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Northwest Atlantic



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Marine Environmental Data Service Report for 1999

by

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Summary

MEDS has the responsibility to be the Regional Environmental Data Center for NAFO, and as such is required to provide an inventory of environmental data collected in the NAFO area annually to the NAFO subcommittee for the environment (STACFEN). This year's report (June 1999) is for the calendar year of 1998. The report includes physical oceanographic inventories of profiles, drifting buoys, waves, tides and water levels. It is important for STACFEN to encourage members to send data and information to the designated data centre in order to get significant return for NAFO.

Also included in this report are some of the recent activities at MEDS of interest to NAFO, such as:

- Archival of P-ALACE Float Data;
- Thermosalinograph data;
- World Ocean climate Experiment (WOCE) CD-Roms;
- Atlantic Zone Monitoring Program;

Background

MEDS has been recognized since 1975 as the Regional Environmental Data Center for ICNAF and subsequently for NAFO. As the regional center, MEDS is required to report on these data annually at the June Meeting of STACFEN, the Standing Committee of Fisheries and the Environment. In order for MEDS to carry out its responsibility of reporting to the Scientific Council, the Designated National Representatives selected by STACFEN are requested to provide MEDS with all marine environmental data collected in the Northwest Atlantic for the preceding years.

Provision of a meaningful report to the Council for its meeting in June 1999 required the submission to MEDS of a completed oceanographic inventory form for data collected in 1998, and oceanographic data pertinent to the NAFO area, for all stations occupied in the year prior to 1998. The data of highest priority are those from the standard sections and stations, as described in NAFO SCR DOC., No. 1, Serial N 1432, 9 p.

Contacting MEDS

Data that have been formatted and archived at MEDS are available to all interested scientists on request. Requests can be made by telephone (613) 990-0243; by internet e-mail to services@meds-sdmm.dfo-mpo.gc.ca, by completing an on-line order form on the MEDS WWW: www.meds-sdmm.dfo-mpo.gc.ca, or by writing to Services, Marine Environmental Data Service (MEDS), Dept. of Fisheries and Oceans, Station W 82, 12th Floor, 200 Kent St., Ottawa, Ont. Canada K1A 0E6.

References

List of NAFO Standard Oceanographic Sections and Stations. The reprint of NAFO SCR DOC., NO. 1, Serial N1432, 9 p. Printed and distributed by: NAFO, P.O. Box 638, Dartmouth, Nova Scotia, Canada B2Y 3Y9.

Recent Activities

1. Archival of P-ALACE Float Data

March 1998 was the start of a significant deployment of profiling floats reporting their data in the TESAC code form on the GTS (Fig. 1). Since that time, the number of floats have increased to over 200 in the water and more than 500 profiles each month (Fig. 2). The majority of the floats report temperature profiles only, and typically down to about 800 m. Most of the floats are operating in the north Atlantic, but there are now some reporting from the tropical Pacific. MEDS acquires and archives these data routinely as part of its GTSPP functions.

Figure 1:

P-ALACE float data received from 1998 (2547)

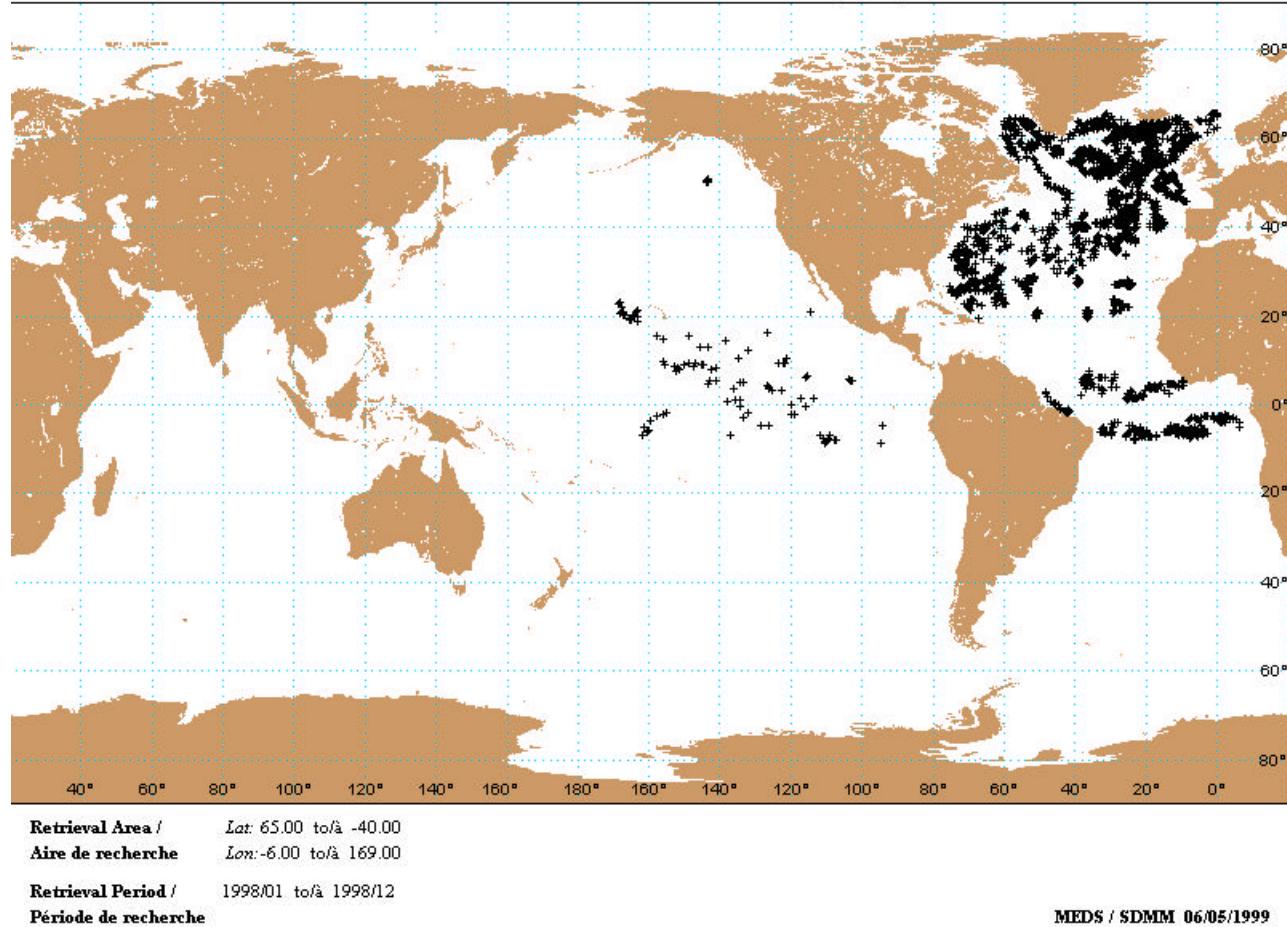
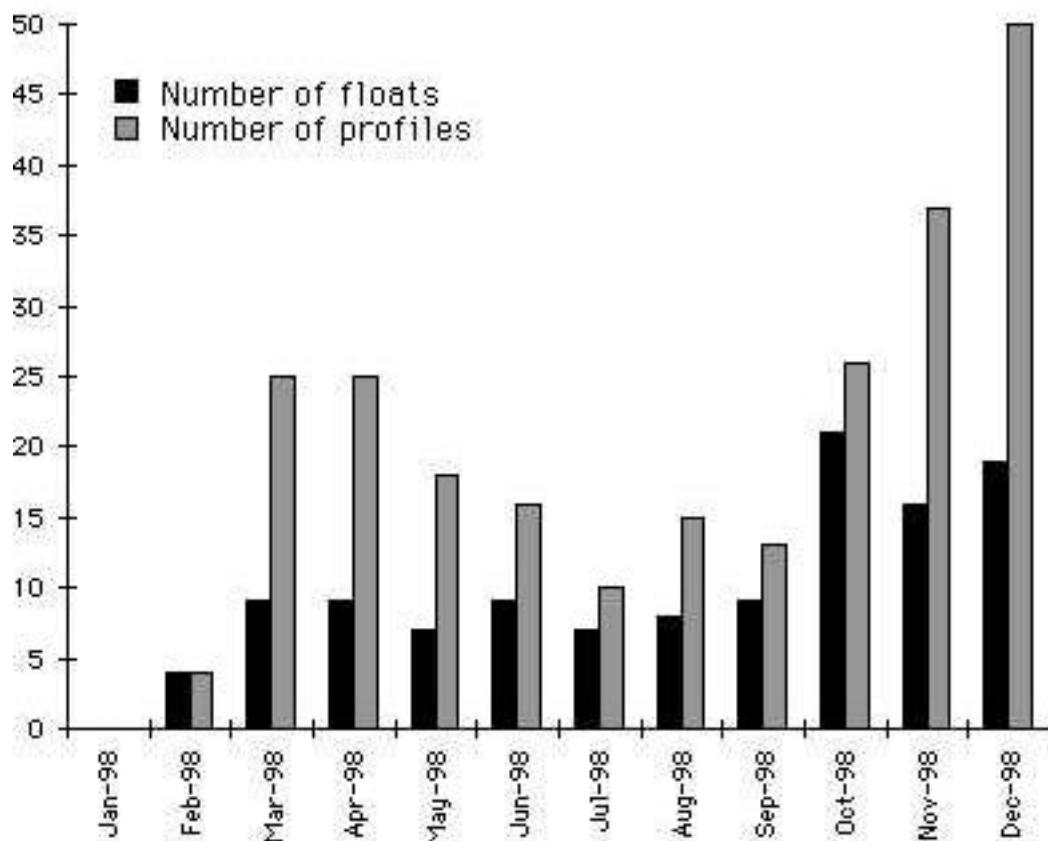


Figure 2:

P-ALACE float Statistics for the NAFO area in 19982. Thermosalinograph data

A number of vessels have been equipped with thermosalinographs to collect surface temperatures and salinities. These data are transmitted via satellite and GTS and captured and archived at MEDS. Until recently, there was very little international effort to quality control and process these data. Recent thrust on global observing systems and data assimilation has provided some impetus to design a data management system for this data. The sampling locations in 1998 and number of observation locations in NAFO area for each month are given in Fig. 3 and 4 respectively.

Figure 3:

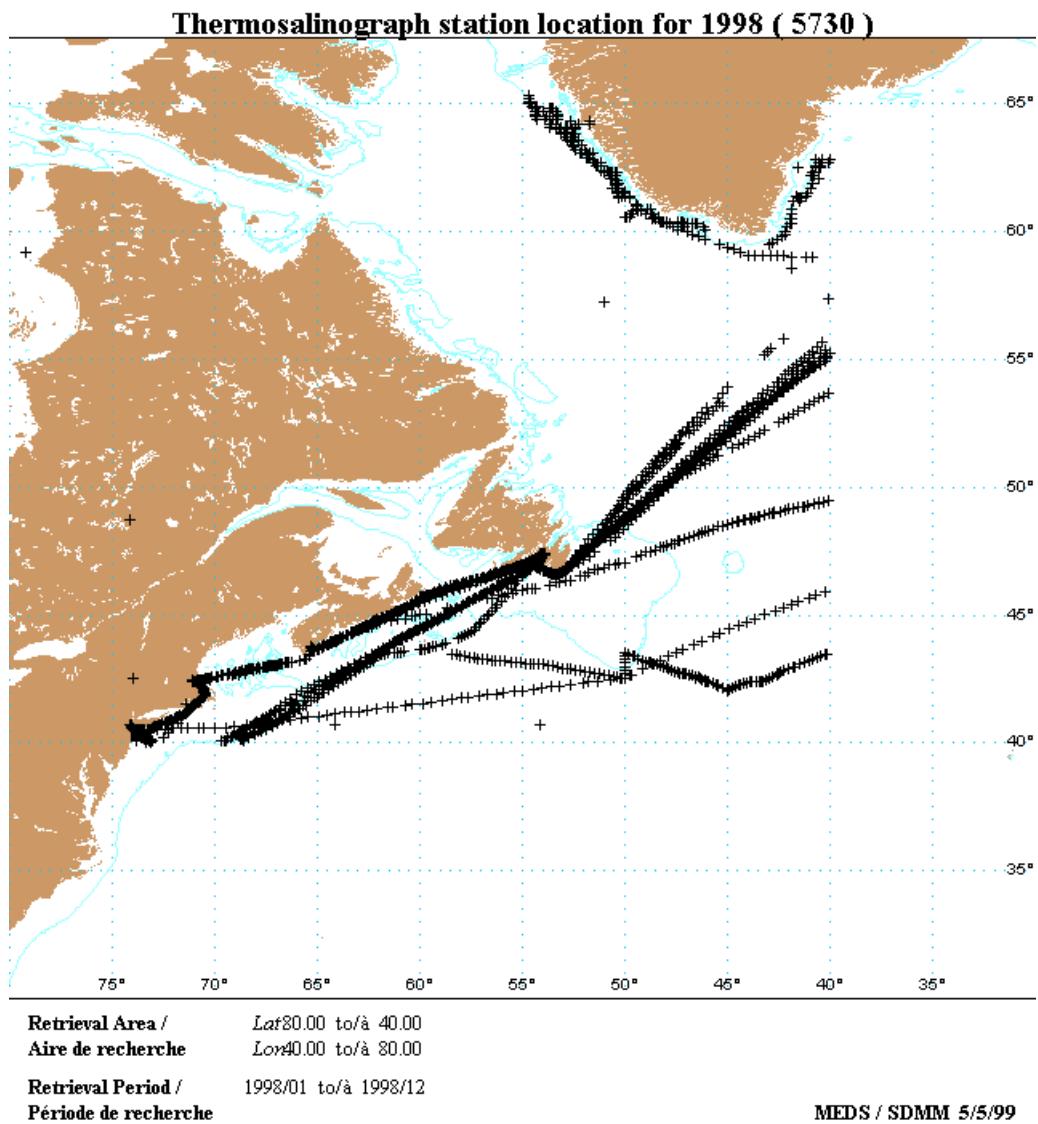
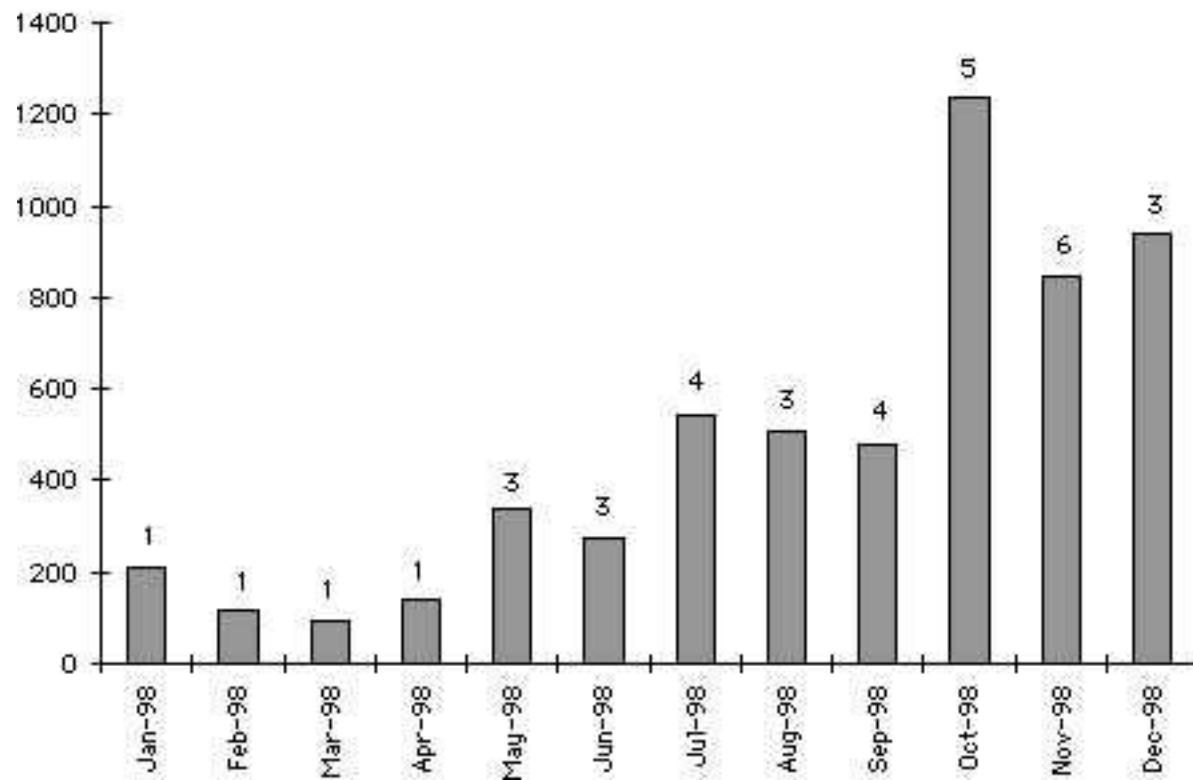


Figure 4:

Number of TSG reports in the NAFO area
 (Numbers at the top of each bar are the number of ships reporting that month)



3. WOCE CD-Roms

In May 1998, the WOCE Data Products Committee issued the first set of CD-ROMS containing all of the available data from the WOCE programme that had been assembled up to the end of 1997. The intention of this first issue was to make the data widely available. A second version is planning to be issued in May of 2000. This issue will increase the data content and correct identified shortcomings on the first version. In addition, all of the data are planning to be issued in a common format to facilitate combining of the data handled by the various WOCE DACs. MEDS will again take a lead in developing the content of the SVP and UOT CDs.

4. Atlantic Zone Monitoring Programme

DFO has funded a programme for the East Coast of Canada called the Atlantic Zonal Monitoring Programme. This coordinates resources from all the East Coast oceanographic institutes to provide a monitoring of the marine climate, biology and chemical responses. Data management will be distributed among participants with MEDS leading the data management team. Particular emphasis will be given to organizing the biology data and data access in near-real time over the network.

Data Inventories:

Ocean Subsurface Data

Vertical profiles are collected worldwide with water sampling bottles and electronic instruments. These subsurface measurements include temperature, salinity, oxygen, a wide variety of nutrients and chemicals, and

biological and other physical variables. Derived parameters, such as sigma-t and geopotential anomaly can be computed upon request.

MEDS becomes aware of surveys of the physics and chemistry of the water column, directly, by delivery of these data to MEDS from responsible institutions and the IGOSS reporting system, and, indirectly, from Cruise Summary Reports and other reports of ocean cruise activity. Table 1 lists data collected in the NAFO area in 1998, received at MEDS but not yet archived. Table 2 gives a summary of the MEDS IGOSS archive for data received during 1998. Table 3 gives a summary of the IGOSS data received for 1998, which has been processed and archived. Table 4a lists data processed and archived, in the past year, which was in the NAFO area, but for years prior to 1998. Table 4b lists those datasets that were received in the past year for years prior to 1998 but have not yet been processed.

Ocean subsurface data is processed at MEDS in much the same way for each of the data sets described in tables 2 and 3. Electronic files are converted from a wide range of formats, into a common Ocean's format. Quality control is carried out by a combination of specially designed software and trained personnel. The quality control has four main functions. The first is to check and ensure that each data message is properly formatted. The second is to identify duplication, and select the best version of a message, based on data type, source of the data, and general qualities in analysis and reporting of the observations. The third check identifies and, if possible, corrects the date/time and geographical positioning information of each message using computer tests and visual inspection of the track for each cruise. The final quality control procedure uses a series of algorithms to find and flag common instrument failures found in profiles of subsurface measurements. Each subsurface profile of temperature, salinity and other subsurface constituents, is also visually inspected using software to plot the data and allow a technician to set quality flags to individual points on a profile.

The tables show summaries of data for the NAFO area. Much of the data MEDS has been aware of, for 1998, has been processed and made available to scientists conducting environmental assessments of the NAFO area. Table 3 includes data from net mounted CTDs.

Table 1: Data collected in the NAFO area in 1998, received at MEDS but not yet archived.

MEDS ID	Country	Ship Name	
06WH98199	Germany	Walther Herwig	108stns
316N98001	USA	Knorr	33 BOT, 33 CTD
21 cruises.	USA	WHOI (USA) via BIO	2121stations
20 cruises	CDN Navy		XBT cruises, 604 stations.
NAFC Assigned Cruise Numbers			

Year	Ship	Cruise	MEDS Cruise #	#CTD	#XBT
1998	3	274	18OK98001	0	31
1998	3	275	18OK98002	0	2
1998	3	276	18OK98003	0	33
1998	3	277	18OK98004	0	10
1998	3	278	18OK98005	1	21
1998	3	279	18OK98006	0	2
1998	3	280	18OK98007	4	27
1998	3	282	18OK98008	1	23
1998	3	283	18OK98009	0	12
1998	3	284	18OK98010	0	11
1998	10	218	181C98001	0	26

Table 1: (continued).

MEDS ID		Country	Ship Name		
1998	10	219	181C98002	0	133
1998	10	220	181C98003	5	79
1998	10	221	181C98004	7	89
1998	10	222	181C98005	2	101
1998	10	223	181C98006	5	67
1998	10	224	181C98007	5	105
1998	10	225	181C98008	0	116
1998	10	226	181C98009	0	52
1998	10	227	181C98010	2	54
1998	10	228	181C98011	9	9
1998	10	229	181C98012	89	100
1998	10	230	181C98013	33	111
1998	10	231	181C98014	10	86
1998	10	232	181C98015	9	76
1998	10	233	181C98016	6	58
1998	25	6	18HB98001	0	30
1998	25	7	18HB98002	0	64
1997	26	1	18VA97100	0	30
1997	26	3	18VA97101	0	44
1997	26	4	18VA97102	0	10
1998	26	5	18VA98001	0	45
1998	26	6	18VA98002	0	45
1998	26	7	18VA98003	0	30
1998	38	1	18HG98001	17	17
1998	39	59	18TL98001	0	24
1998	39	60	18TL98002	0	15
1998	39	61	18TL98003	0	27
1998	39	62	18TL98004	50	23
1998	39	63	18TL98005	0	12
1998	39	64	18TL98006	0	8
1998	39	65	18TL98007	0	57
1998	39	66	18TL98008	0	2
1998	39	67	18TL98009	0	1
1998	39	68	18TL98010	108	71
1998	39	69	18TL98011	67	0
1998	39	70	18TL98012	0	26
1998	39	71	18TL98013	4	50
1998	39	72	18TL98014	1	97
1998	39	73	18TL98015	1	111
1998	39	74	18TL98016	7	118
1998	39	75	18TL98017	3	50
1998	39	76	18TL98018	4	48
1998	49	3	18VA98007	88	88
1998	51	705	189998001	0	51

