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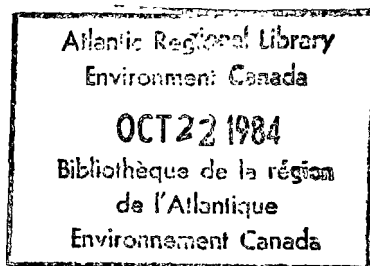
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ANALYSIS OF ACTIVE
HYDROMETRIC STATION NETWORKS
BASED ON DRAINAGE AREA

IWD-AR-WRB-84-62

by

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TABLE OF CONTENTS

	PAGE
List of Figures	(i)
List of Tables	(ii)
1. Introduction	1
2. Methodology	3
3. New Brunswick Network	4
4. Prince Edward Island Network	10
5. Nova Scotia Network	13
6. Newfoundland (Island only) Network	17
7. Newfoundland (Labrador) Network	21
8. Summary and Conclusions	25
9. Recommendations	39
10. References	44
11. Appendix A - List of Active Discharge Stations, 1983 - Maps of Present Hydrometric Network	
12. Appendix B - Maps of Areas Deficient in Network Coverage	

LIST OF FIGURES

	PAGE	
3.0	Distribution of New Brunswick Stations by Drainage Area, Monitored	9
4.0	Prince Edward Island Hydrometric Stations by Drainage Area	12
5.0	Nova Scotia Hydrometric Stations by Drainage Area Monitored	16
6.0	Newfoundland Hydrometric Stations by Drainage Area Monitored	20
7.0	Labrador Hydrometric Stations by Drainage Area Monitored	24
8.0	Comparison of Total Drainage Areas Gauged by Province	28
8.1	Comparison of Total Drainage Areas Gauged by Percent of Province	29
8.2	Percent of Stations in Each Drainage Area Category	30
A.1.a	Hydrometric Gauging Stations by Drainage Basin Size New Brunswick, Prince Edward Island and Nova Scotia (Categories 1 to 3)	
A.1.b	Hydrometric Gauging Stations by Drainage Basin Size New Brunswick, Prince Edward Island and Nova Scotia (Categories 4 and 5)	
A.2.a	Hydrometric Gauging Stations by Drainage Basin Size - Newfoundland (Categories 1 to 3)	
A.2.b	Hydrometric Gauging Stations by Drainage Basin Size - Newfoundland (Category 4)	
A.3	Hydrometric Gauging Stations by Drainage Basin Size - Labrador	
B.1.a	Hydrometric Gauging Stations by Drainage Basin - New Brunswick, Prince Edward Island and Nova Scotia Areas Deficient of Categories 1 to 3	
B.1.b	Hydrometric Gauging Stations by Drainage Basin - New Brunswick, Prince Edward Island and Nova Scotia Areas Deficient of Category 4	
B.2.a	Hydrometric Gauging Stations by Drainage Basin - Newfoundland - Areas Deficient of Categories 1 to 3.	
B.2.b	Hydrometric Gauging Stations by Drainage Basin - Newfoundland - Areas Deficient of Category 4	
B.3	Hydrometric Gauging Stations by Drainage Basin - Labrador - Areas Deficient of Category 4	

LIST OF TABLES

	PAGE
3.0 Active Discharge Stations in New Brunswick	7
4.0 Active Discharge Stations in Prince Edward Island	11
5.0 Active Discharge Stations in Nova Scotia	16
6.0 Active Discharge Stations in Newfoundland	19
7.0 Active Discharge Stations in Labrador	23
8.0 Summary of Drainage Area Distribution	26
8.1 Summary of Drainage Area Network Characteristics	27
8.2 Discharge Stations with Similar Size and Location in New Brunswick	34
8.3 Discharge Stations with Similar Size and Location in Prince Edward Island	35
8.4 Discharge Stations with Similar Size and Location in Nova Scotia	36
8.5 Discharge Stations with Similar Size and Location in Newfoundland	37
8.6 Discharge Stations with Similar Size and Location in Labrador	38
9.0 Summary of Recommendations	41
A.1 Active Discharge Stations	

1. INTRODUCTION

This report specifically addresses drainage area coverage monitored by hydrometric discharge stations as of October, 1983, and how this parameter may be used in the planning of the Atlantic Region hydrometric networks. The adequacy of existing networks is a function of their ability to provide information about the water resource to the planners and developers whose activities may have an impact on the resource.

To ensure that the networks can provide information on the runoff characteristics of each Province, the network should be designed to monitor a balance of relatively small, medium and large drainage areas available within each Province.

The premise of this report is that by analyzing the present network by the spatial distribution of monitored watersheds, deficiencies and redundancies of each network can be identified. This is not to say that the network should be designed solely on drainage area size, but rather that this is one parameter in the network planning process.

It is the intent of this report to make recommendations for the discontinuance of a station, i.e. areas where redundancies may occur, and also to identify what areas appear to be inadequately covered under the basin area distribution criteria. The need for a particular station must be identified in addition to its drainage area coverage value. A station of project status may have a much higher priority parameter than drainage area and thus should remain for the priority purpose. Factors that should be considered in this decision are:

- (1) The station priority, is it a long or short term project station, i.e. an IJC long term station. If it is a short term project, the station should be earmarked for discontinuation after a specified date.
- (2) Stations located on natural streams should be retained over those on regulated streams or for those streams for which data are contributed. The regulated and contributed stations are noted on the maps and the tables in Appendix A.
Where a regulated or contributed station has a high priority, the natural station should remain.
- (3) The third criteria for discontinuance of similar stations are the station's ability to provide the best quality data at the most reasonable cost. Facts such as the stability of the control and the maintenance record of the site should be taken into consideration.
- (4) The last criteria for discontinuance should be the length of record of the station. More data may not provide any new information in terms of regional parameters. However, if the station is necessary to show long term trends or cycles, it should be retained.

The spatial distribution of the watersheds is analysed and discussed in context within the Provinces of the Region. Since Atlantic Region network plans are performed on a provincial basis, the Region is divided into five (5) segments:

- New Brunswick
- Prince Edward Island
- Nova Scotia
- Newfoundland (Island only)
- Labrador

2. METHODOLOGY

The hydrometric stations for each segment were ordered by the magnitude of the drainage areas which they monitor. The approximate drainage areas were delineated on small scale maps for visual analysis as shown on Figures A.1.a, A.1.b, A.2.a, A.2.b and A.3 of the Appendix A. A list of all active discharge stations Table A.1 is also provided in Appendix A.

The ordered station drainage areas are plotted on a semi-log arithmetic plot for visual analysis. Stations with similar sized drainage areas and within a reasonable proximity of each other were selected for possible redundancy from the list and the maps. No distinction was made between natural, regulated or contributed stations at this point in the report. While there may be a desire to have redundant regulated and/or contributed stations where a natural stream of comparative size is available, without this comparison, these would not become evident.

Ultimately, the report will deal in generalities of small, medium and large basins. However, this is a very relative term when one considers the sizes of the provinces and their respective river basins. Since the sizes of the monitored drainage areas over the entire region ranges from .12 km² to 92,500 km², it was decided to categorize the range by the logarithms of the area as follows:

<u>Drainage Area Category</u>	<u>Drainage Area Range(km²)</u>		
1	0	-	10
2	10	-	100
3	100	-	1,000
4	1,000	-	10,000
5	10,000	-	100,000

For instance, in Prince Edward Island, a small station would be of Category 1, a medium station would be Category 2, and a large station would be Category 3. However, for New Brunswick, small would be Categories 1 and 2, medium would be Category 3 and large would be 4 and 5.

Statistical information, such as maximum, minimum, mean and median drainage areas were also calculated from each segment for comparison purposes.

There are a number of basins which are monitored by several gauging stations. Accumulation of their respective drainage areas distorts the view of the amount of the province gauged. To help clarify this, a primary gauging station has been defined such that it is the station furthest downstream in a basin, thus its area is only counted once in calculating the net area gauged.

While observations are made under each Province's heading, the summary and recommendations are brought together at the end of the report.

3. NEW BRUNSWICK NETWORK

The Province of New Brunswick is monitored by 91 hydrometric gauging stations. Of these, 71 stations are used to determine river discharge; however, two stations have indeterminable drainage areas and, though mentioned, they are not included in this analysis. The first station, Chamcook Stream at Little Chamcook Lake Outlet (01AR012), does not monitor the entire outflow of the lake at high lake levels due to an intermittent outflow at a second location; the

second station, Little South Branch Tomogonops River below B Pit (01BQ003) can be affected by inflows from deep underground pumping from the mine above the gauge location. The remaining 69 stations, if taken individually, monitor the runoff from areas totalling 178,369 km². This area is 2.4 times the area of the entire province, however 32 of these stations are upstream of at least one other station and the total area monitored by at least one station is 71,899 km². The areas monitored within, and therefore part of a more downstream gauged area, have been subtracted to produce a single monitored area.

The total area monitored is equivalent to 98% of the total (78,400 km²) area of the province, but approximately 30,000 km² of the area monitored is in the State of Maine and the Province of Quebec. This reduces the coverage to 57% of the area of the Province. The gauging station density is approximately one (1) per thousand km² of the total area of the Province, or of the total area monitored.

Table 3.0 is a listing of all active hydrometric discharge stations ordered by the size of the drainage area monitored. Figures A.1.a and A.1.b show the areal coverage and distribution of gauged watersheds according to the drainage area category. Figure 3.0 is a semi-logarithmic plot of the drainage area of all stations ordered by area.

By analysing the above, a number of observations can be made:

(1) The frequency of occurrence of the various categories are as follows:

<u>Category</u>	<u>No. of Stations</u>	<u>Percent of Total</u>	
1	3	4	
2	8	12	
3	33	48	
4	21	30	
5	<u>4</u>	<u>6</u>	
TOTAL	69	100	
Maximum	39,900 km²	Minimum	3.89 km²
Mean	2,585 km²	Median	484.0 km²

While the mean shows the average drainage area size monitored, the median being the drainage size at which 50% of the stations have a larger drainage area and consequently 50% have a smaller drainage area, gives an indication of the relative distribution of the drainage sizes.

It is interesting to note that:

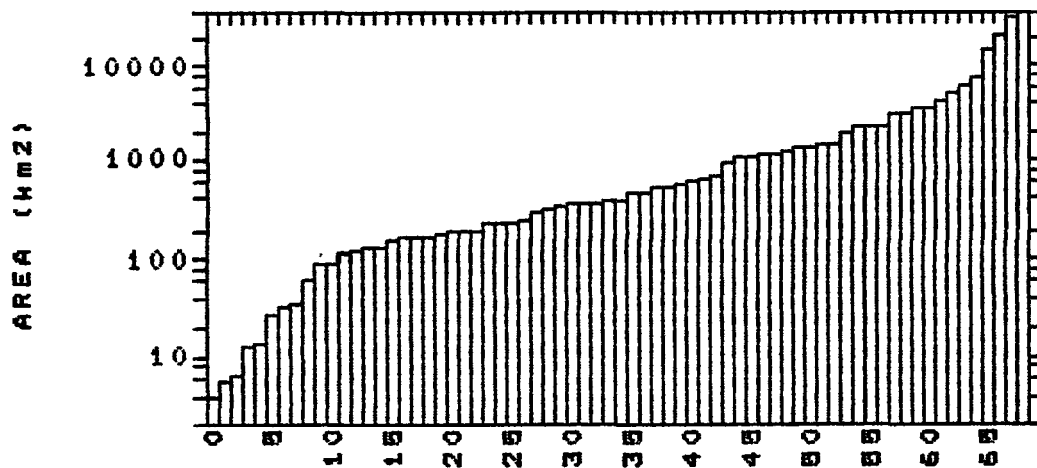
- (a) The number of stations from categories 1 and 2 (all stations monitoring drainage area which are less than 100 km²) is only 16%. Also, the four stations classified in Category 5 area are all on the Saint John River.
 - (b) The category with the greatest number of stations is number 3 (range 100 - 1,000km²) with 48% of the total.
- (2) Figure 3.0 shows that on a province wide basis, there is a good distribution of stations within Categories 3 and 4, and a deficiency of stations monitoring Category 1 and 2 drainage areas. From Figures A.1.a and A.1.b, it can be seen that the deficiency is specifically in the upper Saint John River Basin, the Fundy Shore and the North Shore.

TABLE 3.0 ACTIVE DISCHARGE STATIONS IN NEW BRUNSWICK

STA. NO.	D.A.	LAT.	LONG.	NAT REG	STATION NAME
01AR012	--	450926	0670546	X	CHAMCOOK STREAM AT LITTLE CHAMCOOK LAKE OUTLET
01BQ003	--	471728	0660234	X	LITTLE SOUTH BRANCH TOMOGONOPS RIVER BELOW B PIT
01AL004	3.89	461636	0670117	X	NARROWS MOUNTAIN BROOK NEAR NARROWS MOUNTAIN
01AK006	5.70	460458	0664404	X	NORTH NASHWAAKSIS STREAM AT SANDWITH'S FARM
01AL003	6.48	461756	0670213	X	HAYDEN BROOK NEAR NARROWS MOUNTAIN
01BK006	13.0	473334	0661642	X	FORTY MILE BROOK (WEST BRANCH) AT CARIBOU DEPOT
01BK005	14.2	473404	0661706	X	FORTY MILE BROOK AT CARIBOU DEPOT
01AK005	26.9	460206	0664205	X	NORTH NASHWAAKSIS STREAM NEAR ROYAL ROAD
01BU004	34.2	455314	0643059	X	PALMERS CREEK NEAR DORCHESTER
01AN001	34.4	461754	0654243	X	CASTAWAY BROOK NEAR CASTAWAY
01BJ009	60.8	475917	0664149	X	WALKER BROOK AT CAMPBELLTON
01BJ004	88.6	480052	0662618	X	EEL RIVER NEAR EEL RIVER CROSSING
01AO009	93.2	455724	0661841	X	BURPEE MILLSTREAM NEAR FERNMOUNT
01AR006	114	451235	0671545	X	DENNIS STREAM NEAR ST. STEPHEN
01BJ011	123	474424	0654347	X	NIGADOO RIVER NEAR ALCIDA
01BU003	129	455729	0645244	X	TURTLE CREEK AT TURTLE CREEK
01BV006	130	453332	0650102	X	POINT WOLFE RIVER AT FUNDY NATIONAL PARK
01AJ011	156	462032	0672809	X	COLD STREAM AT COLDSTREAM
01BS001	166	462637	0650355	X	COAL BRANCH RIVER AT BEERSVILLE
01BL002	173	474220	0650918	X	SOUTHWEST CARAQUET RIVER AT BURNSVILLE
01BL001	175	473900	0653440	X	BASS RIVER AT BASS RIVER
01BR001	177	464436	0651217	X	KOUCHIBOUGUAC RIVER NEAR VAUTOUR
01BJ010	190	473630	0654323	X	MIDDLE RIVER NEAR BATHURST
01AQ008	197	452505	0665313	X	PISKAHEGAN RIVER NEAR PLEASANT MOUNTAIN
01AG002	199	464942	0674435	X	LIMESTONE RIVER AT FOUR FALLS
01AH005	230	471503	0670832	X	MAMOZEKEL RIVER NEAR CAMPBELL RIVER
01AK001	234	455642	0671920	X	SHOGOMOC STREAM NEAR TRANS CANADA HIGHWAY
01AQ001	239	451012	0662800	X	LEPREAU RIVER AT LEPREAU
01AK007	240	460257	0671425	X	NACKAWIC RIVER NEAR TEMPERANCE VALE
01AP006	293	453008	0661914	X	NEREPIS RIVER NEAR FOWLERS CORNER
01BQ004	316	471127	0652351	X	BARTIBOG RIVER BELOW HIGHWAY NO. 8
01AF007	339	471446	0675516	X	GRAND RIVER AT VIOLETTE BRIDGE
01AJ010	350	462027	0672758	X	BECAGUIMEC STREAM AT COLDSTREAM
01AR011	357	453951	0674404	X	FOREST CITY STREAM BELOW FOREST CITY DAM
01BJ001	363	473921	0654137	X	TETAGOUCHE RIVER NEAR WEST BATHURST
01BL003	383	472606	0650625	X	TRACADIE RIVER AT MURCHY BRIDGE CROSSING
01BU002	391	455637	0651013	X	PETITCODIAC RIVER NEAR PETITCODIAC
01AJ004	484	462616	0674441	X	BIG PRESQUE ISLE STREAM AT TRACEY MILLS
01BQ003	484	465319	0653544	X	BARNABY RIVER BELOW SEMIWAGAN RIVER
01BJ003	510	475352	0660147	X	JACQUET RIVER NEAR DURHAM CENTRE
01AK008	531	455612	0673249	X	EEL RIVER NEAR SCOTT SIDING
01AM001	557	454025	0664058	X	NORTHWEST OROMOCTO RIVER AT TRACY
01BQ002	611	464917	0660653	X	RENOUS RIVER AT MCGRAW BROOK
01AL008	641	461659	0664415	X	NASHWAAK RIVER AT STANLEY
01AP002	668	460419	0652200	X	CANAAN RIVER AT EAST CANAAN
01BQ001	948	470541	0655014	X	NORTHWEST MIRAMICHI RIVER AT TROUT BROOK
01AN002	1050	461728	0654324	X	SALMON RIVER AT CASTAWAY
01AR004	1070	453410	0672545	X	ST. CROIX RIVER AT VANCEBORO
01AP004	1100	454207	0653605	X	KENNEBECASIS RIVER AT APOHAQUI
01AF003	1150	472006	0680806	X	GREEN RIVER NEAR RIVIERE-VERTE
01AJ003	1210	461258	0674342	X	MEDUXNEKEAG RIVER NEAR BELLEVILLE
01BP001	1340	465609	0655426	X	LITTLE SOUTHWEST MIRAMICHI RIVER AT LYTTLETON

TABLE 3.0(continued) ACTIVE DISCHARGE STATIONS IN NEW BRUNSWICK

STA.NO.	D.A.	LAT.	LONG.	NAT	REG	STATION NAME
01AD003	1360	471225	0685725	X		ST. FRANCIS RIVER AT OUTLET OF GLASIER LAKE
01AQ002	1420	451624	0664824		X	MAGAGUADAVIC RIVER AT ELMCROFT
01AL002	1450	460733	0663644	X		NASHWAAK RIVER AT DURHAM BRIDGE
01BK003	1840	472424	0654742		X	NEPISIGUIT RIVER AT NEPISIGUIT FALLS
01AH002	2230	471024	0671236		X	TOBIQUE RIVER AT RILEY BROOK
01AE001	2260	471414	0683456	X		FISH RIVER NEAR FORT KENT
01BE001	2270	474954	0665254	X		UPSALQUITCH RIVER AT UPSALQUITCH
01AH003	3130	465418	0672342		X	TOBIQUE RIVER AT PLASTER ROCK
01BC001	3160	474000	0672903	X		RESTIGOUCHE RIVER BELOW KEDGWICK RIVER
01AR003	3410	451555	0672835		X	ST. CROIX RIVER NEAR BAILEYVILLE
01AR005	3560	450812	0671905		X	ST. CROIX RIVER AT BARING
01AH004	4330	464730	0674100		X	TOBIQUE RIVER AT NARROWS
01B0001	5050	464410	0654936	X		SOUTHWEST MIRAMICHI RIVER AT BLACKVILLE
01AG003	6060	464852	0674516		X	AROOSTOOK RIVER NEAR TINKER
01BJ007	7740	475429	0665651	X		RESTIGOUCHE RIVER ABOVE RAFTING GROUND BROOK
01AD002	14700	471525	0683535	X		SAINT JOHN RIVER AT FORT KENT
01AF002	21900	470224	0674430		X	SAINT JOHN RIVER AT GRAND FALLS
01AJ001	34200	462812	0673523		X	SAINT JOHN RIVER NEAR EAST FLORENCEVILLE
01AK004	39900	455744	0664951		X	SAINT JOHN RIVER BELOW MACTAQUAC



NUMBER OF STATIONS
 ORDER BY SIZE
 NEW BRUNSWICK HYDROMETRIC STATIONS BY DRAINAGE AREA MONITORED

FIGURE 3.0

The areal coverage and distribution of gauged watersheds according to drainage area size is portrayed in Figures A.1.a and A.1.b. It is readily evident from these figures that the Saint John River Basin is highly monitored, with 19 discharge stations above Fredericton and 15 stations between Fredericton and the mouth. The lower Saint John River Basin is only monitored at tributary streams where the effect of tidal or flood backwater in the lower Saint John will not affect the stage-discharge relationship.

