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NAFO STACFEN MEDS Report 2022

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Abstract

The Marine Environmental Data Section (MEDS) of the Oceans Science Branch of Fisheries and Oceans Canada serves as the Regional Environmental Data Center for NAFO. As part of this role, MEDS provides an annual inventory of environmental data collected in the NAFO Convention Area to the NAFO subcommittee for the environment (STACFEN), including 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 previous calendar year. Reporting includes data and information from NAFO member countries where these are provided to the data center.

Introduction

The Marine Environmental Data Section (MEDS) of the Oceans Science Branch of Fisheries and Oceans Canada (DFO) acts as Regional Environmental Data Center for NAFO. This role began in 1965 when the Canadian Oceanographic Data Centre started providing data management functions to the International Commission for the Northwest Atlantic (ICNAF), and was subsequently formalized in 1975, by which time the Canadian Oceanographic Data Centre (CODC) had become the Marine Environmental Data Service (MEDS). MEDS underwent several name changes from 2005 to 2017, it was known in the interim under acronyms such as ISDM and OSD.

In order for MEDS to carry out its responsibility of reporting to the Scientific Council, the Designated National Representatives selected by STACFEN are requested to provide MEDS with all marine environmental data collected in the Northwest Atlantic for the preceding years. Provision of a meaningful report to the Council for its yearly meetings in May and June requires the submission to MEDS of a completed oceanographic inventory form for data collected in the previous calendar year, and oceanographic data pertinent to the NAFO Convention Area, for all stations occupied in the years prior to the meetings. 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 MEDS are available to all members on request, and are available from DFO institutes. Requests can be made by telephone (613) 990-6065, by e-mail to info@dfo-mpo.gc.ca, by completing an on-line order form on the MEDS web site at <http://www.meds-sdmm.dfo-mpo.gc.ca/isdm->



gdsi/request-commande/form-eng.asp or by writing to Oceans Science Branch, Fisheries and Oceans Canada, 12th Floor, 200 Kent St., Ottawa, Ont. Canada K1A 0E6.

Data Processing and Management

A variety of oceanographic surface, near-surface, and subsurface observations are made every day in the NAFO Convention Area by ship-borne instruments and autonomous devices, including vertical profiles of parameters such as temperature, salinity, oxygen, nutrients and other chemical and biological variables. The Marine Environmental Data Section (MEDS) of the Oceans Science Branch of DFO receives these data either in real-time or delayed mode.

Real-time or near real-time data are acquired directly from instruments (for instance, Argo Canada profilers), from research ships or ships of opportunity, from universities, from DFO research institutes, from the Global Telecommunication System (GTS) of the World Meteorological Organization Information System, and from NOAA's Geostationary Operational Environmental Satellite system. Some real-time data transmitted over satellite or low bandwidth communications are pre-formatted in a way that reduces their vertical resolution or significant figures. Such data receive some form of quality control but generally do not benefit from the calibration made possible after a cruise or an instrument's recovery (in the case of moored equipment or remote controlled devices).

Delayed mode data are acquired through exchanges with research institutes, universities and other ocean databases, such as the World Ocean Database (WOD, NOAA) and the ICES Oceanographic database. The delayed mode data generally take months to years to process from the time a cruise is completed or an instrument has been recovered. For this reason, MEDS continually receives delayed mode data from years preceding the previous observation years and must also query the aforementioned international databases (ICES, WOD) for observational periods covering a number of years. Most real-time data are subject to be replaced with a delayed mode version when available, and even delayed mode data are sometimes subject to recalibration, at which point they must be updated in the archives.

Data processing at MEDS 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 is to identify and correct 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 or series of subsurface measurements. These algorithms depend on data, platform and/or observation program type.

Data Summary

Table 1 and Table 2 below summarize data received by MEDS for the NAFO Convention Area (NCA) in 2022. These refer to the more detailed platform-specific figures and tables at the end of this report. Table and figure numbers in these two tables differ for some platform types, as slightly different groupings of data (e.g., by variable type, sampling type, platform type, real-time vs. delayed mode, or source) are used to maximize clarity in the platform-specific figures and tables.

Table 1. Data observed in NAFO Convention Area in 2022

Data Type	Platform Type	Counts/Duration	Table #	Figure #
Oceanographic profiles	Autonomous drifting (Argo)	6133* profiles from 194 platforms	3	1
	Moorings (Viking)	653* profiles from 5 platforms**	3	1
	Gliders	10747* profiles from 5 platforms	3	1
	Ship	10532 profiles (8350 CTD; 1314 CTD RT*; 360 bottle; 190 XBT; 318 XBT RT* profiles)	4	2
Surface/near-surface observations	Ship (thermosalinograph)	(none reported)	4	4
	Drifting buoys	382090* obs. from 194 buoys	6	4
	Moored buoys	493534* obs. from 18 buoys**	6	4
	Fixed platforms	81841* obs. from 4 platforms	6	4
	Water level gauges	35 sites, avg. ~1 year each	7	4

*Data formatted for real-time transmission

**all Canadian wave buoys described in this report measure waves, and the moorings measuring CTD oceanographic profiles in this table are also equipped with surface buoys measuring waves

Table 2. Data observed prior to 2022 in NAFO Convention Area and acquired between January 2022 and May 2023

Data Type	Platform Type	Counts/Duration	Table #	Figure #
Oceanographic profiles	Ship	18156 profiles (12978 CTD + 4444 bottle + 734 XBT profiles) from 238 cruises	5	3

Description

Oceanographic profiles

Argo (Figure 1, Table 3)

Argo is an international program which started in 2000 and which aims to deploy profiling floats on a 3 by 3 degree grid in the oceans of the world. Each profiling float samples and reports temperature and salinity from 2000 m to the surface every 10 days; pilots are also currently underway for deep Argo floats capable of sampling to 6000 m. Additionally, biogeochemical-Argo floats report oxygen, nitrate, pH, chlorophyll-a, suspended particles, and downwelling irradiance in addition to temperature and salinity. Data are distributed on the GTS within 12 hours of collection and made available on two mirrored Global servers located in France and in the USA.

MEDS carries out data management for Argo Canada profilers, from instrument to publication to the GTS and



global servers. MEDS also decodes and stores all Argo data circulating on the GTS. Over 4000 Argo profiling floats owned by multiple countries are currently sampling the world's oceans.

Autonomous profiling floats programmed with sampling patterns other than a maximum sampling depth of 2000 m (or deeper for Deep Argo) and reporting interval of 10 d are often designated Argo-equivalent.

Gliders (Figure 1, Table 3)

Underwater gliders are autonomous underwater vehicles following saw tooth-like profiles in the ocean while measuring various parameters, during missions that can last months and extend over thousands of kilometers. MEDS regularly acquires data from the gliders owned by the Coastal Environmental Observation Technology and Research (CEOTR) group (headquartered at Dalhousie University) and creates messages for transmission on the GTS after performing automatic quality control. The full data set can be accessed from CEOTR.

Mammals (Figure 1, Table 3)

Among data decoded and acquired from the GTS by MEDS are real-time data transmitted by the Sea Mammal Research Units of University of St Andrews (Scotland). These data are measured by tags featuring miniaturized CTD sensors attached to marine mammals and transmitting oceanographic data in real-time when the animals surface. These devices are used by a variety of researchers worldwide.

Ships (Figures 2 and 3, Table 4)

MEDS receives real-time (within 30 days of observation) messages containing temperature and salinity profile data (either from CTD or XBT) from various Canadian Coast Guard ships, helicopters or opportunity vessels performing research or monitoring activities. The messages are sometimes sent from the ships or shortly after the ship's return. The data are quality controlled (see reference, GTSPP QC manual) prior to transmission on the GTS (if within 30 days of observation) and ingestion in the archive.

MEDS decodes and stores all ship based data circulating on the GTS, either CTD or XBT, including data sampled by ships of opportunity. MEDS further receives delayed mode data from DFO institutes: Northwest Atlantic Fisheries Centre (NAFC), Bedford Institute of Oceanography (BIO), Maurice-Lamontagne Institute (MLI), St. Andrews' Biological Station, Gulf Fisheries Center (GFC, indirectly through BIO or MLI), Institute of Ocean Sciences (IOS) and the Freshwater Institute (FWI). MEDS ingests the data after conversion and visual quality assurance.

MEDS receives delayed mode data from foreign institutes, for example the Spanish Institute of Oceanography, either directly or through BIO. MEDS also periodically queries the World Ocean Database and ICES Oceanographic Database for additional data in the NAFO Convention Area (NCA).

Near-surface observations

Moored buoys and fixed stations (Figure 4, Table 6)

MEDS continuously acquires data from meteorological buoys in Canadian waters equipped with ocean data acquisition systems. These buoys belong to Environment and Climate Change Canada (Meteorological Service of Canada) and measure wind velocity, air and water temperature, pressure and wave spectral energy with estimated period and significant wave height. All data are currently acquired via the Geostationary Operational Environmental Satellite (GOES), on which the buoys transmit, but in some situations the data is acquired in delayed-mode or from the GTS. MEDS also acquires, in delayed mode, data from wave measuring buoys deployed near offshore oil and gas sites as per NEB Guidelines.

BIO, NAFC, and MLI maintain surface buoys, most of which are equipped with subsurface moored instruments such as ADCPs (see mooring section) and a CTD profiler. Those buoys are informally known as "Viking" buoys. MEDS transmitted data from the CTD profiler those buoys on the GTS in 2022. The data can otherwise be



requested from MLI, NAFC, BIO.

A number of U.S. moored buoys and fixed stations in the NCA transmit data on the GTS, and those are also acquired by MEDS. The stations belong to various institutions, such as the National Estuarine Research Reserve System, the University of North Carolina (including the Coastal Ocean Research and Monitoring Program) and the Chesapeake Bay Interpretive Buoy System. Their data management is coordinated by NOAA's National Data Buoy Center. Their positions are typically near the coast.

Drifting buoys (Figure 4, Table 6)

MEDS decodes and stores all drifting buoy data circulating on the GTS. These buoys are deployed by various countries. Most buoys are designed for the Surface Velocity Program and are drogued at 15 m depth. The data reported are temperature and sometimes salinity. The buoy-calculated displacement, over time, provides an estimation of currents at the drogued depth.

Thermosalinographs (Figure 4, Table 5)

MEDS decodes and stores all thermosalinograph data circulating on the GTS. In 2022, no thermosalinograph data were reported in the NCA.

Water level gauges (Figure 4, Table 7)

MEDS processes and archives observed water level data collected from the gauge network maintained by the Canadian Hydrographic Service (CHS), plus a few stations operated by Environment and Climate Canada (Water Survey of Canada). Over 2 million new observations are archived every month.

Other Activities

Atlantic Zone Monitoring Program

Activities under the DFO Atlantic Zone Monitoring Program (AZMP) include regular sampling at 5 fixed stations and 16 standard sections, various monitoring and survey activities, and research cruises in the AZMP area to collect physical, chemical and biological data. MEDS archives physical oceanographic data from the AZMP (as outlined in the preceding sections), and also maintains program information and publications at <https://www.dfo-mpo.gc.ca/science/data-donnees/azmp-pmza/index-eng.html>.

Offshore Oil and Gas Environmental Monitoring Data

As mentioned in the near-surface observations section, MEDS acquires, in delayed mode, monitoring physical oceanographic data collected near offshore oil and gas sites as per NEB Guidelines. No data submissions were received in 2022.

