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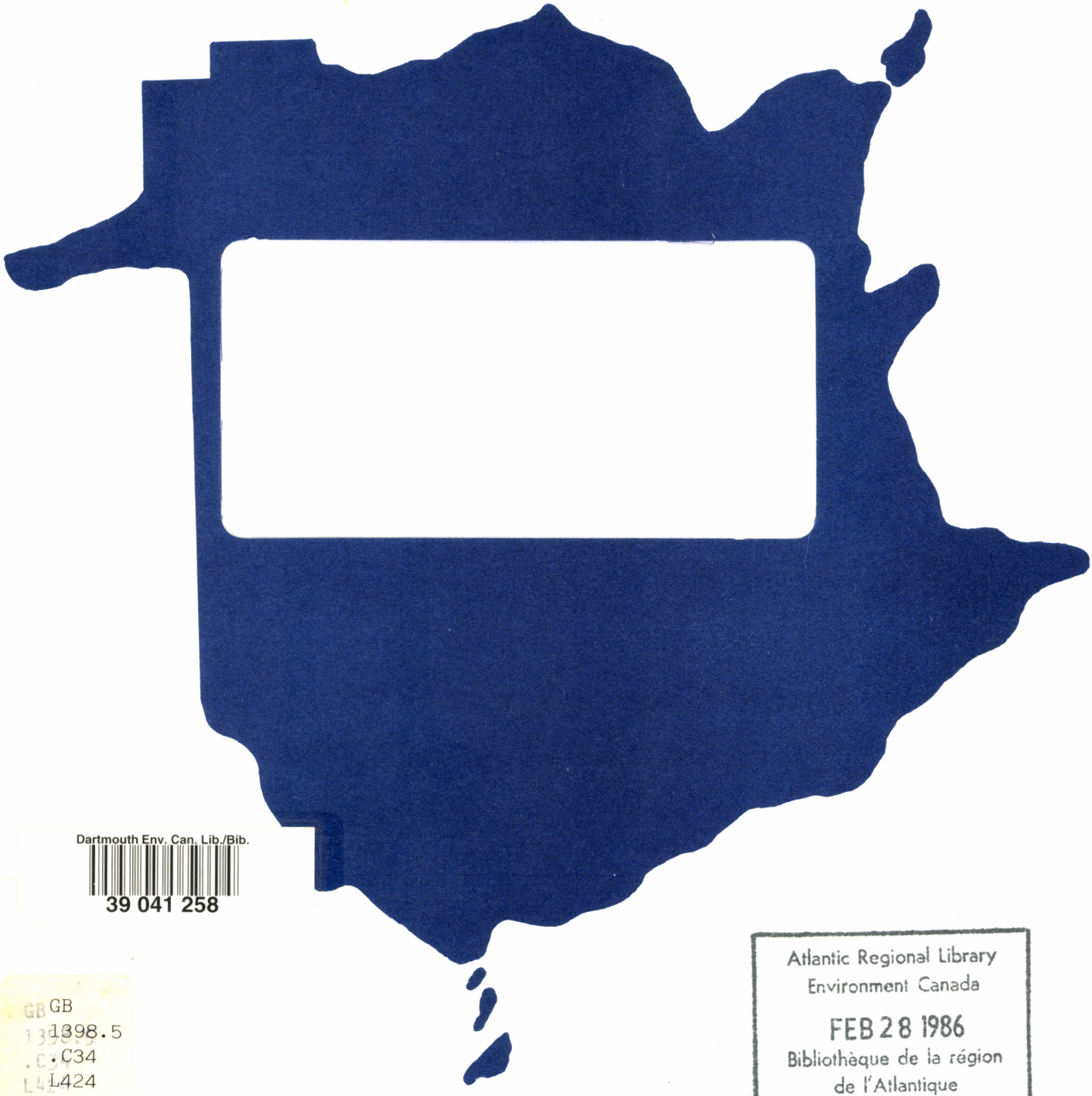

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AVERAGE SOLID ICE THICKNESS OF NEW BRUNSWICK RIVERS (UPDATED TO THE END OF THE 1984-1985 WINTER SEASON)

BY

MELANIE LeBRUN-SALONEN

A REPORT PREPARED

UNDER

THE CANADA WORKS PROGRAM

OCTOBER, 1985

EDWARD B. CURRAN; PROJECT MANAGER

CONTRACT NO. 1829-DE6

ABSTRACT

Measurements of solid ice thickness on New Brunswick rivers and streams has been initiated since 1959 and is an on-going exercise performed by various agencies. This monitoring aids in the understanding of river ice and its potential to jam during spring break-up. This report contains averages of solid ice thickness measurements at several localities to the end of the 1984-1985 winter season.

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ACKNOWLEDGEMENTS

This, "Average Solid Ice Thickness of New Brunswick Rivers," report was sponsored by Inland Waters Directorate, Atlantic Region, Environment Canada, in cooperation with the Water Resources Branch, New Brunswick Department of the Environment. This project was made possible through funding provided by Employment and Immigration Canada for Canada Works Project.

Mr. Ed Curran was hired to act as program manager. His assistance is greatly appreciated.

Special thanks are expressed to the staff of the Water Resources Branch of the New Brunswick Department of the Environment for their assistance in the preparation of this report and particularly to Mr. Brian Burrell, P. Eng., who supervised this project.

Gratitude is expressed to Water Survey of Canada, the New Brunswick Department of Transportation, the New Brunswick Electric Power Commission and the University of New Brunswick for their contributions of solid ice thickness measurements.

The author would also like to thank Mr. Geoff McCain, who typed this report.

CHAPTER 1

INTRODUCTION

The formation and presence of ice covers are natural occurrences in most rivers and lakes in Canada and must be considered as important facets of the winter environment. River ice monitoring programs are of significant importance because of the common occurrence of ice jams which result in extreme flood conditions.

Ice jams are primarily the result of the breakup of river ice during sudden changes in weather conditions. The different types of ice and ice thickness associated with spring breakup in rivers are predominant factors in the formation of ice jams.

This report contains summaries of solid ice thickness measurements, taken on various rivers, streams and headponds throughout New Brunswick. Solid ice thickness is defined as the total amount of blue ice and white ice; frazil ice is excluded. The report also contains maps illustrating the locations of the measurement sites and average monthly measurements. It is anticipated that the presentation of this data shall be useful to the management and control of river ice.

Solid Ice Thickness data was contributed by various agencies which include Water Survey of Canada (WSC), the New Brunswick Department of the Environment (NBDOE), the New Brunswick Department of Transportation (NBDOT), the University

of New Brunswick (UNB) and the New Brunswick Electric Power Commission (NBEPC). All information pertaining to solid ice thickness was obtained from the Saint John River Forecast Centre which acts as a depository for ice-related information collected in New Brunswick.

This report is arranged in chapters by the various agencies reporting solid ice thickness measurements. The report also contains a summary of all available ice measurements. This summary is listed alphabetically by watercourse.

CHAPTER 2

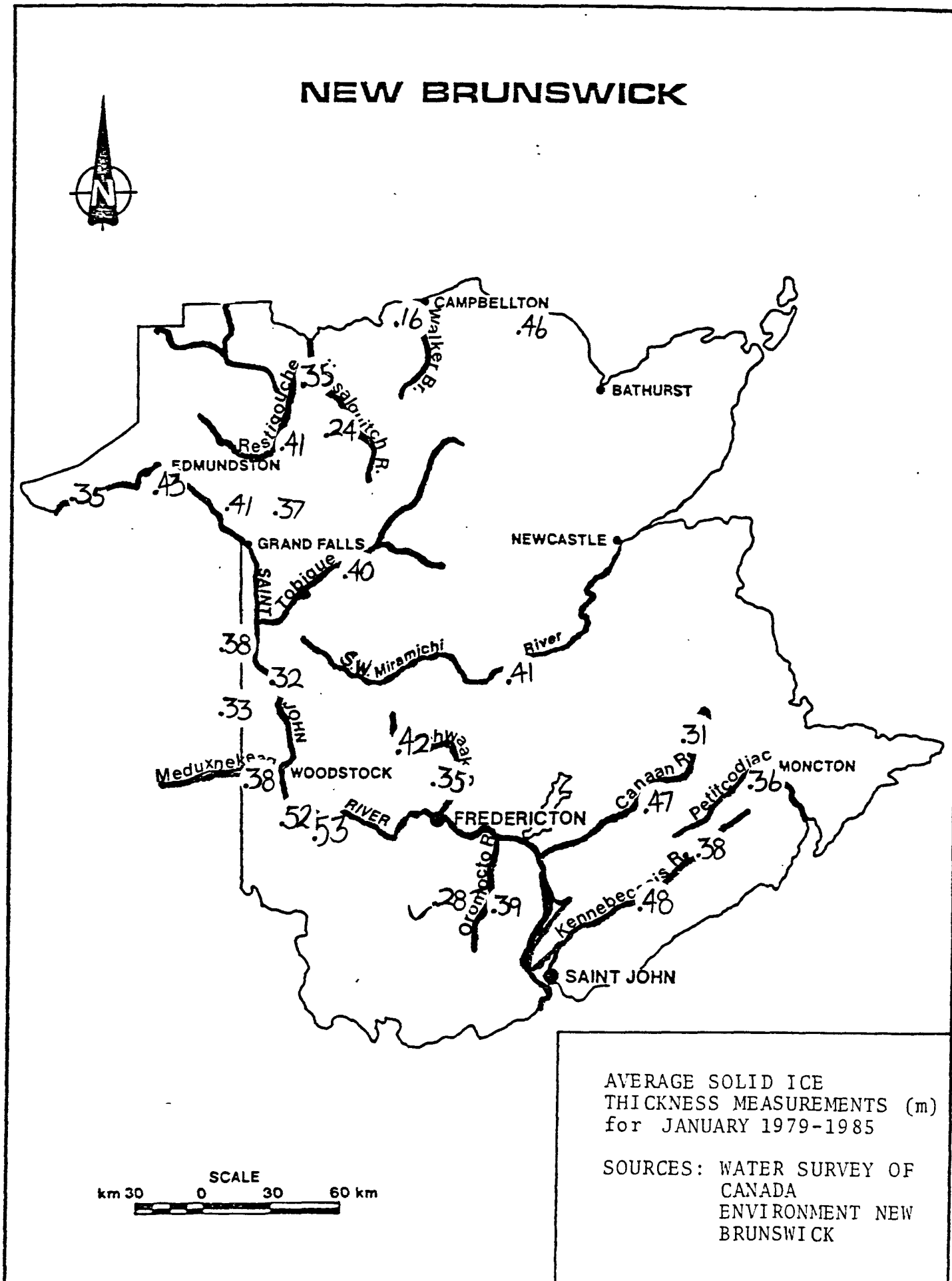
DISCUSSION

This chapter is a brief discussion in terms of monthly and geographic variation of solid ice thickness measurements presented in Chapters 3 to 7.

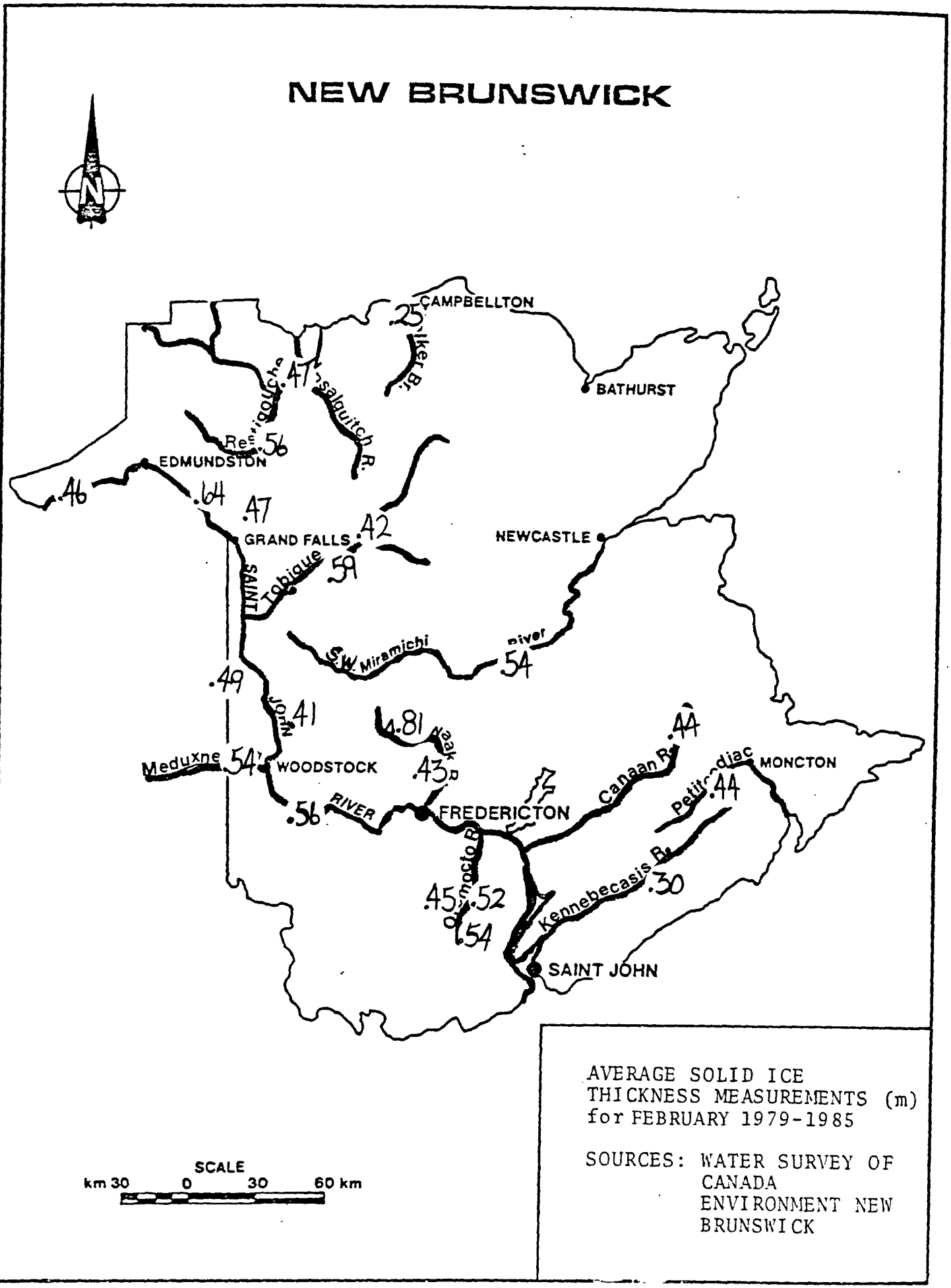
There appears to be a monthly variation of solid ice thickness. By comparison of the data, the ice cover of the rivers and streams is generally the thickest during the month of March, prior to spring break-up. On the Saint John River, spring break-up usually occurs during the second or third week of April. Maps 2.1, 2.2 and 2.3 illustrate ice thickness at various locations during the months of January, February and March respectively. These maps support the above statement on seasonal variation. The solid ice thickness data used to produce the maps are presented in the tables throughout this report.

Winter climatic patterns and cross-section configuration and velocity of the river largely influence the thickness of the ice and any monthly variation of solid ice thickness depends largely upon the external environment.

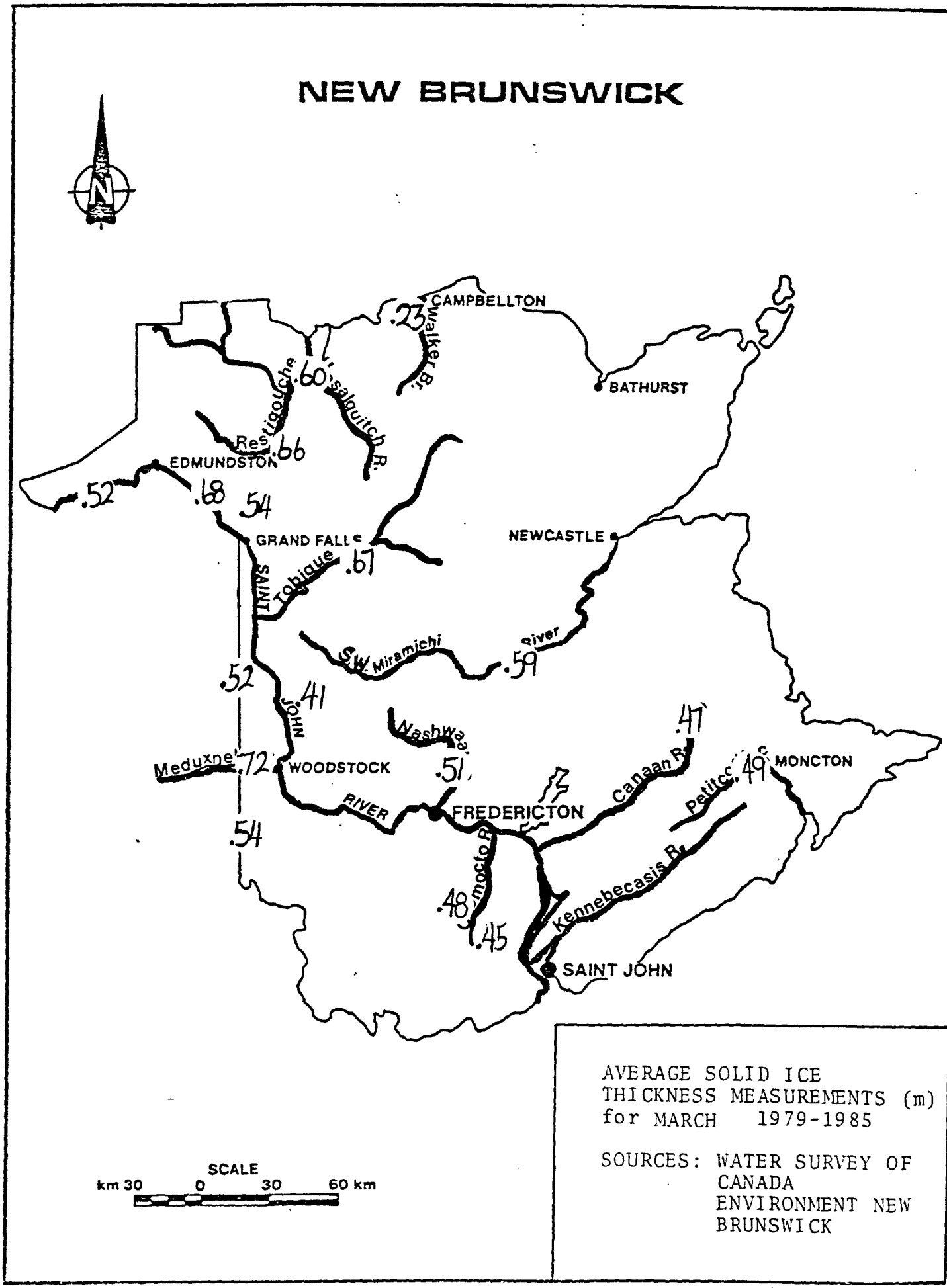
Through examination of the above mentioned maps, there does not appear to be any correlation between ice thickness and the geographic location of the measurement sites. Solid ice thickness depends more upon the specific river or site involved rather than the geographic location. It is to be noted that this analysis is based upon a limited sample size and further data are required in order to reveal any relevant pattern.



Map 2.1 Average Solid Ice Thickness Measurements (January 1979 - 1985)



Map 2.2 Average Solid Ice Thickness Measurements (February 1979 - 1985)



Map 2.3 Average Solid Ice Thickness Measurements (March 1976 - 1985)

CHAPTER 3

NEW BRUNSWICK ELECTRIC POWER COMMISSION SOLID ICE THICKNESS MEASUREMENT PROGRAM

The New Brunswick Electric Power Commission (NBEPC) has identified ice measurement sites at many locations on the headponds. These locations are identified on Figures

Solid ice thickness presneted in Table 3.1 is an average of three or more ice thickness measurements along several cross-sections within the headponds.

TABLE 3.1

AVERAGE SOLID ICE THICKNESS

ON SELECTED NEW BRUNSWICK

HEADPONDS 1959 - 1985*

(Metres)

Year	Beechwood	Tobique	Grand Falls	Mactaquac
1959	-	0.82	-	-
1960	-	0.51	-	-
1961	-	0.47	0.55	-
1962	-	0.80	0.81	-
1963	-	0.58	0.62	-
1964	-	0.70	0.78	-
1965	-	0.55	0.51	-
1966	-	0.58	0.46	-
1967	-	0.41	-	-
1968	-	0.70	0.72	-
1969	-	0.54	0.56	-
1970	0.73	0.76	0.72	-
1971	0.76	0.68	0.67	0.54
1972	0.58	0.56	0.66	0.74
1973	0.63	0.53	0.67	-
1974	0.60	0.54	0.67	-
1975	0.58	0.53	0.55	0.61
1976	0.60	0.62	0.74	-
1977	0.55	0.53	0.51	-
1978	0.53	0.58	0.56	0.79
1979	0.53	0.53	0.67	0.49
1980	0.56	0.71	0.76	0.74
1981	-	0.55	0.58	-
1982	-	0.59	0.58	0.65
1983	0.51	0.56	0.58	0.50
1984	0.52	0.56	0.55	0.43
1985	0.42	0.52	0.40	0.48

*Measurement readings contributed by New Brunswick Electric Power Commission.