Table 2: IGOSS Stations Archived at MEDS for 1998

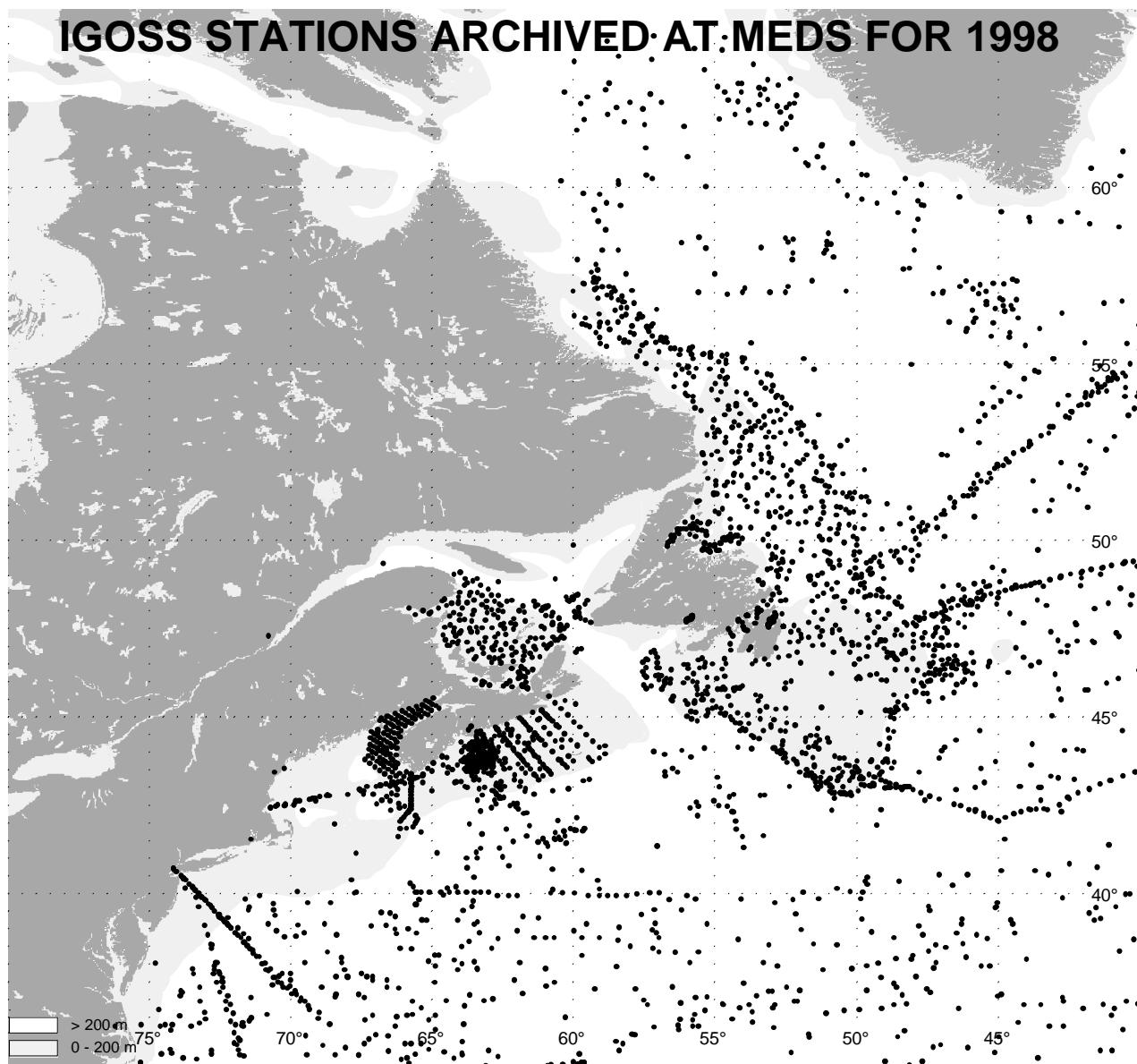


Table 2: IGOSS data received during 1998, and archived. Total = 3116 stations

Ship Name	Country	Call Sign	Cruise Period	BATHY	TESAC	NAFO Subarea
NEPTUNE OLIVINE	SINGAPORE	2GQZ	98 Dec 02 - Dec 03	2	0	30, 4VS
		9VBL	98 Jan-08 - Jan-09	11	0	1F, 2J, 3K, 3L
			Mar-25 - Mar-26	2	0	3M
			Apr-08 - Apr-08	2	0	3M
			Jul-13 - Jul-14	8	0	3M, 3N
			Jul-27 - Jul-27	2	0	3M
			Oct-10 - Oct-11	5	0	3L, 3M
			Oct-25 - Oct-27	12	0	1F, 2J, 3K, 3L
				1	0	3L
				1	22	3L
AIRCRAFT SHAMOOK	USA CANADA	ACFT CG2676	98 Sep-29 - Oct-09	0	12	3L, 3PS
ALFRED NEEDLER	CANADA	CG2683	Sep-05 - Sep-25	0	204	4T, 4VN
			Oct-28 - Nov-25	0	254	4VS, 4W, 4X, 5Y
HOOD UNKNOWN	CANADA	CG2845 CGAG	Sep-16 - Sep-21	0	64	3PS
			Feb-17 - Feb-18	2	0	4X
			Apr-14 - Apr-14	1	0	4W
			May-03 - May-05	6	0	4W, 4X
			May-18 - May-19	2	0	4W, 4X
FREDERICTON	CANADA	CGAN	98 Feb-03 - Feb-04	2	0	4X, 6E
HMCS HALIFAX TELEOST	CANADA	CGAP CGCB	Dec 06 - Dec 09	3	0	3L, 3M, 3N
			Jan-05 - Jan-17	0	8	2J, 3L, 3PS
			Sep-18 - Sep-24	0	26	3L
			Oct-10 - Dec 18	16	408	2H, 2J, 3K, 3L, 3M, 3N
HUDSON W. TEMPLEMAN	CANADA	CGDG CGDV	Nov-20 - Nov-26	0	40	4W, 4X, 5ZE
			Sep-12 - Sep-17	2	52	3K, 3L
			Sep-22 - Oct-01	8	0	1F, 2H, 2J
			Oct-10 - Oct-21	11	89	3L, 3N, 3O
			Nov-09 - Dec 21	25	195	3K, 3L, 3N, 3O
NIPIGON	CANADA	CGZP	98 Feb-02 - Feb-04	4	0	4X, 6E
			Jun-02 - Jun-02	1	0	4W
			Jun-14 - Jun-14	1	0	4S
HALIFAX	CANADA	CHAA	Feb-23 - Feb-23	3	0	6G
			May-09 - May-09	3	0	4W, 4X
			Jun-08 - Jun-16	17	0	4R, 4S, 4T, 4VN, 4VS, 4W, 4X
			Aug-12 - Aug-13	3	0	4W, 4X
			Oct-19 - Nov-05	21	0	4W, 4X, 5Y, 5ZW
HMCS TORONTO	CANADA	CHAD	Dec 01 - Dec 10	17	0	3L, 3N, 4W
			Dec 15 - Dec 16	3	0	3N, 3O
			Jan-13 - Jan-14	4	0	3M, 3O, 3PS
			Sep-10 - Sep-11	3	0	4S, 4T
			Oct-15 - Oct-15	1	0	4W
ENDEAVOUR	CANADA	CYWK	Nov-03 - Nov-04	3	0	4X
			May-25 - May-27	7	0	4W
			Jun-02 - Jun-06	13	0	4W, 4X
			Apr-21 - Apr-21	1	0	4X
			Dec 07 - Dec 13	3	0	4W, 4X
ATHABASKAN	CANADA	CYWM	Feb-04 - Feb-04	1	0	6E
			Feb-23 - Feb-23	2	0	6G
			May-16 - May-20	13	21	3M, 3N
			May-30 - Jun-01	26	14	3L, 3M
			Jan-10 - Jan-14	1	1	2J, 6A
IROQUOIS	CANADA	CZGD	Apr-09 - Apr-09	1	0	6C
			Jan-12 - Jan-12	1	0	6D
			May-21 - May-23	5	0	3M, 3N, 4VS
			Jun-16 - Jun-17	2	0	3M, 3N
			Jan-04 - Jan-04	1	0	5ZE
GAUSS	GERMANY	DBBX	Jan-10 - Jan-14	1	1	2J, 6A
			Apr-09 - Apr-09	1	0	6C
			Jan-12 - Jan-12	1	0	6D
			May-21 - May-23	5	0	3M, 3N, 4VS
			Jun-16 - Jun-17	2	0	3M, 3N
WALTHER HERWIG	GERMANY	DBFR	Nov-01 - Nov-01	3	0	1F
			Nov-14 - Nov-16	6	0	3M, 3N, 4VS, 4W, 4X
			Jul-08 - Jul-12	41	0	3M, 3N, 4VS, 4W, 4X
			Jan-04 - Jan-04	1	0	5ZE
			Jan-10 - Jan-14	1	1	2J, 6A
UNKNOWN	LIBERIA	ELVX4	Apr-09 - Apr-09	1	0	6C
			Jan-12 - Jan-12	1	0	6D
			May-21 - May-23	5	0	3M, 3N, 4VS
			Jun-16 - Jun-17	2	0	3M, 3N
			Jan-04 - Jan-04	1	0	5ZE
EMPIRE STATE	USA	KKFW	Jan-04 - Jan-04	1	0	6D
			Jan-10 - Jan-14	1	1	2J, 6A
			Apr-09 - Apr-09	1	0	6C
			Jan-12 - Jan-12	1	0	6D
			May-21 - May-23	5	0	3M, 3N, 4VS
NOLIZWE	UK	MQLN7	Oct-26 - Oct-27	3	0	6D
			Dec 14 - Dec 14	4	0	6D
			Jan-04 - Jan-06	7	0	5ZW, 6D, 6E
			Jun-01 - Jun-02	5	0	6B, 6D, 6E
			Jul-19 - Jul-20	2	0	6D
NOMZI	UK	MTQU3	Sep-07 - Sep-08	4	0	5ZW, 6D
			Oct-26 - Oct-27	3	0	6D
			Dec 14 - Dec 14	4	0	6D
			Mar-04 - Mar-05	4	0	6D, 6E
			Apr-21 - Apr-22	4	0	6B, 6D, 6E
UNKNOWN	USA	NANY	Jun-09 - Jun-09	2	0	6B, 6D
			Jul-14 - Jul-15	2	0	6B
			Jul-20 - Jul-21	2	0	6C
			Aug-27 - Aug-28	2	0	6B
			Sep-12 - Sep-12	1	0	6C
			Jan-12 - Jan-13	2	0	6C

Table 2: (continued).

ICEPAT GROTON CT	USA	NIDK	98	Feb-12 - Feb-12 Mar-02 - Mar-02 Mar-18 - Mar-18	3 1 1	0 0 0	3L, 3M 3L 3K
UNKNOWN MORELOS	USA NETHERLAND	NSDT PGBB	98	Nov-07 - Nov-07 Aug-30 - Sep-02	5 12	0 0	6C, 6D 3M, 3N, 6D, 6E, 6F, 6G
OLEANDER	NETHERLAND	PJJU	98	Dec 26 - Dec 28 Jan-09 - Jan-14 Feb-14 - Feb-19 Oct-16 - Oct-21	9 21 21 22	0 0 0 0	6E, 6F, 6G, 6H 6A, 6B, 6D 6A, 6B, 6D 6A, 6B, 6D
UNKNOWN	UNKNOWN	SHIP	98	Jan-10 - Jan-10 Jan-17 - Feb-25	1 47	19	6B 1E, 1F, 2J, 3L, 3M, 4T, 4W, 4X, 5Z, 6A, 6C, 6D, 6E, 6F, 6H
				Mar-09 - Mar-10 Mar-30 - Apr-05 Apr-15 - Apr-24 May-04 - May-20 May-27 - Jun-21	4 8 15 36 67	0 0 0 0 0	4W, 4X 2J, 6A, 6B 3L, 3N, 4VS, 4W 3N, 4R, 4W, 4X 2G, 4R, 4S, 4VN, 4W, 4X, 6B, 6C, 6D
				Jun-29 - Jun-30 Jul-06 - Jul-08 Jul-18 - Jul-23 Jul-30 - Aug-04 Aug-13 - Aug-21 Aug-31 - Sep-02 Sep-09 - Sep-10 Oct-05 - Oct-06 Oct-13 - Nov-10	3 4 4 2 9 2 4 3 133	0 0 0 0 0 0 0 0 0	5Z, 6E 6B, 6C 2J, 6C 3PS, 6C 3N, 4VS, 4W, 4X 4W 4VN, 4W, 4X 3M, 4W 3L, 3M, 3N, 3O, 4VS, 4W, 4X, 5Y, 5Z, 6D
				Nov-16 - Nov-19 Dec 02 - Dec 13	9 14	0 0	4W, 4X 3N, 4VS, 4W, 4X
BJARNI SEAMUNDSSON	ICELAND	TFEA	98	Mar-12 - Mar-12 Apr-07 - Apr-08	1 2	0 0	1F 1F
UNKNOWN	ANTIGUA AN	V2AO3	98	Feb-19 - Feb-20 Mar-03 - Mar-04 Mar-19 - Mar-20 Mar-29 - Apr-01 Apr-15 - Apr-17 Apr-28 - Apr-28 May-14 - May-15 Jun-09 - Jun-12 Jun-22 - Jun-23 Feb-17 - Feb-22	4 4 3 3 4 3 5 3 3 19	0 0 0 0 0 0 0 0 0 0	1F, 3K, 3L 3K, 3L, 3M 3K, 3L 3K, 3L, 3M 3K, 3L, 3M 3K, 3L, 3M 1F, 2J, 3K, 3L 3K, 3L 3K, 3M 1F, 3K 1F, 2J, 3K, 3L, 4X, 5Y 3K, 3L, 4X 3K, 4X, 5Y, 5Z 1F, 2J, 3K, 3L, 4X, 5Y 3K, 4X, 5Y 1F, 2J, 3K, 4X, 5Y, 5Z 1F, 2J 5Z 4X, 5Y, 5Z 1F, 2J, 3K, 4X, 5Y, 5Z 5Y, 5Z
PENNYSMART BIBI ENDEAVOR	CANADA UK USA	VOFG VSB13 WAUW	98	Nov-30 - Dec 11 Mar-12 - Mar-12 Mar-06 - Mar-08 Apr-19 - Apr-20 Jul-09 - Jul-12 Jul-19 - Jul-22 Aug-20 - Aug-22 Sep-03 - Sep-05 Oct-01 - Oct-04 Dec 21 - Dec 21	86 1 6 3 9 3 22 12 5 1	0 0 0 0 0 0 0 0 0 0	30, 3PS 6E 6E, 6F, 6G, 6H 6D, 6F 5Z, 6E, 6G, 6H 3M, 6C 3M, 3N, 3O, 4W 6E, 6F, 6G, 6H 5Z, 6E, 6H 6D

Table 2: (continued).