Data Access

- *Argo:* Real-time data are sent to the global data centers within 12 hours of collection; data are also updated in delayed mode. Global Argo data can be downloaded from various sources, as described at <https://argo.ucsd.edu/data/>.
- *Real-time oceanographic data:* Real-time oceanographic profiles from the GTS and other sources, as well as US coastal mooring and fixed platform data from the GTS, are forwarded three times a week to the Global Temperature Salinity Profile Programme's Continuously Managed Database (<https://www.ncei.noaa.gov/products/global-temperature-and-salinity-profile-programme>) and to the Copernicus Marine Environment Monitoring Service (CMEMS) where they are made available in



"near real time in situ" products (<http://www.marineinsitu.eu/dashboard/>). GTS thermosalinograph data are forwarded to the Global Ocean Surface Underway Data archive (<http://www.gosud.org>). The latter two databases are harvested by the EMODnet Physics portal (<https://emodnet.ec.europa.eu/geoviewer/>).

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.

GTSPP Real-Time Quality Control Manual First Revised Edition. UNESCO-IOC 2010. (IOC Manuals and Guides No. 22, Revised Edition.) (IOC/2010/MG/22Rev.)

Boyer, T.P., J. I. Antonov, O. K. Baranova, C. Coleman, H. E. Garcia, A. Grodsky, D. R. Johnson, R. A. Locarnini, A. V. Mishonov, T.D. O'Brien, C.R. Paver, J.R. Reagan, D. Seidov, I. V. Smolyar, and M. M. Zweng, 2013: World Ocean Database 2013, NOAA Atlas NESDIS 72, S. Levitus, Ed., A. Mishonov, Technical Ed.; Silver Spring, MD, 209 pp., <http://doi.org/10.7289/V5NZ85MT>



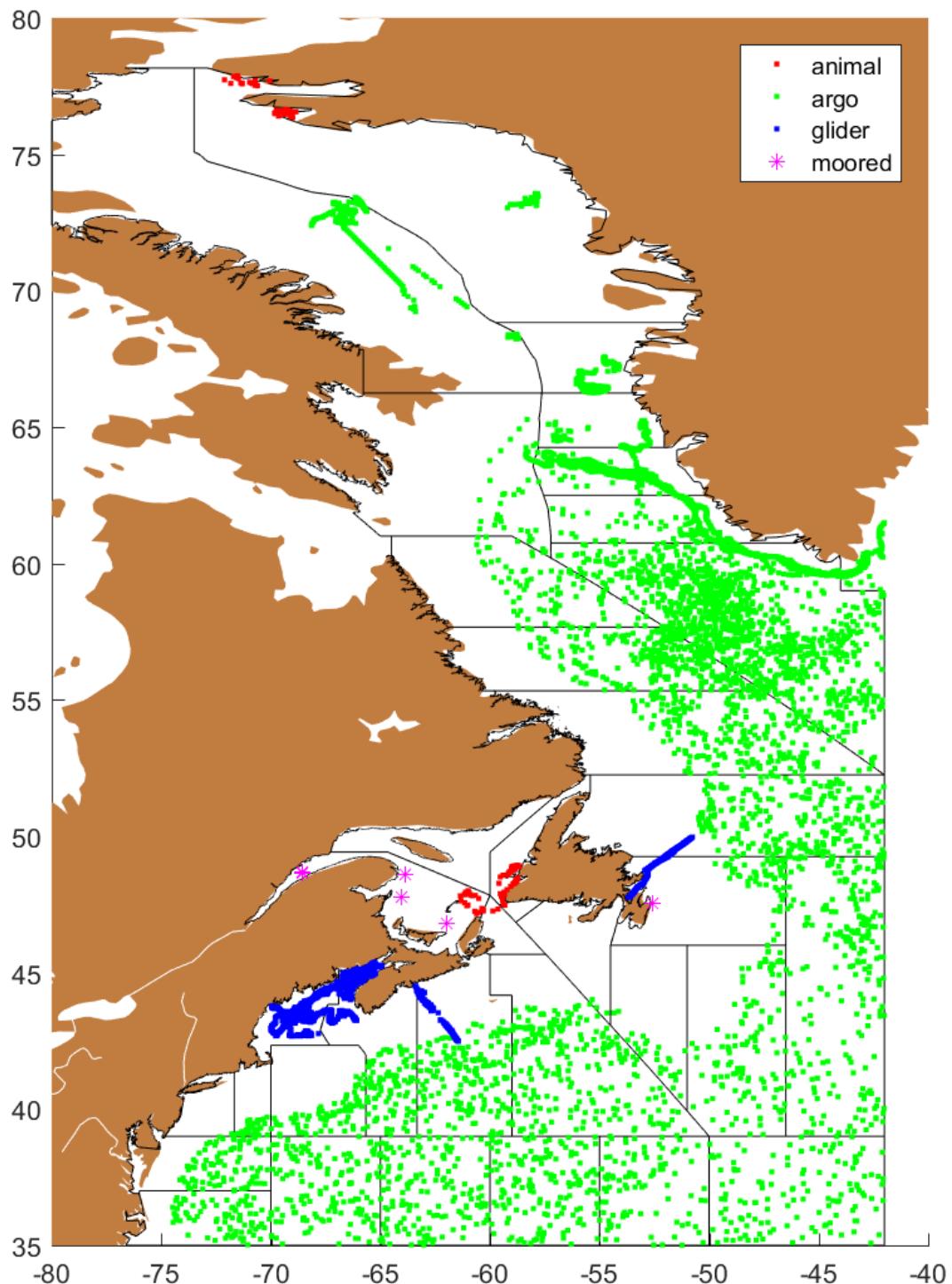
Figures and Tables

Figure 1. Positions of profiles sampled by autonomous platforms in 2022.

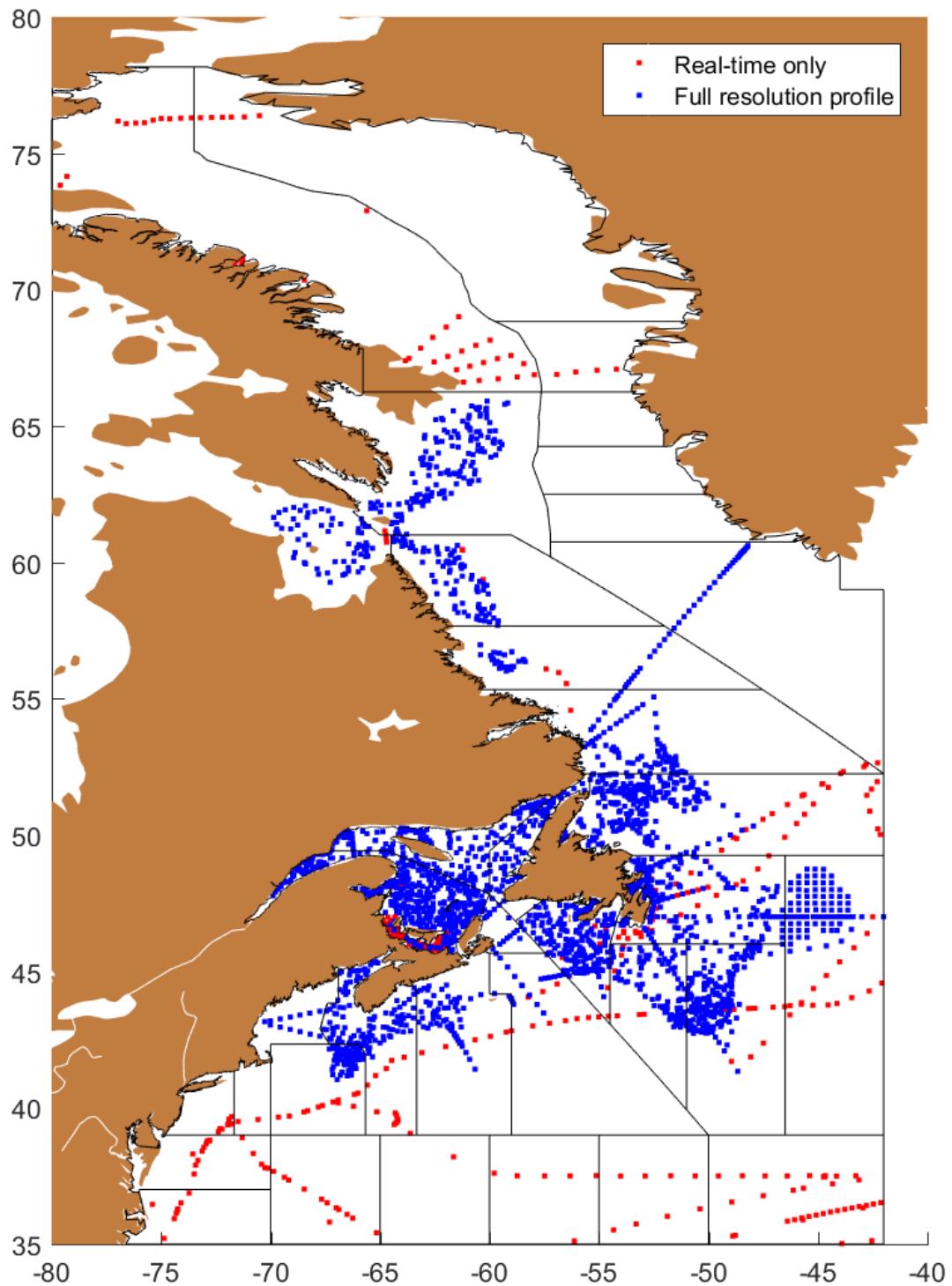


Figure 2. Positions of profiles sampled by ships in 2022.

