



SCIENTIFIC COUNCIL MEETING – JUNE 2013

Integrated Science Data Management NAFO Report 2013

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Abstract

ISDM, as the Regional Environmental Data Center for NAFO, is required to provide an annual inventory of environmental data collected in the NAFO area to the NAFO subcommittee for the environment (STACFEN). Inventories and maps of physical oceanographic observations such as ocean profiles, near surface thermosalinographs, drifting buoys, currents, waves, tides and water level measurements for the calendar year 2012 are included. This report will also provide an update on other ISDM activities during 2012 and beyond.

It is important for STACFEN to encourage members to send data and information to the designated data center in order to get significant return for NAFO member countries.

Introduction

ISDM has been recognized since 1975 (back then as MEDS) as the Regional Environmental Data Center for ICNAF and subsequently for NAFO. In order for ISDM to carry out its responsibility of reporting to the Scientific Council, the Designated National Representatives selected by STACFEN are requested to provide ISDM 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 2013 required the submission to ISDM of a completed oceanographic inventory form for data collected in 2012, and oceanographic data pertinent to the NAFO area, for all stations occupied in the year prior to 2012. The data of highest priority are those from the standard sections and stations, as described in NAFO SCR DOC., No. 1, Serial N 1432, 9p.

Data that have been formatted and archived at ISDM are available to all members on request. Requests can be made by telephone (613) 990-6065, by e-mail to isdm-gdsi@dfo-mpo.gc.ca, by completing an on-line order form on the ISDM web site at <http://www.isdm.gc.ca/isdm-gdsi/request-commande/form-eng.asp> or by writing to Services, Integrated Science Data Management (ISDM), Fisheries and Oceans Canada, 12th Floor, 200 Kent St., Ottawa, Ont. Canada K1A 0E6.

Data Summaries for 2012

Near-surface and profile data

In the NAFO area, a variety of vertical profiles as well as near-surface observations from parameters such as temperature, salinity, oxygen, nutrients and other chemical and biological variables, are being made every year. ISDM receives these data either in real-time (on average within one month of observation) via the Global Telecommunications System (GTS) or in delayed-mode directly from responsible institutions, and indirectly from national Cruise Summary Reports and other reports of marine activities.

The following inventories and corresponding maps summarize the ocean subsurface and near-surface data processing activities in 2012 for the NAFO area:

- **Table 1, Figure 1:** **Real-time temperature and/or salinity data collected and processed in 2012**
TOTAL: 342 058 (279 186) stations
- **Table 2, Figure 2:** **Delayed-mode temperature and/or salinity profiles collected and processed in 2012**
TOTAL: 2834 (1170) stations
- **Table 3, Figure 3:** **Delayed-mode temperature and/or salinity profiles collected prior to 2012 and processed in 2012**
TOTAL: 7373 (6413) stations
- **Table 4, Figure 4:** **Near-surface underway temperature and/or salinity data collected in 2012**
TOTAL: 3133 (1270) stations

The numbers in brackets are the counts for 2011. Data processing at ISDM begins by reformatting files from their original formats into a common 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, units are standardized, and parameter range checks are performed. The second is to identify any duplication, and select the best version based on data type, source of the data, and general qualities in analysis and reporting of the observations. The third check identifies and corrects date/time and geographical positioning errors 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 variables is also visually inspected using software to plot the data and allow a technician to set quality flags to individual points on a profile. <http://www.isdm.gc.ca/isdm-gdsi/ocean/qc-cq-eng.htm>

For the first time since the production of this report, the bottle cast data loaded in the BioChem database during the year were counted and reported with the other delayed-mode data. This explains the increases in the counts behind figures and tables 2 and 3, compared to last year. BioChem is a national archive of marine biological and chemical data administered by ISDM, in which the data is loaded by regional data managers.

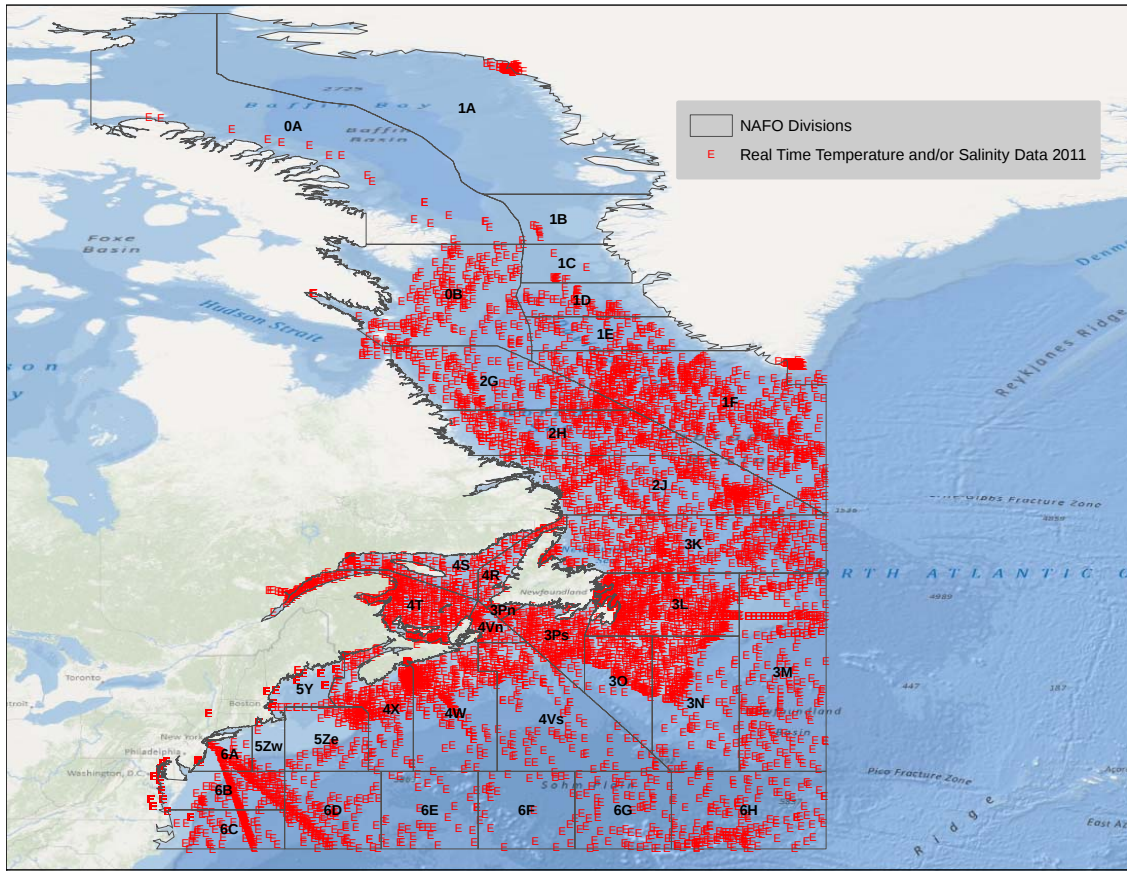


Figure 1: Real-time temperature and/or salinity data collected and processed in 2012

Total = 342 058 (279 186) stations

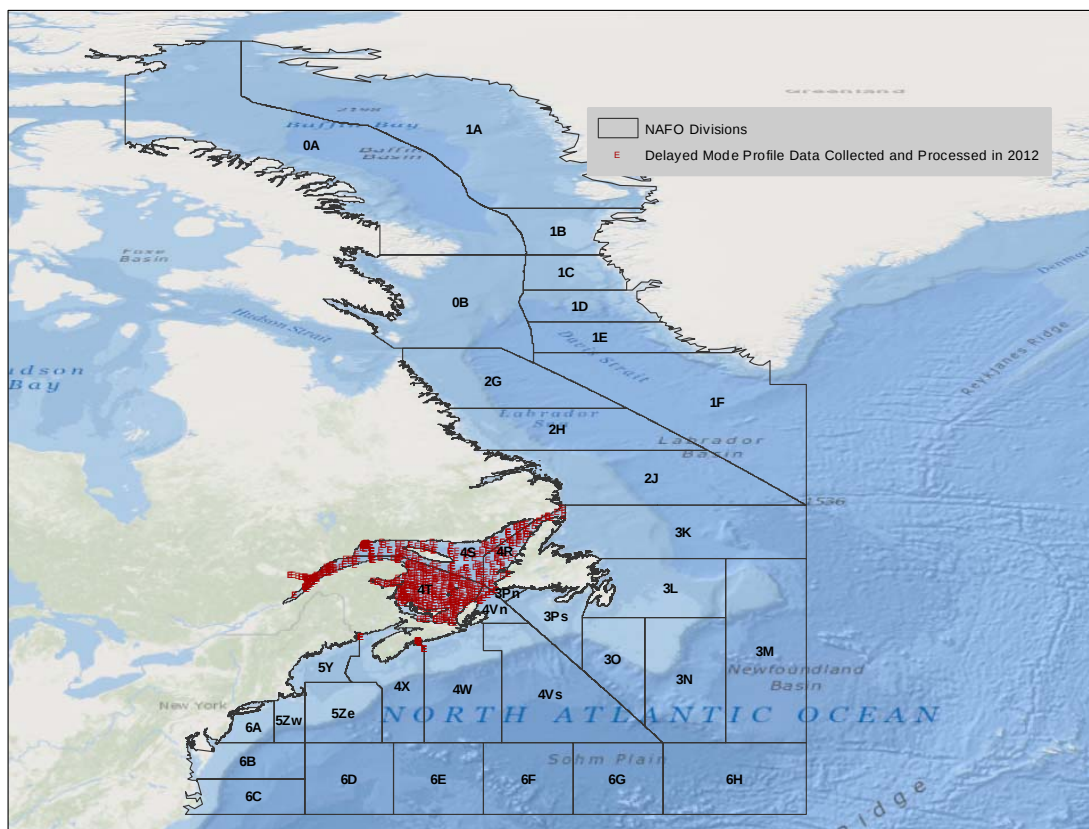


Figure 2: Delayed-mode temperature and salinity profiles collected and processed in 2012

Total = 2834 (1170) stations

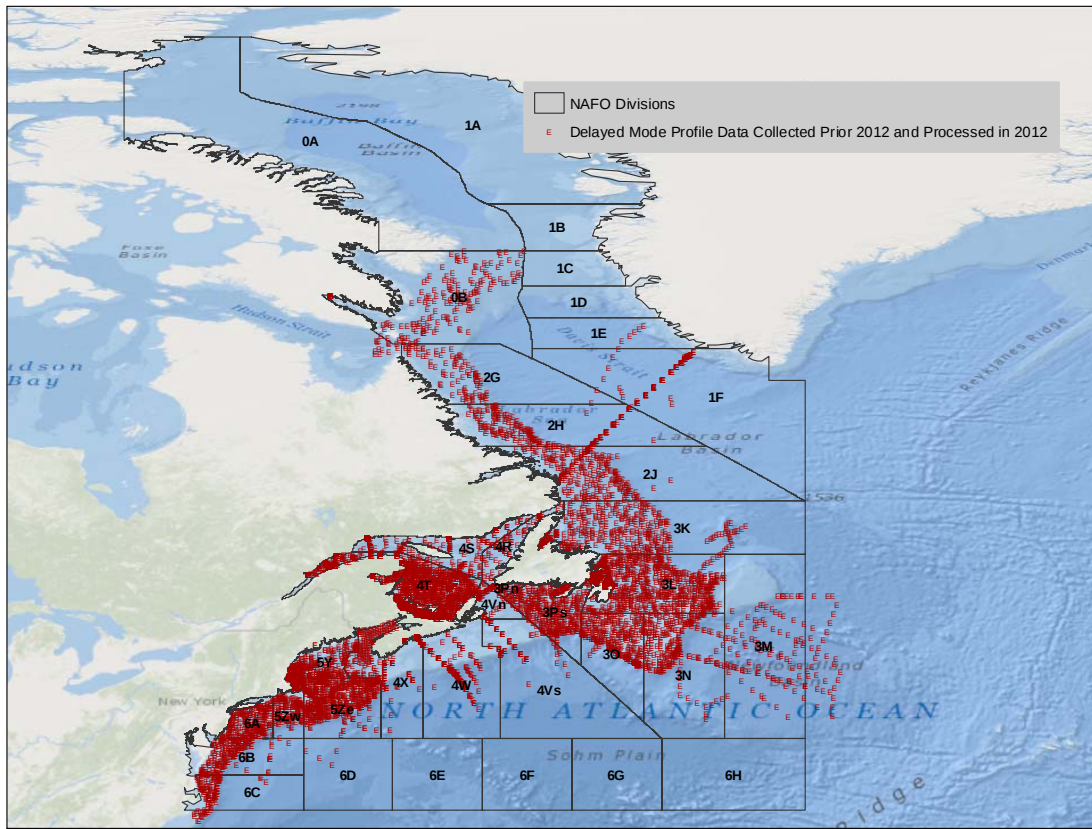


Figure 3: Delayed-mode temperature and salinity profiles collected prior to 2012 and processed in 2012
 Total = 7373 (6413) Stations