TABLE 3.2

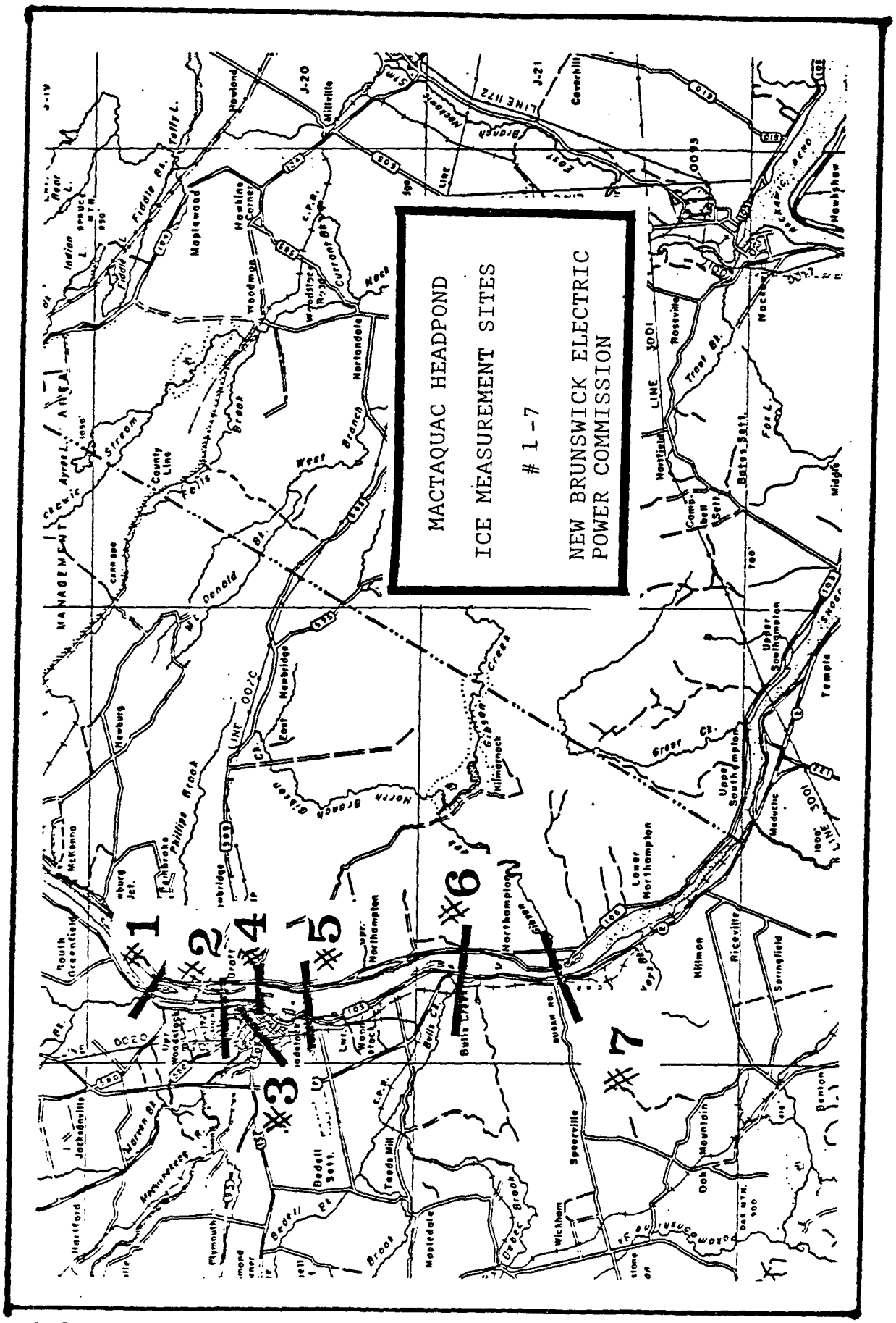
SAINT JOHN RIVER

(MACTAQUAC HEADPOND)

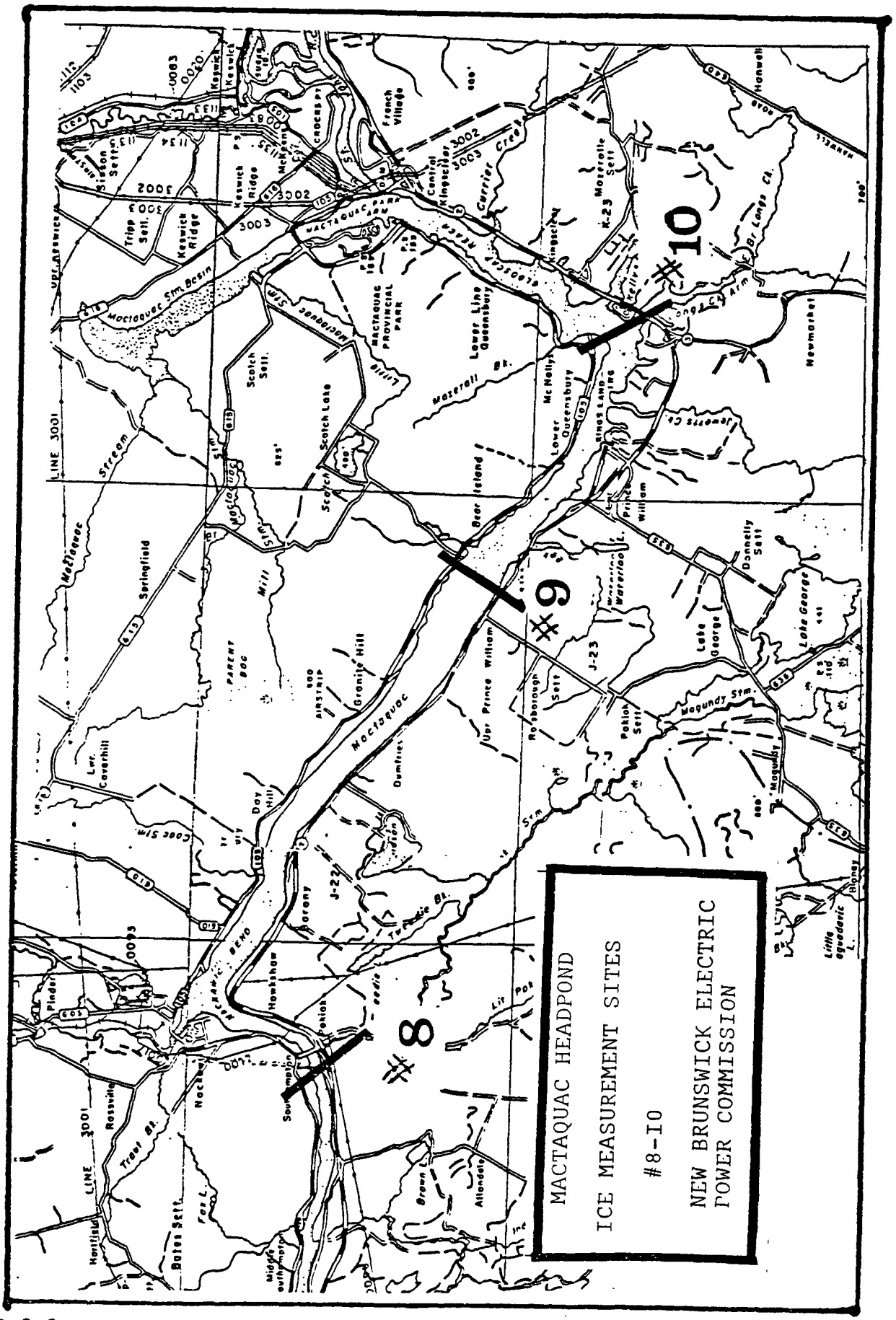
AVERAGE SOLID ICE THICKNESS

(Metres)

Line	Section	Jan 29 1985	Mar 1 1985	Mar 15 1985	Feb 2 1984	Jan 31 1983	Mar 7 1983	Mar 16 1982	Feb 1 1981	Feb 8 1979	Mar 19 1979
1	Newburg-Pine Island	0.31	0.51	0.53	-	0.43	0.58	0.58	-	0.39	0.43
2	Grafton	-	-	-	-	-	0.61	-	-	-	-
3	Woodstock	0.38	0.53	0.56	0.41	0.46	0.61	0.64	0.59	0.52	0.61
4	Meduxnekeag	0.30	0.49	0.49	0.48	0.55	0.59	0.61	-	0.39	0.40
5	Meduxnekeag Gauge	0.29	0.43	0.36	0.48	0.51	0.58	0.61	-	0.43	0.34
6	Bulls Creek	-	-	-	-	-	-	-	0.55	-	-
7	Gibson Mill Stream	0.39	0.53	0.55	0.33	0.28	0.61	0.61	-	-	-
8	Pokiok	-	-	-	0.43	0.34	0.47	-	-	-	-
9	Prince William	0.57	0.51	0.63	0.43	0.41	0.58	0.76	-	0.46	0.61
10	Longs Creek	0.46	0.61	0.58	0.48	0.34	0.53	0.78	-	0.49	0.55
	AVERAGE	0.39	0.52	0.53	0.43	0.42	0.58	0.65	0.57	0.45	0.49



Map 3.1 Mactaquac Headpond Ice Measurement Sites (#1-7) N.B.E.P.C.



Map 3.2 Mactaquac Headpond Ice Measurement Sites (#8-10) N.B.E.P.C.

TABLE 3.3

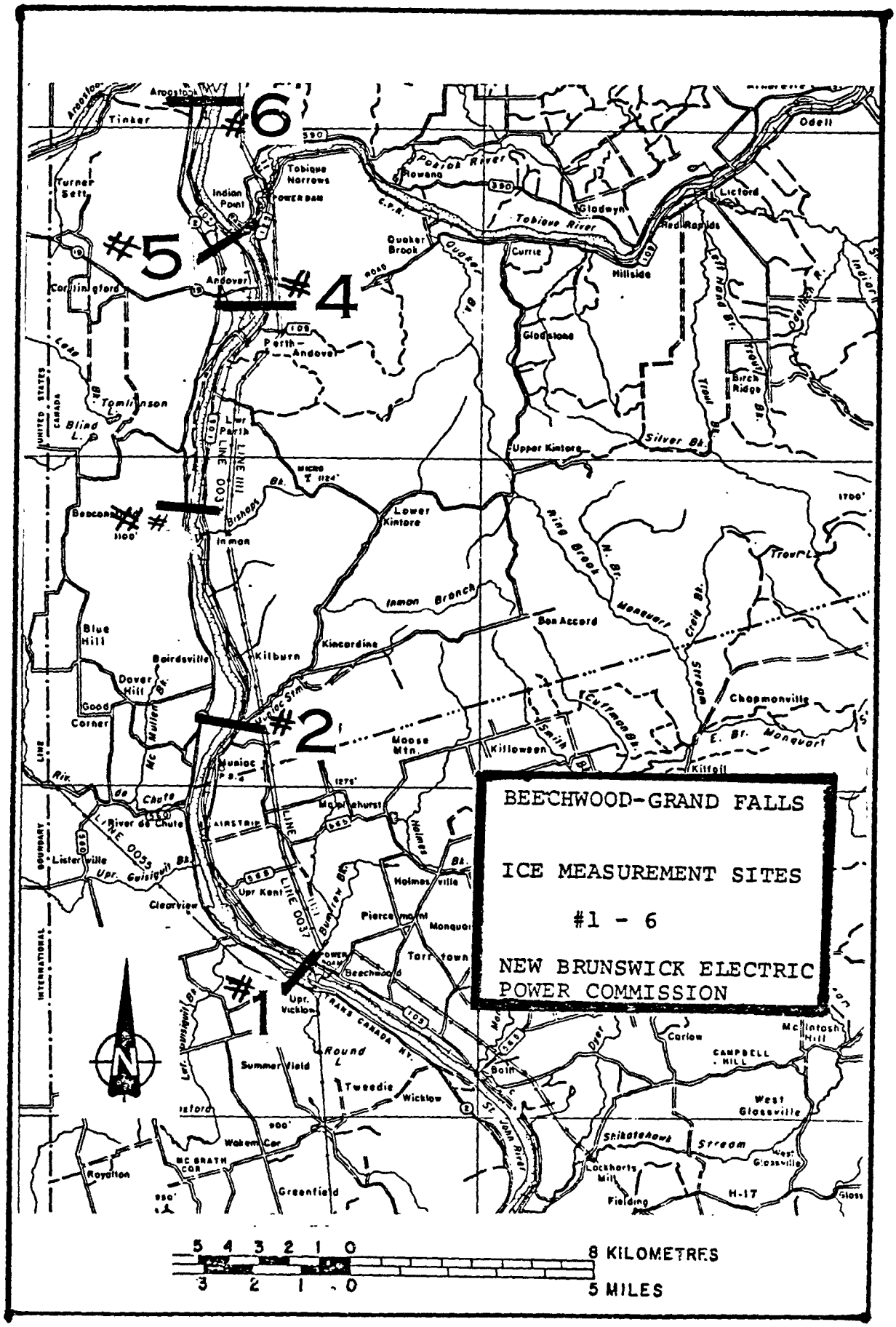
SAINT JOHN RIVER

(BEECHWOOD TO GRAND FALLS)

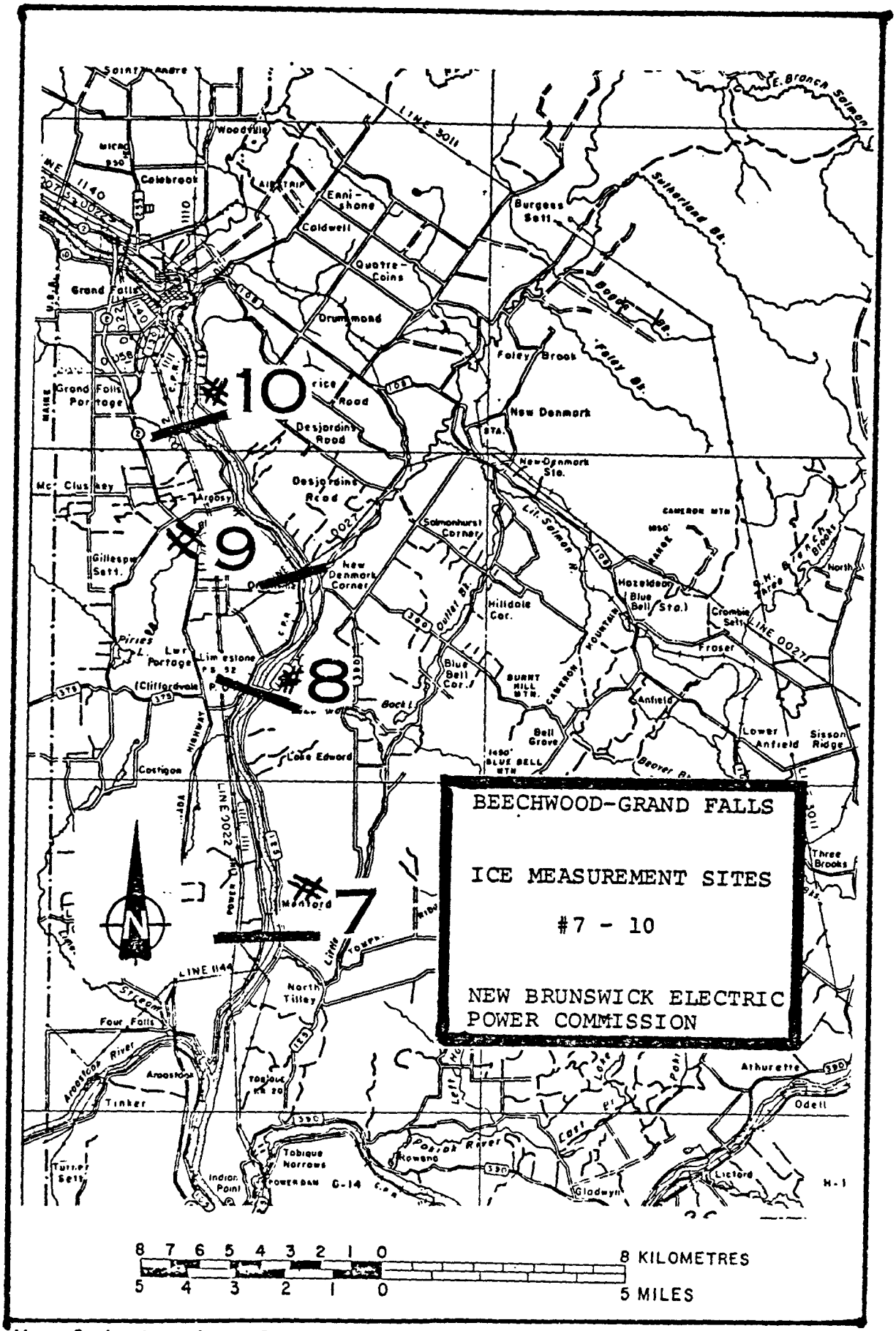
AVERAGE SOLID ICE THICKNESS

(Metres)

Line	Section	Feb 20 1985	Feb 23 1984	Feb 18 1983	Feb 8 1980	Feb 1 1980	Mar 16 1979	Feb 3 1969	Feb 8 1962
1	Beechwood	0.41	0.56	0.48	-	0.55	0.68	0.47	0.61
2	Muniac	0.41	0.48	0.43	-	0.53	0.43	0.41	0.59
3	Inman Crossing	0.43	0.54	0.41	-	0.55	0.48	0.39	0.53
4	Mile 1	0.34	0.48	0.66	-	0.36	0.38	0.35	0.46
5	Christie Crossing	0.41	0.53	0.63	-	0.63	0.68	0.38	0.35
6	Aroostock Junction	0.41	0.54	Open Channel	-	0.62	-	-	-
7	Baker Ferry	0.37	0.49	0.43	0.64	-	-	-	-
8	Brooks Ferry	Unsafe	-	Open Channel	0.66	-	-	-	-
9	Ortonville	0.61	-	Open Channel	0.49	-	-	-	-
10	Rapide de femme	-	-	-	-	-	-	-	-
	AVERAGE	0.42	0.52	0.51	0.56	0.55	0.53	0.40	0.51



Map 3.3 Beechwood-Grand Falls Ice Measurement Sites (#1-6) N.B.E.P.C.



Map 3.4 Beechwood-Grand Falls Ice Measurement Sites (#7-10) N.B.E.P.C.

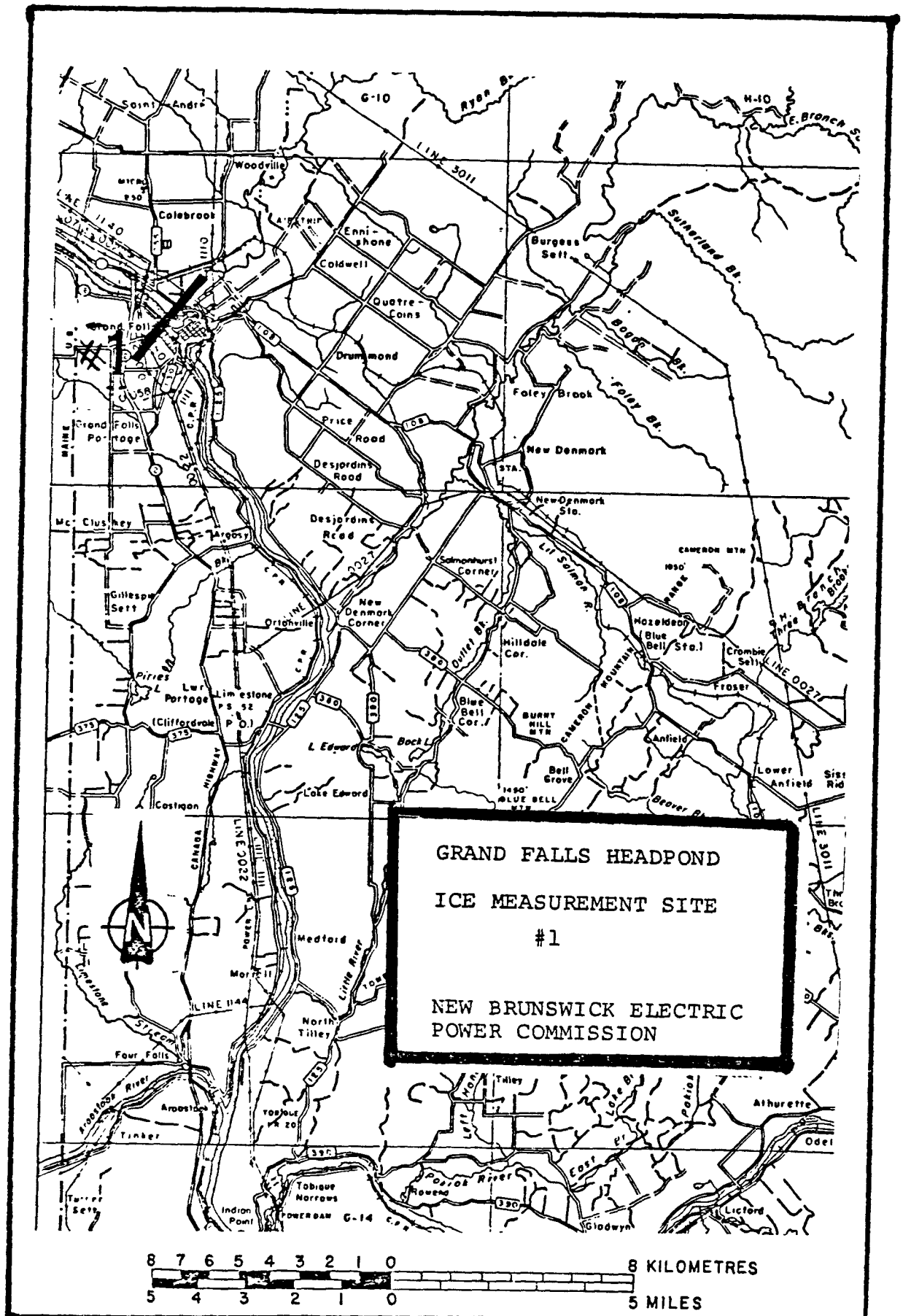
TABLE 3.4

GRAND FALLS HEADPOND

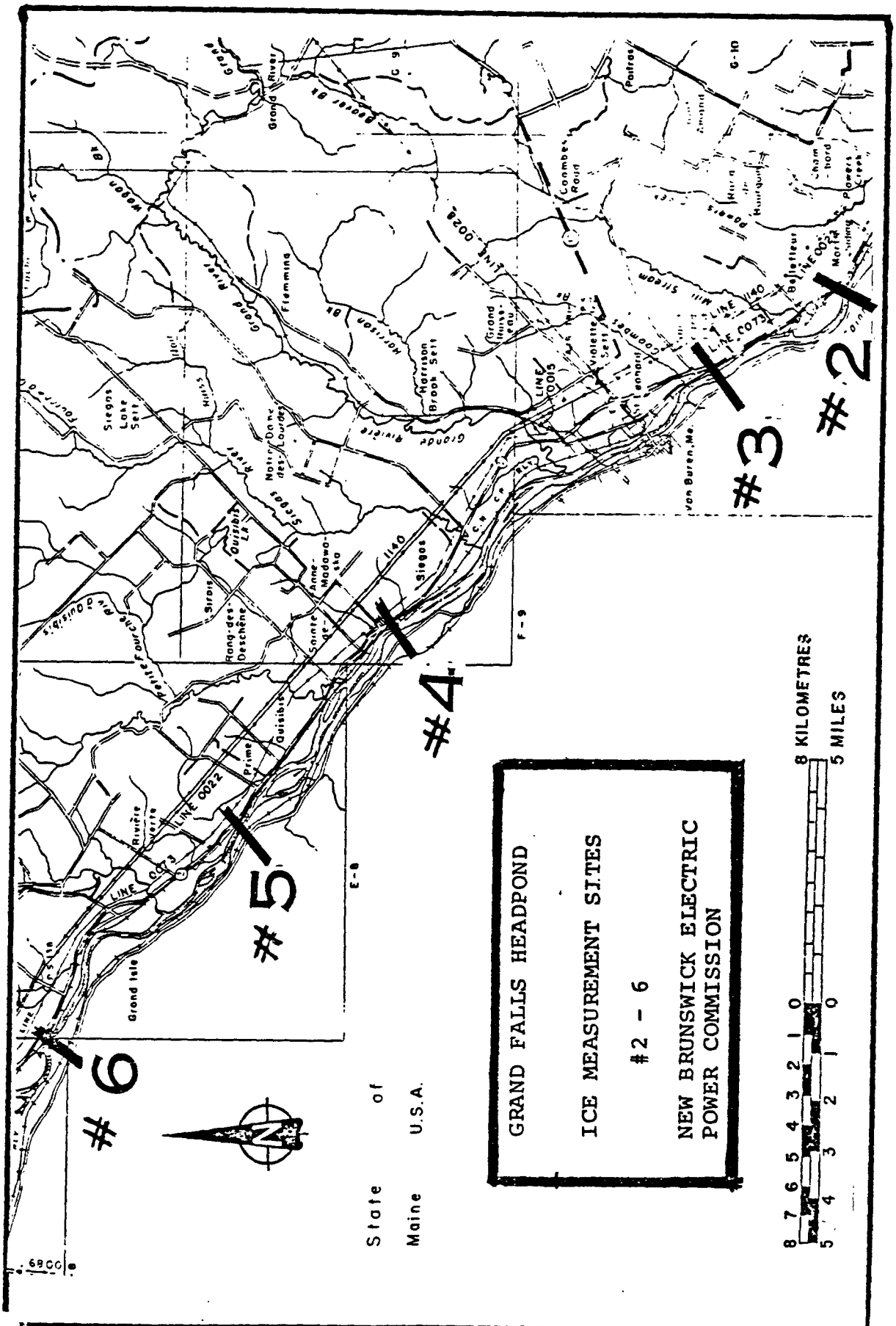
AVERAGE SOLID ICE THICKNESS

(Metres)