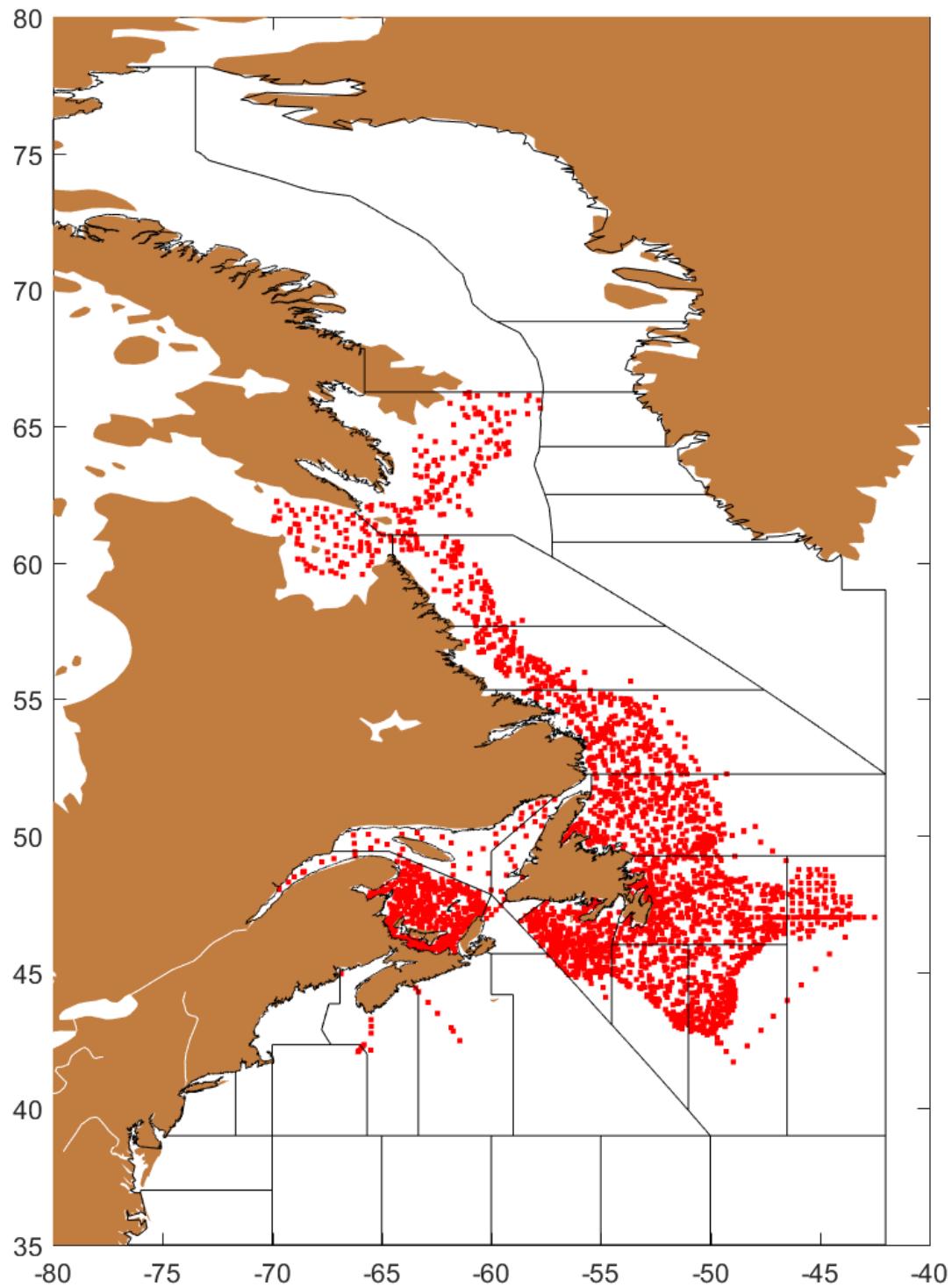


Figure 3. Positions of profiles sampled by ships before 2022 and acquired in 2022/2023.

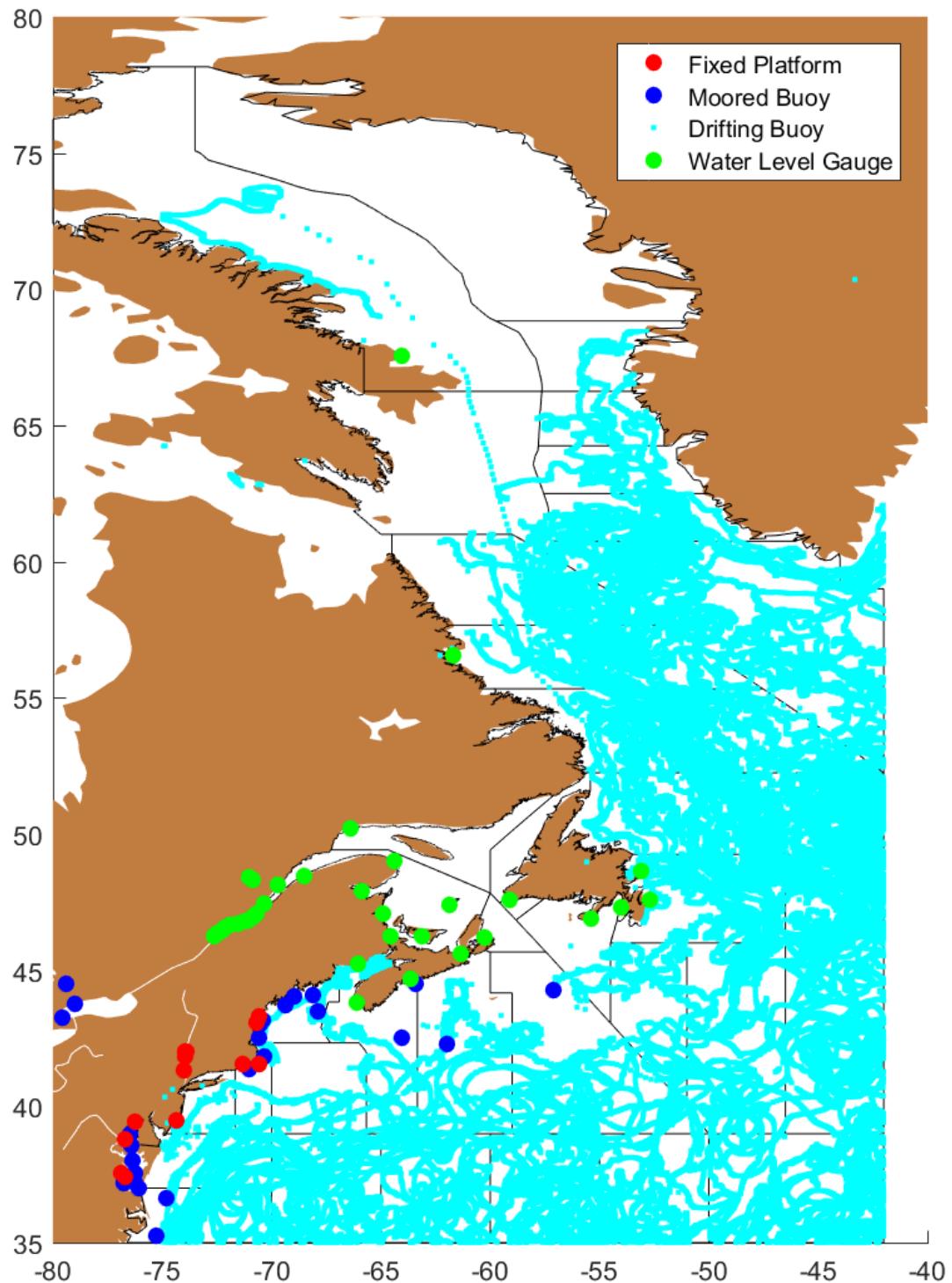


Figure 4. Positions of near surface observations made in 2022.

Table 3. Real-time temperature and /or salinity profiles from autonomous platforms collected and processed in 2022

Platform Type	Platform Name	Country	WMO ID	Reporting Period (months)	Profiles	NAFO Subareas
moored	PMZA-RIKI	Canada	4400481	May-Oct	337	4T
moored	IML-BA	Canada	4400483	May-Jun	48	4T
moored	AZMP-ESG	Canada	4400484	May-Sep	219	4T
moored	PMZA-VAS	Canada	4400485	May-Jun	45	4T
moored	AZMP-STA27	Canada	4400486	Jul-Jul	4	3L
glider		Canada	2801960	Sep-Dec	2191	4X 5Y
glider	SEA019	Canada	4800925	Feb-Feb	186	4W
glider	SEA032	Canada	4800937	Sep-Oct	602	3K 3L
glider	SEA022	Canada	4800993	Apr-Sep	486	4W
glider	SEA024	Canada	4800994	Mar-Mar	188	4W
glider		Canada	4803987	Sep-Oct	781	4X 5Y
glider		Canada	4803988	Sep-Dec	1611	5Y
glider		Canada	4803989	Sep-Nov	1711	4X
glider		Canada	5801965	Sep-Dec	2412	4X 5Y
glider		Canada	5801966	Sep-Oct	579	4X 5Y
argo		USA	1902392	Jan-Dec	37	4Vs4W 4X 6D 6F 6G
argo		USA	1902444	Jan-Dec	36	4Vs4W 4X 5Ze6D 6E 6F 6G
argo		France	1902578	May-Dec	28	1F 2H
argo		USA	3901219	Jan-Dec	37	3M 3N 3O 4Vs4W 6F 6G 6H
argo		Germany	3901601	Jan-Dec	37	3O 3Ps4Vs4W 4X 5Ze6D 6E 6F
argo		Germany	3901602	Jan-Dec	37	4W 4X 5Ze5Zw6B 6C 6D 6E
argo		Germany	3901603	Sep-Nov	7	6F 6G
argo		Germany	3901604	Jan-Apr	10	4W 4X 5Ze6D 6E
argo		Germany	3901654	Jan-Oct	29	4W 4X 5Ze5Zw6E
argo		Poland	3901851	Jan-Dec	31	3M 6H
argo		France	3901970	Oct-Dec	8	6H
argo		USA	4901621	Jan-Jan	1	5Ze
argo		USA	4901702	Jan-Jan	4	4Vs4W
argo		Canada	4901809	Jan-Mar	9	3K 3L 3M
argo		Canada	4901817	Jan-Jan	2	1F
argo		USA	4902102	Jan-Apr	10	4Vs4W 6E 6F
argo		USA	4902104	Jan-Dec	36	4Vs4W 4X 5Ze5Zw6A 6B 6C 6F
argo		USA	4902107	Dec-Dec	2	3M
argo		USA	4902108	Jan-Jan	1	3M
argo		USA	4902111	Jan-Dec	26	4Vs6E 6F 6G
argo		USA	4902114	Jan-Jan	3	6B 6D
argo		USA	4902119	Jan-Dec	37	1F 2H

argo	USA	4902120	May-Dec	23	4Vs6D 6E 6F
argo	USA	4902121	Jan-Dec	43	4W 6B 6C 6D 6E 6F
argo	USA	4902337	Jan-Dec	38	4Vs4W 4X 5Ze6D
argo	USA	4902344	Jan-Dec	10	4X 6B 6C 6D
argo	USA	4902345	Apr-Dec	29	6B 6C 6D
argo	USA	4902348	Jan-Feb	4	6E
argo	Canada	4902394	Jan-Feb	3	4X
argo	Canada	4902395	Jan-Nov	14	3M 3N
argo	Canada	4902437	Oct-Oct	15	0A 1A
argo	Canada	4902439	Jan-Sep	24	3K 3L 3M
argo	Canada	4902441	Jan-Dec	32	6D 6E
argo	Canada	4902442	Jan-Dec	35	3M 3N 4Vs6G 6H
argo	Canada	4902456	Jan-Oct	30	3M 3N
argo	Canada	4902467	Mar-Jun	9	6B 6C 6D
argo	Canada	4902469	Jan-Dec	35	1F 2G
argo	Canada	4902470	Feb-Dec	31	4W 4X 5Ze6B 6C 6D 6E 6F
argo	Canada	4902471	Jan-Dec	35	2H
argo	Canada	4902477	Jan-Dec	35	1F 2H 2J
argo	Canada	4902478	Jan-Dec	36	1F 2G 2H
argo	Canada	4902479	Jan-Dec	35	1F 2H
argo	Canada	4902481	Jan-Dec	24	0B 1D 2G 2H 2J
argo	Canada	4902487	Aug-Nov	5	1F
argo	Canada	4902488	Jan-Dec	17	3M 3N
argo	Canada	4902489	Jan-Dec	35	3M
argo	Canada	4902497	Jan-Jul	4	3K 3M
argo	Canada	4902498	Jan-Dec	35	4W 4X 5Ze5Zw6B 6D 6E
argo	Canada	4902500	Jan-Feb	5	3M 3N
argo	Canada	4902501	Aug-Sep	3	6E
argo	Canada	4902502	Jan-Jul	17	5Zw6B 6C 6D
argo	Canada	4902503	Jan-Dec	31	4X 6D 6E 6F
argo	Canada	4902504	Jan-Jun	14	3K 3L 3M
argo	Canada	4902505	Jan-Dec	35	1E 1F
argo	Canada	4902506	Jan-Oct	27	1F
argo	Canada	4902507	Feb-Dec	29	2J 3K
argo	Canada	4902508	Jan-Dec	36	1F 2H
argo	Canada	4902509	Jan-Jan	2	1F
argo	Canada	4902510	Jan-Dec	29	2J 3K 3L 3M
argo	Canada	4902511	Jan-Dec	35	1F
argo	Canada	4902512	Jan-Jun	17	1F
argo	Canada	4902513	Jan-Dec	36	1F 2G
argo	Canada	4902515	Jan-Dec	36	30 4Vs4W 6F 6G
argo	Canada	4902518	Jan-Dec	36	3N 4Vs5Ze5Zw6B 6D 6E 6F 6G 6H
argo	Canada	4902519	Jan-Dec	35	3N 4Vs4W 6F 6G