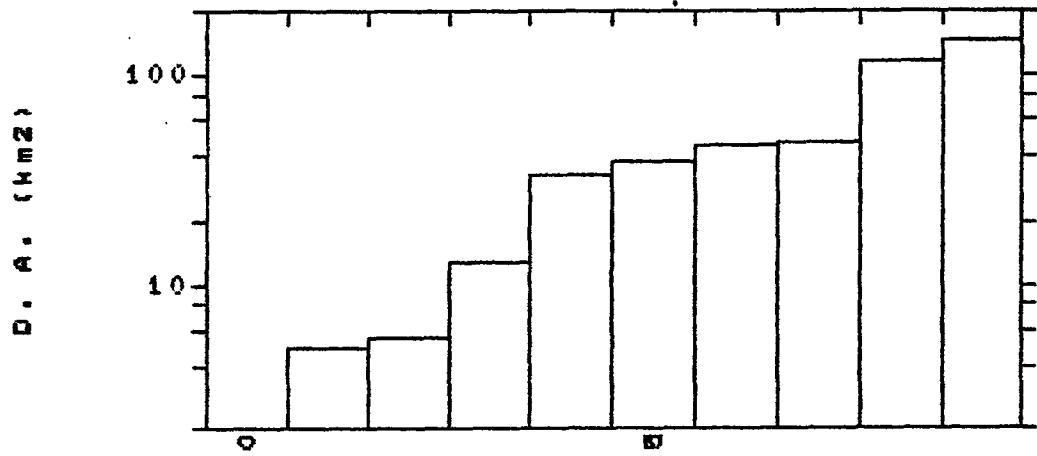
4. PRINCE EDWARD ISLAND NETWORK

The Province is presently monitored by 9 hydrometric discharge stations which, in total, monitor an area of 449.21 km². Only one station (01CB006 - Emerald Brook near Emerald) is upstream of another station, which brings the total area monitored to 443.62 km², or 8% of the total (5,657 km²) area of the Province. The gauging station density is 1.6 stations per 1,000 km² of the total area of the Province, and 20 per 1,000 km² of the total area monitored, which reflects the relatively small size of the drainage areas.

Table 4.0 is a listing of all active hydrometric discharge stations ordered by size of the drainage area monitored. Figure A.1.a shows the areal coverage and distribution of gauged watersheds according to drainage area category. Figure 4.0 is a semi-logarithmic plot of the drainage area of all stations ordered by area. In analysing these data, the following observations are noted:

TABLE 4.0 ACTIVE DISCHARGE STATIONS IN PRINCE EDWARD ISLAND

STA.NO.	D.A.	LAT.	LONG.	NAT REG	STATION NAME
01CC003	4.92	461854	0630848	X	WINTER RIVER AT BRACKLEY WELLS PUMPING STATION
01CB006	5.59	462134	0633329	X	EMERALD BROOK NEAR EMERALD
01CB005	12.9	462049	0633758	X	NORTH BROOK NEAR WALL ROAD
01CE004	33.1	461207	0623923	X	BRUDENELL RIVER AT BRUDENELL
01CC002	37.5	461956	0630353	X	WINTER RIVER NEAR SUFFOLK
01CB004	45.4	462335	0633935	X	WILMOT RIVER NEAR WILMOT VALLEY
01CA003	46.8	464439	0641108	X	CARRUTHERS BROOK NEAR ST. ANTHONY
01CB002	114	462045	0633803	X	DUNK RIVER AT WALL ROAD
01CD003	147	462140	0624202	X	MORELL RIVER AT BANGOR



NUMBER OF STATIONS
 ORDER BY SIZE
 P.E.I. HYDROMETRIC STATIONS BY DRAINAGE AREA MONITORED

Figure 4.0

(1) The frequencies of occurrence of the various categories are as follows:

<u>Category</u>	<u>No. of Stations</u>	<u>Percent of Total</u>
1	2	22
2	5	56
3	<u>2</u>	<u>22</u>
TOTAL	9	100

Maximum	147.0 km ²	Minimum	4.92 km ²
Mean	44.9 km ²	Median	37.50 km ²

(2) From Table 3.0 and Figures A.1.a, A.1.b and 4.0, one can note that on a provincial basis, there appears to be a good distribution of drainage sizes. There appears to be a cluster of stations on or near the Dunk River Basin near Summerside, however, the size distribution appears normal.

5. NOVA SCOTIA NETWORK

The province is presently monitored by 52 hydrometric gauging stations, all but one are used for measuring discharge. These individually monitor a total area of 13,191.4 km². Fourteen stations are located above at least one other station, which brings the total area monitored to 12,132.11 km² or 22% of the total (55,000 km²) area of the Province. The gauging station density is .9 stations per 1,000 km² of the total area of the Province, or 4.2 stations per 1,000 km² of the total area monitored.

Table 5.0 is a listing of all active hydrometric discharge stations ordered by size of the drainage area monitored. Figures A.1.a and A.1.b show the areal coverage and distribution of the watersheds according to drainage area category. Figure 5.0 is a semi-logarithmic plot of the drainage area of all stations ordered by area.

In analysing these data, the following observations are noted:

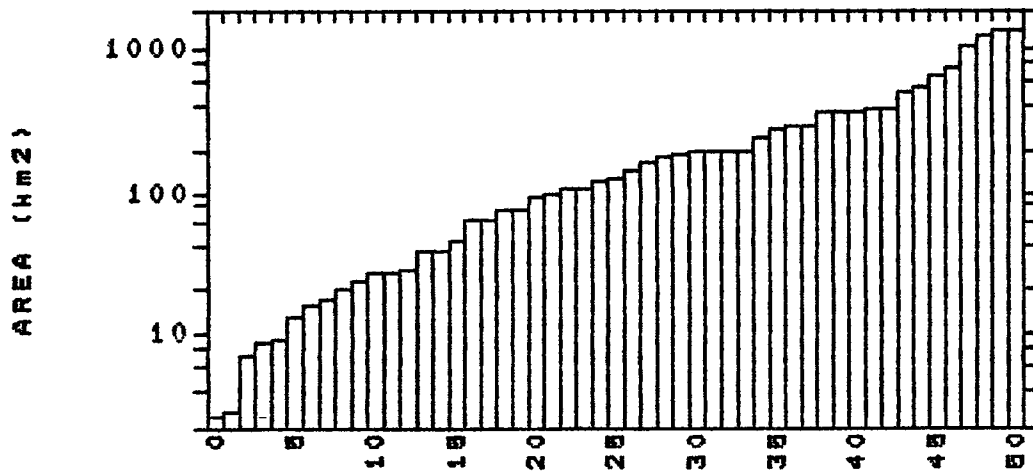
- (1) The frequency of occurrence of the various categories are as follows:

<u>Category</u>	<u>No. of Stations</u>	<u>Percent of Total</u>
1	5	10
2	17	33
3	25	49
4	<u>4</u>	<u>8</u>
TOTAL	51	100
Maximum	1,390 km ²	Minimum 2.58 km ²
Mean	259 km ²	Median 125.00 km ²

- (2) From Table 5.0 and Figures A.1.a and A.1.b, it is noted that, on a provincial basis, there appears to be an even distribution of drainage sizes, however, there also appears to be clusters of Categories 2 and 3 stations in the upper Shubenacadie Basin, the upper Mersey Basin and the the upper Medway Basin.

TABLE 5.0 ACTIVE DISCHARGE STATIONS IN NOVA SCOTIA

STA. NO.	D.A.	LAT.	LONG.	NAT REG	STATION NAME
01DG041	2.58	444721	0633636	X	MUDDY POND BROOK AT WAVERLEY
01ED009	2.80	442446	0651300	X	ROGERS BROOK NEAR JAKES LANDING
01EE007	7.11	442110	0650527	X	WHITEBURN BROOK BELOW POLLOCK LAKE
01DD004	8.81	450130	0643814	X	SHARPE BROOK AT LLOYDS
01DH003	9.07	452035	0631005	X	FRASER BROOK NEAR ARCHIBALD
01EJ004	13.1	444549	0634120	X	LITTLE SACKVILLE RIVER AT MIDDLE SACKVILLE
01EJ005	15.1	443631	0633701	X	MCINTOSH RUN AT HERRING COVE ROAD
01EE005	16.7	442743	0650255	X	MOOSE PIT BROOK AT TUPPER LAKE
01FJ002	19.7	460659	0600026	X	MCASKILL BROOK NEAR BIRCH GROVE
01FJ003	23.3	461020	0600533	X	SOUTHWEST BROOK NEAR COLLEGE OF CAPE BRETON
01DG017	26.7	444621	0633626	X	POWDER MILL LAKE BROOK NEAR WAVERLEY
01FA003	26.7	453750	0611705	X	NORTH LITTLE RIVER BELOW BEAVER DAM LAKE
01EH003	26.9	444106	0635218	X	EAST RIVER AT ST. MARGARETS BAY
01FC003	37.0	463702	0604403	X	CHETICAMP RIVER BELOW ARTEMISE BROOK
01FB006	37.8	461853	0605823	X	LAKE O' LAW BROOK AT EGYPT ROAD
01ER001	45.1	452806	0612736	X	CLAM HARBOUR RIVER NEAR BIRCHTOWN
01DL001	63.2	453510	0642705	X	KELLEY RIVER (MILL CREEK) AT EIGHT MILE FORD
01DR003	64.2	453844	0620115	X	RIGHTS RIVER NEAR ANTIGONISH
01DG018	73.3	451554	0625629	X	PEMBROKE RIVER AT GLENBERVIE
01DG035	76.1	444706	0633503	X	SHUBENACADIE RIVER AT OUTLET LAKE WILLIAM
01DP004	92.2	452950	0624651	X	MIDDLE RIVER AT ROCKLIN
01DG003	96.9	445106	0633954	X	BEAVER RIVER NEAR KINSAC
01DG007	106	444905	0633649	X	SHUBENACADIE RIVER AT LAKE THOMAS
01EE006	108	442938	0645825	X	ROUND LAKE BROOK AT ROUND LAKE
01FH001	120	454348	0603612	X	GRAND RIVER AT LOCH LOMOND
01FE002	125	462215	0603205	X	INDIAN BROOK AT INDIAN BROOK
01EJ001	146	444353	0633945	X	SACKVILLE RIVER AT BEDFORD
01DA001	167	441258	0660702	X	METEGHAN RIVER NEAR METEGHAN RIVER
01DR001	177	453335	0615415	X	SOUTH RIVER AT ST. ANDREWS
01FC002	190	463828	0605649	X	CHETICAMP RIVER ABOVE ROBERT BROOK
01FA001	193	454315	0611710	X	RIVER INHABITANTS AT GLENORA
01EE004	198	442422	0645917	X	WESTFIELD RIVER NEAR NORTH BROOKFIELD
01FJ001	199	455603	0601810	X	SALMON RIVER AT SALMON RIVER BRIDGE
01DH004	202	452530	0631520	X	NORTH RIVER AT NORTH RIVER
01DO001	249	454342	0630309	X	RIVER JOHN AT WELSFORD
01DH005	287	452354	0630723	X	SALMON RIVER AT UNION
01ED007	295	442614	0651324	X	MERSEY RIVER BELOW MILL FALLS
01DN004	298	454042	0633335	X	WALLACE RIVER AT WENTWORTH CENTRE
01FB003	357	461324	0610812	X	SOUTHWEST MARGAREE RIVER NEAR UPPER MARGAREE
01FB001	368	462210	0605836	X	NORTHEAST MARGAREE RIVER AT MARGAREE VALLEY
01EG002	370	443352	0642106	X	GOLD RIVER AT MOSHER'S FALLS
01DG006	389	445555	0633204	X	SHUBENACADIE RIVER AT ENFIELD
01EN002	389	450054	0620545	X	LISCOMB RIVER AT LISCOMB MILLS
01EC001	495	435018	0652212	X	ROSEWAY RIVER AT LOWER OHIO
01DC005	546	445659	0650147	X	ANNAPOLIS RIVER AT WILMOT
01EK001	650	445218	0631318	X	MUSQUODOBOIT RIVER AT CRAWFORD FALLS
01ED005	723	442000	0651216	X	MERSEY RIVER BELOW GEORGE LAKE
01EA003	1070	435524	0655212	X	TUSKET RIVER AT WILSON'S BRIDGE
01EF001	1250	442648	0643530	X	LA HAVE RIVER AT WEST NORTHFIELD
01EQ001	1350	451024	0615854	X	ST. MARYS RIVER AT STILLWATER
01EE001	1390	441024	0643936	X	MEDWAY RIVER AT CHARLESTON



NUMBER OF STATIONS
 ORDER BY SIZE
 NOVA SCOTIA HYDROMETRIC STATIONS BY DRAINAGE AREA MONITORED

FIGURE 5.0

6. NEWFOUNDLAND (ISLAND ONLY) NETWORK

The Island of Newfoundland is presently monitored by 71 hydrometric stations, 13 of which are contributed and 6 are not published. Three of the non published stations are used to estimate the discharge during water quality sampling and therefore only stage-discharge measurements are taken. The remaining three stations are contributed data from small powerhouses and only monthly mean data are available. The 71 stations individually monitor a total area of 68,217.8 km². Seventeen of these stations are upstream of at least one other station, which reduces the total area monitored to 47,799.3 km², or 43% of the total area (112,000 km²) of the Province. The gauging station density is 0.6 stations per thousand km² of the total area of the Province, or 1.5 stations per thousand km² of the total area monitored.

Table 6.0 is a listing of all active hydrometric discharge stations ordered by size of the drainage area monitored. Figures A.2.a and A.2.b show the areal coverage and distribution of the watersheds according to drainage area category. Figure 6.0 is a semi-logarithmic plot of the drainage area of all stations ordered by area.