Line	Section	Feb 15 1985	Feb 21 1984	Feb 15 1983	Mar 9 1982	Jan 31 1980	Feb 23 1979	Feb 7 1969	Feb 23 1962
1	Grand Falls	0.51	0.49	0.49	0.55	0.48	0.62	-	0.66
2	Martin	0.39	0.57	0.53	0.55	0.55	0.68	-	0.78
3	Cyr Junction	0.38	0.58	0.55	0.51	0.51	0.69	0.48	0.84
4	Ste. Anne	0.35	0.57	0.66	0.66	0.50	0.69	0.35	0.83
5	Lynch	0.46	0.56	0.67	0.69	0.56	0.75	0.43	0.84
6	St. Basile	0.33	-	0.58	0.52	0.57	0.60	-	-
	AVERAGE	0.40	0.55	0.58	0.58	0.53	0.67	0.42	0.79



Map 3.5 Grand Falls Headpond Ice Measurement Site (#1) N.B.E.P.C.



Map 3.6 Grand Falls Headpond Ice Measurement Sites (#2-6) N.B.E.P.C.

TABLE 3.5

TOBIQUE RIVER

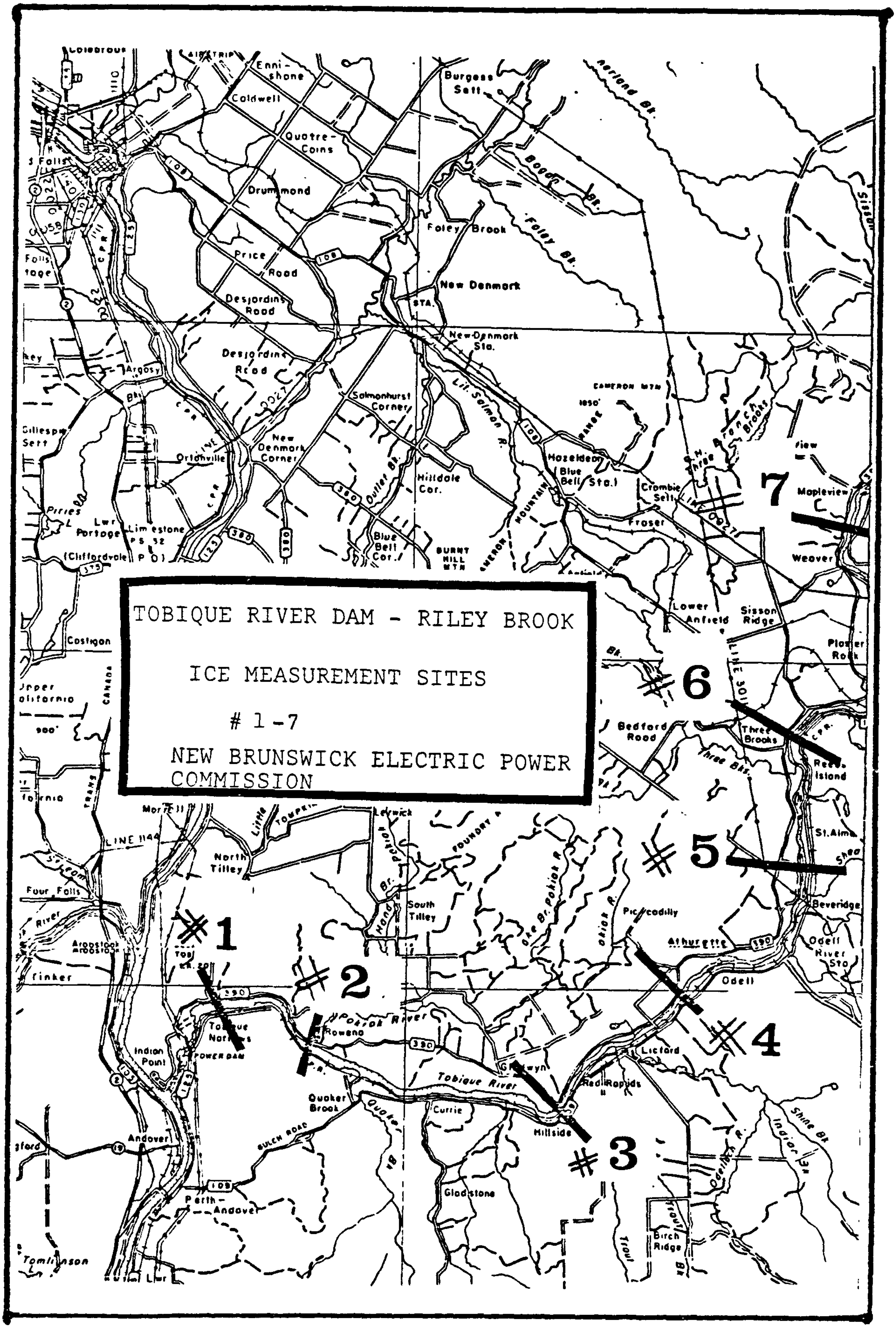
AVERAGE SOLID ICE THICKNESS

(Metres)

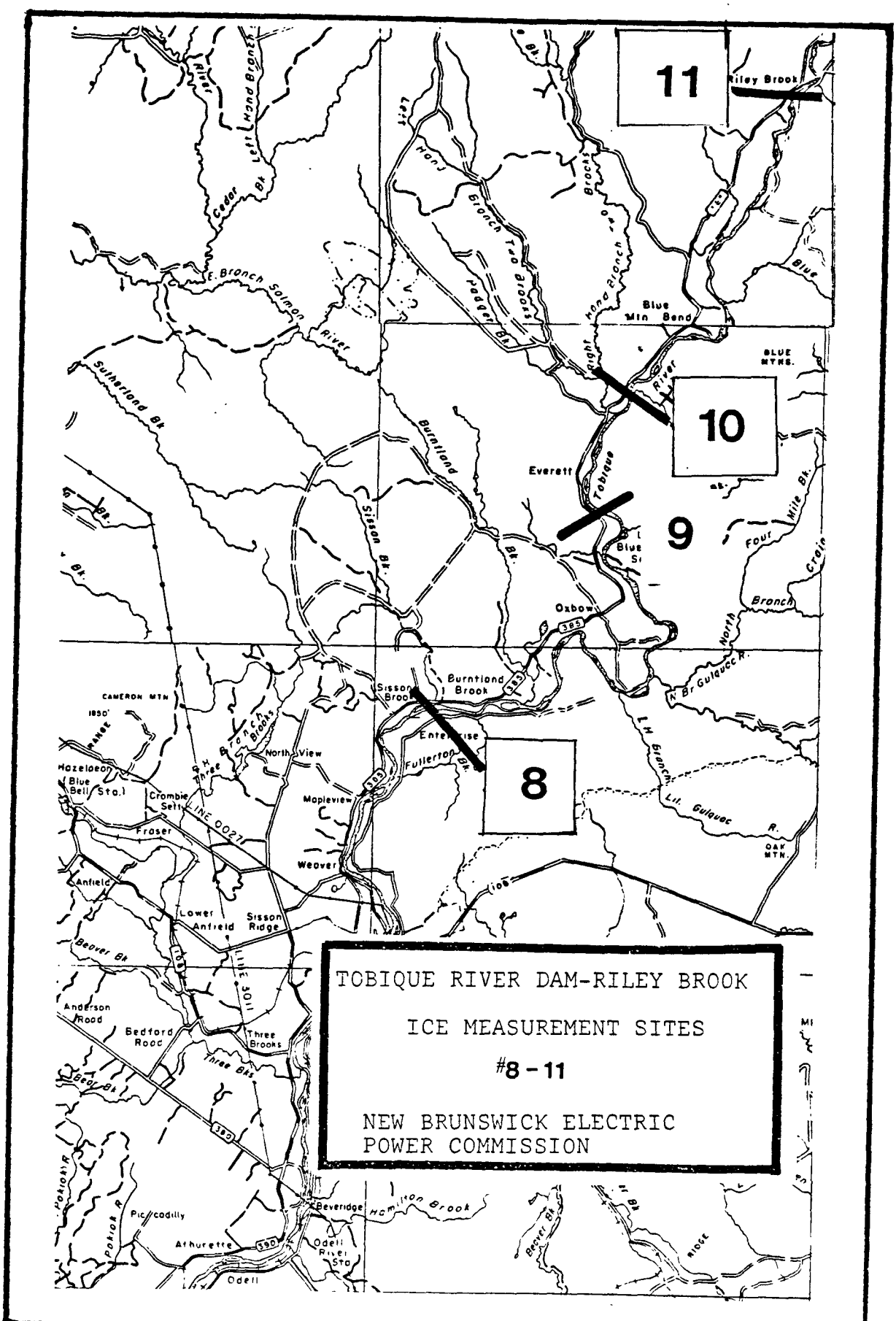
Line	Section	Feb 19 1985	Feb 22 1984	Feb 18 1983	Feb 24 1982	Feb 6** 1980	Feb 21 1979	Feb 5 1969	Feb 14 1962
1	Tilley Rd.	0.48	-	0.57	0.62	0.66**	0.63	0.48	0.76
2	Rowena	0.44	-	0.56	0.51	0.70**	0.68	0.52	0.71
3	Dionne's	0.47	0.61	0.56	0.69	0.61	0.56	-	-
4	Arthurette	0.54	0.52	0.66	0.57	0.69	0.48	-	0.80
5	Odell	0.86*	0.61	0.44	0.62	0.56	-	-	-
6	Grand Falls Highway	0.51	0.53	0.65	0.51	0.47	0.47	0.40	0.59
7	Vincent Road	0.35	0.55	0.62	0.48	0.66	-	0.46	0.81
8	Sisson Brook	0.49	0.61	0.48	0.69	0.72	0.55	0.43	0.85
9	Everett	0.60	-	Open	0.69	0.57	-	-	-
10	Greer's	0.47	0.49	0.51	0.62	0.55	0.47	0.39	0.72
11	Riley Brook	Open	-	Open	0.51	0.48	0.44	0.47	0.79
	AVERAGE	0.52	0.56	0.56	0.59	0.61	0.54	0.45	0.75

* Slush under ice cover - old jam area from freeze-up.

** Measurements were obtained on February 8, 1980.



Map 3.7 Tobique River Dam-Riley Brook Ice Measurement Sites (#1-7) N.B.E.P.C.



Map 3.8 Tobique River Dam-Riley Brook Ice Measurement Site (#8-11) N.B.E.P.C.

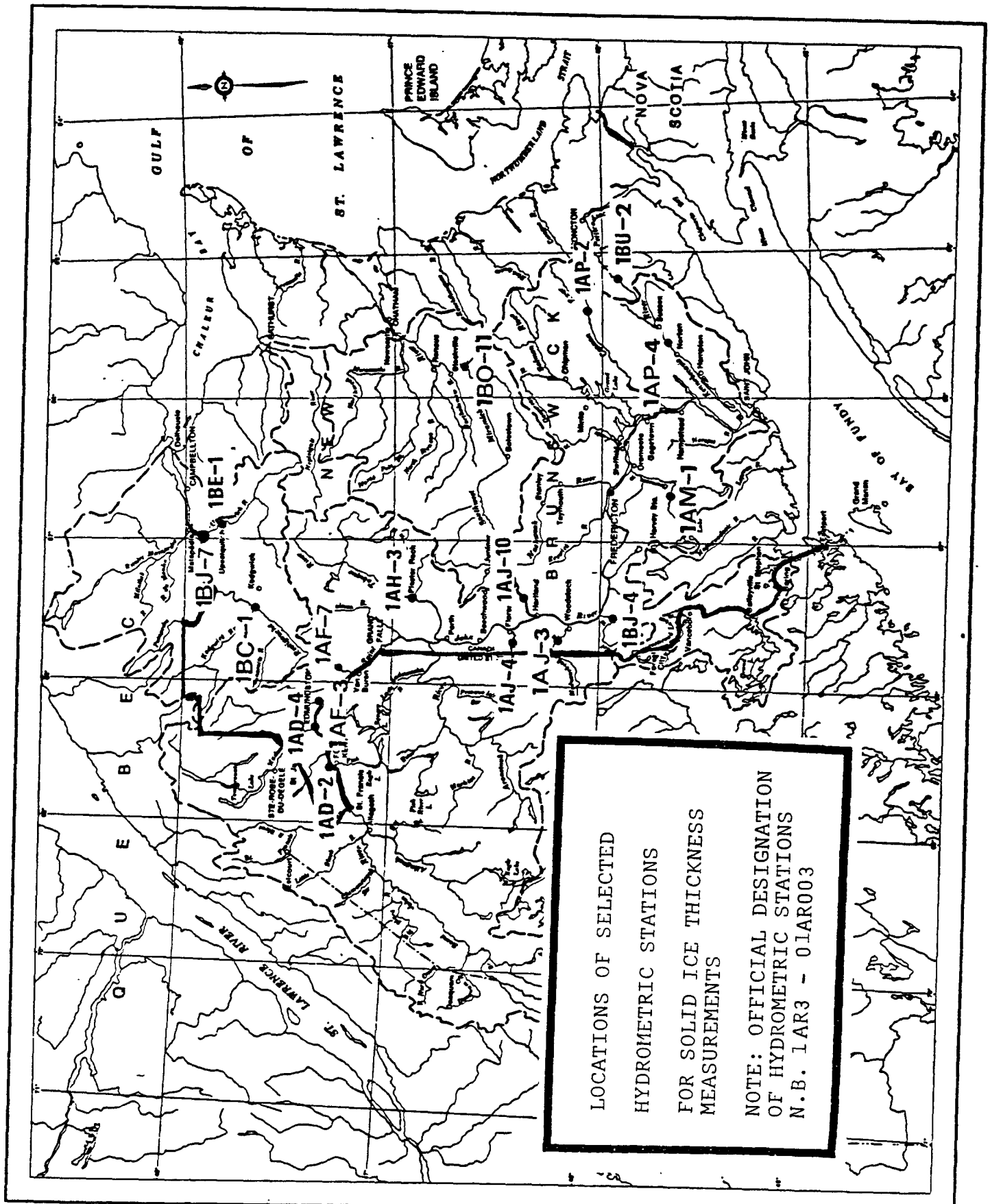
CHAPTER 4

WATER SURVEY OF CANADA

SOLID ICE THICKNESS MEASUREMENT PROGRAM

In New Brunswick, the Water Survey of Canada undertake solid ice measurements at selected hydrometric guaging stations. The selection of the stations is centered around those rivers and tributaries on which discharge measurements are taken under closed water conditions. These locations are identified on Map 4.1 or page 25.

Ice measurements are usually taken once a month in conjunction with winter discharge measurements. The solid ice thickness given in Table 4.1 is usually an average of three or more ice thickness measurements along a cross-section of the site.



Map 4.1 Locations of Selected Hydrometric Stations for Solid Ice Thickness Measurements.

TABLE 4.1

AVERAGE SOLID ICE THICKNESS

AT SELECTED HYDROMETRIC STATION SITES

Station	Date	Average of Readings(m)
Becaguimec Stream at Coldstream (No. 01AJ010)	Feb 15/84	0.39
	Mar 13/84	0.46
	Jan 10/83	0.31
	Mar 7/83	0.36
	Jan 10/80	0.32
	Jan 21/80	0.33
	Jan 28/80	0.44
	Feb 21/80	0.48
	Jan 23/79	0.24
	Jan 30/79	0.27
	Feb 19/79	0.31
	Feb 28/79	0.46
Big Presque Isle Stream at Tracey Mills (No. 01AJ004)	Jan 14/85	0.35
	Jan 28/85	0.35
	Feb 11/85	0.48
	Feb 25/85	0.43
	Mar 11/85	0.50
	Mar 18/85	0.54
	Jan 16/84	0.30
	Feb 2/84	0.41
	Feb 13/84	0.49
	Feb 27/84	0.33
	Mar 12/84	0.32
	Feb 24/83	0.20
	Jan 11/82	0.40
	Feb 10/82	0.60
	Jan 30/79	0.49
	Feb 28/79	0.41
	Mar 14/79	0.70
Canaan River at East Canaan (No. 01AP002)	Jan 7/85	0.27
	Jan 28/85	0.38
	Feb 25/85	0.47
	Mar 18/85	0.46
	Jan 16/84	0.41
	Feb 13/84	0.49
	Feb 25/83	0.38
	Jan 6/83	0.26
	Jan 28/83	0.24
	Jan 26/82	0.37
	Feb 11/82	0.49
	Mar 13/82	0.52
	Jan 11/80	0.21
	Feb 14/80	0.39
	Mar 7/80	0.43

TABLE 4.1 continued

Station	Date	Average of Readings (m)
Eel River at Scott Siding (No. 01BJ004)	Jan 9/85	0.27
	Feb 14/85	0.49
	Feb 17/84	0.49
	Mar 12/84	0.53
	Mar 1/83	0.39
	Mar 2/82	0.55
	Jan 12/81	0.40
	Jan 20/80	0.51
	Jan 31/79	0.68
	Mar 1/79	0.70
	Dec 15/78	0.19
Grand River at Violette Bridge (No. 01AF007)	Jan 14/85	0.35
	Jan 28/85	0.37
	Feb 11/85	0.38
	Feb 25/85	0.50
	Mar 12/85	0.51
	Mar 19/85	0.58
	Feb 13/84	0.64
	Feb 27/84	0.60
	Mar 28/84	0.51
	Apr 16/84	0.71
	Jan 12/83	0.44
	Jan 24/83	0.42
	Feb 8/83	0.54
	Feb 21/83	0.36
	Mar 8/83	0.63
	Jan 13/82	0.31
	Jan 16/81	0.35
	Jan 28/81	0.42
	Jan 29/80	0.53
	Jan 2/79	0.20
	Jan 16/79	0.30
	Feb 13/79	0.36
	Feb 27/79	0.39
	Mar 13/79	0.45

TABLE 4.1 continued

Station	Date	Average of Readings (m)
Green River near Riviere-Verte (No. 01AF003)	Jan 28/85	0.51
	Feb 12/85	0.55
	Feb 26/85	0.65
	Mar 12/85	0.82
	Mar 18/85	0.62
	Apr 2/85	0.75
	Jan 16/84	0.32
	Feb 14/84	0.75
	Mar 26/84	0.61
	Apr 16/84	0.54
	Jan 25/83	0.36
	Feb 8/83	0.75
	Mar 15/83	0.80
	Jan 14/82	0.34
	Feb 8/82	0.60
	Jan 16/81	0.39
	Mar 31/80	0.86
	Jan 2/79	0.32
	Jan 29/79	0.60
	Feb 27/79	0.53
	Mar 13/79	0.35
Kennebecasis River at Apohaqui (No. 01AP004)	Jan 9/85	0.31
	Jan 30/85	0.40
	Jan 18/84	0.31
	Jan 26/83	0.17
	Feb 23/83	0.23
	Jan 6/81	0.54
	Jan 27/81	0.53
	Feb 12/80	0.37
Limestone River at Four Falls (No. 01AG002)	Jan 14/81	0.27
	Jan 28/80	0.39
Meduxnekeag River near Belleville (No. 01AJ003)	Jan 8/85	0.29
	Feb 13/85	0.42
	Mar 11/85	0.47
	Jan 19/84	0.51
	Feb 13/84	0.64
	Mar 12/84	1.09
	Mar 29/84	0.74
	Jan 10/83	0.27
	Feb 10/82	0.60
	Jan 14/81	0.36
	Feb 1/80	0.53
	Jan 18/79	0.38
	Jan 30/79	0.47
	Feb 15/79	0.50
	Mar 1/79	0.59