argo	Canada	4902523	Jan-Dec	34	4Vs6B 6C 6D 6E 6F
argo	Canada	4902526	Apr-Jun	7	6H
argo	Canada	4902527	Apr-May	3	1F 2J
argo	Canada	4902530	Sep-Sep	1	0A
argo	Canada	4902531	Aug-Oct	6	0A
argo	Canada	4902535	May-Dec	23	1F 2H
argo	Canada	4902556	May-Dec	22	4W 4X 5Ze5Zw6B 6C
argo	Canada	4902557	May-Dec	23	1F
argo	Canada	4902573	Jan-Oct	27	4Vs4W 6E 6F 6G
argo	Canada	4902575	Apr-Dec	27	3N 4Vs6G 6H
argo	Canada	4902576	Apr-Dec	28	4Vs4W 4X 5Ze6D
argo	Canada	4902577	Apr-Dec	28	4Vs4W 4X 5Ze5Zw6B 6C
argo	Canada	4902578	May-Dec	23	4Vs4W 4X 5Ze5Zw6B 6D 6E
argo	Canada	4902579	May-Dec	24	1F 2G 2H
argo	Canada	4902580	May-Dec	24	1F
argo	Canada	4902581	May-May	2	2H
argo	Canada	4902582	Apr-Aug	12	3K 3M
argo	Canada	4902590	May-Dec	23	4W 4X 5Ze6D
argo	Canada	4902591	May-Dec	24	1F 2G
argo	Canada	4902592	May-Dec	24	1F 2G
argo	Canada	4902593	May-Dec	24	1F 2H
argo	Canada	4902594	May-Dec	24	1F
argo	Canada	4902595	Apr-Dec	19	3M 3N
argo	Canada	4902598	Oct-Dec	9	4W 4X 5Ze
argo	Canada	4902599	Oct-Dec	8	4Vs4W
argo	Canada	4902602	Jan-Oct	116	0A
argo	Canada	4902630	Oct-Oct	15	0A
argo	USA	4902909	Jun-Dec	20	4W 6D 6E 6F
argo	USA	4902910	Aug-Nov	10	6B 6C
argo	USA	4902913	Jan-Feb	6	6C
argo	USA	4902927	Jan-Dec	37	4Vs4W
argo	USA	4902928	Jan-Aug	20	4Vs4W 6E 6F
argo	USA	4903035	Jan-Dec	25	6D 6E 6F 6G
argo	USA	4903036	Jan-Nov	34	4Vs6D 6E
argo	USA	4903042	Jan-Dec	37	4Vs6F
argo	USA	4903043	Jan-Dec	37	30 4Vs4W 4X 5Ze6B 6D 6E 6G
argo	USA	4903048	Aug-Aug	1	6G
argo	USA	4903049	Jan-Dec	36	4Vs4W 4X 5Ze6C 6D
argo	USA	4903050	Jan-Dec	32	4Vs4W 4X 5Ze6D 6F 6G
argo	USA	4903233	Dec-Dec	2	6C
argo	USA	4903252	Jan-Dec	37	4X 5Ze5Zw6A 6B 6C 6D 6E
argo	USA	4903258	Jan-Dec	35	3N 30 4Vs4W 6G 6H



argo	USA	4903260	Jan-Nov	21	3M 3N 6H
argo	USA	4903280	Jan-Dec	34	4Vs4W 4X 6E 6F
argo	USA	4903360	Jan-Jan	5	0B
argo	USA	4903361	Jan-Aug	434	1B
argo	USA	4903363	Jan-Dec	37	1F 2J
argo	USA	4903364	Jan-Dec	34	1F
argo	USA	4903365	Aug-Aug	3	1F
argo	USA	4903375	Aug-Oct	227	1D 1E 1F
argo	USA	4903377	Aug-Dec	415	0B 1D 1E 1F
argo	USA	4903455	Sep-Dec	466	1C 1D 1E 1F
argo	USA	4903456	Sep-Dec	12	6D 6E 6F
argo	France	4903634	May-Dec	29	1F 2H
argo	USA	5904173	Jan-Jul	20	0B 1E 1F 2G
argo	USA	5904771	Jan-Sep	26	3K
argo	USA	5904774	Apr-Dec	24	1E 1F 2G 2H
argo	USA	5906342	Jan-Feb	5	6F 6G
argo	USA	5906438	Jan-Dec	32	3M 3N 6H
argo	UK	6901169	Jan-Dec	37	0B 1D 1E 1F 2G
argo	UK	6901170	Jan-Dec	36	2G 2H 2J 3K
argo	UK	6901172	Mar-Sep	12	3M
argo	UK	6901173	Jan-May	15	2J
argo	UK	6901178	Feb-Sep	8	3M
argo	UK	6901190	Jan-Oct	7	3M
argo	UK	6901191	Jan-Feb	2	1F
argo	UK	6901194	Jan-Dec	36	2J 3K 3L 3N
argo	UK	6901199	Dec-Dec	1	1F
argo	UK	6901200	Jan-Aug	10	3K 3L 3M
argo	UK	6901202	Jan-Nov	31	2H 2J 3K 3L 3M
argo	Ireland	6901923	Jan-Mar	7	2H 2J
argo	Ireland	6901925	Jan-Dec	46	1F 2H 2J
argo	Ireland	6901930	Jan-Dec	35	2G 2H 2J 3K 3L 3M 3N
argo	France	6902684	Jan-Apr	10	1F 2H
argo	France	6902694	Jan-Sep	27	3K 3L 3M
argo	France	6902695	Jan-Jan	1	3K
argo	France	6902696	Jan-Mar	8	3M
argo	France	6902727	Jan-Nov	44	0A
argo	France	6902749	Jan-Jul	20	3L 3M 3N
argo	France	6902751	Jan-Dec	35	1F
argo	France	6902752	Jan-Dec	36	1E 1F 2G
argo	France	6902756	Jan-Feb	5	3M
argo	France	6902772	Jan-Sep	17	3M 6G 6H
argo	France	6902786	Jan-Dec	36	1F
argo	France	6902787	Jan-Dec	32	0B 2G 2H 2J 3K 3L
argo	France	6902791	Jan-Dec	36	1F 2H 2J



argo	France	6902792	Aug-Dec	13	1D 1F
argo	France	6902793	Jan-Dec	32	0B 2G 2H 2J 3K 3L 3M
argo	France	6902800	Jan-Dec	37	1F 2J
argo	France	6902802	Jan-Oct	30	1C
argo	France	6902818	Jan-Feb	6	2H 2J
argo	France	6902863	Jan-Dec	36	0B 1E 1F 2G 2H
argo	France	6902865	Jul-Dec	6	1F
argo	France	6902881	Jan-May	15	2H 2J
argo	France	6902886	Jan-Dec	36	1F 2H 2J
argo	France	6902888	Jan-Dec	36	1F 2J
argo	France	6902895	May-Dec	23	1F 2H
argo	France	6902952	Jan-Dec	52	1A
argo	France	6902976	Jan-Dec	36	1F 2G 2H
argo	France	6903006	May-Dec	29	1E 1F
argo	France	6903029	Jan-Dec	37	2J 3K
argo	France	6903030	Jan-Dec	35	1F 2H 2J 3K 3L 3M
argo	France	6903032	Jan-Dec	36	1F 2H 2J 3K
argo	France	6903034	Jan-Dec	30	2G 2H 2J 3K 3L 3M
argo	France	6903039	Dec-Dec	1	1F
argo	France	6903040	Jan-Oct	26	0B 2G 2H 2J 3K 3M
argo	France	6903041	Jan-Jan	2	1F
argo	France	6903042	Jan-Dec	36	2H 2J 3K
argo	France	6903083	Jan-Dec	35	0B 1E 1F 2G 2H 2J 3K 3L
argo	France	6903121	Apr-Nov	16	3M 6H
argo	France	6903123	Jan-Oct	27	6G 6H
argo	France	6903125	Jan-Aug	49	0A
argo	France	6903126	Jan-Aug	87	0A
argo	France	6903127	Jan-Oct	120	0A
argo	Norway	6903545	Jan-Dec	36	1F 2H 2J
argo	Norway	6903579	Dec-Dec	12	1E 1F
argo	Spain	6903873	Jan-Dec	33	2H 2J 3K 3L 3M
argo	Germany	6904112	Nov-Nov	1	3M
argo	Germany	6904113	Jan-Jan	6	1F
argo	Germany	6904114	Jan-Dec	41	2H 2J 3K 3L 3M
argo	Germany	6904115	Jan-Aug	39	1F 2H
argo	Germany	6904126	Jan-Mar	9	6G 6H
argo	Germany	6904231	Oct-Dec	47	1F 2H
argo	France	6904238	Dec-Dec	1	3M
argo	France	6904240	May-Dec	26	1F
argo	France	6904241	May-Dec	24	1F 2H
argo	Germany	6990501	Sep-Dec	13	4Vs4W 4X 6E
argo	Germany	7900566	Jan-Feb	7	3K 3M
argo	Germany	7900589	Jan-Aug	44	1F 2J 3K
animal		9901490	Jan-Feb	120	3Pn4R 4T 4Vn

animal	9901494	Jan-Jan	28	1A
animal	9901495	Jan-Apr	113	1A

*Dates are of first and last data reports within the NAFO Convention Area

**Moorings equipped with fixed profiling CTDs, mounted with Viking buoys. Deployments were seasonal and the full data are available at the MLI.