(1) In analysing the data, the following observations were noted:

<u>Category</u>	<u>No. of Stations</u>	<u>Percent of Total</u>
1	5	7
2	25	35
3	30	42
4	<u>11</u>	<u>16</u>
TOTAL	71	100

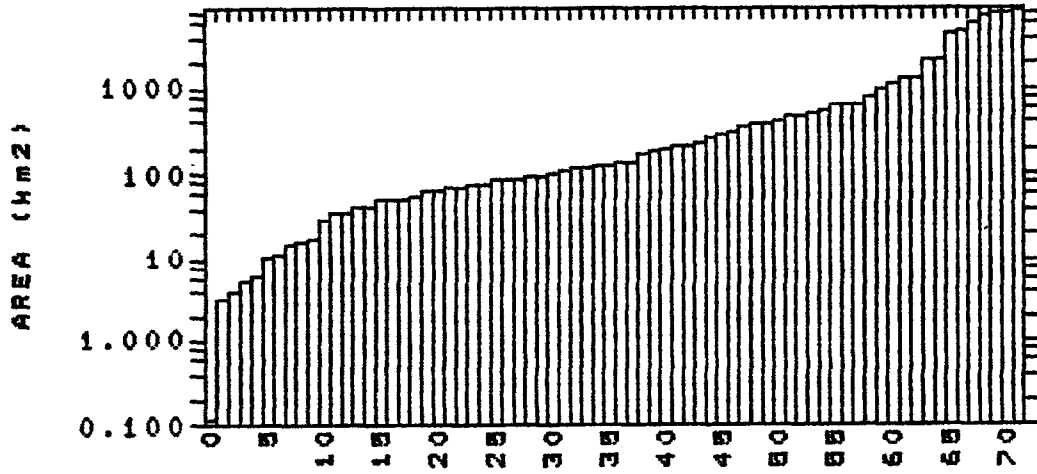
Maximum	8,640 km ²	Minimum	.12 km ²
Mean	947 km ²	Median	127.00 km ²

TABLE 6.0 ACTIVE DISCHARGE STATIONS IN NEWFOUNDLAND

STA.NO.	D.A.	LAT.	LONG.	NAT REG	STATION NAME
02ZM012	.12	473047	0524840	X	WATERFORD RIVER STORM WATER SEWER OUTFALL AT MOUNT PEARL
02ZM014	3.16	473052	0524656	X	UNNAMED TRIBUTARY AT AGRICULTURE FARM
02ZM006	3.90	473806	0525014	X	NORTHEAST POND RIVER AT NORTHEAST POND
02ZM015	5.41	472945	0524841	X	SOUTH BROOK AT RUBY LINE
02ZM013	6.01	473040	0524548	X	SOUTH BROOK AT OLD BAY BULLS ROAD
02ZL003	10.8	474843	0530915	X	SPOUT COVE BROOK NEAR SPOUT COVE
02ZM011	11.4	473141	0524942	X	WATERFORD RIVER NEAR DONOVANS INDUSTRIAL PARK
02ZM017	15.3	474202	0544503	X	LEARY BROOK AT ST. JOHN'S
02ZM010	16.6	473120	0524825	X	WATERFORD RIVER AT MOUNT PEARL
02ZM016	17.3	472141	0530702	X	SOUTH RIVER NEAR HOLYROOD
02ZL004	28.9	473502	0531829	X	SHEARSTOWN BROOK AT SHEARSTOWN
02YS003	36.7	483625	0535850	X	SOUTHWEST BROOK AT TERRA NOVA NATIONAL PARK
02ZK003	37.2	471053	0540227	X	LITTLE BARASWAY RIVER NEAR PLACENTIA
02ZG004	42.7	472702	0545118	X	RATTLE BROOK NEAR BOAT HARBOUR
02ZH002	43.3	475507	0535659	X	COME BY CHANCE RIVER NEAR GOOBIES
02ZM008	52.7	473147	0524434	X	WATERFORD RIVER AT KILBRIDE
02ZN001	53.3	465108	0531811	X	NORTHWEST BROOK AT NORTHWEST POND
02ZM009	53.6	465050	0525827	X	SEAL COVE BROOK NEAR CAPPAHAYDEN
02YL004	58.5	490043	0523647	X	SOUTH BROOK AT SOUTH BROOK
02YP001	63.8	492218	0554844	X	SHOAL ARM BROOK NEAR BADGER BAY
02ZJ001	67.4	482244	0534036	X	SOUTHERN BAY RIVER NEAR SOUTHERN BAY
02ZA002	72.0	480633	0584704	X	HIGHLANDS RIVER AT TRANS-CANADA HIGHWAY
02ZL002	72.5	480118	0531220	X	NEW CHELSEA BROOK AT SEAL COVE POND
02ZJ002	73.6	482345	0531806	X	SALMON COVE RIVER NEAR CHAMPNEYS
02ZM005	76.9	472654	0530332	X	SEAL COVE RIVER AT WHITE HILL POND
02Y0007	88.3	485642	0554942	X	LEECH BROOK NEAR GRAND FALLS
02ZK002	89.6	471626	0535027	X	NORTHEAST RIVER NEAR PLACENTIA
02ZL001	89.8	475128	0532248	X	HEART'S CONTENT RIVER AT SOUTHERN COVE POND
02YM003	93.2	495337	0561322	X	SOUTH WEST BROOK NEAR BAIE VERTE
02YE001	95.7	500937	0573445	X	GREAVETT BROOK ABOVE PORTLAND CREEK POND
02ZK004	104	470525	0534048	X	LITTLE SALMONIER RIVER NEAR NORTH HARBOUR
02ZM003	112	471458	0525320	X	MOBILE RIVER AT MOBILE FIRST POND
02ZG003	115	465229	0554639	X	SALMONIER RIVER NEAR LAMALINE
02ZM002	117	471750	0525100	X	PIERRES BROOK AT GULL POND
02YJ002	124	483256	0583411	X	BLANCHE BROOK NEAR STEPHENVILLE
02YL002	127	485526	0575411	X	CORNER BROOK AT WATSONS BROOK POWERHOUSE
02ZM001	134	472727	0524347	X	PETTY HARBOUR RIVER AT SECOND POND
02ZA003	139	474919	0591140	X	LITTLE CODROY RIVER NEAR DOYLES
02ZG002	166	470738	0551554	X	TIDES BROOK BELOW FRESHWATER POND
02Y0006	177	490621	0552438	X	PETERS RIVER NEAR BOTWOOD
02YD002	200	505544	0560644	X	NORTHEAST BROOK NEAR RODDICKTON
02ZB001	205	473650	0590033	X	ISLE AUX MORTS RIVER BELOW HIGHWAY BRIDGE
02ZG001	205	471250	0551945	X	GARNISH RIVER NEAR GARNISH
02ZC002	230	475127	0574400	X	GRANDY BROOK BELOW TOP POND BROOK
02YR001	267	484828	0541328	X	MIDDLE BROOK NEAR GAMBO
02ZK001	285	471329	0533406	X	ROCKY RIVER NEAR COLINET
02YA001	306	510818	0564732	X	STE. GENEVIEVE RIVER NEAR FORRESTERS POINT
02ZA001	343	482644	0582355	X	LITTLE BARACHOIS BROOK NEAR ST. GEORGE'S
02Y0003	378	490312	0551712	X	RATTILING BROOK AT RATTILING BROOK POWERHOUSE
02YK005	391	492011	0563956	X	SHEFFIELD RIVER NEAR TRANS CANADA HIGHWAY
02YR002	399	492335	0540625	X	RAGGED HARBOUR RIVER NEAR MUSGRAVE HARBOUR
02YN002	469	481432	0574941	X	LLOYDS RIVER BELOW KING GEORGE IV LAKE
02YK002	470	483717	0575538	X	LEWASEECHJEECH BROOK AT LITTLE GRAND LAKE

TABLE 6.0(continued) ACTIVE DISCHARGE STATIONS IN NEWFOUNDLAND

STA.NO.	D.A.	LAT.	LONG.	NAT REG	STATION NAME
02Y0004	508	485318	0554914	X	SANDY BROOK AT SANDY BROOK POWERHOUSE
02YR003	554	490224	0535300	X	INDIAN BAY BROOK NEAR NORTHWEST ARM
02YC001	624	503627	0570904	X	TORRENT RIVER AT BRISTOL'S POOL
02YJ001	640	483431	0582148	X	HARRYS RIVER BELOW HIGHWAY BRIDGE
02YK006	651	490500	0571213	X	HINDS BROOK AT HINDS BROOK POWER HOUSE
02ZH001	764	475649	0541708	X	PIPERS HOLE RIVER AT MOTHERS BROOK
02YM001	974	493043	0560645	X	INDIAN BROOK AT INDIAN FALLS
02ZF001	1170	474448	0552630	X	BAY DU NORD RIVER AT BIG FALLS
02YS001	1290	482630	0542221	X	TERRA NOVA RIVER AT EIGHT MILE BRIDGES
02ZD002	1340	474435	0565605	X	GREY RIVER NEAR GREY RIVER
02YL001	2110	491426	0572145	X	UPPER HUMBER RIVER NEAR REIDVILLE
02YQ004	2150	484607	0550452	X	NORTHWEST GANDER RIVER NEAR GANDER LAKE
02YQ001	4400	490055	0545113	X	GANDER RIVER AT BIG CHUTE
02YK001	5020	490943	0572528	X	HUMBER RIVER AT GRAND LAKE OUTLET
02ZE003	5910	475900	0555112	X	SALMON RIVER AT BAY D'ESPOIR POWERHOUSE
02YL003	7860	485902	0574541	X	HUMBER RIVER AT HUMBER VILLAGE BRIDGE
02Y0001	8460	485550	0554007	X	EXPLOITS RIVER AT GRAND FALLS
02Y0005	8640	485527	0553929	X	EXPLOITS RIVER BELOW STONY BROOK



NUMBER OF STATIONS
 ORDER BY SIZE
 NEWFOUNDLAND HYDROMETRIC STATIONS BY DRAINAGE AREA MONITORED

FIGURE 6.0

(2) From Table 6.0 and Figures 6.0 and A.2.a, it was noted that, on a provincial basis, there appears to be a good distribution of drainage sizes with the percentage of Categories 1 plus 2 equal to that of Category 3. Figure A.2.a, however, also shows that a large percentage (76%) of Category 2 drainage areas are located in the portion of the Province east of a line running from Bonavista Bay to Fortune Bay.

7. NEWFOUNDLAND (LABRADOR) NETWORK

Labrador is presently monitored by 18 stations, two of which separately monitor the outlets from the same drainage area. These stations are:

030D006	Atikonak River at Ossakmanuan Lake Control Structure
030C006	Atikonak River at Lake Gabbro.

As a result, only Station 030C006 is included in the analysis. The remaining 17 stations individually monitor a total of 279,416 km². Seven of these stations are located upstream of the station 030E001 - Churchill River above upper Muskrat Falls, which reduces the total area monitored to 133,526 km², or 46% of the total area (292,000 km²) of the Province. The gauging station density is 0.13 stations per 1,000 km² of total area monitored. Table 7.0 is a listing of all active hydrometric discharge stations ordered by size of the drainage area monitored. Figure A.3 shows the areal coverage and distribution of the watershed according to discharge area category. Figure 7.0 is a semi-logarithmic plot of the drainage area of all stations ordered by area.

In analysing the data, the following observations are noted:

- (1) The frequencies of occurrence of the various category areas are as follows:

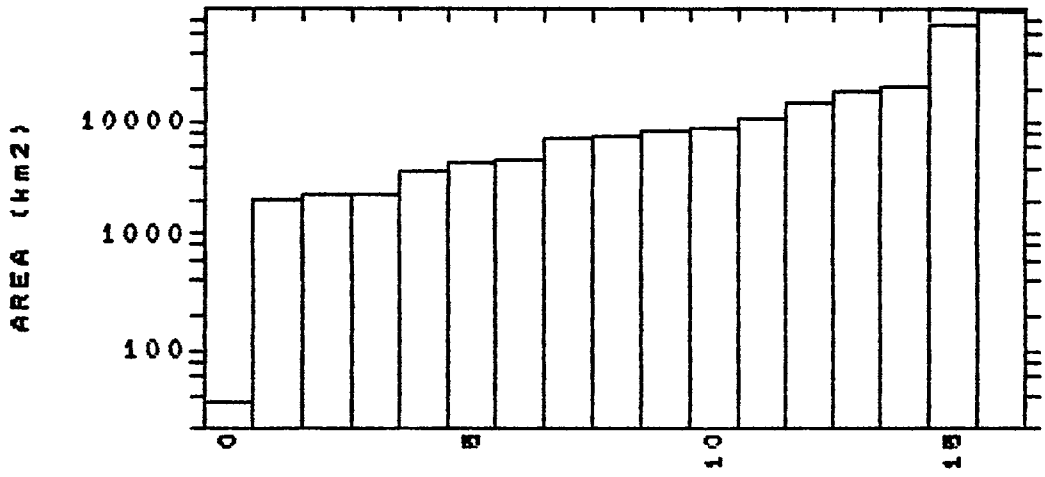
<u>Category</u>	<u>No. of Stations</u>	<u>Percent of Total</u>
1	0	0
2	1	5
3	0	0
4	10	59
5	<u>6</u>	<u>35</u>
TOTAL	17	100

Maximum	92,500 km ²	Minimum	35.5 km ²
Mean	16,436 km ²	Median	7,570.0 km ²

- (2) From Figures 7.0 and A.3 and Table 7.1, it is evident that over 50% of the basins monitored are in the Churchill River Basin, and all, with the exception of 030E001 (Churchill River above upper Muskrat Falls) are contributed stations.
- (3) There appears to be a deficiency of Category 1, 2 and 3 basins which reflects the number of large rivers in Labrador.
- (4) Areas not covered by the network include many of the rivers entering the Labrador Sea in the northern portion of the Province.

TABLE 7.0 ACTIVE DISCHARGE STATIONS IN LABRADOR

STA.NO.	D.A.	LAT.	LONG.	NAT REG	STATION NAME
030D006	--	532653	0644609	X	ATIKONAK RIVER AT OSSAKMANUAN LAKE CONTROL STRUCTURE
02XD001	35.5	514527	0562705	X	NORTHERN BROOK NEAR RED BAY
02XA004	2060	520950	0600334	X	RIVIERE JOIR NEAR PROVINCIAL BOUNDARY
03QC002	2310	523857	0565217	X	ALEXIS RIVER NEAR PORT HOPE SIMPSON
030E003	2330	523653	0611111	X	MINIPI RIVER BELOW MINIPI LAKE
030C005	3680	521714	0641940	X	ATIKONAK RIVER ABOVE ATIKONAK LAKE
03PB002	4480	540754	0612545	X	NASKAUPI RIVER BELOW NASKAUPI LAKE
02XA003	4540	521342	0611921	X	LITTLE MECATINA RIVER ABOVE LAC FOURMONT
030C004	7070	523910	0645051	X	ATIKONAK RIVER (WEST BRANCH) BELOW KEPIMITS LAKE
03NF001	7570	551400	0611757	X	UGJOKTOK RIVER BELOW HARP LAKE
030A004	8310	531340	0661224	X	ASHUANIPI RIVER BELOW WIGHTMAN LAKE
03NG001	8930	543725	0605838	X	KANAIKTIK RIVER BELOW SNEGAMOOK LAKE
03QC001	10900	533203	0572942	X	EAGLE RIVER ABOVE FALLS
030C003	15100	525803	0643940	X	ATIKONAK RIVER ABOVE PANCHIA LAKE
030A001	19000	542718	0663730	X	ASHUANIPI RIVER AT MENIHEK RAPIDS
030C006	21400	534620	0652347	X	ATIKONAK RIVER AT GABBRO LAKE
030D005	69200	533210	0635751	X	CHURCHILL RIVER AT CHURCHILL FALLS POWERHOUSE
030E001	92500	531452	0604721	X	CHURCHILL RIVER ABOVE UPPER MUSKRAT FALLS



NUMBER OF STATIONS
 ORDER BY SIZE
 LABRADOR HYDROMETRIC STATIONS BY DRAINAGE AREA MONITORED

FIGURE 7.0

8. SUMMARY AND CONCLUSIONS

Tables 8.0 and 8.1 summarize the information concerning the network at present.

Figures 8.0 through 8.2 were created to provide a visual comparison of the networks by various areal parameters. This was necessary due to the bias created by the large areas monitored which are international, such as in the Saint John River Basin, and the double counting of drainage areas where sub-watersheds of large rivers are monitored, as in Labrador and New Brunswick. A number of stations have been identified as being similar in drainage area size and proximity, and as such are considered redundant under the drainage area criteria.

Appendix B contains figures showing the areas which lack representation of stations in various categories. No recommendations were made for stations in Category 4 or 5 if it was felt with some certainty that no rivers of that sized drainage area existed in that portion of the Province. Deficiencies have been identified in Categories 1, 2 and 3 as these are the most common sizes, and it is felt that an even distribution of drainage areas of these sizes should be sampled across the region. Rivers in these deficient areas should be co-operatively identified in each Province and recommendations made concerning their ability to fill these voids in the network. Field reconnaissance surveys will be required to identify and confirm each recommended new site in terms of WSC operational requirements.

TABLE 8.0

SUMMARY OF DRAINAGE AREA DISTRIBUTION

PROVINCE	NEW BRUNSWICK	PRINCE EDWARD ISLAND	NOVA SCOTIA	NEWFOUNDLAND (ISLAND ONLY)	(LABRADOR)
Maximum Size Watershed km ²	39,900	147	1,390	8,640	92,500
Minimum Size Watershed km ²	3.89	4.92	2.58	0.12	35.5
Mean of Gauged Area km ²	2,590	44.9	259	947	16,400
Median of Gauged Area km ²	484	37.5	125	127	7,570
Area Gauged as % of Area of Province	57 (1)	8	24	61	46
Gauge Density as No. of Stations/1000 km ²	1.0	1.6	0.9	0.6	0.13

(1) Approximately 30,000 km² of the areas monitored are outside of New Brunswick.

The percentage of the monitored area that is in the province and outside the province amounts to 98% of the total provincial area.

TABLE 8.1
SUMMARY OF DRAINAGE AREA NETWORK CHARACTERISTICS

PROVINCE	TOTAL AREA km ²	NO. OF ACTIVE GAUGING STATIONS		GROSS AREA MONITORED		NO. OF PRIMARY FLOW STATIONS	NET AREA MONITORED		CATEGORY NO. OF STATIONS/ PERCENT OF TOTAL				
		Total	Flow Only	km ²	%		km ²	%	1	2	3	4	5
N.B.	73,400	91	69 (1)	178,000	243	37 (1)	71,900	98 (2)	3/4	8/12	33/48	21/30	4/6
P.E.I.	5,660	9	9	449	8	8	444	8	2/22	5/56	2/22	0/0	0/0
N.S.	55,500	52	51	13,200	24	37	12,100	22	5/10	17/33	25/49	4/8	0/0
Nfld. (Island)	112,000	71	71	68,200	61	54	47,800	43	5/7	25/35	30/42	11/16	0/0
Nfld (Labrador)	292,000	21	17 (3)	279,000	96	10	134,000	46	0/0	1/6	0/0	10/59	6/35

- (1) Two additional stations in N.B. have indeterminant drainage areas and are excluded from analysis.
(2) Approximately 30,000 km² of the gross and net areas monitored are outside of N.E.. This would reduce the percentage of monitored area within the Province to 57%.
(3) One additional station in Labrador shares its drainage area with another and is excluded from the analysis.