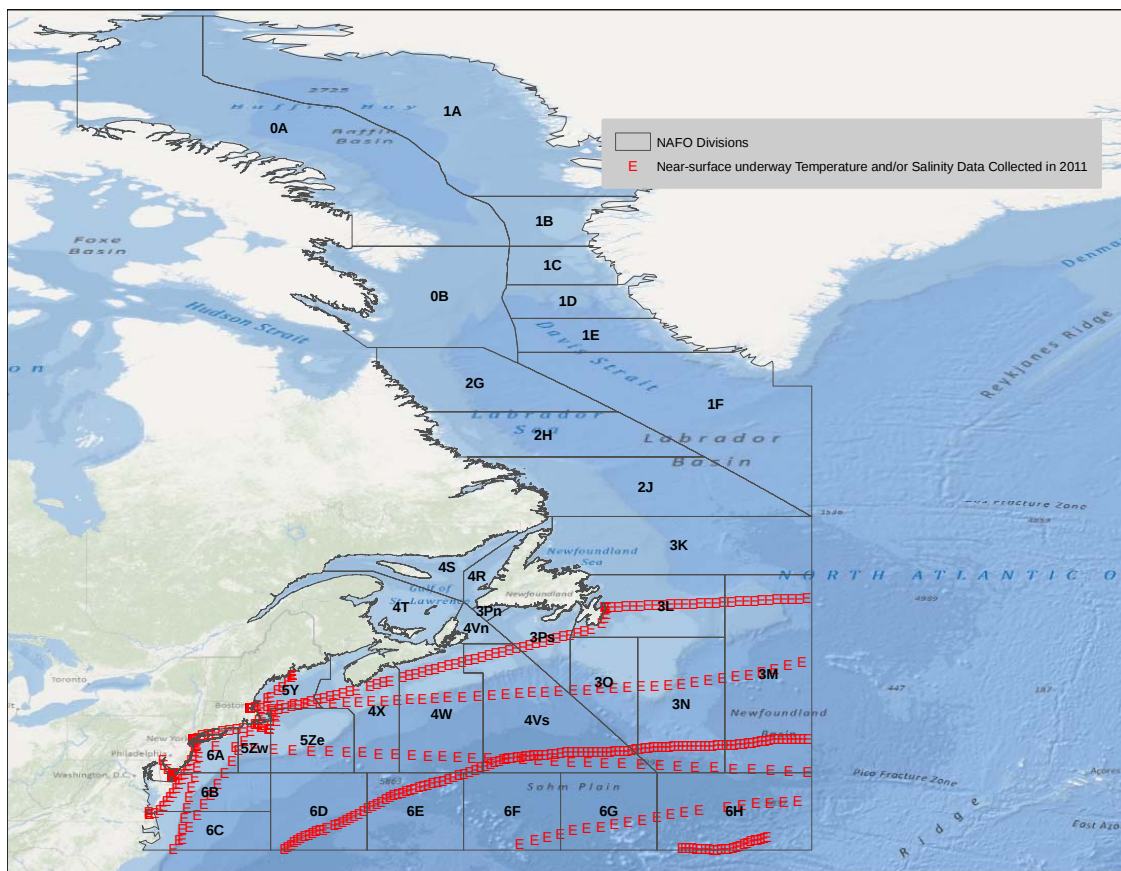


Figure 4: Near-surface underway temperature and/or salinity data collected in 2012
 Total = 3133 (1 270) Stations

Surface data from drifting buoys

The following inventory and map summarize ISDM drifting buoy data collected and processed in 2012 for the NAFO area:

- **Table 5, Figure 5: Drifting Buoys in the NAFO Area in 2012**
TOTAL = 457 156 (364 648) messages from 208 (162) buoys

Drifting buoy data are received at ISDM via the GTS. Quality control techniques are much the same as those for the ocean profile data. Drifting buoys report via satellite, at rates of up to every 15 minutes. These messages are checked for format errors, and reformatted for quality control procedures and subsequent archival. Range checks, flags and possible corrections to the data are carried out by trained personnel, using a system of ISDM software, which organize, analyze and display plots of the data. Quality checks use algorithms which check position, drift speed, and ranges of sea surface temperatures, atmospheric pressure and wind. The range checks include a comparison to NOAA's Asheville 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.

ISDM drifting buoy archive contains over 100 million records for the world's oceans, from 1978 to present, and is currently growing at a rate of approximately one million messages per month. A drifting buoy message is comprised of the buoy position and one or more of the following parameters: surface and subsurface water temperature, air pressure and temperature, wind speed and direction.

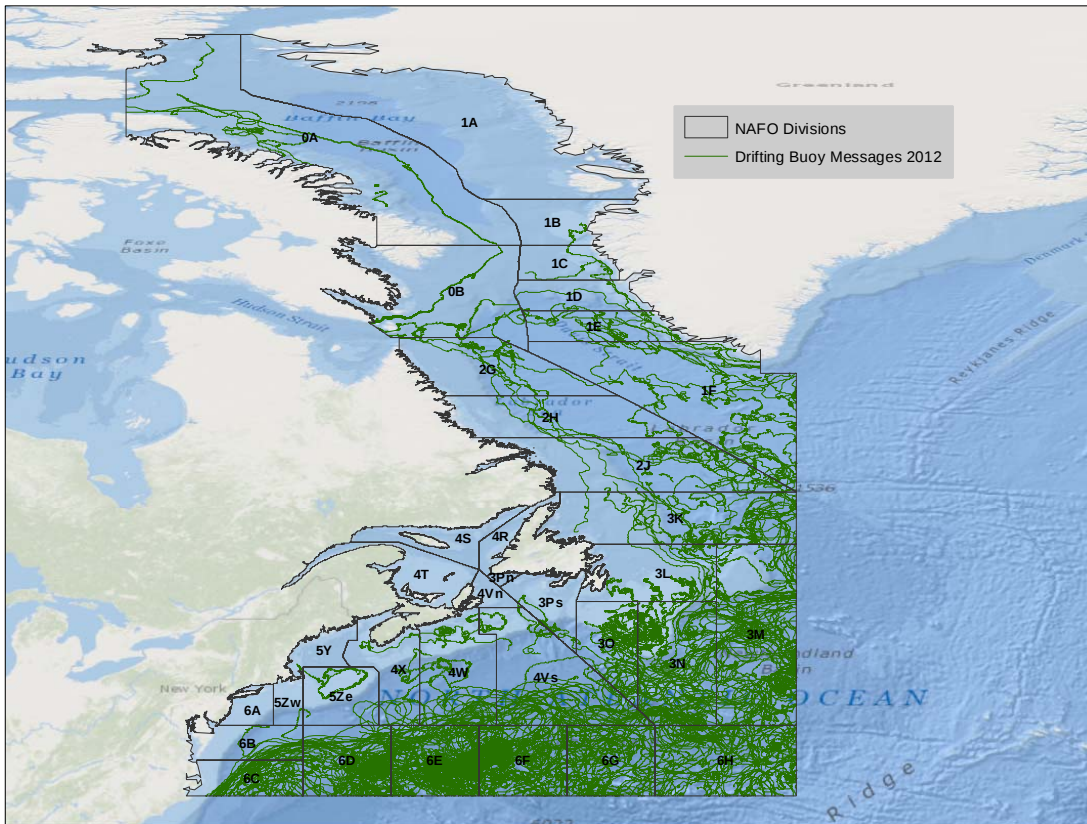


Figure 5: Drifting Buoy messages 2012
Total = 457 156 (364 648) messages, 208 (162) platforms

Current Meter Data

Current meters have been deployed in the NAFO area for many years. Some current meter data are processed and archived at the Bedford Institute of Oceanography (BIO: <http://bluefin2.dfo-mpo.gc.ca/odigrv/index-e.html>), Dartmouth, Nova Scotia, and other are processed and archived at the Maurice-Lamontagne Institute (MLI: http://slgo.ca/app-sgdo/en/docs_reference/format_odf.html).

The following maps and inventory summarizes current meter data deployments and data processing in 2012 in the NAFO area for BIO. The equivalent data for MLI could not be obtained at the time of the report.

Table 6, Figure 6: BIO Current meters recovered in 2012 and processed

TOTAL = 20 instruments on 15 moorings

Table 7, Figure 7: BIO Current meters recovered in 2012 but not yet processed

TOTAL = 25 instruments on 29 moorings

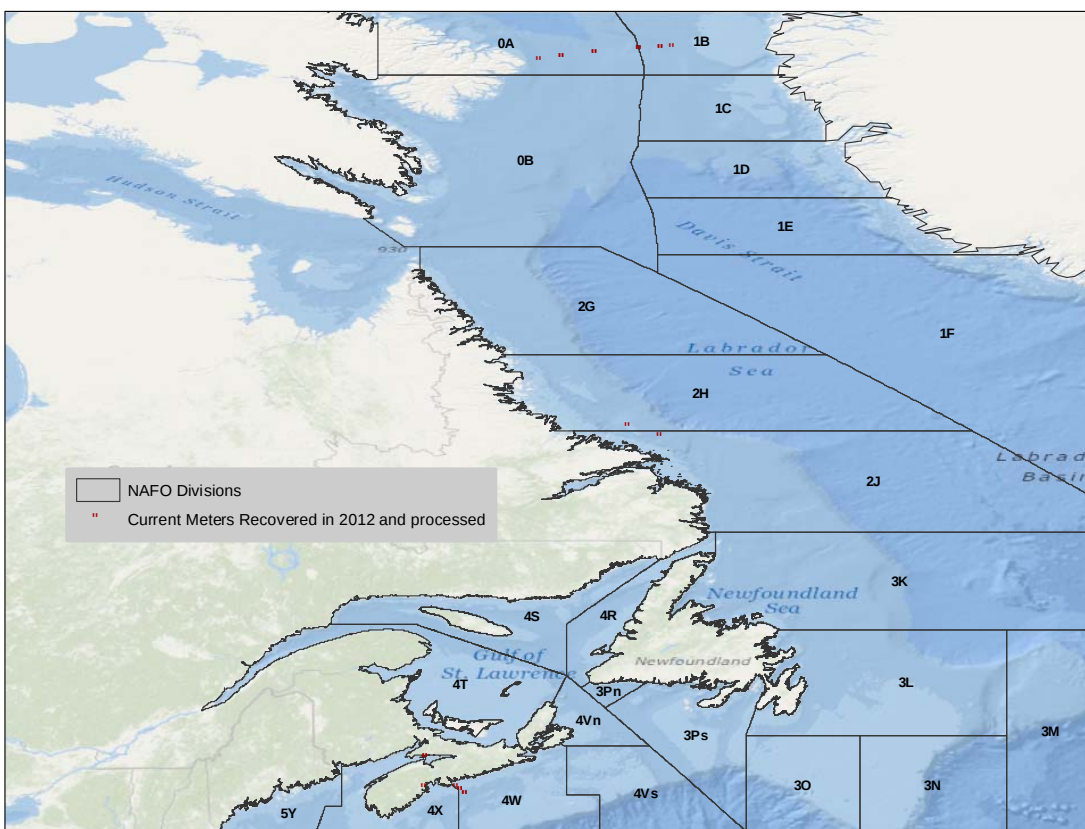


Figure 6: BIO Current Meters Recovered in 2012 and processed
Total = 20 instruments on 15 moorings

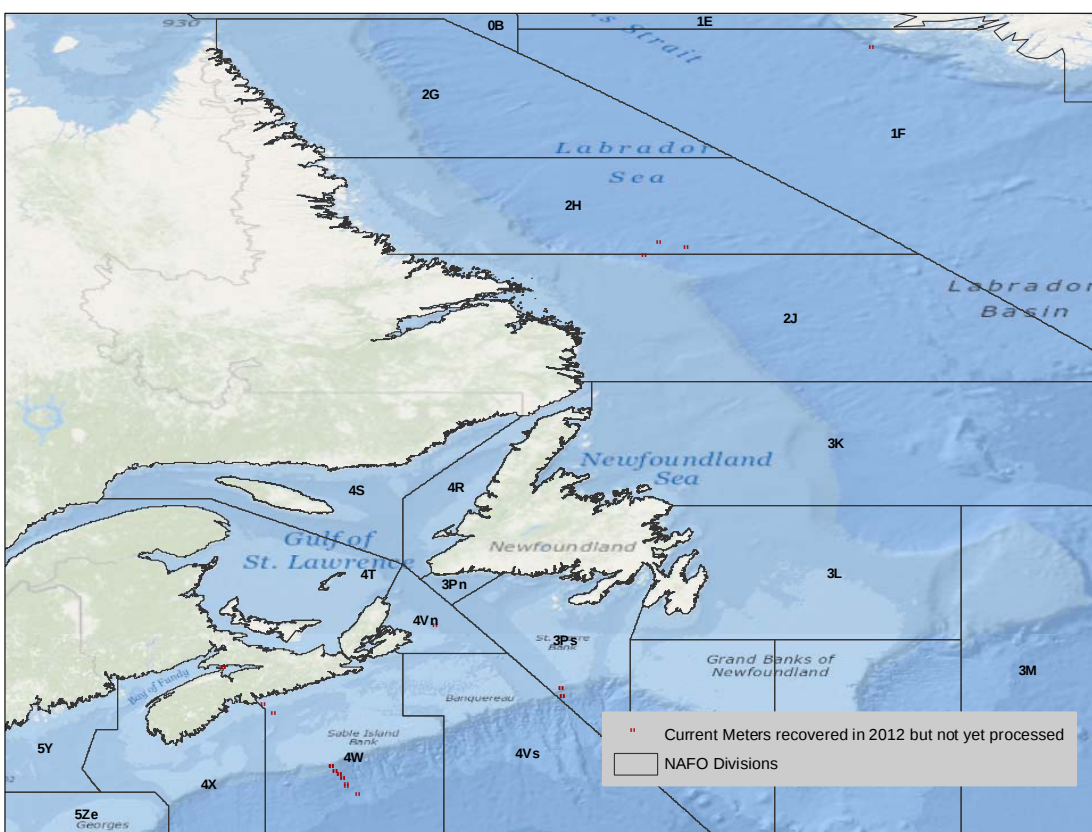


Figure 7: BIO Current Meters recovered from 2012 but not yet processed
Total: 29 instruments on 25 moorings