Table 4. Oceanographic profiles collected by ships in 2022

Country	Mission	First Date	Last Date	CTD	CTD RT*	XBT	XBT RT*	Bottle	TSG**	NAFO_Subareas
USA		20220121	20220412	0	0	0	60	0	0	4X 5Ze6E 6F 6G 6H
USA		20220130	20220415	0	0	0	7	0	0	6H
	189022045	20220816	20220825	148	0	0	0	0	0	4T
	18BP22001	20220427	20221207	40	0	0	0	0	0	4T
CAN		20220913	20221015	0	64	0	0	0	0	0A 0B 1A 1B 2G 2H 2J
CAN	18GP22004	20220818	20220818	2	1	0	0	2	0	3L
	18HE22008	20220304	20220314	196	0	0	0	0	0	3Pn4R 4S 4T 4Vn
	18K822001	20220705	20221017	50	0	0	0	0	0	4T
CAN	18KF22020	20220327	20220331	14	6	0	0	2	0	3L
CAN	18KF22998	20220403	20220422	106	33	0	0	2	0	3L 30 3Ps
CAN	18KF22021	20220405	20220417	92	33	0	0	2	0	3L 30 3Ps
CAN	18KF22022	20220407	20220502	210	72	2	0	0	0	30 3Ps
CAN	18KF22023	20220505	20220517	140	50	0	0	2	0	3L 30 3Ps
CAN	18KF22024	20220522	20220531	42	14	2	0	2	0	3L 30 3Ps
CAN	18KF22025	20220602	20220614	82	29	0	0	2	0	3L 3N 30
CAN	18KF22026	20220615	20221009	244	50	2	0	2	0	2J 3K 3L 3N
CAN	18KF22027	20220923	20221003	84	32	0	0	0	0	2J 3K
CAN	18KF22028	20221006	20221017	136	57	0	0	2	0	3K 3L
CAN	18KF22029	20221020	20221029	98	36	2	0	4	0	3L 3N 30
CAN	18KF22030	20221104	20221115	58	23	4	0	0	0	3L 3N 30
CAN	18KF22031	20221116	20221128	34	14	2	0	0	0	3K 3L
CAN	18KF22032	20221130	20221213	58	20	0	0	0	0	2J 3K 3L
	18LO22018	20220514	20220521	76	0	0	0	0	0	4S
	18LO22015	20220527	20220604	38	0	0	0	0	0	4S
	18LO22025	20220625	20220704	54	0	0	0	0	0	4S 4T
	18LO22037	20220715	20220801	82	0	0	0	0	0	4R 4S 4T
	18LO22040	20220805	20220812	16	0	0	0	0	0	4T
	18LO22016	20220820	20220828	18	0	0	0	0	0	4T
	18LO22051	20220903	20220912	16	0	0	0	0	0	4T
CAN		20220508	20220802	0	64	0	0	0	0	4T
CAN	18MU22233	20220908	20220908	4	0	0	0	0	0	4T
CAN	18MU22022	20220928	20220930	14	0	0	0	0	0	4T
CAN	18NE22547	20220513	20220516	54	19	0	0	0	0	3Ps
CAN	18NE22549	20220608	20220612	20	8	0	0	0	0	3N
CAN	18NE22558	20220701	20220702	6	3	4	2	6	0	3L
CAN	18NE22551	20220912	20220919	16	7	8	4	4	0	3L 3Ps
CAN	18NE22552	20220921	20221003	34	13	0	0	2	0	3K 3L
CAN	18NE22553	20221006	20221018	138	49	4	2	2	0	3K 3L
CAN	18NE22554	20221021	20221027	58	22	0	0	0	0	3N 30
CAN	18NE22556	20221117	20221117	4	1	0	0	0	0	3L
	18OL22033	20220712	20220721	62	0	0	0	0	0	4S 4T

	18OL22054	20221025	20221110	184	0	0	0	0	0	3Pn4R 4S 4T 4Vn
CAN	18QL22102	20220328	20220412	106	0	0	0	0	0	4W 5Ze
CAN	18QL22031	20220501	20221128	396	83	6	0	8	0	2H 2J 3K 3L 4T 4Vn4W
CAN	18QL22025	20220912	20220930	158	0	0	0	0	0	4T 4Vn4W
CAN	18QL22026	20221009	20221017	78	31	4	0	0	0	3K 3L
CAN	18QL22027	20221022	20221031	74	27	0	0	2	0	2J 3K 3L
CAN	18QL22028	20221106	20221112	50	15	0	0	0	0	2H
CAN	18QL22030	20221115	20221218	118	37	2	0	6	0	2J 3K 3L
CAN	18QL22029	20221120	20221123	12	3	2	0	0	0	3K
CAN	18QQ22017	20220730	20220905	596	0	0	0	0	0	0B 2G
CAN	18TL22229	20220110	20220110	2	1	0	0	2	0	3L
CAN	18TL22227	20220113	20220120	46	17	14	7	2	0	3L 3Ps
CAN	18TL22230	20220523	20220531	44	16	2	1	2	0	3L
CAN	18TL22021	20220606	20220616	130	0	0	0	0	0	3Pn4R 4S 4T 4Vn
CAN	18TL22024	20220617	20220626	78	0	0	0	0	0	4R 4S 4T
CAN	18TL22010	20220707	20220806	306	0	0	0	0	0	4W 4X 5Y 5Ze
CAN	18TL22039	20220812	20220914	184	0	0	0	0	0	4R 4S 4T 4Vn
CAN	18TL22233	20221010	20221017	74	24	2	1	0	0	3K
CAN	18TL22234	20221022	20221031	88	33	0	0	0	0	2J 3K
CAN	18TL22235	20221106	20221112	46	16	0	0	0	0	2G 2H
CAN	18TL22236	20221120	20221128	32	12	0	0	0	0	3K 3L
CAN	18TL22237	20221202	20221218	106	40	0	0	0	0	2J 3K
	18VA22667	20220107	20221221	452	0	0	0	0	0	4S 4T 4W 4X
	18VA22669	20220113	20221219	446	0	0	0	0	0	4S 4T 4W 4X
	18VA22362	20220421	20220429	6	0	0	0	0	0	4T 4W
	18VA22666	20220503	20221205	404	0	0	0	0	0	4S 4T 4W 4X
	18VA22001	20220713	20220907	330	0	0	0	0	0	4S 4T 4W 4X
	18VA22036	20220727	20220728	20	0	0	0	0	0	4S 4W
	18VA22461	20221005	20221017	18	0	0	0	0	0	4T 4W 4X
CAN	18VD22165	20220428	20220428	2	1	0	0	0	0	3Ps
CAN	18VD22168	20220520	20220525	32	9	0	0	0	0	3Ps
CAN	18VD22169	20220531	20220607	26	10	0	0	0	0	3L
CAN	18VD22170	20220613	20220613	2	1	0	0	2	0	3L
CAN	18VD22171	20220705	20220709	8	2	0	0	0	0	3K 3L
CAN	18VD22173	20220723	20220729	24	9	0	0	0	0	3L
CAN	18VD22174	20220731	20220813	48	19	0	0	0	0	3L
CAN	18VD22176	20220817	20220819	20	9	0	0	0	0	3L
CAN	18VD22177	20220827	20220903	24	11	0	0	0	0	3K
CAN	18VD22178	20220907	20220915	12	5	0	0	0	0	3K
CAN	18VD22179	20220921	20220926	20	6	0	0	0	0	3L
CAN	18VD22180	20220929	20221012	38	0	0	0	0	0	3L
	29VE220605	20220613	20220630	228	0	0	0	0	0	3N 30
	29VE220704	20220705	20220815	150	0	0	0	0	0	3L 3M 3N

USA		20220426	20220716	0	0	0	116	0	0	1F 2J 3K 3L 3M 3N 3O 3Ps4Vs4W 4X 5Ze5Zw6A 6B 6C
CAN	33AT22002	20220322	20220404	158	1	0	0	0	0	3Pn4Vn4Vs4W 4X 5Y 5Ze
CAN	33AT22001	20220410	20220501	0	105	0	37	162	0	3K 3L 3M 3N 3O 3Ps
CAN	33AT22005	20220504	20220527	150	0	0	0	0	0	1F 2H 2J 3L 4R 4W 4X
CAN	740H22243	20221002	20221018	142	0	0	0	0	0	3Pn3Ps4Vn4Vs4W 4X 5Ze
CAN	740H22002	20221021	20221108	138	51	128	62	138	0	2J 3K 3L 3M 3N 3O
USA		20220125	20220817	0	0	0	16	0	0	6A 6B 6D
USA		20220216	20220712	0	0	0	3	0	0	6B 6C 6D

* Messages formatted for transmission on the GTS. These messages are of lower vertical resolution and uncalibrated versions of the data, to be replaced in the future.

**TSG counts are not number of profiles, but number of point thermosalinograph observations

Dates are of first and last data reports within the NAFO Convention Area.

Table 5. Pre-2022 temperature (XBT) and/or salinity (CTD, bottle) profile data collected aboard ships, entered or updated in 2022/2023.

Mission Number	First Date	Last Date	CTD	Bottle	XBT	NAFO_Subareas
181C99234	19990329	19990329	0	2	0	3L
181C99237	19990507	19990507	0	2	0	3L
181C99238	19990510	19990521	0	4	0	3L
181C99239	19990526	19990604	0	4	0	3L
181C99240	19990605	19990618	0	4	0	3L
181C99241	19990619	19990629	0	4	0	3L
181C99242	19990907	19990907	0	2	0	3L
181C99243	19990927	19990927	0	2	0	3L
181C99244	19991012	19991022	0	4	0	3L
181C99245	19991024	19991105	0	4	0	3L
181C99246	19991106	19991119	0	4	0	3L
181C99247	19991121	19991202	0	4	0	3L
181C99248	19991204	19991214	0	4	0	3L
181C00324	20000717	20000717	0	2	0	3L
181C01367	20010517	20010517	0	2	0	3L
181C01372	20011016	20011016	0	2	0	3L
181C01376	20011210	20011210	0	2	0	3L
181C02417	20020401	20020401	0	2	0	3L
181T00007	20000124	20000124	0	2	0	3L
181T00008	20000203	20000203	0	2	0	3L
181T00009	20000221	20000221	0	2	0	3L
181T00010	20000229	20000229	0	2	0	3L
181T00011	20000315	20000315	0	2	0	3L
181T00013	20000523	20000523	0	2	0	3L
181T00016	20000615	20000615	0	2	0	3L
181T00017	20000629	20000629	0	2	0	3L
181T00018	20000901	20000901	0	2	0	3L
181T00020	20000915	20000915	0	2	0	3L
181T00021	20001002	20001002	0	2	0	3L
181T00022	20001130	20001130	0	2	0	3L
181T01-23	20010109	20010109	0	2	0	3L
181T01-24	20010202	20010202	0	2	0	3L
181T01025	20010330	20010330	0	2	0	3L
181T01027	20010604	20010604	0	2	0	3L
181T01028	20010620	20010620	0	2	0	3L
181T01029	20010704	20010704	0	2	0	3L
181T01-30	20010809	20010809	0	2	0	3L
181T01-31	20010831	20010831	0	2	0	3L
181T01-32	20010917	20010917	0	2	0	3L
181T02033	20020110	20020110	0	2	0	3L
181T02034	20020226	20020226	0	2	0	3L

