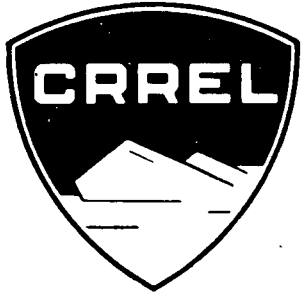


SR 43, Pt. V



Special Report 43, Pt. V

**ICE THICKNESS OBSERVATIONS,
NORTH AMERICAN ARCTIC AND SUBARCTIC
1966-67, 1967-68**

Michael A. Bilello and Roy E. Bates

March 1971

**CORPS OF ENGINEERS, U.S. ARMY
COLD REGIONS RESEARCH AND ENGINEERING LABORATORY
HANOVER, NEW HAMPSHIRE**

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The findings in this report are not to be construed as an official Department of the Army position unless so designated by other authorized documents.

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DA TASK 1T014501B52A

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PREFACE

This is the fifth in a series of reports on lake, river and land-fast sea ice thicknesses observed throughout the North American Arctic and subarctic during the period 1958-68. Like the previous reports, Part V also contains information on ice surface conditions, dates of first ice, freeze-over and breakup, and detailed measurements of ice thickness across Alaskan rivers.

The data used in this study were made available through the cooperation of the Meteorological Branch, Canadian Department of Transport; the Alaska Regional Weather Bureau Office, Environmental Science Services Administration (ESSA), U.S. Department of Commerce; the Water Resources Division of the Alaska Geological Survey, U.S. Department of the Interior; and the Alaska Eskimo Scouts, U.S. Army Alaska National Guard.

This report was prepared by Mr. M. Bilello, Research Meteorologist and Mr. R. Bates, Snow and Ice Branch, Research Division, U.S. Army Cold Regions Research and Engineering Laboratory (USA CRREL). Additional assistance was provided by Miss Madeleine Linden.

This work was performed under DA Task 1T014501B52A, *Basic Research in Earth Physics*.

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ICE THICKNESS OBSERVATIONS, NORTH AMERICAN ARCTIC AND SUBARCTIC, 1966-67, 1967-68

by

Michael A. Bilello and Roy E. Bates

Introduction

The first four reports of this series, Special Report 43, Parts I and II (Bilello, 1961, 1964) and Parts III and IV (Bilello and Bates, 1966, 1969), present ice thickness data observed from 1958 to 1966 at locations throughout North America. These reports also describe the equipment used, the history of the network, and supplementary ice conditions such as dates of ice formation and breakup. This fifth report of the series marks the attainment of a goal of compiling an unbroken decade of unique ice cover data for numerous locations in the Arctic. Personnel of the U.S. Army National Guard, the U.S. Department of Commerce (ESSA), and the Canadian Department of Transport, in cooperation with USA CRREL continue to make these ice observations. Detailed measurements of ice thickness across rivers in Alaska made between 1965 and 1968 were furnished by the U.S. Department of the Interior, Geological Survey, Water Resources Division, Alaska.

The Canadian Department of Transport, Meteorological Branch, published the Canadian ice thickness data collected for 1966-67 and 1967-68 in circulars ICE-2, December 1967 and ICE-1, November 1968 respectively. To avoid major duplication in publishing of the Canadian ice thickness data only the values reported during the period of maximum growth and subsequent decay for these sites are provided in this report. Field personnel of the Alaska National Guard, U.S. Army Alaska (USARAL), provided USA CRREL with the data on ice thickness and conditions in western Alaska from 1966 through 1968.

Reports pertinent to ice observations and forecasting are listed in the previous reports in this series.

Network changes

Lists of participating stations and a history of the expansion of the network from 1958 through 1966 are given in Parts I-IV of this series. During the winters of 1964-65 and 1965-66 there were 72 stations in the network: 49 in Canada and 23 in Alaska.

Between August 1966 and July 1968, 6 new stations were added to the network in Alaska. At one of the new stations, Fort Greely, measurements were made during the 1966-67 winter only; the other stations started taking measurements during the winter of 1967-68. The new stations are listed below.

<u>Station</u>	<u>Location</u>	<u>Elevation</u>
1. Bettles, Alaska	66°54'N, 151°31'W	666 ft
2. Canyon Village, Alaska	67°08'N, 142°05'W	Approx 775 ft
3. Chalkyitsik, Alaska	66°38'N, 143°43'W	560 ft
4. Ft. Greely, Alaska	64°00'N, 145°44'W	1268 ft
5. Minto, Alaska	64°55'N, 149°10'W	328 ft
6. Trappers Creek, Alaska	62°19'N, 150°14'W	360 ft

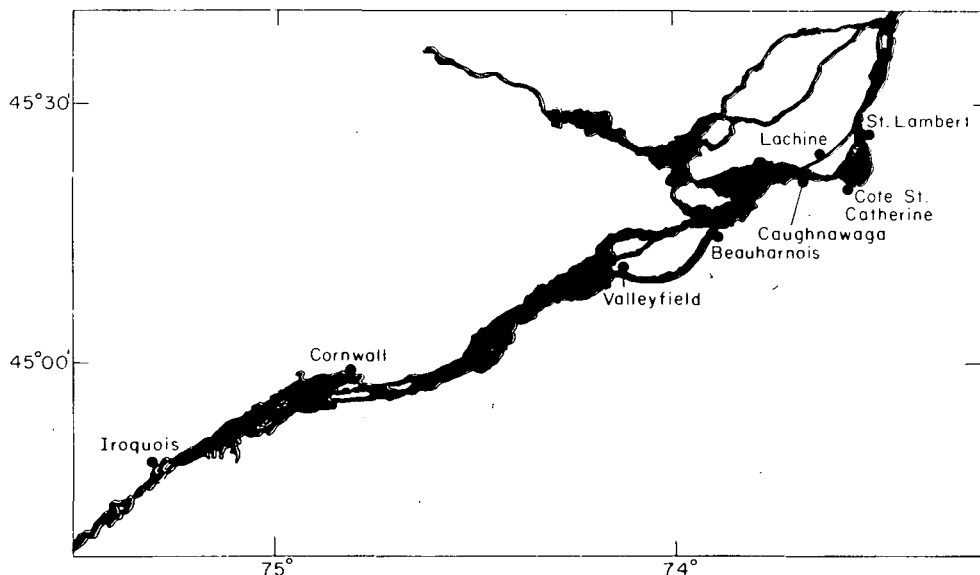


Figure 1. Ice stations along the St. Lawrence River.

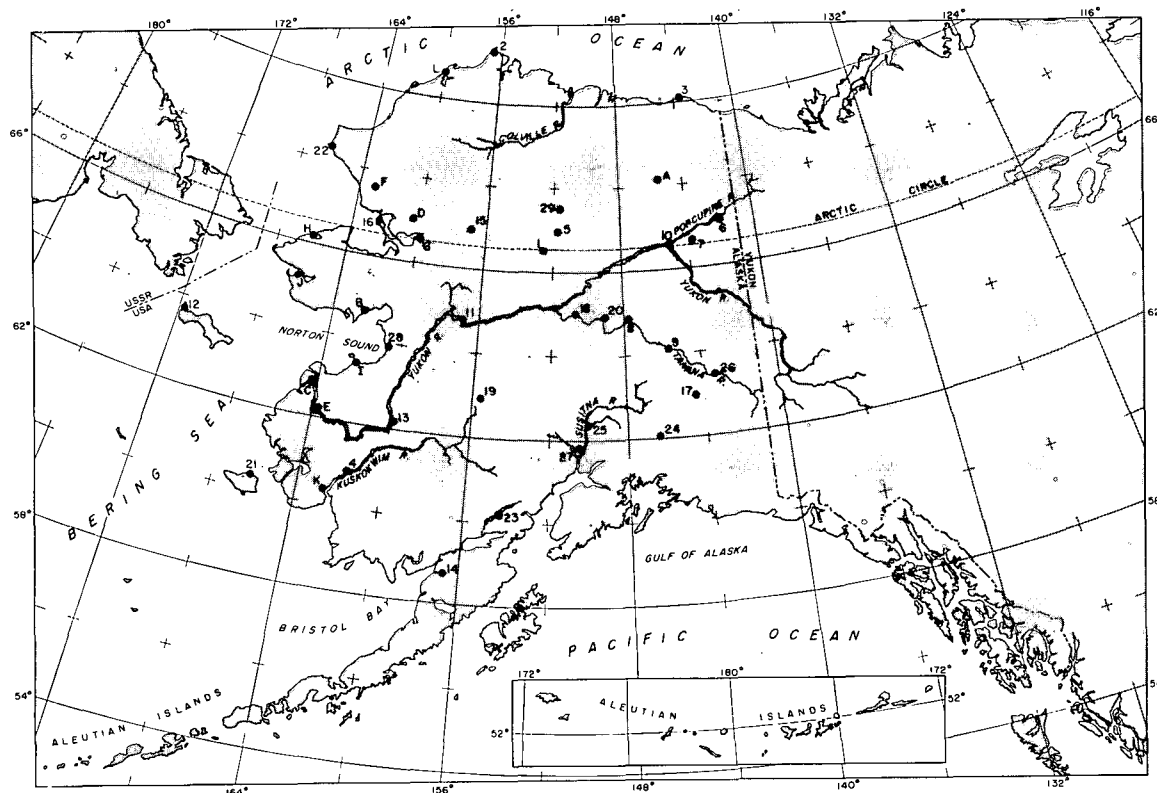
No ice reports were received from Tanacross, Alaska, during the 1966-67 winter, and none from Talkeetna and Wild Lake during 1967-68. In Canada, no reports were received from Grise Fiord and Pond Inlet during 1966-67, and none from Arctic Bay, Cote Ste. Catherine, Grise Fiord, Lachine Canal and St. Lambert during 1967-68. Consequently, at the end of July 1968 there were 69 stations in the network: 43 in Canada and 26 in Alaska. The locations of all stations reporting between 1966 and 1968 are shown in Figures 1, 2 and 3.

The body of water on which measurements were made and the dates of observations are given on the tabulated ice thickness data sheets (Tables II and III). Information on procedures and equipment may be found in Parts I-IV. As in the previous reports, additional ice data such as dates of ice formation and breakup and the depth and density of the snow cover are given in the "Remarks" column in Tables II and III. The information for the Canadian stations was obtained from copies of the original station data sheets received from the Meteorological Branch, Canadian Department of Transport.

Supplementary ice thickness data

Detailed measurements of ice thickness across rivers in Alaska for the period between 1965 and 1968 were obtained from the U.S. Geological Survey, Alaska, for publication in this report. These values were measured in holes cut in the ice at intervals ranging from 1 to 100 ft across streams and rivers at 36 locations between latitudes 59 and 67°N. The U.S. Geological Survey conducts these observations to determine the discharge of water beneath the ice sheet. Thicknesses are measured to the nearest tenth of a foot. Since the tabulated data for this network differ from those in Tables II and III and because the observations were made at irregular times, these data are presented separately in Appendix A. Most of the data in Appendix A are chronological continuations of records published in Parts III and IV. The locations of the stations given are shown in Figure A1.

Through the cooperation of USARAL, the Alaska National Guard Eskimo Scouts continue to furnish USA CRREL with ice condition and thickness data from western Alaska. This information is somewhat erratic in continuity and frequency of observations. Consequently the stations are not being added to the regular ice network and the data are tabulated in Appendix B. The locations



Alaskan Weather Stations

- | | |
|--------------------|------------------------|
| 1. Allakaket | 13. Holy Cross |
| 2. Barrow | 14. King Salmon |
| 3. Barter Island | 15. Kobuk |
| 4. Bethel | 16. Kotzebue |
| 5. Bettles* | 17. Mankomen Lake |
| 6. Canyon Village* | 18. Manley Hot Springs |
| 7. Chalkyitsik* | 19. McGrath |
| 8. Fairbanks | 20. Minto* |
| 9. Fort Greely* | 21. Nunivak |
| 10. Fort Yukon | 22. Point Hope |
| 11. Galena | 23. Port Alsworth |
| 12. Gambell | 24. Snowshoe Lake |

Alaska National Guard Stations

- | |
|----------------------|
| A. Arctic Village |
| B. Elim |
| C. Emmonak* |
| D. Kiana |
| E. Mountain Village* |
| F. Noatak |
| G. Selawik |
| H. Shishmaref |
| I. Stebbins |
| J. Teller |
| K. Tuntutuliak* |
| L. Wainwright |

*New ice stations.

Figure 2. Ice stations in Alaska.

of the stations in this National Guard network during the 1966-67 and 1967-68 winters are also shown in Figure 2. Three new stations have been added to the network since 1966: Emmonak, Mountain Village and Tuntutuliak, Alaska. Maximum annual ice thickness values received from some of the stations in this network were used in Figures 4 and 5.

Additional reports on ice thickness, ice conditions and ice prediction in North America and Greenland which were not listed in Parts I through IV are given in the *Selected Bibliography* of Part V.

Analysis

Figures 4 and 5 are maximum ice thickness maps for the winters of 1966-67 and 1967-68. The maximum ice values shown on the maps refer to specific points and years and should not be considered as maximum possible thicknesses. Fluctuations in snow depth and differences in

ICE THICKNESS OBSERVATIONS

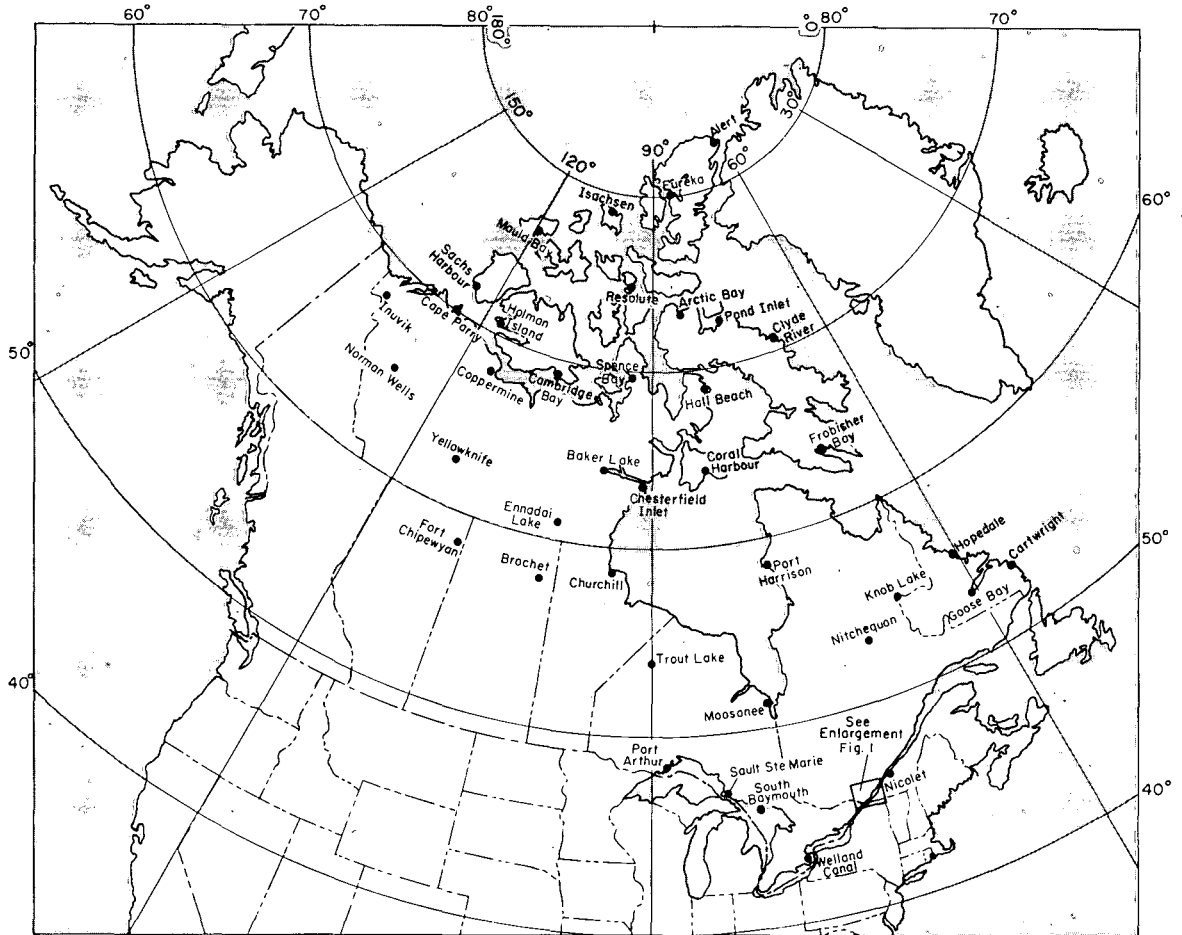


Figure 3. Ice stations in Canada.

meteorological and oceanographic parameters affect the accretion of ice. Consequently, significant differences in thickness may be encountered from place to place and year to year due to factors such as temperature and wind or tides and currents. Maps showing the *least* and *greatest* ice thickness observed at the time of maximum thickness based on 3 to more than 10 years of record are presented in Part III of this series.

The maximum ice thickness values used to prepare Figures 4 and 5 and the dates they were observed are given in Tables II and III. Since the extent of the ice observing network has remained essentially unchanged since 1962 the area of maximum ice thickness analysis remains the same. The general northwest-southeast pattern formed by the isolines of maximum ice in Canada (Fig. 4 and 5) also continues to remain the same, as do the high centers over the north-central region and Port Harrison. In Alaska, values greater than 140 cm of ice again appear in the northern and western zones and an area of less than 100 cm of ice extends from southern Alaska into the central interior. No Alaskan station in the network reported maximum ice thickness of less than 60 cm, but the 60-cm isoline did appear in the Great Lakes - St. Lawrence River area.

An analysis of the variations in ice thickness across Alaskan rivers similar to that given in Parts III and IV is presented here for the measurements made between 1965 and 1968 (Table I). Since fewer years of record were available for Part V than for Parts III and IV, the minimum number of observations required before a station was included in the survey was decreased from 5 to 2 and the years of record from 3 to 1. The computation to determine the variability of ice thickness across the rivers from the mean value remains the same:

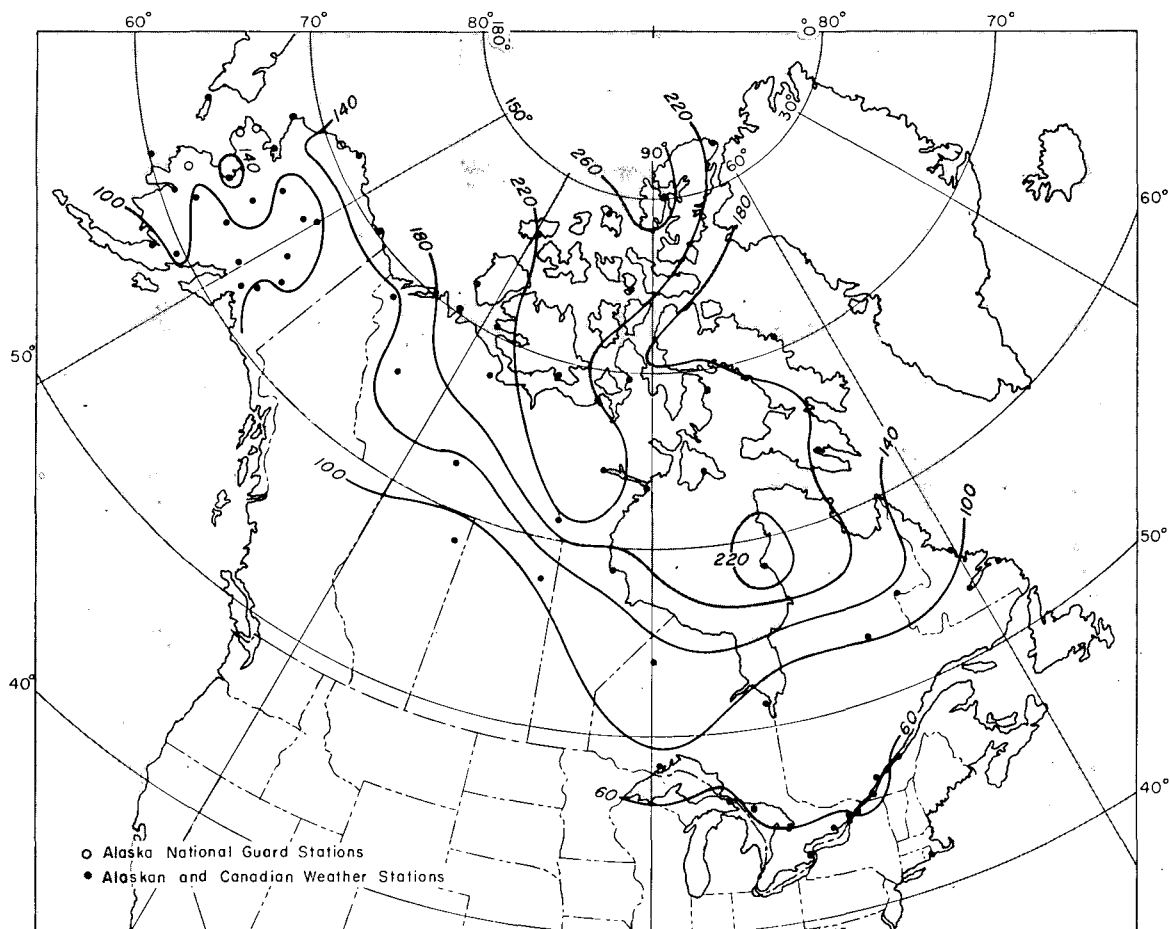


Figure 4. Maximum observed ice thickness in cm (1966-67).

$$\frac{\text{difference between maximum and mean ice thickness}}{\text{mean ice thickness}}$$

For example, if the observed maximum and minimum ice thicknesses across a river were 3.5 ft and 2.6 ft, the mean value would be 3.05 ft and the variation would be: $(3.50 - 3.05)/(3.05) = (0.45/3.05)$ or $\pm 15\%$. These computed percentages are given in Table I.

Of the 99 observations surveyed, open water or variations of $\pm 50\%$ or more were observed 45 times. If all calculations except the six cases of open water given in Table I are considered, the average deviation is 40%; but the variations range from $\pm 7\%$ to 100% (i.e. open water was observed). Variations in ice thickness across the river were high for Knik River at Palmer and Salcha River at Salchaket and low on Snake River at Nome and Skwentna River at Skwentna.

Results obtained from special ice thickness observations made during 1966-67 at Isachsen and 1967-68 at Resolute, Canada, are presented here for information. At Isachsen, measurements were made at two sites, one starting in early September 1966 on a newly formed ice sheet, and the second starting in mid-October on an old sea ice sheet which was 150 cm thick at that time. The old ice sheet had formed during a previous winter and had not completely melted during the summer of 1966. Figure 6 compares the simultaneous ice growth rate at these two sites. As expected, ice accumulated rapidly at the new ice site, and remained unchanged at the old ice site from September through mid-December. The erratic variations in ice thickness between mid-December 1966 and mid-

ICE THICKNESS OBSERVATIONS

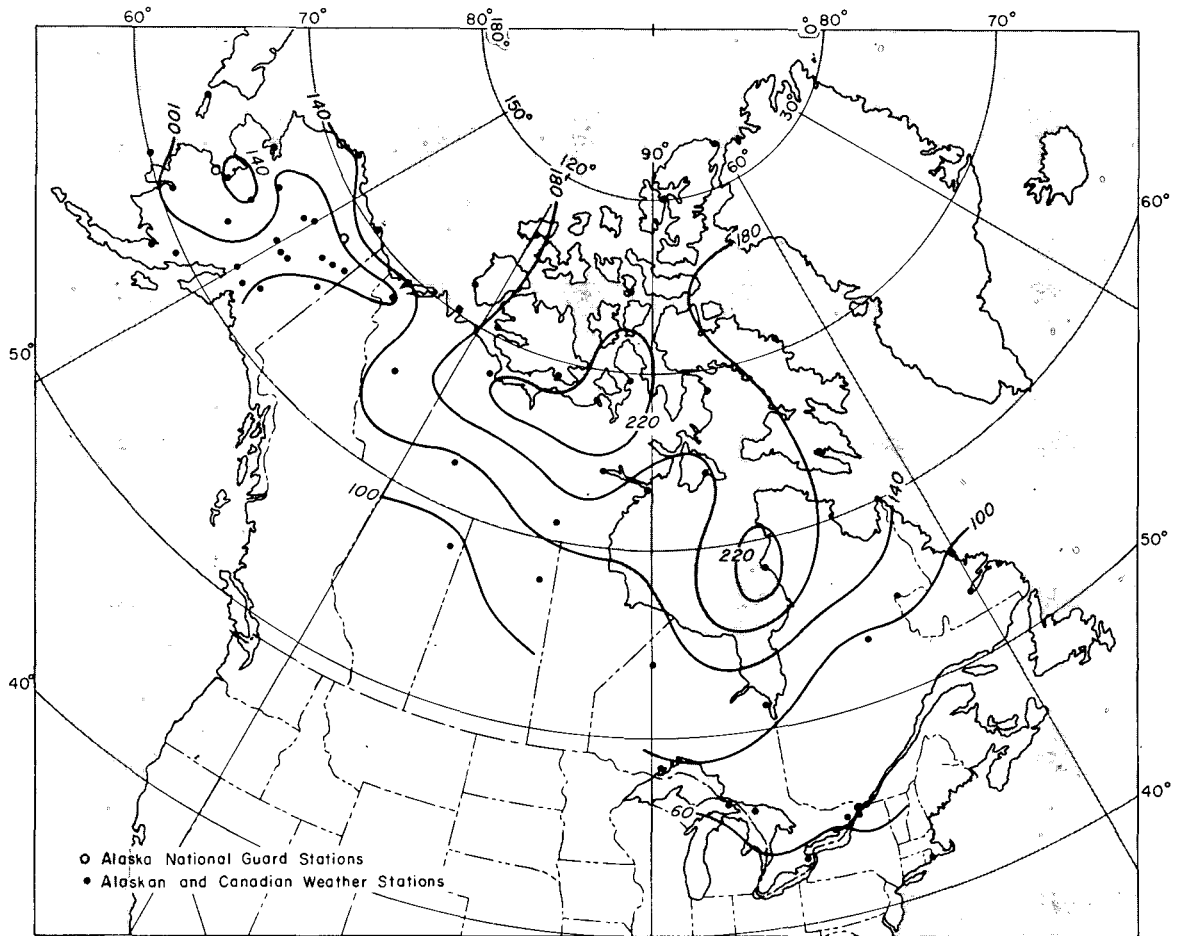


Figure 5. Maximum observed ice thickness in cm (1967-68).

February cannot be explained, except that some ice rafting may have occurred at the old ice site during this period. It is of interest that after both ice sheets finally stabilized at 200 cm in thickness in mid-February, they both then thickened at the same rate until early May when the ablation processes produced some variation.

At Resolute measurements during the 1967-68 winter were made at two sites close to each other. At one, the standard USA CRREL ice thickness measuring auger described in Part IV was used; at the second an experimental ice thickness measuring probe was used. The probe consists of a special 10 to 12-ft-long metal bar which is frozen vertically in the ice. When an enclosed element is heated electrically it becomes free and is lifted until a horizontal crossbar at the bottom of the probe reaches the underside of the ice. After the thickness of the ice is read the probe is released to allow the device at the bottom to descend into the water so that only the bar will re-freeze in the ice sheet. Additional details on this experimental probe may be obtained from the Canadian Meteorological Service, Department of Transport, Toronto, Canada.

Figure 7 compares the measurements made with the auger and the probe. Each thickness value obtained by the auger is from a single measurement; each value obtained by the probe is an average of three measurements. Both methods produced similar readings at the start of the observations in late November and during December 1967. Between January and early March 1968 the probe showed a slight decrease in ice followed by a slower and then a more rapid growth rate, while the auger showed a uniform growth rate during the same period. In March and April the probe indicated little additional ice growth whereas the auger showed an increase from 165 to 185 cm. The probe became inoperative on 12 April. Over the entire season the probe indicated thinner ice than the auger; at

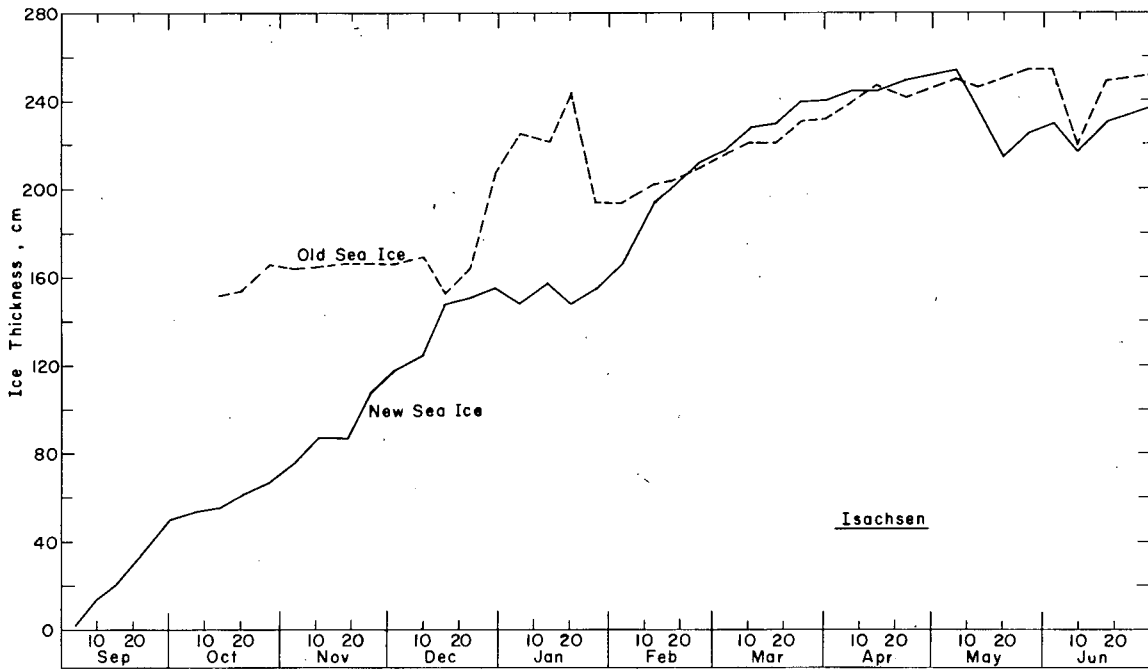


Figure 6. Comparison between ice growth measured in new fresh sea ice and old winter sea ice (1966-67).

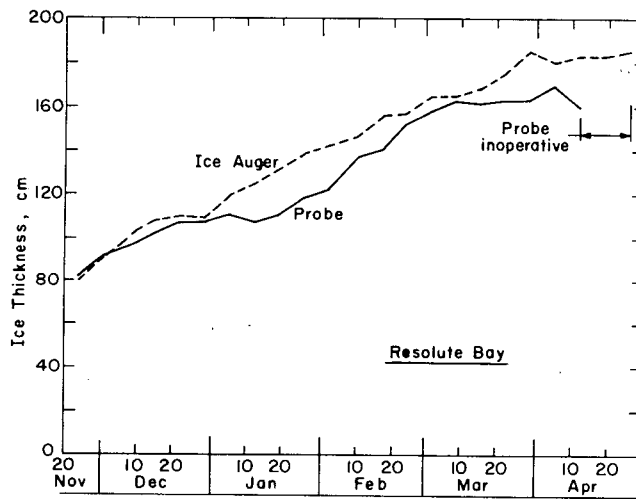


Figure 7. Comparison between ice auger measurements and experimental ice probe measurements, Resolute Bay, N.W.T. (1967-68).

times it showed as much as 20 to 23 cm difference. This difference may have been caused by different surface conditions (e.g. snow depths) resulting from human activity around the permanent installation. Changes in ice growth due to the effects of the thermal conductivity associated with use of the metal box were not available to the authors. Further field tests of the experimental probe were planned for subsequent winters, but the results of these tests are not available.

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Table I. U.S. Geological Survey ice data across rivers, Alaska - % difference.

Site	Year winter season ended			
	1965	1966	1967	1968
Ambler (Kobuk River)		20		16
Anchorage (Chester Creek)			50 67	
Anchor Point (Anchor River)		20	OW 60	
Cantwell (Copper River)			28 39	
Copper Center (Klutina River)			9 66	
Crooked Creek (Kuskokwim River)		39		28
Eagle (Eagle River)	OW	56 64 45 OW 25 61		16 9
Gakona (Gakona River)			30 94	
Glenallen (Tazlina River)			23 50	
Gold Creek (Susitna River)			10 18	97
Hughes (Koyukuk River)		14	20	9
Kaltag (Yukon River)		25	62	
Kasilof (Kasilof River)			50 29	
Lignite (Teklanika River)	88	50		38
McGrath (Kuskokwim River)			14	19
Nenana (Tanana River)	33	25 24	56 37	50
Nome (Snake River)	15	11 24	7	47
Northway Junction (Chisana River)		32		17
Palmer (Knik River)		56	78 83 94	83
Rampart (Yukon River)		81	47	
Rex (Nenana River)	40	19 15		
Ruby (Yukon River)			25	19
Salchaket (Salcha River)	43	84 53		63

OW = open water.

Table I (Cont'd).

Site	Year winter season ended			
	1965	1966	1967	1968
Skwentna (Skwentna River)			10 14	29
Soldotna (Kenai River)		41 62	43	75
Spenard (Campbell Creek)		OW	17 18 33	9
Sutton (Caribou Creek)		24	64	
Talkeetna (Chulitna River)			61 29	58
Talkeetna (Talkeetna River)		64 52 OW	26	59
Tonsina (Squirrel Creek)	50	OW	14	
Tonsina (Tonsina River)			25	33
Windy (Nenana River)			60 82	

OW = open water.

TABLE II (Cont'd)
ICE THICKNESSES (1966-1967)

Date	Ice Thickness (in.) (cm)		Snow Depth (in.) (cm)		Remarks
Barter Island (Alaska) (cont'd)					
1967					
Feb 17	58.	147.	6.5	17.	Surface lightly ridged, few cracks, avg depth of snow on shore: 7 in. (18 cm).
26	59.	150.	6.5	17.	Surface lightly ridged, " " , " " " " on shore: 7 in. (18 cm).
Mar 5	59.5	151.	6.5	17.	Surface lightly ridged, " " , " " " " on shore: 6.5 in. (17 cm).
11	60.	152.	7.	18.	Surface lightly ridged, few " " , " " " " on shore: 6.5 in. (17 cm).
18	60.	152.	8.	20.	Surface lightly ridged, few " " , " " " " on shore: 7.5 in. (19 cm).
25	60.5	154.	8.5	22.	Surface lightly ridged, few " " , " " " " on shore: 10 in. (25 cm).
Apr 3	61.5	156.	3.	8.	Surface lightly ridged, few " " , " " " " on shore: 8.5 in. (22 cm). Maximum ice thickness observed.
8	60.	152.	3.	8.	Surface lightly ridged, no cracks, avg depth of snow on shore: 7 in. (18 cm).
15	55.	140.	2.5	6.	Surface lightly ridged, " " , " " " " shore: 5 in. (13 cm).
22	52.	132.	2.	5.	Surface smooth, no cracks, avg depth of snow on shore: 4.5 in. (11 cm).
29	50.	127.	1.5	4.	Surface smooth, " " , " " " " " " 3 in. (8 cm).
May 5	49.	124.	2.	5.	Surface smooth, " " , " " " " " " 1.5 in. (4 cm).
12	48.	122.	0.5	1.	Surface smooth, " " , " " " " " " 0.5 in. (1 cm).
19	45.	114.	0.5	1.	Surface smooth, " " , " " " " " " trace.
26	42.	107.			Surface smooth, " " , " " " " " " trace.
Jun 2	40.	102.	trace		Surface smooth, few " " ,
9	37.5	95.	"		" " , numerous cracks.
16	34.	86.	"		" " , " " "
18					Lead opened in center of lake. Rapid thawing began.
					" widened to 15 x 20 ft.
23	24.	61.			Ice surface became soft under numerous puddles of water between 18 and 20 June. Surface smooth, and soft, numerous cracks.
30	14.5	37.			Due to breakup ice considered unsafe for further measurement by end of day. Open leads and floating ice chunks. Surface smooth and soft, numerous cracks.

Beauharnois* (P.Q.): Measurements made 400 ft below Lower Lock 3 on Lake St. Louis.

1967					
Mar 6	32.	81.	3.	8.	Surface ice blue in color, maximum ice thickness observed.
13	28.	71.			
27					Ice breaker in area.

Beauharnois* (P.Q.): Measurements made 400 ft above upper gates, Lock 4.

1967					
Feb 6	16.5	41.	1.5	4.	
20	22.	56.	2.	5.	
27	26.5	67.	2.	5.	
Mar 13	29.	74.			Maximum ice thickness observed 6 and 13 Mar.
27					Ice breaker in area.