TABLE 4.1 continued

Station	Date	Average of Readings(m)
Nashwaak River at Durham Bridge (No. 01AL002)	Jan 18/85	0.34
	Feb 18/85	0.55
	Feb 1/85	0.35
	Feb 17/84	0.41
	Mar 26/84	0.50
	Feb 3/84	0.45
	Jan 5/84	0.29
	Jan 20/84	0.38
	Mar 2/84	0.49
	Mar 30/84	0.53
	Jan 15/82	0.39
	Feb 15/82	0.39
Northwest Oromocto River at Tracy (No. 01AM001)	Jan 11/85	0.29
	Feb 5/85	0.40
	Mar 11/85	0.43
	Mar 22/85	0.48
	Jan 16/84	0.41
	Mar 15/84	0.55
	Mar 28/84	0.57
	Jan 7/83	0.12
	Jan 24/83	0.32
	Feb 21/83	0.34
	Mar 14/83	0.39
	Feb 6/81	0.45
	Feb 19/81	0.48
	Feb 19/79	0.55
	Feb 26/79	0.50
Petitcodiac River near Petitcodiac (No. 01BU002)	Jan 7/85	0.23
	Jan 28/85	0.36
	Mar 8/85	0.47
	Mar 18/85	0.46
	Jan 16/84	0.37
	Feb 13/84	0.40
	Mar 13/84	0.24
	Jan 4/83	Open
	Jan 27/83	0.18
	Feb 23/83	0.27
	Mar 17/83	0.55
	Jan 26/82	0.48
	Feb 11/82	0.55
	Mar 13/82	0.66
	Jan 15/81	0.52
	Jan 10/80	0.36
	Feb 14/80	0.57
	Mar 7/80	0.54

TABLE 4.1 continued

Station	Date	Average of Readings(m)
Restigouche River below Kedgwick River (No. 01BC001)	Jan 7/85	0.34
	Feb 4/85	0.39
	Mar 4/85	0.57
	Mar 25/85	0.64
	Jan 10/84	0.38
	Feb 7/84	0.44
	Mar 5/84	0.45
	Apr 3/84	0.38
	Jan 10/83	0.34
	Feb 7/83	0.55
	Mar 14/83	0.62
	Feb 2/82	0.55
	Mar 8/82	0.70
	Feb 2/81	0.43
Restigouche River at Rafting Ground Brook (No. 01BJ007)	Jan 8/85	0.37
	Feb 5/85	0.57
	Mar 5/85	0.62
	Mar 26/85	0.77
	Jan 10/84	0.38
	Feb 7/84	0.59
	Mar 6/84	0.68
	Apr 3/84	0.87
	Jan 10/83	0.48
	Feb 8/83	0.63
	Mar 15/83	0.75
	Feb 2/82	0.43
	Mar 9/82	0.49
Saint John River at Edmundston (No. 01AD004)	Jan 16/79	0.41
	Feb 13/79	0.46
Saint John River at Fort Kent (No. 01AD002)	Jan 29/85	0.17 (Open Seam)
	Feb 12/85	0.39
	Feb 26/85	0.51
	Mar 12/85	0.52
	Jan 17/84	0.30
	Feb 28/84	0.41
	Mar 8/83	0.51
	Jan 28/82	0.47
	Jan 31/80	0.46
	Feb 28/80	0.56

TABLE 4.1 continued

Station	Date	Average of Readings(m)
Southwest Miramichi River at Blackville (No. 01B0001)	Jan 11/85	0.33
	Feb 8/85	0.41
	Feb 27/85	0.51
	Mar 8/85	0.58
	Mar 29/85	0.40
	Jan 9/84	0.52
	Feb 13/84	0.84
	Mar 26/84	0.74
	Jan 3/83	Open Seam
	Feb 28/83	0.48
	Jan 11/82	0.35
	Feb 8/82	0.55
	Mar 8/82	0.65
	Jan 12/81	0.45
	Feb	0.45
Tobique River at Plaster Rock (No. 01AH003)	Jan 30/85	0.41
	Apr 1/85	0.50
	Jan 11/84	0.39
	Feb 1/84	0.53
	Feb 29/84	0.61
	Mar 13/84	0.62
	Mar 28/84	0.68
	Feb 23/83	0.88
	Feb 9/82	0.40
	Jan 15/81	0.30
	Jan 30/79	0.48
	Feb 14/79	0.51
	Mar 13/79	0.70
Tobique River at Riley Brook (No. 01AH002)	Feb 1/84	0.42
Upsalquitch River at Upsalquitch (No. 01BE001)	Jan 17/81	0.25
	Jan 20/81	0.24
Walker Brook at Campbellton (No. 01BJ009)	Jan 9/85	0.16
	Feb 4/85	0.23
	Mar 5/85	0.26
	Mar 25/85	0.21
	Jan 10/84	0.16
	Mar 4/84	80% Open
	Jan 11/83	0.17
	Feb 8/83	0.27

CHAPTER 5

UNIVERSITY OF NEW BRUNSWICK

NEW BRUNSWICK DEPARTMENT OF THE ENVIRONMENT

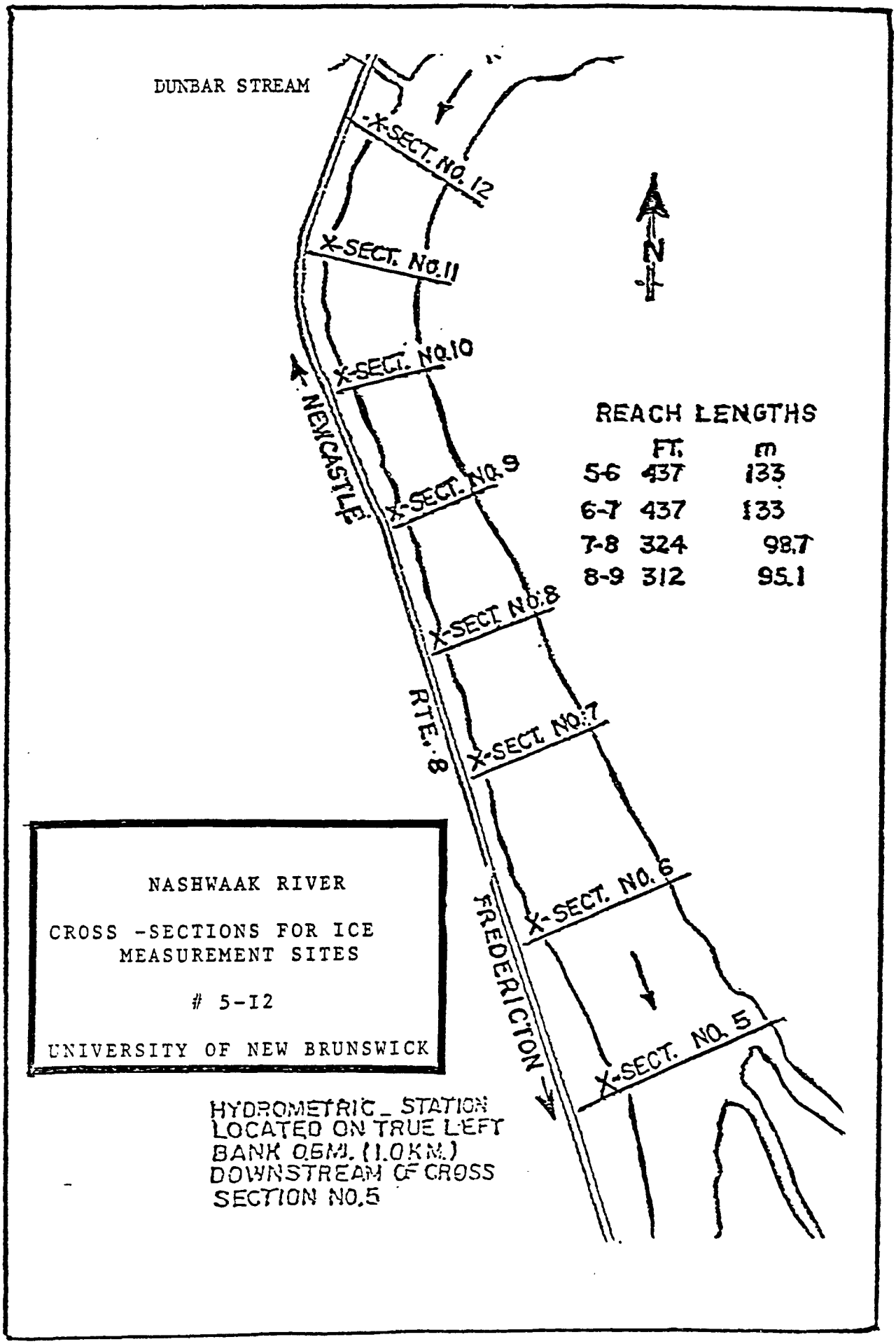
NASHWAAK RIVER SOLID ICE THICKNESS MEASUREMENTS

The University of New Brunswick (UNB) began river studies of the Nashwaak River in 1979. The main objective of the initial studies was to determine the flow conveyance capacity of the river under the influence of ice cover. The upper cross sections (#5-12) were primarily chosen because they are island free and are located on a relatively straight section of the Nashwaak River. Cross section No. 6 is the site of the winter discharge measurements by Water Survey of Canada. It is the easiest accessible location and there is very little inflow between there and the hydrometric gauge. Please refer to Map 5.1.

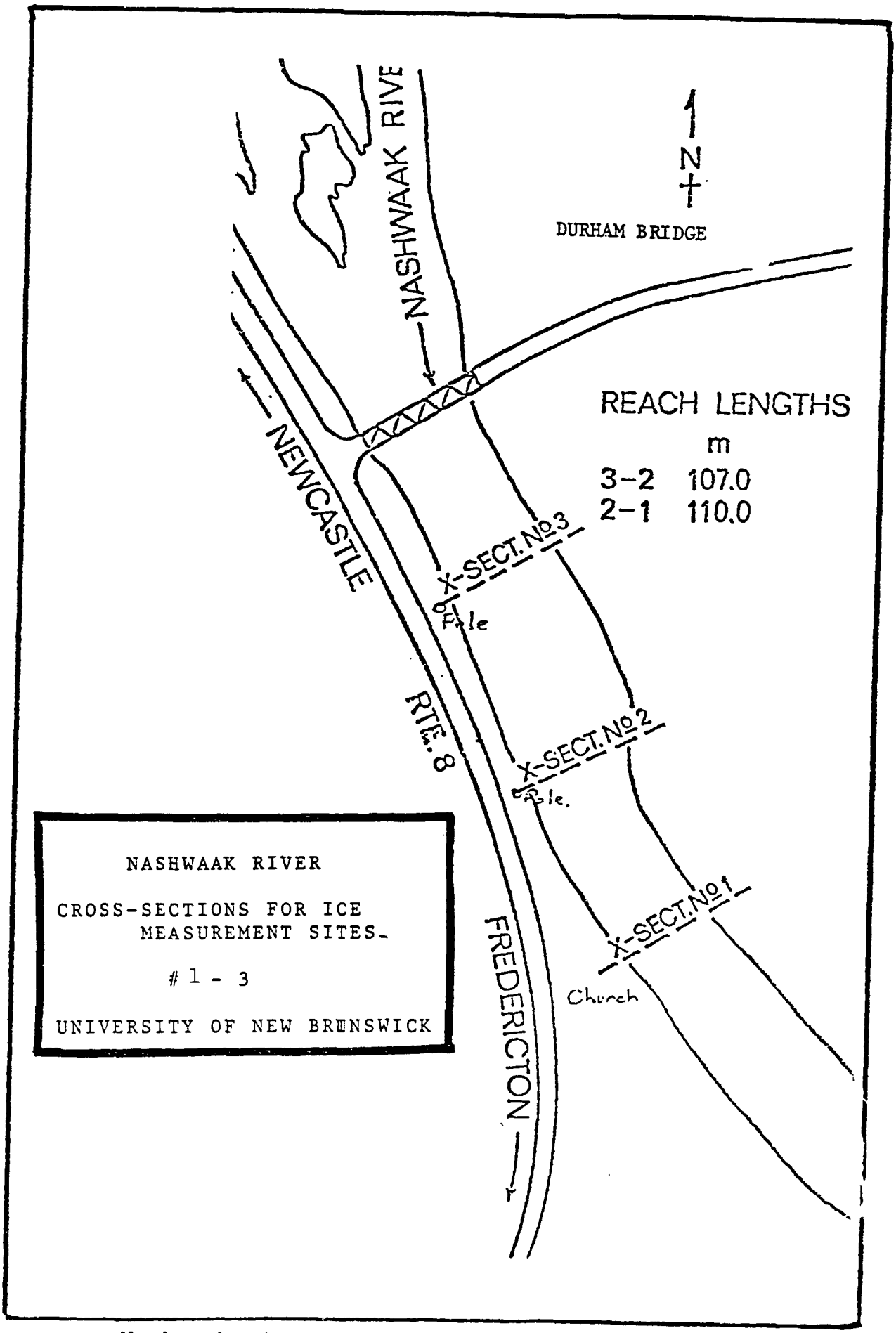
The lower cross sections (#1-3) serves as a back-up site for the upper cross sections. Please refer to Map 5.2.

Surveys are usually taken twice a month by UNB Engineering students and by staff of the New Brunswick Department of the Environment and are done in conjunction with winter discharge measurements undertaken by the Water Survey of Canada.

For additional measurements on solid ice thickness on the Nashwaak River, please refer to other chapters of this report.



Map 5. Nashwaak River Cross-Sections for Ice Measurement Sites (#5-12) UNB



Map 5.2 Nashwaak River Cross-Sections for Ice Measurement Sites (#1-3) UNB

TABLE 5.1

NASHWAAK RIVER 1979

AVERAGE SOLID ICE THICKNESS

(METRES)

Nashwaak River	Jan 3/79	0.30
At Durham Bridge	Jan 17/79	0.27
	Feb 8/79	0.40
	Feb 20/79	0.62
	Feb 28/79	0.65
	Mar 12/79	0.59
	Mar 23/79	0.54
At Taymouth	Mar 1/79	0.68
At Covered Bridge	Mar 23/79	0.46

TABLE 5.2

NASHWAAK RIVER 1980

AVERAGE SOLID ICE THICKNESS

(METRES)

Durham Bridge X Section	Jan 10	Jan 17	Jan 31	Feb 14	Feb 28	Mar 13
#5	0.24	0.30	0.35	0.44	0.46	0.52
#6	0.22	0.27	0.37	0.49	0.54	0.55
#7	0.23	0.27	0.35	0.53	0.53	0.90
#8	0.22	0.31	0.40	0.58	0.57	0.58
#9	0.23	0.30	0.43	0.62	0.68	0.70

At Durham Bridge	Jan 15/80	0.28
	Mar 13/80	0.54

TABLE 5.3

NASHWAAK RIVER 1981

Average Ice Thickness
(Metres)

Durham Bridge X Section	Jan 8	Jan 10	Jan 14	Jan 15	Jan 20	Jan 21	Jan 28	Feb 4
1	-	0.38	-	-	0.36	-	-	Unsafe
2	-	0.36	-	-	0.36	-	-	Unsafe
3	-	0.29	-	-	0.30	-	-	Unsafe
4	-	-	NOT SURVEYED	-		-	-	-
5	0.36	0.43	-	0.37	0.41	-	0.43	Unsafe
6	0.30	0.44	0.38	0.33	0.44	0.40	-	Unsafe
7	-	0.40	-	0.27	0.39	-	-	Unsafe
8	0.29	-	-	0.28	0.33	-	0.36	1.79
9	-	0.32	-	0.28	-	-	0.46	Unsafe
10	-	-	-	0.47	-	-	0.49	Unsafe
11	-	-	-	-	0.32	-	-	Unsafe
12	-	-	0.28	-	0.34	0.38	0.39	Unsafe

TABLE 5.4

NASHWAAK RIVER 1981

Average Ice Thickness
(Metres)

Section	Jan 7	Jan 14	Jan 21	Jan 28	Feb 4
At Stanley	0.33	0.41	0.53	0.38	1.01
McLaggan Bridge	0.41	0.46	0.36	0.34	Unsafe
Nashwaak Bridge	0.38	0.36	0.49	0.49	Unsafe
Taymouth	0.41	0.38	0.39	0.48	1.3
Penniac	-	-	0.40	0.47	Unsafe
Nashwaak Village	0.43	-	-	-	-

TABLE 5.5

NASHWAAK RIVER 1982
AVERAGE SOLID ICE THICKNESS

(METRES)

Durham Bridge X Section	Jan 29	Feb 12	Mar 12	Mar 26
#5	0.48	0.55	0.59	0.55
#6	0.39	0.58	0.65	0.64
#8	0.42	0.59	0.71	-

Nashwaak R. near Durham	Jan 15/82	0.39
	Feb 15/82	0.39
Nashwaak R. opp. school in Stanley	Feb 3/82	0.61
	Mar 3/82	0.50

TABLE 5.6

NASHWAAK RIVER 1983
AVERAGE SOLID ICE THICKNESS
(METRES)

Durham Bridge X Section	Jan 28	Feb 11	Feb 18	Feb 25	Mar 18
#5	0.24	0.32	0.37	0.38	0.37
#6	0.24	0.35	0.38	0.42	0.39
#7	0.24	-	-	-	-
#8	0.24	0.37	0.41	0.48	-

TABLE 5.7

NASHWAAK RIVER 1984

AVERAGE SOLID ICE THICKNESS

(METRES)

Durham Bridge X Section	Feb 3	Feb 10
6	0.37	0.51
8	0.46	0.54

TABLE 5.8

NASHWAAK RIVER 1985

AVERAGE SOLID ICE THICKNESS

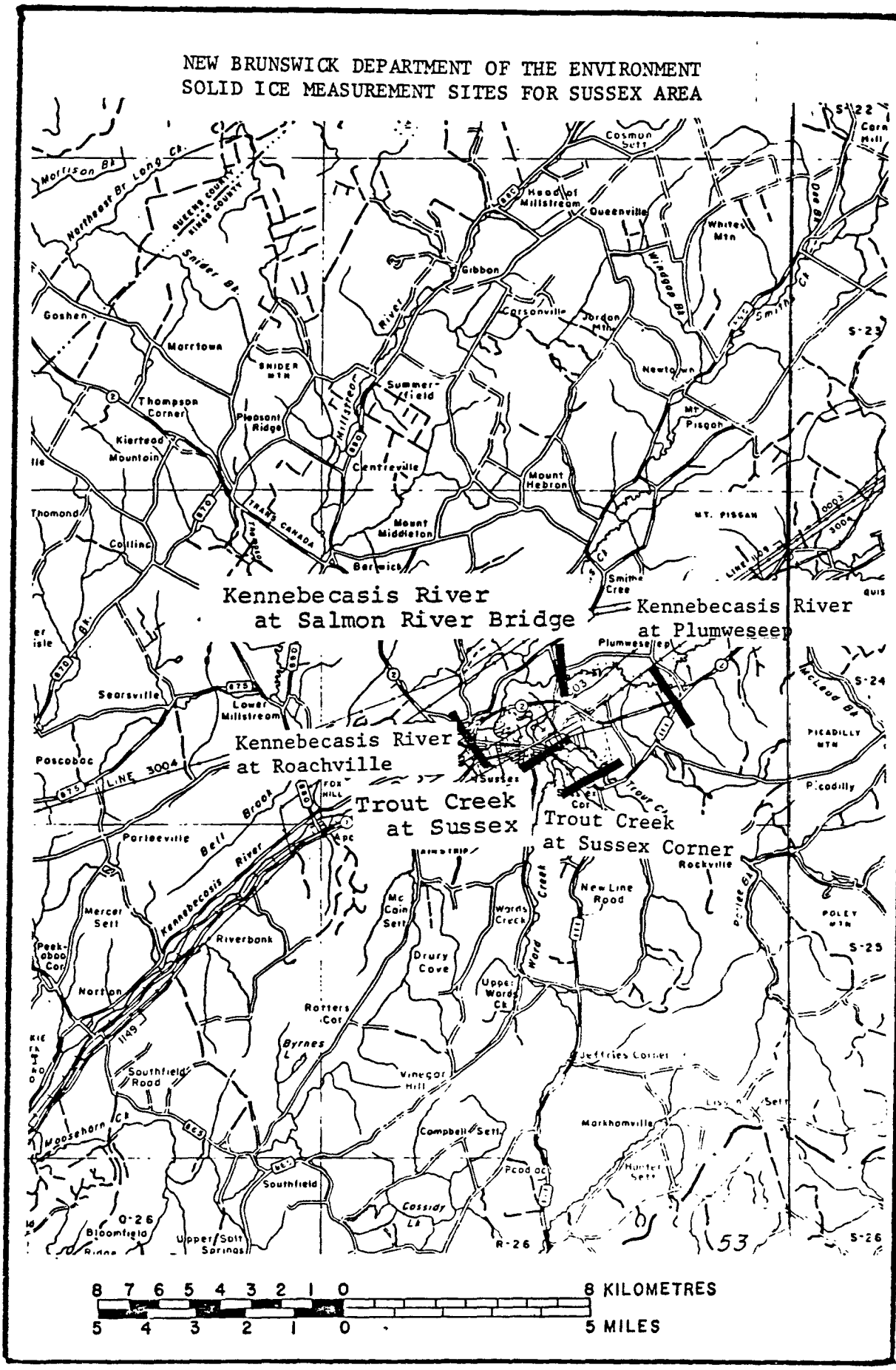
(METRES)

Durham Bridge X Section	Jan 11	Jan 18	Jan 25	Feb 1	Feb 8	Feb 22	Mar 1	Mar 8
6	0.28	0.30	0.28	0.34	0.42	0.45	0.42	0.54
8	0.31	0.45	0.47	0.40	0.41	0.53	0.50	0.54

CHAPTER 6

DEPARTMENT OF THE ENVIRONMENT SOLID ICE THICKNESS MEASUREMENT PROGRAM

Solid ice measurement sites for the New Brunswick Department of the Environment were randomly chosen in river locations where the potential of ice jamming is relatively high. Most of these sites have been on tributaries to the estuary of the Saint John River, for example, the Oromocto and the Kennebecasis Rivers.



