisseur de la neige.

Mots-clés: Mer de Beaufort; fleuve Mackenzie; estuaires; baies; irradiation solaire; fluorescence; algues des glaces; taxons; biomasse; chlorophylle.

INTRODUCTION

This report lists physical, chemical and biological data sampled as part of the Beaufort Shelf Fish Habitat Research Subproject (B.2.1) and the Nearshore Benthic Monitoring Subproject (B.2.3). These studies are components of the Critical Estuarine and Marine Habitat Project (B.2) undertaken by staff of the Department of Fisheries and Oceans (DFO), Central and Arctic Region, as part of the Northern Oil and Gas Action Program (NOGAP). NOGAP is a multi-disciplinary study to provide background data for assessing the potential effects of hydrocarbon development and production on the critical marine and estuarine habitats of the Canadian Arctic coastal shelf.

Subproject B.2.1 was conducted throughout the seasons of 1984 to 1988 on the Canadian Beaufort Sea shelf and Mackenzie River estuary in an area extending from the inshore reaches of the Mackenzie River estuary, including Tuktoyaktuk Harbour and Mason Bay, out to about the 200 m isobath and bounded to the west by Herschel Island and to the east by Amundsen Gulf (Fig. 1). The objectives of Subproject B.2.1 are:

1. to conduct research towards identifying, in spatial and temporal terms, areas of significance to marine and estuarine fish species of the Beaufort Sea shelf;
2. to characterize these areas in terms of community composition, and in terms of chemical, physical and biological parameters; and
3. to describe the feeding habits of selected fish species in relation to habitat and season.

The Beaufort Sea shelf region is significant habitat for marine mammals (Würsig et al. 1985; Norton and Harwood 1985), and estuarine and marine fishes (Craig 1984; Lawrence et al. 1984; Bond and Erickson 1989). Biological data for Subproject B.2.1 included algae sampled from the under-ice surface, zooplankton and ichthyoplankton collected during ice cover and open water, and fish sampled during ice cover (Chiperzak et al. 1991) and open water. The zoo- and ichthyoplanton data is either reported (e.g. Chiperzak et al. 1990; Hopky et al. 1994a) or in preparation for reporting (Hopky, pers. comm.). The data reported here assist in the delineation of fish and marine mammal habitats, and represent the final component of the physical and chemical data to be reported for this Subproject. Related physical (e.g. salinity, temperature) data (e.g. Hopky et al. 1988a), and chemical (e.g. nutrients, dissolved oxygen, silica) and biological (e.g. chlorophyll a) data (Lawrence et al. 1991) are already reported.

Subproject B.2.3 was conducted in March 1985 to 1988, in Tuktoyaktuk Harbour and Mason Bay, located on the eastern side of the Mackenzie River estuary (Fig. 1). The objectives of Subproject B.2.3 are:

1. to characterize the meiobenthic and macrobenthic communities, to determine the extent of interannual variability in numbers and biomass of these communities, and to relate these results to chemical and physical attributes in the sediment and water column; and
2. to develop sampling and analysis methods and to evaluate approaches for future effects-monitoring programs.

Subproject B.2.3 involved the collection of macrobenthos (>500 µm screen) and meiobenthos (64 and 212 µm screens). The contribution of this Subproject to the goal of NOGAP B.2 was to provide baseline biological data on the benthic invertebrate populations found in bays along the Beaufort Sea coast. These coastal bays are often characterized by restricted water circulation with the adjacent shelf waters (Barber 1968), but never the less, provide critical habitat for estuarine, marine and freshwater fish (Bond 1982; Lawrence et al. 1984; Hopky and Ratynski 1984). The biological and related physical (e.g. sediment) data is reported in Hopky et al. (1994b), while the water column salinity and temperature data are reported in Hopky et al. (1990), and related water column chemical data (e.g. nutrients, pH, dissolved oxygen, etc.) in Lawrence et al. (1993).

The data reported here is not distinguished with respect to its Subproject of origin. However, in general, the open water period Beaufort Sea shelf and Tuktoyaktuk Harbour data, and the ice cover period Beaufort Sea shelf data are from Subproject B.2.1; while the ice cover period Tuktoyaktuk Harbour and Mason Bay data are from Subproject B.2.3. The data reported here includes the following:

1. continuous near-surface water temperature data from a stationary buoy near Tuktoyaktuk, for open water periods during 1985 to 1987;
2. in situ water column profiles of fluorescence data from all study areas, during 1986 to 1988;

3. in situ open water sea surface transects of fluorescence data from the Beaufort Sea study area, during 1986;
4. in situ water column profiles of photosynthetically available irradiance (PAR) data from all study areas, 1985 to 1988;
5. continuous solar irradiance data from DFO's Tuktoyaktuk base camp, for various times throughout 1986 to 1988;
6. chlorophyll a biomass and total suspended solids data from ice cores of the landfast ice from the Beaufort Sea study area, 1986 to 1988;
7. snow depth data from ice core sampling stations located on the landfast ice from the Beaufort Sea study area, 1986 to 1988; and
8. algae community composition and density data from ice cores of the landfast ice from the Beaufort Sea study area, 1986 to 1988.

METHODS

STATIONS AND POSITIONING

Locations were designated on the basis of year, and station sample names were generally assigned sequentially in chronological order within year. An example of a typical station is 86033; this refers to the year 1986, with 033 referring to the station number assigned for 1986.

Subproject B.2.1

Samples were collected primarily along the coastal margin of the Beaufort Sea shelf and in Tuktoyaktuk Harbour and Mason Bay. During the ice-on sampling periods of March or May, stations were established by the objective of the primary research program, which was to sample the epontic algal community of the landfast ice under different salinity regimes along the coastal shelf. Station locations were often dependent on ice conditions, particularly near the interface of the landfast ice with the sea ice. A DH6 (Twin Otter) aircraft equipped with wheel skis was used for sampling from the ice surface, and station coordinates were determined using a Global Navigation System on the aircraft. Two stations, 88001 and 88002, were reached using ground vehicles. Coordinates for 88001 were determined by proximity to shoreline features and land maps (NTS series; 1:50 000), and those for 88002 with aircraft flypasts.

During the open water periods, the primary research program was plankton sampling and stations were established accordingly throughout the coastal shelf, and in Tuktoyaktuk Harbour. The MV Sequel, a wooden hulled 12 m vessel, was chartered as the sampling platform. The Sequel had a sailing range of about one week, and selection of sampling stations was often constrained by the vessel's small size and hull construction. Station coordinates were determined using a combination of radar (Furuno Model CR240) fixes to shore, bathymetric charts and satellite navigators (1985 - Magnavox Model MX4102; 1986 to 1988 - JRC Model JLE-3850) with nominal accuracy of ±0.1 km.

Summary data for stations sampled on the Beaufort Sea shelf and in Tuktoyaktuk Harbour for each of 1985 to 1988 are given in Tables 1-4, respectively. Station locations are illustrated in Fig. 2-9.

Subproject B.2.3

Samples were collected in Tuktoyaktuk Harbour and Mason Bay during the ice-on period of March. Station locations were selected on the basis of pre-determined depth strata, bottom gradient and sediment texture consistent with the sampling design for the macro- and meiobenthos. The protocol for sampling the benthos necessitated that station positions be relocated intra- and inter-annually with a high degree of confidence. All stations in Tuktoyaktuk Harbour and Mason Bay were located using a detailed procedure outlined in Hopky et al. (1990). To summarize, in 1986, after locating semi-permanent reference points on land, an infrared rangefinder system (Sokkisha Red Model 2L) was used in combination with a theodolite (Wild TI 70 Series) to precisely position the sampling station. Repeat sampling occurred at each of these stations in subsequent years.

Summary data for stations sampled in Tuktoyuktuk Harbour and Mason Bay are summarized in Tables 3 and 4 for 1987 and 1988, respectively. Station locations are shown in Figs. 10 and 11 for Tuktoyaktuk Harbour and Mason Bay, respectively.

SAMPLE COLLECTION, PROCESSING AND ANALYSIS

Sea-surface temperature buoy

A Ryan Model J-90 submersible analog thermograph (-5 to +25°C range, ±0.3°C accuracy) with 90 day quartz timing mechanism (±0.2% accuracy) was moored at stations 85101 and 86034 on 18 July, 1985, and 16 July, 1986, respectively. The thermographs were retrieved on 03 September, 1985, and 12 September, 1986, respectively. In each case, the units were tethered so that the temperature sensor was 15-30 cm below the water surface.

A Ryan Tempmentor submersible digital recording thermometer, (-32 to +70°C range, ±0.3°C accuracy) with internal quartz clock supported by IBM compatible RTM Version 1.02 software was deployed at station 87014 on 17 July, 1987, and retrieved on 02 September, 1987. As with the analog thermographs, the digital unit was tethered so that the sensor was submerged 15-30 cm below sea surface.

Analog temperature records from 1985 and 1986 were manually transcribed at four hour intervals into numeric data format. Digital temperature data from 1987 were electronically logged at 20 minute intervals and were subsequently electronically processed with the RTM supporting software.

Fluorescence data

A Turner Designs Model 10-005R continuous flow fluorometer with 10-040 light source and optical filters for chlorophyll a excitation, equipped with a Model 10-010 strip recorder, was used to take in situ measurements of water column chlorophyll a fluorescence (detection limit = ±0.005 expressed as $\mu g \cdot L^{-1}$ chlorophyll a; response time = 4 s; to 98% accuracy). The fluorometer was powered by a 12 volt DC source. A 0.25 HP 110 volt AC water pump was installed on the outlet side of the cuvette, so that water was drawn through the cuvette with minimum bubble interference.

Fluorescence profiles were obtained by lowering a weighted, 1.27 cm inside diameter, black rubber garden hose, connected to the inlet port of the fluorometer, to total depth (1 m above the bottom to a maximum depth of 27.5 m). The pump was then turned on and after allowing time for the hose to purge, fluorescence was recorded at discrete depth intervals from bottom to top. As depth permitted, profile intervals were as follows: surface, 2, 4, 6, 8, 10, 12.5, 15, 17.5, 20, 22.5, 25, and 27.5 m.

The fluorometer was not calibrated against a chlorophyll a concentration standard. However, water samples taken from the standard bottle casts at each station (Lawrence et al. 1991, 1993) may be used to derive within-station fluorescence-chlorophyll a concentration relationships. Sensitivity adjustment of the fluorometer was kept constant within each sampling period, however, adjustments from year-to-year were made. For this reason, fluorescence data obtained for a particular profile should not be compared with data obtained from different time periods, until data are standardized using chlorophyll a data from Lawrence et al. (1991, 1993).

In 1986 sea-surface fluorescence data were collected along 13 tracks (1-4 km in length) while the vessel was in transit to and from Tuktoyaktuk. The vessel's sea-water intake was valved into a large poly-tub to enable any entrained air bubbles to escape. From the bottom portion of the tub, water was suctioned to the fluorometer and a continuous fluorescence record was obtained. Vessel position and time were recorded at the beginning and end of each track. The analog data record obtained was manually converted to numerical data at 10 minute intervals along the record.

Photosynthetically available radiation (PAR) data

Continuous data - Tuktoyaktuk: Solar irradiance (PAR) was measured with a quantum sensor (Li-Cor Model LI-190S) mounted on the roof of the DFO field laboratory in Tuktoyaktuk (69°26.3'N, 133°2.1'W). The data were recorded on a Lambda Instruments LI-550 printing integrator. Quantum sensor output ($\mu E \cdot m^{-2}$) was integrated over a one hour period and continuously recorded for the following periods: 12 to 23 May and 8 July to 21 September, 1986; 17 May to 16 September, 1987; and, 13 March to 13 August, 1988. Light data were integrated and recorded over a 24 hour period for the period 24 May to 7 July, 1986.

Light data for each of the periods of record were transformed and reported as averaged daily (for the full 24 hour day) instantaneous irradiance measurements expressed as $mE \cdot m^{-2} \cdot min^{-1}$ (Fee 1990).

Open water season water column profiles (WCP): In 1985, in situ water column profiles of solar irradiance (PAR) were measured with a Licor LI-192S underwater quantum sensor used in conjunction with a sensor-calibrated Licor LI-188 light meter. Light measurements were made on the "sunny side" of the vessel and proceeded as follows: a light reading was first recorded in air at the water surface, following which, light readings were made at 0.5 m depth intervals from surface to 5 m, and at 1 m intervals to the maximum depth at which readings could be made. Light readings at each depth interval were the average of sensor output over a 10 second integration period. Meter output ($\mu E \cdot m^{-2} \cdot sec^{-1}$) was transformed and reported in $mE \cdot m^{-2} \cdot min^{-1}$ units to a depth at which readings were consistently (normally three readings) < 0.1 $mE \cdot m^{-2} \cdot min^{-1}$.

In 1986 and 1987, in situ solar irradiance profiles were measured with a Licor LI-192SA underwater sensor and an LI-190SA "deck" sensor in conjunction with a Licor LI-1000 light meter/logger configured to permit manual logging of light readings averaged over a 10 second integration period. Sensors were recalibrated in each year. Data were output in ASCII format via the RS232 communication port to a micro-computer. The same profile and data transformation procedures were followed in 1986 and 1987 as in 1985, except that a calibrated-for-air "deck" sensor was placed in an unshaded area of the vessel so that surface irradiance was measured in conjunction with each water column interval reading. Light readings were made at 0.5 m depth intervals from surface to 10 m, and thereafter at 1 m intervals to the maximum depth at which readings could be made. The data logger was internally configured to calculate and record the ratio of underwater-to-surface light readings for each depth interval. This provided an instant, real-time indication of the light attenuation properties of the water column under the full range of incident light conditions. Profile output (in $mE \cdot m^{-2} \cdot min^{-1}$) was reported as follows: 1) from surface to the depth at which water-to-surface ratio was consistently <0.001 (normally three readings); 2) from surface to bottom; or 3) from surface to maximum wire length (29 m).

Through the ice water column profiles: Solar irradiance (PAR) profiles were conducted through the ice in March and May, 1987, and in March, 1988. Two profiling techniques were employed in each of the sampling periods. When water column light measurements were not done in conjunction with ice-algae sampling (1987 and 1988 profile sample numbers 1 to 12, Tables 3 and 4, respectively) procedures were identical to those used during open water profiling. The first reading was with the underwater sensor at the air-water interface in the ice hole.

When water column measurements were made in conjunction with ice algae sampling (1987 profile sample numbers 13 to 37, and 1988 profile sample numbers 13 to 26, in Tables 4 and 5, respectively), the first light reading was taken below the surface at the ice-water interface (as opposed to the air-water interface in the ice hole), and was offset horizontally 1.2 m from the hole. Profiling sequence was the same as for open water.

Ice-algae and light (PAR) attenuation (pre- and post-scrape data): A lead counter-weighted, articulated arm was constructed of 2.5 cm square tubular aluminum to the end of which was attached the Licor LI-192SA underwater sensor, fitted with a coarse-toothed hole saw blade that projected just above the light sensor element. The articulated arm was lowered through a 20.3 cm diameter hole in the ice, and once clear of the hole, the light sensor end of the arm was carefully swung vertically into a "looking-up" position at the ice-water interface, 1.2 m away from the centre of the ice hole. The surface sensor was placed on the ice surface in an unshaded location. At this point light readings (the average of sensor output over a 10 second integration period) from the LI-190SA surface sensor and the under water sensor were logged as "Pre-scrape" data on the LI-1000 data logger. The arm was then swung back and forth in a small arc, so as to scrape the under-surface of the ice. Scraping was stopped when the surface felt smooth and hard. A second reading was then logged as "Post-scrape" data. The data logger was internally configured to calculate and record the ratio of underwater-to-surface light intensity for each reading. This provided a measure of the solar irradiance at the ice-water interface in the presence and absence (i.e. pre- and post-scrape, respectively) of algal growth. This sequence of pre-scrape and post-scrape was repeated in the centre of each 90° quadrant around the ice hole.

Comparisons of the sensitivity of the surface (LI-190SA) sensor to the underwater sensor with hole-saw blade attached, were made on a number of occasions in 1987 and 1988 by placing the two sensors side-by-side and recording light readings from each.

Comparisons of the sensitivity of the surface (LI-190SA) sensor with the Biospherical QSL-100 light sensor used in primary production experiments (Hopky, pers. comm.), were made in 1988 by placing the two sensors side-by-side under high and low light conditions and recording light readings from each.

Chlorophyll a determination and ice-algae sampling

Concentration of chlorophyll a in ice cores: A 10.16 cm diameter Sipre corer was used to obtain undisturbed samples of the bottom surface of the ice at locations along the landfast ice of the Beaufort Sea study area in March and May of 1986 and 1987, and in March, 1988. Core lengths were recorded in 1987 and 1988. In most cases cores were 5 cm in length, unless the ice was extremely hard, in which case a shorter core section was cut.

Five ice-coring stations were established in 1986 (three in March and two in May), and at each station, 10 to 30 ice-core sample sites were established based on snow-depth distribution at the station. Holes were then drilled to within 20-60 cm of the bottom surface of the ice at each selected site using an electric powered 20.3 cm diameter auger. The Sipre corer was then used to obtain an ice core, which was immediately cross-sectioned with a hand saw and mitre box so that the bottom portion of the core was retained. Lengths of individual cores retained were not measured, but were estimated to range from approximately 2-10 cm with an average length of 5 cm. A smaller 5.08 cm diameter core was subsequently removed from the centre portion of each Sipre core to obtain samples with as uniform a surface area as possible. The small cores were placed in numbered "Whirl-Pak" bags and immediately placed in a dark cooler. At each core site, snow depth and ice thickness were recorded. A systematic snow depth distribution survey was conducted over the station area within which all cores were taken. Between 190 to 400 snow depth measurements (±1 cm) were measured at approximately 5 m intervals along transects spaced 5-10 m apart.

Ten ice-coring stations were established in 1987 (six in March and four in May). Sampling procedures were the same as for 1986 except that each core-section length was recorded. Most cores were 5 cm long. Five ice-coring stations were established in March 1988. Sampling procedures were the same as for 1987 except that a visual assessment of the integrity of the bottom surface area of each sub-core was recorded.

In the laboratory in Tuktoyaktuk, ice-cores were allowed to melt in the dark, immediately after which the melted volume was measured, and then filtered through Whatman GF/C glass fibre filters, with several rinses of distilled, deionized water. Filters were placed in individual disposable plastic petri dishes, wrapped in aluminum foil and kept frozen, and shipped to DFO's Winnipeg laboratory. Chlorophyll a was determined fluorometrically with a Turner Model 111 following dark extraction in 95% methanol for a minimum of 16 hours (modification of Stainton et al. 1977).

Suspended solids in ice data: An electric powered 20.3 cm diameter auger was used to obtain ice samples for purposes of evaluating ice clarity as measured by the suspended particulate matter in the ice. First the area to be sampled was scraped clean of snow and then using a clean shovel, ice chips augured out of the hole were placed in labelled, clean poly-bags. All the ice was removed from the top 80-90% of the hole, following which a solid ice core was removed from the bottom portion (20-30 cm), with the Sipre corer. The core was processed for chlorophyll a determination as described in the preceding section.

The bagged-ice was returned to the laboratory in Tuktoyaktuk where it was allowed to melt. In 1987, the total melted sample (10-22 L) was filtered in measured batches, through a number of pre-washed and pre-weighed 47 mm diameter, 0.4 µm Nuclopore filters using standard Millipore filtration apparatus. The maximum vacuum was <150 mm Hg for particulate weight determination. Filters were stored in new petri dishes in a freezer and shipped to DFO's Winnipeg laboratory for dry weight determination (Stainton et al. 1977). Precision of the dry-weight determination is 0.5 $mg \cdot L^{-1}$ at 8 $mg \cdot L^{-1}$ particulate concentration. Volumes filtered met operating range accuracy criteria for dry weight determinations (minimum 2.5 mg solids per filter). The total weight of particulates retained on all filters was summed and divided by the total melted-ice volume to provide a mean of the total suspended solids (TSS) concentration ($mg \cdot L^{-1}$) of the ice core.

In 1988, the volume of melted ice from the sample holes was determined, and following thorough mixing in a 25 L container, a 1.00-1.24 L aliquot was removed for TSS determination. The concentration of solids in the sub-sample was then used to back-calculate the total particulates present in the ice core.

Ice algae species distribution and abundance: Cores were taken from a number of sites at ice-core stations sampled in 1986, 1987 and 1988, and preserved in Lugol's solution. To make statistically valid assessments of phytoplankton abundance in the melted core samples, a sub-sample was settled and examined using an Olympus inverted microscope. First, a volumetric measurement (±1 mL) was taken of each sample. Then, a 0.5-10.0 mL sub-sample was removed from each well-mixed sample to determine cell concentration and for scanning electron microscope examination. The amount settled provided approximately 500 cells for counting. An inverted microscope was used to identify and enumerate phytoplankton individuals. Sixty (60) fields were examined at 400x (Smayda 1978). From the counts, the total number of cells was calculated in each core sub-sample. Depending on the volume (of the sub-sample) settled, the number of cells counted was multiplied by a factor (1 mL = 73 966; 2 mL = 36 983; 5 mL = 14 360; 10 mL = 7 184; H. Kling, Freshwater Institute, Winnipeg, pers. comm.) to provide an estimate of the number of $cells{\cdot}mL^{-1}$ in the melted sample. Based on density estimates, the number of cells/core sample was calculated.

Alternatively, when cell densities appeared to be very low, one-half the slide containing the settled cells was examined at 100x. The number of cells per core sample was then calculated by multiplying the number of cells per half-slide x 2, then dividing by the sub-sample size (1-10 mL) and multiplying by the melted core volume.

Results on abundance of each species were reported as **Rare** ($cell{\cdot}mL^{-1} \leq 5$); **Common** ($cell{\cdot}mL^{-1} \geq 6$ but ≤ 50); **Abundant** ($cell{\cdot}mL^{-1} \geq 51$ but ≤ 100); and **Very Abundant** ($cell{\cdot}mL^{-1} \geq 101$).

Phytoplankton were identified with the assistance of a number of taxonomic references (Balech 1974; Cleve-Euler 1951-1955; Horner 1985; Hsiao 1983; Hustedt 1930a, 1930, 1959; Lebour 1930; Schiller 1933, 1937). Phytoplankton were identified to species where possible using a compound light microscope, or a scanning electron microscope (SEM). All specimens were assigned numeric codes based on a catalogue and systematic list developed for NOGAP Subprojects B.2.1 and B.2.3 (Hopky et al. 1994c).

For SEM observation, a concentrated sample was either rinsed and air dried, cleaned using 30% H_2O_2 and $KMnO_4$ then rinsed and air dried, or critical point dried using a biorad polaron cpd. The samples were then coated with gold using a biorad polaron sputter coater. The samples were then examined using an Hitachi S-500 scanning electron microscope.

RESULTS

A summary of all stations sampled and measurements made at each station sampled from 1985 to 1988 are shown in Tables 1 to 4, respectively. Note that all sampling times reported in these and subsequent tables are local time (Mountain Time; daylight-saving for March, and standard time for the remaining months). In 1985, 41 stations were occupied during the period 21 July to 12 August. In that year, water column fluorescence data, ice coring and snow depth measurements were not components of the field program. In 1986, 63 stations were sampled between 23 March and 20 September. During the period of ice cover, ice algae species composition and abundance data were collected along with ice chlorophyll a concentration data in relation to snow depth. During open water, water column light (PAR) and relative fluorescence measurements were made in relation to depth. Data for PAR profile numbers 1, 35, 37 and 38 are not given because each profile is represented by only one reading at the water's surface, prior to light extinction at each station. In 1987, 59 stations were sampled between 05 March and 30 August. Measurements of irradiance (PAR) at the sub-surface ice-water interface, before and after scraping to remove algal growth (PPS), and measurements of ice total suspended solids concentration, were added to the suite of measurements made during the period 19 March to 12 May period of ice-cover sampling. In 1988, 20 stations were sampled between 07 and 24 March. Sampling was similar to that done in March, 1987.

Sea surface temperature data from the temperature buoys deployed in Kugmallit Bay each open water season of 1985 to 1987 are shown in Tables 5 to 7, respectively. The buoys were deployed at approximately the same location each year, that was within the influence of the fresh water plume of the Mackenzie River. The temperature data reflect this influence, and the occasional upwelling of colder offshore water that would occur depending on wind direction (usually with a southern component) and duration. Analysis of the data over a similar period of record for each year (18 July to 01 September) showed that mean water temperature (11.0, 12.1, and 12.3°C for July and 9.0, 10.4, and 10.9°C for August of 1985, 1986, and 1987, respectively) reflected the relative ice-cover situation in those years, with 1985 being one of the worst ice years on record and 1987 being one of the best (Fissel and Melling 1990).

In situ measurements of water column chlorophyll a fluorescence measured in 1986, 1987 and 1988 are shown in Table 8 to 10, respectively. In their present state these data are useful for examining within-profile relative differences in chlorophyll a concentration. Empirical relationships between these data and chlorophyll a data derived from bottle casts (Lawrence et al. 1991, 1993) need to be established prior to examining temporal and spatial differences in chlorophyll a as represented by the fluorescence profile data.

A summary of in situ sea surface fluorescence transect date and location data are shown in Table 11 along with the interval distance along the transect where fluorescence measurements were made. Table 12 shows the surface fluorescence data which are depicted in Fig. 12. Transects 1 to 5 were conducted on 21 August, 1986 while in transit east to west from a point northwest of Cape Dalhousie towards McKinley Bay (Fig. 1), ending near station 86072. The transect data show an increase in fluorescence with proximity to the Mackenzie River (Fig. 12). Chlorophyll a concentration determined from water samples taken at station 86072, ranged from 0.05 $mg \cdot L^{-1}$ near the surface, to 0.37 $mg \cdot L^{-1}$ at 15 m depth (Lawrence et al. 1991). Transects 6 to 10 were done in Kugmallit Bay while in transit to and from the Pullen Island area on 09 and 10 September. Transects 11 to 13 were done on 10 September on transit around the head of Pullen Island. For transects 6 to 13, surface fluorescence was lowest in the high turbidity and fresher water area of Kugmallit Bay and progressively increased to its highest level in the brackish/marine zone near Pullen Island. There were no adjacent stations to provide comparative chlorophyll a data for these latter transects.

Average daily photosynthetically available irradiance (PAR - $mE \cdot m^{-2} \cdot min^{-1}$) measurements made at Tuktoyaktuk in 1986 to 1988 are shown in Tables 13 to 15, respectively. Comparison of mean daily total PAR expressed as $mE \cdot m^{-2} \cdot day^{-1}$ for each month and year of record (Table 16) show that the summer of 1986 and 1987 had considerably more cloud cover than 1988.

Water column profiles of PAR for 1985 to 1988 are shown in Tables 17 to 20, respectively. Note that when calculating extinction coefficients for 1986 to 1988 data, more accurate results may be obtained by calculating the negative slope of the linear regression of the logarithm of the ratio of deck sensor light reading to water sensor light reading, as a function of depth. In 1985, where a single sensor was used, extinction coefficients would be calculated as the negative slope of the linear regression of the logarithm of light as a function of depth (Fee et al. 1988). Some extinction coefficients calculated from 1986 light-ratio data from nearshore waters in the influence of the Mackenzie River plume (Table 21) were in the range of 0.2-0.7. These were associated with Secchi disc readings in the 1.2-0.3 m range. A typical offshore station beyond the influence of the river (Station 86068) had an extinction coefficient of 0.04 and a Secchi disc reading of 14.8 m. Secchi readings and salinity values were obtained from Hopky et al. (1987).

Measurements of irradiance (PAR) at the sub-surface ice-water interface, before and after scraping to remove algal growth that were made in March and May, 1987 and March, 1988 are shown in Tables 22 and 23, respectively. Examination of the 1987 data indicates that light penetration to the ice-water interface is negatively correlated with snow depth, and that the difference in light penetration pre- and post-scrape may be negatively correlated with both snow depth and salinity.

Comparisons of light readings in air of the surface sensor and the underwater sensor fitted with the ice scraper that were done in 1987 and 1988 are shown in Tables 24 and 25, respectively. In the majority of cases readings were similar, however, sun angle appears to have reduced the light reading with the scraper-fitted sensor in a number of cases. It is expected that the diffusion of light through the ice surface would have eliminated this problem when the underwater sensor was in position under the ice surface.

One hundred and twenty-seven species of algae were identified from ice core samples collected during 1986 to 1988. Names and phylogeny are shown in Table 26. Also shown is the species code that was assigned each species in the electronic data base. Dominant ice algae taxa at each sampling location, with associated surface salinity (i.e. at ice/water interface) and snow depth data, are shown in Tables 27 and 28 for March and May periods, respectively. Data were taken from algal species relative abundance data shown in Tables 29 to 31 for collections made in 1986 to 1988, respectively. Salinity data are from Hopky et al. (1987, 1988a,b). Snow depth and other data collected in association with the ice cores sampled for algae community data are shown in Table 32.

Ice core chlorophyll a concentration data from samples collected in 1986 to 1988 are shown along with snow depth and ice thickness data, in Tables 33 to 35, respectively. Chlorophyll a concentration data ($\mu g \cdot L^{-1}$) were converted to areal density units ($mg \cdot m^{-2}$) to compensate for the difference in volume of melted ice cores; whether because of different core lengths between cores, or differences in core porosity and texture.

Assessments of the clarity of ice using TSS, at selected locations in 1987 and 1988 are shown in Tables 36 and 37, respectively. Observations made in the field at the time of sampling, suggested that at locations where ice algae would otherwise be expected to occur (i.e. with underlying estuarine/ marine waters, low snow depth), there was a negative correlation between ice algae abundance and the visible presence of particulate matter in ice.

Snow depth frequency data that were collected at each station sampled for ice algae or ice core chlorophyll a content, are shown in Tables 38 to 40 for years 1986 to 1988, respectively. These data will be useful for extrapolating finer scale, ice core chlorophyll a and site-snow-depth statistics, to a broader, station-scale statistic.

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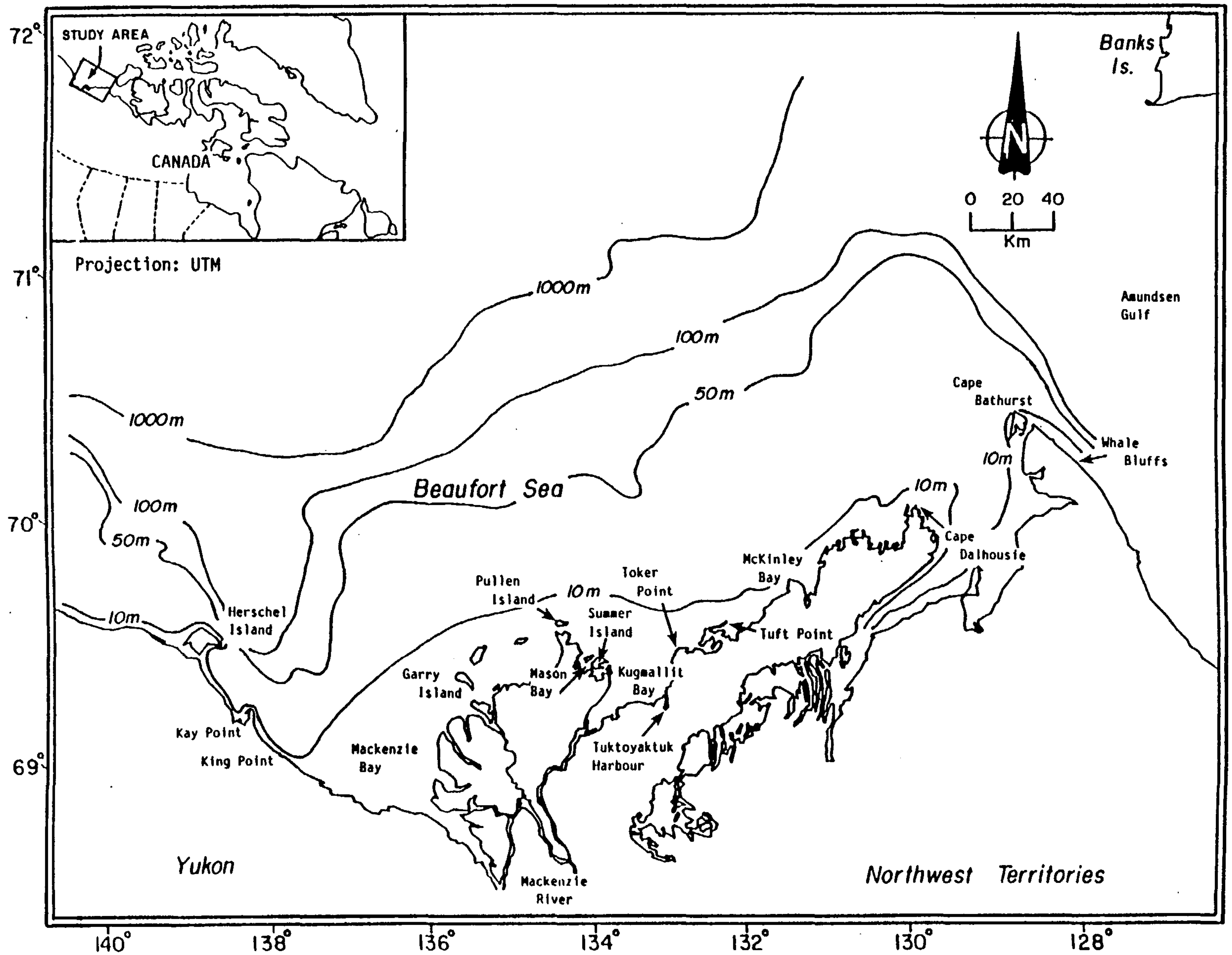

Fig. 1. Location of study area for NOGAP Subprojects B.2.1 and B.2.3.

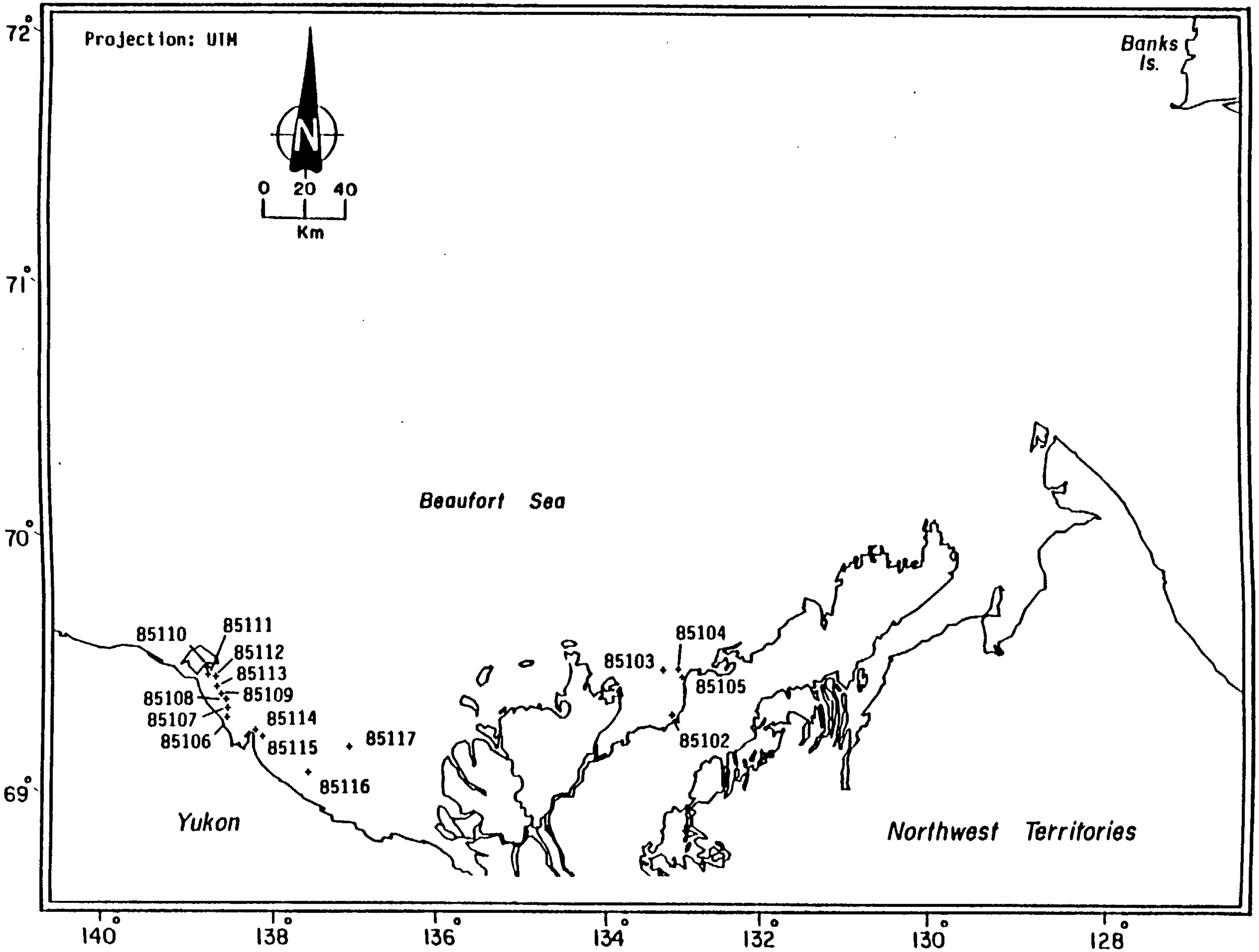

Fig. 2. Location of stations sampled on the Beaufort Sea shelf in July, 1985.

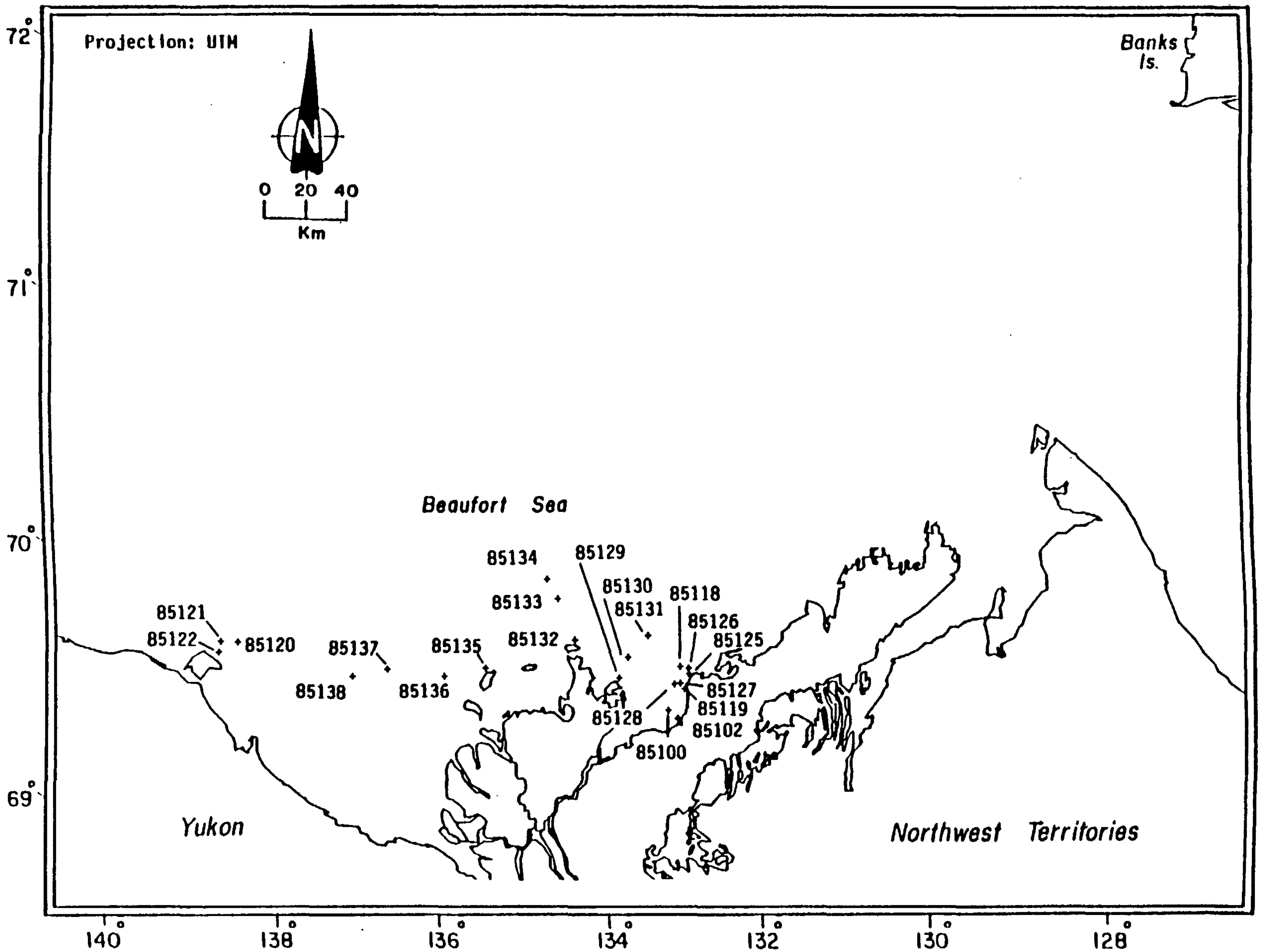

Fig. 3. Location of stations sampled on the Beaufort Sea shelf in August, 1985.

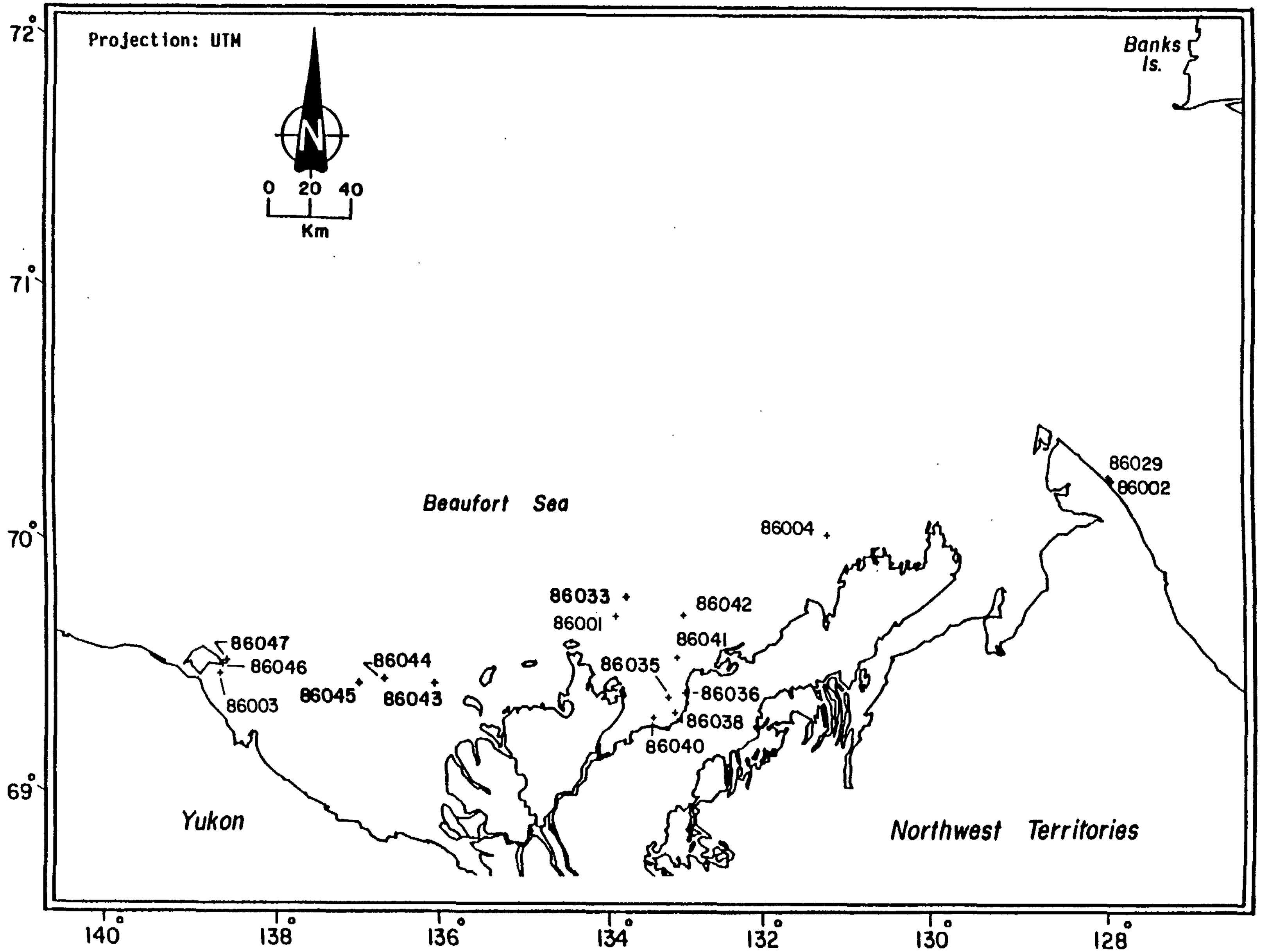

Fig. 4. Location of stations sampled on the Beaufort Sea shelf in March to July, 1986.

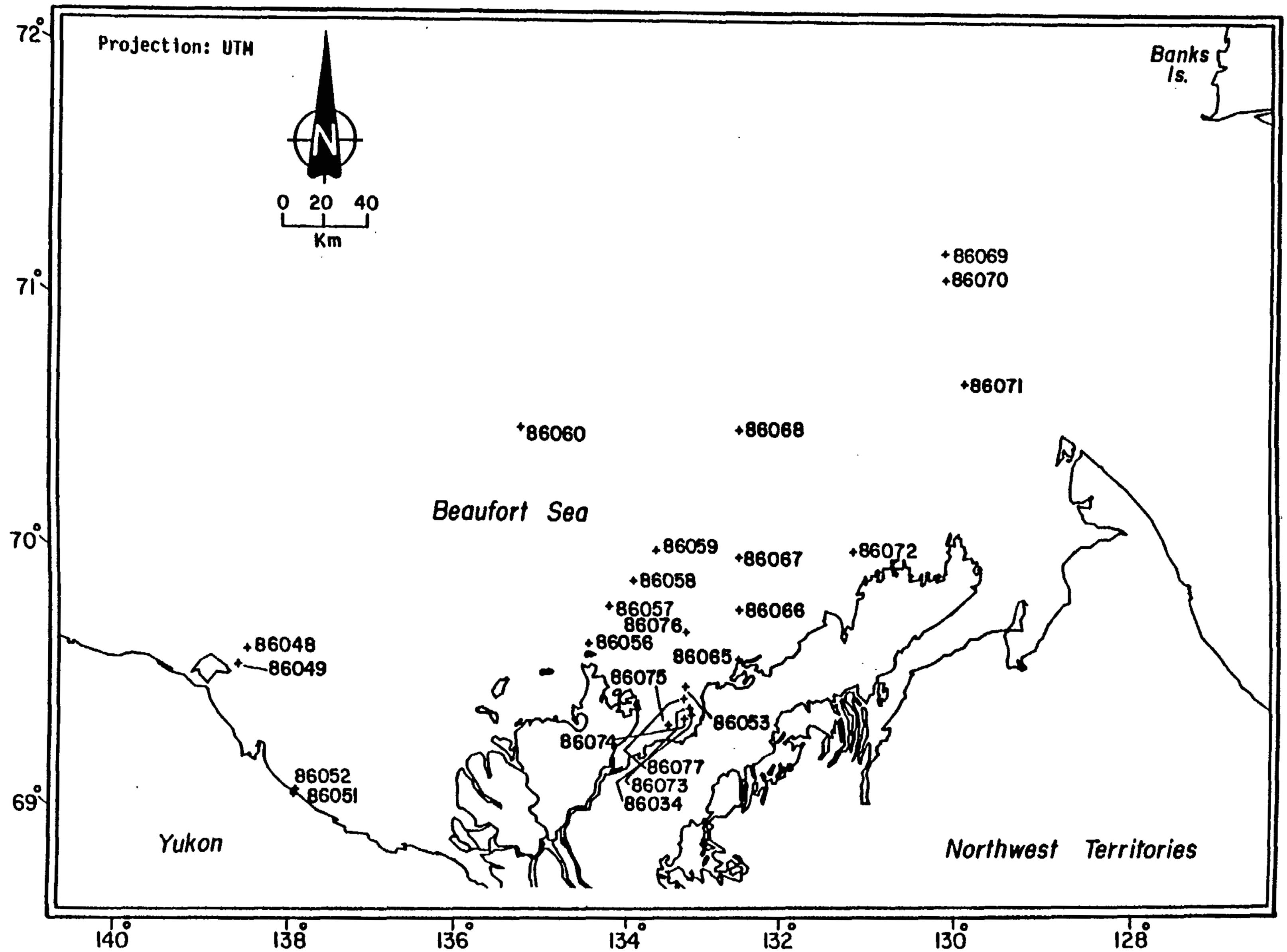

Fig. 5. Location of stations sampled on the Beaufort Sea shelf in August, 1986.

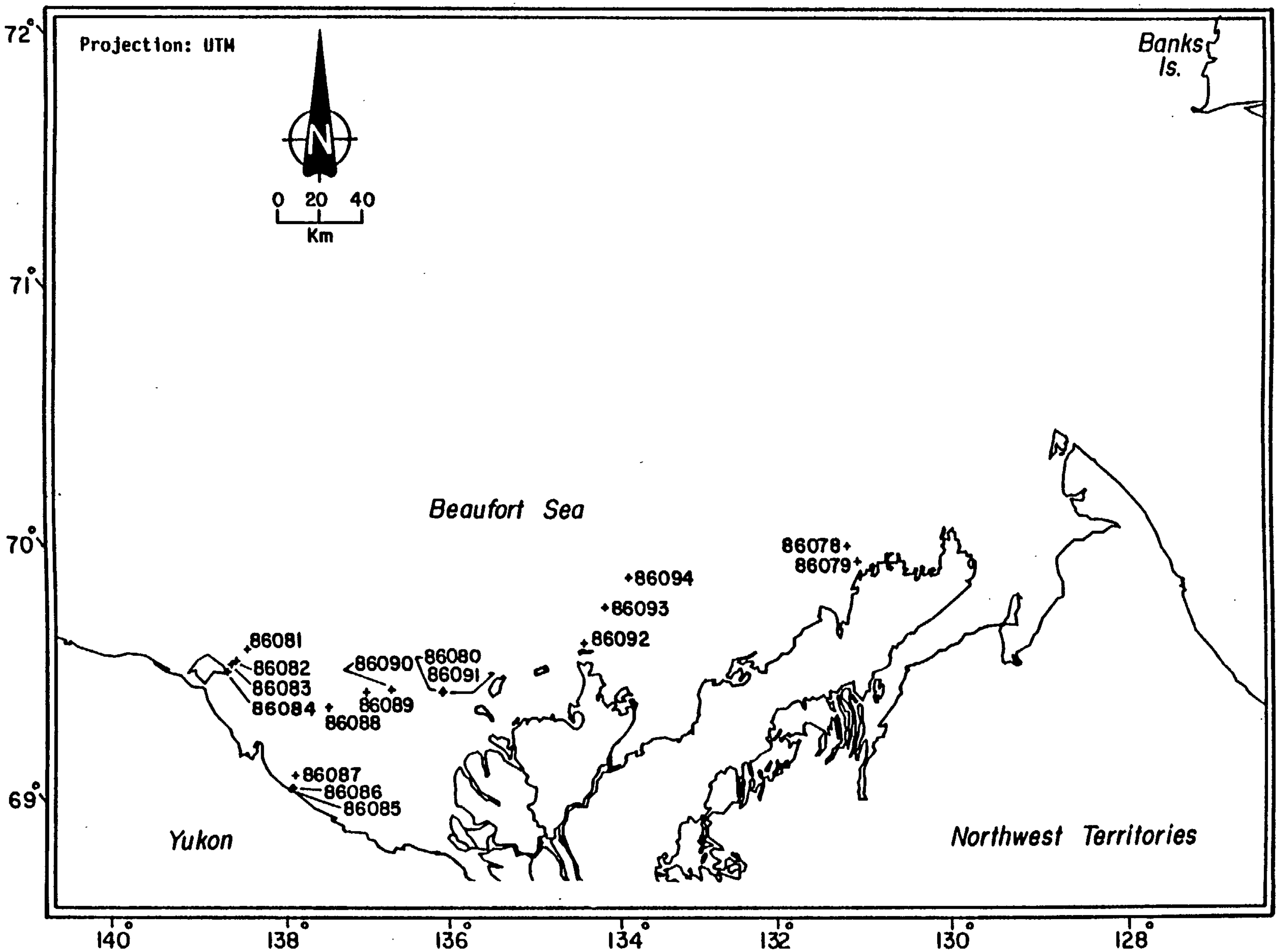

Fig. 6. Location of stations sampled on the Beaufort Sea shelf in September, 1986.