Wave Data

The following map displays where wave data was collected in 2012:

- Figure 8: Wave Buoys in the NAFO Area in 2012**
 15 Environment Canada meteorological buoys
 3 Wave Instruments from the Oil and Gas industry
 (Datawell and Triaxys buoys)

ISDM continues to process and archive operational surface wave data on a daily basis from around Canada. Wave spectra, calculated variables such as the significant wave height and peak period, concurrent wind observations, and raw digital time series of water surface elevations are stored. The wave data has quality flags assigned by a combination of automated algorithms and a visual inspection of the spectral shape. During 2012, data was collected from 18 buoys in the NAFO area. All real-time and historical wave data are made available on-line from the ISDM web site: <http://www.isdm.gc.ca/isdm-gdsi/waves-vagues/index-eng.htm>

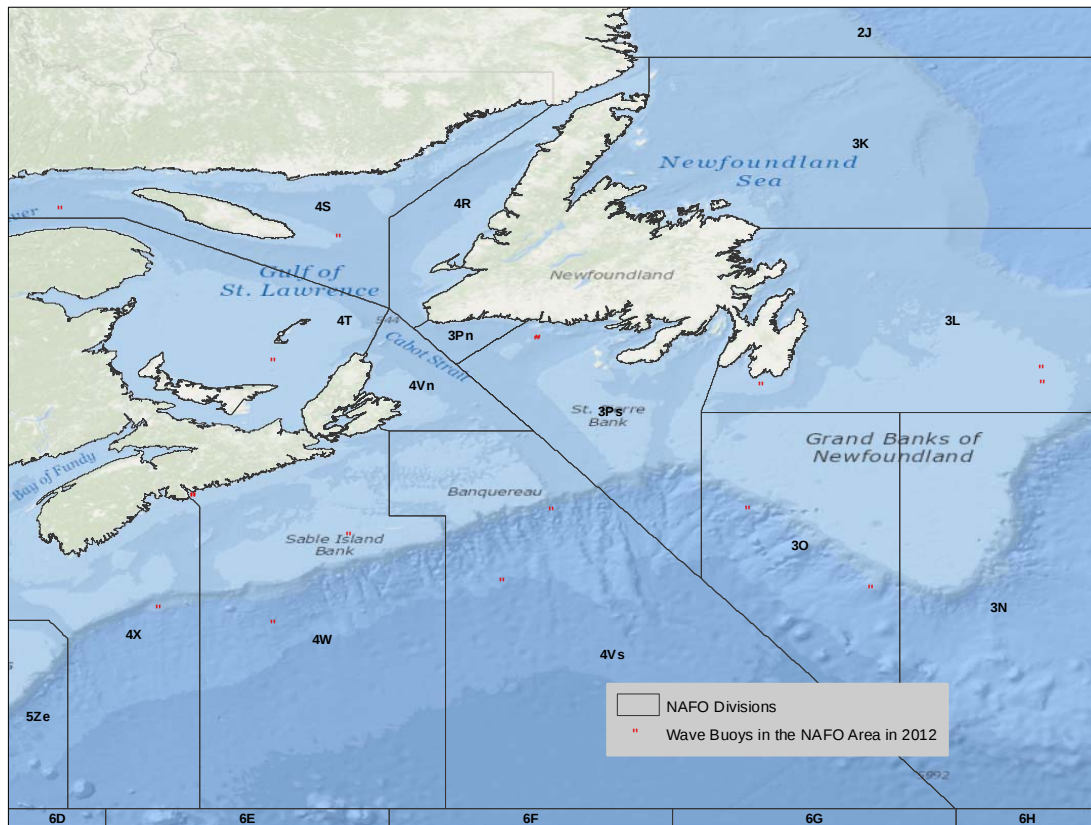


Figure 8: Wave Buoys in the NAFO Area in 2012
Total = 18 Platforms

Tides and Water level Data

As the designated data center, ISDM processes and archives observed water level data collected from the gauge network maintained by the Canadian Hydrographic Service (CHS). There are four main CHS regions: Pacific, Central & Arctic, Quebec, and Atlantic region. Data is also exchanged with Environment Canada every year. Over 2 million new observations are archived every month. The historical tide and water level data archive has digital records with the earliest dating back before the turn of the century.

In 2012, data was reported from 95 stations across Canada with 36 of those stations within the NAFO general area. Data are quality controlled by the regional CHS tidal officers and ISDM before they become available to the public.

The following map displays where ISDM tide and water level data were collected from:

- **Figure 9: Tide and water level data in the NAFO Area in 2012**
Total: 26 gauges

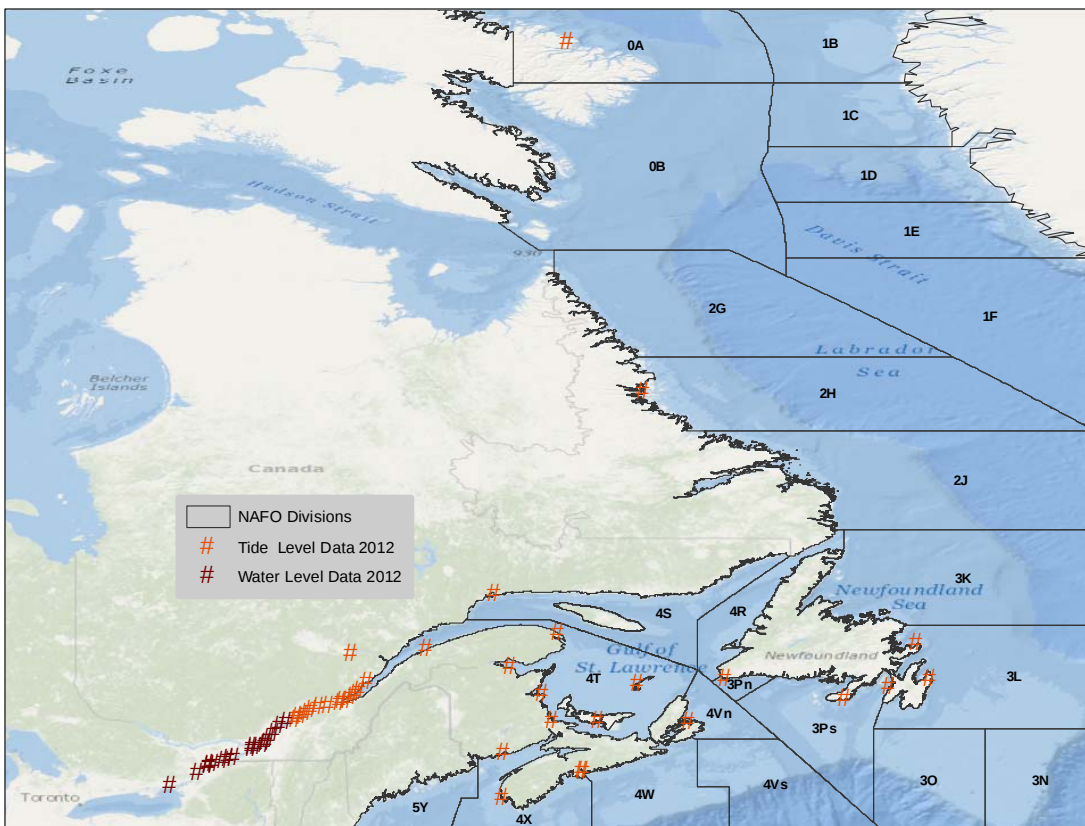


Figure 9: Tide and water level data in the NAFO Area in 2012
Total = 26 gauges

Historical water level data and station benchmarks are available on-line from the ISDM web site:
<http://www.isdm.gc.ca/isdm-gdsi/twl-mne/index-eng.htm>

Tidal predictions are available from the national Tides, Currents and Water Levels web site:
<http://www.tides.gc.ca>

Activity Updates

Argo

Argo is an international program which started in 2000 with aims to deploy profiling floats on a 3 by 3 degree grid in the oceans of the world. Each profiling float samples and reports both temperature and salinity from 2000 m to the surface every 10 days. Some also report oxygen. Data are distributed on the Global Telecommunications System (GTS) within 24 hours of collection and made available on two Global servers located in France and the US. There are currently approximately 3500 Argo profiling floats sampling the world oceans.

ISDM's role is to carry out the processing of the data received from Argo Canada profilers, to distribute the data on the GTS and global servers within 24 hours and to perform the delayed mode processing.

ISDM maintains a web site (<http://www.isdm.gc.ca/isdm-gdsi/argo/index-eng.html>) that contains data and information about Argo Canada profilers as well as general information and statistics about the global array. Global information is also available from the Argo Information Centre at argo.jcommops.org.

During 2012, Argo Canada acquired and deployed 11 Argo profilers in the NAFO region Details of which NAFO regions were sampled are given in table 1 ("PROFILE FLOAT", "CANADA").

The total number of profiles reported in NAFO areas by Argo Canada profilers were 1232 (temperature and salinity), 10% of which were reported by the new profilers. In addition to be sent to the GTS within 24 hrs, the data were sent to the Argo GDACs as netCDF files in the same timelines. Figure 10 shows the Argo profilers sampling and drifting in the North Atlantic during 2012. The red lines indicate Argo Canada profilers, the green lines indicate new Argo Canada profilers and the black lines indicate profilers belonging to other countries.

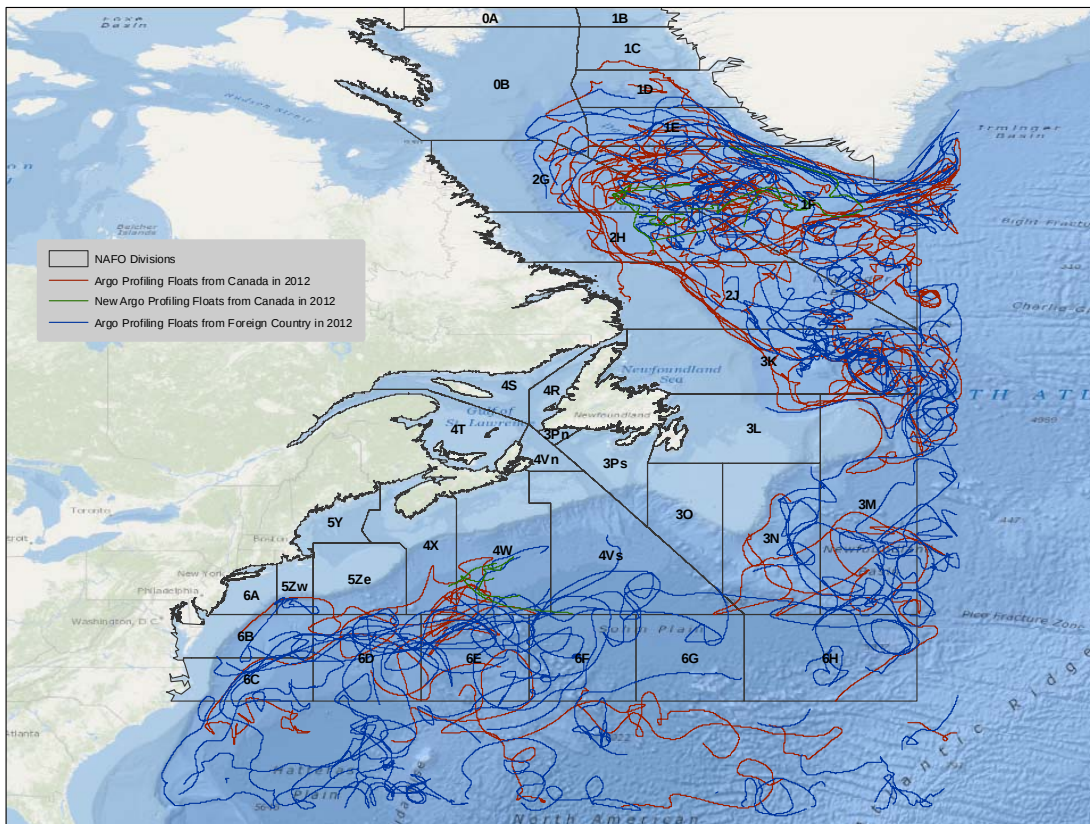


Figure 10: Argo profilers 2012
(red=Canada, green=Canada new, black=foreign)

Atlantic Zone Monitoring Programme (AZMP)

The DFO Atlantic Zone Monitoring Programme activities include regular sampling for 7 fixed stations and 14 standard sections, and research cruises in the AZMP area to collect other physical, chemical and biological data. As part of ISDM' activities in data management, ISDM continues to build and maintain the AZMP web site: <http://www.isdm.gc.ca/isdm-gdsi/azmp-pmza/index-eng.html>.

