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NAFO STACFEN Report 2020

Inventory of environmental data collected in the NAFO Convention Area, 2020

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Abstract

The Marine Environmental Data Section (MEDS) of the Oceans Science branch, as the Regional Environmental Data Center for NAFO, is required to provide an annual inventory of environmental data collected in the NAFO Convention 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 2020 are included.

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

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

In the NAFO Convention Area, a variety of oceanographic surface, near surface and subsurface observations, including vertical profiles of parameters such as temperature, salinity, oxygen, nutrients and other chemical and biological variables, are being made every day by ships borne instruments and autonomous devices. 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 2020. 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 2020.

Data Type	Platform Type	Counts/Duration	Table #	Figure #
Oceanographic profiles	Autonomous drifting (Argo)	4234* profiles from 178 platforms	3	1
	Moorings (Viking)	154* profiles from 4 platforms**	3	1
	Gliders	4086* profiles from 5 platforms	3	1
	Ship	2771 profiles (1042 CTD; 1273 CTD*; and 456 bottle profiles) from at least 16 ships	4	2a
Surface/near-surface observations	Ship (thermosalinograph)	1438* obs. from 1 ship	4	3
	Drifting buoys	1141888* obs. from 311 buoys	6	3
	Moored buoys	258546* obs. from 20 buoys**	6	3
	Fixed platforms	100204* obs. from 3 platforms	6	3
	Water level gauges	12 sites, avg. ~1 year each	7	3

* 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 2020 in NAFO Convention Area and acquired between January 2020 and May 2021.

Data Type	Platform Type	Counts/Duration	Table #	Figure #
Oceanographic profiles	Ship	4801 profiles (1489 CTD + 3302* bottle + 10 XBT profiles) from 15 ships	5	2b

* The bottle data include 482 bottle profiles from BIO's BioChem in 2019 that was not included in the 2019 report.

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. In 2020, no Argo-equivalent floats reported within the NCA.

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 (CEO-TR) 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 CEO-TR.

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 2a and 2b, 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. These data are included in Figure 2a.

MEDS also periodically queries the World Ocean Database and ICES Oceanographic Database for additional data in the NAFO Convention Area (NCA). Due to time restrictions in the preparation of the report, these sources of data could not be included in this year's report.

Near-surface observations

Moored buoys and fixed stations (Figure 3, 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 2020. 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 3, 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 3, Table 5)

MEDS decodes and stores all thermosalinograph data circulating on the GTS. In 2020, one ship (from Canada) reported thermosalinograph data in the NCA.

Water level gauges (Figure 3, 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

The DFO Atlantic Zone Monitoring Program (AZMP) activities 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 maintains program information and publications at <http://www.meds-sdmm.dfo-mpo.gc.ca/isdm-gdsi/azmp-pmza/index-eng.html>. Data can be requested through MEDS: <https://www.meds-sdmm.dfo-mpo.gc.ca/isdm-gdsi/program/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 2020.

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 http://www.argo.ucsd.edu/Argo_data_and.html.
- *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.nodc.noaa.gov/GTSPP/access_data) and to the Copernicus Environment Monitoring Service where they are made available in "near real time in situ" products (http://marine.copernicus.eu/services-portfolio/access-to-products/?option=com_csw&view=details&product_id=INSITU_GLO_NRT_OBSERVATIONS_013_030). 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 (<http://emodnet-physics.eu/Map>).
- *Canadian bottle and plankton data:* Data are available from the BioChem Database (<https://www.dfo-mpo.gc.ca/science/data-donnees/biochem/index-eng.html>).
- *Delayed-mode Canadian oceanographic profiles:* Data are exchanged bilaterally with the World Ocean Database (https://www.nodc.noaa.gov/OC5/WOD/pr_wod.html). Synchronization is however a work in progress and one may need to allow from months to more than a year for Canadian data to become available from these databases after it has been collected.
- *Drifting buoy equatorial moored buoy data from the GTS:* These are sent to the US NOAA National Centers for Environmental Information Ocean Archive System on a yearly basis (<https://www.nodc.noaa.gov/cgi-bin/OAS/prd/text/query>).
- *Canadian moored buoys:* Data are made available on a national website within days of collection (updates on business days): <http://www.meds-sdmm.dfo-mpo.gc.ca/isdm-gdsi/waves-vagues/index-eng.htm>.
- *Canadian water levels:* Data are available from two national websites: <http://waterlevels.gc.ca/> (last 24 hours) and <http://www.meds-sdmm.dfo-mpo.gc.ca/isdm-gdsi/twl-mne/index-eng.htm> (validated, historical). Relevant stations data are shared with international initiatives such as the Permanent Service for Mean Sea Level, Global Sea Level Observing System and IOC Sea Level Station Monitoring facility.
- *Canadian moorings:* Data are available from BIO (<http://www.bio.gc.ca/science/data-donnees/base/index-en.php>) and MLI (<https://slgo.ca/app-sgdo/en/accueil.html>) depending on the site locations.
- *Gliders:* Full resolution glider data from measured by CEOTR can be accessed from their website: <http://ceotr.ocean.dal.ca/>. Information on DFO glider deployments can be accessed from the "Everyone's Glider Observations" website: <https://www.ego-network.org/dokuwiki/doku.php> and the data can be accessed from: <https://www.ego-network.org/dokuwiki/doku.php?id=public:dataaccess>.
- *Marine mammals:* Observations from sensors mounted on marine mammals can be accessed from the MEOP website: <http://www.meop.net/>
- *Other MEDS data:* Canadian oceanographic data and global drifting buoy data can be requested through this form: <http://www.meds-sdmm.dfo-mpo.gc.ca/isdm-gdsi/request-commande/form-eng.asp>.

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

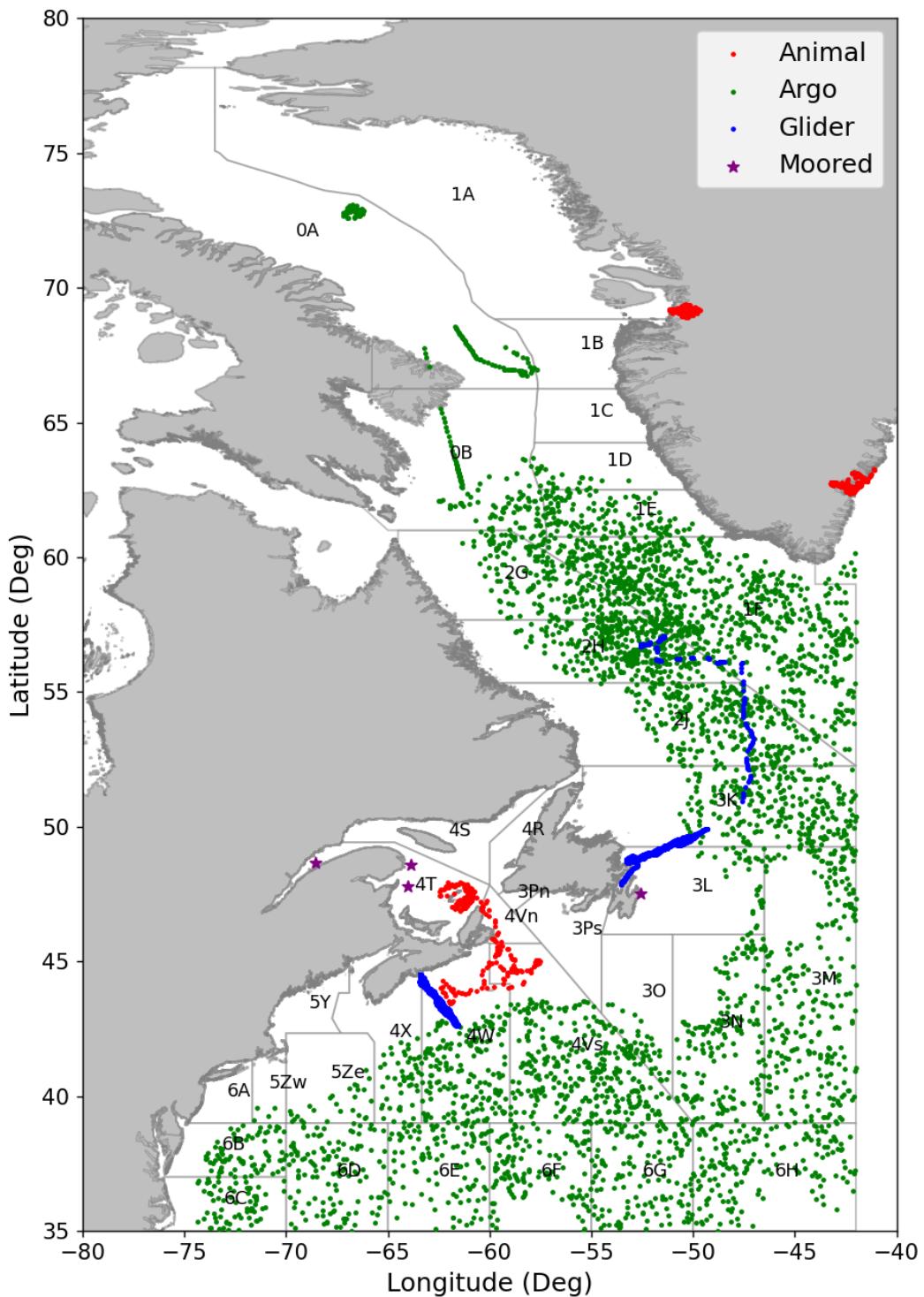


Figure 1. Position of profiles sampled by autonomous platforms in 2020.