COMPARISON OF THE TOTAL DRAINAGE AREAS GAUGED BY PROVINCE

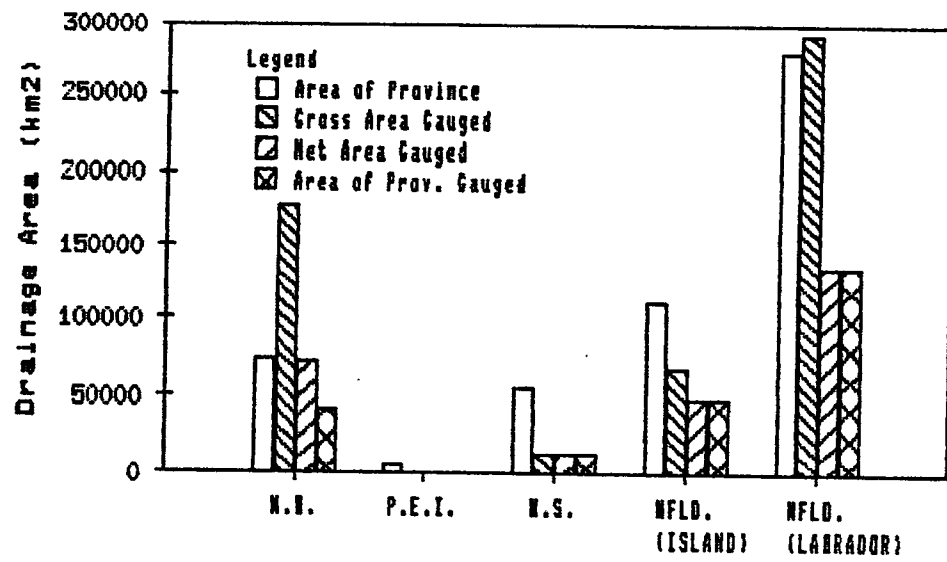


FIGURE 8.0

COMPARISON OF TOTAL DRAINAGE AREAS GAUGED AS PERCENT OF PROVINCE

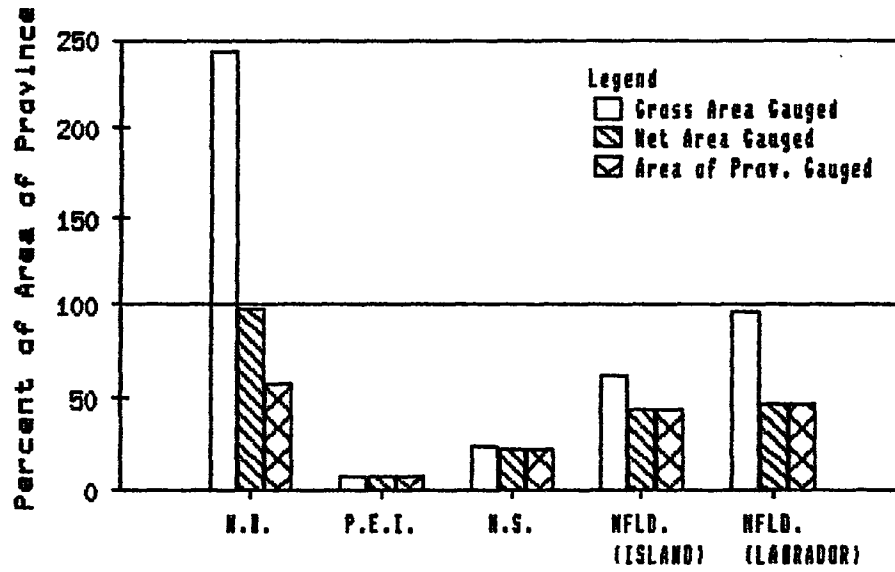


FIGURE 8.1

PERCENT OF STATIONS IN EACH DRAINAGE AREA CATEGORY

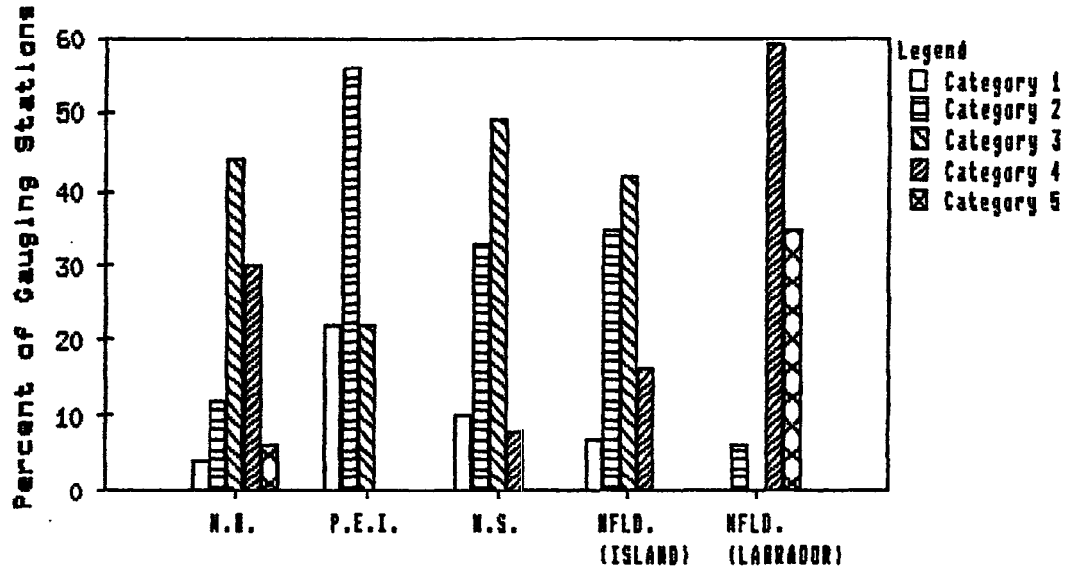


FIGURE 8.2

New Brunswick has a general lack of stations in Category 1 and 2 size ranges as shown in Figures B.1.a, B.1.b and 8.2, while Category 3 stations are scarce in the northwest, the uplands of the Miramichi, the lower Saint John River Basin and the Southeastern Highlands of the Bay of Fundy.

Table 8.2 lists the stations that monitor a similar sized drainage area and are located within close proximity. From Table 8.2, nine regulated stations can be identified as possible redundancies in terms of size and location. Of course, other criteria such as program requirements would override these redundancies. These are:

01BK005	Forty Mile Brook at Caribou Depot
01BJ009	Walker Brook at Campbellton
01AR011	Forest City stream below Forest City Dam
01AJ004	Big Presque Isle Stream at Tracey Mills
01AQ002	Magaguadavic at Elmcroft
01AH002	Tobique River at Riley Brook
01AH003	Tobique River at Plaster Rock
01AR003	St. Croix River near Baileyville
01AR005	St. Croix River at Baring

The two regulated stations, which are contributed, were not identified as redundant under the drainage area contributed.

Category 4 drainage areas could be increased in the Lower Saint John River Basin and the north shore area if suitable locations could be found. The low slope in these areas makes finding sites free of backwater problems difficult.

Prince Edward Island has a reasonable distribution of drainage area sizes throughout the Province. The only stations that could be designated similar are listed in Table 8.3.

As shown in Figure B.1.a expansion of the network could be made for a Category 3 watershed in the western part of the Province.

Nova Scotia appears to be gauged in clusters and as such, there are a number of perceived redundancies and holes in the network. Table 8.4 lists a number of stations which are of a similar drainage basin size and are within a reasonable proximity of each other, and therefore may be considered redundant under the drainage area criteria.

Expansion or redistribution of the network could be made in the areas shown on Figures B.1.a and B.1.b:

- (a) Category 1 or 2 watersheds could be added to the western portion of the Province, the Minas Basin area, the Eastern Shore and the southeast of Cape Breton.
- (b) Category 3 watershed could be added in the Minas Basin area around the St. Margaret's Bay area and the eastern tip of the mainland around Guysborough.
- (c) Category 4 watersheds could be added in the central portion of the mainland and on Cape Breton Island if sites are available.

The Island of Newfoundland appears to be gauged in clumps according to size and as such, a number of similar basins have been identified and are listed in Table 8.5.

Expansion or redistribution of the network could be made as follows:

- (a) Category 1 or 2 watersheds should be added to the central and south shore of the Province.
- (b) Category 3 watersheds should be added in the central south shore, the southeastern portion of the Avalon Peninsula, and the area north and east of Gros Morne National Park down the western shore to the Bay of Islands.
- (c) Category 4 watersheds appear to be limited by their availability.

Figure B.2 and B.2.b contain maps showing the areas which are deficient in the noted categories of monitored drainage areas.

While Labrador could clearly use a complete array of Category 1, 2 and 3 drainage areas, it could also use some expansion or redistribution of the network in Category 4 stations up the northeastern coast and through the Churchill River Basin as shown in Figure B.3. Table 8.6 lists the stations which have similar drainage areas and are within close proximity.

TABLE 8.2 ACTIVE DISCHARGE HYDROMETRIC GAUGING STATIONS IN NEW BRUNSWICK WITH SIMILAR DRAINAGE SIZE AND LOCATION

STA. NO.	D.A.	LAT.	LONG.	NAT	REG	CON	STATION NAME
01BK006	13.0	473334	0661642	X			FORTY MILE BROOK (WEST BRANCH) AT CARIBOU DEPOT
01BK005	14.2	473404	0661706		X		FORTY MILE BROOK AT CARIBOU DEPOT
01BU004	34.2	455314	0643059	X			PALMERS CREEK NEAR DORCHESTER
01AN001	34.4	461754	0654243	X			CASTAWAY BROOK NEAR CASTAWAY
01BJ009	60.8	475917	0664149			X	WALKER BROOK AT CAMPBELLTON
01BJ004	88.6	480052	0662618	X			EEL RIVER NEAR EEL RIVER CROSSING
01A0009	93.2	455724	0661841	X			BURPEE MILLSTREAM NEAR FERNMOUNT
01AR006	114	451235	0671545	X			DENNIS STREAM NEAR ST. STEPHEN
01BU003	129	455729	0645244	X			TURTLE CREEK AT TURTLE CREEK
01BV006	130	453332	0650102	X			POINT WOLFE RIVER AT FUNDY NATIONAL PARK
01BL002	173	474220	0650918	X			SOUTHWEST CARAQUET RIVER AT BURNSVILLE
01BL001	175	473900	0653440	X			BASS RIVER AT BASS RIVER
01BR001	177	464436	0651217	X			KOUCHIBOUGUAC RIVER NEAR VAUTOUR
01BJ010	190	473630	0654323	X			MIDDLE RIVER NEAR BATHURST
01AK001	234	455642	0671920	X			SHOGOMOC STREAM NEAR TRANS CANADA HIGHWAY
01AQ001	239	451012	0662800	X			LEPREAU RIVER AT LEPREAU
01AK007	240	460257	0671425	X			NACKAWIC RIVER NEAR TEMPERANCE VALE
01AJ010	350	462027	0672758	X			BECAGUIMEC STREAM AT COLDSTREAM
01AR011	357	453951	0674404		X		FOREST CITY STREAM BELOW FOREST CITY DAM
01BJ001	363	473921	0654137	X			TETAGOUCHE RIVER NEAR WEST BATHURST
01BL003	383	472606	0650625	X			TRACADIE RIVER AT MURCHY BRIDGE CROSSING
01AJ004	484	462616	0674441			X	BIG PRESQUE ISLE STREAM AT TRACEY MILLS
01B0003	484	465319	0653544	X			BARNABY RIVER BELOW SEMIWAGAN RIVER
01AK008	531	455612	0673249	X			EEL RIVER NEAR SCOTT SIDING
01AM001	557	454025	0664058	X			NORTHWEST OROMOCTO RIVER AT TRACY
01B0002	611	464917	0660653	X			RENOUS RIVER AT MCGRAW BROOK
01AL008	641	461659	0664415	X			NASHWAAK RIVER AT STANLEY
01AN002	1050	461728	0654324	X			SALMON RIVER AT CASTAWAY
01AP004	1100	454207	0653605	X			KENNEBECASIS RIVER AT APOHAQUI
01AQ002	1420	451624	0664824			X	MAGAGUADAVIC RIVER AT ELMCROFT
01AL002	1450	460733	0663644	X			NASHWAAK RIVER AT DURHAM BRIDGE
01AH002	2230	471024	0671236			X	TOBIQUE RIVER AT RILEY BROOK
01AE001	2260	471414	0683456	X			FISH RIVER NEAR FORT KENT
01BE001	2270	474954	0665254	X			UPSALQUITCH RIVER AT UPSALQUITCH
01AH003	3130	465418	0672342			X	TOBIQUE RIVER AT PLASTER ROCK
01BC001	3160	474000	0672903	X			RESTIGOUCHE RIVER BELOW KEDGWICK RIVER
01AR003	3410	451555	0672835	X			ST. CROIX RIVER NEAR BAILEYVILLE
01AR005	3560	450812	0671905	X			

TABLE 8.3 ACTIVE DISCHARGE HYDROMETRIC GAUGING STATIONS IN PRINCE EDWARD ISLAND WITH SIMILAR DRAINAGE SIZE AND LOCATION

STA.NO.	D.A.	LAT.	LONG.	NAT	REG	CON	STATION NAME
01CB006	5.59	462134	0633329	X			EMERALD BROOK NEAR EMERALD
01CB005	12.9	462049	0633758	X			NORTH BROOK NEAR WALL ROAD

TABLE 8.4 ACTIVE DISCHARGE HYDROMETRIC GAUGING STATIONS IN NOVA SCOTIA WITH SIMILAR DRAINAGE SIZE AND LOCATION

STA. NO.	D.A.	LAT.	LONG.	NAT	REG	CON	STATION NAME
01EE007	7.11	442110	0650527	X			WHITEBURN BROOK BELOW POLLOCK LAKE
01EE005	16.7	442743	0650255	X			MOOSE PIT BROOK AT TUPPER LAKE
01EJ004	13.1	444549	0634120	X			LITTLE SACKVILLE RIVER AT MIDDLE SACKVILLE
01EJ005	15.1	443631	0633701		X		MCINTOSH RUN AT HERRING COVE ROAD
01FJ002	19.7	460659	0600026	X			MCASKILL BROOK NEAR BIRCH GROVE
01FJ003	23.3	461020	0600533	X			SOUTHWEST BROOK NEAR COLLEGE OF CAPE BRETON
01FC003	37.0	463702	0604403			X	CHETICAMP RIVER BELOW ARTEMISE BROOK
01FB006	37.8	461853	0605823	X			LAKE O' LAW BROOK AT EGYPT ROAD
01DG018	73.3	451554	0625629	X			PEMBROKE RIVER AT GLENBERVIE
01DG035	76.1	444706	0633503	X			SHUBENACADIE RIVER AT OUTLET LAKE WILLIAM
01DP004	92.2	452950	0624651	X			MIDDLE RIVER AT ROCKLIN
01DG003	96.9	445106	0633954	X			BEAVER RIVER NEAR KINSAC
01DG007	106	444905	0633649	X			SHUBENACADIE RIVER AT LAKE THOMAS
01EE006	108	442938	0645825	X			ROUND LAKE BROOK AT ROUND LAKE
01EE004	198	442422	0645917	X			WESTFIELD RIVER NEAR NORTH BROOKFIELD
01DH004	202	452530	0631520	X			NORTH RIVER AT NORTH RIVER
01D0001	249	454342	0630309	X			RIVER JOHN AT WELSFORD
01DH005	287	452354	0630723	X			SALMON RIVER AT UNION
01DN004	298	454042	0633335	X			WALLACE RIVER AT WENTWORTH CENTRE
01FB003	357	461324	0610812	X			SOUTHWEST MARGAREE RIVER NEAR UPPER MARGAREE
01FB001	368	462210	0605836	X			NORTHEAST MARGAREE RIVER AT MARGAREE VALLEY
01EN002	389	450054	0620545	X			LISCOMB RIVER AT LISCOMB MILLS
01EK001	650	445218	0631318			X	MUSQUODOBOIT RIVER AT CRAWFORD FALLS
01EC001	495	435018	0652212	X			ROSEWAY RIVER AT LOWER OHIO
01ED005	723	442000	0651216	X			MERSEY RIVER BELOW GEORGE LAKE
01EF001	1250	442648	0643530	X			LA HAVE RIVER AT WEST NORTHFIELD
01EE001	1390	441024	0643936			X	MEDWAY RIVER AT CHARLESTON

TABLE 8.5 ACTIVE DISCHARGE HYDROMETRIC GAUGING STATIONS IN NEWFOUNDLAND WITH SIMILAR DRAINAGE SIZE AND LOCATION

STA. NO.	D.A.	LAT.	LONG.	NAT	REG	CON	STATION NAME
02ZM014	3.16	473052	0524656	X			UNNAMED TRIBUTARY AT AGRICULTURE FARM
02ZM015	5.41	472945	0524841	X			SOUTH BROOK AT RUBY LINE
02ZM013	6.01	473040	0524548	X			SOUTH BROOK AT OLD BAY BULLS ROAD
02ZM011	11.4	473141	0524942	X			WATERFORD RIVER NEAR DONOVANS INDUSTRIAL PARK
02ZM017	15.3	474202	0544503	X			LEARY BROOK AT ST. JOHN'S
02ZM010	16.6	473120	0524825	X			WATERFORD RIVER AT MOUNT PEARL
02ZM016	17.3	472141	0530702	X			SOUTH RIVER NEAR HOLYROOD
02ZN001	53.3	465108	0531811	X			NORTHWEST BROOK AT NORTHWEST POND
02ZM009	53.6	465050	0525827	X			SEAL COVE BROOK NEAR CAPPAHAYDEN
02ZJ001	67.4	482244	0534036	X			SOUTHERN BAY RIVER NEAR SOUTHERN BAY
02ZJ002	73.6	482345	0531806	X			SALMON COVE RIVER NEAR CHAMPNEYS
02YP001	63.8	492218	0554844	X			SHOAL ARM BROOK NEAR BADGER BAY
02Y0007	88.3	485642	0554942	X			LEECH BROOK NEAR GRAND FALLS
02ZM005	76.9	472654	0530332		X	X	SEAL COVE RIVER AT WHITE HILL POND
02ZK002	89.6	471626	0535027	X			NORTHEAST RIVER NEAR PLACENTIA
02ZL002	72.5	480118	0531220	X	X		NEW CHELSEA BROOK AT SEAL COVE POND
02ZL001	89.8	475128	0532248	X	X		HEART'S CONTENT RIVER AT SOUTHERN COVE POND
02ZM003	112	471458	0525320	X	X		MOBILE RIVER AT MOBILE FIRST POND
02ZM002	117	471750	0525100	X	X		PIERRES BROOK AT GULL POND
02ZM001	134	472727	0524347	X	X		PETTY HARBOUR RIVER AT SECOND POND
02YJ002	124	483256	0583411	X			BLANCHE BROOK NEAR STEPHENVILLE
02YL002	127	485526	0575411		X	X	CORNER BROOK AT WATSONS BROOK POWERHOUSE
02YD002	200	505544	0560644	X			NORTHEAST BROOK NEAR RODDICKTON
02YA001	306	510818	0564732	X			STE. GENEVIEVE RIVER NEAR FORRESTERS POINT
02Y0003	378	490312	0551712		X	X	RATTLING BROOK AT RATTLING BROOK POWERHOUSE
02Y0004	508	485318	0554914		X	X	SANDY BROOK AT SANDY BROOK POWERHOUSE
02YR002	399	492335	0540625	X			RAGGED HARBOUR RIVER NEAR MUSGRAVE HARBOUR
02YR003	554	490224	0535300	X			INDIAN BAY BROOK NEAR NORTHWEST ARM
02ZA001	343	482644	0582355	X			LITTLE BARACHOIS BROOK NEAR ST. GEORGE'S
02YN002	469	481432	0574941	X			LLOYDS RIVER BELOW KING GEORGE IV LAKE
02YK002	470	483717	0575538	X			LEWASEECHJEECH BROOK AT LITTLE GRAND LAKE
02YJ001	640	483431	0582148	X			HARRYS RIVER BELOW HIGHWAY BRIDGE
02YK006	651	490500	0571213		X	X	HINDS BROOK AT HINDS BROOK POWER HOUSE
02ZF001	1170	474448	0552630	X			BAY DU NORD RIVER AT BIG FALLS
02YS001	1290	482630	0542221	X			TERRA NOVA RIVER AT EIGHT MILE BRIDGES
02Y0001	8460	485550	0554007		X		EXPLOITS RIVER AT GRAND FALLS
02Y0005	8640	485527	0553929		X		EXPLOITS RIVER BELOW STONY BROOK