The wealth of data and information on the site includes:

- Physical and chemical data from 1999 to the present such as CTD, bottle and bathythermograph measurements
- Climate indices showing long term trends of physical variables in the water and atmosphere.
 - o The surface distribution of temperature at the bottom is presented for NAFO sub-areas 4X, 4W, 4Vn and 4Vs
- Water level data for 9 gauges ranging from 1895 to present
- Graphical representations of biological data (phytoplankton, zooplankton)
- Remote Sensing links for Ocean Colour, SST and Primary Productivity product

The data collected as part of AZMP is also compiled in figures and tables 1 to 3.

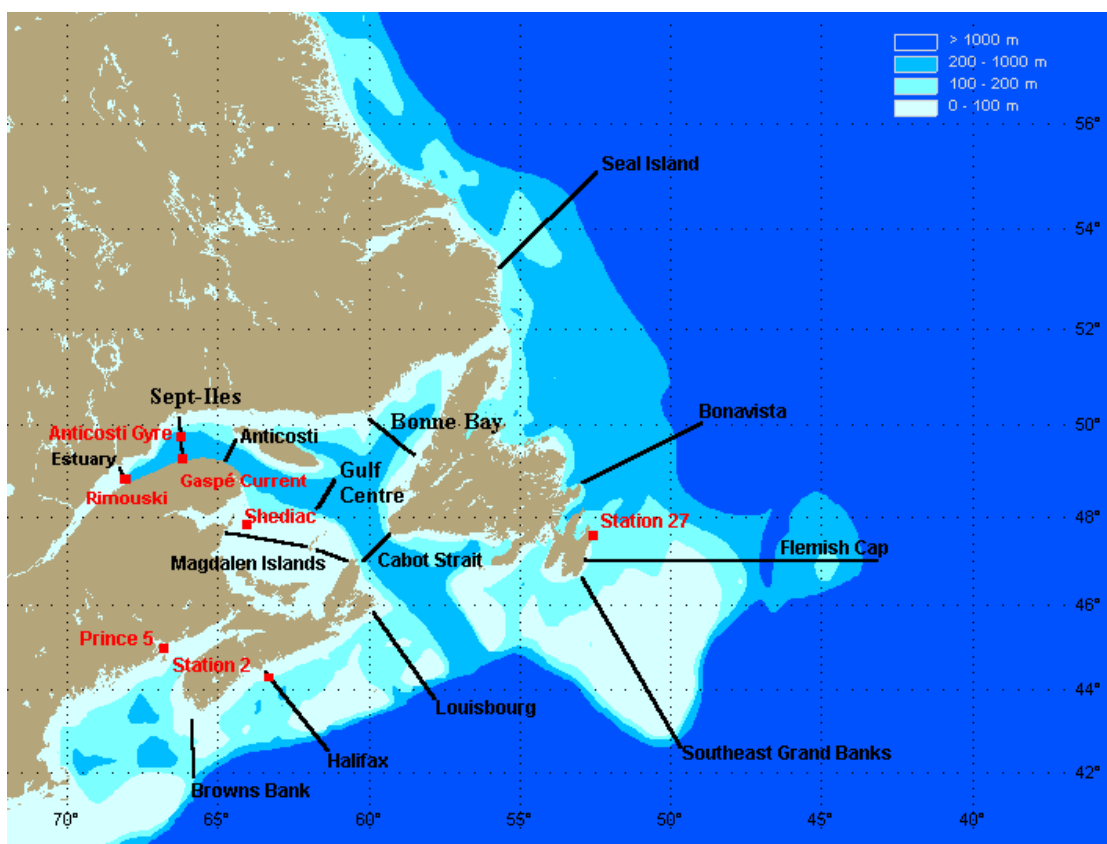


Figure 11: Map of AZMP sections and stations

Aquatic Invasive Species (AIS)

Aquatic Invasive Species are a major threat to Canada's fisheries and aquaculture industry and have been entering Canadian waters for centuries but never as rapidly as today. Every decade, some 15 alien species establish themselves in our coastal or inland waters. In the absence of their natural predators, the most aggressive of them spread rapidly. They can radically alter habitat, rendering it inhospitable for native species. The zebra mussel and sea lamprey are examples of such species that have greatly affected the Great Lakes.

The most effective approach to dealing with this threat involves managing the pathways through which invasive species enter and spread through Canadian waters. For aquatic species these pathways are shipping, recreational and commercial boating, the use of live bait, the aquarium/water garden trade, live food fish, unauthorized introductions and transfers, and canals and water diversions. The shipping pathway is considered the largest single source of new aquatic invasive species. Ballast water that is taken on in foreign ports, for ship stability and safety at sea, is discharged in Canadian waters, along with undesirable "hitchhikers" - foreign species ranging from bacteria to larger organisms.

The Canadian Aquatic Invasive Species database and web application was developed in 2004-5. The main objective was to provide a geo-referenced repository for all invasive species observations gathered in Canada by DFO scientists, provincial departments, other federal or municipal departments and the general public. The second objective was to create a decision making tool that would allow the production of augmented value products that would illustrate trends and movements over time and various locations and thus allow the department to be proactive rather than reactive to observations made.

Currently there is data from the Great Lakes, the Maritimes and some from the Vancouver area. Most of the data are observations of location name, long-lat, species name, date, and any metadata provided.

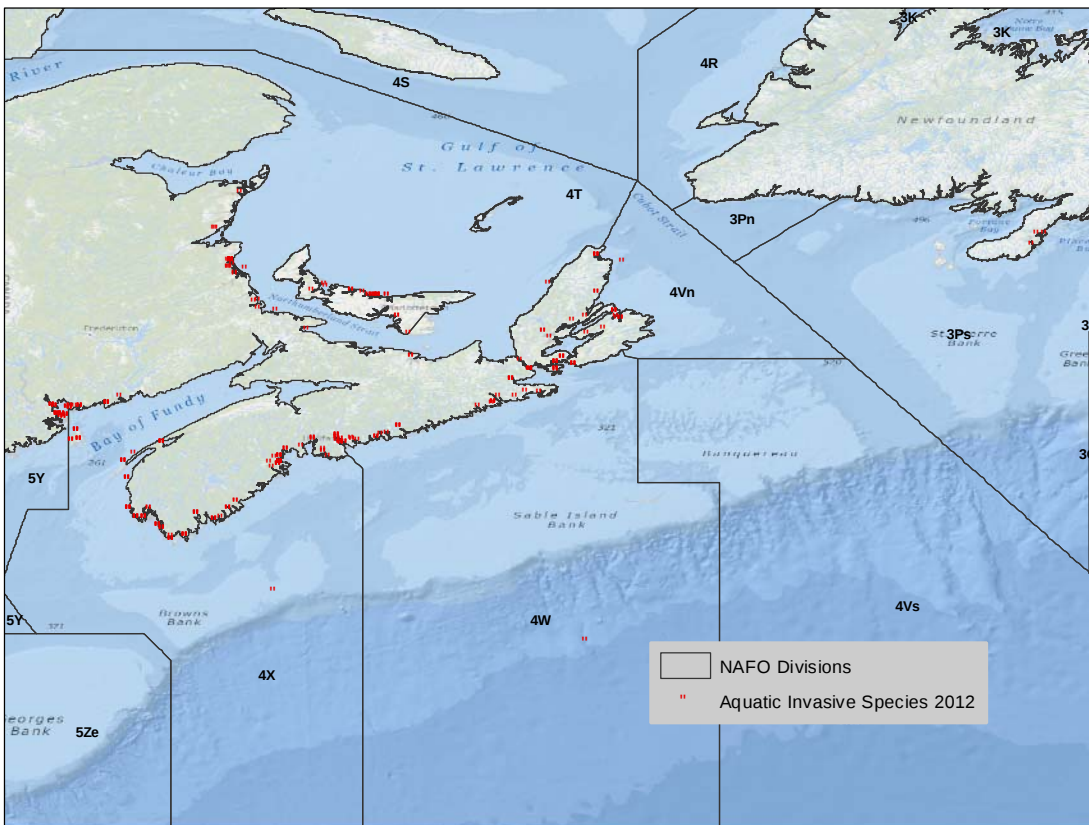


Figure 12: Map of locations where observations of Aquatic Invasive Species were added in 2012

National Science Data Management Committee (NSDMC)

This committee was funded in 2011-12 to a total of \$1.1M. From this, 16 projects were funded. Five projects address primarily data archival issues, nine projects address primarily data access and one addresses primarily standards. Some funds were also set aside for governance. A new project aiming at making physical ocean model outputs (waves, winds) accessible through open source protocols was initiated. Ongoing projects aiming at improving infrastructure, building a metadata repository, creating a detailed gridded bathymetry around Canada, establishing a national multispecies tagging system, creating databases for data types with no home (ADCP, Acoustic Data), rescuing data at risk (plankton in the St. Lawrence) and achieving the rescue of multi-regional freshwater temperature data, received renewed funding. The development and application of a national policy for physical sample archive management is also continuing from last year.

References

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

Table 1: Real-time temperature and /or salinity data collected and processed in 2012

Total: 342 058 (279 186) measurements; a measurement consists of a profile or surface measurement at one place and time.

Platform Name	Country	Call Sign	Report Period	BATHY	TESAC	NAFO Subarea
BOSTON	USA	44013	Jun-20 - Dec-04	0	3987	5ZW
VIRGINIA BEACH 64NM, VA	USA	44014	Feb-14 - Dec-31	0	7614	6C
NEW MEADOWS RIVER	USA	44021	Dec-11 - Dec-31	0	486	5Y
BUOY N NORTHEAST CHANNEL	USA	44024	Jan-01 - Dec-31	0	8441	4X
DISCUS 3	USA	44027	Jan-01 - Oct-31	0	7136	5Y
MASS. BAY / STELLWAGEN	USA	44029	Jan-01 - Dec-31	0	8710	5ZW
WESTERN MAINE SHELF	USA	44030	Jan-01 - Dec-31	0	8712	5ZW
CENTRAL MAINE SHELF	USA	44032	Jan-01 - Dec-31	0	7406	5Y
WEST PENOBSCOT BAY	USA	44033	Feb-16 - Dec-31	0	6978	5Y
EASTERN MAINE SHELF	USA	44034	Jan-01 - Dec-31	0	6520	5Y
JORDAN BASIN	USA	44037	Feb-08 - Dec-31	0	7460	5Y
JAMESTOWN	USA	44041	Jan-01 - Dec-31	0	8337	6B
POTOMAC	USA	44042	Jan-01 - Dec-31	0	7843	6B
PATAPSCO	USA	44043	Jan-01 - Dec-31	0	8187	6B
SUSQUEHANNA	USA	44057	Jan-01 - Dec-13	0	5397	6B
STINGRAY POINT	USA	44058	Jan-01 - Dec-31	0	7886	6B
GOOSSES REEF	USA	44062	Jan-01 - Dec-31	0	7137	6B
ANNAPOLIS	USA	44063	Jan-01 - Dec-31	0	8202	6B
FIRST LANDING	USA	44064	Jan-17 - Dec-31	0	7452	6B
MAERSK VILNIUS	SINGAPORE	9V8503	Mar-12 - Nov-06	99	0	5ZW,6A,6B,6D
RAILROAD, CHESAPEAKE RES	USA	BRIM2	Jan-01 - Dec-31	0	34512	6B
OPILIO	CANADA	CFD2576	May-03 - May-03	0	1	4T
VLADYKOV	CANADA	CFN5960	Aug-15 - Oct-27	5	61	3K,3L
SAMBRO	CANADA	CG2613	Aug-21 - Aug-21	0	1	4W
SHAMOOK	CANADA	CG2676	Apr-21 - Jun-18	0	55	3L,3PS
ALFRED NEEDLER	CANADA	CG2683	Feb-11 - Dec-05	20	1068	3K,3L,3N,3O,3PS,3PN,4R,4VN,4VS,4W,4X,5Y ,5ZE
BELUGA	CANADA	CG3161	Jul-07 - Jul-07	0	2	4T
NSC CALANUS II	CANADA	CG3187	Apr-30 - Aug-08	0	36	4S,4T
F.G. CREED	CANADA	CG3198	Aug-10 - Aug-26	0	8	4S,4T
ANN HARVEY	CANADA	CGAH	Mar-04 - Mar-24	32	0	2J,3K,3L
TELEOST	CANADA	CGCB	Jan-07 - Dec-21	132	987	2H,2J,3K,3L,3M,3N,3O,3PS,4R,4S,4T,4VN
MARTHA L. BLACK	CANADA	CGCC	Jun-01 - Jun-12	0	45	1F,2H,2J,4W,4X
HUDSON	CANADA	CGDG	Sep-24 - Dec-09	33	321	2J,3K,3L,3M,3N,3O,3PS,3PN,4R,4S,4T,4VN,4 VS,4W,4X,5ZE
CCGS DES GROSEILLIERS	CANADA	CGDX	Feb-29 - Feb-29	0	2	4S,4T
CCGS VIOLA M DAVIDSON	CANADA	CGEC	Jan-16 - Dec-19	0	11	4X
SWEET HALL, CHESAPEAKE B	USA	CVQV2	Mar-27 - Dec-31	0	26377	6B
MARIA S. MERIAN	GERMANY	DBBT	May-13 - Jul-20	0	66	1F,2G,2H,2J,3L,3M
TARA	FRANCE	FVNM	Jan-28 - Feb-15	0	16	5ZW,6C
OYSTER RIVER	USA	GBQN3	Apr-03 - Dec-10	0	21416	5ZW