181T02035	20020409	20020409	0	2	0	3L
1.84E+08	20210303	20210310	176	0	0	4R 4S 4T 4Vn
18BP21011	20210408	20211216	50	0	0	4T
18E015110	20150819	20150921	634	0	0	0B 2G
18EG19012	20190801	20190801	0	4	0	3L
18EG19515	20190926	20191007	0	4	0	3L
18HU99003	19991118	19991127	0	54	0	3K 3L 3M 3N 3O
18HU00302	20000422	20000507	0	134	0	3K 3L 3M 3N 3O
18HU00305	20000714	20000730	0	182	0	2G 2H 2J 3K 3L 3M
18HU00004	20001101	20001111	0	122	0	3K 3L 3M 3N 3O
18HU00343	20001218	20001218	0	2	0	3L
18HU01001	20011114	20011125	0	112	0	3K 3L 3M 3N 3O
18HU11111	20111120	20111210	0	150	0	2J 3K 3L 3M 3N 3O 3Ps
18HU12112	20121120	20121209	0	142	0	2J 3K 3L 3M 3N 3O 3Ps
18HU14007	20140516	20140516	0	2	0	3L
18HU14114	20141116	20141207	0	138	0	2J 3K 3L 3M 3N 3O
18HU15115	20151115	20151206	240	186	72	2J 3K 3L 3M 3N 3O 3Ps
18HU18027	20180707	20180716	18	0	0	3Ps
18HU18118	20181111	20181202	0	148	0	3K 3L 3M 3N 3O 3Ps
18HU20208	20200806	20200806	0	2	0	3L
18HU20120	20201110	20201201	0	120	0	3K 3L 3M 3N 3O 3Ps
18KF21001	20210925	20210925	0	2	0	3L
18LL01344	20010108	20010108	0	2	0	3L
18LL01002	20010221	20010221	0	2	0	3L
18LL01351	20010411	20010419	0	4	0	3L
18LL01352	20010421	20010504	0	120	0	3K 3L 3M 3N 3O
18LL01353	20010518	20010524	0	4	0	3L
18LL01355	20010621	20010621	0	2	0	3L
18LL01356	20010713	20010729	0	116	0	2G 2H 2J 3K 3L
18LL01357	20011005	20011005	0	2	0	3L
18MU21146	20210510	20210604	22	0	0	4T
18MU21151	20210706	20210802	178	0	0	4T
18MU21156	20210830	20210908	36	0	0	4T
18NE00012	20000404	20000404	0	2	0	3L
18NE11403	20110517	20110517	0	2	0	3L
18NE11404	20110531	20110531	0	2	0	3L
18NE11405	20110614	20110614	0	2	0	3L
18NE11406	20110623	20110623	0	2	0	3L
18NE11408	20110927	20110927	0	2	0	3L
18NE11409	20111002	20111002	0	2	0	3L
18NE11410	20111018	20111018	0	2	0	3L
18NE11413	20111128	20111128	0	2	0	3L
18NE12417	20120501	20120501	0	2	0	3L
18NE12420	20120612	20120612	0	2	0	3L
18NE12421	20120620	20120620	0	2	0	3L



18NE12425	20121030	20121030	0	2	0	3L
18NE14447	20140619	20140619	0	2	0	3L
18NE15451	20150407	20150426	220	0	6	3Ps
18NE15450	20150411	20150414	40	0	2	3Ps
18NE15452	20150430	20150512	152	0	0	3L 30 3Ps
18NE15453	20150513	20150526	200	2	2	3L 3N 30
18NE15454	20150528	20150607	160	0	2	3L 3N
18NE15455	20150613	20150619	42	2	2	3L
18NE15456	20150909	20150915	80	0	0	3L 3Ps
18NE15457	20150918	20150920	8	2	0	3L
18NE15458	20150924	20151002	76	2	4	3L 30
18NE15459	20151004	20151010	78	2	0	3L 3N 30
18NE15460	20151013	20151027	144	0	10	3L 3N 30
18NE15461	20151028	20151109	88	0	2	3L 3N
18NE15462	20151113	20151123	116	0	2	3L
18NE15463	20151125	20151203	52	0	2	3L
18NE18497	20180606	20180618	0	4	0	3L
18NE18499	20180910	20180910	0	2	0	3L
18NE18500	20180925	20180925	0	2	0	3L
18NE19506	20190330	20190330	0	2	0	3L
18NE19508	20190507	20190507	0	2	0	3L
18NE19509	20190508	20190521	0	4	0	3L
18NE19510	20190522	20190604	0	4	0	3L
18NE19511	20190616	20190616	0	2	0	3L
18NE19512	20190619	20190622	0	4	0	3L
18NE19513	20190915	20190915	0	2	0	3L
18NE19514	20190924	20190924	0	2	0	3L
18NE19516	20191010	20191021	0	6	0	3L
18NE19124	20191015	20191015	0	2	0	3L
18NE19517	20191025	20191105	0	6	0	3L
18NE19518	20191110	20191110	0	2	0	3L
18NE19519	20191130	20191130	0	2	0	3L
18NE19250	20191211	20191211	0	2	0	3L
18NE20015	20200811	20200811	0	2	0	3L
18NE20528	20200828	20200907	0	4	0	3L
18NE20529	20200909	20200909	0	2	0	3L
18NE20530	20200924	20201005	0	4	0	3L
18NE20531	20201012	20201020	0	4	0	3L
18NE20533	20201110	20201110	0	2	0	3L
18NE20534	20201118	20201130	0	4	0	3L
18NE20535	20201203	20201212	0	4	0	3L
18NE21008	20210723	20210723	2	0	0	4W
18OK11600	20110816	20110816	0	2	0	3L
18OK12611	20120618	20120618	0	2	0	3L
18OK16619	20160815	20160815	0	2	0	3L

18OL18011	20180715	20180802	0	162	0	2G 2H 2J 3K 3L 3M
18QL21010	20211013	20211013	0	2	0	3L
18TL99077	19990104	19990117	0	4	0	3L
18TL99078	19990513	19990528	0	26	0	3K 3L
18TL99079	19990530	19990530	0	2	0	3L
18TL99080	19990716	19990801	0	116	0	2H 2J 3K 3L 3M
18TL99081	19990823	19990917	0	4	0	3L
18TL99084	19991009	19991009	0	2	0	3L
18TL99088	19991204	19991204	0	2	0	3L
18TL02406	20020623	20020623	0	2	0	3L
18TL11090	20110405	20110405	0	2	0	3L
18TL11091	20110426	20110502	0	48	0	3L 3M 3N 3O
18TL11092	20110527	20110527	0	2	0	3L
18TL11093	20110708	20110725	0	102	0	2G 2H 2J 3K 3L 3M
18TL11098	20111213	20111213	0	2	0	3L
18TL12100	20120107	20120107	0	2	0	3L
18TL12111	20120304	20120304	0	2	0	3L
18TL12101	20120411	20120430	0	164	0	3K 3L 3M 3N 3O 3Ps
18TL12102	20120509	20120509	0	2	0	3L
18TL12103	20120529	20120529	0	2	0	3L
18TL12104	20120709	20120727	0	142	0	2H 2J 3K 3L 3M
18TL12112	20121221	20121221	0	2	0	3L
18TL14127	20140203	20140203	0	2	0	3L
18TL14129	20140411	20140429	0	132	0	3K 3L 3M 3N 3O 3Ps
18TL14130	20140511	20140511	0	2	0	3L
18TL14131	20140525	20140525	0	2	0	3L
18TL14140	20140623	20140623	0	2	0	3L
18TL14132	20140709	20140728	0	144	0	2H 2J 3K 3L 3M
18TL14141	20141221	20141221	0	2	0	3L
18TL15142	20150107	20150121	170	2	4	3L 3N
18TL15143	20150121	20150202	134	4	0	3K 3L
18TL15155	20150320	20151215	1270	302	308	2H 2J 3K 3L 3M 3N 3O 3Ps
18TL15156	20150320	20150320	2	2	0	3L
18TL15144	20150410	20150427	222	142	72	3L 3M 3N 3O 3Ps
18TL15145	20150429	20150505	98	0	0	3L 3Ps
18TL15146	20150507	20150511	18	2	0	3L
18TL15147	20150512	20150526	56	0	76	3K 3L
18TL15148	20150709	20150727	206	156	130	2H 2J 3K 3L 3M
18TL15150	20151007	20151012	30	0	0	2J 3L
18TL15151	20151015	20151026	174	0	8	2H 2J
18TL15152	20151029	20151107	128	0	0	2J
18TL15153	20151113	20151123	144	0	10	2J 3K
18TL15154	20151116	20151206	206	0	16	3K
18TL18185	20180406	20180424	0	110	0	3K 3L 3M 3N 3O 3Ps
18TL18186	20180501	20180501	0	2	0	3L



18TL18187	20180522	20180522	0	2	0	3L
18TL18193	20181218	20181218	0	2	0	3L
18TL19197	20190412	20190418	0	52	0	3L 3M
18TL19198	20190429	20190429	0	2	0	3L
18TL19199	20190520	20190520	0	2	0	3L
18TL19200	20190627	20190713	0	136	0	2H 2J 3K 3L 3M
18TL19202	20191009	20191009	0	2	0	3L
18TL20210	20200714	20200731	0	130	0	2H 2J 3K 3L 3M
18TL20212	20201013	20201013	0	2	0	3L
18TL21002	20210317	20210317	2	0	0	5Ze
18TL21218	20210423	20210423	0	2	0	3L
18TL21219	20210506	20210517	168	0	0	30 3Ps
18TL21220	20210629	20210719	0	154	0	2H 2J 3K 3L 3M
18TL21222	20211006	20211017	104	2	2	2H 2J 3L
18TL21223	20211024	20211103	78	0	0	2H 2J
18TL21224	20211103	20211115	126	0	0	2J 3K
18TL21225	20211118	20211128	96	0	0	3K
18TL21226	20211205	20211215	44	0	0	3K
18TL21228	20211220	20211220	2	2	0	3L
18VA99001	19990326	19990326	0	2	0	3L
18VA99002	19990416	19990416	0	2	0	3L
18VA99003	19990504	19990504	0	2	0	3L
18VA99004	19990617	19990617	0	2	0	3L
18VA99005	19990706	19990706	0	2	0	3L
18VA99006	19990812	19990812	0	2	0	3L
18VA99000	19991221	19991221	0	2	0	3L
18VA19667	20190109	20191218	100	0	0	4W
18VA20667	20200109	20201222	44	0	0	4W
18VA21003	20210106	20211229	1138	0	0	4T 4Vn4W 4X 5Ze
18VA21004	20210114	20211215	1134	0	0	4T 4Vn4W 4X 5Ze
18VA21002	20210309	20211230	1126	0	0	4T 4Vn4W 4X 5Ze
18VA21022	20210525	20210527	16	0	0	0
18VA21102	20210604	20210622	32	0	0	4W 4X 5Ze
18VA21028	20210713	20210721	74	0	0	4T 4W 4X
18VA21001	20210717	20210921	832	0	0	4T 4W 4X
18VA21222	20210825	20210929	722	0	0	4T 4Vn4W 4X
18VA21221	20210829	20210929	716	0	0	4T 4Vn4W 4X
18VA21038	20210907	20210909	54	0	0	4T 4W
18VA21262	20211007	20211020	20	0	0	4T 4W 4X
18VD14033	20140814	20140814	0	2	0	3L
18VD15040	20150504	20150504	2	0	0	3L
18VD15041	20150516	20150516	2	0	0	3L
18VD15042	20150530	20150607	28	0	0	3Ps
18VD15043	20150615	20150621	26	0	0	3L
18VD15044	20150712	20150719	4	0	0	3K 3L

18VD15045	20150727	20150809	32	0	0	3K 3L
18VD15046	20150813	20150813	4	2	2	3L
18VD15047	20150815	20150820	34	0	0	3L
18VD15048	20150825	20150913	82	0	0	3K
18VD15049	20150919	20150920	30	0	0	3L
18VD15050	20150926	20151004	44	0	0	3L
18VD15051	20151104	20151104	2	0	0	3L
18VD18105	20181015	20181015	0	2	0	3L
18VD19118	20190812	20190812	0	6	0	3L
18VD20136	20200812	20200812	0	2	0	3L
18VD20141	20200929	20200929	0	2	0	
18VD20143	20201014	20201014	0	2	0	3L
18VD21157	20210821	20210821	0	2	0	3L
18VD21166	20211122	20211122	0	2	0	3L
29VE210529	20210605	20210624	228	0	0	3N 30
29VE210712	20210712	20210808	162	0	0	3L 3M
740H19001	20191117	20191210	0	138	0	3K 3L 3M 3N 30 3Ps