TABLE 8.6 ACTIVE DISCHARGE HYDROMETRIC GAUGING STATIONS IN LABRADOR WITH SIMILAR DRAINAGE SIZE AND LOCATION

STA.NO.	D.A.	LAT.	LONG.	NAT	REG	CON	STATION NAME
03QC002	2310	523857	0565217	X			ALEXIS RIVER NEAR PORT HOPE SIMPSON
03OE003	2330	523653	0611111	X			MINIPI RIVER BELOW MINIPI LAKE
03PB002	4480	540754	0612545	X			NASKAUPI RIVER BELOW NASKAUPI LAKE
02XA003	4540	521342	0611921	X			LITTLE MECATINA RIVER ABOVE LAC FOURMONT
03NF001	7570	551400	0611757	X			UGJOKTOK RIVER BELOW HARP LAKE
03NG001	8930	543725	0605838	X			KANAIRIKTOK RIVER BELOW SNEGAMOOK LAKE
03OC003	15100	525803	0643940	X		X	ATIKONAK RIVER ABOVE PANCHIA LAKE
03OA001	19000	542718	0663730		X	X	ASHUANIPI RIVER AT MENIHEK RAPIDS
03OD006	---	532653	0644609		X	X	ATIKONAK RIVER AT OSSAKMANUAN LAKE CONTROL STRUCTURE
03OC006	21400	534620	0652347		X	X	ATIKONAK RIVER AT GABBRO LAKE

9. RECOMMENDATIONS

A number of stations have been identified from each province as redundant only in terms of the spatial distribution of drainage areas by size. As stated earlier, this criteria is only an identifier of possible redundancies between pairs or groups of stations. These stations should be scrutinized to determine which station(s) within a similar pair or group may in fact be discontinued. Factors that should be considered in this decision are:

- (1) The station priority, is it a long or short term project station, i.e. an IJC long term station. If it is a short term project, the station should be earmarked for discontinuation after a specified date.
- (2) Stations located on natural streams should be retained over those on regulated streams or for those streams for which data are contributed. Regulated flow data are generally less useful in the network in terms of the ability to include it in regional analyses. Contributed data, which is generally from regulated flow streams, does not come under the same national quality control standards and therefore its accuracy is less definable. The regulated and contributed stations are noted on the maps and the tables in Appendix A.

Where a regulated or contributed station has a high priority, the natural station should remain.
- (3) The third criteria for discontinuance of similar stations are the station's ability to provide the best quality data at the most reasonable cost. Facts such as the stability of the control and the maintenance record of the site should be taken into consideration.

(4) The last criteria for discontinuance should be the length of record of a station. More data may not provide any new information in terms of regional parameters, however, if the station is necessary to show long term trends or cycles, it should be retained.

A summary of recommendations drawn from the conclusions is given in Table 9.0. The co-ordinating committees for each of the four Federal-Provincial Cost Sharing Agreements should implement the recommendations found in this report on a time basis according to the dollar and manpower resources available.

TABLE 9.0

SUMMARY OF RECOMMENDATIONS

PROVINCE	RECOMMENDATIONS
New Brunswick	<ol style="list-style-type: none"> 1. Review stations designated as similar in Table 8.2 and determine their priority in the network. 2. Examine natural streams in the areas indicated on Figures B.1.a and B.1.b as deficient in each particular drainage area size category and make recommendations for additional stations. These include the following areas: <ol style="list-style-type: none"> (a) Categories 1 and 2 required over most of the Province. (b) Category 3 required in the northeast and central areas of the Province, and the central portion of the Fundy shore. (c) Category 4 required along the Northumberland and North Shore and the drainage areas contributing to the Lower Saint John River.
Prince Edward Island	<ol style="list-style-type: none"> 1. Review the stations 01CB005 - North Brook near Wall Road, and 01CB005 - Emerald Brook near Emerald which have been identified as similar, and determine if a redundancy exists. 2. Examine natural streams with Category 3 drainage areas in the western portion of the Island and make recommendations for an additional station.
Nova Scotia	<ol style="list-style-type: none"> 1. Review the stations listed in Table 8.4 which are designated as similar, and determine their requirement in the network. 2. Examine natural streams in the areas indicated in Figures B.1.a and B.1.b as showing a deficiency in streams of category drainage areas as follows: <ol style="list-style-type: none"> (a) Categories 1 and 2 required in the area comprised of Digby, Yarmouth and Shelburne Counties.

TABLE 9.0

SUMMARY OF RECOMMENDATIONS

PROVINCE	RECOMMENDATIONS
Nova Scotia (cont'd)	<p>(b) Category 3 required in an area located around St. Margaret's Bay and stretching north to the Minas Basin and on to the Northumberland shore west of Tatamagouche. Also included is an area comprised of eastern portions of Antigonish and Guysborough Counties.</p> <p>(c) Category 4 required in areas including the central portion of the Province from Northumberland Strait to the Atlantic Coast, and the Highlands of Cape Breton in the western part of the island.</p>
Newfoundland (Island)	<p>1. Review the similar stations as outlined in Table 8.5 to determine their requirement in the network.</p> <p>2. Examine natural streams in the areas indicated in Figures B.2.a and B.2.b as follows:</p> <p>(a) Categories 1 and 2 stations should be investigated throughout central Newfoundland</p> <p>(b) Category 3 stations should be investigated in the southeastern corner of the Avalon Peninsula, the south central coast, and an area up the west coast between Corner Brook and half way up the Great Northern Peninsula.</p> <p>(c) Category 4 stations should be investigated in the southwestern corner of the Island, the Great Northern Peninsula and an area between Placentia/Fortune Bays and Bonavista/Trinity Bays</p>

TABLE 9.0

SUMMARY OF RECOMMENDATIONS

PROVINCE	RECOMMENDATIONS
Newfoundland (Labrador)	<ol style="list-style-type: none"><li data-bbox="459 321 1386 395">1. Review the similar stations as outlined in Table 8.6 to determine their requirements in the network.<li data-bbox="459 421 1386 734">2. Examine natural streams in the areas indicated in Figure B.3.<ol style="list-style-type: none"><li data-bbox="542 512 1386 587">(a) An array of Category 1, 2 and 3 stations should be investigated throughout the area.<li data-bbox="542 612 1386 734">(b) Category 4 stations should be investigated up the northeastern coast and throughout the lower and central Churchill River Basin.

10.

REFERENCE

T. Ingledow and Associates Limited, Hydrometric Network Plan for the Provinces of Newfoundland, New Brunswick, Nova Scotia and Prince Edward Island, December 1970.

11. APPENDIX A

List of Active Discharge Stations, 1983

NEW BRUNSWICK

STA. NO.	D.A.	LAT.	LONG.	NAT REG	STATION NAME
01AD002	14700	471525	0683535	X	SAINT JOHN RIVER AT FORT KENT
01AD003	1360	471225	0685725	X	ST. FRANCIS RIVER AT OUTLET OF GLASIER LAKE
01AE001	2260	471414	0683456	X	FISH RIVER NEAR FORT KENT
01AF002	21900	470224	0674430	X	SAINT JOHN RIVER AT GRAND FALLS
01AF003	1150	472006	0680806	X	GREEN RIVER NEAR RIVIERE-VERTE
01AF007	339	471446	0675516	X	GRAND RIVER AT VIOLETTE BRIDGE
01AG002	199	464942	0674435	X	LIMESTONE RIVER AT FOUR FALLS
01AG003	6060	464852	0674516	X	AROOSTOOK RIVER NEAR TINKER
01AH002	2230	471024	0671236	X	TOBIQUE RIVER AT RILEY BROOK
01AH003	3130	465418	0672342	X	TOBIQUE RIVER AT PLASTER ROCK
01AH004	4330	464730	0674100	X	TOBIQUE RIVER AT NARROWS
01AH005	230	471503	0670832	X	MAMOZEKEL RIVER NEAR CAMPBELL RIVER
01AJ001	34200	462812	0673523	X	SAINT JOHN RIVER NEAR EAST FLORENCEVILLE
01AJ003	1210	461258	0674342	X	MEDUXNEKEAG RIVER NEAR BELLEVILLE
01AJ004	484	462616	0674441	X	BIG PRESQUE ISLE STREAM AT TRACEY MILLS
01AJ010	350	462027	0672758	X	BECAGUIMEC STREAM AT COLDSTREAM
01AJ011	156	462032	0672809	X	COLD STREAM AT COLDSTREAM
01AK001	234	455642	0671920	X	SHOGOMOC STREAM NEAR TRANS CANADA HIGHWAY
01AK004	39900	455744	0664951	X	SAINT JOHN RIVER BELOW MACTAQUAC
01AK005	26.9	460206	0664205	X	NORTH NASHWAAKSIS STREAM NEAR ROYAL ROAD
01AK006	5.70	460458	0664404	X	NORTH NASHWAAKSIS STREAM AT SANDWICH'S FARM
01AK007	240	460257	0671425	X	NACKAWIC RIVER NEAR TEMPERANCE VALE
01AK008	531	455612	0673249	X	EEL RIVER NEAR SCOTT SIDING
01AL002	1450	460733	0663644	X	NASHWAAK RIVER AT DURHAM BRIDGE
01AL003	6.48	461756	0670213	X	HAYDEN BROOK NEAR NARROWS MOUNTAIN
01AL004	3.89	461636	0670117	X	NARROWS MOUNTAIN BROOK NEAR NARROWS MOUNTAIN
01AL008	641	461659	0664415	X	NASHWAAK RIVER AT STANLEY
01AM001	557	454025	0664058	X	NORTHWEST OROMOCTO RIVER AT TRACY
01AN001	34.4	461754	0654243	X	CASTAWAY BROOK NEAR CASTAWAY
01AN002	1050	461728	0654324	X	SALMON RIVER AT CASTAWAY
01AO009	93.2	455724	0661841	X	BURPEE MILLSTREAM NEAR FERNMOUNT
01AP002	668	460419	0652200	X	CANAAN RIVER AT EAST CANAAN
01AP004	1100	454207	0653605	X	KENNEBECASIS RIVER AT APOHAQUI
01AP006	293	453008	0661914	X	NEREPIS RIVER NEAR FOWLERS CORNER
01AQ001	239	451012	0662800	X	LEPREAU RIVER AT LEPREAU
01AQ002	1420	451624	0664824	X	MAGAGUADAVIC RIVER AT ELMCROFT
01AQ008		452505	0665313	X	PISKAHEGAN RIVER NEAR PLEASANT MOUNTAIN
01AR003	3410	451555	0672835	X	ST. CROIX RIVER NEAR BAILEYVILLE
01AR004	1070	453410	0672545	X	ST. CROIX RIVER AT VANCEBORO
01AR005	3560	450812	0671905	X	ST. CROIX RIVER AT BARING
01AR006	114	451235	0671545	X	DENNIS STREAM NEAR ST. STEPHEN
01AR011	357	453951	0674404	X	FOREST CITY STREAM BELOW FOREST CITY DAM
01AR012		450926	0670546	X	CHAMCOOK STREAM AT LITTLE CHAMCOOK LAKE OUTLET
01BC001	3160	474000	0672903	X	RESTIGOUCHE RIVER BELOW KEDGWICK RIVER
01BE001	2270	474954	0665254	X	UPSALQUITCH RIVER AT UPSALQUITCH
01BJ001	363	473921	0654137	X	TETAGOUCHE RIVER NEAR WEST BATHURST
01BJ003	510	475352	0660147	X	JACQUET RIVER NEAR DURHAM CENTRE
01BJ004	88.6	480052	0662618	X	EEL RIVER NEAR EEL RIVER CROSSING
01BJ007	7740	475429	0665651	X	RESTIGOUCHE RIVER ABOVE RAFTING GROUND BROOK
01BJ009	60.8	475917	0664149	X	WALKER BROOK AT CAMPBELLTON

NEW BRUNSWICK

STA.NO.	D.A.	LAT.	LONG.	NAT REG	STATION NAME
01BJ010	190	473630	0654323	X	MIDDLE RIVER NEAR BATHURST
01BJ011	123	474424	0654347	X	NIGADOO RIVER NEAR ALCIDA
01BK003	1840	472424	0654742	X	NEPISIGUIT RIVER AT NEPISIGUIT FALLS
01BK005	14.2	473404	0661706	X	FORTY MILE BROOK AT CARIBOU DEPOT
01BK006	13.0	473334	0661642	X	FORTY MILE BROOK (WEST BRANCH) AT CARIBOU DEPOT
01BL001	175	473900	0653440	X	BASS RIVER AT BASS RIVER
01BL002	173	474220	0650918	X	SOUTHWEST CARAQUET RIVER AT BURNSVILLE
01BL003	383	472606	0650625	X	TRACADIE RIVER AT MURCHY BRIDGE CROSSING
01BO001	5050	464410	0654936	X	SOUTHWEST MIRAMICHI RIVER AT BLACKVILLE
01BO002	611	464917	0660653	X	RENOUS RIVER AT MCGRAW BROOK
01BO003	484	465319	0653544	X	BARNABY RIVER BELOW SEMIWAGAN RIVER
01BO004	316	471127	0652351	X	BARTIBOG RIVER BELOW HIGHWAY NO. 8
01BP001	1340	465609	0655426	X	LITTLE SOUTHWEST MIRAMICHI RIVER AT LYTTLETON
01BQ001	948	470541	0655014	X	NORTHWEST MIRAMICHI RIVER AT TROUT BROOK
01BQ003		471728	0660234	X	LITTLE SOUTH BRANCH TOMOGONOPS RIVER BELOW B PIT
01BR001	177	464436	0651217	X	KOUCHIBOUGUAC RIVER NEAR VAUTOUR
01BS001	166	462637	0650355	X	COAL BRANCH RIVER AT BEERSVILLE
01BU002	391	455637	0651013	X	PETITCODIAC RIVER NEAR PETITCODIAC
01BU003	129	455729	0645244	X	TURTLE CREEK AT TURTLE CREEK
01BU004	34.2	455314	0643059	X	PALMERS CREEK NEAR DORCHESTER
01BV006	130	453332	0650102	X	POINT WOLFE RIVER AT FUNDY NATIONAL PARK

PRINCE EDWARD ISLAND

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STA.NO.	D.A.	LAT.	LONG.	NAT REG	STATION NAME
01CA003	46.8	464439	0641108	X	CARRUTHERS BROOK NEAR ST. ANTHONY
01CB002	114	462045	0633803	X	DUNK RIVER AT WALL ROAD
01CB004	45.4	462335	0633935	X	WILMOT RIVER NEAR WILMOT VALLEY
01CB005	12.9	462049	0633758	X	NORTH BROOK NEAR WALL ROAD
01CB006	5.59	462134	0633329	X	EMERALD BROOK NEAR EMERALD
01CC002	37.5	461956	0630353	X	WINTER RIVER NEAR SUFFOLK
01CC003	4.92	461854	0630848	X	WINTER RIVER AT BRACKLEY WELLS PUMPING STATION
01CD003	147	462140	0624202	X	MORELL RIVER AT BANGOR
01CE004	33.1	461207	0623923	X	BRUDENELL RIVER AT BRUDENELL

