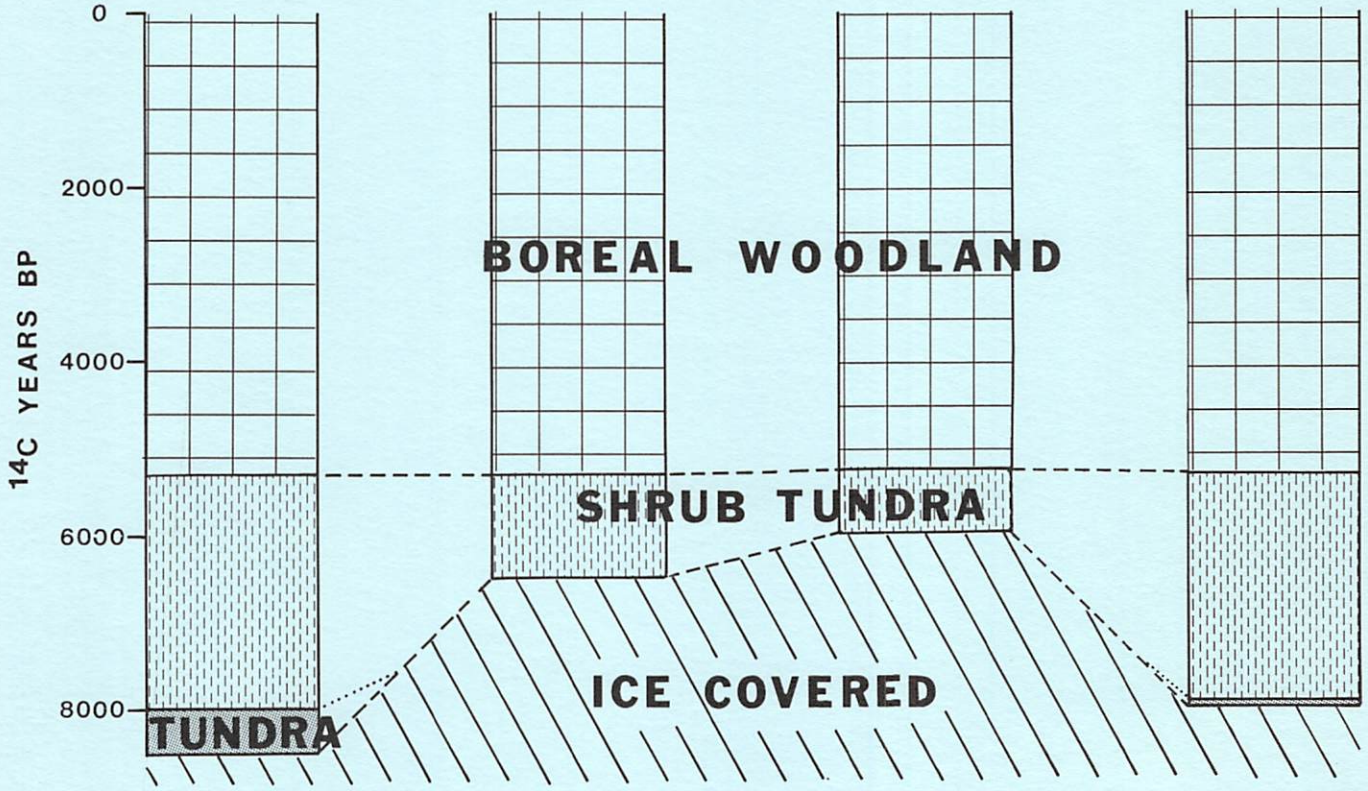
RADIOCARBON DATE LIST I LABRADOR AND NORTHERN QUEBEC, CANADA

Compiled by
Susan K. Short

with contributions from

J. T. Andrews, D. L. Elliott, J. D. Ives, H. Nichols, S. K. Short,
L. K. Stravers, R. Stuckenrath, and M. Stuiver



Occasional Paper No. 36

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INSTITUTE OF ARCTIC AND ALPINE RESEARCH • UNIVERSITY OF COLORADO

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Susan K. Short

Institute of Arctic and Alpine Research
University of Colorado
Boulder, Colorado 80309

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PREFACE

This is the first Occasional Paper devoted to listing radiocarbon dates of the Labrador-Ungava peninsula. Five radiocarbon date lists have already been published for Baffin Island to make a total of six lists now covering the Eastern Canadian Arctic. The samples reported here were collected by INSTAAR members, students, and associates over four field seasons. Radiocarbon date lists conveniently bring together information which would otherwise be dispersed throughout the literature.

Site descriptions and locations are presented for 92 radiocarbon dated samples from the Labrador-Ungava peninsula, Canada. The samples are primarily lake and peat sediments, reflecting a bias for pollen-rich sediments; their dates range between 0 and 19,000 BP. Two dates on a single shell collection are significantly older (>34,000 and >42,000 BP). The dates are presented by geographic location using the 1:250,000 Canadian NTS map series as well as in chronological order.

This list will be of interest and importance to all students of the Quaternary of Labrador and northern Quebec, especially palynologists, biogeographers, and glacial geologists.

Patrick J. Webber
Director, INSTAAR
January, 1981

ACKNOWLEDGMENTS

The dates reported in this list were derived from samples collected by INSTAAR personnel during the 1973, 1975, 1978 and 1979 field seasons. Financial support for the 1973 field season, plus subsequent laboratory contractual funds, came from the Smithsonian Institution as part of their program of archaeological investigations along the central and northern Labrador coast, under Dr. W. Fitzhugh. The 1975 field season was supported by a University of Colorado Council for Research and Creative Work Award to Nichols and in part by NSF grant No. GA 40248 to Ives, with smaller grants to Short from AINA, the Explorer's Club and Sigma Xi. Subsequently, NSF grants ATM-77-17549 to Nichols, Andrews, Barry and Ives and DEB 78-05780 to Elliott and Nichols provided support for the 1978 and 1979 field seasons. Additional funds were provided by grants to individual students and investigators by AINA, the Explorer's Club, the American Alpine Club, and Sigma Xi.

Dr. R. Stuckenrath, Radiation Biology Laboratory, Smithsonian Institution, Washington, D.C., provided dates for the cores collected in 1973 (plus Ublik, 1975); we greatly appreciate the discussions we had with him over problems and solutions encountered in dating the often inorganic sediments in Labrador lake basins. Dr. M. Stuiver, Quaternary Research Center, University of Washington, provided dates on several very small samples collected in 1975 and 1978 which required a small counter.

Many of the samples were processed by Mr. R. Kihl, Sedimentology Laboratory, INSTAAR, and we appreciate his detailed preparations and data recording.

INTRODUCTION

This date list reports the ^{14}C age determinations of 92 samples from the Labrador-Ungava peninsula, Canada. It results from a recent involvement of the Institute of Arctic and Alpine Research in active, interdisciplinary research in the Labrador-Ungava peninsula beginning with the 1973 pollen sampling program (by Short). This lake-coring program was planned in conjunction with archaeological investigations on the central coast under the direction of Dr. W. W. Fitzhugh of the Smithsonian Institution. The results led to an expanded field program in 1975, 1978 and 1979, emphasizing the collection of lake and peat sections in a study of the climatic dynamics of the late Quaternary and using interdisciplinary methods.

The ^{14}C dates presented in this monograph were obtained from samples mainly collected from a series of lake and peat cores. The primary reason for core collection was to facilitate pollen analysis in order to interpret the past record in terms of vegetational and climatic changes. The second reason was to obtain basal radiocarbon dates to assist in the development of a deglaciation chronology of the peninsula. This represented a continuation of early work by J. D. Ives in the 1950's and early 1960's (Ives, 1959b, 1960a, 1960b, 1960c, 1968). Specific objectives of the several years of field work included the following:

1. Determination of chronology of deglaciation and the date of the final disappearance of the late-Wisconsin Laurentide Ice Sheet in the northeast and central regions of Labrador-Ungava. The early work by Ives (ref. to above) postulated that the Kivivic Lake-Boundary Lake area north-northwest of Schefferville, Nouveau-Quebec, was one of the sites for final ice disappearance with a "best guess" for deglaciation of about 6000 BP.
2. Analysis of the pollen diagrams to determine changes in vegetation and in climate. Dating of sediments by ^{14}C, in addition to examining treeline fluctuations, provides evidence of synchroneity of events between Labrador-Ungava peninsula sequences and other published and well-dated Holocene sequences from West Greenland and western and central Arctic Canada. (Bryson, et al., 1965; Nichols, 1972, 1974, 1975; Sorenson, et al., 1971; Sorenson and Knox, 1974)

3. Dating of the major glacial lake shorelines in the George River and Whale River basins (Naskaupi and McLean glacial lakes {Barnett and Peterson, 1964; Ives, 1960a}).
4. An attempt to validate the nunatak hypothesis through an analysis of the existence of ice-free areas during the "Saglek Glaciation" in the Torngat Mountains of northeastern Labrador (Løken, 1962b; Ives, 1974, 1978).