GOODWIN ISLAND	USA	GDWV2	Apr-24 - Nov-15	0	29	6B
CHESNUT NECK	USA	JCQN4	Jan-01 - Nov-14	0	28000	6A
BUOY 126, JACQUES COUSTE	USA	JCTN4	Jan-01 - Dec-31	0	34448	6A
SEALAND TRADER	USA	KIRH	Sep-28 - Dec-07	47	0	6A,6B,6C
OTTER POINT CREEK	USA	LTQM2	Mar-19 - Nov-27	0	23051	6B
T - WHARF BOTTOM	USA	NAQR1	Jan-11 - Dec-31	0	32995	5ZW
PROFILE FLOAT	FRANCE	Q1901210	Feb-24 - Dec-30	0	31	1E,1F
PROFILE FLOAT	FRANCE	Q1901214	Feb-27 - May-17	0	9	1F
PROFILE FLOAT	FRANCE	Q1901217	Mar-03 - Dec-28	0	25	1F,2G,2H,2J
PROFILE FLOAT	FRANCE	Q1901218	Feb-15 - Dec-31	0	32	2J,3K,3L,3M
PROFILE FLOAT	USA	Q1901378	Jan-06 - Dec-28	0	18	6B,6C,6D
PROFILE FLOAT	USA	Q1901465	Jan-06 - Dec-31	0	27	4VS,4W,6B,6C,6D,6E
PROFILE FLOAT	USA	Q4900442	Jan-09 - Feb-29	0	6	4W
PROFILE FLOAT	USA	Q4900801	Jan-03 - May-22	0	15	1F,2J
PROFILE FLOAT	USA	Q4900803	Jan-07 - May-16	0	14	3O,4VS,4W,6G
PROFILE FLOAT	USA	Q4901057	Jan-10 - Nov-15	0	10	6F,6G
PROFILE FLOAT	CANADA	Q4901078	Jan-02 - Feb-01	0	4	6F
PROFILE FLOAT	CANADA	Q4901083	Sep-18 - Oct-18	0	4	6E,6F
PROFILE FLOAT	CANADA	Q4901092	Jan-08 - Aug-25	0	20	1F
PROFILE FLOAT	CANADA	Q4901123	Jan-01 - Jul-29	0	22	1F
PROFILE FLOAT	CANADA	Q4901124	Jan-01 - Apr-30	0	8	0B,1D,1E
PROFILE FLOAT	CANADA	Q4901125	Jan-10 - May-29	0	15	2G,2H,2J
PROFILE FLOAT	CANADA	Q4901127	Jan-09 - Dec-24	0	36	1F,2H
PROFILE FLOAT	CANADA	Q4901129	Jan-06 - Dec-21	0	26	3M,3N,6H
PROFILE FLOAT	CANADA	Q4901139	Jan-10 - Dec-25	0	36	4W,4X,5ZE,5ZW,6A,6B,6D,6E
PROFILE FLOAT	CANADA	Q4901140	Jun-22 - Dec-29	0	6	6E,6G
PROFILE FLOAT	CANADA	Q4901142	Jan-08 - Aug-05	0	22	2G,2H,2J
PROFILE FLOAT	CANADA	Q4901143	Jan-01 - Feb-10	0	4	3K
PROFILE FLOAT	CANADA	Q4901149	Jun-22 - Dec-29	0	10	6C,6D,6E
PROFILE FLOAT	CANADA	Q4901150	Jan-09 - Dec-24	0	35	3M,3N,4VS,6H
PROFILE FLOAT	CANADA	Q4901152	Jan-03 - Oct-19	0	28	1F
PROFILE FLOAT	CANADA	Q4901153	Jan-02 - May-11	0	14	1F
PROFILE FLOAT	CANADA	Q4901154	Jan-02 - Dec-27	0	36	2J,3K,3M
PROFILE FLOAT	CANADA	Q4901155	Jan-10 - Nov-05	0	31	4W,4X,5ZE,6D,6E
PROFILE FLOAT	CANADA	Q4901156	Jan-08 - Mar-18	0	7	3K,3L,3M
PROFILE FLOAT	CANADA	Q4901157	Jan-01 - Dec-26	0	37	1F,2G
PROFILE FLOAT	CANADA	Q4901159	Jan-02 - Dec-27	0	37	1F,2H,2J
PROFILE FLOAT	CANADA	Q4901160	Jan-10 - Dec-25	0	34	2G,2H,2J,3K,3L,3M
PROFILE FLOAT	CANADA	Q4901161	Jan-02 - Dec-27	0	31	2H,2J,3K,3M
PROFILE FLOAT	CANADA	Q4901162	Jan-01 - Dec-26	0	36	1F,2H
PROFILE FLOAT	CANADA	Q4901163	Jan-06 - Dec-31	0	21	1E,1F,2G
PROFILE FLOAT	CANADA	Q4901164	Jan-06 - Dec-31	0	31	1C,1D,1E,1F
PROFILE FLOAT	CANADA	Q4901165	Aug-23 - Oct-02	0	5	1F
PROFILE FLOAT	CANADA	Q4901166	Jan-05 - Dec-30	0	13	1E,1F
PROFILE FLOAT	CANADA	Q4901167	Jan-09 - Dec-24	0	25	1E,1F
PROFILE FLOAT	CANADA	Q4901168	Jan-08 - Oct-14	0	29	2G,2H,2J,3K,3L,3M
PROFILE FLOAT	CANADA	Q4901169	Jan-05 - Oct-01	0	28	1E,2G,2H,2J,3K,3L,3M
PROFILE FLOAT	CANADA	Q4901170	Jan-05 - Dec-30	0	37	1F,2H,2J
PROFILE FLOAT	CANADA	Q4901171	Jan-10 - Dec-25	0	36	1D,1E,1F,2G

PROFILE FLOAT	CANADA	Q4901172	Jan-09 - Dec-24	0	36	1E,1F,2G
PROFILE FLOAT	CANADA	Q4901173	Jan-01 - Dec-16	0	24	1F,2G,2H,2J
PROFILE FLOAT	CANADA	Q4901174	Jan-01 - Dec-16	0	30	1F,2G
PROFILE FLOAT	CANADA	Q4901192	Jul-09 - Dec-26	0	21	1F,2H
PROFILE FLOAT	CANADA	Q4901193	Jul-08 - Dec-25	0	20	1F
PROFILE FLOAT	CANADA	Q4901194	Jul-16 - Sep-28	0	2	2H
PROFILE FLOAT	CANADA	Q4901195	Jul-07 - Dec-23	0	20	1F,2G,2H
PROFILE FLOAT	CANADA	Q4901196	Oct-09 - Dec-18	0	8	4VS,4W
PROFILE FLOAT	CANADA	Q4901198	Jul-07 - Dec-25	0	20	1F
PROFILE FLOAT	CANADA	Q4901199	Oct-08 - Dec-27	0	9	4W,4X
PROFILE FLOAT	CANADA	Q4901200	Jul-08 - Dec-25	0	20	2G,2H
PROFILE FLOAT	CANADA	Q4901201	Oct-08 - Dec-27	0	9	4W
PROFILE FLOAT	CANADA	Q4901202	Jun-29 - Dec-26	0	22	1F
PROFILE FLOAT	USA	Q4901217	Jan-05 - Dec-30	0	35	3M,3N,6H
PROFILE FLOAT	USA	Q4901218	Jan-08 - Sep-14	0	23	3M,3N
PROFILE FLOAT	USA	Q4901219	Jul-01 - Dec-28	0	17	3M
PROFILE FLOAT	USA	Q4901278	Jan-06 - Dec-31	0	35	4VS,4W,4X,6B,6C,6D,6E,6F
PROFILE FLOAT	USA	Q4901290	Jan-05 - Dec-30	0	37	3M,6H
PROFILE FLOAT	USA	Q4901291	Feb-01 - Feb-01	0	1	6B
PROFILE FLOAT	USA	Q4901298	Apr-16 - Dec-22	0	36	5ZE,5ZW,6A,6B,6C,6D,6E
PROFILE FLOAT	USA	Q4901402	Oct-08 - Dec-10	0	9	3M
PROFILE FLOAT	USA	Q4901404	Nov-27 - Dec-28	0	7	1E,1F
PROFILE FLOAT	USA	Q4901448	Aug-26 - Dec-24	0	22	5ZE,6B,6D
PROFILE FLOAT	USA	Q4901450	Sep-20 - Oct-15	0	4	6D
PROFILE FLOAT	GERMANY	Q4901681	Jul-20 - Dec-27	0	15	1F,2J
PROFILE FLOAT	FRANCE	Q5902269	Oct-07 - Dec-26	0	9	1E,1F
PROFILE FLOAT	FRANCE	Q5902299	Jan-09 - Mar-19	0	6	1D
PROFILE FLOAT	USA	Q5903377	Jan-02 - Dec-30	0	66	4VS,4W,4X,6D,6E,6F
PROFILE FLOAT	USA	Q5903387	Jan-07 - Dec-27	0	36	1F,2G,2H
PROFILE FLOAT	USA	Q5903390	Jan-09 - Dec-30	0	35	1F,2G,2H
PROFILE FLOAT	USA	Q5903392	Jan-10 - Dec-31	0	36	1F,2H,2J,3K
PROFILE FLOAT	USA	Q5903393	Jan-10 - Dec-01	0	33	1F
PROFILE FLOAT	USA	Q5903395	Jan-07 - Dec-28	0	36	1F,2J,3K
PROFILE FLOAT	USA	Q5903396	Jan-08 - Dec-29	0	36	1F,2J,3K
PROFILE FLOAT	USA	Q5903397	Jan-08 - Dec-29	0	36	2J,3K
PROFILE FLOAT	USA	Q5903398	Mar-14 - Mar-14	0	1	3M
PROFILE FLOAT	USA	Q5903399	Jan-20 - Jan-20	0	1	3K
PROFILE FLOAT	USA	Q5903594	Sep-06 - Dec-30	0	19	6C,6D,6E,6F
PROFILE FLOAT	USA	Q5903996	Sep-14 - Oct-07	0	19	6F
PROFILE FLOAT	USA	Q5903997	Sep-14 - Nov-07	0	23	6F
PROFILE FLOAT	GERMANY	Q6900514	Aug-21 - Dec-19	0	6	3M
PROFILE FLOAT	GERMANY	Q6900552	Jan-05 - Apr-19	0	6	6C
PROFILE FLOAT	GERMANY	Q6900555	Jan-05 - Apr-19	0	6	1F
PROFILE FLOAT	GERMANY	Q6900557	Jan-03 - Dec-28	0	22	2J,3K,3M
PROFILE FLOAT	GERMANY	Q6900558	Jul-17 - Dec-29	0	11	1E,1F,2G
PROFILE FLOAT	GERMANY	Q6900561	Jan-13 - May-27	0	10	1F
PROFILE FLOAT	GERMANY	Q6900562	Jan-14 - Dec-24	0	24	1E,1F,2H
PROFILE FLOAT	GERMANY	Q6900564	Feb-08 - Aug-06	0	11	1F
PROFILE FLOAT	GERMANY	Q6900566	Jan-04 - Jan-04	0	1	2G
PROFILE FLOAT	UK	Q6900603	Jan-10 - Dec-25	0	34	1F

