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Marine Environmental Data Service Report for 1988

by

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1. Introduction

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This past year has proven to be extremely busy at MEDS. As reported last year, we are in the process of changing computer systems. This entails an almost complete rewrite of our software and a complete change in archiving strategy. The year has been spent planning our new systems and experimenting to try to achieve greater performance. At the same time, a concerted effort was made to eliminate any backlog of data that had not been processed. This was accomplished and is discussed later. In April we took delivery of a new computer and are now removing our archives from the old computer. This will largely be accomplished by the end of June. One complete new system has been installed and a second is under active development. Other systems will be developed in the next year. The acquisition portion of all real-time data systems will be maintained during the change. There will be disruption in the retrieval of all data and in the processing of data acquired in delayed mode. It is expected that MEDS report next year to NAFO will reflect these interruptions in service.

Overall, there appears to be a decline in data collections over the previous year. Both data reported as collected but not at MEDS and data submissions to MEDS are reduced compared to last year. Areas that showed increases were in drifting buoy deployments and in wave data collections. The number of current meter records collected was slightly lower than last year. The most significant declines occurred in oceanographic data. This is seen in both delayed mode processing and in real-time data acquisition through IGOSS.

2. 1988 Data Not yet Received by MEDS

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Table 1 presents a list of the data that are known to have been collected in the NAFO area in 1988, but that have not reached MEDS. There are more than 2500 stations present. This is a 50% drop from last year but last year was unusually high. As in past years, again it is difficult to say if this is due to more efficient data submission to MEDS or simply that information about data collections is lacking.

### 3. 1988 Data Received and Processed

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Table 2 presents the data collected in 1988. There are a total of more than 3800 stations. This is also a reduction from last year of about 27%. There are 3 countries represented in the table. However, almost all of these data are processed and have been placed into MEDS archives.

Table 3 shows the data collected through IGOSS. There are over 4100 stations shown here and this, too, is a reduction from last year of about 31%. Considering that last year showed an increase of about 25%, this year shows a return to the collection levels prior to 1986. Of note is that the proportion of TESAC to BATHY messages is increasing. As for previous years, the number of stations received through IGOSS messages is larger than that received in delayed mode. This is a clear indication that rapid data submission can be accomplished through IGOSS, and that it is an important source for data.

### 4. Drifting Buoy data Received in 1988

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Table 4 records the data collected using drifting buoys. Those buoys reporting through the GTS have 5 digit buoy numbers whereas those with 4 digits do not report in real-time. A more extensive presentation of the data will be found in MEDS annual drifting buoy report. This should be available shortly. The number of buoy-months shows an increase of about 150%. Some of the buoys have been deployed through European programs and these drift into the northern NAFO areas. Other buoys are deployed off of Newfoundland by Canadian scientists. As well, there was a large program, called ERICA, that was studying storm generation off the east coast of North America and this contributed significantly to the number of buoy deployments.

### 5. Current Meter Moorings in 1988

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Table 5 records the current meter moorings made in 1988. There are approximately the same number as last year although the moorings tended to be of shorter duration. Despite this, there were still more data collection made than in 1986, although slightly less than in 1987. The most northerly moorings are from area 3K. In contrast, last year there were moorings in areas 0 and 1. Moorings using "LC" as the first digit were made by scientists in the Department of Fisheries and Oceans. Other moorings, of which there were only a few, were made in conjunction with oil exploration activity.

### 6. Wave Data Collections

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Table 6 shows the locations and durations of wave measurements made in 1988. There is a slight increase of about 6% over last year in the number of station-months recorded. Most notably, there were fewer directional wave measurements made (shown in the column marked "2-D"). As in past years, the observations reported here were made with a variety of instruments.

### 7. Historical Data Acquisitions

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Table 7 notes some of the historical data received by MEDS last year. There was a substantial number of stations processed from years prior to 1981 but these are not shown because of the volume. Had these been recorded, table 7 would be doubled in size. Taking this into account, there were about twice as many stations processed last year than in the previous year. This represents nearly all of the backlog existing at MEDS. MEDS report for next year will reflect the remainder of the backlog. All of these have been processed and the data now reside in MEDS archives.

## 8. Review of Environmental Conditions

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This review is based on a number of analyses. Inputs are used from monthly reports published by scientists at the Bedford Institute (BIO), by sea surface temperature anomaly maps from the US, maps from the TOGA centre and MEDS own analyses. Because there are differences in the base climatology used by the various sources, there are differences in the interpretation of warm or cold conditions. Comparisons are drawn between the different sources when differences are most striking. In general, the BIO analyses appear to have a base temperature that is slightly cooler than the analyses from the US and TOGA. So, when US sources report near normal temperatures, BIO is recording above normal.

### Subarea 0 and 1

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There is not much information available for these regions. The TOGA analyses show modest positive anomalies from January until August. Then, slightly negative anomalies throughout area 1 are indicated. These conditions do not persist long and by September, the negative anomalies show in area 0. These conditions moderate into October, but are still present in area 1 into early November. At this time conditions appear to return to a slight positive anomaly throughout these areas. Both the TOGA and US analyses are in agreement; there is no information for these regions from the BIO or MEDS analyses.

### Subarea 2 and 3

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Area 2 began the year with slightly above normal surface temperatures, while the Grand Banks and Flemish Cap regions recorded temperatures up to 1 degree below normal. As the year progressed the colder water retreated away from the coast but below normal temperatures persisted in the Flemish Cap region well into March. In March there was some hint of slightly cooler than normal temperatures in area 2, but this did not persist. The colder water on the Flemish Cap moved westward in early April so that by May, the Grand Banks were also covered. This colder water occurred only sporadically west of about 50 degrees W during this entire period. During May, colder conditions began to appear in area 2, which until then had shown about normal temperatures. In June, the colder water had engulfed all of region 3 and half of 2. Temperatures were between one half and 1 degree below normal. These conditions appeared to persist until late July at which time temperatures moderated. From August to November, conditions were near normal shifting between slightly warmer and slightly colder than normal. By late November, colder than normal temperatures returned to both of these areas, with anomalies being up to 1 degree below normal.

The information supplied by BIO would suggest that temperatures were near normal throughout the year with some cooler conditions appearing late in the year on the Grand Banks. It was noted that ice arrived earlier in February than is usual and showed a larger eastward extent. BIO also noted that during September the cold core of the Labrador Current was particularly wide but this condition only lasted for a short time. As a general comparison, BIO reported a year that was closer to normal conditions than that reported by other sources.

Analyses prepared by MEDS suggest that conditions on the Grand Banks started the year as cooler than normal, but warmed to above normal conditions by March. These persisted into June when temperatures fluctuated both above and below normal values. From October to the end of the year, the Grand Banks tended to show below normal temperatures.