ENTERPRISE	USA	WAUY	98	Apr-15 - Apr-18 May-17 - May-20 May-26 - May-29 Jun-24 - Jun-26 Jul-03 - Jul-06 Aug-05 - Aug-07 Sep-18 - Sep-21 Oct-27 - Oct-29 Nov-08 - Nov-11 Dec 05 - Dec 08 Dec 22 - Dec 22	6 8 15 6 14 9 11 4 12 12 4	0 0 0 0 0 0 0 0 0 0 0	6D, 6F, 6G, 6H 4X, 5ZE, 6E, 6F, 6G, 6H 3M, 3N, 4VS, 6C, 6D, 6E, 6F 3M, 3N, 4VS, 6C, 6D, 6E, 6F 3N, 3O, 4VS, 4W, 4X, 5ZE 4X, 5ZE, 5ZW, 6E, 6F, 6G, 6H 6F, 6G, 6H 3M, 6D, 6E, 6F, 6G, 6H 4W, 4X, 5ZE, 6F, 6G, 6H 6H
ENDEAVOR	USA	WCE5063	98	Jul-14 - Jul-14	1	0	5ZW
JOHN V VICKERS	USA	WTEC	98	May-11 - May-14 Jul-01 - Jul-03	6 18	0 0	6B, 6F, 6G, 6H 6E, 6F, 6G, 6H
FERREL	USA	WTEZ	98	Jul-12 - Jul-13	2	0	6C
SEALAND CRUSADER	USA	WZJF	98	Feb-07 - Feb-08 Feb-14 - Feb-15 Feb-21 - Feb-22 Mar-07 - Mar-07 Mar-28 - Mar-28 Apr-04 - Apr-04 Apr-09 - Apr-10 Jul-18 - Jul-18 Jul-25 - Jul-25 Jul-31 - Jul-31	2 2 2 1 1 5 10 1 2 1	0 0 0 0 0 0 0 0 0 0	6B, 6C 6B, 6C 6B, 6C 6B 6B 6A 6A, 6B, 6C 6B 6B 6C
				Oct-04 - Oct-04	3	0	6B, 6C

Table 3: Delayed mode Oceanographic Stations Archived at MEDS for 1998.

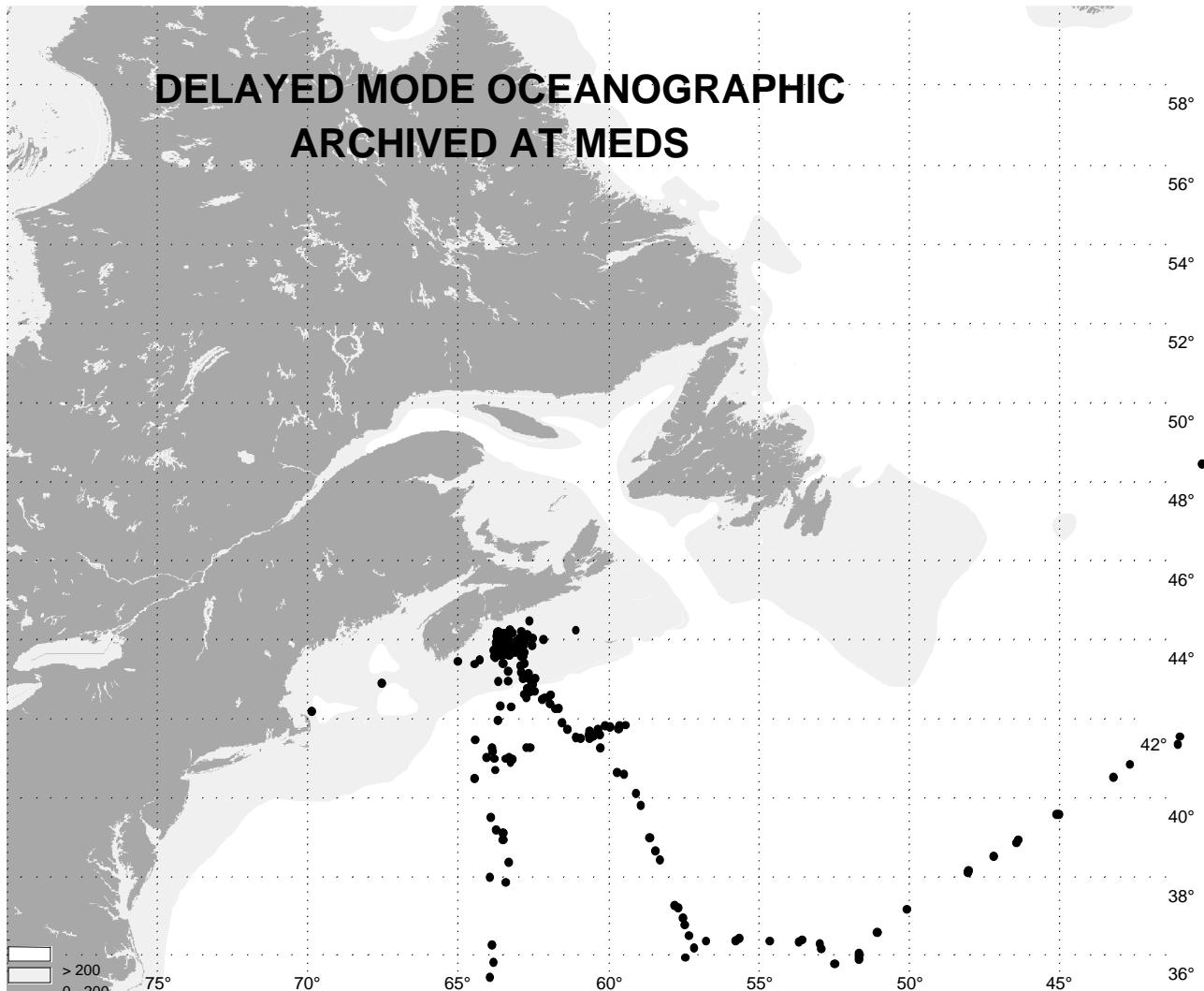


Table 3: Delayed mode data received during 1998. Total = 177 stations

Country	Cruise Num	Cruise Period	BT	CTD	BOTTLE	NAFO	Subarea
CANADA	18FN98001	Feb-02 - Feb-05	9	0	0	4X, 6E	
CANADA	18FN98002	Mar-09 - Mar-10	4	0	0	4W, 4X	
CANADA	18HL98001	Feb-20 - Feb-25	18	0	0	3M, 4W, 6F, 6G, 6H	
CANADA	18IS98001	Feb-02 - Feb-04	6	0	0	4X, 6E	
		Feb-22 - Feb-24	9	0	0	3M, 6F, 6G, 6H	
CANADA	18MP98001	Feb-16 - Feb-20	11	0	0	4X, 5ZE	
CANADA	18NN98003	May-11 - May-14	11	0	0	4W, 4X	
CANADA	18NN98004	May-19 - May-20	5	0	0	4X	
CANADA	18NN98005	May-30 - Jun-03	42	0	0	4W	
CANADA	18NN98006	Jun-08 - Jun-10	6	0	0	4W, 4X	
CANADA	18S698001	Feb-18 - Feb-25	17	0	0	3M, 4VS, 4W, 6F, 6G, 6H	
CANADA	18S698002	May-08 - May-15	29	0	0	4W, 4X	

Table 4 **Historical data (from years prior to 1998), received at MEDS since last NAFO report.**

Table 4a: **HISTORICAL DATA PROCESSED AND ARCHIVED.**
Total = 30225 stations

Cruise No	Year	BT	Bottle	CTD	NAFO	Subarea
06DA02320	1997	0	119	0	5Z,5Y,4X	
06WH97001	1949	0	0	63	XX,1E,1F,1C,1D	
180049022	1949	25	0	0	4R,3K,2J	
180049023	1949	3	0	0	2J	
180049031	1950	17	0	0	3K,4R	
180050022	1950	30	0	0	2J	
180050023	1950	33	0	0	2J	
180050036	1951	12	0	0	2G	
180051022	1951	19	0	0	2J	
180051023	1954	10	0	0	2J,2H	
180054023	1954	4	0	0	2H	
180054036	1954	3	0	0	2G	
180054037	1958	1	0	0	2G	
180158319	1960	0	42	0	6D,1C,1F,2J,0B,3M,6F,3K, 3N,XX,6G,4W,4V,2H, 0A,1D,5Z,3L	
180160325	1960	0	13	0	4V,4W,4R	
180160328	1961	0	58	0	3L,2J,1F,4S,4R,4V,3K,2H,3P	
180161343	1961	0	45	0	3L,4S,3P,4T,3K,4W,4R,2H,2J,4X,1F,3O	
180161347	1961	0	93	0	4T,4S,4R,4V,XX	
180161351	1962	0	48	0	4T,4S,4V,4R	
180162356	1967	0	60	0	4W,4V,3P,4X,6F	
180167045	1968	41	0	0	4W	
180168003	1957	0	56	0	4T,4X,4R,4V,4S	
180357244	1965	0	49	0	2G,0B,1A,2J,0A,XX,1D	
180365001	1968	0	3	0	6C	
180368013	1970	0	57	0	4T,4S	
180470001	1973	0	9	0	XX	
180473003	1976	0	36	0	XX	
180476001	1962	0	23	0	XX	
181062345	1963	0	102	0	4S,4T,4V,4R,4W,4X,3P	
181063005	1964	0	112	0	XX,1B,1A,0B,0A,2J,2G,1D,1C	
181064009	1966	0	76	0	3M,XX,6H,3N,4W,4X	
181066001	1966	0	126	0	2J,1F,1E,3K,2H,XX,3M,2G	
181066002	1967	0	38	0	3M,4W,6H,3N,4X,XX,3O	
181067001	1968	0	2	0	XX	
181068033	1969	0	183	0	4T,XX	
181069013	1969	0	23	0	4R,4S,4T,4V	
181069043	1972	0	48	0	4T,4W	
181072008	1972	0	70	0	3N,6H,3M,XX	
181072100	1988	0	6	0	4W	
181088042	1990	0	34	0	4S,4T,4R,4V	
181089036	1967	0	29	0	4T,4S,4V,4R	
181767001	1997	0	31	0	4R,4T,4V,4S	
181C97001	1997	14	0	1	3P,3L	
181C97002	1997	5	0	2	3P,3O,3L	
181C97003	1997	2	0	1	3O,3N,3L	
181C97004	1997	3	0	1	3O,3N,3L	
181C97005	1997	6	0	2	3N,3L	
181C97006	1997	7	0	1	3L,3O,3N	
181C97007	1997	1	0	2	3L	
181C97008	1997	0	0	80	3L	
181C97009	1997	0	0	78	3O,3L,3N	
181C97010	1997	0	0	7	4R,3L	
181C97011	1997	7	0	3	3O,3N,3L	
181C97012	1997	3	0	5	3N,3O,3L	
181C97013	1997	9	0	2	3L,3N	
181C97014	1997	9	0	5	3L,3N,3P,3O	
181C97015	1997	3	0	1	3L	
181C97016	1971	5	0	2	3L,3K	

Table 4a. (continued)