Sites were selected to provide radiometric control for these objectives; many of the sites were selected by Ives to test his relative deglaciation chronology. Important input was also provided by Nichols in selecting environmentally sensitive sites, primarily in ecotonal situations.

This study has indicated that several lines of research need further attention. More radiocarbon age control is needed across a wider area of central Labrador-Ungava to establish the timing of deglaciation. Along with this, more study is needed to understand the significance of the "old" basal dates on lake sediments from the vicinity of the "Kivivic Lake Disintegration Divide" (Ives, 1968). In addition, there is a need for long lake cores, with firm radiometric-age control, from sites distal to the Saglek moraines in Labrador. Further pollen studies on the record of vegetation and climatic change through the last 3000 years are needed; the location of suitable lake and peat sites for this part of the study has been slow.

PRESENTATION OF THE DATES

The dates presented in this list are ordered by the 1:250,000 NTS topographic map sheets (Figure 1), starting with the most southerly sheets and progressing northward, east to west. Within each map sheet, sites are arranged from south to north and from east to west; within each site, the dates are ordered from youngest to oldest. Site locations are given by conventional latitude/longitude coordinates.

Descriptions of the sites follow the format used in Radiocarbon. Data relating to the details of the collection site and the sampling procedure are presented, followed by a "comment" paragraph containing interpretive information relating to the significance of the date. It is suggested that in citing material presented in this date list, the commentators (indicated by initials) be given credit, e.g., Stravers in Short.

The dates reported have been obtained from five different dating laboratories. The laboratory abbreviations are given in Table I. All dates are presented in uncorrected radiocarbon years BP (AD 1950) as reported by the dating laboratory. The GRL identification listed below the radiocarbon laboratory ID refers to an INSTAAR master reference file maintained by R. Kihl, Sedimentology Laboratory; all samples processed by that laboratory are given GRL numbers.

The dates are summarized in Tables II, II and IV. Table IV tabulates the dates in 1000-year intervals. A histogram of the frequency of dates in these intervals for dates <19,000 BP is shown in Figure 2. A bias toward dates in the 2000 to 5000 BP range can be seen.

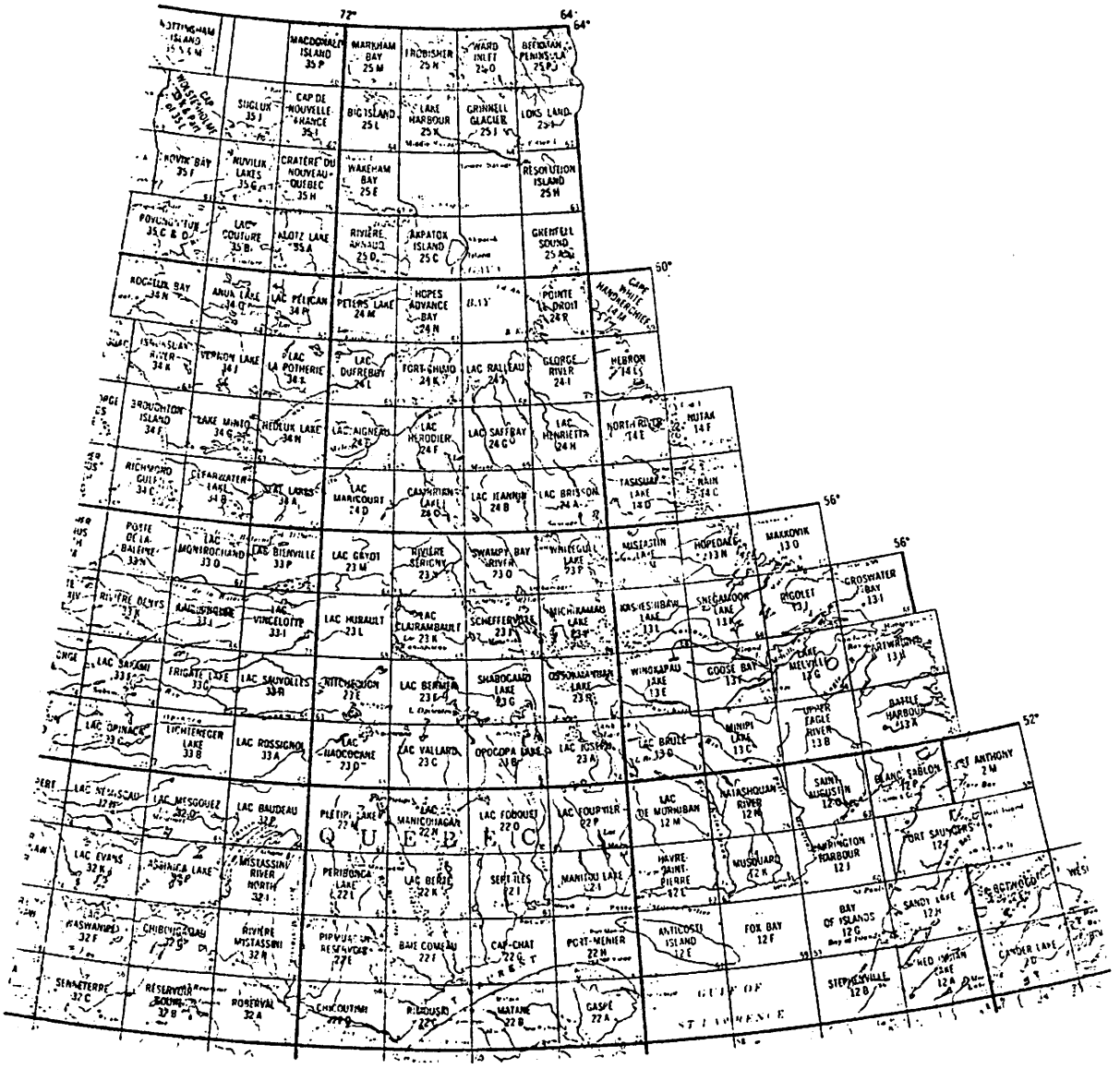

Figure 1. Location map for the 1:250,000 NTS map sheets.

TABLE I

RADIOCARBON LABORATORY IDENTIFICATION

Beta	Beta Analytic Inc.
DIC	Dicarb
GX	Geochron
QL	Quaternary Isotope Laboratory University of Washington
SI	Smithsonian Institution

TABLE II

TYPE OF MATERIAL DATED

Material	Number of dates
Marine shell (MS)	2
Peat (P)	6
Lake sediment (LS)	80
Wood (W)	4