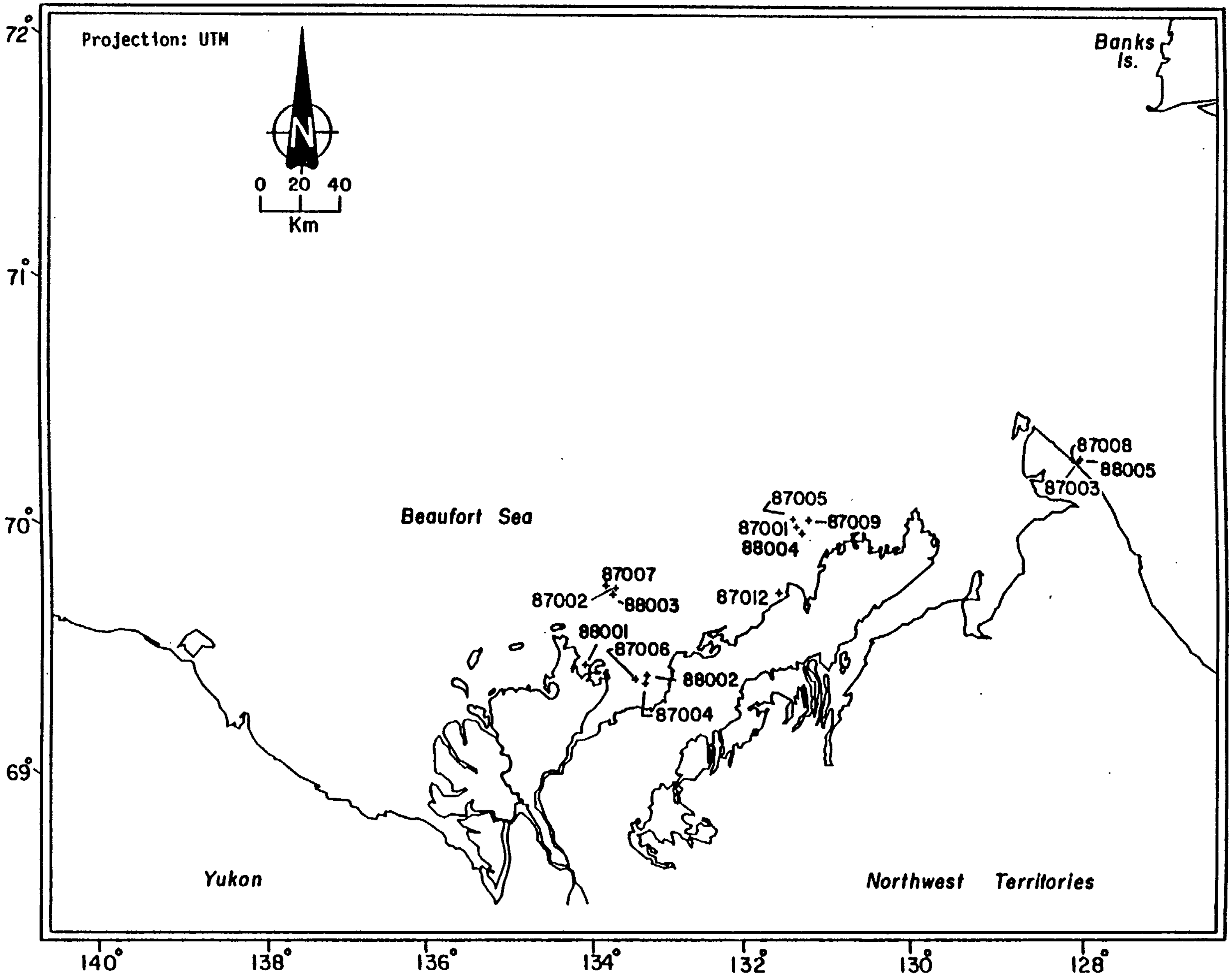

Fig. 7. Location of stations sampled on the Beaufort Sea shelf in March and May, 1987, and March, 1988.

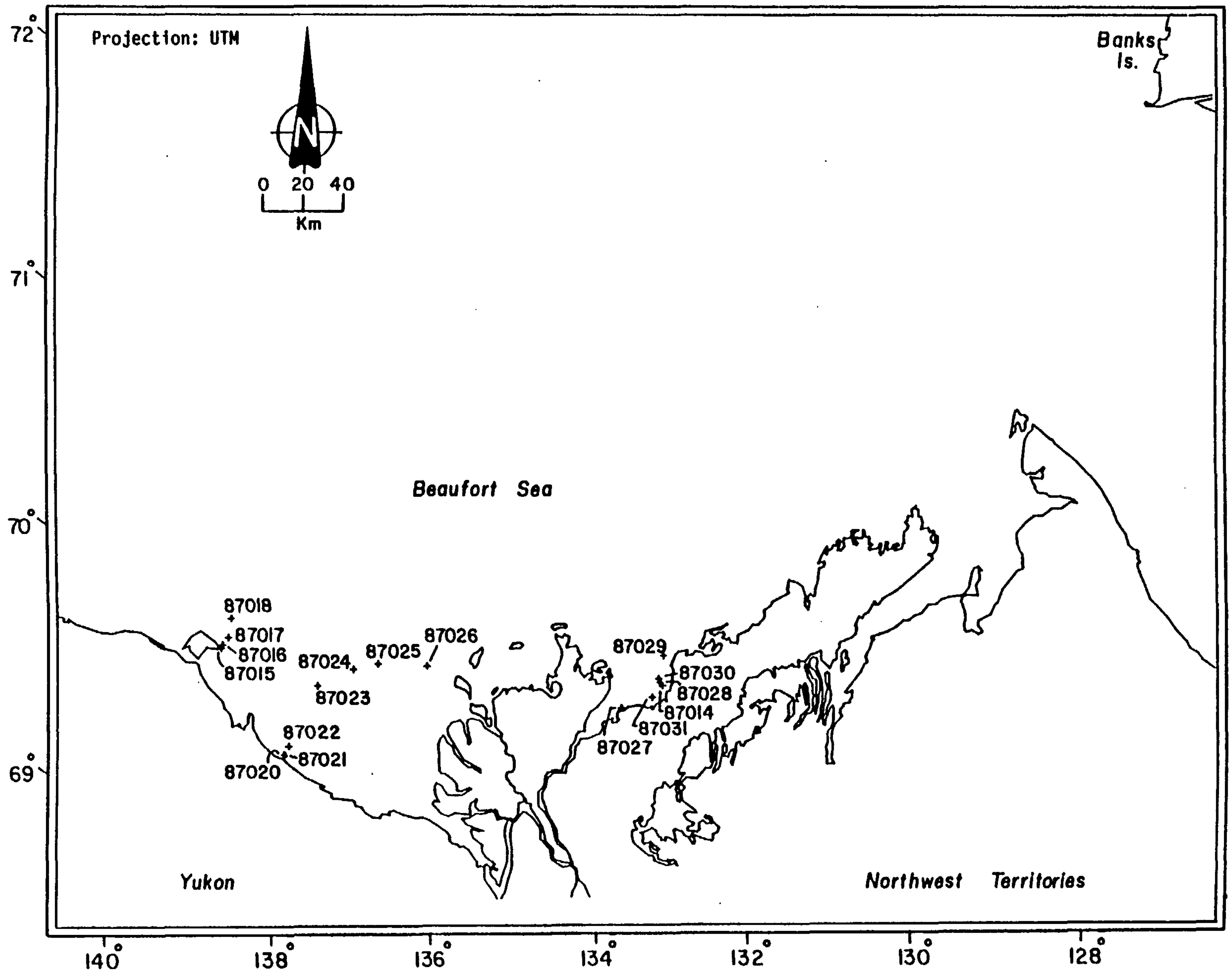

Fig. 8. Location of stations sampled on the Beaufort Sea shelf in July, 1987.

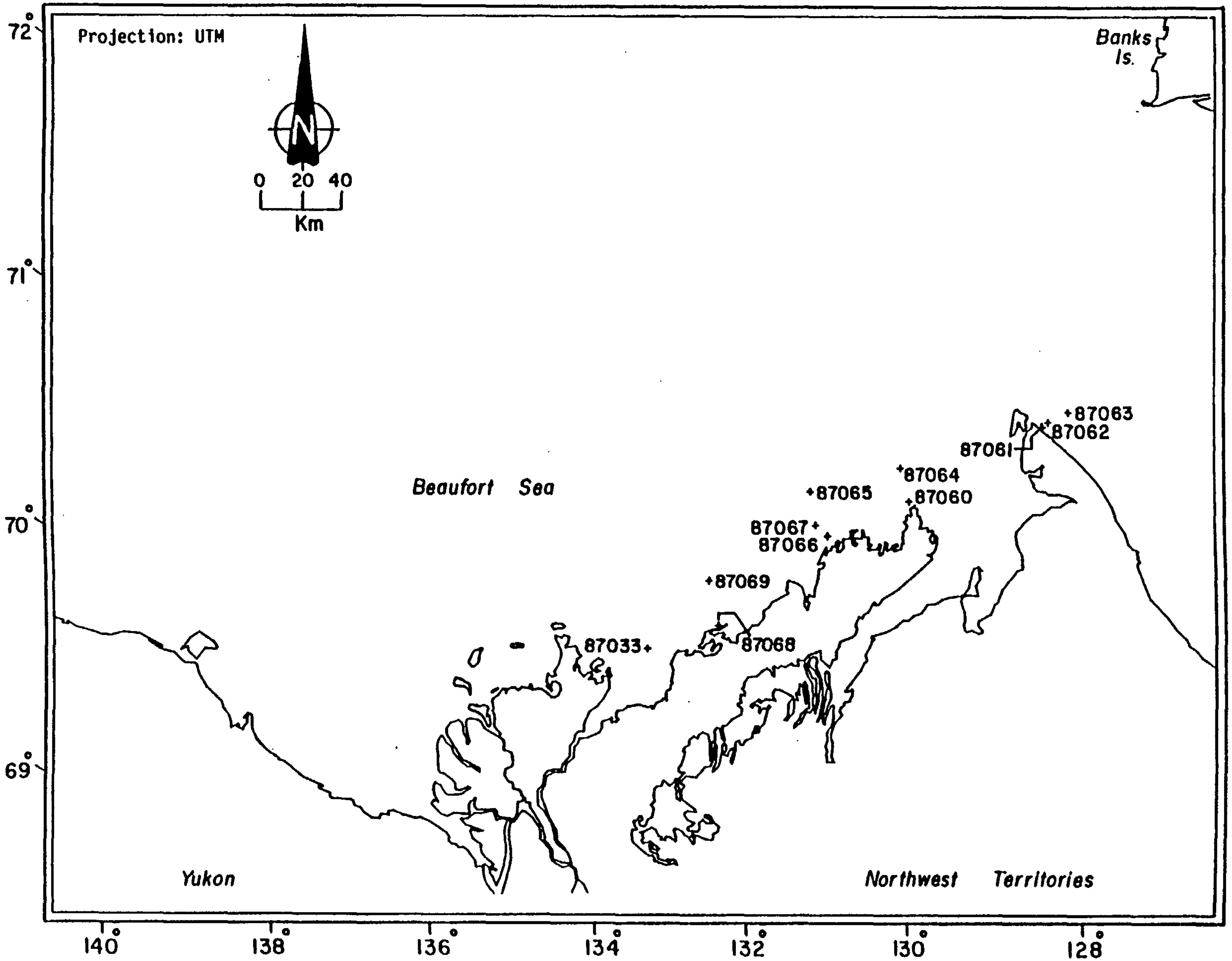

Fig. 9. Location of stations sampled on the Beaufort Sea shelf in August, 1987.

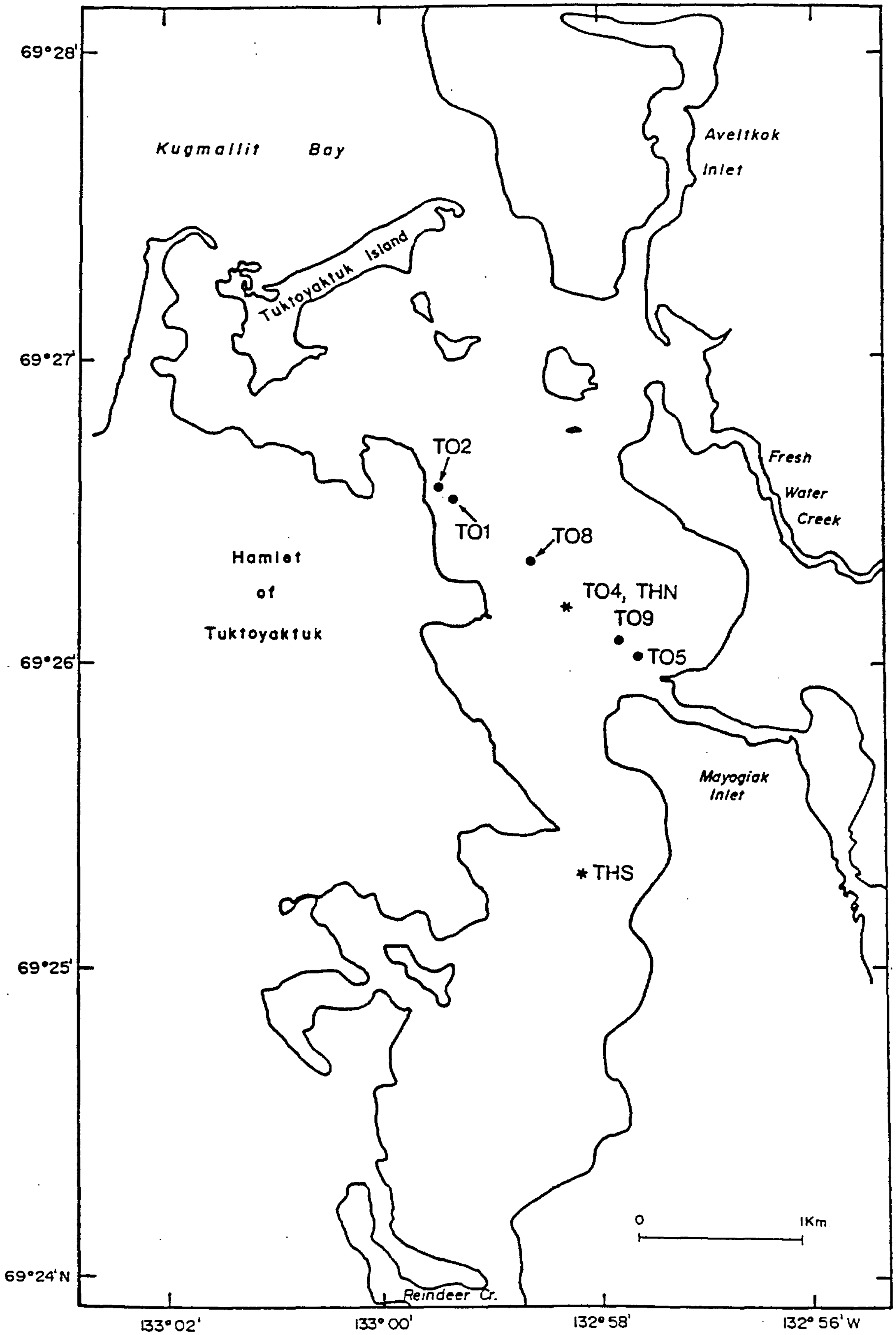

Fig. 10. Location of stations sampled in Tuktoyaktuk Harbour, 1985 to 1988.

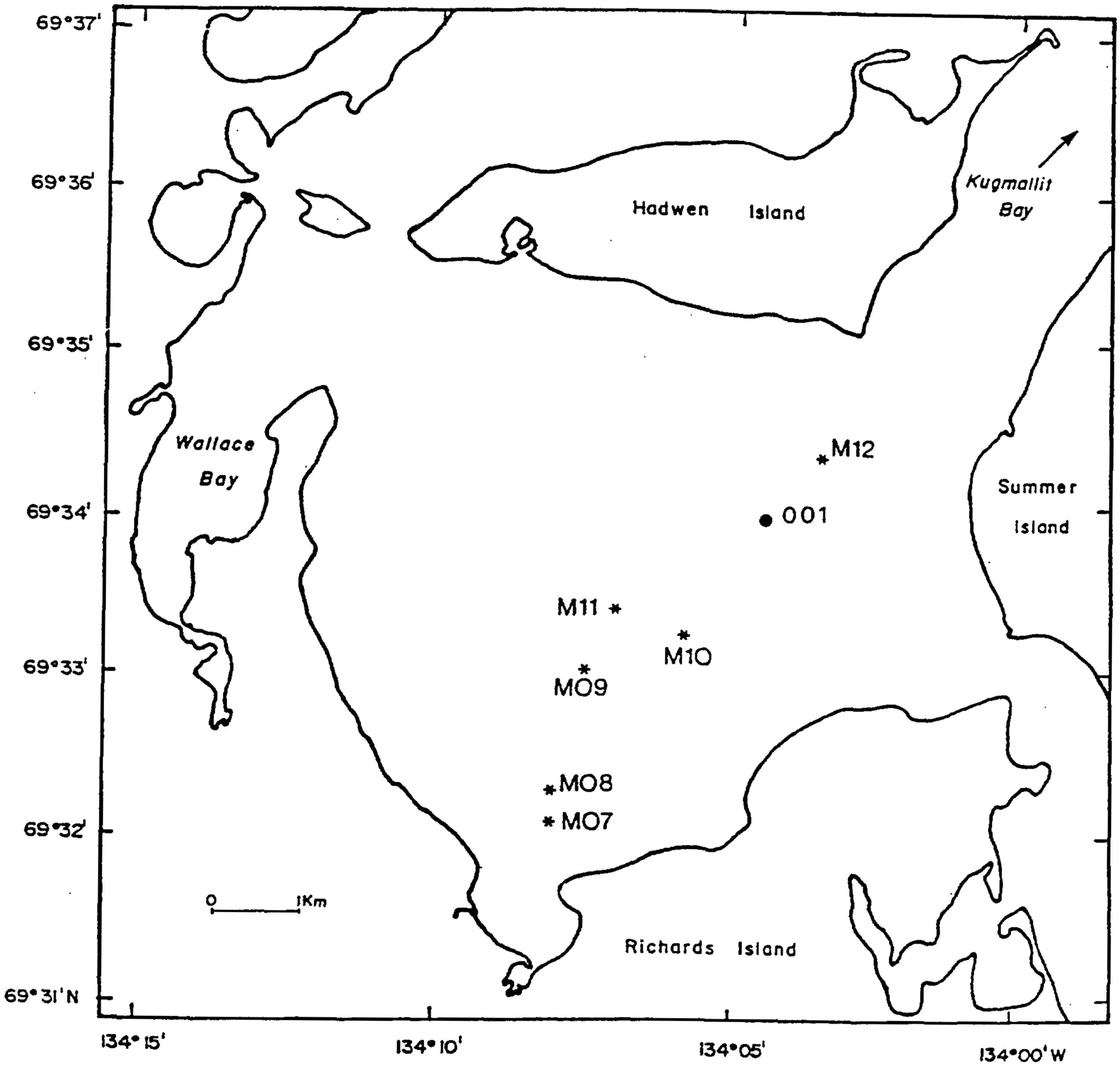

Fig. 11. Location of stations sampled in Mason Bay, 1986 to 1988.

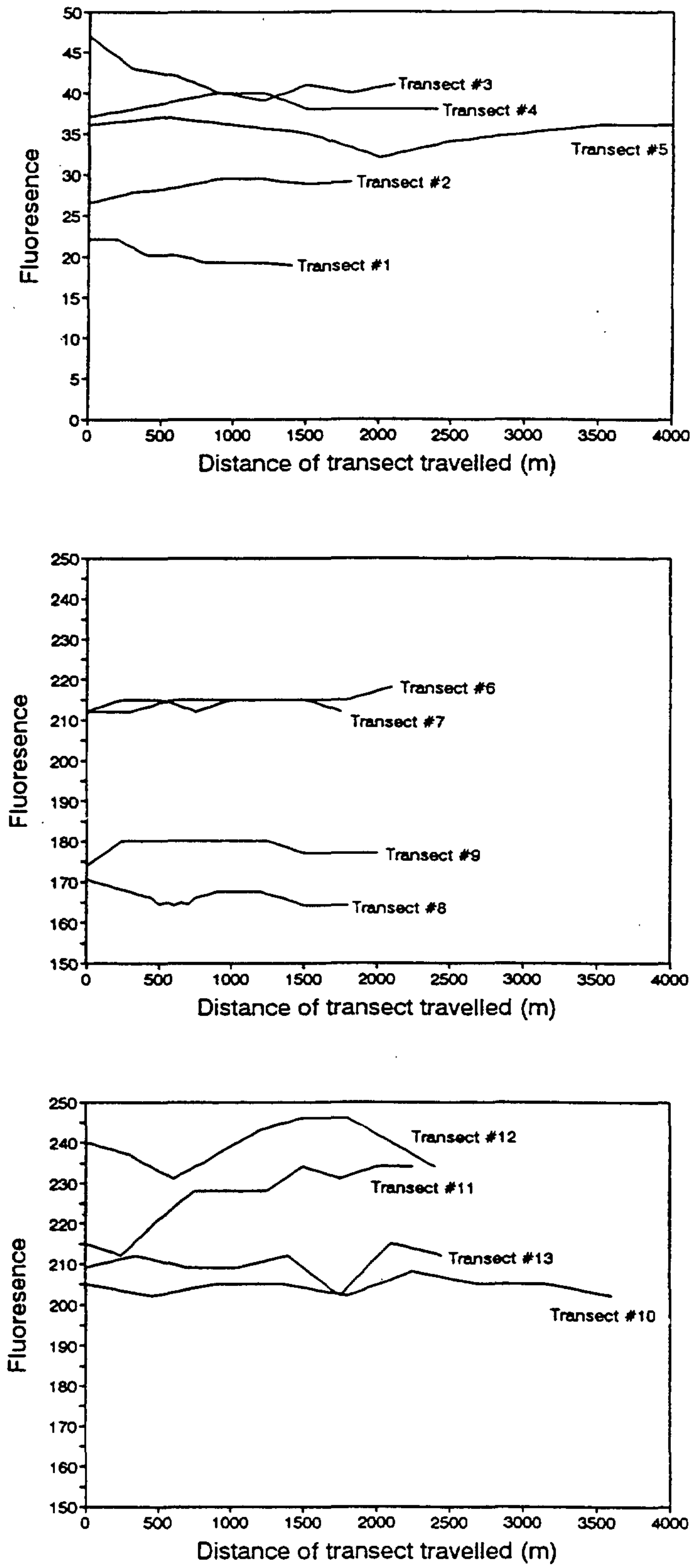

Fig. 12. Coastal Beaufort Sea surface water fluorescence for transects north of Tuktoyaktuk (#1-5), 21 August, north of Pullen Island (#6-9), 9 and 10 September, and in Mackenzie Bay (#10-13), 10 September, 1986.

Table 1. Summary data for stations sampled during 1985.

Station				Latitude		Longitude				PAR Profile[b]			Relative Fluorescence	Ice Core Data[c]			Snow
Sample Number	Name	Location	Date	deg	min	deg	min	Time Arrive[a]	Station Depth (m)	Sample Number	Type	Depth (m)	Profile Sample Number	Algae Sample Number	Chlor-a	TSS	Depth Profile
51	85103	Toker Point west	21 Jul	69	37.8	133	11.1	1055	5.6	1	WCP	3.0					
52	85102	Tuk Harbour west	21 Jul	69	28.1	133	02.0	1500	4.5	2	WCP	1.5					
53	85104	Toker Point west	22 Jul	69	37.1	133	02.3	1140	6.3	3	WCP	2.5					
54	85105	Toker Point west	22 Jul	69	36.5	132	59.8	1445	2.0	4	WCP	2.0					
55	85106	Stokes Point north	24 Jul	69	20.7	138	43.2	0800	4.0	5	WCP	3.5					
56	85107	Stokes Point north	24 Jul	69	23.6	138	44.5	1110	14.5	6	WCP	2.5					
57	85108	Stokes Point north	24 Jul	69	25.0	138	47.9	1400	53.0	7	WCP	3.5					
58	85109	Stokes Point north	24 Jul	69	27.7	138	47.9	1655	69.0	8	WCP	8.0					
59	85110	Thetis Bay south	25 Jul	69	33.2	139	01.5	1000	5.6	9	WCP	3.0					
60	85111	Thetis Bay south	25 Jul	69	31.6	138	59.8	1245	14.5	10	WCP	10.0					
61	85112	Thetis Bay south	25 Jul	69	31.1	138	55.5	1430	52.0	11	WCP	3.5					
62	85113	Thetis Bay south	25 Jul	69	28.5	138	48.8	1730	64.0	12	WCP	2.5					
63	85114	Kay Point east	26 Jul	69	16.9	138	20.2	1005	5.5	13	WCP	1.5					
64	85115	Kay Point east	26 Jul	69	16.2	138	16.6	1220	15.0	14	WCP	1.5					
65	85116	Sabine Point north	26 Jul	69	12.0	137	41.5	1535	29.3	15	WCP	1.5					
66	85117	Shingle Point north	26 Jul	69	18.2	137	11.9	1850	15.2	16	WCP	2.0					
67	85THS	Tuk Harbour south basin	02 Aug	69	25.32	132	58.15	0940	25.0	17	WCP	3.0					
68	85THN	Tuk Harbour north basin	02 Aug	69	26.17	132	58.28	1050	20.0	18	WCP	3.0					
69	85118	Toker Point north	03 Aug	69	40.5	132	57.5	1110	6.0	19	WCP	4.0					
70	85119	Toker Point west	03 Aug	69	36.5	133	00.0	1314	5.0	20	WCP	3.5					
71	85100	Topak Point west	03 Aug	69	30.8	133	09.5	1615	5.0	21	WCP	2.5					
72	85102	Kugmallit Bay west of Tuk	04 Aug	69	28.0	133	02.0	1525	4.5	22	WCP	2.0					
73	85120	Herschel Island north	05 Aug	69	39.7	138	42.5	1145	100.0	23	WCP	3.5					
74	85121	Herschel Island north	05 Aug	69	40.5	138	52.5	1550	50.0	24	WCP	11.0					

[a] Local time.
[b] Type: WCP - water column profile; PPS - pre/post scrape.
[c] For ice core data and snow depth data, X indicates that data exists and that Profile Sample Number = Station Sample Number.

Table 1. Summary data for stations sampled during 1985 (CONTINUED).

Station Sample Number	Station Name	Station Location	Date	Latitude deg	Latitude min	Longitude deg	Longitude min	Time Arrive[a]	Station Depth (m)	PAR Profile[b] Sample Number	PAR Profile Type	PAR Profile Depth (m)	Relative Fluorescence Profile Sample Number	Ice Core Data[c] Algae Sample Number	Ice Core Data Chlor-a	Ice Core Data TSS	Snow Depth Profile
75	85122	Herschel Island north	05 Aug	69	38.3	138	54.7	1920	30.0	25	WCP	11.0					
79	85THN	Tuk Harbour north basin	08 Aug	69	26.17	132	58.28	1900	20.0	26	WCP	11.0					
80	85THS	Tuk Harbour south basin	08 Aug	69	25.32	132	58.15	2050	25.0	27	WCP	11.1					
81	85125	Toker Point north	09 Aug	69	39.0	132	54.6	1555	3.0	28	WCP	2.5					
82	85126	Toker Point north	09 Aug	69	40.3	132	56.5	1800	6.0	29	WCP	5.0					
83	85127	Toker Point west	09 Aug	69	37.3	132	59.9	2005	2.0	30	WCP	2.0					
84	85128	Toker Point west	09 Aug	69	37.3	133	02.0	2200	6.0	31	WCP	4.5					
85	85129	Summer Island north	10 Aug	69	37.0	133	52.5	1055	2.5	32	WCP	2.5					
86	85130	Summer Island north	10 Aug	69	41.9	133	41.0	1325	6.0	33	WCP	5.5					
87	85131	Summer Island north	10 Aug	69	46.2	133	32.0	1530	9.0	34	WCP	3.5					
88	85132	Pullen Island noorth	10 Aug	69	46.8	134	24.2	2030	4.0	35	WCP	3.5					
89	85133	Pullen Island north	11 Aug	69	52.6	134	35.6	1030	10.5	36	WCP	6.0					
90	85134	Pullen Island north	11 Aug	69	58.1	134	36.3	1325	15.0	37	WCP	7.0					
91	85135	Pelly Island west	11 Aug	69	39.2	135	30.1	1900	5.0	38	WCP	4.5					
92	85136	Pelly Island west	12 Aug	69	37.0	135	56.4	1120	6.0	39	WCP	5.0					
93	85137	Pelly Island west	12 Aug	69	39.7	136	37.4	1500	15.0	40	WCP	8.0					
94	85138	Pelly Island west	12 Aug	69	38.9	137	03.0	1800	30.0	41	WCP	7.0					

[a] Local time.
[b] Type: WCP - water column profile; PPS - pre/post scrape.
[c] For ice core data and snow depth data, X indicates that data exists and that Profile Sample Number = Station Sample Number.

Table 2. Summary data for stations sampled during 1986.

Station: Sample Number	Station: Name	Station: Location	Date	Latitude deg	Latitude min	Longitude deg	Longitude min	Time Arrive[a]	Station Depth (m)	PAR Profile[b]: Sample Number	PAR Profile[b]: Type	PAR Profile[b]: Depth (m)	Relative Fluorescence Profile Sample Number	Ice Core Data[c]: Algae Sample Number	Ice Core Data[c]: Chlor-a	Ice Core Data[c]: TSS	Snow Depth Profile
13	86001	Summer Island north	23 Mar	69	56	133	53	1345	13.9						X		X
14	86002	Whale Bluffs north-east	28 Mar	70	22.9	127	22.5	1130	19.4						X		X
15	86003	Thetis Bay south	29 Mar	69	31.9	138	55.3	1100	51.0						X		X
16	86004	McKinley Bay north	30 Mar	70	12.9	131	16.1	0900	20.7								X
56	86029	Whale Bluffs north-east	21 May	70	22.6	127	20.4	1645	37.0					1,2,3, 4,5,6	X		X
59	86033	Summer Island north	22 May	69	57	133	46	1230	16.0					7,8,9,10	X		X
63	86035	Topkak Point west	22 Jul	69	31.8	133	13.5	1230	4.3				1				
64	86035	Topkak Point west	23 Jul	69	30.7	133	14.5	1248	4.3	2	WCP	2.0	2				
65	86036	Topkak Point west	23 Jul	69	32.9	132	59.2	1640	4.5	3	WCP	4.0	3				
										4	WCP	4.0					
66	86038	Kugmallit Bay west of Tuk	25 Jul	69	27.9	133	05.6	1405	3.6	5	WCP	0.5	4				
68	86040	Kugmallit Bay west of Tuk	25 Jul	69	26.4	133	23.5	1735	2.8	6	WCP	1.5	5				
69	86041	Toker Point west	26 Jul	69	40.7	133	07.2	1340	6.1	7	WCP	6.0	6				
70	86042	Toker Point north	26 Jul	69	53.7	133	07.7	1715	15.7	8	WCP	15.0	7				
71	86043	Garry Island west	29 Jul	69	34.1	136	09.5	1310	6.5	9	WCP	6.0	8				
72	86044	Garry Island west	30 Jul	69	33.9	136	48.0	1010	16.1	10	WCP	9.5	9				
73	86045	Garry Island west	30 Jul	69	32.6	137	07.1	1445	30.2	11	WCP	23.0	10				
74	86046	Herschel Island north	31 Jul	69	35.0	138	50.6	1420	6.5	12	WCP	4.0	11				
75	86047	Herschel Island north	31 Jul	69	35.7	138	48.1	1725	16.0	13	WCP	11.0	12				
										14	WCP	14.0					
76	86048	Herschel Island north	01 Aug	69	41.4	138	39.9	1045	149.0	15	WCP	21.0	13				
77	86049	Herschel Island north	01 Aug	69	37.3	138	46.1	1700	43.5	16	WCP	24.0	14				
81	86051	King Point north	03 Aug	69	05.5	137	56.1	1515	6.2	17	WCP	6.0	15				

[a] Local time.
[b] Type: WCP - water column profile; PPS - pre/post scrape.
[c] For ice core data and snow depth data, X indicates that data exists and that Profile Sample Number = Station Sample Number.

Table 2. Summary data for stations sampled during 1986 (CONTINUED).

Station Sample Number	Station Name	Station Location	Date	Latitude deg	Latitude min	Longitude deg	Longitude min	Time Arrive[a]	Station Depth (m)	PAR Profile[b] Sample Number	PAR Profile Type	PAR Profile Depth (m)	Relative Fluorescence Profile Sample Number	Ice Core Data[c] Algae Sample Number	Ice Core Data Chlor-a	Ice Core Data TSS	Snow Depth Profile
82	86052	King Point north	03 Aug	69	06.6	137	55.2	2020	15.5	18	WCP	15.0	16				
86	86THS	Tuk Harbour south basin	07 Aug	69	25.32	132	58.15	1030	23.0	19	WCP	7.0	17				
87	86THN	Tuk Harbour north basin	07 Aug	69	26.17	132	58.28	1415	21.7	20	WCP	5.0	18				
88	86053	Toker Point west	08 Aug	69	37.8	133	11.2	1135	5.5	21	WCP	4.0	19				
90	86056	Pullen Island north	10 Aug	69	48.5	134	24.6	1500	6.6	22	WCP	4.5	20				
91	86057	Pullen Island north	10 Aug	69	57.9	134	10.0	1925	15.5	23	WCP	13.0	21				
92	86058	Pullen Island north	11 Aug	70	04.7	133	51.5	1015	32.0	24	WCP	27.0	22				
93	86059	Pullen Island north-east	11 Aug	70	13.0	133	33.8	1900	49.5	25	WCP	29.0	23				
94	86060	Pullen Island north-east	12 Aug	70	42.8	135	21.3	0630	97.7	26	WCP	27.0	24				
96	86065	Tuft Point north	16 Aug	69	45.2	132	31.3	1515	6.5	27	WCP	5.5	25				
98	86066	Tuft Point north	17 Aug	69	58.0	132	30.5	1605	16.5	28	WCP	15.0	26				
99	86067	Tuft Point north	18 Aug	70	10.8	132	29.7	0900	29.5	29	WCP	28.0	27				
100	86068	Tuft Point north	18 Aug	70	43.5	132	29.0	1715	50.5	30	WCP	27.0	28				
101	86069	Cape Dalhousie north	19 Aug	71	28.1	129	40.6	0715	112.0	31	WCP	27.0	29				
102	86070	Cape Dalhousie north	19 Aug	71	20.8	129	41.1	1345	51.0	32	WCP	25.0	30				
103	86071	Cape Dalhousie north	20 Aug	70	53.8	129	29.3	1354	31.5	33	WCP	20.0	31				
104	86072	McKinley Bay north	21 Aug	70	12.3	131	01.8	1615	16.1	34	WCP	3.5	32				
105	86034	Kugmallit Bay @ Tuk	27 Aug	69	30.7	133	06.5	1130	5.0				33				
106	86073	Topkak Point west	28 Aug	69	32.5	133	07.7	1435	5.0	36	WCP	0.5	34				
107	86074	Topkak Point west	28 Aug	69	30.1	133	12.0	1755	4.8				35				
108	86075	Kugmallit Bay west of Tuk	29 Aug	69	27.9	133	23.6	1410	2.8				36				
109	86076	Toker Point north	30 Aug	69	52.1	133	10.8	1220	14.5	39	WCP	3.5	37				
110	86077	Tibjak Point west	30 Aug	69	35.1	133	11.8	1730	5.2	40	WCP	1.0	38				

[a] Local time.
[b] Type: WCP - water column profile; PPS - pre/post scrape.
[c] For ice core data and snow depth data, X indicates that data exists and that Profile Sample Number = Station Sample Number.

Table 2. Summary data for stations sampled during 1986 (CONTINUED).

Station			Date	Latitude		Longitude		Time Arrive[a]	Station Depth (m)	PAR Profile[b]			Relative Fluorescence Profile Sample Number	Ice Core Data[c]			Snow Depth Profile
Sample Number	Name	Location		deg	min	deg	min			Sample Number	Type	Depth (m)		Algae Sample Number	Chlor-a	TSS	
111	86078	McKinley Bay north	04 Sep	70	11.9	131	2.6	1710	15.7	41	WCP	8.0	39				
112	86079	McKinley Bay north	05 Sep	70	08.3	130	54.9	1030	6.6	42	WCP	6.0	40				
113	86THS	Tuk Harbour south basin	08 Sep	69	25.32	132	58.15	0855	23.0	43	WCP	4.0	41				
114	86THN	Tuk Harbour north basin	08 Sep	69	26.17	132	58.28	1439	20.0	44	WCP	4.5	42				
115	86080	Garry Island west	10 Sep	69	34.2	136	09.8	2015	6.8	45	WCP	1.0	43				
119	86081	Herschel Island north	15 Sep	69	41.2	138	37.6	1850	152.5	46	WCP	27.0	44				
120	86082	Herschel Island north	16 Sep	69	37.7	138	44.8	1045	48.7	47	WCP	26.0	45				
121	86083	Herschel Island north	16 Sep	69	36.7	138	48.4	1405	15.6	48	WCP	13.0	46				
122	86084	Herschel Island north	16 Sep	69	35.1	138	50.8	1640	6.5	49	WCP	6.0	47				
124	86085	King Point north	17 Sep	69	06.5	137	56.3	1615	7.0	50	WCP	6.0	48				
125	86086	King Point north	17 Sep	69	07.1	137	55.2	1755	16.3	51	WCP	15.0	49				
126	86087	King Point north	17 Sep	69	10.3	137	53.9	2010	29.7	52	WCP	13.0	50				
127	86088	King Point north	18 Sep	69	28.4	137	34.1	1410	50.1	53	WCP	0.5	51				
128	86089	Garry Island west	18 Sep	69	32.7	137	06.5	1815	29.0				52				
129	86090	Garry Island west	19 Sep	69	33.7	136	47.8	1000	15.6				53				
130	86091	Garry Island west	19 Sep	69	34.3	136	08.9	1315	7.0				54				
131	86092	Pullen Island north	20 Sep	69	48.1	134	24.6	0915	6.8				55				
132	86093	Pullen Island north	20 Sep	69	57.1	134	09.3	1250	15.0				56				
133	86094	Pullen Island north-east	20 Sep	70	04.5	133	51.3	1540	31.5				57				

[a] Local time.
[b] Type: WCP - water column profile; PPS - pre/post scrape.
[c] For ice core data and snow depth data, X indicates that data exists and that Profile Sample Number = Station Sample Number.

Table 3. Summary data for stations sampled during 1987.

Station Sample Number	Station Name	Station Location	Date	Latitude deg	Latitude min	Longitude deg	Longitude min	Time Arrive[a]	Station Depth (m)	PAR Profile[b] Sample Number	PAR Profile Type	PAR Profile Depth (m)	Relative Fluorescence Profile Sample Number	Ice Core Data[c] Algae Sample Number	Ice Core Data Chlor-a	Ice Core Data TSS	Snow Depth Profile
1	87T02	Tuk Harbour north basin	05 Mar	69	26.57	132	59.50	0930	5.2	1	WCP	5.0	2				
2	87T01	Tuk Harbour north basin	06 Mar	69	26.54	132	59.34	0830	9.7	2	WCP	7.5	1				
3	87T08	Tuk Harbour north basin	07 Mar	69	26.33	132	58.69	0800	14.6	3	WCP	8.0	5				
4	87T04	Tuk Harbour north basin	08 Mar	69	26.17	132	58.28	0800	22.0	4	WCP	9.5	3				
5	87T09	Tuk Harbour north basin	09 Mar	69	26.07	132	57.83	0830	9.0				6				
7	87T09	Tuk Harbour north basin	10 Mar	69	26.07	132	57.83	1340	10.3	5	WCP	5.5	7				
8	87T05	Tuk Harbour north basin	10 Mar	69	26.02	132	57.70	1440	5.2	6	WCP	4.5	4				
9	87M07	Mason Bay	11 Mar	69	31.95	134	08.3	1130	5.3	7	WCP	5.0	8				
10	87M08	Mason Bay	12 Mar	69	32.18	134	08.3	1000	10.1	8	WCP	4.5	9				
11	87M12	Mason Bay	13 Mar	69	34.27	134	03.4	0940	5.6	9	WCP	5.0	13				
12	87M10	Mason Bay	15 Mar	69	33.04	134	05.7	1150	20.3	10	WCP	5.5	11				
14	87M11	Mason Bay	16 Mar	69	33.22	134	06.7	1535	18.2	11	WCP	9.0	12				
15	87M09	Mason Bay	17 Mar	69	32.90	134	07.5	1000	9.9	12	WCP	3.0	10				
16	87001	McKinley Bay north	19 Mar	70	12.9	131	17.3	1145	23.7	13	PPS	0.0				X	X
										14	WCP	13.0					
17	87002	Summer Island north	20 Mar	69	56.8	133	45.3	1000	15.6	15	PPS	0.0		4	X	X	X
										16	WCP	7.5					
18	87003	Whale Bluffs north-east	21 Mar	70	25.1	127	28.1	1020	8.3	17	PPS	0.0		1	X	X	X
										18	WCP	8.0					
19	87005	McKinley Bay north	22 Mar	70	14.4	131	17.1	1000	25.3					3	X	X	
20	87004	Kugmallit Bay	22 Mar	69	31.2	133	18.7	1230	3.5	19	PPS	0.0		2	X	X	X
21	87006	Kugmallit Bay	06 May	69	32.8	133	25.5	0915	3.7					9	X	X	X
22	87006	Kugmallit Bay	07 May	69	32.8	133	25.5	0915	3.7	20	PPS	0.0					
										21	WCP	3.5					

[a] Local time.
[b] Type: WCP - water column profile; PPS - pre/post scrape.
[c] For ice core data and snow depth data, X indicates that data exists and that Profile Sample Number = Station Sample Number.

Table 3. Summary data for stations sampled during 1987 (CONTINUED).

Station										PAR Profile[b]			Relative Fluorescence	Ice Core Data[c]			Snow
Sample Number	Name	Location	Date	Latitude deg	Latitude min	Longitude deg	Longitude min	Time Arrive[a]	Station Depth (m)	Sample Number	Type	Depth (m)	Profile Sample Number	Algae Sample Number	Chlor-a	TSS	Depth Profile
23	87007	Summer Island north	07 May	69	57.6	133	49.3	1000	17.4					5	X	X	X
24	87007	Summer Island north	08 May	69	57.6	133	49.3	0900	17.4	22	PPS	0.0					
										23	WCP	6.5					
										24	PPS	0.0					
										25	WCP	3.0					
25	87008	Whale Bluffs north-east	08 May	70	26.0	127	31.1	1100	13.0	26	PPS	0.0		6,7	X	X	X
										27	WCP	12.5					
										28	PPS	0.0					
										29	WCP	12.0					
26	87009	McKinley Bay north	09 May	70	14.3	131	07.4	1430	17.5	30	PPS	0.0		8	X	X	X
										31	WCP	4.5					
										32	PPS	0.0					
										33	WCP	4.5					
31	87009	McKinley Bay north	12 May	70	14.3	131	07.4	1245	17.5	34	PPS	0.0				X(2)	
										35	WCP	3.0					
										36	PPS	0.0					
										37	WCP	3.5					
39	87012	Atkinson Point north	16 May	69	55.8	131	32.4	1900	7.4						X		
51	87THS	Tuk Harbour south basin	16 Jul	69	25.32	132	58.15	1000	25.5	39	WCP	5.5	14				
52	87THN	Tuk Harbour north basin	16 Jul	69	26.17	132	58.28	1320	21.7	40	WCP	6.0	15				
54	87015	Herschel Island north	19 Jul	69	35.1	138	50.0	1130	6.5	41	WCP	3.0	16				
55	87016	Hercshel Island north	19 Jul	69	36.0	138	49.5	1345	17.7	42	WCP	13.0	17				
56	87017	Herschel Island north	20 Jul	69	38.0	138	45.9	1130	46.6	43	WCP	25.0	18				

[a] Local time.
[b] Type: WCP - water column profile; PPS - pre/post scrape.
[c] For ice core data and snow depth data, X indicates that data exists and that Profile Sample Number = Station Sample Number.

Table 3. Summary data for stations sampled during 1987 (CONTINUED).

Station				Latitude		Longitude				PAR Profile[b]			Relative Fluorescence	Ice Core Data[c]			
Sample Number	Name	Location	Date	deg	min	deg	min	Time Arrive[a]	Station Depth (m)	Sample Number	Type	Depth (m)	Profile Sample Number	Algae Sample Number	Chlor-a	TSS	Snow Depth Profile
57	87018	Herschel Island north	20 Jul	69	43.0	138	44.4	1425	138.0	44	WCP	24.0	19				
59	87020	King Point north	22 Jul	69	06.6	137	57.0	1500	6.7	45	WCP	6.0	20				
60	87021	King Point north	22 Jul	69	06.8	137	56.5	1705	16.1	46	WCP	14.0	21				
61	87022	King Point north	22 Jul	69	10.8	137	52.5	1940	30.0	47	WCP	15.0	22				
62	87023	King Point north	23 Jul	69	27.2	137	33.7	1405	49.9	48	WCP	25.0	23				
63	87024	Garry Island west	23 Jul	69	32.6	137	06.7	1805	31.5	49	WCP	21.0	24				
64	87025	Garry Island west	23 Jul	69	34.0	136	47.5	2105	15.5	50	WCP	13.0	25				
65	87026	Garry Island west	24 Jul	69	34.0	136	09.6	0100	6.0	51	WCP	5.0	26				
66	87014	Kugmallit Bay @ Tuk	26 Jul	69	30.7	133	06.5	1030	4.6	52	WCP	3.0	27				
67	87027	Kittigazuit Bay north	26 Jul	69	24.2	133	38.0	1530	3.1	53	WCP	1.5	28				
68	87028	Topkak Point west	28 Jul	69	31.1	133	08.0	1007	5.5	54	WCP	4.0	29				
69	87029	Toker Point west	28 Jul	69	38.8	133	05.8	1435	6.5	55	WCP	3.5	30				
70	87030	Kugmallit Bay @ Tuk	29 Jul	69	32.2	133	09.4	1030	5.0	56	WCP	4.0	31				
71	87031	Tuktoyaktuk Harbour west	29 Jul	69	27.1	133	14.3	1505	3.3	57	WCP	3.0	32				
73	87033	Toker Point west	01 Aug	69	40.0	133	17.5	0924	6.5	58	WCP	2.0					
96	87060	Cape Dalhousie north	21 Aug	70	17.2	129	45.0	1530	7.0	59	WCP	5.0	33				
97	87061	Cape Bathurst north	22 Aug	70	33.8	127	57.8	1050	8.0	60	WCP	7.5	34				
98	87062	Cape Bathurst north	22 Aug	70	35.2	127	47.6	1450	31.0	61	WCP	25.0	35				
99	87063	Cape Bathurst north	23 Aug	70	37.7	127	30.2	1026	196.5	62	WCP	29.0	36				
100	87064	Cape Dalhousie north	24 Aug	70	26.2	129	50.2	1220	15.8	63	WCP	7.0	37				
101	87066	McKinley Bay north	25 Aug	70	09.3	130	52.6	1406	8.5	64	WCP	4.0	38				
102	87067	McKinley Bay north	25 Aug	70	12.3	131	01.8	1730	16.4	65	WCP	15.0	39				
103	87065	McKinley Bay north	26 Aug	70	21.2	131	04.6	1323	26.0	66	WCP	26.0	40				

[a] Local time.
[b] Type: WCP - water column profile; PPS - pre/post scrape.
[c] For ice core data and snow depth data, X indicates that data exists and that Profile Sample Number = Station Sample Number.

Table 3. Summary data for stations sampled during 1987 (CONTINUED).

Station				Latitude		Longitude				PAR Profile[b]			Relative Fluorescence	Ice Core Data[c]			Snow
Sample Number	Name	Location	Date	deg	min	deg	min	Time Arrive[a]	Station Depth (m)	Sample Number	Type	Depth (m)	Profile Sample Number	Algae Sample Number	Chlor-a	TSS	Depth Profile
104	87068	Tuft Point north	27 Aug	69	46.2	132	22.0	1120	7.0	67	WCP	5.5	41				
105	87069	Tuft Point north	27 Aug	69	58.2	132	28.5	1515	16.5	68	WCP	15.0	42				
106	87THS	Tuk Harbour south basin	30 Aug	69	25.32	132	58.15	1413	22.3	69	WCP	20.0	43				
107	87THN	Tuk Harbour north basin	30 Aug	69	26.17	132	58.28	1550	21.0	70	WCP	20.0	44				

[a] Local time.
[b] Type: WCP - water column profile; PPS - pre/post scrape.
[c] For ice core data and snow depth data, X indicates that data exists and that Profile Sample Number = Station Sample Number.

Table 4. Summary data for stations sampled during 1988.

Station				Latitude		Longitude				PAR Profile[b]			Relative Fluorescence	Ice Core Data[c]			Snow
Sample Number	Name	Location	Date	deg	min	deg	min	Time Arrive[a]	Station Depth (m)	Sample Number	Type	Depth (m)	Profile Sample Number	Algae Sample Number	Chlor-a	TSS	Depth Profile
2	88T02	Tuk Harbour north basin	07 Mar	69	26.57	132	59.50	0800	4.7	1	WCP	4.5	2				
3	88T01	Tuk Harbour north basin	07 Mar	69	26.54	132	59.34	1000	9.7				1				
4	88T08	Tuk Harbour north basin	08 Mar	69	26.33	132	58.69	0830	17.2	2	WCP	12.0	3				
5	88T01	Tuk Harbour north basin	08 Mar	69	26.54	132	59.34	1630	9.7	3	WCP	9.5					
6	88T04	Tuk Harbour north basin	09 Mar	69	26.17	132	58.28	0850	22.0	4	WCP	13.0	4				
7	88T09	Tuk Harbour north basin	10 Mar	69	26.07	132	57.83	0830	8.8	5	WCP	8.5	5				
8	88T05	Tuk Harbour north basin	10 Mar	69	26.02	132	57.70	1540	4.7	6	WCP	4.5	6				
9	88M07	Mason Bay	13 Mar	69	31.95	134	08.3	0930	5.5	7	WCP	4.8	7				
10	88M10	Mason Bay	14 Mar	69	33.04	134	05.7	0815	20.3	8	WCP	11.0	8				
11	88M11	Mason Bay	14 Mar	69	33.22	134	06.7	1450	17.7	9	WCP	9.5	9				
12	88M09	Mason Bay	15 Mar	69	32.90	134	07.5	0900	9.6	10	WCP	9.5	10				
13	88M08	Mason Bay	15 Mar	69	32.18	134	08.3	1815	9.8				11				
14	88M08	Mason Bay	16 Mar	69	32.18	134	08.3	0845	9.8	11	WCP	5.5					
15	88M12	Mason Bay	16 Mar	69	34.27	134	03.4	1500	5.1	12	WCP	4.5	12				
16	88001	Mason Bay	17 Mar	69	34.0	134	04.5	0900	17.6	13	PPS	0.0	13	1	X	X	X
										14	WCP	6.0					
										15	PPS	0.0					
17	88002	Kugmallit Bay	20 Mar	69	34.8	133	16.1	1000	3.7						X	X	X
18	88003	Summer Island north	21 Mar	69	56.8	133	45.3	1100	13.1	16	PPS	0.0		2	X	X	X
										17	WCP	5.5					
19	88004	McKinley Bay	22 Mar	70	10.2	131	12.7	1030	17.9	18	PPS	0.0		3	X	X	X
										19	WCP	12.0					
										20	PPS	0.0					

[a] Local time.
[b] Type: WCP - water column profile; PPS - pre/post scrape.
[c] For ice core data and snow depth data, X indicates that data exists and that Profile Sample Number = Station Sample Number.