#### Subarea 4

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This area began the year with surface temperatures being up to 1 degree below normal throughout. These conditions quickly disappeared so that near normal conditions were reported until April. During this time, there was a tongue of below normal temperature water that stayed in region 4X. By the middle of March, this cooler water was creeping northward and half way up the Scotian Shelf. By the beginning of May, the entire Scotian Shelf showed below normal temperatures of up to 1 degree. These conditions persisted, up until mid August. From this time to early October positive anomalies were recorded except for small local fluctuations. October witnessed the arrival of colder than normal temperatures from about Sable Island and south. These conditions lasted into December when all of the Scotian Shelf and more southern waters showed temperatures up to 1 degree below normal.

BIO reported positive anomalies at the start of the year, changing to colder conditions in February and March and near normal by April. May reports had the conditions near normal in the Gulf of St. Lawrence and slightly warmer than usual on the Scotian Shelf. June was reported slightly cooler but normal temperatures arrived throughout by July. These conditions persisted into October when slightly cooler than normal water arrived on the Scotian Shelf. By the end of the year, near normal temperatures were reported throughout the area.

MEDS analyses are more in agreement with those from US sources. When data exist, they indicate generally below normal conditions throughout the year.

#### Subarea 5 and 6

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These areas began the year with temperatures slightly cooler than normal. These conditions persisted and intensified somewhat so that by late February, temperatures were up to 1.5 degrees cooler than normal. This lasted until early June when there was a moderation in temperatures but still remaining below normal. Cold conditions continued at fluctuating levels until early August. At that time, there was a pocket of cold water in the Gulf of Maine region but this did not persist far offshore. This situation was fairly stable into October, at which time, cooler waters returned throughout the region. As the year progressed temperatures became cooler so that temperatures below the normal were common. Even colder water appeared in mid November but this did not last. The year ended as it had begun with colder than normal temperatures. Overall, slightly cooler than normal temperatures were recorded throughout these regions during almost the entire year.

BIO reported above normal temperatures in January but these quickly fell to normal conditions by February. The normal temperatures continued until May. Then, temperatures appeared to be slightly above normal in the Gulf of Maine. July appeared with strong positive anomalies of up to 3 degrees but conditions returned to near normal by September. These close to normal conditions persisted until the end of the year.

MEDS analyses once more agree more with those from the US. So, cold conditions prevail during most of the year. There are exceptions in near coastal regions in the Gulf of Maine, notably in the spring months and in October.

Table 1: Data collected in the NAFO area in 1988 but not yet received at MEDS. Total = 2597 stations

Ship Name	Cruise Period	NAFO Subarea	Standard Section	Number	Reference
Canada					
Hesper P-52	1 Jan - 3 May		4Vs	?	C85072I01
A.Needler	15 - 26 Feb		4WX	20	C88237I02
A.Needler	29 Feb - 14 Mar		5Yze	114	C88297I03
A.Needler	22 - 30 Mar		4WVs	69	C88188I06
Baffin	5 - 19 Apr		3L	6	C88174I01
Dawson	19 - 28 May		4X	55	C88238I02
L.Hammond	6 - 17 Jun		4X	139	C88238I05
A.Needler	13 - 30 Jun		4X,5ze	198	C88237I01
J.Hart	Apr - Jun		5	47	NAFO
L.Hammond	4 - 22 Jul		5ze	?	C88238I06
A.Needler	Jul - Sep		4	80	NAFO
A.Needler	Oct - Dec		4	91	NAFO
E.E.Prince	Oct - Dec		4,5	206	NAFO
L.Hammond	Oct - Dec		4,5	134	NAFO
Dawson	Oct - Dec		3	30	NAFO
Denmark					
A. Jensen	18 Jan		1	Fylla	2 NAFO
A. Jensen	Apr - Jun		1		22 NAFO
A. Jensen	13 Jun		1	Fylla	5 NAFO
A. Jensen	30 Jun		1	Egdm.	7 NAFO
A. Jensen	1 Jul		1	Holstein.	5 NAFO
A. Jensen	2 Jul		1	Sukkert.	5 NAFO
A. Jensen	3 Jul		1	Fylla	4 NAFO
A. Jensen	24 Aug		1	Fylla	? NAFO
A. Jensen	Jul - Sep		1		23 NAFO
A. Jensen	6 Sep		1	C. Farewell	3 NAFO
A. Jensen	15 Oct		1	Fylla	5 NAFO
A. Jensen	25 Nov		1	Egdm.	7 NAFO
A. Jensen	26 Nov		1	Holstein.	5 NAFO
A. Jensen	27 Nov		1	Suk. Top.	5 NAFO
A. Jensen	28 Nov		1	Fylla	5 NAFO
A. Jensen	Oct - Dec		1		21 NAFO
FRG					
W.Herwig	10 - 11 Oct		1	C. Farewell	4 NAFO
W.Herwig	22 Oct		1	Holstein.	6 NAFO
W.Herwig	30 Oct		1	Fylla	6 NAFO
W.Herwig	10 - 11 Nov		1	Fredriks.	4 NAFO
W.Herwig	12 Dec		1	C. Desol.	4 NAFO
W.Herwig	1 Nov		1	L. Helle.	6 NAFO
USA					
Delaware 2	7 - 31 Jan		6ABC	63	C88111I01
Albatross 4	22 Mar - 1 Apr		5Yze	91	C88188I03
Albatross 4	4 - 15 Apr		5Yze	62	C88188I02
Albatross 4	18 - 21 Apr		5Y	24	C88188I01
Delaware 2	24 Apr - 2 May		6ABC	58	C88188I04
Albatross 4	3 - 7 May		6A	?	C88188I05
Delaware 2	31 May - 4 Jun		6A	39	C88258I03
Delaware 2	10 - 16 Jun		6A	101	C88258I03
Delaware 2	5 - 10 Jul		6A	49	C88258I03
Albatross 4	7 - 15 Jul		6C	139	C88243I02
Delaware 2	16 - 22 Jul		6A	55	C88258I03
Albatross 4	19 - 29 Jul		5ze	225	C88258I01
Delaware 2	29 Jul - 2 Aug		6A	39	C88258I03
Delaware 2	8 - 12 Aug		6A	55	C88258I03
Albatross 4	1 - 10 Oct		5zeZw	254	C88258I02

Codes: ROSCOP = Information has been extracted from ROSCOP forms.  
 NAFO = Information has been extracted from NAFO inventory forms.  
 C... = Information has been extracted from CAMDI at MEDS.  
 Other = Personal communications.