TABLE III. DATES ARRANGED BY AGE, LABORATORY ID, MATERIAL, MAP SHEET, AND SITE

DATE	LAB NO.	TYPE OF MATERIAL+	SITE	MAP NAME	MAP NO.
Modern	DIC-1578	W	Umiakoviarusek	North River	14E
Modern	DIC-1692	W	Desulo Lake	Tasisuak	14D
50± 50 BP	DIC-1695	W	Koroc River	George River	24I
310± 80 BP	QL-1154	LS	Miriam Lake	Cape White Handkerchief	14M
920± 210 BP	GX-6378	LS	Loon Bay	Hebron	14L
1085± 50 BP	SI-2315	LS	Hopedale	Hopedale	13N
1190± 160 BP	GX-5519	LS	Tasiguluk	George River	24I
1230± 70 BP	DIC-1579	P	Umiakoviarusek	North River	14E
1445± 160 BP	GX-5521	LS	Loon Bay	Hebron	14L
1540± 260 BP	GX-6379	LS	Tasiguluk	George River	24I
1550± 70 BP	QL-1155	LS	Miriam Lake	Cape White Handkerchief	14M
1605± 120 BP	SI-2254	LS	Nain Pond	Nain	14C
1630± 80 BP	QL-1153	LS	Miriam Lake	Cape White Handkerchief	14M
1655± 120 BP	SI-2254	LS	Nain Pond	Nain	14C
2080± 80 BP	QL-1439	LS	Boundary Lake	Swampy Bay River	23O
2115± 220 BP	GX-7305	LS	Napaktok Lake	North River	14E
2210± 50 BP	DIC-1577	P	Umiakoviarusek	North River	14E
2315± 100 BP	SI-2251	LS	Pyramid Hills	Lac Henrietta	24H
2435± 50 BP	SI-2916	LS	Ublik Pond	Nutak	14F
2450± 155 BP	SI-2246	LS	Nain Pond	Nain	14C
2650± 70 BP	DIC-1576	P	Umiakoviarusek	North River	14E
2690± 230 BP	GX-6294	LS	Loon Bay	Hebron	14L
2840± 210 BP	GX-7306	LS	Lac Hamard	Schefferville	23J
2845± 140 BP	SI-2256	LS	Track Lake	Whitegull Lake	23P
2895± 235 BP	SI-2735	LS	Hopedale Pond	Hopedale	13N
2945± 85 BP	SI-2740	LS	Kogaluk Plateau L.	Tasisuak	14D
3000± 100 BP	QL-1148	LS	Miriam Lake	Cape White Handkerchief	14M
3030± 120 BP	SI-2919A	LS	Ublik Pond	Nutak	14F
3060± 115 BP	SI-2255A	LS	Track Lake	Whitegull Lake	23P

TABLE III. Cont.

DATE	LAB NO.	TYPE OF MATERIAL+	SITE	MAP NAME	MAP NO.
3190± 60 BP	DIC-1694	W	Umiakoviarusek	North River	14E
3395± 140 BP	SI-2252	LS	Pyramid Hills	Lac Henrietta	24H
3645± 90 BP	SI-2243	LS	Nain Pond	Nain	14C
3725± 125 BP	SI-2257	LS	Track Lake	Whitegull Lake	23P
3830± 69 BP	DIC-884	P	Greenbush Peat	Schefferville	23J
3850± 150 BP	GX-6948	LS	Umaikoviarusek	North River	14E
3865± 85 BP	SI-2736	LS	Hopedale Pond	Hopedale	13N
3945± 75 BP	SI-2253	LS	Track Lake	Whitegull Lake	23P
4000± 90 BP	QL-1149	LS	Matthew Lake	Lac Henrietta	24H
4210± 85 BP	SI-2248	LS	Pyramid Hills L.	Lac Henrietta	24H
4240± 85 BP	SI-2316	LS	Hopedale Pond	Hopedale	13N
4280± 95 BP	SI-1956	LS	Track Lake	Whitegull Lake	23P
4290± 115 BP	SI-2239	LS	Kogaluk Plateau L.	Tasisuak Lake	14D
4300± 190 BP	Beta-1198	LS	Hebron Lake	Hebron	14L
4360± 160 BP	SI-2241	LS	Kogaluk Plateau L.	Tasisuak Lake	14D
4390± 900 BP	QL-1152	LS	Matthew Lake	Lac Henrietta	24H
4430± 85 BP	SI-2917	LS	Ublik Pond	Nutak	14F
4440± 105 BP	DIC-883	P	Helluva Lake Bog	Swampy Bay River	23O
4460± 90 BP	QL-1151	LS	Matthew Lake	Lac Henrietta	24H
4655± 140 BP	SI-2240	LS	Kogaluk Plateau L.	Tasisuak Lake	14D
4690± 95 BP	SI-2249	LS	Pyramid Hills L.	Lac Henrietta	24H
4725± 80 BP	SI-2737	LS	Hopedale Pond	Hopedale	13N
4730± 205 BP	GX-5518	LS	Tasiguluk Lake	George River	24I
4755± 85 BP	SI-1957	LS	Track Lake	Whitegull Lake	23P
4780± 120 BP	QL-1151	LS	Matthew Lake	Lac Henrietta	24H
4920± 100 BP	QL-1440	LS	Boundary Lake	Swampy Bay River	23O
4950± 190 BP	GX-7307	LS	Harp Peninsula L.	Hebron	14L
5215± 105 BP	SI-2247	LS	Pyramid Hills L.	Lac Henrietta	24H
5385± 100 BP	SI-2244	LS	Nain Pond	Nain	14C
5440± 150 BP	SI-1961	LS	Hopedale Pond	Hopedale	13N
5615± 150 BP	SI-2737A	LS	Hopedale Pond	Hopedale	13N
5885± 155 BP	SI-2250	LS	Pyramid Hills L.	Lac Henrietta	24H
5990± 160 BP	Beta-1205	LS	Tunturi Lake	Swampy Bay River	23O

TABLE III. Cont.

DATE	LAB NO.	TYPE OF MATERIAL+	SITE	MAP NAME	MAP NO.
6130± 320 BP	GX-6368	LS	Two Loon Lake	Pointe Le Droit	24P,0
6200± 200 BP	QL-1002	LS	Matthew Lake	Lac Henrietta	24H
6345± 160 BP	Beta-1201	LS	Lac Hamard	Schefferville	23J
6370± 195 BP	GX-6380	P	N. Hebron Peat	Hebron	14L
6550± 285 BP	SI-2242	LS	Nain Pond	Nain	14C
6685± 205 BP	GX-6975	LS	Boundary Lake	Swampy Bay River	230
6745± 80 BP	SI-2918	LS	Ublik Pond	Nutak	14F
6815± 125 BP	SI-1959	LS	Pyramid Hills	Lac Henrietta	24H
6915± 180 BP	Beta-1199	LS	Hebron Lake	Hebron	14L
7195± 210 BP	SI-2738	LS	Nain Pond	Nain	14C
7980± 50 BP	SI-2736A	LS	Hopedale Pond	Hopedale	13N
8610± 925 BP	SI-1955	LS	Kogaluk Plateau L.	Tasisuak Lake	14D
8725± 410 BP	SI-1960	LS	Nain Pond	Nain	14C
8735± 235 BP	GX-6363	LS	Napaktok Lake	North River	14E
9005± 285 BP	GX-7308	LS	Okak Lake	North River	14E
9980± 40 BP	QL-1214B	LS	Boundary Lake	Swampy Bay River	230
10075± 255 BP	GX-6364	LS	Hebron Lake	Hebron	14L
10180± 150 BP	Beta-1203	LS	Napaktok Lake	North River	14E
10260± 360 BP	SI-2739	LS	Ublik Pond	Nutak	14F
10700± 540 BP	GX-5520	LS	Boundary Lake	Swampy Bay River	230
10765± 340 BP	GX-6361	LS	Pemmican Lake	Hebron	14L
11160± 520 BP	GX-5522	LS	Moraine Lake	Hebron	14L
13235± 780 BP	SI-1958	LS	Nain Pond	Nain	14C
14040± 780 BP	GX-6366	LS	Tunturi Lake	Swampy Bay River	230
16330± 330 BP	QL-1214	LS	Boundary Lake	Swampy Bay River	230
16800±2300 BP	GX-6387	LS	Palsa Lake	George River	24I
16975±1040 BP	GX-6365	LS	Lac Hamard	Schefferville	23J
18210±1900 BP	GX-6352	LS	Square Lake	Hebron	14L
34360± 850 BP	SI-4131	MS	Iron Strand	Cape White Handkerchief	14M
42730$^{+6680}_{-9970}$ BP	DIC-517	MS	Iron Strand	Cape White Handkerchief	14M

+ See Table II

TABLE IV

DATES ARRANGED IN 1000-YEAR INTERVALS

AGE RANGE (YR BP)	NO. OF DATES
0-999	5
1000-1999	9
2000-2999	12
3000-3999	11
4000-4999	19
5000-5999	6
6000-6999	9
7000-7999	2
8000-8999	3
9000-9999	2
10,000-10,999	5
11,000-11,999	1
12,000-12,999	
13,000-13,999	1
14,000-14,999	1
15,000-15,999	
16,000-16,999	3
17,000-17,999	
18,000-18,999	1
34,000-34,999	1
42,000-42,999	1
TOTAL	92
Samples submitted; too small to be dated	6