Table 4. Summary data for stations sampled during 1988 (CONTINUED).

Station				Latitude		Longitude		Time Arrive[a]	Station Depth (m)	PAR Profile[b]			Relative Fluorescence Profile Sample Number	Ice Core Data[c]			Snow Depth Profile
Sample Number	Name	Location	Date	deg	min	deg	min			Sample Number	Type	Depth (m)		Algae Sample Number	Chlor-a	TSS	
20	88005	Whale Bluffs north-east	23 Mar	70	25.3	127	28.1	1030	17.0	21	PPS	0.0		4	X	X	X
										22	WCP	16.3					
										23	PPS	0.0					
21	88002	Kugmallit Bay	24 Mar	69	34.8	133	16.1	1330		24	PPS	0.0					
										25	WCP	3.0					
										26	PPS	0.0					

[a] Local time.
[b] Type: WCP - water column profile; PPS - pre/post scrape.
[c] For ice core data and snow depth data, X indicates that data exists and that Profile Sample Number = Station Sample Number.

Table 5. Continuous temperature (°C) buoy data from station 85101, 1985.

Date	Local Time 04:00	08:00	12:00	16:00	20:00	24:00
15 Jul			19.0	12.0	12.0	13.6
16 Jul	10.9	13.6	14.0	16.0	13.9	17.0
17 Jul	16.0	16.0	15.9	14.0	14.5	19.0
18 Jul	21.0	21.8	20.3	11.0	10.5	10.9
19 Jul	10.8	10.7	10.4	10.3	10.2	10.4
20 Jul	10.0	9.8	9.7	9.6	9.9	9.8
21 Jul	9.5	9.3	9.2	9.0	9.0	9.0
22 Jul	9.0	8.8	8.8	8.9	9.0	9.5
23 Jul	9.4	9.0	9.6	10.0	9.5	9.8
24 Jul	9.7	9.3	9.4	10.0	9.9	9.8
25 Jul	9.9	9.5	9.4	10.2	10.1	10.1
26 Jul	10.3	9.9	10.0	10.8	11.0	11.1
27 Jul	11.5	11.7	11.7	11.3	12.0	12.0
28 Jul	12.0	12.0	12.0	12.0	12.2	12.6
29 Jul	12.3	12.2	12.0	11.9	12.0	12.2
30 Jul	12.0	12.0	11.9	12.1	12.0	12.0
31 Jul	11.8	11.7	11.6	11.7	11.7	11.8
01 Aug	11.4	11.1	11.3	11.2	11.2	11.4
02 Aug	11.2	11.0	11.0	11.1	11.1	11.5
03 Aug	11.7	11.0	11.0	11.0	11.3	11.6
04 Aug	11.4	11.1	11.3	12.0	11.3	11.4
05 Aug	11.4	11.4	11.3	11.4	11.3	11.2
06 Aug	11.1	10.7	10.0	10.3	10.2	10.6
07 Aug	10.2	8.8	8.8	8.9	7.0	9.0
08 Aug	7.5	5.3	5.3	6.7	5.9	5.9
09 Aug	4.0	4.0	3.4	3.7	4.7	4.3
10 Aug	6.5	8.4	8.7	8.5	9.3	9.9
11 Aug	9.0	9.0	9.0	9.0	10.4	11.5
12 Aug	11.2	11.7	11.5	11.0	11.0	11.0
13 Aug	10.9	10.4	9.7	9.0	9.9	10.3
14 Aug	9.7	10.2	10.3	11.5	13.7	11.8
15 Aug	10.3	10.1	10.0	9.0	9.1	8.9
16 Aug	8.2	7.6	9.8	10.1	10.2	10.0
17 Aug	9.8	9.2	9.3	9.0	9.4	9.5
18 Aug	9.0	8.8	9.2	9.0	9.2	9.7
19 Aug	8.8	8.9	9.2	10.1	10.6	9.7
20 Aug	9.0	8.9	9.0	9.4	9.1	9.3
21 Aug	6.7	7.2	7.2	7.0	7.9	7.8
22 Aug	7.2	6.5	5.8	6.0	6.5	6.5
23 Aug	7.0	6.8	6.8	7.5	8.8	8.9
24 Aug	7.9	7.8	6.5	6.9	7.6	7.0
25 Aug	6.6	6.9	7.0	6.4	7.0	7.1
26 Aug	6.8	7.0	6.8	6.3	7.8	8.2
27 Aug	7.8	7.4	7.0	6.8	7.0	7.8
28 Aug	7.6	7.4	7.0	6.9	7.0	7.6

Table 5. Continuous temperature (°C) buoy data from station 85101 (CONTINUED).

Date	Local Time 04:00	08:00	12:00	16:00	20:00	24:00
29 Aug	7.8	7.8	7.8	8.0	9.7	9.8
30 Aug	9.2	9.0	9.1	10.3	10.0	10.8
31 Aug	10.3	10.2	10.2	10.3	10.1	9.4
01 Sep	9.2	8.1	8.4	6.2	6.0	5.0
02 Sep	3.5	3.5	3.0	3.0	3.8	3.2
03 Sep	3.2	3.6	3.6	3.3		

Table 6. Continuous temperature (C°) buoy data from station 86034, 1986.

Date	Local Time 04:00	08:00	12:00	16:00	20:00	24:00
16-Jul					13.2	11.0
17-Jul	9.5	8.9	12.2	13.0	13.0	14.3
18-Jul	14.8	14.7	15.4	17.0	18.4	18.0
19-Jul	17.3	17.3	16.9	18.0	17.2	16.7
20-Jul	15.8	14.3	10.1	12.5	12.9	9.5
21-Jul	7.4	9.0	9.4	10.1	10.5	10.8
22-Jul	11.0	11.3	12.0	12.8	12.0	11.2
23-Jul	8.1	9.6	9.4	8.0	7.6	8.5
24-Jul	5.9	11.0	12.0	12.0	12.2	13.0
25-Jul	9.2	11.3	11.2	12.5	12.3	12.2
26-Jul	12.4	11.8	12.5	12.8	12.5	12.7
27-Jul	12.8	12.7	12.8	13.0	13.1	12.3
28-Jul	12.1	10.0	10.8	10.7	11.2	10.8
29-Jul	11.0	11.1	11.1	11.6	11.5	12.0
30-Jul	12.2	10.7	10.7	10.8	10.9	11.2
31-Jul	11.7	11.7	11.8	11.8	12.7	12.8
01-Aug	12.8	12.6	12.6	13.0	12.8	12.2
02-Aug	12.6	12.4	12.3	12.5	14.4	14.8
03-Aug	14.1	14.1	13.1	13.0	13.1	12.8
04-Aug	12.6	12.0	8.3	10.4	10.0	8.1
05-Aug	7.6	7.7	7.4	6.7	8.7	9.0
06-Aug	8.5	8.7	8.9	10.0	9.9	9.4
07-Aug	9.5	9.5	11.6	12.5	13.1	12.8
08-Aug	13.0	12.3	11.9	13.6	12.9	12.5
09-Aug	9.9	11.0	11.3	10.0	11.3	12.1
10-Aug	11.6	11.0	13.0	15.5	15.4	14.6

Table 6. Continuous temperature (C°) buoy data from station 86034 (CONTINUED).

Date	Local Time 04:00	08:00	12:00	16:00	20:00	24:00
11-Aug	11.9	12.3	13.0	15.3	14.0	13.7
12-Aug	13.8	14.0	14.0	15.8	15.6	14.8
13-Aug	14.1	12.5	13.1	13.6	13.6	13.2
14-Aug	12.9	11.4	13.1	14.7	14.8	14.9
15-Aug	14.8	12.6	12.8	13.8	11.9	9.7
16-Aug	9.8	9.2	8.2	10.7	12.1	12.0
17-Aug	11.3	11.1	11.7	12.6	12.0	11.8
18-Aug	11.0	12.4	12.3	12.8	13.2	12.7
19-Aug	12.1	11.9	11.4	10.7	11.0	11.1
20-Aug	11.0	11.2	11.2	10.9	11.0	11.0
21-Aug	10.7	10.9	11.0	11.2	11.0	10.9
22-Aug	10.5	10.1	9.9	9.8	9.7	9.7
23-Aug	9.8	9.4	7.9	8.7	7.1	6.9
24-Aug	7.5	7.2	7.4	7.8	8.0	8.1
25-Aug	8.0	7.9	8.0	8.0	8.0	8.0
26-Aug	8.0	7.4	7.2	7.1	7.3	7.1
27-Aug	7.0	7.0	7.0	7.0	6.8	6.6
28-Aug	6.6	6.1	6.2	6.2	6.2	6.2
29-Aug	6.2	5.6	5.5	6.0	6.9	6.8
30-Aug	5.8	5.2	5.1	5.4	5.8	5.5
31-Aug	5.6	5.7	5.8	6.6	6.7	6.9
01-Sep	6.8	6.5	6.9	7.1	7.6	5.9
02-Sep	5.2	5.5	5.1	5.1	6.1	5.9
03-Sep	5.8	5.9	6.0	6.1	6.5	7.1
04-Sep	7.2	7.5	7.8	8.0	8.0	8.4
05-Sep	8.4	8.4	9.0	9.5	9.5	9.7
06-Sep	10.1	9.8	9.8	9.9	10.6	9.4
07-Sep	7.0	7.9	8.5	9.1	9.7	9.9
08-Sep	7.8	8.5	8.8	7.1	8.6	8.3
09-Sep	8.0	7.6	6.9	7.1	7.1	7.8
10-Sep	7.9	8.0	8.7	8.9	9.6	9.3
11-Sep	9.1	8.6	8.3	8.4	8.6	8.5
12-Sep	8.2	8.1	8.1			

Table 7. Continuous temperature (C°) buoy data from station 87014, 1987.

Date	Local Time	Minutes after the hour					
		0000	0020	0040	0060	0080	0100
17 Jul	1500	18.8	15.3	13.6	19.0	13.9	12.1
17 Jul	1700	10.7	9.6	9.0	8.6	7.8	7.3
17 Jul	1900	6.9	7.1	6.7	6.6	6.7	6.3
17 Jul	2100	6.7	6.8	6.4	6.4	6.5	6.3
17 Jul	2300	6.2	6.1	6.0	5.9	5.8	5.6
18 Jul	0100	5.7	5.8	5.8	5.6	5.8	5.7
18 Jul	0300	5.6	5.4	5.4	5.4	5.6	5.6
18 Jul	0500	5.8	5.8	5.9	6.0	6.1	6.1
18 Jul	0700	6.2	6.2	6.4	6.6	7.3	7.6
18 Jul	0900	8.0	7.8	8.2	11.5	13.9	13.9
18 Jul	1100	14.0	14.0	14.0	14.0	14.0	14.0
18 Jul	1300	14.1	14.2	14.3	14.4	14.4	14.5
18 Jul	1500	14.7	14.4	14.8	14.8	14.9	14.9
18 Jul	1700	14.9	14.8	14.9	14.9	14.8	14.8
18 Jul	1900	14.7	14.6	14.4	14.2	14.3	14.2
18 Jul	2100	14.3	14.3	14.4	14.4	14.2	14.2
18 Jul	2300	14.4	14.4	14.4	14.5	14.5	14.6
19 Jul	0100	14.7	14.7	14.7	14.6	14.6	14.5
19 Jul	0300	14.4	14.5	14.5	14.7	14.8	14.7
19 Jul	0500	14.7	14.7	14.7	14.8	14.7	14.7
19 Jul	0700	14.7	14.6	14.6	14.5	14.5	14.5
19 Jul	0900	14.4	14.5	14.7	14.7	14.8	14.8
19 Jul	1100	14.8	14.7	14.7	14.6	14.6	14.7
19 Jul	1300	14.6	14.7	14.7	14.8	14.8	14.8
19 Jul	1500	14.8	14.8	14.9	15.0	15.1	15.1
19 Jul	1700	15.1	15.3	15.3	15.3	15.3	15.3
19 Jul	1900	15.1	14.9	15.0	15.1	15.1	14.9
19 Jul	2100	14.9	14.8	14.7	14.3	14.6	14.6
19 Jul	2300	14.6	14.4	14.4	14.4	14.3	14.2
20 Jul	0100	14.0	14.0	13.9	13.9	13.8	13.8
20 Jul	0300	13.6	13.5	12.7	12.5	12.4	11.8
20 Jul	0500	11.1	10.8	9.5	9.2	9.3	8.1
20 Jul	0700	7.6	7.6	7.3	7.3	7.4	6.8
20 Jul	0900	7.1	10.2	11.9	12.1	12.2	12.3
20 Jul	1100	12.3	12.5	12.4	12.4	12.3	12.3
20 Jul	1300	12.3	12.3	12.5	12.5	12.4	12.5
20 Jul	1500	12.6	12.7	13.0	13.1	13.4	13.6
20 Jul	1700	13.8	14.0	14.1	14.2	14.6	14.7
20 Jul	1900	14.8	14.9	15.0	14.9	14.8	14.7
20 Jul	2100	14.6	14.4	14.4	14.1	13.9	14.0
20 Jul	2300	14.0	13.5	13.1	12.3	11.7	11.3

Table 7. Continuous temperature (C°) buoy data from station 87014 (CONTINUED).

Date	Local Time	Minutes after the hour 0000	0020	0040	0060	0080	0100
21 Jul	0100	11.2	11.0	10.7	10.4	10.3	10.1
21 Jul	0300	9.8	9.7	9.5	9.7	9.6	9.6
21 Jul	0500	9.6	9.5	9.4	9.4	9.6	9.6
21 Jul	0700	9.6	9.7	9.8	10.4	9.8	9.2
21 Jul	0900	8.6	7.8	7.6	7.8	8.9	8.9
21 Jul	1100	8.1	8.1	8.6	8.4	8.7	8.6
21 Jul	1300	9.1	9.9	9.8	9.8	9.8	9.7
21 Jul	1500	9.8	9.7	9.6	9.5	9.7	10.0
21 Jul	1700	10.3	10.3	10.3	10.4	10.3	11.1
21 Jul	1900	12.0	12.4	12.4	11.9	11.8	11.5
21 Jul	2100	11.3	11.3	11.3	11.5	11.6	11.6
21 Jul	2300	11.6	11.5	11.8	11.8	12.0	12.0
22 Jul	0100	11.9	12.1	11.8	11.7	11.8	11.5
22 Jul	0300	11.1	10.6	11.0	11.0	10.8	10.7
22 Jul	0500	10.6	10.6	10.7	10.7	10.7	10.8
22 Jul	0700	10.8	11.0	11.0	11.0	11.0	11.0
22 Jul	0900	11.1	11.1	11.3	11.3	11.6	11.6
22 Jul	1100	11.8	11.8	11.8	11.8	11.8	11.9
22 Jul	1300	11.9	12.1	12.3	12.5	12.6	12.8
22 Jul	1500	13.0	13.0	12.6	13.1	13.8	14.0
22 Jul	1700	14.0	14.1	14.2	14.3	14.2	14.4
22 Jul	1900	14.7	14.7	14.7	14.8	14.8	14.5
22 Jul	2100	14.5	14.4	13.7	14.0	14.0	13.9
22 Jul	2300	13.9	13.8	14.0	14.2	14.2	14.0
23 Jul	0100	14.0	14.0	14.0	13.9	13.9	13.8
23 Jul	0300	13.9	13.9	13.9	13.9	14.0	14.0
23 Jul	0500	14.0	13.9	13.9	13.9	13.8	13.8
23 Jul	0700	13.7	13.7	13.6	13.6	13.6	13.6
23 Jul	0900	13.5	13.4	13.4	13.2	12.1	11.9
23 Jul	1100	11.9	11.9	11.9	12.1	12.1	12.1
23 Jul	1300	12.1	12.1	12.1	12.1	12.1	12.3
23 Jul	1500	12.5	12.6	13.0	13.5	13.8	13.9
23 Jul	1700	13.8	13.7	13.6	13.5	13.4	13.1
23 Jul	1900	12.7	12.4	12.3	12.1	11.8	11.7
23 Jul	2100	11.3	10.9	10.5	10.4	10.3	10.3
23 Jul	2300	10.2	10.0	9.9	9.8	9.6	9.4
24 Jul	0100	9.2	9.2	9.3	9.1	9.1	9.0
24 Jul	0300	8.9	8.9	8.8	8.7	8.5	8.5
24 Jul	0500	8.2	8.2	8.5	8.1	8.2	8.1
24 Jul	0700	7.9	8.0	8.1	8.3	8.8	9.1
24 Jul	0900	9.2	9.2	9.2	9.3	9.4	9.4
24 Jul	1100	9.2	8.5	8.6	8.6	8.5	8.7

Table 7. Continuous temperature (C°) buoy data from station 87014 (CONTINUED).

Date	Local Time	Minutes after the hour 0000	0020	0040	0060	0080	0100
24 Jul	1300	8.9	8.9	8.9	9.0	9.2	9.2
24 Jul	1500	9.2	9.3	9.4	9.5	9.5	9.9
24 Jul	1700	10.4	10.0	11.5	10.9	9.5	8.4
24 Jul	1900	8.4	8.4	8.4	8.8	9.4	10.4
24 Jul	2100	10.9	11.3	11.8	11.9	12.1	12.2
24 Jul	2300	12.1	12.1	11.7	11.3	11.1	10.8
25 Jul	0100	10.8	10.9	11.0	11.6	12.1	12.6
25 Jul	0300	12.7	12.7	12.7	12.8	12.8	12.9
25 Jul	0500	12.9	12.8	12.8	12.8	12.8	12.6
25 Jul	0700	12.3	12.3	12.6	12.6	12.6	12.6
25 Jul	0900	12.6	12.3	12.1	11.8	11.9	11.8
25 Jul	1100	11.3	11.3	11.3	11.3	11.4	11.3
25 Jul	1300	11.4	11.6	11.6	11.6	11.5	10.8
25 Jul	1500	10.4	10.0	9.6	9.5	10.0	10.8
25 Jul	1700	11.5	11.6	11.6	11.8	10.9	10.5
25 Jul	1900	10.0	9.7	12.3	13.4	13.8	14.0
25 Jul	2100	13.9	13.9	13.9	13.9	13.9	13.9
25 Jul	2300	13.9	13.9	13.7	13.6	13.6	13.5
26 Jul	0100	13.5	13.5	13.5	13.6	13.8	13.6
26 Jul	0300	13.6	13.6	13.6	13.6	13.6	13.4
26 Jul	0500	13.2	13.1	12.6	12.2	12.0	11.9
26 Jul	0700	12.1	11.9	11.8	12.3	12.7	12.8
26 Jul	0900	12.7	12.8	12.9	12.9	13.0	13.0
26 Jul	1100	13.1	13.1	13.3	13.3	13.4	13.5
26 Jul	1300	13.6	14.0	13.9	14.0	13.9	13.9
26 Jul	1500	13.9	14.0	14.0	14.2	14.2	14.2
26 Jul	1700	14.2	14.1	14.1	14.0	14.0	14.1
26 Jul	1900	14.0	11.8	11.1	10.6	11.9	13.2
26 Jul	2100	13.0	14.0	14.2	14.4	14.4	14.4
26 Jul	2300	14.4	14.5	14.5	14.6	14.6	14.5
27 Jul	0100	14.6	14.7	14.6	14.7	14.7	14.7
27 Jul	0300	14.6	14.6	14.6	14.6	14.7	14.7
27 Jul	0500	14.7	14.7	14.7	14.8	14.7	14.7
27 Jul	0700	14.6	14.5	14.4	14.4	14.4	14.4
27 Jul	0900	14.4	14.2	14.1	14.1	14.1	14.1
27 Jul	1100	14.1	14.0	14.0	13.9	13.9	13.8
27 Jul	1300	13.8	13.8	13.7	13.8	13.9	13.9
27 Jul	1500	14.0	13.9	13.9	13.9	13.8	13.8
27 Jul	1700	13.8	13.9	13.9	13.8	13.8	13.9
27 Jul	1900	13.6	12.7	12.3	11.8	11.3	11.3
27 Jul	2100	11.3	11.3	11.3	11.3	11.6	11.5
27 Jul	2300	11.5	11.6	11.6	11.6	11.8	11.8

Table 7. Continuous temperature (C°) buoy data from station 87014 (CONTINUED).

Date	Local Time	Minutes after the hour					
		0000	0020	0040	0060	0080	0100
31 Jul	1300	12.4	12.1	12.2	12.3	12.3	12.1
31 Jul	1500	12.1	12.0	12.0	11.9	11.9	11.9
31 Jul	1700	12.0	12.1	12.1	12.2	12.3	12.2
31 Jul	1900	12.1	11.9	11.8	11.8	11.8	11.8
31 Jul	2100	11.7	11.8	11.8	11.8	11.8	11.6
31 Jul	2300	11.5	11.3	11.1	11.1	11.1	11.0
01 Aug	0100	11.0	10.9	10.9	10.9	10.8	10.8
01 Aug	0300	10.8	10.7	10.7	10.6	10.7	10.5
01 Aug	0500	10.3	10.3	10.3	10.2	10.2	10.0
01 Aug	0700	10.0	10.0	10.0	10.0	10.0	10.2
01 Aug	0900	10.1	10.2	10.2	10.3	10.4	10.5
01 Aug	1100	10.7	10.9	11.0	11.2	11.5	11.6
01 Aug	1300	11.8	11.9	12.1	12.2	12.3	12.3
01 Aug	1500	12.4	12.5	12.5	12.5	12.5	12.5
01 Aug	1700	11.8	11.6	11.3	11.2	10.9	11.1
01 Aug	1900	11.8	11.8	11.4	11.3	11.4	11.4
01 Aug	2100	11.2	11.1	11.0	11.0	10.9	10.9
01 Aug	2300	10.9	10.8	10.9	10.8	10.7	10.4
02 Aug	0100	10.4	10.5	10.5	10.4	10.3	10.2
02 Aug	0300	10.2	10.2	10.0	10.0	10.0	10.0
02 Aug	0500	10.0	9.8	9.7	9.6	9.6	9.6
02 Aug	0700	9.6	9.7	9.7	9.6	9.5	9.8
02 Aug	0900	9.8	10.0	10.3	10.3	10.4	10.4
02 Aug	1100	10.5	11.3	11.8	12.1	12.2	12.3
02 Aug	1300	12.6	12.7	12.8	13.1	13.2	13.1
02 Aug	1500	13.3	13.1	12.3	11.9	11.8	11.6
02 Aug	1700	11.4	11.5	11.3	11.3	11.2	11.1
02 Aug	1900	11.1	11.1	11.1	11.8	11.7	11.3
02 Aug	2100	11.2	11.3	11.3	11.3	11.6	11.6
02 Aug	2300	11.8	12.0	12.1	12.3	12.6	12.7
03 Aug	0100	12.8	12.5	12.5	12.5	12.4	12.4
03 Aug	0300	12.3	12.3	12.1	12.3	12.0	12.1
03 Aug	0500	11.8	11.8	11.8	11.7	11.8	11.6
03 Aug	0700	11.7	11.6	11.6	11.6	11.6	11.7
03 Aug	0900	11.8	11.8	11.8	12.1	12.1	12.3
03 Aug	1100	12.6	12.7	12.8	12.8	13.2	13.4
03 Aug	1300	13.4	13.4	13.6	13.7	13.8	13.9
03 Aug	1500	13.9	14.0	14.1	14.4	14.4	14.3
03 Aug	1700	14.4	14.6	14.4	14.5	14.4	14.4
03 Aug	1900	14.5	14.4	14.4	14.4	14.3	14.2
03 Aug	2100	14.1	14.1	14.0	14.0	14.0	14.0
03 Aug	2300	14.4	14.1	13.9	13.7	13.6	13.6

Table 7. Continuous temperature (C°) buoy data from station 87014 (CONTINUED).

Date	Local Time	Minutes after the hour 0000	0020	0040	0060	0080	0100
28 Jul	0100	11.9	11.8	11.8	11.9	12.0	11.8
28 Jul	0300	11.6	11.8	11.4	11.1	10.9	10.7
28 Jul	0500	10.7	10.3	10.2	10.3	10.5	11.1
28 Jul	0700	11.2	11.3	11.1	11.5	11.5	11.8
28 Jul	0900	11.8	11.9	12.1	12.2	12.4	12.4
28 Jul	1100	12.5	12.6	12.7	12.7	12.7	12.6
28 Jul	1300	12.3	12.5	12.7	12.6	12.8	12.9
28 Jul	1500	13.1	13.2	13.1	13.1	13.1	13.1
28 Jul	1700	13.1	13.1	13.0	12.9	13.0	12.5
28 Jul	1900	11.9	11.8	11.0	10.3	10.3	10.3
28 Jul	2100	10.2	10.3	10.5	10.7	11.3	10.7
28 Jul	2300	10.9	11.1	11.2	11.6	11.8	11.8
29 Jul	0100	12.1	12.1	12.3	12.3	12.2	11.4
29 Jul	0300	11.3	11.6	11.8	11.6	11.5	11.1
29 Jul	0500	10.9	10.0	10.2	10.0	10.0	10.1
29 Jul	0700	10.2	10.1	10.8	10.7	11.1	11.6
29 Jul	0900	11.5	12.3	12.3	12.6	12.6	12.7
29 Jul	1100	12.6	12.6	12.7	12.9	12.9	12.9
29 Jul	1300	12.8	12.9	12.7	12.6	12.5	12.4
29 Jul	1500	12.4	12.7	12.7	12.7	12.8	13.2
29 Jul	1700	13.3	13.6	13.4	13.4	13.3	13.4
29 Jul	1900	13.4	13.4	13.2	13.5	13.4	13.2
29 Jul	2100	13.4	13.4	13.3	13.2	13.2	13.2
29 Jul	2300	13.3	13.2	13.2	13.2	13.2	13.2
30 Jul	0100	13.2	13.1	13.1	13.1	13.1	13.1
30 Jul	0300	13.1	13.0	13.0	12.9	12.9	12.8
30 Jul	0500	12.8	12.8	12.8	12.9	13.1	13.1
30 Jul	0700	13.3	13.0	12.1	11.8	11.6	11.9
30 Jul	0900	11.5	11.8	12.3	12.1	12.0	12.6
30 Jul	1100	12.5	12.4	12.5	12.6	13.3	13.2
30 Jul	1300	13.1	13.0	13.4	13.6	13.6	13.6
30 Jul	1500	13.9	13.9	14.0	14.0	13.9	12.3
30 Jul	1700	13.4	12.3	11.4	11.1	10.9	11.0
30 Jul	1900	11.3	11.3	11.1	10.7	11.2	11.0
30 Jul	2100	10.5	12.5	13.7	13.6	13.6	13.6
30 Jul	2300	13.6	13.6	13.8	13.8	13.8	13.6
31 Jul	0100	13.5	13.5	13.4	13.4	13.4	13.4
31 Jul	0300	13.4	13.3	13.3	13.3	13.2	13.1
31 Jul	0500	13.1	13.1	13.1	13.0	13.1	13.0
31 Jul	0700	13.0	13.0	13.0	12.9	13.0	13.0
31 Jul	0900	13.0	13.0	12.9	12.9	12.8	12.9
31 Jul	1100	12.8	12.8	12.8	12.8	12.8	12.7

Table 7. Continuous temperature (C°) buoy data from station 87014 (CONTINUED).

Date	Local Time	Minutes after the hour					
		0000	0020	0040	0060	0080	0100
04 Aug	0100	13.4	13.4	13.3	13.3	13.3	13.2
04 Aug	0300	13.1	13.1	13.1	13.1	13.0	12.9
04 Aug	0500	12.9	12.9	12.9	12.8	12.6	12.5
04 Aug	0700	12.3	12.3	11.9	11.6	11.7	11.5
04 Aug	0900	11.5	11.1	11.1	11.0	11.8	11.8
04 Aug	1100	12.1	12.2	12.3	12.3	12.5	12.5
04 Aug	1300	12.5	12.5	12.5	12.5	12.6	12.4
04 Aug	1500	12.3	12.3	12.3	12.4	12.4	12.5
04 Aug	1700	12.5	12.6	12.5	12.4	12.3	12.1
04 Aug	1900	12.1	12.1	12.1	12.1	12.1	12.1
04 Aug	2100	12.1	12.1	12.1	12.1	12.0	11.9
04 Aug	2300	11.9	11.9	11.8	11.9	11.8	11.8
05 Aug	0100	11.9	11.8	11.8	11.9	11.9	12.0
05 Aug	0300	12.0	12.0	11.9	11.9	11.8	11.8
05 Aug	0500	11.8	11.8	11.8	11.6	11.6	11.5
05 Aug	0700	11.4	11.3	10.9	10.5	10.3	10.0
05 Aug	0900	10.4	10.5	10.5	10.3	10.4	10.5
05 Aug	1100	10.5	10.3	10.6	10.3	10.5	10.9
05 Aug	1300	11.1	11.3	11.6	11.6	11.6	11.8
05 Aug	1500	11.9	12.1	12.1	12.1	12.1	12.0
05 Aug	1700	11.9	12.1	12.2	12.2	12.2	12.1
05 Aug	1900	12.1	12.1	12.1	12.0	11.9	11.8
05 Aug	2100	11.8	11.6	11.5	11.3	11.3	11.2
05 Aug	2300	11.1	11.0	10.6	10.5	10.3	10.1
06 Aug	0100	11.0	11.0	10.9	10.8	10.6	10.5
06 Aug	0300	10.5	10.5	10.5	10.3	10.3	10.3
06 Aug	0500	10.2	10.3	10.1	10.0	10.0	9.8
06 Aug	0700	9.2	8.9	8.8	8.8	8.7	8.6
06 Aug	0900	8.6	8.6	8.5	8.5	8.5	8.5
06 Aug	1100	8.4	9.2	9.3	9.4	9.6	9.5
06 Aug	1300	9.6	9.5	9.6	9.8	9.8	9.9
06 Aug	1500	9.9	10.0	10.0	10.0	10.0	10.2
06 Aug	1700	10.2	10.1	10.0	9.5	9.4	9.4
06 Aug	1900	9.4	9.4	9.5	9.6	9.6	9.8
06 Aug	2100	9.5	9.4	9.4	9.4	9.4	9.3
06 Aug	2300	9.2	9.2	9.1	9.0	8.9	8.9
07 Aug	0100	8.8	8.8	8.7	8.7	8.7	8.7
07 Aug	0300	8.8	8.9	9.0	9.0	9.2	9.4
07 Aug	0500	9.5	9.7	9.8	9.8	10.0	9.9
07 Aug	0700	10.0	10.0	10.1	10.2	10.2	10.2
07 Aug	0900	10.2	10.3	10.5	10.5	10.6	10.6
07 Aug	1100	10.7	10.8	10.9	11.0	11.0	11.1

Table 7. Continuous temperature (C°) buoy data from station 87014 (CONTINUED).

Date	Local Time	Minutes after the hour 0000	0020	0040	0060	0080	0100
07 Aug	1300	11.1	11.3	11.3	11.3	11.5	11.6
07 Aug	1500	11.6	11.8	11.8	11.8	11.8	12.0
07 Aug	1700	11.9	12.1	12.0	11.6	11.6	11.0
07 Aug	1900	11.3	12.1	12.3	12.3	12.4	12.3
07 Aug	2100	12.2	12.1	12.1	11.8	11.6	11.8
07 Aug	2300	11.6	11.3	11.1	11.1	11.1	10.8
08 Aug	0100	11.3	11.3	11.3	11.2	11.1	10.9
08 Aug	0300	10.8	10.8	10.7	10.7	10.6	10.5
08 Aug	0500	10.3	10.3	10.3	10.4	10.3	10.2
08 Aug	0700	10.2	10.0	9.8	10.0	10.0	10.0
08 Aug	0900	10.0	10.2	10.1	10.2	9.8	10.0
08 Aug	1100	10.0	10.2	10.2	10.3	10.4	10.5
08 Aug	1300	10.8	10.8	11.0	11.1	11.3	11.3
08 Aug	1500	11.8	12.2	12.4	12.5	12.4	12.3
08 Aug	1700	12.5	12.9	12.2	12.3	12.3	11.5
08 Aug	1900	8.9	9.8	10.3	10.7	11.6	11.8
08 Aug	2100	11.8	11.8	11.8	11.8	11.8	11.8
08 Aug	2300	11.4	11.2	11.1	10.9	10.3	9.9
09 Aug	0100	9.2	8.6	8.5	8.3	8.2	8.0
09 Aug	0300	10.5	11.8	11.8	11.8	11.8	11.8
09 Aug	0500	11.8	11.8	11.8	11.8	11.8	11.9
09 Aug	0700	11.9	11.8	11.9	11.9	12.0	12.1
09 Aug	0900	12.0	12.0	12.1	12.1	12.1	11.9
09 Aug	1100	11.6	11.3	11.1	10.8	10.5	10.1
09 Aug	1300	9.6	9.0	9.0	8.8	8.6	8.5
09 Aug	1500	8.6	8.7	8.9	8.9	9.0	9.1
09 Aug	1700	9.2	9.3	9.8	10.0	10.3	10.4
09 Aug	1900	10.5	10.5	10.6	10.6	10.6	10.7
09 Aug	2100	10.7	10.8	10.9	10.9	10.9	10.8
09 Aug	2300	10.9	11.1	10.9	10.9	10.9	10.9
10 Aug	0100	11.1	10.9	10.8	10.9	10.9	10.8
10 Aug	0300	10.8	10.8	10.9	10.9	11.0	11.1
10 Aug	0500	11.0	11.1	11.3	11.1	10.9	10.7
10 Aug	0700	10.3	10.3	10.1	10.2	10.4	10.5
10 Aug	0900	10.6	10.6	10.8	11.1	11.1	11.2
10 Aug	1100	11.2	11.3	11.3	11.0	11.0	11.3
10 Aug	1300	11.3	11.1	11.0	11.2	11.2	10.9
10 Aug	1500	11.2	11.2	11.1	11.2	11.1	10.8
10 Aug	1700	10.8	10.5	10.3	10.3	10.2	9.8
10 Aug	1900	9.8	9.8	9.8	9.8	9.8	9.8
10 Aug	2100	9.8	9.8	9.8	9.9	10.2	10.4
10 Aug	2300	11.5	11.6	11.5	11.3	11.2	11.1

Table 7. Continuous temperature (C°) buoy data from station 87014 (CONTINUED).

Date	Local Time	Minutes after the hour					
		0000	0020	0040	0060	0080	0100
11 Aug	0100	10.9	10.7	10.6	10.6	10.5	10.5
11 Aug	0300	10.6	10.5	10.4	10.6	10.7	10.7
11 Aug	0500	10.6	10.7	10.8	10.9	10.7	10.5
11 Aug	0700	10.5	10.4	10.5	10.6	10.9	10.7
11 Aug	0900	10.6	10.7	10.8	10.9	11.0	11.0
11 Aug	1100	11.0	11.0	11.1	11.1	11.1	11.2
11 Aug	1300	11.1	11.3	11.3	11.5	11.6	11.6
11 Aug	1500	11.6	11.6	11.8	11.9	11.8	12.1
11 Aug	1700	12.1	12.1	12.1	12.1	12.1	11.5
11 Aug	1900	11.1	11.3	11.0	11.0	11.2	10.7
11 Aug	2100	10.3	10.3	10.5	10.6	11.2	11.8
11 Aug	2300	11.8	11.8	11.8	11.1	11.0	10.9
12 Aug	0100	10.5	10.4	10.5	10.4	10.3	9.6
12 Aug	0300	9.1	9.2	9.2	9.5	9.6	9.6
12 Aug	0500	9.5	10.0	10.2	10.2	10.1	10.0
12 Aug	0700	9.8	9.6	9.8	9.8	9.8	9.8
12 Aug	0900	9.8	9.7	9.6	9.6	9.6	9.6
12 Aug	1100	9.8	9.9	9.8	9.8	9.9	9.8
12 Aug	1300	9.7	8.9	8.9	9.3	9.2	9.0
12 Aug	1500	9.2	9.4	9.3	9.3	9.3	9.6
12 Aug	1700	9.5	9.4	10.3	10.4	10.3	10.3
12 Aug	1900	10.0	10.0	10.0	9.8	9.8	9.8
12 Aug	2100	9.7	9.7	9.8	9.6	9.6	9.6
12 Aug	2300	9.6	9.5	9.5	9.5	9.6	9.8
13 Aug	0100	9.2	9.0	9.0	9.0	9.0	8.9
13 Aug	0300	9.0	8.9	8.9	8.7	8.7	8.7
13 Aug	0500	8.6	8.6	8.6	8.6	8.5	8.6
13 Aug	0700	8.5	8.5	8.5	8.5	8.5	8.5
13 Aug	0900	8.5	8.8	8.9	8.9	8.9	8.9
13 Aug	1100	8.9	8.9	8.9	8.9	9.0	9.0
13 Aug	1300	9.2	9.1	9.2	9.2	9.2	8.8
13 Aug	1500	8.7	8.9	9.2	9.0	9.0	9.0
13 Aug	1700	8.9	9.0	9.0	8.9	9.0	9.0
13 Aug	1900	9.0	9.8	9.8	9.7	9.6	9.5
13 Aug	2100	9.5	9.4	9.3	9.3	9.2	9.3
13 Aug	2300	9.2	9.2	9.2	9.2	9.2	9.2
14 Aug	0100	9.2	9.2	9.2	9.1	9.1	9.2
14 Aug	0300	9.2	9.2	9.1	9.1	9.2	9.2
14 Aug	0500	9.2	9.0	9.0	8.9	8.9	8.9
14 Aug	0700	8.9	8.9	8.9	9.0	9.0	8.9
14 Aug	0900	8.9	8.7	8.7	8.8	8.9	8.9
14 Aug	1100	9.2	9.4	9.8	9.9	10.0	10.2

Table 7. Continuous temperature (C°) buoy data from station 87014 (CONTINUED).

Date	Local Time	Minutes after the hour 0000	0020	0040	0060	0080	0100
14 Aug	1300	10.3	10.3	10.5	10.5	10.8	10.8
14 Aug	1500	10.9	11.0	11.1	11.3	11.6	11.8
14 Aug	1700	11.9	12.0	12.2	12.3	12.1	11.5
14 Aug	1900	11.4	11.3	11.4	11.0	10.5	10.2
14 Aug	2100	10.6	10.5	10.7	11.3	11.4	11.3
14 Aug	2300	11.3	11.3	11.1	11.0	11.0	11.0
15 Aug	0100	10.9	10.8	10.8	10.8	10.7	10.6
15 Aug	0300	10.5	10.5	10.5	10.5	10.3	10.2
15 Aug	0500	10.2	10.0	10.0	9.8	9.8	9.7
15 Aug	0700	9.7	9.8	10.0	10.0	9.9	9.8
15 Aug	0900	9.8	10.3	10.7	11.1	11.1	11.3
15 Aug	1100	11.2	10.8	11.3	11.3	11.1	11.5
15 Aug	1300	12.2	12.7	12.9	13.1	13.3	13.4
15 Aug	1500	13.5	13.5	13.5	13.3	12.9	12.9
15 Aug	1700	12.9	12.6	12.1	11.8	11.6	11.5
15 Aug	1900	11.6	11.5	11.5	11.4	11.4	11.3
15 Aug	2100	11.1	11.1	10.7	10.6	10.6	10.4
15 Aug	2300	10.5	10.9	10.3	10.8	10.9	12.1
16 Aug	0100	13.3	13.4	13.4	13.4	13.4	13.4
16 Aug	0300	13.4	13.3	13.3	13.1	13.1	13.0
16 Aug	0500	12.9	12.9	12.9	12.9	12.9	12.9
16 Aug	0700	12.8	12.8	12.9	13.0	13.0	13.1
16 Aug	0900	13.1	12.9	12.7	12.7	12.7	11.9
16 Aug	1100	11.6	11.6	11.9	12.8	13.1	13.1
16 Aug	1300	13.1	13.3	13.3	13.3	13.4	13.5
16 Aug	1500	13.5	13.6	13.6	13.6	13.6	13.6
16 Aug	1700	13.6	13.6	13.6	13.6	13.5	13.5
16 Aug	1900	13.6	13.6	13.4	13.4	13.6	13.6
16 Aug	2100	13.6	13.6	13.8	13.6	13.8	13.4
16 Aug	2300	13.4	13.3	13.3	13.3	13.3	13.3
17 Aug	0100	13.2	13.2	13.3	13.3	13.3	13.2
17 Aug	0300	13.2	13.1	13.0	13.1	13.0	13.1
17 Aug	0500	13.1	13.0	12.9	13.0	12.9	12.9
17 Aug	0700	12.9	12.9	12.9	12.8	12.9	12.8
17 Aug	0900	12.8	12.8	12.8	12.8	12.8	12.8
17 Aug	1100	12.7	12.7	12.6	12.6	12.8	12.7
17 Aug	1300	12.5	12.4	12.8	12.9	13.0	13.0
17 Aug	1500	13.0	13.0	12.9	12.9	13.1	13.1
17 Aug	1700	13.1	13.2	13.3	13.2	13.2	13.1
17 Aug	1900	13.1	13.1	13.0	13.0	12.9	12.9
17 Aug	2100	12.9	12.9	12.9	12.8	12.8	12.8
17 Aug	2300	12.8	12.9	12.7	12.7	12.6	12.5

Table 7. Continuous temperature (C°) buoy data from station 87014 (CONTINUED).

Date	Local Time	Minutes after the hour					
		0000	0020	0040	0060	0080	0100
18 Aug	0100	12.5	12.5	12.4	12.4	12.3	12.3
18 Aug	0300	12.3	12.3	12.3	12.2	12.2	12.1
18 Aug	0500	12.1	12.1	12.1	12.1	12.1	12.1
18 Aug	0700	12.1	12.1	12.0	11.9	11.9	11.8
18 Aug	0900	11.8	11.6	11.8	11.6	11.6	11.7
18 Aug	1100	11.6	11.8	11.7	11.8	11.9	11.9
18 Aug	1300	11.8	11.9	12.0	12.1	12.3	12.5
18 Aug	1500	12.8	13.1	13.5	13.4	13.6	13.4
18 Aug	1700	13.3	13.3	13.4	13.5	13.4	13.3
18 Aug	1900	13.1	12.9	12.9	13.1	12.9	12.8
18 Aug	2100	12.7	12.6	12.6	12.6	12.6	12.6
18 Aug	2300	12.6	12.6	12.7	12.9	12.7	12.6
19 Aug	0100	12.5	12.3	12.6	12.2	12.4	12.4
19 Aug	0300	12.5	12.6	12.6	12.6	12.3	12.2
19 Aug	0500	12.1	12.1	12.1	12.1	12.1	12.1
19 Aug	0700	12.0	12.1	12.1	12.0	12.0	12.1
19 Aug	0900	12.1	12.1	12.1	11.8	11.9	12.0
19 Aug	1100	12.0	12.1	12.0	12.0	12.1	12.2
19 Aug	1300	12.1	12.1	12.1	12.1	12.1	12.2
19 Aug	1500	12.2	12.2	12.1	12.1	12.1	11.9
19 Aug	1700	11.8	11.8	11.6	11.5	11.5	11.3
19 Aug	1900	11.2	11.1	11.0	10.9	10.8	10.8
19 Aug	2100	10.6	10.5	10.5	10.6	10.5	10.4
19 Aug	2300	10.3	10.3	10.3	10.4	10.5	10.6
20 Aug	0100	11.0	11.3	11.3	11.4	11.5	11.6
20 Aug	0300	11.8	11.6	11.8	11.8	11.8	11.8
20 Aug	0500	11.8	11.8	11.8	11.8	11.9	11.8
20 Aug	0700	11.8	11.9	12.1	12.1	12.0	12.1
20 Aug	0900	12.1	12.1	12.1	12.1	12.1	12.1
20 Aug	1100	12.1	12.1	12.1	12.2	12.2	12.3
20 Aug	1300	12.3	12.2	12.1	12.3	12.1	12.1
20 Aug	1500	12.0	12.1	12.0	11.9	11.9	12.0
20 Aug	1700	12.1	11.8	11.8	11.8	11.8	11.6
20 Aug	1900	11.6	11.6	11.6	11.8	11.6	11.6
20 Aug	2100	11.6	11.6	11.6	11.6	11.6	11.8
20 Aug	2300	11.6	11.6	11.5	11.4	11.3	11.3
21 Aug	0100	11.3	11.3	11.3	11.2	11.2	11.1
21 Aug	0300	11.2	11.1	11.1	11.1	11.0	10.9
21 Aug	0500	11.1	10.9	10.8	10.7	10.8	10.9
21 Aug	0700	11.0	11.2	11.2	11.3	11.4	11.4
21 Aug	0900	11.5	11.3	11.3	11.4	11.3	11.4
21 Aug	1100	11.5	11.4	11.4	11.4	11.4	11.4

Table 7. Continuous temperature (C°) buoy data from station 87014 (CONTINUED).

Date	Local Time	Minutes after the hour					
		0000	0020	0040	0060	0080	0100
21 Aug	1300	11.5	11.5	11.3	11.3	11.3	11.4
21 Aug	1500	11.5	11.3	10.9	10.8	10.8	10.8
21 Aug	1700	10.9	10.9	10.9	10.9	11.0	11.1
21 Aug	1900	11.1	11.1	11.1	11.1	11.1	11.1
21 Aug	2100	11.1	11.1	11.1	11.1	11.1	11.1
21 Aug	2300	11.1	11.1	11.1	11.0	10.9	10.8
22 Aug	0100	10.7	10.8	10.8	10.9	11.0	11.1
22 Aug	0300	11.2	11.1	11.1	10.9	11.1	10.8
22 Aug	0500	10.6	10.6	10.5	10.6	10.5	10.5
22 Aug	0700	10.5	10.6	10.5	10.6	10.6	10.7
22 Aug	0900	10.7	10.7	10.7	10.7	10.8	10.7
22 Aug	1100	10.8	10.8	10.8	11.0	10.9	10.9
22 Aug	1300	11.0	11.0	11.0	11.0	11.1	11.1
22 Aug	1500	11.1	11.1	11.1	11.1	11.2	11.1
22 Aug	1700	11.1	11.1	11.1	11.1	11.1	11.1
22 Aug	1900	11.1	11.1	11.1	11.0	11.1	11.1
22 Aug	2100	11.2	11.3	11.5	11.4	11.6	11.3
22 Aug	2300	11.4	11.6	11.8	11.7	11.8	11.6
23 Aug	0100	11.7	11.8	11.8	11.6	11.6	11.6
23 Aug	0300	11.6	11.6	11.6	11.6	11.4	11.4
23 Aug	0500	11.5	11.5	11.5	11.6	11.5	11.8
23 Aug	0700	11.8	11.8	11.8	11.8	11.6	11.5
23 Aug	0900	11.5	11.5	11.8	11.5	11.5	11.4
23 Aug	1100	11.6	11.5	11.4	11.3	11.3	11.3
23 Aug	1300	11.3	11.3	11.3	11.3	11.3	11.3
23 Aug	1500	11.2	11.2	11.4	11.4	11.3	11.4
23 Aug	1700	11.6	11.5	11.5	11.5	11.4	11.4
23 Aug	1900	11.3	11.4	11.3	11.3	11.4	11.5
23 Aug	2100	11.5	11.5	11.5	11.5	11.6	11.5
23 Aug	2300	11.5	11.5	11.4	11.3	11.4	11.4
24 Aug	0100	11.4	11.3	11.5	11.3	11.3	11.3
24 Aug	0300	11.3	11.3	11.3	11.4	11.6	11.5
24 Aug	0500	11.5	11.6	11.6	11.6	11.8	11.6
24 Aug	0700	11.5	11.5	11.5	11.5	11.3	11.3
24 Aug	0900	11.4	11.3	11.3	11.6	11.8	11.9
24 Aug	1100	12.1	12.1	12.1	12.1	12.1	12.2
24 Aug	1300	12.1	12.1	11.8	11.8	11.6	11.6
24 Aug	1500	11.7	11.8	11.9	12.1	11.9	11.9
24 Aug	1700	11.6	11.5	11.5	11.4	11.5	11.4
24 Aug	1900	11.5	11.6	11.8	11.9	12.1	12.1
24 Aug	2100	12.1	12.1	12.1	11.8	12.0	11.9
24 Aug	2300	11.8	11.8	11.8	11.8	11.8	11.8

Table 7. Continuous temperature (C°) buoy data from station 87014 (CONTINUED).

Date	Local Time	Minutes after the hour 0000	0020	0040	0060	0080	0100
25 Aug	0100	11.8	11.8	11.8	11.8	11.8	11.7
25 Aug	0300	11.8	11.8	11.8	11.8	11.9	11.8
25 Aug	0500	11.8	11.8	11.8	11.8	11.8	11.8
25 Aug	0700	11.8	11.8	11.8	11.9	12.0	12.2
25 Aug	0900	12.1	12.0	11.9	12.0	11.9	11.9
25 Aug	1100	11.8	11.8	11.6	11.8	11.8	11.6
25 Aug	1300	11.8	11.8	11.8	11.7	11.8	11.9
25 Aug	1500	11.9	11.8	12.0	11.8	11.8	11.8
25 Aug	1700	11.8	11.8	11.8	11.6	11.3	11.5
25 Aug	1900	11.4	11.3	11.6	11.5	11.5	11.5
25 Aug	2100	11.4	11.2	11.1	11.6	11.8	11.8
25 Aug	2300	12.1	11.9	11.8	11.8	11.6	11.6
26 Aug	0100	11.5	11.4	11.4	11.3	11.3	11.3
26 Aug	0300	11.2	11.3	11.2	11.3	11.1	11.5
26 Aug	0500	11.8	11.8	11.8	11.9	11.8	11.8
26 Aug	0700	11.8	11.8	11.8	11.8	11.6	11.5
26 Aug	0900	11.6	11.8	11.8	11.8	11.8	11.8
26 Aug	1100	11.8	11.8	11.8	11.8	11.8	11.8
26 Aug	1300	11.8	11.8	11.6	11.6	11.6	11.5
26 Aug	1500	11.5	11.5	11.5	11.5	11.6	11.5
26 Aug	1700	11.6	11.6	11.6	11.5	11.6	11.5
26 Aug	1900	11.5	11.3	11.3	11.3	11.2	11.2
26 Aug	2100	11.3	11.4	11.5	11.6	11.6	11.6
26 Aug	2300	11.6	11.6	11.6	11.6	11.6	11.6
27 Aug	0100	11.6	11.6	11.5	11.6	11.5	11.5
27 Aug	0300	11.5	11.5	11.4	11.5	11.3	11.3
27 Aug	0500	11.5	11.5	11.4	11.4	11.5	11.5
27 Aug	0700	11.4	11.5	11.6	11.5	11.5	11.6
27 Aug	0900	11.6	11.6	11.6	11.6	11.6	11.6
27 Aug	1100	11.6	11.6	11.6	11.6	11.6	11.6
27 Aug	1300	11.6	11.6	11.6	11.6	11.7	11.6
27 Aug	1500	11.6	11.7	11.6	11.7	11.7	11.6
27 Aug	1700	11.7	11.6	11.6	11.6	11.6	11.6
27 Aug	1900	11.6	11.8	11.6	11.6	11.8	11.6
27 Aug	2100	11.6	11.5	11.6	11.5	11.5	11.6
27 Aug	2300	11.5	11.6	11.3	11.3	11.3	11.4
28 Aug	0100	11.3	11.3	11.3	11.1	11.1	11.1
28 Aug	0300	11.2	11.1	11.1	11.0	10.9	10.8
28 Aug	0500	10.9	10.9	10.9	10.9	10.8	10.7
28 Aug	0700	10.8	10.5	10.5	10.4	10.3	10.4
28 Aug	0900	10.4	10.3	10.3	10.3	10.4	10.4
28 Aug	1100	10.5	10.5	10.5	10.5	10.4	10.6

Table 7. Continuous temperature (C°) buoy data from station 87014 (CONTINUED).

