Northwest Atlantic Fisheries Organization

Serial No. N2841 **NAFO SCR Doc. 97/14**

SCIENTIFIC COUNCIL MEETING - JUNE 1997

Marine Environment Data Service Report for 1996

by

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Summary

An inventory of environmental data collected in the NAFO area is contributed annually by MEDS to the NAFO subcommittee for the environment (STACFEN). This year's report (June 1997) is for the calendar year of 1996. The report includes physical oceanographic inventories of profiles, drifting buoys, waves, tides and water levels. The inventory shows that real-time data traditionally reported in this series, have been collected in quantities comparable with that of past years. Delayed-mode data quantities are lower for 1996.

Recent activities at MEDS of interest to NAFO include the participation in the:
- development of a toxic chemicals database,
- plans to develop a geographical Ocean Climate database with the Atlantic Regional Offices,
- development of an Atlantic Coastal zone monitoring system;
- RADARSAT;
- Joint Global Ocean Flux study;
- Ocean data rescue project.

Background

MEDS (Marine Environmental Data Service of Canada) has been recognized since about 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 the Scientific Council. In order for MEDS to carry out its responsibility of reporting to the Scientific Council, the Designated National Representatives selected by the Environmental Subcommittee 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 1997 required the submission to MEDS of a completed oceanographic inventory form for data collected in 1996, and oceanographic data pertinent to the NAFO area, for all stations occupied in the year prior to 1996. The data of highest priority are those which occupied standard sections and stations, as described in ICNAF Selected Papers, No. 3, 1978, (pages 109-117).

Contacting MEDS

Data which has been formatted and archived at MEDS is available to all interested scientists, within Canada and through international data exchange agreements. Arrangements can be made for data retrieval and delivery at MEDS, by telephone (613) 990-0243; by internet e-mail to services@ottmed.meds.dfo.ca, by completing an on-line order form on the MEDS WWW: www.meds.dfo.ca, or by writing to Services, Marine Environmental Data Service (MEDS), Dept. of Fisheries and Oceans, 12th floor, 200 Kent St., Ottawa, Ont. Canada K1A 0E6.

References

List of NAFO Standard Oceanographic Sections and Stations. The reprint of ICNAF Selected Papers, No. 3, 1978, (pages 109-117). Printed and distributed by: NAFO, P.O.Box 638, Dartmouth, Nova Scotia, canada B2Y 3Y9.

Recent Activities:

1. Atlantic Coastal Monitoring Proposal

An Ocean Monitoring Working Group (OMWG) has been created by DFO in response to the need to develop an efficient and integrated monitoring program for the Northwest Atlantic region. The OMWG is comprised of a number of specialists in all Ocean Sciences disciplines from the three Atlantic regions of DFO and MEDS. The proposal is still under review by DFO management.

MEDS is proposed as the focal point for the safekeeping and dissemination of data and information relevant to the Monitoring Program through a centralized World Wide Web server. All data collected by the Monitoring Program during the current and prior year of operation will be available on-line via this central server. Links to relevant regional data sets will also be provided.

Recognizing an acute lack of biological data and the need to adopt an ecosystem approach to study the marine environment, the present proposal suggests the establishment of a minimal and permanent sampling program to supplement existing data from other programs (e.g., fisheries surveys) in order to resolve the spatial and temporal variability of biological, chemical and physical variables at the seasonal, interannual, decadal and climatic scales of interest to Fisheries and other Clients. The proposed sampling strategy includes:

1. Representative sections across the shelves and in the Gulf of St. Lawrence that would be occupied once a year quasi-simultaneously during the autumn in order to provide a regional synoptic coverage, and on 2-3 other occasions on an opportunistic basis at other seasons.

2. Fixed stations at logistically accessible locations throughout the region that would be occupied every two weeks most of the year in order to provide the temporal resolution required to monitor certain high frequency elements and mainly biological variables.

3. Monthly Continuous Plankton Recorder sampling along the present existing route (crossing the Grand Bank, St. Pierre Bank, the Scotian Shelf and Georges Bank) and possibly a new one in the Gulf of St. Lawrence.

4. Remote sensing of temperature (immediately) and phytoplankton (in the future through ocean colour sensors).

5. To complete the spatial coverage, supplementary data from existing programs (e.g., temperature and salinity data from fisheries surveys, Long Term Temperature Monitoring and Toxic Algae Programs, etc.). Other sampling possibilities will also be explored.

A minimal and affordable suit of physical, chemical and biological (phytoplankton, zooplankton) measurements would also be undertaken at the sections and fixed stations.

For further information please contact Jean Gagnon: gagnon@ottmed.meds.dfo.ca

2. Toxic Chemicals Information System

The National Contaminants Information System contains information about data collections made in fresh and salt waters in and around Canada. The earliest records go back into the early years of the 1900s and the most recent data are from the present. The contaminants referenced include chemicals such as dioxins that are considered hazardous, but also chemicals such as nitrates and silicates which are naturally occurring components in water.

The interpretation of these data is strongly dependent on the data collection techniques and circumstances. Without information about these techniques and procedures the observations have more limited use. The NCIS project, therefore, developed an organized archive and information system in which data and information would be stored. The system has been built based on a relational database to store both data and information. It is a distributed system with MEDS in Ottawa and DFO regions taking part in the design, building and operation. A client-server interface is provided to the system. Each participant operates a server on which is held the database. Client software runs on one or more machines in each region and permits queries to be made across the DFO communications network to examine holdings in the local region or other regions. Upon identification of data of interest, a request can be made for the data. Depending on access privileges, the data plus information pertaining to the data are extracted from the appropriate archives.

For further information please contact Bob Keeley: keeley@ottmed.meds.dfo.ca

3. RADARSAT

In early 1996, Canada launched RADARSAT, a satellite with a synthetic aperature radar. MEDS is involved in developing hardware and software that takes images and produces three types of products in an operational time frame. The first detects targets by large radar cross section and wakes. The second maps ocean features and the third is a directional wave product. All of these are being tested to ensure that the results are reliable. The results of the analyses are relayed to MEDS for archiving along with the parameter settings in the algorithms used to derive the products.

For further information please contact Bob Keeley: keeley@ottmed.meds.dfo.ca

4. Joint Global Ocean Flux Study (JGOFS)

MEDS is responsible for the management and archival of data collected in the Canadian JGOFS programme. Canadian JGOFS, the largest and most ambitious of Canadian oceanographic initiatives, has brought together biologists, physicists, chemists and geologists from universities and government laboratories in a concerted effort to address what is arguably the most important environmental challenge the world has yet faced - global warming. The resulting collaboration and attendant integrative approach to the science will answer many questions about how the oceans sequester carbon, and will provide an atmosphere of cooperation that will be felt in the Canadian oceanography community for decades to come.

The past years have been a particularly important period in the Canadian JGOFS Program. Project science is now well established, collaboration has grown, and working groups have addressed the important issues of core measurements, data management, and ship use.

MEDS, regional agencies of the Canadian Department of Fisheries and Oceans, and participating scientists in Canadian Universities, have created a distributed data management system. Each JGOFS project or involved agency have data managers who handle and distribute data from cruises, from responsible scientists to other scientists within the project. These managers compile final data lists and send them to MEDS for archival and publication.

In JGOFS the data publication products include the tables of measurements and the reports and

documentation needed to understand each of the techniques used by the originator to produce these tables.

For further information please contact Graham Glenn: glenn@ottmed.meds.dfo.ca

5. Ocean Data Rescue Project

Valuable data sets held by individual researchers in the private sector, universities and even in the government are at risk of being lost as a result of organizational and program cutbacks, retirement of principal investigators, and outdated storage media. These data sets constitute a national asset as they were collected with public funds and in many cases constitute the only source of historical climatological data. Hence, there is a real need for a project to identify, inventory and document these data sets and to merge them into the national archive after appropriate quality control and reformatting. The objectives of this particular project are to:

1. Identify, inventory and document datasets at risk.
2. Reformat, quality control and standardize the observations into databases where and when possible.
3. Archive them at MEDS and improve access to these datasets both nationally and internationally.

For further information please contact Jean Gagnon: gagnon@ottmed.meds.dfo.ca

Data Inventories:

Ocean Subsurface Data

Vertical profiles are collected worldwide with water sampling bottles and electronic instruments. These subsurface measurements include temperature, salinity, oxygen and a wide variety of nutrients and chemicals. 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 1996, but not yet received at MEDS. Table 2 lists data collected in the NAFO area in 1996, received at MEDS but not yet archived. Table 3(a) gives a summary of the MEDS IGOSS archive for data received during 1996. Table 3(b) gives a summary of the data received from its originator for 1996, 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 1996. Table 4b lists those datasets that were received in the past year for years prior to 1996 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 3(a), and 3(b). 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 1996, has been processed and made available to scientists conducting environmental assessments of the NAFO area. Table 3b includes data from net mounted CTDs.

Table 1: Data collected in the NAFO area in 1996, not yet received at MEDS.