* Ice thickness data available in: CANADIAN DEPT OF TRANSPORT ICE 2 DEC 1967

TABLE 11 (Cont'd)
ICE THICKNESSES (1966-1967)

Date	Ice Thickness (in.) (cm)	Snow Depth (in.) (cm)	Remarks
Bethel (Alaska): Measurements made south of Nerby's Store, 75 to 95 yd from the north shore.			
1966			
Oct 17			Ice piling on shore as tide goes out.
19			Ice started to flow and covered approximately half of river.
20			River frozen over with open water in places. Approximately 2/5 of river ice is smooth and 3/5 is pressure ridged averaging about 9 in. high, with some as high as 2 to 3 ft.
22			One open water area remained in front of Bethel Village.
24			Children and a few natives are traveling on river.
28			Plane landed on river ice on a marked off strip.
30	11.	23.	1. 3. Surface smooth, no cracks, water overflow on river in a few places.
Nov 6	13.5	34.	Surface smooth, no cracks, surface ice in spots contained a small layer of shell ice and/or water. Pressure ridges reduced in size and number due to warm weather.
13	13.5	34.	3. 8. Surface smooth, no cracks. Ice 14 in. (36 cm) thick 300 yd from shore.
20	15.	38.	Surface smooth, few cracks. Ice 16.5 in. (42 cm) thick 300 yd from shore.
27	18.	46.	Surface smooth, few cracks, rain reduced size of pressure ridges and only a few remain on river.
Dec 4	20.5	52.	Surface smooth, few cracks.
11	26.	66.	" " " " " "
18	29.5	75.	0.5 1. " " " " " "
26	32.5	83.	0.5 1. " " " " " ". Ice 34.5 in. (88 cm) thick 300 yd from shore.
27			Some water overflow on both sides of river.
31			Water overflowed ice test site.
1967			
Jan 2	33.	84.	0.5 1. Surface smooth, no cracks, overflow water on ice at measurement site. Shell ice at top over 5 in. (13 cm) of slush over the main ice layer. Avg depth of snow cover on shore: 4 in. (10 cm).
8	40.	102.	2. 5. Surface smooth, no cracks. Ice thickness greater because of freezing of overflow water. Avg depth of snow on shore: 6 in. (15 cm).
15	36.5	93.	2. 5. Surface smooth, no cracks. Measurement site moved 20 yd to avoid overflow area. Avg depth of snow on shore: 6 in. (15 cm).
22	36.5	93.	6. 15. Surface smooth, no cracks. " " " " " "
29	37.	94.	7. 18. Surface smooth, " " " " " " south side of river has less snow cover due to southerly winds and water overflow. Avg depth of snow on shore: 8 in. (20 cm).
Feb 5	38.	97.	8. 20. Surface smooth, no cracks. Ice in middle of river 35.5 in. (90 cm) with 8 in. (20 cm) of snow. Water overflow on south side of river increased in area. Avg depth of snow on shore: 8 in. (20 cm).
12	39.	99.	6.5 17. Surface smooth, no cracks, avg depth of snow on shore: 7.5 in. (19 cm).
19	39.5	100.	7.5 19. Surface smooth, " " " " " " " " " " " "
26	40.	102.	7.5 19. Surface smooth, " " " " " " " " " " " " " " " "
Mar 5	41.	104.	9. 23. Surface smooth, " " " " " " " " " " " " " " " "
12	41.5	104.	9. 23. Surface smooth, " " " " " " " " " " " " " " " "
19	41.	104.	9. 23. Surface smooth, " " " " " " " " " " " " " " " "
26	42.	109.	8.5 22. Surface smooth, no cracks, avg depth of snow on shore: 9 in. (23 cm). Ice readings taken at midstream of river agree favorably with those at ice measurement site.

TABLE II (Cont'd)
ICE THICKNESSES (1966-1967)

Date	Ice Thickness (in.) (cm)	Snow Depth (in.) (cm)	Remarks
Bethel (Alaska) (cont'd)			
1967			
Apr 1			Water and slush on middle portions in south end of river.
2	43.	110.	3.5 9. Surface smooth, no cracks, layer includes 5.5 in. (14 cm) of slush over main ice cover, with 3.5 in. (9 cm) of crusty snow at top.
3			River ice partially covered with slush.
4			" " completely " " " " . Planes having trouble taking off due to slush.
9	42.	107.	Surface smooth, no cracks. Layer consists of 3/4 in. (2 cm) ice over 8 in. (20 cm) slush over the main ice layer.
16	46.	117.	Surface smooth, no cracks. Layer consists of 3 in. (8 cm) crust ice over 6 in. (15 cm) water and slush, then 4 in. (10 cm) of very soft ice all over the main ice layer. Maximum ice thickness observed.
23	45.	114.	One to 8 in. of loose ice crystals on surface. Ice sheet at 3 points 42 to 45 in. thick and from 12 to 20 in. of it is very soft.
30	36.	91.	Two to 8 in. of loose ice crystals on surface. Ice sheet at 5 points varied between 25 and 37 in. in thickness, and from 9 to 19 in. of it is very soft. Few small open holes observed in ice. Surface extremely rough and becoming dark, overflow observed on south side of river during high tides.
May			
3			Water area on ice approximately 100 yd wide on south side of river and is increasing in depth.
4			Last of Cessna 180's were taken off the ice. Unable to walk on ice.
6			A Cessna of floats moved across the ice to south side and made a take off from the water area on the ice.
7			Ice is very dark. Some men walked across the ice but with great difficulty and one fell through. Shore ice is breaking up.
8			Anchor ice is moving and river ice has shifted. Ice started to move about 6:30 A.M.
9			Ice stopped most of the day. Most of ice now small chunks and needle-like in appearance. River still solid with ice.
10			Water still rising, ice moved only a little.
11			River about 1/3 full of ice and running on south side. A float plane landed on river near north side. A few boats seen on river.
12			River passed its crest. Few stray ice chunks in river.
14			Ice all gone. Ice flowed continuously in channel near the old airport during breakup.
Brochet* (MAN): Measurements made on portion of Reindeer Lake known as Brochet Bay.			
1966			
Oct 29			Brochet Bay completely covered with ice.
1967			
Apr 30	41.	104.	18. 46.
May 6	37.5	95.	13. 33.
13	38.	97.	12. 30.
27	41.	104.	
Jun 3	32.	81.	
10	25.	64.	
15			
18			

* Ice thickness data available in: CANADIAN DEPT OF TRANSPORT ICE 2 DEC 1967

TABLE II (Cont'd)
ICE THICKNESSES (1966-1967)

Date	Ice Thickness (in.) (cm)	Snow Depth (in.) (cm)	Remarks
Cambridge Bay* (N.W.T.): Measurements made 100 yd SSE of townsite dock.			
1967			
May 19	90.5	230.	Maximum ice thickness observed.
26	89.5	227.	
Jun 2	89.5	227.	1. 3.
9	90.	229.	trace
16	89.5	227.	1. 3. Shore lead becoming too wide to cross.
23	85.	216.	trace Surface smooth, no cracks from 4 Nov 1966 to 23 June 1967.
30	74.5	189.	trace " lightly rafted, few cracks.
Cape Parry* (N.W.T.): Measurements made on Gillet Bay approximately 1/2 mile due south of Federal Electric's hangar and about three hundred yd offshore.			
1966			
Oct 8			Freshwater lakes frozen over.
17	9.	23.	9 in. (23 cm) of ice on freshwater lakes.
Nov 2			Amundsen Gulf frozen over.
4			Surface smooth, no cracks.
11			" " , few "
15			Lead approximately 4 miles north, approximately 400 yd in width, length unknown.
21			From 18 to 21 Nov open water in east-west line approximately 1 mile from shore, 1 mile in width, length unknown.
24			Gulf completely ice covered.
25			Surface smooth, few cracks.
Dec 14			Open lead approximately 8 to 10 miles north, length and width unknown.
22			Same lead approximately 1.5 to 2 miles from shore.
1967			
Jan 20			Open water 1/2 mile from shore to north, approximately 2 miles in width, east to west, length unknown.
Feb 3			Surface smooth, few cracks.
10			" " , " " from 11 Nov 1966 to 10 Feb 1967.
24			Surface " , numerous cracks.
Mar 12			Open water approximately 1.5 miles from shore extending 10 miles north, length and width unknown.
13			Ice completely covering ocean due to strong NW winds.
15			Open water approximately 2 miles from shore. Width approximately 1000 yd, length unknown.
17			Ice completely covering ocean. No leads or open water.
31			Surface smooth, numerous cracks from 17 Feb to 31 Mar.
Jun 2			" " , few cracks from 7 Apr to 2 June. Amundsen Gulf open within approximately 3 miles from shore.
3			Amundsen Gulf open to approximately 1 1/2 to 2 miles from shore. Water partly covered with broken ice.
7			Strong east winds for two days. Ice broken to about 1/2 mile from shore.
9	80.5	204.	4. 10. Maximum ice thickness observed.
16	78.5	199.	4. 10.
23	73.	185.	4. 10. Strong NW winds; ice covers most of gulf. Few leads.
29			Gulf open to 3 miles from shore. Numerous cracks in remaining ice.
30	64.	163.	2. 5.
Jul 7	64.	163.	2. 5.
14	54.5	138.	2. 5.
21	30.	76.	1. 3. Surface smooth, numerous cracks from 9 June to 21 July.
23			Ice on the Amundsen Gulf moved in towards shore. Ice rotten with numerous cracks.
28			First movement of ice seaward. Gulf open to approximately 8 miles from shore. Gulf contains broken ice cakes.

* Ice thickness data available in: CANADIAN DEPT OF TRANSPORT ICE 2 DEC 1967

TABLE II (Cont'd)
ICE THICKNESSES (1966-1967)

Date	Ice Thickness (in.) (cm)	Snow Depth (in.) (cm)	Remarks
Cape Parry* (N.W.T.) (cont'd)			
1967			
Jul 31			Ice in Gillet Bay rotten with numerous cracks. Little sign of significant ice movement.
Cartwright* (NFLD): Measurements made approximately 200 yd south of USAF dock in Cartwright Harbour.			
1966			
Dec 8			Frozen over but broken up later in day. The narrow strait to west of measurement site not frozen over. This narrow strait very rarely freezes over. Surface lightly ridged, no cracks.
	17		" smooth, no cracks.
	25		" " " " " "
	30		" " " " " "
1967			
Feb 25			Open lead west of station due to strong tide, approximately 1/2 mile in length and 1/4 mile in width. Snow depths variable in Cartwright Harbour.
Mar 31	24.	61.	12. 30. Open lead due to strong tide still observed west of station. Length approximately 1/4 mile and width 1/8 mile.
Apr 28	27.	69.	7. 18. Maximum ice thickness observed. Open lead west of station throughout the above period due to strong tide. This lead is now approximately 1 mile in length and 1/2 mile in width and becoming larger daily.
May 5	23.	56.	5. 13. Surface smooth, no cracks from 25 Dec 1966 to 5 May 1967. Ice covered with considerable water and slush to a depth of 5 in. (13 cm).
	12		Ice measurement not taken, ice considered unsafe to walk on. Ice no longer in use as a runway for aircraft. Mail delivered on floats over open water areas to the west of Cartwright. Harbor half covered with rough ice, open water around Cartwright contains drifting ice pans.
Caughnawaga (P.Q.): Measurements made on south shore canal, approximately 3600 ft above Mercier Bridge.			
1967			
Jan 23	15.	38.	Surface ice blue in color, no cracks.
	30	44.	" " " " " " " " " "
Feb 6	18.	46.	
	13	56.	Few cracks.
	20	62.	
	27	62.	No " " " " " "
Mar 6	26.	66.	Maximum ice thickness observed.
	30		Ice breaker in area.
Chesterfield Inlet* (N.W.T.): Measurements made on Spurrel Inlet on Hudson Bay, approximately 1800 ft east of the operations building.			
1966			
Nov 4			Ice forming.
	14		Completely frozen over, with large areas of rafted ice on tidal flats.
1967			
May 5	78.	198.	2. 5.
	12	199.	2. 5.
	19	200.	3. 8.
	26	196.	7. 18.
Jun 3	79.5	202.	6. 15. Maximum ice thickness observed.
	10	201.	2. 5. Surface smooth, no cracks from 18 Nov 1966 to 10 June 1967.

* Ice thickness data available in: CANADIAN DEPT OF TRANSPORT ICE 2 DEC 1967

TABLE II (Cont'd)
ICE THICKNESSES (1966-1967)

Date	Ice Thickness (in.) (cm)		Snow Depth (in.) (cm)		Remarks
Chesterfield Inlet* (N.W.T.) (cont'd)					
1967					
Jun 16	75.	191.			Surface lightly ridged, numerous cracks.
22					Ice across mouth of Spurrel Inlet developed a huge crack and ice began to break up.
23					By morning, wind and tide had moved ice several miles offshore. Large amounts of floe ice drifting about in bay and considerable pileup of shore ice on tidal flats.
Churchill* (MAN): Measurements made approximately 400 ft WSW from edge of wharf on line with south end of #1 annex and 131 ft from south corner of conveyor gallery.					
1967					
May 12	65.	165.	10.	25.	Maximum ice thickness observed.
Jun 2	58.	147.			
9					Complete breakup.
Clyde River* (N.W.T.): Measurements made approximately 1200 ft NW of Dept of Transport living quarters, on Patricia Bay.					
1966					
Nov 8					Ice safe for walking.
10					1/2 bay frozen over.
14					Bay completely frozen over.
Dec 31	30.	76.	7.	18.	Surface smooth, few cracks from 12 Nov to 31 Dec.
1967					
Jan 28					Ridged ice around the shore, greatest concentration of ice is at head of bay.
Mar 26					Surface smooth, no cracks from 7 Jan to 26 Mar.
Jun 24	62.	157.	2.	5.	" " , few " . Maximum ice thickness observed.
Jul 2	55.	140.	1.	3.	
8	56.	142.			
15	38.	97.			" " , " " from 1 Apr to 15 July.
22	27.	69.			" " , numerous cracks.
25					A lead from the shore to polynya at head of bay formed allowing canoe travel.
Aug 3					Breakup occurred, however brash ice was carried into the bay by incoming tidal action.
Coppermine* (N.W.T.): Measurements made on Coronation Gulf near mouth of Coppermine River. At a point 100 yd north of Dept of Transport dock.					
1966					
Oct 25					Coppermine River frozen over.
31					Harbor frozen over.
1967					
Apr 28					Surface smooth, no cracks from 4 Nov 1966 to 28 Apr 1967.
May 5	70.	178.	2.	5.	" " , numerous cracks.
12	76.	193.	1.	3.	" " , " " .
20	80.	203.	1.	3.	" " , " " . Maximum ice thickness observed.
27	80.	203.	2.	5.	Surface " , " " .
Jun 2	76.	193.	2.	5.	" moderately rafted, numerous cracks.
9	72.	183.	2.	5.	" " " " " " .
16	54.	137.	1.	3.	Open area resulting from water runoff from land became a shore lead and extended 150 ft from shore and was approximately 3/4 mile in length. Surface heavily rafted, few leads.
20					Same shore lead became 250 ft in width, and 1 mile in length.
23	20.	51.			Thickness estimated because of shore lead and unsafe ice. Surface heavily rafted, numerous leads.
24					Numerous brash ice moving continually; occasionally water appeared clear of ice around sandbar. Lead averages 300 yd in width and 1/2 mile in length.
30					Breakup.

* Ice thickness data available in: CANADIAN DEPT OF TRANSPORT ICE 2 DEC 1967

TABLE II (Cont'd)
ICE THICKNESSES (1966-1967)

Date	Ice Thickness (in.) (cm)		Snow Depth (in.) (cm)		Remarks
Coral Harbour* (N.W.T.): Measurements made in South Bay 5/8 mile SW of Snafu Point.					
1966					
Nov 28					Surface smooth, no cracks 12 to 28 Nov.
1967					
Jan 1					First appearance of light hummocking along the shore.
27					" " " a few standing floes. Light hummocking observed along the shoreline throughout the month. Surface smooth, few cracks from 4 Dec 1966 to 27 Jan 1967.
Feb 4					Surface lightly rafted, few cracks.
24					No observation due to breakdown of Bombadier.
May 30	66.	168.	12.	30.	Surface moderately rafted, few cracks from 4 Mar to 30 May.
Jun 3	66.	168.	12.	30.	
9	78.5	199.	11.	28.	Maximum ice thickness observed.
17	77.	196.	6.	15.	Surface lightly ridged, few cracks 3 to 17 June.
24	62.5	159.			" smooth, few cracks.
Cornwall Canal* (ONT): Measurements made 400 ft above Lock 19.					
1967					
Jan 23					Ice thickness readings commenced at the above measurement site. Water level of canal 3 to 4 ft below normal.
Mar 20	21.	53.			Maximum ice thickness observed.
28	20.	51.			Surface of ice beginning to rot. Surface smooth, no cracks from 23 Jan to 28 Mar.
Apr 3					Ice unsafe to measure. Open water 400 ft west of measuring site. Crack 25 ft NE of site about 50 ft in length. Surface smooth.
Cote Ste. Catherine* (P.Q.): Measurements made on south shore canal, 500 ft above upper sector gates.					
1967					
Feb 6					Surface smooth, no cracks from 23 Jan to 6 Feb.
Mar 6	27.	69.			" ice blue in color.
13	30.	76.			Maximum ice thickness observed. Surface smooth, few cracks 13 Feb to 13 Mar.
Ennadai Lake* (N.W.T.): Measurements made on Ennadai Lake, 270 degrees true from station approximately 100 yd from shore.					
1966					
Nov 26					Snowdrifts 6 to 8 in. (15 to 20 cm) in height, numerous clear patches of ice.
Dec 30					Snowdrifts 6 to 8 in. (15 to 20 cm) in height. all month, numerous areas of ice surface clear of snow.
1967					
Jan 31					Snowdrifts 6 to 8 in. (15 to 20 cm) in height all month, numerous areas of ice surface clear of snow.
Feb 28					Snowdrifts 4 to 6 in. (10 to 15 cm) in height all month, numerous areas of ice surface clear of snow.
Mar 24					Surface smooth, no cracks from 4 Nov 1966 to 24 Mar 1967.
31					Snowdrifts 16 to 20 in. (41 to 51 cm) in height all month, areas of ice surface clear of snow.
Apr 30					Snowdrifts 12 to 20 in. (30 to 41 cm) in height all month, few areas of ice surface clear of snow.

* Ice thickness data available in: CANADIAN DEPT OF TRANSPORT ICE 2 DEC 1967

TABLE II (Cont'd)
ICE THICKNESSES (1966-1967)

Date	Ice Thickness (in.) (cm)		Snow Depth (in.) (cm)		Remarks
Ennadai Lake* (N.W.T.) (cont'd)					
1967					
May 19	85.	216.	8.	20.	Maximum ice thickness observed. Snow generally 6 in. (15 cm) in depth, many bare spots on ice surface, few drifts. A layer of water covers ice, varying from 1 to 3 in. deep in spots.
26	81.5	207.	6.	15.	
Jun 2	79.	201.	trace		
9	76.5	194.	"		
16	67.5	171.	"		
19					Shore lead developed around station.
23	55.5	141.			
26					First ice movement occurred. No snow on ice. Ice rotten in places and generally candled to a depth of 6 to 12 in. (15 to 30 cm).
29					Several large cracks first noted in ice between station and island. Cracks varied from 6 in. to several ft in width. Lead from shore along station to island 1/2 mile in length.
30	35.5	90.			Surface smooth, few cracks from 31 Mar to 30 June.
Jul 7					" " , numerous cracks.
11					High winds cleared a portion of the bay of ice.
17					Some ice remained south of station until high winds and warmer temperatures caused complete breakup.
Eureka* (N.W.T.): Measurements made on Slidre Fiord, approximately 300 yd south of new barracks.					
1966					
Sep 8					First ice formed completely over fiord.
18					Rafted, hummocked, and ridged pressure ice observed off shoreline with smooth ice conditions observed towards center of fiord. Surface smooth, few cracks.
25					Various types of pressure ice offshore extending 1/2 mile, with smooth ice conditions observed towards center of Fiord.
Oct 18					Fresh water ice thickness 20 in. (51 cm) in dam storage pond.
Nov 15					Fresh water ice " 35 in. (89 cm) " " storage pond.
1967					
Jan 21					Air temperature reached -53F 15 to 21 Jan.
May 5	96.	244.	6.	15.	Surface moderately hummocked, few cracks.
12					" " " " " " from 30 Sept 1966 to 12 May 1967.
20	105.	267.	2.	5.	Maximum ice thickness observed. Numerous cracks across fiord after 12 May. Water observed running off land onto fiord ice. Depth of water on ice varies from 4 to 15 in. Light ridging, numerous cracks.
26	101.	256.	6.	15.	Surface lightly ridged, numerous cracks.
Jun 2	99.	251.	1.	3.	Numerous puddles forming fiord from snow melt and water runoff from land. Leads extending from north and south shores nearly across fiord, with cracks extending across fiord.
10	94.	239.	1.	3.	Surface lightly ridged, numerous cracks.
16	80.	203.			" " hummocked, " " "
24	75.	191.			" " " " leads.
30	65.	165.			" " " " " " Thaw holes starting to show through ice in a few places. Polynya forming at each river mouth, at the creek mouth and into fiord. Numerous puddles on ice.

* Ice thickness data available in: CANADIAN DEPT OF TRANSPORT ICE 2 DEC 1967

TABLE II (Cont'd)
ICE THICKNESSES (1966-1967)

Date	Ice Thickness (in.) (cm)	Snow Depth (in.) (cm)	Remarks
Eureka* (N.W.T.) (cont'd):			
1967			
Jul 8	55. 140.		Advanced honeycombing and thaw holes; extensive cracks over entire fiord; shore lead 200 yd in width observed. Numerous leads across fiord north-south up to 1/2 mile in width.
12			
13	45. 114.		Slide Fiord breaking up.
15			Fiord 30 percent open water and extended at least 6 square miles in front of station.
Fairbanks, (Alaska) (College Experiment Station): Measurements made on Smith Lake, approximately 4000 ft NNW of the weather bureau station.			
1966			
Oct 6			Shore ice out to 2 to 3 ft from shore, ice 1/8 in. thick.
8			Shore " " " 20 to 50 ft " " , " 1/4 to 3/8 in. thick.
10			1/4 of lake covered with ice 1/4 to 3/4 in. thick, east end open.
15			Lake frozen over, ice 1/2 to 1 in. (.5 to 3 cm) thick.
22	3. 8.	1.5 4.	Surface smooth, few small cracks.
29	7. 18.	1. 3.	" " " " " " " "
Nov 2	10. 25.	1. 3.	" " " " " " " "
11	10. 25.	5. 13.	" " " " " " " " Snow density 0.138 g/cm ³ .
16	11. 29.	5. 13.	" " " " " " " " 0.129 " "
18	13. 33.	12. 30.	" " " " " " " " 0.147 " "
29	13. 33.	4. 10.	" " " " " " " " 0.145 " "
Dec 6	17. 43.	4.5 11.	Snow density 0.142 g/cm ³ .
13	18.5 47.	5. 13.	" " " " " " " " 0.152 " "
20	19.5 50.	4. 10.	" " " " " " " " 0.164 " "
26	21. 53.	6. 15.	" " " " " " " " 0.158 " "
1967			
Jan 4	22. 56.	8. 20.	" " " " " " " " 0.155 " "
12	23. 58.	8. 20.	" " " " " " " " 0.160 " "
19	24. 61.	8.5 22.	" " " " " " " " 0.122 " "
25	24. 61.	12. 30.	" " " " " " " " 0.130 " "
Feb 1	25. 64.	10.5 27.	" " " " " " " " 0.160 " "
7	25. 64.	13. 33.	" " " " " " " " 0.167 " "
17	29. 74.	12. 30.	" " " " " " " " 0.155 " "
21	26. 66.	12. 30.	" " " " " " " " 0.162 " "
27	26. 66.	12. 30.	" " " " " " " " 0.161 " "
Mar 8	26. 66.	16.5 42.	" " " " " " " " 0.185 " "
14	27. 69.	15.5 39.	" " " " " " " " 0.194 " "
21	28. 71.	18. 46.	" " " " " " " " 0.165 " "
31	27. 69.	23. 58.	" " " " " " " " 0.162 " "
Apr 6	27.5 70.	7. 18.	7 in. water on top of ice.
14	28. 71.	10.5 27.	5 " " " " " " " "
19	28.5 72.	4.5 11.	" " " " " " " " "
28	30. 76.	4. 10.	" " " " " " " " " Maximum ice thickness observed.
May 2			Water on top of ice.
10			No thawing along shoreline.
20			Lake frozen over with very little thawing along west shore outlet of lake.
22			Majority of lake frozen over, considerable thawing along west shore.
28			Lake clear of ice.
Fort Chipewyan* (ALTA): Measurements made 800 ft south of government dock on Lake Athabasca.			
1966			
Nov 11			Surface smooth, few cracks.
18			" " " " " " " " from 11 to 18 Nov.

* Ice thickness data available in: CANADIAN DEPT OF TRANSPORT ICE 2 DEC 1967

TABLE II (Cont'd)
ICE THICKNESSES (1966-1967)

Date	Ice Thickness (in.) (cm)		Snow Depth (in.) (cm)		Remarks
Fort Chipewyan* (ALTA) (cont'd)					
1966					
Nov 23					Vehicles began crossing ice on winter road. Ice measured at Quatres Fourches River crossing. The 12 measurements were taken with an average of 25 cm. Surface smooth, no cracks.
25					
Dec 9					" " " " " from 18 Nov to 9 Dec.
1967					
Apr 7					" lightly ridged, few cracks from 16 Dec 1966 to 7 Apr 1967.
15					Winter road on ice out of service.
21	36.	91.	10.	25.	Maximum ice thickness observed from 7 to 21 Apr.
28	33.5	85.	6.	15.	Surface lightly rafted, few cracks 14 to 28 Apr.
Fort Greely, Bolio Lake (Alaska): Measurements made at two sites on Bolio Lake, one 150 ft from shore and the other in the center of lake. Remarks pertain to both sites and the first snow and ice value for each date refers to the 150 ft location.					
1966					
Nov 18	11.	28.	6.	15.	Surface smooth, no cracks. Avg depth of snow on shore: approximately 12 in. (38 cm). Drifting of snow on lake.
	13.	33.	6.	15.	
25	11.	28.	10.	25.	Surface smooth, no cracks. Avg depth of snow on shore: approximately 12 in. (30 cm). Drifting of snow on lake.
	14.	36.	10.	25.	
Dec 2	13.	33.	6.	15.	Surface smooth, no cracks. Avg depth of snow on shore: approximately 12 in. (30 cm).
	14.	36.	8.	20.	
9	13.	33.	6.	15.	Surface smooth, no cracks. " " " " " " "
	14.	36.	8.	20.	approximately 12 in. (30 cm). Drifting of snow on lake.
23	18.	46.	6.	15.	Surface smooth, no cracks. Avg depth of snow on shore: approximately 12 in. (30 cm). Drifting of snow on lake.
	18.	46.	8.	20.	
1967					
Jan 5	20.	51.	4.	10.	Surface smooth, no cracks. Avg depth of snow on shore: approximately 15 in. (38 cm). Drifting of snow on lake.
	20.	51.	6.	15.	
20	24.	61.	6.	15.	Surface smooth, no cracks. Avg depth of snow on shore: approximately 15 in. (38 cm). Drifting of snow on lake.
	23.	58.	6.	15.	
26	24.	61.	9.	23.	Surface smooth, no cracks. " " " " " " "
	24.	61.	10.	25.	approximately 15 in. (38 cm). Drifting of snow on lake.
Feb 2	24.	61.	9.	23.	Surface smooth, no cracks. Avg depth of snow on shore: approximately 15 in. (38 cm). Drifting of snow on lake.
	23.	58.	10.	25.	
9	28.	71.	7.	18.	Surface smooth, no cracks. Avg depth of snow on shore: approximately 15 in. (38 cm). Drifting of snow on lake.
	28.	71.	9.	23.	
17	27.	69.	8.	20.	Surface smooth, no cracks. Avg depth of snow on shore: approximately 15 in. (38 cm). Drifting of snow on lake.
	28.	71.	9.	23.	
24	29.	74.	9.	23.	Surface smooth, no cracks. Avg depth of snow on shore: approximately 15 in. (38 cm). Drifting of snow on lake.
	27.	69.	12.	30.	approximately 20 in. (51 cm). Drifting of snow on lake.
Mar 2	29.	74.	6.	15.	Surface smooth, no cracks. Avg depth of snow on shore: approximately 15 in. (38 cm). Drifting of snow on lake.
	28.	71.	8.	20.	
10	30.	76.	10.	25.	Surface smooth, no cracks. Avg depth of snow on shore: approximately 15 in. (38 cm). Drifting of snow on lake.
	28.	71.	12.	30.	
17	30.	76.	8.	20.	Surface smooth, no cracks. Avg depth of snow on shore: approximately 15 in. (38 cm). Drifting of snow on lake.
	27.	69.	14.	36.	
24	32.	81.	10.	25.	Surface smooth, no cracks. Avg depth of snow on shore: approximately 20 in. (51 cm). Drifting of snow on lake.
	29.	74.	14.	36.	Maximum ice thickness observed 150 ft from shore.
31	27.	69.	12.	30.	Surface smooth, no cracks. Avg depth of snow on shore: approximately 20 in. (51 cm). Drifting of snow on lake.
	30.	76.	6.	15.	Maximum ice thickness observed center of lake.
Apr 7	30.	76.			Surface smooth, no cracks. Avg depth of snow on shore: approximately 15 in. (38 cm). Almost all snow on lake has melted. 3 in. (8 cm) of slush present where measurement was made.

* Ice thickness data available in: CANADIAN DEPT OF TRANSPORT ICE 2 DEC 1967

TABLE II (Cont'd)
ICE THICKNESSES (1966-1967)

Date	Ice Thickness		Snow Depth		Remarks
	(in.)	(cm)	(in.)	(cm)	
Fort Greely, Bolio Lake (Alaska) (cont'd)					
1967					
Apr 13	30.	76.	4.	10.	Surface smooth, no cracks. Avg depth of snow on shore: approximately 15 in. (38 cm). At 150 ft from shore 2 in. (5 cm) of frozen slush present between snow and ice. Halfway across lake, 2 in. (5 cm) of frozen slush ice present directly under the snow. This was chipped away before drilling. After drilling through 2 in. (5 cm) of water was found and after drilling through a total of 8 in. (20 cm) of ice, another break-through occurred. This 8 in. (20 cm) was called frozen slush in addition to the 2 in. (5 cm) of frozen slush that had been chipped away before drilling. A total of 24 in. (61 cm) of ice therefore, covered the lake.
	24.	61.	2.	5.	
Fort Yukon (Alaska): Measurements made on Yukon River.					
1966					
Nov 6	12.5	32.	1.	3.	Surface smooth, no cracks.
	13.	33.	1.5	4.	" " " "
	18				First run of ice on Yukon River.
	19	41.	1.5	4.	Surface smooth, no cracks.
	20				Shore ice forming at measurement site.
27	22.	56.	2.	5.	Freeze over across the river. Surface smooth, no cracks.
Dec 3	28.5	72.	2.	5.	Surface smooth, no cracks.
	34.	86.	2.	5.	" " " "
	24	37.5	3.	8.	" " " "
	31	39.	5.	13.	" " " "
1967					
Jan 7	40.5	103.	8.5	22.	" " " "
	41.	104.	8.5	22.	" " " "
	22	42.	9.5	24.	" " " "
	28	37.	9.5	24.	" " " "
Frobisher Bay* (N.W.T.): Measurements made halfway between Dept of Transport causeway and Long Island.					
1966					
Dec 2					Surface smooth, no cracks.
	10				" " " "
	16				" " " "
	30				Tidal ridge extends parallel to shore. Ridge is 20 ft high and approximately 100 ft from shore.
1967					
Jan 31					Tidal ridge extends parallel to shore. Ridge is 20 ft high and approximately 150 ft from shore.
Feb 12					Surface smooth, few cracks from 23 Dec 1966 to 12 Feb 1967.
	28				Tidal ridge parallel to shore. Ridge is 20 ft high and approximately 200 ft from shore.
Mar 31					Tidal ridge parallel to shore. " " " " " " approximately 250 ft from shore.
Apr 14	60.	152.	4.	10.	
	21	55.	4.	10.	
	28	65.	8.	20.	
	30				Tidal ridge parallel to shore. " " " " " " approximately 250 ft from shore.
May 5	65.	165.	4.	10.	
	12	66.	8.	20.	
	19	69.	8.	20.	Maximum ice thickness observed.
	26	68.	2.	5.	Surface smooth, numerous cracks from 17 Feb to 26 May.
	31				Tidal ridge parallel to shore. Ridge is 20 ft high and approximately 250 ft from shore.

* Ice thickness data available in: CANADIAN DEPT OF TRANSPORT ICE 2 DEC 1967

TABLE II (Cont'd)
ICE THICKNESSES (1966-1967)

Date	Ice Thickness (in.) (cm)	Snow Depth (in.) (cm)	Remarks
Frobisher Bay* (N.W.T.) (cont'd)			
1967			
Jun 3	58. 147.	2. 5.	Surface rough, numerous cracks. Open leads forming and gradually widening.
9	63. 160.	1. 3.	Surface rough, numerous " "
16	53. 135.	1. 3.	" " , " " .
23	38. 97.	1. 3.	" " , " " .
30			considered unsafe for ice thickness measurement. rough, numerous cracks.
Galena (Alaska): Measurements made on Yukon River at Galena approximately 300 ft out from shore.			
1966			
Oct 10			First ice observed in river. Current appears to be normal and river is rising slowly.
22			Ice started flowing in river and froze solid on edges of river on side away from current.
29	9. 23.		Ice still moving in channel at normal current speed. Ice frozen solid with cracks on side away from current. The 9 in. (23 cm) thickness measurement is along the shore where there is little or no current.
Nov 5	11. 28.	3. 8.	Surface rough, few cracks.
12	12. 30.	5. 13.	" " , " " .
26			No ice measurements on 19 and 26 Nov due to water overflow approximately 40 ft wide on one side of river.
Dec 24	23. 58.	10. 25.	Surface smooth, few cracks.
31	22. 56.	10. 25.	" " , " " .
1967			
Jan 7	24. 61.	10. 25.	" " , numerous cracks.
14	26. 66.	10. 25.	" " , " " .
21	27. 69.	14. 36.	" " , " " .
28	28.5 72.	7. 18.	" " , " " . Snowdrifts of various sizes in all areas of Yukon River.
Feb 4	31. 79.	10. 25.	Surface rough.
11	34. 86.	10. 25.	" " .
18	30. 76.	16. 41.	" " .
25	32. 81.	19. 48.	" " , numerous cracks.
Mar 4	34. 86.	23. 58.	" " , " " .
11	33. 84.	23. 58.	" " , " " .
18	36. 91.	20. 51.	" " , " " .
25	45. 114.	22. 56.	" " , " " . Maximum ice thickness observed.
Apr 30			No observations taken in Apr.
May 8			26 to 30 ft of open water out from shore.
Gambell (Alaska): Measurements made on Troutman Lake.			
1966			
Oct 10			Ice formed on Troutman Lake.
15	2.5 6.		Surface smooth, no cracks.
22	5. 13.		" " , very few cracks. Crack 1/4 in. in width, approximately 30 yd in length at south end of lake.
29	8.5 22.		Surface smooth, very few cracks.
Nov 5	10.5 27.		" " , few cracks.
12	12. 30.		" " , " " .
19	13.5 34.		" " , " " .
26	15. 38.		" rough, " " .