Table 2: Data collected in the NAFO area in 1988 and received by MEDS.  
Total = 3805 stations

Ship Name	Cruise Period	NAFO Subarea	Data Type			Cruise Number
			BT	Bot	CTD	
Canada						
ATHABASKAN	06 Jan-10 Mar/88	4WX, 5Ze, 6ABCDE				181888010
IROQUOIS	15 Jan-10 Mar/88	4WX, 5Ze, 6ABCDE	119			181888006
SAGUENAY	18 Jan-29 Feb/88	4WX, 5Ze, 6ABCDE	38			181888008
ASSINIBOINE	18 Jan-10 Mar/88	4WX, 5Ze, 6ABCDE	77			181888005
ANNAPOLIS	19 Jan-01 Feb/88	3LNOPs, 4WX	12			181888007
GATINEAU	25 Jan-10 Mar/88	4WX, 5Ze, 6ABCDE	83			181888009
W. TEMPLEMAN	26 Jan-14 Feb/88	3LOPs	133	34		180588024
G. ATLANTICA	03 Feb-22 Feb/88	2J, 3KL	60			180588001
MARGAREE	17 Feb-17 Feb/88	4W	3			181888001
FRASER	18 Feb-10 Mar/88	4WX, 5Ze, 6ABCDE	64			181888003
MARGAREE	22 Feb-25 Feb/88	4WX	10			181888002
SHAMOOK	12 Mar-30 Mar/88	3L	35	15		180588013
W. TEMPLEMAN	05 Apr-10 Apr/88	3L	7	28		180588025
W. TEMPLEMAN	20 Apr-09 May/88	3LNO	200	2		180588026
L. HAMMOND	27 Apr-03 May/88	3L	32			180588035
G. ATLANTICA	28 Apr-10 May/88	3LO	7	2		180588002
L. HAMMOND	06 May-20 May/88	3LO	39			180588036
W. TEMPLEMAN	11 May-24 May/88	3L	125	5		180588027
G. ATLANTICA	13 May-01 Jun/88	3L	29	2		180588003
W. TEMPLEMAN	27 May-09 Jun/88	3LNOPs	119	2		180588028
MARINUS	03 Jun-18 Jun/88	3Ps	8			180588019
G. ATLANTICA	03 Jun-19 Jun/88	3KL	131	2		180588004
SHAMOOK	09 Jun-22 Jun/88	3L	32			180588014
G. ATLANTICA	21 Jun-04 Jul/88	3LNO	54	2		180588005
SHAMOOK	28 Jun-11 Jul/88	3L	35			180588015
G. ATLANTICA	06 Jul-26 Jul/88	2HJ, 3KL	167	2		180588006
SHAMOOK	24 Jul-09 Aug/88	2J	10	10		180588016
G. ATLANTICA	28 Jul-14 Aug/88	3LOPs	47	2		180588007
W. TEMPLEMAN	01 Aug-15 Aug/88	2J, 3KLM	54	102	97	180588029
MARINUS	12 Aug-23 Aug/88	3L	25			180588020
G. ATLANTICA	16 Aug-08 Sep/88	2GHJ, 3KL	136	15		180588008
W. TEMPLEMAN	18 Aug-22 Aug/88	3LOPs		2		180588030
SHAMOOK	24 Aug-16 Sep/88	3Ps	25			180588017
W. TEMPLEMAN	25 Aug-13 Sep/88	3LNO	126	3		180588031
MARINUS	29 Aug-02 Sep/88	3L	19			180588021
MARINUS	07 Sep-20 Sep/88	3L	26			180588022
W. TEMPLEMAN	18 Sep-06 Oct/88	2GHJ, 3KL	16	1		180588032
SHAMOOK	04 Oct-13 Oct/88	3L	27			180588018
G. ATLANTICA	07 Oct-25 Oct/88	2J, 3KL	37	2		180588009
W. TEMPLEMAN	09 Oct-21 Oct/88	3LNO	32	2		180588033
MARINUS	25 Oct-06 Dec/88	3KL	15			180588023
W. TEMPLEMAN	26 Oct-13 Nov/88	3LNO	141	55		180588034
G. ATLANTICA	03 Nov-14 Nov/88	2HJ, 3KL	32	8		180588010
Canada						
G. ATLANTICA	17 Nov-29 Nov/88	2HJ, 3KL	79	6		180588011
G. ATLANTICA	30 Nov-14 Dec/88	2HJ, 3KL	98	20		180588012
Iceland						
BAKKAFOSS	06 Apr-10 Apr/88	1EF		15		46AA88001
BAKKAFOSS	4 - 7 Jul/88	1F		15		46AA88002
BAKKAFOSS	12 - 16 Sep/88	1F		18		46AA88002
USSR						
PERSEI13	01 Mar-23 Jun/88	3KLMNO	444			90P388001
K. SHAYTANOV	03 Sep-09 Dec/88	0, 1, 2, 3KLMNO	188			90KS88012
VILNIUS	2 - 23 Sep/88	2GHJ, 3KL	53			90VJ88024

Table 3: IGOSS data received during 1988.  
Total = 4193 stations.

Ship Name	Country	Call Sign	Cruise Period	Message Type		NAFO Subarea
				BATHY	TESAC	
Pacduchess	Liberia	A8VI	18 - 22 Jun	8		6BDEFGH
Hudson	Canada	CGDG	9 - 21 Sep	15		6E
Baffin	Canada	CGCL	2 - 18 Oct		75	0AB, 1C
Dawson	Canada	CGBV	2 - 4 Jun		32	5Ze
		CGBV	26 Jun - 14 Jul		183	4W, 5Ze
		CGBV	1 - 10 Aug		29	1F, 2HJ, 3K
		CGBV	30 Sep - 17 Oct		210	5Ze
		CGBV	23 - 28 Nov		25	4WX
		CGBV	4 - 10 Dec		35	4RST
W. Templeman	Canada	CGDV	1 Jan - 14 Feb	132		3LOPs, 4R
		CGDV	20 Apr - 9 May	200		3LNO
		CGDV	27 May - 9 Jun	119		3LOPs
		CGDV	1 - 10 Aug	51		2J, 3KLN
A. Needler	Canada	CG2683	3 - 12 Mar	18		5Ze
		CG2683	5 - 12 Jul	12		4WX
L. Cowley	Canada	CG2959	5 Jan - 4 Feb	25		3LNO
		CG2959	30 Mar - 10 Apr	20		2J, 3KL
		CG2959	20 - 31 May	18	1	3KL
Y. Clipper	FRG	DLEZ	19 - 20 Mar	12		4X, 5Y
		DLEZ	16 Apr	8		4X, 5Y
		DLEZ	10 - 11 May	10		4X, 5Y
		DLEZ	11 Jun	11		4X, 5Y
		DLEZ	8 - 9 Jul	7		4X, 5Y
		DLEZ	12 - 13 Aug	10		4X, 5Y
		DLEZ	9 - 10 Sep	12		4X, 5Y
		DLEZ	24 - 25 Oct	10		4X, 5Y
Monsoon	USSR	EREA	2 - 17 Feb	32	33	3MN, 6H
		EREA	28 Feb - 5 Apr	85	68	3MN, 6H
Volna	USSR	EREB	5 - 21 Feb	16	32	3NO, 4Vs, 6GH
		EREB	27 Feb - 3 APR	6	85	3LMN
V. Bugaen	USSR	ERES	5 - 12 Jan	16	10	3MN
		ERES	15 Feb - 29 Mar	88	68	3KLMN, 6H
		ERES	11 - 26 Jun	33	24	2J, 3KM
E. Krenkel	USSR	EREU	2 Jan - 16 Feb	98	1	3MNO, 6H
Persey 3	USSR	ESGU	26 Mar - 6 Apr		60	3NO
		ESGU	10 Apr - 9 May		118	2J, 3KLM
		ESGU	13 May - 2 Jun		102	2J, 3KLMNO
Cryos	France	FNBA	9 - 12 Feb	23		3Ps
		FNBA	16 Feb - 4 Mar	47		3Ps
		FNBA	7 - 10 Mar	24		3Ps
Delaware 2	USA	KNBD	25 - 29 Jan	5		6B
???	USA	NOCF	28 Oct	20		4Vsw, 6EF
		NOCF	3 Dec	28		4Vsw, 6EFG
		NOCF	16 Dec	16		4WX, 6EF
		NOCF	28 Dec	24		4Vsw, 6EFG
Oleander	Neth.	PJYG	8 Jan	10		6A
		PJYG	5 Feb	14		6AB
		PJYG	18 Mar	13		6AB
		PJYG	8 Apr	11		6AB
		PJYG	13 - 14 Apr	23		6AB
		PJYG	5 - 6 May	16		6AB
		PJYG	10 Jun	16		6AB
		PJYG	7 - 9 Jul	13		6AB
		PJYG	9 Sep	20		6AB
		PJYG	13 - 14 Oct	15		6AB
		PJYG	4 Nov	13		6AB
		PJYG	2 - 3 Dec	17		6AB
Ijma	USSR	UFJN	1 - 30 Sep	40	36	2JG, 3KL
		UFJN	5 - 15 Oct		27	3KLM
		UFJN	26 Oct - 10 Dec		95	2HJ, 3KLMNO