Inventory of Oceanographic Stations in the Northwest Atlantic

Year: 1996
Country: Denmark

NAFO STANDARD SECTION

Ship Name	Sub-area	Date Span	Name	Stations	Type	Parameters
Agdleq	1	280696	Holstein	5	STD	T,S
	1	290696	Sukkeit	5	STD	T,S
	1	300696	Fylla	5	STD	T,S
	1	020796	Frederikshab	5	STD	T,S
	1	030796	Cape Deso	5	STD	T,S
	1	040796	Cape Farwell	5	STD	T,S

OTHER STATIONS

Ship Name	Seasons	JFM	AMJ	JAS	OND	Stations	Type	Parameters
Paamiul				X		37	STD	T,S

Year: 1996
Country: Germany

NAFO STANDARD SECTION

Ship Name	Sub-area	Date Span	Name	Stations	Type	Parameters
Walther Herwig III	1E	101096	Cape Desol.	3	CTD	T,S,O2
	1D	161096	Fyllas Bank	5	CTD	T,S,O2

OTHER STATIONS

Ship Name	Seasons	JFM	AMJ	JAS	OND	Stations	Type	Parameters
Walther Herwig III					X	55	CTD & Rosette	T,S

Platform	Origin-Cr_Id	DOD-Ref-No	Project	Period
Gauss	276/3	19970031	WOCE	13.06.1996 - 02.07.1996
Valdivia	161/1	19970008		18.07.1996 - 18.08.1996
Walther Herwig III	164	19960203		11.09.1995 - 26.10.1995
	176	19960277		20.09.1996 - 30.10.1996

Year: 1996
Country: Canada (BIO)

The Bedford Institute of Oceanography has holdings of CTD data collected by the Marine Fish Divison and the Gulf Fisheries Center during 1995 and 1996 They also have data sets collected in the vicinity of Greenland between 1989 and 1994. These datasets contain CTD data originating from Denmark and Bottle data from Germany.

Table 2: Data collected in the NAFO area in 1996, received at MEDS but not yet archived.

Country: CANADA (NAFC) Total Profiles/Stations = 3134

Ship Name	Cruise Period	BT	Bottle	CTD	MEDS ID
Teleost	Jan-02 - Jan-12	15		41	18TL96001
Teleost	Jan-15 - Jan-26	5		44	18TL96002
Teleost	Jan-29 - Feb-04	0		3	18TL96003
Alfred Needler	Jan-29 - Feb-06	0		40	18NE96001
Wilfred Templeman	Jan-29 - Feb-06	0		40	181C96001
Alfred Needler	Feb-07 - Feb-15	0		61	18NE96002
Teleost	Feb-06 - Feb-16	6		13	18TL96004
Wilfred Templeman	Feb-07 - Feb-15	0		60	181C96002
Teleost	Mar-15 - Mar-24	0		3	18TL96005
Alfred Needler	Mar-18 - Mar-28	0		88	18NE96003
Marinus	Jan-08 - Feb-02	9		0	18MN96001
Wilfred Templeman	Mar-18 - Mar-28	1		79	181C96003
Parizeau (96004)	Apr-24 - May-02	0		60	18PZ96001
Shamook	Apr-15 - May-26	0		19	180K96001
Shamook	Mar-29 - May-08	0		12	180K96002
Shamook	May-10 - May-16	0		17	180K96003
Wilfred Templeman	Apr-04 - Apr-19	2		75	181C96004
Teleost	Apr-23 - May-01	0		4	18TL96006
Wilfrid Templeman	May-06 - May-17	1		85	181C96005
Wilfrid Templeman	Mar-22 - May-03	15		71	181C96006
Wilfrid Templeman	May-21 - May 31	3		85	181C96007
Teleost	May-13 - May-31	0		23	18TL96007
Wilfred Templeman	Jun-03 - Jun-14	2		95	181C96007
Shamook	May-29 - Jun-17	6		5	180K96004
Teleost	Jun-03 - Jun-21	2		44	18TL96008
Parizeau	Jul-17 - Jul-31	40		125	18PZ96002
Shamook	Jun-20 - Jul-05	0		3	180K96005
Teleost	Jun-23 - Jul-05	0		9	18TL96009
Teleost	Jul-22 - Jul-28	0		12	18TL96010
Shamook	Jul-09 - Aug-02	0		13	180K96006
Wilfred Templeman	Jul-02 - Jul-12	0		1	181C96009
Atlantic Lindsay	Jul-14 - Jul-25	55		0	18A196001
Shamook	Aug-05 - Aug-16	11		1	180K96007
Wilfrid Templeman	Jun-17 - Jun-28	4		102	181C96010
Teleost	Jul-30 - Aug-16	2		133	18TL96011
Teleost	Aug-19 - Sep-06	0		73	18TL96012
Wilfred Templeman	Aug-19 - Sep-06	0		78	181C96011
Wilfred Templeman	Sep-19 - Sep-20	0		7	181C96012
Teleost	Sep-07 - Sep-14	0		9	18TL96013
Grenfell	Sep-11 - Sep-15	2		0	18GN96001
Wilfred Templeman	Sep-23 - Oct-03	2		48	181C96013
Shamook	Sep-24 - Oct-04	1		16	180K96008
Teleost	Sep-16 - Sep-28	3		69	18TL96014
Teleost	Sep-28 - Oct-11	3		65	18TL96015
Wilfred Templeman	Oct-07 - Oct-18	1		61	181C96014
Teleost	Oct-14 - Oct-21	0		2	18TL96015
Wilfred Templeman	Oct-24 - Nov-01	8		78	181C96015
Shamook	Oct-07 - Oct-31	0		6	180K96009
Wilfred Templeman	Nov-04 - Nov-18	17		110	181C96016
CCG Bernier	Nov-13 - Nov-17	0		6	18BB96001
Teleost	Oct-21 - Nov-09	8		118	18TL96016

Teleost	Nov-09 - Nov-22	8	102	18TL96017
Wilfred Templeman	Nov-27 - Dec-07	3	32	181C96017
Teleost	Nov-25 - Dec-06	5	53	18TL96018
Wilfred Templeman	Dec-10 - Dec-13	1	20	181C96018
Afred Needler	Nov-22 - Dec-06	7	85	18NE96004
Teleost	Dec-10 - Dec-18	7	34	18TL96019
Shamook	Nov-09 - Dec-01	21	0	180K96010

Ship Name	Accession#	Agency	BT	Bottle	CTD	MEDS ID
Alfred Needler	A9611601	STABS		X		18NE96001
Alfred Needler	A9611601	STABS			X	18NE96001
HMCS Montreal	A9615501	METOCE	2			18MP96001
HMCS Toronto	A9615501	METOCE	112			18TR96001
HMCS Charlottetown	A9615501	METOCE	60			18C896001
HMCS Onondaga	A9615501	METOCE	6			18OD96001
HMCS Nipigon	A9615501	METOCE	4			18NN96002
HMCS Nipigon	A9615501	METOCE	17			18NN96001
HMCS Terra Nova	A9615501	METOCE	12			18TN96002
HMCS Terra Nova	A9615501	METOCE	27			18TN96001
HMCS Ville de Quebec	A9615501	METOCE	80			18VQ96001