Date	Local Time	Minutes after the hour 0000	0020	0040	0060	0080	0100
28 Aug	1300	10.6	10.6	10.6	10.6	10.6	10.6
28 Aug	1500	10.5	10.6	10.4	10.4	10.3	10.3
28 Aug	1700	10.3	10.4	10.4	10.4	10.3	10.3
28 Aug	1900	10.2	10.2	10.2	10.3	10.2	10.3
28 Aug	2100	10.2	10.1	10.2	9.9	10.0	10.0
28 Aug	2300	10.0	10.0	10.0	10.0	10.0	9.8
29 Aug	0100	9.8	9.8	9.8	9.8	9.8	9.8
29 Aug	0300	9.8	9.8	9.8	9.7	9.8	9.7
29 Aug	0500	9.8	9.7	9.2	8.6	8.5	8.8
29 Aug	0700	9.0	9.1	9.4	9.5	9.4	9.0
29 Aug	0900	9.2	9.4	9.2	9.2	8.6	8.5
29 Aug	1100	8.6	8.9	8.9	8.9	8.9	8.9
29 Aug	1300	8.9	8.9	8.9	8.9	8.9	9.0
29 Aug	1500	9.0	9.0	9.0	9.1	9.1	9.0
29 Aug	1700	9.1	9.0	8.8	8.9	8.9	8.9
29 Aug	1900	8.6	8.5	8.4	8.3	8.4	8.3
29 Aug	2100	8.3	8.3	8.6	8.3	8.2	8.3
29 Aug	2300	8.2	8.4	8.2	8.2	8.1	8.1
30 Aug	0100	8.1	8.0	8.0	8.0	8.0	7.9
30 Aug	0300	7.9	7.8	7.8	7.9	7.8	7.8
30 Aug	0500	7.8	7.8	7.8	7.7	7.8	7.6
30 Aug	0700	7.8	7.8	7.8	7.8	7.8	7.9
30 Aug	0900	7.9	7.8	7.8	7.8	7.8	7.8
30 Aug	1100	7.8	7.7	7.6	7.6	7.5	7.4
30 Aug	1300	7.6	7.4	7.4	7.4	7.4	7.4
30 Aug	1500	7.4	7.5	7.4	7.5	7.6	7.6
30 Aug	1700	7.6	7.6	7.6	7.6	7.4	7.4
30 Aug	1900	7.3	7.5	7.6	7.7	7.6	7.6
30 Aug	2100	7.4	7.6	7.0	6.9	7.1	7.2
30 Aug	2300	7.2	7.1	7.0	6.8	6.5	6.1
31 Aug	0100	6.0	6.0	6.1	6.1	6.1	6.1
31 Aug	0300	6.4	6.4	6.4	6.3	6.1	6.1
31 Aug	0500	6.0	6.0	6.0	6.2	6.3	6.3
31 Aug	0700	6.3	6.2	6.4	6.4	6.2	6.3
31 Aug	0900	6.5	6.4	6.0	6.1	6.4	6.2
31 Aug	1100	5.9	5.9	5.5	5.6	5.6	5.4
31 Aug	1300	5.6	5.6	5.6	5.6	5.8	6.3
31 Aug	1500	6.8	6.5	6.6	6.8	7.3	7.3
31 Aug	1700	7.3	7.4	7.4	7.2	7.1	7.0
31 Aug	1900	6.9	7.0	6.9	6.8	7.4	7.7
31 Aug	2100	7.8	7.6	7.8	7.7	7.8	7.6
31 Aug	2300	7.4	7.6	7.7	7.8	7.6	7.8

Table 7. Continuous temperature (C°) buoy data from station 87014 (CONTINUED).

Date	Local Time	Minutes after the hour					
		0000	0020	0040	0060	0080	0100
01 Sep	0100	8.0	8.1	8.1	8.0	8.1	8.0
01 Sep	0300	8.0	8.0	7.9	7.8	7.8	7.8
01 Sep	0500	7.8	7.8	7.8	7.8	7.8	7.8
01 Sep	0700	7.8	7.8	7.7	7.8	7.7	7.6
01 Sep	0900	7.8	7.6	7.4	7.6	7.4	7.6
01 Sep	1100	7.7	7.8	7.8	7.7	7.8	7.8
01 Sep	1300	7.7	7.8	7.8	7.8	7.8	7.8
01 Sep	1500	7.8	7.8	7.6	7.6	7.5	7.4
01 Sep	1700	7.3	7.2	7.4	7.4	7.6	7.5
01 Sep	1900	7.4	7.4	7.4	7.3	7.1	7.4
01 Sep	2100	7.3	7.3	7.3	7.3	7.3	7.4
01 Sep	2300	7.3	7.3	7.2	7.1	7.1	7.1
02 Sep	0100	7.1	7.0	6.9	6.9	6.7	6.8
02 Sep	0300	6.8	6.8	6.9	6.8	6.8	6.7
02 Sep	0500	6.7	6.8	6.7	6.3	6.1	6.1
02 Sep	0700	6.1	6.0	6.0	5.9	5.9	5.8
02 Sep	0900	5.8	5.8	6.2	6.1	6.5	6.5
02 Sep	1100	6.4	6.4	6.4	6.4	6.4	6.4
02 Sep	1300	6.4					

Table 8. Relative fluorescence profile data for 1986.

Profile Sample Number	Depth (m)	Relative Fluorescence	Profile Sample Number	Depth (m)	Relative Fluorescence	Profile Sample Number	Depth (m)	Relative Fluorescence	Profile Sample Number	Depth (m)	Relative Fluorescence
1	0.0	190	10	1.0	17	15	0.0	79	22	2.0	25
1	1.0	190	10	2.0	19	15	1.0	82	22	4.0	19
1	2.0	198	10	4.0	21	15	2.0	98	22	6.0	20
1	4.0	104	10	6.0	25	15	4.0	120	22	8.0	18
			10	8.0	20	15	6.0	137	22	10.0	16
2	0.0	98	10	10.0	17				22	12.5	19
2	1.0	88	10	12.5	15	16	0.0	76	22	15.0	17
2	2.0	73	10	15.0	14	16	2.0	88	22	17.5	18
2	3.5	90	10	17.5	13	16	1.0	85	22	20.0	33
			10	20.0	12	16	4.0	104	22	22.2	20
3	0.0	68	10	22.5	13	16	6.0	122			
3	1.0	67	10	25.0	13	16	8.0	35	23	0.0	20
3	2.0	67	10	27.5	13	16	10.0	21	23	2.0	22
3	4.0	66				16	12.5	19	23	4.0	23
			11	0.0	67	16	14.0	19	23	6.0	23
4	0.0	158	11	1.0	69				23	8.0	26
4	1.0	158	11	2.0	64	17	0.0	95	23	10.0	25
4	2.0	87	11	4.0	57	17	1.0	92	23	12.5	24
4	3.0	49	11	6.0	45	17	2.0	93	23	15.0	21
						17	4.0	39	23	17.5	21
5	0.0	149	12	0.0	75	17	6.0	38	23	20.0	22
5	1.0	149	12	1.0	79	17	8.0	40	23	22.5	23
5	2.0	152	12	2.0	81	17	10.0	41	23	25.0	20
5	2.5	169	12	4.0	76	17	12.5	41	23	27.5	21
			12	6.0	59	17	15.0	40	23	30.0	20
6	0.0	82	12	8.0	58	17	17.5	41			
6	0.5	95	12	10.0	60	17	20.0	39	24	0.0	28
6	1.0	92	12	12.5	55	17	22.5	37	24	1.0	28
6	2.0	95	12	15.0	57				24	2.0	28
6	4.0	93				18	0.0	101	24	4.0	30
6	5.5	90	13	0.0	51	18	1.0	101	24	6.0	27
6	6.0	84	13	1.0	52	18	2.0	98	24	8.0	21
			13	2.0	56	18	4.0	50	24	10.0	17
7	0.0	140	13	4.0	74	18	6.0	40	24	12.5	16
7	1.0	130	13	6.0	58	18	8.0	42	24	15.0	19
7	2.0	120	13	8.0	40	18	10.0	41	24	17.5	17
7	4.0	375	13	10.0	29	18	12.5	39	24	20.0	15
7	6.0	169	13	12.5	26	18	15.0	39	24	22.5	16
7	8.0	167	13	15.0	24	18	17.5	32	24	25.0	14
7	10.0	7	13	17.5	22	18	20.0	40	24	27.5	12
7	12.5	6	13	20.0	20				24	30.0	10
7	15.0	6	13	22.5	14	19	0.0	49			
			13	25.0	13	19	1.0	58	25	1.0	74
8	0.0	126	13	26.0	13	19	2.0	47	25	2.0	164
8	1.0	136				19	4.0	85	25	4.0	525
8	2.0	120	14	0.0	46				25	6.0	555
8	4.0	101	14	1.0	48	20	0.0	107			
8	6.0	84	14	2.0	56	20	1.0	115	26	1.0	15
			14	4.0	48	20	2.0	123	26	2.0	14
9	0.0	60	14	6.0	38	20	4.0	145	26	4.0	14
9	1.0	58	14	8.0	24	20	6.0	180	26	6.0	18
9	2.0	61	14	10.0	22				26	8.0	23
9	4.0	193	14	12.5	19	21	0.0	88	26	10.0	15
9	6.0	207	14	15.0	17	21	1.0	82	26	12.5	186
9	8.0	21	14	17.5	17	21	2.0	82	26	15.0	272
9	10.0	21	14	20.0	17	21	4.0	85			
9	12.5	33	14	22.5	17	21	6.0	92	27	1.0	19
9	15.0	18	14	25.0	18	21	8.0	88	27	2.0	19
			14	27.5	18	21	10.0	117	27	4.0	19
10	0.0	16	14	29.0	17	21	12.5	142	27	6.0	20
						21	14.5	137	27	8.0	20

Table 8. Relative fluorescence profile data for 1986 (CONTINUED).

Profile Sample Number	Depth (m)	Relative Fluorescence	Profile Sample Number	Depth (m)	Relative Fluorescence	Profile Sample Number	Depth (m)	Relative Fluorescence	Profile Sample Number	Depth (m)	Relative Fluorescence
27	10.0	20	31	20.0	15	40	1.0	19	45	20.0	7
27	12.5	20	31	22.5	21	40	2.0	20	45	22.5	8
27	15.0	21	31	25.0	21	40	4.0	20	45	25.0	8
27	17.5	35	31	27.5	21	40	6.0	22	45	27.5	6
27	20.0	198	31	29.0	21						
27	22.5	215				41	0.0	101	46	0.0	61
27	25.0	213	32	0.0	11	41	1.0	101	46	1.0	65
27	27.5	216	32	1.0	14	41	2.0	88	46	2.0	65
			32	2.0	23	41	4.0	79	46	4.0	21
28	1.0	11	32	4.0	33	41	6.0	73	46	6.0	22
28	2.0	11	32	6.0	70	41	8.0	70	46	8.0	22
28	4.0	11	32	8.0	125	41	10.0	66	46	10.0	24
28	6.0	11	32	10.0	137	41	12.5	66	46	12.5	23
28	8.0	11	32	12.5	145	41	15.0	76			
28	10.0	10	32	15.0	155	41	17.5	76	47	0.0	8
28	12.5	11				41	20.0	77	47	1.0	7
28	15.0	10	33	0.0	3	41	21.5	85	47	2.0	7
28	17.5	9	33	1.0	3				47	4.0	6
28	20.0	9	33	2.0	3	42	0.0	71	47	6.0	6
28	22.5	11	33	4.0	3	42	1.0	70			
28	25.0	12	33	5.0	3	42	2.0	69	48	0.0	24
28	27.5	14				42	4.0	63	48	1.0	22
28	30.0	16	34	0.0	103	42	6.0	38	48	2.0	24
			34	1.0	73	42	8.0	35	48	4.0	23
29	1.0	25	34	2.0	90	42	10.0	30	48	6.0	22
29	2.0	25	34	4.0	277	42	12.5	39			
29	4.0	24				42	15.0	29	49	0.0	21
29	6.0	26	35	0.0	114	42	17.5	27	49	1.0	22
29	8.0	25	35	1.0	107	42	18.5	28	49	2.0	22
29	10.0	23	35	2.0	106				49	4.0	21
29	12.5	23	35	4.0	119	43	0.0	71	49	6.0	20
29	15.0	23				43	1.0	70	49	8.0	23
29	17.5	24	36	0.0	183	43	2.0	52	49	10.0	22
29	20.0	24	36	1.0	180	43	4.0	50	49	12.5	22
29	22.5	24	36	2.0	180	43	6.0	41	49	15.0	24
29	25.0	29									
29	27.5	32	37	0.0	28	44	1.0	37	50	0.0	21
29	30.0	27	37	1.0	28	44	2.0	37	50	1.0	20
			37	2.0	29	44	4.0	40	50	2.0	20
30	1.0	49	37	4.0	29	44	6.0	45	50	4.0	21
30	2.0	52	37	6.0	28	44	8.0	42	50	6.0	20
30	4.0	51	37	8.0	28	44	10.0	42	50	8.0	21
30	6.0	52	37	10.0	19	44	12.5	43	50	10.0	20
30	8.0	52	37	12.5	20	44	15.0	38	50	12.5	21
30	10.0	52	37	13.5	20	44	17.5	36	50	15.0	22
30	12.5	53				44	20.0	35	50	17.5	25
30	15.0	53	38	0.0	46	44	22.5	36	50	20.0	27
30	17.5	53	38	1.0	43	44	25.0	36	50	22.5	25
30	20.0	53	38	2.0	44	44	27.5	35	50	25.0	24
30	22.5	50	38	4.0	45	44	30.0	31	50	27.5	24
30	25.0	50	39	0.0	6						
			39	1.0	6	45	0.0	5	51	1.0	16
31	1.0	9	39	2.0	6	45	1.0	5	51	2.0	17
31	2.0	9	39	4.0	23	45	2.0	5	51	4.0	18
31	4.0	9	39	6.0	21	45	4.0	6	51	6.0	19
31	6.0	9	39	8.0	23	45	6.0	6	51	8.0	21
31	8.0	10	39	10.0	35	45	8.0	6	51	10.0	28
31	10.0	10	39	12.5	39	45	10.0	6	51	12.5	133
31	12.5	9	39	15.0	41	45	12.5	5	51	15.0	133
31	15.0	10				45	15.0	6	51	17.5	53
31	17.5	9	40	0.0	20	45	17.5	7	51	20.0	12

Table 8. Relative fluorescence profile data for 1986 (CONTINUED).

Profile Sample Number	Depth (m)	Relative Fluorescence	Profile Sample Number	Depth (m)	Relative Fluorescence	Profile Sample Number	Depth (m)	Relative Fluorescence	Profile Sample Number	Depth (m)	Relative Fluorescence
51	22.5	14	52	22.5	33	54	4.0	23	56	12.5	18
51	25.0	12	52	25.0	34	54	6.0	28			
51	27.5	18	52	27.5	40				57	0.0	46
51	30.0	18				55	0.0	59	57	1.0	45
			53	1.0	20	55	1.0	60	57	2.0	44
52	0.0	23	53	2.0	20	55	2.0	61	57	4.0	33
52	1.0	23	53	4.0	17	55	4.0	61	57	6.0	30
52	2.0	23	53	6.0	18	55	5.0	59	57	8.0	28
52	4.0	23	53	8.0	25				57	10.0	22
52	6.0	25	53	10.0	28	56	0.0	43	57	12.5	18
52	8.0	25	53	12.5	26	56	1.0	43	57	15.0	16
52	10.0	33	53	13.5	29	56	2.0	43	57	17.5	15
52	12.5	21				56	4.0	37	57	20.0	14
52	15.0	45	54	0.0	70	56	6.0	26	57	22.5	22
52	17.5	75	54	1.0	70	56	8.0	24	57	25.0	14
52	20.0	33	54	2.0	42	56	10.0	19	57	27.5	15

Table 9. Relative fluorescence profile data for 1987.

Profile Sample Number	Depth (m)	Relative Fluorescence	Profile Sample Number	Depth (m)	Relative Fluorescence	Profile Sample Number	Depth (m)	Relative Fluorescence	Profile Sample Number	Depth (m)	Relative Fluorescence
1	2.0	101	5	12.5	95	11	2.0	139	14	10.0	180
1	4.0	88	5	14.0	98	11	4.0	149	14	12.5	193
1	6.0	82				11	6.0	130	14	15.0	171
1	8.0	82	6	2.0	85	11	8.0	114	14	17.5	164
1	9.0	85	6	4.0	88	11	10.0	111	14	20.0	155
			6	6.0	117	11	12.5	114	14	24.5	164
2	2.0	73	6	8.0	123	11	15.0	85	14	22.5	149
2	4.0	73				11	17.5	85			
			7	2.0	85	11	19.0	88	15	0.0	111
3	2.0	92	7	4.0	98				15	1.0	107
3	4.0	92	7	6.0	133	12	2.0	139	15	2.0	133
3	6.0	92	7	8.0	130	12	4.0	139	15	4.0	133
3	8.0	95				12	6.0	126	15	6.0	133
3	10.0	95	8	2.0	136	12	8.0	111	15	8.0	136
3	12.5	95	8	4.0	133	12	10.0	111	15	10.0	152
3	15.0	95				12	12.5	111	15	12.5	145
3	17.5	79	9	2.0	158	12	15.0	98	15	15.0	139
3	20.0	111	9	4.0	142	12	17.5	95	15	17.5	133
			9	6.0	126				15	20.0	136
4	2.0	88	9	8.0	120	13	2.0	111			
4	4.0	104	9	9.0	120	13	4.0	107	16	1.0	2
									16	2.0	3
5	1.5	85	10	2.0	111	14	0.0	126	16	5.0	4
5	2.0	79	10	4.0	117	14	1.0	123	16	4.0	4
5	4.0	92	10	6.0	98	14	2.0	120			
5	6.0	95	10	8.0	92	14	4.0	139	17	1.0	40
5	8.0	95	10	9.0	92	14	6.0	145	17	2.0	40
5	10.0	98				14	8.0	145	17	4.0	95

Table 9. Relative fluorescence profile data for 1987 (CONTINUED).

Profile Sample Number	Depth (m)	Relative Fluorescence	Profile Sample Number	Depth (m)	Relative Fluorescence	Profile Sample Number	Depth (m)	Relative Fluorescence	Profile Sample Number	Depth (m)	Relative Fluorescence
17	6.0	126	23	2.0	133	31	0.0	231	38	4.0	85
17	8.0	174	23	4.0	133	31	1.0	234	38	6.0	88
17	10.0	183	23	6.0	120	31	2.0	250			
17	12.5	272	23	8.0	199	31	4.0	262	39	0.0	73
17	15.0	288	23	10.0	297				39	1.0	76
			23	12.5	164	32	0.0	76	39	2.0	73
18	0.0	60	23	15.0	164	32	1.0	79	39	4.0	70
18	1.0	85	23	17.5	161	32	2.0	66	39	6.0	76
18	2.0	190	23	20.5	142	32	2.5	85	39	8.0	92
18	4.0	190	23	22.5	111	33	0.0	88	39	10.0	82
18	6.0	95	23	25.0	98	33	1.0	92	39	12.5	79
18	8.0	95				33	2.0	88			
18	10.0	126	24	0.0	22	33	4.0	96	40	0.0	26
18	12.5	88	24	1.0	22	33	6.0	96	40	1.0	26
18	15.0	111	24	2.0	22				40	2.0	26
18	17.5	164	24	4.0	20	34	0.0	76	40	4.0	26
18	20.0	139	24	6.0	60	34	1.0	82	40	6.0	27
			24	8.0	67	34	2.0	82	40	8.0	28
19	1.0	45	24	10.0	62	34	4.0	88	40	10.0	32
19	2.0	43	24	12.5	68	34	6.0	95	40	12.5	37
19	4.0	36	24	15.0	55				40	15.0	32
19	6.0	66	24	17.5	51	35	0.0	46	40	17.5	33
19	8.0	70	24	20.0	49	35	1.0	45	40	20.0	41
19	10.0	60	24	22.5	47	35	2.0	44	40	22.5	41
19	12.5	33	24	25.0	43	35	4.0	45	40	25.0	43
19	15.0	31				35	6.0	45			
19	17.5	29	25	0.0	88	35	8.0	48	41	1.0	98
19	20.0	29	25	1.0	88	35	10.0	50	41	2.0	98
			25	2.0	88	35	12.5	74	41	4.0	98
20	0.0	95	25	4.0	73	35	15.0	210	41	6.0	92
20	1.0	145	25	6.0	190	35	17.5	220			
20	2.0	256	25	8.0	167	35	20.0	220	42	0.0	40
20	4.0	228	25	10.0	243	35	22.5	250	42	1.0	40
20	5.5	470	25	12.5	85				42	2.0	39
			25	13.5	95	36	0.0	25	42	4.0	34
21	0.0	114				36	1.0	25	42	6.0	30
21	1.0	164	26	0.0	85	36	2.0	25	42	8.0	30
21	2.0	300	26	1.0	82	36	4.0	25	42	10.0	29
21	4.0	142	26	2.0	82	36	6.0	25	42	12.5	31
21	6.0	152	26	4.0	60	36	8.0	25	42	15.0	34
21	8.0	164	26	5.0	120	36	10.0	35			
21	10.0	142				36	12.5	36	43	0.0	107
21	12.5	133	27	0.0	88	36	15.0	33	43	1.0	107
21	15.0	126	27	1.0	88	36	17.5	30	43	2.0	107
			27	2.0	79	36	20.0	30	43	4.0	107
22	0.0	88	27	4.0	63	36	22.5	32	43	6.0	101
22	1.0	88				36	25.0	33	43	8.0	42
22	2.0	104	28	0.0	107				43	10.0	40
22	4.0	101	28	1.0	107	37	0.0	40	43	12.5	40
22	6.0	107	28	2.0	107	37	1.0	39	43	15.0	41
22	8.0	120				37	2.0	36	43	17.5	41
22	10.0	126	29	0.0	117	37	4.0	42	43	20.0	41
22	12.5	180	29	1.0	79	37	6.0	46			
22	15.0	303	29	2.0	66	37	8.0	47	44	1.0	114
22	17.5	136	29	4.0	66	37	10.0	39	44	2.0	114
22	20.0	88				37	12.5	44	44	4.0	111
22	22.5	66	30	0.0	92	37	15.0	77	44	5.0	111
22	25.0	54	30	1.0	92				44	6.0	111
			30	2.0	88	38	0.0	88	44	8.0	49
23	0.0	133	30	4.0	92	38	1.0	95	44	9.0	40
23	1.0	133	30	5.0	88	38	2.0	88	44	10.0	39

Table 9. Relative fluorescence profile data for 1987 (CONTINUED).

Profile Sample Number	Depth (m)	Relative Fluorescence	Profile Sample Number	Depth (m)	Relative Fluorescence	Profile Sample Number	Depth (m)	Relative Fluorescence	Profile Sample Number	Depth (m)	Relative Fluorescence
44	12.5	39	44	15.0	51	44	17.5	62	44	20.0	60

Table 10. Relative fluorescence profile data for 1988.

Profile Sample Number	Depth (m)	Relative Fluorescence	Profile Sample Number	Depth (m)	Relative Fluorescence	Profile Sample Number	Depth (m)	Relative Fluorescence	Profile Sample Number	Depth (m)	Relative Fluorescence
1	1.3	126	4	8.0	76	8	4.0	82			
1	2.0	98	4	10.0	76	8	6.0	59	11	1.2	107
1	4.0	101	4	12.5	76	8	8.0	56	11	2.0	101
1	6.0	92	4	15.0	75	8	10.0	54	11	4.0	73
1	8.0	85	4	17.5	75	8	12.5	53	11	6.0	62
1	9.0	92	4	20.0	76	8	15.0	56	11	8.0	58
			4	21.5	78	8	17.5	56	11	9.3	56
2	1.0	107				8	19.8	55			
2	2.0	98	5	1.5	88				12	1.5	104
2	4.0	98	5	2.0	85	9	1.2	114	12	2.0	95
			5	4.0	88	9	2.0	88	12	4.0	85
3	1.5	107	5	6.0	79	9	4.0	79	12	4.6	66
3	2.0	107	5	8.0	76	9	6.0	57			
3	4.0	109				9	8.0	60	13	1.5	107
3	6.0	101	6	1.5	85	9	10.0	59	13	2.0	92
3	8.0	98	6	2.0	85	9	12.5	56	13	4.0	82
3	10.0	95	6	4.1	85	9	15.0	56	13	6.0	70
3	12.5	92				9	17.5	56	13	8.0	63
3	15.0	95	7	1.5	120				13	10.0	66
3	16.5	95	7	2.0	136	10	1.4	101	13	12.5	62
			7	4.0	101	10	2.0	82	13	15.0	58
4	1.5	95	7	5.0	85	10	4.0	70	13	17.0	57
4	2.0	88				10	6.0	55			
4	4.0	88	8	1.5	120	10	8.0	52			
4	6.0	82	8	2.0	98	10	9.1	54			

Table 11. Summary data for sea surface fluorescence transects, Beaufort Sea shelf study area, 1986.

Transect Number	Date	Start			Finish			Bearing	Site Interval (m)
		Time	Latitude deg min	Longitude deg min	Time	Latitude deg min	Longitude deg min		
1	21 Aug	1404	70 13.25	130 18.27	1411	70 13.18	130 20.80	095	200.0
2	21 Aug	1430	70 15.88	130 28.02	1439	70 15.88	130 31.36	090	300.0
3	21 Aug	1502	70 15.25	130 39.38	1512	70 15.25	130 43.38	090	312.5
4	21 Aug	1530	70 14.74	130 50.47	1540	70 14.79	130 54.60	090	288.9
5	21 Aug	1600	70 12.70	130 55.18	1611	70 12.70	130 59.48	090	477.8
6	09 Sep	1702	69 43.84	135 08.34	1712	69 43.53	135 11.72	105	287.5
7	09 Sep	1800	69 41.50	135 27.01	1809	69 41.16	135 30.13	107	262.5
8	10 Sep	1107	69 34.06	133 18.63	1117	69 34.72	133 21.24	054	300.0
9	10 Sep	1200	69 38.09	133 34.09	1210	69 38.86	133 37.14	054	266.7
10	10 Sep	1302	69 43.14	133 51.87	1313	69 43.84	133 57.02	126	455.6
11	10 Sep	1400	69 46.97	134 10.48	1411	69 47.76	134 13.63	054	250.0
12	10 Sep	1500	69 48.20	134 26.82	1511	69 47.85	134 30.60	105	277.8
13	10 Sep	1600	69 46.20	134 47.24	1612	69 45.70	134 50.99	111	325.0

Table 12. Sea surface fluorescence data from transects in the Beaufort Sea, 1986.

Transect Number	Site Number	Surface Fluorescence	Transect Number	Site Number	Surface Fluorescence
1	1	22.1	7	7	215.0
1	2	22.1	7	8	212.0
1	3	20.2			
1	4	20.2	8	1	170.6
1	5	19.3	8	2	167.5
1	6	19.3	8	3	164.3
1	7	19.3	8	4	167.5
1	8	18.9	8	5	167.5
			8	6	164.3
2	1	26.5	8	7	164.3
2	2	27.8			
2	3	28.4	9	1	173.8
2	4	29.4	9	2	180.1
2	5	29.4	9	3	180.1
2	6	28.8	9	4	180.1
2	7	29.1	9	5	180.1
			9	6	180.1
3	1	37.0	9	7	177.0
3	2	38.0	9	8	177.0
3	3	39.0	9	9	177.0
3	4	40.0			
3	5	39.0	10	1	205.0
3	6	41.0	10	2	202.0
3	7	40.0	10	3	205.0
3	8	41.0	10	4	205.0
			10	5	202.0
4	1	47.0	10	6	208.0
4	2	43.0	10	7	205.0
4	3	42.0	10	8	205.0
4	4	40.0	10	9	202.0
4	5	40.0			
4	6	38.0	11	1	215.0
4	7	38.0	11	2	212.0
4	8	38.0	11	3	221.0
4	9	38.0	11	4	228.0
			11	5	228.0
5	1	36.0	11	6	228.0
5	2	37.0	11	7	234.0
5	3	36.0	11	8	231.0
5	4	35.0	11	9	234.0
5	5	32.0	11	10	234.0
5	6	34.0			
5	7	35.0	12	1	240.0
5	8	36.0	12	2	237.0
5	9	36.0	12	3	231.0
			12	4	237.0
6	1	212.0	12	5	243.0
6	2	212.0	12	6	246.0
6	3	215.0	12	7	246.0
6	4	215.0	12	8	240.0
6	5	215.0	12	9	234.0
6	6	215.0			
6	7	215.0	13	1	209.0
6	8	218.0	13	2	212.0
			13	3	209.0
7	1	212.0	13	4	209.0
7	2	215.0	13	5	212.0
7	3	215.0	13	6	202.0
7	4	212.0	13	7	215.0
7	5	215.0	13	8	212.0
7	6	215.0			

Table 13. Average daily photosynthetically available irradiance (PAR - $mE \cdot m^{-2} \cdot min^{-1}$) measured at Tuktoyaktuk in 1986.

Date	PAR	Date	PAR	Date	PAR
13 May	26.10	26 Jun	14.55	09 Aug	5.82
14 May	21.77	27 Jun	10.54	10 Aug	12.93
15 May	16.23	28 Jun	15.21	11 Aug	9.61
16 May	16.75	29 Jun	13.77	12 Aug	7.77
17 May	17.63	30 Jun	9.65	13 Aug	9.82
18 May	18.91	01 Jul	11.12	14 Aug	18.30
19 May	18.22	02 Jul	11.78	15 Aug	22.39
20 May	18.78	03 Jul	14.10	16 Aug	20.26
21 May	17.20	04 Jul	14.40	17 Aug	23.35
22 May	16.91	05 Jul	12.71	18 Aug	11.77
24 May	14.04	06 Jul	13.29	19 Aug	13.91
25 May	14.76	07 Jul	11.54	20 Aug	19.35
26 May	12.08	08 Jul	12.45	21 Aug	14.75
27 May	13.47	10 Jul	1.25	22 Aug	14.70
28 May	14.92	11 Jul	7.98	23 Aug	9.99
29 May	15.71	12 Jul	13.91	24 Aug	12.74
30 May	14.86	13 Jul	16.29	25 Aug	10.56
31 May	15.72	14 Jul	14.70	26 Aug	10.94
01 Jun	13.93	15 Jul	17.04	27 Aug	6.30
02 Jun	12.10	16 Jul	12.93	28 Aug	6.85
03 Jun	12.98	17 Jul	15.31	29 Aug	12.63
04 Jun	15.18	18 Jul	12.43	30 Aug	11.07
05 Jun	13.96	19 Jul	15.90	31 Aug	19.78
06 Jun	15.24	20 Jul	7.34	01 Sep	12.10
07 Jun	14.88	21 Jul	16.46	02 Sep	16.90
08 Jun	14.99	22 Jul	15.96	03 Sep	17.74
09 Jun	15.61	23 Jul	16.46	04 Sep	16.58
10 Jun	11.19	24 Jul	14.90	05 Sep	15.99
11 Jun	10.13	25 Jul	12.33	06 Sep	17.09
12 Jun	14.52	26 Jul	8.73	07 Sep	16.61
13 Jun	15.22	27 Jul	8.46	08 Sep	16.81
14 Jun	15.38	28 Jul	8.68	09 Sep	4.75
15 Jun	14.96	29 Jul	7.14	10 Sep	9.66
16 Jun	12.38	30 Jul	7.59	11 Sep	15.31
17 Jun	6.82	31 Jul	8.88	12 Sep	3.92
18 Jun	11.14	01 Aug	9.14	13 Sep	8.76
19 Jun	15.19	02 Aug	7.07	14 Sep	13.90
20 Jun	13.83	03 Aug	9.78	15 Sep	11.60
21 Jun	15.20	04 Aug	12.51	16 Sep	8.13
22 Jun	13.45	05 Aug	9.65	17 Sep	5.26
23 Jun	10.64	06 Aug	8.16	18 Sep	3.62
24 Jun	13.40	07 Aug	8.18	19 Sep	4.88
25 Jun	11.60	08 Aug	11.81	20 Sep	9.15

Table 14. Average daily photosynthetically available irradiance (PAR - $mE \cdot m^{-2} \cdot min^{-1}$) measured at Tuktoyaktuk in 1987.

Date	PAR	Date	PAR	Date	PAR
18 May	15.62	28 Jun	7.31	07 Aug	15.03
19 May	17.92	29 Jun	9.19	08 Aug	15.14
20 May	9.61	30 Jun	10.13	09 Aug	4.34
21 May	9.75	01 Jul	18.22	10 Aug	5.47
22 May	10.28	02 Jul	20.08	11 Aug	8.57
23 May	10.30	03 Jul	19.16	12 Aug	14.22
24 May	9.81	04 Jul	19.39	13 Aug	14.19
25 May	9.60	05 Jul	14.07	14 Aug	13.94
26 May	9.75	06 Jul	19.83	15 Aug	12.66
27 May	8.38	07 Jul	19.62	16 Aug	6.20
28 May	9.62	08 Jul	19.48	17 Aug	6.16
29 May	9.63	09 Jul	18.84	18 Aug	9.37
30 May	6.85	10 Jul	19.83	19 Aug	6.69
31 May	6.10	11 Jul	16.69	20 Aug	5.49
01 Jun	8.50	12 Jul	17.93	21 Aug	7.29
02 Jun	10.37	13 Jul	17.36	22 Aug	5.34
03 Jun	10.29	14 Jul	18.99	23 Aug	6.02
04 Jun	8.95	15 Jul	18.76	24 Aug	3.99
05 Jun	8.31	16 Jul	17.33	25 Aug	5.53
06 Jun	10.38	17 Jul	7.47	26 Aug	4.10
07 Jun	10.32	18 Jul	12.03	27 Aug	6.51
08 Jun	9.90	19 Jul	17.45	28 Aug	7.48
09 Jun	7.41	20 Jul	17.01	29 Aug	2.52
10 Jun	6.93	21 Jul	7.62	30 Aug	5.70
11 Jun	4.86	22 Jul	13.52	31 Aug	6.45
12 Jun	6.69	23 Jul	13.96	01 Sep	3.08
13 Jun	9.04	24 Jul	15.28	02 Sep	7.49
14 Jun	10.38	25 Jul	10.59	03 Sep	6.07
15 Jun	8.96	26 Jul	13.81	04 Sep	7.16
16 Jun	7.38	27 Jul	5.34	05 Sep	4.47
17 Jun	10.14	28 Jul	10.03	06 Sep	7.84
18 Jun	10.45	29 Jul	13.73	07 Sep	4.25
19 Jun	9.84	30 Jul	14.37	08 Sep	5.09
20 Jun	8.16	31 Jul	9.76	09 Sep	6.36
21 Jun	10.41	01 Aug	16.13	10 Sep	6.84
22 Jun	9.49	02 Aug	16.59	11 Sep	3.59
23 Jun	10.25	03 Aug	16.24	12 Sep	3.73
24 Jun	9.53	04 Aug	8.06	13 Sep	3.66
25 Jun	5.73	05 Aug	12.87	14 Sep	6.62
26 Jun	6.08	06 Aug	5.74	15 Sep	3.76
27 Jun	9.71				

Table 15. Average daily photosynthetically available irradiance (PAR - $mE \cdot m^{-2} \cdot min^{-1}$) measured at Tuktoyaktuk in 1988.

Date	PAR	Date	PAR	Date	PAR
13 Mar	11.93	26 Apr	21.37	09 Jun	23.46
14 Mar	8.19	27 Apr	22.51	10 Jun	23.37
15 Mar	9.22	28 Apr	23.85	11 Jun	23.32
16 Mar	9.83	29 Apr	24.47	12 Jun	30.78
17 Mar	11.83	30 Apr	21.86	13 Jun	21.53
18 Mar	12.19	01 May	22.98	14 Jun	23.60
19 Mar	12.68	02 May	21.73	15 Jun	19.61
20 Mar	12.46	03 May	22.85	16 Jun	19.19
21 Mar	13.27	04 May	25.99	17 Jun	23.59
22 Mar	12.46	05 May	20.19	18 Jun	16.82
23 Mar	11.87	06 May	23.25	19 Jun	33.85
24 Mar	11.95	07 May	21.13	20 Jun	21.01
25 Mar	14.95	08 May	19.45	21 Jun	0.67
26 Mar	14.56	09 May	28.15	22 Jun	26.46
27 Mar	15.15	10 May	22.61	23 Jun	29.06
28 Mar	16.08	11 May	23.06	24 Jun	19.10
29 Mar	17.68	12 May	23.95	25 Jun	16.66
30 Mar	17.44	13 May	20.82	26 Jun	20.50
31 Mar	16.61	14 May	21.21	27 Jun	25.02
01 Apr	17.13	15 May	24.52	28 Jun	23.05
02 Apr	17.92	16 May	25.35	29 Jun	23.06
03 Apr	17.98	17 May	28.93	30 Jun	26.85
04 Apr	15.60	18 May	27.86	01 Jul	24.23
05 Apr	16.43	19 May	24.87	02 Jul	24.28
06 Apr	19.22	20 May	18.93	03 Jul	23.97
07 Apr	20.33	21 May	23.35	04 Jul	24.17
08 Apr	21.39	22 May	18.85	05 Jul	21.87
09 Apr	20.10	23 May	18.33	06 Jul	22.87
10 Apr	18.96	24 May	18.87	07 Jul	23.90
11 Apr	20.47	25 May	26.23	08 Jul	35.75
12 Apr	22.47	26 May	20.68	09 Jul	21.33
13 Apr	21.16	27 May	21.60	10 Jul	23.44
14 Apr	23.49	28 May	28.91	11 Jul	20.35
15 Apr	25.21	29 May	24.19	12 Jul	24.44
16 Apr	24.20	30 May	29.49	13 Jul	28.49
17 Apr	25.28	31 May	18.74	14 Jul	28.67
18 Apr	23.56	01 Jun	25.34	15 Jul	32.15
19 Apr	26.34	02 Jun	24.07	16 Jul	23.46
20 Apr	23.01	03 Jun	25.69	17 Jul	26.21
21 Apr	22.69	04 Jun	23.21	18 Jul	16.97
22 Apr	19.39	05 Jun	19.99	19 Jul	12.93
23 Apr	24.52	06 Jun	22.61	20 Jul	26.69
24 Apr	17.67	07 Jun	14.34	21 Jul	23.96
25 Apr	27.22	08 Jun	23.11	22 Jul	28.01

Table 15. Average daily photosynthetically available irradiance (CONTINUED).

Date	PAR	Date	PAR	Date	PAR
23 Jul	20.84	30 Jul	32.21	06 Aug	15.52
24 Jul	13.35	31 Jul	32.05	07 Aug	28.96
25 Jul	14.52	01 Aug	24.24	08 Aug	25.05
26 Jul	29.67	02 Aug	14.53	09 Aug	14.72
27 Jul	27.89	03 Aug	17.17	10 Aug	5.73
28 Jul	25.01	04 Aug	18.82	11 Aug	17.95
29 Jul	27.06	05 Aug	11.72	12 Aug	25.14

Table 16. Mean daily total photosynthetically available irradiation ($mE \cdot m^{-2} \cdot day^{-1}$) at Tuktoyaktuk, for each month of record during 1986 to 1988.

Month	Mean Daily PAR ($mE \cdot m^{-2} \cdot day^{-1} \times 10^{-3}$)		
	1986	1987	1988
March			19.0
April			31.0
May	24.3	14.7	33.3
June	19.1	12.7	32.1
July	17.4	22.2	35.3
August	17.7	12.7	26.4
September	16.5	8.0	

Table 17. Photosynthetically available irradiation ($mE \cdot m^{-2} \cdot min^{-1}$) water column profile data for 1985.

Profile Sample Number	Depth of Water Sensor	Water Sensor Reading	Start Time
1	0.0	9.9	1050
1	0.5	5.9	
1	1.0	0.9	
1	1.5	0.2	
1	2.0	<0.1	
1	2.5	<0.1	
1	3.0	<0.1	
2	0.0	8.4	1500
2	0.5	<0.1	
2	1.0	<0.1	
2	1.5	<0.1	
3	0.0	45.1	1140
3	0.5	27.9	
3	1.0	7.7	
3	1.5	<0.1	
3	2.0	<0.1	
3	2.5	<0.1	
4	0.0	41.4	1445
4	0.5	8.9	
4	1.0	<0.1	
4	1.5	<0.1	
4	2.0	<0.1	
5	0.0	27.1	800
5	0.5	21.3	
5	1.0	3.0	
5	1.5	1.3	
5	2.0	0.6	
5	2.5	0.2	
5	3.0	0.1	
5	3.5	<0.1	
6	0.0	35.8	1110
6	0.5	18.7	
6	1.0	0.7	
6	1.5	<0.1	
6	2.0	<0.1	

Profile Sample Number	Depth of Water Sensor	Water Sensor Reading	Start Time
6	2.5	<0.1	
7	0.0	31.3	1400
7	0.5	7.6	
7	1.0	1.6	
7	1.5	0.5	
7	2.0	0.1	
7	2.5	<0.1	
7	3.0	<0.1	
7	3.5	<0.1	
8	0.0	52.1	1655
8	0.5	26.5	
8	1.0	10.6	
8	1.5	3.2	
8	2.0	1.7	
8	2.5	1.0	
8	3.0	0.5	
8	3.5	0.3	
8	4.0	0.2	
8	5.0	0.1	
8	6.0	<0.1	
8	7.0	<0.1	
8	8.0	<0.1	
9	0.0	5.9	1000
9	0.5	1.6	
9	1.0	0.5	
9	1.5	0.1	
9	2.0	<0.1	
9	2.5	<0.1	
9	3.0	<0.1	
10	0.0	22.7	1245
10	0.5	12.2	
10	1.0	8.1	
10	1.5	5.2	
10	2.0	4.0	
10	2.5	2.8	
10	3.0	2.1	

Profile Sample Number	Depth of Water Sensor	Water Sensor Reading	Start Time
10	3.5	1.3	
10	4.0	1.0	
10	5.0	0.5	
10	6.0	0.3	
10	7.0	0.1	
10	8.0	<0.1	
10	9.0	<0.1	
10	10.0	<0.1	
11	0.0	27.1	1430
11	0.5	6.7	
11	1.0	1.7	
11	1.5	0.8	
11	2.0	0.2	
11	2.5	<0.1	
11	3.0	<0.1	
11	3.5	<0.1	
12	0.0	28.4	1730
12	0.5	4.6	
12	1.0	0.6	
12	1.5	<0.1	
12	2.0	<0.1	
12	2.5	<0.1	
13	0.0	9.2	1005
13	0.5	<0.1	
13	1.0	<0.1	
13	1.5	<0.1	
14	0.0	5.2	1220
14	0.5	<0.1	
14	1.0	<0.1	
14	1.5	<0.1	
15	0.0	10.0	1535
15	0.5	<0.1	
15	1.0	<0.1	
15	1.5	<0.1	

Profile Sample Number	Depth of Water Sensor	Water Sensor Reading	Start Time
16	0.0	5.4	1850
16	0.5	0.1	
16	1.0	<0.1	
16	1.5	<0.1	
16	2.0	<0.1	
17	0.0	27.9	940
17	0.5	12.4	
17	1.0	1.3	
17	1.5	0.2	
17	2.0	<0.1	
17	2.5	<0.1	
17	3.0	<0.1	
18	0.0	18.2	1050
18	0.5	6.1	
18	1.0	1.2	
18	1.5	0.3	
18	2.0	<0.1	
18	2.5	<0.1	
18	3.0	<0.1	
19	0.0	38.8	1110
19	0.5	11.0	
19	1.0	3.4	
19	1.5	0.9	
19	2.0	0.3	
19	2.5	0.1	
19	3.0	<0.1	
19	3.5	<0.1	
19	4.0	<0.1	
20	0.0	50.2	1314
20	0.5	12.1	
20	1.0	3.4	
20	1.5	0.9	
20	2.0	0.3	
20	2.5	<0.1	
20	3.0	<0.1	
20	3.5	<0.1	

Table 17. Photosynthetically available irradiation ($mE \cdot m^{-2} \cdot min^{-1}$) water column profile data for 1985 (CONTINUED).

Profile Sample Number	Depth of Water Sensor	Water Sensor Reading	Start Time
21	0.0	29.1	1615
21	0.5	4.1	
21	1.0	0.4	
21	1.5	<0.1	
21	2.0	<0.1	
21	2.5	<0.1	
22	0.0	10.1	1525
22	0.5	2.0	
22	1.0	<0.1	
22	1.5	<0.1	
22	2.0	<0.1	
23	0.0	11.6	1145
23	0.5	2.8	
23	1.0	0.8	
23	1.5	0.5	
23	2.0	0.2	
23	2.5	<0.1	
23	3.0	<0.1	
23	3.5	<0.1	
24	0.0	33.7	1550
24	0.5	10.7	
24	1.0	4.1	
24	1.5	1.7	
24	2.0	0.4	
24	2.5	0.4	
24	3.0	0.3	
24	3.5	0.3	
24	4.0	0.2	
24	4.5	0.2	
24	5.0	0.2	
24	6.0	0.2	
24	7.0	0.2	
24	8.0	0.2	
24	9.0	0.2	
24	10.0	0.2	
24	11.0	0.2	
25	0.0	41.2	1920
25	0.5	15.0	
25	1.0	8.6	
25	1.5	5.5	
25	2.0	3.8	
25	2.5	3.3	
25	3.0	2.9	
25	3.5	2.7	
25	4.0	2.6	
25	4.5	2.6	
25	5.0	3.5	
25	6.0	2.6	
25	7.0	2.6	
25	8.0	3.2	
25	9.0	2.8	
25	10.0	6.5	
25	11.0	3.8	
26	0.0	23.8	1900
26	0.5	5.9	
26	1.0	1.6	
26	1.5	0.5	
26	2.0	0.5	
26	2.5	0.6	
26	3.0	0.7	
26	3.5	0.8	
26	4.0	0.8	
26	4.5	0.7	
26	5.0	0.7	
26	6.0	0.7	
26	7.0	0.7	
26	8.0	0.7	
26	9.0	0.7	
26	10.0	0.7	
26	11.0	0.6	
27	0.0	23.7	2030
27	0.5	5.1	
27	1.0	1.4	
27	1.5	1.0	
27	2.0	0.4	
27	2.5	<0.1	
27	3.0	0.4	
27	3.5	0.4	
27	4.0	0.5	
27	4.5	0.5	
27	5.0	0.5	
27	6.0	0.5	
27	7.0	0.5	
27	8.0	0.5	
27	9.0	0.5	
27	10.0	0.5	
27	11.1	0.5	
28	0.0	44.9	1555
28	0.5	9.1	
28	1.0	3.2	
28	1.5	0.7	
28	2.0	0.5	
28	2.5	0.2	
29	0.0	21.2	1800
29	0.5	11.9	
29	1.0	4.8	
29	1.5	2.3	
29	2.0	0.9	
29	2.5	0.8	
29	3.0	0.5	
29	3.5	0.4	
29	4.0	0.3	
29	5.0	0.3	
30	0.0	12.0	2005
30	0.5	2.3	
30	1.0	0.9	
30	1.5	0.4	
30	2.0	0.3	
31	0.0	4.1	2200
31	0.5	1.2	
31	1.0	0.5	
31	1.5	0.4	
31	2.0	0.3	
31	2.5	0.3	
31	3.0	0.3	
31	3.5	0.3	
31	4.0	0.3	
31	4.5	0.3	
32	0.0	9.7	1055
32	0.5	0.7	
32	1.0	0.3	
32	1.5	0.1	
32	2.0	<0.1	
32	2.5	<0.1	
33	0.0	19.7	1325
33	0.5	5.8	
33	1.0	2.8	
33	1.5	0.2	
33	2.0	0.3	
33	2.5	0.2	
33	3.0	0.1	
33	3.5	0.1	
33	4.0	0.1	
33	4.5	0.1	
33	5.0	0.1	
33	5.5	0.1	
34	0.0	5.2	1530
34	0.5	1.8	
34	1.0	0.6	
34	1.5	0.3	
34	2.0	0.1	
34	2.5	<0.1	
34	3.0	<0.1	
34	3.5	<0.1	
35	0.0	2.8	2030
35	0.5	1.4	

Table 17. Photosynthetically available irradiation ($mE \cdot m^{-2} \cdot min^{-1}$) water column profile data for 1985 (CONTINUED).

Profile Sample Number	Depth of Water Sensor	Water Sensor Reading	Start Time	Profile Sample Number	Depth of Water Sensor	Water Sensor Reading	Start Time	Profile Sample Number	Depth of Water Sensor	Water Sensor Reading	Start Time	Profile Sample Number	Depth of Water Sensor	Water Sensor Reading	Start Time
35	1.0	0.7		37	1.0	9.8		38	4.5	<0.1		40	4.0	0.8	
35	1.5	0.4		37	1.5	4.6						40	4.5	0.6	
35	2.0	0.2		37	2.0	2.8		39	0.0	9.9	1120	40	5.0	0.4	
35	2.5	<0.1		37	2.5	1.3		39	0.5	6.2		40	6.0	0.2	
35	3.0	<0.1		37	3.0	0.5		39	1.0	3.8		40	7.0	<0.1	
35	3.5	<0.1		37	3.5	0.6		39	1.5	2.4		40	8.0	<0.1	
				37	4.0	0.3		39	2.0	1.6					
36	0.0	8.5	1030	37	4.5	0.2		39	2.5	1.1		41	0.0	5.2	1800
36	0.5	5.5		37	5.0	<0.1		39	3.0	0.7		41	0.5	3.7	
36	1.0	4.1		37	6.0	<0.1		39	3.5	0.5		41	1.0	2.3	
36	1.5	3.8		37	7.0	<0.1		39	4.0	0.3		41	1.5	1.5	
36	2.0	3.3						39	4.5	0.2		41	2.0	1.0	
36	2.5	3.0		38	0.0	7.0	1900	39	5.0	<0.1		41	2.5	0.6	
36	3.0	2.9		38	0.5	2.7						41	3.0	0.4	
36	3.5	2.8		38	1.0	1.7		40	0.0	14.0	1500	41	3.5	0.3	
36	4.0	2.8		38	1.5	0.1		40	0.5	8.5		41	4.0	0.2	
36	4.5	2.7		38	2.0	0.3		40	1.5	6.1		41	4.5	0.1	
36	5.0	2.7		38	2.5	0.1		40	2.0	3.4		41	5.0	<0.1	
36	6.0	0.6		38	3.0	0.1		40	2.5	2.6		41	6.0	<0.1	
				38	3.5	<0.1		40	3.0	2.0		41	7.0	<0.1	
37	0.0	40.2	1325	38	4.0	<0.1		40	3.5	1.2					
37	0.5	21.2													

Table 18. Photosynthetically available irradiation ($mE \cdot m^{-2} \cdot min^{-1}$) water column profile data for 1986.