Table 3 continued: IGOSS data received during 1988.

Ship Name	Country	Call Sign	Cruise Period	Message Type		NAFO Subarea
				BATHY	TESAC	
K. Shaitanov	USSR	UFYN	13 - 27 Sep		31	2GHJ, 3KL
		UFYN	14 Oct - 10 Nov		60	0AB, 2GHJ
		UFYN	21 Nov - 9 Dec		28	3KLNO
C. Roger	Canada	VCBT	5 - 8 Mar	6		3L
		VCBT	18 - 25 Mar	13		3NOPs
		VCBT	11 - 22 Jun	17		2HJ, 3KL
		VCBT	1 - 10 Sep	8		3KL
		VCBT	16 Oct - 2 Nov	21		3LM
C. Briar	Canada	VCTF	24 Jan - 9 Feb	9		2J, 3K, 4R
		VCTF	25 Apr - 3 May	8		2J, 3KL
		VCTF	9 - 15 May	10		3K
		VCTF	21 - 27 May	8		3KL
		VCTF	26 Jun - 1 Jul	7		4X
		VCTF	8 - 23 Jul	10		4SX
		VCTF	4 - 15 Aug	13		2J, 3K
		VCTF	7 Oct - 13 Nov	21		4TVsWX
		VCTF	3 - 22 Feb	60		2J, 3KL
		VCTF	28 Apr - 19 Jun	167		3KL
G. Atlantica	Canada	VC9450	21 Jun - 4 Jul	51		3LNO
		VC9450	6 - 26 Jul	164		2HJ, 3KL
		VC9450	12 - 26 Mar	35		3L
L. Hammond	Canada	VC9616	27 Apr - 20 May	72		3LO
		VC9616	2 Jan	28		4X, 5ze, 6DE
Aircraft	USA	VP56	6 Jan	25		4WVsX, 6EFG
		VP56	13 Jan	22		4WX, 5ze, 6BCDE
		VP56	2 Mar	24		4WVsX, 5ze, 6DEF
Aircraft	USA	VXN-8	6 Dec	16		6BD
		VXN-8	5 - 17 Mar	47		6ABC
Albatross 4	USA	WMVF	22 - 31 Mar	42		5zeZw, 6AB
		WMVF	5 - 20 Apr	43		5zeZw
		WMVF	20 - 29 Jul	48		5zeZw, 6A
		WMVF	2 - 10 Aug	32		5ze
		WMVF	13 - 30 Sep	62		5zeZw, 6ABC
		WMVF	3 - 12 Oct	20		5ze
		WMVF	18 - 28 Oct	47		5zeZw
		WMVF	26 Jan - 2 Feb	19		6C
Oregon 2	USA	WTDO	16 - 22 Jul	28		6C
		WTEG	1 - 5 Aug	11		3MNO, 4Vs, 6EF
Mt. Mitchell	USA	WTEG	9 - 10 Feb	13		6C
		WTEZ	17 - 18 Feb	7		6BC
Ferrel	USA	WTEZ	25 - 26 Feb	11		6B
		WTEZ				



Table 4: Data collected by drifting buoys in the NAFO area in 1988.  
Total = 135 buoy months

Buoy Number	Period	NAFO Subarea	SST	AP	AT	WS	WD	TC
41513	3 - 27 Dec	6D	X	X	X	X	X	
41514	1 - 28 Dec	6DE	X	X	X	X	X	
41516	1 - 14 Dec	6C	X	X	X	X	X	
41517	1 - 30 Dec	6D	X	X	X	X	X	
44501	21 Apr - 16 Jun	3KL	X		X			
44502	21 Apr - 17 Jun	3L	X					
44503	5 May - 21 Jun	3NO	X					
44504	20 May - 15 Jun	2HJ,3KL	X					
44505	2 Aug - 4 Nov	2GHJ,3K	X					
44511	1 - 31 Jan	3M	X					
44512	1 Jan - 29 Feb	3LM	X					
44516	8 - 12 Apr	3N	X	X	X			
44517	8 - 22 Apr	4X,5Ze	X	X	X			
44519	22 Aug - 8 Nov	1EF	X	X	X			
44520	24 Nov - 28 Dec	6CD	X	X	X	X	X	
44522	2 - 31 Dec	4W,6E	X	X	X			
44523	14 - 28 Dec	6E	X	X	X			
44524	14 - 28 Dec	3O	X	X	X			
44525	1 - 14 Dec	6EF	X	X	X	X	X	
44526	1 - 14 Dec	6DE	X	X	X	X	X	
44527	1 - 28 Dec	6D	X	X	X	X	X	
44528	2 - 30 Dec	6CD	X	X	X	X	X	
44529	1 - 31 Dec	6EFG	X	X	X	X	X	
44530	14 - 28 Dec	5Ze,6D	X	X	X			
44531	15 - 31 Dec	4WX	X	X	X			
44533	14 - 15 Dec	4W,6E	X	X	X			
44541	14 - 31 Dec	4Vs	X	X	X			
44542	15 - 16 Dec	4W	X	X	X			
44543	14 Dec	4Vs	X	X	X			
44545	14 - 21 Dec	4Vs	X	X	X			
44546	14 - 21 Dec	4W	X	X	X			
44547	16 - 22 Dec	4WVs	X	X	X			
44548	14 - 21 Dec	4Vs	X	X	X			
44549	14 - 25 Dec	3L	X	X	X			
44550	15 - 22 Dec	3O	X	X	X			
44551	14 - 24 Dec	3O	X	X	X			
44552	14 - 22 Dec	3O	X	X	X			
44553	14 - 24 Dec	3NO	X	X	X			
44554	15 Dec	3O	X	X	X			
44555	14 - 21 Dec	3O	X	X	X			
44556	15 - 19 Dec	6E	X	X	X			
44604	1 - 31 Dec	1F	X	X				
44612	1 Mar - 11 Aug	0B,1DEF	X	X				
44676	10 - 11 Apr	3K		X	X			
44677	25 Mar - 31 Aug	2HJ,3K						
44678	30 Mar - 15 May	3K						
44679	30 Mar - 28 Apr	3K						
44681	30 Mar - 24 May	3K						
44726	1 - 31 Jan	1F	X	X	X			
44733	26 Feb - 11 Mar	2HJ,3K		X	X			
44734	26 Feb - 6 Apr	2HJ,3K		X	X			
44736	5 - 8 Feb	2J						
44737	7 Mar - 25 Jul	3KLOPs						
44742	18 Apr - 31 May	3KM	X	X	X			
44751	7 Mar - 10 Apr	3K			X			
44754	27 Feb - 20 Apr	2HJ,3K						
44755	25 Mar - 2 May	2J						
44756	26 Feb - 18 Apr	2HJ,3KL						
44757	4 - 8 Feb	2J						
44758	7 Mar - 31 May	3KLMN						
44759	26 Feb - 12 Mar	2HJ						
62501	1 - 29 Feb	1F	X	X				
64523	1 Sep - 31 Dec	1EF	X	X				
65514	1 Sep - 24 Oct	1F	X	X				