Table 3a: IGOSS Stations Archived at MEDS for 1996

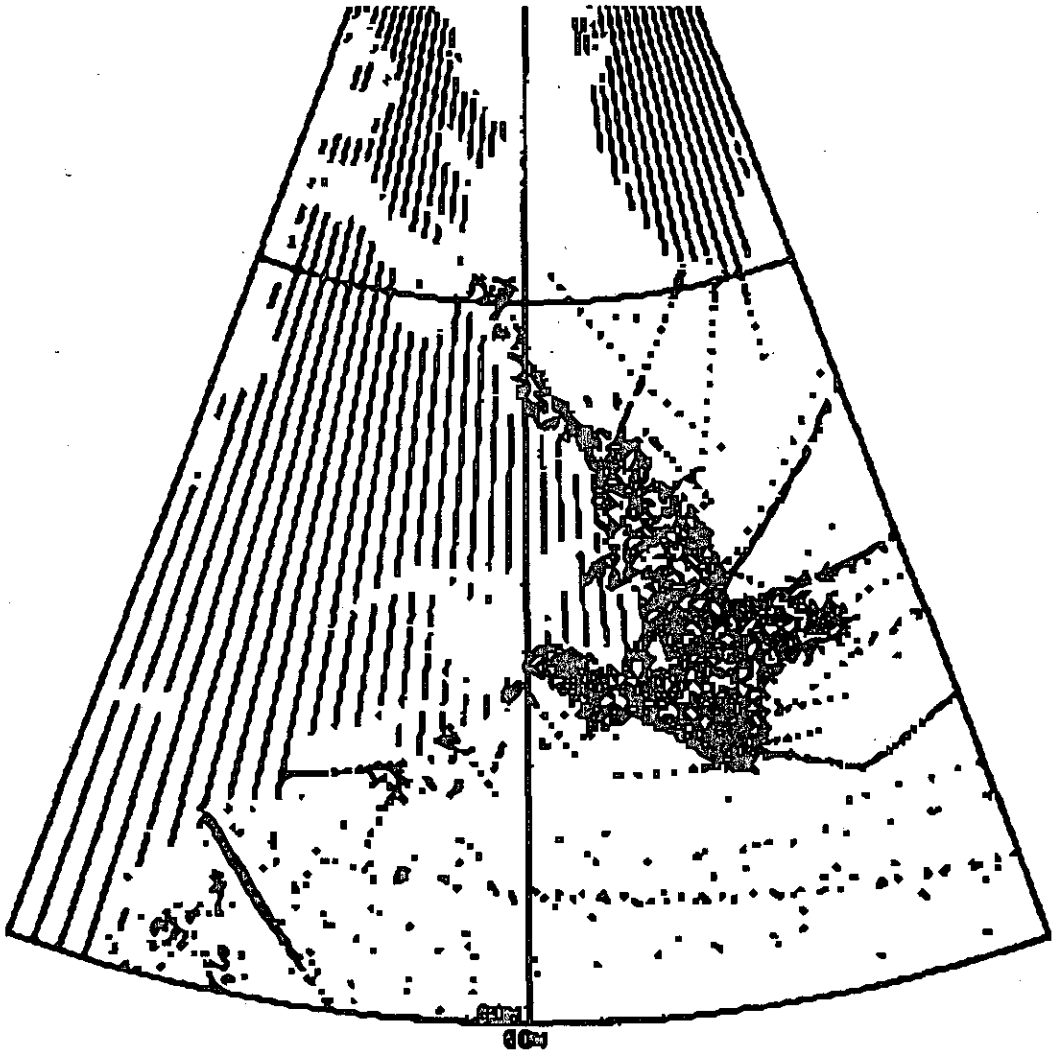


Table 3(a): IGOSS data received during 1996, and archived.
Total = 4629 stations

Ship Name	Country	Call Sign		Cruise Period	BATHY	TESAC	NAFO Subarea
		0HIP	93	Apr-04 - Apr-04	1	0	6A
RECIFE	PANAMA	3EGR6	93	Jan-22 - Jan-22	2	0	6D,6E
				Mar-26 - Mar-28	10	0	5ZE,6A,6D,6E,6F
				Aug-24 - Aug-27	5	0	4W,6G,6H
				Oct-30 - Oct-30	1	0	6A
				Nov-07 - Nov-08	3	0	6C,6D
UNKNOWN	USA	3EHE6	93	Jul-18 - Jul-19	5	0	4VS,6G,6H
				Oct-04 - Oct-07	8	0	4VS,4W,4X,6G,6H
				Dec 04 - Dec 04	1	0	6C
				Dec 13 - Dec 15	7	0	5ZE,6E,6F
SHAMOOK	CANADA	CG2676	93	Jan-20 - Jan-20	0	1	3L
				Jan-25 - Jan-27	0	3	3L
				May-12 - May-13	3	0	3L
				May-27 - Jun-08	3	15	3L
				Jun-23 - Jun-24	0	2	3L
				Jul-12 - Jul-29	0	56	3L
				Aug-05 - Aug-18	14	0	3L
				Aug-24 - Aug-25	5	0	3L
				Sep-09 - Sep-10	3	6	3L
				Oct-29 - Nov-09	0	37	3L
MARINUS	CANADA	CG2680	93	Nov-22 - Nov-25	2	0	3L
				Dec 04 - Dec 05	3	0	3L
ALFRED NEEDLER	CANADA	CG2683	93	Mar-04 - Mar-13	22	4	4VS,4W
				Mar-24 - Mar-24	1	0	4W
				Jun-01 - Jun-07	0	6	3L
				Jul-06 - Aug-01	184	100	4VN,4VS, 4W,4X,5Y
				Nov-14 - Nov-24	0	65	5ZE
PARIZEAU	CANADA	CGBS	93	Apr-27 - May-03	0	57	3L,3N
				Jun-03 - Jun-10	0	87	3K,3L
				Oct-11 - Oct-24	0	108	4W,4X,5ZE
				Nov-11 - Nov-20	0	70	3PS,4R, 4S,4T,4VN,4VS
HUDSON	CANADA	CGDG	93	Jun-19 - Jun-23	0	27	1F,2H,2J
				Aug-09 - Aug-10	0	2	2J
				Nov-16 - Dec 14	0	86	3L,3M, 3N,4VS,6G,6H
E.E. PRINCE	CANADA	CGDK	93	Oct-03 - Oct-03	0	1	5Y
				Oct-24 - Nov-04	0	117	4X,5Y
W. TEMPLEMAN	CANADA	CGDV	93	Jan-10 - Jan-27	0	46	2J,3K,3L
				Feb-05 - Feb-24	3	160	3L,3O,3PS, 3PN,4VN
				Mar-09 - Mar-18	49	0	5ZE
				Apr-01 - Apr-21	12	149	3L,3O,3PS, 3PN,4VN,4VS
				Apr-26 - May-06	2	93	3L,3N,3O
				Aug-24 - Dec 16	31	743	3K,3L,3N,3O
		CHAC	93	Dec 04 - Dec 04	1	0	4W
USN COMMAND TASK UNIT	USA	CTU	93	Aug-22 - Aug-22	28	0	4W,4X,5ZE,6E
QUEST	CANADA	CZDO	93	Mar-08 - Mar-10	3	0	4W
				Apr-15 - Apr-17	3	0	6E
				May-05 - May-08	10	0	4W,4X,6E
				May-27 - May-27	1	0	4W
				Jun-04 - Jun-10	10	0	4W

				Aug-05 - Aug-06	4	0	4W
				Aug-13 - Aug-14	9	0	4W
				Sep-12 - Sep-12	1	0	6D
				Sep-25 - Sep-25	1	0	6E
				Nov-10 - Nov-16	8	0	3O,4VS
				Dec 03 - Dec 11	20	0	4W
SEDCO-BP471	LIBERIA	D5BC	93	Jun-04 - Jun-11	31	0	6A,6B,6D, 6E,6F,6G,6H
				Jul-21 - Jul-24	12	0	3L,4W,4X, 5ZE,5ZW,6A
				Jul-30 - Aug-01	3	0	1F,3K
				Nov-18 - Nov-22	14	0	1F,2J,3K,3L
				Nov-29 - Nov-30	6	0	3N,6H
KOELN ATLANTIC	FRG	DAKE	93	Jan-02 - Jan-03	11	0	3M,3N
				Feb-04 - Feb-07	29	0	3M,3N,3O, 4VS,4W,4X,5ZE
				Mar-11 - Mar-14	31	0	3M,3N,3O, 4VS,4W,4X,5ZE
				Apr-22 - Apr-24	29	0	3M,3N,3O, 4VS,4W,4X
				May-08 - May-10	28	0	3M,3N,3O, 4VS,4W,4X,5ZE
				Jul-23 - Jul-25	16	0	3L,3M,4VS,4W
				Aug-07 - Aug-09	17	0	3M,3N,3O, 4VS,4W,4X,5ZE
				Oct-14 - Oct-17	13	0	3L,3M,4VS, 4W,4X,5ZE
				Oct-29 - Oct-30	5	0	3M
GAUSS	FRG	DBBX	93	Jun-25 - Jun-26	24	14	3M,3N
				Jul-08 - Jul-11	0	19	3M,3N
DAGMAR AERNN	FRG	DIXX	93	Jun-10 - Jun-11	3	0	1F
YANKEE CLIPPER	FRG	DLEZ	93	Jan-15 - Jan-16	11	0	4X,5Y,5ZW
				Feb-12 - Feb-12	1	0	5ZW
				Feb-20 - Feb-20	12	0	4X,5Y,5ZW
				Mar-13 - Mar-13	10	0	4X,5Y,5ZW
				Apr-22 - Apr-23	10	0	4X,5Y,5ZW
				May-14 - May-15	9	0	4X,5Y,5ZW
				Jun-11 - Jun-12	7	0	4X,5Y,5ZW
				Aug-06 - Aug-07	5	0	4X,5Y,5ZW
				Sep-11 - Sep-11	2	0	4X,5Y
				Sep-24 - Sep-25	4	0	4X,5ZW
COLUMBUS OHIO	LIBERIA	ELHL6	93	May-25 - May-25	2	0	6C,6D
ANGO	FRANCE	FNOM	93	Jan-13 - Jan-14	3	0	6G,6H
DELAWARE #2	USA	KNBD	93	Jul-08 - Jul-14	4	0	5ZE
				Aug-12 - Aug-17	3	0	5ZE
				Nov-01 - Nov-01	1	0	5ZW
SEA WOLF	USA	KNFG	93	Feb-07 - Feb-07	2	0	6B
				Mar-22 - Mar-22	1	0	6C
				May-04 - May-04	1	0	6C
				Jun-16 - Jun-17	3	0	6B,6C
				Jul-28 - Jul-28	1	0	6C
				Sep-09 - Sep-10	5	0	6B,6C,6D
				Oct-20 - Oct-20	3	0	6B,6C
TEXAS CLIPPER	USA	KVWA	93	Jul-20 - Jul-21	2	0	3K,3L
ICEPAT GROTON CT	USA	NIDK	93	Jan-04 - Jan-04	1	0	3M
				Feb-26 - Feb-26	2	0	3M
				Mar-21 - Mar-25	7	0	3N
				Apr-01 - Apr-02	3	0	3M,3N
				May-04 - May-04	1	0	3N