Map 6.1 Department of the Environment Ice Measurement sites for Sussex Area

TABLE 6.1

AVERAGE SOLID ICE THICKNESS

AT SELECTED ENVIRONMENT NEW BRUNSWICK

GAUGING SITES

Location	Year	Average of Readings (m)
Back Creek At Blissville	Jan 25/83	0.39
	Feb 19/79	0.60
	Feb 26/79	0.43
Canaan River at Canaan Forks	Jan 6/81	0.48
	Jan 23/81	0.47
	Jan 27/81	0.46
Kennebecasis River at Plumweseep	Jan 23/81	0.51
	Jan 27/81	0.49
Kennebecasis River at Roachville	Jan 23/81	0.54
	Jan 27/81	0.42
Kennebecasis River at Salmon River Bridge	Jan 23/81	0.57
	Jan 27/81	0.56
Meduxnekeag River at Centennial Park	Jan 19/81	0.61
	Jan 26/81	0.55
	Feb 8/81	0.60
Oromocto River at French Lake	Feb 6/81	0.45
	Feb 19/79	0.58
Saint John River at Bull's Creek	Jan 19/81	0.47
	Jan 26/81	0.57
	Feb 9/81	0.56
Southeast Oromocto River at Blissville	Jan 24/83	0.32
	Feb 6/81	0.49
	Feb 19/79	0.61
	Feb 26/79	0.56
	Mar 22/79	0.45
Trout Creek at Sussex Corner	Jan 23/81	0.10
	Jan 27/81	Ice Free
Trout Creek at Sussex	Jan 23/81	0.53
	Jan 27/81	0.52

Table 6.1 continued

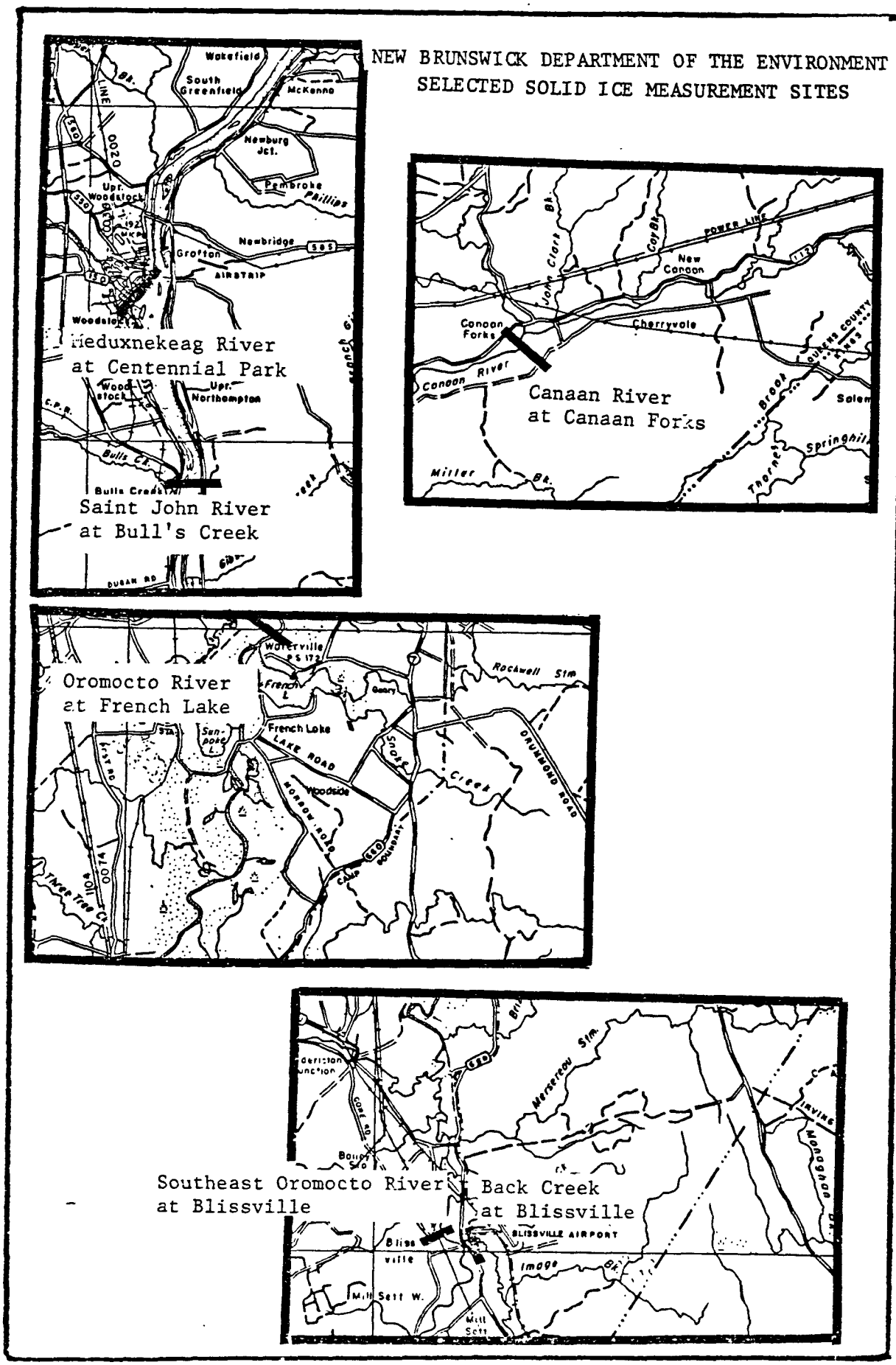
Location	Year	Average of Readings (m)
Walker Brook at Campbellton	Jan 9/85	0.16
	Feb 4/85	0.23
	Mar 5/85	0.26
	Mar 25/85	0.21
	Jan 10/84	0.16
	Mar 4/84	80% Open
	Jan 11/83	0.17
	Feb 8/83	0.27
	Jan 7/81	0.35
	Jan 10/81	0.36
	Jan 16/81	0.36
	Jan 30/81	0.35
	Feb 6/81	0.31
	Feb 13/81	0.36
Walker Brook at Sugarloaf Park	Jan 7/81	0.28
	Jan 10/81	0.28
	Jan 16/81	0.27
	Jan 30/81	0.24
	Feb 6/81	0.24
	Feb 13/81	0.27

CHAPTER 7

DEPARTMENT OF TRANSPORTATION

SOLID ICE THICKNESS MEASUREMENT PROGRAM

The New Brunswick Department of Transportation conducts solid ice measurement readings at various bridge sites around the province. Their main reason for undertaking these measurements is the need for ice thickness information to be used for bridge design. This program was initiated in 1976.



Map 6.2 Department of the Environment Ice Measurement Sites for Various Locations in New Brunswick

TABLE 7.1

DEPARTMENT OF TRANSPORTATION

SOLID-ICE THICKNESS REPORTS*

RESTIGOUCHE RIVER BRIDGE #3

	Mar 19 1976 m	Mar 14 1977 m	Mar 10 1978 m	Mar 9 1979 m	Mar 19 1980 m	Mar 13 1981 m	Mar 18 1982 m
Section A (u/s 30.48)	0.78	0.58	0.54	Ice Ran	0.68	River Clear	0.54
Section B (u/s 152.4)	0.70	0.62	0.55	March 7/79	0.67	Of Ice	0.59

S.W. MIRAMICHI RIVER BRIDGE #2

	Mar 24 1976 m	Mar 11 1977 m	Mar 7 1978 m	Mar 6 1979 m	Mar 11 1980 m	Mar 9 1981 m	Mar 5 1982 m
Section A (u/s 30.48)	0.75	0.55	River Open	0.77	0.70	Ice Unsafe	0.62
Section B (u/s 152.4)	0.75	0.58	River Open	0.79	0.68	Ice Unsafe	0.70

MADAWASKA RIVER BRIDGE #5

	Mar 11 1976 m	Mar 10 1977 m	Mar 14 1978 m	Mar 13 1979 m	Mar 20 1980 m	Mar 17 1981 m	Mar 22 1982 m
Section A (u/s 30.48)	0.66	0.69	River Open	0.82	0.63	River Open	0.73
Section B (u/s 152.4)	0.66	0.65	River Open	0.73	0.64	River Open	0.68

TABLE 7.1

MADAWASKA RIVER BRIDGE #4

	Mar 11 1976 m	Mar 10 1977 m	Mar 14 1978 m	Mar 13 1979 m	Mar 20 1980 m	Mar 17 1981 m	Mar 22 1982 m
Section A (u/s 30.48)	0.64	0.65	0.29	0.58	0.74	River Clear	0.63
Section B (u/s 152.4)	0.63	0.53	0.29	0.62	0.83	of Ice	0.63

UPSALQUITCH RIVER BRIDGE #1

	Mar 16 1976 m	Mar 14 1977 m	Mar 9 1978 m	Mar 9 1979 m	Mar 19 1980 m	Mar 12 1981 m	Mar 18 1982 m
Section A (u/s 30/48)	0.59	Ice Not Safe	0.53	Ice Ran	0.46	0.66	0.61
Section B (u/s 152.4)	0.58	River Open on both sides	0.56	March 7/79	0.38	0.42	0.70

BARTIBOG RIVER BRIDGE #1

	Mar 22 1976 m	Mar 8 1977 m	Mar 8 1978 m	Mar 7 1979 m	Mar 13 1980 m	Mar 16 1982 m
Section A (u/s 30.48)	0.81	0.70	0.89	0.67	0.62	0.77
Section B (u/s 152.4)	0.82	0.68	0.74	0.62	0.59	0.92

TABLE 7.1

INTERNATIONAL BRIDGE AT ST. LEONARD

	Mar 15 1976 m	Mar 16 1977 m	Mar 15 1978 m	Mar 13 1979 m	Mar 20 1980 m	Mar 17 1981 m	Mar 19 1982 m
Section A (u/s 30.48)	0.77	0.63	0.74	0.61	0.63	Ice Jammed	0.88
Section B (u/s 152.4)	0.78	0.68	0.57	0.65	0.75	Not Safe	0.79

WOODSTOCK-GRAFTON BRIDGE

	Mar 10 1976 m	Mar 17 1977 m	Mar 16 1978 m	Mar 15 1979 m	Mar 20 1980 m	Mar 18 1981 m	Mar 23 1982 m
Section A (u/s 30.48)	0.74	Unable To Test	0.69	River Open	0.78	0.43	0.65
Section B (u/s 152.4)	0.72	0.61 of Water Cover	0.68	at Piers	0.79	0.42	0.59

S.W. MIRAMICHI RIVER BRIDGE #4

	Mar 11 1977 m	Mar 7 1978 m	Mar 6 1979 m	Mar 11 1980 m	Mar 9 1981 m	Mar 15 1982 m
Section A (u/s 30.48)	0.77	0.69	0.84	0.90	Ice	0.73
Section B (u/s 152.4)	0.66	0.73	0.85	0.85	Unsafe	0.92

TABLE 7.1

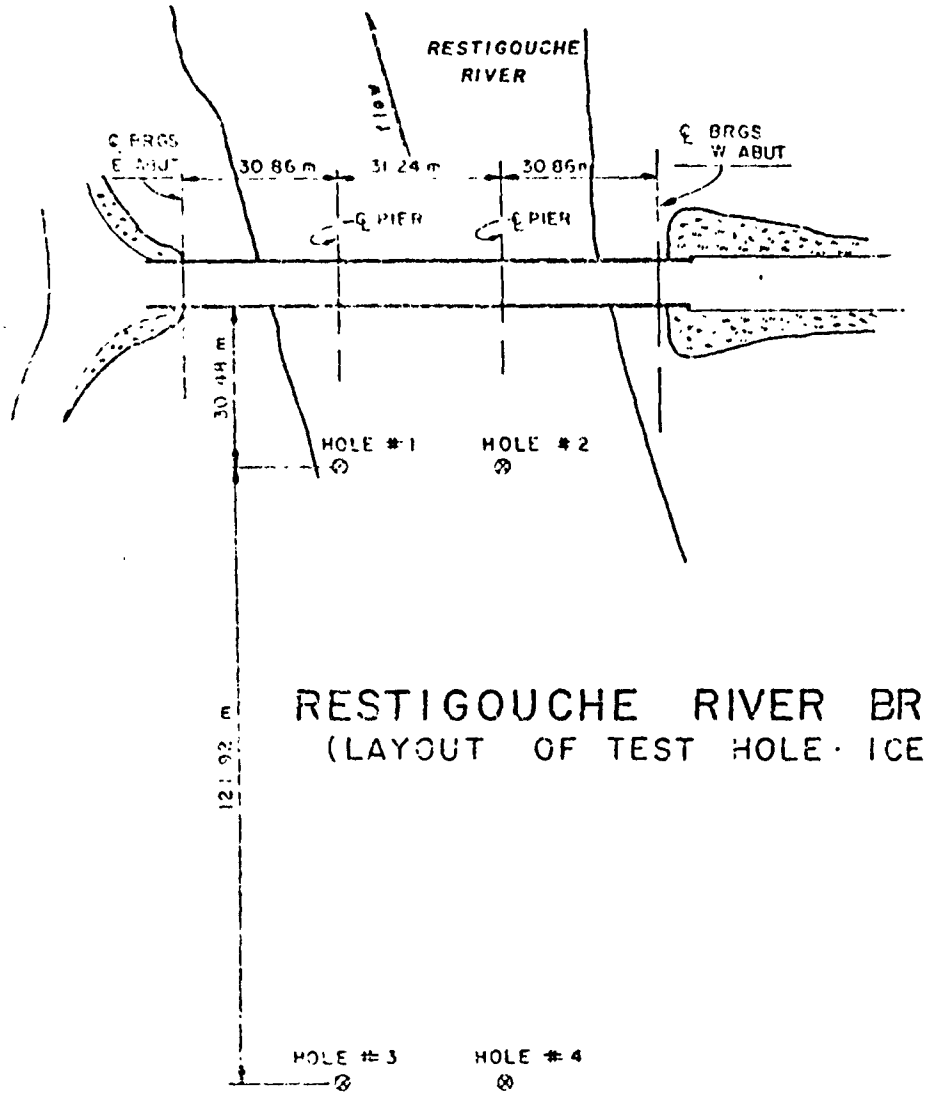
N.W. MIRAMICHI RIVER BRIDGE #2

	Mar 23 1976 m	Mar 8 1977 m	Mar 8 1978 m	Mar 8 1979 m	Mar 13 1980 m	Mar 10 1981 m	Mar 16 1982 m
Section A (u/s 30.48)	0.90	0.98	0.73	0.85	0.67	0.61	0.89
Section B (u/s 152.4)	0.93	0.88	0.69	0.84	0.75	0.54	0.82

HAWKSHAW BRIDGE

	Mar 10 1976 m	Mar 17 1977 m	Mar 16 1978 m	Mar 15 1979 m	Mar 21 1980 m	Mar 18 1981 m	Mar 23 1982 m
Section A (u/s 30.48)	0.65	Unable to Test	0.75	0.60	0.62	0.35	0.60
Section B (u/s 152.4)	0.72	0.61 of Water Cover/ Ice Soft	0.71	0.55	0.65	0.33	0.60

*Measurement readings contributed by Department of Transportation are located at Bridge Sites.

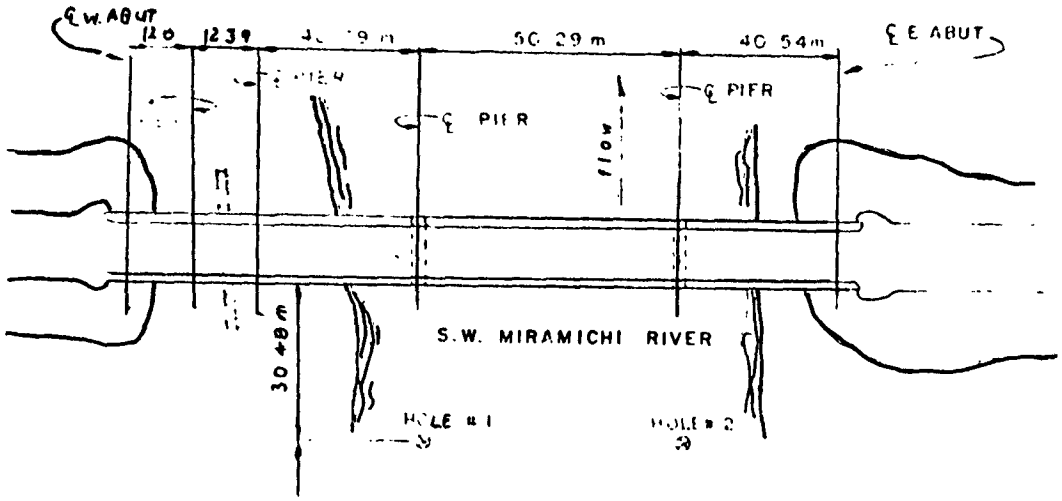


RESTIGOUCHE RIVER BRIDGE #3
(LAYOUT OF TEST HOLE · ICE THICKNESS)

ICE THICKNESS

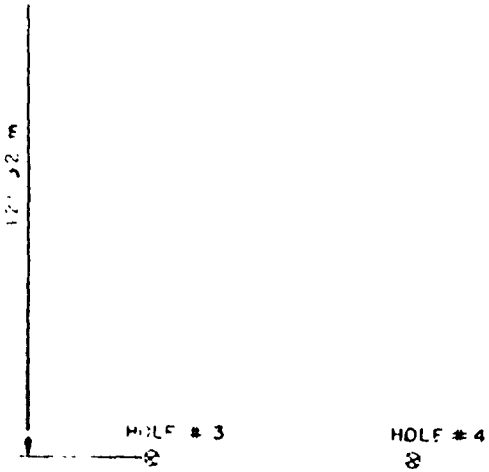
DATE	HOLE #1	HOLE #2	HOLE #3	HOLE #4
MARCH 19/76	.85 m	.72 m	.75 m	.66 m
MARCH 14/77	.55 m	.61 m	.58 m	.67 m
WATER & SNOW COVER – .46 m – ice very soft				
MARCH 10/78	.55 m	.52 m	.55 m	.56 m
MARCH 9/79	ICE RAN MARCH 7			
MARCH 19/80	.76 m	.61 m	.73 m	.60 m
	Snow Cover – 46 m			
MARCH 13/81	— RIVER CLEAR OF ICE —			
MARCH 18/82	.44 m	.64 m	.58 m	.60 m

Map 7.1 Restigouche River Bridge # 3 Ice Measurement Sites (DOT)



S.W. MIRAMICHI RIVER BRIDGE #2 (BLACKVILLE

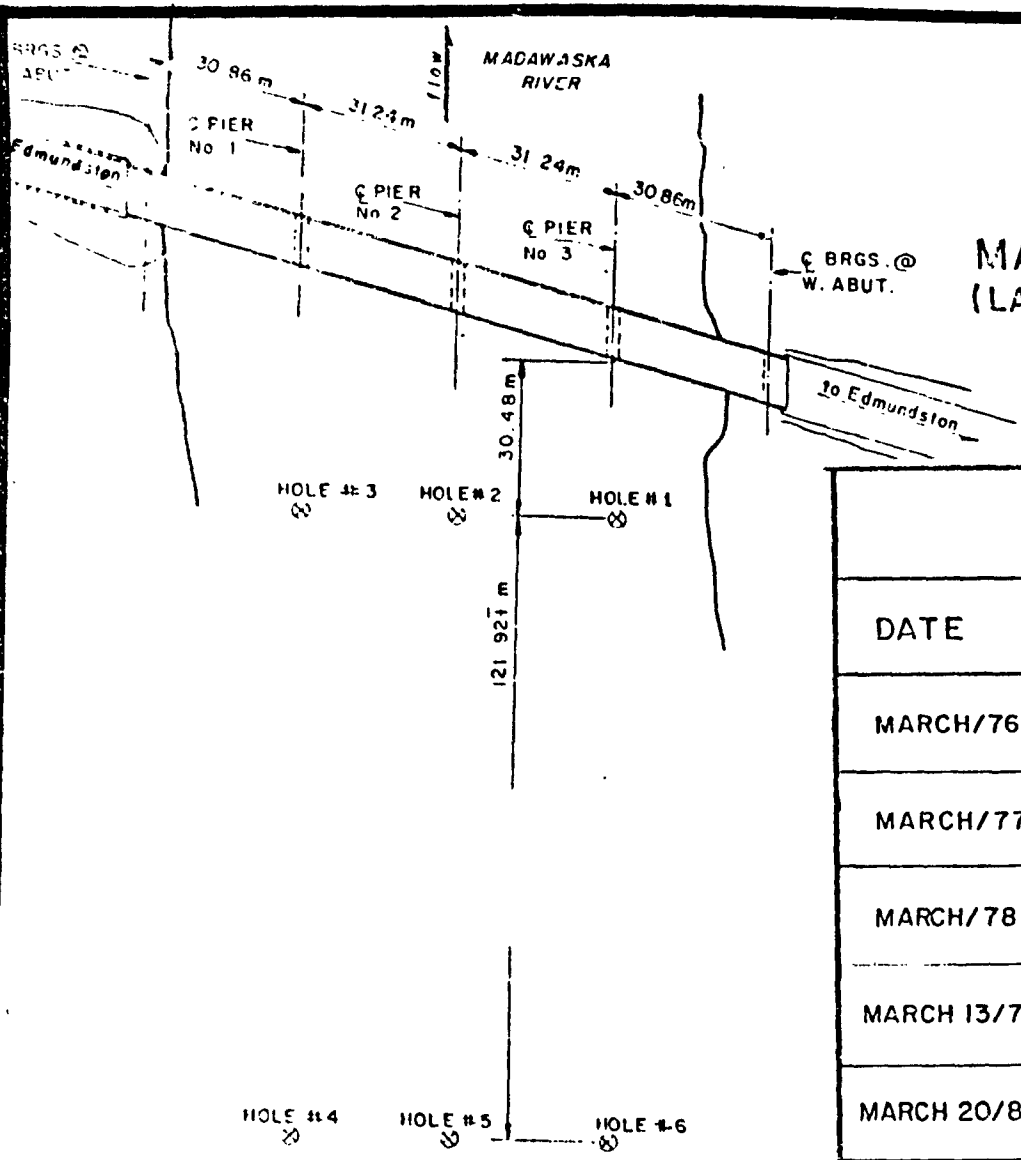
(LAYOUT OF TEST HOLES · ICE THICKNESS)