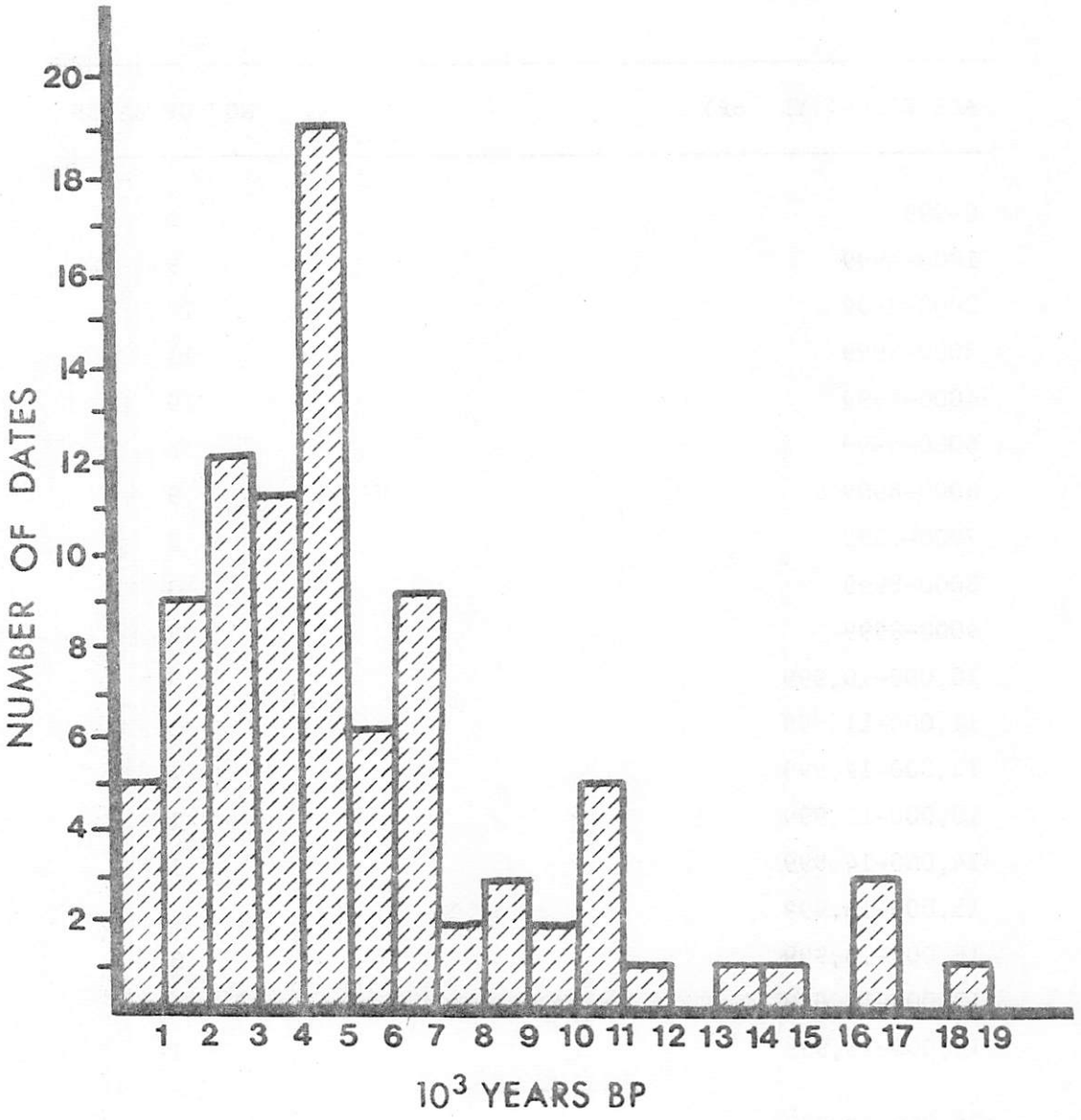

Figure 2. Frequency distribution of ^{14}C dates <19,000 BP in 1000-year intervals.

RADIOCARBON DATES BY 1:250,000 NTS MAP SHEET, FROM SOUTH TO NORTH

1. SCHEFFERVILLE (Map Sheet No. 23J; 54-55°N, 66-68°W)

LAC HAMARD

GX-7306 (GRL-479-0)	20-35 cm	2840± 210
Beta-1201	70-80 cm	6345± 160
GX-6354 (GRL-411-0)	97.5-107.5 cm	16975±1040

Basal lake clay and necron mud samples from a 107.5 cm core taken from Lac Hamard, Quebec (54°48'N, 67°30'W), located 40 km west of Schefferville at 564 m asl on granite bedrock in open spruce woodland. Collected by H. Nichols, July, 1978. Comment (LKS, SKS): The Lac Hamard and Tunturi Lake (see below) sites were chosen because of their location on granitic bedrock, thus avoiding any possible carbonate contamination suspected in the old dates from Boundary Lake (see below). However, the very old basal date (GX-6354) from this site is difficult to explain in an area which was previously believed to have been ice covered at least 7000 years ago. A possible re-examination of the deglaciation chronology may be necessary; however, a more likely explanation may be some form of contamination. Based on pollen analyses by Stravers, Beta-1201 marks the height of a shrub tundra episode and the beginning of a transitional period to spruce woodland in the area. It suggests a pre-8000 date for deglaciation, assuming constant sedimentation rates, and rapid migration of vegetation from surrounding areas. The topmost date, GX-7306, dates an episode of generally decreasing "absolute" pollen values in the diagrams suggesting cooler conditions (Stravers, 1981).

GREENBUSH PEAT

DIC-884	190-200 cm	3830± 60

Basal peat sample from Greenbush Lake Peat, Quebec (54°59'N, 67°14'W), located in open spruce woodland with small stands of closed-crown spruce forest and dense birch shrub, approximately 40 km northwest of Schefferville and 5 km

east of Kivivic Lake at 534 m asl (Grayson, 1956). Recollected by J.D. Ives and H. Nichols, July, 1975. Comment (SKS, LKS, JDI): Grayson (1956) obtained a solid carbon date of 5300±800 BP at this site from basal sediments exhibiting a boreal woodland pollen assemblage at a depth of 244-267 cm. He originally placed deglaciation of the Greenbush basin at 6000 BP, with surrounding areas free of ice as early as 8500 BP. However, this date was misused and became the basis for several estimates that the final disappearance of Wisconsin ice occurred about 5000 BP in the Kivivic Lake area (Morrison, 1966, 1970; Ives, 1960b; Bryson et al., 1969; Prest, 1970). During resampling with a Hiller-type peat corer, the peat stratigraphy showed that the basal peat was not conformable with the underlying mineral sediment (Nichols, personal communication, 1975); however, the coring operation was made difficult by a very high water content of the peat and five or six separate attempts had to be made to obtain a core. However, the date from this site is believed to represent a date for the initiation of peat growth long after deglaciation rather than deglaciation itself. This date also stands in contrast to the basal date on wood from Helluva Lake Bog (see below) which indicates local treeline was well established in the area by 4500 BP.

2. HOPEDALE (Map Sheet No. 13N; 55-56°N, 60-62°W)

	HOPEDALE POND	
SI-2735	11.5-18.5 cm	2985±235
SI-2315	60.5-67.5 cm	1085±50
SI-2736	66.5-73.5 cm	3985±85
SI-2736A	" "	7980±50
SI-2727	91.5-98.5 cm	4725±80
SI-2727A	" "	5615±150
SI-2316	123.5-130.5 cm	4240±85
SI-1961	133.5-135 cm	5440±150

Mud and silt samples from a 145-cm core from Hopedale Pond (unofficial name), Labrador (55°28'N, 60°17'W), the higher of two ponds at 75-80 m asl located just north of the radar towers behind the settlement of Hopedale. Exposed bedrock and a dry lichen-heath dominate the landscape. Collected by W.W. Fitzhugh and S. Cox,

July, 1973. Comment (SKS): All the lake samples were small and diluted and counted at reduced pressure. Problems with dating reversals are evident in the above list. An experiment utilizing the NaOH-soluble portion of two samples, SI-2736A and SI-2737A, produced consistently older dates, which were not used in the production of pollen diagrams from this site (Short and Nichols, 1977; Short 1978a, b). The late date for the initiation of deposition at this site (SI-1961) cannot be explained by its position below the marine limit (Fitzhugh, personal communication, 1973). Marine limit curves published from Hamilton Inlet, 80 km south, (Jordan, 1975: Fig. 9) suggest a date between 9000 and 8000 BP for the initiation of deposition in a basin of a similar altitude. It is possible that sampling problems in the field are responsible for the reduced record.