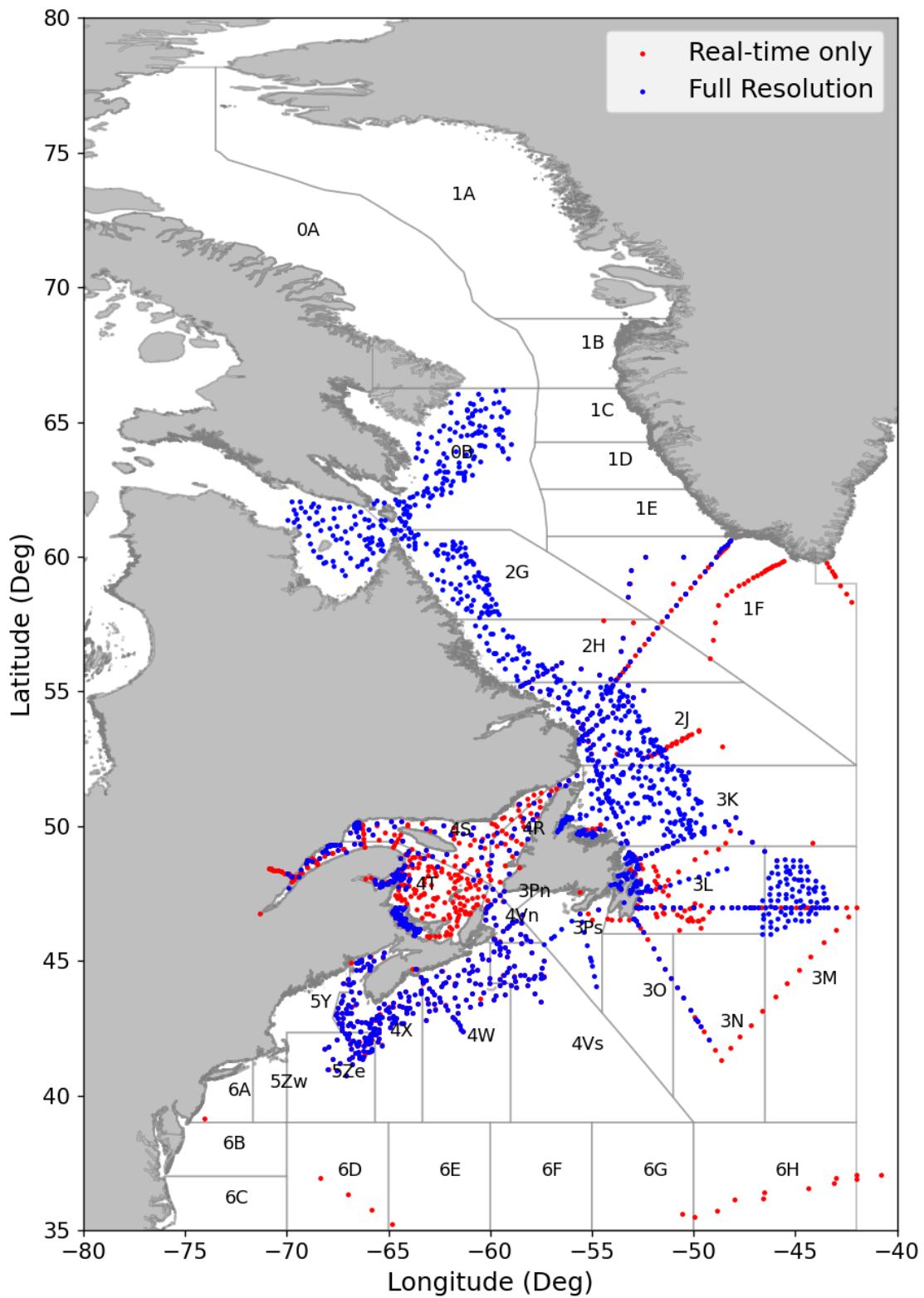


Figure 2a. Position of profiles sampled by ships in 2020.

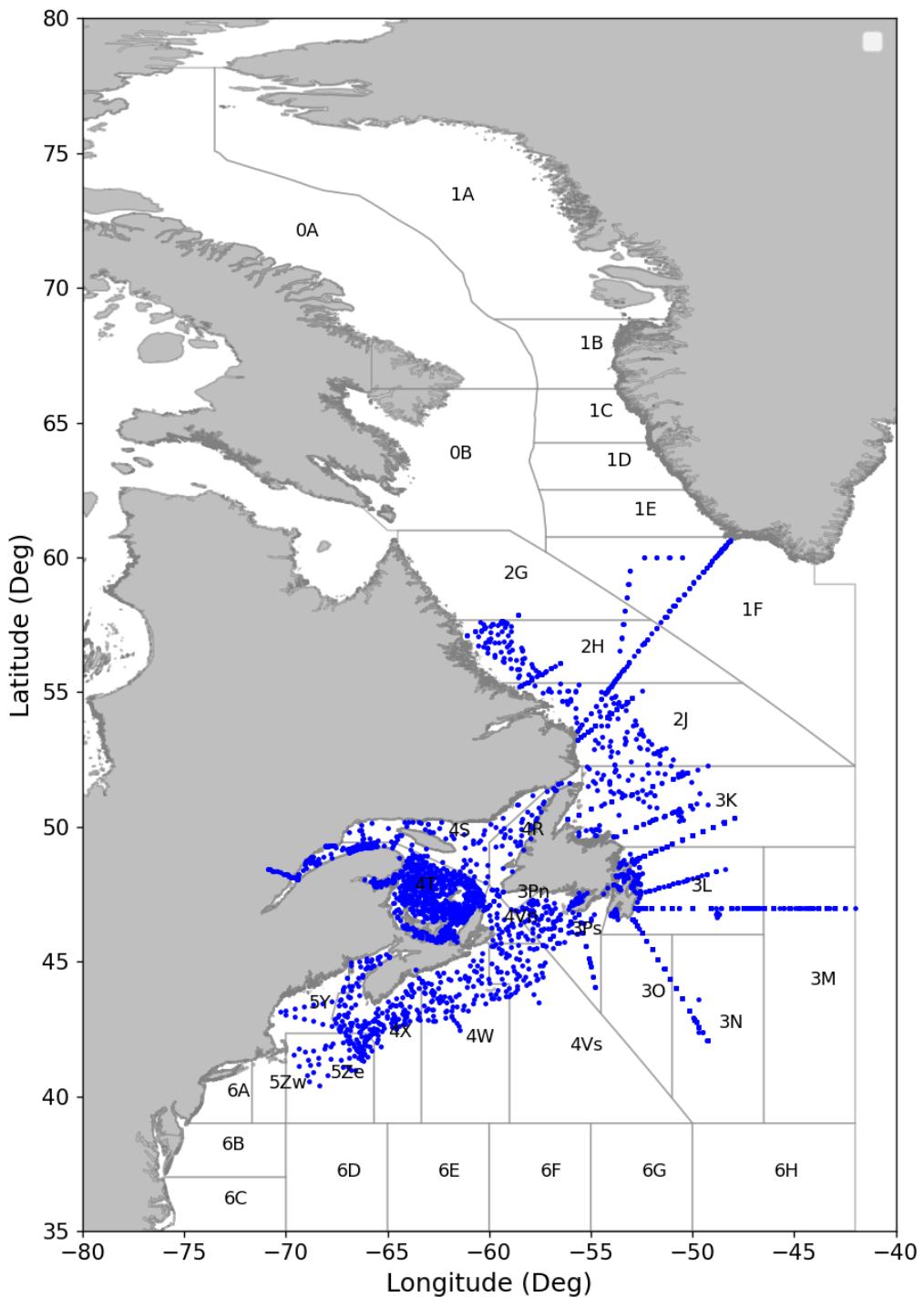


Figure 2b. Position of profiles sampled by ships before 2020 and acquired in 2019/2020. This includes bottle profiles from BIO in 2019 that were not included in the 2019 report.

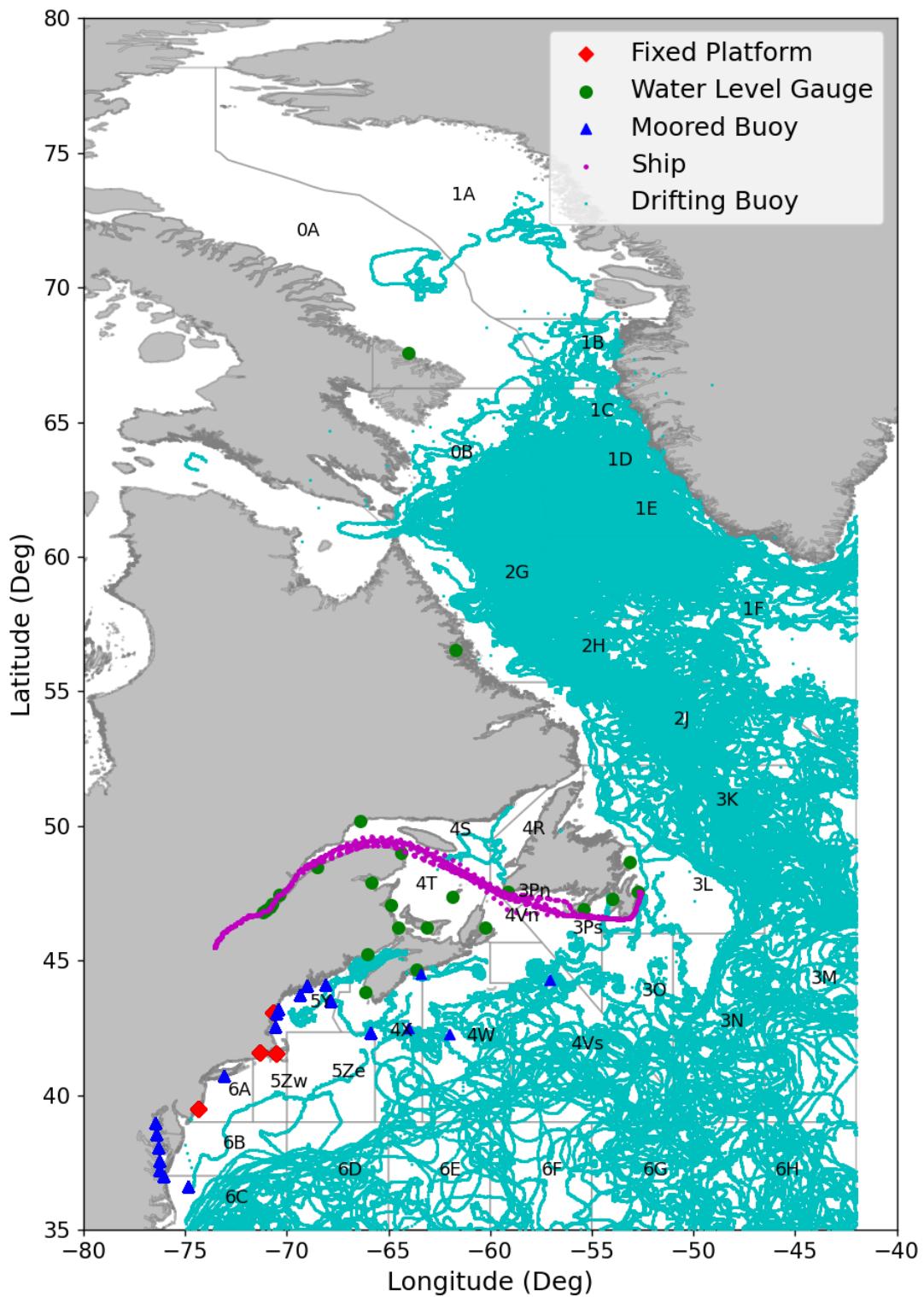


Figure 3. Position of near surface observations made in 2020.

Table 3. Real-time temperature and /or salinity profiles from autonomous platforms collected and processed in 2020.