Profile Sample Number	Depth of Water Sensor (m)	Surface Sensor Reading	Water Sensor Reading	Water/ Surface Ratio	Time
2	0.0	76.1	<0.1	0.001	1317
2	0.5	73.5	78.9	1.074	1319
2	1.0	73.2	3.1	0.043	1319
2	1.5	71.2	<0.1	<0.001	1319
2	2.0	72.4	<0.1	<0.001	1320
3	0.0	70.3	99.0	1.409	1712
3	0.5	70.3	49.7	0.707	1712
3	1.0	70.1	16.7	0.239	1713
3	1.5	70.1	7.0	0.100	1713
3	2.0	70.1	2.9	0.041	1713
3	2.5	69.9	1.4	0.020	1713
3	3.0	70.0	0.7	0.010	1714
3	3.5	70.1	0.3	0.005	1714
3	4.0	70.3	0.2	0.002	1714
4	0.0	70.1	82.5	1.177	1714
4	0.5	70.4	22.4	0.318	1714
4	1.0	70.4	6.2	0.087	1714
4	1.5	70.3	5.5	0.079	1715
4	2.0	70.3	5.5	0.078	1715
4	2.5	70.2	5.3	0.076	1715
4	3.0	70.2	5.2	0.074	1715
4	3.5	70.1	5.1	0.073	1715
4	4.0	70.1	5.1	0.072	1715
5	0.0	49.9	30.3	0.607	1433
5	0.5	52.8	<0.1	0.001	1433
6	0.0	76.5	40.6	0.531	1748
6	0.5	71.2	0.2	0.003	1748
6	1.5	68.6	<0.1	<0.001	1749
7	0.0	45.1	36.9	0.819	1346
7	0.5	45.6	23.6	0.517	1346
7	1.0	46.2	16.1	0.349	1346
7	1.5	47.3	12.0	0.254	1347
7	2.0	48.7	7.9	0.162	1347
7	2.5	52.0	5.6	0.108	1347
7	3.0	52.9	4.0	0.076	1348
7	3.5	50.0	2.4	0.048	1348
7	4.0	51.2	1.9	0.037	1348
7	4.5	53.4	1.4	0.026	1349
7	5.0	51.1	0.9	0.017	1349
7	5.5	49.9	0.6	0.012	1350
7	6.0	49.0	0.4	0.008	1350
8	0.0	53.7	32.6	0.608	1731
8	0.5	49.8	34.1	0.683	1732
8	1.0	54.9	32.8	0.596	1732
8	1.5	51.9	25.4	0.489	1733
8	2.0	41.7	16.3	0.391	1736
8	2.5	38.8	12.3	0.317	1737
8	3.0	37.8	8.7	0.231	1737
8	3.5	38.4	6.5	0.170	1737
8	4.0	39.2	4.8	0.124	1738
8	4.5	40.2	3.3	0.082	1738
8	5.0	40.2	2.8	0.070	1738
8	5.5	39.7	2.0	0.050	1738
8	6.5	32.5	0.9	0.027	1741
8	7.0	30.9	0.6	0.020	1742
8	7.5	25.7	0.4	0.017	1745
8	8.0	25.3	0.3	0.014	1745
8	8.5	24.0	0.3	0.011	1745
8	9.0	23.1	0.2	0.011	1745
8	9.5	21.4	0.2	0.009	1746
8	11.0	21.1	0.1	0.005	1746
8	12.0	20.8	<0.1	0.004	1746
8	13.0	20.5	<0.1	0.002	1747
8	14.0	20.7	<0.1	0.002	1747
8	15.0	19.2	<0.1	0.001	1748
9	0.0	34.4	25.6	0.745	1340
9	0.5	33.7	17.4	0.515	1341
9	1.0	33.5	9.5	0.283	1341
9	1.5	33.4	4.8	0.142	1341
9	2.0	33.3	2.6	0.079	1342
9	2.5	33.1	1.5	0.044	1342
9	3.0	32.7	0.8	0.025	1342
9	3.5	32.0	0.4	0.014	1343
9	4.0	31.5	0.3	0.008	1343
9	4.5	31.1	0.1	0.005	1343
9	5.0	30.7	<0.1	0.003	1343
9	5.5	30.5	<0.1	0.002	1344
9	6.0	30.2	<0.1	0.001	1344
10	0.0	16.8	12.2	0.728	1024
10	0.5	17.1	9.4	0.553	1024
10	1.0	18.6	6.0	0.324	1024
10	1.5	22.0	5.2	0.238	1025
10	2.0	22.3	3.1	0.140	1025
10	2.5	21.7	2.4	0.109	1026
10	3.0	21.3	1.4	0.068	1026
10	3.5	22.6	1.3	0.056	1027
10	4.0	23.0	0.8	0.034	1027
10	4.5	24.8	0.5	0.019	1027
10	5.0	25.4	0.3	0.011	1028
10	5.5	25.6	0.2	0.007	1028
10	6.0	26.0	0.1	0.005	1028
10	6.5	25.4	<0.1	0.003	1029
10	7.0	28.6	<0.1	0.002	1029
10	7.5	28.5	<0.1	0.002	1029
10	8.0	29.4	<0.1	0.002	1030
10	8.5	29.6	<0.1	0.001	1030
10	9.0	25.1	<0.1	0.001	1030
10	9.5	22.1	<0.1	0.001	1031
11	0.0	29.4	17.4	0.592	1500
11	0.5	33.0	22.8	0.692	1502
11	1.0	32.9	17.2	0.523	1502
11	1.5	33.0	13.6	0.412	1502
11	2.0	33.1	10.4	0.314	1503
11	2.5	34.0	8.5	0.250	1503
11	3.0	33.2	7.0	0.210	1503
11	3.5	32.9	5.2	0.157	1503
11	4.0	32.3	3.9	0.120	1504
11	4.5	31.9	2.7	0.085	1504
11	5.0	32.1	2.2	0.067	1505

Table 18. Photosynthetically available irradiation ($mE \cdot m^{-2} \cdot min^{-1}$) water column profile data for 1986 (CONTINUED).

Profile Sample Number	Depth of Water Sensor (m)	Surface Sensor Reading	Water Sensor Reading	Water/ Surface Ratio	Time	Profile Sample Number	Depth of Water Sensor (m)	Surface Sensor Reading	Water Sensor Reading	Water/ Surface Ratio	Time
11	5.5	31.8	1.5	0.047	1505	14	1.0	9.4	3.6	0.383	1901
11	6.0	31.4	1.2	0.038	1505	14	1.5	9.3	2.4	0.264	1901
11	6.5	31.1	0.9	0.028	1506	14	2.0	9.2	1.6	0.176	1902
11	7.0	30.8	0.8	0.027	1506	14	2.5	9.0	1.1	0.121	1902
11	7.5	29.7	0.6	0.021	1506	14	3.0	8.9	0.8	0.087	1902
11	8.0	30.5	0.5	0.017	1507	14	3.5	9.0	0.6	0.065	1903
11	8.5	30.0	0.4	0.015	1507	14	4.0	8.9	0.5	0.053	1903
11	9.0	29.8	0.4	0.013	1507	14	4.5	8.8	0.4	0.042	1903
11	9.5	28.6	0.3	0.010	1508	14	5.0	8.7	0.3	0.034	1904
11	10.0	27.8	0.3	0.009	1508	14	5.5	8.7	0.2	0.029	1904
11	11.0	27.1	0.2	0.008	1508	14	6.0	8.5	0.2	0.023	1904
11	12.0	26.5	0.2	0.006	1509	14	6.5	8.6	0.2	0.019	1905
11	13.0	26.0	0.1	0.005	1509	14	7.0	8.1	0.1	0.017	1906
11	14.0	25.6	0.1	0.004	1509	14	7.5	8.3	0.1	0.013	1906
11	15.0	25.4	<0.1	0.004	1510	14	8.0	8.2	0.1	0.014	1906
11	16.0	25.3	<0.1	0.003	1510	14	8.5	8.3	<0.1	0.009	1907
11	17.0	25.2	<0.1	0.002	1510	14	9.0	8.3	<0.1	0.007	1907
11	18.0	25.4	<0.1	0.002	1511	14	9.5	8.2	<0.1	0.006	1907
11	19.0	25.5	<0.1	0.001	1511	14	10.0	8.1	<0.1	0.005	1908
11	20.0	25.7	<0.1	0.002	1512	14	11.0	8.2	<0.1	0.006	1908
11	21.0	25.9	<0.1	0.001	1512	14	12.0	8.2	<0.1	0.005	1909
11	22.0	26.2	<0.1	0.001	1512	14	14.0	8.1	<0.1	0.002	1910
11	23.0	26.6	<0.1	<0.001	1513						
						15	0.0	19.4	10.6	0.547	1100
12	0.0	11.9	8.1	0.684	1426	15	0.5	19.6	9.3	0.475	1100
12	0.5	12.0	2.7	0.221	1426	15	1.0	19.4	6.2	0.317	1100
12	1.0	12.1	0.8	0.070	1427	15	1.5	19.5	5.3	0.273	1100
12	1.5	12.4	0.2	0.017	1427	15	2.0	19.4	3.4	0.176	1101
12	2.0	12.5	<0.1	0.008	1427	15	2.5	19.9	2.9	0.145	1101
12	2.5	12.7	<0.1	0.003	1427	15	3.0	20.3	2.2	0.110	1101
12	3.0	12.9	<0.1	0.001	1428	15	3.5	20.9	1.7	0.082	1102
12	3.5	13.1	<0.1	0.001	1428	15	4.0	22.2	1.4	0.064	1102
12	4.0	13.3	<0.1	<0.001	1428	15	4.5	22.9	1.0	0.045	1102
						15	5.0	22.4	0.8	0.036	1102
13	0.0	20.1	14.4	0.719	1757	15	5.5	22.5	0.5	0.024	1103
13	0.5	20.7	11.3	0.546	1757	15	6.0	21.9	0.4	0.019	1103
13	1.0	21.5	8.1	0.377	1757	15	6.5	22.0	0.3	0.015	1103
13	1.5	22.5	6.3	0.282	1758	15	7.0	22.1	0.3	0.013	1104
13	2.0	23.4	4.4	0.189	1758	15	7.5	21.5	0.2	0.010	1104
13	2.5	24.1	3.2	0.134	1758	15	8.0	21.5	0.2	0.009	1104
13	3.0	24.8	2.5	0.100	1759	15	8.5	22.0	0.2	0.007	1105
13	3.5	25.6	2.0	0.076	1759	15	9.0	22.5	0.1	0.006	1105
13	4.0	26.2	1.3	0.048	1800	15	9.5	22.5	0.1	0.005	1105
13	4.5	25.9	1.2	0.045	1800	15	10.0	21.5	0.1	0.005	1106
13	5.0	26.1	0.8	0.033	1801	15	11.0	20.4	<0.1	0.004	1106
13	5.5	25.6	0.7	0.027	1801	15	12.0	19.5	<0.1	0.003	1107
13	6.0	24.3	0.6	0.023	1802	15	13.0	15.2	<0.1	0.003	1110
13	6.5	23.8	0.4	0.015	1802	15	14.0	15.3	<0.1	0.002	1111
13	7.0	23.3	0.3	0.015	1803	15	15.0	15.2	<0.1	0.002	1111
13	7.5	22.8	0.2	0.010	1804	15	16.0	15.3	<0.1	0.001	1111
13	8.0	22.5	0.2	0.008	1804	15	17.0	15.8	<0.1	0.001	1112
13	8.5	22.3	0.2	0.007	1805	15	18.0	16.3	<0.1	0.002	1112
13	9.0	21.7	<0.1	0.005	1805	15	19.0	16.8	<0.1	0.001	1112
13	9.5	21.3	<0.1	0.004	1806	15	20.0	17.2	<0.1	0.001	1113
13	10.0	20.8	<0.1	0.002	1807	15	21.0	17.9	<0.1	0.001	1113
13	11.0	20.4	<0.1	0.002	1807						
						16	0.0	13.5	9.6	0.710	1740
14	0.0	9.5	7.7	0.815	1900	16	0.5	13.1	7.3	0.558	1740
14	0.5	9.4	5.5	0.593	1901	16	1.0	12.8	4.8	0.372	1740

Table 18. Photosynthetically available irradiation ($mE \cdot m^{-2} \cdot min^{-1}$) water column profile data for 1986 (CONTINUED).

Profile Sample Number	Depth of Water Sensor (m)	Surface Sensor Reading	Water Sensor Reading	Water/ Surface Ratio	Time
16	1.5	13.4	3.8	0.284	1740
16	2.0	13.5	2.6	0.190	1741
16	2.5	14.1	2.1	0.150	1741
16	3.0	14.7	1.5	0.101	1741
16	3.5	15.0	1.1	0.073	1742
16	4.0	15.3	0.8	0.053	1742
16	4.5	15.7	0.6	0.041	1742
16	5.0	15.8	0.5	0.032	1742
16	5.5	15.2	0.4	0.027	1743
16	6.0	15.5	0.4	0.023	1743
16	6.5	16.2	0.3	0.019	1743
16	7.0	16.7	0.3	0.016	1743
16	7.5	17.0	0.2	0.014	1744
16	8.0	16.9	0.2	0.012	1744
16	8.5	16.3	0.2	0.010	1744
16	9.0	15.5	0.1	0.009	1745
16	9.5	15.2	0.1	0.008	1745
16	10.0	15.6	0.1	0.007	1745
16	11.0	15.8	<0.1	0.006	1745
16	12.0	16.3	<0.1	0.005	1746
16	13.0	16.6	<0.1	0.004	1746
16	14.0	16.4	<0.1	0.004	1746
16	15.0	16.4	<0.1	0.003	1746
16	16.0	17.2	<0.1	0.003	1747
16	17.0	17.3	<0.1	0.002	1747
16	18.0	17.3	<0.1	0.002	1747
16	19.0	16.9	<0.1	0.002	1748
16	20.0	15.9	<0.1	0.002	1748
16	21.0	15.5	<0.1	0.002	1749
16	22.0	15.9	<0.1	0.001	1749
16	23.0	16.2	<0.1	0.001	1749
16	24.0	16.5	<0.1	0.001	1750
17	0.0	32.0	30.5	0.951	1708
17	0.5	32.2	22.1	0.686	1708
17	1.0	31.9	16.7	0.525	1708
17	1.5	31.8	12.3	0.385	1708
17	2.0	32.0	8.8	0.276	1709
17	2.5	32.1	6.5	0.203	1709
17	3.0	32.0	4.5	0.142	1709
17	3.5	31.8	3.3	0.104	1709
17	4.0	31.8	2.5	0.080	1710
17	4.5	32.4	1.7	0.052	1710
17	5.0	32.5	1.3	0.041	1710
17	5.5	32.6	1.0	0.031	1710
17	6.0	32.9	0.7	0.021	1711
18	0.0	23.3	16.3	0.699	2030
18	0.5	23.2	12.5	0.538	2030
18	1.0	23.2	9.7	0.420	2030
18	1.5	22.8	6.2	0.273	2031
18	2.0	21.9	4.8	0.218	2031
18	2.5	21.7	3.5	0.162	2032
18	3.0	21.6	2.3	0.106	2032
18	3.5	21.6	1.8	0.081	2032
18	4.0	21.5	1.2	0.056	2033
18	4.5	21.4	0.8	0.039	2033
18	5.0	21.4	0.7	0.031	2033
18	5.5	21.2	0.5	0.023	2034
18	6.0	21.0	0.3	0.016	2034
18	6.5	20.7	0.2	0.012	2034
18	7.0	20.6	0.2	0.010	2035
18	7.5	20.5	0.2	0.009	2035
18	8.0	20.2	0.2	0.008	2035
18	8.5	19.7	0.1	0.007	2036
18	9.0	20.3	0.1	0.006	2036
18	9.5	20.5	<0.1	0.005	2036
18	10.0	20.3	<0.1	0.004	2037
18	11.0	19.4	<0.1	0.003	2037
18	12.0	20.0	<0.1	0.002	2037
18	13.0	19.5	<0.1	0.002	2038
18	14.0	18.8	<0.1	0.001	2038
18	15.0	18.3	<0.1	0.001	2038
19	0.0	9.4	8.4	0.897	1047
19	0.5	9.3	3.5	0.373	1048
19	1.0	9.3	2.2	0.240	1048
19	1.5	9.4	1.4	0.146	1048
19	2.0	9.6	0.7	0.073	1049
19	2.5	9.7	0.3	0.036	1049
19	3.0	9.6	0.2	0.022	1049
19	3.5	9.8	0.1	0.013	1049
19	4.0	9.8	<0.1	0.007	1050
19	4.5	9.7	<0.1	0.004	1050
19	5.0	9.4	<0.1	0.003	1050
19	5.5	9.3	<0.1	0.002	1050
19	6.0	9.1	<0.1	0.001	1050
19	6.5	8.9	<0.1	0.001	1051
19	7.0	8.8	<0.1	0.001	1051
20	0.0	39.6	37.4	0.943	1424
20	0.5	39.7	6.9	0.173	1424
20	1.0	39.6	2.1	0.053	1424
20	1.5	39.5	0.7	0.017	1424
20	2.0	39.4	0.3	0.007	1424
20	2.5	39.3	0.1	0.004	1425
20	3.0	38.9	<0.1	0.002	1425
20	3.5	39.2	<0.1	0.002	1425
20	4.0	39.3	<0.1	0.001	1425
20	4.5	39.3	<0.1	<0.001	1426
20	5.0	39.3	<0.1	<0.001	1426
21	0.0	42.6	46.3	1.085	1145
21	0.5	44.1	22.5	0.511	1145
21	1.0	45.5	11.8	0.260	1145
21	1.5	44.2	5.6	0.126	1146
21	2.0	47.1	2.6	0.056	1146
21	2.5	46.7	1.2	0.027	1146
21	3.0	45.9	0.3	0.007	1147
21	3.5	47.1	<0.1	0.001	1147
21	4.0	48.0	<0.1	<0.001	1147
22	0.0	74.2	74.7	1.007	1520
22	0.5	74.2	16.8	0.227	1520
22	1.0	71.2	6.9	0.097	1521
22	1.5	70.0	2.1	0.030	1521
22	2.0	68.9	0.8	0.012	1521
22	2.5	68.4	0.2	0.004	1522

Table 18. Photosynthetically available irradiation ($mE \cdot m^{-2} \cdot min^{-1}$) water column profile data for 1986 (CONTINUED).

Profile Sample Number	Depth of Water Sensor (m)	Surface Sensor Reading	Water Sensor Reading	Water/ Surface Ratio	Time
22	3.0	70.0	0.2	0.002	1522
22	3.5	68.5	<0.1	0.001	1522
22	4.0	71.1	<0.1	<0.001	1523
22	4.5	68.6	<0.1	<0.001	1523
23	0.0	34.1	20.9	0.611	1931
23	0.5	33.2	16.9	0.509	1931
23	1.0	33.7	11.8	0.350	1932
23	1.5	32.8	9.3	0.283	1932
23	2.0	31.9	7.8	0.244	1932
23	2.5	32.2	6.9	0.213	1933
23	3.0	32.4	6.4	0.198	1933
23	3.5	32.6	5.5	0.169	1933
23	4.0	32.9	5.0	0.153	1933
23	4.5	33.2	4.1	0.123	1934
23	5.0	32.3	3.7	0.115	1934
23	5.5	32.3	3.4	0.105	1934
23	6.0	29.8	2.7	0.090	1935
23	6.5	27.6	2.2	0.080	1935
23	7.0	26.6	1.9	0.072	1935
23	7.5	25.2	1.7	0.068	1936
23	8.0	23.4	1.4	0.059	1936
23	8.5	22.7	1.2	0.053	1936
23	9.0	22.3	1.0	0.045	1937
23	9.5	23.1	0.9	0.037	1937
23	10.0	24.2	0.6	0.023	1937
23	11.0	25.8	0.3	0.013	1938
23	12.0	26.4	0.2	0.008	1938
23	13.0	27.1	<0.1	0.004	1938
24	0.0	9.6	7.5	0.782	1027
24	0.5	10.4	5.4	0.521	1027
24	1.0	10.1	4.7	0.463	1027
24	1.5	9.9	4.1	0.418	1028
24	2.0	9.9	2.9	0.297	1028
24	2.5	9.8	2.4	0.241	1028
24	3.0	10.1	1.8	0.182	1029
24	3.5	10.1	1.5	0.146	1029
24	4.0	10.3	1.2	0.119	1029
24	4.5	9.8	1.0	0.106	1030
24	5.0	10.1	0.8	0.079	1030
24	5.5	9.7	0.7	0.069	1031
24	6.0	10.1	0.5	0.051	1031
24	6.5	10.2	0.4	0.042	1031
24	7.0	10.4	0.4	0.036	1032
24	7.5	9.8	0.3	0.033	1032
24	8.0	10.3	0.3	0.026	1032
24	8.5	10.2	0.2	0.023	1033
24	9.0	10.2	0.2	0.021	1033
24	9.5	10.7	0.2	0.018	1033
24	10.0	10.0	0.2	0.019	1034
24	11.0	10.6	0.2	0.015	1034
24	12.0	10.7	0.1	0.014	1034
24	13.0	10.4	0.1	0.014	1035
24	14.0	11.0	0.1	0.012	1035
24	15.0	11.0	0.1	0.011	1036
24	16.0	11.4	0.1	0.009	1036
24	17.0	11.9	0.1	0.009	1036
24	18.0	12.1	<0.1	0.008	1036
24	19.0	11.6	<0.1	0.008	1037
24	20.0	12.1	<0.1	0.006	1037
24	21.0	12.4	<0.1	0.005	1037
24	22.0	12.6	<0.1	0.004	1038
24	23.0	13.0	<0.1	0.003	1038
24	24.0	13.0	<0.1	0.001	1038
24	25.0	14.1	<0.1	0.002	1039
24	26.0	13.6	<0.1	0.002	1039
24	27.0	14.6	<0.1	<0.001	1039
25	0.0	25.2	27.0	1.070	1922
25	0.5	22.3	19.2	0.859	1923
25	1.0	21.8	13.4	0.615	1924
25	1.5	21.6	10.8	0.498	1924
25	2.0	20.9	9.2	0.442	1924
25	2.5	20.4	7.8	0.383	1925
25	3.0	19.7	6.5	0.328	1925
25	3.5	19.5	5.6	0.288	1926
25	4.0	19.7	5.0	0.253	1926
25	4.5	19.8	4.5	0.226	1926
25	5.0	19.7	3.9	0.200	1926
25	5.5	20.0	3.6	0.179	1927
25	6.0	20.1	3.2	0.160	1927
25	6.5	20.4	2.9	0.144	1927
25	7.0	20.9	2.7	0.128	1928
25	7.5	21.2	2.5	0.118	1928
25	8.0	22.3	2.5	0.113	1928
25	8.5	23.5	2.3	0.097	1929
25	9.0	23.9	2.3	0.095	1929
25	9.5	24.0	2.1	0.089	1929
25	10.0	22.6	2.0	0.091	1930
25	11.0	20.1	1.7	0.083	1935
25	12.0	19.9	1.5	0.077	1935
25	13.0	20.2	1.4	0.069	1935
25	14.0	20.4	1.3	0.062	1935
25	15.0	20.4	1.2	0.058	1936
25	16.0	20.5	1.1	0.052	1936
25	17.0	20.5	1.0	0.049	1936
25	18.0	20.9	0.9	0.045	1936
25	19.0	21.0	0.9	0.042	1937
25	20.0	21.2	0.8	0.038	1937
25	21.0	21.2	0.8	0.037	1937
25	22.0	21.9	0.7	0.033	1938
25	23.0	22.6	0.6	0.028	1938
25	24.0	23.4	0.6	0.027	1938
25	25.0	23.9	0.6	0.025	1938
25	26.0	25.0	0.5	0.022	1939
25	27.0	24.9	0.5	0.020	1939
25	28.0	24.3	0.5	0.019	1939
25	29.0	23.8	0.4	0.018	1940
26	0.0	2.1	1.4	0.681	0701
26	0.5	2.1	1.2	0.571	0702
26	1.0	2.1	1.0	0.471	0702
26	1.5	2.1	0.9	0.403	0702
26	2.0	2.1	0.7	0.350	0703
26	2.5	2.7	0.6	0.217	0704
26	3.0	2.7	0.5	0.190	0704
26	3.5	2.7	0.4	0.158	0704

Table 18. Photosynthetically available irradiation ($mE \cdot m^{-2} \cdot min^{-1}$) water column profile data for 1986 (CONTINUED).

Profile Sample Number	Depth of Water Sensor (m)	Surface Sensor Reading	Water Sensor Reading	Water/ Surface Ratio	Time
26	4.0	2.8	0.4	0.133	0704
26	4.5	2.8	0.3	0.115	0705
26	5.0	2.7	0.3	0.100	0705
26	5.5	2.6	0.2	0.090	0700
26	6.0	2.6	0.2	0.081	0706
26	6.5	2.6	0.2	0.074	0706
26	7.0	2.7	0.2	0.067	0706
26	7.5	2.7	0.2	0.063	0707
26	8.0	2.7	0.2	0.059	0707
26	8.5	2.8	0.2	0.057	0707
26	9.0	2.8	0.1	0.052	0708
26	9.5	2.8	0.1	0.051	0708
26	10.0	2.8	0.1	0.047	0708
26	11.0	3.2	0.1	0.043	0711
26	12.0	3.2	0.1	0.039	0712
26	13.0	3.2	0.1	0.036	0712
26	14.0	3.3	0.1	0.033	0712
26	15.0	3.3	<0.1	0.030	0713
26	16.0	3.4	<0.1	0.028	0713
26	17.0	3.4	<0.1	0.026	0713
26	18.0	3.3	<0.1	0.024	0714
26	19.0	3.3	<0.1	0.021	0714
26	20.0	3.3	<0.1	0.020	0715
26	21.0	3.3	<0.1	0.018	0715
26	22.0	3.3	<0.1	0.017	0715
26	23.0	3.3	<0.1	0.016	0716
26	24.0	3.3	<0.1	0.015	0716
26	25.0	3.4	<0.1	0.014	0716
26	26.0	3.4	<0.1	0.012	0717
26	27.0	3.5	<0.1	0.011	0717
27	0.0	71.5	59.9	0.839	1522
27	0.5	71.4	39.5	0.553	1522
27	1.0	71.3	24.8	0.348	1523
27	1.5	71.2	11.3	0.159	1523
27	2.0	72.3	6.6	0.092	1524
27	2.5	72.1	3.9	0.054	1524
27	3.0	72.1	1.8	0.025	1524
27	3.5	73.3	0.8	0.011	1524
27	4.0	71.5	0.5	0.007	1525
27	4.5	71.8	0.2	0.003	1525
27	5.0	71.9	<0.1	<0.001	1526
27	5.5	71.6	<0.1	<0.001	1526
28	0.0	65.0	75.8	1.166	1609
28	0.5	68.2	58.2	0.854	1610
28	1.0	68.8	45.8	0.666	1610
28	1.5	69.0	36.3	0.526	1611
28	2.0	68.9	28.0	0.405	1611
28	2.5	67.3	21.8	0.324	1611
28	3.0	68.2	19.2	0.281	1611
28	3.5	68.5	15.3	0.223	1612
28	4.0	67.0	12.2	0.182	1612
28	4.5	68.6	10.1	0.147	1612
28	5.0	68.3	8.8	0.128	1613
28	5.5	68.3	7.1	0.104	1613
28	6.0	68.4	6.2	0.091	1613
28	6.5	69.2	4.9	0.071	1614
28	7.0	70.0	4.2	0.060	1614
28	7.5	70.7	3.6	0.051	1614
28	8.0	71.4	3.1	0.043	1615
28	8.5	71.5	2.9	0.041	1615
28	9.0	72.0	2.6	0.036	1615
28	9.5	73.2	2.4	0.033	1615
28	10.0	72.1	2.2	0.030	1616
28	11.0	73.4	1.7	0.024	1616
28	12.0	73.0	1.5	0.020	1617
28	13.0	72.4	1.0	0.014	1617
28	14.0	74.0	0.6	0.007	1617
28	15.0	71.6	0.3	0.004	0617
29	0.0	5.0	4.0	0.797	0857
29	0.5	4.8	3.3	0.671	0857
29	1.0	4.7	2.6	0.545	0857
29	1.5	4.7	2.3	0.493	0858
29	2.0	4.6	2.1	0.450	0858
29	2.5	4.6	1.9	0.408	0858
29	3.0	4.7	1.7	0.360	0859
29	3.5	4.8	1.6	0.335	0859
29	4.0	4.9	1.4	0.282	0859
29	4.5	4.8	1.2	0.254	0900
29	5.0	4.7	1.3	0.264	0900
29	5.5	4.7	1.0	0.222	0900
29	6.0	4.6	1.0	0.223	0900
29	6.5	4.6	0.9	0.207	0901
29	7.0	4.6	0.9	0.188	0901
29	7.5	4.7	0.8	0.171	0902
29	8.0	4.9	0.8	0.157	0902
29	8.5	5.0	0.7	0.146	0902
29	9.0	5.1	0.7	0.137	0902
29	9.5	5.3	0.7	0.128	0903
29	10.0	5.5	0.6	0.118	0903
29	11.0	5.7	0.6	0.109	0904
29	12.0	5.8	0.6	0.100	0904
29	13.0	6.0	0.5	0.091	0904
29	14.0	6.1	0.5	0.083	0904
29	15.0	6.2	0.5	0.076	0905
29	16.0	6.2	0.4	0.068	0905
29	17.0	6.1	0.4	0.063	0905
29	18.0	6.2	0.3	0.051	0906
29	19.0	6.2	0.3	0.044	0906
29	20.0	6.2	0.2	0.027	0906
29	21.0	6.4	0.1	0.016	0907
29	22.0	7.7	<0.1	0.006	0910
29	23.0	7.7	<0.1	0.004	0911
29	24.0	7.8	<0.1	0.003	0911
29	25.0	7.8	<0.1	0.002	0911
29	26.0	7.8	<0.1	<0.001	0912
29	27.0	7.7	<0.1	<0.001	0912
29	28.0	7.6	<0.1	<0.001	0912
30	0.0	19.2	11.7	0.609	1729
30	0.5	18.7	10.3	0.550	1729
30	1.0	18.1	9.5	0.527	1729
30	1.5	17.7	8.4	0.474	1729
30	2.0	17.6	7.8	0.441	1730
30	2.5	18.0	7.3	0.404	1730
30	3.0	18.4	6.8	0.372	1730

Table 18. Photosynthetically available irradiation ($mE \cdot m^{-2} \cdot min^{-1}$) water column profile data for 1986 (CONTINUED).

Profile Sample Number	Depth of Water Sensor (m)	Surface Sensor Reading	Water Sensor Reading	Water/ Surface Ratio	Time
30	3.5	18.9	6.5	0.343	1731
30	4.0	19.2	6.2	0.323	1731
30	4.5	18.1	5.6	0.307	1731
30	5.0	17.2	5.0	0.290	1731
30	5.5	16.9	4.6	0.270	1732
30	6.0	16.9	4.3	0.255	1732
30	6.5	17.0	4.0	0.238	1732
30	7.0	17.2	3.9	0.225	1733
30	7.5	17.3	3.7	0.215	1733
30	8.0	17.2	3.6	0.207	1733
30	8.5	17.1	3.3	0.195	1734
30	9.0	16.9	3.1	0.185	1734
30	9.5	16.7	3.0	0.178	1734
30	10.0	16.7	2.8	0.168	1734
30	11.0	16.7	2.6	0.154	1735
30	12.0	16.6	2.3	0.140	1735
30	13.0	16.9	2.1	0.123	1735
30	14.0	17.3	1.9	0.109	1736
30	15.0	18.0	1.8	0.098	1736
30	16.0	18.7	1.7	0.090	1737
30	17.0	19.1	1.6	0.085	1737
30	18.0	19.3	1.5	0.080	1737
30	19.0	19.9	1.4	0.073	1738
30	20.0	21.1	1.4	0.068	1738
30	21.0	23.9	1.5	0.063	1738
30	22.0	27.3	1.6	0.059	1739
30	23.0	28.2	1.6	0.055	1739
30	24.0	27.9	1.4	0.051	1739
30	25.0	28.0	1.3	0.047	1740
30	26.0	25.8	1.1	0.044	1740
30	27.0	24.5	1.0	0.041	1740
31	0.0	1.7	1.2	0.697	0806
31	0.5	1.8	1.1	0.610	0806
31	1.0	1.9	1.0	0.526	0806
31	1.5	1.9	0.9	0.468	0807
31	2.0	2.0	0.9	0.462	0807
31	2.5	2.1	1.0	0.468	0807
31	3.0	2.1	1.0	0.450	0807
31	3.5	2.2	0.9	0.419	0808
31	4.0	2.2	0.9	0.398	0808
31	4.5	2.3	0.9	0.391	0808
31	5.0	2.4	0.9	0.374	0809
31	5.5	2.4	0.9	0.351	0809
31	6.0	2.5	0.8	0.336	0809
31	6.5	2.6	0.8	0.321	0809
31	7.0	2.7	0.8	0.291	0810
31	7.5	2.8	0.8	0.280	0810
31	8.0	2.9	0.8	0.261	0810
31	8.5	3.1	0.8	0.253	0811
31	9.0	3.2	0.8	0.246	0811
31	9.5	3.3	0.7	0.226	0811
31	10.0	3.4	0.7	0.219	0811
31	11.0	3.5	0.7	0.207	0812
31	12.0	3.6	0.7	0.199	0812
31	13.0	3.7	0.7	0.177	0812
31	14.0	3.8	0.5	0.134	0813
31	15.0	4.0	0.5	0.126	0813
31	16.0	4.1	0.4	0.103	0813
31	17.0	4.2	0.3	0.082	0813
31	18.0	4.4	0.3	0.079	0814
31	19.0	4.5	0.3	0.071	0814
31	20.0	4.7	0.3	0.065	0815
31	21.0	4.9	0.3	0.056	0815
31	22.0	4.9	0.2	0.047	0815
31	23.0	5.0	0.2	0.038	0816
31	24.0	5.1	0.2	0.030	0816
31	25.0	5.2	0.1	0.023	0816
31	26.0	5.3	<0.1	0.013	0817
31	27.0	5.4	<0.1	0.002	0817
32	0.0	41.3	34.2	0.826	1457
32	1.0	34.8	19.7	0.565	1458
32	2.0	57.4	37.7	0.656	1458
32	3.0	29.8	11.7	0.395	1459
32	4.0	35.8	11.9	0.331	1459
32	5.0	50.9	18.1	0.356	1500
32	6.0	33.9	7.8	0.231	1501
32	7.0	39.2	8.4	0.214	1501
32	8.0	41.6	7.8	0.188	1502
32	9.0	34.1	4.9	0.143	1502
32	10.0	31.4	4.0	0.127	1503
32	11.0	37.3	4.2	0.113	1503
32	12.0	28.5	2.4	0.086	1504
32	13.0	58.3	7.5	0.129	1505
32	14.0	34.2	2.3	0.068	1506
32	15.0	32.7	1.8	0.055	1507
32	16.0	39.6	2.4	0.062	1507
32	17.0	41.3	2.4	0.058	1507
32	18.0	41.8	1.9	0.045	1508
32	19.0	42.4	1.6	0.038	1508
32	20.0	42.0	1.4	0.032	1509
32	21.0	40.3	0.8	0.020	1510
32	22.0	39.8	0.5	0.014	1510
32	23.0	39.3	0.2	0.005	1510
32	24.0	41.9	0.2	0.004	1511
32	25.0	43.8	<0.1	0.002	1511
33	0.0	48.1	34.0	0.706	1451
33	1.0	51.7	72.8	1.410	1451
33	2.0	14.5	12.6	0.868	1452
33	3.0	13.8	10.7	0.769	1452
33	4.0	36.4	9.7	0.266	1453
33	5.0	33.3	7.7	0.231	1453
33	6.0	33.0	6.9	0.208	1454
33	7.0	33.4	6.3	0.189	1454
33	8.0	32.6	5.9	0.182	1454
33	9.0	32.7	5.3	0.161	1455
33	10.0	33.4	4.7	0.142	1455
33	11.0	33.3	4.2	0.127	1456
33	12.0	34.3	4.1	0.118	1456
33	13.0	34.4	3.5	0.103	1457
33	14.0	34.5	3.2	0.094	1457
33	15.0	33.8	2.9	0.086	1457
33	16.0	35.9	2.5	0.071	1458
33	17.0	41.7	2.4	0.059	1458
33	18.0	49.6	2.3	0.045	1459
33	19.0	55.8	1.2	0.022	1459

Table 18. Photosynthetically available irradiation ($mE \cdot m^{-2} \cdot min^{-1}$) water column profile data for 1986 (CONTINUED).

Profile Sample Number	Depth of Water Sensor (m)	Surface Sensor Reading	Water Sensor Reading	Water/ Surface Ratio	Time	Profile Sample Number	Depth of Water Sensor (m)	Surface Sensor Reading	Water Sensor Reading	Water/ Surface Ratio	Time
33	20.0	55.9	0.2	0.003	1500	43	0.0	16.6	6.9	0.418	0909
						43	0.5	17.0	5.1	0.303	0909
34	0.0	32.0	30.3	0.948	1624	43	1.0	16.7	2.3	0.139	0910
34	0.5	34.7	24.0	0.692	1624	43	1.5	17.1	1.3	0.075	0910
34	1.0	39.8	19.8	0.496	1624	43	2.0	17.2	0.8	0.046	0910
34	1.5	45.8	12.6	0.275	1625	43	2.5	17.2	0.4	0.025	0910
34	2.0	67.7	12.6	0.187	1625	43	3.0	17.2	0.2	0.012	0911
34	2.5	77.9	8.7	0.112	1625	43	3.5	17.2	0.1	0.006	0911
34	3.0	46.2	2.0	0.044	1626	43	4.0	17.0	<0.1	0.001	0911
34	3.5	44.3	0.4	0.008	1626						
						44	0.0	60.2	46.7	0.776	1448
36	0.0	22.2	3.7	0.165	1506	44	0.5	60.4	30.7	0.508	1448
36	0.5	21.7	0.6	0.027	1506	44	1.0	62.0	11.7	0.188	1448
						44	1.5	60.7	5.4	0.088	1449
39	0.0	15.3	11.9	0.781	1222	44	2.0	60.1	2.4	0.039	1449
39	0.5	15.0	5.8	0.384	1223	44	2.5	60.4	1.4	0.023	1449
39	1.0	14.9	3.2	0.218	1223	44	3.0	61.0	0.8	0.014	1450
39	1.5	15.0	2.1	0.142	1223	44	3.5	61.6	0.5	0.008	1450
39	2.0	15.1	1.6	0.103	1223	44	4.0	61.9	0.2	0.003	1450
39	2.5	15.0	0.8	0.055	1224	44	4.5	60.5	<0.1	0.001	1451
39	3.0	15.1	0.5	0.033	1224						
39	3.5	14.8	0.2	0.013	1224	45	0.0	11.4	14.8	1.303	2023
						45	0.5	11.7	5.4	0.461	2024
40	0.0	50.8	37.3	0.735	1736	45	1.0	11.4	0.3	0.026	2024
40	0.5	51.0	7.5	0.146	1736						
40	1.0	49.6	0.3	0.006	1736	46	0.0	11.1	11.1	0.996	1859
						46	0.5	11.1	9.6	0.868	1859
41	0.0	31.1	56.0	1.802	1718	46	1.0	10.9	6.8	0.627	1900
41	0.5	30.3	46.0	1.519	1718	46	1.5	11.0	5.9	0.536	1900
41	1.0	30.5	30.2	0.988	1719	46	2.0	10.4	4.6	0.443	1900
41	1.5	30.9	21.4	0.692	1719	46	2.5	11.2	3.7	0.333	1901
41	2.0	30.7	14.3	0.466	1719	46	3.0	11.1	3.0	0.272	1901
41	2.5	29.9	10.3	0.345	1719	46	3.5	11.0	2.5	0.229	1901
41	3.0	30.2	7.8	0.257	1720	46	4.0	10.9	2.1	0.192	1901
41	3.5	30.3	5.9	0.194	1720	46	4.5	10.9	1.8	0.163	1902
41	4.0	29.8	4.1	0.137	1720	46	5.0	10.9	1.4	0.131	1902
41	4.5	29.3	3.0	0.103	1720	46	5.5	11.0	1.2	0.107	1902
41	5.0	29.2	2.1	0.072	1720	46	6.0	10.7	1.0	0.093	1902
41	5.5	28.9	1.6	0.057	1721	46	6.5	10.8	0.9	0.079	1903
41	6.0	28.3	1.0	0.035	1721	46	7.0	10.8	0.8	0.070	1903
41	6.5	28.1	0.7	0.026	1721	46	7.5	10.6	0.6	0.061	1903
41	7.0	27.8	0.5	0.017	1721	46	8.0	10.7	0.6	0.056	1903
41	7.5	27.9	0.3	0.011	1722	46	8.5	10.6	0.5	0.048	1904
41	8.0	27.8	0.1	0.004	1722	46	9.0	10.7	0.5	0.044	1904
						46	9.5	10.4	0.4	0.039	1904
42	0.0	20.5	23.4	1.144	1036	46	10.0	10.4	0.4	0.035	1904
42	0.5	22.8	21.7	0.950	1036	46	11.0	10.4	0.3	0.027	1904
42	1.0	22.3	12.7	0.572	1036	46	12.0	10.4	0.2	0.021	1905
42	1.5	22.3	9.9	0.443	1037	46	13.0	10.5	0.2	0.017	1905
42	2.0	22.5	6.8	0.302	1037	46	14.0	10.3	0.1	0.014	1905
42	2.5	21.0	4.7	0.222	1037	46	15.0	10.6	0.1	0.012	1905
42	3.0	21.7	3.7	0.169	1038	46	16.0	10.6	0.1	0.010	1905
42	3.5	20.3	2.3	0.111	1038	46	17.0	10.6	<0.1	0.009	1906
42	4.0	17.5	1.1	0.065	1038	46	18.0	10.6	<0.1	0.008	1906
42	4.5	17.4	0.7	0.038	1039	46	19.0	10.7	<0.1	0.007	1906
42	5.0	20.4	0.5	0.026	1039	46	20.0	10.6	<0.1	0.007	1906
42	5.5	18.8	0.2	0.011	1040	46	21.0	10.8	<0.1	0.006	1907
42	6.0	18.8	0.1	0.006	1040	46	22.0	10.9	<0.1	0.005	1907
						46	23.0	10.8	<0.1	0.004	1907

Table 18. Photosynthetically available irradiation (mE·m^{-2}·min^{-1}) water column profile data for 1986 (CONTINUED).

Profile Sample Number	Depth of Water Sensor (m)	Surface Sensor Reading	Water Sensor Reading	Water/ Surface Ratio	Time
46	24.0	10.8	<0.1	0.003	1907
46	25.0	10.9	<0.1	0.005	1908
46	26.0	10.9	<0.1	0.001	1908
46	27.0	10.6	<0.1	0.002	1908
47	0.0	22.4	24.0	1.075	1046
47	0.5	22.6	15.7	0.694	1046
47	1.0	21.5	12.0	0.557	1047
47	1.5	19.7	8.5	0.431	1047
47	2.0	18.3	6.9	0.377	1047
47	2.5	16.4	5.1	0.311	1047
47	3.0	15.3	4.1	0.268	1047
47	3.5	14.2	3.3	0.233	1048
47	4.0	13.2	2.8	0.208	1048
47	4.5	12.8	2.3	0.180	1048
47	5.0	12.5	2.0	0.161	1048
47	5.5	12.6	1.5	0.121	1049
47	6.0	13.6	1.4	0.103	1049
47	6.5	14.4	1.2	0.084	1049
47	7.0	14.7	1.1	0.074	1049
47	7.5	15.6	1.0	0.063	1049
47	8.0	17.0	1.0	0.056	1050
47	8.5	17.6	0.9	0.049	1050
47	9.0	17.0	0.8	0.047	1050
47	9.5	15.5	0.7	0.046	1050
47	10.0	14.4	0.7	0.046	1051
47	11.0	15.0	0.6	0.038	1051
47	12.0	15.0	0.4	0.026	1055
47	13.0	15.5	0.3	0.022	1055
47	14.0	16.1	0.3	0.021	1055
47	15.0	27.4	0.3	0.010	1056
47	16.0	29.2	0.2	0.008	1056
47	17.0	25.1	0.2	0.006	1056
47	18.0	25.7	0.1	0.006	1056
47	19.0	29.7	0.1	0.004	1057
47	20.0	32.7	0.1	0.003	1057
47	21.0	21.5	<0.1	0.005	1057
47	22.0	24.1	<0.1	0.003	1058
47	23.0	24.9	<0.1	0.002	1058
47	24.0	24.2	<0.1	0.002	1058
47	25.0	24.0	<0.1	0.002	1058
47	26.0	23.7	<0.1	0.001	1059
48	0.0	28.6	30.7	1.071	1412
48	0.5	29.7	21.2	0.715	1412
48	1.0	29.7	18.1	0.607	1413
48	1.5	30.2	15.1	0.501	1413
48	2.0	30.6	11.7	0.382	1413
48	2.5	31.5	9.9	0.314	1414
48	3.0	33.4	9.1	0.273	1414
48	3.5	33.5	7.5	0.223	1414
48	4.0	33.2	6.2	0.188	1415
48	4.5	35.2	5.7	0.161	1415
48	5.0	34.1	4.8	0.142	1415
48	5.5	33.8	4.4	0.129	1415
48	6.0	33.4	3.8	0.113	1416
48	6.5	33.7	3.3	0.097	1416
48	7.0	39.4	3.1	0.080	1416
48	7.5	34.8	2.5	0.072	1417
48	8.0	33.3	2.0	0.061	1417
48	8.5	34.3	1.6	0.047	1417
48	9.0	35.2	1.2	0.035	1418
48	9.5	34.6	1.0	0.030	1418
48	10.0	33.8	0.8	0.022	1418
48	11.0	34.8	0.5	0.013	1418
48	12.0	33.1	0.2	0.007	1419
48	13.0	33.7	0.1	0.004	1419
49	0.0	17.7	18.6	1.052	1645
49	0.5	17.6	7.6	0.432	1645
49	1.0	17.5	5.1	0.295	1645
49	1.5	17.5	3.1	0.176	1646
49	2.0	17.5	2.2	0.124	1646
49	2.5	17.5	1.3	0.076	1646
49	3.0	17.6	1.1	0.063	1646
49	3.5	17.5	0.8	0.048	1646
49	4.0	17.5	0.6	0.036	1646
49	4.5	17.4	0.6	0.034	1647
49	5.0	17.2	0.5	0.027	1647
49	5.5	17.2	0.4	0.023	1647
49	6.0	17.0	0.3	0.020	1647
50	0.0	23.0	21.5	0.935	1617
50	0.5	22.8	11.6	0.509	1617
50	1.0	23.0	6.3	0.273	1617
50	1.5	22.9	4.3	0.190	1617
50	2.0	22.8	3.6	0.158	1618
50	2.5	22.6	2.7	0.120	1618
50	3.0	22.8	2.2	0.098	1618
50	3.5	22.5	1.5	0.069	1618
50	4.0	22.2	1.3	0.059	1618
50	4.5	21.9	0.9	0.040	1619
50	5.0	22.0	0.7	0.033	1619
50	5.5	21.9	0.5	0.023	1619
50	6.0	21.3	0.4	0.020	1620
51	0.0	15.0	13.0	0.865	1800
51	0.5	14.7	10.3	0.696	1800
51	1.0	14.7	5.8	0.395	1801
51	1.5	14.9	5.4	0.364	1801
51	2.0	14.4	4.5	0.310	1801
51	2.5	14.4	3.8	0.266	1801
51	3.0	14.2	3.1	0.217	1802
51	3.5	14.2	2.5	0.176	1802
51	4.0	14.1	2.1	0.149	1802
51	4.5	14.0	1.8	0.130	1802
51	5.0	13.8	1.5	0.108	1803
51	5.5	13.6	1.3	0.094	1803
51	6.0	13.5	1.1	0.081	1803
51	6.5	13.4	0.9	0.068	1803
51	7.0	13.1	0.8	0.058	1803
51	7.5	13.2	0.6	0.048	1804
51	8.0	12.8	0.5	0.041	1804
51	8.5	12.7	0.4	0.034	1804
51	9.0	12.6	0.4	0.028	1805
51	9.5	12.3	0.3	0.022	1805
51	10.0	12.1	0.2	0.018	1805
51	11.0	11.8	0.1	0.013	1805

Table 18. Photosynthetically available irradiation ($mE \cdot m^{-2} \cdot min^{-1}$) water column profile data for 1986 (CONTINUED).

Profile Sample Number	Depth of Water Sensor (m)	Surface Sensor Reading	Water Sensor Reading	Water/ Surface Ratio	Time	Profile Sample Number	Depth of Water Sensor (m)	Surface Sensor Reading	Water Sensor Reading	Water/ Surface Ratio	Time
51	12.0	11.5	0.1	0.010	1806	52	5.5	2.5	0.4	0.139	2025
51	13.0	11.2	<0.1	0.006	1806	52	6.0	2.5	0.3	0.117	2025
51	14.0	11.1	<0.1	0.003	1806	52	6.5	2.5	0.3	0.102	2025
51	15.0	11.0	<0.1	0.004	1806	52	7.0	2.5	0.2	0.085	2025
						52	7.5	2.5	0.2	0.078	2026
52	0.0	2.7	2.2	0.812	2022	52	8.0	2.4	0.2	0.071	2026
52	0.5	2.7	1.7	0.637	2023	52	8.5	2.5	0.1	0.057	2026
52	1.0	2.7	1.4	0.518	2023	52	9.0	2.4	0.1	0.047	2026
52	1.5	2.7	1.2	0.426	2023	52	9.5	2.4	<0.1	0.038	2026
52	2.0	2.7	1.0	0.370	2023	52	10.0	2.4	<0.1	0.034	2027
52	2.5	2.7	0.8	0.314	2023	52	11.0	2.4	<0.1	0.022	2027
52	3.0	2.6	0.7	0.286	2024	52	12.0	2.4	<0.1	0.011	2027
52	3.5	2.6	0.6	0.228	2024	52	13.0	2.4	<0.1	0.007	2027
52	4.0	2.6	0.5	0.201	2024						
52	4.5	2.6	0.5	0.178	2024	53	0.0	9.9	1.4	0.142	1413
52	5.0	2.6	0.4	0.154	2024	53	0.5	9.8	0.8	0.081	1414

Table 19. Photosynthetically available irradiation ($mE \cdot m^{-2} \cdot min^{-1}$) water column profile data for 1987.

Profile Sample Number	Depth of Water Sensor (m)	Surface Sensor Reading	Water Sensor Reading	Water/ Surface Ratio	Time
1	0.0	20.6	20.7	1.008	1335
1	0.5	17.4	15.4	0.883	1336
1	1.0	15.8	6.7	0.422	1336
1	1.5	16.0	3.3	0.207	1336
1	2.0	15.8	2.2	0.139	1336
1	2.5	15.8	1.2	0.078	1336
1	3.0	16.0	0.7	0.042	1337
1	3.5	16.1	0.5	0.028	1337
1	4.0	16.2	0.3	0.018	1337
1	4.5	15.9	0.2	0.013	1337
1	5.0	15.6	0.1	0.008	1337
2	1.5	37.4	2.1	0.055	1434
2	2.0	37.4	1.4	0.038	1434
2	2.5	37.4	1.2	0.032	1434
2	3.0	37.4	0.7	0.020	1434
2	3.5	37.5	0.5	0.014	1434
2	4.0	37.5	0.3	0.007	1434
2	4.5	37.5	0.2	0.004	1435
2	5.0	37.6	0.1	0.003	1435
2	5.5	37.6	<0.1	0.002	1435
2	6.0	37.7	<0.1	0.002	1436
2	6.5	37.6	<0.1	0.001	1436
2	7.0	37.5	<0.1	0.001	1436
2	7.5	37.6	<0.1	0.001	1436
3	0.0	4.1	3.3	0.814	0957
3	1.0	4.1	0.6	0.154	0957
3	2.0	4.2	0.2	0.045	0957
3	3.0	4.3	<0.1	0.017	0957
3	4.0	4.3	<0.1	0.006	0957
3	5.0	4.3	<0.1	0.003	0958
3	6.0	4.3	<0.1	0.002	0958
3	7.0	4.4	<0.1	0.002	0958
3	8.0	4.5	<0.1	0.001	0958
4	0.0	28.1	25.5	0.907	1255
4	0.5	27.9	5.1	0.181	1256
4	1.0	28.0	3.2	0.114	1256
4	1.5	28.2	2.1	0.074	1256
4	2.0	28.2	1.6	0.056	1256
4	2.5	28.3	1.0	0.037	1256
4	3.0	28.3	0.7	0.026	1257
4	3.5	28.2	0.5	0.018	1257
4	4.0	28.4	0.3	0.012	1257
4	4.5	28.3	0.2	0.008	1257
4	5.0	28.4	0.2	0.006	1257
4	5.5	28.4	0.1	0.004	1258
4	6.0	28.3	<0.1	0.003	1258
4	6.5	28.4	<0.1	0.003	1258
4	7.0	28.5	<0.1	0.002	1258
4	7.5	28.5	<0.1	0.002	1258
4	8.0	28.4	<0.1	0.002	1259
4	8.5	28.4	<0.1	0.001	1259
4	9.0	28.6	<0.1	0.001	1259
4	9.5	28.7	<0.1	0.001	1259
5	0.0	51.2	41.1	0.802	1425
5	2.0	51.3	1.0	0.020	1426
5	2.5	51.2	0.4	0.008	1426
5	3.0	51.2	0.3	0.006	1426
5	3.5	51.3	0.2	0.004	1427
5	4.0	51.4	0.1	0.002	1427
5	4.5	51.3	<0.1	0.001	1427
5	5.0	51.3	<0.1	0.001	1427
5	5.5	51.4	<0.1	0.001	1428
6	0.0	30.4	19.2	0.632	1627
6	0.5	30.8	10.8	0.350	1627
6	1.0	30.8	3.8	0.125	1627
6	1.5	30.8	2.4	0.078	1627
6	2.0	30.7	1.4	0.047	1628
6	2.5	30.7	0.9	0.029	1628
6	3.0	30.8	0.6	0.019	1628
6	3.5	30.6	0.4	0.012	1628
6	4.0	30.7	0.2	0.008	1628
6	4.5	30.6	0.2	0.005	1629
7	0.0	24.9	26.1	1.050	1302
7	0.5	24.9	7.1	0.286	1302
7	1.0	24.9	4.7	0.191	1302
7	1.5	24.9	2.9	0.117	1302
7	2.0	24.9	1.9	0.077	1302
7	2.5	24.9	1.2	0.048	1303
7	3.0	25.0	0.8	0.031	1303
7	3.5	25.0	0.5	0.022	1303
7	4.0	25.0	0.4	0.016	1303
7	4.5	25.0	0.3	0.012	1303
7	5.0	25.0	0.2	0.009	1304
8	0.0	22.4	18.5	0.829	1503
8	0.5	22.1	5.9	0.265	1504
8	1.0	22.6	3.0	0.132	1504
8	1.5	22.7	1.5	0.066	1504
8	2.0	22.7	1.0	0.042	1504
8	2.5	22.7	0.2	0.009	1504
8	3.0	22.8	<0.1	0.004	1505
8	3.5	22.8	<0.1	0.001	1505
8	4.0	22.8	<0.1	<0.001	1505
8	4.5	22.9	<0.1	<0.001	1505
9	0.0	12.0	9.6	0.805	1040
9	0.5	12.0	4.4	0.365	1041
9	1.0	12.1	1.8	0.151	1041
9	1.5	12.1	1.0	0.085	1041
9	2.0	12.2	0.5	0.043	1041
9	2.5	12.2	0.3	0.024	1041
9	3.0	12.3	0.2	0.016	1042
9	3.5	12.3	0.1	0.010	1042
9	4.0	12.4	<0.1	0.007	1042
9	4.5	12.5	<0.1	0.005	1042
9	5.0	12.5	<0.1	0.004	1043
10	0.0	35.4	29.6	0.837	1459
10	0.5	35.3	3.7	0.105	1459
10	1.0	35.1	1.8	0.052	1459
10	1.5	35.0	1.1	0.031	1500
10	2.0	35.2	0.5	0.015	1500
10	2.5	35.3	0.3	0.007	1500
10	3.0	34.9	0.2	0.005	1500

Table 19. Photosynthetically available irradiation ($mE \cdot m^{-2} \cdot min^{-1}$) water column profile data for 1987 (CONTINUED).