3. WHITEGULL (Map Sheet No. 23P; 55-56°N, 64-66°W)

	TRACK LAKE	
SI-2258A	41-50 cm	too small
SI-2255A	56.5-63.5 cm	3060±115
SI-2257	81.5-88.5 cm	3725±125
SI-2254	111.5-118.5 cm	1605±120
SI-2256	151.5-158.5 cm	2845±140
SI-2253	251.5-258.5 cm	3945±75
SI-1956	312.5-317 cm	4280±95
SI-1957	317-321 cm	4755±85

Necron mud and basal clayey silt (SI-1957) samples from a 346.5-cm core taken from Track Lake (unofficial name), Quebec (55°46'N, 65°10'W), located 1.6 km west of the De Pas River in lichen woodland at an elevation of 440 m asl. Collected by S.K. Short and W.W. Fitzhugh, July, 1973. Comment (SKS): Problems with small sample size (SI-1957, SI-2256, SI-2254, SI-2257, SI-2255A, SI-2258A) resulted in a series of reversed dates which are difficult to interpret. Published pollen data (Short and Nichols, 1977; Short, 1978a, b) emphasize SI-1957, SI-1956, SI-2253, SI-2257, and SI-2255A in the interpretation of the diagrams. The delay in deposition at this site until about 5000 BP is not

yet understood, although it is possible that stagnant ice occupied the basin until that late date.

4. SWAMPY BAY RIVER (Map Sheet No. 230; 55-56°N, 66-68°W)

TUNTURI LAKE

Beta-1200	15-25 cm	too small
Beta-1205	80-90 cm	5990±160
GX-6366 (GRL-405-0)	135-137.5 cm	14,040±780

Basal clay and necron mud samples from a 140-cm core from Tunturi Lake (unofficial name), Quebec (55°01'N, 67°30'W), located 50 km northwest of Schefferville and 9 km west of Kivivic Lake at an altitude of 610 m asl at the lichen woodland/tundra ecotone (altitudinal) boundary. Collected by H. Nichols, July, 1978. Comments (LKS): As in the case of Lac Hamard and Boundary Lake (see comments), this site was chosen to provide a minimum date for deglaciation of the central peninsula. The basal date (GX-6366) seems to be in error according to the "accepted" deglaciation chronologies. Three sources of error seem possible: 1) contamination from old carbon of inifinite age as found in graphite, etc.("hard water effect"); 2) contamination from organics from older glacially-derived sediments mixed with the younger sediments; or 3) an unconformity between post-glacial sediments and sediments from the last interglacial that were not scoured from the basin by ice.

The mid-core date (Beta-1205) marks the beginning of the shrub tundra-spruce woodland transition period (Stravers, 1981), and indicates rapid migration of the forest if the original deglaciation chronology (Morrison, 1970; Bryson et al., 1969; Prest, 1970) is accepted.

BOUNDARY LAKE

Primary Core		
QL-1439 (GRL-447-0)	5-15 cm	2080±80
QL-1440 (GRL-448-0)	140-150 cm	4920±100

GX-5520 (GRL-370-0)	253-263 cm	10,700±540
Duplicate Core #1		
QL-1214B (GRL-333, 334, 334-0)	250-270 cm (estimated)	9980±40
QL-1214 (GRL-336-0)	270-280 cm (estimated)	16,330±330
Duplicate Core #2		
GX-6975 (GRL-468-0)	63.5-92 cm (basal)	6685±205

Lake mud and clay samples from several cores from Boundary Lake, Quebec (55°15'N, 67°24'W), located 50 km northwest of Schefferville at 525 m asl in lichen woodland. Collected by H. Nichols, S.K. Short, and J.D. Ives, July 1975. Comments (LKS, SKS, JDI): Site is located 3 km north of Kivivic Lake and was chosen for sampling because of its importance in studying the proposed center of ice disintegration, a radius of some 300 km around Kivivic Lake. This site was chosen after failure to obtain a core from Kivivic Lake itself. Glacial meltwater channels above the Boundary Lake shoreline slope towards the north indicating remnant ice sloping up towards the south. In contrast, similar channels at the south end of Kivivic slope towards the south (Ives, 1959b). For this reason, after a 263.5-cm primary core was recovered in three sections, two duplicate basal cores were taken. The first radiocarbon assays were done on duplicate core #1, whose depth was estimated (field) at 250-280 cm; the entire core was dated (QL-1214, QL-1214B). The unexpected old dates produced by this core led to the dating of the primary core and then, most recently, duplicate core #2. The basal date from the primary core (GX-5520) correlates well with the first assays. However, GX-6975 from duplicate core #2 is much younger than the previous basal dates, and pollen analyses of this core and the primary core (Stravers, 1981) suggest that the base of #2 seems to "fit in" 25-30 cm above the base of the primary core, that is, at approximately 230-235 cm. The 6685±205 BP (GX-6975) may be a composite date since the amount of organic matter necessary for a date was derived from more than 25 cm of sediment. The pollen diagrams suggest spruce was present at the Boundary Lake site by at least 5000 years BP.

A 2000 year old date (QL-1439) from the sediment immediately below the surface sediment in the primary core is consistent with other "top" dates north and east of the site (see Kogaluk Plateau Lake, Loon Bay), and suggests a marked decrease in sedimentation rates in the last 2-3000 years (see Short, 1978a,b).

HELLUVA LAKE BOG

DIC-883 4440±105

A wood (Picea sp.) fragment rooted in mineral soil at the base of a 48.5 cm peat section from Helluva Lake, Quebec (55°18'N, 67°35'W), located 80 km northwest of Schefferville at 580 m asl. The vegetation around the bog is well-developed lichen woodland. Collected by J.D. Ives, H. Nichols, and S.K. Short, July, 1975. Comment (SKS, JDI): Helluva Lake Bog is presently located in the uppermost part of the altitudinal treeline. The size of wood fragments in the bog, including the dated sample, and the general site setting, support an assumption of higher treeline at 4500 BP, followed by a retreat sometime in the late Holocene. Ives reports on the presence of fossil snags at higher levels 4-6 km further north.

5. NAIN (Map Sheet No. 14C; 56-57°N, 60-62°W)

NAIN POND

SI-2246	31.5-38.5 cm	2450±155
SI-2245	61.5-68.5 cm	1655±120
SI-2244	91.5-98.5 cm	5385±100
SI-2243	121.5-128.5 cm	3645±90
SI-2242	176.5-183.5 cm	6550±285
SI-1958	194.5-197.5 cm	13,235±780
SI-1960	212.5-217.5 cm	8725±410
SI-2738	217.5-225 cm	7195±210

Necron and colloidal mud samples from a 238.5 cm core taken from Nain Pond (unofficial name), Labrador (56°32'N, 61°49'W), located on the plateau 8 km west

of the town of Nain at an altitude of 80 m asl. Widely spaced lichen woodland surrounds the lake. Collected by S.K. Short and W.W. Fitzhugh, July 1973. Comment (SKS): As seen above, problems with dating reversals are a major problem at this site. In part, small sample size is at fault; this is a common problem with the very inorganic northern Labrador-Ungava lake sites, and pretreatment with NaOH to remove possible humic acid contamination reduced the samples by up to 80% (R. Struckenrath, personal communication, 1975). However, field sampling problems and confused stratigraphy are probably also at fault here.

Two thrusts, totalling 217.5 cm, were collected initially. The second thrust included some clay, but because mud was observed on the bottom of the tube, a third thrust, for a total of 238.5 cm, was collected. In the field, the third thrust was believed to be totally clay, indicating that the mud on the bottom of the second thrust was contamination. However, in the lab, the third thrust proved to be mud grading into clay, suggesting the possibility that the clay in the second thrust was a lens. The pollen diagrams (Short and Nichols, 1977; Short, 1978a, b) were constructed using all three cores and all dates.

Thus, the basal stratigraphy and dating at this site is very confused, and three different interpretations can be proposed. First, the mud dated 8725±410 (SI-1960) at the base of the second thrust may be contamination; therefore, the 13,235±780 BP date (SI-1958) accurately dates the basal organic sediments and the transition to shrub tundra at this site. We do not accept the latter date at present because it is in conflict with the dating for this transition at the other Labrador sites (i.e., ca. 6500 BP) and because the sample was very small in size. Second, the third thrust represents an overlap with the second thrust. However, the date of 7195±210 BP (SI-2738) is difficult to fit in here. Third, the sequence is essentially correct, but the dates are in error because of small sample size. In this case, the clay band in thrust 2 would represent an episode of inwash.