* Ice thickness data available in: CANADIAN DEPT OF TRANSPORT ICE 2 DEC 1967

TABLE II (Cont'd)
ICE THICKNESSES (1966-1967)

Date	Ice Thickness (in.) (cm)		Snow Depth (in.) (cm)		Remarks
Goose Bay* (NFLD) (cont'd)					
1967					
May 19					Ice considered unsafe.
28					Basin completely free of ice.
Hall Beach* (N.W.T.): Measurements made in harbor ESE from weather office, 120 yd SE of end of dock which is aligned E-W.					
1966					
Nov 26					Lead observed, masked by sea smoke. Ice rafted 3 ft high for the first 1/4 mile this side of open water. Surface lightly ridged, few cracks from 12 to 26 Nov.
Dec 31					Leads parallel and about 1 mile from shore, masked mostly by sea smoke.
1967					
Jan 20					Surface smooth, few cracks from 2 Dec 1966 to 20 Jan 1967.
31					Great amounts of sea smoke evident about 1/2 to 3/4 mile offshore all month.
Feb 28					Lead approximately 3/4 mile offshore evident all month. Depending on winds, leads were observed up to several miles in width and length.
Mar 31					Lead 1 mile offshore, varying in width and length with changes in wind direction.
Apr 28					One lead, variable in width, estimated to be 1/4 mile off shore. Lead closes with onshore winds. 200 to 300 ft from shore two cracks approximately 2 ft in width have appeared.
May					Lead observed occasionally 3/4 mile offshore.
Jun 23	79.	201.	6.	15.	Water observed on ice. Surface lightly ridged, few cracks from 29 Jan to 23 June. Maximum ice thickness observed.
30	69.	175.			Pools of water and slush on ice. Surface lightly ridged, numerous cracks.
Holman Island* (N.W.T.): Measurements made on West side of Kings Bay, 150 ft from shoreline tidal crack.					
1966					
Nov 25					Amundsen Gulf appears to be completely frozen over. No strong winds observed during month.
1967					
Jan 27					Some ice movement and small patches of open water observed on Amundsen Gulf.
Feb 3					Amundsen Gulf completely frozen over.
Apr 28					No ice movement, or open water observed in Amundsen Gulf.
Jun 9	84.	213.	3.	8.	Maximum ice thickness observed 2 and 9 June.
16	82.5	210.			Surface lightly ridged, no cracks from 4 Nov 1966 to 16 June 1967.
23	76.	193.			Surface smooth, few cracks.
30	69.5	177.			Small lead 23 to 30 June between Holman and Holman Island. Lead opens and closes with wind and tides, avg width 30 to 50 ft. Small ice movement, weather cold and no signs of breakup. Small lakes still completely frozen except along shorelines.
Holy Cross (Alaska): Measurements made 1/2 mile above Holy Cross on Walker's Slough.					
1966					
Oct 17					Ice first formed on slough.
20					Ice safe for man.
26					Ice safe for jeep travel. Ice first formed on Yukon River.
29	12.	30.	trace		Ice completely covered Yukon River with the exceptions of a few holes in area opposite Holy Cross. Surface smooth, no cracks.

* Ice thickness data available in: CANADIAN DEPT OF TRANSPORT ICE 2 DEC 1967

TABLE II (Cont'd)
ICE THICKNESSES (1966-1967)

Date	Ice Thickness (in.)	(cm)	Snow Depth (in.)	(cm)	Remarks
Holy Cross (Alaska) (cont'd)					
1966					
Nov 5	14.	36.	1.	3.	Surface smooth, no cracks.
19	17.	43.	trace		Surface lightly ridged, no cracks.
27	20.	51.	0.5	1.	Surface smooth, no cracks.
Dec 2	22.	56.	1.5	4.	" " " " . Avg depth of snow: 2 in. (5 cm).
11	28.	71.	1.	3.	Surface lightly ridged, no cracks. Avg depth of snow: 1 in. (3 cm).
1967					
Jan 8	30.	76.	10.	25.	Surface smooth, no cracks. Avg depth of snow: 12 in. (30 cm).
14	31.	79.	8.	20.	Surface " " " " " " " " 11 in. (28 cm).
21	34.	86.	7.	18.	Surface " " " " " " " " 10 in. (25 cm).
28	32.	81.	11.	28.	Surface " " " " " " " " 11 in. (28 cm).
Feb 4	33.	84.	10.5	27.	Surface " " " " " " " " 11 in. (28 cm).
13	38.	97.	9.	23.	Surface " " " " " " " " 11 in. (28 cm). Maximum ice thickness observed.
18	36.	91.	10.5	27.	Surface smooth, no cracks. Avg depth of " 11.5 in. (29 cm).
25	34.	86.	12.	30.	Surface " " " " " " " " 12 in. (30 cm).
Mar 4	32.	81.	11.	28.	Surface " " " " " " " " 11 in.
Hopedale* (NFLD): Measurements made on Hopedale Harbor on a line from USAF dock to Ellen Island.					
1966					
Dec 15					Freeze over.
30					Open lead observed between Ellen and Anniowaktook Islands froze over on 27 Dec. Lead approximately 100 yd in length, 50 yd in width.
1967					
Jan 13					Surface lightly ridged, no cracks from 16 Dec to 13 Jan.
20					Surface heavily ridged, no cracks.
27					Snow on 20 and 27 was packed very hard. Surface moderately ridged, no cracks.
Feb 3					Surface lightly ridged, no cracks.
26					Surface heavily ridged, no cracks from 10 to 26 Feb.
Mar 23					Surface lightly ridged, no cracks from 3 to 23 Mar.
31	41.5	105.	4.	10.	Ice surface covered with frozen snow, surface rough. Surface moderately ridged, no cracks. Maximum ice thickness observed.
Apr 7	41.	104.	3.	8.	Surface lightly ridged, no cracks.
15	40.	102.	4.	10.	" moderately " " " "
21	39.	99.	3.	8.	" " " " few "
28	27.	94.	3.	8.	" " " " " "
May 5	34.	86.			
12	32.	81.	2.	5.	Approximately 2 in. (5 cm) slush on ice.
19	33.	83.	1.	3.	Surface smooth, few cracks from 5 to 19 May.
26	28.	71.	2.	5.	" " , numerous cracks.
27					Open lead in extreme west end of harbor around USAF docks, widening rapidly.
31					Ice thawed along shoreline, used boat to gain access to ice for measurement. Open lead 25 yd wide around shoreline along north side of harbor.
Jun 1					Large open lead between Anniowaktook and Ellen Islands.
2	15.	38.			Surface smooth, numerous cracks.
3					Last aircraft landing on ice.

* Ice thickness data available in: CANADIAN DEPT OF TRANSPORT ICE 2 DEC 1967

TABLE II (Cont'd)
ICE THICKNESSES (1966-1967)

Date	Ice Thickness (in.) (cm)		Snow Depth (in.) (cm)		Remarks
Hopedale* (NFLD) (cont'd)					
1967					
Jun 4					Ice began to break up.
5					Few loose ice cakes left in harbor.
7					Harbor completely free of ice.
Inuvik* (N.W.T.): Measurements made on Mackenzie River east channel at townsite of Inuvik, N.W.T., midstream about 80 yd off docking area and adjacent to ice landing strip.					
1967					
Apr 7	54.	137.	7.	18.	Maximum ice thickness observed.
14	52.	132.	12.	30.	
21	48.	122.	14.	36.	
28	44.5	113.	3.	8.	Water on top of ice near shore, snow very wet. Surface smooth, few cracks from 4 Nov 1966 to 28 Apr 1967.
May 5					10 to 15 ft of open water between main ice sheet and shoreline. Water covers approximately 25% of ice.
12					15 to 20 ft of open water between main ice sheet and shoreline.
29					Small aircraft taking off and landing on water.
31					Open water on both sides of river. Distance from shoreline to ice sheet varies between 50 to 100 ft.
Iroquois* (ONT): Measurements made 500 ft above upper gates of Lock 7.					
1967					
Jan 23					Ice appeared unsafe to measure. Open water 1500 ft west of lock.
Feb 27	16.	41.	5.	13.	
Mar 6	16.	41.	5.	13.	Maximum ice thickness observed on 27 Feb and 6 Mar.
13	12.	30.	1.	3.	Surface smooth, no cracks from 23 Jan to 13 Mar.
20					Unsafe to measure ice. Open water 125 ft west of upper gates, ice rotting and open water in spots.
Iroquois* (ONT): Measurements made 400 ft below lower gates of Lock 7.					
1967					
Jan 23					Ice unsafe to measure, broken pieces of ice partly frozen together. Surface smooth, no cracks.
26					Open water.
30					Surface frozen over. Unsafe to measure. Surface lightly ridged, no cracks.
Feb 27	16.	41.	4.	10.	
Mar 6	16.	41.	4.	10.	Surface lightly ridged, no cracks from 6 Feb to 6 Mar.
13	12.	30.			Maximum ice thickness observed on 27 Feb and 6 Mar.
20					Surface smooth, no cracks. Approximately 1 in. of overflow water has frozen.
				Unsafe to measure ice, open water 200 ft east of lower gates. Ice rotting and open water in spots, 12 ft wide along lock wall. Surface smooth, no cracks.	
Isachsen* (N.W.T.): 1: Measurements made at new ice site 200 yd SSW of tide gauge marker on beach. 2: Measurements made on polar ice 1 mile SSE of tide gauge marker on beach of Deer Bay. Remarks pertain to both measurement sites.					
1966					
Sep 4					Freeze over. Surface smooth, few leads.
10					Surface smooth, few cracks.
23					Ice floe 4 ft high on shore.
Nov 4					Surface smooth, no cracks from 17 Sept to 4 Nov.
1967					
May 6	99.5	253.	20.	51.	Maximum ice thickness at ice site 1. Decreasing ice values refer to site 1 also.
12	93.5	237.			
26	100.	254.	21.5	55.	Maximum ice thickness observed at site 2.

* Ice thickness data available in: CANADIAN DEPT OF TRANSPORT ICE 2 DEC 1967.

TABLE II (Cont'd)
ICE THICKNESSES (1966-1967)

Date	Ice Thickness (in.) (cm)		Snow Depth (in.) (cm)		Remarks
Isachsen* (N.W.T.) (cont'd)					
1967					
Jun 2	90.	229.			
9	85.	216.	24.	61.	
17	90.	229.	17.5	44.	Surface lightly ridged, no cracks from 11 Nov 1966 through 17 June 1967. Slush around shore 18 in. deep, extending out along shore onto the ice for 50 to 100 ft. Ice observation made on snowshoes.
23					No observation due to shore puddles 50 to 200 yd. in width.
24					Open area of water 1/2 mile across bay.
25					Puddles covered 20% of bay area.
27					" " 60% " " "
28					" " 80% " " "
Jul 1	93.5	237.			Shore puddle extending completely around bay area. 50 to 100 yd in width. Extent of puddle is somewhat reduced due to decreasing runoff. Surface lightly ridged, few cracks.
4					30% of bay covered with puddles. Snow and slush cover parts of bay.
King Salmon (Alaska): Measurements made on Naknek River near USAF dock at the Federal Aviation Administration dock (about 1/4 mile downriver from last years observation site).					
1966					
Oct 22					Thin ice extends out 10 to 35 ft from shore. Several large pieces of thin sheet ice floating on river. Ice estimated 1/4 in. to 1 in. thick and tributaries frozen over. River still navigable but may prove hazardous to small craft.
29					Thin ice estimated 1/2 to 2 in. (1.5 to 5 cm) thick, extends out 25 to 100 ft from shore. 1 in. (3 cm) of snow covers ice in most places.
Nov 5					Ice extends 25 to 100 ft from shore and estimated to be 2 to 6 in. (5 to 15 cm) thick and is covered with water in spots. Ice jammed up 1/4 mile down river and preventing ice movement.
12					Thin ice extends 15 to 100 ft from shore estimated 1/8 to 3 in. (.1 to 8 cm) thick. Broken slabs of ice along shore 6 to 8 in. (15 to 20 cm) thick. Some large chunks of rafted ice extend out of water 2 to 3 ft near shore.
19					Ice consists mostly of broken slabs 6 in. (15 cm) thick and large chunks ice 3 to 6 ft thick which extend 50 to 75 ft out from shore.
26					Broken slabs and large chunk ice extend approximately 50 ft from shore with 1/4 in. sheet ice covering water between chunks. 1/4 in. sheet ice extends out another 50 ft, 1 to 2 in. (3 to 5 cm) of loose snow covers chunk ice.
Dec 3	11.	28.			Thin ice observed along shore where 2 layers of ice formed with water between layers. Few open water areas near center of channel 20 to 30 ft across. Surface smooth, numerous cracks.
10	15.	38.			Cracks on 3 and 10 Dec vary from 25 to 150 yd in length. Surface smooth, numerous cracks.
17	20.5	52.			" " ; few cracks.
24	24.	61.			" " " "
31	25.5	65.	3.	8.	" rough, " " "
1967					
Jan 7	27.	69.	2.5	6.	Soft ice observed at top. Surface rough, no cracks.
14	29.5	75.	5.	13.	Surface rough, few cracks.
21	28.	71.			Measurement point moved 30 yd towards center of river because ice sheet is becoming thick and is too close to the river bottom. Surface rough, few small cracks.
28	29.5	75.	1.	3.	Surface coarse, no cracks.
Feb 4	32.5	83.	5.	13.	" smooth, " " "
11	32.5	83.			" " " " "
18	33.	84.	1.	3.	" coarse, " " "
25	36.5	93.	1.5	4.	" rough, few " " Maximum ice thickness observed.

* Ice thickness data available in: CANADIAN DEPT OF TRANSPORT ICE 2 DEC 1967

TABLE II (Cont'd)
ICE THICKNESSES (1966-1967)

Date	Ice Thickness (in.)	(cm)	Snow Depth (in.)	(cm)	Remarks
Kobuk (Alaska) (cont'd)					
1967					
May 6	31.	79.	2.	5.	Large number of puddles of water on ice. Surface smooth, cracks snow covered. 10 in. (25 cm) snow and water on ice.
13	25.	64.			Ice raised, open water at river edge, many bare spots on ice. Surface smooth, cracks snow covered. 9 in. (23 cm) snow and water on ice.
20	31.	79.			Many holes in ice, river open along both shores. Approximately 20 ft open water between shore and main ice sheet. Ice moved about 100 ft 2235 LST.
21					Ice moved from 1610 to 1710 LST. Ice moved from 2050 to 2105 LST.
22					Ice went out at 1820 LST.
25					Outboard motor boats using river.
28					Last flowing ice.
Kotzebue (Alaska): Measurements made offshore from village of Kotzebue approximately 1/2 mile NNE of Weather Bureau Air Station.					
1966					
Oct 16	.	.			First ice.
22	7.	18.			Surface smooth, no cracks.
29	13.	33.			" " " " "
Nov 5	15.5	39.			" " " " " . Avg depth of snow on shore: 3 in. (8 cm).
12	17.	43.			Surface smooth, " " " " " " " " "
19	18.	46.			7 in. (18 cm). Surface smooth, " " " " " " " " "
26	19.	48.			10 in. (25 cm). Surface smooth, " " " " " " " " "
					14 in. (36 cm).
Dec 3	22.	56.			Surface smooth, " " " " " " " " "
10	27.	69.			14 in. (36 cm). Surface smooth, " " " " " " " " "
17	28.	71.			14 in. (36 cm). Surface smooth, " " " " " " " " "
24	29.5	75.			14 in. (36 cm). Surface smooth, " " " " " " " " "
31	30.	74.			17 in. (43 cm). Surface smooth, " " " " " " " " "
					18 in. (46 cm).
1967					
Jan 7	30.5	77.			Surface lightly ridged, few cracks. Avg depth of snow on shore: 23 in. (58 cm).
14	32.5	83.			Surface lightly ridged, few " " " " " " " " "
21	34.5	88.			on shore: 23 in. (58 cm). Surface lightly ridged, few " " " " " " " " "
28	35.5	90.			on shore: 23 in. (58 cm). Surface lightly ridged, few " " " " " " " " "
					on shore: 23 in. (58 cm).
Feb 4	27.	94.			Surface smooth, few cracks. Avg depth of snow on shore: 23 in. (58 cm).
11	38.	97.			Surface smooth, " " " " " " " " "
18	40.	102.			25 in. (64 cm). Surface smooth, " " " " " " " " "
25	41.	104.			26 in. (66 cm). Surface smooth, " " " " " " " " "
					27 in. (69 cm).
Mar 4	42.	107.			Surface smooth.
11	43.	109.			" " " " "
18	42.	107.			" " " " "
25	42.5	108.			" " " " "

TABLE II (Cont'd)
ICE THICKNESSES (1966-1967)

Date	Ice Thickness (in.) (cm)	Snow Depth (in.) (cm)	Remarks
Kotzebue (Alaska) (cont'd)			
1967			
Apr 1	42.5 108.	8. 20.	Surface smooth, few cracks.
8	43. 109.	8. 20.	" " , " " .
15	44. 112.	8. 20.	" " , " " .
22	43. 109.	7. 18.	" " , " " .
29	44.5 113.	7. 18.	" " , " " . Maximum ice thickness observed.
May 6	42.5 108.		Surface " , " " .
13	40. 102.		" lightly ridged, few cracks.
20	39.5 100.		" " " , " " .
27	33. 84.		" " " , " " .
Jun 3	19. 48.		" rough, numerous cracks.
Lachine Canal* (P.Q.): Measurements made 500 ft below Lower Lock 5.			
1967			
Feb 20	21. 53.		
27	21. 53.		
Mar 6	21. 53.	4. 10.	Maximum ice thickness observed from 20 Feb to 6 Mar.
Lachine Canal* (P.Q.): Measurements made 500 ft above Upper Lock 5.			
1967			
Feb 6	13. 33.	4. 10.	Surface ice blue in color.
13	17. 43.	2. 5.	Few cracks.
20	18. 46.	4. 10.	" " .
27	24. 61.	2. 5.	
Mar 6	24. 61.		
13	24. 61.		
20	24. 61.		Maximum ice thickness observed on 27 Feb, 6, 13 and 20 Mar.
23	23. 58.		
Mankomen Lake (Alaska): Measurements made on Mankomen Lake.			
1966			
Oct 8			Ice freezing around edges of lake.
22	2. 5.		Ice at north end of lake, open water in center of lake.
29	9. 23.		Surface smooth, no cracks.
Nov 5	12. 30.		" " , few " " .
12	16. 41.	1. 3.	" " , " " .
19	20. 51.	5.5 14.	" " , " " .
26	20. 51.	7. 13.	" " , " " .
Dec 3	21.5 55.	2. 5.	" rough, no cracks.
10	26. 66.	2. 5.	" " , " " .
17	30. 76.	1. 3.	" " , " " .
24	31. 79.	3. 8.	" " , " " .
31	33. 84.	8. 20.	" " , " " .
1967			
Jan 7	33. 84.	7. 18.	" " , " " . Avg depth of snow on shore: 7 in. (18 cm) fluffy snow.
14	34. 86.	6. 15.	Surface rough, no cracks. " " " " " "
21	36. 91.	3. 8.	7 in. (18 cm) compacted snow. Surface rough, no cracks. Avg. " " " " " "
28	38.5 98.	3. 8.	5 in. (13 cm) drifted snow. Surface rough, no cracks. " " " " " "
			4 in. (10 cm) drifted and rough.
Feb 4	40. 102.	4. 10.	Surface rough, no cracks. Avg depth of snow on shore: 4 in. (10 cm) drifted snow.
11	40. 102.	10. 25.	Surface rough, no cracks. " " " " " "
			8 in. (20 cm) rough snow.

* Ice thickness data available in: CANADIAN DEPT OF TRANSPORT ICE 2 DEC 1967

TABLE II (Cont'd)
ICE THICKNESSES (1966-1967)

Date	Ice Thickness (in.) (cm)		Snow Depth (in.) (cm)		Remarks
Mould Bay* (N.W.T.): Measurements made 3/4 to 1 and 1/4 mile WSW of station on Mould Bay.					
1966					
Sep 26					Surface smooth, no cracks.
Oct 9					" " " " .
16					" " " " .
23					" " " " .
Dec 31					" 75% snow covered, drifts up to 12 in. (30 cm) deep.
1967					
Jan 29					Surface smooth, no cracks from 16 Dec 1966 to 29 Jan 1967.
Feb 4					Surface " , few " .
Mar 31	86.5	220.	6.	15.	Light ridging predominantly within 3/4 mile of shoreline. Maximum ice thickness observed.
Apr 7	86.	218.	10.	25.	
14	83.	211.	10.	25.	
21	83.	211.	12.	30.	
28	86.	218.	11.	28.	Ridging of ice greatest near shore line.
May 5	85.5	217.	13.	33.	
12	85.	216.	20.	51.	
19	85.	216.	20.	51.	One main crack 6 in. in width running perpendicular from shore line at Thunder Mountain, across length of Bay. Surface lightly ridged, few cracks from 11 Feb to 26 May.
26	84.5	215.			
Jun 2	86.	218.	18.	46.	Ice soft and snow cover slushy.
9	84.	213.	19.	48.	Light ridging of ice near shore.
16	86.	218.	16.	41.	
30					Snow melted off bay leaving ice snow free, ice surface soft and wet. Run-off water from creek covering shore-line area. Surface smooth, few cracks from 2 to 30 Jun.
Nicolet* (P.Q.): Measurements made at site "A" on Lake St. Peter, lat 46° 12' 45" and long. 72° 39' 54".					
1967					
Jan 6					First measurement of winter, ice previously unsafe. Slush first 25 ft out from shore. Surface lightly ridged, no cracks on 6 and 10 Jan.
17					Ice at site "A" is soft but at 3000 yd offshore ice is 10 in. (25 cm) thick and solid, snow depth 11 in. (29 cm).
Feb 3					Surface smooth, few cracks from 17 Jan to 3 Feb.
17					" moderately ridged, few cracks.
Mar 16	15.5	39.	16.	41.	Maximum ice thickness observed. Ice pack broken up along shipping channel with some ice piling up to 25 ft or more. Surface smooth, few cracks from 22 Feb to 16 Mar.
Apr 2					Ice on Nicolet River went out in the afternoon.
3					" piling on channel side of lake. Ice unsafe to walk on. No measurements taken.
17					Ice completely out of Lake St. Peter except along bays on south shore.
Nitchequon* (P.Q.): Measurements made approximately 200 ft off wharf on Lake Nichicun.					
1966					
Nov 18					Surface smooth, few cracks from 4 to 18 Nov.
25					" " , no " .
30					Mild weather prevailed during the last week of the month, air temperature ranging between 35° and 40°F. Lake covered with approximately 1 in. (3 cm) of melt-water. Open water all month in the narrows at head of Ft. George River.
Dec 30					Open water remained all month in the narrows at head of Ft. George River. Snow surface started to become uneven due to high winds and little snowfall.

* Ice thickness data available in: CANADIAN DEPT OF TRANSPORT ICE 2 DEC 1967

TABLE II (Cont'd)
ICE THICKNESSES (1966-1967)

Date	Ice Thickness (in.) (cm)		Snow Depth (in.) (cm)		Remarks
Nitchequon* (P.Q.) (cont'd)					
1967					
Jan 6					Snow lightly drifted on ice. Avg amount of snow drifting on ice. Aircraft still landing without problems. Narrows at head of Ft. George River became snow covered due to high winds and blowing snow.
27					
Feb 24					Drifting snow on lake has caused small ridges in snow cover but this does not appear to prevent aircraft landings. Narrows at head of Ft. George River still snow covered as high winds and blowing snow persisted for a large portion of the month.
28					
Mar 17					Surface smooth, few cracks from 2 Dec 1966 to 17 Mar 1967. Narrows at the head of Ft. George River frozen over until the 19th. Narrows open and open water area increasing in size daily. Surface lightly ridged, few cracks. " " " " " " " " " " " "
20					
24					
31					
Apr 28					" smooth, few cracks from 7 to 28 Apr.
May 12	41.	104.	4.	10.	" lightly ridged, few cracks 5 and 12 May. " " " " " " , numerous cracks. Maximum ice thickness observed. Surface lightly ridged, " " " The narrows at head of Ft. George River open all month. All large streams entering or leaving lake were open and large amounts of open water visible.
19	40.	102.			
26	35.5	90.			
31					
Jun 2	28.	71.			Surface crystallized, numerous cracks. Open water all along shore of lake. Many small lakes nearby are free of ice. Lake considered unsafe for walking as boats easily broke the crystallized ice. Aircraft landed on one of the smaller lakes. Main lake completely ice free.
7					
9					
13					
17					
Norman Wells* (N.W.T.): Measurements made on Mackenzie River, approximately 100 yd from shore, at a bearing of 230° from the rawinsonde office building.					
1966					
Nov 4					Ice on river stopped flowing, however some areas remained open due to river currents. Surface lightly ridged, few cracks. " " " " " " River completely frozen over. Surface lightly ridged, few cracks.
12					
18					
21					
25					
Dec 30					Snow cover drifted and hard packed.
1967					
Apr 28	59.	150.	8.	20.	Maximum ice thickness observed. Surface lightly ridged, few cracks from 12 Nov 1966 to 30 Apr 1967.
May 5	48.	123.			
Nunivak (Alaska): Measurements made on Mekoryuk Shoal Bay.					
1966					
Oct 15					First ice observed. Slush and small ice cakes in river. Upper part of river frozen solid. Bay open, river frozen over solid 2 miles upriver from bay.
22					
29					
31					

* Ice thickness data available in: CANADIAN DEPT OF TRANSPORT ICE 2 DEC 1967

TABLE II (Cont'd)
ICE THICKNESSES (1966-1967)

Date	Ice Thickness (in.)	Ice Thickness (cm)	Snow Depth (in.)	Snow Depth (cm)	Remarks
Nunivak (Alaska) (cont'd)					
1966					
Nov 5					Small floes and slush drifting with tides and current.
12					" " " " on surface.
19					Warm weather, bay practically clear of ice, very few small floes.
26					Colder weather, bay full of slush and small ice floes.
Dec 3	8.	20.			Surface rough, many cracks.
10	17.	43.			" " " " " "
17	17.	43.			" " " " " "
24	21.5	55.	3.	8.	" " " " " "
31	22.5	57.	5.	13.	" " " " " "
1967					
Jan 3					High winds broke up sea ice.
7	23.	58.	2.	5.	Surface smooth, many cracks.
14	24.5	62.	4.	10.	" " " " " "
21	24.	61.	3.	8.	" " " " " "
28	25.	64.	5.	13.	" " " " " "
30					Sea ice refrozen.
Feb 4	23.5	60.	5.	13.	Surface smooth, " " "
11	24.5	62.	8.	20.	" " " " " "
18	31.5	80.	9.5	24.	" " " " " "
25	33.	84.	10.	25.	Few cracks. Snowdrifts on surface.
Mar 4	36.5	92.	12.	30.	Surface smooth, few cracks.
7					River channel was opened by high winds.
11	42.	108.	6.	15.	Surface smooth, few cracks. Maximum ice thickness observed.
18					Channel and part of bay opened, floating ice cakes observed.
25					Most of ice gone, ice cakes drifting back and forth with the tides.
Apr 8					Mekoryuk Bay mostly clear of ice.
15					Ice cakes drifting in with the tide.
29					Small ice cakes drifting in and out with the tide.
30					Beach clear of ice.
May 6					Few ice cakes in river and bay.
13					Occasional small ice cakes drifting down from upriver.
20					Bay clear of ice.
Point Hope (Alaska): Measurements made west of the village, approximately 150 yd offshore.					
1967					
Mar 4	35.5	90.	5.	13.	Surface smooth, no cracks. Avg depth of snow on shore: 4 in. (10 cm). Open lead directly north, 2 miles in width tapering off west of village. Small lead observed 1/4 mile south of observation point.
12	37.5	95.	3.	8.	Surface smooth, few cracks. Avg depth of snow on shore: 2 in. (5 cm). Open lead north 1 1/2 miles in width, wind from SW and west, approximately 5 knots.
18	38.5	98.	2.	5.	Surface smooth, few cracks. Avg depth of snow on shore: 1 in. (3 cm). Open lead north, 2 miles in width, south at 7 knots.
25	40.	102.	2.	5.	Surface smooth, few cracks. No open leads.
Apr 1	42.	107.	5.	13.	No open leads observed. Surface smooth, few cracks. Avg depth of snow on shore: 4 in. (10 cm).
8	42.5	108.	3.	8.	Surface smooth, few cracks. Avg depth of snow on shore: 7 in. (18 cm).
15	43.	109.	4.	10.	Surface smooth, " " " " " " " " " "
22	46.5	118.	4.	10.	Surface smooth, " " " " " " " " " "
29	47.	119.	3.	8.	Surface smooth, " " " " " " " " " "
					2 in. (5 cm). Maximum ice thickness observed.

TABLE II (Cont'd)
ICE THICKNESSES (1966-1967)

Date	Ice Thickness (in.) (cm)		Snow Depth (in.) (cm)		Remarks
Port Alsworth (Alaska) (cont'd)					
1967					
Apr 22	36.	91.	6.	15.	Huge holes along each shore. Water overflow surface rough, numerous cracks 6 to 12 in. (15 to 30 cm) in width.
29	31.	79.			Ice unsafe for light airplanes due to warm temperatures. 1/2 in. (1 cm) honeycomb ice at top. Water overflow observed.
Port Arthur* (ONT): Measurements made approximately 250 ft from SW corner of Canadian Railroad dock at lat 48° 25' 50" and long. 89° 12' 57".					
1966					
Dec 6					Freeze over. Ice covers 60% of area from Port Arthur breakwater out to Thunder Cape. Earliest coverage of ice since 1959.
29					Surface smooth, no cracks.
1967					
Mar 29	37.5	95.	2.	5.	Maximum ice thickness observed from 15 to 29 Mar. Moderate pressure ridging at three Port Arthur Harbour entrances. Some ice deterioration evident in harbor. Surface smooth, no cracks from 29 Dec 1966 to 29 Mar 1967.
Apr 6	35.	89.			
Port Harrison* (P.Q.): Measurements made mid-stream of Inoucdjouac River (Innuksuak River) approximately 1/4 mile upriver from Hudson Bay Company dock, between the nursing station and upper air staff house.					
1966					
Nov 11					Surface smooth, no cracks.
18					Lead approximately 50 ft in width and 500 ft in length on west side. Surface lightly ridged, few cracks.
25					Layers of snow crust, and soft ice over the hard ice.
Dec 2					Surface smooth, few cracks on 25 Nov and 2 Dec.
1967					
May 13					Snow wet, ice covered with scattered pools of water and slush.
20	102.	259.	10.	25.	Maximum ice thickness observed. Snow very wet, ice covered with pools of water from runoff of a small stream. Surface smooth, no cracks from 23 Dec 1966 to 20 May 1967.
27	97.	246.	1.	3.	Surface lightly ridged, few cracks.
Jun 3	94.	239.			Ice beginning to move out from shore, many soft spots around drifting site. Surface moderately ridged, numerous cracks.
10					Shore leads 2 to 6 ft in width on both sides of river, center still solid but some open areas forming. Ice considered unsafe for measuring, estimated to 80 to 85 in. (203 to 216 cm) thick.
17					Shore leads have widened considerably in many places and leads now observed up and down the river from measurement site. Ice still solid at site.
21					Ice moved out in early morning and piling up approximately 1/4 mile south of Hudson Bay Co. dock.
Resolute* (N.W.T.): Measurements made in the middle of Resolute Bay.					
1966					
Sep 30					Narrow lead on east side of bay. Smooth pancake ice, no cracks.
Oct 29					Ice slushy on four observations during month, then quite hard and dry.

* Ice thickness data available in: CANADIAN DEPT OF TRANSPORT ICE 2 DEC 1967

TABLE II (Cont'd)
ICE THICKNESSES (1966-1967)

Date	Ice Thickness (in.) (cm)		Snow Depth (in.) (cm)		Remarks
Resolute* (N.W.T.) (cont'd)					
1967					
Jan 6					Surface smooth, no cracks from 1 Oct 1966 to 6 Jan 1967.
Feb 24					Few tidal cracks near shoreline.
Jun 23	93.	236.	6.	15.	Maximum ice thickness observed.
30	91.	231.			Tidal cracks and 3 in. of water on ice surface. Surface smooth, few cracks from 13 Jan to 30 June.
Jul 7					
					Observation not taken due to the presence of a large shoreline crack and considerable amounts of water on ice.
15	78.	198.			Surface smooth, numerous cracks.
22	70.	178.			" " " " "
28	60.	152.			Bay approximately 60% covered with ice. Considerable cracking of ice and puddling present on surface.
Sachs Harbour* (N.W.T.): Measurements made 100 yd from shore, south from the R.C.M.P. detachment.					
1966					
Nov 4					Surface smooth, few cracks.
11					" lightly ridged, few cracks.
1967					
Apr 21					" smooth, no cracks from 18 Nov 1966 to 21 Apr 1967.
May 19	80.	203.	9.	23.	
26	79.	201.	10.	25.	
Jun 2	79.	201.	10.	25.	
9	79.	201.	11.	28.	Surface smooth, few cracks from 28 Apr to 9 June.
16	78.	198.	9.	23.	Shore lead observed, approximately 1/4 mile in width and approximately 80 miles in length.
23	72.	183.	3.	8.	Shore lead approximately 2 miles in width and 80 miles in length.
30					Some coverage of ice on bay, but measurement not taken due to water on top of ice.
St. Lambert Lock* (P.Q.): Measurements made 500 ft below lower gate, south shore canal.					
1967					
Feb 6					2 layers of ice. Top layer 2 in. thick, with a 1 in. space in-between. Bottom layer 1 1/4 in. thick.
27					Ice covered with 4 in. (10 cm) water.
Mar 6	24.	61.	4.	10.	Maximum ice thickness observed. Surface is blue in color.
13					Ice conditions unsafe for measurement, lock ice surface flooded over.
Sault Ste. Marie* (ONT): Measurements made on canal 300 ft and 600 ft east of lock and 1700 ft and 2000 ft west of lock. Remarks pertain to all sites.					
1967					
Jan 23					4 in. (10 cm) slush over ice at 1700 ft west and 2 in. (5 cm) slush over ice at 2000 ft west sites. East 300 and east 600 ft ice sites unsafe to travel on.
Feb 6					Drifting snow on ice.
Mar 13					2 in. (5 cm) slush covering ice west of lock and 4 in. (10 cm) slush covering ice at east end of lock.
20	21.	53.			Maximum ice thickness observed at 1700 ft west.
	21.5	55.			" " " " " 2000 " " "
	13.5	34.			" " " " " 300 ft east.
	13.	33.			" " " " " 600 " " "
28					Last reading of the season due to ice being unsafe to travel on and start of breakup.

* Ice thickness data available in: CANADIAN DEPT OF TRANSPORT ICE 2 DEC 1967

TABLE II (Cont'd)
ICE THICKNESSES (1966-1967)

Date	Ice Thickness (in.) (cm)	Snow Depth (in.) (cm)	Remarks
Schefferville* (P.Q.): Measurements made on <u>Knob Lake</u> at three sites (east, center, and west locations). Remarks pertain to all measurement sites.			
1966			
Nov 18			Surface lightly ridged, numerous small cracks observed with no preferred orientation.
25			Surface lightly ridged, numerous cracks. Cracks observed were larger than the previous week with no preferred orientation. Flooding has taken place along a number of the cracks.
30			Pools of water observed on lake.
Dec 2			" " " and slush observed on the 1st but frozen over by 2nd. Surface lightly ridged, few cracks.
9			Lake completely covered with snow, very little drifting.
23			Surface smooth, no cracks 9 to 23 Dec. Light snowfall throughout the month, drifts have not developed to any great extent.
30			Light surface ridging, some possibly caused by cracking of ice. Average clear ice thickness for the three sites is 3 1/2 in. (9 cm).
1967			
Jan 13			Surface lightly ridged, no cracks 6 and 13 Jan.
Feb 10			" moderately ridged, no cracks from 20 Jan to 10 Feb.
17			Surface heavily ridged, no cracks. Development of sastrugi aligned NW-SE. Maximum snow depth observed 26 in. (66 cm).
24			Surface moderately ridged, no cracks. Snow falling and smoothing snow surface topography.
Mar 24			Surface moderately ridged, no cracks from 27 Feb. to 24 Mar.
31			3 in. (8 cm) snowfall smoothed out lake surface during month. Surface lightly ridged, no cracks.
Apr 7			Surface lightly ridged, few cracks.
28	54.	137.	8. 20. Patches of bare ice beginning to show from beneath the decreasing snow cover. Surface lightly ridged, no cracks. Maximum ice thickness observed at east location.
May 5	53.5	136.	2. 5. Surface smooth, few cracks.
12	48.5	123.	Extensive slushing of surface.
15	46.5	118.	
26	40.	102.	Slush areas on lake were observed adjacent to shore. White ice still encountered when drilling at east.
31			Surface smooth, few cracks all month.
Jun 2	34.5	88.	Shore leads and a number of open cracks close to main inlet. First evidence of ice candling, high temperatures and high winds. Surface smooth, numerous cracks.
5			Considerable reduction in ice cover, lake 65% covered.
9			Ice unsafe for drilling.
12			Lake continued to clear under influence of strong NW winds 10 and 12 June. Lake clear of ice.

Schefferville* (P.Q.): Measurements made on Maryjic Lake at three sites (east, center, and west locations).
Remarks pertain to all measurement sites.

1966

Nov 18			Surface smooth, numerous cracks.
25			Unlike Knob Lake, moderate ridges developed, few cracks.
30			Pools of water observed on ice.
Dec 1			" " " on ice surface.
2			" " " frozen over. Surface lightly ridged, few cracks.
9			Lake completely covered with snow.
30			Clear ice thickness 1.5 in. (4 cm). Surface smooth, no cracks from 9 to 30 Dec.