PROFILE FLOAT	UK	Q6900613	Dec-30 - Dec-30	0	1	1F
PROFILE FLOAT	UK	Q6900616	Jan-06 - May-05	0	15	1D,1E,1F,2G
PROFILE FLOAT	UK	Q6900617	Aug-06 - Dec-24	0	13	1E,1F
PROFILE FLOAT	FRANCE	Q6900638	Feb-08 - Dec-24	0	32	3M,3N,4VS,6F,6G,6H
PROFILE FLOAT	FRANCE	Q6900640	Sep-27 - Dec-26	0	10	1D,1E,1F
PROFILE FLOAT	FRANCE	Q6900643	Apr-12 - May-02	0	3	3M
PROFILE FLOAT	IRELAND	Q6900648	Jun-29 - Dec-26	0	19	0B,1E,1F,2G
PROFILE FLOAT	NETHERLAND	Q6900753	Nov-10 - Dec-30	0	3	1E,1F
PROFILE FLOAT	NETHERLAND	Q6900754	Jan-15 - Sep-11	0	8	1F
PROFILE FLOAT	NETHERLAND	Q6900755	Oct-22 - Dec-31	0	4	1E,1F
PROFILE FLOAT	GERMANY	Q6900865	May-14 - Nov-30	0	10	4VS,4W,6E,6F
PROFILE FLOAT	GERMANY	Q6900867	Jan-07 - Feb-06	0	4	6H
PROFILE FLOAT	FRANCE	Q6900910	Jun-23 - Nov-12	0	16	4W,6D,6E
PROFILE FLOAT	FRANCE	Q6900965	Jul-18 - Dec-26	0	18	0B,1E,1F
PROFILE FLOAT	FRANCE	Q6901001	Oct-29 - Dec-28	0	7	2H
PROFILE FLOAT	GERMANY	Q6901047	Jan-09 - Dec-24	0	30	3M,6H
PROFILE FLOAT	GERMANY	Q6901061	Jan-26 - Jan-26	0	1	3K
PROFILE FLOAT	GERMANY	Q6901064	Jan-07 - Dec-21	0	30	2J,3K,3M
PROFILE FLOAT	GERMANY	Q6901065	Feb-05 - Feb-25	0	3	3M
PROFILE FLOAT	GERMANY	Q6901085	Nov-14 - Dec-24	0	5	6D,6E
PROFILE FLOAT	GERMANY	Q6901217	Nov-05 - Dec-25	0	6	4W,6E
SEA ANIMAL	UNKNOWN/IN	Q9900435	Jan-06 - May-14	0	264	1A
SEA ANIMAL	UNKNOWN/IN	Q9900436	Jan-21 - May-10	0	214	1A
UNKNOWN/INCONNU	UNKNOWN/IN	SHIP	Jan-04 - Dec-19	378	260	2J,3L,3M,3N,3PS,4R,4S,4T,4VN,4VS,4W,4X,5Y,5ZE,5ZW,6A,6B,6C
REYKJAFLOSS	ANTIGUA AN	V2FB6	Mar-14 - Dec-30	115	0	1F,2J,3K,3L,4X,5Y,5ZE,5ZW
OLEANDER	USA	V7SX3	Feb-25 - Dec-08	273	0	6A,6B,6C,6D
		VOLZ	Jul-20 - Aug-24	2	249	0B,1C,2G,3L
OOCL MONTREAL	CHINA	VRYO3	Jan-07 - Dec-09	53	0	1F,2J,3K,3L,3M
HORIZON PRODUCER	USA	WJBJ	Dec-08 - Dec-08	47	0	6A,6B,6C
SEALAND NAVIGATOR	USA	WPGK	Mar-03 - Jul-07	121	0	6A,6B,6C
ROME EXPRESS	BERMUDA	ZCDJ3	May-26 - Dec-10	68	0	6F,6G,6H

Table 2: Delayed mode profile data collected in 2012

Total: 2834 (1170) stations

Country	Cruise Number	Cruise Period	BT	CTD	BOTTLE	NAFO Subarea
CANADA	18BG12032	Jul-07 - Jul-07	0	8	0	4T
CANADA	18CN12001	May-30 - Jun-03	0	12	0	4T
CANADA	18CN12002	Apr-30 - May-06	0	124	0	4S
CANADA	18FC12001	Aug-10 - Aug-26	0	32	0	4S 4T
CANADA	18FC12032	Jul-12 - Jul-16	0	164	0	4T
CANADA	18HE12004	Mar-05 - Mar-16	0	400	294	4R 4S 4T 4VN
CANADA	18OP12048	Sep-07 - Sep-15	0	48	0	4T
CANADA	18SG12666	Jan-23 - Jan-23	0	4	0	4W
		Mar-29 - Mar-29	0	4	0	4W
		Apr-18 - Apr-18	0	4	0	4W
CANADA	18SG12667	Jan-04 - Jan-04	0	4	0	4X
		Jan-11 - Jan-11	0	4	0	4X
		Jan-18 - Jan-18	0	4	0	4X
		Jan-25 - Jan-25	0	8	0	4X
		Feb-01 - Feb-01	0	8	0	4X
		Feb-07 - Feb-08	0	36	0	4X
		Feb-14 - Feb-14	0	4	0	4X
		Feb-23 - Feb-23	0	4	0	4X
		Mar-01 - Mar-01	0	4	0	4X
		Mar-07 - Mar-07	0	4	0	4X
		Mar-14 - Mar-14	0	4	0	4X
		Mar-21 - Mar-21	0	4	0	4X
		Mar-28 - Mar-28	0	4	0	4X
		Apr-02 - Apr-02	0	4	0	4X
CANADA	18TL12001	Jun-04 - Jun-20	0	484	0	4R 4S 4T 4VN
CANADA	18TL12002	Aug-01 - Aug-31	0	460	0	3K 4R 4S 4T 4VN
CANADA	18TL12105	Sep-05 - Sep-26	0	600	0	4T 4VN
CANADA	18VA12666	Jun-18 - Jun-18	0	4	0	4W
		Aug-21 - Aug-21	0	4	0	4W
		Nov-19 - Nov-19	0	4	0	4W
		Dec 13 - Dec 13	0	4	0	4W
CANADA	18VA12668	Apr-20 - Apr-20	0	8	0	4T
		May-03 - May-03	0	4	0	4T
		May-24 - May-24	0	4	0	4T
		Jun-14 - Jun-14	0	4	0	4T
		Jul-11 - Jul-11	0	4	0	4T
		Aug-16 - Aug-16	0	8	0	4T
		Oct-19 - Oct-19	0	8	0	4T
		Nov-20 - Nov-20	0	8	0	4T
CANADA	18VA12669	Jan-16 - Jan-16	0	4	0	4X
		Feb-13 - Feb-13	0	4	0	4X
		Mar-12 - Mar-12	0	4	0	4X
		Apr-16 - Apr-16	0	4	0	4X
		Jul-16 - Jul-16	0	4	0	4X
		Aug-13 - Aug-13	0	4	0	4X
		Sep-17 - Sep-17	0	4	0	4X
		Oct-26 - Oct-26	0	4	0	4X
		Nov-20 - Nov-20	0	4	0	4X

Table 3: Delayed-mode profile data collected prior to 2012 and processed in 2012

Total: 7373 (6413) stations

Country	Cruise number	Year	TowedCTD	CTD	BOT	BT	NAFO Subareas
Canada	187F11001	2011	0	0	113	0	4T 4S
Canada	18BG11033	2011	0	0	19	0	4T
Canada	18CN11012	2011	0	21	0	0	4T
Canada	18HU11009	2011	0	2	72	0	4W 3PS 4VS 3L 3K 2J 2H 1F 1E 2G
Canada	18HU11043	2011	0	0	66	0	4W 4X 5ZE 4VN 4R 4VS
Canada	18HU11061	2011	0	0	66	0	4T 4VN 4S 4R
Canada	18MF11001	2011	0	8	0	0	4T 4S
Canada	18NE11401	2011	69	0	0	0	3PS 3PN
Canada	18NE11402	2011	78	0	0	0	3PS
Canada	18NE11403	2011	98	2	0	0	3PS 3O 3L
Canada	18NE11405	2011	95	2	0	0	3L 3N
Canada	18NE11406	2011	38	2	0	0	3L
Canada	18NE11407	2011	0	1	0	0	3L
Canada	18NE11408	2011	0	6	0	0	3L 3PS
Canada	18NE11409	2011	16	1	0	0	3O 3L
Canada	18NE11410	2011	83	2	0	0	3L 3O 3N
Canada	18NE11411	2011	29	1	0	0	3N 3L
Canada	18NE11412	2011	46	0	0	0	3L 3N 3O
Canada	18NE11413	2011	52	2	0	0	3L 3N
Canada	18NE11414	2011	19	1	0	0	3L
Canada	18OK11595	2011	0	1	0	0	3L
Canada	18OK11596	2011	0	25	0	0	3L
Canada	18OK11598	2011	0	33	0	0	3L
Canada	18OK11599	2011	0	16	0	0	3L
Canada	18OK11600	2011	0	27	0	0	3L
Canada	18OK11601	2011	0	36	0	0	3L
Canada	18OK11602	2011	0	31	0	0	3K
Canada	18OK11604	2011	0	19	0	0	3L
Canada	18OK11605	2011	0	6	0	0	3L
Canada	18TL11090	2011	0	9	0	0	3L 3PS
Canada	18TL11092	2011	44	33	0	0	3L 3K 3N
Canada	18TL11094	2011	34	138	77	0	4T 4VN 3L 2J 2H
Canada	18TL11095	2011	63	0	0	0	2H 2J
Canada	18TL11096	2011	60	0	0	0	2J 3K
Canada	18TL11097	2011	54	0	0	0	3K 2J
Canada	18TL11098	2011	57	2	0	0	3K 3L
Canada	18TL11099	2011	29	1	0	0	3K 3L
Canada	18VA11025	2011	0	3	0	0	3L
Canada	18VA11106	2011	250	0	0	0	3PS 2G 0B 1C
Canada	18VA11666	2011	0	3	0	0	5Y 4W
Canada	18VA11702	2011	0	333	0	0	4T 4VN
USA	316G11001	2011	0	33	0	0	6A 6B 6C
USA	316G11002	2011	0	192	0	0	5ZW 6A 6B 6C 5ZE 5Y 4X
USA	316G11005	2011	0	269	0	0	5ZW 6A 6B 6C 5ZE 4X 5Y
USA	316G11008	2011	0	193	0	0	5ZW 5Y 5ZE 4X
USA	316G11009	2011	0	139	0	0	5ZW 6A 6B 6C 5ZE 4X 5Y

USA	316G11010	2011	0	87	0	0	5ZE 5ZW
USA	33H511001	2011	0	86	0	0	6B 6C 6A 5ZE
USA	33HH11002	2011	0	344	0	0	6B 6C 6A 5ZW 5ZE 4X 5Y
USA	33HH11003	2011	0	106	0	0	5ZW 5ZE 6A 6B 6C 6D 4X
USA	33HH11004	2011	0	29	0	0	6A
USA	33HH11005	2011	0	345	0	0	6C 6B 6A 5ZW 5ZE 5Y 4X
Canada	18HU10014	2010	0	0	431	0	3L 3K 2J 1F 2H 4W
Canada	18NE10930	2010	87	1	0	0	3L 3PS 3PN
Canada	18NE10931	2010	91	0	0	0	3PS 3PN 4R
Canada	18NE10932	2010	77	0	0	0	3PS 3O
Canada	18NE10933	2010	71	2	0	0	3L 3O 3N
Canada	18NE10940	2010	0	16	0	0	3L 3PS
Canada	18NE10941	2010	0	3	0	0	3PS
Canada	18NE10943	2010	60	1	0	0	3L 3O 3N
Canada	18NE10945	2010	92	1	0	0	3L 3O
Canada	18NE10946	2010	64	1	0	0	3L 3K
Canada	18NE10947	2010	41	1	0	0	3K 3L
Canada	18OK10884	2010	0	13	0	0	3L
Canada	18OK10954	2010	0	5	0	0	3PS
Canada	18OK10955	2010	0	24	0	0	3PS
Canada	18OK10956	2010	0	1	0	0	3L
Canada	18OK10957	2010	0	1	0	0	3L
Canada	18OK10958	2010	0	15	0	0	3L
Canada	18OK10961	2010	0	22	0	0	3K
Canada	18OK10962	2010	0	15	0	0	3L
Canada	18OK10963	2010	0	9	0	0	3L
Canada	18OK10964	2010	0	5	0	0	3L
Canada	18SG10667	2010	0	64	0	0	4X
Canada	18TL10975	2010	70	1	0	0	3L 2J 2H
Canada	18TL10976	2010	49	0	0	0	2J 2H
Canada	18TL10977	2010	80	0	0	0	2J 3K
Canada	18TL10978	2010	73	1	0	0	3K 2J 3L
Canada	18TL10980	2010	23	1	0	0	3L 3K
Canada	18VA10923	2010	0	20	0	0	4X
Canada	187F09001	2009	0	0	276	0	4T 4S
Canada	18HU09015	2009	0	0	40	0	3L 3K 2J 1F 2H 4W
Canada	18SG09667	2009	0	51	0	0	4X
Canada	18VA09057	2009	0	97	0	0	4X 5Y
Canada	187F08001	2008	0	0	270	0	4T 4S
Canada	187F06001	2006	0	0	269	0	4T 4S
Canada	18OP06037	2006	0	261	0	0	4T
Canada	18OP05036	2005	0	124	0	0	4T
Canada	187F94001	1994	0	0	236	0	4T 4S

Table 4: Near-surface thermosalinograph data collected in 2012

TOTAL: 3133 (1270) stations

Ship Name	Country	Call Sign		Cruise Period	TRACKOB	NAFO Subarea
UNKNOWN/INCONNU	UNKNOWN/IN	KS077	12	May-23 - Oct-01	2969	4R,4S,4T,4VN,4W,4X,5Y,5ZE,5ZW,6A,6B,6C
		KS097	12	Jun-06 - Jun-10	4	6B
				Jun-16 - Jun-17	3	6B
				Jun-29 - Aug-31	132	6B
				Sep-22 - Sep-22	2	6B
				Oct-06 - Oct-07	2	6B
				Oct-17 - Oct-17	16	6B
				Oct-27 - Oct-31	5	6B