182471007	1971	0	8	0	4T, XX
182471017	1971	0	7	0	4T
182471031	1971	0	13	0	4T, XX
182471036	1972	0	28	0	4T, XX
182472038	1980	0	28	0	XX, 4T
189980001	1980	0	12	0	3N, 3L
189980002	1980	0	26	0	3N, 3L, 3O
189980003	1980	0	46	0	3L, 3N, 3O, 3P
189980004	1980	0	46	0	3P, 3N, 3O, 3L
189980005	1980	0	46	0	3L, 3N, 3O, 3P
189980006	1980	0	58	0	3P, 3L, 3N, 3O
189980007	1980	0	49	0	3L, 3P, 3N, 3O
189980008	1980	0	58	0	3L, 3P, 3O, 3N
189980009	1980	0	46	0	3O, 3N, 3L
189980010	1980	0	63	0	3L, 3N, 3P, 3O
189980011	1980	0	49	0	3O, 3P, 3L, 3N
189980012	1980	0	52	0	3L, 3O, 3P, 3N
189980013	1980	0	50	0	3L, 3O, 3P, 3N
189980014	1981	0	45	0	3L, 3P, 3O, 3N
189981001	1997	0	50	0	3L, 3N, 3O, 3P
18A197001	1997	39	0	0	3O, 3N
18A197002	1997	44	0	0	3N, 3O
18A197003	1997	49	0	0	3O, 3N
18A197004	1996	30	0	0	3O, 3N
18AH96003	1989	42	0	0	4W, 5Y, 4X
18BA89003	1949	0	40	65	3N, 3P, XX, 6G, 3O, 3M, 6F
18BD49001	1950	0	75	0	3K, 2J, 2G, 2H, 4R
18BD50001	1993	0	136	0	2J
18BG93012	1995	0	0	28	4T
18BG95017	1996	0	0	12	4T
18BG96017	1997	0	0	15	4T
18BW97001	1993	0	0	51	3P
18C793022	1997	0	0	10	4T
18C897004	1991	17	0	0	4X, 4W
18CN91044	1991	0	0	3	4T
18CN91068	1992	0	0	4	4S
18CN92038	1992	0	0	5	4S
18CN92060	1993	0	0	2	4T
18CN93007	1993	0	0	6	4T
18CN93010	1993	0	0	6	4T, 4S
18CN93044	1995	0	0	7	4T
18CN95003	1995	0	0	2	4S
18CN95008	1995	0	0	2	XX
18CN95035	1995	0	0	17	4T
18CN95036	1996	0	0	9	4T
18CN96016	1996	0	0	18	4V
18CN96036	1996	0	0	1	4S
18CN96037	1990	0	0	33	4T
18DA90012	1990	0	0	31	2H, 1F, 2J
18DA90073	1997	0	0	6	XX, 4T
18EN97001	1992	5	0	0	4W
18FC92020	1992	0	0	28	4V
18FC92047	1993	0	0	33	4T
18FC93015	1995	0	0	41	4V
18FC95042	1991	0	0	24	4T, XX
18FL91002	1991	0	0	6	4T, XX
18FL91063	1992	0	0	6	4T, XX
18FL92016	1992	0	0	80	4S
18FL92046	1992	0	0	19	4T
18FL92057	1993	0	0	13	4S, 4R, 4T
18FL93039	1997	0	0	7	4T
18FN97004	1989	30	0	0	4X, 4W, 5Y
18GA89001	1991	1	0	47	3P, 4S, 4R, 4T
18GA91002	1988	0	0	29	4R, 4T, 3P, 4S, 4V
18GE88001	1988	0	0	35	4T
18GE88002	1989	0	0	35	4T
18GE89015	1990	0	0	8	4T

Table 4a. (continued)

18GE90006	1990	0	0	3	4S
18GE90010	1990	0	0	13	4S
18GE90068	1997	0	0	2	4T, XX
18HB97001	1997	0	0	1	3L
18HB97002	1997	0	0	21	XX, 3L
18HB97003	1997	0	0	20	3P
18HB97004	1997	0	0	33	3P, 3L
18HB97005	1991	22	0	0	3L
18HE91905	1992	0	0	9	2J
18HE92911	1995	0	0	12	2J
18HE95911	1996	0	0	2	2J
18HE95914	1989	0	0	6	2J
18HH89001	1990	0	0	326	4T
18HH90001	1990	0	0	299	4T
18HH90002	1991	0	0	15	4T
18HH91001	1991	0	0	16	4T
18HH91002	1992	0	0	15	4T
18HH92001	1997	0	0	27	XX, 4T
18HL97004	1997	4	0	0	6H, 4V
18HS97001	1992	18	0	18	3K, 2H, 2J, 3L
18HU92014	1993	0	0	51	XX, 1F, 3M, 3K, 2H, 2J
18HU92053	1993	0	0	5	6H, 3N, 4V
18HU93039	1994	0	0	101	6H, XX, 3M, 3N, 6G, 4V, 3L
18HU94008	1995	0	0	54	2H, 2J, 3K, 1F, 4V, 3L
18HU95003	1997	0	0	99	3N, 3M, XX, 6H, 4V, 3O, 3L, 4W, 6G
18IS97010	1997	6	0	0	4W, 4X
18IS97011	1983	14	0	0	4W, 4X
18LH83001	1983	0	27	0	4X, 5Z
18LH83002	1983	0	22	0	4X
18LH83003	1983	0	27	0	4X
18LH83004	1984	0	26	0	4X
18LH84002	1984	0	0	44	5Z, 4X
18LH84003	1984	0	0	50	5Z, 4X
18LH84004	1984	0	0	59	4X, 5Z
18LH84005	1985	0	0	39	4X
18LH85002	1985	0	0	84	4X, 5Z, 5Y
18LH85003	1985	0	0	42	4X, 5Z
18LH85004	1989	0	0	90	4X, 5Z, 5Y
18LH89001	1989	4	0	0	4R, 4S
18LH89018	1989	0	0	45	4T, 4S
18LH89047	1990	0	0	91	4R, 4S, 4T, 4V
18LH90001	1991	0	0	1	5Z
18LH91001	1988	0	0	1	5Z
18LL88027	1990	0	0	81	4T
18LL90001	1990	0	0	58	4T, 4S
18LL90012	1990	0	0	19	XX, 4T
18LL90034	1990	0	0	8	XX, 4T
18LL90058	1990	0	0	7	XX, 4T
18LL90067	1991	0	0	58	4T, 4S
18LL91001	1991	0	0	182	4T, XX
18LL91014	1991	0	0	5	XX, 4T
18LL91021	1991	0	0	76	XX, 4T, 4S
18LL91064	1997	0	0	163	4T
18LL97001	1996	233	0	0	3L, 3K, XX, 3P
18NA96002	1996	0	0	64	4V, XX, 4W
18NA96013	1996	0	0	65	4V, 4W, XX
18NA96022	1989	0	0	64	XX, 4V, 4W
18NE89020	1992	0	0	60	4S, 4T
18NE92009	1995	0	0	49	4R, 3P
18NE95026	1996	0	0	3	4T
18NE96009	1997	0	0	211	4T, 4V
18NN97010	1995	12	0	0	3L, 4X, 4W, 4V, 3P
18OD95001	1997	1	0	0	4W
18OK97001	1997	16	0	0	3P
18OK97002	1997	0	0	35	3L
18OK97003	1997	0	0	25	3P
18OK97004	1997	0	0	28	3L

Table 4a. (continued)

18OK97005	1997	0	0	11	3L
18OK97006	1997	0	0	11	3L
18OK97007	1997	2	0	22	3L
18OK97008	1997	1	0	5	3L
18OK97009	1997	0	0	29	3L
18OK97010	1995	0	0	7	3L
18OR95912	1983	0	0	3	4W, 4X
18PE83001	1987	0	15	0	4X, 5Z
18PE87002	1988	0	0	131	4T, 4V, 4S
18PE88002	1990	0	0	133	4T, 4V, 4S
18PE90024	1991	0	0	119	4T, 4S
18PE91020	1987	0	0	101	4T, 4S
18PT87029	1996	0	0	128	4T
18PW95040	1996	0	0	11	4X, 4W
18PW95042	1994	0	0	17	4W, 4X
18PZ94029	1995	0	0	66	4W, 4V, 4X
18PZ95007	1996	0	0	10	4X, 4W
18PZ96013	1996	0	0	25	4R, 4V
18PZ96024	1996	0	0	48	4X, 4W, 5Z
18PZ96032	1997	0	0	55	4W, 4X
18PZ97014	1997	32	0	65	3L, 3N, 3O, 3K
18PZ97015	1972	50	0	132	3L, 3K, 2J, 3M, 4R
18QU72001	1997	0	10	0	1A, 4S, 2H, 1F, 1B, 1C
18SN97020	1997	0	0	59	0A, 1B, 1A, 0B, XX, 2G
18SN97021	1977	0	0	19	0A, XX, 1A
18TC77001	1997	0	0	59	4T
18TL97001	1997	1	0	16	3P, 3O, 3L
18TL97002	1997	0	0	3	3K, 2J, 3L
18TL97003	1997	0	0	9	3L, 3P
18TL97004	1997	0	0	9	3L, 3N
18TL97005	1997	0	0	28	3L
18TL97006	1997	13	0	2	3P, 4V, 3O, 4T, 3L
18TL97007	1997	0	0	74	3K, 2J, 3L
18TL97008	1997	0	0	1	3P, 3L
18TL97009	1997	0	0	9	4X
18TL97010	1997	5	0	1	2G, 3L, 2H
18TL97011	1997	5	0	1	2J, 2H
18TL97012	1997	7	0	0	2J, 3K
18TL97013	1997	13	0	0	3K
18TL97014	1997	4	0	3	3L, 3M, 3K
18TL97015	1988	4	0	1	3L, 3M, 3N
18VA88037	1988	0	0	11	4T
18VA88040	1988	0	0	17	XX, 4T
18VA88042	1989	0	0	61	4S, 4R, 4T
18VA89056	1990	0	0	82	4S, 4T
18VA90009	1995	0	0	24	4V, 4R
18VA95048	1997	0	0	72	4R
18VA97001	1997	0	0	46	3P
18VA97002	1996	0	0	36	3L
18VQ96004	1997	1	0	0	4X
18VQ97005	1950	28	0	0	4X, 4W
26 05350	1955	0	17	0	1A, 1B, 1C, 1D
26 08460	1971	0	36	0	1D, 1A, 1C, 1B, 0B
26AJ00820	1946	0	3	0	1D
26AJ46001	1953	0	2	0	1C
26AJ53101	1954	0	1	0	1D
26AJ54824	1955	0	3	0	1D
26AJ55116	1956	0	2	0	1D
26AJ56001	1978	0	5	0	1D
26AJ78001	1979	0	95	0	1D, 1A, 1B, 1C, 1E
26AJ79001	1980	0	57	0	1D, 1B, 1C, 1A, 1E, 1F
26AJ80001	1954	0	1	0	1D
26DA08240	1964	0	18	0	1C, 0B, 1A, 1B, 1D
26DA64075	1928	0	16	0	1A, 1B, 1D, 0B
26GO28001	1953	0	123	0	1B, 1A, 0A, 1D, 1C, 0B, XX
26RG53001	1975	0	42	0	1C, 1E, 1D, 1F, 1B, 2G, 1A, 2H
26RG75001	1980	0	1	0	1D

Table 4a. (continued)