Comparisons with other pollen data in the area, especially with Ublik Pond, 88 km to the north, suggest that the second explanation and the 8700 BP "basal" date are probably the most accurate; that is, there were sampling problems in the field and an overlap problem resulted, compounded by dating problems.

6. TASISUAK (Map Sheet No. 14D; 56-57°N, 62-62°W)

DESULO LAKE

DIC-1692 — *Picea glauca* — Modern

Picea glauca (Moench) Voss (identification by D.L. Elliott) macrofossil from Desulo Lake (unofficial name), Labrador (54°04'N, 63°48'30"W). Specimen is a free-standing surface sample from an extensive tree macrofossil zone above the main tree stands at the lake at 533 m asl. Collected by D.L. Elliot, S.K. Short, and L.K. Stravers, July, 1979. Comment (DLE, SKS): The sample was submitted to date apparent retreat of altitudinal tree line on the central Labrador plateau near the present northern limit of tree growth. The sample consists of the approximately 50 innermost rings out of a total of 109 rings in the original sample; the outer surface is very eroded and pitted, with the bark and some of the rings eroded away. In addition, the rings are slightly narrower than current living trees at Desulo Lake (Elliott, unpublished data). For these reasons, we question the ^{14}C date of "modern", and the laboratory has agreed to run more tests on the sample.

KOGALUK PLATEAU LAKE

SI-2750	0-5 cm	2945±85
SI-2241	5-10 cm	4360±160
SI-2239	11.5-18.5 cm	4290±115
SI-2240	21.5-27.5 cm	4655±140
SI-2238	34-41 cm	too small
SI-1955	44-47 cm	8610±925

Lake mud and basal clay samples from a 55-cm core taken from Kogaluk Plateau Lake (unofficial name), Labrador (56°04'N, 63°45'W), located 13 km southwest of the Kogaluk River on the Nain Plateau, about 1.6 km north and east of the height of land, at 530 m asl. The site is located at the northern limit of tree growth on the plateau with clumps of dwarfed spruce (krummholz) surviving in sheltered areas. Collected by S.K. Short and W.W. Fitzhugh, July, 1973. Comment (SKS): All samples were small, due to the inorganic nature of the lake basin, and all

were diluted during sample preparation for dating; therefore, there is a reversal in the middle of the core (SI-2239). The basal date (SI-1955) provides a minimum deglaciation date for the central Labrador plateau, and the topmost sample (SI-2740) provides evidence for very reduced sedimentation in the lake basin in the last 3000 years with only 5 centimeters of deposition.

7. NUTAK (Map Sheet No. 14F; 57-58°N, 60-62°W)

	UBLIK POND	
SI 2916	16.5-23.5 cm	2435±50
SI-2917	61.5-68.5 cm	4430±85
SI-2918	126.5-133.5 cm	6745±80
SI-2919A	165-177.5, 173.5-175 cm	3050±120
SI-2739	183-188 cm	10,260±360

Lake mud samples from a 192.5-cm core from Ublik Pond (unofficial name), Labrador (57°23'N, 62°03'W), located between Okak Bay and Ublik Bay in a sparse lichen woodland at an elevation of 122 m asl. Collected by W.W. Fitzhugh, July 1975. Comment (SKS): Because of problems with small and inorganic samples encountered in other Labrador lake cores and resulting in dating reversals, Dr. H. Nichols requested that Dr. R. Stuckenrath utilize only 2N HCl pretreatment technique on samples SI-2916, SI-2917, SI-2918, and SI-2919. This resulted in a series of dates which fit stratigraphically into a sequence. It is important to note that sample SI-2919A was very small since the original and primary sample from 166.5-173.5 cm (SI-2919) was lost during counting; therefore, this date was not included on the pollen diagrams produced from this site (Short and Nichols, 1977; Short, 1978a,b). The basal sample (SI-2739) indicates that glacial ice had retreated west of the north-central coast by about 10,500 BP, and supports earlier work in the area by Andrews (1961) and Løken (1962a, b).

8. NORTH RIVER (Map Sheet No. 14E; 57-58°N, 62-64°W)

UMIAKOVIARUSEK LAKE BOG

DIC-1578 (GRL-463-0)	4-6 cm	Modern
DIC-1579 (GRL-464-0)	95-97	1230±70
DIC-1577 (GRL-451-0)	177.5-180.5 cm	2210±50
DIC-1576 (GRL-465-0)	211.5-216.5 cm	3850±150
GX-6948 (GRL-466-0)	216.5-226.5 cm	3850±150
DIC-1694	Larix laricina bole	3190±60

Peat, clay, and wood samples from a monolith collected from a palsa bog located behind a late Wisconsin end moraine at the northeastern end of Umiakoviarusek Lake, Labrador (57°19'N, 62°20'W) at 61 m asl. The site is located in spruce woodland. The section consisted of 180.5 cm of sedge peat grading into Sphagnum peat (samples DIC-1578, DIC-1579, DIC-1577) overlying a 11.5 cm aeolian lens, which rested on a 20-cm thick lens of charcoal and burnt peat (DIC-1694), which lay on a blue-grey lake clay (GX-6948). DIC-1694 dates a Larix laricina macrofossil from the burnt lens. Collected by S.K. Short, D.L. Elliott, and L.K. Stravers, July, 1979; site located by J.T. Andrews (Andrews, 1961). Comment (SKS): The dates from this section are younger than expected in the field. Pollen analyses of lake sites along the northeastern Labrador coast indicate that spruce woodland occupied the area ca. 4200 years BP; it was expected that the fire episode would date shortly after the establishment of the forest in the area. However, the date for the fire episode of 2650 BP correlates well with a proposed cooling and drying episode dated 3000-2500 BP in Labrador (Short and Nichols, 1977; Short, 1978a, b) and Nichols' correlation of cooling/drying periods and episodes of fire in Keewatin (Nichols, 1975). The date on the Larix laricina fossil (DIC-1694) indicates that the forest had been well-established in this area for some time previous to the fire.

DIC-1577 dates the initiation of peat growth at the site following the fire episode and an aeolian deposit subjected to pedogenesis. Together with the

upcore dates (DIC-1578 and DIC-1579), a roughly linear deposition rate of approximately 13 years/cm is suggested. Insect fossils from the bog have been analyzed (Elias, 1980), and pollen analyses are planned.

OKAK LAKE

GX-7308 (GRL-478-0)	213-223 cm	9005±285

Basal colloidal mud from a 245-cm core taken from Okak Lake (unofficial name), Labrador (57°23'N, 62°07'W), located 35 km southwest of Ublik Pond at an elevation of 105 m asl in spruce woodland. Collected by S.K. Short, D.L. Elliott, and L.K. Stravers, July, 1979. Comment (SKS): In order to check on the pollen spectra recovered at Ublik Pond, especially the early birch-tundra episode dated ca. 9000 to 6700 BP, the area was re-visited in 1979 in order to sample a second lake site. The basal radiocarbon date from Okak Lake (GX-7308) is 1200 years younger than the basal sediments at Ublik Pond; the reason for this delay is not understood at present.

NAPAKTOK LAKE

GX-7305	30-45 cm	2115±220
Beta-1203	130-140 cm	10,180±150
GX-6363 (GRL-412-0)	237.5-242.5 cm	8735±235

Colloidal mud samples from a 245-cm lake core taken from Napaktok Lake (unofficial name), Labrador (57°55'N, 62°34'W), located at an elevation of 143 m above Napaktok Bay, the northern limit of spruce woodland on the Labrador coast (Elliott, 1979; Elliott and Short, 1979). Dwarfed krummholz spruce were observed around the lake site also. Collected by H. Nichols, July, 1978. Comment (SKS): The basal radiocarbon date (GX-6363) provides a minimum date of deglaciation of the plateau above Napaktok Bay and is correlated with the development of tundra vegetation at the site (Short, unpublished data). Other basal dates on the northern Labrador coast range from 8600 to 10,300 years BP.