Platform Type	Platform Name	Country	WMO ID	Start	End	Profiles	NAFO Subareas
moored	PMZA-RIKI	Canada	4400481	Sep	Nov	21	4T
moored	IML-BA	Canada	4400483	Sep	Nov	65	4T
moored	AZMP-VAS	Canada	4400485	Sep	Nov	49	4T
moored	AZMP-STA27	Canada	4400486	Oct	Nov	19	3L
glider	SEA019	Canada	4800925	Feb	Oct	936	4W 4X
glider	SEA032	Canada	4800937	Oct	Oct	163	4W
glider	SEA022	Canada	4800993	Mar	Oct	1720	4W 4X 3L 3K
glider	SEA024	Canada	4800994	Jul	Jul	195	4W 4X
glider	Pearldiver	Canada	6801735	Jan	Nov	1072	3K 2J 1F 2H
argo		USA	3901219	Jan	Apr	12	6G 4Vs 6H
argo		Germany	3901601	Jan	Dec	37	6D 4W 4Vs 30
argo		Germany	3901602	Jan	Dec	37	6H 6G 6F 4Vs 30
argo		Germany	3901603	Jan	Sep	26	4Vs 4W 6G
argo		Germany	3901604	Sep	Dec	11	6C 6B 6D 6E
argo		Germany	3901637	Jan	Jan	1	6H
argo		Germany	3901638	Jan	May	10	3M 3N
argo		Germany	3901639	Jan	Feb	6	4X 5Ze 6E
argo		Germany	3901640	Jan	Jun	14	3M 3N 6H
argo		Germany	3901641	Jan	Mar	8	6D 4W
argo		Germany	3901656	Jan	Jul	20	6D 6E
argo		Germany	3901668	Jan	Dec	52	2H 1F 2G
argo		Germany	3901669	Jan	Dec	57	1F 2J 2H
argo		Poland	3901851	May	Dec	22	1F 1E 0B 2G 2H 2J 6C 6B 6D 6E 4X 4W 4Vs 6G 3N 3M 6H
argo		EU	3901987	Mar	Aug	52	6H
argo		USA	4901594	Jan	Dec	38	4Vs 30 3N 3M 6H 6D 6B 6E 4W 4X 6F 4Vs
argo		USA	4901621	Jan	Dec	38	6E
argo		USA	4901630	Jun	Jul	3	5Ze 6B 6D 6E 6F
argo		USA	4901631	Jan	Dec	33	6G 6H
argo		USA	4901699	Jan	May	11	6F 6E 6D 6C 6B
argo		USA	4901702	Feb	Dec	10	3N 6H 6G 4Vs
argo		USA	4901721	Jan	Dec	35	2J 3K 3L 3M
argo		Canada	4901747	Jan	Dec	29	6E 4W 4X 4Vs
argo		Canada	4901788	Jan	Nov	28	6H 3N 6G 4Vs 3M
argo		Canada	4901798	Jan	Jun	16	1F 1E
argo		Canada	4901809	Nov	Dec	6	1F
argo		Canada	4901817	Dec	Dec	3	6C 6B 6D 6E 4X 6F
argo		USA	4902102	Jan	Dec	33	6G 6F
argo		USA	4902104	Mar	Sep	13	6H 6G
argo		USA	4902108	Oct	Dec	7	6H 6G



argo	USA	4902111	Jan	Dec	40	4Vs 30 4W
argo	USA	4902112	Jan	Oct	29	6H 3N 4Vs 6G 6F
argo	USA	4902114	Jan	Dec	38	4Vs 6G 6F 4W
argo	USA	4902118	Jan	Dec	37	1F 2G 0B 2H 2J 3K
argo	USA	4902119	Jan	Dec	37	1E 1F 2G 0B 6E 6F 4Vs 6G 6H
argo	USA	4902120	Jan	Dec	33	3N 6C 6B 6D 6E 4W
argo	USA	4902121	May	Dec	24	4Vs
argo	USA	4902122	Jan	Jun	7	4Vs 4W
argo	USA	4902337	Jan	Dec	71	4W 6F 4Vs 6G 30 6B 6C 6D 6E 4W
argo	USA	4902344	Jan	Dec	37	6F 4Vs 6G
argo	USA	4902346	Jan	Jan	3	6E 5Ze 6B 6D 6E
argo	USA	4902348	Jan	Dec	38	4W 6F 4X
argo	Canada	4902392	Jan	Dec	27	3N 6G 6H 3M
argo	Canada	4902394	Jan	Dec	31	4W 4X 4Vs 6F 30
argo	Canada	4902395	Jan	Dec	37	2J 2H 2G 1F
argo	Canada	4902399	Jan	Apr	10	2J 2H
argo	Canada	4902400	Jan	Oct	30	3M 3N 6H
argo	Canada	4902409	Jan	Dec	12	1F
argo	Canada	4902410	Jan	Apr	11	3L 3N 3M
argo	Canada	4902424	Jan	Dec	26	3M 3N
argo	Canada	4902438	Jan	Sep	28	2H 2J 3K 3L 3M
argo	Canada	4902439	Jan	Dec	37	1F 2H
argo	Canada	4902440	Feb	Feb	1	3M
argo	Canada	4902441	Jan	Dec	36	4Vs 4W
argo	Canada	4902442	Jan	Dec	36	6E 4W 4Vs 6F 6G
argo	Canada	4902452	Jan	Oct	28	2J 3K 6F 6G 3N 4Vs 3M
argo	Canada	4902455	Jan	Dec	33	6H
argo	Canada	4902456	Jan	Dec	36	3M 3N 4W 4X 5Ze 6B 6C
argo	Canada	4902467	Jan	Dec	36	6D 6E
argo	Canada	4902468	Jan	Dec	36	3K 3L 3M
argo	Canada	4902469	Jan	Dec	37	2G 2H 1F 4W 4X 5Ze 6D 6E
argo	Canada	4902470	Jan	Jun	16	6F
argo	Canada	4902471	Jan	Dec	37	1F 2G 2H
argo	Canada	4902477	Jan	Dec	36	1F 2J
argo	Canada	4902478	Jan	Dec	37	2H 2G 1F
argo	Canada	4902479	Jan	Dec	36	2G 1F 2H 2J
argo	Canada	4902480	Jan	Oct	29	1F 2H
argo	Canada	4902481	Jan	Dec	35	2H 1F
argo	Canada	4902487	Jan	Dec	36	1F
argo	Canada	4902488	Jan	Dec	36	1F 2G 2H 2J 3K 3M
argo	Canada	4902489	Jan	Dec	37	2H 1F 2J



argo	Canada	4902495	Jan	Dec	37	1F
argo	Canada	4902496	Jan	Dec	28	3M
argo	Canada	4902497	Jan	Dec	32	3N 3M 3N 3M 6H 6G 4Vs
argo	Canada	4902498	Jan	Dec	37	30
argo	Canada	4902499	Jan	Dec	37	3N 30 3M 6H
argo	Canada	4902500	Oct	Dec	9	4W 4Vs
argo	Canada	4902501	Oct	Dec	10	4W 4Vs
argo	Canada	4902502	Oct	Dec	9	4Vs
argo	Canada	4902503	Oct	Dec	9	4Vs 4W
argo	Canada	4902504	Aug	Dec	16	1F 2H
argo	Canada	4902505	Aug	Dec	17	2H 1F
argo	Canada	4902506	Aug	Dec	15	1F 2G
argo	Canada	4902507	Aug	Dec	16	1F 1E 0B 2G
argo	Canada	4902508	Aug	Dec	15	1F 1E
argo	Canada	4902509	Aug	Dec	17	2H
argo	Canada	4902510	Aug	Dec	17	2H 1F
argo	Canada	4902511	Aug	Dec	16	1F 2H
argo	Canada	4902512	Aug	Dec	15	1F
argo	Canada	4902513	Aug	Dec	14	1F 1E
argo	Canada	4902523	Oct	Dec	9	4W 4X
argo	Canada	4902524	Oct	Dec	9	4W 4Vs
argo	Canada	4902526	Nov	Dec	4	3N
argo	Canada	4902527	Nov	Nov	1	3M
argo	Canada	4902528	Nov	Nov	1	3M
argo	Canada	4902529	Nov	Dec	4	3N
argo	USA	4902910	Jan	Dec	38	4Vs 6G 6H 3N 6F 6E 4W 4Vs 6F 6G
argo	USA	4902911	Jan	Sep	22	6H
argo	USA	4902912	Jan	May	27	6C
argo	USA	4902913	Feb	Dec	32	6E 4W 4X 5Ze 6D 6B 6C 6D 6E 6F
argo	USA	4902927	Jan	Dec	37	4Vs 6G 4W
argo	USA	4902928	Mar	Dec	14	6C 6B 6D 5Ze 5Zw
argo	USA	4903035	Jan	Dec	32	3N 4Vs 6G 6H
argo	USA	4903036	Jan	Dec	18	6F 6E 6D 6C 6B
argo	USA	4903042	Jan	Dec	14	6C 6B 6D 6E 6C 6D 6E 4W 6F
argo	USA	4903043	Jul	Dec	17	4Vs 6G
argo	USA	4903044	Oct	Dec	9	6C 6B 6D 6E
argo	USA	4903046	Aug	Dec	18	1F 2J
argo	USA	4903047	Jan	Jan	1	6E 30 4Vs 4W 6E 6G 3N 6H
argo	USA	4903048	Jan	Aug	25	6B 6D 6E 4X 4W 6F 4Vs
argo	USA	4903049	Jan	Dec	37	

argo	USA	4903050	Jul	Dec	16	6C 6D 6E 4W 6B 6C 6D 6E 4W 4X 5Ze 5Zw
argo	USA	4903260	Jan	Dec	37	6H
argo	USA	4903329	Nov	Dec	5	1F 1E
argo	USA	5904173	Nov	Dec	6	3K
argo	USA	5904176	Jan	Mar	8	2J 3K
argo	USA	5904771	Jan	Dec	30	3L 3N 6H 6G
argo	USA	5904772	Feb	Nov	24	1F 1E 2G 2H 2J
argo	UK	6901167	Jan	Jun	18	1F 2G
argo	UK	6901169	Jan	Dec	37	1F 2G
argo	UK	6901170	Mar	Dec	30	1F
argo	UK	6901171	Jan	Dec	35	1F
argo	UK	6901173	Jan	Dec	35	3K 2J 1F
argo	UK	6901178	Jan	Dec	36	2H 2J 3K 3L 3M 3N
argo	UK	6901191	Jan	Dec	38	3K 3L 3M 2J
argo	UK	6901194	Jan	Dec	37	0B 1E 1F 2G 2H
argo	UK	6901200	Dec	Dec	3	1D 0B 2G 2H 2J 3K 3L
argo	UK	6901207	Jan	Dec	37	1E 0B 1F 2G 2H 2J 3K 3L 3M
argo	France	6901719	Jan	Dec	34	1F
argo	France	6901720	Oct	Dec	9	3M 3K
argo	France	6901721	Jan	Dec	19	1F
argo	France	6901722	Jan	Aug	16	2H 2G 1F
argo	France	6901751	Jan	May	15	6H
argo	France	6901753	Mar	Nov	13	3K 3M
argo	Ireland	6901921	Jan	Dec	45	1F 1E 0B 1D 2G 2H
argo	Ireland	6901923	May	Dec	29	1F 1E 2G
argo	Ireland	6901925	Sep	Dec	14	1F 1E
argo	France	6902659	Jan	Aug	21	6H 3M
argo	France	6902661	Jan	Apr	11	6H
argo	France	6902662	Feb	Nov	26	3K 3M
argo	France	6902684	Jan	Dec	36	1F 2H 2G
argo	France	6902686	Jan	Dec	35	2H 1F
argo	France	6902694	Jan	Dec	37	1E 0B 1D
argo	France	6902695	Jul	Dec	17	1F 1E 2G
argo	France	6902707	Jan	Mar	8	3N 3M
argo	France	6902709	Jan	Oct	5	3M 3K
argo	France	6902727	Jan	Nov	64	0A
argo	France	6902752	Aug	Sep	3	1F
argo	France	6902753	Jan	May	14	3L 3M 3K
argo	France	6902754	Jan	Dec	37	1F 1E 2G 2H 2J
argo	France	6902755	Jan	Dec	37	0B 1E 1D 2G 2H 2J
argo	France	6902756	Jan	Dec	37	0B 1E 1D 2G 2H 2J
argo	France	6902787	Jan	Dec	36	1E 1D 0B 2G 2H
argo	France	6902788	Mar	Mar	1	

argo	France	6902789	Jan	Nov	33	1F 1E 2G 2H
argo	France	6902792	Jan	Oct	28	1F
argo	France	6902800	Feb	Dec	32	1F 1E 2G
argo	France	6902802	Jan	Jun	18	1F
argo	France	6902805	Mar	Dec	30	1F 1E 2G
argo	France	6902863	Jan	Dec	31	2J 3K 3L 3M
argo	France	6902865	Jan	Dec	36	2J 1F
argo	France	6902886	Aug	Dec	14	1F 1E
argo	France	6902888	Aug	Dec	14	1F 1E 0B 2G
argo	France	6902952	Jan	Nov	72	0A 1B
argo	France	6902967	Jan	Oct	64	0A 0B
argo	France	6902970	Aug	Dec	15	2J 3K
argo	France	6902971	Jul	Jul	2	3M
argo	France	6902973	Jul	Jul	2	3M
argo	France	6902976	Aug	Dec	15	2H 1F
argo	France	6902978	Aug	Dec	9	3M 3K
argo	France	6903029	Aug	Dec	15	2J 3K
argo	France	6903030	Aug	Dec	14	2H 1F
argo	France	6903032	Aug	Dec	15	1F
argo	France	6903034	Aug	Dec	15	1F 2G
argo	Germany	7900527	Jan	Nov	22	3K 3L 3M 2J
argo	Germany	7900528	Jan	Feb	6	3K 3M
argo	Germany	7900529	Feb	Feb	2	3M
argo	Germany	7900566	Aug	Dec	19	2H 2G
animal		990124619	Dec	Dec	17	4T
animal		990124620	Jan	Apr	296	4Vs 4W 4Vn 4T
animal		990124919	Dec	Dec	18	
animal		990124920	Jan	Apr	223	
animal		990125019	Dec	Dec	15	1A
animal		990125020	Jan	Mar	142	1A
animal		990125219	Dec	Dec	18	
animal		990125220	Jan	Apr	312	
animal		990138820	Jul	Dec	403	1A
animal		990138920	Jul	Dec	330	1A
animal		990139020	Jul	Oct	289	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 2020.