* Ice thickness data available in: CANADIAN DEPT OF TRANSPORT ICE 2 DEC 1967

TABLE II (Cont'd)
ICE THICKNESSES (1966-1967)

Date	Ice Thickness (in.) (cm)		Snow Depth (in.) (cm)		Remarks
Schefferville* (P.Q.) (Maryjo Lake sites) (cont'd)					
1967					
Jan 13					Surface lightly ridged, no cracks 6 and 13 Jan.
20					" moderately " , " " .
27					" lightly " , " " .
Feb 17					Not as much sastrugi on Maryjo Lake as on Knob Lake possibly because Maryjo is more sheltered.
24					Snowfall smoothed out snow surface topography.
Mar 24					Surface moderately ridged, no cracks from 3 Feb to 24 Mar.
31					Surface lightly ridged, no cracks. Snowfall on 24 and 31 Mar smoothed out lake surface.
Apr 7					Surface lightly ridged, few cracks.
21	45.	114.	10.	25.	Maximum ice thickness observed at west measurement site. Decreasing ice values pertain to the west site also.
28	43.	109.			Patches of bare ice observed. South inlet opening up, water observed flowing into lake after 24 Apr. Surface smooth, no cracks 14 to 28 Apr.
May 5	42.5	108.			
12	40.	102.			Extensive slushing on surface of ice.
19	38.5	98.			
22					Shore cracks noted along western shore.
26	36.	91.			Lead developing westward from the southern inlet, 10 yd long. Surface smooth, few cracks from 5 to 26 May.
31					Areas of slush adjacent to shore.
Jun 2	27.5	70.			Extensive shore leads and cracks associated with southern inlet and also along eastern shore. Surface smooth; numerous cracks.
5					First candling and large reduction in ice cover between 2 and 5 June.
8					Southern part of lake cleared first, due to strong SW winds and water inflow.
9					Slush ice on east shore of lake.
10					Lake clear of ice.
Snowshoe Lake (Alaska): Measurements made approximately 200 yd north of aircraft charter facilities on south shore on Snowshoe Lake.					
1966					
Oct 8					Shallow bay at SW end of lake frozen.
9					Ice melted.
10					Shallow bay refroze.
12					Ice around most of shore end frozen out from southern end approximately 500 ft.
19					Due to northerly winds ice retreated to about 250 ft from south shore by 15 Oct. Ice continues to retreat slowly through 19 Oct.
20					Ice refrozen by morning to approximately 500 ft around shore.
21					Lake froze over completely overnight which is different than usual. Lake usually freezes earlier and gradually until just a narrow strip toward the northern end of lake remains open. This deeper area then finally freezes completely over.
23	6.5	17.			Surface smooth, few cracks.
29	9.5	24.	0.5	1.	" " , " " .

* Ice thickness data available in: CANADIAN DEPT OF TRANSPORT 'ICE 2 DEC 1967

TABLE II (Cont'd)
ICE THICKNESSES (1966-1967)

Date	Ice Thickness (in.) (cm)		Snow Depth (in.) (cm)		Remarks
Snowshoe Lake (Alaska) (cont'd)					
1966					
Nov 5	11.	28.	5.5	14.	Water overflow at south end of lake near creek outlet. Surface smooth, few cracks. Snow density 0.168 g/cm ³ .
12	11.	28.	7.	18.	Water overflow out approximately 150 yd from south shore of lake. Surface smooth, few cracks.
19	12.	30.	7.	18.	Water overflow now frozen. Surface smooth, few cracks.
26	12.	30.	10.	25.	New overflow in various places on lake. Any place a hole is opened in ice (for fishing, water etc.) water overflow spreads over the general area. Surface smooth, few cracks.
Dec 4	15.5	39.	6.	15.	This depth includes water overflow, which is refreezing. At top there is 2 in. (5 cm) of ice, over 1 in. (3 cm) of water, over 12.5 (32 cm) of solid ice. Surface lightly ridged, few cracks. Snow density 0.169 g/cm ³ .
10	16.5	42.	6.	15.	Water overflow frozen, solid ice entire depth. Surface lightly ridged, few cracks. Snow density 0.192 g/cm ³ .
17	18.5	47.	6.5	17.	Surface lightly ridged, few cracks. Snow density 0.152 g/cm ³ .
25	18.5	47.	9.	23.	Surface " " , " " . " " 0.166 g/cm ³ .
31	19.5	50.	9.5	24.	Surface " " , " " . " " 0.243 g/cm ³ .
1967					
Jan 7	20.	51.	11.	28.	Surface " " , " " . " " 0.239 g/cm ³ .
14	20.5	52.	13.	33.	Surface " " , " " . " " 0.231 g/cm ³ .
21	21.	53.	12.5	32.	Surface " " , " " . " " 0.239 g/cm ³ .
28	22.	56.	11.5	29.	Surface moderately " " , " " . " " 0.202 g/cm ³ .
Feb 4	23.5	60.	11.5	29.	Surface " " , " " . " " 0.205 g/cm ³ .
11	24.	61.	16.	41.	Surface " " , " " . " " 0.234 g/cm ³ .
19	24.	61.	18.5	47.	Surface " " , " " . " " 0.229 g/cm ³ . Water overflowed onto ice over large portion of lake. 4 in. of water over measurement site.
25	24.	61.	19.5	50.	Snow measurement of 19.5 (50 cm) includes 5.5 in. (14 cm) water over ice. Surface of ice rather mushy in upper 1 in. (3 cm) layer. Measurement site moved approximately 100 ft south, still in an extreme overflow area, large portion of lake covered with water. Surface moderately ridged, few cracks. Snow density 0.225 g/cm ³ .
Mar 5	24.	61.	14.	36.	Numerous holes in lake ice with water overflow. 14 in. (36 cm) of snow included 2.5 in. water over a thin layer of ice (1/4 in.), over 6 in. of water over the harder lake ice. Surface heavily ridged, few cracks. Snow density 0.161 g/cm ³ .
11	24.	61.	9.5	24.	Beneath the 9.5 in. (24 cm) snow was a layer of ice 3/4 in. thick, then 8 in. water on top of regular ice. Surface of ice mushy. Surface heavily ridged, few cracks. Snow density 0.210 g/cm ³ .
18	33.5	85.	7.5	19.	Overflow freezing, observed a thin layer of water between regular ice and frozen overflow. Surface lightly ridged, few cracks. Snow density 0.210 g/cm ³ .
26	33.5	85.	7.	18.	Surface lightly ridged, few cracks. Snow density 0.204 g/cm ³ .
Apr 2	33.5	85.	6.	15.	Surface lightly ridged, few cracks. Snow density 0.250 g/cm ³ .
9	33.5	85.	4.	10.	Maximum ice thickness observed 18 Mar to 9 Apr. Snow cover varies from 3.5 to 6 in. (9 to 15 cm) in depth. Surface lightly ridged, few cracks. Snow density 0.190 g/cm ³ .

TABLE II (Cont'd)
ICE THICKNESSES (1966-1967)

Date	Ice Thickness (in.) (cm)		Snow Depth (in.) (cm)		Remarks
Snowshoe Lake (Alaska) (cont'd)					
1967					
Apr 16	33.	84.	4.	10.	Surface lightly ridged, few cracks. Snow density: 0.220 g/cm ³ .
23	32.5	83.	5.	13.	Ice soft near surface. Surface moderately ridged, few cracks. Snow density: 0.324 g/cm ³ .
30	32.	81.	1.	3.	Top 10 in. (25 cm) of ice very soft to drill. Ice seemed rather soft all the way through compared to earlier winter drilling. Depth of snow varies from 0 to 2.5 in. (0 to 6 cm).
May 7	31.	79.	0.5	1.	9 in. (23 cm) ice and water over regular ice. Surface heavily ridged, few cracks.
14	28.	71.			Bay at SW corner of lake at creek inlet and outlet free of ice. Surface heavily ridged, few cracks.
24					Ice free from shore and drifts between shorelines with the wind.
28					Breaks in ice sheet open approximately 200 yd from south shore.
30					Lake ice broken up and moving with the wind.
31					Lake approximately 1/4 to 1/3 ice free.
Jun 2					Lake nearly ice free.
3					Lake ice free. Last ice went out over night.
South Baymouth* (ONT): Measurements made 100 yd from end of station wharf.					
1967					
Jan 6					Surface smooth, no cracks.
13					4 to 9 in. (10 to 23 cm) of slush over ice. Surface smooth, no cracks.
20					Slush observed on 13 Jan now frozen. Surface smooth, no cracks.
22					Outer basin of South Baymouth frozen over.
May 10	26.	66.	4.	10.	
17	26.	66.	6.	15.	
23	26.	66.	8.	20.	
31	26.	66.			Maximum ice thickness observed from 10 to 31 Mar. Surface smooth, no cracks from 6 Jan to 31 Mar.
Spence Bay* (N.W.T.): Measurements made 40 yd from east shore of Spence Harbour and 330 yd from north shore.					
1966					
Oct 11					Ice 3 in. (8 cm) thick.
14					Surface smooth, no cracks.
21					" " " "
25					Bombardier able to use sea ice for first time.
1967					
May 19	73.	185.	6.	15.	Maximum ice thickness observed. Ice becoming soft approximately 3 ft below surface.
27	72.5	184.			
Jun 2	72.5	184.	6.	15.	
9	72.	183.	6.	15.	
16					Unable to take ice thickness at regular site, water completely covering area. Thickness taken approximately 400 yd from north shore. Surface smooth, no cracks from 14 Oct 1966 to 16 June 1967.
23	70.	178.			Measurement site covered by water, ice thickness taken at same place as on 16 June. Surface smooth, few cracks.
30	70.5	179.			Surface smooth, few cracks 23 and 30 June.

* Ice thickness data available in: CANADIAN DEPT OF TRANSPORT ICE 2 DEC 1967

TABLE II (Cont'd)
ICE THICKNESSES (1966-1967)

Date	Ice Thickness (in.) (cm)	Snow Depth (in.) (cm)	Remarks
Talkeetna (Alaska): Measurements made on Susitna River.			
1966			
Oct 22			First ice formed.
29			Ice extends from shore to shore.
Nov 5			Main channel ice broken up.
12			Avg depth of snow on shore: 3 in. (8 cm).
19			" " " " " " " " 3 in. (8 cm).
26			Main channel remains open, 8 miles below and 19 miles above measuring point. Avg depth of snow on shore: 14 in. (36 cm).
Dec 3			Main channel remained open. Avg depth of snow on shore: 26 in. (66 cm).
10			Main channel remained " " " " " " " " 26 in. (66 cm).
17			Main channel remained " " " " " " " " 28 in. (71 cm).
24			Main channel remained " " " " " " " " 29 in. (74 cm).
31	4.5	11.	Surface lightly ridged, no cracks. Avg depth of snow on shore: 31 in. (79 cm).
1967			
Jan 7	6.	15.	Surface lightly ridged, " " " " " " " " shore: 34 in. (86 cm).
14	6.	15.	Surface lightly ridged, " " " " " " " " shore: 35 in. (89 cm).
21	14.	36.	Surface lightly ridged, " " " " " " " " shore: 35 in. (89 cm).
28	18.	46.	Surface lightly ridged, " " " " " " " " shore: 35 in. (89 cm).
Feb 4	22.	56.	Surface lightly ridged, few " " " " " " " " shore: 35 in. (89 cm).
11	24.	61.	4. 10. Surface lightly ridged, " " " " " " " " shore: 39 in. (99 cm).
18	24.	61.	4. 10. Surface lightly ridged, " " " " " " " " shore: 39 in. (99 cm).
25	23.	58.	5. 13. Surface lightly ridged, numerous cracks. Avg depth of snow on shore: 40 in. (102 cm).
Mar 4	25.	64.	5. 13. Surface lightly ridged, numerous " " " " " " " " snow on shore: 36 in. (91 cm).
11	26.5	67.	5. 13. Surface lightly ridged, numerous " " " " " " " " snow on shore: 36 in. (91 cm).
18	28.	71.	6. 15. Surface lightly ridged, numerous " " " " " " " " snow on shore: 36 in. (91 cm).
25	28.	71.	6. 15. Surface lightly ridged, numerous " " " " " " " " snow on shore: 33 in. (84 cm).
Apr 1	28.	71.	5. 13. Maximum ice thickness observed from 18 Mar to 1 Apr. Surface lightly ridged, numerous cracks. Avg depth of snow on shore: 36 in. (91 cm).
8	27.5	70.	17. 43. Surface lightly ridged, numerous " " " " " " " " snow on shore: 53 in. (135 cm).
15	26.5	67.	18. 46. Surface lightly ridged, numerous " " " " " " " " snow on shore: 53 in. (135 cm).
22	25.	64.	12. 30. Surface lightly ridged, numerous " " " " " " " " snow on shore: 48 in. (122 cm).
29	21.5	55.	4. 10. Surface lightly ridged, numerous " " " " " " " " snow on shore: 40 in. (102 cm). Overflow on main channel.
30			First signs of breakup of main channel.

Trout Lake* (ONT): Measurements made 140 yd south of Department of Transport dock.

1966

Nov 2			Ice first formed.
4			Surface smooth, no cracks.
9			Lake frozen over completely.

* Ice thickness data available in: CANADIAN DEPT OF TRANSPORT ICE 2 DEC 1967

TABLE 11 (Cont'd)
ICE THICKNESSES (1966-1967)

Date	Ice Thickness (in.) (cm)	Snow Depth (in.) (cm)	Remarks
Trout Lake* (ONT) (cont'd)			
1967			
Apr 21			Measurement site has 3 in. of water on top of ice.
28			" " " " " " " " " " " " " " " " with 1/4 in. of ice on surface of water.
May 12	50.	127.	2. 5. Maximum ice thickness observed.
19	45.5	116.	Surface smooth, no cracks from 4 Nov 1966 to 19 May 1967.
26	41.	104.	Surface rough, numerous cracks.
Jun 2	25.	64.	Open leads offshore and around entire bay.
8			Bay clear of ice.
Unalakleet (Alaska): Measurements made east of post office on Kouwegak River slough.			
1966			
Oct 22	6.	15.	Surface smooth, no cracks.
29	12.	30.	" " " " , few " "
Nov 5	21.	53.	" heavily ridged, numerous cracks.
12	17.	43.	0.5 1. " " " " , " " "
19	18.	46.	2. 5. " " " " , " " "
26	32.	81.	12. 30. " " " " , " " "
Dec 3	25.	64.	7. 18. " smooth, few large cracks.
10	26.	66.	5. 13. " " " " , " " "
17	31.	79.	12. 30. " " " " , " " "
24	34.	86.	12. 30. " " " " , " " "
31	38.	97.	11. 28. 6 in. of water overflow on top of ice caused by extremely high tides. Surface smooth, few large cracks.
1967			
Jan 7	42.	107.	25. 64. 7 in. (18 cm) water overflow. Approximately 12 in. (30 cm) ice beneath a water layer apparently attached to the bottom of the slough. Surface smooth, few cracks.
14	42.	107.	25. 64. Very difficult to obtain accurate measurements with 7 in. (18 cm) overflow on top of ice. Layer of water in between 42 in. of ice, another ice layer attached to the bottom. Surface smooth, few cracks.
21	52.	132.	24... 61. Surface smooth, few large cracks.
28	48.	122.	7. 18. Ice measurement site moved 75 ft further out into the mouth of the slough. Moved smooth, few large cracks.
Feb 4	52.	132.	15. 38. Few cracks.
11	52.	132.	
18	48.	122.	
25	51.	130.	
Mar 4	51.	130.	Surface smooth, few cracks.
11	53.	135.	3. 8. " " " " , " " "
18	54.	137.	5. 13. " " " " , " " "
25	55.	140.	6. 15. " " " " , " " "
Apr 1	56.	140.	6. 15. " " " " , " " "
8	56.	140.	8. 20. " " " " , " " "
15	56.	140.	10. 25. " " " " , " " "
22	57.	145.	14. 36. Maximum ice thickness observed. Surface smooth, few cracks.
29	56.	140.	4. 10. Two large holes at center of the slough, each 20 ft long. Surface water covers the slough and the Unalakleet River. 4 in. (10 cm) overflow at measurement site. Surface smooth, few cracks.
May 6	52.	132.	Fast thaw during past week. Surface smooth, several large cracks.
14	42.	104.	Surface smooth, several cracks.
20	34.	86.	Surface broken.
27			" " " "

* Ice thickness data available in: CANADIAN DEPT OF TRANSPORT ICE 2 DEC 1967

TABLE 11 (Cont'd)
ICE THICKNESSES (1966-1967)

Date	Ice Thickness (in.) (cm)		Snow Depth (in.) (cm)		Remarks
Valleyfield* (P.Q.): Measurements made 500 ft above Valleyfield Bridge 10.					
1967					
Feb 6					Ridging extends from Valleyfield bridge upstream for approximately 1/2 mile. Ice unsafe. Surface heavily ridged, no cracks. Beauharnois canal and Lake St. Louis partly frozen over.
	13				No measurement taken. Ice unsafe from 2 Feb to 3 Mar.
Mar 3	32.	81.	3.	8.	Maximum ice thickness observed.
Welland Canal* (ONT): Measurements made above Guard Gate.					
1967					
Jan 23					Numerous cracks.
Feb 6					Slushy snow cover.
	13				Surface smooth.
	20				Few cracks.
	27	13.	33.		Maximum ice thickness observed.
Welland Canal* (ONT): Measurements made at Bridge 10.					
1967					
Jan 23					Numerous large cracks.
Feb 13	10.	25.			Surface smooth, maximum ice thickness observed.
Welland Canal* (ONT): Measurements made at Bridge 18.					
1967					
Jan 23					Open water.
Feb 6					No cracks.
	13	8.	20.		Surface smooth, no cracks. Maximum ice thickness observed.
	20				Surface smooth.
	27				" " "
Welland Canal* (ONT): Measurements made at Bridge 19.					
1967					
Feb 6					No cracks.
	13				Surface smooth, no cracks.
	20	11.	28.	1.	3. Maximum ice thickness observed.
	27				Surface smooth.
Welland Canal* (ONT): Measurements made at Port Colborne Harbor (above Lock 8).					
1967					
Feb 6					No cracks.
	13				Surface smooth, no cracks.
	20				" " " " "
	27	12.	30.		Maximum ice thickness observed on 20 and 27 Feb.
Welland Canal* (ONT): Measurements made at Port Weller Harbor (entrance to Lock 1).					
1967					
Jan 30					Open water all month.
Feb 6					Drift ice had slush on surface.
	13	5.5	14.		Frozen drift ice. Maximum ice thickness observed.
	26				Drift ice, many open cracks.
	27				Frozen drift ice.
Wild Lake (Alaska): Measurements made approximately 30 yd east of weather station.					
1966					
Oct 17					First ice in shallow bay.
	24				Ice in shallow bay, skim ice floating on water.
	25				Lower half of lake frozen over.
	26				Lake frozen except for approximately 1 x 1/3 mile of open water at north end. 2 1/2 in. (6 cm) of ice 8 ft from shore.

* Ice thickness data available in: CANADIAN DEPT OF TRANSPORT ICE 2 DEC 1967

TABLE II (Cont'd)
ICE THICKNESSES (1966-1967)

Date	Ice Thickness (in.)	Ice Thickness (cm)	Snow Depth (in.)	Snow Depth (cm)	Remarks
Wild Lake (Alaska) (cont'd)					
1966					
Oct 28	3.5	9.			Freeze over.
30	6.5	17.			
Nov 1	7.	18.	3.5	9.	Surface smooth, no cracks.
8	8.5	22.	3.5	9.	" " , " " .
15	11.5	29.	3.5	9.	" " , " " .
22	13.	33.	5.	13.	" " , " " .
29	14.	36.	5.	13.	" " , " " .
Dec 6	16.	41.	5.	13.	" " , " " .
13	18.5	47.	5.	13.	" " , " " .
20	20.	51.	7.	18.	" " , " " .
28	20.5	52.	7.	18.	" " , " " .
1967					
Jan 3	20.5	52.	9.5	24.	" " , " " .
10	21.	53.	9.5	24.	" " , " " .
17	22.	56.	9.5	24.	" " , " " .
24	23.	58.	10.	25.	" " , " " .
31	24.	61.	10.	25.	" " , " " .
Feb 7	25.	64.	11.	28.	" " , " " .
14	26.	66.	11.	28.	" " , " " .
21	26.5	67.	13.	33.	" " , " " .
28	27.5	70.	16.	41.	" " , " " .
Mar 7	27.	69.	16.	41.	" " , " " .
14	28.5	72.	17.	43.	" " , " " .
28	30.	76.	13.	33.	" " , " " .
Apr 4	30.5	77.	20.	51.	" " , " " .
11	31.5	80.	21.	53.	" " , " " .
18	33.	84.	16.	41.	Frozen overflow, " " .
25	35.	89.	14.	36.	" " , " " .
30					3 in. (8 cm) water overflow under snow from 16 to 30 Apr. Water started flowing onto lake from stream.
May 2	36.	91.	10.	25.	Maximum ice thickness observed. Streams started flowing. Surface smooth, no cracks.
9	33.	84.	7.	18.	" " , " " .
16	33.	84.	6.	15.	" " , " " .
23	31.	79.			" rough, few " .
30	20.	51.			Water overflow covering lake most of month. Open water around edges. Surface rough, numerous cracks.
Jun 5					Large leads.
6					Ice broken up in small pieces.
8					Lake completely free of ice.
Yellowknife* (N.W.T.): Measurements made approximately 175 yd NW of Pacific Western Airlines float base, on Back Bay at Yellowknife.					
1967					
Mar 17					Surface smooth, no cracks from 4 Nov 1966 to 17 Mar 1967.
Apr 14					" " , few " " 24 Mar to 14 Apr.
28	53.	135.	8.	20.	Maximum ice thickness observed. Surface candled, few cracks 21 and 28 Apr.
May 5	52.5	133.	6.	15.	Surface moderately rafted, few cracks.
12	51.	130.	4.	10.	" snow wet, few cracks.
19	49.	124.	1.5	4.	" smooth, few cracks.
26	41.	104.			1 in. water on surface, few cracks.
Jun 2	24.	61.			Ice unsafe, open water out to 25 ft from shore.

* Ice thickness data available in: CANADIAN DEPT OF TRANSPORT ICE 2 DEC 1967.

TABLE III
ICE THICKNESSES (1967-1968)

Date	Ice Thickness (in.) (cm)		Snow Depth (in.) (cm)		Remarks
Alert* (N.W.T.): Measurements made 500 ft NW of hydrographic bench mark near center of Dumbell Bay.					
1967					
Dec 8					Surface smooth, no cracks from 15 Sept to 8 Dec. Ice auger badly damaged when froze into the ice. New auger ordered.
1968					
May 10					First ice report since 8 Dec 1967 due to damaged ice auger.
31	79.	201.	12.	30.	Surface smooth, no cracks all month. Maximum ice thickness observed.
Alert* (N.W.T.): Measurements made on Dumbell Lake, 200 ft south of station pump house.					
1967					
Oct 27					Surface smooth, no cracks from 22 Sept to 27 Oct.
Dec 1					" " " " " 3 Nov to 1 Dec.
8					Ice auger was badly damaged and cannot be effectively used. New auger has been ordered. Surface smooth, no cracks.
1968					
May 10					First ice report since 8 Dec 1967 due to damaged ice auger.
31	80.	203.	24.	61.	Surface smooth, no cracks all month. Maximum ice thickness observed.
Allakaket (Alaska): Measurements made in front of St. John's-in-the-Wilderness Church.					
1967					
Oct 7					Slush ice flowing in river.
14					Shore ice 1 in. (3 cm) thick. Snow on ice 3 in. (8 cm) in depth. Surface smooth.
21					Shore ice 2 in. (5 cm) thick. " " " 6 in. (15 cm) in depth. Surface smooth.
23					River frozen over. Ice very smooth with no overflow.
28					Snow on ice 4 in. (10 cm) in depth.
					Shore ice 4 in. (10 cm) thick. Snow on ice 8 in. (20 cm) in depth. Surface smooth.
Nov 4	8.	20.	10.	25.	Surface smooth.
11	12.	30.	12.	30.	" " "
18	14.	36.	15.	38.	
25	15.	38.	5.	13.	10 in. (25 cm) of water overflow on ice.
Dec 2	16.	41.	5.	13.	Surface smooth.
9	17.	43.	7.	18.	
16	18.	46.	15.	38.	
23	22.	56.	15.	38.	
30	24.	61.	20.	51.	
1968					
Jan 6	25.	64.	15.	38.	
13	26.	66.	15.	38.	
20	28.	71.	13.	33.	
27	30.	76.	15.	38.	
Feb 3	31.	79.	15.	38.	" " "
10	33.	84.	18.	46.	
14					Strong winds all night.
17	33.	84.	14.	36.	
24	34.	86.	13.	33.	
Mar 2	34.	86.	23.	58.	
9	34.	86.	23.	58.	
16	34.	86.	23.	58.	
23	34.	86.	22.	56.	
30	34.	86.	21.	53.	

* Ice thickness data available in: CANADIAN DEPT OF TRANSPORT ICE 1 NOV 1968

TABLE III (Cont'd)
ICE THICKNESSES (1967-1968)

Date	Ice Thickness (in.) (cm)		Snow Depth (in.) (cm)		Remarks
Allakaket (Alaska) (cont'd)					
1968					
Apr 6	34.	86.	21.	53.	
13	35.	89.	22.	56.	
20	35.	89.	20.	51.	
27	35.	89.	20.	51.	
May 4	35.	89.	14.	36.	Maximum ice thickness observed from 13 Apr to 4 May.
7					Water 2 ft deep over the ice.
8					Same open water at mouth of Alatna River.
9					Open water at mouth of Alatna River.
10					" " about 50 yd above measurement site.
11					Water up 3 ft.
13					Open water area approximately 8 ft in width and 30 yd in length.
15					Water 1 ft deep on ice.
16					Open water area approximately 12 ft in width and 40 yd in length.
17					Ice breaking up at mouth of Alatna River.
18					Anchor ice rising from bottom.
19					Ice jamming upstream near bend of Koyukuk and Alatna Rivers.
20					Surface ice moving, water rising fast.
21					Ice running bank to bank in river.
22					Ice flowing " " " " " "
24					Some ice flowing in river.
26					Small amounts of ice on Alatna River.
Baker Lake* (N.W.T.): Measurements made 500 ft south of meteorological pump house.					
1967					
Oct 27					Aircraft reports lake frozen for 10 miles to the east and no open water visible. Surface smooth, few cracks.
1968					
Feb 20					Scheduled measurement for 16 Feb delayed due to storm of 15 to 19 Feb. Storm had 50 to 80 mph winds, zero miles visibility and air temperatures between -30° and -35°F.
Apr 26	85.	216.			
May 8	85.	216.			
10	85.	216.			Maximum ice thickness observed 26 Apr to 17 May.
17	84.	213.			
24	82.	208.			
31	82.	208.			
Jun 7	81.	206.			
14	75.	191.			Surface smooth, no cracks from 3 Nov 1967 to 14 June 1968.
21	71.	180.			
28	51.	130.			Surface " , few " 21 to 28 June.
Barrow (Alaska): Measurements made on Imikpuk Lake at approximately 140 ft ENE and bearing 060° true from U.S. Navy Arctic Research Lab water intake.					
1967					
Sep 20					First shore to shore ice observed.
Oct 21	13.	33.	2.	5.	Surface lightly ridged, no cracks. 2 in. (5 cm) crusted snow on surface, overlying a layer of honeycombed crystals (probably depth hoar).
28	16.	41.	1.	3.	Avg depth of snow: 2 in. (5 cm), medium packed.
31					No leads or cracks.
Nov 4	16.5	42.	2.	5.	Irregular drifting, firmly packed snow sufficient to support 180 lb in most areas. Snow depth varies from 1.5 to 4 in. (4 to 10 cm). Surface lightly ridged, no cracks. Avg depth of snow on shore: 2.5 in. (6 cm), firmly packed.

* Ice thickness data available in: CANADIAN DEPT OF TRANSPORT ICE 1 NOV 1968

TABLE III (Cont'd)
Ice Thicknesses (1967-1968)

Date	Ice Thickness (in.) (cm)		Snow Depth (in.) (cm)		Remarks
Barrow (Alaska) (cont'd)					
1967					
Nov 11					Snow more firmly packed than on 4 Nov. Depth varies from 2 to 4 in. (5 to 10 cm). Surface lightly ridged, few cracks. Avg depth of snow on shore: 3 in. (8 cm).
18	23.	58.	2.	5.	Snow firmly packed, depth on shore varies from 2 to 4 in. (5 to 10 cm). Surface lightly ridged, few cracks. Ice cracks ($\frac{1}{2}$ to 1 in. in width) observed, approximately every 40 to 50 ft and extending an undetermined distance in various directions.
25	25.	64.	1.5	4.	Bottom 1.5 in. (4 cm) of snow cover during Nov consisted of depth hoar. Surface lightly ridged, few cracks. Avg depth of snow on shore: 3 in. (8 cm).
30					Few cracks in ice approximately every 50 ft, mostly $\frac{1}{2}$ in. in width. One crack 3 ft from point of measurement is $\frac{3}{4}$ in. in width, another approximately 70 ft from point of measurement is 1 in. in width.
Dec 2	28.	71.	2.5	6.	Cracks in ice approximately every 50 ft are mostly 1 in. in width. One crack 60 ft SSW of measurement site is 1 in. in width. Surface lightly ridged, few cracks.
9	31.	79.	2.5	6.	Light fresh snow obscured all but one crack $\frac{1}{2}$ in. in width. Surface lightly ridged, few cracks.
16	33.5	85.	4.	10.	Cracks in ice are $\frac{1}{4}$ to $\frac{1}{2}$ in. in width. Surface lightly ridged, few cracks.
23	34.	86.	5.5	14.	Light fresh snow. Two cracks in ice $\frac{1}{4}$ to $\frac{1}{2}$ in. in width. Surface lightly ridged, few cracks.
30	37.	94.	7.	18.	Bottom $\frac{1}{2}$ in. (4 cm) of snow cover during Dec consisted of depth hoar. Surface snow cover in general is sufficiently packed to support the weight of a 170 lb man. No cracks in ice visible due to heavy snow cover. Surface lightly ridged, No data for Jan 1968.
1968					
Feb 3	43.	109.	12.	30.	Surface lightly ridged, few cracks. Avg depth of snow: 11 in. (28 cm), firmly packed.
10	45.	114.	12.	30.	One crack in ice, 1 in. in width approximately 60 ft south of site. Surface lightly ridged, few cracks. Avg depth of snow: 11 in. (28 cm), firmly packed.
17	48.	122.	10.	25.	Surface lightly ridged, few cracks. Avg depth of snow: 12 in. (30 cm), very firmly packed.
24	50.	127.	10.	25.	Bottom 1 in. (3 cm) snow cover during Feb consisted of depth hoar. Surface cover sufficiently packed to support the weight of a 170 lb man. Cracks in ice mostly $\frac{1}{2}$ in. in width and located between the jetty and the measurement site. Surface lightly ridged, few cracks. Avg depth of snow: 12 in. (30 cm), very firmly packed.
Mar 2	51.5	131.	15.	38.	Only one crack visible approximately 60 ft south of site. $\frac{1}{2}$ in. wide. Surface lightly ridged, no cracks. Avg depth of snow: 12 in. (30 cm), firmly packed.
9	50.5	128.	20.	51.	Surface lightly ridged, no cracks. Avg depth of snow: 12 in. (30 cm), firmly packed.
16	53.5	136.	20.	51.	Surface lightly ridged, no cracks. " " " "
23	54.5	138.	16.	41.	Surface lightly ridged, no cracks. " " " "
30	55.	141.	15.	38.	Bottom 1 in. (3 cm) of snow cover during month consisted of depth hoar. New and drifted snow obscured any sign of cracks from 16 to 30 Mar. Maximum ice thickness observed. Surface lightly ridged, no cracks. Avg depth of snow: 13 in. (33 cm), firmly packed.
Barter Island (Alaska): Measurements made about 1 mile SE of living quarters on a lake south of Tropo Road, at about 10 to 25 yd offshore.					
1967					
Oct 14	10.	25.	3.	8.	Surface smooth, no cracks.
21	11.	28.	4.	10.	" " " " . Avg depth of snow on shore: 2 in. (5 cm).
28	12.5	32.	6.	15.	Surface lightly ridged, no cracks. Avg depth of snow on shore: 3 in. (8 cm).

TABLE III (Cont'd)
ICE THICKNESSES (1967-1968)

Date	Ice Thickness (in.) (cm)		Snow Depth (in.) (cm)		Remarks
Barter Island (Alaska) (cont'd)					
1967					
Nov 3	20.	51.	3.	8.	Complete ice cover (shore to shore) on lake. Surface smooth, no cracks.
11	26.	66.			Few cracks in ice observed. Surface lightly ridged. Avg depth of snow on shore: 10 in. (25 cm).
17	29.	74.	1.5	4.	Few cracks in ice observed, from a few inches to a few feet in length. Surface lightly ridged. Avg depth of snow on shore: 8 in. (20 cm).
26	31.	79.	0.5	1.	Numerous cracks in ice over entire lake. Length varies from a few feet to several feet and multi-branched. Surface smooth. Avg depth of snow on shore: 9 in. (23 cm).
Dec 2	33.	84.	0.5	1.	Snow on lake varied from none to drifts up to approximately 20 in. (51 cm).
8	36.	91.	0.5	1.	Strong winds have created large patches of snow-free surface over ice. Large snow drifts located around edges of lake.
16	46.	117.			
23	47.	119.	6.	15.	More uniform snow cover on lake 6 to 10 in. (15 to 25 cm), with no snowless patches.
31	49.	125.	10.	25.	Surface smooth with numerous cracks in ice throughout Dec. Cracks were a few inches to several feet in length. Most ice fractures well below surface of ice. Relatively deep snow cover over lake, gently rolling drifts to 24 in. Avg depth of snow on shore: approximately 13 in. (33 cm). Cracks in ice noted only after scraping away snow.
1968					
Jan 6	49.	125.			Numerous large cracks in ice several feet in length, 1/4 in. in width. Snow cover irregular, rolling drifts. Snow cover varied from open patches to 24 in. (61 cm) or more in drifts.
13	49.	125.	19.	48.	Strong winds (up to 45 knots) from 13 through 15 Jan completely covered lake surface; large drifts observed with some "gullying".
20	52.	132.	12.	30.	Strong winds varied snow depth considerably, large drifts present, some pitting and gullying.
27	53.	135.	12.	30.	Lake completely covered with snow. Snow very hard and densely packed, probably due to continuous strong winds.
Feb 3	53.	135.	8.	20.	Lake completely covered with snow. Surface mostly rolling drifts up to 36 in. (91 cm) deep.
10	53.	135.	12.	30.	Strong winds during week have packed snow very hard. Large patches appear to have frozen to the ice. Snow surface is flat and smooth.
17	53.	135.			Large patches of ice surface free of snow. Drifts up to 24 in. (61 cm) are still present.
24	53.	135.			Snow cover softer than previously observed. Thickness of ice at the Barter Island water intake hole is 42 in. (107 cm). This site is closer to shore and 25 yd east of observation site.
Mar 2	58.	147.	3.	8.	Lake completely covered with snow, drifts are 24 in. (61 cm) high and surface is somewhat pitted.
16	63.	160.	9.	23.	Numerous cracks in ice present all winter. No leads or openings anywhere, cracks are quite deep. Several large patches of snow-free ice on lake surface, otherwise lake covered with rippled snow, drifts are 24 in. (61 cm) high. Ice thickness varies; area about 8 ft from measurement site avg is 71 in. (180 cm) thick and at water hole site avg is 49 in. (124 cm) thick, but the later site is kept open artificially.
23	68.	173.	3.	8.	
30	70.	178.			

TABLE III (Cont'd)
ICE THICKNESSES (1967-1968)

Date	Ice Thickness (in.) (cm)		Snow Depth (in.) (cm)		Remarks
Barter Island (Alaska) (cont'd)					
1968					
Apr 6	70.	178.	3.	8.	Snow cover over entire lake. Snow relatively loose. Maximum ice thickness 30 May to 6 Apr.
13	70.	178.	6.	15.	Top layer of snow rather brittle except for approximately 1/4 in. loose new snow on surface. Cracks on ice less numerous than during previous months. Length of cracks also shorter although still quite deep.
20	69.	175.	3.	8.	
27	69.	175.	3.	8.	
May 5	67.	170.	3.	8.	Avg depth of snow on shore: 22 in. (56 cm); rather loose except for crusty 1/4 in. top layer.
11	65.	165.	2.5	6.	Some drifted and rippled snow near site. Avg snow density: 0.328 g/cm ³ .
19	62.	157.	1.5	4.	Snow smooth, crusty with some slight ridging. Avg snow density: 0.317 g/cm ³ .
26	57.	145.	2.	5.	Surface crusty down to 1/2 in. deep. Avg snow depth on shore: 11 in. (28 cm); avg density, 0.303 g/cm ³
30	49.	124.	1.5	4.	Surface crusty down to 1 in. deep and pitted. Avg snow density: 0.248 g/cm ³ .
Jun 8	42.	107.	4.	10.	Avg snow density: 0.201 g/cm ³ . Surface smooth, few cracks.
15	33.5	85.	trace		Lead extends across lake, 200 yd in length and 4 in. in width. Others on lake are 30 yd in length and 1 to 3 in. in width. Surface smooth, numerous cracks.
22	21.5	55.			Surface smooth, numerous cracks.
29	13.	33.			Part of lake covered only with pancake ice. Some areas soft to walk on. Ice measurements terminated due to rapid melting (45° to 54°F during part of the day). Ice near shore still fast in numerous spots. Surface smooth, many cracks.
Beauharnois*(P.Q.): Measurements made at three sites: 3000 ft above Valleyfield Bridge 10, 400 ft below Lock 3, and 400 ft above Lock 4. Remarks pertain to all sites.					
1968					
Jan 22					Surface heavily ridged, no cracks.
29					" needle ice.
Feb 5					" solid, no cracks.
26	28.	71.			Maximum ice thickness observed at 400 ft below Lock 3. From bridge 10 to entrance of Lake St. Francis channel is frozen with a few areas of open water. Beauharnois canal frozen over with clear ice except from Hydro-Quebec camp 3 to bridge 10. Lake St. Louis frozen over except at power discharge area.
29					
Mar 5	27.	69.			Maximum ice thickness observed at 3000 ft above Valleyfield bridge 10.
14	26.	66.			Maximum ice thickness observed on 26 Feb and 14 Mar at 400 ft above lock 4.
19	23.	58.			
21					Surface solid ice from 12 Feb to 21 Mar.
Bethel (Alaska): Measurements made 40 yd from the shore of Kuskokwim River, south of Nerby's store.					
1967					
Oct 20					River clear of ice except for some places near shore.
21					Sub-freezing nights, river frozen over smooth with very few ridges.
25					Children skating on ice.
28					A few local residents crossed river ice.
29	5.	13.	1.5	4.	Measured ice close to shore at three locations, obtained readings of 5, 5½, and 6 in. Surface smooth, no cracks.