				May-18 - May-19	2	0	3L
				Jun-01 - Jun-03	4	0	3L,3M,3N
				Jun-11 - Jun-11	1	0	3K
DOYLE	USA	NJHD	93	Sep-12 - Sep-12	1	0	6C
UNKNOWN	USA	NNJB	93	Jan-07 - Jan-12	8	0	6B,6C
				Feb-04 - Feb-05	2	0	6C
				Oct-13 - Oct-13	2	0	6C
				Dec 08 - Dec 12	3	0	6B,6C
USCG POLAR SEA	USA	NRUO	93	Jul-08 - Jul-13	7	0	1F,2H,2J,5ZE,6A
				Sep-02 - Sep-02	1	0	6H
OLEANDER	NETHERLAND	PJJU	93	Jan-08 - Jan-08	1	0	6A
				Feb-05 - Feb-06	2	0	6A
				Mar-06 - Mar-11	19	0	6A,6D
				Apr-03 - Apr-08	27	0	6A,6B,6C,6D
				May-07 - May-12	16	0	6A,6B,6D
				Jun-12 - Jun-16	14	0	6A,6D
				Jul-03 - Jul-07	9	0	6A,6D
				Aug-04 - Aug-07	5	0	6A,6B
				Sep-24 - Sep-29	16	0	6A,6B
				Oct-16 - Oct-16	23	0	6A,6B,6D
				Nov-05 - Nov-10	21	0	5ZW,6A,6B,6D
				Dec 04 - Dec 05	21	0	6A,6B,6D
UNKNOWN	UNKNOWN	SHIP	93	Jan-05 - Jan-05	1	0	3L
				Jan-14 - Jan-14	1	0	3L
				Jan-22 - Jan-25	2	0	3L,6D
				Mar-20 - Mar-24	2	0	4VS,6B
				Apr-02 - Apr-05	3	0	6E,6H
				Apr-26 - Apr-26	1	0	6F
				May-03 - May-06	2	0	6C,6E
				Jun-09 - Jun-12	1	1	3L,5Y
				Jul-19 - Jul-20	3	0	3K
				Aug-10 - Aug-17	21	0	3K,4W,4X
				Aug-22 - Aug-22	3	0	4W,4X,6E
				Sep-02 - Sep-08	4	0	3K,3N,4W,6D
				Sep-24 - Sep-25	4	0	4X,5Y
				Oct-16 - Oct-27	5	0	3M,3N,6B,6C,6E
				Nov-08 - Nov-08	1	0	6D
				Nov-23 - Nov-23	1	0	6H
				Dec 04 - Dec 04	1	0	6B
				Dec 22 - Dec 22	1	0	4VS
				Dec 30 - Dec 30	1	0	3K
IJMA	USSR	UFJN	93	Apr-28 - May-29	0	88	3L,3N,3O
				Jun-04 - Jul-07	0	74	3L,3M,3N,3O
PROF MULTANOVSKY	USSR	UJFO	93	Jan-01 - Jan-10	49	0	3L,3M,3N
				Jan-25 - Jan-25	1	0	3O
				Nov-04 - Nov-04	18	0	3L,3M
SKOGAFOSS	ANTIGUA AN	V2QT	93	Jun-14 - Jun-16	11	0	1F,2J,3K,3L
				Nov-05 - Nov-07	6	0	4X,5Y,5ZW
				Dec 01 - Dec 01	1	0	4X
				Dec 06 - Dec 06	8	0	4X,5Y,5ZW
				Dec 30 - Dec 30	3	0	3K
GADUS ATLANTICA	CANADA	VC9450	93	Feb-05 - Mar-02	36	31	2J,3K,3L
				May-21 - May-29	0	9	3L,3PS
				Jun-10 - Jun-29	65	0	3K,3L,3M
				Jul-23 - Oct-18	133	188	2J,3K,3L, 3N,3O,3PS,4R
				Oct-30 - Nov-09	4	77	2J,3K
				Nov-25 - Dec 06	5	87	3K,3L
UNKNOWN	AUSTRALIA	VJPK	93	Jun-09 - Jun-28	43	0	3K,3L

BIBI	UK	VSBI3	93	Feb-13 - Feb-16	7	0	3M,3N,4VS, 6C,6D,6E
				Apr-07 - Apr-09	6	0	6E,6F,6G,6H
				May-03 - May-03	1	0	6H
				May-23 - May-26	7	0	3M,3N,4VS,6C,6E
				Jul-08 - Jul-08	1	0	6E
				Oct-05 - Oct-08	11	0	3M,3N,6E,6F,6G
				Nov-21 - Nov-22	7	0	6F,6G,6H
AIRCRAFT	USA	VXN-8	93	Sep-06 - Sep-06	21	0	4VS,4W,6E
FOGO ISLE	CANADA	VXZM	93	Oct-20 - Oct-25	0	36	4S,4VN
PETREL V	CANADA	VYPK	93	Apr-29 - May-06	0	166	4W
SEA-LAND ACHIEVER	USA	WPKD	93	Jan-01 - Jan-01	3	0	4W,4X
				Jan-11 - Jan-13	9	0	6D,6E,6F,6G,6H
				Feb-02 - Feb-05	5	0	3M,3N,4X
				Feb-14 - Feb-17	10	0	3M,4VS,6C, 6D,6E,6F,6G
				Mar-10 - Mar-11	2	0	3M,4VS
				Mar-22 - Mar-25	7	0	3M,3N,6D,6F
				Apr-14 - Apr-16	2	0	3N,4X
				Apr-25 - Apr-28	9	0	3M,3N,6D,6E,6F
				May-19 - May-21	9	0	3M,3N,4VS,4W
				May-29 - Jun-01	7	0	6D,6E,6F,6G,6H
				Jun-23 - Jun-25	4	0	3M,4VS,4W,4X
				Jul-04 - Jul-06	12	0	3N,4VS,6C, 6D,6E,6F
				Jul-27 - Jul-29	8	0	3M,3O,4VS,4W
				Aug-07 - Aug-10	17	0	3M,3N,4VS, 4W,6C,6D,6E
				Sep-07 - Sep-10	9	0	3M,3N,3O,4VS,4X
				Sep-18 - Sep-22	14	0	3M,3N,4VS, 6C,6D,6F
				Oct-13 - Oct-16	7	0	3M,3N,3O, 4VS,4W,6D
				Oct-24 - Oct-27	18	0	3M,3N,4VS, 6C,6D,6E,6F
				Nov-16 - Nov-19	5	0	4VS,4W,5ZE,6H
				Dec 01 - Dec 01	1	0	3M
				Dec 21 - Dec 23	8	0	3M,3N,4VS,4W
PACMISRANFAC HAWAREA	USA	WRBA	93	Aug-10 - Aug-10	14	0	4W,4X
TABASCO	MEXICO	XCSH	93	Apr-25 - Apr-28	9	0	3M,3N,4VS, 6E,6F,6G