Dates are of first and last data reports within the NAFO Convention Area

Table 6. Real-time surface water, air, atmospheric parameters and wave* data from buoys, collected and processed in 2022

Country	Type	Name	ID	Reporting Period	Profiles	NAFO Subareas
USA	Fixed Platform	Coastal Marine Lab, New Castle, NH	CMLN3	Jan-Sep	4762	5Y
USA	Fixed Platform	Buoy 126, Jacques Cousteau Reserve, NJ	JCTN4	Jan-Dec	34576	6A
USA	Fixed Platform	T-Wharf Bottom, Narragansett Bay Reserve, RI	NAQR1	Jan-Dec	33002	5Zw
USA	Fixed Platform	Menauhant, Waquoit Bay Reserve, MA	WAQM3	Jan-Dec	9501	5Zw
Canada	Moored Buoy		4400137	Jan-Jan	28	4Vs4W 4X
USA	Moored Buoy		4100120	Aug-Dec	5449	6C
USA	Moored Buoy	Buoy A01 - Massachusetts Bay	4400029	Jan-Dec	8385	5Y
USA	Moored Buoy	Buoy B01 - Western Maine Shelf	4400030	Jan-Dec	8351	5Y
USA	Moored Buoy	Buoy E01 - Central Maine Shelf	4400032	Jan-Dec	6545	5Y
USA	Moored Buoy	Buoy F01 - Penobscot Bay	4400033	Jan-Dec	8137	5Y
USA	Moored Buoy	Buoy I01 - Eastern Maine Shelf	4400034	Jan-Dec	8589	5Y
USA	Moored Buoy	Buoy M01 - Jordan Basin	4400037	Jan-Dec	7365	5Y
USA	Moored Buoy	Potomac, MD	4400042	Jan-Dec	81305	6B
USA	Moored Buoy	Stingray Point, VA	4400058	Jan-Dec	81464	6B
USA	Moored Buoy	Gooses Reef, MD	4400062	Jan-Dec	75132	6B
USA	Moored Buoy	Annapolis, MD	4400063	Jan-Dec	79669	6B
USA	Moored Buoy	Great South Bay	4400064	May-Dec	23131	6B
USA	Moored Buoy	York Spit, VA	4400072	Jan-Dec	68942	6B
USA	Moored Buoy	CO2 Gulf of Maine Buoy	4400073	Jan-Feb	299	5Y
USA	Moored Buoy		4400085	Jul-Dec	7315	5Zw
USA	Moored Buoy		4400088	Jan-Dec	16118	6C
USA	Moored Buoy		4400090	Jul-Dec	7310	5Y
USA	Drifting Buoy		1301547	Mar-Jun	1695	3M 6H
USA	Drifting Buoy		1301548	Jan-Mar	1049	6G 6H
USA	Drifting Buoy		1301575	Jan-May	511	5Ze6B 6C 6D
USA	Drifting Buoy		1301579	Jan-Mar	1229	3M 6H
UK	Drifting Buoy		1301603	Jan-Jul	2795	3N 3O 4Vs6F 6G 6H

France	Drifting Buoy	1301619	Aug-Dec	1428	4W 4X 6B 6C 6D 6E
USA	Drifting Buoy	1501670	Jan-Sep	2611	3M 6H
USA	Drifting Buoy	1501672	Aug-Aug	115	6G
USA	Drifting Buoy	1501725	Jan-Dec	5984	4Vs4W 6E 6F 6G
Canada	Drifting Buoy	1801660	Sep-Oct	3107	4X
Canada	Drifting Buoy	3801560	Sep-Oct	748	4X
Canada	Drifting Buoy	3801561	Sep-Dec	2446	4X 5Y
Canada	Drifting Buoy	3801562	Sep-Dec	2239	5Y 5Ze
USA	Drifting Buoy	4101542	Feb-Mar	369	6H
USA	Drifting Buoy	4101546	Dec-Dec	224	6B 6C 6D
USA	Drifting Buoy	4101586	Aug-Nov	748	6F 6G
USA	Drifting Buoy	4101656	Mar-Dec	6792	1E 1F 2G 2H 2J 3K
USA	Drifting Buoy	4101664	Jan-Jun	2636	3K 3M
France	Drifting Buoy	4101707	Aug-Oct	382	6D 6E
EU	Drifting Buoy	4101718	Jan-Jun	3365	3M 3N 30 4Vs6G 6H
EU	Drifting Buoy	4101721	Jul-Nov	2408	6H
France	Drifting Buoy	4101743	Nov-Dec	109	6H
UK	Drifting Buoy	4101753	Oct-Oct	200	6G 6H
USA	Drifting Buoy	4101840	Feb-Feb	39	6C
France	Drifting Buoy	4101844	Apr-Apr	1	6G
USA	Drifting Buoy	4101856	Jul-Dec	1962	6B 6C 6D
	Drifting Buoy	4102525	Mar-Jun	433	6B 6C 6D 6E
	Drifting Buoy	4102531	Jan-Feb	456	6G 6H
	Drifting Buoy	4102534	Jan-Aug	2468	6B 6C 6D 6E
	Drifting Buoy	4102566	Oct-Nov	514	6F 6G
	Drifting Buoy	4102567	Oct-Oct	4	3M 6H
	Drifting Buoy	4102570	Oct-Nov	688	3N 30 4Vs4W 6D 6E 6F 6G
USA	Drifting Buoy	4102621	Jan-Apr	590	6H
USA	Drifting Buoy	4102632	Nov-Dec	945	6B 6C 6D 6E
USA	Drifting Buoy	4201523	Jan-Jun	3261	3M 3N 4Vs6F 6G 6H

USA	Drifting Buoy	4201545	Jan-Feb	49	6G
	Drifting Buoy	4201655	Apr-Jun	1296	3M 3N 30 4Vs4W 6B 6C 6D 6E 6F 6G
	Drifting Buoy	4201656	Apr-May	183	4Vs4W 4X 6B 6C 6D 6E
USA	Drifting Buoy	4201703	Jan-Mar	875	3M 3N 30 4Vs
USA	Drifting Buoy	4400502	Jun-Jul	1001	3K 3L 3M
USA	Drifting Buoy	4400503	Jul-Dec	3679	0B 1D 2G 2H 2J 3K 3L 3N
EU	Drifting Buoy	4400857	Sep-Oct	116	6H
EU	Drifting Buoy	4401572	Jul-Nov	1545	6F
France	Drifting Buoy	4401585	Jan-Mar	1156	3M 3N 6H
France	Drifting Buoy	4401586	Jan-Mar	471	6B 6C 6D
USA	Drifting Buoy	4401762	Apr-Jul	820	6H
USA	Drifting Buoy	4401813	Oct-Oct	76	6H
USA	Drifting Buoy	4401867	Jan-Dec	4418	3N 30 4Vs6F 6G 6H
USA	Drifting Buoy	4401901	Jan-Apr	1223	3M
USA	Drifting Buoy	4402565	Apr-Apr	1	1F
USA	Drifting Buoy	4402608	Dec-Dec	189	1F
USA	Drifting Buoy	4402621	Jan-Jun	3404	3K 3M
USA	Drifting Buoy	4402627	Jan-Feb	861	3K
USA	Drifting Buoy	4402632	Jan-Oct	3262	1F 2J 3K
USA	Drifting Buoy	4402634	Jan-Nov	451	1F 2J
USA	Drifting Buoy	4402635	Jan-Jan	108	2J 3K
USA	Drifting Buoy	4402640	Jan-Jun	1316	3K 3L 3M
USA	Drifting Buoy	4402643	Jan-Apr	1361	1F
USA	Drifting Buoy	4402644	Jan-Mar	1342	1F 2J
USA	Drifting Buoy	4402645	Jan-Nov	302	0B 1F 2J 3K
USA	Drifting Buoy	4402648	Jan-Nov	6843	0B 1E 1F 2G 2H
USA	Drifting Buoy	4402652	Jan-Mar	1098	2J 3K 3L 3M
USA	Drifting Buoy	4402653	Apr-Nov	1369	6D 6E 6F
USA	Drifting Buoy	4402656	Jan-Apr	1861	3N 30 4Vs4W
EU	Drifting Buoy	4402672	Sep-Sep	1	4Vs

EU	Drifting Buoy	4402675	Jan-Apr	1891	3M 6H
EU	Drifting Buoy	4402712	Jan-Apr	2347	0A
EU	Drifting Buoy	4402714	Jan-Jan	281	2G 2H
EU	Drifting Buoy	4402720	Jan-Feb	876	2J 3K
EU	Drifting Buoy	4402721	Jan-Jul	3089	3K 3M
EU	Drifting Buoy	4402723	Jan-Dec	7840	3L 3N 30 3Ps4Vs
EU	Drifting Buoy	4402726	Jan-Nov	6886	2H 2J 3K 3L 3M
EU	Drifting Buoy	4402727	Jan-Feb	338	3M
EU	Drifting Buoy	4402732	Oct-Dec	1464	3K 3L 3N 30
USA	Drifting Buoy	4402733	Oct-Dec	1571	2J 3K
EU	Drifting Buoy	4402734	Oct-Dec	1405	2J 3K 3L
EU	Drifting Buoy	4402735	Oct-Dec	1591	2J 3K 3L
EU	Drifting Buoy	4402736	Oct-Dec	1525	3K 3L 3N
EU	Drifting Buoy	4402742	Nov-Nov	539	3M
EU	Drifting Buoy	4402743	Nov-Dec	1284	30
EU	Drifting Buoy	4402744	Nov-Dec	1284	30 3Ps
EU	Drifting Buoy	4402745	Oct-Nov	69	3L
EU	Drifting Buoy	4402746	Oct-Dec	1514	3L 3M 3N
	Drifting Buoy	4402747	Dec-Dec	10	0B
EU	Drifting Buoy	4402748	Aug-Nov	1983	0A 0B 2G 2H 2J 3K 3L
EU	Drifting Buoy	4402749	Jul-Dec	3752	1F 2H 2J
EU	Drifting Buoy	4402750	Jul-Dec	3029	1F
	Drifting Buoy	4402751	Nov-Dec	1218	3N 30 4Vs4W 4X 5Ze6E 6G 6H
USA	Drifting Buoy	4402752	Nov-Dec	1334	5Ze5Zw6A 6B 6C 6D
USA	Drifting Buoy	4402753	Nov-Dec	727	4W 4X 5Zw6A 6B 6D 6E
	Drifting Buoy	4402754	Nov-Nov	304	4X 5Ze
USA	Drifting Buoy	4402876	Aug-Oct	1249	4W 4X 5Ze5Zw6A 6B 6D 6E
USA	Drifting Buoy	4402877	Aug-Dec	3043	5Ze5Zw6A 6B
USA	Drifting Buoy	4402878	Aug-Dec	2952	4Vs4W 4X 5Ze6D 6E
USA	Drifting Buoy	4402880	Aug-Dec	2834	4Vs4W 4X 6A 6B 6C 6D 6E