Profile Sample Number	Depth of Water Sensor (m)	Surface Sensor Reading	Water Sensor Reading	Water/ Surface Ratio	Time	Profile Sample Number	Depth of Water Sensor (m)	Surface Sensor Reading	Water Sensor Reading	Water/ Surface Ratio	Time
10	3.5	35.3	11.1	0.003	1500	16	4.5	39.0	0.1	0.003	1146
10	4.0	35.3	6.9	0.002	1500	16	5.0	39.0	<0.1	0.002	1147
10	4.5	35.3	<0.1	0.001	1501	16	5.5	38.7	<0.1	0.002	1147
10	5.0	35.3	<0.1	0.001	1501	16	6.0	38.7	<0.1	0.002	1147
10	5.5	35.4	<0.1	0.001	1501	16	6.5	39.0	<0.1	0.001	1148
						16	7.0	39.2	<0.1	0.001	1148
11	0.0	19.2	2.3	0.122	1708	16	7.5	39.0	<0.1	0.001	1148
11	0.5	19.1	1.5	0.076	1708						
11	1.0	19.1	1.0	0.051	1708	18	2.0	39.6	1.1	0.028	1213
11	1.5	19.1	0.6	0.033	1708	18	2.5	39.5	1.1	0.027	1213
11	2.0	19.0	0.4	0.021	1709	18	3.0	39.5	1.0	0.025	1213
11	2.5	19.1	0.3	0.015	1709	18	3.5	39.3	0.9	0.023	1214
11	3.0	19.0	0.2	0.010	1709	18	4.0	39.6	0.8	0.021	1214
11	3.5	18.9	0.1	0.008	1710	18	4.5	40.3	0.8	0.019	1214
11	4.0	18.6	0.1	0.006	1710	18	5.0	40.6	0.7	0.018	1215
11	4.5	17.6	<0.1	0.005	1711	18	5.5	41.0	0.7	0.017	1215
11	5.0	18.4	<0.1	0.004	1711	18	6.0	41.1	0.7	0.016	1215
11	5.5	17.6	<0.1	0.003	1712	18	6.5	41.4	0.6	0.015	1216
11	6.0	17.3	<0.1	0.003	1712	18	7.0	41.2	0.6	0.014	1216
11	6.5	17.3	<0.1	0.002	1712	18	7.5	41.3	0.5	0.013	1216
11	7.0	17.4	<0.1	0.002	1712	18	8.0	40.7	0.5	0.013	1217
11	7.5	11.1	<0.1	0.002	1715						
11	8.0	18.3	<0.1	0.001	1716	21	2.0	39.9	0.7	0.017	0924
11	8.5	17.9	<0.1	0.001	1716	21	2.5	40.1	0.4	0.010	0924
11	9.0	17.5	<0.1	0.001	1716	21	3.0	40.2	0.2	0.006	0925
						21	3.5	40.2	0.2	0.004	0925
12	0.0	38.9	24.9	0.641	1602						
12	0.5	38.9	3.3	0.085	1603	23	2.0	44.6	0.3	0.007	0920
12	1.0	38.9	0.8	0.021	1603	23	2.5	44.8	0.2	0.005	0921
12	1.5	38.8	0.4	0.009	1603	23	3.0	45.3	0.2	0.004	0921
12	2.0	38.8	<0.1	0.001	1603	23	3.5	46.1	0.1	0.003	0921
12	2.5	38.9	<0.1	<0.001	1603	23	4.0	47.0	0.1	0.002	0921
12	3.0	38.9	<0.1	<0.001	1604	23	4.5	47.9	<0.1	0.002	0921
						23	5.0	48.6	<0.1	0.002	0922
14	2.0	37.5	0.4	0.010	1557	23	5.5	49.3	<0.1	0.001	0922
14	2.5	36.0	0.3	0.009	1557	23	6.0	49.9	<0.1	0.001	0922
14	3.0	35.4	0.3	0.007	1557	23	6.5	50.2	<0.1	0.001	0922
14	3.5	35.7	0.2	0.006	1558						
14	4.0	36.3	0.2	0.005	1559	25	2.0	36.1	<0.1	<0.001	0936
14	4.5	36.1	0.2	0.004	1559	25	2.5	35.5	<0.1	<0.001	0936
14	5.0	35.6	0.1	0.004	1559	25	3.0	33.5	<0.1	<0.001	0936
14	5.5	35.4	0.1	0.003	1600						
14	6.0	35.3	0.1	0.003	1600	27	1.5	84.4	4.6	0.054	1500
14	6.5	34.1	0.1	0.003	1600	27	2.0	84.2	4.2	0.050	1500
14	7.0	35.5	<0.1	0.002	1601	27	2.5	83.9	3.5	0.042	1500
14	7.5	35.5	<0.1	0.002	1601	27	3.0	84.2	3.0	0.036	1501
14	8.0	36.9	<0.1	0.002	1602	27	3.5	84.4	2.6	0.031	1501
14	8.5	36.2	<0.1	0.002	1602	27	4.0	84.5	2.4	0.029	1501
14	9.0	36.0	<0.1	0.002	1602	27	4.5	84.2	2.2	0.026	1502
14	9.5	35.8	<0.1	0.002	1603	27	5.0	84.1	2.1	0.025	1502
14	10.0	35.4	<0.1	0.002	1603	27	5.5	83.8	1.9	0.023	1502
14	11.0	36.1	<0.1	0.001	1603	27	6.0	83.8	1.8	0.021	1502
14	12.0	35.4	<0.1	0.001	1604	27	6.5	83.5	1.6	0.020	1503
14	13.0	36.6	<0.1	0.001	1604	27	7.0	82.8	1.5	0.018	1503
						27	7.5	82.5	1.4	0.017	1503
16	2.0	38.4	0.4	0.011	1144	27	8.0	82.7	1.3	0.016	1503
16	2.5	38.2	0.3	0.008	1145	27	8.5	82.9	1.2	0.014	1504
16	3.0	38.2	0.2	0.006	1145	27	9.0	82.8	1.1	0.013	1504
16	3.5	38.4	0.2	0.004	1145	27	9.5	82.8	1.0	0.012	1504
16	4.0	38.5	0.1	0.004	1146	27	10.0	82.9	1.0	0.012	1504

Table 19. Photosynthetically available irradiation ($mE \cdot m^{-2} \cdot min^{-1}$) water column profile data for 1987 (CONTINUED).

Profile Sample Number	Depth of Water Sensor (m)	Surface Sensor Reading	Water Sensor Reading	Water/ Surface Ratio	Time
27	11.0	83.2	0.8	0.010	1505
27	12.0	83.6	0.7	0.009	1505
27	12.5	84.0	0.7	0.008	1505
29	1.5	72.1	2.3	0.032	1524
29	2.0	73.4	2.0	0.027	1524
29	2.5	74.4	1.8	0.024	1524
29	3.0	75.1	1.6	0.021	1525
29	3.5	75.5	1.4	0.018	1525
29	4.0	76.0	1.3	0.017	1525
29	4.5	76.4	1.2	0.016	1526
29	5.0	76.7	1.1	0.014	1526
29	5.5	76.9	1.0	0.013	1527
29	6.0	77.6	0.9	0.012	1527
29	6.5	79.0	0.9	0.011	1527
29	7.0	79.7	0.8	0.011	1528
29	7.5	80.0	0.8	0.010	1528
29	8.0	80.9	0.7	0.009	1528
29	8.5	81.4	0.7	0.008	1528
29	9.0	81.7	0.6	0.008	1529
29	9.5	81.7	0.6	0.007	1529
29	10.0	81.5	0.6	0.007	1529
29	11.0	81.8	0.5	0.006	1530
29	12.0	82.0	0.4	0.005	1530
31	2.0	57.3	0.2	0.003	1844
31	2.5	57.3	0.1	0.002	1844
31	3.0	57.2	<0.1	0.002	1844
31	3.5	57.1	<0.1	0.001	1845
31	4.0	57.0	<0.1	0.001	1845
31	4.5	56.9	<0.1	0.001	1846
33	2.0	50.8	0.2	0.003	1914
33	2.5	50.7	0.1	0.002	1915
33	3.0	50.6	<0.1	0.002	1915
33	3.5	50.6	<0.1	0.001	1915
33	4.0	50.5	<0.1	0.001	1916
33	4.5	50.4	<0.1	0.001	1916
35	2.0	79.1	<0.1	0.001	1452
35	2.5	80.6	<0.1	0.001	1452
35	3.0	82.5	<0.1	0.001	1453
37	2.0	71.6	0.1	0.002	1516
37	2.5	71.1	<0.1	0.001	1517
37	3.0	69.8	<0.1	0.001	1517
37	3.5	67.4	<0.1	0.001	1518
39	0.0	54.2	59.3	1.095	1050
39	0.5	54.9	25.3	0.460	1051
39	1.0	55.2	9.5	0.173	1051
39	1.5	54.8	4.3	0.078	1052
39	2.0	54.5	2.1	0.038	1052
39	2.5	54.9	1.2	0.021	1052
39	3.0	54.4	0.2	0.004	1053
39	3.5	53.9	0.2	0.003	1053
39	4.0	54.2	<0.1	0.002	1053
39	4.5	54.2	<0.1	0.001	1054
39	5.0	55.6	<0.1	0.001	1054
39	5.5	55.6	<0.1	<0.001	1054
40	0.0	71.0	68.0	0.958	1350
40	0.5	71.4	31.4	0.440	1350
40	1.0	71.4	11.7	0.164	1351
40	1.5	70.2	5.1	0.073	1351
40	2.0	71.6	2.6	0.036	1351
40	2.5	72.5	1.2	0.016	1352
40	3.0	73.1	0.8	0.011	1352
40	3.5	73.1	0.4	0.006	1352
40	4.0	73.2	0.2	0.003	1352
40	4.5	72.6	0.1	0.002	1353
40	5.0	71.0	<0.1	0.001	1353
40	5.5	71.2	<0.1	<0.001	1353
40	6.0	71.0	<0.1	<0.001	1353
41	0.0	44.7	48.6	1.088	1158
41	0.5	43.2	12.8	0.297	1159
41	1.0	40.8	0.3	0.007	1159
41	1.5	44.7	<0.1	0.002	1159
41	2.0	40.6	<0.1	<0.001	1200
41	2.5	42.9	<0.1	<0.001	1200
41	3.0	60.8	<0.1	<0.001	1200
42	0.0	39.0	26.6	0.682	1444
42	0.5	37.5	20.0	0.533	1444
42	1.0	35.4	14.4	0.408	1444
42	1.5	40.7	12.8	0.313	1445
42	2.0	37.6	10.0	0.267	1445
42	2.5	39.4	9.0	0.228	1445
42	3.0	42.7	6.0	0.139	1446
42	3.5	41.6	4.9	0.117	1446
42	4.0	36.3	3.4	0.095	1446
42	4.5	35.7	3.1	0.087	1447
42	5.0	36.6	2.5	0.069	1447
42	5.5	38.7	2.0	0.052	1448
42	6.0	38.9	1.6	0.042	1448
42	6.5	38.5	1.3	0.033	1448
42	7.0	41.0	1.0	0.025	1449
42	7.5	41.3	0.8	0.018	1449
42	8.0	41.5	0.6	0.015	1450
42	8.5	42.5	0.5	0.011	1450
42	9.0	40.9	0.2	0.006	1450
42	9.5	45.4	0.2	0.004	1451
42	10.0	39.1	0.1	0.003	1451
42	11.0	39.2	<0.1	0.001	1452
42	12.0	37.8	<0.1	0.001	1452
42	13.0	37.1	<0.1	0.001	1452
43	0.0	53.1	10.0	0.189	1304
43	0.5	48.6	9.0	0.186	1304
43	1.0	50.3	6.9	0.136	1305
43	1.5	50.0	5.7	0.114	1305
43	2.0	44.9	4.6	0.102	1305
43	2.5	43.2	4.0	0.093	1306
43	3.0	39.0	3.4	0.088	1306
43	3.5	41.3	2.9	0.070	1306
43	4.0	45.4	3.1	0.068	1307
43	4.5	42.1	2.5	0.060	1307
43	5.0	40.7	2.4	0.060	1307
43	5.5	35.5	2.1	0.060	1308
43	6.0	31.9	2.0	0.061	1308

Table 19. Photosynthetically available irradiation ($mE \cdot m^{-2} \cdot min^{-1}$) water column profile data for 1987 (CONTINUED).

Profile Sample Number	Depth of Water Sensor (m)	Surface Sensor Reading	Water Sensor Reading	Water/ Surface Ratio	Time	Profile Sample Number	Depth of Water Sensor (m)	Surface Sensor Reading	Water Sensor Reading	Water/ Surface Ratio	Time
43	6.5	35.9	2.0	0.057	1309	45	0.0	86.3	109.3	1.266	1510
43	7.0	50.4	2.2	0.044	1309	45	0.5	85.4	39.2	0.458	1511
43	7.5	49.2	2.1	0.042	1309	45	1.0	86.6	15.2	0.176	1512
43	8.0	50.7	1.9	0.037	1310	45	1.5	86.2	9.1	0.106	1512
43	8.5	55.2	2.1	0.038	1310	45	2.0	84.9	5.5	0.065	1512
43	9.0	51.5	2.0	0.039	1310	45	2.5	85.1	3.4	0.039	1513
43	9.5	56.4	1.9	0.034	1311	45	3.0	86.1	2.0	0.023	1513
43	10.0	53.9	1.8	0.034	1311	45	3.5	85.1	1.3	0.015	1513
43	11.0	50.1	1.6	0.032	1311	45	4.0	86.0	0.6	0.007	1514
43	12.0	51.4	1.6	0.030	1312	45	4.5	85.2	0.3	0.003	1514
43	13.0	58.3	1.5	0.026	1312	45	5.0	84.7	<0.1	0.001	1514
43	14.0	60.8	1.4	0.024	1312	45	5.5	85.6	<0.1	<0.001	1515
43	15.0	57.7	1.3	0.023	1313	45	6.0	85.0	<0.1	<0.001	1515
43	16.0	53.2	1.1	0.021	1313						
43	16.0	55.9	1.2	0.021	1313	46	0.0	67.9	77.5	1.142	1725
43	17.0	57.3	1.1	0.019	1314	46	0.5	63.8	34.9	0.547	1726
43	18.0	60.1	1.1	0.018	1315	46	1.0	68.8	16.4	0.239	1726
43	19.0	61.1	1.0	0.016	1315	46	1.5	68.0	11.8	0.173	1726
43	20.0	62.7	0.9	0.015	1316	46	2.0	65.3	8.1	0.124	1726
43	21.0	62.8	0.9	0.015	1316	46	2.5	68.3	5.5	0.080	1727
43	22.0	64.3	0.8	0.013	1316	46	3.0	67.7	4.6	0.068	1727
43	23.0	65.2	0.8	0.013	1317	46	3.5	68.6	3.7	0.055	1727
43	24.0	50.8	0.7	0.014	1317	46	4.0	68.5	2.8	0.042	1727
43	25.0	65.8	0.7	0.010	1317	46	4.5	68.3	2.4	0.035	1728
						46	5.0	68.6	2.0	0.030	1728
44	0.0	13.8	18.2	1.313	1748	46	5.5	68.7	1.6	0.024	1728
44	0.5	37.7	37.0	0.981	1749	46	6.0	68.3	1.3	0.019	1728
44	1.0	21.0	23.1	1.101	1749	46	6.5	68.3	1.1	0.017	1728
44	1.5	52.3	18.6	0.355	1750	46	7.0	67.7	1.0	0.014	1729
44	2.0	55.5	13.8	0.248	1750	46	7.5	65.3	0.8	0.013	1729
44	2.5	44.2	11.6	0.262	1750	46	8.0	59.9	0.7	0.012	1729
44	3.0	56.1	10.0	0.179	1750	46	8.5	67.0	0.5	0.008	1729
44	3.5	55.0	8.1	0.147	1751	46	9.0	68.6	0.4	0.006	1730
44	4.0	55.6	6.3	0.113	1751	46	9.5	68.6	0.3	0.004	1730
44	4.5	57.4	6.8	0.119	1751	46	10.0	69.1	0.2	0.003	1730
44	5.0	59.5	5.8	0.098	1752	46	11.0	54.0	<0.1	0.002	1731
44	5.5	57.2	5.2	0.092	1752	46	12.0	68.2	<0.1	<0.001	1731
44	6.0	55.4	5.2	0.094	1752	46	13.0	66.8	<0.1	<0.001	1732
44	6.5	56.5	5.4	0.096	1753	46	14.0	68.6	<0.1	<0.001	1732
44	7.0	55.9	4.8	0.086	1753						
44	7.5	60.1	4.3	0.072	1753	47	0.0	45.4	17.2	0.379	2009
44	8.0	57.9	3.7	0.064	1754	47	0.5	45.0	64.6	1.434	2010
44	8.5	58.5	3.6	0.062	1754	47	1.0	44.4	31.0	0.698	2011
44	9.0	59.1	3.3	0.056	1755	47	1.5	44.0	17.1	0.388	2011
44	9.5	60.0	2.8	0.047	1755	47	2.0	45.0	10.4	0.231	2011
44	10.0	55.8	2.3	0.041	1756	47	2.5	44.8	5.3	0.118	2011
44	11.0	60.7	2.2	0.036	1756	47	3.0	45.0	4.5	0.100	2012
44	12.0	60.7	2.0	0.033	1757	47	3.5	45.4	2.5	0.056	2012
44	13.0	59.0	1.7	0.029	1757	47	4.0	45.5	2.1	0.047	2012
44	14.0	60.4	1.6	0.026	1757	47	4.5	44.0	1.6	0.036	2012
44	15.0	60.0	1.5	0.025	1758	47	5.0	44.2	1.2	0.027	2012
44	16.0	58.1	1.3	0.022	1758	47	5.5	44.6	0.9	0.020	2013
44	17.0	61.8	1.2	0.019	1758	47	6.0	44.0	0.8	0.018	2013
44	18.0	58.2	1.0	0.018	1759	47	6.5	44.5	0.6	0.014	2013
44	19.0	57.6	0.9	0.016	1759	47	7.0	45.0	0.5	0.012	2014
44	20.0	58.5	0.8	0.014	1800	47	7.5	44.5	0.4	0.009	2014
44	21.0	58.1	0.8	0.013	1800	47	8.0	45.0	0.3	0.007	2014
44	22.0	58.2	0.7	0.012	1800	47	8.5	44.5	0.3	0.006	2015
44	23.0	57.0	0.7	0.012	1801	47	9.0	44.3	0.2	0.005	2015
44	24.0	56.0	0.6	0.011	1801	47	9.5	45.0	0.2	0.004	2015

Table 19. Photosynthetically available irradiation ($mE \cdot m^{-2} \cdot min^{-1}$) water column profile data for 1987 (CONTINUED).

Profile Sample Number	Depth of Water Sensor (m)	Surface Sensor Reading	Water Sensor Reading	Water/ Surface Ratio	Time
47	10.0	43.7	0.2	0.004	2016
47	11.0	43.8	0.1	0.003	2016
47	12.0	43.4	<0.1	0.002	2016
47	13.0	44.6	<0.1	0.001	2017
47	14.0	43.9	<0.1	0.001	2017
47	15.0	44.0	<0.1	0.001	2017
48	0.0	51.8	40.5	0.782	1506
48	0.5	51.3	27.5	0.536	1506
48	1.0	51.4	22.7	0.441	1506
48	1.5	50.4	18.5	0.367	1507
48	2.0	52.5	15.7	0.299	1507
48	2.5	52.5	13.3	0.254	1507
48	3.0	51.6	10.9	0.211	1507
48	3.5	51.3	10.2	0.199	1507
48	4.0	50.7	8.1	0.159	1508
48	4.5	50.8	7.1	0.139	1508
48	5.0	48.9	6.0	0.123	1508
48	5.5	48.6	5.1	0.105	1508
48	6.0	49.0	4.4	0.090	1509
48	6.5	49.0	3.8	0.078	1509
48	7.0	49.1	3.4	0.069	1509
48	7.5	49.1	3.0	0.061	1510
48	8.0	48.5	2.7	0.055	1510
48	8.5	49.0	2.3	0.047	1510
48	9.0	51.6	1.9	0.036	1511
48	9.5	52.7	1.5	0.029	1511
48	10.0	52.8	1.3	0.024	1511
48	11.0	52.1	0.9	0.018	1511
48	12.0	51.6	0.7	0.014	1512
48	13.0	52.0	0.6	0.011	1512
48	14.0	52.3	0.5	0.009	1512
48	15.0	52.4	0.4	0.007	1513
48	16.0	52.3	0.3	0.006	1513
48	17.0	53.1	0.2	0.005	1513
48	18.0	52.3	0.2	0.004	1514
48	19.0	50.6	0.1	0.003	1514
48	20.0	48.3	0.1	0.002	1514
48	21.0	47.6	<0.1	0.002	1514
48	22.0	47.1	<0.1	0.002	1515
48	23.0	47.3	<0.1	0.001	1515
48	24.0	46.2	<0.1	0.001	1515
48	25.0	46.2	<0.1	0.001	1516
49	0.0	22.5	19.2	0.854	1838
49	0.5	22.4	8.2	0.366	1838
49	1.0	25.4	8.1	0.318	1839
49	1.5	26.8	6.5	0.243	1839
49	2.0	28.6	5.6	0.196	1839
49	2.5	29.7	4.8	0.161	1840
49	3.0	29.6	3.4	0.115	1840
49	3.5	28.7	2.4	0.085	1840
49	4.0	28.1	2.1	0.074	1841
49	4.5	28.3	1.6	0.057	1841
49	5.0	29.0	1.5	0.051	1841
49	5.5	29.0	1.2	0.041	1842
49	6.0	29.3	1.1	0.038	1842
49	6.5	29.5	0.9	0.031	1842
49	7.0	29.7	0.9	0.029	1843
49	7.5	31.3	0.8	0.027	1843
49	8.0	31.4	0.7	0.023	1843
49	8.5	30.4	0.6	0.021	1844
49	9.0	29.3	0.6	0.019	1844
49	9.5	28.7	0.5	0.017	1844
49	10.0	29.0	0.4	0.015	1844
49	11.0	29.4	0.4	0.012	1845
49	12.0	30.0	0.3	0.010	1845
49	13.0	29.4	0.2	0.008	1846
49	14.0	30.5	0.2	0.007	1846
49	15.0	31.9	0.2	0.005	1847
49	16.0	32.1	0.1	0.004	1847
49	17.0	32.0	<0.1	0.003	1847
49	18.0	35.8	<0.1	0.002	1848
49	19.0	38.1	<0.1	0.001	1848
49	20.0	40.3	<0.1	0.001	1849
49	21.0	41.1	<0.1	0.001	1849
50	0.0	11.6	7.7	0.661	2126
50	0.5	11.5	4.8	0.412	2126
50	1.0	11.6	2.5	0.214	2127
50	1.5	11.7	1.5	0.125	2127
50	2.0	11.4	0.9	0.075	2127
50	2.5	11.5	0.5	0.045	2128
50	3.0	11.6	0.3	0.023	2128
50	3.5	11.5	0.2	0.019	2128
50	4.0	11.5	0.1	0.011	2129
50	4.5	11.2	0.1	0.010	2129
50	5.0	11.0	<0.1	0.008	2129
50	5.5	10.6	<0.1	0.006	2130
50	6.0	10.2	<0.1	0.006	2130
50	6.5	10.1	<0.1	0.005	2130
50	7.0	9.9	<0.1	0.004	2131
50	7.5	9.8	<0.1	0.004	2131
50	8.0	9.9	<0.1	0.003	2131
50	8.5	10.1	<0.1	0.003	2131
50	9.0	10.3	<0.1	0.003	2132
50	9.5	10.2	<0.1	0.003	2132
50	10.0	10.1	<0.1	0.002	2132
50	11.0	10.2	<0.1	0.001	2133
50	13.0	10.0	<0.1	<0.001	2133
51	0.0	1.6	1.0	0.636	0115
51	0.5	1.5	0.2	0.141	0116
51	1.0	1.5	<0.1	0.024	0116
51	1.5	1.5	<0.1	0.006	0116
51	2.0	1.5	<0.1	0.001	0116
51	4.0	1.4	<0.1	0.001	0118
51	5.0	1.4	<0.1	<0.001	0119
52	0.0	65.6	54.7	0.834	1106
52	0.5	66.3	8.7	0.131	1107
52	1.0	66.3	2.0	0.030	1107
52	1.5	66.8	0.5	0.007	1107
52	2.0	67.0	<0.1	0.001	1108
52	2.5	67.3	<0.1	<0.001	1108
52	3.0	67.1	<0.1	<0.001	1108
53	0.0	95.3	74.9	0.786	1555
53	0.5	93.5	1.8	0.019	1555
53	1.0	102.3	<0.1	0.001	1555

Table 19. Photosynthetically available irradiation ($mE \cdot m^{-2} \cdot min^{-1}$) water column profile data for 1987 (CONTINUED).

Profile Sample Number	Depth of Water Sensor (m)	Surface Sensor Reading	Water Sensor Reading	Water/ Surface Ratio	Time
53	1.5	101.3	<0.1	<0.001	1556
54	0.0	61.3	59.8	0.975	1050
54	0.5	51.9	13.3	0.257	1050
54	1.0	45.9	6.0	0.131	1051
54	1.5	44.8	0.9	0.020	1051
54	2.0	39.5	0.5	0.012	1051
54	2.5	43.7	0.2	0.004	1052
54	3.0	44.9	<0.1	0.001	1052
54	3.5	52.1	<0.1	0.001	1052
54	4.0	56.4	<0.1	<0.001	1053
55	0.0	55.3	45.1	0.816	1503
55	0.5	54.9	14.5	0.265	1503
55	1.0	54.5	7.4	0.137	1504
55	1.5	54.1	0.6	0.011	1504
55	2.0	53.0	0.2	0.004	1504
55	2.5	51.5	<0.1	0.001	1505
55	3.0	50.6	<0.1	<0.001	1505
55	3.5	50.1	<0.1	<0.001	1505
56	0.0	41.5	34.6	0.833	1102
56	0.5	68.5	21.3	0.311	1102
56	1.0	62.9	7.9	0.126	1102
56	1.5	49.2	2.4	0.050	1103
56	2.0	38.1	0.5	0.013	1103
56	2.5	38.1	<0.1	0.003	1103
56	3.0	58.0	<0.1	<0.001	1103
56	3.5	71.4	<0.1	<0.001	1104
56	4.0	70.9	<0.1	<0.001	1104
57	0.0	94.7	52.9	0.558	1534
57	0.5	79.0	13.9	0.176	1535
57	1.0	100.5	3.1	0.031	1535
57	1.5	108.8	0.8	0.007	1535
57	2.0	112.8	0.3	0.003	1536
57	2.5	81.5	<0.1	0.001	1536
57	3.0	29.7	<0.1	<0.001	1537
58	0.0	83.8	60.1	0.717	1354
58	0.5	84.4	13.8	0.163	1354
58	1.0	84.2	0.5	0.006	1355
58	1.5	84.1	<0.1	0.001	1355
58	2.0	86.6	<0.1	<0.001	1355
59	0.0	76.3	42.4	0.557	1540
59	0.5	76.3	20.1	0.263	1540
59	1.0	77.4	7.7	0.099	1540
59	1.5	78.9	3.9	0.050	1540
59	2.0	79.0	2.1	0.027	1541
59	2.5	77.8	0.7	0.009	1541
59	3.0	79.0	0.4	0.006	1541
59	3.5	79.6	0.2	0.002	1541
59	4.0	78.7	<0.1	0.001	1541
59	4.5	79.0	<0.1	<0.001	1542
59	5.0	80.2	<0.1	<0.001	1542
60	0.0	4.3	3.0	0.700	1101
60	0.5	4.3	2.2	0.505	1101
60	1.0	4.4	1.2	0.277	1101
60	1.5	4.4	0.7	0.149	1101
60	2.0	4.6	0.4	0.092	1102
60	2.5	4.6	0.4	0.082	1103
60	3.0	4.7	0.2	0.050	1103
60	3.5	4.8	0.2	0.039	1104
60	4.0	4.9	0.2	0.031	1104
60	4.5	5.0	<0.1	0.009	1104
60	5.0	5.1	<0.1	0.006	1105
60	5.5	5.1	<0.1	0.003	1105
60	6.0	5.2	<0.1	0.002	1105
60	6.5	5.1	<0.1	0.001	1106
60	7.0	5.1	<0.1	0.001	1106
60	7.5	5.1	<0.1	<0.001	1106
61	0.0	16.9	14.3	0.847	1534
61	0.5	16.9	11.8	0.695	1534
61	1.0	17.0	11.6	0.684	1534
61	1.5	17.0	11.2	0.661	1535
61	2.0	17.5	9.5	0.543	1535
61	2.5	17.8	9.0	0.507	1535
61	3.0	18.2	8.9	0.488	1535
61	3.5	18.0	8.4	0.467	1536
61	4.0	18.1	7.8	0.434	1536
61	4.5	18.1	7.5	0.414	1536
61	5.0	18.0	7.2	0.398	1536
61	5.5	18.2	7.1	0.389	1537
61	6.0	18.5	7.0	0.377	1537
61	6.5	19.4	7.1	0.364	1537
61	7.0	20.1	7.3	0.364	1537
61	7.5	20.0	7.1	0.355	1537
61	8.0	18.8	6.5	0.346	1538
61	8.5	17.4	6.1	0.349	1538
61	9.0	15.6	5.2	0.334	1538
61	9.5	15.5	5.0	0.321	1539
61	10.0	15.5	4.8	0.311	1539
61	11.0	16.7	4.7	0.282	1539
61	12.0	16.1	4.4	0.275	1539
61	13.0	16.1	4.3	0.265	1540
61	14.0	16.3	4.0	0.244	1540
61	15.0	16.1	3.1	0.193	1540
61	16.0	16.3	2.6	0.162	1540
61	17.0	16.3	1.8	0.108	1541
61	18.0	16.2	0.8	0.051	1541
61	19.0	16.0	0.5	0.028	1541
61	20.0	15.8	0.2	0.012	1541
61	21.0	15.7	<0.1	0.004	1541
61	22.0	14.4	<0.1	0.002	1542
61	23.0	12.8	<0.1	0.001	1542
61	24.0	12.3	<0.1	<0.001	1542
61	25.0	11.7	<0.1	<0.001	1542
62	0.0	15.6	8.3	0.532	1226
62	0.5	16.4	7.9	0.481	1227
62	1.0	16.8	7.3	0.436	1227
62	1.5	16.9	7.0	0.412	1228
62	2.0	17.2	6.7	0.388	1228
62	2.5	17.3	6.2	0.360	1228
62	3.0	17.3	5.8	0.335	1228
62	3.5	17.3	5.7	0.333	1229
62	4.0	17.3	5.5	0.321	1229

Table 19. Photosynthetically available irradiation ($mE \cdot m^{-2} \cdot min^{-1}$) water column profile data for 1987 (CONTINUED).

Profile Sample Number	Depth of Water Sensor (m)	Surface Sensor Reading	Water Sensor Reading	Water/ Surface Ratio	Time
62	4.5	17.8	5.6	0.316	1229
62	5.0	18.0	5.7	0.319	1229
62	5.5	18.1	5.6	0.311	1230
62	6.0	18.2	5.9	0.323	1230
62	6.5	18.3	5.7	0.312	1230
62	7.0	18.9	5.7	0.304	1230
62	7.5	19.3	5.8	0.301	1231
62	8.0	19.6	5.8	0.295	1231
62	8.5	19.7	5.7	0.290	1231
62	9.0	19.8	5.6	0.284	1231
62	9.5	20.2	5.6	0.278	1232
62	10.0	21.2	5.7	0.271	1232
62	11.0	21.5	5.7	0.267	1232
62	12.0	22.3	5.8	0.258	1233
62	13.0	22.4	5.5	0.247	1233
62	14.0	23.1	5.0	0.219	1234
62	15.0	23.3	4.6	0.196	1234
62	16.0	23.2	3.9	0.168	1234
62	17.0	23.1	3.5	0.150	1234
62	18.0	22.3	3.0	0.136	1235
62	19.1	21.7	2.7	0.124	1235
62	20.0	21.1	2.4	0.113	1235
62	21.0	21.5	2.2	0.105	1236
62	22.0	22.0	2.1	0.097	1236
62	23.0	22.1	2.0	0.090	1236
62	24.0	22.2	1.9	0.084	1236
62	25.0	22.4	1.7	0.077	1237
62	26.0	22.3	1.6	0.073	1237
62	27.0	22.8	1.5	0.066	1237
62	28.0	22.2	1.3	0.058	1238
62	29.0	21.1	1.2	0.055	1238
63	0.0	11.3	7.0	0.620	1234
63	0.5	11.4	7.4	0.650	1234
63	1.0	11.5	6.8	0.590	1234
63	1.5	11.5	5.7	0.496	1235
63	2.0	11.6	4.9	0.423	1235
63	2.5	11.6	4.2	0.361	1235
63	3.0	11.6	2.7	0.234	1235
63	3.5	11.7	1.6	0.138	1235
63	4.0	11.7	1.0	0.088	1236
63	4.5	11.7	0.4	0.030	1236
63	5.0	11.8	0.1	0.010	1236
63	5.5	11.8	<0.1	0.004	1236
63	6.0	12.1	<0.1	0.001	1237
63	6.5	12.3	<0.1	0.001	1237
63	7.0	12.4	<0.1	<0.001	1237
64	0.0	77.0	91.4	1.187	1453
64	0.5	37.4	13.8	0.369	1453
64	1.0	35.6	4.6	0.128	1453
64	1.5	32.3	1.4	0.044	1454
64	2.0	36.7	0.4	0.012	1454
64	2.5	39.6	0.2	0.005	1454
64	3.0	48.2	<0.1	0.001	1454
64	3.5	54.9	<0.1	<0.001	1455
64	4.0	56.5	<0.1	<0.001	1455
65	0.0	17.8	9.7	0.541	1812
65	0.5	17.9	3.6	0.200	1812
65	1.0	17.9	1.8	0.103	1812
65	1.5	18.0	1.1	0.062	1813
65	2.0	18.1	0.8	0.044	1813
65	2.5	18.3	0.7	0.037	1813
65	3.0	18.3	0.6	0.033	1813
65	3.5	18.2	0.6	0.032	1814
65	4.0	18.1	0.6	0.031	1814
65	4.5	17.9	0.6	0.031	1814
65	5.0	17.8	0.6	0.031	1814
65	5.5	17.8	0.6	0.031	1814
65	6.0	17.9	0.5	0.031	1815
65	6.5	17.8	0.6	0.031	1815
65	7.0	17.6	0.5	0.031	1815
65	7.5	16.7	0.5	0.032	1816
65	8.0	16.0	0.5	0.033	1816
65	8.5	15.5	0.5	0.034	1816
65	9.0	15.0	0.5	0.031	1817
65	9.5	14.9	0.5	0.031	1817
65	10.0	14.9	0.4	0.030	1817
65	11.0	15.0	0.5	0.030	1818
65	12.0	15.8	0.4	0.027	1818
65	13.0	15.6	0.4	0.027	1819
65	14.0	14.9	0.4	0.027	1819
65	15.0	13.8	0.4	0.028	1820
66	0.0	23.9	17.6	0.738	1344
66	0.5	23.8	14.3	0.599	1344
66	1.0	23.8	13.1	0.548	1344
66	1.5	23.8	11.5	0.481	1345
66	2.0	23.8	10.6	0.444	1345
66	2.5	23.8	10.2	0.431	1345
66	3.0	23.8	9.7	0.406	1345
66	3.5	23.8	8.9	0.376	1345
66	4.0	23.8	8.2	0.343	1346
66	4.5	23.8	8.2	0.344	1346
66	5.0	23.8	7.7	0.323	1346
66	5.5	23.9	7.5	0.315	1346
66	6.0	23.9	7.0	0.294	1347
66	6.5	23.9	6.6	0.278	1347
66	7.0	23.9	6.3	0.262	1347
66	7.5	24.0	5.9	0.245	1347
66	8.0	24.0	5.4	0.227	1348
66	8.5	24.0	4.9	0.206	1348
66	9.0	24.0	4.8	0.199	1348
66	9.5	24.1	4.5	0.187	1348
66	10.0	24.1	4.1	0.172	1349
66	11.0	24.1	3.7	0.155	1349
66	12.0	24.1	3.3	0.137	1349
66	13.0	24.2	2.9	0.120	1349
66	14.0	24.3	2.3	0.096	1350
66	15.0	24.3	1.7	0.070	1350
66	16.0	24.3	1.5	0.062	1350
66	17.0	24.3	1.3	0.054	1350
66	18.0	24.4	1.2	0.047	1351
66	19.0	24.4	0.8	0.033	1351
66	20.0	24.4	0.5	0.020	1351
66	21.0	24.4	0.3	0.013	1351
66	22.0	24.5	0.2	0.009	1351
66	23.0	24.5	0.2	0.006	1352
66	24.0	24.5	0.1	0.005	1352

Table 19. Photosynthetically available irradiation ($mE \cdot m^{-2} \cdot min^{-1}$) water column profile data for 1987 (CONTINUED).

Profile Sample Number	Depth of Water Sensor (m)	Surface Sensor Reading	Water Sensor Reading	Water/ Surface Ratio	Time	Profile Sample Number	Depth of Water Sensor (m)	Surface Sensor Reading	Water Sensor Reading	Water/ Surface Ratio	Time
66	25.0	24.4	<0.1	0.004	1352	69	5.0	57.1	2.1	0.036	1429
66	26.0	24.4	<0.1	0.003	1352	69	5.5	60.7	2.0	0.034	1430
						69	6.0	73.0	2.0	0.028	1430
67	0.0	23.7	19.6	0.827	1135	69	6.5	58.6	2.0	0.034	1430
67	0.5	22.5	9.4	0.417	1135	69	7.0	84.4	2.0	0.024	1430
67	1.0	21.7	2.8	0.130	1135	69	7.5	74.0	2.0	0.027	1431
67	1.5	21.7	2.4	0.111	1136	69	8.0	63.9	1.9	0.030	1431
67	2.0	22.4	2.1	0.093	1136	69	8.5	60.8	1.9	0.032	1431
67	2.5	23.7	2.0	0.083	1136	69	9.0	51.9	1.9	0.037	1431
67	3.0	24.1	1.9	0.081	1136	69	9.5	48.2	1.9	0.039	1431
67	3.5	24.0	1.9	0.080	1136	69	10.0	47.9	1.9	0.040	1432
67	4.0	23.4	1.9	0.082	1137	69	11.0	41.0	1.9	0.047	1432
67	4.5	22.4	1.9	0.085	1137	69	12.0	40.5	1.9	0.047	1432
67	5.0	23.1	1.9	0.082	1137	69	13.0	44.1	1.9	0.043	1433
67	5.5	23.4	1.9	0.081	1138	69	14.0	58.1	1.9	0.033	1433
						69	15.0	52.9	1.9	0.036	1433
68	0.0	11.5	10.0	0.871	1530	69	16.0	70.6	1.9	0.027	1434
68	0.5	11.6	8.7	0.752	1530	69	17.0	93.3	1.9	0.020	1434
68	1.0	11.6	7.3	0.627	1531	69	18.0	33.8	1.8	0.053	1435
68	1.5	11.6	6.3	0.538	1531	69	19.0	32.4	1.8	0.055	1435
68	2.0	11.1	5.5	0.497	1531	69	20.0	29.6	1.6	0.055	1436
68	2.5	11.1	4.5	0.407	1531						
68	3.0	11.4	4.1	0.356	1532	70	0.0	16.9	9.3	0.552	1550
68	3.5	11.4	3.7	0.321	1532	70	0.5	16.8	2.2	0.132	1550
68	4.0	11.4	3.3	0.293	1532	70	1.0	16.6	1.7	0.105	1550
68	4.5	11.2	3.2	0.288	1532	70	1.5	16.5	1.7	0.104	1551
68	5.0	11.5	3.0	0.264	1532	70	2.0	16.4	1.7	0.104	1551
68	5.5	11.2	3.0	0.266	1533	70	2.5	16.2	1.7	0.104	1551
68	6.0	11.6	2.9	0.249	1533	70	3.0	16.2	1.7	0.104	1551
68	6.5	11.1	2.8	0.251	1533	70	3.5	16.2	1.7	0.104	1551
68	7.0	11.4	2.7	0.240	1533	70	4.0	16.1	1.7	0.104	1552
68	7.5	12.1	2.7	0.222	1533	70	4.5	16.3	1.7	0.102	1552
68	8.0	12.5	2.7	0.214	1534	70	5.0	16.5	1.7	0.101	1552
68	8.5	12.5	2.6	0.210	1534	70	5.5	16.5	1.7	0.100	1552
68	9.0	12.5	2.6	0.207	1534	70	6.0	16.5	1.7	0.100	1553
68	9.5	12.8	2.6	0.205	1534	70	6.5	16.5	1.6	0.100	1553
68	10.0	13.0	2.6	0.197	1535	70	7.0	16.2	1.7	0.102	1553
68	11.0	12.5	2.5	0.201	1535	70	7.5	16.1	1.6	0.102	1553
68	12.0	12.6	2.5	0.199	1535	70	8.0	15.8	1.6	0.104	1554
68	13.0	12.7	2.5	0.196	1535	70	8.5	15.7	1.6	0.104	1554
68	14.0	12.7	2.5	0.197	1536	70	9.0	15.5	1.6	0.105	1554
68	15.0	12.6	2.5	0.197	1536	70	9.5	15.4	1.6	0.105	1554
						70	10.0	15.3	1.6	0.105	1554
69	0.0	78.7	54.9	0.699	1427	70	11.0	15.2	1.6	0.106	1555
69	0.5	79.0	7.8	0.099	1427	70	12.0	15.0	1.6	0.107	1555
69	1.0	49.2	2.9	0.060	1427	70	13.0	15.1	1.6	0.106	1555
69	1.5	24.3	2.3	0.096	1428	70	14.0	15.0	1.6	0.107	1555
69	2.0	25.8	2.2	0.085	1428	70	15.0	14.9	1.6	0.108	1555
69	2.5	42.7	2.2	0.051	1428	70	16.0	14.7	1.6	0.109	1556
69	3.0	76.6	2.1	0.028	1428	70	17.0	14.6	1.6	0.109	1556
69	3.5	79.2	2.1	0.027	1429	70	18.0	14.5	1.6	0.111	1556
69	4.0	79.9	2.1	0.026	1429	70	19.0	14.6	1.6	0.110	1556
69	4.5	78.5	2.1	0.027	1429	70	20.0	14.7	1.6	0.108	1557

Table 20. Photosynthetically available irradiation ($mE \cdot m^{-2} \cdot min^{-1}$) water column profile data for 1988.

Profile Sample Number	Depth of Water Sensor (m)	Surface Sensor Reading	Water Sensor Reading	Water/ Surface Ratio	Time
1	0.0	2.5	1.9	0.757	0924
1	0.5	2.5	1.0	0.377	0924
1	1.0	2.6	0.3	0.132	0924
1	1.5	2.6	0.3	0.135	0924
1	2.0	2.6	0.2	0.074	0925
1	2.5	2.6	0.1	0.042	0925
1	3.0	2.6	<0.1	0.027	0925
1	3.5	2.7	<0.1	0.018	0925
1	4.0	2.7	<0.1	0.011	0926
1	4.5	2.7	<0.1	0.008	0926
2	0.0	4.9	5.4	1.091	1012
2	0.5	4.9	3.1	0.630	1013
2	1.0	5.0	1.6	0.328	1013
2	1.5	5.0	1.2	0.245	1013
2	2.0	5.0	0.7	0.150	1013
2	2.5	5.0	0.4	0.087	1014
2	3.0	5.0	0.3	0.057	1014
2	3.5	5.0	0.2	0.036	1014
2	4.0	5.0	0.1	0.024	1014
2	4.5	5.0	<0.1	0.015	1014
2	5.0	5.0	<0.1	0.011	1015
2	5.5	5.1	<0.1	0.009	1015
2	6.0	5.1	<0.1	0.007	1015
2	6.5	5.1	<0.1	0.006	1016
2	7.0	5.1	<0.1	0.005	1016
2	7.5	5.1	<0.1	0.004	1016
2	8.0	5.1	<0.1	0.004	1016
2	8.5	5.2	<0.1	0.003	1018
2	9.0	5.2	<0.1	0.003	1018
2	9.5	5.2	<0.1	0.002	1018
2	10.0	5.3	<0.1	0.002	1019
2	11.0	5.3	<0.1	0.002	1019
2	12.0	5.3	<0.1	0.001	1020
3	0.0	23.1	12.3	0.531	1634
3	0.5	23.1	4.0	0.173	1635
3	1.0	23.1	2.5	0.110	1635
3	1.5	23.0	1.8	0.080	1635
3	2.0	23.0	1.3	0.055	1635
3	2.5	23.0	0.8	0.036	1636
3	3.0	22.9	0.6	0.025	1636
3	3.5	22.9	0.4	0.016	1637
3	4.0	22.8	0.3	0.011	1637
3	4.5	22.8	0.2	0.008	1637
3	5.0	22.8	0.1	0.006	1637
3	5.5	22.8	0.1	0.005	1638
3	6.0	22.7	<0.1	0.004	1638
3	6.5	22.7	<0.1	0.003	1638
3	7.0	22.7	<0.1	0.002	1639
3	7.5	22.7	<0.1	0.002	1639
3	8.0	22.9	<0.1	0.002	1639
3	8.5	20.7	<0.1	0.002	1640
3	9.0	16.6	<0.1	0.001	1640
3	9.5	20.3	<0.1	0.001	1641
4	0.0	8.2	6.6	0.805	1029
4	0.5	8.2	3.8	0.461	1029
4	1.0	8.2	2.3	0.278	1029
4	1.5	8.2	1.5	0.178	1029
4	2.0	8.2	1.0	0.119	1030
4	2.5	8.3	0.6	0.071	1030
4	3.0	8.3	0.4	0.048	1030
4	3.5	8.4	0.3	0.031	1030
4	4.0	8.4	0.2	0.022	1031
4	4.5	8.5	0.1	0.014	1031
4	5.0	8.5	<0.1	0.011	1031
4	5.5	8.5	<0.1	0.009	1031
4	6.0	8.6	<0.1	0.007	1032
4	6.5	8.7	<0.1	0.006	1032
4	7.0	8.7	<0.1	0.005	1032
4	7.5	8.8	<0.1	0.004	1032
4	8.0	8.8	<0.1	0.004	1033
4	8.5	8.9	<0.1	0.003	1033
4	9.0	8.9	<0.1	0.003	1033
4	9.5	8.9	<0.1	0.002	1033
4	10.0	8.9	<0.1	0.002	1034
4	11.0	8.9	<0.1	0.001	1034
4	12.0	8.9	<0.1	0.001	1034
4	13.0	8.9	<0.1	0.001	1035
5	0.0	5.4	4.1	0.754	942
5	0.5	5.4	2.2	0.414	943
5	1.0	5.4	1.2	0.229	943
5	1.5	5.5	0.9	0.157	943
5	2.0	5.5	0.6	0.110	944
5	2.5	5.5	0.4	0.072	944
5	3.0	5.5	0.3	0.048	945
5	3.5	5.5	0.2	0.032	945
5	4.0	5.6	0.1	0.022	945
5	4.5	5.6	<0.1	0.014	945
5	5.0	5.6	<0.1	0.012	946
5	5.5	5.6	<0.1	0.010	946
5	6.0	5.6	<0.1	0.008	946
5	6.5	5.6	<0.1	0.007	946
5	7.0	5.6	<0.1	0.006	946
5	7.5	5.7	<0.1	0.005	947
5	8.0	5.7	<0.1	0.004	947
5	8.5	5.7	<0.1	0.004	947
6	0.0	9.9	6.6	0.670	1703
6	0.5	9.9	3.7	0.376	1703
6	1.0	9.9	2.2	0.228	1703
6	1.5	9.9	1.5	0.152	1703
6	2.0	9.9	0.9	0.096	1704
6	2.5	9.9	0.6	0.065	1704
6	3.0	9.9	0.4	0.044	1704
6	3.5	10.0	0.3	0.028	1704
6	4.0	10.0	0.2	0.018	1705
6	4.5	9.9	0.1	0.013	1705
7	0.0	33.4	24.7	0.739	1143
7	0.5	33.1	16.0	0.484	1143
7	1.0	32.7	7.0	0.214	1143
7	1.5	32.3	4.4	0.135	1143
7	2.0	32.3	2.6	0.082	1143
7	2.5	32.4	1.8	0.055	1144
7	3.0	32.6	1.2	0.037	1144
7	3.5	33.1	0.8	0.025	1144
7	4.0	33.4	0.6	0.019	1144

Table 20. Photosynthetically available irradiation ($mE \cdot m^{-2} \cdot min^{-1}$) water column profile data for 1988 (CONTINUED).