* Ice thickness data available in: CANADIAN DEPT OF TRANSPORT ICE 1 NOV 1968

TABLE III (Cont'd)
ICE THICKNESSES (1967-1968)

Date	Ice Thickness (in.) (cm)	Snow Depth (in.) (cm)	Remarks
Bethel (Alaska) (cont'd)			
1967			
Nov 1			Piper cub landed on ice.
2			River ice has film of water on it.
6	4.5	11.	Surface smooth, no snow on ice, no cracks.
11			A few planes parked on ice were taken off due to thin ice.
12			Wheels of last plane parked on ice melted through. No reading due to thin ice and considerable water overflow.
16			Local residents walking on ice.
19	5.	13.	Surface smooth, no cracks.
22			Plane parked on ice again.
26	8.5	22.	trace Snow drifts up to 6 in. (15 cm) deep on ice.
Dec 3	11.5	29.	1. 3. About 1/3 of ice surface still clear of snow. Surface smooth, no cracks. Avg depth of snow on river: 3/4 in. (2 cm).
10	18.	48.	Surface smooth, no cracks. Avg depth of snow on river: 1/2 in. (1 cm).
17	20.5	52.	About 1/4 of ice clear of snow and drifts up to 8 in. (20 cm) in height in spots. Ice thickness in middle of river was 21.5 in. (55 cm) with no snow. Surface smooth, no cracks. Avg depth of snow on river: 1 in. (3 cm).
24	22.5	57.	trace About 20% of river ice still clear of snow and drifts are up to 6 in. (15 cm) deep in spots. Avg depth of snow on river: 1.5 in. (4 cm).
1968			
Jan 1			Rain during past week caused overflow on ice.
2	23.	58.	Surface smooth, no cracks.
7	24.5	62.	Ice thickness in middle of river 25.5 (65 cm) with no snow cover. Surface smooth, few cracks.
14	25.5	65.	1. 3. Ice surface 1/3 clear of snow. Snow packed on Bethel half of river due to car and plane travel. Surface smooth, few cracks.
21	29.5	75.	Surface smooth, few cracks.
26			Overflow of water covered most of river ice. Water was about 1/2 in. deep at measuring site.
28	31.	79.	River had small areas of shell ice. Ice thickness in middle of river was 33 in. (84 cm) with no snow. Surface smooth, few cracks.
Feb 4	33.	84.	Surface smooth, no cracks.
11	36.	91.	1. 3. Ice thickness in center of river was 37.5 (95 cm) with 1.5 in. (4 cm) avg snow cover depth. Surface smooth, no cracks.
18	38.	97.	River water is low, river ice is much lower than the attached shore ice. Surface smooth, few cracks.
25	38.	97.	Ice thickness in center of river was 40.5 in. (103 cm), no snow cover. Trace of snow covers about 3/4 of river. Surface smooth, numerous cracks.
Mar 3	38.5	98.	1. 3. Snow depth varied from none to about 5 in. (13 cm). Surface smooth, no cracks.
10	42.	107.	1.5 4. " " " " "
17	40.5	103.	1.5 4. " " " " "
24	41.5	105.	1.5 4. Ice thickness 20 ft from measuring site was 41.5 in. (105 cm) with 2 in. (5 cm) snow. Surface smooth, no cracks.
31	42.	107.	1. 3. Surface smooth, no cracks.
Apr 7	42.5	108.	trace Maximum ice thickness observed. Surface smooth, no cracks.
14	42.	107.	1. 3. Ice thickness 4 1/2 ft. from measurement site was 44.5 in. (113 cm) and in middle of river 44 in. (112 cm). Some water overflow on south side of river. Surface smooth, no cracks.
21	40.5	103.	Measurement site had 3 in. (8 cm) slush and 9 in. (23 cm) of soft ice on top. Avg depth of slush was 2 in. (5 cm) on river. Surface smooth, no cracks.
28	34.	86.	Ice crystals 4 in. (10 cm) in depth observed on top of ice cover. Bottom 26 in. (66 cm) of ice cover was soft. Top 8 in. (20 cm) was firm. Surface smooth, few cracks.

TABLE III (Cont'd)
ICE THICKNESSES (1967-1968)

Date	Ice Thickness (in.) (cm)		Snow Depth (in.) (cm)		Remarks
Bethel (Alaska) (cont'd)					
1968					
May 5	34.	86.			Top 12 in. (30 cm) of ice at measurement site were rotten, next 10 in. (25 cm) below that were firm and the bottom 12 in. (30 cm) were soft. Three other sites all had 36 in. (91 cm) of ice with top 12 in. (30 cm) of it rotten, next 12 in. (30 cm) firm, and bottom 12 in. (30 cm) soft. A light pickup vehicle was driven on the ice. Surface smooth, few cracks.
6					Tide action has piled ice on south side of river near a sand bar.
7					Last plane was removed from ice.
8					Tundra buggy had trouble crossing ice.
9					Dog team crossed river; ice is black in color.
10					Water started to rise.
11					Water covering 1/3 of ice on south side; north side had considerable overflow.
12					Shore ice breaking up and large holes can be seen in ice.
13					Ice moved but two men still crossed river.
14					Ice moved a little and then jammed.
16					Ice moved rapidly on the 15th and 16th down channels on both sides.
17					Highest water to date. Loose ice running near center of river. Boats and planes started to use river.
19					Small amount of ice left near banks of river.
20					Ice entirely gone.
Bettles (Alaska): Measurements made at Evansville about 100 ft offshore on Koyukuk River.					
1967					
Oct 22	7.5	19.	0.5	1.	Surface smooth, no cracks.
28	8.	20.	2.5	6.	" " " " " "
Nov 4	9.	23.	10.5	27.	Layer of water near top of ice cover. Surface smooth, no cracks.
11	9.5	24.	11.	28.	Surface smooth, no cracks.
18	11.	28.	6.	15.	" " " " " "
25	18.	46.	4.	10.	Layer of water near top of ice cover. " " " " , no cracks.
Dec 2	20.	51.	8.	20.	1 in. water near top of ice layer. Surface smooth, no cracks.
9	19.	48.	10.	25.	1/2 in. water near top of ice layer. Surface smooth, no cracks.
16	19.	48.	14.	36.	Surface smooth, no cracks.
23	19.	48.	15.	38.	Two layers of water each 0.5 and 4 in. deep separated by thin ice layer all below surface ice layer. Surface smooth, no cracks.
30	18.	46.	12.	30.	Surface conditions similar to that on 23rd.
1968					
Jan 6	19.	48.	9.	23.	Surface smooth, no cracks.
13	18.	46.	8.	20.	9 in. of water near top of ice on 6 and 13 Jan. Surface smooth, no cracks.
20	28.	71.	8.	20.	Surface smooth, no cracks.
27	28.	71.	12.	30.	2 in. layers of water observed 7 in. from the top of ice on 20th and 27th. This thickness unusual for Bettles, normally ice is thicker. Surface smooth, no cracks.
Feb 3	27.	69.	12.	30.	Surface smooth, no cracks. Snow soft and loose.
10	27.	69.	15.	38.	There was still about 1/2 in. layer of water in between the ice sheet. Surface smooth, no cracks, snow cover soft and loose.
17	27.	69.	14.	36.	No water layers observed during drilling of ice.
24	27.	69.	14.	36.	Surface smooth, no cracks, snow cover soft and loose. " " " " " " " " " " " "

TABLE III (Cont'd)
ICE THICKNESSES (1967-1968)

Date	Ice Thickness (in.) (cm)		Snow Depth (in.) (cm)		Remarks
Beetles (Alaska) (cont'd)					
1968					
Mar 2	28.	71.	22.	56.	Surface smooth, no cracks, snow cover soft.
9	28.	71.	19.	48.	" " , " " , " " " .
16	30.	76.	19.	48.	" " , " " , " " " .
23	30.	76.	19.	48.	" " , " " , " " " .
30	31.	79.	18.	46.	" " , " " , " " " .
Apr 6	31.	79.	17.5	44.	" " , " " .
13	31.	79.	20.	52.	" " , " " .
20	32.	81.	20.	52.	" " , " " .
27	32.	81.	20.	52.	Cold weather has prevented any melting or ablation of ice. Surface smooth, no cracks.
May 4	32.	81.	11.	28.	Maximum ice thickness observed between 20 Apr and 4 May. Surface smooth, no cracks.
11	31.	79.	1.	3.	Surface smooth, no cracks.
18	28.	71.			Small cracks in ice caused by rising water. Final observation. Ice expected to be gone within one week.
Brochet* (MAN): Measurements made approximately 300 yd from shore on Brochet Bay of Reindeer Lake.					
1967					
Oct 29					Bay covered with snow and slush.
31					Snow and slush on bay frozen over.
Nov 2					Young clear ice developed.
1968					
Feb 24					Surface smooth, no cracks from 4 Nov 1967 to 24 Feb 1968.
Mar 30					Surface smooth, few cracks all month.
Apr 6					" lightly rafted, few cracks.
13					" " " , " " .
20					" " " , " " .
27					" " " , numerous cracks. Approximately 50% of bay covered by 2 to 6 in. of water.
May 4	46.	117.	1.	3.	Surface lightly rafted, few cracks. Maximum ice thickness observed.
11	39.5	100.			Surface lightly rafted, numerous cracks.
18	34.	86.			Surface moderately rafted, " " .
24					Ice safe to walk on due to extensive candling. Leads opened up across the bay, 50% of bay covered with candled ice.
Cambridge Bay* (N.W.T.): Measurements made 100 yd SSE of townsite dock.					
1968					
May 31	83.	211.			Surface smooth, no cracks from 4 Oct 1967 to 31 May 1968.
Jun 7	83.	211.	1.	3.	Maximum ice thickness observed on 31 May and 7 June. Surface smooth, few cracks.
14	80.	203.			" " , no " .
21	76.	193.			" " , " " .
28	59.5	151.			" " , few " .
Canyon Village (Alaska): Measurements made in front of the village, in the middle of Porcupine River.					
1968					
Feb 24	32.	81.	14.	36.	Surface smooth, no cracks. Snow hard packed, some drifting.
Mar 2	30.	76.			Surface smooth, " " .
9	30.	76.			" " , " " .
16	30.	76.			" " , " " . Avg snow depth: 14 in. (36 cm), hard packed between 2 and 16 Mar.

* Ice thickness data available in: CANADIAN DEPT OF TRANSPORT ICE 1 NOV 1968

TABLE III (Cont'd)
ICE THICKNESSES (1967-1968)

Date	Ice Thickness (in.) (cm)		Snow Depth (in.) (cm)		Remarks
Canyon Village (Alaska) (cont'd)					
1968					
Mar 23	33.	84.	11.	28.	Surface smooth, no cracks.
30	32.	81.	11.	28.	Snow depth hard packed between 16th and 30th. 3 in. (8 cm) of snow inundated with water and refroze. Surface smooth, no cracks.
Apr 6	32.	81.	11.	28.	" " , " " .
13	32.	81.	11.	28.	" " , " " .
20	32.	81.	11.	28.	" " , " " .
27	32.	81.	10.	25.	Small opening in ice observed 1/4 mile above village. Surface smooth, no cracks.
May 1					Huge opening 1/4 mile above village.
2					About 2 ft of water covered ice during the night and gradually drained through.
4	36.	91.			Maximum ice thickness observed. Surface honeycombed, numerous cracks.
6					Water on ice on both sides of river.
11	34.	86.			Surface honeycombed, numerous cracks.
12					Water rose about 12 in.
16					Both shores flooded.
18					Ice started moving at 1055 LST.
20					Considerable ice still in river.
25					River clear of ice, but considerable amount still on both shores.
Cape Parry* (N.W.T.): Measurements made on Gillet Bay, approximately 1½ miles south of Federal Electric's hangar. Measurements taken approximately 300 yd from shore.					
1967					
Sep 24					Shore lead on north edge of bay. Dimensions approximately 100 yd by 150 yd.
29					Shore lead still observed.
30					Gillet Bay filled by flowing winter ice. Floes very hummocked. Young ice formed in areas between the ice floes. Ice measurements on 24 and 29 Sept taken on young ice. Amundsen Gulf remains ice free.
Oct 12					Shore lead frozen over.
Nov 9					4 mile-wide open lead in east-west direction 5 miles offshore from 1 to 9 Nov.
10					Lead frozen over.
30					Few wide cracks on Amundsen Gulf from 25 to 30 Nov. These leads freeze over and reform depending on wind speed and direction.
Dec 22					Several leads in Amundsen Gulf.
23					All leads frozen. Surface smooth, few cracks from 24 Sept to 23 Dec.
29					Surface smooth, numerous cracks.
1968					
Jan 5					Surface smooth, few cracks.
10					Open lead in east-west line 4 miles offshore from 2 to 10 Jan on Amundsen Gulf.
12					Surface smooth, few cracks.
14					1 to 2 mile-wide lead due to south winds. Lead running in east-west direction on gulf.
19					Surface smooth, few cracks.
20					Lead frozen.
26					Surface smooth, few cracks.
Feb 2					" " , " " .
8					1 to 2 mile-wide lead 2 to 3 miles offshore.
9					Surface smooth, few cracks.

* Ice thickness data available in: CANADIAN DEPT OF TRANSPORT ICE 1 NOV 1968

TABLE III (Cont'd)
ICE THICKNESSES (1967-1968)

Date	Ice Thickness		Snow Depth		Remarks
Cape Parry* (N.W.T.) (cont'd)					
1968					
Feb 14					1 to 2 mile-wide lead on Amundsen Gulf 2 to 3 miles offshore from 8 to 14 Feb.
16					Surface smooth, few cracks from 5 Jan to 16 Feb.
23					" lightly hummocked, few cracks.
29					Lead on Amundsen Gulf 2 to 3 miles offshore. Length and width unknown due to fog over open water area.
Mar 2					Surface moderately ridged, numerous cracks.
8					" " " " " "
15					" " " " " "
22					" " " " " "
29					" " " " " "
31					No leads on Gillet Bay throughout the month. Constant opening and closing of lead in east-west direction 5 miles offshore on Amundsen Gulf. Open leads observed on 5, 10, 12 to 14, 16 to 20, and 23 to 31 Mar.
Apr 26					Pilot reports indicate that open leads extend beyond 10 miles offshore on Amundsen Gulf.
May 24	65.	165.	9.	23.	Maximum ice thickness observed.
31	61.	155.			Open lead on Amundsen Gulf throughout month varying from approximately 1 to 8 miles offshore. Lead running in east-west direction. Width estimated between 1 and 8 miles. Aircraft indicates that a lead runs from 50 miles west of Cape Parry to Cape Young in a straight line. Width estimated 1 to 5 miles. Snow extremely wet due to warm temperatures. Approximately 2 in. of water exists on most areas of ice.
Jun 7	55.	140.			
14	47.	119.			
21	37.	94.			
25					First breakup of winter ice on Amundsen Gulf. Ice in Gillet Bay becoming slushy.
28	37.	94.			Throughout period open lead on Amundsen Gulf 1 to 5 miles offshore running in east-west direction. Landfast ice out approximately 1 to 3 miles offshore. Surface moderately ridged, numerous cracks from 2 Mar to 28 June.
Jul 5	13.	33.			Numerous cracks on Gillet Bay. Surface smooth, numerous cracks.
13					Breakup of Amundsen Gulf. Few ice growlers left near shore.
16					Gillet Bay approximately 1/10 covered with slush and winter ice.
Cartwright* (NFLD): Measurements made approximately 200 yd south of USAF dock in Cartwright Harbour of Sandwich Bay.					
1967					
Dec 29					Surface lightly ridged.
1968					
Jan 6					" smooth.
13					" " "
22					" " "
27					Variable depths of snow covers Cartwright Harbour, surface very rough. Area between Cartwright mainland and Earl Island usually open in past years is now completely frozen over.
Feb 22					Severe wind and snow storm.
24					Ice surface covered with drifted hard packed snow. Avg snow depth: 13 in. (33 cm).

* Ice thickness data available in: CANADIAN DEPT OF TRANSPORT ICE 1 NOV 1968

TABLE III (Cont'd)
ICE THICKNESSES (1967-1968)

Date	Ice Thickness (in.) (cm)		Snow Depth (in.) (cm)		Remarks
Cartwright* (NFLD) (cont'd)					
1968					
Mar 10					Surface lightly ridged, no cracks from 2 Feb to 10 Mar.
23					" moderately " , " " on 16 and 23 Mar.
30					" lightly " , " " .
Apr 5	31.	79.	17.	43.	Maximum ice thickness observed.
13	30.5	77.			
20	26.5	67.			Surface smooth, no cracks from 5 to 20 Apr.
26	26.5	67.			9 in. (23 cm) slush on top of ice. Surface smooth, no cracks.
May 4	9.	23.			Slush on ice, numerous small holes caused by melt around rocks and other objects. Surface smooth, no cracks.
8					Cartwright Harbour 95% ice-free, drifting ice pans moving around with the tide. A belt of ice just east of Earl Island extends approximately 1½ miles to the Black Head and Cartwright approaches.
10					Ice unsafe.
Caughnawaga* (P.Q.): Measurements made approximately 3600 ft above Canadian Pacific Railroad bridge.					
1968					
Feb 26	25.	64.			Maximum ice thickness observed. Numerous cracks all month.
Mar 4	23.	58.			Few cracks.
11	20.	51.			Surface moderately ridged, few cracks.
18					Large ice crack near canal wall. Ice rotten.
Chalkyitsik (Alaska): Measurements made on the Black River, 200 yd north of the village community hall and 20 ft from the river bank.					
1968					
Jan 21	24.	61.	16.	41.	Surface smooth, numerous cracks.
27	24.	61.	18.	46.	Cracks in ice due to thermal expansion, air temperatures -57° to -60°f. No open cracks visible. Cracks ¾ in. in width were observed in ice by shoveling snow off the ice for about 60 ft across the river. River being used as a landing field for airplanes.
Feb 3	26.	66.	18.	46.	Surface smooth, numerous cracks.
10	27.	69.	19.	48.	" " , " " .
17	27.	69.	17.	43.	" " , " " . Avg depth of snow: 19 in. (48 cm).
24	29.	74.	18.	46.	One large crack in ice running in south to north direction across part of river used as air field. Crack approximately 2 in. in width but is not open. No open cracks visible. Ice thickness on a nearby lake was 26 in. (66 cm) with 19 in. (48 cm) snow cover.
Mar 2	28.	71.	17.	43.	Surface smooth, numerous cracks. Avg depth of snow: 18 in. (46 cm).
9	28.	71.	18.	46.	Surface smooth, " " .
16	29.	74.	18.	46.	" " , " " .
23	31.	79.	14.	36.	Maximum ice thickness observed. Ice thickness in nearby lake 28½ in. (72 cm) and snow cover 14 in. (36 cm). Snow on lake and river is very loose and powdery. Snow starting to pack and form a crust on top. Surface smooth, numerous cracks. Avg depth of snow: 18 in. (46 cm).
30	28.	71.	17.5	44.	No new cracks in ice observed.

* Ice thickness data available in: CANADIAN DEPT OF TRANSPORT ICE 1 NOV 1968

TABLE III (Cont'd)
ICE THICKNESSES (1967-1968)

Date	Ice Thickness (in.) (cm)		Snow Depth (in.) (cm)		Remarks
Chalkyitsik (Alaska) (cont'd)					
1968					
Apr 6	30.	76.	17.	43.	Surface smooth, numerous cracks. Avg depth of snow: 19 in. (48 cm).
13	29.	74.	19.	48.	Surface smooth, " " "
20	30.	76.	18.5	47.	" " " " "
27	29.	74.	16.5	42.	No open or new cracks in ice observed. Ice thickness in nearby lake is 30 in. (76 cm), snow cover 16 in. (41 cm). Surface rough, numerous cracks. Avg depth of snow: 17 in. (43 cm).
30					Snow depth down to 6 in. (15 cm). Weather warm and snow melting quite fast. Some water flooding beneath the snow on lake and river ice.
May 6	30.	76.	3.	8.	Ice thickness on nearby lake 30 in. (76 cm), snow cover 6 in. (15 cm). Surface rough, numerous cracks.
7					Water started to rise in river.
8					Water rising fast. Unable to get on river ice.
10					Ice broke and started to run at 2000 LST.
11					Ice jammed below and above village, village partly flooded.
13					Ice jam broke and water flowing freely in river.
Chesterfield Inlet* (N.W.T.): Measurements made on Spurrel Inlet of Hudson Bay, approximately 1800 ft east of operations building.					
1968					
May 17	63.	160.	12.	30.	Maximum ice thickness observed.
26	59.5	151.			Surface smooth, no cracks from 1 Dec 1967 to 26 May 1968.
Jun 1	60.	152.			
8	60.	152.			
15	59.	150.			
22	58.	147.			Surface " , few " " " 1 to 22 June.
Clyde River* (N.W.T.): Measurements made on Patricia Bay, approximately 1000 ft from shore.					
1967					
Dec 16					Surface smooth, few cracks from 28 Oct to 16 Dec.
1968					
Jan 14					" " , " " " " 24 Dec 1967 to 14 Jan 1968.
Feb 25					Surface lightly ridged, few cracks from 21 Jan to 25 Feb.
Apr 26					Surface moderately " , " " " " 1 Mar to 26 Apr.
Jun 7	67.	170.			
14	66.	168.			
21	66.	168.			
28	67.	170.	5.	13.	Maximum ice thickness observed on 7 and 28 June. Surface lightly ridged, few cracks from 4 May to 28 June.
Jul 5	63.	160.			
12	57.	145.	1.	3.	Surface smooth, few cracks from 5 to 20 July.
20	63.	160.			" " , numerous cracks. River flowed into north end of Patricia Bay and opened an area 1/4 to 1/2 mile in width. Little apparent change in ice conditions elsewhere on bay.
26	41.5	105.			

* Ice thickness data available in: CANADIAN DEPT OF TRANSPORT ICE 1 NOV 1968

TABLE III (Cont'd)
ICE THICKNESSES (1967-1968)

Date	Ice Thickness (in.) (cm)	Snow Depth (in.) (cm)	Remarks
College, Alaska (Univ Exp Station): Measurements made on Smith Lake, approximately 4000 ft NNW of weather station.			
1967			
Oct 10			Lake entirely frozen over.
18			Surface smooth, few cracks. Avg depth of snow: 2.5 in. (6 cm).
30	7.	18.	2.5 6. Surface smooth, no cracks. Snow very soft. Ice thickness measurement made 10 ft from shore.
Nov 6	8.	20.	4. 10. Surface smooth, no cracks. Snow cover density is light.
13	8.	20.	7.5 19. " " " " " " " " very light.
20	8.	20.	Surface " " " " " " " " . Avg depth of snow: 4 in. (10 cm). 4 in. water between snow and ice layer. Avg density: 0.186 g/cm ³ .
27	7.	18.	Surface rough, no cracks. Avg depth of snow: 2 in. (5 cm); avg snow density: 0.215 g/cm ³ . Three layers above main ice sheet: 2 3/4 in. water on bottom, 2 1/2 in. on top, with a 4 1/4 in. ice layer between.
Dec 4	16.5	42.	3. 8. Surface rough and pitted, no cracks. Avg snow density: 0.134 g/cm ³ .
11	17.5	44.	4. 10. Surface rough " " " " " " " " . " " " " " " " " 0.132 g/cm ³ .
18	19.	48.	6.5 17. Surface rough " " " " " " " " . " " " " " " " " 0.139 g/cm ³ .
27	20.	51.	9.5 24. Surface rough " " " " " " " " . " " " " " " " " 0.155 g/cm ³ .
1968			
Jan 2	20.	51.	9. 23. Surface soft " " " " " " " " . " " " " " " " " 0.191 g/cm ³ .
8	19.5	50.	9.5 24. Surface soft, rough, and pitted, no cracks. Avg snow density: 0.228 g/cm ³ .
15	21.5	55.	9. 23. Surface soft, rough, and pitted, " " " " " " " " . " " " " " " " " snow density: 0.241 g/cm ³ .
22	22.	56.	9.5 24. Surface rough and pitted, no cracks. Avg snow density: 0.209 g/cm ³ .
29	22.5	57.	Surface rough " " " " " " " " . " " " " " " " " 0.142 g/cm ³ . Weight of snow on ice forced water up through augered hole. 2 in. water over ice.
Feb 6	22.	56.	12. 30. Surface rough, no cracks. 5.5 in. water on top of ice. Avg snow density: 0.196 g/cm ³ .
12	22.	56.	10.5 27. Surface rough, no cracks. 6.6 in. " " " " " " " " . Avg snow density: 0.159 g/cm ³ .
19	22.5	57.	9.5 24. Surface rough and pitted, no cracks. 1.5 in. water on ice and 4 in. (10 cm) new ice. Avg snow density: 0.187 g/cm ³ .
27	23.	58.	11. 28. Surface rough and pitted, no cracks. 1 in. water on ice and 4 in. (10 cm) new ice. Avg density: 0.188 g/cm ³ .
Mar 4	23.	58.	10.5 27. Surface rough and pitted, no cracks. 1 in. water on ice and 5 in. (13 cm) new ice. Avg snow density: 0.201 g/cm ³ .
11	28.	71.	8. 20. Surface rough and pitted, no cracks. Avg snow density: 0.168 g/cm ³ .
18	28.	71.	8.5 22. Surface moderately ridged, no cracks. Avg snow density: 0.201 g/cm ³ .
25	28.	71.	9. 23. Surface moderately ridged, no cracks. " " " " " " " " 0.184 g/cm ³ .
Apr 1	29.5	75.	8. 20. Surface smooth, no cracks. Avg snow density: 0.167 g/cm ³ .
8	29.	74.	8. 20. Maximum ice thickness observed. Surface smooth, no cracks. Avg " " " " : 0.200 " " .

TABLE III (Cont'd)
ICE THICKNESSES (1967-1968)

Date	Ice Thickness (in.) (cm)	Snow Depth (in.) (cm)	Remarks
College, Alaska (Univ Exp Station) (cont'd)			
1968			
Apr 15	29. 74.	8.5 22.	Surface smooth, no cracks. Avg snow density: 0.218 g/cm ³ .
22	28.5 72.	6.5 17.	Surface " , " " . " " " 0.234 g/cm ³ .
27			Snow has been reduced to a hard crust 0 to 1 in. (0 to 3 cm) in depth. A few pools of water showing on ice.
29	27. 69.		No cracks.
May 6			Marshy area surrounding lake was flooded with runoff, routine reading and measurements impossible to obtain.
13			No snow on ice. Ice appears to be becoming honeycombed.
18			Water observed around edge of ice. Ice appears darker.
20			A few ice floes in center of lake. Ice completely gone from lake.
Coppermine* (N.W.T.): Measurements made on Coronation Gulf near mouth of Coppermine River, 100 yd north of Dept of Transport dock.			
1967			
Nov 17			Surface smooth, no cracks 3 to 17 Nov.
1968			
Jan 26			Tidal crack observed approximately 25 yd offshore.
Feb 9			Surface smooth, few cracks from 24 Nov 1967 to 9 Feb 1968.
May 3			Surface lightly ridged, few cracks.
10			" " " , " " "
17			" " " , " " "
24	86. 218.	3. 8.	Maximum ice thickness observed.
28			1 to 2 in. (3 to 5 cm) of slush on ice runway. Rest of the ice surface has standing water. These conditions only exist within 100 to 150 yd from shore, further out ice surface normal.
31	56. 142.		Surface lightly rafted, few cracks from 16 Feb to 24 May.
Jun 7	46. 117.		Surface moderately rafted, numerous cracks.
8			Lead observed.
12			No ice measurement taken due to candel and unsafe condition of ice.
16			Lead observed on 8th has gradually widened and ice floes have started moving. Lead 70 yd in width when ice started moving.
Coral Harbour* (N.W.T.): Measurements made on South Bay, approximately 1 mi SW of Snafu Beach.			
1967			
Nov 10			Sea ice sheet considered safe to travel on. Surface smooth, no cracks.
17			Ice marker lost, ice not measured at same location as on 10 Nov.
Dec 29			Surface smooth, no cracks from 10 Nov to 29 Dec.
1968			
May 15			First day air temperature rose to above freezing.
31	69.5 177.	18. 46.	Maximum ice thickness observed. Surface smooth, few cracks from 5 Jan to 31 May. Appeared to be about 2 in. of water under the first 4 in. (10 cm) of ice during measurement.
Jun 7			No measurement due to large amounts of meltwater on ice.

* Ice thickness data available in: CANADIAN DEPT OF TRANSPORT ICE 1 NOV 1968

TABLE III (Cont'd)
ICE THICKNESSES (1967-1968)

Date	Ice Thickness (in.) (cm)	Snow Depth (in.) (cm)	Remarks
Cornwall* (ONT): Measurements made in canal 400 ft above Lock 19. Water level in canal is $3\frac{1}{2}$ ft below normal due to work along canal.			
1968			
Mar 18	27.	69.	Maximum ice thickness observed from 4 to 18 Mar. Surface smooth, no cracks from 22 Jan to 25 Mar.
25	24.	61.	
Apr 1			Open water area 15 ft in width along both sides of canal. Open water 300 ft above measurement site.
Ennadai Lake* (N.W.T.): Measurements made west of station on Ennadai Lake, approximately 100 yd from shore.			
1967			
Oct 20			First ice formed.
23			Lake completely frozen over. Surface smooth, no cracks.
Nov 24			Snowdrifts up to 1 ft in height.
1968			
Feb 23			" " " 2 " " " in places. Occasional patches of bare ice.
May 17	59.5	151.	Maximum ice thickness observed. Surface smooth, no cracks from 23 Oct 1967 to 24 May 1968. Few holes in ice.
24	56.	142.	
28			
Jun 1	56.	142.	First sign of a shore lead on south side of bay. Ice candled. Surface smooth, few cracks on 1 and 7 June. Large lead observed. Surface rough, few cracks. " " " " " " Ice badly candled. Large cracks across lake, ice extremely rotten.
3			
7	53.	135.	
8			
14	49.	124.	
21	39.	99.	
22			
30			
Eureka* (N.W.T.): Measurements made on Slide Fiord, 300 yd from shore, south of Building 2.			
1967			
Sep 14			Fiord froze over. Surface smooth, no cracks.
24			
1968			
May 24	83.	211.	Increase in number of cracks since last week, ice softer. Surface smooth, few cracks from 29 Sept 1967 to 31 May 1968.
31	83.	211.	
Jun 7	83.	211.	
14	79.5	202.	
21	67.	170.	Maximum ice thickness observed on 24 May, 31 May, and 7 June.
28	52.	132.	
Jul 5	41.	104.	Shore lead 100 ft in length. Surface smooth, numerous cracks all month.
9			
12	37.	94.	
19	28.	71.	
21			
Lead 200 yd in width running directly across fiord from station. Shore lead 300 yd in width running entirely across fiord. Surface smooth, numerous cracks on 5 and 12 July. " lightly hummocked, numerous cracks. Complete breakup of Slide Fiord.			
Fort Chipewyan* (ALTA): Measurements made on Lake Athabasca 800 ft south of the government dock.			
1967			
Dec 8			Surface smooth, few cracks on 1 and 8 Dec. " " , no " .
15			

* Ice thickness data available in: CANADIAN DEPT OF TRANSPORT ICE 1 NOV 1968

TABLE III (Cont'd)
ICE THICKNESSES (1967-1968)

Date	Ice Thickness (in.)	Ice Thickness (cm)	Snow Depth (in.)	Snow Depth (cm)	Remarks
Fort Chipewyan* (ALTA) (cont'd)					
1968					
Mar 1					Large pressure ridge formed approximately 200 ft north of test site. Height of ridge approximately 3 ft above normal.
29	36.5	93.	3.	8.	Surface lightly rafted, few cracks from 22 Dec 1967 to 29 Mar 1968.
Apr 4					Bay area used for skiplane landings is unserviceable.
5	36.5	93.	2.	5.	Surface lightly ridged, few cracks.
12	36.5	93.	2.	5.	Maximum ice thickness observed from 29 Mar to 12 Apr.
19	34.	86.	1.	3.	
26	33.5	85.	1.	3.	Surface lightly ridged, few cracks from 5 to 26 Apr.
30	33.	84.			Few leads in shallow bay below townsite. Surface lightly ridged, numerous cracks.
Fort Yukon (Alaska): Measurements made on Yukon River.					
1967					
Nov 5	9.5	24.	2.	5.	Surface smooth, no cracks.
12	10.5	27.	4.	10.	" " , " " .
18	11.	28.	5.	13.	" " , " " .
24					Snow drifting made it difficult to take an accurate snow measurement.
25	17.5	44.	5.	13.	Surface smooth, no cracks.
Dec 2	19.	48.	6.	15.	" " , " " .
9	19.5	50.	7.	18.	" " , " " .
16	20.5	52.	7.5	19.	" " , " " .
23	21.	53.	8.5	22.	" " , " " .
30	22.5	57.	8.5	22.	Ice sheet pressing slightly downward because water overflowing upward through test hole.
1968					
Jan 6	24.	61.	9.	23.	Surface smooth, no cracks.
13	24.	61.	9.	23.	" " , " " .
20	25.	64.	9.	23.	" " , " " .
27	26.	66.	11.	28.	" " , " " .
Feb 3	28.	71.	11.	28.	" " , " " .
10	29.	74.	11.	28.	" " , " " .
17	29.5	75.	15.	38.	" " , " " .
24	31.5	80.	15.	38.	Drifted snow over measuring site. Surface smooth, no cracks.
Mar 2	31.	79.	15.	38.	Surface smooth, no cracks.
9	30.	76.	14.	36.	" " , " " .
16	29.5	75.	14.	36.	" " , " " .
23	30.5	77.	14.	36.	" " , " " .
30	31.5	80.	14.	36.	Snow drifts observed 9 to 30 Mar. Surface smooth, no cracks.
Apr 6	31.5	80.	14.	36.	Surface smooth, no cracks.
13	33.	84.	15.	38.	" " , " " .
20	33.	84.	14.	36.	" " , " " .
27	33.	84.	12.	30.	Maximum ice thickness observed from 13 to 27 Apr. Surface smooth, no cracks.
May 4					No measurement taken due to approximately 8 in. of water observed on top of ice.
9					River ice "lifted" causing water on ice to drain through cracks. Area unsafe for ice thickness measurement.
Frobisher Bay* (N.W.T.): Measurements made halfway between Long Island and Dept of Transport causeway.					
1967					
Dec 29					Tidal ridge 50 ft from shore and 10 ft high.
1968					
Jan 26					" " 100 in. " " " 15 " " .
Feb 24					" " 150 " " " " 20 " " .
Mar 31					By end of month tidal ridge was 200 ft from shore and 20 ft high.