Table 5: DRIBU data received during 2012

TOTAL = 457156 (364 648) messages from 208 (162) buoys

BUOY	DATE RANGE	DAYS	SST	AP	AT	WS	WD	TC	NAFO Subarea
13569	Sep-26 - Dec-31	97	X	X	X	-	-	-	6E,4W,4VS,6G,6H
13611	Dec-20 - Dec-20	1	X	-	-	-	-	-	3K
31527	Jan-03 - Mar-13	70	X	X	-	-	-	-	6G,6H
41501	Mar-19 - Mar-28	9	X	X	-	-	-	-	6E,6D
41502	Mar-19 - Aug-14	148	X	X	-	-	-	-	6E,6D,6C
41503	Mar-19 - Sep-13	178	X	X	-	-	-	-	6E,6D,6C
41504	Mar-19 - Mar-26	7	X	X	-	-	-	-	6D,6E
41505	Mar-19 - May-11	53	X	X	-	-	-	-	6D,6E
41506	Mar-19 - Sep-03	168	X	X	-	-	-	-	6E,6D,6F,4W,4X
41507	Mar-19 - Sep-22	187	X	X	-	-	-	-	6E,6D
41508	Mar-19 - Oct-14	209	X	X	-	-	-	-	6E,6D,4W,6F,6G,6H
41509	Mar-20 - Mar-30	11	X	X	-	-	-	-	6E,6D
41510	Mar-19 - Oct-02	197	X	X	-	-	-	-	6D,6C
41554	Nov-13 - Dec-31	49	X	X	-	-	-	-	6F,6E
41556	Jun-05 - Jul-21	46	X	X	-	-	-	-	6G,6F,6H
41557	Jan-01 - Mar-04	64	X	X	X	-	-	-	6F,6G
41558	Mar-19 - Sep-30	195	X	X	-	-	-	-	6E,6D
41559	Jul-19 - Aug-31	43	X	X	-	-	-	-	6G,6F
41563	Jan-01 - Jun-11	163	X	X	-	-	-	-	6F,6G,6H
41564	Mar-19 - Aug-25	159	X	X	-	-	-	-	6E,6D
41565	Jan-16 - Feb-14	30	X	X	X	-	-	-	6H
41566	Mar-19 - Apr-06	18	X	X	-	-	-	-	6E,6D
41567	Jun-05 - Jun-13	9	X	X	-	-	-	-	6H,6G
41574	Mar-19 - Apr-19	32	X	X	-	-	-	-	6E,6D
41575	Jan-01 - Sep-02	246	X	X	X	-	-	-	6H,6G,4VS,6F,6D,6E
41576	Mar-19 - Jun-16	89	X	X	-	-	-	-	6C,6B,6D,6E,4W,6F
41592	Jan-01 - Feb-06	37	-	-	-	-	-	-	6F,6E
41602	May-09 - Jul-16	69	X	X	-	-	-	-	6C,6B,6D,6E
41609	Apr-08 - May-07	30	X	X	-	-	-	-	6C,6D
41612	Dec-20 - Dec-31	12	X	X	X	-	-	-	6C,6B,6D,6E
41613	Jun-18 - Dec-30	195	X	X	-	-	-	-	6C,6B,6D,6E
41615	Mar-14 - Mar-19	5	X	X	-	-	-	-	6C,6B,6D
41616	Jul-20 - Dec-31	165	X	X	X	-	-	-	6E,4W,6F,4VS,6G,4X,6D,5ZE
41620	Mar-24 - Oct-14	205	X	X	-	-	-	-	6C,6B,6D,6E,4W,4VS,6F
41675	Mar-24 - Dec-08	259	X	X	-	-	-	-	6C,6B,6D,6E,4W,4VS,6F,6G,6H
41677	Feb-21 - Aug-01	162	X	X	-	-	-	-	6B,6D,6E,4W,4VS,6F
41678	Mar-19 - Sep-13	179	X	X	-	-	-	-	6D,6C,5ZE
41679	Mar-19 - Sep-24	189	X	X	-	-	-	-	6D,6E,4W,6F,4VS,6G,3N
41680	Mar-19 - Aug-20	154	X	X	-	-	-	-	6E,6D,6F,4VS,6G,3N,3O,3M
41681	May-11 - Jun-21	42	X	X	-	-	-	-	6C,6B,6D,6E,4W,4VS,6F
41682	May-22 - Aug-19	90	X	X	-	-	-	-	6C,6B,6D
41684	May-08 - Jul-07	61	X	X	-	-	-	-	6C,6B,6D,6E,4W,4VS
41685	May-11 - Jun-30	50	X	X	-	-	-	-	6C,6B,6D,6E,4W,4VS,3N,6H,3M
41687	Jun-05 - Jul-25	50	X	X	-	-	-	-	6H,6G
41688	Jul-07 - Aug-22	46	X	X	-	-	-	-	6H

41692	May-08 - Jun-03	26	X	X	-	-	-	-	6C
41717	Jan-01 - Apr-19	109	X	X	X	-	-	-	6H,6G,6F,3N
41736	Feb-15 - May-26	101	-	X	X	-	-	-	6C,6B,6D
41910	Jan-01 - Jun-19	171	X	X	-	-	-	-	6F,6G,4VS,3N,6H,3M
41912	Jan-01 - Apr-29	120	X	X	X	-	-	-	6F,6E,6G,6H
41913	Jan-01 - Apr-01	92	X	X	X	-	-	-	4W,6F,6E,4VS,6G,3N,6H,3M
41915	Apr-22 - Aug-03	103	X	X	X	-	-	-	6C,6B,6D
41916	Jan-01 - Sep-24	268	X	X	X	-	-	-	6C,6D,6E,6F,4VS,6G,6H
41917	Jun-20 - Nov-01	134	X	X	-	-	-	-	6H,3M,3N
41918	Oct-09 - Oct-19	10	X	X	-	-	-	-	6E,6F
41924	Jan-01 - May-24	145	X	X	X	-	-	-	6E,6F,6G,4VS,3N,6H,3M
41925	Jun-05 - Jul-18	43	X	X	-	-	-	-	6F
41927	Jan-01 - Mar-10	70	X	X	-	-	-	-	6D,6E
41930	Jan-01 - Jul-15	197	X	X	X	-	-	-	6E,4W,6F,4VS,3O,3N,3M,6H,6G
41936	Jan-01 - Jan-09	9	X	X	-	-	-	-	4VS,3O,3N
41937	Jan-01 - Jan-29	29	X	X	X	-	-	-	6C,6D
41939	Jan-01 - Feb-12	43	X	X	X	-	-	-	6D,6E
41942	Apr-17 - May-13	27	X	X	X	-	-	-	6H
41954	Jan-02 - Apr-04	93	X	X	X	-	-	-	6D,6C,6B
41960	Jan-01 - Oct-08	282	X	X	X	-	-	-	6E,4W,4VS,3O,3N,3M
41968	Oct-14 - Dec-31	79	-	X	-	-	-	-	6C
41969	Jan-01 - Apr-09	100	X	X	X	-	-	-	6F,6G
41975	Dec-16 - Dec-20	4	X	X	X	-	-	-	6C
41981	Oct-02 - Dec-31	91	X	X	-	-	-	-	6H
41989	Jan-01 - Sep-14	258	X	X	-	-	-	-	6E,6D,4X,4W,4VS,6F,6G,3N,6H,3M,3O
41991	Jan-01 - Jul-06	188	X	X	-	-	-	-	6G,4VS,3N,6H,3M
41995	Jan-01 - May-02	123	X	X	X	-	-	-	4W,6E,6F,4VS,3O,3N
42507	Jun-01 - Oct-06	127	X	X	-	-	-	-	6C,6B,6D,6E,4X,4W,4VS,3N,3O,3M
42508	Jan-01 - Jan-27	27	X	X	-	-	-	-	6F
42536	Mar-14 - Jun-19	98	X	X	-	-	-	-	6C,6B,6D,6E,4W,6F
42574	Dec-07 - Dec-07	1	X	-	-	-	-	-	3L
43534	Sep-16 - Dec-31	107	-	X	-	-	-	-	6C,6B,6D,6E,4X,5ZE,4W,4VS,3O,3N,3M
43573	Jul-03 - Dec-31	182	X	X	-	-	-	-	6C,6B,6D,6E,4W,4VS,6F,6G
43574	Jun-17 - Oct-15	121	X	X	-	-	-	-	6C,6B,6D,6E,6F,6G
43576	May-23 - Sep-02	102	X	X	-	-	-	-	6C,6B,6D,6E
44501	Feb-09 - Mar-28	48	X	X	-	-	-	-	3K,3L,3M
44502	Mar-28 - Aug-11	137	X	X	-	-	-	-	3L,3M,3N,3K
44503	Apr-20 - Jun-29	70	X	X	-	-	-	-	3K,3L,3N,3M
44504	Apr-20 - Jun-29	71	X	X	-	-	-	-	3K,3L,3M
44505	May-17 - Jun-05	19	X	X	-	-	-	-	3L,3M
44506	Jun-11 - Dec-31	204	X	X	-	-	-	-	3L,3O,3N
44507	Jun-11 - Dec-31	204	X	X	-	-	-	-	3L,3N,3O
44508	Jun-11 - Dec-31	204	X	X	-	-	-	-	3L,3N,3O
44509	Jun-11 - Oct-04	115	X	X	-	-	-	-	3L,3N,3M,3K
44513	Jul-03 - Dec-12	162	X	X	-	-	-	-	6H
44514	Jul-03 - Aug-02	30	X	X	-	-	-	-	6H,3M,6G
44517	Jul-03 - Nov-18	138	X	X	-	-	-	-	4VS,3O,3N,3M,6H
44519	Jul-03 - Dec-07	157	X	X	-	-	-	-	6H,3N,4VS,6G,3M
44521	Jul-03 - Aug-16	45	X	X	-	-	-	-	4VS,6G,6H
44522	Jan-01 - Apr-05	96	X	X	-	-	-	-	3M

44523	Aug-11 - Aug-14	4	X	X	-	-	-	-	6B
44524	Aug-11 - Sep-24	44	X	X	-	-	-	-	6B,6A,6D
44549	Dec-17 - Dec-29	13	X	X	X	-	-	-	1F
44551	Feb-07 - Oct-08	245	X	X	X	-	-	-	3M,6H
44560	May-21 - Aug-08	79	X	X	-	-	-	-	3M,6H
44562	Jun-01 - Jun-09	8	X	X	-	-	-	-	6H
44601	Oct-02 - Dec-30	90	X	X	X	-	-	-	3K,3L,3N,3M
44603	Oct-02 - Dec-03	63	X	X	X	-	-	-	3K,2J,1F
44606	Oct-30 - Dec-11	43	X	X	X	-	-	-	3M
44607	Jan-01 - Feb-02	33	X	X	X	-	-	-	3K
44608	Jan-01 - Apr-15	106	X	X	X	-	-	-	3N,3M
44609	Jan-31 - Sep-02	215	X	X	X	-	-	-	3O,3N
44615	Jan-23 - Jan-29	6	X	X	X	-	-	-	3K
44616	Jan-24 - Sep-03	223	X	X	X	-	-	-	3K,2J,1F
44617	Jan-24 - Feb-14	22	X	X	X	-	-	-	3K,3L
44620	Feb-08 - Feb-23	16	X	X	X	-	-	-	3N,3M
44621	Jan-01 - Feb-20	51	X	X	X	-	-	-	3M,3K
44622	Jul-10 - Dec-31	175	X	X	X	-	-	-	4VS,4W,4X
44623	Nov-15 - Dec-31	47	X	X	X	-	-	-	3K,3L,3M
44624	Dec-12 - Dec-31	20	X	X	X	-	-	-	2J,3K
44625	Feb-06 - Feb-21	15	X	X	X	-	-	-	2J,1F
44627	Apr-11 - Oct-30	203	X	X	X	-	-	-	3N,3O,4VS,3M
44628	Apr-11 - Jun-23	73	X	X	X	-	-	-	3N,3M,3L,3K
44629	Apr-11 - Jul-24	105	X	X	X	-	-	-	3M,3K
44630	May-31 - Jun-21	21	X	X	X	-	-	-	3M
44668	Jan-19 - Feb-22	35	X	X	X	-	-	-	6H
44685	Jun-04 - Dec-31	211	X	X	X	-	-	-	4W,4X,4VS,6F,3O
44686	Jun-04 - Dec-05	185	X	X	X	-	-	-	4VS,4W,4X
44687	Jun-04 - Dec-31	211	X	X	X	-	-	-	4VS,3PS,4VN,3O,3N,3M
44721	Jun-04 - Dec-31	211	X	X	X	-	-	-	3N,3O,3M,6H,6G
44724	Jul-23 - Jul-30	7	X	X	X	-	-	-	1F
44725	Jun-25 - Aug-22	58	X	X	X	-	-	-	1F,2J
44726	Jun-25 - Nov-08	137	X	X	X	-	-	-	1F,3K
44727	Jun-25 - Nov-01	129	X	X	X	-	-	-	2J,1F
44728	Jun-25 - Nov-30	159	X	X	X	-	-	-	2J,3K,3L,3N,3M
44730	Jul-20 - Dec-31	165	X	X	X	-	-	-	1F,1E,1D,0B,2G,2H,2J,3K
44739	May-15 - Dec-31	231	X	X	X	-	-	-	3M,6H,6G
44740	Jul-09 - Dec-12	157	X	X	X	-	-	-	4X,4W,4VS,6G,3N,6H,6F
44741	Oct-05 - Dec-05	62	X	X	X	-	-	-	3M
44742	Sep-24 - Oct-18	25	X	X	X	-	-	-	3M
44744	Jan-01 - Mar-21	81	X	X	X	-	-	-	3N,3M
44745	Jan-01 - Mar-12	72	X	X	X	-	-	-	3L,3K,2J,1F
44747	Mar-13 - Mar-23	11	X	X	X	-	-	-	6H
44760	Jul-11 - Dec-31	174	X	X	X	-	-	-	3L,3N,3O
44761	Jul-11 - Jul-24	13	X	X	X	-	-	-	3M,3K
44762	Dec-18 - Dec-31	14	X	X	X	-	-	-	3O,4VS,3N
44764	Jan-01 - Jan-12	12	X	X	X	-	-	-	2J,1F
44767	Jan-27 - Feb-08	13	X	X	X	-	-	-	3N,3M
44768	Jan-27 - Feb-11	16	X	X	X	-	-	-	3M,3K
44769	Jul-19 - Nov-15	120	X	X	X	-	-	-	1F,1E