26RG80001	1992	0	4	0	1D,1C
310292001	1992	0	0	16	5Y
310292002	1992	0	0	15	5Y
310292003	1992	0	0	16	5Y
310292004	1993	0	0	55	5Y,4X
310293001	1994	0	0	34	4X,5Y
310294001	1995	0	0	10	4X,5Z
310295001	1995	0	0	35	6B,5Z,6C,6D
310295002	1995	0	0	49	5Y,4X,5Z
310295004	1995	0	0	54	5Z
310295005	1995	0	0	87	5Z
310295006	1995	0	0	39	6B,6C,6A,XX
310295007	1996	0	0	120	5Z
310296001	1996	0	0	10	5Z
310296002	1996	0	0	7	5Z
310296003	1996	0	0	25	5Z
310296004	1997	0	0	31	5Y,4X
310297001	1969	0	0	20	5Z,6E,4X,4W
311S15330	1990	0	2	0	XX
316G90001	1990	0	0	176	5Z,6A,5Y
316G90003	1990	0	0	90	5Z
316G90005	1990	0	0	96	5Z
316G90006	1990	0	0	100	5Z
316G90011	1990	0	0	74	5Z
316G90012	1990	0	0	121	5Z,5Y
316G90014	1991	0	0	128	5Z
316G91001	1991	0	0	128	5Z,5Y
316G91003	1991	0	0	149	5Z,6A,5Y
316G91005	1991	48	0	269	5Z,6A,6C,5Y,6B,4X,XX
316G91008	1991	0	0	82	5Y,5Z,4X
316G91010	1991	0	0	341	6B,6A,4X,5Y,5Z,6C,XX
316G91011	1991	0	0	125	5Z,5Y
316G91013	1992	0	0	132	5Z
316G92001	1992	0	0	85	5Z
316G92002	1992	0	0	123	5Z
316G92003	1992	0	0	61	6A,5Z
316G92005	1992	0	0	25	5Z,6B,6A
316G92006	1992	0	0	120	5Y,6B,5Z,6A,6C
316G92007	1992	0	0	112	5Y,4X,5Z
316G92012	1992	0	0	128	5Z,5Y
316G92014	1993	0	0	116	5Z
316G93001	1993	0	0	40	5Y
316G93006	1993	0	0	123	5Z,4X
316G93008	1993	0	0	100	5Y,5Z,4X
316G93011	1993	0	0	329	6C,5Z,5Y,6A,6B,4X
316G93012	1993	0	0	132	5Z,5Y
316G93014	1994	0	0	133	5Z
316G94001	1994	0	0	95	5Z
316G94002	1994	0	0	153	6B,6A,5Z,6C
316G94003	1994	0	0	306	5Z,6A,6B,4X,5Y,6C,XX
316G94004	1994	0	0	194	5Z
316G94006	1994	0	0	106	5Z
316G94007	1994	0	0	136	6A,5Z,6C,6B,5Y
316G94008	1994	0	0	26	5Z
316G94009	1994	0	0	58	5Z,6A
316G94012	1997	0	0	4	5Z,5Y
316G97005	1997	0	0	29	6A,6B,6C
316G97006	1997	0	0	18	6A
316G97007	1997	0	0	30	6B,6A,5Z,6C
316G97008	1974	0	0	12	5Y
316N27080	1991	0	57	0	6E,6B,6F,4X,4V,6C,4W,6D
316O91005	1992	0	0	111	6A,5Z,6B,6C
316O92004	1993	0	0	100	6B,5Z,6A,6C
316O93001	1951	0	0	141	6A,6B,5Z,6C
319970180	1993	0	224	0	5Z
319993001	1995	0	0	177	6A,5Z

Table 4a. (continued)

319995001	1995	0	0	41	6B, 6A, 5Z, 6C
319995002	1996	0	0	34	5Z
319996001	1964	0	0	54	5Y, 4X, 5Z
31A427100	1976	0	72	0	4X, 5Z, 5Y, 6A
31A428730	1975	0	133	0	5Z, 4X, 5Y
31A428740	1976	0	77	0	5Z, 4X, 5Y
31A428750	1975	0	49	0	5Z
31A428870	1992	0	74	0	5Z, 4X
31A492002	1992	0	0	59	6C, 6B, 6A
31A492003	1992	0	0	307	5Z, 5Y, 6B, 6A, 6C, XX, 4X
31A492004	1992	0	0	51	5Z
31A492005	1992	0	0	33	5Z
31A492011	1993	16	0	291	6A, 5Z, 6B, 4X, 5Y, 6C
31A493003	1993	4	0	117	5Z, 6A, 6B, 6C
31A493004	1993	0	0	323	5Z, 5Y, 4X, 6B, 6A, 6C, XX
31A493005	1993	0	0	54	6B, 6A, 6C, 5Z
31A493006	1994	0	0	47	5Z
31A494003	1994	0	0	65	5Z
31A494004	1994	0	0	48	5Z
31A494005	1994	0	0	154	5Z, 6A, 6B, 6C
31A494006	1994	0	0	71	5Y, 4X, 5Z
31A494007	1994	0	0	99	5Z
31A494009	1994	0	0	329	5Z, 6A, 5Y, 6B, 4X, 6C, XX
31A494010	1995	0	0	25	5Z
31A495002	1995	0	0	43	5Z
31A495003	1995	0	0	75	5Z, 6B, 6A, 6C
31A495004	1995	0	0	127	6B, 5Z, 4X, 6A, 5Y, 6C
31A495005	1995	0	0	61	5Z, 4X
31A495006	1995	0	0	48	5Z, 4X
31A495007	1995	0	0	55	6A, 6B, 5Z, 6C
31A495008	1995	0	0	37	5Z, 4X
31A495009	1995	0	0	50	5Z, 6A
31A495010	1995	0	0	73	5Z, 4X, 5Y
31A495012	1996	0	0	237	4X, 6A, 5Z, 6C, 6B, 5Y
31A496001	1996	0	0	16	5Z, 6A
31A496002	1996	0	0	21	5Z, 6A
31A496003	1996	0	0	136	6C, 5Z, 6B, 6A
31A496004	1996	0	0	345	6B, 6A, 6C, 5Z, 5Y, 4X
31A496005	1996	0	0	136	5Z, 4X
31A496006	1996	0	0	80	5Z
31A496007	1996	0	0	47	5Z, 4X
31A496008	1996	0	0	64	5Z
31A496009	1996	0	0	417	5Z, 6A, 6C, 6B
31A496010	1996	0	0	49	5Z
31A496011	1996	0	0	359	5Y, 6A, 5Z, 6C, 4X, 6B
31A496012	1997	0	0	56	5Z, 5Y, 4X
31A497001	1997	0	0	19	5Z, 4X
31A497003	1997	0	0	126	6A, 6C, 5Z, 6B
31A497004	1997	0	0	337	6A, 5Z, 6B, 6C, 5Y, 4X
31A497005	1997	0	0	86	5Z, 4X
31A497007	1997	0	0	40	5Z, 4X
31A497008	1997	0	0	18	5Z, 5Y
31A497009	1997	0	0	482	5Z, 6A, 6B, 6C
31A497011	1963	0	0	363	5Z, 5Y, 6B, 6A, 4X, 6C
31AN01730	1966	0	18	0	4X, 5Z
31AN09060	1952	0	37	0	5Y, 4X, 5Z
31AS03840	1934	0	5	0	4W
31AT03020	1961	0	1259	0	5Y, 4X, 5Z, XX, 6A, 30, 6C, 6E, 6B, 4V, 3N, 6F, 6D, 4W, 6G, 3P, 3M, 6H
31AT04350	1959	0	11	0	4W, 4X, 5Z, 6D, 4V
31CF04290	1956	0	205	0	6A, 6D, 5Z, 4X, 6B, 5Y, 6C, 4W
31CF09990	1967	0	24	0	6A, 5Z
31CF11770	1967	0	6	0	5Y
31CF12890	1956	0	5	0	5Y
31CF22990	1962	0	24	0	6A, 5Z
31CI02900	1967	0	9	0	6E, 4X, XX

Table 4a. (continued)

31CI11520	1968	0	40	0	5Y,5Z
31CI12540	1971	0	45	0	5Z,5Y
31EV24280	1963	0	116	0	5Z,6B,4X,5Y,6A,6C,XX,6D
31EV63001	1995	0	22	0	2J,1F,2H
31EV95061	1995	0	0	37	5Z
31EV95063	1995	0	0	56	5Z,4X
31EV95065	1996	0	0	70	5Z,4X
31EV96076	1996	0	0	73	5Z,4X
31EV96078	1996	0	0	78	5Z,4X
31EV96082	1968	0	0	103	5Z
31EW13180	1977	0	3	0	1A
31MT28690	1951	0	94	0	5Z,4X,5Y
31RE14710	1964	0	1	0	3M
31TR02130	1971	0	64	0	5Z,4X,6D,6A,6H,6E,4W,6G,6F,6C,6B
31TR26870	1995	0	19	0	3O,3K,1F,3L,XX,3P
32JO95003	1995	0	0	18	5Z
32JO95005	1995	0	0	69	5Z
32JO95007	1996	0	0	96	5Z
32OC96075	1997	0	0	78	5Z,4X
32OC97001	1997	0	0	123	5Z
32OC97002	1997	0	0	66	5Z,4X
32OC97003	1997	0	0	131	5Z
32OC97030	1997	0	0	80	5Z,4X
32OC97098	1991	0	0	103	5Z,4X
32YN91003	1991	54	0	48	6A,6B,4X,5Z,6C
33AM91003	1992	0	0	52	5Z
33GL92019	1993	45	0	0	5Y,5Z
33GL93020	1994	51	0	0	5Y,5Z
33GL94012	1996	44	0	0	5Z,5Y
33GL96011	1997	46	0	0	5Z,5Y
33GL97014	1982	0	0	49	5Z,5Y
49K682001	1970	0	58	0	6D,4W,6E,6C,4V,4X,6B,5Z
67WI70001	1971	0	83	0	5Z,5Y,4V,4X,4W
67WI71001	1973	0	121	0	3O,5Z,5Y,4X,4W,3N
67WI73002	1975	0	168	0	5Z,6C,5Y,6A,4X,6B
90BE75002	1975	0	84	0	5Z,4X
90BE75003	1981	0	88	0	5Z,4X
90KN81004	1980	0	176	0	3L,3K,3N,3O,2J,3M
90KV80002	1959	0	343	0	3O,3K,3M,2J,3L,3N
90ML00140	1960	0	32	0	3M,3N,6F,6C,4X,4W,6E,5Z,6B,6D,XX,3O
90ML00690	1968	0	30	0	6B,4W,6G,5Z,6D,6C,6F,4X,6E,XX
90ML02350	1958	0	61	0	3M,3L,4V,2J,3N,XX,2H,6G,6F
90ML09610	1970	0	1	0	XX
90MU02900	1971	0	116	0	6D,4X,3M,6C,4W,6G,6H,6E,5Z,6F,6B,4V,XX,3N
90MU03050	1958	0	185	0	6F,6D,6G,6H,XX,6C,4X,6B,6E,5Z,6A
90NO02100	1967	0	4	0	1D
90NO67022	1973	0	14	0	1B,3K,2J,1C,0A,1D,2G
90P304400	1973	0	457	0	3N,3K,3L,3O,4V,3M,3P,2J,XX
90PH04390	1982	0	330	0	3M,3N,2H,3P,2J,3K,3L,3O,4V,6G,1F,XX
90VE82004	1976	0	15	0	3L,3O,3N

TABLE 4b. HISTORICAL DATA RECEIVED BUT NOT ARCHIVED.

MEDS ID	Ship			
18NE97254	Needler cruise 254	from STABS	BOT/CTD	
18NE97255	Needler cruise 255	from STABS	BOT/CTD	
18HU96014	Hudson cruise	from BIO.		

Drifting Buoy (Dribu) Data

Drifting buoy (or DRIBU) data are received at MEDS over the GTS. Measures taken to assure its quality are much the same as those for the ocean subsurface data described previously. DRIBUs report via satellite, at rates of up to every 15 minutes. These messages are for format errors, and reformatted for quality control procedures and subsequent archival. Checks, flags and possible corrections to the data are carried out by trained personnel, using a system of MEDS software, which organize, analyze and display plots of the data. Quality checks use algorithms which check drifting speed and position, and ranges of sea surface temperatures and sea level pressure. The range checks include a comparison to NOAA's Ashville SST Climatology (2.5x2.5 degrees and monthly). Duplicates are

checked, which is important for discriminating between data received directly from buoys and messages routed through other data centers. Lower quality data (which are this type of duplicate) are flagged as such.

MEDS as the RNODEC for drifting buoy data, has holdings of over 10 million (as of 1997) DRIBU records for the world's oceans, beginning in 1978, and growing at a rate of more than one million messages per year. The message is comprised of the buoy position and some of the following parameters: surface and subsurface water temperature, air pressure and temperature, wind speed and direction.

Table 5 lists data collected by Drifting Buoys in the NAFO Area in 1998. A map of DRIBU tracks for 1998, processed and archived by MEDS, is shown in the figure.