  

Buoy Number	Period	NAFO Subarea	SST	AP	AT	WS	WD	TC
2750	28 Jun - 7Jul	4WX						
2754	23 Aug - 15 Oct	4X						
2755	30 Sep - 16 Oct	4X						
2757	28 Jun - 16 Oct	4X						
3325	23 Jan - 29 Feb	2H		X				
4440	23 Aug - 1 Sep	4X						
4447	23 Aug - 13 Oct	4X						

Codes: SST = Sea surface temperature  
AP = Air pressure  
AT = Air temperature  
WS = Wind speed  
WD = Wind direction  
TC = Thermistor chain

Table 5: Current meter moorings in the NAFO area in 1988.

ID	N Lat	W Long	Depth	Period	Area	East Mean	North Mean
Whiterose	46.48	48.01		1 Jan - 30 Jun	3L		
E-09							
LC1067-31	46.19	60.22	14	12 Jan - 27 Apr	4Vn	0.004	-0.013
Terra Nova	46.28	48.30		25 Jan - 30 Apr	3L		
C-09							
LC1067-25	44.68	63.62	14	2 - 8 Feb	4W	0.019	-0.007
LC1067-26	44.68	63.62	15	2 - 8 Feb	4W	0.019	-0.009
LC1067-27	44.68	63.62	16	2 - 8 Feb	4W	0.017	-0.009
LC1067-28	44.68	63.62	14	8 - 12 Feb	4W	0.000	-0.011
LC1067-29	44.68	63.62	15	8 - 12 Feb	4W	0.001	-0.009
LC1067-30	44.68	63.62	16	8 - 12 Feb	4W	-0.007	-0.002
Terra Nova	46.28	48.26		5 Mar - 14 Jun	3L		
E-79							
LC1067-32	47.48	53.14	15	7 Mar - 6 Jun	3L	-0.013	-0.003
LC1067-33	47.48	53.14	81	7 Mar - 6 Jun	3L	0.002	-0.002
LC1067-34	47.58	53.17	15	7 Mar - 6 Jun	3L	0.000	0.055
LC1067-35	47.58	53.17	81	7 Mar - 6 Jun	3L	-0.004	0.012
LC1067-36	47.56	53.08	15	7 Mar - 6 Jun	3L	-0.005	-0.019
LC1067-37	47.56	53.08	81	7 Mar - 6 Jun	3L	0.003	0.027
LC1067-39	49.51	57.89	12	7 May - 2 Aug	3K	0.017	-0.013
LC1067-1	44.25	51.00	11	30 Apr - 18 Sep	3N	-0.019	-0.002
LC1067-2	44.25	51.00	61	30 Apr - 18 Sep	3N	-0.007	0.005
LC1067-62	66.26	56.78	495	27 May - 5 Jun	1B	-0.026	0.046
LC1067-7	42.00	66.80	11	25 Jun - 11 Jul	5Ze	0.119	-0.104
LC1067-8	42.00	66.80	34	25 Jun - 11 Jul	5Ze	0.071	-0.030
LC1067-9	42.00	66.80	57	25 Jun - 11 Jul	5Ze	0.026	-0.028
LC1067-10	42.00	66.80	64	25 Jun - 11 Jul	5Ze	0.027	-0.031
LC1067-16	41.98	66.50	9	27 Jun - 9 Jul	5Ze	0.085	-0.088
LC1067-17	41.98	66.50	41	27 Jun - 9 Jul	5Ze	0.068	-0.035
LC1067-18	41.98	66.50	73	27 Jun - 9 Jul	5Ze	0.012	-0.012
LC1067-3	42.08	66.80	10	27 Jun - 11 Jul	5Ze	0.251	-0.068
LC1067-4	42.08	66.80	34	27 Jun - 11 Jul	5Ze	0.128	-0.005
LC1067-5	42.08	66.80	57	27 Jun - 11 Jul	5Ze	0.023	-0.027
LC1067-6	42.08	66.80	64	27 Jun - 11 Jul	5Ze	0.041	-0.036
LC1067-11	42.15	66.50	10	27 Jun - 9 Jul	5Ze	0.123	0.066
LC1067-12	42.15	66.50	39	27 Jun - 9 Jul	5Ze	0.312	-0.135
LC1067-13	42.15	66.50	71	27 Jun - 9 Jul	5Ze	0.207	-0.030
LC1067-14	42.15	66.50	102	27 Jun - 9 Jul	5Ze	0.133	0.046
LC1067-15	42.15	66.50	138	27 Jun - 9 Jul	5Ze	0.063	0.031
Whiterose	46.49	47.57		13 Jul - 11 Aug	3L		
A-90							
LC1067-40	49.51	57.89	12	3 Aug - 25 Oct	3K	0.020	-0.014
LC1067-41	42.08	66.80	34	30 Sep - 15 Oct	5Ze	0.090	-0.048
LC1067-42	42.08	66.80	56	30 Sep - 15 Oct	5Ze	-0.002	-0.006
LC1067-43	42.08	66.80	63	30 Sep - 15 Oct	5Ze	-0.017	-0.047
LC1067-19	43.20	65.72	10	5 - 13 Nov	4X	-0.036	-0.069
LC1067-20	43.20	65.70	10	5 - 10 Nov	4X	0.012	-0.027
LC1067-21	44.67	65.71	15	24 - 25 Nov	4X	-0.034	0.017
LC1067-22	45.36	64.17	16	26 Nov	4X	-0.227	-0.012
LC1067-23	45.24	64.29	21	26 - 27 Nov	4X	-0.086	0.015
LC1067-24	44.44	66.24	102	28 Nov	4X	0.097	0.077
LC1067-44	45.06	66.83	6	6 - 31 Dec	4X	0.024	0.047

Table 6: Locations of instrumented wave data collections  
Total = 26192 spectra.