Platform	Country	Mission	First Date	Last Date	CTD	CTD RT*	Bottle	NAFO Subareas
Unknown	Unknown	(various)	20200106	20201216	0	68	0	4W 4T 2H 1F 2J 4W 4R
Hudson	Canada	18DL20001	20200722	20200811	0	0	45	3L
Hudson	Canada	18HU15115	20201101	20201101	0	0	3	3L 3Ps 5Ze 4X 4W 4Vs
Hudson	Canada	18HU20063	20201004	20201014	0	0	51	4Vn 3Pn 3Ps
L'Alliance	Canada	18K820001	20201026	20201026	4	0	0	4T
Leim	Canada	18LO20015	20200710	20200716	24	0	0	4S
Leim	Canada	18LO20027	20200926	20200928	4	0	0	4T
Leim	Canada	18LO20029	20201002	20201010	18	0	0	4T
M. Perly	Canada	18MU20001	20200916	20201008	35	0	0	4T
M. Perly	Canada	18MU20150	20200710	20200805	53	0	0	4T
Alfred Needler	Canada	18NE15457	20201101	20201101	0	0	1	3L 5Ze 4X 5Y 4W
Alfred Needler	Canada	18NE20025	20200705	20200808	0	0	163	4Vs 4Vn 3M 3L 3K 3N 3O
Alfred Needler	Canada	18NE20120	20201110	20201201	0	0	57	3Ps
Alfred Needler	Canada	18NE20533	20201106	20201110	10	0	1	3L 3K
Alfred Needler	Canada	18NE20534	20201118	20201130	40	0	1	3K 3L
Alfred Needler	Canada	18NE20535	20201203	20201212	20	0	1	3K 3L
Teleost	Canada	18TL15143	20201101	20201101	0	0	1	3L
Teleost	Canada	18TL15144	20201101	20201101	0	0	20	3L 3Ps
Teleost	Canada	18TL15148	20201101	20201101	0	0	14	3L 3K 2J
Teleost	Canada	18TL20002	20200301	20200313	0	0	31	5Ze 4W
Teleost	Canada	18TL20012	20200813	20200905	66	0	0	4R 4S 4Vn 4T
Teleost	Canada	18TL20102	20200308	20200320	0	0	37	4X 5Y 4W
Teleost	Canada	18TL20208	20200801	20200806	6	0	0	3L
Teleost	Canada	18TL20210	20200720	20200730	77	0	25	3K 3L 2J 2H
Teleost	Canada	18TL20212	20201013	20201020	35	0	1	3L 2J
Teleost	Canada	18TL20213	20201022	20201031	46	0	0	2J 2H
Teleost	Canada	18TL20214	20201106	20201116	38	0	0	2J
Teleost	Canada	18TL20215	20201121	20201129	24	0	0	3K
Teleost	Canada	18TL20216	20201203	20201215	55	0	0	3K 2J
Sigma-t	Canada	18VA20666	20200114	20201214	0	0	4	4W
Vladykov	Canada	18VD20125	20200725	20200731	11	0	0	3L
Vladykov	Canada	18VD20135	20200802	20200808	9	0	0	3L
Vladykov	Canada	18VD20136	20200812	20200812	1	0	0	3L
Vladykov	Canada	18VD20137	20200815	20200818	10	0	0	3L
Vladykov	Canada	18VD20138	20200827	20200903	20	0	0	3K
Vladykov	Canada	18VD20139	20200906	20200916	19	0	0	3K
Vladykov	Canada	18VD20140	20200921	20200925	10	0	0	3L
Vladykov	Canada	18VD20141	20200929	20200929	1	0	0	3L
Vladykov	Canada	18VD20142	20201001	20201013	16	0	0	3L



Vladykov	Canada	18VD20143	20201014	20201014	3	0	0	3L
Vladykov	Canada	18VD20144	20201018	20201026	5	0	0	3L 3K 3Ps
Vizconde de Eza	Spain	29VE200624	20200630	20200729	75	0	0	3M 3L
Katsheshuk II	Canada	VAAI20115	20200722	20200823	307	0	0	2G 0B
Maersk Visby	Singapore		20200918	20200921	0	5	0	6E 6D 6A
Vladykov	Canada		20190815	20190916	0	23	0	3L 3K
Leim	Canada		20200710	20201010	0	42	0	4S 4T 3L 4Vs 4Vn 4W
Alfred Needler	Canada		20191025	20200808	0	199	0	4X 5Ze 5Y
Acadia	Canada		20200715	20200731	0	358	0	3M 3L 3K 2J 2H 4R 4S 3Pn 4Vn
helicopter	Canada		20200302	20200315	0	109	0	4T 3M 3N 3K 3L
Hudson	Canada		20201110	20201201	0	232	0	3Ps
Amundsen	Canada		20200722	20200809	0	61	0	1F 2J 2H 4R 4W
Viola M. Davidson	Canada		20191217	20201117	0	9	0	4X
M. Perly	Canada		20200710	20201008	0	88	0	4T
Maria S. Merian	Germany		20200810	20200829	0	67	0	1F 3K 2J 3L 2H
Chicago Express	Germany		20200717	20200831	0	12	0	6H 6G

* 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. Dates are of first and last data reports within the NAFO Convention Area. No TSG or XBT data was received for 2020. Additional full resolution CTD profiles from some of these cruises were received at MEDS but could not be ingested and counted in time for this report.

Table 5. Pre-2020 temperature (XBT) and/or salinity (CTD, bottle) profile data collected aboard ships, entered or updated in 2019/2020.

Platform	Mission Number	First Date	Last Date	CTD	Bottle	XBT	NAFO_Subareas
Beluga II	18BP19004	20190412	20191213	32	0	0	4T 1F 2H 2J 2G 4Vn
Amundsen	18DL19001	20190601	20190621	64	51	0	4R 4T 4W
Frederick G. Creed	18FC19033	20190808	20190823	11	0	0	4R
Fogo Isle	18FL91098	19910921	19910927	93	0	0	4T 4S
Fogo Isle	18FL92073	19920522	19920522	6	0	0	4T
Hudson	18HU00004	20001101	20001111	0	61	0	3M 3L 3K 3N 30
Hudson	18HU01001	20011114	20011125	0	56	0	3M 3L 3K 3N 30
Hudson	18HU01002	20010221	20010221	0	1	0	3L
Hudson	18HU02449	20021110	20021122	0	56	0	3M 3L 3K 3N 30
Hudson	18HU03507	20031119	20031206	0	66	0	3M 3L 3K 3N 30
Hudson	18HU04586	20041120	20041205	0	68	0	3M 3L 3K 3N 30
Hudson	18HU05656	20051128	20051212	0	53	0	3M 3L 3K 3N 30
Hudson	18HU06707	20061119	20061119	0	1	0	3L
Hudson	18HU06731	20061118	20061205	0	108	0	3M 3L 3K 3N 30
Hudson	18HU07754	20071122	20071205	0	46	0	3M 3L 3K 3N 30 3M 3L 3K 3N 30
Hudson	18HU08865	20081124	20081210	0	60	0	2J 3Ps 3M 3L 3K 3N 30
Hudson	18HU09929	20091123	20091209	0	57	0	2J 3M 3L 3N 3K 30
Hudson	18HU10983	20101123	20101211	0	49	0	2J 3M 3L 3K 3N 30
Hudson	18HU13113	20131118	20131208	0	78	0	2J 3Ps 1F 2J 2H 3L 4Vn
Hudson	18HU16006	20160430	20160518	60	0	0	3Pn 4W
Hudson	18HU16116	20161113	20161120	0	30	0	3N 3O 3L 3Ps
Hudson	18HU99003	19991118	19991127	0	27	0	3M 3N 3K 3O 3L
L'Alliance	18K819001	20190521	20190821	29	0	0	4T
Leim	18L019011	20190511	20190519	7	0	0	4S
Leim	18L019047	20190916	20190922	8	0	0	4T
Leim	18L019050	20191001	20191009	20	0	0	4T
M.Perley	18MU19001	20190921	20191010	18	0	0	4T
M.Perley	18MU19008	20190815	20190819	21	0	0	4T
M.Perley	18MU19040	20190723	20190805	54	0	0	4T
M.Perley	18MU19142	20191016	20191030	11	0	0	4T
Alfred Needler	18NE09905	20090602	20090602	0	1	0	3L
Alfred Needler	18NE09914	20091019	20091019	0	1	0	3L
Alfred Needler	18NE09915	20091103	20091103	0	1	0	3L
Alfred Needler	18NE09918	20091215	20091215	0	1	0	3L
Alfred Needler	18NE10934	20100615	20100615	0	1	0	3L
Alfred Needler	18NE10935	20100626	20100626	0	1	0	3L
Alfred Needler	18NE10942	20101005	20101005	0	1	0	3L