The 10,000+ date from half way up the core (Beta-1203) is rejected as too old to date the initiation of alder-birch shrub tundra at this site (Short, unpublished data), and the date is not accepted as accurate due to dating problems in the lab (Beta Analytic, Inc., personal communication, 1980). Comparative dates for this period at other Labrador pollen sites are 6000-6700 BP (Short, 1978a, b); however, by extrapolating between the basal date and the topmost date (GX-7305), the resulting estimate for this transition at Napaktok Lake is ca. 5100 years BP, substantially younger than at other sites. This may reflect the problem in obtaining a date for this period here, or, alternatively, the migration of dwarf birch and alder shrub onto the high, stressed plateau above Napaktok Bay may have been delayed due to its topographic position. The topmost date (GX-7305) provides evidence for decreased sedimentation in the last 3000-2000 BP, a widespread phenomenon in the Labrador lake sites reported by Short (Short, 1978a, b).

9. LAC HENRIETTA (Map Sheet No. 24H; 57-58°N, 64-66°W)

MATTHEW LAKE

QL-1148	27.5-37.5 cm	3000±100
QL-1149	57.5-67.5 cm	4000±90
QL-1150	77.5-85 cm	4460±90
QL-1151	92.5-100 cm (base of C 1)	4780±120
QL-1152 (GRL-274-0)	100-105 cm (top of C 2)	4390±900
QL-1002 (GRL-276-0)	135-155 cm	6200±200

Silty lake mud samples from a 162.5-cm core taken from Matthew Lake (unofficial name), Quebec (57°30'N, 65°15'W), located behind Pic Pyramide on the George River at 305 m asl, below Naskapi Lake shoreline 4. Very sparse tree growth surrounds the lake at present, but the site is located only a few kilometers from the densely forested George River. Collected by H. Nichols, S.K. Short, and J.D. Ives, July, 1975. Comment (SKS): The basal radiocarbon date (QL-1002) is similar but slightly younger than the basal date from Pyramid Hills Lake (see below), located between Naskapi Lake Shorelines 2 and 3, thus providing a chronology for the timing of the disappearance of the glacial lake in the George River Basin.

QL-1152, top of Core 2, and QL-1151, base of Core 1, were submitted to check for possible overlap of thrusts during sampling. The results support in part this suspicion, although the ± factor on the former is very large, and the pollen data (Short, unpublished data) does not indicate an overlap. Therefore, it cannot be stated positively that there was an overlap between Cores 1 and 2. QL-1148 dates the decrease in sedimentation and pollen deposition in the lake basin and fits in with the established chronology for Labrador (see Short, 1978a, b).

PYRAMID HILLS LAKE

SI-2251	21.5-28.5 cm	2315±100
SI-2252	61.5-68.5 cm	3395±140
SI-2249	109-116 cm	4690±95
SI-2248	129-136 cm	4210±85
SI-2250	149-156 cm	5885±155
SI-2247	164-171 cm	5215±105
SI-1959	180.5-185.5 cm	6815±125

Necron mud and silty clay (SI-1959) samples from a 200-cm core taken from Pyramid Hills Lake (unofficial name), Quebec (57°38'N, 65°10'W), located 8 km east of the George River and 14 km north of Pic Pyramide, at an elevation of 380 m asl. The site is located at the forest tundra ecotone, with a dry shrub-heath tundra plus a few dwarfed spruce dominating the site; however, the nearby George River is densely forested. Naskapi 3 and 2 proglacial lake shorelines are located approximately 30 and 45 m, respectively, above present lake level. Collected by W.W. Fitzhugh and K. Cummings, July, 1973. Comment (SKS): Small sample size led to several dating reversals at this site, but the problem here is not as severe as at other sites. The basal date (SI-1959) places a minimum date for the duration of the Naskapi Lake complex in this area (Ives, 1959a; Ives, Andrews, and Barry, 1975; Short, 1978a). The topmost sample (SI-2251) marks a period of reduced lake productivity and reduced organic sedimentation.

10. HEBRON (Map Sheet No. 14L; 58-59°N, 62-64°W)

HARP PENINSULA LAKE

GX-7307 (GRL-474-0)	81-96 cm	4950±190

Basal sandy silt from a 96-cm core taken from Harp Peninsula Lake (unofficial name), Labrador (58°02'N, 62°46'W), located in dwarf shrub tundra at 198 m asl. Collected by S.K. Short, D.L. Elliott, and L.K. Stravers, July, 1979. Comment (SKS): The Hebron Fiord area was revisited in 1979 because of the importance of the area in studying tree line fluctuations on the northern Labrador coast and to expand the pollen record obtained from Hebron Pond (see below). The basal radiocarbon date (GX-7307) is much younger than other dates from the area (ca. 8500-10,200 BP), and is not believed to accurately date deglaciation in the area. The core was taken about 20 m off a steep, gravelly shore and it is possible that the date marks a period of inwashing at this site. It is also hypothesized that local small snow patches lasted well into the Holocene on high plateau areas in northern Labrador.

HEBRON LAKE

Beta-1198	40-50 cm	4300±190
Beta-1199	135-145 cm	6915±180
GX-6364 (GRL-406-0)	161.5-169 cm	10,075±255

Silty necron mud samples from a 169-cm core taken from Hebron Lake (unofficial name), Labrador (58°12'N, 63°04'W), located 5 km north of Hebron Fiord (Freytag Inlet) and 33 km west of the abandoned settlement of Hebron at 168 m asl. The vegetation around the site is well-developed shrub tundra. Collected by H. Nichols, July, 1978. Comment (SKS): Basal radiocarbon date (GX-6364) is similar in age to others in the area (Ublik Pond, Pemmican Lake, Moraine Lake), and suggests that the outer northeastern Labrador coast was ice-free by at least 10,200-10,500 years ago. Beta-1100 dates the initiation of alder-birch shrub tundra (Short, unpublished data) in this area, and the date compares favorably with those from other Labrador-Ungava pollen sites (Short, 1978a). Beta-1198 dates increases in values of several taxa,

including spruce, on the "absolute" pollen diagram. The date of 4300 BP is consistent with the establishment of spruce woodland in areas to the south of the Hebron area.

NORTH HEBRON PEAT

GX-6380 6370±195
(GRL-435-0)

Basal gravelly sedge peat from a duplicate basal sample collected from alongside a 45-cm thick peat section at Hebron Lake (see above). Collected by H. Nichols and D.L. Elliott, July, 1978. Comment (SKS): The basal date for this short peat section indicates that peat growth was initiated during the birch-alder shrub tundra period, defined by Short's palynological work in the peninsula (Short and Nichols, 1977; Short, 1978a, b), and interpreted as a warm period. It should be noted that Grayson's (1956) and Morrison's (1966, 1970) basal or initial peat dates also fall within this time period.

MORAINE LAKE

GX-5522 78-90 cm 11,160±520
(GRL-372-0)

Basal sandy mud from a 90-cm core taken from Moraine Lake (unofficial name), Labrador (58°22'N, 63°33'W), located on the distal side of a section of the Saglek Moraines (Ives, 1976) at 550 m asl between Uglutok Fiord and the west arm of Saglek Fiord. The vegetation is a dry-heath lichen tundra. The date was taken on a 12-cm slug of mud below a cap of 78 cm of coarse sand. Collected by H. Nichols and S.K. Short, July, 1975. Comment (SKS, JDI): The basal date provides a minimum date for the development of the Saglek Moraines. However, the low organic content of the core material and the widespread rocky nature of the lake floor would imply that the recovered date is not very close to the actual age of the moraines (see Square Lake below). Pollen analyses have been completed by Short (unpublished data) and suggest a grass-sedge tundra environment at this time; this contrasts with the shrub taxa observed in four samples analyzed from the (undated) sand section.

SQUARE LAKE

GX-6362 (GRL-413-0)	91-98 cm	18,210±1900

Basal silty clay from a 97.5-cm core taken from Square Lake (unofficial name), Labrador (58°38'N, 63°36'W), located 3 km south of Nakvak Brook at an elevation of 513 m in a tundra landscape. The site is dammed by an extensive section of the Saglek Moraines. Collected by H. Nichols, July, 1978. Comment (JDI): Square Lake was first visited by Ives in 1957 during initial attempts to delineate a series of weathering zones (Ives, 1960c; 1978). The site is of great significance because the implied minimum age of the Saglek Moraines supports earlier speculation that they may represent the Late-Wisconsin maximum position of Laurentide Ice Sheet outlet glaciers passing through the Torngat Mountains. This in turn would provide minimum ages for the Koroksoak Weathering Zone which is separated from Saglek Weathering Zone by the moraine, and strongly implies the existence of large ice-free areas in the Torngat Mountains during the Late-Wisconsin maximum (Ives, 1978). The reliability of the date, obtained from a very small sample (0.105 gm carbon; Krueger Enterprises, Inc., personal communication, 1979), must be considered with caution. However, it is reasonable to postulate that 18,200 BP is indeed a minimum age, so that the comments on its significance in respect to the age of the moraines are valid.