Profile Sample Number	Depth of Water Sensor (m)	Surface Sensor Reading	Water Sensor Reading	Water/ Surface Ratio	Time
7	4.5	33.7	0.5	0.014	1145
7	4.8	33.7	0.4	0.011	1145
8	0.0	7.0	5.1	0.732	1000
8	0.5	7.0	2.6	0.372	1000
8	1.0	7.0	1.5	0.215	1001
8	1.5	7.0	0.9	0.128	1001
8	2.0	7.0	0.4	0.061	1001
8	2.5	7.1	0.3	0.040	1001
8	3.0	7.1	0.2	0.025	1001
8	3.5	7.1	0.1	0.017	1002
8	4.0	7.1	<0.1	0.012	1002
8	4.5	7.2	<0.1	0.009	1002
8	5.0	7.2	<0.1	0.007	1002
8	5.5	7.2	<0.1	0.006	1002
8	6.0	7.2	<0.1	0.005	1003
8	6.5	7.2	<0.1	0.004	1003
8	7.0	7.3	<0.1	0.003	1003
8	7.5	7.3	<0.1	0.003	1003
8	8.0	7.3	<0.1	0.002	1004
8	8.5	7.4	<0.1	0.002	1004
8	9.0	7.4	<0.1	0.002	1004
8	9.5	7.4	<0.1	0.001	1004
8	10.0	7.5	<0.1	0.001	1005
8	11.0	7.5	<0.1	0.001	1005
9	0.0	14.5	10.4	0.717	1634
9	0.5	14.5	5.7	0.393	1634
9	1.0	14.5	2.9	0.203	1635
9	1.5	14.5	1.6	0.113	1635
9	2.0	14.6	1.0	0.066	1635
9	2.5	14.6	0.5	0.037	1635
9	3.0	14.5	0.3	0.022	1635
9	3.5	14.5	0.2	0.014	1636
9	4.0	14.4	0.1	0.010	1636
9	4.5	14.3	<0.1	0.007	1636
9	5.0	14.4	<0.1	0.005	1636
9	5.5	14.4	<0.1	0.004	1637
9	6.0	14.5	<0.1	0.003	1637
9	6.5	14.5	<0.1	0.003	1637
9	7.0	14.5	<0.1	0.002	1637
9	7.5	14.5	<0.1	0.002	1638
9	8.0	14.5	<0.1	0.002	1638
9	8.5	14.4	<0.1	0.001	1638
9	9.0	14.4	<0.1	0.001	1638
9	9.5	14.4	<0.1	0.001	1638
10	0.0	11.1	10.7	0.965	1033
10	0.5	11.1	6.8	0.611	1033
10	1.0	11.2	5.6	0.499	1033
10	1.5	11.2	4.7	0.416	1034
10	2.0	11.1	3.3	0.296	1034
10	2.5	11.2	2.9	0.263	1034
10	3.0	11.1	2.7	0.243	1034
10	3.5	11.1	2.5	0.221	1035
10	4.0	11.1	2.4	0.213	1035
10	4.5	11.1	2.9	0.259	1035
10	5.0	11.1	3.5	0.312	1036
10	5.5	11.1	3.4	0.310	1036
10	6.0	11.1	2.4	0.219	1036
10	6.5	11.1	2.3	0.208	1036
10	7.0	11.1	2.1	0.192	1037
10	7.5	11.1	1.9	0.174	1037
10	8.0	11.1	1.7	0.150	1037
10	8.5	11.1	1.5	0.137	1037
10	9.0	11.1	1.8	0.162	1038
10	9.5	11.1	2.1	0.188	1038
11	0.0	2.3	1.7	0.740	0850
11	0.5	2.4	0.8	0.354	0850
11	1.0	2.4	0.4	0.174	0851
11	1.5	2.4	0.2	0.098	0851
11	2.0	2.4	0.1	0.051	0851
11	2.5	2.4	<0.1	0.029	0851
11	3.0	2.4	<0.1	0.015	0852
11	3.5	2.5	<0.1	0.009	0852
11	4.0	2.5	<0.1	0.006	0852
11	4.5	2.5	<0.1	0.004	0852
11	5.0	2.5	<0.1	0.003	0853
11	5.5	2.5	<0.1	0.002	0853
12	0.0	31.3	23.5	0.750	1620
12	0.5	31.2	13.4	0.428	1620
12	1.0	31.2	6.8	0.219	1620
12	1.5	31.2	4.5	0.145	1620
12	2.0	31.2	3.5	0.111	1621
12	2.5	31.4	2.9	0.091	1621
12	3.0	31.4	2.5	0.080	1621
12	3.5	31.4	2.3	0.074	1621
12	4.0	31.4	2.1	0.068	1621
12	4.5	31.4	3.1	0.098	1622
14	2.0	28.8	0.2	0.006	1625
14	2.5	28.8	0.1	0.005	1625
14	3.0	28.6	<0.1	0.003	1627
14	3.5	28.6	<0.1	0.002	1627
14	4.0	28.6	<0.1	0.002	1627
14	4.5	28.5	<0.1	0.002	1628
14	5.0	28.4	<0.1	0.001	1628
14	5.5	28.4	<0.1	0.001	1629
14	6.0	28.3	<0.1	0.001	1629
17	1.5	36.7	0.4	0.012	1611
17	2.0	36.6	0.3	0.009	1611
17	2.5	36.4	0.2	0.006	1612
17	3.0	36.1	0.2	0.005	1612
17	3.5	36.1	0.1	0.003	1612
17	4.0	36.0	<0.1	0.002	1613
17	4.5	35.9	<0.1	0.001	1613
17	5.0	35.9	<0.1	0.001	1614
17	5.5	35.8	<0.1	0.001	1614
19	1.0	39.6	0.3	0.009	1504
19	1.5	39.6	0.3	0.008	1504
19	2.0	39.6	0.3	0.008	1505
19	2.5	39.5	0.3	0.007	1505
19	3.0	39.4	0.2	0.006	1505
19	3.5	39.4	0.2	0.005	1506
19	4.0	39.3	0.2	0.005	1506
19	4.5	39.2	0.2	0.004	1506

Table 20. Photosynthetically available irradiation ($mE \cdot m^{-2} \cdot min^{-1}$) water column profile data for 1988 (CONTINUED).

Profile Sample Number	Depth of Water Sensor (m)	Surface Sensor Reading	Water Sensor Reading	Water/ Surface Ratio	Time	Profile Sample Number	Depth of Water Sensor (m)	Surface Sensor Reading	Water Sensor Reading	Water/ Surface Ratio	Time
19	5.0	38.8	0.1	0.004	1506	22	5.5	54.1	0.3	0.006	1401
19	5.5	38.6	0.1	0.003	1507	22	6.0	54.3	0.3	0.006	1401
19	6.0	38.6	0.1	0.003	1507	22	6.5	54.5	0.3	0.005	1402
19	6.5	38.4	<0.1	0.002	1507	22	7.0	54.5	0.3	0.005	1402
19	7.0	38.4	<0.1	0.002	1507	22	7.5	54.5	0.2	0.004	1402
19	7.5	38.3	<0.1	0.002	1507	22	8.0	54.6	0.2	0.004	1402
19	8.0	38.3	<0.1	0.002	1508	22	8.5	54.8	0.2	0.004	1402
19	8.5	38.3	<0.1	0.002	1508	22	9.0	54.7	0.2	0.004	1403
19	9.0	38.2	<0.1	0.002	1508	22	9.5	54.6	0.2	0.003	1403
19	9.5	38.1	<0.1	0.002	1508	22	10.0	54.5	0.2	0.003	1403
19	10.0	38.1	<0.1	0.001	1509	22	11.0	54.5	0.2	0.003	1403
19	11.0	38.3	<0.1	0.001	1509	22	12.0	54.3	0.1	0.003	1404
19	12.0	38.1	<0.1	0.001	1509	22	13.0	54.3	0.1	0.002	1404
						22	14.0	54.2	0.1	0.002	1404
22	1.0	54.7	0.9	0.017	1358	22	15.0	54.2	<0.1	0.002	1405
22	1.5	54.8	0.7	0.012	1359	22	16.0	54.2	<0.1	0.002	1405
22	2.0	54.8	0.7	0.013	1359	22	16.3	54.1	<0.1	0.001	1405
22	2.5	54.7	0.6	0.011	1359						
22	3.0	54.6	0.5	0.010	1359	25	1.5	44.5	0.1	0.003	1348
22	3.5	54.3	0.5	0.009	1400	25	2.0	43.3	<0.1	0.001	1348
22	4.0	53.9	0.4	0.008	1400	25	2.5	42.1	<0.1	0.001	1349
22	4.5	54.0	0.4	0.007	1401	25	3.0	37.4	<0.1	0.001	1349
22	5.0	54.0	0.3	0.006	1401						

Table 21. Light extinction coefficients at one offshore (86068), two Kugmallit Bay (86036, 86041) and two Tuktoyaktuk Harbour stations sampled in 1986, in comparison to Secchi depth and salinity.

Station	Date	Extinction Coefficient (m^{-1})	Station Depth (m)	Secchi Depth (m)	Surface Salinity (Practical Scale)
86068	18 August	0.04	51	14.8	31
86036	23 July	0.23	5	0.8	25
86041	26 July	0.33	6	0.9	30
86THS	07 August	0.48	23	1.2	12
86THN	07 August	0.71	22	0.3	10

Table 22. Photosynthetically available irradiation ($mE \cdot m^{-2} \cdot min^{-1}$) data for pre- and post-scraping of underice surfaces in 1987.

Profile Sample Number	Quadrant Number	Underice Surface	Surface Sensor Reading	Water Sensor Reading	Water/ Surface Ratio	Time	Snow Depth (cm)
13	1	Pre-scrape	40.0	0.5	0.013	1549	2
13	1	Post-scrape	40.7	0.9	0.022	1549	
13	2	Pre-scrape	40.5	0.5	0.012	1550	
13	2	Post-scrape	38.3	1.0	0.025	1551	
13	3	Pre-scrape	37.9	0.5	0.013	1552	
13	3	Post-scrape	38.2	0.9	0.024	1553	
13	4	Pre-scrape	35.8	0.4	0.012	1554	
13	4	Post-scrape	37.1	0.9	0.025	1555	
15	1	Pre-scrape	43.0	0.9	0.021	1136	1
15	1	Post-scrape	42.6	1.1	0.025	1137	
15	2	Pre-scrape	41.6	0.7	0.016	1137	
15	2	Post-scrape	39.9	0.9	0.024	1139	
15	3	Pre-scrape	38.8	1.2	0.030	1140	
15	3	Post-scrape	38.0	1.4	0.036	1141	
15	4	Pre-scrape	37.6	1.0	0.027	1142	
15	4	Post-scrape	38.5	1.1	0.029	1143	
17	1	Pre-scrape	37.5	1.3	0.034	1207	1
17	1	Post-scrape	37.8	1.6	0.041	1208	
17	2	Pre-scrape	38.0	1.3	0.034	1208	
17	2	Post-scrape	38.2	1.6	0.041	1209	
17	3	Pre-scrape	38.0	1.1	0.029	1210	
17	3	Post-scrape	38.3	1.3	0.035	1211	
17	4	Pre-scrape	38.9	1.2	0.031	1211	
17	4	Post-scrape	39.3	1.6	0.040	1212	
19	1	Pre-scrape	56.8	0.3	0.005	1333	14
19	1	Post-scrape	58.2	0.3	0.004	1336	
19	2	Pre-scrape	58.2	0.3	0.004	1336	
19	2	Post-scrape	58.2	0.3	0.004	1336	
20	1	Pre-scrape	38.6	0.6	0.015	0920	3
20	1	Post-scrape	38.8	0.6	0.015	0920	
20	2	Pre-scrape	38.9	0.6	0.014	0921	
20	2	Post-scrape	39.2	0.6	0.014	0921	
20	3	Pre-scrape	39.3	0.6	0.016	0922	
20	3	Post-scrape	39.4	0.6	0.016	0922	
20	4	Pre-scrape	39.5	0.7	0.018	0923	
20	4	Post-scrape	39.7	0.7	0.018	0923	

Profile Sample Number	Quadrant Number	Underice Surface	Surface Sensor Reading	Water Sensor Reading	Water/ Surface Ratio	Time	Snow Depth (cm)
22	1	Pre-scrape	39.8	0.3	0.007	0914	2
22	1	Post-scrape	42.5	0.9	0.022	0915	
22	2	Pre-scrape	41.3	0.3	0.008	0916	
22	2	Post-scrape	44.2	1.0	0.022	0917	
22	3	Pre-scrape	44.2	0.5	0.011	0918	
22	3	Post-scrape	45.5	0.9	0.020	0919	
22	4	Pre-scrape	45.6	0.3	0.008	0919	
22	4	Post-scrape	45.1	0.9	0.019	0920	
24	1	Pre-scrape	51.6	<0.1	0.001	0931	14
24	1	Post-scrape	50.0	<0.1	0.001	0931	
24	2	Pre-scrape	41.8	<0.1	0.001	0932	
24	2	Post-scrape	39.5	<0.1	0.002	0933	
24	3	Pre-scrape	38.4	<0.1	0.001	0933	
24	3	Post-scrape	36.7	<0.1	0.002	0934	
24	4	Pre-scrape	34.7	<0.1	0.001	0935	
24	4	Post-scrape	35.9	<0.1	0.001	0935	
26	1	Pre-scrape	90.4	4.4	0.049	1454	2
26	1	Post-scrape	89.8	4.6	0.052	1455	
26	2	Pre-scrape	89.0	4.8	0.054	1455	
26	2	Post-scrape	88.7	6.2	0.070	1456	
26	3	Pre-scrape	89.2	5.7	0.064	1456	
26	3	Post-scrape	88.0	7.5	0.085	1457	
26	4	Pre-scrape	87.1	5.6	0.065	1458	
26	4	Post-scrape	85.6	6.7	0.078	1459	
28	1	Pre-scrape	80.6	2.5	0.031	1516	2
28	1	Post-scrape	81.2	3.5	0.043	1517	
28	2	Pre-scrape	79.7	2.5	0.031	1518	
28	2	Post-scrape	79.1	2.9	0.037	1519	
28	3	Pre-scrape	80.9	2.7	0.034	1520	
28	3	Post-scrape	75.0	3.5	0.047	1521	
28	4	Pre-scrape	70.6	2.3	0.033	1522	
28	4	Post-scrape	70.4	2.8	0.040	1523	
30	1	Pre-scrape	58.6	0.2	0.003	1838	5
30	1	Post-scrape	58.5	0.3	0.004	1839	
30	2	Pre-scrape	58.3	0.2	0.003	1839	
30	2	Post-scrape	58.2	0.3	0.004	1840	

Table 22. Photosynthetically available irradiation (mE·m^{-2}·min^{-1}) data for pre- and post-scraping of underice surfaces in 1987 (CONTINUED).

Profile Sample Number	Quadrant Number	Underice Surface	Surface Sensor Reading	Water Sensor Reading	Water/ Surface Ratio	Time	Snow Depth (cm)
30	3	Pre-scrape	58.0	0.2	0.003	1841	
30	3	Post-scrape	57.8	0.2	0.004	1841	
30	4	Pre-scrape	57.6	0.2	0.003	1842	
30	4	Post-scrape	57.5	0.2	0.004	1843	
32	1	Pre-scrape	52.5	0.2	0.003	1908	5
32	1	Post-scrape	52.2	0.3	0.005	1909	
32	2	Pre-scrape	52.1	0.2	0.004	1909	
32	2	Post-scrape	51.8	0.3	0.005	1910	
32	3	Pre-scrape	51.6	0.2	0.004	1911	
32	3	Post-scrape	51.3	0.3	0.005	1912	
32	4	Pre-scrape	51.2	0.2	0.003	1913	
32	4	Post-scrape	51.0	0.2	0.004	1913	
34	1	Pre-scrape	77.6	<0.1	0.001	1444	15
34	1	Post-scrape	77.3	0.1	0.002	1446	
34	2	Pre-scrape	76.1	<0.1	0.001	1446	
34	2	Post-scrape	71.5	<0.1	0.001	1448	
34	3	Pre-scrape	72.4	<0.1	0.001	1449	
34	3	Post-scrape	76.6	0.1	0.001	1450	
34	4	Pre-scrape	83.0	<0.1	0.001	1451	
34	4	Post-scrape	79.4	<0.1	0.001	1452	
36	1	Pre-scrape	69.7	0.1	0.002	1509	16
36	1	Post-scrape	70.7	0.2	0.002	1510	
36	2	Pre-scrape	69.4	0.1	0.002	1511	
36	2	Post-scrape	78.1	0.2	0.002	1512	
36	3	Pre-scrape	83.7	0.2	0.002	1513	
36	3	Post-scrape	78.1	0.2	0.002	1514	
36	4	Pre-scrape	75.2	0.1	0.002	1515	
36	4	Post-scrape	72.6	0.2	0.002	1516	

Table 23. Photosynthetically available irradiation ($mE \cdot m^{-2} \cdot min^{-1}$) data for pre- and post-scraping of underice surfaces in 1988.

Profile Sample Number	Quadrant Number	Underice Surface	Surface Sensor Reading	Water Sensor Reading	Water/ Surface Ratio	Time	Snow Depth (cm)
13	1	Pre-scrape	29.3	0.2	0.007	1620	5
13	1	Post-scrape	29.2	0.2	0.007	1621	
13	2	Pre-scrape	29.2	0.2	0.007	1621	
13	2	Post-scrape	29.1	0.2	0.006	1622	
13	3	Pre-scrape	29.0	0.2	0.006	1623	
13	3	Post-scrape	29.0	0.2	0.006	1623	
13	4	Pre-scrape	28.9	0.2	0.006	1624	
13	4	Post-scrape	28.9	0.2	0.006	1624	
15	1	Pre-scrape	34.4	<0.1	0.003	1646	20
15	1	Post-scrape	34.1	<0.1	0.002	1647	
15	2	Pre-scrape	34.1	<0.1	0.002	1647	
15	2	Post-scrape	34.0	<0.1	0.002	1648	
15	3	Pre-scrape	34.0	<0.1	0.001	1648	
15	3	Post-scrape	33.9	<0.1	0.001	1649	
15	4	Pre-scrape	33.8	<0.1	0.001	1649	
15	4	Post-scrape	33.8	<0.1	0.001	1650	
16	1	Pre-scrape	37.7	0.4	0.011	1605	2
16	1	Post-scrape	37.6	0.9	0.024	1606	
16	2	Pre-scrape	37.5	0.4	0.010	1607	
16	2	Post-scrape	37.6	0.6	0.017	1607	
16	3	Pre-scrape	37.5	0.4	0.012	1608	
16	3	Post-scrape	37.4	0.8	0.021	1608	
16	4	Pre-scrape	37.3	0.5	0.012	1609	
16	4	Post-scrape	37.2	0.8	0.020	1610	
18	1	Pre-scrape	38.9	0.4	0.011	1459	2
18	1	Post-scrape	39.6	1.0	0.024	1500	
18	2	Pre-scrape	39.5	0.4	0.010	1501	
18	2	Post-scrape	39.8	0.8	0.020	1502	
18	3	Pre-scrape	39.9	0.4	0.011	1502	
18	3	Post-scrape	40.1	0.9	0.023	1503	
18	4	Pre-scrape	40.1	0.5	0.012	1503	
18	4	Post-scrape	40.0	1.0	0.024	1503	
20	1	Pre-scrape	41.1	0.1	0.004	1518	2
20	1	Post-scrape	40.9	0.2	0.004	1519	
20	2	Pre-scrape	40.5	<0.1	0.002	1520	
20	2	Post-scrape	40.5	<0.1	0.002	1521	

Profile Sample Number	Quadrant Number	Underice Surface	Surface Sensor Reading	Water Sensor Reading	Water/ Surface Ratio	Time	Snow Depth (cm)
20	3	Pre-scrape	40.3	0.1	0.003	1521	
20	3	Post-scrape	40.0	0.4	0.011	1522	
20	4	Pre-scrape	39.9	0.2	0.006	1522	
20	4	Post-scrape	39.8	0.3	0.007	1523	
21	1	Pre-scrape	55.3	1.4	0.025	1354	3
21	1	Post-scrape	55.4	2.3	0.042	1355	
21	2	Pre-scrape	54.9	0.9	0.016	1355	
21	2	Post-scrape	55.0	2.7	0.049	1356	
21	3	Pre-scrape	55.0	1.0	0.018	1356	
21	3	Post-scrape	54.4	2.6	0.048	1357	
21	4	Pre-scrape	54.5	0.9	0.017	1357	
21	4	Post-scrape	54.7	2.3	0.043	1358	
23	1	Pre-scrape	48.6	0.7	0.014	1414	4
23	1	Post-scrape	48.2	1.1	0.023	1415	
23	2	Pre-scrape	47.9	0.6	0.012	1416	
23	2	Post-scrape	47.6	1.4	0.030	1416	
23	3	Pre-scrape	47.3	0.6	0.012	1417	
23	3	Post-scrape	47.0	1.2	0.026	1417	
23	4	Pre-scrape	46.9	0.4	0.009	1418	
23	4	Post-scrape	48.6	0.9	0.018	1419	
24	1	Pre-scrape	49.4	0.1	0.002	1344	18
24	1	Post-scrape	48.6	<0.1	0.002	1344	
24	2	Pre-scrape	49.0	0.1	0.002	1345	
24	2	Post-scrape	52.3	0.1	0.002	1345	
24	3	Pre-scrape	49.9	0.2	0.003	1346	
24	3	Post-scrape	46.8	0.1	0.003	1346	
24	4	Pre-scrape	48.9	0.2	0.003	1346	
24	4	Post-scrape	48.1	0.2	0.003	1347	
26	1	Pre-scrape	36.0	<0.1	<0.001	1412	35
26	1	Post-scrape	39.0	<0.1	<0.001	1413	
26	2	Pre-scrape	37.4	<0.1	<0.001	1413	
26	2	Post-scrape	36.3	<0.1	<0.001	1413	
26	3	Pre-scrape	35.5	<0.1	0.001	1414	
26	3	Post-scrape	37.0	<0.1	0.001	1414	
26	4	Pre-scrape	37.2	<0.1	0.001	1415	
26	4	Post-scrape	36.0	<0.1	0.001	1415	

Table 24. In-air sensitivity comparison of surface sensor (LI-190SA) to underwater sensor (LI-192SA) fitted with ice scraper, 1987.

Profile Sample Number	Surface Sensor Reading ($mE \cdot m^{-2} \cdot min^{-1}$)	Underwater Sensor Reading ($mE \cdot m^{-2} \cdot min^{-1}$)	Underwater/ Surface Ratio	Time
22	35.3	27.7	0.78	0913
26	92.7	110.4	1.19	1453
30	59.0	45.1	0.76	1836
32	53.0	42.8	0.81	1906
34	78.8	91.4	1.17	1442
36	75.6	81.0	1.07	1506

Table 25. In-air sensitivity comparison of surface sensor (LI-190SA) to underwater sensor (LI-192SA) fitted with ice scraper, 1988.

Profile Sample Number	Surface Sensor Reading ($mE \cdot m^{-2} \cdot min^{-1}$)	Underwater Sensor Reading ($mE \cdot m^{-2} \cdot min^{-1}$)	Underwater/ Surface Ratio	Time
18	38.3	35.1	0.92	1458
20	40.8	23.6	0.58	1517
21	54.6	51.7	0.95	1353
23	49.5	51.9	1.04	1414
24	56.4	42.0	0.74	1342
26	37.5	31.4	0.83	1416

Table 26. List of scientific names of algae collected in the Beaufort Sea study area during 1986 to 1988, ordered according to phylogenetic relationships.

Scientifc Name and Phylogenetic Relationship	Authority	Species Code
Kingdom Protista		020000
Phylum Chrysophyta		
Class Bacillariophyceae		020001
Achnanthes taeniata	Grunow 1880	021011
Amphiprora alata	(Ehrenberg 1840)Kutzing	021021
Amphiprora gigantea var. septentrionalis	(Grunow) Cleve 1880	021022
Amphiprora kjellmanii	Cleve	021023
Amphiprora kjellmanii var. striolata	(Grunow) Cleve 1880	021024
Amphiprora paludosa	Wm. Smith 1853	021025
Amphiprora paludosa var. hyperborea	(Grunow) Cleve 1880	021026
Amphiprora paludosa var. punctulata	(Grunow) Cleve 1880	021027
Amphora cf. laevis laevissima	(Gregory 1857) Cleve 1895	021031
Amphora proteus	Gregory 1857	021032
Caloneis brevis	(Gregory 1857) Cleve 1894	021041
Caloneis liber	(Wm. Smith 1853) Cleve 1894	021042
Cerataulina pelagica	(Cleve 1889) Hendey 1937	021051
Chaetoceros ceratosporum	Ostenfeld 1910	021061
Chaetoceros gracilis	Paulsen 1905	021062
Chaetoceros septentrionalis	Ostrup 1895	021063
Cocconeis placentula var. euglypta	(Ehrenberg 1854) Grunow 1884	021071
Cocconeis scutellum var. stauroneiformis	Rabenhorst 1864	021072
Coscinodiscus sp.		021080
Coscinodiscus kuetzingii	Schmidt 1878	021081
Cyclotella comta	(Ehrenberg 1844) Kutzing	021091
Cylindrotheca closterium	(Ehrenberg 1839) Reimann et Lewin	021101
Diatoma elongatum	(Lyngbye 1819) Agardh 1824	021111
Diploneis incurvata	(Gregory 1856) Cleve	021121
Diploneis litoralis var. clathrata	(Ostrup 1895) Cleve	021122
Diploneis vacillans	(A. Schmidt 1875) Cleve	021123
Eunotia lunaris	(Ehrenberg 1831) Brebisson	021131
Fragilaria construens	(Ehrenberg 1841) Grunow	021141
Fragilaria islandica	Grunow in Van Heurck 1881	021142
Fragilaria pinnata	Ehrenberg 1841	021143
Fragilaria striatula	Lyngbye 1819	021144
Gomphonema sp.	Agardh 1824	021150
Gomphonema exiguum	Kutzing 1844	021151
Gomphonema kamtschaticum	Grunow 1878	021152
Gyrosigma cf. kuetzingii	(Grunow 1860) Cleve	021161
Hantzschia weyprechii	Grunow 1880	021171
Licmophora gracilis var. anglica	(Kutzing) Peragallo	021181
Melosira arctica	Dickie in litt.	021191
Navicula sp.	Bory 1822	021200
Navicula algida	Grunow 1884	021201
Navicula bahusiensis	(Grunow in Van Heurck 1880)	021202
Navicula directa	(Wm. Smith 1856) Ralfs	021203
Navicula directa var. cuneata	Ostrup 1895	021204
Navicula gastrum	(Ehrenberg 1841) Kutzing	021205
Navicula glacialis	(Cleve 1873) Grunow	021206
Navicula gracilis	Ehrenberg 1830	021207
Navicula kariana	Grunow in Cleve & Grunow 1880	021208
Navicula maculosa	Donkin 1871	021209
Navicula marina	Ralfs in Pritchard 1861	021211
Navicula pelagica	Cleve 1896	021212
Navicula pygmaea	Kutzing 1849	021213
Navicula rhynchocephala	Kutzing 1844	021214
Navicula salinarum	Grunow in Cleve & Muller 1878	021215
Navicula scopulorum	Brebisson in Kutzing 1849	021216
Navicula spicula	(Hickie 1874) Cleve	021217
Navicula vanhoeffenii	Gran 1897	021218
Navicula vitrea	Grunow in Cleve & Muller 1879	021219
Neidium bisulcatum	(Lagerstedt 1873) Cleve	021221
Neidium bisulcatum cf. var. undulata	Muller 1898	021222

Table 26. List of scientific names of algae collected in the Beaufort Sea study area during 1986 to 1988 (CONTINUED).

Scientifc Name and Phylogenetic Relationship	Authority	Species Code
Nitzschia sp.	Hassal 1845	021230
Nitzschia acicularis	(Kutzing 1844) Wm. Smith	021231
Nitzschia cf. acuminata	(Wm. Smith 1853) Grunow	021232
Nitzschia angularis	Wm. Smith 1853	021233
Nitzschia closterium	(Ehrenberg 1839) Wm. Smith	021234
Nitzschia cylindrus	(Grunow) Hasle	021235
Nitzschia frigida	Grunow 1880	021236
Nitzschia laevissima	Grunow in Cleve & Muller 1882	021237
Nitzschia longissima	(Brebisson in Kutzing) Grunow	021238
Nitzschia cf. palea	(Kutzing 1844) Wm. Smith	021239
Nitzschia plana	Wm. Smith 1853	021241
Nitzschia polaris	Grunow in Cleve & Muller 1882	021242
Nitzschia seriata	Cleve 1883	021243
Nitzschia sigma	(Kutzing 1844) Wm. Smith	021244
Nitzschia sigmoidea	(Nitzsch 1817) Wm. Smith	021245
Nitzschia cf. thermalis	(Ehrenberg 1841)	021246
Pinnularia cf. gibba	Ehrenberg 1841	021251
Pinnularia quadratarea	(A. Schmidt 1874) Cleve	021252
Pinnularia quadratarea var. constricta	(Ostrup 1895) Heiden	021253
Pinnularia quadratarea var. minor	(Grunow 1880) Cleve	021254
Pleurosigma angulatum	(Quekett 1848) Wm. Smith	021261
Pleurosigma angulatum var. strigosum	(Wm. Smith 1852) Van Heurck	021262
Pleurosigma clevei	Grunow 1880	021263
Pleurosigma elongatum	Wm. Smith 1852	021264
Pleurosigma longum	Cleve 1873	021265
Pleurosigma salinarum	(Grunow 1878) Grunow	021266
Stauroneis sp.	Verrill 1900	021270
Stauroneis cf. linearis	Wm. Smith 1853	021271
Stauroneis quadripedis	(Cleve-Euler 1952) Hendey	021272
Stauroneis septentrionalis	Grunow 1884	021273
Stephanodiscus astraea	(Ehrenberg 1844) Grunow	021281
Synedra acus	Kutzing 1844	021291
Synedra camtschatica	Grunow 1862	021292
Synedra hyperborea	Grunow 1884	021293
Synedra pulchella	(Ralfs 1844) Kutzing	021294
Synedra tabulata	(Agardh 1832) Kutzing	021295
Synedra tabulata var. fasciculata	(Lyngbye 1819?) Hustedt	021296
Tabellaria flocculosa	(Roth 17970 Kutzing	021301
Thalassionema nitzschioides	(Grunow 1862) Van Heurck	021311
Thalassiosira baltica	(Grunow 1880) Ostenfeld	021321
Thalassiosira gravida	Cleve 1896	021322
Thalassiosira lacustris	(Grunow) Hasle	021323
Thalassiosira nordenskioeldii	Cleve	021324
Thalassiothrix frauenfeldii	(Grunow 1863)	021331
Thalassiothrix longissima	Cleve & Grunow in Cleve & Muller 1878	021332
Class Chrysophyceae		
Chrysochromulina sp.	Lackey 1938	024010
Chrysococcus sp.	Klebs	024020
Ochronomas sp.	Wysotzki	024030
Class Dictyophyceae		
Ebria tripartita	Lemmermann	025011
Phylum Chlorophyta		
Class Chlorophyceae		
Carteria sp.	Diesing	023010
Chlamydomonas sp.	Ehrenberg 1833	023020
Chlorococcus sp.	Fries	023030
Kirchneriella lunaris	(Kirchner) Moebius	023041
Koliella sp.		023050
Pyramidomonas grossi	Parke	023061
Schroederia sp.	Lemmermann	023070
Phylum Euglenophyta		

Table 26. List of scientific names of algae collected in the Beaufort Sea study area during 1986 to 1988 (CONTINUED).

Scientifc Name and Phylogenetic Relationship	Authority	Species Code
Class Euglenophyceae		
Euglena proxima	Dangeard 1901	027011
Euglena viridis	Ehrenberg 1830	027012
Phylum Pyrrophyta		
Class Dinophyceae		
Amphidinium sp.	Claparide and Lachmann	022010
Gymnodinium sp.	Stein	022020
Oxytoxum sp.	Stein	022030
Peridiniella catenata	(Levander) Balech	022041
Prorocentrum rampi	Sournia	022051
Protoperidinium bipes	(Paulsen 1908) Balech	022061
Protoperidinium globulus var. *ovatum*	(Diwald) Balech	022062
Protoperidinium grenlandicum	(Woloszynska) Balech	022063
Protoperidinium pellucidum	Berg	022064
Phylum Cryptophyta		
Class Cryptophyceae		
Cryptomonas sp.	Ehrenberg	026010

Table 27. Number of ice algae taxa and dominant taxa with associated snow depth and surface salinity data, collected in March, 1987 and 1988.

Station/ Algae Sample Number	Surface Salinity (Practical Scale)	Snow Depth (cm)	Number of Algae Taxa	Dominant Taxa
87003/1	32	1	49	Diatoma elongatum Thalassionema nitzshioides Schroederia sp.
87004/2	0	10	2	Chlamydomonas sp.
87005/3	28	3	40	Fragilaria construens Nitzschia frigida Thalassionema nitzschioides
87002/4	10	1	43	Diatoma elongatum Fragilaria striatula Thalassionema nitzschioides
88001/1	10	7	5	Nitzschia frigida Chrysococcus sp. Ochronomas sp.
88003/2	16	4	43	Diatoma elongatum Fragilaria striatula Ochronomas sp.
88004/3	32	5	37	Diatoma elongatum Fragilaria striatula Ochronomas sp.
88005/4	33	3	33	Diatoma elongatum Fragilaria striatula Chrysococcus sp.

Table 28. Number of ice algae taxa and dominant taxa with associated snow depth and surface salinity data, collected in May, 1986 and 1987.

Station/ Algae Sample Number	Surface Salinity (Practical Scale)	Snow Depth (cm)	Number of Algae Taxa	Dominant Taxa
86029/1	31	8	37	Nitzschia frigida Fragilaria striatula Nitzschia acicularis
86029/2	31	8	37	Nitzschia frigida Fragilaria construens Nitzschia acicularis
86029/3	7	10	32	Nitzschia frigida Fragilaria striatula Nitzschia acicularis
86029/4	7	11	36	Nitzschia frigida Fragilaria striatula
86029/5	7	13	34	Nitzschia frigida Chaetoceros ceratosporum Fragilaria striatula
86029/6	7	17	32	Nitzschia frigida Fragilaria islandica Thalassionema nitzschioides
86033/7	7	9	18	Nitzschia cylindrus Peridiniella catenata
86033/8	7	13	11	Peridiniella catenata Fragilaria islandica Fragilaria striatula
86033/9	7	19	20	Nitzschia cylindrus Thalassionema nitzschioides
86033/10	7	21	13	Fragilaria construens Peridiniella catenata Koliella sp.
87007/5	11	3	47	Nitzschia frigida Fragilaria striatula
87008/6	32	14	2	Thalassionema nitzschioides
87008/7	3	21	32	Nitzschia closterium
87009/8	8	44	4	Fragilaria striatula Cryptomonas sp.
87006/9	0	3	5	Nitzschia frigida

Table 29. Relative abundance of algae sampled from ice cores in 1986.

Algae Sample Number	Species	Abundance[a]	Algae Sample Number	Species	Abundance[a]
1	Amphiprora gigantea var. septentrionalis	R	2	Nitzschia seriata	C
1	Amphiprora kjellmanii var. striolata	R	2	Nitzschia sigma	C
1	Amphiprora paludosa	C	2	Pinnularia quadratarea	R
1	Amphiprora paludosa var. hyperborea	R	2	Pleurosigma angulatum	R
1	Chaetoceros ceratosporum	C	2	Pleurosigma elongatum	C
1	Chaetoceros septentrionalis	C	2	Pleurosigma longum	R
1	Diatoma elongatum	R	2	Synedra acus	C
1	Fragilaria construens	C	2	Thalassionema nitzschioides	C
1	Fragilaria islandica	C	2	Thalassiosira lacustris	R
1	Fragilaria pinnata	R	2	Thalassiothrix longissima	R
1	Fragilaria striatula	A	2	Protoperidinium grenlandicum	R
1	Gomphonema exiguum	R	2	Chlamydomonas sp.	R
1	Gomphonema kamtschaticum	R	2	Chrysochromulina sp.	C
1	Navicula bahusiensis	R	2	Chrysococcus sp.	C
1	Navicula directa	R	2	Ebria tripartita	R
1	Navicula gastrum	C	2	Cryptomonas sp.	R
1	Navicula salinarum	C			
1	Navicula spicula	R	3	Amphiprora gigantea var. septentrionalis	R
1	Nitzschia sp.	C	3	Amphiprora kjellmanii var. striolata	R
1	Nitzschia acicularis	C	3	Amphiprora paludosa	C
1	Nitzschia frigida	V	3	Amphiprora paludosa var. hyperborea	R
1	Nitzschia laevissima	R	3	Amphiprora paludosa var. punctulata	R
1	Nitzschia longissima	C	3	Chaetoceros ceratosporum	C
1	Nitzschia sigma	C	3	Chaetoceros septentrionalis	C
1	Nitzschia sigmoidea	R	3	Fragilaria construens	A
1	Pinnularia quadratarea var. minor	R	3	Fragilaria pinnata	C
1	Pleurosigma elongatum	C	3	Fragilaria striatula	A
1	Pleurosigma longum	R	3	Gomphonema kamtschaticum	R
1	Stauroneis cf. linearis	C	3	Navicula bahusiensis	R
1	Synedra acus	C	3	Navicula directa	R
1	Synedra camtschatica	R	3	Navicula gastrum	C
1	Synedra tabulata var. fasciculata	R	3	Navicula salinarum	C
1	Tabellaria flocculosa	R	3	Nitzschia acicularis	A
1	Thalassionema nitzschioides	C	3	Nitzschia frigida	V
1	Chrysochromulina sp.	C	3	Nitzschia laevissima	R
1	Chrysococcus sp.	C	3	Nitzschia longissima	R
1	Euglena viridis	R	3	Nitzschia sigma	C
			3	Pinnularia quadratarea	R
2	Amphiprora kjellmanii	R	3	Pleurosigma elongatum	A
2	Amphiprora paludosa	C	3	Pleurosigma longum	R
2	Amphiprora paludosa var. hyperborea	R	3	Stauroneis quadripedis	R
2	Chaetoceros ceratosporum	C	3	Synedra camtschatica	R
2	Chaetoceros septentrionalis	C	3	Synedra tabulata	R
2	Diatoma elongatum	R	3	Synedra tabulata var. fasciculata	C
2	Fragilaria construens	A	3	Thalassionema nitzschioides	C
2	Fragilaria islandica	C	3	Protoperidinium grenlandicum	R
2	Fragilaria pinnata	C	3	Chlamydomonas sp.	R
2	Fragilaria striatula	A	3	Chrysochromulina sp.	C
2	Navicula sp.	C	3	Chrysococcus sp.	C
2	Navicula bahusiensis	R			
2	Navicula directa	R	4	Achnanthes taeniata	C
2	Navicula gastrum	C	4	Amphiprora gigantea var. septentrionalis	R
2	Navicula salinarum	C	4	Amphiprora kjellmanii	R
2	Navicula spicula	C	4	Amphiprora paludosa	C
2	Navicula vanhoeffenii	C	4	Chaetoceros ceratosporum	C
2	Nitzschia acicularis	A	4	Chaetoceros septentrionalis	C
2	Nitzschia frigida	V	4	Cocconeis placentula var. euglypta	R
2	Nitzschia laevissima	C	4	Diatoma elongatum	R
2	Nitzschia longissima	C	4	Fragilaria construens	C

[a] R = rare; C = common; A = abundant; V = very abundant.

Table 29. Relative abundance of algae sampled from ice cores in 1986 (CONTINUED).

Algae Sample Number	Species	Abundance[a]	Algae Sample Number	Species	Abundance[a]
4	Fragilaria islandica	C	5	Chrysochromulina sp.	R
4	Fragilaria striatula	A	5	Chrysococcus sp.	C
4	Gomphonema kamtschaticum	R	5	Cryptomonas sp.	R
4	Navicula bahusiensis	R			
4	Navicula directa	R	6	Amphiprora kjellmanii var. striolata	R
4	Navicula gastrum	C	6	Amphiprora paludosa var. punctulata	R
4	Navicula salinarum	C	6	Chaetoceros ceratosporum	C
4	Nitzschia acicularis	C	6	Chaetoceros septentrionalis	C
4	Nitzschia frigida	V	6	Cocconeis placentula var. euglypta	R
4	Nitzschia laevissima	C	6	Eunotia lunaris	R
4	Nitzschia longissima	C	6	Fragilaria construens	C
4	Nitzschia polaris	C	6	Fragilaria islandica	C
4	Nitzschia sigma	C	6	Gomphonema kamtschaticum	R
4	Pinnularia quadratarea	R	6	Navicula directa	R
4	Pleurosigma elongatum	C	6	Navicula gastrum	R
4	Pleurosigma longum	R	6	Navicula salinarum	C
4	Stauroneis cf. linearis	R	6	Navicula spicula	R
4	Stauroneis quadripedis	R	6	Neidium bisulcatum	R
4	Synedra acus	C	6	Nitzschia acicularis	C
4	Synedra hyperborea	C	6	Nitzschia angularis	R
4	Synedra tabulata var. fasciculata	C	6	Nitzschia frigida	V
4	Tabellaria flocculosa	R	6	Nitzschia longissima	C
4	Thalassionema nitzschioides	C	6	Nitzschia polaris	R
4	Protoperidinium grenlandicum	R	6	Nitzschia sigma	C
4	Chlamydomonas sp.	R	6	Pinnularia quadratarea	R
4	Chrysococcus sp.	C	6	Pleurosigma angulatum	R
4	Ebria tripartita	R	6	Pleurosigma elongatum	C
			6	Pleurosigma longum	C
5	Amphiprora kjellmanii	C	6	Synedra acus	R
5	Amphiprora paludosa	C	6	Synedra hyperborea	C
5	Amphiprora paludosa var. hyperborea	R	6	Synedra tabulata	R
5	Caloneis brevis	R	6	Thalassionema nitzschioides	C
5	Caloneis liber	R	6	Protoperidinium grenlandicum	R
5	Chaetoceros ceratosporum	A	6	Chlamydomonas sp.	C
5	Chaetoceros septentrionalis	C	6	Chrysochromulina sp.	R
5	Fragilaria construens	C	6	Chrysococcus sp.	C
5	Fragilaria islandica	C			
5	Fragilaria pinnata	R	7	Cocconeis scutellum var. stauroneiformis	R
5	Fragilaria striatula	A	7	Diatoma elongatum	C
5	Gomphonema exiguum	R	7	Fragilaria construens	C
5	Navicula bahusiensis	R	7	Fragilaria islandica	C
5	Navicula directa	R	7	Fragilaria striatula	A
5	Navicula gastrum	C	7	Navicula maculosa	C
5	Navicula salinarum	C	7	Navicula salinarum	C
5	Nitzschia acicularis	A	7	Nitzschia acicularis	R
5	Nitzschia frigida	V	7	Nitzschia cylindrus	V
5	Nitzschia laevissima	R	7	Nitzschia polaris	C
5	Nitzschia longissima	C	7	Nitzschia sigma	R
5	Nitzschia sigma	C	7	Synedra tabulata	R
5	Pinnularia quadratarea	C	7	Tabellaria flocculosa	R
5	Pleurosigma elongatum	C	7	Gymnodinium sp.	R
5	Stauroneis quadripedis	R	7	Peridiniella catenata	V
5	Synedra acus	C	7	Protoperidinium bipes	C
5	Synedra hyperborea	C	7	Koliella sp.	C
5	Synedra tabulata	C	7	Cryptomonas sp.	R
5	Tabellaria flocculosa	R			
5	Thalassionema nitzschioides	C	8	Coscinodiscus kuetzingii	R
5	Protoperidinium globulus var. ovatum	R	8	Fragilaria islandica	V
5	Protoperidinium grenlandicum	R	8	Fragilaria striatula	V

[a] R = rare; C = common; A = abundant; V = very abundant.

Table 29. Relative abundance of algae sampled from ice cores in 1986 (CONTINUED).

Algae Sample Number	Species	Abundance[a]	Algae Sample Number	Species	Abundance[a]
8	Navicula sp.	C	9	Peridiniella catenata	V
8	Nitzschia polaris	C	9	Prorocentrum rampi	R
8	Gymnodinium sp.	C	9	Protoperidinium pellucidum	C
8	Peridiniella catenata	V	9	Chlorococcus sp.	C
8	Protoperidinium bipes	C	9	Koliella sp.	A
8	Chlamydomonas sp.	R	9	Cryptomonas sp.	C
8	Koliella sp.	A	9	Euglena proxima	R
8	Cryptomonas sp.	R			
			10	Amphiprora kjellmanii	R
9	Amphiprora kjellmanii	R	10	Fragilaria construens	V
9	Fragilaria construens	C	10	Fragilaria striatula	A
9	Fragilaria islandica	C	10	Navicula gastrum	R
9	Fragilaria pinnata	R	10	Nitzschia closterium	R
9	Navicula bahusiensis	R	10	Nitzschia cylindrus	A
9	Navicula salinarum	R	10	Thalassionema nitzschioides	C
9	Nitzschia cylindrus	V	10	Thalassiosira lacustris	R
9	Nitzschia polaris	R	10	Gymnodinium sp.	C
9	Pinnularia quadratarea	R	10	Peridiniella catenata	V
9	Thalassionema nitzschioides	V	10	Koliella sp.	V
9	Thalassiosira baltica	R	10	Cryptomonas sp.	C
9	Thalassiosira gravida	R	10	Euglena viridis	R
9	Thalassiosira lacustris	C			

[a] R = rare; C = common; A = abundant; V = very abundant.

Table 30. Relative abundance of algae sampled from ice cores in 1987.

Algae Sample Number	Species	Abundance[a]	Algae Sample Number	Species	Abundance[a]
1	Amphiprora gigantea var. septentrionalis	R	3	Eunotia lunaris	R
1	Amphiprora kjellmanii	R	3	Fragilaria construens	V
1	Cocconeis placentula var. euglypta	C	3	Fragilaria islandica	C
1	Cylindrotheca closterium	R	3	Fragilaria pinnata	C
1	Diatoma elongatum	A	3	Fragilaria striatula	C
1	Eunotia lunaris	R	3	Gomphonema sp.	R
1	Fragilaria construens	C	3	Gomphonema exiguum	C
1	Fragilaria islandica	C	3	Gomphonema kamtschaticum	R
1	Fragilaria pinnata	R	3	Hantzschia weyprechii	R
1	Fragilaria striatula	C	3	Navicula directa	R
1	Gomphonema exiguum	C	3	Navicula gastrum	R
1	Gomphonema kamtschaticum	R	3	Navicula glacialis	R
1	Navicula algida	R	3	Navicula kariana	R
1	Navicula bahusiensis	R	3	Navicula maculosa	R
1	Navicula directa	C	3	Navicula pelagica	C
1	Navicula directa var. cuneata	R	3	Navicula spicula	R
1	Navicula gastrum	R	3	Neidium bisulcatum	R
1	Navicula kariana	C	3	Nitzschia frigida	V
1	Navicula rhynchocephala	R	3	Nitzschia sigma	R
1	Navicula salinarum	C	3	Nitzschia cf. thermalis	R
1	Navicula spicula	R	3	Pinnularia quadratarea	C
1	Neidium bisulcatum	R	3	Pinnularia quadratarea var. constricta	R
1	Nitzschia cylindrus	R	3	Pleurosigma elongatum	C
1	Nitzschia frigida	C	3	Pleurosigma longum	R
1	Nitzschia laevissima	R	3	Synedra acus	R
1	Nitzschia polaris	R	3	Synedra hyperborea	R
1	Nitzschia sigma	R	3	Thalassionema nitzschioides	A
1	Pinnularia cf. gibba	R	3	Thalassiosira lacustris	R
1	Pinnularia quadratarea	R	3	Thalassiothrix longissima	R
1	Pleurosigma angulatum var. strigosum	C	3	Gymnodinium sp.	R
1	Pleurosigma elongatum	C	3	Protoperidinium grenlandicum	R
1	Pleurosigma salinarum	C	3	Carteria sp.	R
1	Stauroneis quadripedis	R	3	Chlorococcus sp.	R
1	Synedra acus	R	3	Koliella sp.	R
1	Synedra hyperborea	C			
1	Synedra tabulata var. fasciculata	R	4	Amphiprora kjellmanii	R
1	Tabellaria flocculosa	R	4	Caloneis brevis	R
1	Thalassionema nitzschioides	A	4	Caloneis liber	R
1	Thalassiosira baltica	R	4	Chaetoceros ceratosporum	R
1	Thalassiothrix frauenfeldii	C	4	Cocconeis placentula var. euglypta	R
1	Thalassiothrix longissima	C	4	Coscinodiscus kuetzingii	R
1	Amphidinium sp.	R	4	Diatoma elongatum	V
1	Gymnodinium sp.	R	4	Fragilaria construens	C
1	Oxytoxum sp.	R	4	Fragilaria islandica	A
1	Schroederia sp.	A	4	Fragilaria pinnata	C
1	Chrysochromulina sp.	R	4	Fragilaria striatula	V
1	Chrysococcus sp.	C	4	Gomphonema sp.	R
1	Ochronomas sp.	R	4	Gomphonema exiguum	R
1	Cryptomonas sp.	C	4	Gomphonema kamtschaticum	R
			4	Navicula bahusiensis	R
2	Chlamydomonas sp.	C	4	Navicula directa	C
2	Ochronomas sp.	R	4	Navicula gastrum	R
			4	Navicula maculosa	R
3	Amphiprora gigantea var. septentrionalis	R	4	Navicula salinarum	R
3	Amphiprora kjellmanii	R	4	Navicula spicula	R
3	Amphora proteus	R	4	Neidium bisulcatum	R
3	Caloneis brevis	C	4	Neidium bisulcatum cf. var. undulata	C
3	Chaetoceros ceratosporum	R	4	Nitzschia laevissima	R
3	Cocconeis placentula var. euglypta	R	4	Nitzschia longissima	R

[a] R = rare; C = common; A = abundant; V = very abundant.

Table 30. Relative abundance of algae sampled from ice cores in 1987 (CONTINUED).

Algae Sample Number	Species	Abundance[a]	Algae Sample Number	Species	Abundance[a]
4	Nitzschia cf. palea	R	5	Protoperidinium grenlandicum	R
4	Nitzschia sigma	R	5	Carteria sp.	R
4	Pinnularia cf. gibba	R	5	Chlorococcus sp.	C
4	Pinnularia quadratarea	R	5	Chrysochromulina sp.	C
4	Pleurosigma salinarum	R	5	Chrysococcus sp.	C
4	Stauroneis quadripedis	R	5	Ebria tripartita	R
4	Synedra tabulata	C	5	Cryptomonas sp.	C
4	Thalassionema nitzschioides	V	5	Euglena proxima	R
4	Thalassiosira lacustris	R			
4	Thalassiothrix longissima	C	6	Chaetoceros septentrionalis	C
4	Amphidinium sp.	R	6	Cylindrotheca closterium	R
4	Protoperidinium grenlandicum	R	6	Diatoma elongatum	C
4	Chlorococcus sp.	C	6	Diploneis litoralis var. clathrata	R
4	Kirchneriella lunaris	R	6	Eunotia lunaris	C
4	Pyramidomonas grossi	R	6	Fragilaria construens	C
4	Chrysochromulina sp.	C	6	Fragilaria islandica	C
4	Chrysococcus sp.	C	6	Fragilaria striatula	R
4	Ochronomas sp.	R	6	Gomphonema kamtschaticum	C
4	Cryptomonas sp.	C	6	Licmophora gracilis var. anglica	R
			6	Navicula bahusiensis	R
5	Achnanthes taeniata	A	6	Navicula directa	C
5	Amphiprora alata	R	6	Navicula gastrum	R
5	Amphiprora gigantea var. septentrionalis	R	6	Navicula rhynchocephala	C
5	Amphiprora kjellmanii	R	6	Navicula salinarum	R
5	Amphiprora paludosa	R	6	Navicula scopulorum	R
5	Caloneis brevis	R	6	Navicula vitrea	R
5	Caloneis liber	C	6	Neidium bisulcatum	C
5	Cerataulina pelagica	C	6	Nitzschia acicularis	C
5	Chaetoceros ceratosporum	R	6	Nitzschia closterium	R
5	Chaetoceros septentrionalis	R	6	Nitzschia laevissima	R
5	Fragilaria construens	R	6	Nitzschia plana	R
5	Fragilaria pinnata	C	6	Nitzschia polaris	R
5	Fragilaria striatula	V	6	Nitzschia sigma	R
5	Gomphonema exiguum	R	6	Pinnularia cf. gibba	R
5	Navicula bahusiensis	R	6	Pinnularia quadratarea	R
5	Navicula directa	R	6	Pinnularia quadratarea var. constricta	R
5	Navicula gastrum	R	6	Stauroneis quadripedis	R
5	Navicula salinarum	R	6	Synedra hyperborea	C
5	Navicula spicula	R	6	Synedra tabulata	R
5	Neidium bisulcatum	R	6	Synedra tabulata var. fasciculata	C
5	Nitzschia acicularis	C	6	Tabellaria flocculosa	C
5	Nitzschia frigida	V	6	Thalassionema nitzschioides	A
5	Nitzschia longissima	R	6	Peridiniella catenata	R
5	Nitzschia cf. palea	R	6	Carteria sp.	C
5	Nitzschia polaris	C	6	Chlamydomonas sp.	R
5	Nitzschia sigma	C	6	Schroederia sp.	C
5	Nitzschia cf. thermalis	R	6	Chrysochromulina sp.	C
5	Pinnularia quadratarea	R	6	Chrysococcus sp.	C
5	Pleurosigma clevei	R	6	Ochronomas sp.	C
5	Stauroneis quadripedis	R	6	Ebria tripartita	R
5	Stephanodiscus astraea	R	6	Cryptomonas sp.	R
5	Synedra acus	C			
5	Synedra hyperborea	C	7	Chaetoceros septentrionalis	R
5	Synedra pulchella	R	7	Cocconeis placentula var. euglypta	R
5	Thalassionema nitzschioides	C	7	Diatoma elongatum	C
5	Thalassiothrix frauenfeldii	C	7	Diploneis incurvata	R
5	Thalassiothrix longissima	R	7	Diploneis vacillans	R
5	Amphidinium sp.	R	7	Eunotia lunaris	C
5	Peridiniella catenata	R	7	Fragilaria construens	R

[a] R = rare; C = common; A = abundant; V = very abundant.