Alfred Needler	18NE10944	20101101	20101101	0	1	0	3L
Alfred Needler	18NE13433	20130514	20130514	0	2	0	3L
Alfred Needler	18NE13435	20130621	20130621	0	1	0	3L
Alfred Needler	18NE13438	20131001	20131001	0	1	0	3L
Alfred Needler	18NE13439	20131015	20131015	0	1	0	3L
Alfred Needler	18NE16464	20160825	20160825	0	1	0	3L
Alfred Needler	18NE16465	20160909	20160909	0	1	0	3L
Alfred Needler	18NE16466	20160927	20160927	0	1	0	3L
Alfred Needler	18NE16470	20161122	20161122	0	1	0	3L
Alfred Needler	18NE16471	20161202	20161206	0	2	0	3L
Alfred Needler	18NE16472	20161215	20161215	0	1	0	3L
Alfred Needler	18NE19002	Feb	Mar	0	47	0	5Ze
Alfred Needler	18NE19012	20190801	20190801	0	2	0	3L
Alfred Needler	18NE19030	Jul	Aug	0	237	0	4X 5Ze 4W 4Vs 4Vn 5Y
Alfred Needler	18NE19102	Feb	Mar	0	75	0	4X 5Y 4W
Alfred Needler	18NE19124	20191015	20191015	0	1	0	3L
Alfred Needler	18NE19506	20190330	20190330	0	1	0	3L
Alfred Needler	18NE19507	20190410	20190417	67	0	0	3Ps 3Pn
Alfred Needler	18NE19508	20190507	20190507	0	1	0	3L
Alfred Needler	18NE19509	20190508	20190521	0	2	0	3L
Alfred Needler	18NE19510	20190522	20190604	0	2	0	3L
Alfred Needler	18NE19511	20190616	20190616	0	1	0	3L
Alfred Needler	18NE19512	20190619	20190622	0	2	0	3L
Alfred Needler	18NE19513	20190915	20190915	0	1	0	3L
Alfred Needler	18NE19514	20190924	20190924	0	1	0	3L
Alfred Needler	18NE19515	20190926	20191007	0	2	0	3L
Alfred Needler	18NE19516	20191010	20191021	0	2	0	3L
Alfred Needler	18NE19517	20191025	20191105	0	3	0	3L
Alfred Needler	18NE19518	20191110	20191110	0	1	0	3L
Coriolis II	18OL19001	Apr	Apr	0	72	0	4X 4Vn 4Vs 4W 5Y 5Ze 3Pn
Inquisitor	18QM04552	20040721	20040803	0	44	0	3M 3L 3K 2J
Inquisitor	18QM04557	20041112	20041112	0	1	0	3L
Inquisitor	18QM04563	20040622	20040622	0	1	0	3L
Inquisitor	18QM04566	20040712	20040712	0	1	0	3L
Inquisitor	18QM04570	20040817	20040817	0	1	0	3L
Inquisitor	18QM04572	20040917	20040917	0	1	0	3L
Inquisitor	18QM05580	20050105	20050105	0	1	0	3L
Inquisitor	18QM07792	20070927	20070927	0	1	0	3L
Inquisitor	18QM09863	20090217	20090217	0	1	0	3L
Inquisitor	18QM09901	20090409	20090409	0	1	0	3L
Inquisitor	18QM09923	20090702	20090702	0	1	0	3L
Inquisitor	18QM09924	20090818	20090818	0	1	0	3L
Inquisitor	18QM10959	20100820	20100820	0	1	0	3L



Inquisitor	18QM16619	20160815	20160815	0	1	0	3L
Aqviq	18QQ05620	20050610	20050610	0	1	0	3L
Aqviq	18QQ05621	20050629	20050629	0	1	0	3L
Aqviq	18QQ05624	20050717	20050803	0	58	0	3M 3L 3K 2J
Aqviq	18QQ05625	20050823	20050823	0	1	0	3L
Aqviq	18QQ05629	20051110	20051110	0	1	0	3L
Aqviq	18QQ05654	20050909	20050909	0	1	0	3L
Aqviq	18QQ05655	20050929	20050929	0	1	0	3L
Aqviq	18QQ07762	20070703	20070703	0	1	0	3L
Aqviq	18QQ07765	20070731	20070731	0	1	0	3L
Aqviq	18QQ07766	20070802	20070815	0	46	0	3L 3K 2J
Aqviq	18QQ07767	20070828	20070828	0	1	0	3L
Aqviq	18QQ07800	20070713	20070713	0	1	0	3L
Teleost	18TL00302	20000422	20000507	0	67	0	3M 3L 3K 3N 30 3M 3L 3K 2J 2H
Teleost	18TL00305	20000714	20000730	0	91	0	2G
Teleost	18TL00324	20000717	20000717	0	1	0	3L
Teleost	18TL00343	20001218	20001218	0	1	0	3L
Teleost	18TL01344	20010108	20010108	0	1	0	3L
Teleost	18TL01351	20010411	20010419	0	2	0	3L
Teleost	18TL01352	20010421	20010504	0	60	0	3M 3L 3N 3K 30
Teleost	18TL01353	20010518	20010524	0	2	0	3L
Teleost	18TL01355	20010621	20010621	0	1	0	3L
Teleost	18TL01356	20010713	20010729	0	58	0	3L 3K 2J 2H 2G
Teleost	18TL01357	20011005	20011005	0	1	0	3L
Teleost	18TL01367	20010517	20010517	0	1	0	3L
Teleost	18TL01372	20011016	20011016	0	1	0	3L
Teleost	18TL01376	20011210	20011210	0	1	0	3L
Teleost	18TL02363	20020119	20020119	0	1	0	3L
Teleost	18TL02393	20020125	20020125	0	1	0	3L
Teleost	18TL02403	20020421	20020505	0	65	0	3M 3L 3K 3N 30
Teleost	18TL02404	20020517	20020525	0	2	0	3L
Teleost	18TL02405	20020609	20020609	0	1	0	3L
Teleost	18TL02406	20020623	20020623	0	1	0	3L
Teleost	18TL02407	20020703	20020703	0	1	0	3L 3M 3L 3K 2J 2H
Teleost	18TL02408	20020712	20020728	0	58	0	2G
Teleost	18TL02411	20021018	20021018	0	1	0	3L
Teleost	18TL02417	20020401	20020401	0	1	0	3L
Teleost	18TL02426	20021003	20021003	0	1	0	3L
Teleost	18TL03040	20030409	20030409	0	1	0	3L
Teleost	18TL03041	20030903	20030903	0	1	0	3L
Teleost	18TL03042	20030916	20030916	0	1	0	3L
Teleost	18TL03457	20030114	20030114	0	1	0	3L
Teleost	18TL03460	20030508	20030516	0	2	0	3L

Teleost	18TL03462	20030419	20030504	0	66	0	3M	3L	3K	3N	30
Teleost	18TL03463	20030526	20030526	0	1	0	3L				
							3M	3L	3K	2J	2H
Teleost	18TL03466	20030721	20030806	0	62	0	2G				
Teleost	18TL03467	20030920	20030920	0	1	0	3L				
Teleost	18TL03481	20030613	20030613	0	1	0	3L				
Teleost	18TL03485	20031017	20031017	0	1	0	3L				
Teleost	18TL03486	20031031	20031031	0	1	0	3L				
Teleost	18TL03508	20030623	20030623	0	1	0	3L				
Teleost	18TL04043	20040325	20040325	0	1	0	3L				
Teleost	18TL04513	20040121	20040121	0	1	0	3L				
Teleost	18TL04520	20040402	20040410	0	2	0	3L				
							3M	3L	3K	3N	2J
Teleost	18TL04524	20040417	20040502	0	48	0	30				
Teleost	18TL04526	20040510	20040529	0	3	0	3L				
Teleost	18TL04541	20041217	20041217	0	1	0	3L				
Teleost	18TL04548	20040611	20040611	0	1	0	3L				
Teleost	18TL05588	20050202	20050202	0	1	0	3L				
Teleost	18TL05590	20050210	20050210	0	1	0	3L				
Teleost	18TL05601	20050430	20050509	0	35	0	3L	3K	3N	30	
Teleost	18TL05603	20050604	20050604	0	1	0	3L				
Teleost	18TL05608	20051014	20051014	0	1	0	3L				
Teleost	18TL05619	20050527	20050527	0	1	0	3L				
Teleost	18TL06663	20060207	20060207	0	1	0	3L				
Teleost	18TL06670	20060422	20060502	0	49	0	3M	3L	3K	3N	30
Teleost	18TL06673	20060610	20060621	0	2	0	3L				
Teleost	18TL06674	20060704	20060704	0	1	0	3L				
Teleost	18TL06675	20060725	20060807	0	49	0	3M	3L	3K	2J	
Teleost	18TL06684	20061219	20061219	0	1	0	3L				
Teleost	18TL06697	20060825	20060908	0	2	0	3L				
Teleost	18TL06703	20060928	20060928	0	1	0	3L				
Teleost	18TL06705	20061023	20061023	0	1	0	3L				
Teleost	18TL06706	20061107	20061107	0	1	0	3L				
Teleost	18TL07732	20070301	20070313	0	2	0	3L				
Teleost	18TL07740	20070402	20070410	0	2	0	3L				
Teleost	18TL07741	20070411	20070427	0	70	0	3M	3L	3K	3N	30
Teleost	18TL07742	20070525	20070525	0	1	0	3L				
Teleost	18TL07743	20070604	20070604	0	1	0	3L				
Teleost	18TL07750	20071012	20071012	0	1	0	3L				
Teleost	18TL07760	20070510	20070510	0	1	0	3L				
Teleost	18TL07761	20070625	20070625	0	1	0	3L				
Teleost	18TL07771	20071106	20071106	0	1	0	3L				
Teleost	18TL08756	20080222	20080309	0	2	0	3L				
Teleost	18TL08806	20080409	20080417	0	2	0	3L				
Teleost	18TL08807	20080420	20080505	0	74	0	3M	3L	3K	3N	30

Teleost	18TL08808	20080525	20080525	0	1	0	3L
Teleost	18TL08811	20080707	20080720	0	50	0	3M 3L 3K 2J
Teleost	18TL08827	20080603	20080603	0	1	0	3L
Teleost	18TL08828	20080617	20080617	0	1	0	3L
Teleost	18TL08833	20080919	20080919	0	1	0	3L
Teleost	18TL08835	20081007	20081007	0	1	0	3L
Teleost	18TL08864	20080609	20080609	0	1	0	3L
						3M 3L 3K 3N 30	
Teleost	18TL09886	20090425	20090515	0	73	0	3Ps
						3M 3L 3K 2J 2H	
Teleost	18TL09890	20090711	20090727	0	62	0	2G
Teleost	18TL09894	20091020	20091020	0	1	0	3L
Teleost	18TL09895	20091103	20091103	0	1	0	3L
Teleost	18TL09899	20091221	20091221	0	1	0	3L
Teleost	18TL10900	20100309	20100309	0	1	0	3L
Teleost	18TL10970	20100401	20100409	0	2	0	3L
						3M 3L 3K 3N 30	
Teleost	18TL10971	20100415	20100504	0	81	0	3Ps
Teleost	18TL10972	20100527	20100527	0	1	0	3L
						3M 3L 3K 2J 2H	
Teleost	18TL10973	20100708	20100724	0	62	0	2G
Teleost	18TL10979	20101213	20101213	0	1	0	3L
Teleost	18TL13113	20130403	20130409	0	4	0	3L
						3M 3L 3K 3N 30	
Teleost	18TL13114	20130410	20130429	0	148	0	3Ps
Teleost	18TL13115	20130510	20130510	0	2	0	3L
Teleost	18TL13116	20130527	20130527	0	2	0	3L
Teleost	18TL13117	20130709	20130728	0	64	0	3M 3L 3K 2J 2H
Teleost	18TL13124	20130308	20130308	0	2	0	3L
Teleost	18TL16053	20160415	20160415	0	1	0	3L
Teleost	18TL16157	20160401	20160406	0	7	0	3L 3Ps
Teleost	18TL16159	20160511	20160517	0	26	0	3M 3L
Teleost	18TL16160	20160708	20160728	0	57	0	3M 3L 3K 2J
Teleost	18TL16164	20161106	20161106	0	1	0	3L
Teleost	18TL16166	20161206	20161206	0	1	0	3L
Teleost	18TL16168	20160211	20160211	0	1	0	3L
Teleost	18TL16169	20160510	20160510	0	1	0	3L
Teleost	18TL16171	20160608	20160616	0	2	0	3L
Teleost	18TL16172	20160621	20160621	0	1	0	3L
						4R 4S 4Vn 3Pn	
Teleost	18TL19009	20190526	20190615	144	0	0	4T
Teleost	18TL19021	20190906	20191001	123	0	0	4T 4Vn
Teleost	18TL19036	20190815	20190903	65	0	0	4R 4S 4Vn 4T
Teleost	18TL19197	20190412	20190418	0	26	0	3M 3L
Teleost	18TL19198	20190429	20190429	14	1	0	3L
Teleost	18TL19199	20190520	20190520	6	1	0	3L
Teleost	18TL19200	20190627	20190713	0	68	0	3M 3L 3K 2J 2H