44772	Jul-20 - Dec-31	165	X	X	X	-	-	-	2H,1F,2J
44774	Jul-19 - Dec-31	166	X	X	X	-	-	-	1F,1E,1D,0B,2G,2H,2J,3K
44775	Jan-02 - Nov-19	322	X	X	X	-	-	-	3M,1F
44776	Jul-20 - Oct-01	74	X	X	X	-	-	-	2J,1F
44777	Jul-24 - Oct-22	90	X	X	X	-	-	-	2J,1F
44778	Jul-24 - Nov-25	124	X	X	X	-	-	-	2J,3K,3L,3M
44779	Jul-24 - Dec-19	149	X	X	X	-	-	-	2J,1F
44780	Jul-24 - Oct-11	79	X	X	X	-	-	-	1F
44831	Mar-02 - Aug-28	179	X	X	-	-	-	-	6E,4X,4W,4VS,6F
44832	Nov-12 - Dec-31	50	X	X	-	-	-	-	6H
44833	Jul-03 - Oct-28	117	X	X	-	-	-	-	3N,3M,6H
44836	Aug-12 - Oct-03	52	X	X	-	-	-	-	1F
44838	Sep-20 - Dec-31	103	X	X	X	-	-	-	6F,6E,6D
44839	Aug-04 - Aug-06	3	X	X	X	-	-	-	6F
44840	Jul-13 - Sep-20	69	X	X	-	-	-	-	1F,1E,1D,1C,1B
44841	Jul-20 - Dec-01	134	X	X	X	-	-	-	6F,4W,4VS,3N,6H,6G,3M
44845	Mar-02 - Sep-07	189	X	X	-	-	-	-	6D,6E,4X,4W,4VS,6F
44848	Mar-02 - Sep-11	194	X	X	-	-	-	-	6E,4X,4W,4VS,6F
44850	Jan-01 - Apr-23	114	X	X	X	-	-	-	6G,6F,6E,6D
44863	Feb-13 - Mar-07	24	X	X	X	-	-	-	3N,3M
44864	Feb-13 - May-11	88	X	X	X	-	-	-	3O,3N,3M
44865	Feb-21 - Apr-11	51	X	X	X	-	-	-	3M
44866	Feb-21 - Aug-21	182	X	X	X	-	-	-	2J,3K,3L,3M
44867	Feb-21 - Dec-21	305	X	X	X	-	-	-	3N,3O,3M,6H
44868	Feb-21 - Mar-02	11	X	X	X	-	-	-	2J
44869	Mar-02 - Mar-07	6	X	X	X	-	-	-	3M
44870	Mar-02 - Mar-22	20	X	X	X	-	-	-	3K,3L
44872	Mar-19 - Mar-28	9	X	X	X	-	-	-	3N,3M
44873	Mar-19 - Nov-16	242	X	X	X	-	-	-	3N,3O,3M
44875	Mar-19 - Mar-21	3	X	X	X	-	-	-	3M
44878	Jan-01 - Jan-21	21	X	X	X	-	-	-	6H
44884	Oct-19 - Nov-06	19	-	-	-	-	-	-	1F
44889	May-16 - Jul-09	54	X	X	-	-	-	-	6H,3M
44895	Sep-07 - Sep-12	5	X	X	-	-	-	-	1F
44896	May-14 - Sep-23	132	X	X	-	-	-	-	6G,4VS,3N,6H,6F
44901	May-15 - Nov-19	189	X	X	-	-	-	-	5ZE,5ZW,6B,6D,6E,4X,4W,4VS,6G,3O,3N,6H
44903	Jan-07 - Jan-15	8	X	X	X	-	-	-	3M
44905	Jan-10 - Apr-03	85	-	-	-	-	-	-	6H
44906	May-14 - Oct-12	152	X	X	-	-	-	-	6G,6F
44912	May-14 - Dec-31	232	X	X	-	-	-	-	6F,4VS,6G,6E
44915	Jan-01 - Jul-03	185	X	X	-	-	-	-	6E,6D,4X,4W,4VS,6F,6G
44917	Jun-12 - Jul-24	43	X	X	-	-	-	-	3M,3K
44920	Apr-17 - Aug-18	123	X	X	-	-	-	-	5ZW,5ZE
44923	Jun-13 - Jun-15	3	X	X	-	-	-	-	3K
44925	Jun-21 - Oct-16	118	X	X	-	-	-	-	3N,3M,3K,2J
44929	Jun-12 - Dec-21	192	X	X	-	-	-	-	3N,3O,3M
44932	Jun-23 - Aug-14	53	-	X	-	-	-	-	3O,3N,3M,3K
44944	May-27 - May-28	2	X	X	-	-	-	-	6H
47532	Jan-01 - Nov-28	333	-	-	-	-	-	-	0A,1B,1C,0B,2G,2H,2J,3K,1F
47533	Jan-01 - Jun-22	174	-	X	-	-	-	-	0A,1B,1C,0B

47550	Jul-28 - Dec-31	157	X	X	X	-	-	-	0A
47551	Oct-10 - Dec-31	83	-	X	-	-	-	-	0A
47555	Jan-01 - Oct-29	303	X	X	-	-	-	-	1E,1F,1D,0A
47559	Jan-01 - Dec-31	366	-	X	-	-	-	-	0A
47570	Oct-03 - Nov-26	54	X	X	-	-	-	-	1E,1D,0B,2G,1F
48662	Aug-11 - Dec-31	143	X	X	X	-	-	-	2G,2H,2J,3K
48663	Aug-11 - Dec-31	143	X	X	X	-	-	-	1E,1F,2G,2H,2J
62905	Jan-09 - Jan-16	7	X	X	X	-	-	-	6F
64522	Dec-19 - Dec-30	12	X	X	X	-	-	-	1F
64525	Nov-27 - Dec-31	35	X	X	X	-	-	-	1F
64612	Apr-15 - Apr-25	10	X	X	X	-	-	-	1F
64622	Oct-19 - Dec-31	74	X	X	X	-	-	-	1F,1E,1D,1C
64716	Nov-20 - Dec-31	42	X	X	-	-	-	-	1F

Table 6: BIO Current Meter data recovered and processed in 2012

Latitude	Longitude	Sounding Depth (meters)	Instrument Depth (meters)	Start Date	End Date	Serial Number	Mooring Number
55.1202	57.0898	1031	1011	23-May-10	11-May-11	Aanderaa RCM8 #1039	1771
55.4085	58.0638	106	94	18-Nov-10	8-Jun-11	ADCP RDI #14033	1789
45.2396	64.2594	30.4	27	11-Mar-11	13-Jul-11	ADCP RDI #10487	1792A
45.2396	64.2594	30.4	27	11-Mar-11	13-Jul-11	ADCP RDI #3409	1792B
44.3477	63.3058	134	128	23-Sep-11	31-Mar12	ADCP RDI #1266	1812
44.2494	63.1667	182	178	23-Sep-11	31-Mar12	ADCP RDI #14017	1813
44.1341	63.0314	179	175	23-Sep-11	31-Mar12	ADCP RDI #10220	1814
44.3474	64.3047	125	13	31-Mar-12	14-Aug-12	ADCP RDI #1269	1819
44.2497	63.1661	169	17	31-Mar-12	15-Sep-12	ADCP RDI #10572	1820
44.1340	63.0324	173	17	31-Mar-12	15-Sep-12	ADCP RDI #15538	1821
66.6426	60.777	441	256	15-Sep-10	7-Oct-11	Aanderaa #1607	C1
66.7632	60.0768	656	210	15-Sep-10	6-Oct-11	Aanderaa #3306	C2
66.7632	60.0768	656	505	15-Sep-10	6-Oct-11	Aanderaa #5578	C2
66.8526	59.056	1032	208	15-Sep-10	5-Oct-11	Aanderaa #4271	C3
66.8526	59.056	1032	502	15-Sep-10	5-Oct-11	Aanderaa #6402	C3
66.9797	57.6888	866	210	13-Sep-10	4-Oct-11	Aanderaa #5574	C4
66.9797	57.6888	866	509	13-Sep-10	6-Oct-11	Aanderaa #8695	C4
67.0366	57.0334	685	195	13-Sep-10	4-Oct-11	Aanderaa #5567	C5
67.0366	57.0334	685	470	13-Sep-10	4-Oct-11	Aanderaa #7525	C5
67.0712	56.6808	385	250	13-Sep-10	4-Oct-11	Aanderaa #4602	C6

Table 7: BIO Current Meter data recovered in 2012 and 2013 but not yet processed

Latitude	Longitude	Sounding Depth (meters)	Instrument Depth (meters)	Start Date	End Date	Serial Number	Mooring Number
44.556	56.0656	2051	401	3-May-11	7-May-11	Aanderaa #7650	1768
44.556	56.0656	2051	2271	3-May-10	7-May-11	ADCP RDI #3367	1768
44.7465	56.0857	1175	579	3-May-10	8-May-11	Aanderaa #655	1769
44.7465	56.0857	1175	309	3-May-10	8-May-11	ADCP RDI #1646	1769
74.0831	91.0425	149	80	5-Aug-10	11-Aug-11	ADCP RDI #493	1772
74.0817	91.0327	147	146	10-Aug-10	7-Aug-11	ADCP RDI #1269	1773
74.1958	90.8528	270	244	10-Aug-10	7-Aug-11	ADCP RDI #10572	1774
74.2042	90.8279	264	78	10-Aug-10	7-Aug-11	ADCP RDI #511	1775
42.8536	61.632	1094	1777	13-Dec-10	24-Sep-11	AanderaaRCM11 #678	1777
42.8536	61.632	1094	1050	13-Dec-10	24-Sep-11	ADCP RDI #13592	1777
42.7401	61.5742	1672	1650	13-Dec-10	24-Sep-11	ADCP RDI #13873	1778
42.6562	61.455	1485	2250	13-Dec-10	24-Sep-11	ADCP RDI #13874	1779
42.5575	61.3704	2750	2750	13-Dec-10	24-Sep-11	ADCP RDI #10941	1780
42.3927	61.2768	3319	3350	13-Dec-10	27-Sep-11	ADCP RDI #13983	1781
55.4085	53.0638	106	94	18-Nov10	8-Jun-11	ADCP RDI #14033	1789
60.2452	48.5854	N/A	N/A	N/A	N/A	AanderaaRCM11 #NA	1798
55.5189	53.7206	N/A	N/A	N/A	N/A	AanderaaRCM11 #NA	1799
55.1995	54.0870	N/A	N/A	N/A	N/A	Aanderaa RCM8 #9088	1800
42.8522	61.6333	1115	1065	29-Sep11	5-Apr-13	ADCP RDI #11432	1804*
42.7386	61.5726	1732	1682	29-Sep11	5-Apr-13	ADCP RDI #11433	1805*
42.6568	61.4554	2325	2275	29-Sep11	5-Apr-13	ADCP RDI #13153	1806*
42.5584	61.3693	2782	2732	26-Sep11	5-Apr-13	ADCP RDI #12455	1807*
42.3896	61.2807	3415	NA	26-Sep11	5-Apr-13	ADCP RDI #11089	1808*
42.1822	61.0031	3871	3821	28-Sep11	7-Apr-13	ADCP RDI #16405	1809*
46.2550	59.1420	120	116	26-Apr12	6-Oct-12	ADCP RDI #9088	1815
45.2387	64.2587	26	23	29-Mar-12	9-Aug-12	ADCP RDI #10487	1818 (A)
45.2387	64.2587	26	23	29-Mar-12	9-Aug-12	ADCP RDI #1997	1818 (B)
44.3481	63.3044	115	109	15-Oct12	4-Apr-13	ADCP RDI #14074	1827*
44.1345	63.0330	167	163	15-Oct12	4-Apr-13	ADCP RDI #11217	1829*