Canada	Drifting Buoy	4403556	Jan-Mar	915	3M
Canada	Drifting Buoy	4403557	Jan-Feb	450	3M
Canada	Drifting Buoy	4403558	Jan-Jun	3539	3M 3N 30
Canada	Drifting Buoy	4403559	Jan-Mar	1606	3L
Canada	Drifting Buoy	4403568	Apr-Dec	5680	3L 3N 30 3Ps4Vs
Canada	Drifting Buoy	4403569	Apr-Dec	5372	3L 3M 3N 30 4Vs
Canada	Drifting Buoy	4403570	Apr-May	764	3L
Canada	Drifting Buoy	4403571	Apr-May	766	3L
Canada	Drifting Buoy	4403572	Apr-Aug	2693	3K 3L 3M 3N
Canada	Drifting Buoy	4403573	Apr-May	213	3L
Canada	Drifting Buoy	4403575	Apr-May	518	3L
Canada	Drifting Buoy	4403576	Apr-May	224	3L
Canada	Drifting Buoy	4403577	Apr-Jul	1474	3L
USA	Drifting Buoy	4601782	Feb-Feb	623	3M
Canada	Drifting Buoy	4701738	Jan-Dec	7783	0A
USA	Drifting Buoy	6202613	Nov-Dec	836	4Vs4W 4X 5Ze6B 6C 6D 6E
USA	Drifting Buoy	6202629	Jan-Mar	361	3M 6H
USA	Drifting Buoy	6202632	Aug-Dec	3491	1B 1C 1D 1E 1F
USA	Drifting Buoy	6202644	Oct-Dec	987	6H
USA	Drifting Buoy	6202660	Jan-Jul	4017	1F 2G 2H
USA	Drifting Buoy	6202664	Jan-Jun	3223	1F 2H 2J
USA	Drifting Buoy	6203507	Jan-Jan	86	6B
USA	Drifting Buoy	6203508	Jan-Jan	71	4X
USA	Drifting Buoy	6203516	Jan-May	2834	4W 4X 5Ze
USA	Drifting Buoy	6203588	Mar-Oct	4800	1F
EU	Drifting Buoy	6203601	Apr-Jul	1243	6H
EU	Drifting Buoy	6203607	Jan-Apr	1458	6G 6H
EU	Drifting Buoy	6203612	Nov-Dec	139	6G
EU	Drifting Buoy	6203613	Oct-Dec	1570	4Vs4W 4X 5Ze6B 6C 6D 6E
EU	Drifting Buoy	6203624	Dec-Dec	655	6B 6C 6D



USA	Drifting Buoy	6203772	Nov-Dec	787	6E
USA	Drifting Buoy	6203777	Sep-Oct	862	4Vs4W 6B 6C 6D 6E
USA	Drifting Buoy	6203778	Jan-Dec	7463	0B 1E 1F 2G 2H 2J
USA	Drifting Buoy	6203779	Jan-Nov	588	0B 2G 3K
USA	Drifting Buoy	6203781	Jan-Feb	888	2J 3K
USA	Drifting Buoy	6203783	Jan-Jan	3	2G
USA	Drifting Buoy	6203784	Jan-Apr	2170	2J 3K 3L 3M 3N
USA	Drifting Buoy	6203785	Jan-Mar	1040	1F 2H
USA	Drifting Buoy	6203786	Jan-Mar	1083	2J 3K 3L 3M
USA	Drifting Buoy	6203787	Jan-Nov	5915	3K 3L 3M 3N
USA	Drifting Buoy	6203789	Jan-Dec	1588	3K 3L 3M 3N
USA	Drifting Buoy	6203790	Jan-Feb	645	2J 3K
USA	Drifting Buoy	6203792	Jan-Jan	182	2G
USA	Drifting Buoy	6203793	Jan-Mar	1264	2J 3K
USA	Drifting Buoy	6203794	Jan-Oct	4693	2H 2J 3K 3L 3M
USA	Drifting Buoy	6203795	Jan-Jul	1883	2J 3K 3M
USA	Drifting Buoy	6203796	Jan-Feb	650	0B 1E
USA	Drifting Buoy	6203797	Jan-Dec	6865	0B 1F 2G 2H 2J 3K
USA	Drifting Buoy	6203799	Jan-Nov	5700	1F 2G 2H 2J 3K 3L 3M
USA	Drifting Buoy	6203800	Jan-Apr	1046	2J 3K 3M
USA	Drifting Buoy	6203802	Jan-Jun	2805	2J 3K 3L 3M
USA	Drifting Buoy	6203803	Jan-Mar	1026	1F 2J 3K
USA	Drifting Buoy	6203804	Jan-Dec	5596	2G 2H 2J 3K 3L 3M
USA	Drifting Buoy	6203806	Jan-Jul	3513	2J 3K 3L 3M
USA	Drifting Buoy	6203807	Jan-Dec	7248	1E 1F 2G 2H 2J 3K
USA	Drifting Buoy	6203808	Jan-Aug	4255	2J 3K 3L 3M
EU	Drifting Buoy	6203845	Mar-Jun	1763	3M 3N
EU	Drifting Buoy	6203848	Apr-Dec	5291	4Vs6E 6F
EU	Drifting Buoy	6203851	Apr-Jul	1514	6G
EU	Drifting Buoy	6301572	Nov-Dec	462	1F 2J

EU	Drifting Buoy	6301575	Nov-Dec	884	1F
EU	Drifting Buoy	6301576	May-Jun	1001	1F
EU	Drifting Buoy	6401581	Mar-Mar	162	1F
EU	Drifting Buoy	6401583	Dec-Dec	71	1F
EU	Drifting Buoy	6401759	Jan-Jun	1644	1F
EU	Drifting Buoy	6401760	Jan-Dec	8195	0B 1C 1D 1E 1F 2G
EU	Drifting Buoy	6401761	Jan-Oct	6442	1B 1C 1D 1E 1F 2G 2H
USA	Drifting Buoy	6401832	Jan-Nov	6100	0B 1E 1F 2G 2H 2J 3K 3L 3M
USA	Drifting Buoy	6401836	Apr-Nov	4279	1B 1C 1D 1E 1F
USA	Drifting Buoy	6401872	Jul-Nov	2302	1C 1D 1E 1F
USA	Drifting Buoy	6402512	Jan-Mar	1302	1F 2J
USA	Drifting Buoy	6402523	Jan-Feb	891	1C 1D 1E
USA	Drifting Buoy	6402531	Jan-Mar	801	1E 1F
USA	Drifting Buoy	6402547	Jan-Jan	333	1F 2J 3K
USA	Drifting Buoy	6402551	Jan-Dec	7734	1F 2G 2H 2J 3K 3L 3M
USA	Drifting Buoy	6402559	Jan-Apr	1065	2G 2H
USA	Drifting Buoy	6402570	Jan-Jan	3	3Ps
USA	Drifting Buoy	6402572	Jan-Feb	439	2J 3K
USA	Drifting Buoy	6402587	Jan-Dec	7033	2H 2J 3K 3L 3M
USA	Drifting Buoy	6402589	Jan-Feb	688	2J 3K
USA	Drifting Buoy	6402591	Jan-Feb	678	2J 3K
USA	Drifting Buoy	6402592	Jan-Nov	5775	1E 1F 2G 2H 2J 3K
EU	Drifting Buoy	6402594	Jan-Dec	7634	1F 2G 2H 2J
EU	Drifting Buoy	6402596	Jan-Feb	332	1F
EU	Drifting Buoy	6402597	Jan-Nov	5852	2G 2H 2J 3K 3L 3M
EU	Drifting Buoy	6402598	Jan-Mar	1107	1D 1E
USA	Drifting Buoy	6402599	Jan-Aug	4279	2H 2J 3K 3L 3M
USA	Drifting Buoy	6402611	Jan-Jun	2298	3K 3L 3M
USA	Drifting Buoy	6402656	Jan-Jul	1549	1F 2J
USA	Drifting Buoy	6402683	Mar-Jul	755	1F 2H 2J 3K

USA	Drifting Buoy	6402729	Oct-Dec	1787	1E 1F
USA	Drifting Buoy	6501703	Jan-Mar	1319	3L 3N
Canada	Drifting Buoy	6801509	Jan-Jun	527	2J 3K 3L
Canada	Drifting Buoy	6801761	Sep-Sep	195	5Y
Canada	Drifting Buoy	7801561	Sep-Dec	2178	4W 4X 5Y
Canada	Drifting Buoy	7801562	Sep-Nov	1377	4X 5Y
Canada	Drifting Buoy	7801563	Sep-Dec	2443	4X

*Buoys marked by this symbol also measure waves

Dates are of first and last data reports within the NAFO Convention Area

Viking buoys are not shown in this table; see Table 3

Table 7. Water level data collected in 2022

Station ID	Name	Reporting period (months)	Longitude (W)	Latitude (N)	NAFO	Sub-Area
65	Saint John	Jan-Dec	66.063	45.251	4X	
365	Yarmouth	Feb-Dec	66.1167	43.8333	-	
491	Bedford Institute	Jan-Dec	63.6167	44.6833	4W	
575	Port Hawkesbury	Jan-Dec	45.6167	61.3667	-	
612	North Sydney	Jan-Dec	60.25	46.2167	-	
665	Port aux Basques	Jan-Dec	59.1333	47.5667	-	
755	St. Lawrence	Jan-Dec	55.3901	46.9168	-	
835	Argentia	Jan-Dec	53.9833	47.3	3Ps	
905	St. John's	Jan-Dec	52.7167	47.5667	-	
990	Bonavista	Jan-Dec	53.115	48.651	-	
1430	Nain	Jan-Aug	61.6833	56.55	-	
1700	Charlottetown	Jan-Dec	63.1167	46.2333	4T	
1805	Shediac Bay	Jan-Dec	64.546	46.227	4T	
1970	Cap-aux-Meules	Jan-Sep	61.8573	47.3789	-	
2000	Lower Escuminac	Jan-Dec	64.8833	47.0833	4T	
2145	Belledune	Jan-Dec	65.85	47.9	-	
2330	Rivière-au-Renard	Jan-Dec	64.3805	48.997	4T	
2780	Sept-Îles	Jan-Dec	66.3768	50.1948	-	
2985	Rimouski	Jan-Dec	68.5137	48.4783	4T	
3057	Saint-Joseph-de-la-Rive	Jan-Dec	70.3655	47.4488	4T	
3075	Banc du Cap Brûlé	Mar-Dec	70.710833	47.0895	4T	
3100	Saint-Francois Île d'Orléans	Jan-Dec	70.8082	46.9965	4T	
3110	Saint-Laurent île d'Orléans	Jan-Dec	71.0033	46.8582	4T	
3248	Vieux-Québec	Jan-Dec	71.2019	46.8111	-	
3280	Neuville	Jan-Dec	46.6965	71.57283	-	
3300	Portneuf	Jan-Dec	46.68117	71.87717	-	
3335	Deschaillons-sur-Saint-Laurent	Jan-Dec	46.561	72.10583	-	
3345	Batiscan	Jan-Dec	46.50033	72.24583	-	
3353	Bécancour	Jan-Dec	46.40033	72.3795	-	
3360	Trois-Rivières	Jan-Dec	46.3405	72.53917	-	
3365	Port-Saint-François	Jun-Dec	46.2725	72.61933	-	
3424	Baie-Sainte-Catherine	Jan-Dec	48.1264	69.7297	-	
3460	Port-Alfred	Jan-Dec	48.334	70.86917	-	
3480	Chicoutimi	Jan-Dec	48.43083	71.05483	-	
3980	Qikiqtarjuaq	Jan-Dec	64.031752	67.56052	0A	