ICE THICKNESS

DATE	HOLE # 1	HOLE # 2	HOLE # 3	HOLE # 4
MARCH 24/76	.79 m	.72 m	.73 m	.76 m
	SNOW COVER .18m - ICE HARD			
MARCH 11/77	.54 m	.57 m	.59 m	.56 m
	SNOW & WATER COVER .61m - ICE HARD			
MARCH 7/78	RIVER OPEN AT PIERS & CHANNE			
MARCH 6/79	.79 m	.76 m	.79 m	.79 m
	SNOW & WATER COVER - 015m			
MARCH 11/80	.52 m	.88m	.73 m	.64 m
	Snow Cover - .15 m			
MARCH 9/81	---- ICE	UNSAFE ----		
MARCH 5/82	.61m	.63m	.61m	.80m

Map 7.2 Southwest Miramichi River Bridge # 2 Ice Measurement Sites (DOT)



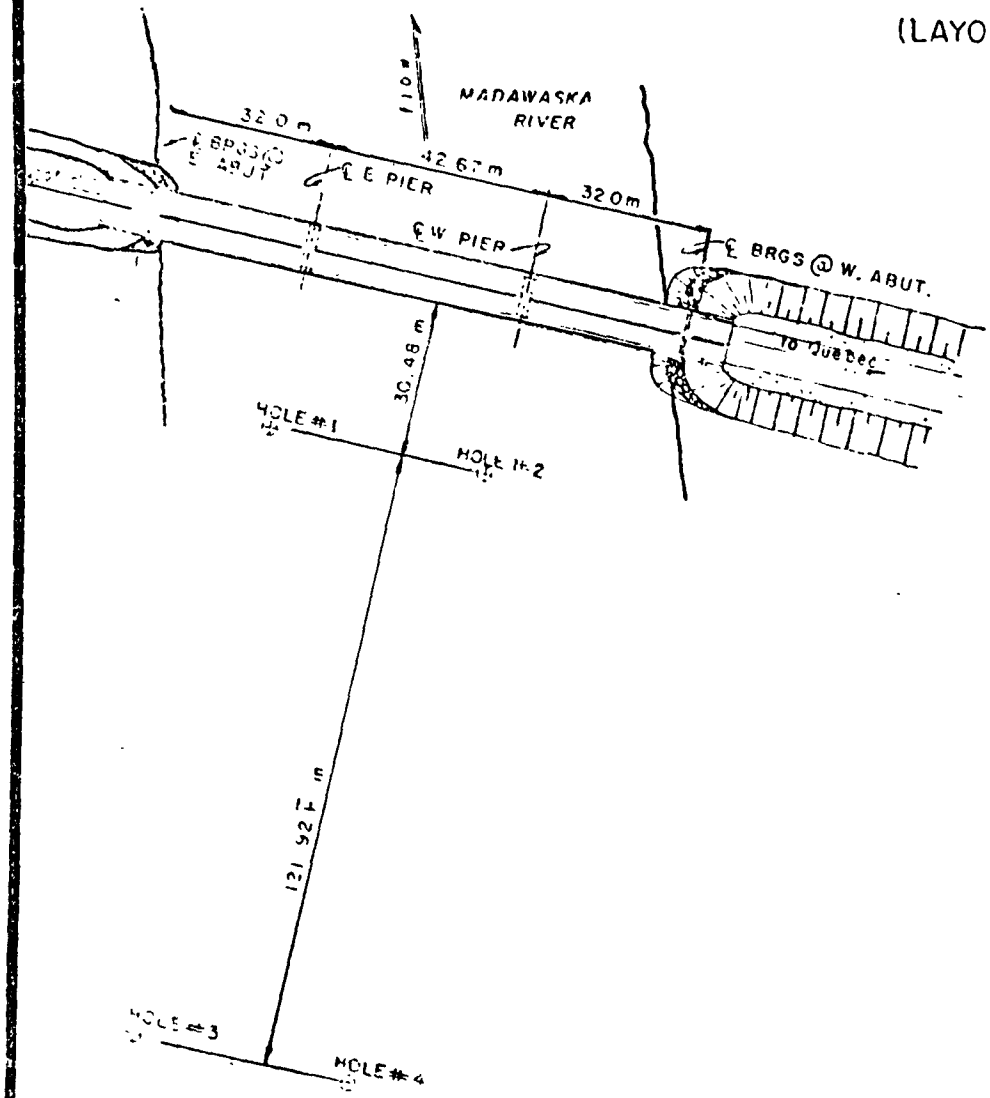
MADAWASKA RIVER BRIDGE #5
(LAYOUT OF TEST HOLES· ICE THICKNESS)

ICE THICKNESS

DATE	HOLE # 1	HOLE #2	HOLE # 3	HOLE # 4	HOLE # 5	HOLE # 6
MARCH/76	.66 m	.67m	.67m	dry	.66 m	.65m
MARCH/77	.64 m	.73m	.70m	.61 m dry	.64 m	.70m
MARCH/78	—RIVER	OPEN—				
MARCH 13/79	.79m	.85m	.82 m	.73 m	.73m	X
MARCH 20/80	.67m Snow &	.61m Water Cover - .15m	.61m	.61 m	.67m	.64 m
MARCH 17/81	———	RIVER	CLEAR OF ICE		———	
MARCH 22/82	.73m	.66m	.81m	.65m	.66 m	.74 m

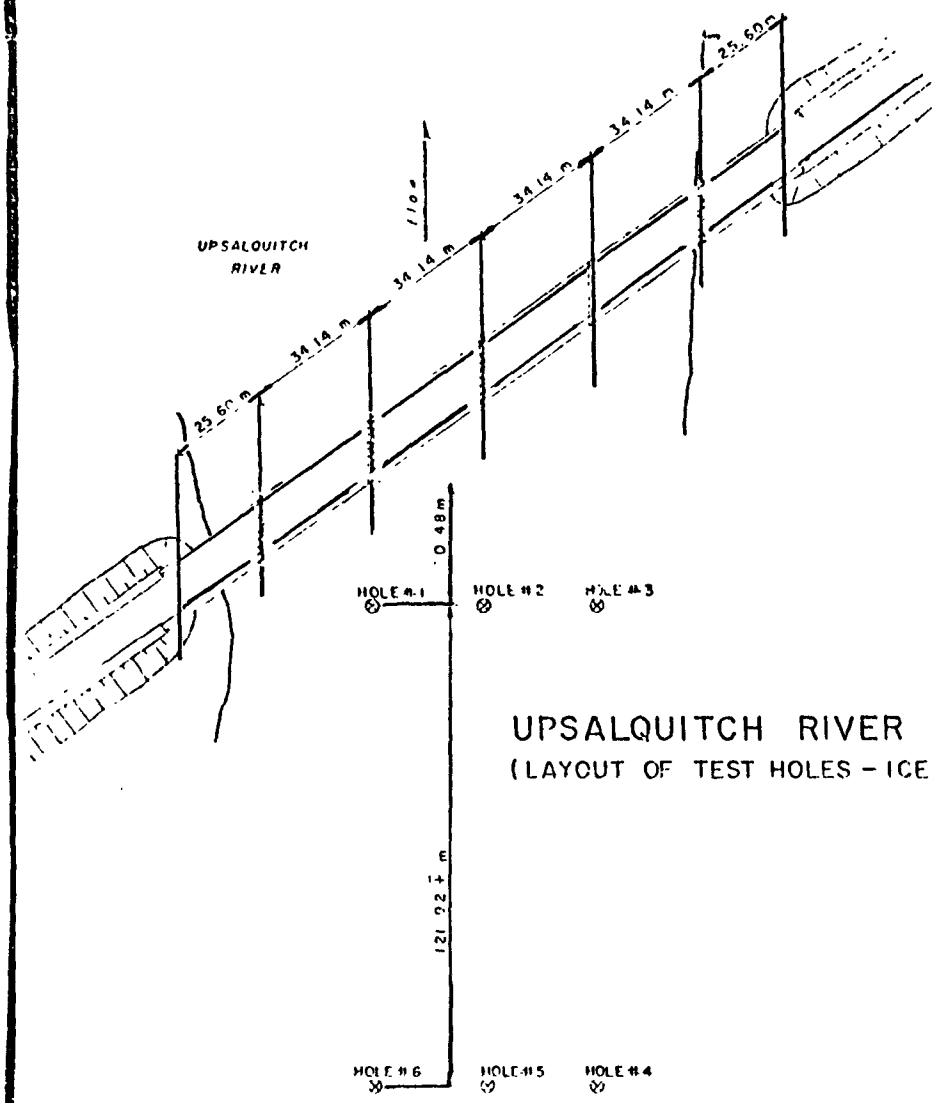
Map 7.3 Madawaska River Bridge # 5 Ice Measurement Sites (DOT)

MADAWASKA RIVER BRIDGE #4
(LAYOUT OF TEST HOLES · ICE THICKNESS)



ICE THICKNESS				
DATE	HOLE #1	HOLE #2	HOLE #3	HOLE #4
MARCH 11/76	.67 m	.62 m	.62 m	.64 m.
MARCH 10/77	.64 m	.67 m	.52 m	.55m
	water cover ≈ .40m			
MARCH 14/78	.30 m	.29 m	.29 m	.30 m
MARCH 13/79	.58m	58m	.61 m	64 m
MARCH 20/80	.67 m	.82 m	.88 m	.79 m
	Ice & Water Cover - .18m			
MARCH 17/81	—— RIVER · CLEAR OF ICE ——			
MARCH 22/82	.65m	.61 m	.66m	.60m

Map 7.4 Madawaska River Bridge #4, Ice Measurement Sites (DOT)

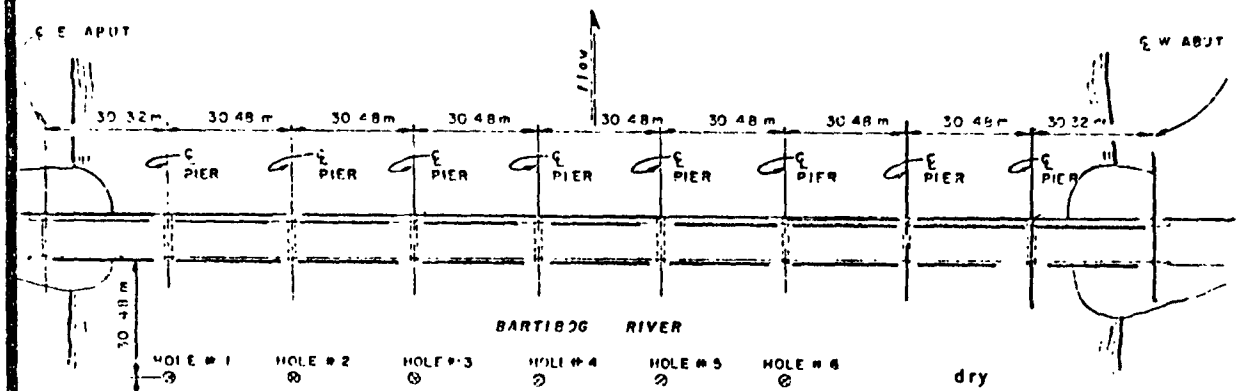


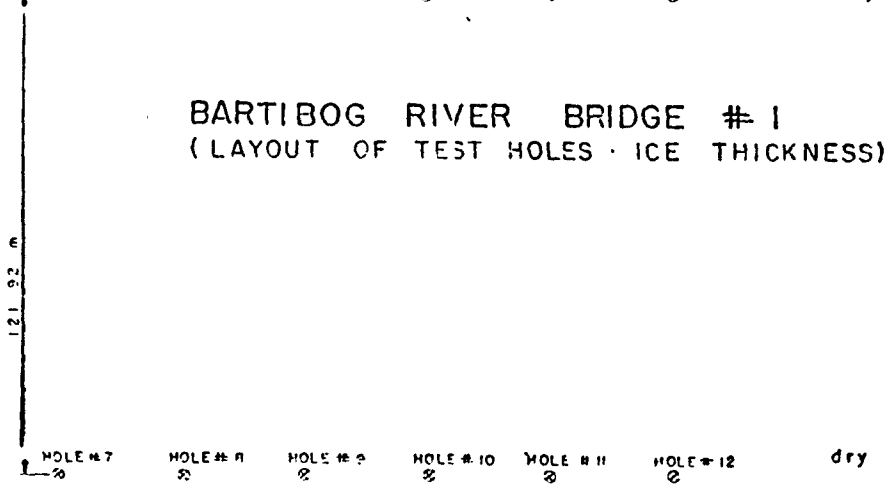
UPSALQUITCH RIVER BRIDGE #1
(LAYOUT OF TEST HOLES - ICE THICKNESS)

ICE THICKNESS

DATE	HOLE #1	HOLE #2	HOLE #3	HOLE #4	HOLE #5	HOLE #6
MARCH 16/76	dry	.56 m	.62 m	.60 m	.57 m	dry
MARCH 14/77	ice not safe — river open on both sides					
MARCH 9/78	dry	.54 m	.52 m	.57 m	.55 m	dry
MARCH 9/79	Ice ran	March 7				
MARCH 19/80	dry Snow Cover - .40 m	.46 m	.46 m	.43 m	.34 m	dry
MARCH 12/81	dry	.74 m	.59 m	.46 m	.38 m	dry
MARCH 18/82	dry	.64 m	.59 m	.75 m	.65 m	dry

Map 7.5 . Upsalquitch River Bridge #1 Ice Measurement Sites (DOT)

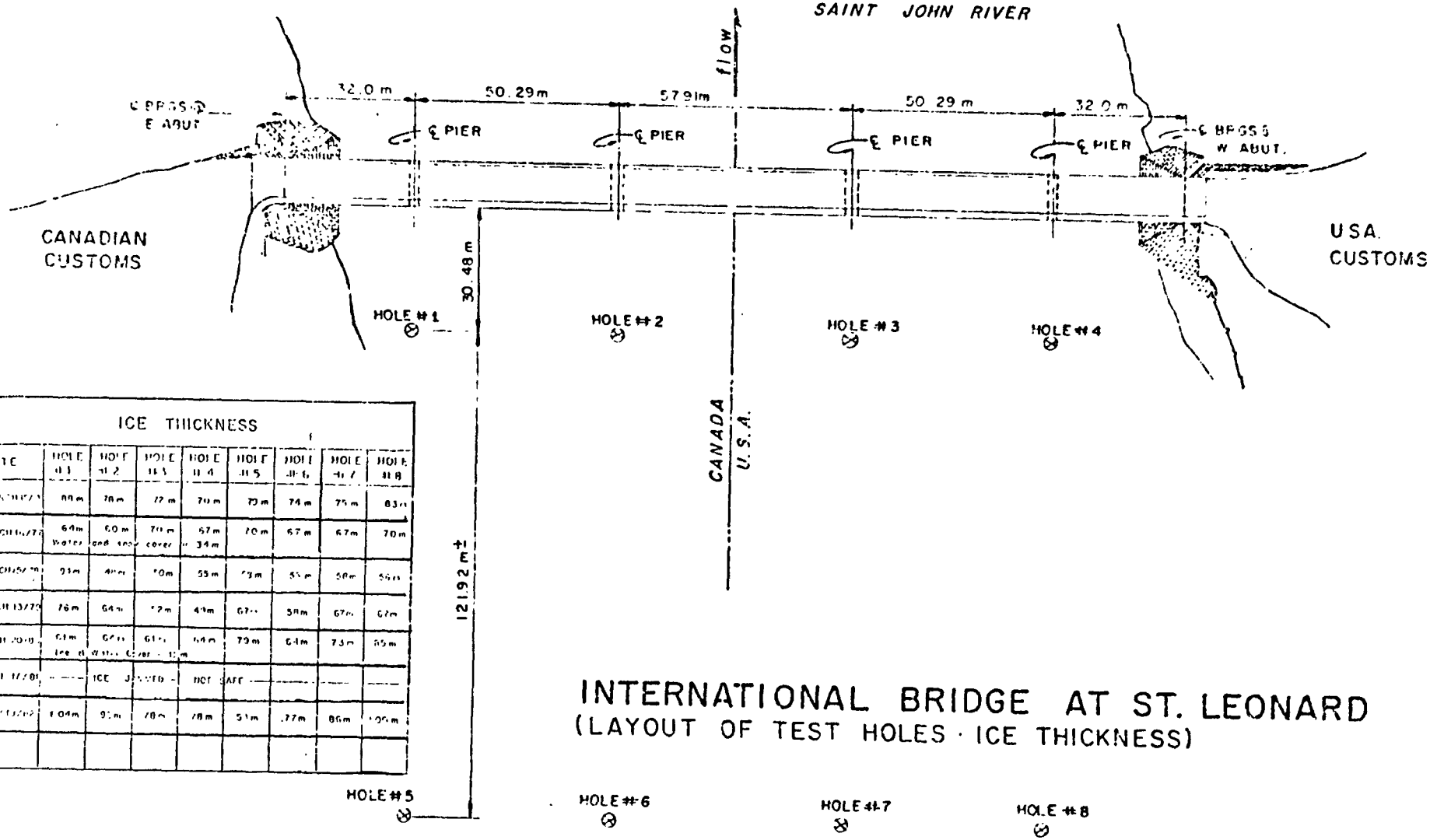




BARTIBOG RIVER BRIDGE #1
(LAYOUT OF TEST HOLES · ICE THICKNESS)

ICE THICKNESS												
DATE	HOLE #1	HOLE #2	HOLE #3	HOLE #4	HOLE #5	HOLE #6	HOLE #7	HOLE #8	HOLE #9	HOLE #10	HOLE #11	HOLE #12
MARCH 22/76	.90m	91m	.67m	.82m	76m	dry	94m	.85m	.82m	.70m	.85m	.79m
MARCH 8/77	70m ICE	76m SOFT	64m	.82m	70m	61m	.73m	.73m	.56m	.61m	70m	73m
MARCH 8/78	.96m	.97m SNOW	.81m	.91m	.78m	dry	.76m	.77m	66m	.70m	.70m	.76m
MARCH 7/79	70m	64m	61m	.70m	64m	.70m	.70m	67m	64m	58m	52m	61m
MARCH 13/80	.76m	.76m Snow	.64m	.46m	.58m	.52m	.52m	.61m	.58m	.58m	.55m	.76m
MARCH 9/81	.35m	.50m	.52m	.46m	.46m	.46m	.39m	.38m	.44m	.52m	.46m	.43m
MARCH 16/82	.79m	.70m	.71m	.78m	.84m	.80m	.98m	.92m	.97m	.83m	.89m	.88m

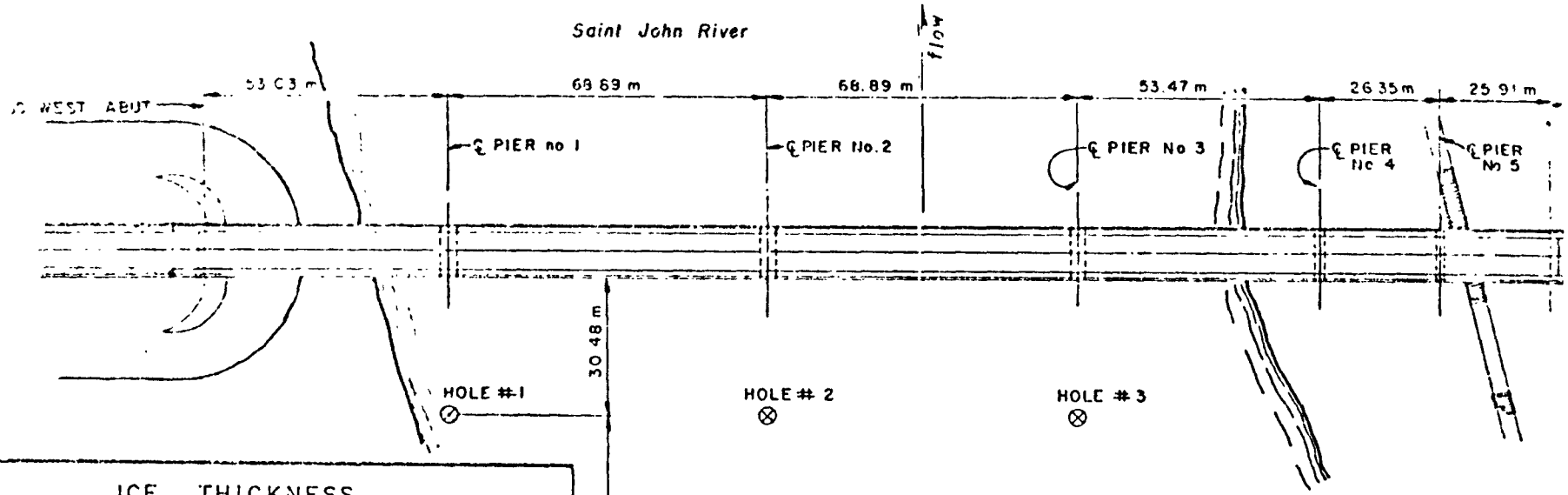
Map 7.6 Bartibog River Bridge #1 Ice Measurement Sites (DOT)



ICE THICKNESS

DATE	HOLE #1	HOLE #2	HOLE #3	HOLE #4	HOLE #5	HOLE #6	HOLE #7	HOLE #8
[illegible]	88 m	78 m	72 m	70 m	75 m	74 m	75 m	83 m
[illegible]	64m Water	60 m and snow	70 m cover	67m + 34m	70 m	67 m	67m	70 m
[illegible]	93m	49m	70m	55m	73m	55 m	58m	56m
[illegible]	76m	64m	72m	49m	67m	58m	67m	67m
[illegible]	63m	64m	61m	64m	79m	64m	73m	85m
[illegible]	—	ICE	[illegible]	NOT	SAFE	—	—	—
[illegible]	104m	93m	78m	78m	51m	77m	86m	105m