* Ice thickness data available in: CANADIAN DEPT OF TRANSPORT ICE 1. NOV 1968

TABLE III (Cont'd)
ICE THICKNESSES (1967-1968)

Date	Ice Thickness (in.) (cm)		Snow Depth (in.) (cm)		Remarks
Frobisher Bay* (N.W.T.) (cont'd)					
1968					
Apr 26					Tidal ridge 150 ft from shore and 20 ft high.
30					Ice measurement taken at Caron Island, 5 miles SSE of Frobisher. Ice thickness there: 64 in. (162 cm).
May 24	65.	165.	5.	13.	
31	65.	165.	5.	13.	Ice beginning to deteriorate, very soft from top to bottom.
Jun 7	65.	165.	4.	10.	Maximum ice thickness observed 24 May to 7 June. Surface smooth, few cracks from 24 Nov 1967 to 7 June. 1968.
14	63.	160.	3.	8.	
21	56.	142.	2.	5.	
26	54.	137.	2.	5.	Surface rough, few cracks from 14 to 26 June.
28	44.	112.	2.	5.	
Jul 3	43.	109.	2.	5.	
5	40.	102.	2.	5.	Surface rough, numerous cracks 3 to 5 July. Ice considered unsafe for further measurements this season.
Galena (Alaska): Measurements made in center of village near post office, approximately 300 to 800 ft offshore on the Yukon River.					
1967					
Oct 14					Very thin ice floes started running on river.
17					River unnavigable for boats.
22					River almost full of ice and movement slowed to 1½ to 2 mph.
26					Ice stopped running in Yukon River with quite a bit of overflow.
Nov 7					Ice was unsafe to cross until this date because of warm weather.
12	10.	25.	2.5	6.	Surface smooth, few cracks. Avg depth of snow: 4 in. (10 cm). Ice seems uniform in thickness. 7 holes drilled across river, all measured approximately 10 in. (25 cm) in thickness.
Dec 2	39.	99.	2.	5.	Surface rough, few cracks.
9	42.	107.	2.	5.	" " , " " .
1968					
Feb 4	48.	122.	28.	71.	" " , " " .
11	46.	117.	24.	61.	" moderately ridged, no cracks.
18	43.	109.	18.	46.	" " " " , " " .
25	50.	127.	30.	76.	" " " " , " " . Snowfall during month resulted in 6 in. (15 cm) of crusted snow, over 18 to 24 in. (46 to 61 cm) snow, all over the ice.
Mar 3	55.	140.	36.	91.	Maximum ice thickness observed. Surface rough, few cracks. Snow surface crusted.
10	43.	109.	30.	76.	Surface rough, few cracks.
17	48.	122.	36.	91.	" " , " " .
24	44.	112.	30.	76.	" " , " " .
31	42.	107.	30.	76.	" " , " " . Upper 6 in. (15 cm) snow surface over ice fluffy.
Apr 7					Surface very fluffy, few cracks. Ice rafted in places, some measured to be 6½ ft thick.
14	42.	107.	18.	46.	Surface rough, no cracks.
21	44.	112.	14.	36.	" " , " " . Snow over ice melting rapidly.
28	48.	122.	24.	61.	" " , " " . " hard packed.
May 5	24.	61.			" honeycombed, numerous cracks.
6					All snow melted and water observed on top of ice.
8	15.	38.			More water overflow on ice and cracks along bank.
					Surface honeycombed, numerous cracks.
12	6.	15.			Crack approximately 5 to 15 ft in length and 2 ft in width all along bank and out into channel. Surface honeycombed, numerous cracks.

* Ice thickness data available in: CANADIAN DEPT OF TRANSPORT ICE 1 NOV 1968

TABLE III (Cont'd)
ICE THICKNESSES (1967-1968)

Date	Ice Thickness (in.) (cm)	Snow Depth (in.) (cm)	Remarks
Galena (Alaska) (cont'd)			
1968			
May 15	4.	10.	Some cracks in ice each approximately 2 in. in width. Surface honeycombed, numerous cracks.
17			River broke up at approximately 0900 LST.
25			" clear of ice.
Gambell (Alaska): Measurements made on Troutman Lake.			
1967			
Oct 16			Lake froze over.
21	3.	8.	Surface smooth, no cracks.
28	7.	18.	" " " " . Avg depth of snow: 0.5 in. (1 cm).
Nov 4	7.5	19.	Surface " , few " . " " " " 1 in. (3 cm).
11	9.	23.	Surface " , " " . " " " " 8 in. (20 cm).
18	12.	30.	Surface " , numerous cracks. Avg depth of snow: 9 in. (23 cm).
25	16.	41.	Surface smooth, " " . " " " " 6 in. (15 cm).
Dec 2	19.5	50.	Surface smooth, " " . " " " " 8 in. (20 cm).
9	25.	64.	Surface smooth, " " . " " " " 5 in. (13 cm).
16	29.	74.	Surface lightly ridged, numerous cracks. Avg depth of snow: 12 in. (30 cm).
23	30.5	77.	Surface lightly ridged, " " . " " " " snow: 8 in. (20 cm).
30	31.	79.	2. 5. Surface lightly ridged, " " . " " " snow: 15 in. (38 cm).
1968			
Jan 6	31.	79.	2. 5. Surface lightly ridged, " " . " " " snow: 20 in. (51 cm).
13	31.5	80.	4. 10. Surface lightly ridged, " " . " " " snow: 25 in. (64 cm).
20	32.5	83.	4. 10. Surface lightly ridged, " " . " " " snow: 25 in. (64 cm).
27	33.	84.	12. 30. Surface lightly ridged, " " . " " " snow: 15 in. (38 cm).
Feb 3	34.	86.	10. 25. Surface lightly ridged, " " . " " " snow: 18 in. (46 cm).
10	36.5	93.	10. 25. Surface lightly ridged, " " . " " " snow: 15 in. (38 cm).
17	39.	99.	8. 20. Surface lightly ridged, " " . " " " snow: 15 in. (38 cm).
24	40.	102.	8. 20. Surface lightly ridged, " " . " " " snow: 15 in. (38 cm).
Mar 2	41.	104.	10. 25. Surface lightly ridged, " " . " " " snow: 15 in. (38 cm).
9	41.5	105.	8. 20. Surface lightly ridged, " " . " " " snow: 17 in. (43 cm).
16	42.	107.	10. 25. Surface lightly ridged, " " . " " " snow: 17 in. (43 cm).
23	43.	109.	12. 30. Surface lightly ridged, " " . " " " snow: 20 in. (51 cm).
30	43.	109.	15. 38. Surface lightly ridged, " " . " " " snow: 20 in. (51 cm).
Apr 6	43.5	110.	10. 25. Surface rough, numerous cracks. Avg depth of snow: 25 in. (64 cm).
13	43.5	110.	12. 30. Maximum ice thickness observed on 6 and 13 Apr. Surface rough, numerous cracks. Avg depth of snow: 25 in. (64 cm).

TABLE III (Cont'd)
ICE THICKNESSES (1967-1968)

Date	Ice Thickness (in.) (cm)		Snow Depth (in.) (cm)		Remarks
Gambell (Alaska) (cont'd)					
1968					
Apr 20	41.5	105.	15.	38.	Surface rough, numerous cracks. Avg depth of snow: 30 in. (76 cm).
27	43.	109.	15.	38.	Surface rough, " " " " " "
					48 in. (122 cm).
Goose Bay* (NFLD): Measurements made on Terrington Basin.					
1967					
Nov 10					Terrington Basin froze over.
20					Warm air temperatures past week caused numerous breaks in the ice field.
Dec 4					Ice thickness up to 14 in. (36 cm) in areas of rafted ice pans. Terrington Basin has 10/10 ice coverage.
11					Surface moderately ridged, few cracks.
15					" lightly ridged, no cracks.
22					Snow cover includes approximately 6.5 in. (17 cm) of slush. Layer of ice 1 in. (3 cm) over 9 in. (23 cm) of water, then 10 in. (25 cm) of solid ice beneath.
1968					
Mar 30	34.	86.			Ice covered with 4 to 6 in. (10 to 15 cm) slush.
Apr 12	34.	86.	16.	41.	Maximum ice thickness observed on 30 Mar and 12 Apr. Ice covered with 4 to 6 in. (10 to 15 cm) slush beneath snow.
21	30.	76.			Ice covered with 4 to 6 in. (10 to 15 cm) water and snow.
26	30.	76.			" " " 2 " 3 " (5 to 8 cm) slush.
May 3	25.	64.			2 to 4 in. (5 to 10 cm) slush on ice surface. Surface smooth, no cracks from 15 Dec 1967 to 3 May 1968.
17					Terrington Basin 50% open.
21					" " 90% "
22					" " clear of ice.
Hall Beach* (N.W.T.): Measurements made in harbor opening into Foxe Basin, approximately 3/4 mile ESE from weather office.					
1967					
Oct 3					First ice formed. Slush ice just below water level.
20					Surface lightly ridged, no cracks on 13 and 20 Oct.
1968					
Mar 31					All extension rods and auger lost through the ice while measuring ice thickness.
Apr 28					New extension rods and auger received.
May 4					One lead appeared, approximately 1 mile from shore, variable in width from 1/8 to 1/4 mile across depending on wind direction and speed.
12					Surface lightly ridged, few cracks from 27 Oct 1967 to 12 May 1968.
17					Surface lightly " , numerous cracks.
25					Due to persistent surface winds from NW at 20 to 30 mph, the outer edge of lead is not discernible.
Jun 21					Surface lightly ridged, few cracks 26 May to 21 June.
28	82.	208.	3.	8.	Maximum ice thickness observed. Surface lightly ridged, numerous cracks from 1 to 2 ft in length could be seen. The flow edge of ice is only about 3/16 mile from shore. Puddles of water forming on top of ice surface.
Holman Island* (N.W.T.): Measurements made on the west side of Kings Bay, opposite barge landing dock.					
1967					
Oct 6					Small ponds and lakes frozen over during first week of October.
11					Kings Bay and Queens Bay frozen over.

* Ice thickness data available in: CANADIAN DEPT OF TRANSPORT ICE 1 NOV 1968

TABLE III (Cont'd)
ICE THICKNESSES (1967-1968)

Date	Ice Thickness (in.) (cm)	Snow Depth (in.) (cm)	Remarks
Holman Island* (N.W.T.) (cont'd)			
1967			
Oct 13			Amundsen Gulf open.
Nov 30			Open lead 1/4 to 1/2 mile in width from Holman Island, running west past Kings and Queens Bays during entire month.
Dec 15			Open water in Amundsen Gulf during first half of December due to mild weather and strong easterly winds.
1968			
Jan 26			Open patches of water in Amundsen Gulf.
Feb 23			Open water in a few places on Amundsen Gulf due to strong easterly gales.
Mar 29	73. 185.	1. 3.	Maximum ice thickness observed. Open water in Amundsen Gulf, approximately 5 miles from Holman Island. Open water and large leads observed in moving ice, extending across Amundsen Gulf to mainland. Surface lightly ridged, no cracks from 13 Oct 1967 to 29 Mar 1968.
Holy Cross (Alaska): Measurements made on Ghost Creek Slough.			
1967			
Nov 24	17. 43.		Surface smooth, few cracks.
Dec 12	26.5 67.		" " , numerous cracks.
19	28. 71.	trace	" " , " "
29	31.5 80.	"	Cracks are approximately 1/4 to 1/2 in. in width and up to 25 ft in length. Surface moderately ridged, numerous cracks.
1968			
Jan 1	29. 74.		Surface rough, few cracks.
Feb 5	36. 91.	trace	" moderately ridged, numerous cracks.
12	39. 99.		" drifted, numerous cracks.
19	41. 104.		" " , " "
21	44. 112.	6. 15.	" " , " " . Maximum ice thickness observed.
Hopedale* (NFLD): Measurements made in Hopedale Harbour, approximately halfway between USAF dock and Ellen Island.			
1968			
Feb 10			Surface smooth, no cracks from 7 Jan to 10 Feb.
Mar 16			" lightly ridged, no cracks from 16 Feb to 16 Mar.
22			" moderately ridged, no cracks.
29			" " " , " " on 22 and 29 Mar.
Apr 8			" lightly ridged, no cracks.
12			" moderately " , " "
19	39. 99.	2. 5.	Maximum ice thickness observed. Increase of ice thickness from 12 to 19 Apr due to snow cover on ice melting and then freezing.
22			Ice beginning to thaw along shoreline on village side of harbor.
26	38.5 98.	1. 3.	Surface smooth, few cracks on 19 and 26 Apr.
30			Ice still deteriorating along shoreline of village.
May 8	33. 84.	1. 3.	
10	29. 74.		
19	24. 61.	1. 3.	

* Ice thickness data available in: CANADIAN DEPT OF TRANSPORT ICE 1 NOV 1968

TABLE III (Cont'd)
ICE THICKNESSES (1967-1968)

Date	Ice Thickness (in.) (cm)		Snow Depth (in.) (cm)		Remarks
Hopedale* (NFLD) (cont'd)					
1968					
May 24	12.	30.			Lead at west end of harbor extending from USAF dock across mouth of harbor, also open water along shoreline extending from government dock to D.O.T. area. Numerous leads in harbor. Ice measurements taken on 24 May and 31 May were estimated due to unsafe ice. Most of harbor free of ice but easterly winds were drifting ice in from outside harbor. Surface smooth, no cracks all month.
31	4.	10.			
Inuvik* (N.W.T.): Measurements made on Mackenzie River, east channel, approximately 80 yd from docking area.					
1967					
Oct 18					Open stretch of water approximately 75 ft square, 200 yd above observation point.
Nov 17					Due to warm weather, water was observed on top of ice between river bank and observation point.
1968					
Mar 29					Snow firmly packed on ice surface.
Apr 19					Continual flow of water up through drill hole after break-through by ice auger.
May 3	39.	99.	10.	25.	Maximum ice thickness observed.
10	37.5	95.	8.	20.	Snow has a high water content. Surface smooth, few cracks 18 Oct 1967 to 10 May 1968.
17					Open water along river bank out a distance of 15 to 20 ft, unable to get on ice for observation.
28					Open water out for 50 ft from river bank, small pieces of floating ice.
Iroquois* (ONT): Measurements made 500 ft above upper canal gates.					
1968					
Feb 26	20.	51.			Maximum ice thickness observed on 26 Feb and 4 Mar.
Mar 4	20.	51.	2.	5.	
11	19.	48.	2.	5.	Surface smooth, no cracks from 2 Jan to 18 Mar. Ice unsafe to measure, open water.
18	15.	38.			
25					
Iroquois* (ONT): Measurements made 400 ft below canal gates.					
1968					
Feb 26	24.	61.	1.	3.	Maximum ice thickness observed.
Mar 18					Surface smooth, no cracks from 22 Jan to 18 Mar. Ice unsafe to measure, open water.
25					
Isachsen* (N.W.T.): Measurements made on old winter ice, 1 mile SSW of gauge marker in "Hole in Fog Bay" part of Deer Bay. New ice measured 50 ft SSW of the tide gauge marker. Remarks pertain to both sites.					
1967					
Aug 29					Freeze-over of open water areas.
Sep 15					Top 10 in. (25 cm) of old ice rotten.
1968					
Jan 19					Snow at new site 30 in. (76 cm) in depth.
Feb 23	65.	165.	3.	8.	Maximum ice thickness observed at new ice site. New ice measurement taken by measuring auger and extension due to the ice being frozen to the bottom of bay.
Mar 1					New ice measurement site discontinued due to ice being frozen to the bottom.
May 31	136.	345.	5.	13.	Maximum ice thickness observed at old winter ice site. Surface lightly ridged, no cracks from 8 Sept 1967 to 31 May 1968. This maximum ice value was not used in the analysis presented in figure 5.

* Ice thickness data available in: CANADIAN DEPT OF TRANSPORT ICE 1 NOV 1968

TABLE III (Cont'd)
ICE THICKNESSES (1967-1968)

Date	Ice Thickness (in.) (cm)		Snow Depth (in.) (cm)		Remarks
Isachsen* (N.W.T.) (cont'd)					
1968					
Jun 6					Shore puddle up to 3 to 4 ft in depth extending completely around bay. Bay ice 20% covered with puddles.
King Salmon (Alaska): Measurements made on Naknek River near USAF dock.					
1967					
Oct 28					Smooth thin ice extends 15 to 40 ft from shore. Few small pieces sheet ice floating in river. Ice thickness ranges from 1½ in. (4 cm) along shore to an estimated 1¼ in. (0.5 cm) a short distance from shore. River still navigable.
Nov 11					Widely scattered patches of thin shore ice.
18					Ice extends out into channel, main channel still free of ice. Large chunks of ice jammed along shore.
25	4.	10.	2.5	6.	
29					Ice now extends from shore to shore.
Dec 2	6.5	17.	1.	3.	Surface lightly ridged, few cracks.
9	16.	41.	1.	3.	" " " " " "
16	16.	41.	1.	3.	" " " " " "
23	18.5	47.	2.	5.	" smooth, few cracks.
30					Unseasonably warm temperatures melted all ice along shore. Water 3 ft deep along shore. Water 5 to 6 in. (13 to 15 cm) deep covers usual observation site.
1968					
Jan 6	15.	38.			Surface smooth, few cracks. Some cracks 75 yd in length observed perpendicular to river.
13	20.	51.			Few cracks in ice 60 yd in length. Surface smooth, few cracks.
20	25.	64.			Ice extremely clear and smooth. Surface smooth, few cracks.
27	27.	69.	2.	5.	Surface smooth, few cracks. Avg depth of snow: 3 in. (8 cm).
Feb 3	32.	81.	1.5	4.	Surface smooth, few cracks approximately 60 yd in length.
10	33.	84.	1.5	4.	Water and slush on ice due to warm temperatures.
17	33.5	85.			Surface smooth, numerous cracks.
24	32.5	83.			Maximum ice thickness observed. Surface smooth, numerous cracks.
					Warmer temperatures have melted all snow on ice and pools of water beginning to form over entire surface area.
					Shallow water all along shore extending out 10 to 20 yd. Surface smooth, numerous cracks.
Mar 2					Thin crusty ice extends out from shore to approximately 35 yd. Unable to reach normal point of observation.
9					Channel open, shelf of ice extends out approximately 20 yd from both shores. Thickness of shelf varies from 32 in. (81 cm) near shore to 9 in. (23 cm) near open water. Heavy ridging on surface of shelf with many cracks.
16					Ice extends 40 ft from each shore. River open, few ice floes.
22					River open and navigable, very light shore ice.
30					Few small ice floes.
Apr 7					River open and navigable, very little shore ice. Few ice floes 15 to 30 in. (38 to 76 cm) thick drifting with tide and scattered along the shoreline.
14					River open and navigable, very little shore ice, numerous small ice floes drifting with tide. Few ice floes 15 to 30 in. (38 to 76 cm) thick, scattered along both shores.
21					River open and navigable. Few small ice floes scattered along shore, all ice very rotten.
28					River open, shore ice nearly gone. Very few small ice floes drifting with the tide, some scattered along shoreline.

* Ice thickness data available in: CANADIAN DEPT OF TRANSPORT ICE 1 NOV 1968

TABLE III (Cont'd)
ICE THICKNESSES (1967-1968)

Date	Ice Thickness (in.) (cm)	Snow Depth (in.) (cm)	Remarks
Kobuk (Alaska): Measurements made at middle of Kobuk River in front of village.			
1967			
Oct 10			First ice flowed in river for 3 days then stopped due to warmer weather.
15			Ice started running again.
18			River froze over solid in the evening.
21	6.	15.	Surface smooth, no cracks.
28	9.	23.	" " , snow-covered cracks.
Nov 4	11.	28.	" " , cracks are snow-covered.
11	11.	28.	" " , few cracks.
18	13.	33.	" " , cracks are " "
25	15.	38.	7 in. (18 cm) slush and water over ice and 7 in. (18 cm) snow above slush.
Dec 2	19.5	50.	4. 10. Surface smooth, snow-covered cracks.
9	21.5	55.	5. 13. " " , " " " "
16	22.	56.	11. 28. " " , " " " "
23	22.	56.	17. 43. " " , " " " "
30	24.	61.	12. 30. " " , " " " "
1968			
Jan 6	24.	61.	7. 18. 6 in. (15 cm) slush and water over ice and 7 in. (18 cm) snow above slush. Surface smooth, snow-covered cracks.
13	27.	69.	10. 25. Surface smooth, snow-covered cracks.
20	27.5	70.	9. 23. " " , " " " "
27	29.	74.	15. 38. " " , " " " "
Feb 2	27.5	70.	18. 46. " " , " " " "
10	30.5	77.	21. 53. " " , " " " "
17	30.5	77.	19. 48. " " , " " " "
24	31.	79.	19. 48. " " , " " " "
Mar 2	33.	84.	23. 58. " " , " " " "
9	33.	84.	20. 51. " " , " " " "
16	35.	89.	19. 48. " " , " " " "
23	36.	91.	23. 58. " " , " " " "
30	37.5	95.	20. 51. " " , " " " "
Apr 6	37.5	95.	19. 48. " " , " " " "
13	37.5	95.	18. 46. " " , " " " "
20	37.	94.	17. 43. " " , " " " "
27	37.5	95.	19. 48. " " , " " " "
May 4	38.	97.	19. 48. " " , " " " " . Maximum ice thickness observed.
11	37.	94.	7. 18. Surface smooth, snow- " " . Very wet snow.
18	24.	61.	10. 25. " " , " " " " . Water and snow on ice.
25	22.	56.	12. 30. ice floating in channels. Open areas forming. Surface smooth, snow-covered cracks.
27			Ice broke up and moved out at 1755 LST.

Kotzebue (Alaska): Measurements made offshore of the village, approximately 1½ mile NNE of WBAS.

1967		
Oct 21	6.5	17.
28	9.5	24.
Nov 4	9.5	24.
11	11.	28.
18	15.	38.
25	16.5	42.
Dec 2	21.	53.
9	24.5	62.
16	25.5	65.
23	26.	66.
30	27.	69.

TABLE III (Cont'd)
 ICE THICKNESS (1967-1968)

Date	Ice Thickness (in.) (cm)	Snow Depth (in.) (cm)	Remarks
Kotzebue (Alaska) (cont'd)			
1968			
Jan 6	27.5 70.		
13	29. 74.		
20.	30. 76.		
27	38. 97.		
Feb 3	31. 79.		
10	35. 89.		
17	36.5 93.		
24	38. 97.		
Mar 2	39. 99.		
9	39. 99.		
16	38.5 98.		
23	39.5 100.		
30	41. 104.		
Apr 6	41.5 105.		
13	41. 104.		
20	41.5 105.		
27	42. 107.		Maximum ice thickness observed.
May 4	41. 104.		
11	34.5 88.		
18	33.5 85.		
25	28. 71.		
Jun 1	18. 46.		Water overflow onto ice in front of town.
3			Ice moving in channel.
o			
Mankomen Lake (Alaska): Measurements made on Mankomen Lake.			
1967			
Oct 15			First ice along shore.
22	1. 3.		Lower 1/4 of lake ice covered.
23			Lake completely frozen over by 23 Oct with 2 to 4 in. (5 to 10 cm) of ice.
29	7. 18.	1.5 4.	Surface smooth, no cracks.
Nov 5	8. 20.	5. 13.	" wet, no cracks.
12	9.5 24.	2. 5.	" rough, no cracks.
19	10. 25.	6. 15.	" very slushy, no cracks.
26	10. 25.	6. 15.	Many open holes on ice at upper end of lake and a large amount of water overflow all around lake.
Dec 3	12. 30.		6 in. water overflow on ice. Surface rough, no cracks.
10	18. 46.		" " " " " " " " " " "
17	25. 64.	4. 10.	Surface rough, no cracks.
24	26. 66.		" " " " " " " " " "
31	28. 71.		" " " " " " " " " "
1968			
Jan 7	30. 76.	8. 20.	" " " " " " " " " "
14	30. 76.	4. 10.	High winds blew most of snow off lake. Surface rough, no cracks.
21	32. 81.	4. 10.	Snow hard-packed due to high winds. Surface rough, no cracks.
28	33. 84.	12. 30.	Surface rough, no cracks.
Feb 4	35. 89.	3. 8.	Strong winds last few days caused hard-packed drifts over lake. Surface rough, no cracks.
11	37. 94.		Surface rough, no cracks.
18	37. 94.	7. 18.	" " " " " " " " " "
25	37. 94.	13. 33.	New snowfall over the hard-packed snowdrifts. Surface rough, no cracks.
Mar 3	37. 94.	15. 38.	Surface rough, no cracks.
10	36. 91.	12. 30.	" " " " " " " " " "
17	38. 97.	12. 30.	" " " " " " " " " "
24	39. 99.	12. 30.	" " " " " " " " " "
31	41. 104.	12. 30.	Snow surface crusty all month. Maximum ice thickness observed. Surface rough, no cracks.

TABLE III (Cont'd)
ICE THICKNESSES (1967-1968)

Date	Ice Thickness (in.)	Ice Thickness (cm)	Snow Depth (in.)	Snow Depth (cm)	Remarks
Mankomen Lake (Alaska) (cont'd)					
1968					
May 5	37.	94.	10.	25.	Surface slushy, no cracks.
12	35.	89.	8.	20.	" " " "
19	32.	81.	4.	10.	" water mixed with slush, no cracks.
26	30.	76.			Ice rotten along shore. Surface slushy, holes in ice.
Jun 2	25.	64.			Ice honeycombed all over lake. Many holes in ice.
9					Ice estimated 12 to 15 in. (30 to 38 cm). Ice honeycombed all over lake.
16					Lake clear of ice.
Manley Hot Springs (Alaska): Measurements made at the end of landing road on the Tanana River.					
1967					
Nov 4	20.	51.	1.	3.	Surface moderately ridged, no cracks.
11	26.	66.	5.	13.	" " " "
18	32.5	83.	7.	18.	" " " " , few " "
25	40.	102.	10.	25.	" " " " , " " "
Dec 2	18.	46.	10.	25.	" smooth, few small cracks.
9	21.	53.	10.5	27.	" " " " "
16	20.	51.	10.	25.	" " " " "
23	19.	48.	12.	30.	" " " " "
30	19.5	50.	14.	36.	" " " " "
1968					
Jan 6	19.5	50.	18.	46.	2.5 in. water overflow, cracks along surface.
13	21.	53.	24.	61.	3 in. water overflow, small cracks.
21	24.	61.	18.	46.	" " " " " "
27	25.	64.	24.	61.	" " " " " "
31					Considerable water overflow throughout month.
Feb 3	27.	69.	24.	61.	
10	28.	71.	24.	61.	
17	29.	74.	12.	30.	
24	30.	76.	15.	38.	
28					No water overflow during month, snow-covered ice.
Mar 2	31.5	80.	12.	30.	
9	25.	64.	18.	46.	5 in. water overflow. Lead 20 x 40 ft observed 1 mile above landing. Open lead 20 ft in width and 40 ft in length 1/4 mile above landing.
16	22.	56.	18.	46.	3 in. water overflow.
23	26.	66.	12.	30.	
30	26.	66.	22.	56.	1.5 in. water overflow.
Apr 6	29.	74.	11.	28.	
13	28.	71.	10.	25.	
20	31.	79.	9.	23.	Approximately 1 in. water overflow.
27	34.	86.	6.	15.	Maximum ice thickness observed.
McGrath (Alaska): Measurements made on the Kuskokwim River.					
1967					
Oct 13					First ice formed on river.
24					Freeze-over of river.
28	4.5	11.	2.	5.	Surface smooth, few cracks.
31					Numerous holes and leads along the bar side of river froze over on 28 Oct.
Nov 4	6.	15.			Surface smooth, numerous cracks.
11	12.	30.	1.5	4.	" " " " "
18	12.	30.	2.5	6.	" " " " "
25	15.	38.	2.	5.	Some open holes up to 8 in. in diameter in various places along stream froze over.
Dec 2	19.	48.	2.	5.	Surface smooth, numerous cracks.
9	23.	58.	2.5	6.	" " " " "
16	24.5	62.	8.	20.	" " " " "
23	27.	69.	8.	20.	" " " " "
30	27.	69.	10.	25.	Some water overflow observed during month. Surface smooth, numerous cracks.

TABLE III (Cont'd)
 ICE THICKNESSES (1967-1968)

Date	Ice Thickness (in.)	Ice Thickness (cm)	Snow Depth (in.)	Snow Depth (cm)	Remarks
McGrath (Alaska) (cont'd)					
1968					
Jan 6	32.5	83.			Surface smooth, numerous cracks.
13	33.5	85.	1.	3.	" " " " "
20	37.	94.	1.5	4.	Large diagonal cracks extending across river upstream, and downstream from measurement site. Surface smooth, numerous cracks.
27	39.	99.	1.	3.	Surface smooth, numerous cracks.
Feb 3	40.	102.	5.	13.	" " " " "
10	41.5	105.	15.	38.	" " " " " . Maximum ice thickness observed.
17	39.	99.	10.	25.	Surface " " " " "
24	39.	99.	11.	28.	" " " " "
Mar 2	39.5	100.	9.5	24.	" " " " "
9	39.5	100.	9.	23.	" " " " "
16	39.	99.	10.	25.	" " " " "
23	38.	97.	11.	28.	" " " " " . Slight erosion of ice indicated.
30	37.	94.	14.	36.	Surface smooth, " " "
Apr 6	36.	91.	9.	23.	Water flowed up through drill hole onto ice. Surface smooth, numerous cracks.
13	35.	89.	9.5	24.	Surface smooth, numerous cracks.
20	30.	76.	6.5	17.	Water overflow at measurement site. Water rising. Water started flowing. Surface smooth, numerous cracks.
26					Water on ice flowing past measurement site, overflow depth 12' in.
27	28.	71.			Ice measurement taken under the water overflow. Surface smooth, numerous cracks.
May 4	26.5	67.	1.5	4.	Surface smooth, numerous cracks.
11	25.	64.			Ice stratified along shoreline, with long diagonal cracks, 1 to 2 in. in width. Surface smooth, numerous cracks. Ice unsafe for further measurements.
15					Water overflow, rising slowly along and over shore ice to depths of 1½ to 2 ft.
Minto (Alaska): Measurements made 1/3 mile west of St. Barnabas Mission.					
1967					
Oct 8	0.5	1.			Thin sheets of ice running in river.
15					Ice thickened in places, variable thickness, ice still running.
16					Ice running only where current is swift. Ice solid along bank.
23					Freeze-over complete.
30	3.	8.			Light ridging, few cracks along bank.
Nov 3	3.	8.	2.	5.	Surface lightly ridged, no cracks.
Dec 6	16.	41.	11.	28.	" " " " " . Avg depth of snow: 9 in. (23 cm).
11	16.	41.	11.	28.	Surface lightly " " " " " . " " " " "
18	16.	41.	16.	41.	9 in. (23 cm). Surface lightly " " " " " . " " " " "
25	17.	43.	14.	36.	14 in. (36 cm). Surface lightly " " " " " . " " " " "
					13 in. (33 cm). Water overflow on some parts of river. Cracks in ice along river bank.
1968					
Jan 1	17.	43.	14.	36.	Surface lightly ridged, no cracks. Avg depth of snow: 13 in. (33 cm).
8	23.	58.	17.	43.	Surface lightly " " " " " . " " " " "
15	26.	66.	9.	23.	16 in. (41 cm). Surface lightly " " " " " . " " " " "
22	23.	58.	9.	23.	9 in. (23 cm). Surface lightly " " " " " . " " " " "
29	27.	69.	18.	46.	9 in. (23 cm). Surface lightly " " " " " . " " " " "
					17 in. (43 cm).
Feb 5	27.	69.	18.	46.	Surface lightly " " " " " . " " " " "
12	29.	74.	16.	41.	16 in. (41 cm). Surface lightly " " " " " . " " " " "
					14 in. (36 cm).

TABLE III (Cont'd)
ICE THICKNESSES (1967-1968)

Date	Ice Thickness (in.) (cm)		Snow Depth (in.) (cm)		Remarks
Minto (Alaska) (cont'd)					
1968					
Feb 19	29.	74.	15.	38.	Surface lightly ridged, no cracks. Avg depth of snow: 14 in. (36 cm).
26	30.	76.	15.	38.	Surface lightly " , " " . " " " "
					14 in. (36 cm).
Mar 4	27.	69.	14.	36.	Surface lightly " , " " .
11	27.	69.	13.	33.	" " " , " " .
18	28.	71.	13.	33.	" " " , " " .
25	28.	71.	13.	33.	" " " , " " .
Apr 1	27.	69.	13.	33.	" " " , " " . " " " "
					13 in. (33 cm).
8	28.	71.	13.5	34.	Surface lightly " , " " . " " " "
					13.5 in. (34 cm).
15	28.	71.	12.	30.	Surface lightly " , " " . " " " "
					12 in. (30 cm).
22	28.	71.	9.	23.	Surface lightly " , " " . " " " "
					10 in. (25 cm).
29	28.	71.	6.	15.	Surface lightly " , " " . " " " "
					8 in. (20 cm).
May 6					Large amounts of water on ice, no thickness measurement taken. Water rising in river since 29 Apr.
8					Ice first moved in river at Nanana.
12					" " " at Minto.
24					" jammed and caused some flooding in village.
Moosanee* (ONT): Measurements made SE of Hudson's Bay manager's house, 100 ft from tide marker.					
1967					
Nov 26					Surface smooth, few tidal cracks along shore. Frozen lead along eastern shore about 1/2 mile in length and 50 ft in width.
1968					
Jan 28					Surface smooth, few tidal cracks along shoreline from 3 Dec 1967 to 28 Jan 1968.
Feb 23	41.5	105.	1.	3.	Maximum ice thickness observed.
Mar 10	35.5	90.	2.	5.	Surface lightly hummocked, few cracks.
17	34.5	88.	2.	5.	" " " , " tidal cracks from 5 Feb to 17 Mar.
Apr 7	40.	102.			Surface smooth, few cracks. 3 in. (8 cm) rotten ice on surface, numerous puddles along shoreline from runoff. Lead along west bank 50 ft in width. Observation point inaccessible due to rotten ice. Large deep puddles on ice from creek runoff.
14					Ice started to break up.
17					River clear of ice.
26					
Mould Bay* (N.W.T.): Measurements made on Mould Bay, approximately 1 1/4 miles west of station meteorological office.					
1967					
Sep 29					Surface lightly ridged, few cracks. No complete break up during summer. A 1/4-mile-wide lead extended along shoreline for a few miles but the major portion of ice did not break up in the bay. The lead froze over around 15 Sept.
1968					
Feb 23					Snow cover hard-packed.
Apr 26					Open leads reported by pilots approximately 30 miles south of station.

* Ice thickness data available in: CANADIAN DEPT OF TRANSPORT ICE 1 NOV 1968

TABLE III (Cont'd)
ICE THICKNESSES (1967-1968)

Date	Ice Thickness (in.) (cm)		Snow Depth (in.) (cm)		Remarks
Mould Bay* (N.W.T.) (cont'd)					
1968					
May 13					Ice thickness on small fresh water pond one mile east of station 85 in. (216 cm).
31	69.	175.	25.	64.	Maximum ice thickness observed on 24 and 31 May. Surface smooth, few cracks from 6 Oct 1967 to 31 May 1968.
Jun 3					Meltwater over land began flowing onto ice.
19					A 4 ft crack formed, extending across the bay directly in front of station.
Nicolet* (P.Q.): Measurements made on Lake St. Peter, Site "A" at lat 72° 39' 54" and long. 46° 12' 45". Site "B" at lat 46° 13' 01" and long. 72° 42' 00".					
1967 Site "A"					
Nov 17					Surface smooth, few cracks. Ice extends out approximately 1 mile from shore.
24					Surface smooth, numerous cracks. Ice extends out approximately 1/4 mile from shore.
29					Surface smooth, few cracks. Ice extends out from shore to ship canal.
Dec 8					Surface smooth, numerous cracks.
13					" " , few cracks. Water and snow on ice.
28					Nicolet River broke up. Surface smooth, few cracks. Large open area 50 to 70 ft wide offshore.
1967 Site "B"					
Nov 30					Surface moderately ridged, few cracks.
Dec 28					No further measurements taken at Nicolet during the 1967-68 ice year.
Nitchequon* (P.Q.): Measurements made on Lake Nitchequon, adjacent to ice landing strip, 200 ft south of dock.					
1967					
Nov 7					Ice along shore out 20 to 30 yd.
8					Lake 95% frozen over.
9					Lake completely frozen over.
Dec 29					Areas of slush up to 6 in. (15 cm) deep on lake.
1968					
Feb 28					12 to 18 in. (30 to 46 cm) drifts of hard-packed snow observed on lake during month. However, drifts did not affect operation of DC-3 which carried out the winter airlift.
Mar 1					Surface smooth, no cracks from 10 Nov 1967 to 1 Mar 1968.
29					Snow this month leveled drifts reported last month, making conditions ideal for aircraft landings, 3 in. (8 cm) of water beneath snow at measuring site.
Apr 12	37.	94.	17.5	44.	
19	36.	91.	3.	8.	
26	34.	86.	5.5	14.	6 to 10 in. (15 to 25 cm) of snow and water observed on top of ice during month. By end of month only scattered areas of slush and snow observed. The mouth of Fort George River opened on 19 Apr and at the end of the month there was 1/2 mile of open water visible.
May 3	34.	86.	2.	5.	Breakup proceeding quite rapidly, numerous cracks by end of month, all small lakes, ponds and streams ice-free, main lake still approximately 75% ice-covered.
10	37.	94.			Maximum ice thickness observed, on 12 Apr and 10 May.
17	25.	64.			Surface crystalized, few cracks from 10 to 17 May.
24	13.	33.			" " , numerous cracks from 10 to 17 May.
31					Breakup proceeding quite rapidly, numerous cracks. By end of month all small lakes, ponds and streams ice-free, main lake still approximately 75% ice-covered.