Station Name	Latitude	Longitude	Area	Period	Number	1-D	2-D
Terra Nova C-09	46.28	48.30	3L	1 Jan - 5 Mar			X
Hibernia	46.67	48.67	3L	1 Jan - 1 Apr	400		X
Whiterose E-09	46.48	48.01	3L	1 Jan - 30 Jun			X
Delaware Bay	38.50	74.60	6B	1 Jan - 12 Nov	2114		X
Shearwater	44.48	63.42	4X	1 Jan - 31 Dec	8049		X
Torbay	47.63	52.50	3L	1 Jan - 31 Dec	5822		X
Hotel	38.50	70.70	6B	1 Jan - 31 Dec	2315		X
Gulf of Maine	42.70	68.30	5Y	1 Jan - 31 Dec	2315		X
Nantucket	40.50	69.40	5Ze	1 Jan - 31 Dec	2315		X
Georges Bank	41.10	66.60	5Ze	1 Jan - 31 Dec	2315		X
Terra Nova E-79	46.28	48.26	3L	5 Mar - 14 Jun			X
Pointe-aux-Loups	47.54	61.81	4T	29 May - 16 Jun	141		X
Whiterose A-90	46.49	47.57	3L	1 Jul - 11 Aug			X
C44137	41.35	61.35	4W	30 Nov - 8 Dec	46		X
C44138	44.25	55.62	3Ps	30 Nov - 31 Dec	360		X
Sable Island	44.32	57.35	4W	2 Dec - 31 Dec	330		X

Code: number = number of spectra collected  
1-D = non-directional wave data  
2-D = directional wave data

Table 7: Historical data received in MEDS in 1988.  
Total = 13,955 stations

Ship Name	Cruise Period	NAFO Subarea	Number	Reference
Canada				
HURON	23 Apr-28 Apr/76	4T	250	181076006
G. ATLANTICA	14 May-31 May/81	3LMNO	102	180581039
VARIOUS	24 Jun-09 Jul/81	3LMNO	95	180581040
VARIOUS	30 Jul-08 Aug/81	3KLM	57	180581041
G. ATLANTICA	26 Jan-14 Feb/82	3LM	118	180582002
E. E. PRINCE	20 Apr-27 Apr/82	4Vn	8	183182001
MARINUS	05 Jun-27 Jun/82	3L	53	180582029
G. ATLANTICA	07 Jul-27 Jul/82	2HJ, 3KL	152	180582015
DAWSON	26 Jul-04 Aug/82	4W	89	181082026
G. ATLANTICA	09 Sep-26 Sep/82	2GHJ, 3KL	121	180582021
G. ATLANTICA	30 Sep-24 Oct/82	2J, 3KL	25	180582022
G. ATLANTICA	30 Oct-15 Nov/82	2HJ, 3K	172	180582023
E. E. PRINCE	18 Nov-18 Nov/82	4W	5	183182003
SHAMOOK	18 May-15 Jun/83	3L	55	180583012
MARINUS	25 May-29 Jun/83	3L	63	180583014
G. ATLANTICA	14 Jun-04 Jul/83	3LNO	64	180583006
G. ATLANTICA	31 Jul-31 Jul/83	2H	8	180583025
G. ATLANTICA	06 Sep-17 Sep/83	3KL	15	180583026
W. TEMPLEMAN	26 Sep-01 Oct/83	3L	8	180583019
SHAMOOK	23 Nov-08 Dec/83	3L	7	180583029
W. TEMPLEMAN	23 Jan-30 Jan/84	3L	34	180584020
G. ATLANTICA	01 Feb-20 Feb/84	3LM	188	180584001
W. TEMPLEMAN	05 Feb-09 Feb/84	3L	21	180584021
G. ATLANTICA	24 Feb-09 Mar/84	4Vs, 6FG	160	180584037
A. NEEDLER	09 Apr-17 Apr/84	3LNOPs, 4Vs	94	180584031
G. ATLANTICA	24 Apr-14 May/84	3L	51	180584002
A. NEEDLER	28 Apr-09 May/84	3NO	116	180584032
G. ATLANTICA	16 May-23 May/84	3LNO	10	180584003
A. NEEDLER	18 May-21 May/84	3L	36	180584033
MARINUS	27 May-31 May/84	3L	9	180584016
SHAMOOK	29 May-14 Jun/84	3L	101	180584013
SHAMOOK	04 Jul-13 Jul/84	3L	81	180584014

Table 7 continued: Historical data received in MEDS in 1988.