LOON BAY

GX-5521 (GRL-371-0)	0-10 cm	1445±160
GX-6378 (GRL-422-0)	127.5-132.5 cm	920±210
GX-6294 (GRL-380-0)	318.5-328.5 cm	2690±230

Silty necron mud samples from a 328.5-cm core from Loon Bay (unofficial name), Labrador (58°38'N, 63°45'W), located at the east end of an unnamed lake on Nakvak Brook at 242 m asl in sedge-shrub tundra. Collected by H. Nichols and S.K. Short, July, 1975. Comment (SKS): The recent age of the basal sample (GX-6294) is surprising for the unusual depth of sediment from the northern Labrador peninsula.

Sample GX-6378 was very small, as additional material was lost in the lab, and the date is presumably in error. If this is true, then the topmost date (GX-5519) records a decrease in sedimentation in the late Holocene with only 10 centimeters of sediment accumulating in the last 1500 years. Pollen analyses have been completed by Short (unpublished data).

PEMMICAN LAKE

GX-6361 (GRL-384-0)	72.5-82.5 cm	10,765±340

Basal silty mud and sand from a 82.5-cm core taken from Pemmican Lake (unofficial name), Labrador (58°40'N, 63°22'W), located 20 km north of Saglek Fiord at an elevation of 380 m asl. The local vegetation is a dry lichen-heath tundra. Collected by H. Nichols and S.K. Short, July, 1975. Comment (JDI, SKS): The basal date provides a minimum date for deglaciation. While it fits in well with other dates obtained from the Hebron and Napaktok fiord areas to the south, Pemmican Lake is probably distal to the Saglek Moraines so that the "real" date of deglaciation of the site is probably prior to 16,000 or 18,000 BP. Alternately this site may have been occupied by local ice, a less likely situation.

11. GEORGE RIVER (Map Sheet No. 24I; 58-59°N, 64-66°W)

TASIGULUK LAKE

GX-5519 (GRL-369-0)	0-10 cm	1190±160
GX-6379 (GRL-428-0)	84.5-89.5 cm	1540±260
GX-5518	177-187 cm	4730±205

Sandy necron mud samples from a 187-cm core taken from Tasiguluk Lake, Quebec (58°28'N, 64°02'W), located 12 km west of the height of land south of the Koroc River drainage at 530 m asl. The lake is surrounded by a dry lichen-heath tundra. Collected by H. Nichols and S.K. Short, July, 1975. Comment (SKS): The lake site

is situated below a series of lake shorelines; thus, the basal date (GX-5518) provides a minimum date for the draining of this lake complex. The young date suggests either a very late blockage of ice down valley or sampling error in that the youngest sediments were not reached during the coring program. The topmost date (GX-5519) illustrates a common problem in northern and central Labrador lake sediments: decreased sedimentation in the upper part of the core. Pollen analyses are completed for this core (Short, unpublished data).

PALSA LAKE

GX-6387 (GRL-408-0) — 338-348 cm — 16,800±2300

Basal silty clay from a 350-cm core from Palsa Lake (unofficial name), Quebec (58°28'N, 65°10'W), located in a dry lichen-heath tundra ca. 15 km south of the Koroc River in the Barnoin River drainage at 143 m asl. Lichen woodland occupies both river valleys. Collected by H. Nichols, July, 1978. Comment (SKS, JDI, JTA): The date for the basal sediments is similar to that from Square Lake (see above). However, dates from basal sediments in western Ungava Bay (Gray et al., 1980) are closer to 7000 to 7500 BP. Because of this discrepancy and because this site is believed to be important, organic sediment analyses and pollen analyses are planned for the core.

KOROC RIVER

DIC-1695 — Picea mariana — 50±50 (AD 1900)

Picea mariana (Mill.) B.S.P. (identification by D.L. Elliott) macrofossil from above the Koroc River (58°42'N, 65°24'W), Quebec at both the latitudinal and elevational tree limit in northern Labrador-Ungava (235 m asl). The sample was collected by D.L. Elliott, July, 1978, from a wind-gap krummholz community above the main Picea mariana stand; Larix laricina (Du Roi) K. Koch individuals were observed at the site (Elliott, 1979). Comment (DLE, SKS): The sample consisted of the secondary center of the innermost ring years 10-90 in a sequence of 188

years; the outer bark and wood have decayed away. The macrofossil P. mariana specimens in the krummholz zone are larger than the living forms. In addition, the fossils are very eroded, perhaps indicative of death many years ago. For these reasons, we question the validity of the radiocarbon result, and tests are being run by the laboratory to check for sources of error.

12. CAPE WHITE HANDKERCHIEF (Map Sheet No. 14M; 59-60°N, 62-64°W)

IRON STRAND

SI-4131	Balanus	$34,360 \pm 850$
DIC-517	Balanus	$42,730^{+6680}_{-9970}$

Shells collected from a 7 m wave-cut cliff section along Iron Strand, Labrador (59°33'N, 63°50'W), 3 km from the northeastern corner of Miriam Lake. The shells were fragmented; the main genus is Balanus sp., with Mya truncata and Hiatella arctica also present. Collected by J.D. Ives, July, 1975 (Ives, 1977). Comment (JDI, JTA): This locality, on the outer coast of the Torngat Mountain section of Labrador, was investigated because of the anticipation that it was the most likely place to find "old" mollusk shells. It is backed by high coastal mountains and situated well away from major fiords. Thus the interpretation of the initial amino acid ratios on shell fragments as Holocene (Ives, 1977) was regarded with scepticism and the initial ^{14}C date (SI-4131) was reassuring in terms of the geomorphic relationships of the site. Andrews et al. (1981) have reported that the amino acid ratios (which were obtained from Balanus and Hiatella arctica) are much lower than ratios from the Kogalu Member, Baffin Island, that is ocnsidered to date between 70,000 and 80,000 BP. The ^{14}C dates, therefore, obtained from the predominant Balanus material in one collection, may be close approximations of the "true" age. Other sites in Arctic Canada with ^{14}C dates of 40,000 or so frequently have amino acid ratios correlative with the Kogalu Member or even older. Blake (1980) has reported a stratum at Cape Storm, Ellesmere Island, N.W.T., which has similar amino acid ratios and "finite" ^{14}C dates. Thus, the Iron Strand site may be recording a middle Wisconsin interstade. This conclusion would not be in conflict with recent work on the glaciation of the Torngat Mountains.

MIRIAM LAKE

QL-1154	7.5-10 cm	310±80
QL-1155	40-50 cm	1550±70
QL-1153	64.5-67.5 cm	1630±80

Silty sand samples from a 75-cm core taken from Miriam Lake, Labrador (59° 33'N, 63°53'W), located along Iron Strand, south of Ryan's Bay at 0 m asl. The present vegetation is tundra. Collected by H. Nichols and S.K. Short, July, 1975. Comment (SKS): The presence of terrestrial pollen taxa (Short, unpublished data) in the basal sediments of the core indicates that the site was above sea level since the onset of deposition at 1630 BP. Sample QL-1155 dates an exotic peak of tree pollen from the south, while QL-1154 dates an episode of decreased sedimentation and pollen production in the late Holocene.

13. POINTE LE DROIT (Map Sheet No. 24P; 59-60°N, 64-66°W)

TWO LOON LAKE

GX-6368 (GRL-409-0)	99-109 cm	6130±320

Basal sandy clay sample from a 109-cm core taken from Two Loon Lake, Labrador (59°28'N, 64°11'W), located 5 km north of and draining into Upper Kangalaksiorvik Lake, Torngat Mountains, at an elevation of 45 m asl, in a dry lichen-heath tundra environment. Collected by H. Nichols, July, 1978. Comment (JDI, SKS): The site was selected by Ives because it lies distal to the Kangalaskorvik moraines (Løken, 1962, unpubl.) and within the central area of Løken's 1958 field investigations. Løken (1962a) concluded that ice had withdrawn inland on the heads of several of the local fiords by about 9000 BP. The 6,130 BP basal date from this site, therefore, is younger than was anticipated, and the apparent delay in sedimentation is not understood.

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