Table 5: Data Collected by Drifting Buoys in the NAFO Area in 1998
Number of Buoys = 109 and Buoy Days = 9098

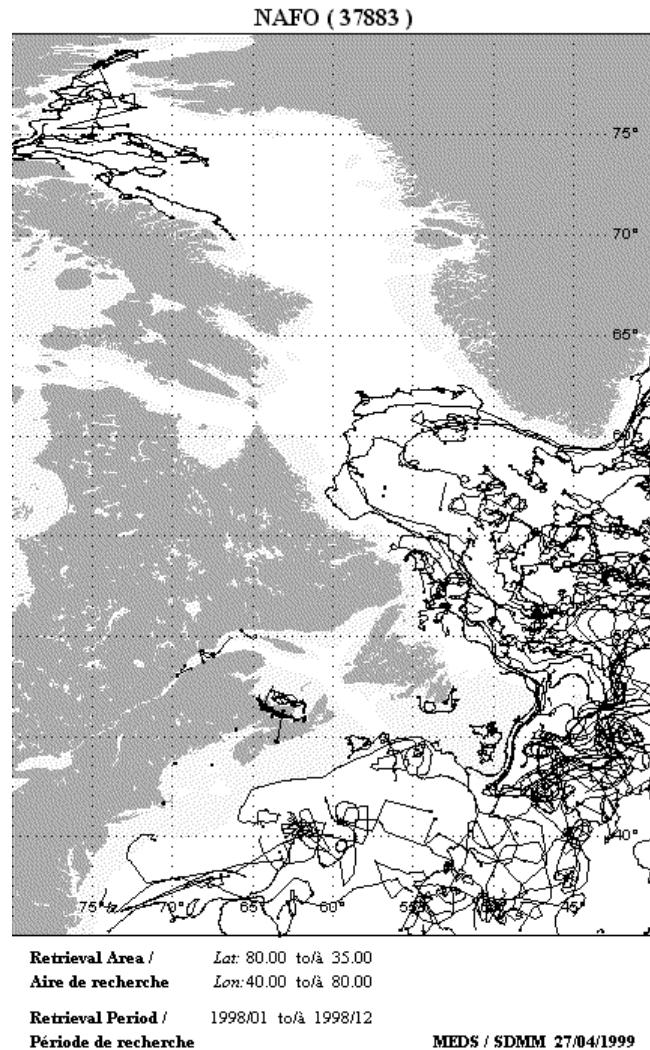
Table 5. (continued)

44696	Feb-24	-	Mar-04	9	-	-	-	-	-	-	4T
44697	Feb-20	-	Apr-02	41	-	-	-	-	-	-	4T
44698	Feb-20	-	Mar-14	22	-	-	-	-	-	-	4T
44699	Apr-29	-	May-01	2	-	-	-	-	-	-	4X
44700	May-02	-	May-04	3	-	-	-	-	-	-	4X
44701	Apr-29	-	May-01	2	-	-	-	-	-	-	4X
44702	Apr-30	-	May-01	2	-	-	-	-	-	-	4X
44703	May-02	-	May-04	3	-	-	-	-	-	-	4X
44733	Feb-23	-	May-04	70	-	-	-	-	-	-	4T, 4X
44734	Feb-23	-	May-04	70	-	-	-	-	-	-	4T, 4X
44735	Feb-24	-	Apr-04	40	-	-	-	-	-	-	4T
44736	Mar-15	-	Mar-20	5	-	-	-	-	-	-	4T
44737	Feb-26	-	Apr-04	38	-	-	-	-	-	-	4T
44738	Feb-21	-	Apr-10	48	-	-	-	-	-	-	4T
44742	Apr-24	-	Jun-11	48	X	X	X	-	-	-	3M
44743	Apr-24	-	Nov-30	221	X	X	X	-	-	-	3N, 3O
44751	Mar-13	-	Apr-08	26	-	-	-	-	-	-	4T
44752	Mar-12	-	Mar-22	11	-	-	-	-	-	-	4T
44755	Mar-15	-	Mar-16	1	-	-	-	-	-	-	4T
44756	Mar-08	-	May-04	57	-	-	-	-	-	-	2J, 3K
44760	Nov-06	-	Nov-11	6	X	X	X	-	-	-	2J, 3K
44762	Nov-02	-	Dec 31	60	X	X	X	X	X	-	3O, 3N, 3M
44763	Jan-01	-	Mar-18	77	X	X	X	-	-	-	3N, 3M, 3K
44764	Oct-02	-	Dec 04	63	X	X	X	-	-	-	3K
44765	Jan-11	-	Aug-04	206	X	X	X	-	-	-	1F
44766	Jan-01	-	Jan-10	10	X	X	X	-	-	-	1F
44767	Jul-06	-	Oct-23	110	X	X	X	-	-	-	2J, 1F, 3K
44774	Apr-24	-	Aug-17	116	X	X	X	-	-	-	3K, 2J
44776	May-26	-	Oct-26	154	X	X	X	-	-	-	3M, 3L, 3K
44778	Apr-24	-	Dec 18	238	X	X	X	-	-	-	1F, 2G, 2H, 2J, 3K, 3L, 3M
44779	Apr-24	-	Oct-05	165	X	X	X	-	-	-	3PS, 3O, 4VS, 3N, 3M
44782	May-31	-	May-31	1	X	X	X	-	-	-	3M
44833	Jan-02	-	Aug-25	235	X	X	-	-	-	-	4VS, 3PS, 3O, 4W
44834	Jan-01	-	Mar-25	84	X	X	X	-	-	-	3K, 3L, 3M, 2J, 1F
44843	Jan-01	-	Jan-04	4	X	X	-	-	-	-	4VS
44901	Jan-01	-	Nov-22	326	X	X	X	-	-	-	2J, 1F
44902	Feb-13	-	Mar-12	27	X	X	-	-	-	-	3N, 3M
44906	Mar-02	-	Mar-27	25	X	X	-	-	-	-	1F
44909	Aug-02	-	Dec 30	151	X	X	-	-	-	-	1F, 1E, 2G, 2H, 2J, 3K, 3L
44915	Mar-22	-	Aug-01	132	X	X	-	-	-	-	6G, 4VS, 6H, 3N
44921	Jan-01	-	Aug-06	217	X	X	-	-	-	-	6H, 6G, 3N, 6F, 6E
44925	Jan-01	-	Dec 06	340	-	X	X	-	-	-	1E, 1F, 2G, 2H, 2J
44927	Jan-02	-	Apr-14	103	X	X	-	-	-	-	5ZW, 6A, 6B, 6D, 6E, 4W, 4X
44928	Aug-24	-	Aug-28	4	X	X	-	-	-	-	6H
44929	Jan-02	-	Jul-05	184	X	X	-	-	-	-	3M, 3N, 3K, 2J, 1F
44930	Jan-01	-	Dec 25	358	X	X	-	-	-	-	4W, 4X, 4VS, 6G, 3N, 3M
44933	Jan-03	-	Nov-24	325	X	X	-	-	-	-	6B, 6C, 6D, 3M
44934	Jan-01	-	Jul-06	187	X	X	-	-	-	-	6G, 6F, 4VS, 3O, 3N, 6H
44935	Jan-14	-	Jun-16	154	X	X	-	-	-	-	6H, 3M, 3N
47548	Apr-27	-	Oct-20	176	-	-	-	-	-	-	0A
47550	May-02	-	Oct-10	161	-	X	-	-	-	-	0A, 1A
47552	Mar-04	-	Jun-23	112	-	-	-	-	-	-	4X, 1A
47553	Mar-04	-	Mar-05	1	-	-	-	-	-	-	4X
47555	Mar-04	-	Jun-27	115	-	-	-	-	-	-	4X, 1A
47556	Oct-30	-	Dec 31	63	-	X	-	-	-	-	0A
47557	May-28	-	Jul-22	55	-	-	-	-	-	-	0A, 1A
47559	Jun-23	-	Jul-15	22	-	-	-	-	-	-	0A
48519	Oct-26	-	Nov-06	11	-	-	-	-	-	-	0A, 0B, 2G, 2H, 2J, 4R, 4S, 4T
51633	Mar-10	-	Jun-14	97	X	X	-	-	-	-	6C, 6D, 6E, 4W, 6F, 4VS
51639	Jan-20	-	Jan-21	2	X	X	-	-	-	-	4X

Table 5. (continued)

52643	Jul-22	- Jul-30	8	-	X	-	-	-	-	4X
61508	Dec 04	- Dec 31	28	X	X	-	-	-	-	4T
61509	Dec 05	- Dec 29	24	X	X	-	-	-	-	4T
61510	Dec 22	- Dec 25	3	X	X	-	-	-	-	4T
64530	Jan-10	- Jul-09	181	X	X	X	-	-	-	1F,1E
64563	Jan-01	- Feb-18	49	-	X	X	-	-	-	1F,2J
64906	Dec 04	- Dec 18	15	X	X	-	-	-	-	4X
64909	Dec 03	- Dec 18	16	X	X	-	-	-	-	4X
64930	Nov-11	- Dec 30	49	X	X	-	-	-	-	1F,1E,2G
64943	Jan-01	- Dec 30	364	X	X	-	-	-	-	2H,2J,1F
64946	Jan-01	- Jan-25	25	X	X	-	-	-	-	2H,2J,3K
64949	Aug-07	- Aug-29	23	X	X	-	-	-	-	1F
65563	Jan-08	- Jan-08	1	X	X	-	-	-	-	1F
65591	Sep-16	- Nov-10	55	-	X	X	-	-	-	1F
65597	Jan-01	- Jan-02	2	-	X	X	-	-	-	1F
71542	Sep-30	- Sep-30	1	-	-	-	-	-	-	5ZW
71548	Sep-30	- Sep-30	1	-	-	-	-	-	-	5ZW
73509	Mar-13	- Apr-21	40	-	X	-	-	-	-	4X,5Y
74532	Mar-12	- Apr-21	40	-	X	-	-	-	-	4X

Table 5: DRIFTING BUOY DATA ARCHIVED IN THE NAFO AREA FOR 1998



Current Meter Data

Current meters have been deployed in the NAFO area for many years. These data are processed and archived at The Bedford Institute of Oceanography (BIO), Dartmouth, Nova Scotia and are available via the WWW:
www.marimates.dfo.ca/science/ocean/welcome.html

Table 6: Current Meter data archived at BIO for 1998

CRUISE	EVENT_SPEC	INSTRUMENT	MODEL	LAT	LON	START	END	DEP	SOUNDING	SAMPL_INT
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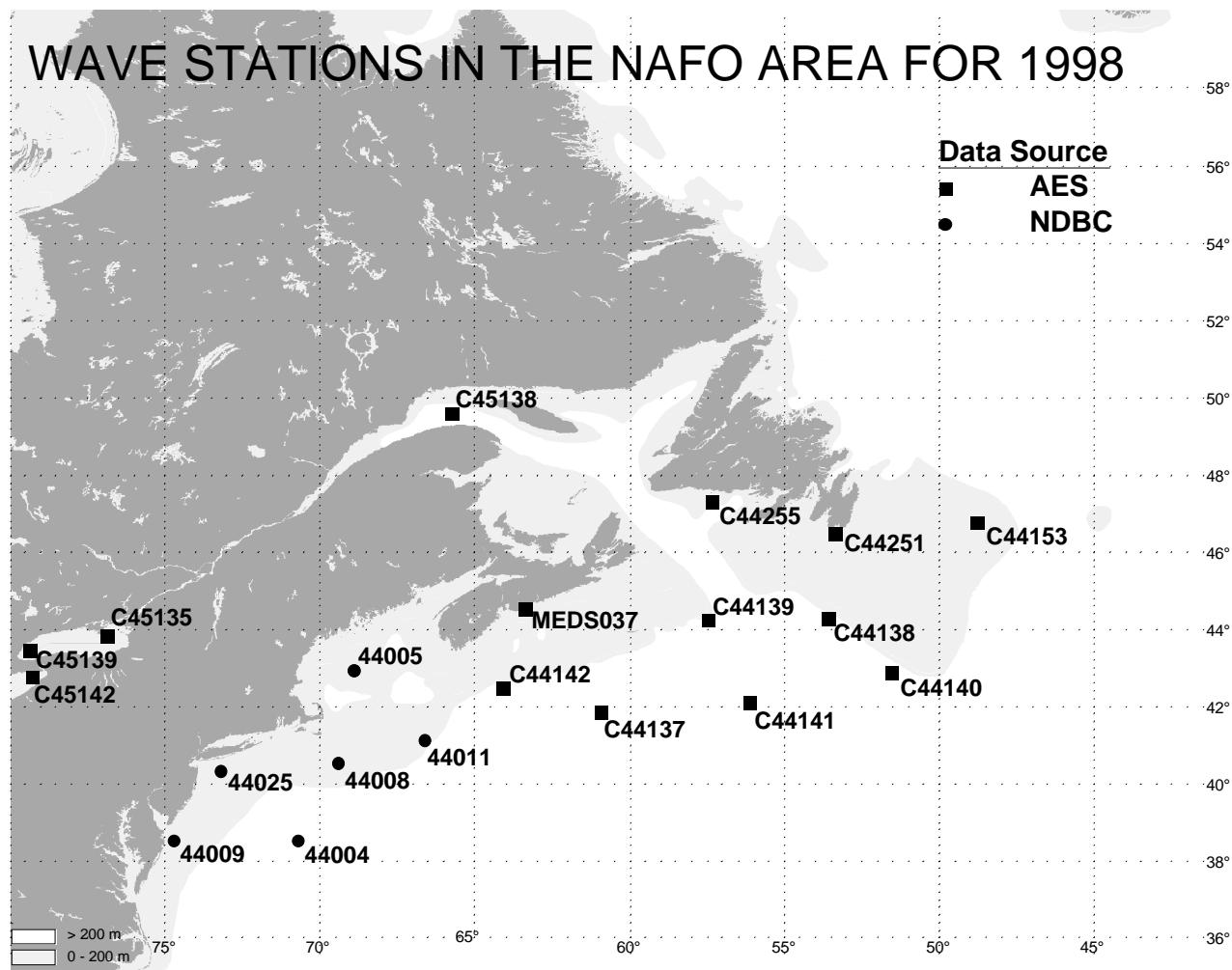
Wave Data

Table 7 lists wave measurement data in the NAFO area for 1998. These data are quality controlled with a visual inspection and with MEDS software to set flags on data showing instrument failures. An inventory of wave data, in the NAFO area, will show many locations with a time series of data spanning many years. Historical wave data are available on a CD-Rom.