Ship Name	Cruise Period	NAFO Subarea	Number	Reference
G.ATLANTICA	05 Jul-30 Jul/84	2HJ,3KL	139	180584006
W.TEMPLEMAN	26 Jul-01 Aug/84	3L	60	180584025
L.HAMMOND	29 Jul-04 Aug/84	3KLM	11	180584030
W.TEMPLEMAN	11 Aug-21 Aug/84	3L	88	180584026
MARINUS	13 Aug-16 Aug/84	3L	3	180584018
W.TEMPLEMAN	23 Aug-04 Sep/84	3KL	70	180584027
G.ATLANTICA	14 Sep-26 Sep/84	3LOPs	4	180584008
MARINUS	30 Sep-15 Oct/84	3K	15	180584019
SHAMOOK	07 Oct-09 Oct/84	3L	3	180584015
G.ATLANTICA	26 Oct-08 Nov/84	2J,3KL	78	180584010
W.TEMPLEMAN	04 Nov-27 Nov/84	3L	21	180584028
G.ATLANTICA	10 Nov-21 Nov/84	2J,3KL	85	180584011
G.ATLANTICA	23 Nov-06 Dec/84	2J,3KL	114	180584012
W.TEMPLEMAN	30 Nov-05 Dec/84	3LNO	8	180584029
W.TEMPLEMAN	10 Jan-21 Jan/85	3L	83	180585004
W.TEMPLEMAN	24 Jan-04 Feb/85	3L	82	180585005
G.ATLANTICA	31 Jan-17 Feb/85	3LM	170	180585001
G.ATLANTICA	20 Feb-13 Mar/85	3LO,4Vs	220	180585002
W.TEMPLEMAN	08 Mar-26 Mar/85	3LNOPs	118	180585008
G.ATLANTICA	08 Apr-16 Apr/85	3LOPs	6	180585010
A.NEEDLER	11 Apr-26 Apr/85	3LNO	147	180585038
W.TEMPLEMAN	17 Apr-29 Apr/85	3LNO	90	180585025
DAWSON	23 Apr-24 Apr/85	4X	43	181085900
DAWSON	27 Apr-03 May/85	3LMN	25	181085008
G.ATLANTICA	12 May-28 May/85	3L	31	180585011
W.TEMPLEMAN	15 May-27 May/85	3L	94	180585027
G.ATLANTICA	19 Jun-07 Jul/85	3LNO	46	180585013
A.NEEDLER	04 Jul-11 Jul/85	4WX,5Ze	40	180385003
G.ATLANTICA	11 Jul-28 Jul/85	3KL,4RS	39	180585014
SHAMOOK	11 Jul-06 Aug/85	2J,3K	94	180585021
PANDORA2	15 Jul-18 Jul/85	3N	42	180585043
A.NEEDLER	16 Jul-25 Jul/85	4VnVsW	11	180385004
W.TEMPLEMAN	26 Jul-27 Jul/85	3L	11	180585029
W.TEMPLEMAN	31 Jul-12 Aug/85	3LNOPs	84	180585030
G.ATLANTICA	01 Aug-21 Aug/85	2HJ,3KL	186	180585015
A.NEEDLER	03 Aug-12 Aug/85	2J,3KL	31	180585039
MARINUS	07 Aug-17 Aug/85	3L	22	180585023
DAWSON	14 Aug-17 Aug/85	3L	42	181085024
W.TEMPLEMAN	17 Aug-21 Aug/85	3L	3	180585031
A.NEEDLER	09 Sep-17 Sep/85	4VnWX,5Ze,6DE	65	183185002
G.ATLANTICA	12 Sep-22 Sep/85	3L	5	180585016
G.ATLANTICA	24 Sep-20 Oct/85	2J,3KL	32	180585017
BAFFIN	03 Oct-15 Oct/85	0AB,2GH	65	181085029
MARINUS	06 Oct-16 Oct/85	3K	38	180585024
A.NEEDLER	08 Oct-15 Oct/85	4VnVsWX	62	180385005
W.TEMPLEMAN	09 Oct-21 Oct/85	3L	88	180585034
E.E.PRINCE	22 Oct-11 Nov/85	4X	23	180385006
W.TEMPLEMAN	23 Oct-03 Nov/85	3LNOPs	85	180585035
G.ATLANTICA	05 Nov-17 Nov/85	2J,3K	123	180585018
SHAMOOK	06 Nov-14 Nov/85	3L	22	180585022
W.TEMPLEMAN	09 Nov-18 Nov/85	3LNOPs	63	180585036
DAWSON	13 Nov-18 Nov/85	4RST	35	181085039
ATHABASKAN	20 Nov-29 Nov/85	4X,5YZe,6ABCDE	9	181885036
G.ATLANTICA	20 Nov-03 Dec/85	3KL	104	180585019
W.TEMPLEMAN	21 Nov-02 Dec/85	3LNO	6	180585037
ATHABASKAN	09 Dec-12 Dec/85	4WX	13	181885037
DAWSON	10 Dec-14 Dec/85	4X	79	181085041
DAWSON	12 Dec-13 Dec/85	4X	36	181085950
W.TEMPLEMAN	12 Jan-20 Jan/86	2J,3KL	12	180586001
IROQUOIS	21 Jan-12 Mar/86	4X,5YZe,6ABCDE	77	181886002
DAWSON	25 Feb-27 Feb/86	4X	33	181086900
A.NEEDLER	04 Mar-11 Mar/86	4X,5Ze	18	180386001
A.NEEDLER	18 Mar-25 Mar/86	4Vsw	15	180386002
SAGUENAY	18 Mar-02 May/86	4WX	40	181886012
ATHABASKAN	26 Mar-27 Mar/86	4W	4	181886008
DAWSON	02 Apr-10 Apr/86	4W	60	181086001

Table 7 continued: Historical data received in MEDS in 1988.

Ship Name	Cruise Period	NAFO Subarea	Number	Reference
ATHABASKAN	14 Apr-23 Apr/86	4X, 5Ze, 6ABCDE	10	181886009
ALGONQUIN	14 Apr-06 Aug/86	???	152	181886019
NIPIGON	28 Apr-01 May/86	4WX	16	181886006
OTTAWA	09 May-09 May/86	4W	1	181886010
OTTAWA	15 May-28 May/86	4WX, 6E	47	181886011
SAGUENAY	15 May-16 Jun/86	4WX, 6E	89	181886018
ASSINIBOINE	22 May-22 May/86	4X	3	181886013
ASSINIBOINE	23 May-23 May/86	4WX	3	181886014
ATHABASKAN	27 May-28 May/86	4W	3	181886024
ATHABASKAN	29 May-15 Jun/86	4WX, 6E	67	181886023
NIPIGON	02 Jun-16 Jun/86	4WX, 6E	63	181886017
ASSINIBOINE	27 Jun-04 Jul/86	4WX	17	181886015
HURON	01 Jul-02 Jul/86	4WX	5	181886021
ASSINIBOINE	07 Jul-11 Jul/86	4WX	13	181886016
HURON	07 Jul-11 Jul/86	4W	14	181886022
A.NEEDLER	07 Jul-17 Jul/86	4WX	95	180386003
A.NEEDLER	08 Jul-17 Jul/86	4WX	19	180386003
A.NEEDLER	21 Jul-30 Jul/86	3Ps, 4VnWX	80	180386004
A.NEEDLER	23 Jul-28 Jul/86	3Ps, 4VnVsw, 5YZe	8	180386004
W.TEMPLEMAN	01 Aug-18 Aug/86	2J, 3KLMNO	150	180586034
NIPIGON	30 Sep-17 Oct/86	3LNOPs, 4VnVs	48	181886025
A.NEEDLER	13 Nov-01 Dec/86	3LPs	115	180586038
DAWSON	15 Nov-21 Nov/86	4RST	26	181086037
G.ATLANTICA	29 Nov-12 Dec/86	3KL	79	180586040
G.ATLANTICA	03 Dec-12 Dec/86	3KL	2	180586040
G.ATLANTICA	31 Jan-21 Feb/87	2J, 3KL	124	180587001
G.ATLANTICA	31 Jan-21 Feb/87	3L	2	180587001
W.TEMPLEMAN	12 Feb-12 Feb/87	3L	1	180587019
W.TEMPLEMAN	12 Feb-03 Mar/87	3LPs	65	180587019
A.NEEDLER	20 Feb-02 Mar/87	4Vs	94	180587030
W.TEMPLEMAN	06 Mar-22 Mar/87	3OPs	100	180587020
L.HAMMOND	08 Mar-15 Mar/87	3NO	68	180587032
W.TEMPLEMAN	03 Apr-17 Apr/87	3LNO	121	180587021
W.TEMPLEMAN	04 Apr-08 Apr/87	3O	3	180587021
W.TEMPLEMAN	22 Apr-04 May/87	3L	2	180587022
G.ATLANTICA	30 Apr-12 May/87	3L	2	180587002
G.ATLANTICA	30 Apr-12 May/87	3LOPs	5	180587002
MARINUS	02 May-20 May/87	3L	31	180587014
W.TEMPLEMAN	07 May-19 May/87	3L	2	180587023
W.TEMPLEMAN	07 May-19 May/87	3LNO	139	180587023
G.ATLANTICA	15 May-15 May/87	3L	1	180587003
G.ATLANTICA	15 May-01 Jun/87	3L	29	180587003
W.TEMPLEMAN	21 May-02 Jun/87	3L	134	180587024
W.TEMPLEMAN	21 May-02 Jun/87	3L	2	180587024
MARINUS	28 May-21 Jun/87	3KL	23	180587015
W.TEMPLEMAN	05 Jun-18 Jun/87	3LOPs	113	180587025
G.ATLANTICA	05 Jun-23 Jun/87	3L	2	180587004
G.ATLANTICA	05 Jun-23 Jun/87	3KL	109	180587004
G.ATLANTICA	25 Jun-25 Jun/87	3L	1	180587005
G.ATLANTICA	25 Jun-06 Jul/87	3LNO	59	180587005
MARINUS	25 Jun-13 Jul/87	3L	121	180587016
A.NEEDLER	29 Jun-09 Jul/87	4WX	104	180387001
G.ATLANTICA	08 Jul-20 Jul/87	2HJ, 3KL	123	180587006
A.NEEDLER	14 Jul-22 Jul/87	3Ps, 4VnWX	76	180387002
MARINUS	16 Jul-23 Jul/87	3L	27	180587017
G.ATLANTICA	24 Jul-24 Jul/87	3L	1	180587007
G.ATLANTICA	24 Jul-29 Jul/87	3LOPs	31	180587007
A.NEEDLER	30 Jul-06 Aug/87	4WX	41	180387003
G.ATLANTICA	30 Jul-11 Aug/87	3L	2	180587008
G.ATLANTICA	30 Jul-11 Aug/87	3L	111	180587008
W.TEMPLEMAN	02 Aug-14 Aug/87	2J, 3KL	60	180587026
W.TEMPLEMAN	02 Aug-15 Aug/87	2J, 3KL	53	180587026
W.TEMPLEMAN	02 Aug-15 Aug/87	2J, 3KL	60	180587026
MARINUS	05 Aug-18 Aug/87	3L	37	180587018
G.ATLANTICA	13 Aug-04 Sep/87	2GHJ, 3KL	188	180587009
MARGAREE	31 Aug-30 Sep/87	???	80	181887062
SKEENA	31 Aug-08 Oct/87	???	157	181887052