* Ice thickness data available in: CANADIAN DEPT OF TRANSPORT ICE 1 NOV 1968

TABLE III (Cont'd)
ICE THICKNESSES (1967-1968)

Date	Ice Thickness (in.) (cm)	Snow Depth (in.) (cm)	Remarks
Nitchequon* (P.Q.) (cont'd)			
1968			
Jun 1			Lake Nitchequon 50% ice-covered.
2			" " 5% " " "
3			" " free of ice, breakup complete.
Norman Wells* (N.W.T.): Measurements made on a smooth area of Mackenzie River, 100 yd from the north shore bearing 210° true from rawinsonde office.			
1967			
Nov 13			First ice on river.
16			River 99% frozen over and ice stopped flowing.
Dec 22			Surface lightly ridged, few cracks from 17 Nov to 22 Dec.
1968			
May 5	59. 150.	6. 15.	Maximum ice thickness observed.
12	58. 147.		
19	54. 137.		
26	47. 119.		Surface lightly ridged, numerous cracks from 29 Dec 1967 to 26 May 1968.
Nunivak (Alaska): Measurements made on Mekoryuk Bay.			
1967			
Oct 14			First ice.
21			Slush upriver and some small flowing ice cakes observed.
28			Running ice in river started to freeze over.
Nov 4			Small floes and slush floating in and out of bay with the tide.
11			Mild weather, small ice floes and slush floating in bay.
25			Bay still open with floating ice and slush. River flowing into bay is frozen over.
Dec 2	16.5 42.	0.5 1.	Bay froze over between 30 Nov and 2 Dec. Surface rough, many cracks.
9	17. 43.	1. 3.	Surface rough, many cracks.
16	20. 51.	4. 10.	" smooth, " " "
23	23. 58.	3. 8.	" " , few " "
30	17. 43.	3. 8.	" rough, many " "
1968			
Jan 13	16. 41.	3. 8.	" smooth, few small cracks.
20	17. 43.	4. 10.	" " " " "
27	14. 36.		" rough, " " " "
Feb 10	27. 69.	1.5 4.	" smooth, " cracks. Avg depth of snow: 1 in. (3 cm). Ice showing through snow in most places.
17	32. 81.	1. 3.	Surface smooth, few cracks. Avg depth of snow: 2 in. (5 cm).
24	34. 86.		Maximum ice thickness observed. Surface smooth, few cracks. Avg depth of snow: 3 in. (8 cm).
Mar 2	24. 61.	3. 8.	Surface smooth, few cracks.
9	25. 64.	3.5 9.	" " " " "
16	28. 71.	4. 10.	" " " " "
23	30. 76.	6. 15.	" lightly ridged, few cracks.
30	28. 71.	12. 30.	" rough, few cracks.
Apr 6	25.5 65.	12. 30.	" smooth, " " "
13	25. 64.	10. 25.	" " " " "
20	23. 58.	8. 20.	" " " " "
27	20. 51.	5. 13.	" " " " "
May 4	25. 61.	7. 18.	" " " " "
11	21.5 55.	5. 13.	" " " " "
18	19.5 50.	2. 5.	" " " " "

* Ice thickness data available in: CANADIAN DEPT OF TRANSPORT ICE 1 NOV 1968

TABLE III (Cont'd)
ICE THICKNESSES (1967-1968)

Date	Ice Thickness (in.) (cm)		Snow Depth (in.) (cm)		Remarks
Nunivak (Alaska) (cont'd)					
1968					
May 24					First lead opened on channel and entire channel opened with the tide later in the day.
25					Ice cakes started moving in and out with the tide.
Jun 1					Ice floes still in bay making it impossible for boats to travel.
8					Ice still obstructs channel when the tide comes in.
15					Few patches of ice in bay and flowing in river.
Point Hope (Alaska): Measurements made west of village.					
1967					
Sep 25					First ice observed on Kopuk River.
Oct 28					Ice reformed, too thin for measurements.
Nov 4					Heavy rain and warm weather broke up thin ice.
14					Ice started forming around village.
25					Ice all around edges of shore. Ice moving, too dangerous for measurements.
Dec 2	18.	46.			
9	21.	53.			
16	24.	61.			
23	29.	74.			
30	35.	89.			Open lead on north side of village, ice is piled up on south side.
1968					
Jan 6	37.	94.			Surface smooth.
13	38.	97.			
20	42.	107.			Open leads observed on south side of the point, approximately 1/4 mile in width, and the north of the point out approximately 1 mile from shore.
31					No further measurements taken during winter.
Pond Inlet* (N.W.T.): Measurements made 1 mile north of settlement.					
1967					
Oct 15					Freeze-over.
1968					
Mar 29					Surface heavily ridged, no cracks all month.
May 31	55.5	141.	10.	25.	Maximum ice thickness observed. Pressure ridges near shoreline breaking up, water present during high tide. Snow cover very soft and wet, melting fast. Surface heavily ridged, few cracks from 5 Apr to 31 May.
Jun 7	50.	127.	8.	20.	
14	47.	119.	6.5	17.	
21	46.	117.	4.	10.	Surface moderately ridged, few cracks from 7 to 21 June.
28	45.	114.			Ice unsafe for aircraft landing. Pot holes, cracks, and water on surface. 6 to 12 ft of open water along shoreline. Lead in river 5 miles SW of settlement gradually opening.
Jul 5	37.5	95.			Surface smooth, few cracks from 28 June to 5 July.
12	34.	86.			
17					Lead 1 mile NE of settlement, approximately 5 miles in length, 3 to 8 ft in width, depending on wind direction. Open water extends from settlement to Salmon River, distance from shore to ice is approximately 1 mile.
19	30.	76.			Ice broke up and drifted out to 3 miles from shore with tide.
26	24.	61.			Surface rough with holes, numerous cracks from 12 to 26 July.

* Ice thickness data available in: CANADIAN DEPT OF TRANSPORT ICE 1 NOV 1968

TABLE III (Cont'd)
ICE THICKNESSES (1967-1968)

Date	Ice Thickness (in.) (cm)	Snow Depth (in.) (cm)	Remarks
Pond Inlet* (N.W.T.) (cont'd)			
1968			
Aug 30			Large ice pans and pack ice observed during month. From the 2nd to end of the second week considerable ice observed in the sound, consisting of large pans and pack ice which on occasion would close off the inlet, but move with wind or tidal changes. Inlet clear of ice on 14 Aug, but floating pans of ice were still observed on 30 Aug.
Port Alsworth (Alaska): Measurements made on Hardenbourg Bay.			
1967			
Nov 4	2.	5.	Surface smooth.
11	4.5	11.	" " Bay entirely frozen over.
18	2.	5.	" " 2/3 of bay opened up after ice was measured due to strong winds.
22			Bay again completely frozen over.
25	4.	10.	Surface smooth.
Dec 2	10.	25.	0.5 1. " " , no cracks.
9	15.5	39.	2. 5. " " " " .
16	16.5	42.	4. 10. " " " " .
23	17.	43.	3. 8. " " " " .
30	18.	46.	1/2 in. water overflow around edge of bay. Surface smooth, no cracks.
1968			
Jan 6	18.	46.	2. 5. Surface smooth, no cracks.
13	20.5	52.	0 to 14 in. (0 to 36 cm) snow drifts compacted. Surface smooth, no cracks.
20	26.	66.	0 to 14 in. (0 to 36 cm) " " " " .
27	29.	74.	8. 20. Surface smooth, no cracks.
Feb 3	31.	79.	8. 20. " " " " . Avg depth of snow: 8 in. (20 cm).
10	31.5	80.	4. 10. Depth of snow 4 to 12 in. (10 to 30 cm), drifted. Snow firm, compacted and glazed with ice. Surface rough, no cracks. 4 to 12 in. (10 to 30 cm) snow drifts.
17	30.	76.	Surface rough, no cracks.
24	34.	86.	Overflow along west shore. Maximum ice thickness observed. Surface rough, no cracks.
Mar 2	32.	81.	Surface rough, few cracks. Ice started becoming honey-combed. 2 in. of water on surface.
9	30.5	77.	Surface rough, few cracks.
16	28.5	72.	" " " " .
23	28.	71.	" " " " .
30	26.5	67.	Ice solid and dry 9 to 30 Mar. Surface rough, few cracks.
Apr 6	26.5	67.	Water on ice crystalized. Surface rough, few cracks.
13	24.	61.	" " " mostly crystalized. Surface rough, few cracks.
20	23.5	60.	3. 8. Open leads north side along shore to NE end of bay. Surface rough, few cracks.
27	17.	43.	Ice unsafe for small planes or man. Surface rough, few cracks.
May 4	11.	28.	Surface rough and crystalized.
11	4.	10.	" " " " .
13			Hardenbourg Bay clear of ice.
Port Arthur* (ONT): Measurements made approximately 250 ft from SW corner of Canadian Railroad dock ruins in Port Arthur at lat 48° 26' 50" and long. 89° 12' 57".			
1967			
Dec 22			Freeze-over.
1968			
Jan 31			Moderate pressure ridging evident at three Port Arthur harbor entrances. Surface smooth, no cracks all month.

* Ice thickness data available in: CANADIAN DEPT OF TRANSPORT ICE 1 NOV 1968

TABLE III (Cont'd)
ICE THICKNESSES (1967-1968)

Date	Ice Thickness (in.) (cm)		Snow Depth (in.) (cm)		Remarks
Port Arthur* (ONT) (cont'd)					
1968					
Feb 28					Moderate pressure ridging evident at three Port Arthur harbor entrances.
May 13	38.5	98.			Maximum ice thickness observed.
20	35.	89.	3.	8.	
27	34.	86.			Harbor entrances now open.
Port Harrison* (P.Q.): Measurements made at mid-channel, approximately 1/2 mile upriver from Hudson Bay Company store.					
1967					
Nov 3					Small amounts of ice along shore.
12					River frozen over 1/2 mile upstream.
17					Slush ice about 50 ft downriver from measurement site.
					" " extends for approximately 200 ft downriver to open water area.
24					Surface smooth, open water downriver from measurement site.
1968					
Mar 15					Surface " , no cracks from 2 Feb to 15 Mar.
26					Rapids above station opened up slightly allowing water to flood the ice for a distance of approximately 1 1/2 mile. The flooded ice extended past the measurement area and the site was under slush and water for a few days.
29					Surface smooth, few cracks from 22 to 29 Mar.
May 10	101.	257.	2.	5.	Maximum ice thickness observed. Surface smooth, no cracks from 5 Apr to 10 May.
17	98.	249.			
21					High water from river caused a lead to form along shore.
24	91.	231.			Surface lightly ridged, few cracks from 17 to 24 May.
27					Ice along shores of river becoming rotten.
31	86.	218.			Surface moderately ridged, few cracks.
Resolute* (N.W.T.): Measurements made approximately in the center of Resolute Bay.					
1967					
Nov 10					Surface smooth, no cracks from 3 to 10 Nov.
1968					
Apr 26					" " , few " " 18 Nov 1967 to 26 Apr 1968.
May 17					Surface " , numerous cracks from 3 to 17 May.
31					" " ; " " on 24 and 31 May.
Jun 7					" " , " " .
14					" " , " " .
21					" " , " " .
28					Layer of slush on surface. Very hard to reach measurement site due to water around edge of bay. Surface smooth, numerous cracks.
Jul 5	81.	206.	2.	5.	Maximum ice thickness observed. Surface smooth, numerous cracks from 7 June to 5 July.
12	68.	172.			Numerous leads near shore.
19	64.	163.			Fresh leads forming across bay.
26	54.5	138.			Surface crusty, numerous cracks from 12 to 26 July.
					Large lead across mouth of bay.
Aug 2					Ice measurements discontinued due to unsafe ice conditions and large shore leads.

* Ice thickness data available in: CANADIAN DEPT OF TRANSPORT ICE 1 NOV 1968

TABLE III (Cont'd)
ICE THICKNESSES (1967-1968)

Date	Ice Thickness (in.) (cm)		Snow Depth (in.) (cm)		Remarks
Sachs Harbour* (N.W.T.): Measurements made 100 yd from shore, due south of RCMP detachment.					
1967					
Oct 8	Ocean frozen over to the horizon in all directions.				
1968					
May 24	61.	155.	9.	23.	Maximum ice thickness observed.
31	60.	152.	5.	13.	Surface smooth, few cracks from 20 Oct 1967 to 31 May 1968.
Jun 7	53.	135.			
14	41.	104.			
21	23.	58.			Surface lightly rafted, numerous cracks from 7 to 21 June.
25					Large cracks opened up.
26					Cracks widened into leads.
27					Bay ice broke up and moved out.
Sault Ste. Marie* (ONT): Measurements made on the canal 300 and 600 ft east of lock and 1700 and 2000 ft west of lock. Remarks pertain to all sites.					
1968					
Jan 22	Ice unsafe 300 ft east of lock.				
29	" " " " " " " "				
Feb 12	25.	64.			Maximum ice thickness observed 1700 ft west of lock.
19	18.5	47.	6.5	17.	
26	21.	53.			
Mar 4	22.	56.			
11	22.5	57.			
18	21.	53.			
25	18.	46.			
28					Ice unsafe for travel. Thickness values are for 1700 ft west of lock.
Schefferville* (P.Q.): Measurements made on Knob Lake, Quebec. Three sites: east, center and west. Remarks pertain to all sites.					
1967					
Nov 6	Freeze over at all measurement sites.				
27	Surface smooth, few cracks on 17 and 27 Nov.				
Dec 29	Snow on 12 and 13 Dec turned to slush and froze to form snow-ice during colder air temperatures. Surface smooth, no cracks all month.				
1968					
Jan 5	Surface lightly ridged, no cracks.				
12	" moderately " " " "				
18	" lightly " " " "				
26	" " " " " "				
Feb 28	Deep slush was observed at east site on 16 Feb and at west site on 23 Feb. The center site remained slush-free all month.				
Mar 8	Lenses of slush 1/2 to 3 in. thick were observed at east and west sites on 1 and 8 Mar.				
29	Surface lightly ridged, no cracks from 2 Feb to 29 Mar.				
Apr 12	49.	124.	13.	33.	Maximum ice thickness observed at west site.
19	48.5	123.	9.	23.	
26					Surface of lake flooded to a depth of 9 in. (23 cm). Variations in depth of slush throughout month.
May 3	46.5	118.	4.	10.	
10	46.5	118.			
17	39.	99.			Surface smooth, no cracks from 5 Apr to 17 May.
20					A small area of open water appeared in Post Office Bay.
24	33.5	85.			A shore crack along the NW and north side of lake developed.
31					Inshore ice still hard, ice further out very soft, and was considered unsafe out across to the observation site.

* Ice thickness data available in: CANADIAN DEPT OF TRANSPORT ICE 1 NOV 1968

TABLE III (Cont'd)
ICE THICKNESSES (1967-1968)

Date	Ice Thickness (in.) (cm)		Snow Depth (in.) (cm)		Remarks
Schefferville* (P.Q.): Measurements made on Maryjo Lake. Three sites: east, west and center. Remarks pertain to all sites.					
1967					
Nov 7					Lake froze over.
17					Surface smooth, few cracks.
Dec 29					" " , no cracks all month.
1968					
Jan 26					" lightly ridged, no cracks all month.
Feb 9					Heavy snowfall so far this month. Surface smooth, no cracks on 2 and 9 Feb.
Mar 29					Surface lightly ridged, no cracks from 16 Feb to 29 Mar.
Apr 26					" of lake flooded to a depth of 6 to 9 in. (15 to 23 cm).
May 3	45.	114.	10.	25.	Maximum ice thickness observed at east site. Surface smooth, no cracks.
10	39.	99.	2.	5.	
17	40.	102.	1.	3.	Surface smooth, no cracks from 5 Apr to 17 May.
24	32.	81.			
31	28.5	72.			A meltwater stream started flowing onto the lake ice on 17 May at its SE corner and opened up a small pool of water which had broken the ice edge back some 20 yd offshore by the end of the month. Surface smooth, few cracks from 24 to 31 May.
Snowshoe Lake (Alaska): Measurements made approximately 100 yd west of new aircraft charter facilities on east shore of Snowshoe Lake.					
1967					
Oct 1					First ice in bay at SW end of lake.
5					Ice frozen out approximately 150 yd from south shore.
15					Considerable pan ice in morning over all of lake, gone by noon.
16					2/3 of lake frozen over.
20					Lake frozen over again.
28	4.	10.	0.5	1.	Surface lightly ridged, numerous cracks.
31					Crossed lake by foot.
Nov 4	6.	15.	0.5	1.	Surface smooth, numerous cracks.
11	8.5	22.	1.	3.	" " , " " :
18	10.	25.	1.	3.	" " , " " :
25	14.5	37.	5.	13.	Some water overflow along east shore. Snow cover varies in depth from trace to 9 in. (0 to 23 cm) due to drifting during periods of snowfall along with strong northerly winds. Surface smooth, numerous cracks. Snow density: 0.236 g/cm ³ .
Dec 2	15.	38.	7.	18.	Surface smooth, few cracks. Snow density: 0.228 g/cm ³ .
9	16.	41.	7.	18.	" " , " " . " " 0.220 " .
16	18.	46.	11.	28.	" " , " " . " " 0.180 " .
					Water overflow evident over most of lake. Numerous holes appeared after heavy snowfall during midweek.
24	19.	48.	8.	20.	1 in. of water overflow between ice and snow cover.
					Surface smooth, few cracks. Snow density: 0.200 g/cm ³ .
30	20.5	52.	6.5	17.	Surface lightly ridged, few cracks. Snow density: 0.208 g/cm ³ .
1968					
Jan 6	21.	53.	9.	23.	Top 10 in. (25 cm) of ice softer to drill. Surface lightly ridged, few cracks. Snow density: 0.176 g/cm ³ .
13	22.	56.	8.5	22.	Surface lightly ridged, few cracks. Snow density: 0.188 g/cm ³ .
20	22.5	57.	10.	25.	Surface lightly " , " " . " " 0.200 g/cm ³ .
27	23.5	60.	9.5	24.	Surface lightly " , " " . " " 0.213 g/cm ³ .

* Ice thickness data available in: CANADIAN DEPT OF TRANSPORT ICE 1 NOV 1968

TABLE III (Cont'd)
ICE THICKNESSES (1967-1968)

Date	Ice Thickness (in.) (cm)	Snow Depth (in.) (cm)	Remarks
Snowshoe Lake (Alaska) (cont'd)			
1968			
Feb 3	25. 64.	8.5 22.	Ice very brittle and easily drilled. Snow cover is almost all depth hoar with a crusty top. Surface lightly ridged, few cracks. Snow density: 0.207 g/cm ³ .
10	25. 64.	15.5 39.	Surface lightly ridged, few cracks. Snow density: 0.181 g/cm ³ .
17	25. 64.	11. 28.	Surface lightly " , " " . " "
25	25. 64.	10. 25.	0.217 g/cm ³ . Beneath the top 10 in. (25 cm) of ice, a 1-in. layer of water was observed on 18 and 25 Feb. Some water overflow observed over most of lake. Surface lightly ridged, few cracks. Snow density: 0.205 g/cm ³ .
Mar. 2	25. 64.	8.5 22.	Surface lightly ridged, few cracks. Snow density: 0.257 g/cm ³ .
9	25. 64.	7.5 19.	Surface moderately " , " " . " "
16	25. 64.	7. 18.	0.249 g/cm ³ . Surface moderately " , " " . " "
23	33. 84.	9.5 24.	0.225 g/cm ³ . Surface moderately " , " " . " "
30	34. 86.	13. 33.	0.211 g/cm ³ . Water and slush layers observed within the ice cover during drilling throughout month. Surface moderately ridged, few cracks. Snow density: 0.200 g/cm ³ . Maximum ice thickness observed.
Apr 7	33. 84.	10. 25.	Surface moderately ridged, few cracks. Snow density: 0.226 g/cm ³ .
13	33. 84.	10.5 27.	Surface moderately " , " " . " "
21	33. 84.	10. 25.	0.216 g/cm ³ . Surface moderately " , " " . " "
28	33. 84.	6.5 17.	0.220 g/cm ³ . Snow cover wet, especially near surface of ice. Surface moderately ridged, few cracks. Snow density: 0.306 g/cm ³ .
May 5	32.5 83.	4. 10.	Surface moderately ridged, few cracks. Snow density: 0.332 g/cm ³ .
11	32. 81.		Deep water over ice around edge of lake. Ice very mushy in top 10 in. (25 cm), rest of ice granular and fairly soft and wet. Surface moderately ridged, few cracks.
18	28. 71.		Surface moderately ridged, few cracks.
24			Ice very dark and rotten and starting to shift. Water level of lake quite high from snowmelt runoff and rain.
26			Entire mass of ice starting to break up.
South Baymouth* (CONT): Measurements made 100 yd from end of station wharf.			
1967			
Dec 26			Outer basin of south bay froze over.
1968			
Jan 26			Surface smooth, no cracks from 4 to 26 Jan.
Mar 16	26. 66.		
22	26. 66.		Maximum ice thickness observed on 15 and 22 Mar.
29	23. 58.		Surface smooth, few cracks from 2 Feb to 29 Mar.
Spence Bay* (N.W.T.): Measurements made approximately 150 yd from north shore and approximately 130 yd from west shore.			
1967			
Dec 1			Pressure ridges along east shore of bay.
1968			
Jan 31			" " " " " " " during month.
Mar 31			Six " " " " " " " all month.

* Ice thickness data available in: CANADIAN DEPT OF TRANSPORT ICE 1 NOV 1968

TABLE III (Cont'd)
ICE THICKNESSES (1967-1968)

Date	Ice Thickness (in.) (cm)	Snow Depth (in.) (cm)	Remarks
Spence Bay* (N.W.T.) (cont'd)			
1968			
Apr 26			Six pressure ridges along east shore of bay all month.
May 31	91. 231.	10. 25.	Maximum ice thickness observed. Six pressure ridges still noted along east shore all month.
Jun 7	77. 196.	4. 10.	
14	73. 185.	4. 10.	
21	68. 173.		Surface smooth, few cracks from 13 Oct 1967 to 21 June. 1968.
28	63. 160.		5-yd-wide lead along shore from station to point 1/2 mile east of station. 60% of ice covered with water. Surface smooth, numerous cracks.
Jul 5	59.5 151.		" " " " " "
12	46. 117.		Navigable lead for 1 mile along shoreline to the west of station. 60% of ice covered with water, mostly around shore. Surface smooth, few leads.
Tanacross (Alaska): Measurements made on Tanana River directly in front of village.			
1967			
Oct 6			Ice running in river during morning.
11			" " " " " " thicker than on 6 Oct.
12			" freezing out from edges.
30			Warmer weather during last part of month, no ice.
Nov 14			Ice slowly formed out to 4 ft from river edges.
18			No trace of floating ice. River frozen over 4 miles upstream, but not at measurement site.
Dec 4			River finally frozen over in one place.
6			Ice unsafe to walk on.
23			Freeze-over date later than normal.
1968			
Feb 17	38. 97.	8. 20.	No ice measurements from 6 Dec to 17 Feb due to lack of ice auger brace. Surface lightly ridged, no cracks.
24	38. 97.	7. 18.	Surface lightly ridged, no cracks.
Mar 2	37. 94.	8. 20.	" " " " " " . Avg depth of snow:
10	29. 74.	10. 25.	10 in. (25 cm). Surface lightly " " " " " " " "
17	29. 74.	8. 20.	10 in. (25 cm). Surface lightly " " " " " " " "
24	35. 89.	12. 30.	9 in. (23 cm). Surface lightly " " " " " " " "
31	34. 86.	10. 25.	11 in. (28 cm). Surface lightly " " " " " " " "
Apr 7	34. 86.	9. 23.	9 in. (23 cm). Surface lightly " " " " " " " "
14	41. 104.	7. 18.	Surface lightly " " " " " " " "
21	41. 104.	3. 8.	" " " " " " " " . Maximum ice thickness
29	38. 97.		observed on 14 and 21 Apr. Ice porous. River has open areas. River still crossable on foot, but caution must be used. Surface slushy, numerous cracks.
May 5	11. 28.		Ice is porous, numerous cracks. Crossing by foot extremely hazardous.
12			Ice floes observed from 12 to 15 May.

* Ice thickness data available in: CANADIAN DEPT OF TRANSPORT ICE 1 NOV 1968

TABLE III (Cont'd)
ICE THICKNESSES (1967-1968)

Date	Ice Thickness (in.)	Ice Thickness (cm)	Snow Depth (in.)	Snow Depth (cm)	Remarks
Trapper's Creek (Alaska): Measurements made in middle of Susitna River (main channel), 3/4 mile from Talkeetna, Alaska.					
1968					
Jan 13	29.	71.	4.	10.	Surface smooth, no cracks.
20	31.	79.	4.	10.	" " " "
27	33.	84.	7.	18.	" " " , few " "
Feb 3	37.	94.	4.	10.	" " " " " " . Avg depth of snow: 21 in. (53 cm). Maximum ice thickness observed.
10	33.	84.	7.	18.	Surface smooth, few cracks. Avg depth of snow: 22 in. (56 cm).
17	31.	79.	6.	15.	Surface " " , no " " " " " " " " 26 in. (66 cm). 6 in. of water overflow over drilling site. Ice beginning to rot.
24	36.	91.	10.	25.	Surface smooth, no cracks. Avg depth of snow: 28 in. (71 cm).
Mar 2					River is unsafe for drilling due to water overflow. Avg depth of snow: 18 in. (46 cm). Cracks running along edges of channels caused when ice was forced downward to below water level. 12 to 18 in. water overflow over drilling site and over other channels. No measurements can be taken until water on ice refreezes.
9	35.	89.			Water overflow frozen. Surface smooth, no cracks. Avg depth of snow on shore: 15 in. (38 cm).
16	35.	89.			Surface smooth, few cracks. Avg depth of snow on shore: 15 in. (38 cm).
23	31.	79.	1.	3.	Surface smooth, " " " " " " " " " " " "
30	30.	76.	1.	3.	Surface smooth, " " " " " " " " " " " " 17 in. (43 cm).
Apr 6	34.	86.			Cracks run mostly length wise in the channels, few small cracks run across the channels. Cracks running parallel with channels are from 1 to 12 in. (3 to 30 cm) in width, some are 50 ft or more in length. Ice soft with 1 in. of water overflow at drill site. Surface smooth, few cracks. Avg depth of snow on shore: 16 in. (41 cm).
13	29.	74.			Surface smooth, few cracks. Avg depth of snow on shore: 20 in. (51 cm).
20	20.	51.			Ice very rotten, 8 in. water overflow at drill site. Many holes and cracks, open water in many places. Surface smooth, numerous cracks. Avg depth of snow on shore: 20 in. (51 cm).
27					Ice completely saturated with water and settling in places. Ice unsafe for drilling. Surface smooth, numerous cracks. Avg depth of snow on shore: 15 in. (38 cm).
May 4					Main channels of Susitna and Talkeetna River open. Ice estimated 12 to 18 in. (30 to 46 cm) thick. Surface wet, numerous cracks. Avg depth of snow on shore: 9 in. (23 cm).
8					Ice jamming near bridge site and water rising.
11					All ice jams broken up, ice flowing in main channels.
25					River ice still flowing. River level is near normal.
Trout Lake* (ONT): Measurements made 150 yd south of Dept of Transport dock.					
1967					
Nov 17					Surface smooth, numerous cracks from 10 to 17 Nov.
Dec 8					" " " " , no cracks from 24 Nov to 8 Dec.
22					" " " " , few " " " " 15 to 22 Dec.
30					" " " " , no " " " " " "
1968					
Mar 29					3 in. (8 cm) of slush on ice at measurement site. 6 in. (15 cm) of slush on ice around shoreline.

* Ice thickness data available in: CANADIAN DEPT OF TRANSPORT ICE 1 NOV 1968

TABLE III (Cont'd)
ICE THICKNESSES (1967-1968)

Date	Ice Thickness (in.) (cm)		Snow Depth (in.) (cm)		Remarks
Trout Lake* (ONT) (cont'd)					
1968					
Apr 5	48.	122.	trace		Maximum ice thickness observed.
12	44.	112.	1.	3.	
19	43.	109.			
24					First small lead appeared in lake.
26	36.	91.	trace		Surface smooth, few cracks from 5 Jan to 26 Apr.
May 3	35.	89.			" " , no cracks.
10	30.	76.	trace		Shore leads. Surface smooth, no cracks.
13					Lead extending out into lake starting at a point in south bay.
17	12.	30.			Large open lead approximately 200 ft in width in south bay of lake. Ice unsafe to measure, but estimated from broken edges to be approximately 12 in. (30 cm) thick. High winds for several days shifted large areas of ice, causing many open leads.
22					Ice clear around Post Island.
Jun 4					Big Trout Lake completely clear of ice. Water level of Trout Lake is 2 to 3 ft below normal.
Unalakleet (Alaska): Measurements made directly east of post office on Kouwegak River Slough.					
1967					
Oct 21	3.	8.			Surface smooth, no cracks.
28	9.5	24.	2.	5.	" " , " " . Avg snow density: 0.200 g/cm ³ .
Nov 4	10.	25.			Surface " " , few " " .
11	14.	36.			" " , no " " .
18	5.	13.			" " , " " . High tides and rain melted the snow and thawed some of the ice during first two weeks of the month.
25	9.5	24.			Surface smooth, no cracks.
Dec 2	15.	38.			" " , few " " .
9	23.	58.	0.5	1.	" " , " " .
16	25.	64.	3.	8.	" " , " " .
23	27.	69.			" " , " " .
30	34.	86.			High tides and some water overflow onto ice during month. Surface smooth, few cracks.
1968					
Jan 6	33.	84.			" " , " " .
13	34.	86.			" " , " " .
20	38.	97.			" " , " " .
27	44.	112.			" " , " " .
31					High tides and water overflow all month.
Feb 3	45.	114.			Surface smooth, few cracks.
10	46.	117.	2.	5.	" " , " " .
17	50.	127.			" " , " " .
24	53.	135.			" " , " " .
Mar 2	53.	135.	3.	8.	" " , " " .
9	56.	142.	3.	8.	" " , " " .
16	54.	137.	6.	15.	" " , " " .
23	54.5	138.	10.	25.	" " , " " .
30	57.5	146.	10.	25.	" " , " " .
Apr 6	56.	142.	10.	25.	" " , " " . Snow density: 0.220 g/cm ³ .
13	57.	145.	12.	30.	" " , " " . " " 0.240 " " .
20	60.	152.	6.	15.	" " , " " . " " 0.246 " " .
27	61.	155.	4.	10.	" " , " " . " " 0.230 " " .
May 4	61.	155.			Maximum ice thickness observed on 27 Apr and 4 May. 4 in. water on ice, few cracks.
11	57.	145.			Few cracks.
18	39.	99.			
25	21.	53.			Ice moving out.
Jun 1	34.	86.			
2	39.	99.			

* Ice thickness data available in: CANADIAN DEPT OF TRANSPORT ICE 1 NOV 1968

TABLE III (Cont'd)
ICE THICKNESSES (1967-1968)

Date	Ice Thickness (in.) (cm)	Snow Depth (in.) (cm)	Remarks
Unalakleet (Alaska) (cont'd)			
1968			
Jun 3	29.	74.	
4	13.	33.	
Valleyfield* (P.Q.): Measurements made 3600 ft above Valleyfield bridge.			
1968			
Mar 4	27.	69.	Maximum ice thickness observed.
11	25.	64.	Surface smooth, no cracks from 22 Jan to 11 Mar.
18	18.	46.	" " , few "
Welland Canal* (ONT): Measurements made in Port Colborne Harbour (above Lock 8).			
1968			
Jan 22			Surface rough, few cracks.
29			" smooth, " " .
Feb 5			" " , no " .
19			" rough, some " .
Mar 4			" " , no " .
11	22.	56.	Maximum ice thickness observed.
18	13.	33.	
25	10.5	27.	
Welland Canal* (ONT): Measurements made in Port Weller Harbour (entrance to Lock 1).			
1968			
Jan 22			Large broken drift ice.
29	10.	25.	Maximum ice thickness observed. Broken ice, drift ice, and open water observed.
Feb 12			Frozen drift ice.
19			" " " .
26			" " " .
Mar 25			Drift ice 3 to 8 in. (8 to 20 cm) thick and open water throughout month.
Welland Canal* (ONT): Measurements made above Guard Gate.			
1968			
Jan 29			Some water observed on ice surface.
Mar 3	18.	46.	Maximum ice thickness observed.
25			Ice weak around edges.
Welland Canal* (ONT): Measurements made at Bridge 10.			
1968			
Mar 11	18.	46.	Maximum ice thickness observed.
25			Ice very weak around edges and cracks observed.
Welland Canal* (ONT): Measurements made at Bridge 18.			
1968			
Jan 22	10.	25.	Maximum ice thickness observed near shore. Open water at midstream, surface rough, no cracks.
29			Open water at midstream, few cracks.
Feb 12			" " " " .
19			Surface rough, no cracks near shore, open water midstream.
26			Open water midstream.
Mar 4			Surface rough near shore, open water midstream.
25			Open water after 11 Mar.

* Ice thickness data available in: CANADIAN DEPT OF TRANSPORT ICE 1 NOV 1968

TABLE III (Cont'd)
ICE THICKNESSES (1967-1968)

Date	Ice Thickness (in.) (cm)		Snow Depth (in.) (cm)		Remarks
Welland Canal* (ONT): Measurements made at Bridge 19.					
1968					
Jan 22					Surface rough, no cracks.
29					No cracks.
Feb 19					Surface rough, " " .
Mar 4	12.5	32.	2.5	6.	Maximum ice thickness observed. Surface rough, no cracks.
25	7.	18.			Ice honeycombed 50 ft from canal wall on 18 and 25 Mar.
Wild Lake (Alaska): Measurements made approximately 30 yd east of weather station. Measurements taken during May 1968 only.					
1968					
May 15	31.	79.			Surface rough, few cracks.
20					Streams open.
22	30.	76.			Surface rough, " " .
26					Water around lake edge.
29	18.	46.			Frozen overflow approximately 8 in. thick covered most of lake during the period of measurement.
Jun 6					Ice out on north half of lake.
10					" completely out on lake.
Yellowknife* (N.W.T.): Measurements made approximately 175 yd NW of Northward Aviation float base on Back Bay.					
1968					
Mar 22					Surface smooth, no cracks 10 Nov 1967 to 22 Mar 1968.
May 3					" " , few " from 29 Mar to 3 May.
10	53.	135.			Maximum ice thickness observed. Surface slushy, few cracks.
17	48.	122.			Surface candled few cracks.
24	39.	99.			" rotten, numerous cracks.
* Ice thickness data available in: CANADIAN DEPT OF TRANSPORT ICE 1 NOV 1968					

**APPENDIX A: SUPPLEMENTARY DETAILED ICE-THICKNESS
OBSERVATIONS ACROSS ALASKAN RIVERS.**

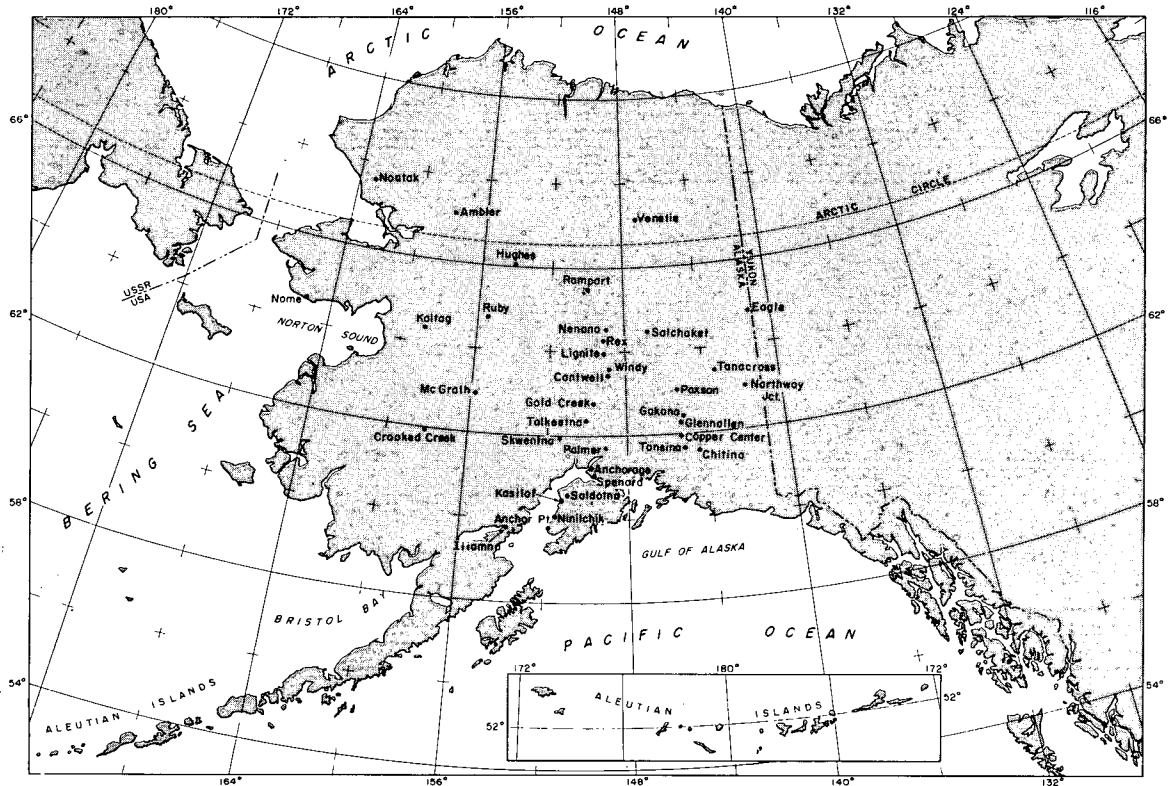


Figure A1. Map of Alaskan stations in Appendix A.