INTERNATIONAL BRIDGE AT ST. LEONARD
(LAYOUT OF TEST HOLES · ICE THICKNESS)

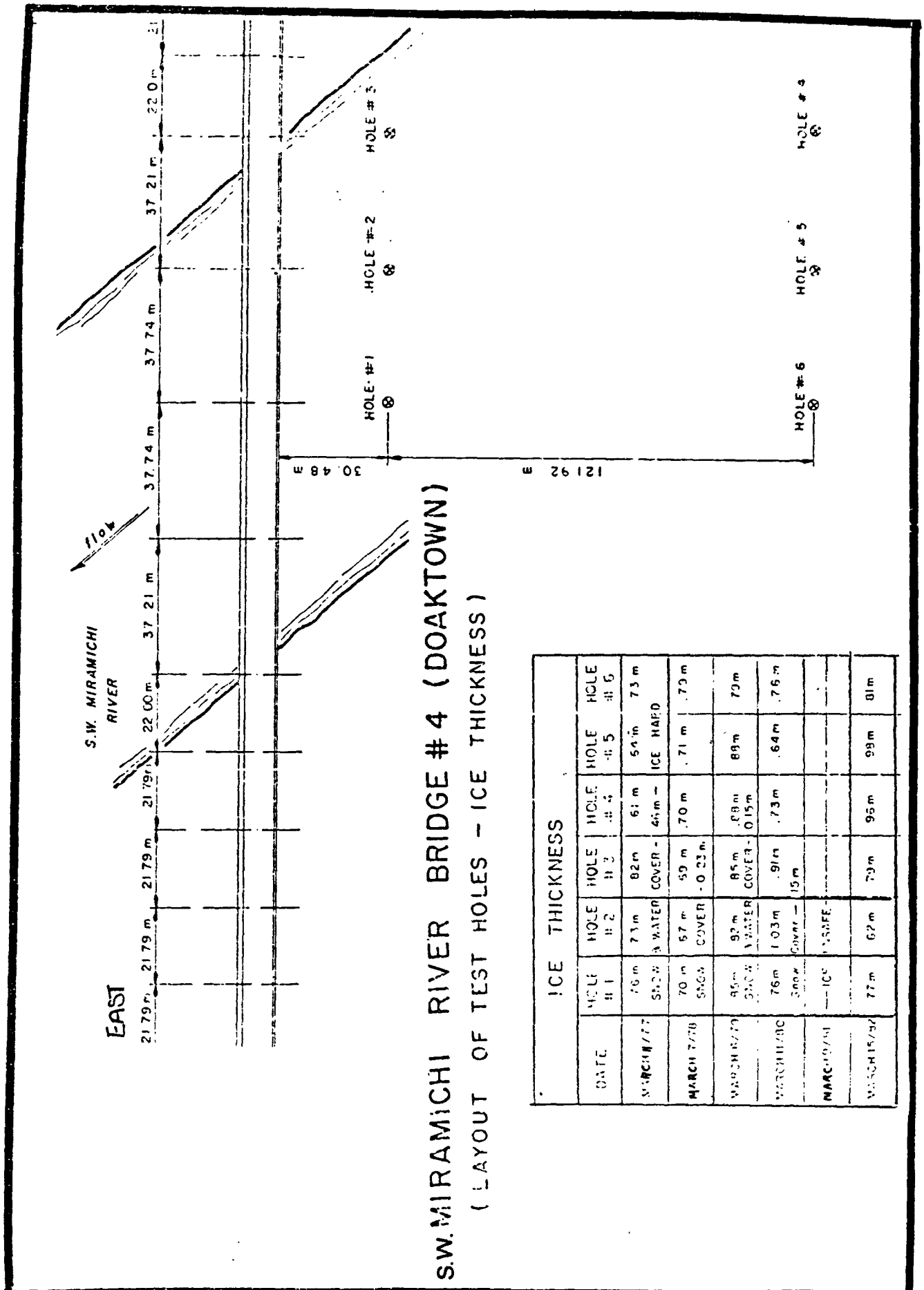


ICE THICKNESS

DATE	HOLE #1	HOLE #2	HOLE #3	HOLE #4	HOLE #5	HOLE #6
MARCH 10/ '6	.64 m	.70 m	.61 m	.73 m	.70m	.73m
MARCH 17/ '7	UNABLE TO TEST ICE – .61 m WATER COVER – ICE VERY SOFT					
MARCH 16/79	.78 m	.75 m	.73 m	.71 m	.73m	.68 m
MARCH 15/79	.67 m	.55 m	.58m	55m	X	X
MARCH 21/80	70 m Soft	.61 m Ice - Wat	.55 m r Cover –	67 m 09 m	.64 m	.64 m
MARCH 16/81	.44 m	.32 m	.29m	.37m	.24 m	.37 m
MARCH 23/32	.60m	.60m	.61m	.62m	.58m	.61 m

HOLE #4 HOLE # 5 HOLE # 6

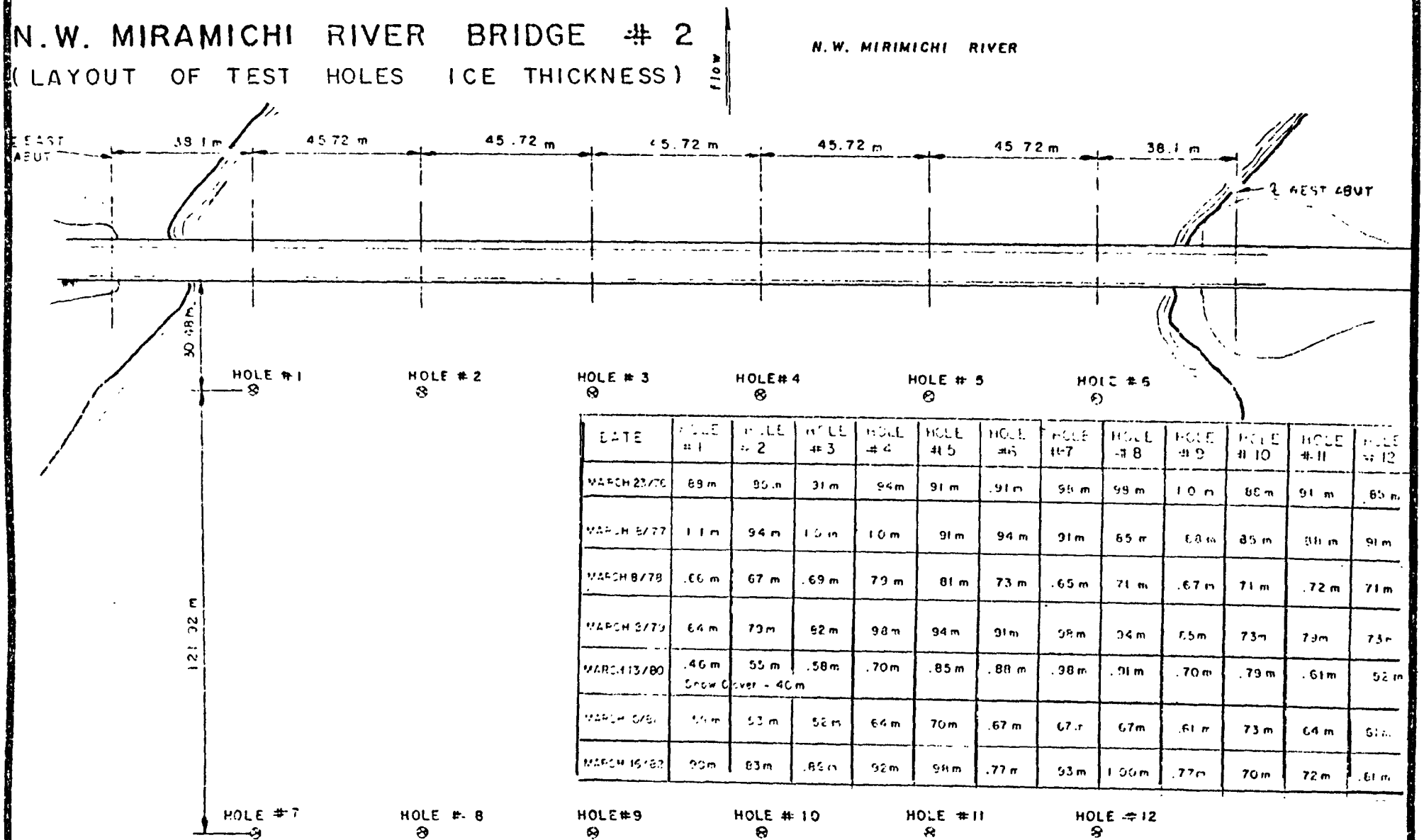
WOODSTOCK - GRAFTON BRIDGE
(LAYOUT OF TEST HOLES – ICE THICKNESS)



Map 7.9 Southwest Miramichi River Bridge # 4 (Doaktown) Ice Measurement Sites (DOT)

N.W. MIRAMICHI RIVER BRIDGE # 2

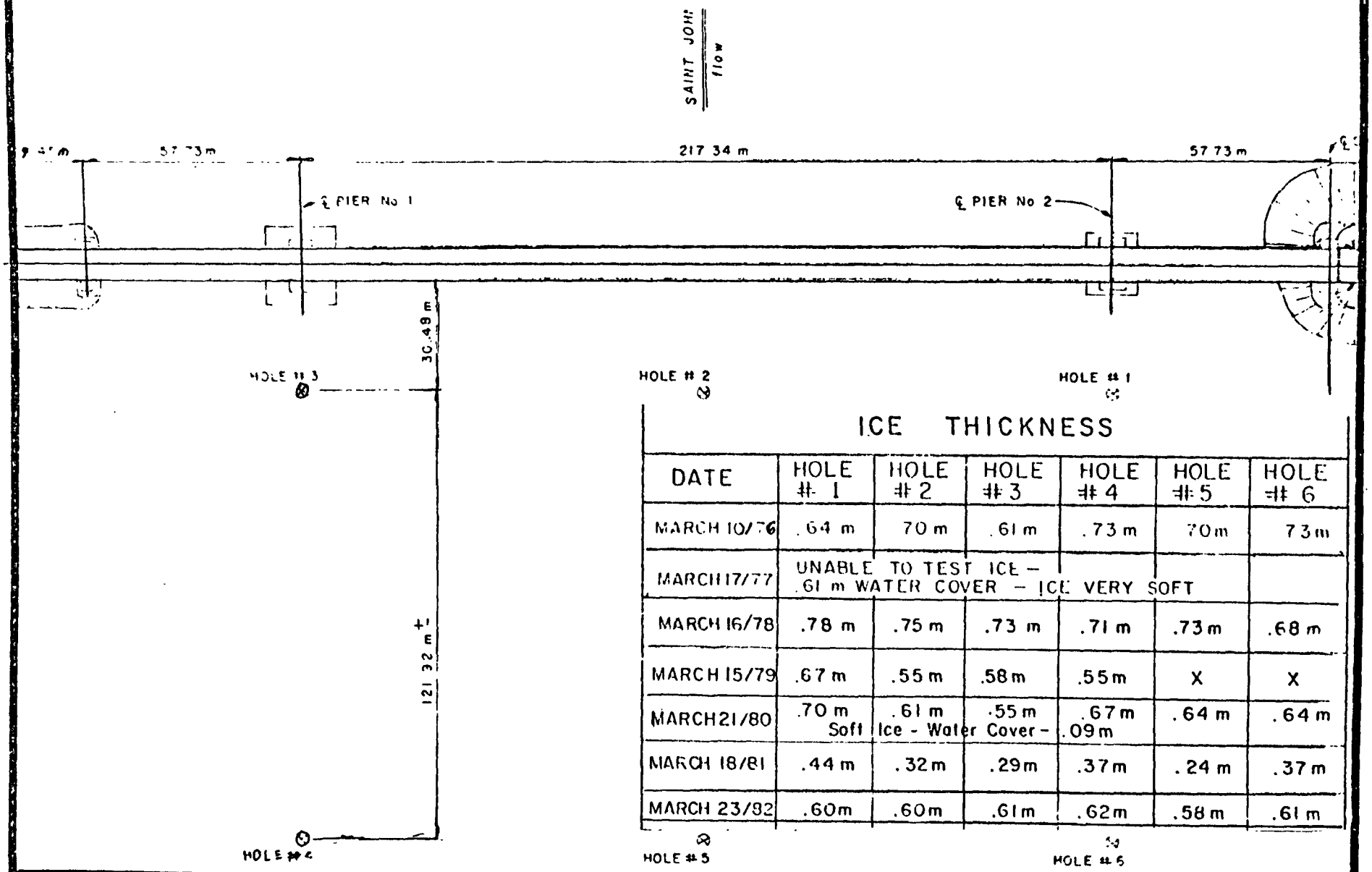
(LAYOUT OF TEST HOLES ICE THICKNESS)



DATE	HOLE #1	HOLE #2	HOLE #3	HOLE #4	HOLE #5	HOLE #6	HOLE #7	HOLE #8	HOLE #9	HOLE #10	HOLE #11	HOLE #12
MARCH 23/76	89 m	96 m	31 m	94m	91 m	.91 m	96 m	99 m	1 0 m	88 m	91 m	85 m
MARCH 5/77	1 1 m	94 m	1 0 m	1 0 m	91m	94 m	91m	85 m	88 m	85 m	88 m	91 m
MARCH 8/78	.66 m	67 m	.69 m	79 m	81 m	73 m	.65 m	71 m	.67 m	71 m	.72 m	71 m
MARCH 8/79	64 m	79m	82 m	98 m	94 m	91m	98 m	94 m	85m	73m	79m	73m
MARCH 13/80	.46 m Snow Cover - 40m	55 m	.58m	.70m	.85 m	.88 m	.98 m	.91 m	.70 m	.79 m	.61m	52 m
MARCH 8/81	99 m	93 m	92 m	64 m	70m	.67 m	67 m	67m	.61 m	73 m	64 m	61 m
MARCH 16/82	99m	83m	.89 m	92m	98m	.77 m	93m	1 00m	.77m	70m	72 m	.61 m

Map 7.10 Northwest Miramichi River Bridge #2 Ice Measurement Sites (DOT)

PLAN OF THE HAWKSHAW BRIDGE
(ICE THICKNESS SURVEY - TEST HOLE LOCATIONS)



ICE THICKNESS

DATE	HOLE #1	HOLE #2	HOLE #3	HOLE #4	HOLE #5	HOLE #6
MARCH 10/76	.64 m	70 m	.61 m	.73 m	70m	73m
MARCH 17/77	UNABLE TO TEST ICE – .61 m WATER COVER – ICE VERY SOFT					
MARCH 16/78	.78 m	.75 m	.73 m	.71 m	.73m	.68 m
MARCH 15/79	.67 m	.55 m	.58m	.55m	X	X
MARCH 21/80	.70 m Soft	.61 m Ice - Water Cover -	.55 m	.67 m .09m	.64 m	.64 m
MARCH 18/81	.44 m	.32m	.29m	.37m	.24 m	.37 m
MARCH 23/82	.60m	.60m	.61m	.62m	.58 m	.61 m

Map 7.11 Hawkshaw Bridge Ice Measurement Sites (DOT)

CHAPTER 8

CONCLUDING REMARKS

The Saint John River Forecast Centre plays an important role as a central depository for ice-related information. However, analysis of the available solid ice thickness measurements are difficult due to the fact that there is limited ice data.

The following recommendations are made for general consideration only:

1. All ice measurements should follow a regular and standardized schedule.
2. The number of ice sampling sites should be increased so as to eventually allow for a full and detailed analysis of solid ice thickness of New Brunswick's rivers.
3. A central data base should be established for all available solid ice thickness measurements.
4. The measurement of ice strength should be considered.
5. Photographs of the sampling sites should be taken during low open water conditions showing any man-made or natural obstructions.
6. Ice thickness measurements should be correlated with cumulative degree-days of freezing.

APPENDIX A

AVERAGE SOLID ICE THICKNESS

ON NEW BRUNSWICK RIVERS

APPENDIX

AVERAGE SOLID ICE THICKNESS

(WATERCOURSES ALPHABETICALLY LISTED)

LOCATION	YEAR	AVERAGE OF READINGS (m)
Back Creek at Blissville	Jan 25/83	0.39
	Feb 19/79	0.60
	Feb 26/79	0.43
Bartibog River at Bridge #1	Mar 16/82	0.84
	Mar 13/80	0.61
	Mar 7/79	0.64
	Mar 8/78	0.81
	Mar 8/77	0.69
	Mar 22/76	0.82
Becaquimec Stream at Coldstream (No. 01AJ010)	Feb 15/84	0.39
	Mar 13/84	0.46
	Jan 10/83	0.31
	Mar 7/83	0.36
	Jan 10/83	0.32
	Jan 21/80	0.33
	Jan 28/80	0.44
	Feb 21/80	0.48
	Jan 23/79	0.24
	Jan 30/79	0.27
	Feb 19/79	0.31
	Feb 28/79	0.46
Big Presque Isle Stream at Tracey Mills (No. 01AJ004)	Jan 14/85	0.35
	Jan 28/85	0.35
	Feb 11/85	0.48
	Feb 25/85	0.43
	Mar 11/85	0.50
	Mar 18/85	0.54
	Jan 16/84	0.30
	Feb 2/84	0.41
	Feb 13/84	0.49
	Feb 27/84	0.33
	Mar 12/84	0.32
	Feb 24/83	0.20
	Jan 11/82	0.40
	Feb 10/82	0.60
	Jan 30/79	0.49
	Feb 28/79	0.41
	Mar 14/79	0.70

LOCATION	YEAR	AVERAGE OF READINGS (m)
Canaan River at East Canaan (No. 01AP002)	Jan 7/85	0.27
	Jan 28/85	0.38
	Feb 25/85	0.47
	Mar 18/85	0.46
	Jan 16/84	0.41
	Feb 13/84	0.49
	Feb 25/83	0.38
	Jan 6/83	0.26
	Jan 28/83	0.24
	Jan 26/82	0.37
	Feb 11/82	0.49
	Mar 13/82	0.52
	Jan 11/80	0.21
	Feb 14/80	0.39
	Mar 7/80	0.43
Canaan River at Canaan Forks	Jan 6/81	0.48
	Jan 23/81	0.47
	Jan 27/81	0.46
Eel River at Scott Siding (No. 01BJ004)	Jan 9/85	0.27
	Feb 14/85	0.49
	Feb 17/84	0.49
	Mar 12/84	0.53
	Mar 1/83	0.39
	Mar 2/82	0.55
	Jan 12/81	0.40
	Jan 21/80	0.51
	Jan 31/79	0.68
	Mar 1/79	0.70
	Dec 15/78	0.19
Grand River at Violette Bridge (No. 01AF007)	Jan 14/85	0.35
	Jan 28/85	0.37
	Feb 11/85	0.38
	Feb 25/85	0.50
	Mar 12/85	0.51
	Mar 19/85	0.58
	Feb 13/84	0.64
	Feb 27/84	0.60
	Mar 28/84	0.51
	Apr 16/84	0.71
	Jan 12/83	0.44
	Jan 24/83	0.42
	Feb 8/83	0.54
	Feb 21/83	0.36
	Mar 8/83	0.63
	Jan 13/82	0.31
	Jan 16/81	0.35

LOCATION	YEAR	AVERAGE OF READINGS (m)
Grand River at Violette Bridge (No. 01AF007) Continued:-	Jan 28/81	0.42
	Jan 29/80	0.53
	Jan 2/79	0.20
	Jan 16/79	0.30
	Feb 13/79	0.36
	Feb 27/79	0.39
	Mar 13/79	0.45
Green River near Riviere-Verte (No. 01AF003)	Jan 28/85	0.51
	Feb 12/85	0.55
	Feb 26/85	0.65
	Mar 12/85	0.82
	Mar 18/85	0.62
	Apr 2/85	0.75
	Jan 16/84	0.32
	Feb 14/84	0.75
	Mar 26/84	0.61
	Apr 16/84	0.54
	Jan 25/83	0.36
	Feb 8/83	0.75
	Mar 15/83	0.80
	Jan 14/82	0.34
	Feb 8/82	0.60
	Jan 16/81	0.39
	Mar 31/80	0.86
	Jan 2/79	0.32
	Jan 29/79	0.60
	Feb 27/79	0.53
	Mar 13/79	0.35
Kennebecasis River at Apohaqui (No. 01AP004)	Jan 9/85	0.31
	Jan 30/85	0.40
	Jan 18/84	0.31
	Jan 26/83	0.17
	Feb 23/83	0.23
	Jan 6/81	0.54
	Jan 27/81	0.53
	Feb 12/80	0.37
Kennebecasis River at Plumweseep	Jan 23/81	0.51
	Jan 27/81	0.49
Kennebecasis River at Roachville	Jan 23/81	0.54
	Jan 27/81	0.42
Kennebecasis River at Salmon River Bridge	Jan 23/81	0.57
	Jan 27/81	0.56
Limestone River at Four Falls (No. 01AG002)	Jan 14/81	0.27
	Jan 28/81	0.39

LOCATION	YEAR	AVERAGE OF READINGS (m)
Madawaska River at Bridge #4	Mar 22/82	0.63
	Mar 17/81	River Open
	Mar 20/80	0.79
	Mar 13/79	0.60
	Mar 14/78	0.30
	Mar 10/77	0.60
	Mar 11/76	0.63
Madawaska River at Bridge #5	Mar 22/82	0.71
	Mar 17/81	River Open
	Mar 20/80	0.63
	Mar 13/79	0.78
	Mar /78	River Open
	Mar /77	0.67
	Mar /76	0.66
Meduxnekeag River near Belleville (No. 01AJ003)	Jan 8/85	0.29
	Feb 13/85	0.42
	Mar 11/85	0.47
	Jan 19/84	0.51
	Feb 13/84	0.64
	Mar 12/84	1.09
	Mar 29/84	0.74
	Jan 10/83	0.27
	Feb 10/82	0.60
	Jan 14/81	0.36
	Feb 1/80	0.53
	Jan 18/79	0.38
	Jan 30/79	0.47
	Feb 15/79	0.50
	Mar 1/79	0.59
Meduxnekeag River at Centennial Park	Jan 19/81	0.61
	Jan 26/81	0.55
	Feb 8/81	0.60
	Mar 11/81	0.43
	Feb 1/80	0.43
Nashwaak River at Cross Section #1	Jan 10/81	0.38
	Jan 20/81	0.36
Nashwaak River at Cross Section #2	Jan 10/81	0.36
	Jan 20/81	0.36
Nashwaak River at Cross Section #3	Jan 10/81	0.29
	Jan 20/81	0.30