NOVA SCOTIA

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STA.NO.	D.A.	LAT.	LONG.	NAT	REG	STATION NAME	PAGE	1
01DA001	167	441258	0660702		X	METEGHAN RIVER NEAR METEGHAN RIVER		
01DC005	546	445659	0650147		X	ANNAPOLIS RIVER AT WILMOT		
01DD004	8.81	450130	0643814	X		SHARPE BROOK AT LLOYDS		
01DG003	96.9	445106	0633954	X		BEAVER RIVER NEAR KINSAC		
01DG006	389	445555	0633204	X		SHUBENACADIE RIVER AT ENFIELD		
01DG007	106	444905	0633649	X		SHUBENACADIE RIVER AT LAKE THOMAS		
01DG017	26.7	444621	0633626	X		POWDER MILL LAKE BROOK NEAR WAVERLEY		
01DG018	73.3	451554	0625629	X		PEMBROKE RIVER AT GLENBERVIE		
01DG035	76.1	444706	0633503	X		SHUBENACADIE RIVER AT OUTLET LAKE WILLIAM		
01DG041	2.58	444721	0633636	X		MUDDY POND BROOK AT WAVERLEY		
01DH003	9.07	452035	0631005	X		FRASER BROOK NEAR ARCHIBALD		
01DH004	202	452530	0631520	X		NORTH RIVER AT NORTH RIVER		
01DH005	287	452354	0630723	X		SALMON RIVER AT UNION		
01DL001	63.2	453510	0642705	X		KELLEY RIVER (MILL CREEK) AT EIGHT MILE FORD		
01DN004	298	454042	0633335	X		WALLACE RIVER AT WENTWORTH CENTRE		
01DO001	249	454342	0630309	X		RIVER JOHN AT WELSFORD		
01DP004	92.2	452950	0624651	X		MIDDLE RIVER AT ROCKLIN		
01DR001	177	453335	0615415	X		SOUTH RIVER AT ST. ANDREWS		
01DR003	64.2	453844	0620115	X		RIGHTS RIVER NEAR ANTIGONISH		
01EA003	1070	435524	0655212		X	TUSKET RIVER AT WILSON'S BRIDGE		
01EC001	495	435018	0652212	X		ROSEWAY RIVER AT LOWER OHIO		
01ED005	723	442000	0651216	X		MERSEY RIVER BELOW GEORGE LAKE		
01ED007	295	442614	0651324	X		MERSEY RIVER BELOW MILL FALLS		
01ED009	2.80	442446	0661300	X		ROGERS BROOK NEAR JAKES LANDING		
01EE001	1390	441024	0643936		X	MEDWAY RIVER AT CHARLESTON		
01EE004	198	442422	0645917	X		WESTFIELD RIVER NEAR NORTH BROOKFIELD		
01EE005	16.7	442743	0650255	X		MOOSE PIT BROOK AT TUPPER LAKE		
01EE006	108	442938	0645825	X		ROUND LAKE BROOK AT ROUND LAKE		
01EE007	7.11	442110	0650527	X		WHITEBURN BROOK BELOW POLLOCK LAKE		
01EF001	1250	442648	0643530	X		LA HAVE RIVER AT WEST NORTHFIELD		
01EG002	370	443352	0642106	X		GOLD RIVER AT MOSHER'S FALLS		
01EH003	26.9	444106	0635218	X		EAST RIVER AT ST. MARGARET'S BAY		
01EJ001	146	444353	0633945	X		SACKVILLE RIVER AT BEDFORD		
01EJ004	13.1	444549	0634120	X		LITTLE SACKVILLE RIVER AT MIDDLE SACKVILLE		
01EJ005	15.1	443631	0633701		X	MCINTOSH RUN AT HERRING COVE ROAD		
01EK001	650	445218	0631318		X	MUSQUODOBOIT RIVER AT CRAWFORD FALLS		
01EN002	389	450054	0620545	X		LISCOMB RIVER AT LISCOMB MILLS		
01EO001	1350	451024	0615854	X		ST. MARYS RIVER AT STILLWATER		
01ER001	45.1	452806	0612736	X		CLAM HARBOUR RIVER NEAR BIRCHTOWN		
01FA001	193	454315	0611710	X		RIVER INHABITANTS AT GLENORA		
01FA003	26.7	453750	0611705		X	NORTH LITTLE RIVER BELOW BEAVER DAM LAKE		
01FB001	368	462210	0605836	X		NORTHEAST MARGAREE RIVER AT MARGAREE VALLEY		
01FB003	357	461324	0610812	X		SOUTHWEST MARGAREE RIVER NEAR UPPER MARGAREE		
01FB006	37.8	461853	0605823	X		LAKE O'LAWS BROOK AT EGYPT ROAD		
01FC002	190	463828	0605649		X	CHETICAMP RIVER ABOVE ROBERT BROOK		
01FC003	37.0	463702	0604403		X	CHETICAMP RIVER BELOW ARTEMISE BROOK		
01FE002	125	462215	0603205		X	INDIAN BROOK AT INDIAN BROOK		
01FH001	120	454348	0603612	X		GRAND RIVER AT LOCH LOMOND		
01FJ001	199	455603	0601810	X		SALMON RIVER AT SALMON RIVER BRIDGE		
01FJ002	19.7	460659	0600026	X		MCASKILL BROOK NEAR BIRCH GROVE		
01FJ003	23.3	461020	0600533	X		SOUTHWEST BROOK NEAR COLLEGE OF CAPE BRETON		

NEWFOUNDLAND

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STA. NO.	D.A.	LAT.	LONG.	NAT REG	STATION NAME
02YA001	306	510818	0564732	X	STE. GENEVIEVE RIVER NEAR FORRESTERS POINT
02YC001	624	503627	0570904	X	TORRENT RIVER AT BRISTOL'S POOL
02YD002	200	505544	0560644	X	NORTHEAST BROOK NEAR RODDICKTON
02YE001	95.7	500937	0573445	X	GREAVETT BROOK ABOVE PORTLAND CREEK POND
02YJ001	640	483431	0582148	X	HARRYS RIVER BELOW HIGHWAY BRIDGE
02YJ002	124	483256	0583411	X	BLANCHE BROOK NEAR STEPHENVILLE
02YK001	5020	490943	0572528	X	HUMBER RIVER AT GRAND LAKE OUTLET
02YK002	470	483717	0575538	X	LEWASEECHJEECH BROOK AT LITTLE GRAND LAKE
02YK005	391	492011	0563956	X	SHEFFIELD RIVER NEAR TRANS CANADA HIGHWAY
02YK006	651	490500	0571213	X	HINDS BROOK AT HINDS BROOK POWER HOUSE
02YL001	2110	491426	0572145	X	UPPER HUMBER RIVER NEAR REIDVILLE
02YL002	127	485526	0575411	X	CORNER BROOK AT WATSONS BROOK POWERHOUSE
02YL003	7860	485902	0574541	X	HUMBER RIVER AT HUMBER VILLAGE BRIDGE
02YL004	58.5	490043	0523647	X	SOUTH BROOK AT SOUTH BROOK
02YM001	974	493043	0560645	X	INDIAN BROOK AT INDIAN FALLS
02YM003	93.2	495337	0561322	X	SOUTH WEST BROOK NEAR BAIE VERTE
02YN002	469	481432	0574941	X	LLOYDS RIVER BELOW KING GEORGE IV LAKE
02Y0001	8460	485550	0554007	X	EXPLOITS RIVER AT GRAND FALLS
02Y0003	378	490312	0551712	X	RATTLING BROOK AT RATTLING BROOK POWERHOUSE
02Y0004	508	485318	0554914	X	SANDY BROOK AT SANDY BROOK POWERHOUSE
02Y0005	8640	485527	0553929	X	EXPLOITS RIVER BELOW STONY BROOK
02Y0006	177	490621	0552438	X	PETERS RIVER NEAR BOTWOOD
02Y0007	88.3	485642	0554942	X	LEECH BROOK NEAR GRAND FALLS
02YP001	63.8	492218	0554844	X	SHOAL ARM BROOK NEAR BADGER BAY
02YQ001	4400	490055	0545113	X	GANDER RIVER AT BIG CHUTE
02YQ004	2150	484607	0550452	X	NORTHWEST GANDER RIVER NEAR GANDER LAKE
02YR001	267	484828	0541328	X	MIDDLE BROOK NEAR GAMBO
02YR002	399	492335	0540625	X	RAGGED HARBOUR RIVER NEAR MUSGRAVE HARBOUR
02YR003	554	490224	0535300	X	INDIAN BAY BROOK NEAR NORTHWEST ARM
02YS001	1290	482630	0542221	X	TERRA NOVA RIVER AT EIGHT MILE BRIDGES
02YS003	36.7	483625	0535850	X	SOUTHWEST BROOK AT TERRA NOVA NATIONAL PARK
02ZA001	343	482644	0582355	X	LITTLE BARACHOIS BROOK NEAR ST. GEORGE'S
02ZA002	72.0	480633	0584704	X	HIGHLANDS RIVER AT TRANS-CANADA HIGHWAY
02ZA003	139	474919	0591140	X	LITTLE CODROY RIVER NEAR DOYLES
02ZB001	205	473650	0590033	X	ISLE AUX MORTS RIVER BELOW HIGHWAY BRIDGE
02ZC002	230	475127	0574400	X	GRANDY BROOK BELOW TOP POND BROOK
02ZD002	1340	474435	0565605	X	GREY RIVER NEAR GREY RIVER
02ZE003	5910	475900	0555112	X	SALMON RIVER AT BAY D'ESPOIR POWERHOUSE
02ZF001	1170	474448	0552630	X	BAY DU NORD RIVER AT BIG FALLS
02ZG001	205	471250	0551945	X	GARNISH RIVER NEAR GARNISH
02ZG002	166	470738	0551554	X	TIDES BROOK BELOW FRESHWATER POND
02ZG003	115	465229	0554639	X	SALMONIER RIVER NEAR LAMALINE
02ZG004	42.7	472702	0545118	X	RATTLE BROOK NEAR BOAT HARBOUR
02ZH001	764	475649	0541708	X	PIPERS HOLE RIVER AT MOTHERS BROOK
02ZH002	43.3	475507	0535659	X	COME BY CHANCE RIVER NEAR GOOBIES
02ZJ001	67.4	482244	0534036	X	SOUTHERN BAY RIVER NEAR SOUTHERN BAY
02ZJ002	73.6	482345	0531806	X	SALMON COVE RIVER NEAR CHAMPNEYS
02ZK001	285	471329	0533406	X	ROCKY RIVER NEAR COLINET
02ZK002	89.6	471626	0535027	X	NORTHEAST RIVER NEAR PLACENTIA
02ZK003	37.2	471053	0540227	X	LITTLE BARASWAY RIVER NEAR PLACENTIA
02ZK004	104	470525	0534048	X	LITTLE SALMONIER RIVER NEAR NORTH HARBOUR
02ZL001	89.8	475128	0532248	X	HEART'S CONTENT RIVER AT SOUTHERN COVE POND

NEWFOUNDLAND

STA.NO.	D.A.	LAT.	LONG.	NAT REG	STATION NAME
02ZL002	72.5	480118	0531220	X	NEW CHELSEA BROOK AT SEAL COVE POND
02ZL003	10.8	474843	0530915	X	SPOUT COVE BROOK NEAR SPOUT COVE
02ZL004	28.9	473502	0531829	X	SHEARSTOWN BROOK AT SHEARSTOWN
02ZM001	134	472727	0524347	X	PETTY HARBOUR RIVER AT SECOND POND
02ZM002	117	471750	0525100	X	PIERRES BROOK AT GULL POND
02ZM003	112	471458	0525320	X	MOBILE RIVER AT MOBILE FIRST POND
02ZM005	76.9	472654	0530332	X	SEAL COVE RIVER AT WHITE HILL POND
02ZM006	3.90	473806	0525014	X	NORTHEAST POND RIVER AT NORTHEAST POND
02ZM008	52.7	473147	0524434	X	WATERFORD RIVER AT KILBRIDE
02ZM009	53.6	465050	0525827	X	SEAL COVE BROOK NEAR CAPPAYDEN
02ZM010	16.6	473120	0524825	X	WATERFORD RIVER AT MOUNT PEARL
02ZM011	11.4	473141	0524942	X	WATERFORD RIVER NEAR DONOVANS INDUSTRIAL PARK
02ZM012		473047	0524840	X	WATERFORD RIVER STORM WATER SEWER OUTFALL AT MOUNT PEARL
02ZM013	6.01	473040	0524548	X	SOUTH BROOK AT OLD BAY BULLS ROAD
02ZM014	3.16	473052	0524656	X	UNNAMED TRIBUTARY AT AGRICULTURE FARM
02ZM015	5.41	472945	0524841	X	SOUTH BROOK AT RUBY LINE
02ZM016	17.3	472141	0530702	X	SOUTH RIVER NEAR HOLYROOD
02ZM017	15.3	474202	0544503	X	LEARY BROOK AT ST. JOHN'S
02ZN001	53.3	465108	0531811	X	NORTHWEST BROOK AT NORTHWEST POND

LABRADOR

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STA.NO.	D.A.	LAT.	LONG.	NAT	REG	STATION NAME
02XA003	4540	521342	0611921	X		LITTLE MECATINA RIVER ABOVE LAC FOURMONT
02XA004	2060	520950	0600334	X		RIVIERE JOIR NEAR PROVINCIAL BOUNDARY
02XD001	35.5	514527	0562705	X		NORTHERN BROOK NEAR RED BAY
03NF001	7570	551400	0611757	X		UGJOKTOK RIVER BELOW HARP LAKE
03NG001	8930	543725	0605838	X		KANAIKTIK RIVER BELOW SNEGAMOOK LAKE
03OA001	19000	542718	0663730		X	ASHUANIPI RIVER AT MENIHEK RAPIDS
03OA004	8310	531340	0661224	X		ASHUANIPI RIVER BELOW WIGHTMAN LAKE
03OC003	15100	525803	0643940	X		ATIKONAK RIVER ABOVE PANCHIA LAKE
03OC004	7070	523910	0645051	X		ATIKONAK RIVER (WEST BRANCH) BELOW KEPIMITS LAKE
03OC005	3680	521714	0641940	X		ATIKONAK RIVER ABOVE ATIKONAK LAKE
03OC006	21400	534620	0652347		X	ATIKONAK RIVER AT GABBRO LAKE
03OD005	69200	533210	0635751		X	CHURCHILL RIVER AT CHURCHILL FALLS POWERHOUSE
03OD006		532653	0644609		X	ATIKONAK RIVER AT OSSAKMANUAN LAKE CONTROL STRUCTURE
03OE001	92500	531452	0604721		X	CHURCHILL RIVER ABOVE UPPER MUSKRAT FALLS
03OE003	2330	523653	0611111	X		MINIPI RIVER BELOW MINIPI LAKE
03PB002	4480	540754	0612545	X		NASKAUPI RIVER BELOW NASKAUPI LAKE
03QC001	10900	533203	0572942	X		EAGLE RIVER ABOVE FALLS
03QC002	2310	523857	0565217	X		ALEXIS RIVER NEAR PORT HOPE SIMPSON