Teleost	18TL19202	20191009	20191021	61	1	0	3L	2J	2H
Teleost	18TL19203	20191025	20191102	19	0	0	2J	2H	
Teleost	18TL19204	20191109	20191109	1	0	0	2J		
Teleost	18TL19205	20191121	20191129	48	0	0	2J		
Teleost	18TL19206	20191207	20191222	51	0	0	3K	2J	
Teleost	18TL99077	19990104	19990117	0	2	0	3L		
Teleost	18TL99078	19990513	19990528	0	13	0	3K	3L	
Teleost	18TL99079	19990530	19990530	0	1	0	3L		
Teleost	18TL99080	19990716	19990801	0	58	0	3M	3L	3K 2J 2H
Teleost	18TL99081	19990823	19990917	0	3	0	3L		
Teleost	18TL99084	19991009	19991009	0	1	0	3L		
Teleost	18TL99088	19991204	19991204	0	1	0	3L		
Teleost	18TL99234	19990329	19990329	0	1	0	3L		
Teleost	18TL99237	19990507	19990507	0	1	0	3L		
Teleost	18TL99238	19990510	19990521	0	2	0	3L		
Teleost	18TL99239	19990526	19990604	0	2	0	3L		
Teleost	18TL99240	19990605	19990618	0	2	0	3L		
Teleost	18TL99241	19990619	19990629	0	2	0	3L		
Teleost	18TL99242	19990907	19990907	0	1	0	3L		
Teleost	18TL99243	19990927	19990927	0	1	0	3L		
Teleost	18TL99244	19991012	19991022	0	2	0	3L		
Teleost	18TL99245	19991024	19991105	0	2	0	3L		
Teleost	18TL99246	19991106	19991119	0	2	0	3L		
Teleost	18TL99247	19991121	19991202	0	2	0	3L		
Teleost	18TL99248	19991204	19991214	0	2	0	3L		
(Various)	18VA19001	20190712	20190922	328	0	0	4T		
(Various)	18VA19012	20190801	20190801	2	0	0	3L		
(Various)	18VA19013	20190828	20190829	0	0	10	3L	3Ps	4Vs
(Various)	18VA19668	20190509	20191004	6	0	0	4T		
Vladykov	18VD13014	20130613	20130624	0	2	0	3L		
Vladykov	18VD13023	20130813	20130813	0	1	0	3L		
Vladykov	18VD19109	20190427	20190428	2	0	0	3Ps		
Vladykov	18VD19111	20190524	20190531	31	0	0	3Ps		
Vladykov	18VD19112	20190610	20190615	18	0	0	3L		
Vladykov	18VD19114	20190714	20190715	2	0	0	3K		
Vladykov	18VD19116	20190723	20190725	9	0	0	3L		
Vladykov	18VD19118	20190812	20190812	3	3	0	3L		
Vladykov	18VD19119	20190815	20190818	15	0	0	3L		
Vladykov	18VD19121	20190913	20190916	8	0	0	3K		
Vladykov	18VD19122	20190924	20190927	9	0	0	3L		
Vladykov	18VD19123	20191002	20191012	21	0	0	3L		
Vladykov	18VD19124	20191015	20191015	1	0	0	3L		
RRS James Cook	740H19001	20191117	20191117	1	0	0	3L		

* 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 2020.

Country	Type	Name	ID	Start	End	Profiles	NAFO Subareas
USA	Fixed Platform	Coastal Marine Lab - New Castle, NH	CMLN3	Jan	Dec	2506	5Y
USA	Fixed Platform	Jacques Cousteau Reserve, NJ	JCTN4	Jan	Dec	34750	6A
USA	Fixed Platform	T-Wharf Bottom Narragansett Bay Reserve, RI	NAQR1	Jan	Dec	31543	5Zw
USA	Fixed Platform	Meanauhant Waquoit Bay Reserve, MA	WAQM3	Jan	Dec	31405	5Zw
USA	Moored Buoy	Buoy N01 - Northeast Channel	4400024	Jan	Dec	387	4X
USA	Moored Buoy	Massachusetts Bay	4400029	Jan	Dec	8683	5Y
USA	Moored Buoy	Western Maine Shelf	4400030	Jan	Dec	8466	5Y
USA	Moored Buoy	Central Maine Shelf	4400032	Jan	Dec	8670	5Y
USA	Moored Buoy	Penobscot Bay	4400033	Jan	Dec	8411	5Y
USA	Moored Buoy	Eastern Maine Shelf	4400034	Jan	Dec	8695	5Y
USA	Moored Buoy	Jordan Basin	4400037	Jan	Dec	8551	5Y
USA	Moored Buoy	Potomac, MD	4400042	Jan	Dec	39453	6B
USA	Moored Buoy	Stingray Point VA	4400058	Jan	Dec	42596	6B
USA	Moored Buoy	Gooes Reef MD	4400062	Jan	Dec	44342	6B
USA	Moored Buoy	Annapolis MD	4400063	Apr	Dec	27558	6B
USA	Moored Buoy	First Landing VA	4400064	Jan	Jun	4036	6B
USA	Moored Buoy	Great South Bay	4400069	Jan	Jan	394	6A
USA	Moored Buoy	York Spit VA	4400072	Jan	Dec	8008	6B
USA	Moored Buoy	CO2 Gulf of Maine Buoy	4400073	Jan	Dec	7772	5Y
USA	Moored Buoy		4400088	Jul	Dec	7063	6C
Canada	Moored Buoy*	East Scotia Slope	4400137	Jan	Dec	7986	4W
Canada	Moored Buoy*	Banquerau Banks	4400139	Jan	Dec	8545	4Vs
Canada	Moored Buoy*	La Have Bank	4400150	Jan	Dec	5692	4X
Canada	Moored Buoy*	Halifax Harbour	4400258	Jan	Jun	3238	4W
USA	Drifting Buoy		1301511	Sep	Dec	1077	6C 6D 6C 6B 6D 6E 4W
USA	Drifting Buoy		1301525	Feb	Jun	3250	4Vs 6G 30 3N 3M 6C 6B 6D 6E 4X 4W
USA	Drifting Buoy		1301567	Nov	Dec	1227	4Vs 3N 6G 3M 6C 6D 6B 4W 4X 6E
	Drifting Buoy		1301610	Aug	Dec	3266	4Vs 3N 30 3M
	Drifting Buoy		1301612	Nov	Dec	760	6H 3M
	Drifting Buoy		1402559	Jun	Dec	3552	6H 6G 4Vs 6F
USA	Drifting Buoy		1501670	May	Jul	474	6C



USA	Drifting Buoy	1501671	Apr	May	234	6C
USA	Drifting Buoy	1601633	Jan	Jan	1	4S
USA	Drifting Buoy	3101555	May	Dec	3093	6C 6D 6B 6E 4X
USA	Drifting Buoy	3201560	Nov	Dec	664	6H
USA	Drifting Buoy	3301551	May	May	580	6C 6B
USA	Drifting Buoy	4100538	Jan	Jul	3069	6G 6H 3N 4Vs 6E 6D 6C 6B 4W 4X
	Drifting Buoy	4101529	Jan	Dec	1466	4Vs 6G 3N 30 6H 6C 6D 6E 6F 6G 4Vs
USA	Drifting Buoy	4101541	Jan	Jul	3059	3N 3M
USA	Drifting Buoy	4101546	Jan	Apr	1950	6H
USA	Drifting Buoy	4101559	Oct	Dec	66	6H
	Drifting Buoy	4101565	Nov	Dec	989	6F 6E
	Drifting Buoy	4101573	Oct	Dec	1543	6H 6G 4Vs 3N
	Drifting Buoy	4101574	Jan	Dec	1898	6G 6H
France	Drifting Buoy	4101577	Jul	Dec	3264	6A
	Drifting Buoy	4101617	May	Nov	2	4W 3M
	Drifting Buoy	4101623	Jan	Aug	5336	2H 1F 0B
	Drifting Buoy	4101624	Jan	May	3000	3K 3L 3N 3M
	Drifting Buoy	4101627	Jan	Dec	8793	1F 1E 2G 0B 2H 6C 6D 6B 4W 6E
	Drifting Buoy	4101630	Sep	Dec	2678	4Vs 6F 30 6G 3N 6H 6C 6B 6D 4W 4Vs
USA	Drifting Buoy	4101643	Nov	Dec	972	4X 6E 30
USA	Drifting Buoy	4101644	Jul	Dec	3137	6H 6G 6F 6C 6B 6D 4W 6E
USA	Drifting Buoy	4101649	Sep	Nov	1864	4Vs 3N 30 3M
USA	Drifting Buoy	4101650	Jan	Dec	1010	6G 6H
USA	Drifting Buoy	4101661	Nov	Nov	2	2G 1E 1D 0B 1F 2G 2H 2J 3K 3L 3N 4T 6H
USA	Drifting Buoy	4101663	Jan	Dec	8788	4Vs 6G 30
	Drifting Buoy	4101664	Oct	Dec	1532	1F
France	Drifting Buoy	4101702	May	Dec	1925	6C 6D 6E
	Drifting Buoy	4101708	Mar	Nov	3546	6H 6G 3M 3N 6F 4W 4Vs 6E 3N
	Drifting Buoy	4101715	May	Dec	2288	6H 3M 6E 6F 4W 4Vs 30
	Drifting Buoy	4101717	Jul	Nov	3237	3N 6G 6H 3M
	Drifting Buoy	4101720	Jan	Feb	908	3M 6H
	Drifting Buoy	4101721	Dec	Dec	84	6G
France	Drifting Buoy	4101742	Nov	Dec	1386	6G 6H
France	Drifting Buoy	4101743	Jun	Aug	1091	6C 6D
USA	Drifting Buoy	4101748	Aug	Dec	637	6C 6D 6E 6C 6D 6B 6E 4W
USA	Drifting Buoy	4101749	Aug	Nov	575	4Vs 30 3N 6H 3M 6C 6B 6D 4X 6E 4W 4Vs 30 3N 3M 6H
	Drifting Buoy	4101752	May	Dec	4837	6G
USA	Drifting Buoy	4101813	Jan	Dec	2254	6D 6B 6E 6F 6C