Table 3 b:Oceanographic Stations (other than IGOSS) Archived at MEDS for 1996

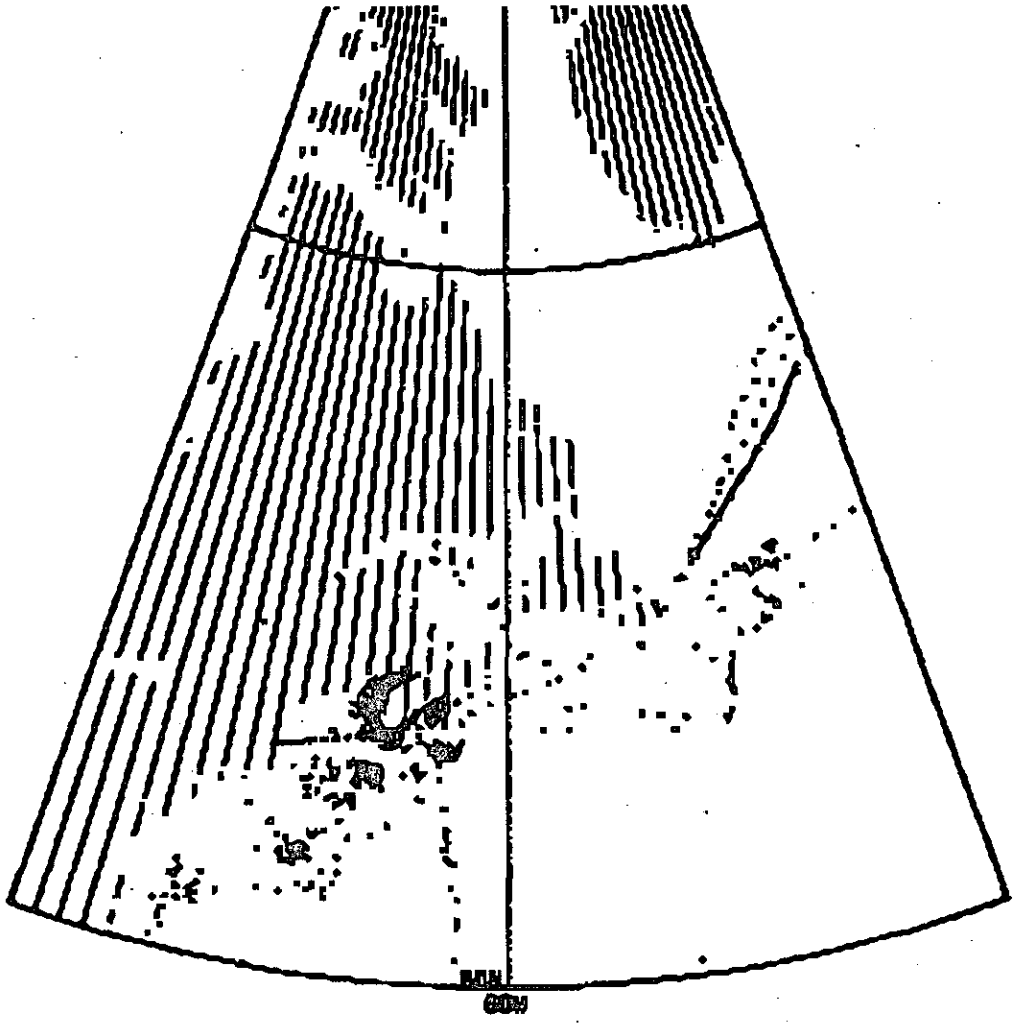


Table 3(b): Delayed Mode data received during 1996.
Total = 941 stations

Country	Cruise Num	Cruise Period	BT	CTD	BOTTLE	NAFO Subarea
CANADA	181096100	Jan-09 - Jan-14	23	0	0	1F,2J,3K,3L,4X,5Y,5ZW
CANADA	181096101	Feb-06 - Feb-12	21	0	0	1F,2J,3K,4X,5Y,5ZW
CANADA	181096102	Mar-06 - Mar-12	45	0	0	1F,2J,3K,3L,4X,5Y,5ZW
CANADA	18AH96001	Aug-20 - Aug-24	15	0	0	1F,2J,3K,3L,3PS,4VS,4W
		Sep-24 - Sep-24	3	0	0	3M
CANADA	18C896001	Feb-23 - Feb-23	5	0	0	4W,6G
		Apr-05 - Apr-05	1	0	0	6B
CANADA	18HL96001	Nov-28 - Nov-29	5	0	0	4X
CANADA	18HL96002	Dec 03 - Dec 05	3	0	0	4W
CANADA	18MP96001	Feb-08 - Feb-08	2	0	0	4X
CANADA	18NE96001	Feb-20 - Feb-29	0	76	83	5ZE
CANADA	18NE96003	Nov-03 - Nov-15	0	153	155	4W,4X,5Y
CANADA	18NN96001	Feb-06 - Feb-08	9	0	0	4X
		Mar-04 - Mar-06	8	0	0	4W,4X
CANADA	18NN96002	Mar-26 - Mar-27	4	0	0	4W
CANADA	18NN96003	Sep-19 - Sep-25	3	0	0	4X
CANADA	18NN96004	Oct-08 - Oct-17	45	0	0	4X,5ZE,5ZW,6B,6D
CANADA	18OD96001	Jan-10 - Jan-13	4	0	0	4X
		Jan-20 - Jan-21	2	0	0	6B,6C
CANADA	18PW95036	Feb-01 - Feb-01	0	5	0	4W
CANADA	18PW95037	Feb-08 - Feb-08	0	5	0	4W
CANADA	18PW95038	Feb-15 - Feb-15	0	7	0	4W
CANADA	18S696001	Nov-13 - Nov-14	4	0	0	5ZE,6C,6D
CANADA	18TN96001	Feb-05 - Feb-29	27	0	0	3L,3M,3N,3O,4VN,4VS,4W,4X
CANADA	18TN96002	Mar-25 - Mar-29	12	0	0	4W,4X
CANADA	18TR96001	Feb-22 - Feb-24	12	0	0	4W,4X,6E
		Mar-28 - Apr-01	22	0	0	4X,6B,6C,6D
CANADA	18TR96002	Jun-13 - Jun-27	51	0	0	4W,4X,5Y,5ZE
CANADA	18TR96003	Aug-19 - Aug-22	9	0	0	4S,4T,4VN,4W
		Sep-08 - Sep-10	6	0	0	4S,4T,4VN,4W
CANADA	18TR96004	Sep-17 - Oct-08	44	0	0	3L,3M,3N,3O,4VS
CANADA	18VQ96001	Feb-23 - Feb-24	4	0	0	4W,6E
		Mar-28 - Apr-02	17	0	0	4X,5ZE,6B,6C,6D
CANADA	18VQ96002	Aug-20 - Aug-24	16	0	0	1F,2J,3K,3L,3PS,4VS,4W
CANADA	18VQ96003	Nov-04 - Nov-08	22	0	0	4W,4X

Table 4: Historical data (from years prior to 1995), received at MEDS since last NAFO report.

Table 4a: HISTORICAL DATA PROCESSED AND ARCHIVED.
Total = 1325 stations

Cruise No	Year	BT	Bottle	CTD	NAFO Subarea
180593002	1993	4	0	0	3L,3K,2J
180593003	1993	3	0	0	3P
180593010	1993	12	0	0	3P,4V,3O,3L,4R
180593038	1993	5	0	0	3L
181095105	1995	19	0	0	5Y,4X,3K,3L,5Z,XX
181095106	1995	21	0	0	XX,3K,2J,4X,1F,5Y,3L,5Z
181095107	1995	23	0	0	4X,5Y,1F,3K,5Z,2J,XX
181095108	1995	24	0	0	1F,3K,2J,XX,5Y,4X

181095109	1995	23	0	0	5Z,2J,5Y,1F,3K,4X,XX
181095110	1995	20	0	0	XX,3K,2J,4X,5Y,1F,5Z
181095111	1995	20	0	0	4X,5Y,3K,5Z,2J,1F,XX
181095112	1995	21	0	0	XX,1F,4X,5Z,3K,2J,5Y
181095113	1995	26	0	0	5Z,4X,5Y,2J,3K,1F,3L,XX
181095114	1995	23	0	0	3K,3L
18AH95004	1993	3	0	0	4W
18HE93906	1994	0	0	5	2J
18HE94905	1994	0	0	3	2J
18HE94906	1995	0	0	6	2J
18HE95906	1992	0	0	2	2J
18HU92014	1993	0	0	51	1F,XX,3M,3K,2H,2J
18HU93019	1995	0	0	27	1F,2J,2H
18MP95002	1995	19	0	0	5Z,6B,4X,6C
18MP95003	1995	9	0	0	4W
18MP95004	1995	11	0	0	4X,4W
18MP95005	1995	7	0	0	4X,4W
18MP95006	1987	14	0	0	4X,4W
18NE87003	1988	39	0	0	4W,4X,5Z
18NE88005	1995	13	0	0	4W,4V,4X
18NE95005	1995	0	125	123	4X,5Y
18NE95006	1994	0	113	112	5Z,4X
18PZ94011	1994	0	0	24	4X,4W
18PZ94018	1994	0	0	42	4X,5Z,4W
18PZ94033	1995	0	0	85	3P,4X,5Z,4V,4T,4S,4R,4W
18PZ95010	1995	0	0	49	4X,5Z,4W
18PZ95031	1995	0	0	92	4S,4T,4R,4V,4W
18PZ95032	1995	0	0	42	4V,4T,4R,3P,4W
18PZ95034	1993	0	0	56	4X,5Y,5Z,4W
18QU93002	1995	9	0	0	4W

TABLE 4b HISTORICAL DATA RECEIVED BUT NOT ARCHIVED.

Accession#	Year	Agency	BT	Bottle	CTD	MEDS ID
A9602901	1995	METOCE	156			18VQ95002
A9602901	1995	METOCE	73			18TR95002
A9602901	1995	METOCE	108			18VQ95002
A9602901	1995	METOCE	156			18VQ95002
A9603901	1995	METOCE	29			18GU95005
A9603901	1995	METOCE	15			18IS95003
A9603901	1995	METOCE	8			18IS95004
A9603901	1995	METOCE	46			18IS95005
A9603901	1995	METOCE	32			18IS95006
A9608208	1995	NAFC			8	18TL95001
A9608208	1995	NAFC			87	181C95001
A9608208	1995	NAFC			54	18TL95002
A9608208	1995	NAFC			46	18GA95001
A9608208	1995	NAFC			10	188895001
A9608208	1995	NAFC			102	18TL95003
A9608208	1995	NAFC			106	18GA95002
A9608208	1995	NAFC			126	18GA95003
A9608208	1995	NAFC			71	18TL95005
A9608208	1995	NAFC			110	18TL95006
A9608208	1995	NAFC			65	185L95007
A9608208	1995	NAFC			78	181C95003
A9608208	1995	NAFC			99	181C95004
A9608208	1995	NAFC			14	180K95002

A9608208	1995	NAFC		142	181C95005
A9608208	1995	NAFC		7	180K95003
A9608208	1995	NAFC		9	18TL95008
A9608208	1995	NAFC		77	181C95006
A9608208	1995	NAFC		93	181C95007
A9608208	1995	NAFC		3	181C95008
A9608208	1995	NAFC		6	18TL95009
A9608208	1995	NAFC		2	181C95009
A9608208	1995	NAFC		162	18PZ95001
A9608208	1995	NAFC		2	18TL95010
A9608208	1995	NAFC		2	180K95004
A9608208	1995	NAFC		23	18TL96011
A9608208	1995	NAFC		1	18OK95005
A9608208	1995	NAFC		2	18TL95012
A9608208	1995	NAFC		4	181C95010
A9608208	1995	NAFC		108	18TL95013
A9608208	1995	NAFC		237	18OK95006
A9608208	1995	NAFC		4	18OK95007
R9608208	1995	NAFC		67	18TL95014
R9608208	1995	NAFC		74	181C95011
R9608208	1995	NAFC		87	181C95012
A9608208	1995	NAFC		120	181C95013
A9608208	1995	NAFC		31	18TL95015
A9608208	1995	NAFC		15	180K95008
A9608208	1995	NAFC		85	181C95014
A9608208	1995	NAFC		4	180K95009
A9608208	1995	NAFC		63	181C95015
A9608208	1995	NAFC		57	181C95016
A9608208	1995	NAFC		11	18OK95011
A9608208	1995	NAFC		29	18TL95016
A9608208	1995	NAFC		30	18TL95017
A9608208	1995	NAFC		55	181C95017
A9608209	1995	NAFC		1	18TL95001
A9608209	1995	NAFC	1		181C95001
A9608209	1995	NAFC	28		181C95002
A9608209	1995	NAFC	11		18TL95003
A9608209	1995	NAFC	21		18TL95005
A9608209	1995	NAFC	1		18TL95006
A9608209	1995	NAFC	2		180K95001
A9608209	1995	NAFC	7		181C95003
A9608209	1995	NAFC	6		181C95004
A9608209	1995	NAFC	5		181C95005
A9608209	1995	NAFC	12		181C95006
A9608209	1995	NAFC	10		181C95007
A9608209	1995	NAFC	39		18PZ95001
A9608209	1995	NAFC	12		180K95004
A9608209	1995	NAFC	21		18TL95011
A9608209	1995	NAFC	11		180K95005
A9608209	1995	NAFC	4		18TL95013
A9608209	1995	NAFC	2		181C95012
A9608209	1995	NAFC	2		181C95013
A9608209	1995	NAFC	1		18OK95008
A9608209	1995	NAFC	4		181C95014
A9608209	1995	NAFC	4		181C95015
A9608209	1995	NAFC	3		181C95016
A9608209	1995	NAFC	10		18OK95010
A9608209	1995	NAFC	1		180K95011
A9608209	1995	NAFC	5		18TL95016
A9608209	1995	NAFC	1		18TL95017

A9608209	1995	NAFC	6			181C95017
A9611601	1995	STABS			X	18NE95005
A9614201	1995	STABS		X		18NE95006
A9614201	1995	STABS			X	18NE95006
A9615501	1995	METOCE	14			18MP95006
A9615501	1995	METOCE	7			18MP95005
A9615501	1995	METOCE	11			18MP95004
A9615501	1995	METOCE	9			18MP95003
A9615501	1995	METOCE	18			18MP95002

Drifting Buoy (Dribu) Data

Drifting buoy (or DRIBU) data is 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). Duplicate checking is done, and is important to discriminate between data 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 RNODC for drifting buoy data, has holdings of over 9 million (as of 1996) 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.