LOCATION	YEAR	AVERAGE OF READINGS (m)
Nashwaak River at Cross Section #5	Jan 28/83	0.24
	Feb 11/83	0.32
	Feb 18/83	0.37
	Feb 25/83	0.38
	Mar 18/83	0.37
	Jan 29/82	0.48
	Feb 12/82	0.55
	Mar 12/82	0.59
	Mar 26/82	0.55
	Jan 8/81	0.36
	Jan 10/81	0.43
	Jan 15/81	0.37
	Jan 20/81	0.41
	Jan 28/81	0.43
	Feb 4/81	Unsafe
Nashwaak River at Cross Section #6	Jan 11/85	0.28
	Jan 18/85	0.30
	Jan 25/85	0.28
	Feb 1/85	0.34
	Feb 8/85	0.42
	Feb 22/85	0.45
	Mar 1/85	0.42
	Mar 8/85	0.54
	Feb 3/84	0.37
	Feb 10/84	0.51
	Jan 28/83	0.24
	Feb 11/83	0.35
	Feb 18/83	0.38
	Feb 25/83	0.42
	Mar 18/83	0.39
	Jan 29/82	0.39
	Feb 12/82	0.58
	Mar 12/82	0.65
	Mar 26/82	Unsafe
	Jan 8/81	0.30
	Jan 10/81	0.44
	Jan 14/81	0.38
	Jan 15/81	0.33
	Jan 20/81	0.44
	Jan 21/81	0.40
	Feb 4/81	Unsafe
Nashwaak River at Cross Section #7	Jan 28/83	0.24
	Jan 10/81	0.40
	Jan 15/81	0.27
	Jan 20/81	0.39
	Feb 4/81	Unsafe

LOCATION	YEAR	AVERAGE OF READINGS (m)
Nashwaak River at Cross Section #8	Jan 11/85	0.31
	Jan 18/85	0.45
	Jan 25/85	0.47
	Feb 1/85	0.40
	Feb 8/85	0.41
	Feb 22/85	0.53
	Mar 1/85	0.50
	Mar 8/85	0.54
	Feb 3/84	0.46
	Feb 10/84	0.54
	Jan 28/83	0.24
	Feb 11/83	0.37
	Feb 18/83	0.41
	Feb 25/83	0.48
	Mar 12/82	0.71
	Jan 29/82	0.42
	Feb 12/82	0.59
	Jan 8/81	0.29
	Jan 15/81	0.28
	Jan 20/81	0.33
	Jan 28/81	0.36
	Feb 4/81	1.76
Nashwaak River at Cross Section #9	Jan 10/81	0.32
	Jan 15/81	0.28
	Jan 28/81	0.46
	Feb 3/81	Unsafe
Nashwaak River at Cross Section #10	Jan 15/81	0.47
	Jan 28/81	0.49
	Feb 4/81	Unsafe
Nashwaak River at Cross Section #11	Jan 20/81	0.32
	Feb 4/81	Unsafe
Nashwaak River at Cross Section #12	Jan 14/81	0.28
	Jan 20/81	0.34
	Jan 21/81	0.38
	Jan 28/81	0.39
	Feb 4/81	Unsafe
Nashwaak River at Durham Bridge (No. 01AL002)	Jan 18/85	0.34
	Feb 1/85	0.35
	Feb 18/85	0.55
	Mar 29/85	0.59
	Jan 5/84	0.29
	Jan 20/84	0.38
	Feb 3/84	0.45

LOCATION	YEAR	AVERAGE OF READINGS (m)
Nashwaak River at Durham Bridge Continued:-	Feb 17/84	0.41
	Mar 21/84	0.49
	Mar 26/84	0.50
	Mar 30/84	0.53
	Feb 15/82	0.39
	Jan 15/81	0.39
	Jan 15/80	0.28
	Mar 13/80	0.54
	Jan 17/79	0.27
	Feb 8/79	0.40
	Feb 20/79	0.62
	Feb 28/79	0.65
	Mar 12/79	0.59
	Mar 23/79	0.54
Nashwaak River at McLaggan Bridge	Jan 7/81	0.41
	Jan 14/81	0.46
	Jan 21/81	0.36
	Jan 28/81	0.34
	Feb 4/81	Unsafe
Nashwaak River at Nashwaak Bridge	Jan 7/81	0.38
	Jan 14/81	0.36
	Jan 21/81	0.49
	Jan 28/81	0.49
	Feb 4/81	Unsafe
Nashwaak River at Penniac	Jan 21/81	0.40
	Jan 28/81	0.47
	Feb 4/81	Unsafe
Nashwaak River at Stanley	Feb 3/82	0.61
	Mar 3/82	0.50
	Jan 7/81	0.33
	Jan 14/81	0.41
	Jan 21/81	0.53
	Jan 28/81	0.38
	Feb 4/81	1.01
Nashwaak River at Taymouth	Jan 7/81	0.41
	Jan 14/81	0.38
	Jan 21/81	0.39
	Jan 28/81	0.48
	Feb 4/81	Unsafe
	Mar 1/79	0.68

LOCATION	YEAR	AVERAGE OF READINGS (m)
Northwest Miramichi River at Bridge #2	Mar 16/82	0.85
	Mar 10/81	0.58
	Mar 13/80	0.71
	Mar 8/79	0.84
	Mar 8/78	0.71
	Mar 8/77	0.93
	Mar 23/76	0.91
Northwest Oromocto River at Tracy (No. 01AM001)	Jan 11/85	0.29
	Feb 5/85	0.40
	Mar 11/85	0.43
	Mar 22/85	0.48
	Jan 16/84	0.41
	Mar 15/84	0.55
	Mar 28/84	0.57
	Jan 7/83	0.12
	Jan 24/83	0.32
	Feb 21/83	0.34
	Mar 14/83	0.39
	Feb 6/81	0.45
	Feb 19/81	0.48
	Feb 19/79	0.55
	Feb 26/79	0.50
Oromocto River at French Lake	Feb 6/81	0.45
	Feb 19/79	0.58
Petitcodiac River near Petitcodiac (No. 01BU002)	Jan 7/85	0.23
	Jan 28/85	0.36
	Mar 8/85	0.47
	Mar 18/85	0.46
	Jan 16/84	0.37
	Feb 13/84	0.40
	Mar 13/84	0.24
	Jan 4/83	Open
	Jan 27/83	0.18
	Feb 23/83	0.27
	Mar 17/83	0.55
	Jan 26/82	0.48
	Feb 11/82	0.55
	Mar 13/82	0.66
	Jan 15/81	0.52
	Jan 10/80	0.36
	Feb 14/80	0.57
	Mar 7/80	0.54

LOCATION	YEAR	AVERAGE OF READINGS (m)
Restigouche River at Bridge #3	Mar 18/83	0.56
	Mar 13/81	River Clear
	Mar 19/81	0.67
	Mar 9/79	Ice Ran
	Mar 10/78	0.54
	Mar 14/77	0.60
	Mar 19/76	0.74
Restigouche River below Kedgwick River (No. 01BC001)	Jan 7/85	0.34
	Feb 4/85	0.39
	Mar 4/85	0.57
	Mar 25/85	0.64
	Jan 10/84	0.38
	Feb 7/84	0.44
	Mar 5/84	0.45
	Apr 3/84	0.38
	Jan 10/83	0.34
	Feb 7/83	0.55
	Mar 14/83	0.62
	Feb 2/82	0.55
	Mar 8/82	0.70
	Feb 2/81	0.43
Restigouche River at Rafting Ground Brook (No. 01BJ007)		0.37
	Feb 5/85	0.57
	Mar 5/85	0.62
	Mar 26/85	0.77
	Jan 10/84	0.38
	Feb 7/84	0.59
	Mar 6/84	0.68
	Apr 3/84	0.87
	Jan 10/83	0.48
	Feb 8/83	0.63
	Mar 15/83	0.75
	Feb 2/82	0.43
	Mar 9/82	0.49
Saint John River at Aroostook Junction	Feb 20/85	0.41
	Feb 23/84	0.54
	Feb 18/83	Open Channel
	Feb 1/80	0.62
Saint John River at Baker Ferry	Feb 20/85	0.37
	Feb 23/84	0.49
	Feb 18/83	0.43
	Feb 1/80	0.64

LOCATION	YEAR	AVERAGE OF READINGS (m)
Saint John River at Beechwood	Feb 20/85	0.41
	Feb 23/85	0.56
	Feb 18/83	0.48
	Feb 1/80	0.53
	Mar 16/79	0.68
	Feb 3/69	0.47
	Feb 8/63	0.61
Saint John River at Brooks Ferry	Feb 20/85	Unsafe
	Feb 23/83	Open
	Feb 17/83	Open Channel
	Feb 1/80	0.63
Saint John River at Bull's Creek	Jan 19/81	0.47
	Jan 26/81	0.57
	Feb 9/81	0.56
Saint John River at Christie Crossing	Feb 20/85	0.41
	Feb 23/84	0.53
	Feb 18/83	0.63
	Feb 1/80	0.63
	Mar 16/79	0.68
	Feb 3/69	0.38
	Feb 8/62	0.35
Saint John River at Cyr Junction	Feb 15/85	0.38
	Feb 21/84	0.58
	Feb 15/83	0.55
	Mar 8/82	0.51
	Jan 31/80	0.51
	Feb 23/79	0.69
	Feb 7/69	0.48
	Feb 23/62	0.84
Saint John River at Edmundston (No. 01AD004)	Jan 16/79	0.41
	Feb 13/79	0.46
Saint John River at Fort Kent (No. 01AD002)	Jan 29/85	0.17
	Feb 12/85	0.39
	Feb 26/85	0.51
	Mar 12/85	0.52
	Jan 17/84	0.30

LOCATION	YEAR	AVERAGE OF READINGS (m)
Saint John River at Fort Kent (No. 01AD002) Continued:-	Feb 28/84	0.41
	Mar8/83	0.51
	Jan 28/82	0.47
	Jan 31/80	0.46
	Feb 28/80	0.56
Saint John River at Gibson Mill Stream	Jan 29/85	0.39
	Mar 1/85	0.53
	Mar 15/85	0.55
	Feb 2/84	0.33
	Jan 31/83	0.28
	Mar 7/83	0.61
	Mar 16/82	0.61
Saint John River at Grafton	Mar 7/83	0.61
Saint John River at Grand Falls	Feb 15/85	0.51
	Feb 21/84	0.49
	Feb 15/83	0.49
	Mar 9/82	0.55
	Jan 31/80	0.48
	Feb 23/79	0.62
	Feb 23/62	0.66
Saint John River at Hawkshaw Bridge	Mar 23/82	0.60
	Mar 18/81	0.34
	Mar 21/80	0.63
	Mar 15/79	0.58
	Mar 16/78	0.73
	Mar 17/77	Ice Unsafe
	Mar 10/76	0.70
Saint John River at Inman Crossing	Feb 20/85	0.43
	Feb 23/84	0.54
	Feb 18/83	0.41
	Feb 1/80	0.55
	Mar 16/79	0.48
	Feb 3/69	0.39
	Feb 8/62	0.53
Saint John River at International Bridge (St. Leonard)	Mar 19/82	0.83
	Mar 17/81	Ice Jammed
	Mar 20/80	0.69
	Mar 13/79	0.63
	Mar 15/78	0.62
	Mar 16/77	0.67
	Mar 15/76	0.77

LOCATION	YEAR	AVERAGE OF READINGS (m)
Saint John River at Longs Creek	Jan 29/85	0.46
	Mar 1/85	0.61
	Mar 15/85	0.58
	Feb 2/84	0.48
	Jan 13/83	0.34
	Mar 7/83	0.53
	Feb 16/82	0.78
	Feb 8/79	0.49
	Mar 19/79	0.55
Saint John River at Lynch	Feb 15/85	0.46
	Feb 21/84	0.56
	Feb 15/83	0.67
	Mar 9/82	0.69
	Jan 31/81	0.56
	Feb 23/79	0.75
	Feb 7/69	0.43
	Feb 23/62	0.84
Saint John River at Martin	Feb 15/85	0.39
	Feb 21/84	0.57
	Feb 15/83	0.53
	Mar 9/82	0.55
	Jan 31/81	0.55
	Feb 23/79	0.68
	Feb 23/62	0.78
Saint John River at Meduxnekeag	Jan 29/85	0.30
	Mar 1/85	0.49
	Mar 15/85	0.49
	Feb 2/84	0.48
	Jan 31/83	0.55
	Mar 7/83	0.59
	Mar 16/82	0.61
	Feb 8/79	0.39
	Mar 19/79	0.40
Saint John at Meduxnekeag Gauge	Jan 29/85	0.29
	Mar 1/85	0.43
	Mar 15/85	0.36
	Feb 2/84	0.48
	Jan 31/84	0.51
	Mar 7/83	0.58
	Mar 16/83	0.61
	Feb 8/79	0.43
	Mar 19/79	0.34

LOCATION	YEAR	AVERAGE OF READINGS (m)
Saint John River at Mile 1	Feb 20/85	0.34
	Feb 23/84	0.48
	Feb 18/83	0.66
	Feb 1/80	0.36
	Mar 16/79	0.38
	Feb 3/69	0.35
	Feb 8/62	0.46
Saint John River at Muniac	Feb 20/85	0.41
	Feb 23/84	0.48
	Feb 18/83	0.43
	Feb 1/80	0.55
	Mar 16/79	0.43
	Feb 3/69	0.41
	Feb 8/62	0.59
Saint John River at Newburg-Pine Island	Jan 29/85	0.31
	Mar 1/85	0.51
	Mar 15/85	0.53
	Jan 31/83	0.43
	Mar 7/83	0.58
	Mar 16/82	0.58
	Feb 8/79	0.39
	Mar 19/79	0.43
Saint John River at Orton-ville	Feb 20/85	0.61
	Feb 18/83	Open Channel
	Feb 1/80	0.49
Saint John River at Pokiok	Feb 2/84	0.43
	Jan 31/83	0.34
	Mar 7/83	0.47
Saint John River at Prince William	Jan 29/85	0.57
	Mar 1/85	0.51
	Mar 15/85	0.63
	Feb 2/84	0.43
	Jan 31/83	0.41
	Mar 7/83	0.58
	Mar 16/82	0.76
	Feb 8/79	0.46
	Mar 19/79	0.61

LOCATION	YEAR	AVERAGE OF READINGS (m)
Saint John River at Ste. Anne de Madawaska	Feb 15/85	0.35
	Feb 21/84	0.57
	Feb 15/83	0.66
	Mar 9/82	0.66
	Jan 31/80	0.50
	Feb 23/79	0.69
	Feb 7/69	0.35
	Feb 23/62	0.83
Saint John River at St. Basile	Feb 15/85	0.33
	Feb 15/83	0.58
	Mar 9/82	0.52
	Jan 31/80	0.56
	Feb 23/79	0.60
Saint John River at Woodstock	Jan 29/85	0.38
	Mar 1/85	0.53
	Mar 15/85	0.56
	Feb 2/84	0.41
	Jan 31/83	0.46
	Mar 7/83	0.61
	Mar 16/82	0.64
	Feb 1/81	0.59
	Feb 8/79	0.52
	Mar 19/79	0.61
Saint John River at Woodstock-Grafton Bridge	Mar 23/82	0.63
	Mar 18/81	0.43
	Mar 20/80	0.78
	Mar 15/79	Open
	Mar 16/78	0.68
	Mar 17/77	Ice Unsafe
	Mar 10/76	0.73
Southeast Oromocto River at Blissville	Jan 24/83	0.32
	Feb 6/81	0.49
	Feb 19/79	0.61
	Feb 26/79	0.56
	Mar 22/79	0.45
Southwest Miramichi River at Blackville (No. 01B0011)	Jan 11/85	0.33
	Feb 8/85	0.41
	Feb 27/85	0.51
	Mar 8/85	0.58
	Mar 29/85	0.40
	Jan 9/84	0.52
	Feb 13/84	0.84

LOCATION	YEAR	AVERAGE OF READINGS (m)
Southwest Miramichi River at Blackville (No. 01B0011) Continued:-	Mar 26/84	0.74
	Jan 3/83	Open Seam
	Feb 28/83	0.48
	Jan 11/82	0.35
	Feb 8/82	0.55
	Mar 8/82	0.65
	Jan 12/81	0.45
	Feb 9/81	0.45
Southwest Miramichi River at Bridge #2	Mar 5/82	0.66
	Mar 9/81	Unsafe
	Mar 11/80	0.69
	Mar 6/79	0.78
	Mar 7/78	Open
	Mar 11/77	0.57
	Mar 24/76	0.75
Southwest Miramichi River at Bridge #4	Mar 15/82	0.82
	Mar 9/81	Unsafe
	Mar 11/80	0.82
	Mar 6/79	0.84
	Mar 7/78	0.71
	Mar 11/77	0.71
Tobique River at Arthurette	Feb 19/85	0.54
	Feb 22/84	0.52
	Feb 18/83	0.66
	Feb 24/83	0.57
	Feb 6/80	0.69
	Feb 21/79	0.48
	Feb 14/62	0.80
Tobique River at Dionne's	Feb 19/85	0.47
	Feb 22/84	0.61
	Feb 18/83	0.56
	Feb 24/82	0.69
	Feb 6/80	0.61
	Feb 21/79	0.56
Tobique River at Everette	Feb 19/85	0.60
	Feb 18/83	Open
	Feb 24/82	0.69
	Feb 6/80	0.57

LOCATION	YEAR	AVERAGE OF READINGS (m)
Tobique River at Grand Falls Highway	Feb 19/85	0.51
	Feb 22/84	0.53
	Feb 18/83	0.65
	Feb 24/82	0.51
	Feb 6/80	0.47
	Feb 21/79	0.47
	Feb 5/69	0.40
	Feb 14/62	0.59
Tobique River at Greer's	Feb 19/85	0.47
	Feb 22/84	0.49
	Feb 18/83	0.51
	Feb 24/82	0.62
	Feb 6/80	0.55
	Feb 21/79	0.47
	Feb 5/69	0.39
	Feb 14/62	0.72
Tobique River at Odell	Feb 19/85	0.86*
	Feb 22/84	0.61
	Feb 18/83	0.44
	Feb 24/82	0.62
	Feb 6/80	0.56
Tobique River at Plaster Rock (No. 01AH003)	Jan 30/85	0.41
	Apr 1/85	0.50
	Jan 11/84	0.39
	Feb 1/84	0.53
	Feb 29/84	0.61
	Mar 13/84	0.62
	Mar 28/84	0.68
	Feb 23/83	0.88
	Feb 9/82	0.40
	Jan 15/81	0.30
	Jan 30/79	0.48
	Feb 14/79	0.51
	Mar 13/79	0.70
Tobique River at Riley Brook	Feb 19/85	Open
	Feb 1/84	0.42
	Feb 22/84	Open
	Feb 18/83	Open
	Feb 24/82	0.51
	Feb 6/80	0.48
	Feb 21/79	0.44
	Feb 5/69	0.47
	Feb 14/62	0.79

* Slush under ice cover - old jam from freeze-up

LOCATION	YEAR	AVERAGE OF READINGS (m)
Tobique River at Rowena	Feb 19/85	0.44
	Feb 22/84	Open
	Feb 18/83	0.56
	Feb 24/82	0.51
	Feb 6/80	0.70
	Feb 21/79	0.68
	Feb 5/69	0.52
	Feb 14/62	0.71
Tobique River at Sisson Brook	Feb 19/85	0.49
	Feb 22/84	0.61
	Feb 18/83	0.48
	Feb 24/82	0.69
	Feb 6/80	0.72
	Feb 21/79	0.55
	Feb 5/69	0.43
	Feb 14/62	0.85
Tobique River at Tilley Road	Feb 19/85	0.48
	Feb 22/84	Open
	Feb 18/83	0.57
	Feb 24/82	0.62
	Feb 6/80	0.66
	Feb 21/79	0.63
	Feb 5/69	0.48
	Feb 14/62	0.76
Tobique River at Vincent Road	Feb 19/85	0.35
	Feb 22/85	0.55
	Feb 18/83	0.62
	Feb 24/82	0.48
	Feb 6/80	0.66
	Feb 5/69	0.46
	Feb 14/62	0.81
Trout Creek at Sussex Corner	Jan 23/81	0.10
	Jan 27/81	Ice Free
Trout Creek at Sussex	Jan 23/81	0.53
	Jan 27/81	0.52
Upsalquitch River at Bridge #1	Mar 18/83	0.66
	Mar 12/81	0.54
	Mar 19/80	0.42
	Mar 9/79	Ice Ran
	Mar 9/78	0.54
	Mar 14/77	Unsafe
	Mar 16/76	0.59

LOCATION	YEAR	AVERAGE OF READINGS (m)
Upsalquitch River at Upsalquitch (No. 01BE001)	Jan 17/81	0.25
	Jan 20/81	0.24
Walker Brook At Campbellton (No. 01BJ009)	Jan 9/85	0.16
	Feb 4/85	0.23
	Mar 5/85	0.26
	Mar 25/85	0.21
	Jan 10/84	0.16
	Mar 4/84	80% Open
	Jan 11/83	0.17
	Feb 8/83	0.27
	Jan 7/81	0.35
	Jan 10/81	0.36
	Jan 16/81	0.36
	Jan 30/81	0.35
	Feb 6/81	0.31
	Feb 13/81	0.36
Walker Brook at Sugarloaf Park	Jan 7/81	0.28
	Jan 10/81	0.28
	Jan 16/81	0.27
	Jan 30/81	0.24
	Feb 6/81	0.24
	Feb 13/81	0.27

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AVERAGE SOLID ICE THICKNESS OF NEW BRUNSWICK RIVERS : UPDATED TO THE END OF THE 1984-1985
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