APPENDIX A: SUPPLEMENTARY DETAILED ICE -
THICKNESS OBSERVATIONS ACROSS ALASKAN RIVERS (1)

Distance Across River (ft)	Ice Thickness (ft)	Distance Across River (ft)	Ice Thickness (ft)	Distance Across River (ft)	Ice Thickness (ft)
<u>Ambler: Measurements made on Kobuk River</u>		<u>Chester Creek (cont'd)</u>		<u>Anchor River (cont'd)</u>	
Dec 13, 1966		Jan 3, 1967		Mar 27, 1967	
0	LEW (1' snow)	28	0.1	28	0.9
60	1.6	31	0.3	30	REW
80	1.6	33	REW		
100	1.5			<u>Cantwell: Measurements made on Susitna River</u>	
120	1.6	<u>Anchorage: Measurements made on Ship Creek</u>		Jan 21, 1967	
140	1.8	Feb 16, 1967			
160	1.4			0	REW (2' snow)
180	1.5	0	LEW	20	3.0 (0.5-1' snow)
200	1.6	2	1.1	30	3.0
220	1.6	5	0.9	40	3.1
260 to 320	1.5	6 to 18	Open water	50	3.2
340	1.5	21	0.7	60	3.2
380 to 440	1.8	29	0.8	80	5.1
480	2.1	32	0.8	100	5.3
520	REW	34	REW	120	4.8
Mar 17, 1968				140	4.8
0	LEW (1-1.5' snow)	<u>Anchor Point: Measurements made on Anchor River</u>		160	4.6
50	3.7	Apr 7, 1966		180	4.4
100	3.5			200	3.8
150	3.3			220	4.1
200	3.6			240	4.0
250	3.6	9	LEW	260	3.9
300 to 350	3.5	12	2.0	280	LEW
375	4.0	13	2.0		
400	3.7	14	2.0	Mar 28, 1967	
425	3.4	15	1.9		
450	4.0	16	1.8	0	REW (2' snow)
500	3.9	17	2.3	5	2.6
525	3.8	18	1.3	10	2.3
550	4.6	19 to 21	1.2	15	2.9
590	REW	23	1.3	20	3.5
<u>Anchorage: Measurements made on Chester Creek</u>		24	1.5	25	3.8
		26	REW	30	3.2
				35	3.0
		Jan 18, 1967		40	2.8
				45	2.9
		0	LEW	50	2.6
		2	Open water	55	3.5
		4	0.2	60	3.9
		6	0.4	65	4.5
		9	1.5	70	5.2
		11	1.7	80	LEW
		14	1.9		
		17	2.3	<u>Chitina: Measurements made on Copper River</u>	
		21	2.0	Jan 17, 1967	
		26	2.0		
		31	1.9		
		41	1.7		
			REW	0	LEW (18" snow)
				25	2.7 (2' snow)
		Mar 27, 1967		50	3.0
				125	3.5
		10	LEW	225	3.5
		12	2.0	250	2.5
		14	1.0	275	3.5
		16	1.1	300	2.5
		18	0.9	325	2.5
		20	0.8	350	Slush
		22	1.0	375	REW
		24	0.5		
		26	0.7		

(1) See figure A-1 for location of measurement site.

(2) REW and LEW mean Right and Left Edge of Water facing downstream and the (-) means no observation.

APPENDIX A: SUPPLEMENTARY DETAILED ICE -
THICKNESS OBSERVATIONS ACROSS ALASKAN RIVERS

Distance Across River (ft)	Ice Thickness (ft)	Distance Across River (ft)	Ice Thickness (ft)	Distance Across River (ft)	Ice Thickness (ft)	
Eagle River (cont'd)		Yukon River (cont'd)		Tazlina River (cont'd)		
Mar 4, 1966 ⁺		Apr 28, 1968		Jan 18, 1967		
64	REW	40	3.0	30	3.3 (1.5' snow)	
		80	3.0	40	2.8	
Mar 14, 1966		120	2.7	50	2.6	
		160	2.8	60	2.8	
0	LEW	190	2.9	70	2.8	
15	1.0	220	3.2	80	2.6	
18 to 46	0.6	260	3.0	90	2.5	
50	1.0	300	3.3	100	3.0	
55	REW	340	3.0	110	3.2	
		380	10.0	120	4.0	
Mar 14, 1966 ⁺		420	10.0	130	3.2	
		460	6.0	140	3.7	
45	LEW	500	4.0	145	REW	
50	-	540	2.8			
55	-	580	2.5			
60	0.6	620	2.8			
65 to 75	2.5	660	3.5	0	REW (2' snow)	
80 to 103	0.6	700	2.7	5	1.5	
		740	2.7	8	2.0	
Jan 18, 1968		780	3.0	12	2.3 (1-1.5' snow)	
		820	3.2	16	2.7	
48	- (2" snow)	860	2.8	20	2.8	
53	2.3	900	3.0	24 to 32	3.0	
55	2.3	940	3.0	36	2.8	
58	2.2			40 to 50	2.3	
60	2.4	Gakona: Measurements made on			55	2.9
63	2.4	Gakona River			60	2.7
65	2.3			65	1.7	
68	2.4	Jan 19, 1967			70	2.7
70	2.4			80	2.0	
73	2.3	0	LEW (1-2' snow)	85	1.0	
75	2.1	2	Open Water	91	1.5	
78	2.1	6	2.0	96	1.5	
80	2.2	8	2.2	103	LEW	
83	2.3	10	2.3			
85	2.4	12	2.0	Gold Creek: Measurements made on		
88	2.5	14	2.0	Susitna River		
90	2.5	16	2.2			
93	2.2	18	2.3			
95	1.9	20	2.2	Jan 11, 1968		
98	1.8	22	2.3	0	LEW	
100	1.8	24	2.5	15	0.9	
103	2.0	26	3.0	25	1.5	
105	-	28	3.0	34	2.5	
		30	3.6	41	2.7	
Feb 15, 1968		32	3.7	50	2.0	
		40	REW	60	1.4	
5 to 18	2.8			65	1.6	
20	2.9			75	4.0 (Slush)	
23	2.9			80	1.6	
25	2.8	3	LEW	90	1.7	
28	2.5	4	0.1	105	1.8	
30	2.6	6	0.1	110	2.5	
33	2.7	8	0.2	120	2.1	
35	2.7	10	0.2	130	5.7	
38	2.4	12	0.3	145	0.1	
40	2.6	14	0.7	180	1.4	
43	2.7	16	3.1	210	REW	
45	2.7	18	REW (9-14" snow)			
47	LEW					
		Glennallen: Measurements made on				
Eagle: Measurements made on		Tazlina River			-	LEW
Yukon River				0	2.7	
Apr 28, 1968				10	2.5	
				20	2.8	
0	LEW	0	LEW (0.5' snow)	30	2.6	
20	2.7	10	4.0	35	2.6	
		20	3.7	40	2.5	

+ Observations probably made slightly up or down stream of previous measurements.

APPENDIX A: SUPPLEMENTARY DETAILED ICE -

THICKNESS OBSERVATIONS ACROSS ALASKAN RIVERS

Distance Across River (ft)	Ice Thickness (ft)	Distance Across River (ft)	Ice Thickness (ft)	Distance Across River (ft)	Ice Thickness (ft)
Susitna River (cont'd)		Koyukuk River (cont'd)		Kasilof River (cont'd)	
Jan 19, 1967		Mar 16, 1968		Jan 19, 1967	
45	2.5	375 to 450	3.3	9	1.3
50	2.4	500	3.1	18	1.6
55	2.4	550	REW	30	1.4
60	2.3			40	0.7
65 to 75	2.4	<u>Iliamna: Measurements made on</u>		50	1.4
80	2.5	<u>Newhalen River</u>		58	1.5
90	2.5			68	1.5
100 to 120	2.6 (8" snow)	Apr 12, 1966		78	1.3
130	REW (2--2.5' snow)			88	2.1
		100	REW	98	1.7
Apr 8, 1967		140	0.9	108	1.8
		160	1.5	118	1.5
0	REW	180	1.7	128	1.1
10	3.0	200	1.6	133	1.6
20	3.8	220	1.5	147	1.4
30	3.9	240	1.5	157	1.5
40	3.5	260	1.1	165	LEW
50	3.1	280	1.2		
60	3.4	300	1.2	Mar 30, 1967	
70	3.1	350	LEW		
80	3.4			14	LEW
90	3.4	<u>Kaltag: Measurements made on</u>		26	1.9
100	3.6	<u>Yukon River</u>		35	2.3
110	3.6			45	2.5
120	3.5	Dec 11, 1966		55	2.2
135	2.7			65	2.2
155	LEW	0	LEW	75	2.8
		200	0.9	85	2.7
<u>Hughes: Measurements made on</u>		300	0.6	95	2.7
<u>Koyukuk River</u>		400	0.7	105	2.9
		500	0.7	115	2.0
Dec 14, 1966		600 to 900	0.8	125	2.0
0	LEW (1' snow)	1000 to 2000	1.0	135	1.8
40	1.7	2150	REW	145	1.6
80	1.7			155	REW
120	1.8	Mar 19, 1967			
160	1.7	0	REW (2.2' snow)	<u>Lignite: Measurements made on</u>	
200	1.9	100	4.5 (slush)	<u>Teklanika River</u>	
240	2.0	200	8.5	Nov 9, 1965	
280 to 440	1.8	300	8.5		
480	1.6	400	2.5	0	REW
520	1.5	500	2.5	10	0.4
560	REW	600	2.7	20	0.5
		700	2.3	30	0.7
Mar 16, 1967		800	2.3	40	0.7
0	LEW (2' snow)	900	2.1	50	0.8
40	3.3	1000	2.2	60	Slush
80	3.2	1100	2.1	70	1.1
120	3.2	1200	2.2	75	0.5
160	2.9	1300	2.4	80	0.4
200	2.5	1400	2.3	85	0.6
240	2.2	1500	2.5	90	0.1
280	3.2	1600	2.7	95	Slush
320	3.2	1700	2.5	105	0.6
	REW	1800	2.4	115	1.1
		1900	2.5	125	1.0
		2000	2.3	135	1.3
Mar 16, 1968		2100	2.3	145	1.5
50	LEW (1.5-2' snow)	2200	2.1	150	1.5
100	3.4	2300	2.0	155	1.0
150	3.3	2400	LEW	160	LEW
200	3.7	<u>Kasilof: Measurements made on</u>			
250	3.7	<u>Kasilof River</u>			
300	3.5				
350	3.5	Jan 19, 1967			
		0	LEW		

APPENDIX A: SUPPLEMENTARY DETAILED ICE -

THICKNESS OBSERVATIONS ACROSS ALASKAN RIVERS

Distance Across River (ft)	Ice Thickness (ft)	Distance Across River (ft)	Ice Thickness (ft)	Distance Across River (ft)	Ice Thickness (ft)
<u>Minilchik: Measurements made on Minilchik River</u>		Snake River (cont'd)		Chisana River (cont'd)	
Jan 18, 1967		Dec 12, 1966		Jan 18, 1966	
0	LEW	0	LEW	89	2.1
2	1.2	2	0.8	99	2.1
4	2.3	4	1.0	109	1.8
6	3.2	6	1.3	116	1.3
8	3.8	8	1.0	126	1.5
10	2.8	10	1.0	133 to 148	1.8
12	2.4	12	1.3	158	1.9
14	3.4	14	1.0	168	1.6
16	2.9	16	1.3	178	REW
18	2.5	18	1.3		
20	1.1	20	1.2		
24	1.8	22	1.2	Apr 26, 1968	
28	REW	24	1.3	0	LEW
		27	1.2	5	2.8
		30	1.2	15	2.5
<u>Noatak: Measurements made on Noatak River</u>		33	1.3	25	2.4
Apr 5, 1966		37	1.3	35 to 55	2.2
		41	REW	65	2.1
				75	2.1
0	LEW	Mar 18, 1967		85	2.0
50	4.5			95	2.1
100	4.0	41	REW	105	2.1
150	4.5	45	4.5	115	2.0
200	4.5	49	4.3	125	2.1
250 to 850	4.3	53	4.1	135	2.2
900	REW	57	4.0	145	2.5
		61	3.9	155	REW
		65	3.9		
<u>Nome: Measurements made on Snake River</u>		69 to 77	4.1	<u>Palmer: Measurements made on Knik River</u>	
Dec 7, 1965		82	4.2	Nov 17, 1966	
0	LEW (1' snow)	88	LEW	0	REW
2	1.9	Mar 18, 1968		5	0.4
4	1.8	2	2.0 (1' snow)	10	0.5
6	2.1	4	2.4	20 to 70	0.6
8	2.3	7	2.1	80	0.8
10	2.3	8	1.2	90 to 215	0.6
12	2.2	10	1.0	230	0.8
14	2.1	12	1.0	245	1.0
16	2.0	14	1.2	260	1.2
18	1.8	16	1.5	300	0.9
20	1.7	18	1.9	340	0.8
22 to 26	1.8	20	1.9	380	1.0
28	1.7	23	2.4	420	1.0
30 to 34	1.8	25	2.6	460	1.4
36	REW	27	2.8		
		29	2.8	Jan 9, 1967	
Mar 5, 1966		31	2.4	0	REW
4	LEW (6" snow)	33	2.5	10	0.3
6	2.8	35	2.6	20	1.5
8	3.0	38	2.7	40	1.7
10	2.9	41	2.5	60	1.8
13	2.7	42	REW	80	1.6
15 to 20	2.6	<u>Northway Junction: Measurements made on Chisana River</u>		100	2.0
23	2.7			120	2.0
24 to 28	2.6	Jan 18, 1966		130 to 150	1.9
31	2.5			160	2.0
33	2.4			170	1.9
35	2.5	32	LEW	180	1.9
37	2.5	40	2.1	200	2.2
39	2.6	50	2.4	240	2.4
41	2.9	58	2.5		
43	REW	66	2.3		LEW
		74	2.3		
		82	2.2		

APPENDIX A: SUPPLEMENTARY DETAILED ICE -

THICKNESS OBSERVATIONS ACROSS ALASKAN RIVERS

Distance Across River (ft)	Ice Thickness (ft)	Distance Across River (ft)	Ice Thickness (ft)	Distance Across River (ft)	Ice Thickness (ft)
Nenana River (cont'd)		Melozitna River (cont'd)		<u>Salchaket: Measurements made on Salcha River</u>	
Feb 21, 1965		Mar 16, 1968		Nov 11, 1965	
12	3.0	61	3.2		
15	3.9	66	3.0		REW
18	4.0	68	3.0	0	1.5
21	4.1	74	3.0	10	0.7
24 to 30	3.9	80	3.2	20	0.8
36	3.8	84	3.0	30	0.6
42	3.8	90	2.7	35	0.7
48	4.1	96	3.0	40	0.7
54	4.7	102	3.1	45	1.0
60	4.4	107	3.3	50	1.1
72	3.3	112	3.4	60	LEW
78 to 90	2.0	117	3.2	20	LEW
96	REW	124	3.0	30	1.5
		125	REW	40	1.0
Feb 10, 1966		<u>Ruby: Measurements made on Yukon River</u>		50	1.1
60	LEW			60	1.1
65	3.9			70	1.4
70	3.8			80	1.5
75	3.7		Mar 15, 1967+	90	1.4
80	3.6			100	1.5
85	3.5	100	REW	110	1.3
90	3.7	200	4.0	120	1.4
95	3.8	300	2.7	130	0.9
100	3.9	400	2.4	140	1.1
105	4.6	500	2.5	150	0.9
110	4.8	600	2.4	160 to 180	0.7
115	5.0	700	2.5	190	0.8
120	5.1	800	2.5	200	0.9
	REW	900	2.7	210	1.2
		1000	2.6	220	1.2
		1100	2.4		REW
Mar 19, 1966		1200	2.9		
30	LEW (2' snow)	1300	3.0		Feb 5, 1966
35	4.3	1400	2.5		
40	3.8	1500	3.0		
45	3.9	1600	2.5	0	REW
50	4.1	1700	3.3	5	1.2
54	4.3	1800	3.7	10	2.0
56	4.3		2.7	15	2.9
58	4.5		2.9	20	3.4
60	4.7		REW	25	2.8
62	4.6			30	1.3
64	4.6			35	1.9
66	4.5	100	LEW		1.8
68	4.1	100 to 200	- (2-2.5' snow)		LEW
70	4.0	300	4.0		
75	3.6	400	3.5	180	REW
80	3.5	500	3.5	190	1.3
85	3.8	600	2.9	200	1.5
90	3.5	700	4.0	210	1.7
95	REW	800	3.5	220	1.7
		900	4.0	230 to 250	1.8
		1000	3.0	260 to 280	1.6
		1100	3.5		1.8
		1200	3.4		1.7
<u>Ruby: Measurements made on Melozitna River</u>		1300	3.5		1.3
		1400	4.0		1.8
		1500	3.0		1.3
		1600	4.0		0.3
		1700	3.1		LEW
	LEW (2' snow)	1800	4.3		
	Open water	1900	3.4		
	0.4	2100	3.0		
	0.6	2200	4.0		
17 to 18	Open water	2300	4.0	10	LEW
22	0.6		REW	15	1.0
24	REW			20	1.0
				25	0.8
54	LEW			30	1.0
56	3.3			35	1.5

+ Snow depth variable across river 1.5 to 4 ft in depth.

APPENDIX A: SUPPLEMENTARY DETAILED ICE -

THICKNESS OBSERVATIONS ACROSS ALASKAN RIVERS

Distance Across River (ft)	Ice Thickness (ft)	Distance Across River (ft)	Ice Thickness (ft)	Distance Across River (ft)	Ice Thickness (ft)	
Salcha River (cont'd)		Skwentna River (cont'd)		Kenai River (cont'd)		
Mar 20, 1966		Mar 29, 1967		Apr 5, 1966		
40	1.5	-	REW	40	2.4	
45	1.4	0	2.3	45	2.0	
50	1.7	5	2.5	50	2.0	
55	1.6	10	2.9	55	3.0	
60	1.5	15	3.1	60	3.0	
65	1.5	20	3.0	65	5.0	
70	1.6	25	3.1	70	4.5	
75	Froze	30 to 40	3.0	75	4.0	
95	2.2	45	2.9	80	6.5	
100	2.3	50	2.9	85	8.0	
110	2.3	55	2.6	90	8.5	
120	2.2	60	2.6	95	8.0	
130	2.6	65	2.8	110	REW	
140	2.3	70	2.9			
150	2.0	75	3.0			
160	REW	80	3.0	Mar 29, 1967		
		85	2.9	0	LEW	
0	LEW	90	2.9	15	1.6	
5	1.4	100	2.6	25	1.7	
11	1.9	110	2.9	35	2.0	
18	2.3	120	LEW (4' snow)	45	1.6	
28	-			55	1.8	
		Mar 26, 1968		65	1.8	
Feb 16, 1968		0	REW (3-4' snow)	75	2.5	
0	REW	10	4.0	80	2.3	
2	0.6	20	3.4	85	2.9	
4	0.6	30	3.2	90	2.5	
6	1.0	40 to 60	3.2	95	1.8	
8	1.7	70	3.1	100	1.9	
10	2.0	80	3.2	105	2.0	
12	2.4	90	3.5	110	2.0	
14 to 18	2.6	100	3.5	115	2.0	
21	2.5	110	2.6	135	1.5	
25	2.5	120	2.5	155	4.0	
28	2.3	130	2.3	180	REW	
30	2.0	160	2.9			
32	1.8	200	2.2	Mar 11, 1968		
34	1.5	230	3.8			
36	1.4		LEW	0	LEW	
38	1.0	<u>Soldotna: Measurements made on</u>			5	1.5
41	LEW	<u>Kenai River</u>			25	2.2
<u>Skwentna: Measurements made on</u>		Feb 11, 1966		40	5.0	
<u>Skwentna River</u>		0	LEW	50	2.0	
Feb 14, 1967		0 to 10	1.5	60	1.8	
		20	1.8	70	2.3	
35	REW	30	2.5	80	2.5	
45	Slush	40 to 70	1.9	90	2.5	
60	Slush	85	2.2	100	8.0	
70	Slush	95	1.8	110	6.0	
80	2.3	110	1.8	120	3.0	
90	2.5	125	Pier	130	7.6	
100	2.4	140	1.8	140	10.3	
110	2.4	155	2.3	150	6.8	
120	2.3	170	2.4	160	8.5	
130	2.2	185	2.5	170	3.7	
140	2.4	210	2.4	180	2.5	
150	2.3		2.5	240	REW	
160	2.2		1.8			
170	2.2		2.6	<u>Spenard: Measurements made on</u>		
180	2.5		REW	<u>Campbell Creek</u>		
190	2.6	0		Nov 14, 1966		
200	2.7 (2.5' snow)	10	LEW	5	REW	
210	2.4	15	3.0	7	0.6	
220	LEW (3.8' snow)	20	3.0	13	0.5	
		25	5.0	15	0.5	
		30	5.5	17	0.4	
		35	2.3	18	0.4	
			2.3	19	0.5	

APPENDIX A: SUPPLEMENTARY DETAILED ICE -

THICKNESS OBSERVATIONS ACROSS ALASKAN RIVERS

Distance Across River (ft)	Ice Thickness (ft)	Distance Across River (ft)	Ice Thickness (ft)	Distance Across River (ft)	Ice Thickness (ft)
Talkeetna River (cont'd)		Talkeetna River (cont'd)		Squirrel Creek (cont'd)	
Jan 29, 1966		Jan 10, 1968		Apr 2, 1966	
125	1.8	110	1.0	12 to 16	Open water
130	1.6	120	0.9	17 to 18	0.2
135	1.0	130	1.0	19	0.1
140	1.0	140	1.6	20	0.1
145	2.0	150	2.3	21	-
150	2.3	160	2.2		
155	LEW	168	1.7		
		176	1.6		
		184	1.4	7	REW
		192	0.7	9	2.0
Mar 16, 1966		200	0.9	11	-
0	LEW (1-2' snow)	210	1.0	12 to 17	1.5
5	Open water	220	1.3	18	1.7
10	2.7	230	1.8	20	1.8
15	0.7	240	0.6	22	2.0 (2' snow)
20	1.9	245	LEW	23	LEW (1' snow)
25	1.6				
30	1.9				
35	2.0				
40	2.0				
45	1.9				
50	1.7				
55	2.0				
60	2.0				
65	1.9	35 to 55	2.1	8	LEW
70	2.1	65	2.2	12 to 20	2.5
75	2.1	75	2.3	24	3.8
80	2.2	85	2.0	28	4.2
85	2.4	95	2.2	32	4.2
90	2.5	105	2.3	36	4.4
95	2.6	115	2.4	40	4.0
105	2.6	125	2.4	44	3.9 (2' snow)
115	2.7	135	2.3	48	3.8 (1' snow)
125	3.0	145	2.2	52	REW
135	REW	155	2.3		
		165	2.4		
		175	2.5		
Apr 7, 1967		185	1.2	7	REW
0	REW	191	1.1	10	2.9
10	2.1	197	LEW	15	2.6
25	1.7			20	2.4
35	2.2			25	2.1
45	2.3			30	2.0
55	2.2			35	2.3
65	2.3			40	2.1
75	2.3			45	1.5
85	2.6	4	LEW	50	1.7
95	2.9	5	0.9	55	2.1
105	2.9	6	0.8	62	2.3
115	2.6	7	0.7	70	2.1
125	2.6	8	0.6	78	2.3
135	2.7	9	0.6	86	3.0
145	2.7	10	0.7	93	2.6
155	2.8	11	0.3	95	LEW
165	2.6	12	0.3		
170	LEW	13	0.5		
		14	0.5		
		15	0.6		
		16	0.7		
Jan 10, 1968		17	0.8		
0	REW	18	0.9		
15	1.9	20	REW	5	-
30	2.1			20	2.3
45	1.8			30	2.6
60	1.9			40	2.5
75	1.7	8	0.3	50	2.3
85	2.0	9	0.2	60 to 115	2.4
100	1.4	10	0.2	135 to 275	2.5
		11	0.3	295	2.6

Tanacross: Measurements made on

Tanana River

Tonsina: Measurements made on

Tonsina River

Jan 18, 1967

Mar 6, 1968

Dec 8, 1965

Nov 29, 1966

Tonsina: Measurements made on

Squirrel Creek

Venetie: Measurements made on

Chandalar River

Apr 2, 1966

THICKNESS OBSERVATIONS ACROSS ALASKAN RIVERS

Distance Across River (ft)	Ice Thickness (ft)	Distance Across River (ft)	Ice Thickness (ft)	Distance Across River (ft)	Ice Thickness (ft)
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Windy: Measurements made on
Nenana River

Feb 17, 1967

0	REW (5-7" snow)
5 to 30	3.3
35	2.8
40	2.2
45	1.8
50	1.4
55	1.1
60	0.8
65	1.1
69	LEW

Mar 28, 1967

2	LEW (1.5' snow)
5	1.2
8	0.9
11	0.5
14	0.4
17	0.5
20	0.8
23	1.1
26	1.4
29	1.6
32	1.8
37	2.4
42	3.3
47	3.6
52	3.7
57	3.7
62	3.8
67	4.0
72	4.1
77	REW

AND ICE CONDITIONS FOR ALASKA⁽¹⁾ 1966-67

Date	Ice Thickness (in.) (cm)	Snow Depth (in.) (cm)	Remarks
Arctic Village: Measurements made on the lake at Arctic Village.			
1966			
Apr 12	17	43	
1967			
Jan 8	26	66	15 38
Mar 7	37	94	10 25
			Surface smooth, no cracks.
Apr 15	45	114	8 20
			" " , " " .
May 10	38	97	5 13
			" " , " " .
Elim: Measurements made 500m east of B.I.A. school.			
1966			
Oct 31			Ice formed during last week of month.
Nov 15			Ice extended from horizon to horizon.
Dec 20			Ice stopped moving in and out at measurement site.
1967			
Jan 1	64	8	20
			Surface heavily ridged, no cracks.
Feb 13			Ice drifted out from measurement site after 6 Feb then reformed same week.
Emmonak: Measurements made approximately across from the village of Emmonak.			
1967			
Jan 6	27	69	4 10
	31	127	9 23
			Surface lightly ridged, few cracks.
			" " " , numerous cracks. Avg depth of snow on shore: 11 in. (28 cm).
Kiana: Measurements made in front of village on the Kobuk River.			
1967			
Apr 9	73	185	7 18
			Ice solid, few cracks. Crack completely across the river approximately $\frac{1}{2}$ to 1 in. in width.
Mountain Village: Measurements made on main river in front of village.			
1967			
Jan 17	28	71	8 20
			Surface smooth, few cracks. Avg depth of snow: 6 in. (15 cm). River lower than normal for time of year.
Mar 2	36	91	8 20
			Surface smooth.
Apr 5	44	112	6 15
			" " , few cracks. Water along shore due to warm air temperatures.
Noatak: Measurements made on river opposite Noatak village. Width of river 255 ft.			
1967			
Mar 3	11	28	1 3
			Surface smooth, no cracks. Avg depth of snow: 16 in. (41 cm). Water overflow melted the snow cover on the ice which refroze.
Selawik: Measurements made on east river, 360m northeast of U.S. National Guard Armory.			
1966			
Nov 15	19	48	
			Surface lightly ridged, few cracks.
Dec 15	31	79	3 8
			" " " , " " .
1967			
Jan 24	37	94	4 10
			" moderately ridged, few cracks.
Feb 29	49	124	3 8
			" rough.
Mar 15	51	130	3 8
			" " , few cracks.
Apr 15	55	140	7 18
			" moderately ridged, few cracks.
May 15	53	135	
			" " " , no cracks. Approximately 6.5 (17 cm) of rotten ice on top of the solid ice.

(1) See figure 1 for station location.

APPENDIX B: SUPPLEMENTARY ICE THICKNESS OBSERVATIONS

AND ICE CONDITIONS FOR ALASKA⁽¹⁾ 1966-67

Date	Ice Thickness (in.)	(cm)	Snow Depth (in.)	(cm)	Remarks	
Shishmaref: Measurements made 600 yd south of the village.						
1966	Dec 2	18	46	18	46	Surface smooth, few cracks.
1967	Jan 2	28	71			" " , " " .
	Mar 2	42	107			" " , " " .
	Apr 2	44	112			" " , " " .
	May 2	45	114			" " , " " .
Stebbins: Measurements made in front of National Guard Armory.						
1966	Oct 20					Freeze over on ponds and rivers.
	Nov 15					Stebbins Bay froze over , Freeze over occurred later than normal.
	Dec 15	27	69	5	13	Surface moderately ridged, no cracks. No leads, only shore cracks caused by high tides.
1967	Mar 19	39	99	17	43	Surface lightly ridged, few cracks. Shoreline has 2 cracks 10 ft apart extending along entire length, caused by the tide.
	Apr 22	60	152	16	41	Surface smooth, 3 to 4 in. cracks along shore due to tidal action. First movement of ice observed on 19 Apr.
	May 20	26	66			Surface rough, no snow. Cracks along shore. Ice rotten, with pot holes at all measurement sites.
	Mar 19	28	71	9	23	Surface smooth, no cracks.
	Apr 22	48	122	9	23	" " .
	May 20	22	56			" rough, no snow.
	Apr 22	36	91	9	23	" smooth.
	May 20	32	81			" rough, no snow.
	Mar 19	37	94	8	20	" lightly ridged, no cracks.
	Apr 22	48	122	8	20	" smooth.
	May 20	23	58			" rough, no snow.
	Mar 19	36	91	8	20	" smooth, no cracks.
	Apr 22	48	122	12	30	" " .
	May 20	28	71			" rough, no snow.
Teller: Measurements made 480 m out from the Teller Public School.						
1967	Jan 19	36	91	2	5	Surface smooth, no cracks.
	Mar 19	45	114	5	13	" " , " " .

APPENDIX B: SUPPLEMENTARY ICE THICKNESS OBSERVATIONS

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AND ICE CONDITIONS FOR ALASKA⁽¹⁾ 1966-67

Date	Ice Thickness (in.) (cm)		Snow Depth (in.) (cm)		Remarks
Tuntutuliak: Measurements made on Kinak River, in front of National Guard Armory.					
1966					
Dec 31	28	71	9	23	Surface smooth, no cracks.
1967					
Jan 31	33	84			
Apr 5	36	91	3	8	Surface rough, few cracks. Heavy ridges and cracks due to tidal action. Snow is deep near banks of river, but is only 3 in. (8 cm) deep on main river due to tidal overflow.
Wainwright: Measurements made on Lagoon, behind village approximately 381 m from airport road entrance.					
1967					
Mar 15	58	147	6	15	Surface smooth, few cracks. Avg depth of snow: 10 in. (25 cm).
Apr 6	62	157	10	25	Surface smooth, " " " " " "
					15 in. (38 cm).

APPENDIX B: SUPPLEMENTARY ICE THICKNESS OBSERVATIONS

AND ICE CONDITIONS FOR ALASKA⁽¹⁾ 1967-68

Date	Ice Thickness (in.)	(cm)	Snow Depth (in.)	(cm)	Remarks
Arctic Village: Measurements made on the east fork river.					
1967					
Dec 8	3	8	12	30	
27	15	38	13	33	
1968					
Jan 7	21	53	16	41	
Mar 15	28	71	30	76	Surface smooth, no cracks.
Apr 1	43	109	32	81	" " , " "
Elim: Measurements made 200 to 500 m east of village.					
1967					
Nov 29	10	25			" " , " " . Open lead in front of village out beyond 400 M. Ice piled up at edge of lead. Lead is approximately 500 M in width and 1000 M in length.
Dec 31	31	78	7	18	Surface smooth, few cracks. Surface lightly ridged approximately 500 M SE of beach in front of village.
1968					
Jan 31	36	91	15	38	Surface smooth, few cracks. Surface lightly ridged approximately 500 M SE of beach in front of village.
Mar 31	41	104	18	46	Surface smooth, few cracks. Surface lightly ridged 300 M SE of beach in front of village. Snow hard-packed.
Apr 30	42	107	19	48	Surface smooth, few cracks. Surface lightly ridged 300 M SE of beach. Snow hard-packed 4 in. of water on top of ice, beneath snow cover.
Selawik: Measurements made on river 350 m northeast of National Guard Armory.					
1967					
Oct 18	1	3			Surface smooth, freeze over of river.
Nov 20	12	30	2	5	" " .
Dec 15	18	46	1	3	" " , few cracks. Avg depth of snow: 4 in. (10 cm).
1968					
Jan 15	30	76			Surface lightly ridged.
Shishmaref: Measurements made 180 deg true and 600 yd south of village.					
1967					
Dec 1	19	48	1	3	Surface smooth, few cracks. " " " " 10 in. (25 cm). Freeze over occurred during the first week in November.
1968					
Jan 1	28	71	6	15	Surface smooth, few cracks. Avg depth of snow: 15 in. (38 cm).
Feb 1	34	86	6	15	Surface lightly ridged, no cracks.
Mar 30	35	89	16	41	" smooth, no cracks.
Stebbins: Measurements made in bay in front of National Guard Armory.					
1967					
Nov 28					Freeze over, date is later than normal.
1968					
Jan 28	37	94	7	18	Measurement made 20 ft from shore, surface heavily ridged, few cracks.

(1) See figure 1 for station locations.

APPENDIX B: SUPPLEMENTARY ICE THICKNESS OBSERVATIONS

AND ICE CONDITIONS FOR ALASKA⁽¹⁾ 1967-68

Date	Ice Thickness (in.)	(cm)	Snow Depth (in.)	(cm)	Remarks
Stebbins (cont'd) 1968 (cont'd) Jan 28	36	91			Measurements made 200 ft from shore. Surface heavily ridged, few cracks.
	32	81			Measurements made 400 ft from " " moderately ridged, few cracks.
	37	94	1	3	Measurements made 600 ft from shore. " smooth.
	33	84	1	3	Measurements made 800 " " " " lightly ridged.
Mar 16	48	122	1	3	Measurements made 50 " " " " moderately ridged.
	46	117	4	10	Measurements made 200 " " " " heavily ridged.
	44	112	3	8	Measurements made 400 " " " " heavily ridged.
	45	114	8	20	Measurements made 600 " " " " moderately ridged.
	43	109	8	20	Measurements made 1000 " " " " moderately ridged. Cracks on shore caused by tidal action. No leads observed between Stebbins and Stuart Island.
Apr 6	48	122	12	30	Measurements made 50 ft from shore. Surface smooth, no cracks.
	48	122	3	8	Measurements made 200 " " " " smooth, no cracks.
	41	104	10	25	Measurements made 400 " " " " smooth, no cracks.
	51	130	10	25	Measurements made 600 " " " " smooth, no cracks.
	50	127	5	13	Measurements made 800 " " " " smooth, no cracks. Cracks along shoreline caused by tidal action.
May 13	34	86	1	3	Surface lightly ridged, no cracks.
	38	97	7	18	" " " " " "
	35	89	1	3	" " " " " "
	32	81	1	3	" " " " " "
	25	64	6	15	" " " " " "
31					First ice movement.
Wainwright: Measurements made approximately 435 m west northwest of village.					
1967					
Nov 3					Freeze over complete. Snow hard-packed.
Dec 4	26	66	2	5	Surface smooth, no cracks.
1968					
Jan 6	35	89	4	10	" " " " "
Apr 21	55	140	6	15	" " " " "

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13. ABSTRACT This fifth in a series of reports on lake and river ice and land-fast sea ice records ice thicknesses observed throughout the North American arctic and subarctic during the 1966-67 and 1967-68 seasons. Information on ice surface conditions, dates of first ice, freeze-over and breakup, and detailed measurements of ice thickness across Alaskan rivers are also included. Continued reports from the Alaska National Guard Network on ice thickness measurements on lakes and rivers in the remote regions of interior Alaska are presented. Analyses on maximum observed ice thicknesses reported during the two winters in North America and deviations from the mean ice thickness amounts measured across Alaska rivers between 1965 and 1968 were conducted.			
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