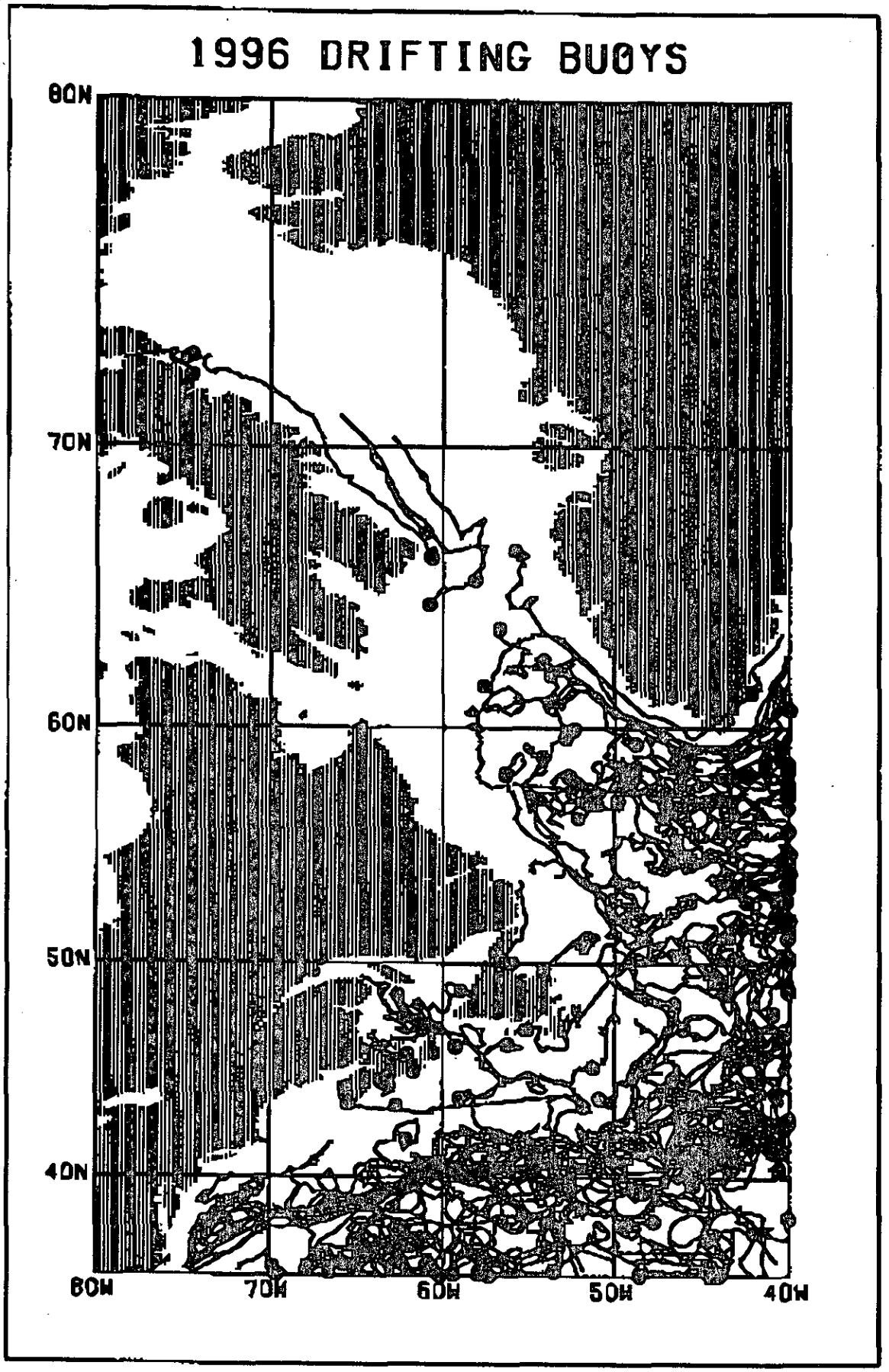
Table 5 lists data collected by Drifting Buoys in the NAFO Area in 1996. Maps of DRIBU tracks for 1996, processed and archived by MEDS, are show in the figure.

Table 5: Data Collected by Drifting Buoys in the NAFO Area in 1996
Number of Buoys = 129 and Buoy Days = 13149

BUOY	DATE RANGE	DAYS	SST	AP	AT	WS	WD	TC	NAFO Subarea
13922	Feb-23 - Sep-03	193	X	X	-	-	-	-	6E,6F,6G
23913	Jan-23 - Jan-25	3	X	X	-	-	-	-	4X
25565	Jan-01 - Jan-19	19	-	X	X	-	-	-	1F
33835	Jul-26 - Jul-27	1	X	X	-	-	-	-	4X
41526	Mar-13 - Aug-24	165	X	X	-	X	X	-	6F,6G
41527	Oct-27 - Oct-27	1	X	X	-	-	-	-	6C
41529	Oct-06 - Dec 31	87	-	X	-	X	X	-	6C,6B,6D,6E,4W,4VS,6G,3N,6H,3M
41530	Sep-20 - Dec 31	103	X	X	-	X	X	-	6C,6B,6D,6E,4W,4VS,6G,3N,6H
41585	Jan-01 - Jul-22	204	X	X	-	X	X	-	6D,6E,4W,6F,4VS,6G,3N,3M,6H
41901	Feb-07 - Jun-22	136	X	X	-	-	-	-	6D,6E,6F
41902	Nov-09 - Nov-16	7	X	X	-	-	-	-	6D
41911	Jul-09 - Nov-01	116	X	X	-	-	-	-	6H
41912	Oct-23 - Nov-05	13	X	X	-	-	-	-	6C,6D
41917	Nov-18 - Dec 22	34	X	X	-	-	-	-	6H,3M
41919	May-28 - Dec 30	217	X	X	-	-	-	-	6H,6G,6F,6E,6D
41923	Sep-03 - Dec 31	120	X	X	-	-	-	-	6F,4VS,4W
41925	Feb-21 - May-16	86	X	X	-	-	-	-	6H,3M
41929	Jul-18 - Nov-26	132	X	X	-	-	-	-	6G,6F,4W,4VS,6H,3M