Table 7 continued: Historical data received in MEDS in 1988.

Ship Name	Cruise Period	NAFO Subarea	Number	Reference
G.ATLANTICA	04 Sep-04 Sep/87	3L	1	180587009
DAWSON	17 Sep-26 Sep/87	3NO	81	180587031
W.TEMPLEMA	25 Sep-07 Oct/87	2GHJ, 3KL	5	180587027
W.TEMPLEMAN	25 Sep-12 Oct/87	2GHJ, 3KL	16	180587027
NIPIGON	29 Sep-10 Oct/87	4STWX	14	181887059
G.ATLANTICA	09 Oct-26 Oct/87	2J, 3KL	17	180587010
W.TEMPLEMAN	15 Oct-15 Oct/87	3L	1	180587028
W.TEMPLEMAN	15 Oct-01 Nov/87	3L	169	180587028
G.ATLANTICA	28 Oct-08 Sep/87	2J, 3KL	8	180587011
G.ATLANTICA	28 Oct-09 Sep/87	2J, 3KL	91	180587011
W.TEMPLEMAN	06 Nov-24 Nov/87	3LNO	54	180587029
SKEENA	09 Nov-12 Nov/87	4WX	12	181887060
G.ATLANTICA	11 Nov-24 Nov/87	2J, 3KL	85	180587012
G.ATLANTICA	12 Nov-24 Nov/87	2J, 3KL	29	180587012
L.HAMMOND	23 Nov-01 Dec/87	3LNO	53	180587033
G.ATLANTICA	26 Nov-09 Dec/87	3L	2	180587013
G.ATLANTICA	26 Nov-09 Dec/87	3KL	99	180587013
NIPIGON	10 Dec-10 Dec/87	4WX	3	181887054
Denmark				
-----				
RESEARCH	30 Mar-16 Dec/81	0AB, 1ABCDEF	122	26RG81001
RESEARCH	14 Jan-11 Nov/82	0AB, 1ABCDEF	155	26RG82001
RESEARCH	03 Jan-28 Oct/83	0AB, 1ABCDEF	127	26RG83001
RESEARCH	28 Oct-20 Dec/83	0AB, 1ABCDEF	44	26RG83002
RESEARCH	05 Jan-03 May/84	1CDEF	62	26RG84001
RESEARCH	05 May-06 Dec/84	0AB, 1ABCDEF	104	26RG84002
RESEARCH	02 Jan-24 Nov/85	0AB, 1ABCDEF	193	26RG85001
RESEARCH	05 Apr-17 Aug/86	0AB, 1ABCDEF	123	26RG86001
USA				
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ASTERIAS	13 Jan-14 Jan/83	5Zw	47	31AA83003
ASTERIAS	05 May-06 May/83	5Zw	48	31AA83004
Iceland				
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BAKKAFOSS	09 Mar-12 Mar/85	1EF	15	46AA85001
BAKKAFOSS	30 Jun-02 Jul/85	1F	11	46AA85002
BAKKAFOSS	10 Sep-13 Sep/85	1F	15	46AA85004
BAKKAFOSS	03 Dec-06 Dec/85	1F	16	46AA85005
BAKKAFOSS	11 Mar-14 Mar/86	1F	12	46AA86001
BAKKAFOSS	08 Jun-11 Jun/86	1F	16	46AA86004
BAKKAFOSS	29 Sep-02 Oct/86	1DEF	15	46AA86002
BAKKAFOSS	24 Dec-27 Dec/86	1F	16	46AA86003
BAKKAFOSS	02 Mar-06 Mar/87	1F	16	46AA87001
BAKKAFOSS	17 Jun-20 Jun/87	1EF	15	46AA87002
BAKKAFOSS	01 Sep-04 Sep/87	1DEF	14	46AA87003
USSR				
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A.KNIPOVICH	01 Jun-28 Jul/81	2J, 3KLMNO	176	90KN81004
PROSHION	22 Sep-05 Nov/81	2J, 3KLMNO	140	90PH81024
PERSEI13	02 Dec-27 Jan/82	0, 1, 2, 3KLMNO	102	90P381026
SULOY	16 Apr-04 Aug/83	3KLMNO	316	90C583027
SULOY	16 Oct/83-29 Jan/84	0, 1, 2, 3KLMNO	127	90C583029
POISK	29 Mar-31 May/84	3LMNO	79	90PK84049
SULOY	29 Mar-20 Jul/84	3KLMNO	446	90C584030
LENSK	06 Jun-08 Jun/84	3MN	13	90RI84018
SULOY	14 Sep-13 Nov/84	0B, 1CDEF, 2GHJ, 3KLMNO	44	90C584031
PERSEI13	10 Mar-04 Jul/87	3KLMNO	504	90P387037
F.NANSEN	30 Aug-03 Dec/87	2HJ, 3KLMNO, 6GH	192	90NF87001
K.SHAYTANOV	13 Sep-07 Dec/87	0, 1, 2, 3KLMNO	222	90K587001