Table 7: Wave spectra in the NAFO area for 1998 Total Spectra = 78754

STATION	STATION NAME	LATITUDE	LONGITUDE	INST TYPE	WATER DEPTH	NUMBER OF GOOD SPECTRA (M)	NAFO SUBAREA
44004	Hotel	38.5000	70.7000	US	3231.0	6616	6B
44005	Gulf of Maine	42.9000	68.9000	US	29.0	6441	5Y
44008	Nantucket	40.5000	69.4000	US	55.0	6592	5ZE
44009	Delaware Bay	38.5000	74.7000	US	28.0	8127	6B
44011	Georges Bank	41.1000	66.6000	US	88.0	8270	5ZE
44025	Long Island	40.3000	73.2000	US	40.0	7224	6A
C44137	East Scotia Slope	41.6480	60.9400	AE	4500.0	3896	4W
C44138	SW Grand Banks	44.2580	53.6230	AE	1470.0	3538	3O
C44139	Banquereau	44.2000	57.5000	AE	1500.0	155	4VS
C44140	Tail of the Bank	42.8520	51.5670	AE	1500.0	835	3O
C44141	Laurentian Fan	42.0670	56.1520	AE	4500.0	3623	4VS
C44142	La Have Bank	42.4450	64.1000	AE	1500.0	3937	4X
C44153	Hibernia	46.7350	48.8020	AE	81.0	487	3L
C44251	Nickerson Bank	46.4400	53.3900	AE	69.0	3632	3L
C44255	NE Burgeo Bank	47.2820	57.3520	AE	185.0	2759	3Ps
C45135	Prince Edward Pt.	43.7900	76.8730	AE	68.0	1584	5Y
C45138	Mont Louis	49.5550	65.7450	AE	335.0	2883	4S
C45139	West Lake Ontario	43.4270	79.3820	AE	126.0	1507	5Y
C45142	Point Colborne	42.7370	79.2900	AE	27.0	1812	5Y
MEDS037	Osborne Head	44.4903	63.4042	WR	57.0	4836	4W

WAVE STATIONS IN THE NAFO AREA FOR 1998

**Tide and Water level Data**

MEDS processes and archives operational tides and water level data reported on a daily to monthly basis from the Canadian Hydrographic Service (CHS) active permanent water level network. CHS regional offices are located in Halifax NS, Ste. Flavie QC, Burlington ON, and Sidney BC. Approximately 70,000 new readings are updated every month from the network.

MEDS archives observed 15-minute heights, hourly heights and monthly instantaneous extremes collected from the Atlantic, Pacific, and Arctic coasts, the Great Lakes and the St. Lawrence River. The historical tides and water level data archives presently hold over 30 million records with the earliest dating back before the turn of the century. Harmonic analyses and supplementary tidal predictions are also available on request.

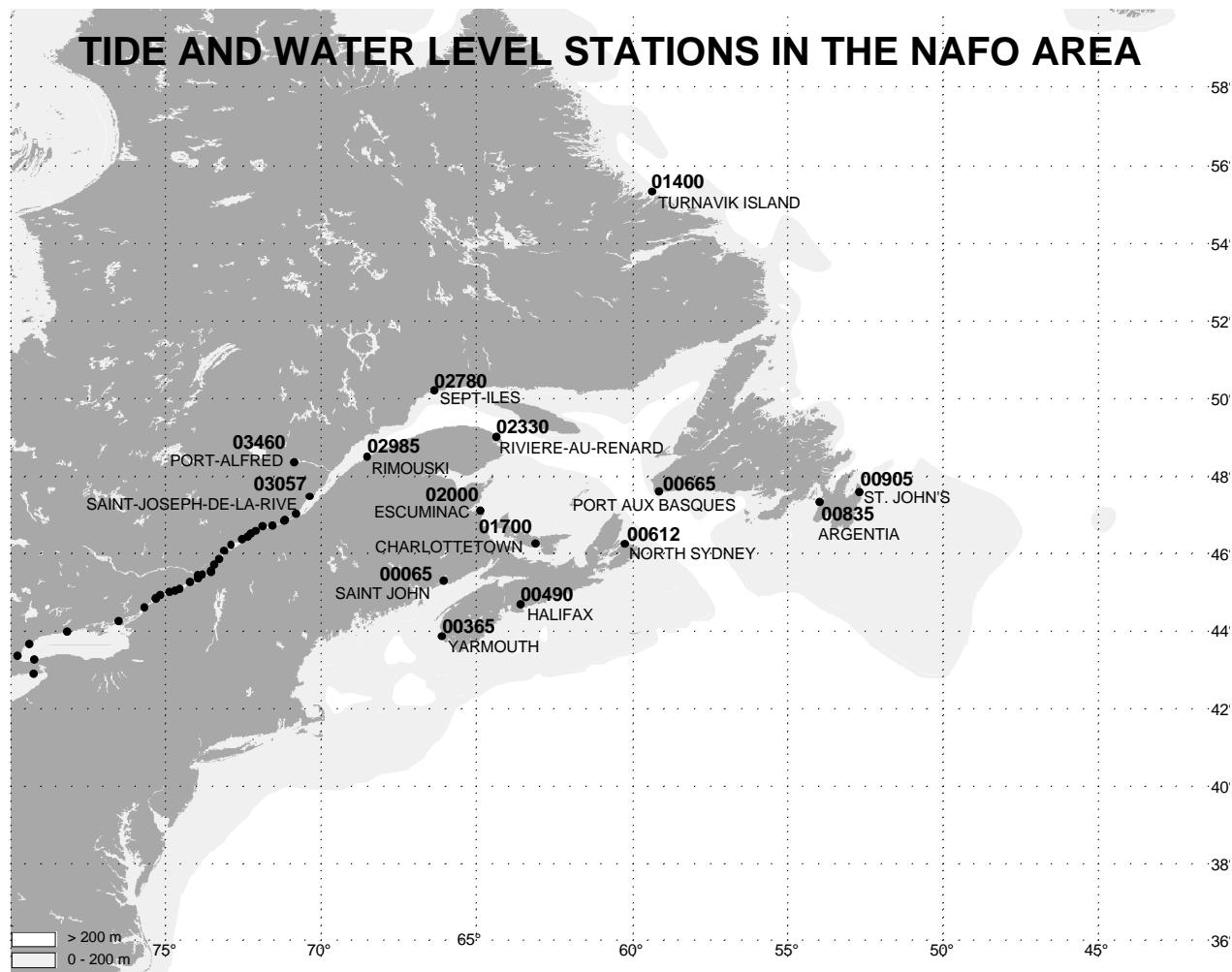
Table 8 lists tide and water level data in the NAFO area for 1998. These data are quality controlled using MEDS software. An inventory of tide and water level data, in the NAFO area, will show many locations with a time series of data spanning many years.

Table 8: Tide and Water level data in the NAFO area for 1998**Total Stations = 47**

STATION NUMBER	STATION NAME	LATITUDE	LONGITUDE	15-MINUTE HEIGHTS # OF DAYS	HOURLY HEIGHTS # OF DAYS
00065	SAINT JOHN	45.27	66.06	354	364
00365	YARMOUTH	43.84	66.12	336	359
00490	HALIFAX	44.66	63.59	357	365
00612	NORTH SYDNEY	46.22	60.25	261	283
00665	PORT AUX BASQUES	47.57	59.14	361	365
00835	ARGENTIA	47.30	53.98	264	343
00905	ST. JOHN'S	47.56	52.71	344	357
01700	CHARLOTTETOWN	46.23	63.12	356	362
02000	LOWER ESCUMINAC	47.08	64.89	160	364
02330	RIVIERE-AU-RENARD	48.98	64.37		363
02780	SEPT-ILES	50.18	66.37	351	351
02985	RIMOUSKI	48.48	68.52	305	305
03057	SAINT-JOSEPH-DE-LA-RIVE	47.45	70.37	361	365
03100	SAINT-FRANCOIS	47.00	70.81	365	365
03246	ST. CHARLES RIVER BASIN	46.82	71.20	363	363
03250	QUEBEC (LAUZON)	46.83	71.17	363	363
03280	NEUVILLE	46.70	71.57	361	361
03300	PORTNEUF	46.68	71.88	362	362
03335	CAP A LA ROCHE	46.56	72.11	363	363
03345	BATISCAN	46.50	72.25	364	363
03353	BECANCOUR	46.40	72.38	365	365
03360	TROIS-RIVIERES	46.34	72.54	363	362
03460	PORT-ALFRED	48.33	70.87		250
12865	PORT COLBORNE	42.87	79.25	365	365
13030	PORT WELLER	43.24	79.22	365	365
13150	BURLINGTON	43.34	79.77	359	358
13320	TORONTO	43.64	79.38	365	365
13590	COBOURG	43.96	78.17	365	365
13988	KINGSTON (PORTSMOUTH)	44.22	76.52	365	365
14400	BROCKVILLE	44.59	75.68	365	365
14600	IROQUOIS ABOVE/AMONT	44.82	75.32	365	365
14602	IROQUOIS BELOW/AVAL	44.84	75.31	365	365
14660	MORRISBURG	44.90	75.18	365	365
14870	CORNWALL	45.02	74.71	361	360
14940	SUMMERSTOWN	45.06	74.55	365	365
15110	COTEAU-LANDING	45.25	74.21		322
15220	POINTE-DES-CASCADES	45.34	73.95		353
15330	POINTE-CLAIRES	45.43	73.82		365
15520	MONTRÉAL JETTY NO 1	45.50	73.55	365	365
15540	MONTRÉAL FRONTENAC ST.	45.53	73.54	361	361
15660	VARENNES	45.68	73.44	365	365
15780	CONTRECOEUR IRON ORE	45.83	73.28	304	304
15930	SOREL	46.05	73.12	362	362
15975	LAKE/LAC SAINT-PIERRE	46.19	72.90	338	338
16005	SAINTE-ANNE-DE-BELLEVUE	45.41	73.96		356

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TIDE AND WATER LEVEL STATIONS IN THE NAFO AREA FOR 1998

**Conclusion**

Overall MEDS has been very active in 1998, as in the previous years. Large volume of data has been captured or delivered to MEDS. However, except for the IGOSS messages and for the others captured from the GTS, data submission to MEDS by the member countries of NAFO was very limited.

Like many other countries, MEDS has gone through a transformation, in fact, our capability has not diminished at all and only broadened. Though a few key individuals have retired in the last few years, the vacancies thus created were used to rejuvenate the data centre through hiring new graduates in biology and chemistry in addition to computer sciences, and training. MEDS will continue to provide the necessary support to NAFO and in particular to STACFEN.