41936	Jan-01 - Nov-16	321	X	X	-	-	-	-	6E,6D
41939	Jan-01 - Jul-02	184	X	X	-	-	-	-	3M
41940	Jan-26 - May-02	97	X	X	-	-	-	-	6C,6D,6E
42624	Dec 31 - Dec 31	1	X	X	X	X	X	-	2J,1F
44501	Mar-07 - Jul-22	138	X	X	-	-	-	-	3L,3M,3N
44502	May-07 - Oct-31	177	X	X	-	-	-	-	3K,3L,3M
44503	May-29 - Nov-25	180	X	X	-	-	-	-	4VS,3O,3PS,3N
44504	Mar-07 - Jul-22	137	X	X	-	-	-	-	3L,3N
44505	Apr-25 - Jul-22	88	X	X	-	-	-	-	3K
44506	Apr-25 - Aug-22	120	X	X	-	-	-	-	3L,3M,3N,3O,3K
44507	Jan-01 - Jul-22	204	X	X	-	-	-	-	4VS,3O,3N,3M,6H,6G,3K
44510	Jan-01 - Apr-12	103	X	X	-	-	-	-	3O,3PS,4VS,4VN
44511	Jan-01 - Mar-26	86	X	X	-	-	-	-	6H
44512	Apr-25 - Jul-12	78	X	X	-	-	-	-	3L,3PS
44513	Aug-18 - Dec 31	136	X	X	-	X	X	-	2H,2J,3K,3L,3N
44529	Jan-03 - Oct-17	289	X	X	-	-	-	-	6G,6F,4VS,6H,3M,3N
44534	Jan-02 - Apr-02	91	X	X	-	-	-	-	4VS,3O,3N,3M
44535	Jan-01 - Feb-27	57	X	X	-	-	-	-	6E,4W,4VS,3O,3N,3M
44536	Jan-02 - Jan-18	16	X	X	-	-	-	-	6B,6A
44542	Jan-02 - Jul-04	184	X	X	-	-	-	-	5ZW,6B,6C,6D,5ZE,4X,4W,4VS,6G,3O,3N,3M
44549	Apr-01 - Jun-28	89	X	X	-	-	-	-	1F
44552	Jan-02 - Dec 31	364	X	X	-	-	-	-	5ZE,6D,6E,4W,4VS,3N,3M,3K
44554	Jan-03 - Dec 20	353	X	X	-	-	-	-	6B,6C,6D,6E,3N,3M,6H,6G,6F
44555	Jan-01 - Dec 30	365	X	X	-	-	-	-	6A,6B,6C,6D,5ZW,6E,4W,4X,4VS,3O,3L
44556	Jan-01 - Mar-25	85	X	X	-	-	-	-	6E,4W,4X,6D
44557	Jan-01 - Jun-06	158	X	X	-	-	-	-	6D,5ZE,6E,4W,4VS,3O,3N,3M
44561	Jan-01 - Jun-04	156	X	X	-	-	-	-	6B,6C,6D,6E,4W,4VS,3O,3N,3M
44563	Jan-01 - Sep-06	250	X	X	-	-	-	-	4X,6E,4W,4VS,3N,3M
44564	Jan-01 - Mar-01	61	X	X	-	-	-	-	6D,5ZE,3O,6E,4W,4VS
44565	Jan-01 - Apr-03	94	X	X	-	-	-	-	6D,5ZE,6E,4W,4VS,3O,3N,3M
44569	Jan-01 - Apr-12	103	X	X	-	-	-	-	5ZE,5ZW,6A,6B,6C,6D,6E,4W,4VS,3N,3M
44570	Jan-01 - Nov-20	325	X	X	-	-	-	-	5ZW,6B,6A,6C,6D,5ZE,4X,4W,4VS,3O,6H,3N,3M
44617	Aug-22 - Sep-13	22	X	X	X	-	-	-	3M,3K
44631	Feb-12 - Apr-15	63	-	-	-	-	-	-	4T,4VN,3PN,3PS,4VS,4W
44632	Feb-12 - Apr-05	54	-	-	-	-	-	-	4T,4S,4R
44633	Feb-12 - Apr-11	60	-	-	-	-	-	-	4T,4S,4VN
44634	Apr-25 - Apr-30	5	-	-	-	-	-	-	4W
44645	Apr-03 - Apr-08	5	-	-	-	-	-	-	4X
44647	Apr-08 - Oct-21	196	-	-	-	-	-	-	4X,0A
44677	Mar-08 - Apr-08	31	-	X	-	-	-	-	4T
44684	Feb-01 - Apr-02	62	-	X	-	-	-	-	3L,2J,4T,4S,4VN
44688	Mar-12 - Mar-27	15	X	X	-	-	-	-	4T,4VN
44690	Feb-01 - Mar-27	56	-	X	-	-	-	-	3L,2J,4T
44692	Mar-18 - May-02	45	-	X	-	-	-	-	2J,3K
44693	Feb-12 - Feb-13	1	-	-	-	-	-	-	4X
44726	Nov-04 - Nov-14	10	X	X	X	X	X	-	1F
44742	Jan-01 - Jan-24	24	X	X	X	X	X	-	1F
44743	Aug-26 - Nov-07	73	X	X	X	-	-	-	2J,3K,3M
44755	Feb-01 - Jun-27	148	-	-	-	-	-	-	4X,4W
44761	Jan-01 - Aug-08	221	-	X	X	-	-	-	2H,2J,1F
44763	Jan-01 - Jan-17	17	X	X	X	-	-	-	1F
44767	Feb-08 - Feb-13	6	X	X	X	-	-	-	2J,1F
44771	Mar-07 - May-13	68	X	X	X	X	X	-	1F,2J,3K,3M
44774	Jan-01 - May-08	129	X	X	X	-	-	-	2J,3K
44775	May-31 - Sep-15	107	X	X	X	-	-	-	2J,3K,1F
44776	Oct-15 - Nov-25	42	X	X	X	X	X	-	1F,2J
44777	May-31 - Jul-16	47	X	X	X	-	-	-	2J,1F
44778	May-21 - Jul-07	47	X	X	X	-	-	-	1F
44780	Sep-03 - Oct-01	29	X	X	X	-	-	-	1F

44849	Nov-26 - Dec 31	36	-	X	-	-	-	-	2G
44850	Nov-15 - Dec 31	47	X	X	-	-	-	-	1F
44901	Jan-02 - Aug-15	226	X	X	-	-	-	-	1F
44904	Jan-01 - Feb-07	37	X	X	-	-	-	-	1F
44906	Jan-16 - Feb-03	19	X	X	-	-	-	-	3M
44907	Jan-03 - Dec 31	364	X	X	-	-	-	-	1F,1E,2G,2H
44909	Oct-23 - Dec 31	70	X	X	-	-	-	-	3M,3K
44910	Nov-14 - Dec 31	48	X	X	-	-	-	-	2G,2H,1F
44911	Mar-09 - Nov-30	266	X	X	-	-	-	-	3L,3K,2J,2H,1F
44912	Mar-08 - Aug-11	157	X	X	-	-	-	-	3L,3N,3O
44913	Jan-03 - Dec 31	364	X	X	-	-	-	-	1F,1E
44914	Mar-25 - Apr-12	19	X	X	-	-	-	-	3M
44915	Jan-01 - Dec 30	364	X	X	-	-	-	-	1F,1E,1D,2G,2H,2J,3K,3L
44917	Oct-31 - Nov-26	26	X	X	-	-	-	-	2H,2G,1F
44918	Oct-31 - Dec 31	62	X	X	-	-	-	-	1F,2G
44919	Jan-01 - Dec 31	366	X	X	-	-	-	-	3O,3N,3M,2H,1F
44923	Oct-31 - Dec 31	62	X	X	-	-	-	-	2J,3K,1F,2G
44924	Oct-31 - Dec 31	62	X	X	-	-	-	-	2H,1F
44925	Oct-31 - Nov-26	26	X	X	-	-	-	-	2H
46764	Dec 03 - Dec 31	29	-	X	-	-	-	-	1F
47032	Mar-27 - Apr-11	15	-	-	-	-	-	-	4X
47033	Apr-08 - May-13	35	-	-	-	-	-	-	4X
47531	Jan-01 - Feb-09	40	-	-	-	-	-	-	0A
47532	Jan-01 - Mar-06	66	-	-	-	-	-	-	0A,1B,1C,0B
47533	Jan-01 - Mar-07	67	-	-	-	-	-	-	0A,1B,1C
47540	Mar-01 - Dec 23	298	-	-	-	-	-	-	4T,0A
47541	Feb-08 - Dec 31	328	-	X	-	-	-	-	4T,4S,0A
47542	Apr-04 - May-13	40	-	-	-	-	-	-	4X
48529	Apr-09 - May-10	31	-	-	-	-	-	-	4X
48552	Apr-05 - Apr-10	6	-	-	-	-	-	-	4X
51632	May-15 - May-16	1	X	X	-	-	-	-	4X
53546	Dec 03 - Dec 12	9	X	X	-	-	-	-	4X
56503	Dec 03 - Dec 12	9	X	X	-	-	-	-	4X
56513	Nov-28 - Dec 04	7	X	X	X	-	-	-	4X
56516	Dec 04 - Dec 12	9	X	X	-	-	-	-	4X
62503	Aug-19 - Aug-19	1	X	X	X	-	-	-	3L
62694	Apr-03 - May-14	42	X	X	X	-	-	-	1F
62906	Oct-21 - Dec 30	70	X	X	-	-	-	-	1F,1E
62910	Oct-13 - Dec 30	79	-	X	-	-	-	-	1F
63661	Jun-26 - Jul-02	7	-	X	X	-	-	-	4X
64943	Jan-08 - Feb-11	34	X	X	-	-	-	-	1F
64944	Nov-27 - Dec 31	34	X	X	-	-	-	-	1F,1E
64949	Jan-01 - Dec 31	366	X	X	-	-	-	-	1D,1E,1F,1C,1B
65594	Jan-01 - Aug-02	215	X	X	X	-	-	-	1F
65595	Apr-03 - Jul-16	104	X	X	X	-	-	-	1F
65599	Aug-22 - Dec 31	132	-	X	X	-	-	-	1F,2J,2G,2H,3K,3L,3M
65901	Sep-21 - Dec 30	100	X	X	-	-	-	-	1D,1E
71542	Apr-24 - May-13	20	-	X	X	-	-	-	4X
71544	Jun-29 - Jul-02	3	-	X	-	-	-	-	4X
71545	Jun-26 - Jul-02	7	-	X	-	-	-	-	4X
71546	Jun-26 - Jul-02	7	-	X	-	-	-	-	4X
71557	Jun-26 - Jul-02	7	-	X	-	-	-	-	4X


1996 DRIFTING BUOYS
80N
70N
60N
50N
40N
80W
70W
60W
50W
40W

Current Meter Data

Current meters have been deployed in the NAFO area for many years. The Bedford Institute of Oceanography, Dartmouth, Nova Scotia collects and archives a substantial set of these observations.