USA	Drifting Buoy	4101814	Jun	Dec	792	6C 6C 6D 6B 6E 4W
USA	Drifting Buoy	4201528	Aug	Nov	3898	4Vs 30 3N 3M 6B 6D 6C 4X 4W 6E
USA	Drifting Buoy	4201530	Aug	Nov	3635	4Vs 30 3N 3M 6H
USA	Drifting Buoy	4201556	Jan	Jan	446	3N 3M
USA	Drifting Buoy	4400501	Nov	Dec	1369	3M 3L
	Drifting Buoy	4400777	Jul	Dec	2275	6E 6F 6D
	Drifting Buoy	4401542	Jul	Jul	1	6F
	Drifting Buoy	4401563	Jan	Jan	176	6H
	Drifting Buoy	4401565	Jan	Jan	188	1F
	Drifting Buoy	4401574	Jul	Dec	4344	1F 1E
	Drifting Buoy	4401581	Jan	Nov	2170	3M 3N 6H 6G 6F 6E 4W 4Vs
USA	Drifting Buoy	4401762	Sep	Dec	2642	3N 30 6H
USA	Drifting Buoy	4401786	Jan	Oct	6787	1F 2H 2J
USA	Drifting Buoy	4401787	Oct	Nov	277	6F
USA	Drifting Buoy	4401813	Mar	Dec	2665	6H 3M
USA	Drifting Buoy	4401817	Sep	Sep	1	6C
	Drifting Buoy	4401822	Jan	Jan	551	2G 2H
	Drifting Buoy	4401824	Jan	Jan	108	
	Drifting Buoy	4401825	Jan	Feb	750	1A 1B 30 3Ps 4Vs 4W 6E
	Drifting Buoy	4401826	Jan	Sep	6216	6G
	Drifting Buoy	4401827	Jan	Dec	3474	4X
	Drifting Buoy	4401828	Jan	May	2936	3K 3L 3M 1F 2J
	Drifting Buoy	4401829	Jan	Jul	3692	3L 3M
	Drifting Buoy	4401830	Jan	Feb	915	3N 3M
	Drifting Buoy	4401831	Feb	May	1167	4W 4Vs 30 3N 3M
	Drifting Buoy	4401833	Feb	May	2064	3L 3Ps
	Drifting Buoy	4401837	Feb	Jun	3258	30 4Vs 3N 3M
	Drifting Buoy	4401839	Feb	Mar	917	3K
	Drifting Buoy	4401840	Feb	Jul	2558	3L 3K 3M 2J
USA	Drifting Buoy	4401848	Jun	Dec	4966	4X 4W 4Vs 3Ps 30
USA	Drifting Buoy	4401850	Jun	Dec	4897	4Vs 3N 3M 4W 4X 5Ze 6E 6D
USA	Drifting Buoy	4401851	Jun	Nov	4171	4Vs 30 3N 3M
USA	Drifting Buoy	4401894	Jan	May	2847	30 3N 3M 3K 2J 1F 1F 1E 1D 1C 0B 1B
USA	Drifting Buoy	4401896	Sep	Dec	2321	2G
USA	Drifting Buoy	4401897	Apr	Dec	5867	1F 1E 2G 2H
	Drifting Buoy	4402510	Jan	Jan	278	3M
USA	Drifting Buoy	4402534	Nov	Dec	1078	1F 1E 1D
USA	Drifting Buoy	4402537	Jan	Dec	7956	1F 2G 2H 2J 3K
USA	Drifting Buoy	4402553	Feb	Jul	2805	1F 1E 1D 1C 1F 1E 1D 0B 2G 2H
USA	Drifting Buoy	4402554	Feb	Dec	6936	2J 3K 3L 3M 1F 1E 1D 0B 2G 2H
USA	Drifting Buoy	4402555	Feb	Dec	7047	2J 3K 3L 3M



USA	Drifting Buoy	4402556	Feb	Oct	5286	1F 1E 1D 1C 1B
USA	Drifting Buoy	4402557	Feb	May	1373	1F 1E 1D
USA	Drifting Buoy	4402558	Feb	Jun	2053	1F 1E 1D 1C 1F 1E 1D 1C 0B 2G
USA	Drifting Buoy	4402559	Feb	Dec	6794	2H 2J 3K 3L 3N 3M
USA	Drifting Buoy	4402560	Feb	Nov	5829	1F 1E 1D 0B 2G 2H 2J 3K 3L 3N 3M 1F 1E 1D 0B 2G 2H
USA	Drifting Buoy	4402561	Feb	Dec	7036	2J
USA	Drifting Buoy	4402562	Feb	Nov	5525	1F 1E 0B 2G 2H 2J 3K
USA	Drifting Buoy	4402563	Feb	Dec	6673	1F 1E 1D 0B 2G 2H 2J 3K 3L 3M
USA	Drifting Buoy	4402564	Feb	Oct	4882	1F 1E 1D 0B 2G 2H 2J 3K 3L 3N 3M
USA	Drifting Buoy	4402565	Feb	Nov	5861	1F 1E 2G
USA	Drifting Buoy	4402566	Feb	Dec	6910	1F 1E 2G 1F 1E 1D 0B 2G 2H
USA	Drifting Buoy	4402567	Feb	Dec	6495	2J 3K
USA	Drifting Buoy	4402568	Feb	Oct	5326	1F 2G 1F 1E 1D 0B 2G 2H
USA	Drifting Buoy	4402584	Feb	Dec	7057	2J 3K 3M
USA	Drifting Buoy	4402585	Feb	Dec	6989	1F 1E 1D 0B 2G 2H 2J 3K 3L 3N 30
USA	Drifting Buoy	4402586	Feb	Dec	7091	1F 1E 0B 2G 2H 2J
USA	Drifting Buoy	4402587	Feb	Nov	5034	1F 1E 2G 2H 2J 3K 1F 1E 1D 1C 0B 2G
USA	Drifting Buoy	4402588	Feb	Dec	6344	2H 2J 3K 3L 3N 3M
USA	Drifting Buoy	4402589	Feb	Dec	6967	1F 2G 2H 2J 3K
USA	Drifting Buoy	4402590	Feb	Dec	7031	1F 1E 1D 1C 1B 1F 1E 1D 0B 2G 2H
USA	Drifting Buoy	4402591	Feb	Dec	5897	2J 3K 3L 3M 1F 1E 1D 0B 2G 2H
USA	Drifting Buoy	4402592	Feb	Dec	6015	2J 3K 3L 3N 30 3M 1F 1E 1D 1C 1B 0A
USA	Drifting Buoy	4402593	Feb	Dec	5164	1A
USA	Drifting Buoy	4402594	Feb	Dec	6745	1F 1E 1D 0B 2G 2H 2J 3K 3L 3M
USA	Drifting Buoy	4402595	Feb	Dec	5184	1F 1E 1D 0B 2G 2H 2J 3K 3L 3M
USA	Drifting Buoy	4402596	Feb	Dec	6453	1F 1E 1D 0B 2G 2H 2J 3K 3L 3M
USA	Drifting Buoy	4402597	Feb	May	1868	1F 1E 1D 0B 2G
USA	Drifting Buoy	4402598	Feb	Dec	5963	1F 1E 2H 2J
USA	Drifting Buoy	4402599	Feb	Sep	4154	1F 1E 0B 2G 2H
USA	Drifting Buoy	4402600	Feb	Oct	5132	1F 2G 2H 2J 1F 1E 2G 2H 2J 3K
USA	Drifting Buoy	4402601	Feb	Dec	6996	3M 1F 1E 1D 0B 2G 2H
USA	Drifting Buoy	4402602	Feb	Dec	6940	2J
	Drifting Buoy	4402603	Sep	Dec	2852	2G 2H 2J 3K 3L 30 3Ps
	Drifting Buoy	4402604	Sep	Dec	2849	2G 2H 2J 3K 3L 3M 3N
	Drifting Buoy	4402605	Sep	Nov	2081	2H 2G 2J 3K

	Drifting Buoy	4402606	Sep	Dec	2852	2H 2J 3K
	Drifting Buoy	4402607	Sep	Dec	2853	2H 2J 3K 3L 3M
	Drifting Buoy	4402608	Sep	Dec	2851	2J 3K 3L 3M
	Drifting Buoy	4402609	Sep	Dec	2851	2H 2J 3K 3L 3M
	Drifting Buoy	4402610	Sep	Dec	2852	2J 2H 3K 3L 3M
	Drifting Buoy	4402611	Dec	Dec	731	3K 3L
	Drifting Buoy	4402612	Dec	Dec	731	3K 3L
	Drifting Buoy	4402613	Dec	Dec	731	3K
	Drifting Buoy	4402614	Dec	Dec	730	2J 3K
	Drifting Buoy	4402615	Dec	Dec	731	2J 3K 3L 3N
	Drifting Buoy	4402616	Dec	Dec	730	3K 2J 3L
	Drifting Buoy	4402617	Dec	Dec	731	2G 2H
	Drifting Buoy	4402618	Dec	Dec	731	3L 30
USA	Drifting Buoy	4402619	Aug	Oct	1051	1F 1E 1D 1C
USA	Drifting Buoy	4402620	Aug	Dec	2897	1F 1E 1D 0B 1F 1E 1D 0B 2G 2H
USA	Drifting Buoy	4402621	Aug	Dec	2965	2J
USA	Drifting Buoy	4402622	Aug	Dec	3080	1F 1E 1D
USA	Drifting Buoy	4402623	Aug	Dec	3015	1F 1E 1D 0B 2G
USA	Drifting Buoy	4402624	Aug	Dec	3014	1F 1E 1D 0B 2G 2H 1F 1E 1D 1C 0B 2G
USA	Drifting Buoy	4402625	Aug	Dec	2983	2H 2J
USA	Drifting Buoy	4402626	Aug	Dec	3001	1F 1E 1D 0B 2G
USA	Drifting Buoy	4402627	Aug	Dec	2981	1F
USA	Drifting Buoy	4402628	Aug	Dec	2904	1F 1E 0B 2G 1F 1E 1D 1C 0B 2G
USA	Drifting Buoy	4402629	Aug	Dec	2987	2H
USA	Drifting Buoy	4402630	Aug	Dec	3039	1F 1E 1D 1C 0B 2G
USA	Drifting Buoy	4402631	Aug	Dec	2890	1F 1E 1D 1C 1B 0A
USA	Drifting Buoy	4402632	Aug	Dec	3019	1F 1E 2G
USA	Drifting Buoy	4402633	Aug	Dec	3064	1F 1E 1D 1C 0B 2G
USA	Drifting Buoy	4402634	Aug	Dec	3023	1F 1E 1D 2G 0B 1F 1E 1D 0B 2G 2H
USA	Drifting Buoy	4402635	Aug	Dec	3067	2J 1F 1E 1D 0B 2G 2H
USA	Drifting Buoy	4402636	Aug	Dec	3039	2J
USA	Drifting Buoy	4402637	Aug	Dec	3040	1F 1E 1D
USA	Drifting Buoy	4402638	Aug	Dec	3057	1F 1E 1D 1C 0B 2G
USA	Drifting Buoy	4402639	Aug	Dec	3069	1F 1E 1D 1C 1B 0A
USA	Drifting Buoy	4402640	Aug	Dec	3046	1F 1E 1D 0B 2G
USA	Drifting Buoy	4402641	Aug	Dec	3050	1F 1E 1D 0B 2G
USA	Drifting Buoy	4402642	Aug	Dec	2999	1F 1E 1D 1C 0B
USA	Drifting Buoy	4402643	Aug	Dec	2856	1F 1E 1D 0B 2G
USA	Drifting Buoy	4402644	Aug	Dec	3065	1F 1E 1D 0B
USA	Drifting Buoy	4402645	Aug	Dec	3052	1F 1E
USA	Drifting Buoy	4402646	Aug	Dec	3021	1F 1E 1D 0B 2G
USA	Drifting Buoy	4402647	Aug	Dec	3044	1F 1E 0B