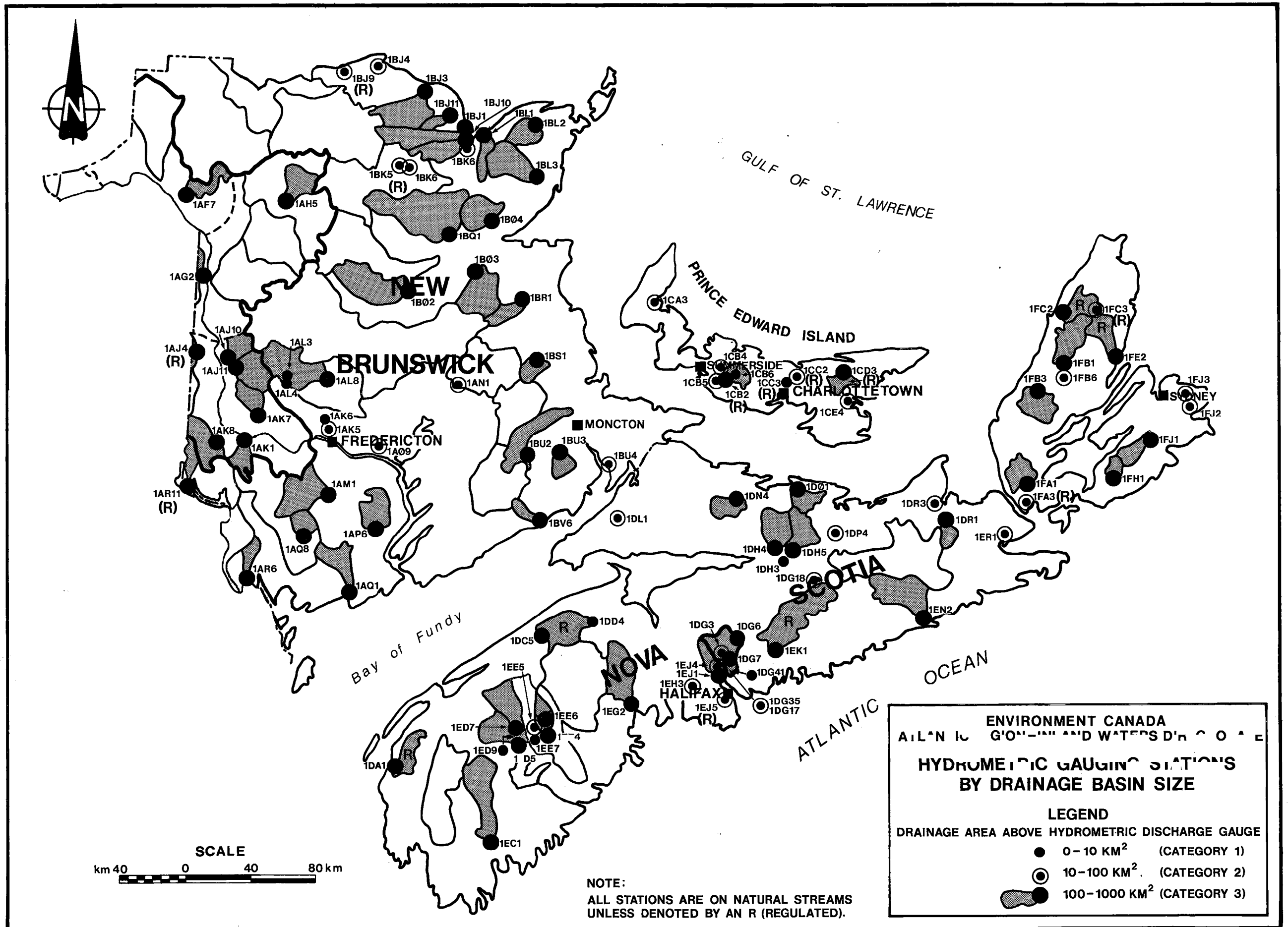


Figure A.1.a

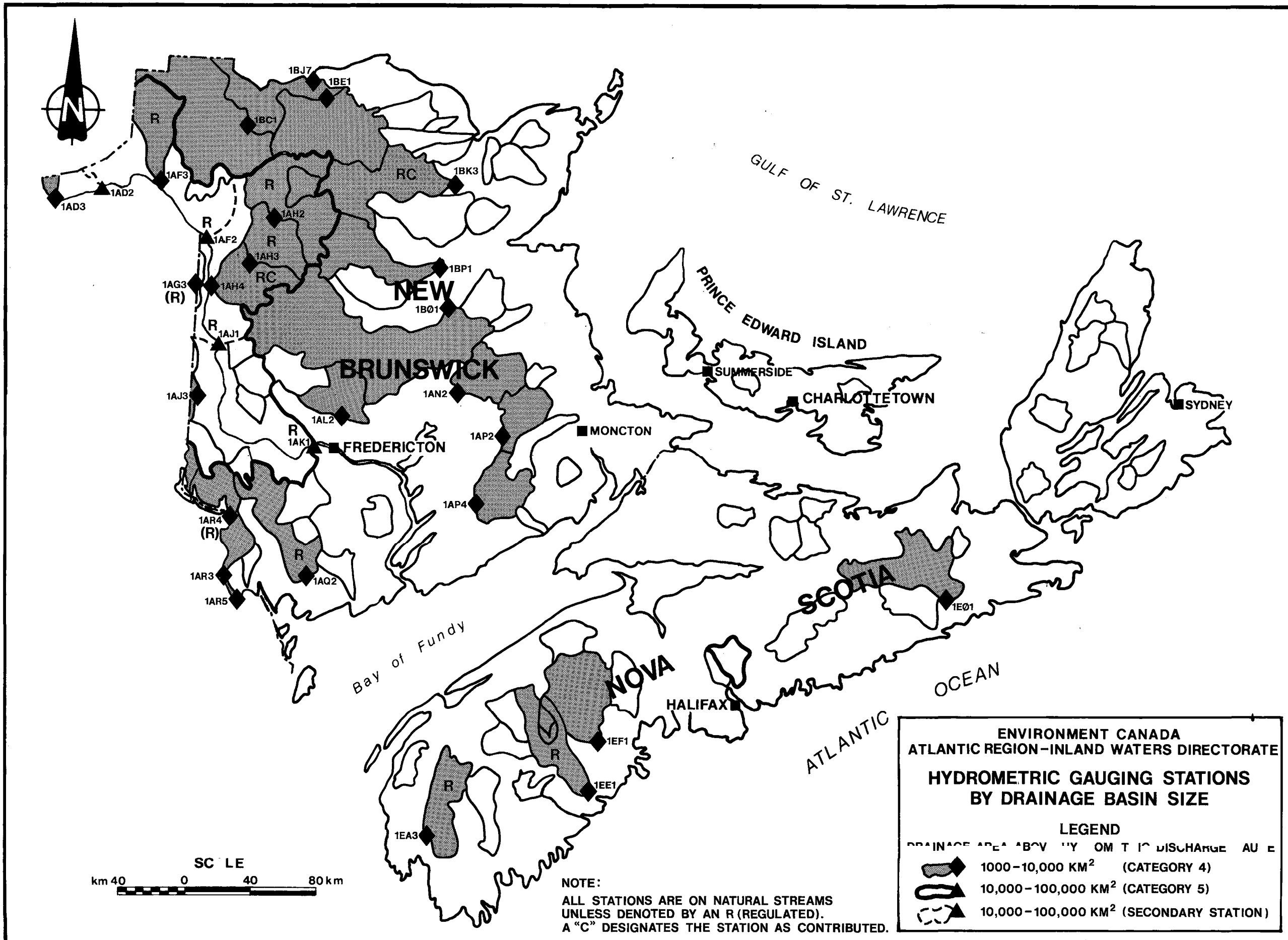
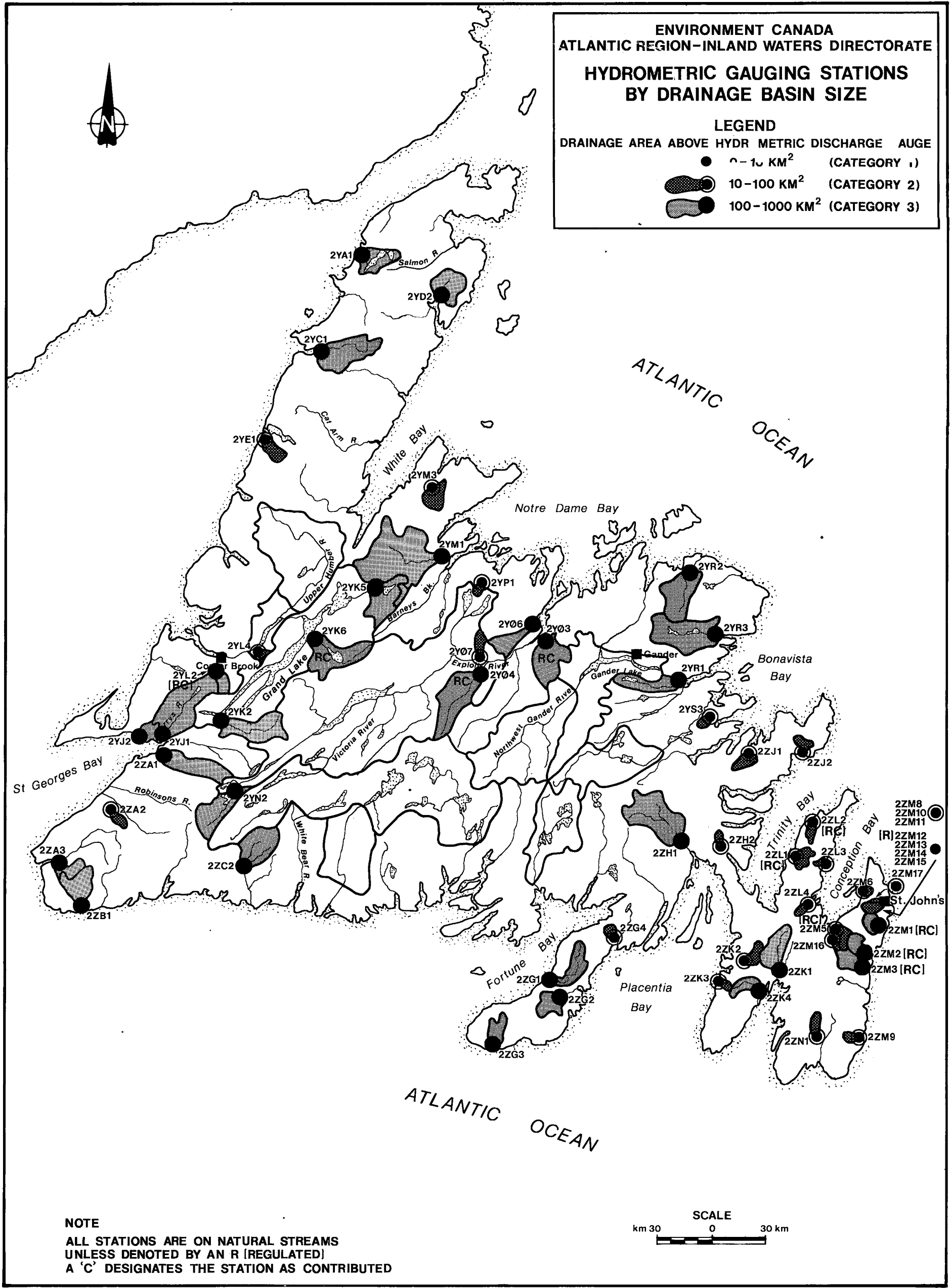


Figure A.1.b

ENVIRONMENT CANADA
 ATLANTIC REGION-INLAND WATERS DIRECTORATE
**HYDROMETRIC GAUGING STATIONS
 BY DRAINAGE BASIN SIZE**

LEGEND
 DRAINAGE AREA ABOVE HYDR METRIC DISCHARGE AUGE

●	0-10 KM ²	(CATEGORY 1)
◐	10-100 KM ²	(CATEGORY 2)
◑	100-1000 KM ²	(CATEGORY 3)



NOTE
 ALL STATIONS ARE ON NATURAL STREAMS
 UNLESS DENOTED BY AN R [REGULATED]
 A 'C' DESIGNATES THE STATION AS CONTRIBUTED

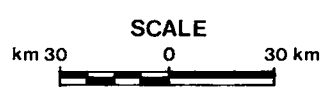
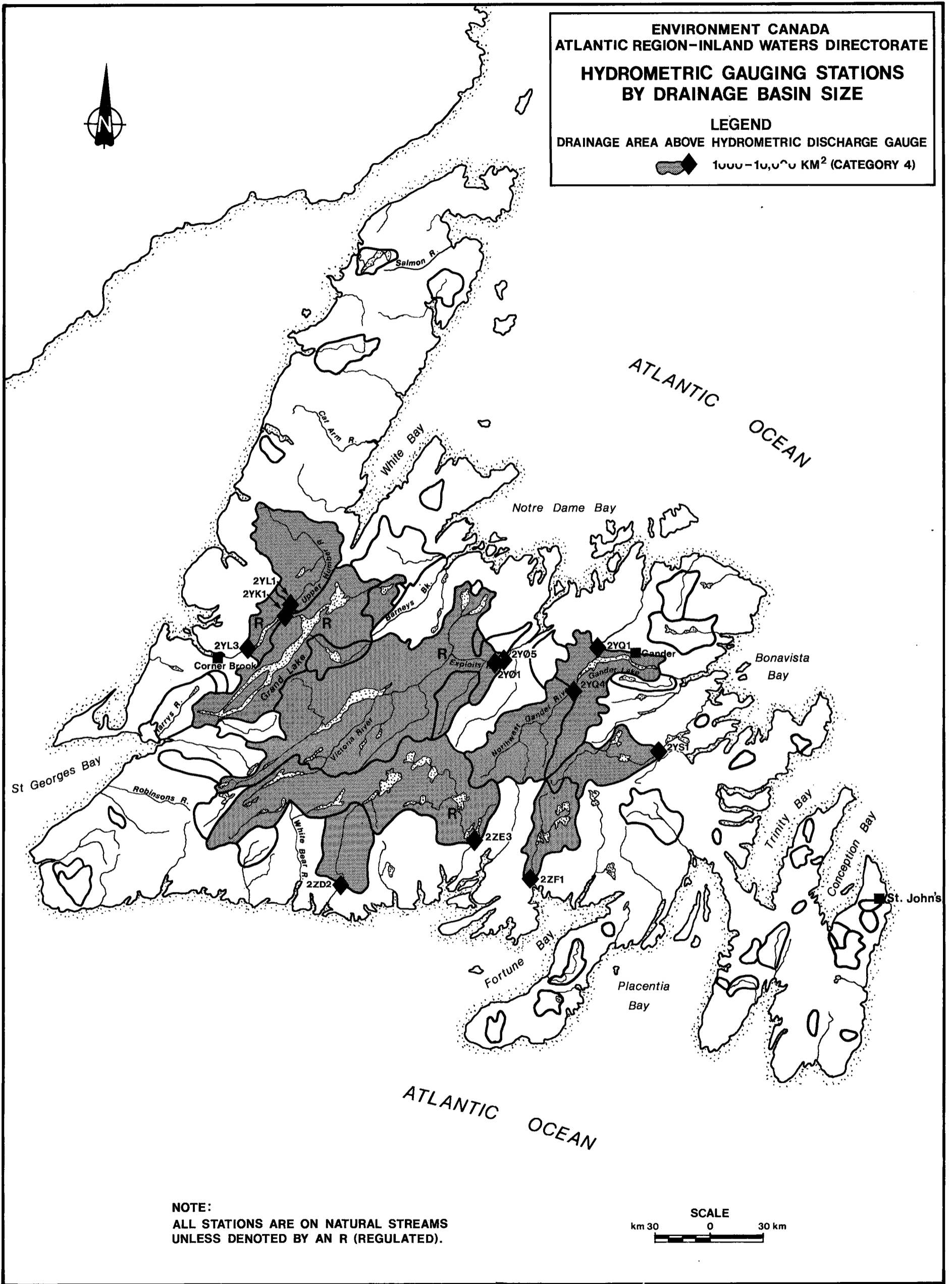


Figure A.2.a

ENVIRONMENT CANADA
 ATLANTIC REGION-INLAND WATERS DIRECTORATE
**HYDROMETRIC GAUGING STATIONS
 BY DRAINAGE BASIN SIZE**

LEGEND
 DRAINAGE AREA ABOVE HYDROMETRIC DISCHARGE GAUGE
 1000-10,000 KM² (CATEGORY 4)



NOTE:
 ALL STATIONS ARE ON NATURAL STREAMS
 UNLESS DENOTED BY AN R (REGULATED).

SCALE
 km 30 0 30 km

Figure A.2.b

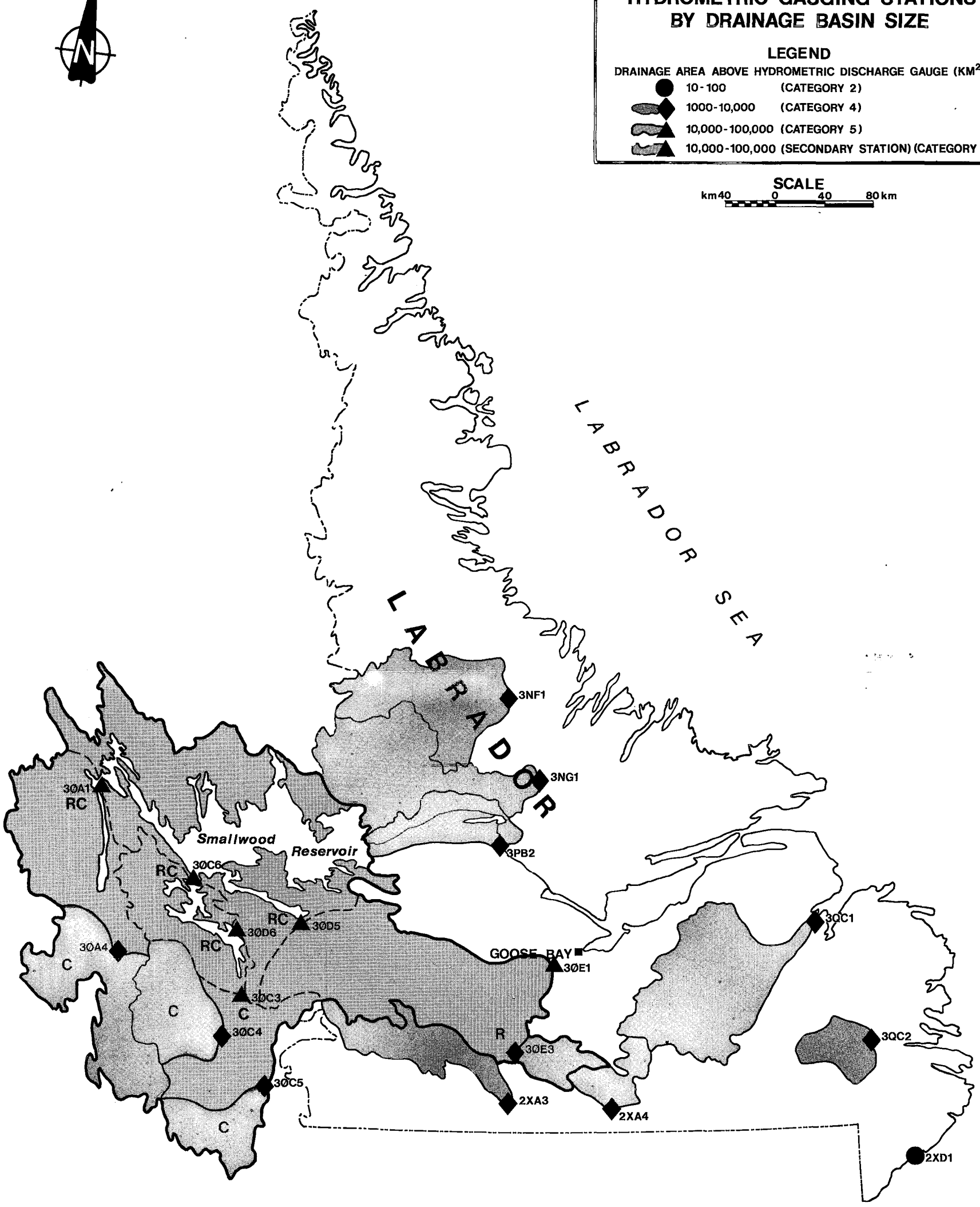
ENVIRONMENT CANADA
ATLANTIC REGION - INLAND WATERS DIRECTORATE

HYDROMETRIC GAUGING STATIONS BY DRAINAGE BASIN SIZE

LEGEND

DRAINAGE AREA ABOVE HYDROMETRIC DISCHARGE GAUGE (KM²)

- 10 - 100 (CATEGORY 2)
- ◆ 1000 - 10,000 (CATEGORY 4)
- ▲ 10,000 - 100,000 (CATEGORY 5)
- ▲ 10,000 - 100,000 (SECONDARY STATION) (CATEGORY 5)



NOTE:
ALL STATIONS ARE ON NATURAL STREAMS
UNLESS DENOTED BY AN R (REGULATED).
A "C" DENOTES A STATION AS CONTRIBUTED.