Table 30. Relative abundance of algae sampled from ice cores in 1987 (CONTINUED).

Algae Sample Number	Species	Abundance[a]	Algae Sample Number	Species	Abundance[a]
7	Fragilaria islandica	C	8	Navicula directa	R
7	Fragilaria striatula	C	8	Navicula gastrum	C
7	Gomphonema exiguum	R	8	Navicula glacialis	R
7	Navicula directa	R	8	Navicula maculosa	R
7	Navicula gastrum	R	8	Navicula marina	C
7	Navicula kariana	R	8	Navicula rhynchocephala	R
7	Navicula rhynchocephala	R	8	Navicula salinarum	R
7	Navicula salinarum	R	8	Navicula spicula	C
7	Nitzschia closterium	C	8	Neidium bisulcatum	R
7	Nitzschia frigida	C	8	Neidium bisulcatum cf. var. undulata	C
7	Nitzschia longissima	C	8	Nitzschia frigida	R
7	Nitzschia sigma	R	8	Nitzschia polaris	R
7	Stauroneis quadripedis	R	8	Pleurosigma clevei	R
7	Synedra camtschatica	R	8	Stauroneis quadripedis	C
7	Synedra hyperborea	C	8	Synedra acus	R
7	Tabellaria flocculosa	C	8	Synedra hyperborea	R
7	Thalassionema nitzschioides	C	8	Synedra tabulata var. fasciculata	C
7	Gymnodinium sp.	R	8	Thalassionema nitzschioides	C
7	Protoperidinium bipes	R	8	Thalassiosira gravida	R
7	Carteria sp.	C	8	Thalassiosira lacustris	R
7	Chlamydomonas sp.	R	8	Thalassiothrix longissima	C
7	Chrysochromulina sp.	C	8	Oxytoxum sp.	R
7	Chrysococcus sp.	C	8	Peridiniella catenata	C
7	Ochronomas sp.	R	8	Protoperidinium grenlandicum	R
7	Cryptomonas sp.	C	8	Carteria sp.	R
			8	Koliella sp.	R
8	Amphiprora kjellmanii	R	8	Schroederia sp.	R
8	Caloneis liber	R	8	Chrysochromulina sp.	C
8	Cerataulina pelagica	R	8	Chrysococcus sp.	R
8	Chaetoceros ceratosporum	R	8	Ochronomas sp.	C
8	Chaetoceros septentrionalis	C	8	Cryptomonas sp.	A
8	Coscinodiscus kuetzingii	C	8	Euglena proxima	R
8	Cyclotella comta	R			
8	Fragilaria construens	C	9	Melosira arctica	C
8	Fragilaria islandica	C	9	Nitzschia frigida	V
8	Fragilaria pinnata	R	9	Chrysochromulina sp.	R
8	Fragilaria striatula	A	9	Chrysococcus sp.	C
8	Gomphonema exiguum	R	9	Cryptomonas sp.	R

[a] R = rare; C = common; A = abundant; V = very abundant.

Table 31. Relative abundance of algae sampled from ice cores in 1988.

Algae Sample Number	Species	Abundance[a]	Algae Sample Number	Species	Abundance[a]
1	Nitzschia frigida	V	3	Navicula bahusiensis	R
1	Gymnodinium sp.	R	3	Navicula directa	C
1	Chlamydomonas sp.	C	3	Navicula glacialis	R
1	Chrysococcus sp.	V	3	Navicula gracilis	C
1	Ochronomas sp.	V	3	Navicula kariana	R
			3	Navicula maculosa	R
2	Amphora cf. laevis laevissima	R	3	Navicula spicula	C
2	Chaetoceros ceratosporum	C	3	Nitzschia acicularis	C
2	Diatoma elongatum	V	3	Nitzschia closterium	C
2	Fragilaria construens	C	3	Nitzschia cylindrus	C
2	Fragilaria islandica	V	3	Nitzschia frigida	A
2	Fragilaria striatula	V	3	Nitzschia laevissima	A
2	Gomphonema exiguum	R	3	Nitzschia polaris	C
2	Gomphonema kamtschaticum	R	3	Nitzschia sigma	C
2	Gyrosigma cf. kuetzingii	C	3	Pleurosigma angulatum	R
2	Navicula bahusiensis	C	3	Pleurosigma elongatum	R
2	Navicula directa	C	3	Pleurosigma salinarum	R
2	Navicula gastrum	R	3	Stauroneis sp.	R
2	Navicula glacialis	C	3	Synedra acus	R
2	Navicula gracilis	R	3	Synedra hyperborea	C
2	Navicula kariana	R	3	Synedra tabulata	R
2	Navicula maculosa	R	3	Synedra tabulata var. fasciculata	C
2	Navicula marina	R	3	Tabellaria flocculosa	C
2	Navicula pygmaea	R	3	Thalassiosira lacustris	R
2	Navicula rhynchocephala	R	3	Gymnodinium sp.	C
2	Navicula salinarum	R	3	Ochronomas sp.	V
2	Navicula spicula	C			
2	Neidium bisulcatum	R	4	Cerataulina pelagica	R
2	Nitzschia acicularis	C	4	Chaetoceros ceratosporum	C
2	Nitzschia cf. acuminata	R	4	Chaetoceros gracilis	R
2	Nitzschia closterium	R	4	Chaetoceros septentrionalis	R
2	Nitzschia frigida	A	4	Diatoma elongatum	V
2	Nitzschia laevissima	C	4	Fragilaria construens	C
2	Nitzschia cf. palea	R	4	Fragilaria islandica	C
2	Nitzschia polaris	C	4	Fragilaria pinnata	R
2	Nitzschia sigma	C	4	Fragilaria striatula	A
2	Pinnularia quadratarea var. constricta	R	4	Gomphonema exiguum	C
2	Pleurosigma angulatum	R	4	Gomphonema kamtschaticum	C
2	Pleurosigma elongatum	R	4	Hantzschia weyprechii	R
2	Pleurosigma longum	R	4	Navicula directa	C
2	Pleurosigma salinarum	R	4	Navicula gastrum	R
2	Stauroneis septentrionalis	C	4	Navicula marina	R
2	Synedra hyperborea	C	4	Navicula spicula	R
2	Synedra tabulata var. fasciculata	C	4	Nitzschia cylindrus	C
2	Thalassiosira lacustris	C	4	Nitzschia frigida	C
2	Gymnodinium sp.	C	4	Nitzschia longissima	R
2	Ochronomas sp.	V	4	Nitzschia sigmoidea	R
2	Ebria tripartita	C	4	Pinnularia quadratarea var. constricta	R
2	Cryptomonas sp.	C	4	Pleurosigma angulatum	R
			4	Pleurosigma angulatum var. strigosum	R
3	Amphiprora kjellmanii	R	4	Pleurosigma elongatum	C
3	Amphiprora paludosa	R	4	Pleurosigma salinarum	R
3	Chaetoceros ceratosporum	C	4	Synedra hyperborea	R
3	Diatoma elongatum	V	4	Synedra tabulata var. fasciculata	C
3	Fragilaria construens	C	4	Amphidinium sp.	R
3	Fragilaria islandica	A	4	Gymnodinium sp.	C
3	Fragilaria pinnata	C	4	Pyramidomonas grossi	R
3	Fragilaria striatula	V	4	Chrysococcus sp.	V
3	Gomphonema exiguum	C	4	Ochronomas sp.	C
3	Gomphonema kamtschaticum	C	4	Ebria tripartita	R
3	Gyrosigma cf. kuetzingii	R			

[a] R = rare; C = common; A = abundant; V = very abundant.

Table 32. Summary data for ice cores sampled for algae, 1986 to 1988.

Year	Algae Sample Number	Station Sample Number	Station Name	Core Number	Core Length (cm)	Core Volume (ml)	Ice Thickness (cm)	Snow Depth (cm)
1986	1	56	86029			64		8.0
	2	56	86029			72		8.0
	3	56	86029			73		10.0
	4	56	86029			61		11.0
	5	56	86029			53		13.0
	6	56	86029			73		17.0
	7	59	86033			114		9.0
	8	59	86033			140		13.0
	9	59	86033			64		19.0
	10	59	86033			105		21.0
1987	1	18	87003	21	3.5	113	1.6	1.0
	2	20	87004	22	1.5	63	1.6	10.0
	3	19	87005	16	3.0	99	1.1	2.5
	4	17	87002	16	5.0	83		1.0
	5	23	87007	26	5.0	177	1.6	3.0
	6	25	87008	31	5.0	135	1.1	1.0
	7	25	87008	31	5.0	110	1.1	1.0
	8	26	87009	26	5.0	193	1.8	4.0
	9	21	87006	16	3.0	49	2.0	3.0
1988	1	16	88001	28	5.0	152	1.9	7.0
	2	18	88002	17	5.0	22	1.5	4.0
	3	19	88004	2	5.0	56	1.1	5.0
	4	20	88005	1	5.0	54	1.0	3.0

Table 33. Ice core chlorophyll a (Chl a) data for stations sampled in 1986.

Station Sample Number	Core Number	Melted Core Volume (ml)	Chl a Concentration (μg/L)	Core Length (cm)	Core Area (cm^2)	Chl a ($mg \cdot m^{-2}$)	Ice Thickness (m)	Snow Depth (cm)
13	1	80	77.5		20.27	3.06	2.1	0.0
13	2	47	23.0		20.27	0.53	2.2	0.0
13	3	82	23.8		20.27	0.96		3.0
13	4	76	3.4		20.27	0.13	1.5	4.0
13	5	164	0.4		20.27	0.03	1.5	8.0
13	6	83	1.6		20.27	0.07	1.6	10.0
13	7	75	1.3		20.27	0.05	1.3	11.0
13	8	82	1.4		20.27	0.06	1.3	13.0
13	9	77	0.8		20.27	0.03	1.5	19.0
13	10	77	0.4		20.27	0.02	1.4	20.0
13	11	74	0.4		20.27	0.01	1.2	22.0
13	12	62	88.0		20.27	2.69	2.1	0.0
13	13	73	23.2		20.27	0.84	2.1	0.0
13	14	45	33.2		20.27	0.74		1.5
13	15	75	13.1		20.27	0.48	1.4	4.0
13	16	86	1.0		20.27	0.04	1.4	8.0
13	17	78	0.4		20.27	0.02	1.6	12.0
13	18	72	0.3		20.27	0.01	1.4	20.0
13	19	83	0.2		20.27	0.01	1.5	21.0
13	20	79	0.2		20.27	0.01	1.3	24.0
13	21	151	0.2		20.27	0.01	1.4	25.0
13	22	73	131.0		20.27	4.72	2.0	0.0
13	23	141	0.2		20.27	0.01	1.8	2.0
13	24	76	1.8		20.27	0.07	1.5	6.0
13	25	68	1.8		20.27	0.06	1.5	8.0
13	26	72	0.7		20.27	0.02	1.5	12.0
13	27	74	1.2		20.27	0.04	1.4	15.0
13	28	78	0.6		20.27	0.02	1.4	19.0
13	29	81	0.6		20.27	0.02		23.0
13	30	84	0.4		20.27	0.02	1.4	25.0
14	1	76	42.0		20.27	1.57	1.5	1.0
14	2	82	113.0		20.27	4.57	1.1	3.0
14	3	81	109.0		20.27	4.36	1.0	3.0
14	4	75	92.0		20.27	3.40	1.0	3.0
14	5	87	60.5		20.27	2.60	1.0	3.0
14	6	81	7.1		20.27	0.28	0.9	16.0
14	7	77	14.2		20.27	0.54	0.9	16.0
14	8	76	10.6		20.27	0.40	0.9	17.0
14	9	78	17.5		20.27	0.67		17.0
14	10	79	0.9		20.27	0.04	1.3	25.0
14	11	84	49.0		20.27	2.03	1.0	11.0
14	12	82	36.4		20.27	1.47	0.9	11.0
14	13	85	34.4		20.27	1.44	1.0	11.0
14	14	86	29.4		20.27	1.25	1.0	14.0
14	15	75	1.2		20.27	0.04	1.4	20.0
14	16	99	13.8		20.27	0.67	1.3	21.0
14	17	80	3.2		20.27	0.13	0.9	22.0
14	18	69	2.0		20.27	0.07	0.9	25.0
14	19	74	9.4		20.27	0.34		25.0
14	20	78	75.5		20.27	2.91	1.0	3.0
14	21	79	85.0		20.27	3.31	1.0	3.0
14	22	84	99.0		20.27	4.10	1.0	3.0
14	23	77	96.5		20.27	3.67		5.0
14	24	72	6.0		20.27	0.21	1.3	6.0
14	25	80	85.0		20.27	3.35	1.0	7.0
14	26	82	52.5		20.27	2.12	1.0	8.0
14	27	83	12.7		20.27	0.52		9.0
14	28	82	33.8		20.27	1.37	1.0	10.0

Table 33. Ice core chlorophyll a (Chl a) data for stations sampled in 1986 (CONTINUED).

Station Sample Number	Core Number	Melted Core Volume (ml)	Chl a Concentration (µg/L)	Core Length (cm)	Core Area (cm^2)	Chl a ($mg \cdot m^{-2}$)	Ice Thickness (m)	Snow Depth (cm)
15	1	82	9.1		20.27	0.37	1.6	0.0
15	2	72	10.1		20.27	0.36	1.5	0.0
15	3	59	1.9		20.27	0.06	1.5	0.0
15	4	73	16.3		20.27	0.59	1.6	9.0
15	5	86	0.5		20.27	0.02	1.5	10.0
15	6	75	0.1		20.27	0.00	1.7	11.0
15	7	63	0.6		20.27	0.02	1.7	12.0
15	8	77	5.9		20.27	0.22	1.5	15.0
15	9	69	0.2		20.27	0.01		16.0
15	10	79	0.2		20.27	0.01	1.7	20.0
56	1	67	14.1		20.27	0.47	1.0	7.0
56	2	71	11.1		20.27	0.39	1.2	7.0
56	3	75	5.7		20.27	0.21	1.2	7.0
56	4	31	35.2		20.27	0.54	1.0	9.0
56	5	61	5.3		20.27	0.16	1.1	9.0
56	6	65	12.9		20.27	0.41	1.2	9.0
56	7	69	8.0		20.27	0.27	1.1	10.0
56	8	63	9.1		20.27	0.28	1.1	11.0
56	9	67	20.8		20.27	0.69	1.2	11.0
56	10	67	11.3		20.27	0.37	1.2	11.0
56	11	71	18.5		20.27	0.65	1.1	11.0
56	12	64	16.2		20.27	0.51	1.1	12.0
56	13	73	50.5		20.27	1.82	1.1	12.0
56	14	74	8.8		20.27	0.32	1.1	12.0
56	15	72	48.5		20.27	1.72	1.1	14.0
56	16	67	91.0		20.27	3.01	1.1	15.0
56	17	70	120.0		20.27	4.14	1.1	15.0
56	18	70	82.0		20.27	2.83	1.1	15.0
56	19	66	167.0		20.27	5.44	1.1	18.0
56	20	70	88.0		20.27	3.04	1.2	20.0
59	1	70	197.0		20.27	6.80	0.8	8.0
59	2	110	220.0		20.27	11.94	0.8	9.0
59	3	71	168.0		20.27	5.88	1.0	10.0
59	4	83	369.0		20.27	15.11	0.8	10.0
59	5	108	189.0		20.27	10.07	0.8	10.0
59	6	112	669.0		20.27	36.96		10.0
59	7	100	136.0		20.27	6.71	0.8	12.0
59	8	125	136.0		20.27	8.39	0.8	12.0
59	9	70	256.0		20.27	8.84	0.8	14.0
59	10	57	170.0		20.27	4.78	0.9	15.0
59	11	95	143.0		20.27	6.70	0.8	15.0
59	12	100	139.0		20.27	6.86	0.8	16.0
59	13	108	65.0		20.27	3.46	0.8	18.0
59	14	80	174.0		20.27	6.87	0.9	19.0
59	15	125	98.0		20.27	6.04	0.9	19.0
59	16	103	114.0		20.27	5.79	0.8	21.0
59	17	112	139.0		20.27	7.68	0.8	21.0
59	18	105	108.0		20.27	5.59	1.0	22.0
59	19	120	102.0		20.27	6.04	0.8	22.0
59	20	115	71.5		20.27	4.06	0.8	23.0
59	21	115	173.0		20.27	9.81	0.8	23.0

Table 34. Ice core chlorophyll a (Chl a) data for stations sampled in 1987.

Station Sample Number	Core Number	Melted Core Volume (ml)	Chl a Concentration (µg/L)	Core Length (cm)	Core Area (cm^2)	Chl a ($mg \cdot m^{-2}$)	Ice Thickness (m)	Snow Depth (cm)
16	1	86	328.0	5.0	20.27	13.92	1.1	3.0
16	2	57	319.0	5.0	20.27	8.97	1.1	3.0
16	3	76	451.0	5.0	20.27	16.91	1.0	2.0
16	4	72	200.0	5.0	20.27	7.10	1.0	4.0
16	5	74	217.0	5.0	20.27	7.87	1.0	2.0
16	6	70	570.0	5.0	20.27	19.68	1.0	3.0
16	7	74	551.0	5.0	20.27	19.98	0.9	4.0
16	8	77	411.0	5.0	20.27	15.61	1.1	2.0
16	9	84	432.0	5.0	20.27	17.90	1.2	2.0
16	10	82	545.0	5.0	20.27	22.05	1.2	2.0
17	1	65	264.0	5.0	20.27	8.47	1.3	1.0
17	2	62	300.0	5.0	20.27	9.18	1.2	5.0
17	3	68	134.0	4.0	20.27	4.50	1.2	3.0
17	4	74	168.0	5.0	20.27	6.13	1.4	1.0
17	5	62	272.0	5.0	20.27	8.32	1.2	2.0
17	6	73	169.0	5.0	20.27	6.09	1.3	3.0
17	7	64	146.0	5.0	20.27	4.61	1.3	7.0
17	8	77	126.0	5.0	20.27	4.79	1.2	4.0
17	9	73	141.0	5.0	20.27	5.08	1.3	2.0
17	10	78	132.0	5.0	20.27	5.08	1.2	4.0
17	11	47	238.0	3.0	20.27	5.52	1.4	2.0
17	13	72	99.5	5.0	20.27	3.53	1.1	6.0
17	14	74	126.0	5.0	20.27	4.60	1.2	6.0
17	15	73	46.0	5.0	20.27	1.66	1.0	10.0
18	1	73	59.5	5.0	20.27	2.14	1.5	2.0
18	2	73	40.0	5.0	20.27	1.44	1.3	4.0
18	3	77	57.0	5.0	20.27	2.17	1.5	2.0
18	4	67	27.6	5.0	20.27	0.91	2.0	0.5
18	5	69	45.5	5.0	20.27	1.55	1.5	2.5
18	6	67	23.8	5.0	20.27	0.79	1.7	5.0
18	7	76	68.5	5.0	20.27	2.57	1.6	2.5
18	8	66	54.0	5.0	20.27	1.76	2.0	1.0
18	9	81	41.5	5.0	20.27	1.66	1.9	1.0
18	11	80	94.0	5.0	20.27	3.71	1.6	2.5
18	12	73	83.0	5.0	20.27	2.99	1.4	7.5
18	13	78	112.0	5.0	20.27	4.31	1.4	4.0
18	14	83	53.5	5.0	20.27	2.19	1.5	2.0
18	15	76	73.5	5.0	20.27	2.76	1.5	3.0
18	16	82	54.5	5.0	20.27	2.20	1.7	2.0
18	17	76	38.4	5.0	20.27	1.44	1.6	9.0
18	18	78	60.0	5.0	20.27	2.31	1.7	2.0
18	19	76	36.0	5.0	20.27	1.35	1.8	0.5
18	20	82	45.0	5.0	20.27	1.82	1.7	1.0
18	22	78	52.5	5.0	20.27	2.02	1.7	4.5
19	1	79	960.0	5.0	20.27	37.41	1.1	2.0
19	2	76	667.0	5.0	20.27	25.01	1.1	3.0
19	3	75	802.0	5.0	20.27	29.67	1.1	2.0
19	4	.	.	5.0	20.27	.	1.2	2.0
19	5	78	720.0	5.0	20.27	27.71	1.1	4.0
19	6	80	700.0	5.0	20.27	27.63	1.1	3.0
19	7	78	705.0	5.0	20.27	27.13	1.1	2.0
19	8	80	768.0	5.0	20.27	30.31	1.1	3.0
19	9	82	488.0	5.0	20.27	19.74	1.1	3.0
19	10	76	729.0	5.0	20.27	27.33	1.1	3.0
19	11	76	981.0	5.0	20.27	36.78	1.1	2.0
19	12	82	663.0	5.0	20.27	26.82	1.1	2.0
19	13	80	583.0	5.0	20.27	23.01	1.1	2.0

Table 34. Ice core chlorophyll a (Chl a) data for stations sampled in 1987 (CONTINUED).

Station Sample Number	Core Number	Melted Core Volume (ml)	Chl a Concentration (μg/L)	Core Length (cm)	Core Area (cm^2)	Chl a ($mg \cdot m^{-2}$)	Ice Thickness (m)	Snow Depth (cm)
19	14	84	671.0	5.0	20.27	27.81	1.1	5.0
19	15	70	587.0	5.0	20.27	20.27	1.1	5.0
20	1	82	0.9	5.0	20.27	0.03	1.5	15.0
20	2	70	0.3	4.0	20.27	0.01	1.5	21.0
20	3	76	0.3	5.0	20.27	0.01	1.4	15.0
20	4	90	0.2	6.0	20.27	0.01	1.4	14.0
20	6	69	0.8	4.0	20.27	0.03	1.5	13.0
20	9	52	0.4	3.5	20.27	0.01	1.5	15.0
20	10	51	0.3	3.0	20.27	0.01	1.6	14.0
20	12	79	0.2	5.0	20.27	0.01	1.5	17.0
20	14	47	0.3	2.5	20.27	0.01	1.5	13.0
20	16	76	0.2	5.0	20.27	0.01	1.4	20.0
20	18	27	0.9	1.5	20.27	0.01	1.4	32.0
20	19	58	0.4	4.0	20.27	0.01	1.3	33.0
20	20	48	0.4	2.0	20.27	0.01	1.7	25.0
20	21	38	0.3	2.0	20.27	0.01	1.6	10.0
21	1	30	2.9	1.5	20.27	0.04	1.8	9.0
21	2	36	0.3	1.0	20.27	0.01	1.7	13.0
21	3	44	0.9	1.5	20.27	0.02	1.8	26.0
21	4	32	5.1	2.0	20.27	0.08	1.7	15.0
21	5	23	2.5	1.0	20.27	0.03	1.7	14.0
21	6	17	0.7	0.7	20.27	0.01	1.9	18.0
21	7	17	2.5	0.5	20.27	0.02	1.7	21.0
21	8	26	6.1	1.5	20.27	0.08	1.8	13.0
21	9	24	1.9	2.0	20.27	0.02	1.8	14.0
21	10	17	2.6	0.7	20.27	0.02	1.7	15.0
21	11	22	6.6	0.5	20.27	0.07	2.0	27.0
21	12	19	10.9	1.0	20.27	0.10	2.0	9.0
21	13	19	20.6	1.0	20.27	0.19	2.0	5.0
21	14	19	8.1	0.5	20.27	0.08	2.0	3.0
21	15	17	7.0	0.7	20.27	0.06	2.0	32.0
23	1	78	49.0	5.0	20.27	1.89	1.6	1.0
23	2	80	122.0	5.0	20.27	4.81	1.6	8.0
23	3	86	45.5	5.0	20.27	1.93	1.6	5.0
23	4	84	43.0	5.0	20.27	1.78	1.7	9.0
23	5	81	89.0	5.0	20.27	3.56	1.6	2.0
23	6	74	36.2	5.0	20.27	1.32	1.5	2.0
23	7	78	269.0	5.0	20.27	10.35	1.6	10.0
23	8	81	747.0	5.0	20.27	29.85	1.6	13.0
23	9	79	41.5	5.0	20.27	1.62	1.7	2.0
23	10	77	48.5	5.0	20.27	1.84	1.5	1.0
23	11	60	307.0	4.0	20.27	9.09	1.6	14.0
23	12	77	61.5	5.0	20.27	2.34	1.6	8.0
23	13	80	168.0	5.0	20.27	6.63	1.7	4.0
23	14	79	113.0	5.0	20.27	4.40	1.6	2.0
23	15	80	169.0	5.0	20.27	6.67	1.6	2.0
23	16	32	381.0	2.0	20.27	6.01	1.6	1.0
23	17	79	166.0	5.0	20.27	6.47	1.6	9.0
23	18	78	160.0	5.0	20.27	6.16	1.5	3.0
23	19	55	142.0	3.5	20.27	3.85	1.5	4.0
23	20	79	503.0	5.0	20.27	19.60	1.5	3.0
23	21	80	548.0	5.0	20.27	21.63	1.5	30.0
23	22	83	46.0	5.0	20.27	1.88	1.7	1.0
23	23	80	58.5	5.0	20.27	2.31	1.6	3.0
23	24	63	588.0	4.0	20.27	18.28	1.6	5.0
23	25	77	88.5	5.0	20.27	3.36	1.6	2.0

Table 34. Ice core chlorophyll a (Chl a) data for stations sampled in 1987 (CONTINUED).

Station Sample Number	Core Number	Melted Core Volume (ml)	Chl a Concentration (µg/L)	Core Length (cm)	Core Area (cm^2)	Chl a ($mg \cdot m^{-2}$)	Ice Thickness (m)	Snow Depth (cm)
25	1	44	68.5	2.5	20.27	1.49	1.0	1.0
25	2	82	31.2	5.0	20.27	1.26	1.0	2.0
25	3	79	31.0	5.0	20.27	1.21	1.0	2.0
25	4	78	31.6	5.0	20.27	1.22	1.1	2.0
25	5	83	34.2	5.0	20.27	1.40	1.0	2.0
25	6	37	63.0	2.0	20.27	1.15	1.0	2.0
25	7	86	31.0	5.0	20.27	1.32	1.0	1.0
25	8	76	36.6	5.5	20.27	1.37	1.0	3.0
25	9	74	43.0	5.0	20.27	1.57	1.0	2.0
25	10	72	50.5	5.0	20.27	1.79	1.0	2.0
25	11	82	103.0	5.0	20.27	4.17	1.0	3.0
25	12	85	40.5	5.0	20.27	1.70	1.1	1.0
25	13	81	38.2	5.0	20.27	1.53	1.0	3.0
25	14	80	52.0	5.0	20.27	2.05	1.0	5.0
25	15	90	36.8	5.0	20.27	1.63	1.0	1.0
25	16	84	56.0	5.0	20.27	2.32	1.1	5.0
25	17	82	39.8	5.0	20.27	1.61	1.0	1.0
25	18	83	58.0	5.0	20.27	2.37	1.3	3.0
25	19	82	40.0	5.0	20.27	1.62	1.3	2.0
25	20	80	33.8	5.0	20.27	1.33	1.3	2.0
25	21	82	47.0	5.0	20.27	1.90	1.4	2.0
25	22	84	33.6	5.0	20.27	1.39	1.4	2.0
25	23	81	48.0	5.0	20.27	1.92	1.1	1.0
25	24	80	48.0	5.0	20.27	1.89	1.0	3.0
25	25	81	52.5	5.0	20.27	2.10	1.1	3.0
25	26	63	56.5	4.0	20.27	1.76	1.1	5.0
25	27	80	46.0	5.0	20.27	1.82	1.0	1.0
25	28	81	33.2	5.0	20.27	1.33	1.1	1.0
25	29	81	43.0	5.0	20.27	1.72	1.0	2.0
25	30	76	37.6	5.0	20.27	1.41	1.1	1.0
26	2	81	291.0	5.0	20.27	11.63	1.8	6.0
26	3	83	214.0	5.0	20.27	8.76	1.8	11.0
26	4	40	567.0	2.0	20.27	11.19	1.8	4.0
26	5	85	350.0	5.0	20.27	14.68	1.8	5.0
26	6	83	348.0	5.0	20.27	14.25	1.7	4.0
26	7	82	261.0	5.0	20.27	10.56	1.7	12.0
26	8	85	779.0	5.0	20.27	32.67	1.8	13.0
26	9	85	376.0	5.0	20.27	15.77	1.8	5.0
26	10	60	170.0	4.0	20.27	5.03	1.6	27.0
26	11	63	1325	5.0	20.27	41.18	1.8	6.0
26	12	75	957.0	5.0	20.27	35.41	1.8	4.0
26	12	85	28.0	5.0	20.27	1.17	1.8	4.0
26	13	89	104.0	5.0	20.27	4.57	1.8	9.0
26	14	78	548.0	5.0	20.27	21.09	1.8	14.0
26	15	79	280.0	5.0	20.27	10.91	1.7	15.0
26	16	75	354.0	5.0	20.27	13.10	1.8	6.0
26	17	85	170.0	5.0	20.27	7.13	1.8	15.0
26	18	75	220.0	5.0	20.27	8.14	1.7	11.0
26	19	87	450.0	5.0	20.27	19.31	1.8	15.0
26	20	72	262.0	5.0	20.27	9.31	1.8	5.0
26	21	77	274.0	5.0	20.27	10.41	1.8	4.0
26	22	81	360.0	5.0	20.27	14.39	1.8	7.0
26	23	83	202.0	5.0	20.27	8.27	1.8	9.0
26	24	78	208.0	5.0	20.27	8.00	1.8	4.0
26	25	85	236.0	5.0	20.27	9.90	1.8	4.0
26	27	81	290.0	5.0	20.27	11.59	1.8	5.0
39	1	59	167.0	4.5	20.27	4.86	1.6	12.0

Table 35. Ice core chlorophyll a (Chl a) data for stations sampled in 1988.

Station Sample Number	Core Number	Melted Core Volume (ml)	Chl a Concentration (μg/L)	Core Length (cm)	Core Area (cm^2)	Chl a ($mg \cdot m^{-2}$)	Ice Thickness (m)	Snow Depth (cm)
16	1	72	0.6	6.0			1.7	3.0
16	2	82	0.4	6.0			2.0	15.0
16	3	62	5.4	5.0	12.16	0.10	1.7	3.0
16	4	38	0.6	3.0	14.19	0.01	1.7	29.0
16	5	77	5.3	5.0	20.27	0.20	1.9	4.0
16	6	72	0.8	5.0	18.24	0.02	1.9	5.0
16	7	70	1.1	5.0	16.22	0.03	1.7	15.0
16	8	72	0.6	5.0	14.19	0.02	1.6	10.0
16	9	80	1.1	5.0	20.27	0.04	1.4	24.0
16	10	60	5.9	5.0	12.16	0.10	1.7	5.0
16	11	64	0.6	5.0	10.14	0.01	1.6	28.0
16	12	74	0.4	5.0	16.22	0.01	1.7	15.0
16	13	79	2.2	5.0	20.27	0.09	1.8	5.0
16	14	74	0.7	5.0	14.19	0.02	1.7	11.0
16	15	35	0.7	3.0	10.14	0.01	1.4	10.0
16	16	75	2.0	5.0	12.16	0.04	1.8	10.0
16	17	75	0.3	5.0	18.24	0.01	1.5	33.0
16	18	71	0.3	5.0	18.24	0.01	1.7	16.0
16	19	75	0.5	5.0	20.27	0.02	1.8	13.0
16	20	72	1.4	5.0	16.22	0.04	1.8	6.0
16	21	75	0.7	5.0	20.27	0.03	1.7	19.0
16	22	73	2.0	5.0	16.22	0.06	1.7	8.0
16	23	65	6.1	4.0	14.19	0.14	1.9	2.0
16	24	76	0.9	5.0	16.22	0.03	1.9	5.0
16	25	55	0.7	4.0	10.14	0.01	1.8	8.0
16	26	80	2.1	6.0	20.27	0.08	2.0	9.0
16	27	74	0.5	5.0	18.24	0.02	1.6	24.0
16	28	5		0.0	1.42			1.9
16	29	69	1.0	5.0	12.16	0.02	1.8	14.0
16	30	54	0.4	5.0	6.08	0.00	1.7	23.0
17	1	42	0.3	3.0	20.27	0.01	1.5	11.0
17	2	13	0.8	1.5	20.27	0.00	1.7	13.0
17	3	12	0.6	1.0	20.27	0.00	1.7	13.0
17	4	21	0.4	1.0	20.27	0.00	1.7	9.0
17	5	11	0.9	0.5	20.27	0.01	1.8	6.0
17	6	12	0.5	0.5	20.27	0.00	1.4	25.0
17	7	22	0.4	1.0	20.27	0.00	1.6	22.0
17	8	14	0.3	1.0	20.27	0.00	1.7	11.0
17	9	24	0.3	1.0	20.27	0.00	1.7	17.0
17	10	27	0.3	1.0	20.27	0.00	1.4	28.0
17	11	17	0.5	1.0	20.27	0.00	1.6	10.0
18	1	78	2.2	5.0	20.27	0.08	1.6	2.0
18	2	80	4.3	5.0	20.27	0.17	1.5	9.0
18	3	73	2.2	5.0	20.27	0.08	1.7	4.0
18	4	64	198.0	5.0	20.27	6.25	1.6	3.0
18	5	79	3.4	5.0	20.27	0.13	1.7	6.0
18	6	73	43.0	5.0	20.27	1.55	1.5	1.0
18	7	76	155.0	5.0	20.27	5.81	1.6	1.0
18	8	75	6.6	5.0	20.27	0.24	1.6	13.0
18	9	72	6.7	5.0	20.27	0.24	1.8	4.0
18	10	84	113.0	5.0	20.27	4.68	1.6	2.0
18	11	72	153.0	5.0	20.27	5.43	1.5	3.0
18	12	81	287.0	5.0	20.27	11.47	1.6	2.0
18	13	79	84.5	5.0	20.27	3.29	1.5	8.0
18	14	53	269.0	2.0	20.27	7.03	1.5	3.0
18	15	45	16.7	3.0	20.27	0.37	1.6	15.0
18	16	49	166.0	3.0	20.27	4.01	1.5	5.0
18	17	77	360.0	5.0	20.27	13.68	1.5	4.0

Table 35. Ice core chlorophyll a (Chl a) data for stations sampled in 1988 (CONTINUED).

Station Sample Number	Core Number	Melted Core Volume (ml)	Chl a Concentration (µg/L)	Core Length (cm)	Core Area (cm^2)	Chl a ($mg \cdot m^{-2}$)	Ice Thickness (m)	Snow Depth (cm)
18	18	32	111.0	3.0	16.22	1.40	1.5	8.0
18	19	73	19.0	5.0	20.27	0.68	1.5	14.0
18	20	75	86.0	5.0	20.27	3.18	1.6	4.0
18	21	67	48.0	5.0	20.27	1.59	1.5	7.0
18	22	86	188.0	6.0	20.27	7.98	1.5	2.0
18	23	78	203.0	5.0	20.27	7.81	1.6	3.0
18	24	70	22.6	4.0	20.27	0.78	1.5	14.0
18	25	82	148.0	5.0	20.27	5.99	1.5	7.0
18	26	72	74.5	5.0	20.27	2.65	1.4	11.0
18	27	31	840.0	1.5	20.27	12.85	1.5	2.0
18	28	78	4.2	5.0	20.27	0.16	1.8	5.0
18	29	82	3.0	5.0	20.27	0.12	1.6	7.0
18	30	90	2.6	5.0	20.27	0.12	1.9	7.0
19	1	85	693.0	5.0	20.27	29.06	1.2	2.0
19	2	76	514.0	5.0	20.27	19.27	1.1	5.0
19	3	75	642.0	5.0	20.27	23.75	1.2	3.0
19	4	77	718.0	5.0	20.27	27.27	1.2	5.0
19	5	83	545.0	5.0	20.27	22.32	1.2	5.0
19	6	84	617.0	5.0	20.27	25.57	1.2	3.0
19	7	69	84.5	5.0	20.27	2.88	1.5	2.0
19	8	48	13.3	3.0	20.27	0.31	1.6	9.0
19	10	76	10.6	5.0	20.27	0.40	1.5	9.0
19	11	65	162.0	3.0	20.27	5.19	1.6	2.0
19	12	82	244.0	5.0	14.19	6.91	1.7	2.0
19	13	72	217.0	5.0	20.27	7.71	1.7	2.0
19	14	56	3.2	5.0	16.22	0.07	1.7	6.0
19	15	72	4.5	5.0	20.27	0.16	1.7	7.0
19	16	81	86.0	5.0	20.27	3.44	1.7	5.0
19	17	82	35.8	5.0	20.27	1.45	1.8	5.0
19	18	73	118.0	5.0	20.27	4.25	2.0	1.0
19	19	71	74.5	5.0	20.27	2.61	1.5	8.0
19	20	78	51.0	5.0	18.24	1.77	1.7	5.0
19	21	76	367.0	5.0	20.27	13.76	1.6	5.0
19	22	83	258.0	5.0	20.27	10.56	1.7	1.0
19	23	77	170.0	5.0	20.27	6.46	1.6	1.0
19	24	77	86.5	5.0	20.27	3.29	1.7	4.0
19	25	74	5.0	5.0	20.27	0.18	1.7	10.0
19	26	63	2.6	5.0	20.27	0.08	1.7	19.0
19	27	76	56.5	5.0	20.27	2.12	1.0	16.0
19	28	79	562.0	5.0	20.27	21.90	1.2	5.0
19	29	60	784.0	4.0	20.27	23.21	1.2	2.0
19	30	82	502.0	5.0	20.27	20.31	1.2	3.0
20	1	74	390.0	5.0	20.27	14.24	1.0	3.0
20	2	83	379.0	5.0	20.27	15.52	1.0	3.0
20	3	74	294.0	5.0	20.27	10.73	1.0	4.0
20	4	86	323.0	5.0	20.27	13.70	1.0	3.0
20	5	85	270.0	5.0	20.27	11.32	1.0	3.0
20	6	73	433.0	5.0	20.27	15.59	1.0	5.0
20	7	68	259.0	5.0	20.27	8.69	1.0	10.0
20	8	80	314.0	5.0	20.27	12.39	1.0	8.0
20	9	81	372.0	5.0	20.27	14.87	1.0	3.0
20	10	81	342.0	5.0	20.27	13.67	1.0	3.0
20	11	80	257.0	5.0	20.27	10.14	1.0	3.0
20	12	85	312.0	5.0	20.27	13.08	1.0	3.0
20	13	75	524.0	5.0	20.27	19.39	1.0	3.0
20	14	79	389.0	5.0	20.27	15.16	1.0	3.0
20	15	84	384.0	5.0	20.27	15.91	1.0	3.0
20	16	81	370.0	5.0	20.27	14.79	1.0	4.0

Table 35. Ice core chlorophyll a (Chl a) data for stations sampled in 1988 (CONTINUED).

Station Sample Number	Core Number	Melted Core Volume (ml)	Chl a Concentration (µg/L)	Core Length (cm)	Core Area (cm^2)	Chl a ($mg \cdot m^{-2}$)	Ice Thickness (m)	Snow Depth (cm)
20	17	77	410.0	5.0	20.27	15.57	1.0	3.0
20	18	83	586.0	5.0	20.27	24.00	1.0	3.0
20	19	82	367.0	5.0	20.27	14.85	1.0	3.0
20	20	78	440.0	5.0	20.27	16.93	1.0	3.0
20	21	78	295.0	5.0	20.27	11.35	1.0	3.0
20	22	81	288.0	5.0	20.27	11.51	1.0	6.0
20	23	77	377.0	5.0	20.27	14.32	1.1	4.0
20	24	81	208.0	5.0	20.27	8.31	1.1	9.0
20	25	78	251.0	5.0	20.27	9.66	1.1	5.0
20	26	82	332.0	5.0	20.27	13.43	1.1	5.0
20	27	79	521.0	5.0	20.27	20.31	1.0	8.0
20	28	75	233.0	5.0	20.27	8.62	1.1	7.0
20	29	81	212.0	5.0	20.27	8.47	1.0	4.0
20	30	82	318.0	5.0	20.27	12.86	1.0	11.0

Table 36. Total suspended solids (TSS) data from ice cores sampled in 1987.

Sample Number	Total Weight (mg)	Total Volume (l)	TSS (mg/l)
16	59.71	11.20	5.33
17	94.20	13.52	6.97
18	30.76	15.38	2.00
20	729.55	12.39	58.90
19	47.66	12.95	3.68
21	51.05	16.08	3.17
23	17.75	18.25	0.97
25	42.46	14.60	2.91
26	125.16	11.10	11.30
26	107.60	16.60	6.48
31	110.57	11.80	9.37
31	267.34	6.95	38.50

Table 37. Total suspended solids (TSS) data from ice cores sampled in 1988.

Sample Number	Total Weight (mg)	Total Volume (l)	TSS (mg/l)
16	230.55	20.85	11.06
16	309.60	17.20	18.00
17	758.00	18.95	40.00
17	184.00	18.40	10.00
18	274.40	19.60	14.00
18	185.00	18.50	10.00
19	64.00	12.80	5.00
19	285.00	19.00	15.00
20	58.50	11.70	5.00
20	46.40	11.60	4.00

Table 38. Depth-frequency, mean and standard deviation (SD) snow depth data sampled in 1986.

Station Sample Number	Snow Depth (cm)	Frequency
13	0.0	24
13	1.0	22
13	2.0	35
13	3.0	45
13	4.0	44
13	5.0	58
13	6.0	21
13	7.0	27
13	8.0	16
13	9.0	16
13	10.0	16
13	11.0	10
13	12.0	7
13	13.0	8
13	14.0	4
13	15.0	5
13	16.0	6
13	17.0	2
13	18.0	3
13	19.0	5
13	20.0	3
13	21.0	2
13	22.0	1
13	23.0	4
13	24.0	1
13	25.0	3
13	26.0	1
13	27.0	2
13	28.0	2
13	31.0	2
13	32.0	1
13	35.0	1
13	36.0	1
13	39.0	1
13	40.0	1
Mean =	7.1	
S.D. =	6.8	
Samples = 400		
14	1.0	2
14	2.0	14
14	3.0	79
14	4.0	135
14	5.0	58
14	6.0	26
14	7.0	12
14	8.0	9
14	9.0	1
14	10.0	8
14	11.0	6
14	12.0	3
14	13.0	3
14	14.0	9
14	15.0	1
14	16.0	4
14	17.0	4
14	18.0	6
14	19.0	1
14	20.0	5
14	21.0	2
14	22.0	4
14	23.0	3
14	27.0	1
14	29.0	1
14	36.0	1
14	46.0	1
14	78.0	1
Mean =	6.4	
S.D. =	6.5	
Samples = 400		
15	7.0	1
15	10.0	3
15	11.0	3
15	12.0	1
15	13.0	1
15	15.0	3
15	16.0	9
15	17.0	5
15	18.0	2
15	19.0	10
15	20.0	5
15	21.0	4
15	22.0	2
15	23.0	10
15	24.0	4
15	25.0	9
15	26.0	7
15	27.0	7
15	28.0	8
15	29.0	8
15	30.0	14
15	31.0	4
15	32.0	3
15	33.0	8
15	34.0	5
15	35.0	11
15	36.0	6
15	37.0	3
15	38.0	6
15	39.0	5
15	40.0	2
15	41.0	4
15	42.0	4
15	43.0	4
15	44.0	2
15	45.0	2
15	47.0	1
15	49.0	1
15	52.0	1
15	55.0	1
15	56.0	1
Mean =	28.6	
S.D. =	9.4	
Samples = 190		
16	1.0	1
16	2.0	15
16	3.0	109
16	4.0	139
16	5.0	50
16	6.0	25
16	7.0	13
16	8.0	10
16	9.0	5
16	10.0	6
16	11.0	3
16	12.0	3
16	13.0	5
16	14.0	1
16	15.0	3
16	16.0	5
16	18.0	1
16	20.0	1
16	22.0	1
16	23.0	2
16	24.0	1
16	25.0	1
Mean =	5.0	
S.D. =	3.5	
Samples = 400		
56	3.0	1
56	5.0	1
56	6.0	4
56	7.0	23
56	8.0	44
56	9.0	78
56	10.0	83
56	11.0	42
56	12.0	31
56	13.0	23
56	14.0	14
56	15.0	26
56	16.0	16
56	17.0	4
56	18.0	2
56	19.0	2
56	20.0	2
56	22.0	2
56	23.0	2
Mean =	10.8	
S.D. =	2.9	
Samples = 400		
59	8.0	3
59	9.0	5
59	10.0	15
59	11.0	30
59	12.0	24
59	13.0	27
59	14.0	27
59	15.0	32
59	16.0	15
59	17.0	10
59	18.0	2
59	19.0	2
59	20.0	4
59	21.0	2
59	22.0	1
59	23.0	1
Mean =	13.5	
S.D. =	2.7	
Samples = 200		

Table 39. Depth-frequency, mean and standard deviation (SD) snow depth data sampled in 1987.

Station Sample Number	Snow Depth (cm)	Frequency
16	1.0	4
16	2.0	54
16	3.0	34
16	4.0	2
16	5.0	4
16	6.0	1
Mean =	2.5	
S.D. =	0.9	
Samples =	99	
17	1.0	58
17	2.0	79
17	3.0	21
17	4.0	11
17	5.0	10
17	6.0	8
17	7.0	2
17	8.0	1
17	9.0	1
17	12.0	1
Mean =	2.4	
S.D. =	1.7	
Samples =	192	
18	0.0	1
18	1.0	37
18	2.0	30
18	3.0	36
18	4.0	2
18	5.0	3
18	6.0	2
18	7.0	1
18	9.0	1
18	13.0	2
18	14.0	1
Mean =	2.6	
S.D. =	2.2	
Samples =	116	
20	6.0	1
20	8.0	2
20	9.0	1
20	10.0	3
20	11.0	4
20	12.0	4
20	13.0	1
20	14.0	8
20	15.0	25
20	16.0	6
20	17.0	9
20	18.0	10
20	19.0	6
20	20.0	19
20	21.0	8
20	22.0	2
20	23.0	13
20	24.0	11
20	25.0	17
20	26.0	6
20	27.0	6
20	28.0	5
20	29.0	4
20	30.0	12
20	31.0	2
20	32.0	2
20	33.0	1
20	34.0	2
20	35.0	2
20	37.0	1
20	39.0	4
20	40.0	1
20	42.0	2
Mean =	21.6	
S.D. =	7.0	
Samples =	200	
21	3.0	1
21	7.0	1
21	10.0	6
21	11.0	1
21	12.0	7
21	13.0	6
21	14.0	7
21	15.0	12
21	16.0	6
21	17.0	8
21	18.0	11
21	19.0	5
21	20.0	13
21	21.0	6
21	22.0	12
21	23.0	8
21	24.0	4
21	25.0	14
21	26.0	9
21	27.0	2
21	28.0	6
21	29.0	3
21	30.0	8
21	31.0	5
21	32.0	8
21	33.0	12
21	34.0	1
21	35.0	6
21	36.0	1
21	37.0	1
21	38.0	4
21	39.0	1
21	40.0	2
21	41.0	1
21	42.0	1
21	44.0	1
21	46.0	1
21	47.0	1
Mean =	23.4	
S.D. =	8.3	
Samples =	202	
23	0.0	3
23	1.0	60
23	2.0	122
23	3.0	52
23	4.0	35
23	5.0	28
23	6.0	20
23	7.0	20
23	8.0	14
23	9.0	7
23	10.0	11
23	11.0	3
23	12.0	5
23	14.0	2
23	15.0	2
23	16.0	3
23	18.0	4
23	19.0	1
23	20.0	2
23	21.0	3
23	22.0	1
23	23.0	1
23	25.0	1
Mean =	4.4	
S.D. =	4.2	
Samples =	400	
25	1.0	44
25	2.0	116
25	3.0	50
25	4.0	9
25	5.0	1
25	6.0	1
25	7.0	3
25	17.0	1
Mean =	2.3	
S.D. =	1.4	
Samples =	225	
26	2.0	2
26	3.0	2
26	4.0	13
26	5.0	60
26	6.0	29
26	7.0	29
26	8.0	27
26	9.0	24
26	10.0	29
26	11.0	23
26	12.0	11
26	13.0	12
26	14.0	13
26	15.0	4
26	16.0	10
26	17.0	4
26	18.0	3
26	20.0	2
26	21.0	2
26	24.0	1
Mean =	8.8	
S.D. =	3.9	
Samples =	300	

Table 40. Depth-freqency, mean and standard deviation (SD) snow depth data sampled in 1988.

Station Sample Number	Snow Depth (cm)	Frequency	Station Sample Number	Snow Depth (cm)	Frequency	Station Sample Number	Snow Depth (cm)	Frequency
16	3.0	5	17	9.0	17	18	14.0	7
16	4.0	2	17	10.0	30	18	15.0	3
16	5.0	19	17	11.0	20	18	16.0	1
16	6.0	12	17	12.0	16	18	17.0	5
16	7.0	12	17	13.0	14	18	18.0	2
16	8.0	21	17	14.0	21	18	19.0	6
16	9.0	13	17	15.0	48	18	21.0	5
16	10.0	33	17	16.0	20	18	25.0	1
16	11.0	29	17	17.0	13	18	26.0	1
16	12.0	21	17	18.0	19	Mean =	5.3	
16	13.0	13	17	19.0	12	S.D. =	4.7	
16	14.0	21	17	20.0	16	Samples =	400	
16	15.0	37	17	21.0	18			
16	16.0	19	17	22.0	12	19	1.0	66
16	17.0	7	17	23.0	12	19	2.0	220
16	18.0	10	17	24.0	7	19	3.0	62
16	19.0	16	17	25.0	18	19	4.0	16
16	20.0	20	17	26.0	4	19	5.0	9
16	21.0	8	17	27.0	5	19	6.0	3
16	22.0	10	17	28.0	3	19	7.0	4
16	23.0	13	17	29.0	2	19	8.0	2
16	24.0	10	17	30.0	6	19	9.0	4
16	25.0	10	17	31.0	4	19	10.0	5
16	26.0	5	17	32.0	3	19	13.0	1
16	27.0	8	17	33.0	2	19	14.0	2
16	28.0	3	17	34.0	1	19	20.0	1
16	29.0	5	17	35.0	2	19	21.0	1
16	30.0	4	17	40.0	2	19	22.0	2
16	31.0	4	17	41.0	1	19	24.0	1
16	34.0	1	Mean =	16.0		19	30.0	1
16	35.0	2	S.D. =	7.1		Mean =	2.8	
16	36.0	2	Samples =	400		S.D. =	3.1	
16	37.0	1				Samples =	400	
16	40.0	1	18	1.0	33			
16	42.0	1	18	2.0	92	20	1.0	2
16	44.0	1	18	3.0	80	20	2.0	43
Mean =	15.3		18	4.0	41	20	3.0	295
S.D. =	7.4		18	5.0	34	20	4.0	43
Samples =	399		18	6.0	16	20	5.0	12
			18	7.0	11	20	6.0	2
17	2.0	2	18	8.0	11	20	7.0	1
17	3.0	6	18	9.0	14	20	8.0	1
17	4.0	5	18	10.0	16	20	13.0	1
17	5.0	6	18	11.0	7	Mean =	3.1	
17	6.0	8	18	12.0	8	S.D. =	0.9	
17	7.0	12	18	13.0	6	Samples =	400	
17	8.0	13						