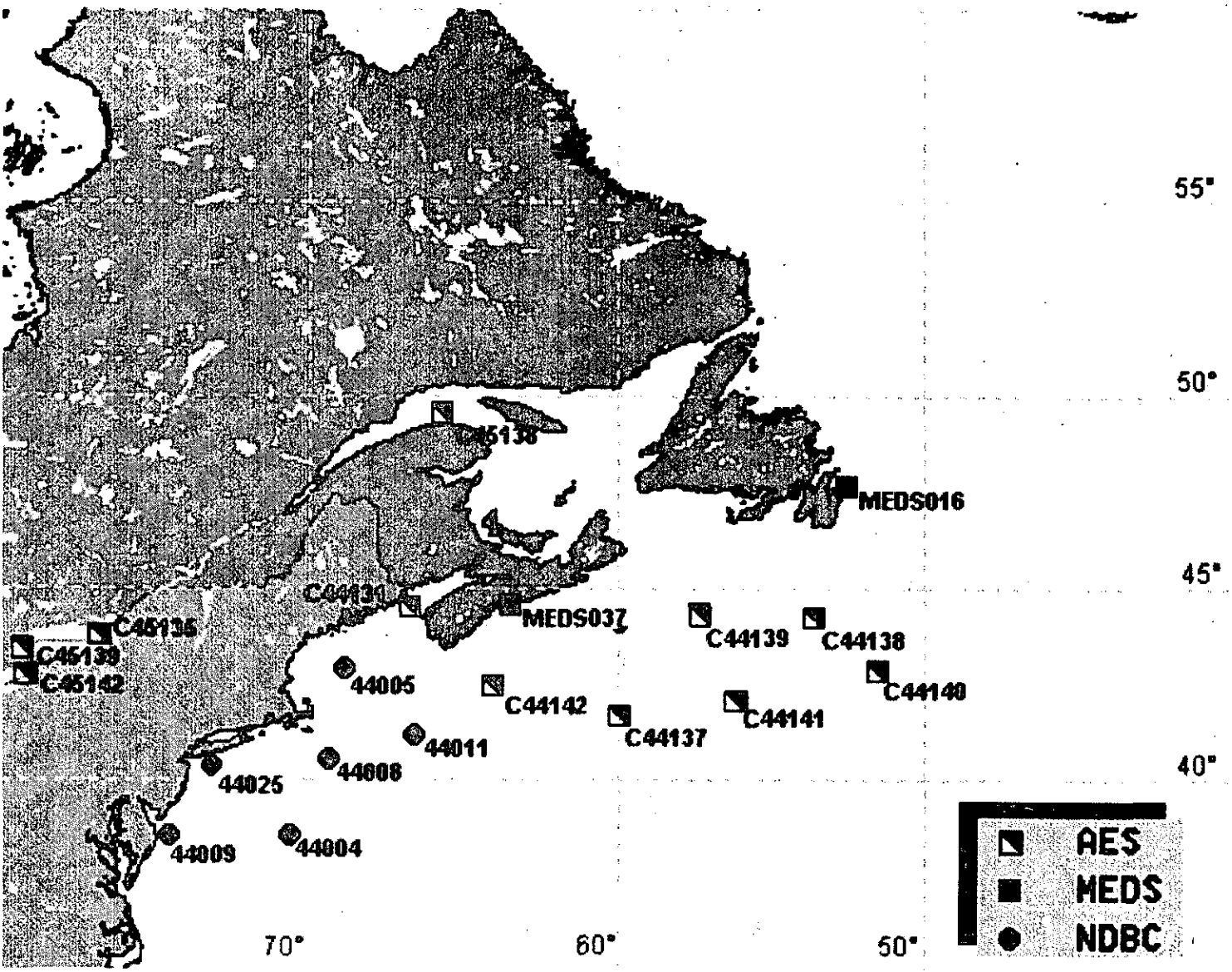
Wave Data

Table 6 lists wave measurement data in the NAFO area for 1996. 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.

Table 6: Wave spectra in the NAFO area for 1996
Total Spectra = 98769

STATION	STATION NAME	LATITUDE	LONGITUDE	INST TYPE	WATER DEPTH (M)	NUMBER OF GOOD SPECTRA	NAFO SUBAREA
44004	Hotel	38.5000	70.7000	US	3231.0	7946	6B
44005	Gulf of Maine	42.9000	68.9000	US	22.0	4845	5Y
44008	Nantucket	40.5000	69.4000	US	60.0	4617	5ZE
44009	Delaware Bay	38.5000	74.7000	US	28.0	8604	6B
44011	Georges Bank	41.1000	66.6000	US	87.0	7043	5ZE
44025	Long Island	40.3000	73.2000	US	40.0	8554	6A
C44131	Gannet Rock	44.5000	66.7830	AE	34.0	3118	4X
C44137	East Scotian Slope	41.6000	60.0330	AE	4500.0	2131	4W
C44138	SW Grand Banks	44.2330	53.6330	AE	1500.0	3702	3O
C44139	Banquereau	44.3170	57.3500	AE	1100.0	901	4VS
C44140	Tail of the Bank	42.7330	50.5170	AE	1430.0	6453	3N
C44141	Laurentian Fan	42.0670	56.1500	AE	4500.0	8054	4VS
C44142	La Have Bank	42.4670	64.2330	AE	1500.0	3690	4X
C45135	Prince Edward Point	43.7830	76.8670	AE	72.0	3645	5Y
C45138	Mont Louis	49.5330	65.7330	AE	335.0	2397	4S
C45139	West Lake Ontario	45.4330	79.3830	AE	126.0	48	5Y
C45142	Point Colborne	42.7330	79.2830	AE	24.0	788	5Y
MEDS016	Torbay	47.6320	52.5000	WR	165.0	7177	3L
MEDS037	Osborne Head	44.4890	63.4160	WR	61.6	15056	4W

WAVE STATIONS IN THE NAFO AREA FOR 1996



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 7 lists tide and water level data in the NAFO area for 1996. 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 7: Tide and Water level data in the NAFO area for 1996
Total Stations = 64

STATION NUMBER	STATION NAME	LATITUDE	LONGITUDE	15-MINUTE HEIGHTS # OF DAYS	HOURLY HEIGHTS # OF DAYS
00065	SAINT JOHN	45.27	66.06	366	366
00365	YARMOUTH	43.84	66.12	358	366
00490	HALIFAX	44.66	63.59	366	366
00612	NORTH SYDNEY	46.22	60.25	354	366
00665	PORT AUX BASQUES	47.57	59.14	324	346
00835	ARGENTIA	47.30	53.98	347	348
00905	ST. JOHN'S	47.56	52.71	359	359
01630	PICTOU	45.68	62.70	57	69
01700	CHARLOTTETOWN	46.23	63.12	357	357
01915	RUSTICO	46.47	63.28	67	67
01970	CAP-AUX-MEULES	47.38	61.87	20	20
02000	LOWER ESCUMINAC	47.08	64.89	316	328
02330	RIVIERE-AU-RENARD	48.98	64.37		366
02780	SEPT-ILES	50.18	66.37	348	348
02935	SAINTE-ANNE-DES-MONTS	49.12	66.48		356
02985	RIMOUSKI	48.48	68.52	364	364
03057	SAINT-JOSEPH-DE-LA-RIVE	47.45	70.37		366
03100	SAINT-FRANCOIS	47.00	70.81	362	362
03125	GROS CACOUNA	47.93	69.52		336
03246	ST. CHARLES RIVER BASIN	46.82	71.20	360	360
03250	QUEBEC (LAUZON)	46.83	71.17	364	366
03280	NEUVILLE	46.70	71.57	361	366
03300	PORTNEUF	46.68	71.88	363	366
03335	CAP A LA ROCHE	46.56	72.11	366	366
03345	BATISCAN	46.50	72.25	366	366
03350	CHAMPLAIN	46.44	72.34		305
03353	BECANCOUR	46.40	72.38	361	359
03360	TROIS-RIVIERES	46.34	72.54	366	366
03460	PORT-ALFRED	48.33	70.87		337
03480	CHICOUTIMI	48.43	71.08	35	35
12865	PORT COLBORNE	42.87	79.25	366	366
13030	PORT WELLER	43.24	79.22	366	366
13150	BURLINGTON	43.34	79.77	366	366
13320	TORONTO	43.64	79.38	366	366

13590	COBOURG	43.96	78.17	366	366
13988	KINGSTON (PORTSMOUTH)	44.22	76.52	366	366
14400	BROCKVILLE	44.59	75.68	366	366
14600	IROQUOIS ABOVE/AMONT	44.82	75.32	366	366
14602	IROQUOIS BELOW/AVAL	44.84	75.31	366	366
14660	MORRISBURG	44.90	75.18	366	366
14805	LONG SAULT DAM	44.99	74.87		366
14870	CORNWALL	45.02	74.71	366	366
14940	SUMMERSTOWN	45.06	74.55	366	366
15110	COTEAU-LANDING	45.25	74.21		337
15140	COTEAU-DU-LAC	45.30	74.17		366
15220	POINTE-DES-CASCADES	45.34	73.95		366
15260	BEAUHARNOIS ABOVE/AMONT	45.30	73.93		366
15262	BEAUHARNOIS BELOW/AVAL	45.32	73.92		341
15330	POINTE-CLAIRE	45.43	73.82		326
15390	LACHINE	45.43	73.67		366
15450	COTE-STE-CATHERINE ABOVE	45.41	73.57		366
15470	LA PRAIRIE	45.47	73.51		175
15505	SAINT-LAMBERT ABOVE	45.49	73.52		360
15507	SAINT-LAMBERT BELOW	45.50	73.52		361
15520	MONTREAL JETTY NO 1	45.50	73.55	366	366
15540	MONTREAL FRONTENAC ST.	45.53	73.54	356	362
15630	POINTE AUX TREMBLES	45.63	73.49		349
15660	VARENNES	45.68	73.44	362	365
15720	VERCHERES	45.78	73.36		366
15780	CONTRECOEUR IRON ORE	45.83	72.28	334	332
15793	LAVALTRIE	45.88	73.27		363
15930	SOREL	46.05	73.12	360	366
15975	LAKE/LAC SAINT-PIERRE	46.19	72.90	358	358
16005	SAINTE-ANNE-DE-BELLEVUE	45.41	73.96		366

TIDE AND WATER LEVEL STATIONS IN THE NAFO AREA FOR 1996