Figure A.3

12. APPENDIX B

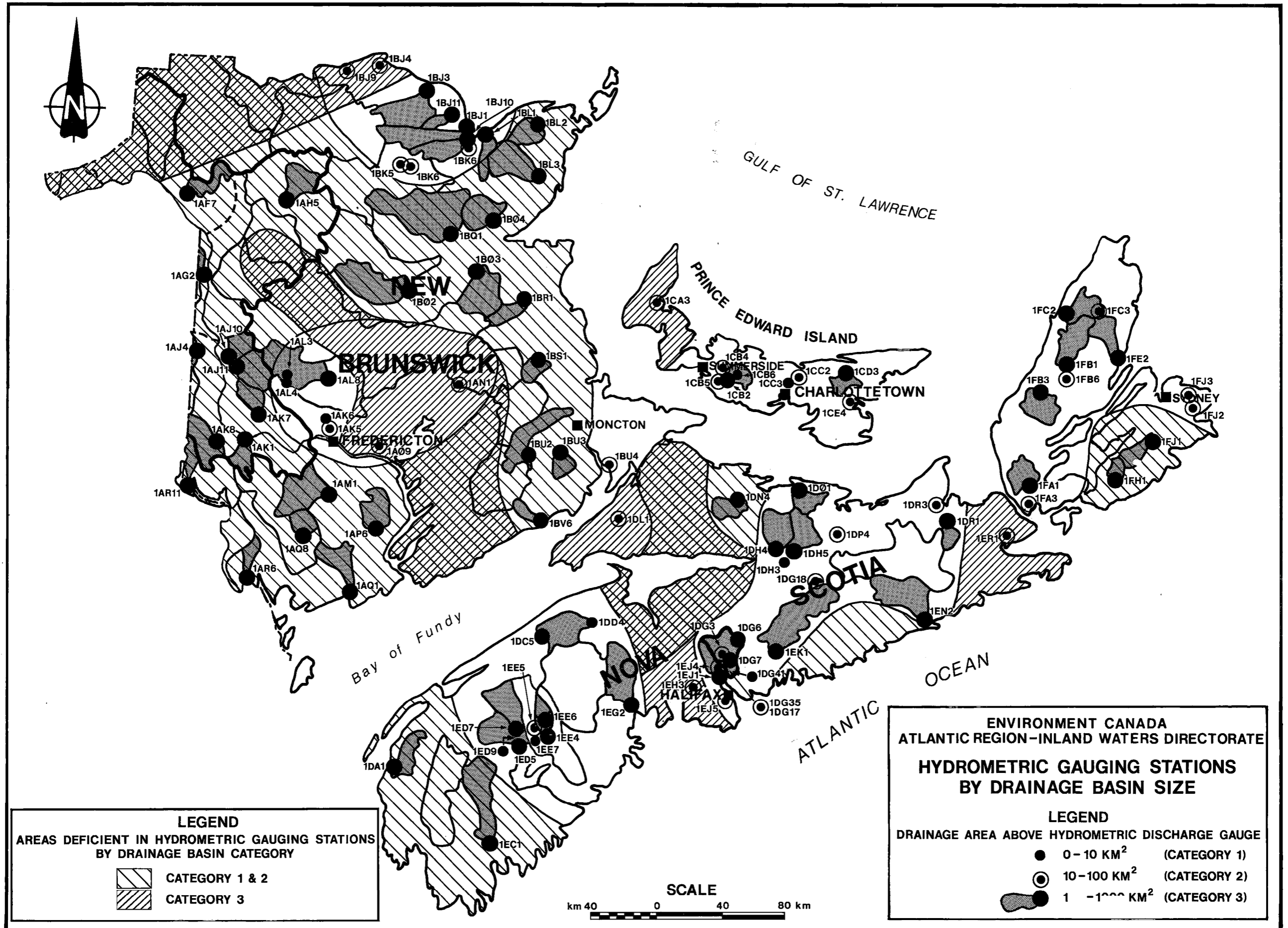


Figure B.1.a

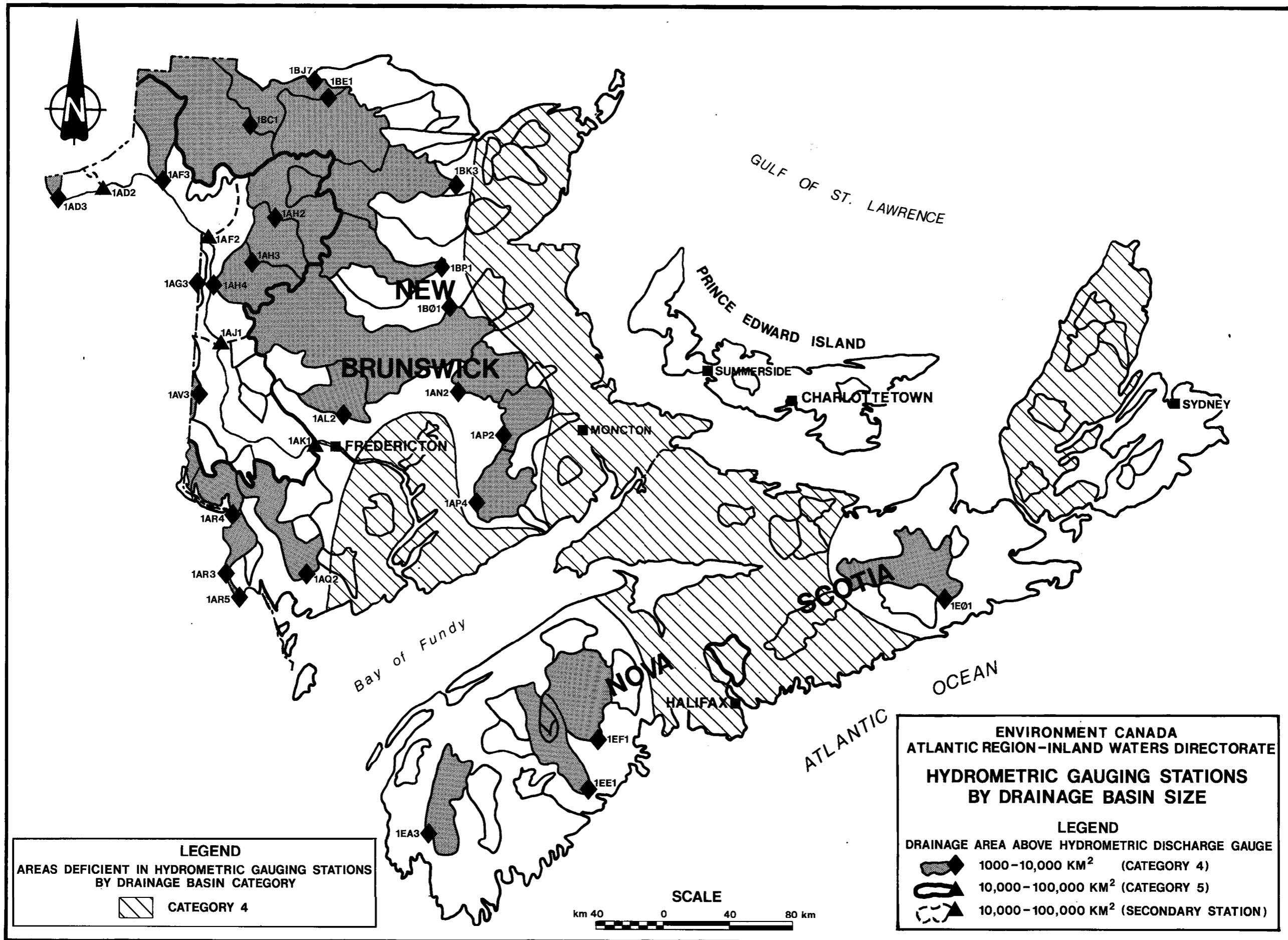
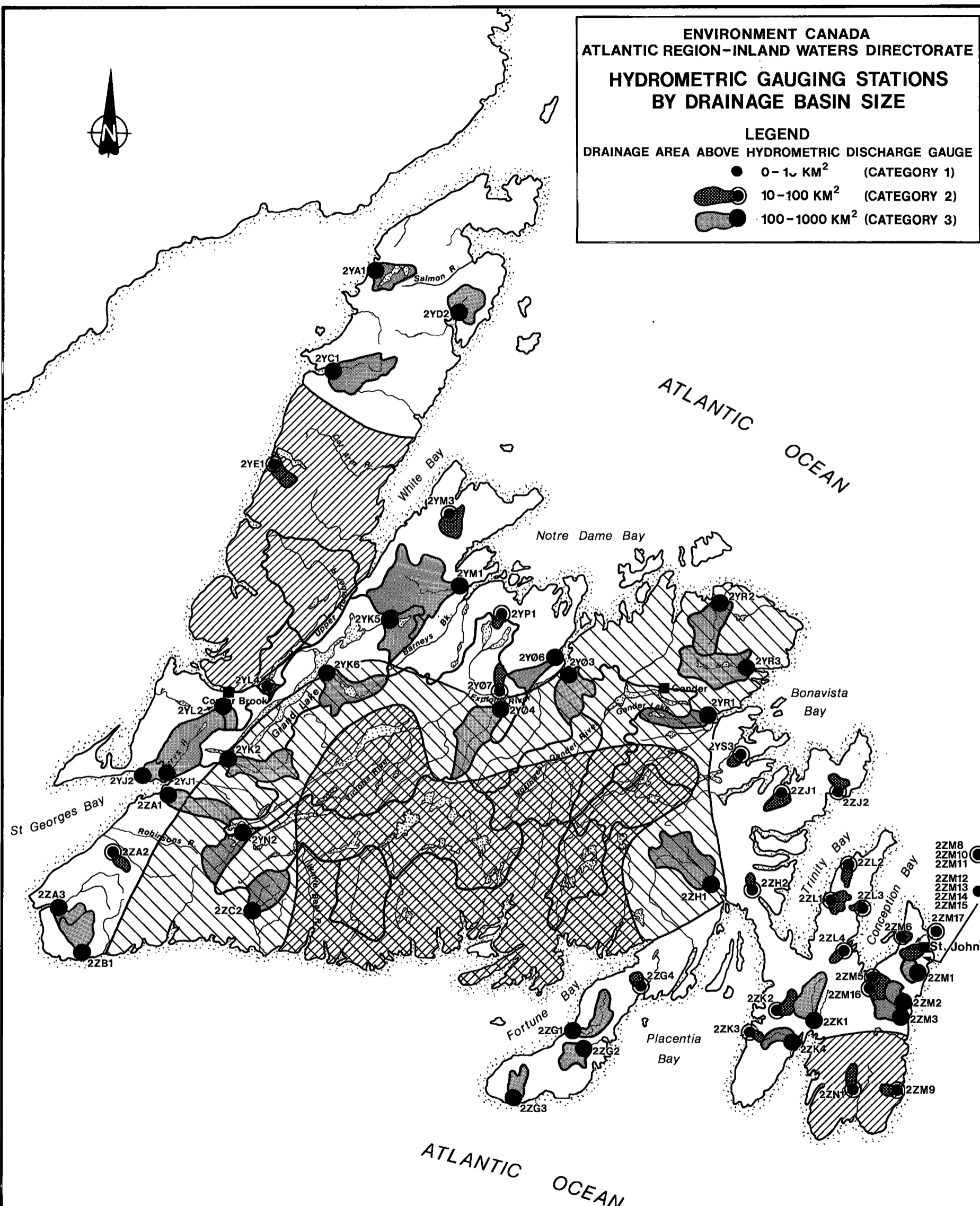


Figure B.1.b

ENVIRONMENT CANADA
 ATLANTIC REGION-INLAND WATERS DIRECTORATE
**HYDROMETRIC GAUGING STATIONS
 BY DRAINAGE BASIN SIZE**

LEGEND
 DRAINAGE AREA ABOVE HYDROMETRIC DISCHARGE GAUGE

- 0-10 KM² (CATEGORY 1)
- ◐ 10-100 KM² (CATEGORY 2)
- ◑ 100-1000 KM² (CATEGORY 3)




LEGEND
 AREAS DEFICIENT IN HYDROMETRIC GAUGING STATIONS
 BY DRAINAGE BASIN CATEGORY

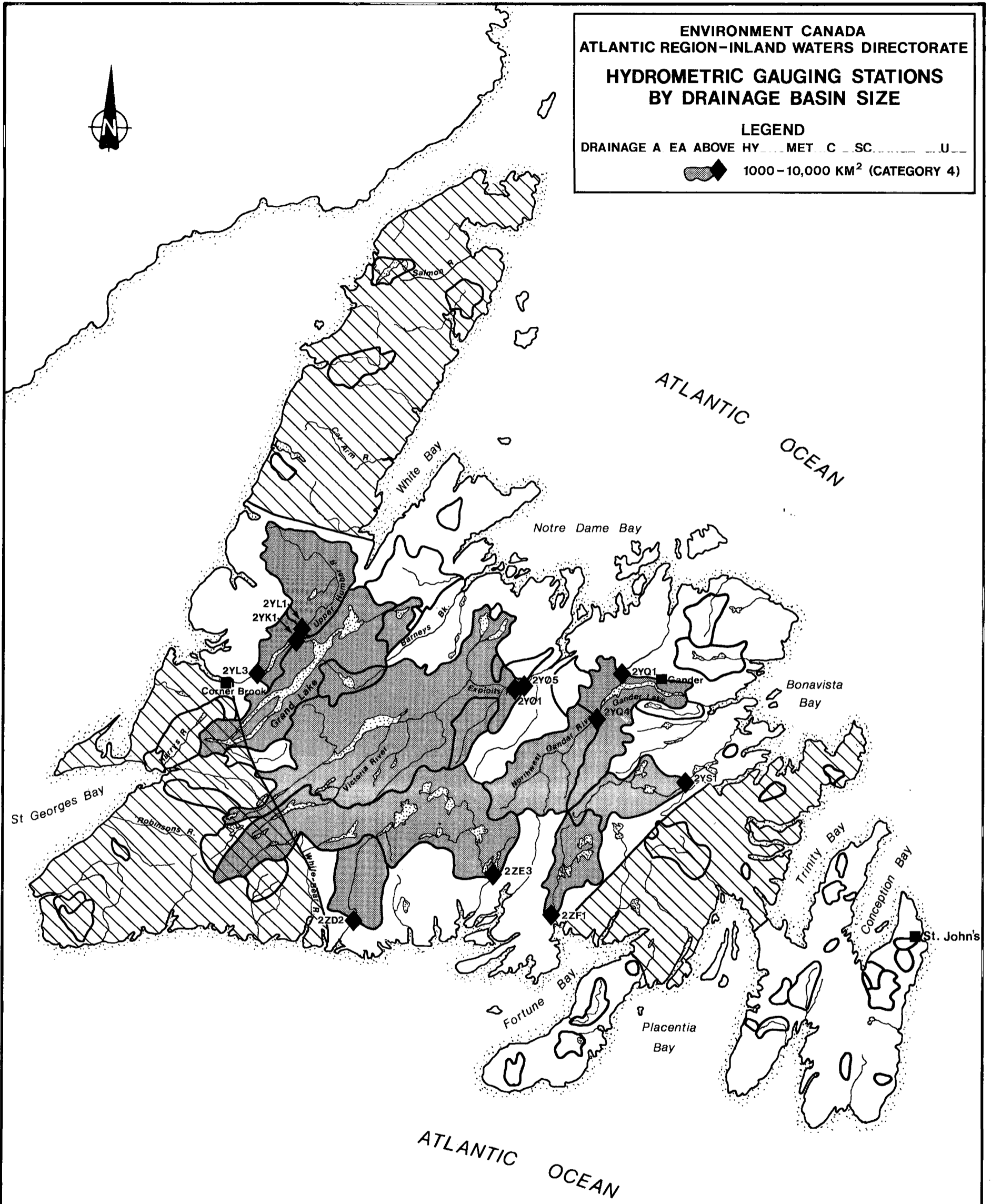
- ◐ CATEGORY 1 & 2
- ◑ CATEGORY 3

SCALE
 km 30 0 30 km

Figure B.2.a

ENVIRONMENT CANADA
 ATLANTIC REGION-INLAND WATERS DIRECTORATE
**HYDROMETRIC GAUGING STATIONS
 BY DRAINAGE BASIN SIZE**

LEGEND
 DRAINAGE A EA ABOVE HY MET C SC U
 1000-10,000 KM² (CATEGORY 4)



LEGEND
 AREAS DEFICIENT IN HYDROMETRIC GAUGING STATIONS
 BY DRAINAGE BASIN CATEGORY
 CATEGORY 4

SCALE
 km 30 0 30 km

Figure B.2.b

ENVIRONMENT CANADA
 ATLANTIC REGION - INLAND WATERS DIRECTORATE

HYDROMETRIC GAUGING STATIONS BY DRAINAGE BASIN SIZE

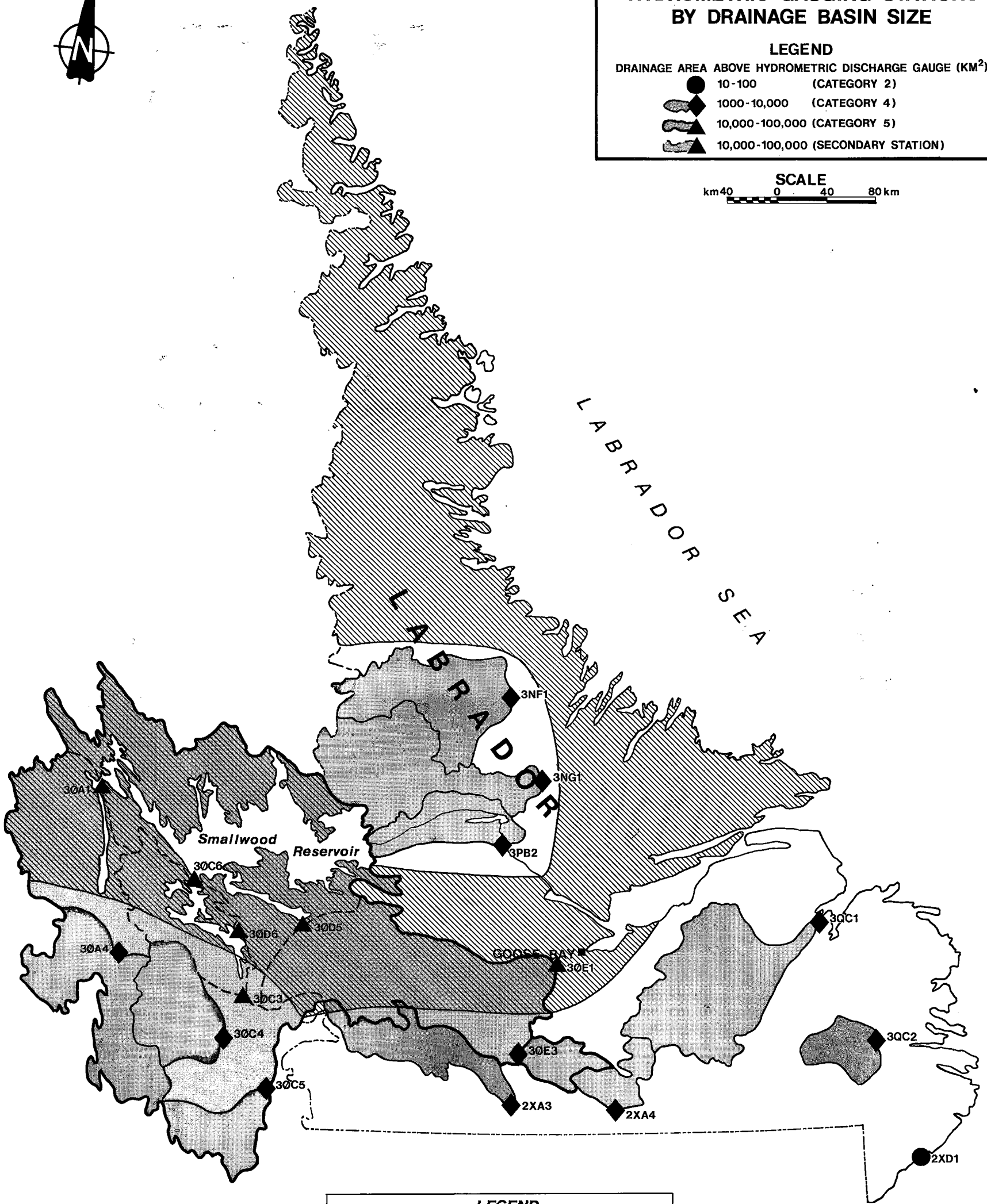
LEGEND

DRAINAGE AREA ABOVE HYDROMETRIC DISCHARGE GAUGE (KM²)

- 10-100 (CATEGORY 2)
- ◆ 1000-10,000 (CATEGORY 4)
- ▲ 10,000-100,000 (CATEGORY 5)
- ▲ 10,000-100,000 (SECONDARY STATION)

SCALE

km 40 0 40 80 km



LEGEND

AREAS DEFICIENT IN HYDROMETRIC GAUGING STATIONS
 BY DRAINAGE BASIN CATEGORY

▨ CATEGORY 4

Figure B.3