USA	Drifting Buoy	4402648	Aug	Dec	3048	1F 1E 2G
USA	Drifting Buoy	4402649	Aug	Dec	2904	1F 1E 1D 0B 2G
USA	Drifting Buoy	4402650	Aug	Dec	2987	1F 1E 1D 0B 2G 1F 1E 1D 1C 0B 2G
USA	Drifting Buoy	4402651	Aug	Dec	3028	2H 2J
USA	Drifting Buoy	4402652	Aug	Dec	3022	1F 1E 1D 0B 1F 1E 1D 1C 0B 2G
USA	Drifting Buoy	4402653	Aug	Dec	3028	2H 2J 3K 3L
USA	Drifting Buoy	4402657	Aug	Dec	3466	4W
USA	Drifting Buoy	4402658	Aug	Sep	1057	3Ps 3L 30
USA	Drifting Buoy	4402659	Aug	Dec	3455	4Vs 3Ps 4W 6E
USA	Drifting Buoy	4402660	Aug	Dec	3428	3L 30 3N 3M
USA	Drifting Buoy	4402661	Aug	Dec	3073	1A 0A
USA	Drifting Buoy	4402662	Aug	Nov	2562	4W 6E 4X
USA	Drifting Buoy	4402663	Aug	Dec	3458	4Vs 4W 4X
USA	Drifting Buoy	4402664	Aug	Oct	1911	3L 30 1F
USA	Drifting Buoy	4402665	Aug	Dec	3331	3Ps 4Vs 30 3N 3M
	Drifting Buoy	4402684	Jan	Jan	419	4W
	Drifting Buoy	4402686	Jan	Jan	379	4W 4X 4W 4Vs 6F 30
	Drifting Buoy	4402687	Jan	Jul	6053	3N 3M
	Drifting Buoy	4402688	Jan	Jan	336	
	Drifting Buoy	4402689	Jan	Mar	2146	5Ze 6D 6B 5Zw 6A
	Drifting Buoy	4402690	Jan	Feb	1352	4X
	Drifting Buoy	4402691	Jan	Jan	256	4X
	Drifting Buoy	4402692	Jan	Jan	145	4X
	Drifting Buoy	4402693	Jan	Feb	846	4X
	Drifting Buoy	4402694	Jan	Jun	4123	4X
	Drifting Buoy	4402695	Jan	Feb	774	4X
	Drifting Buoy	4402696	Feb	Feb	621	4X
	Drifting Buoy	4402697	Feb	Apr	2897	4X
	Drifting Buoy	4402698	Feb	Mar	701	4X 5Y
	Drifting Buoy	4402699	Feb	Jun	7985	4X 5Y
	Drifting Buoy	4402702	Mar	May	2349	4X
	Drifting Buoy	4402703	Mar	Jul	3967	4X 5Y 5Ze
	Drifting Buoy	4402706	Jan	Jan	163	4X
Canada	Drifting Buoy	4700546	Jan	Dec	3134	6G 6F 3N 6H 3M
Canada	Drifting Buoy	4700584	Nov	Dec	1370	6G 6H
USA	Drifting Buoy	5301547	Mar	Mar	1	6F
	Drifting Buoy	5301764	May	Dec	5412	1F 1E 2G 2H 2J
	Drifting Buoy	6202629	Aug	Nov	966	3M 3N
USA	Drifting Buoy	6202660	Dec	Dec	619	1F
USA	Drifting Buoy	6202662	Mar	Dec	5231	1F 1E 1D 1C 1B 1F 1E 1D 1C 1B 0A
USA	Drifting Buoy	6202663	May	Dec	5322	0B 2G 2H 2J
USA	Drifting Buoy	6202664	Feb	Dec	1244	1F

USA	Drifting Buoy	6202665	Aug	Dec	2639	1F 1E 1D 1C 1B
USA	Drifting Buoy	6202669	Jul	Dec	4146	1F 1E 1D 1C 1B 1F 1E 1D 1C 0B 2G
USA	Drifting Buoy	6202678	Apr	Dec	5565	2H 2J 3K
USA	Drifting Buoy	6202679	Jan	Apr	2321	1F 1E 1D 0B
	Drifting Buoy	6203529	Jan	Dec	4512	6F 6G 6H
USA	Drifting Buoy	6203564	Jan	Jul	4474	2G 2H 2J 3K 3L 3M
USA	Drifting Buoy	6203566	Jan	Feb	922	1C 1B 0B 0A
USA	Drifting Buoy	6203571	Jan	Jan	545	1B 1A
USA	Drifting Buoy	6203574	Jan	Sep	5730	2G 2H 2J 3K
USA	Drifting Buoy	6203576	Jan	Mar	1815	4S 4R
USA	Drifting Buoy	6203578	Jan	May	2892	0B 1C 1D 2G
USA	Drifting Buoy	6203582	Jan	Dec	8245	1F 1E 0B 2G
USA	Drifting Buoy	6203584	Jan	Jan	526	0B 1C
USA	Drifting Buoy	6203588	Jan	Nov	5546	1F
	Drifting Buoy	6203646	Aug	Dec	3162	1A
	Drifting Buoy	6203706	Sep	Oct	417	6D 6C
	Drifting Buoy	6203710	Aug	Sep	453	1F
	Drifting Buoy	6301570	Nov	Nov	108	1F
	Drifting Buoy	6301571	Nov	Dec	1163	1F 1E 1D 1C
USA	Drifting Buoy	6401531	Jul	Dec	4374	1F 1E 1D 1C 0B 2G 1E 0B 1F 2G 2H 2J
USA	Drifting Buoy	6401783	Jan	Jun	1720	3K
USA	Drifting Buoy	6401809	Jan	Sep	5673	1E 0B 2G 2H 2J
USA	Drifting Buoy	6401810	Jan	Feb	1031	1F 1E 1E 0B 2G 2H 2J 3K
USA	Drifting Buoy	6401811	Jan	Nov	7514	3L 3M 1F
USA	Drifting Buoy	6401812	Jan	Jun	3614	0B 2G 2H 2J 3K
USA	Drifting Buoy	6401813	Jan	Dec	8135	1F 1E 2G 2H
USA	Drifting Buoy	6401814	Jan	Dec	8498	0B 1E 2G 2H 1F
USA	Drifting Buoy	6401815	Jan	Mar	1432	1E 0B 2G 2H 2J 1E 1F 0B 2G 2H 2J
USA	Drifting Buoy	6401816	Jan	Sep	5885	3K 3L 3M
USA	Drifting Buoy	6401817	Jan	Dec	8511	1E 1F 2G 2H 2J
USA	Drifting Buoy	6401818	Jan	Dec	8433	1E 0B 2G 1F 2H 2J
USA	Drifting Buoy	6401819	Jan	Mar	1623	1E 1D 0B
USA	Drifting Buoy	6401820	Jan	Nov	6370	1E 0B 2G 1F 2H 2J 1E 1D 0B 2G 2H 2J
USA	Drifting Buoy	6401821	Jan	Dec	8033	3K 3L 3M
USA	Drifting Buoy	6401822	Jan	Dec	8090	1F 1E 2G 2H 1E 0B 1F 2G 2H 2J
USA	Drifting Buoy	6401823	Jan	Oct	6581	3K 3L 3M
USA	Drifting Buoy	6401824	Jan	Oct	5575	1F 1E 2G 1D 1C 0B
USA	Drifting Buoy	6402505	Jan	Dec	7910	1F 2G 2H 1E 1D 0B 1F 2G 2H
USA	Drifting Buoy	6402506	Jan	Dec	8072	2J 3K 3L 3N
USA	Drifting Buoy	6402507	Jan	Mar	1615	1E 1F 2G 0B 2H 2J 1E 0B 1F 2G 2H 2J
USA	Drifting Buoy	6402508	Jan	Dec	8546	3K 3L 3N 3M

USA	Drifting Buoy	6402509	Jan	Dec	8221	1E 1F 2G 0B 2H 2J
USA	Drifting Buoy	6402510	Jan	Nov	7303	1E 1F 2G 2H 2J 3K 1E 1F 2G 0B 2H 2J
USA	Drifting Buoy	6402511	Jan	Oct	6218	3K 3L 3M
USA	Drifting Buoy	6402512	Jan	Dec	8601	1E 1D 0B 2G 2H 2J
USA	Drifting Buoy	6402513	Jan	Dec	8089	1E 0B 2G 2H 2J 1F
USA	Drifting Buoy	6402514	Jan	Oct	6524	1F 2G 2H 2J 3K 1E 1F 0B 2G 2H 2J
USA	Drifting Buoy	6402515	Jan	Dec	8571	3K
USA	Drifting Buoy	6402516	Jan	Dec	8544	0B 1F 2G 1E 2H 2J
USA	Drifting Buoy	6402517	Jan	Jun	3897	1E 1D 0B 2G 2H 2J 1E 1F 1D 0B 2G 2H
USA	Drifting Buoy	6402518	Jan	Dec	8248	2J 3K 3L 3M 1E 1F 2G 2H 2J 3K
USA	Drifting Buoy	6402519	Jan	Dec	8450	3M 1E 1F 2G 2H 2J 3K
USA	Drifting Buoy	6402520	Jan	Dec	7812	3L 3N 3O
USA	Drifting Buoy	6402521	Jan	Feb	1001	1E 0B 2G 0B 1E 1F 2G 2H 2J
USA	Drifting Buoy	6402522	Jan	Dec	8586	3K
USA	Drifting Buoy	6402523	Jan	Aug	5433	1E 1F 2G 2H 2J 3K 1E 0B 2G 2H 2J 3K
USA	Drifting Buoy	6402524	Jan	Dec	8520	3L 3M
USA	Drifting Buoy	6402525	Jan	Jun	3885	1E 1F 1D 0B
USA	Drifting Buoy	6402526	Jan	Sep	6068	1E 1F 2G 2H 2J 1E 1F 2G 2H 2J 3K
USA	Drifting Buoy	6402527	Jan	Dec	7433	3L 3M
USA	Drifting Buoy	6402528	Jan	Dec	8500	1F 1E 2G 0B 2H
USA	Drifting Buoy	6402529	Jan	Nov	7211	1E 1F 0B 2G 2H 2J 1E 0B 2G 2H 2J 3K
USA	Drifting Buoy	6402530	Jan	Sep	5786	3L 3M 1F
USA	Drifting Buoy	6402531	Jan	Dec	8556	2G 2H 1F 1C 1D 0B 2G 2H 2J
USA	Drifting Buoy	6402532	Jan	Oct	7052	3K 3L 3N 3O
USA	Drifting Buoy	6402533	Jan	Dec	8573	1F 1E 2G 2H 1D 1E 0B 2G 2H 2J
USA	Drifting Buoy	6402534	Jan	Dec	8504	3K
USA	Drifting Buoy	6402535	Jan	Dec	8593	1E 1F 2G 2H 2J 1E 1F 2G 2H 2J 3K
USA	Drifting Buoy	6402536	Jan	Dec	8597	3L 3M
USA	Drifting Buoy	6402537	Jan	Jul	4526	1D 0B 2G 2H 2J 3K
USA	Drifting Buoy	6402538	Jan	Jun	3604	1D 0B 2G 1E
USA	Drifting Buoy	6402539	May	Dec	5850	1F 1E 0B 1F 1E 1D 1C 1B 0B
USA	Drifting Buoy	6402540	May	Dec	5271	0A 2G
USA	Drifting Buoy	6402543	Sep	Sep	289	1F
USA	Drifting Buoy	6402547	Oct	Dec	1659	1F 1E
USA	Drifting Buoy	6402551	Dec	Dec	244	1F
USA	Drifting Buoy	6402569	Aug	Dec	3039	1F 1E 1D 1C 1B 1A
USA	Drifting Buoy	6402570	Aug	Dec	3048	1F 1E 1D 0B 2G
USA	Drifting Buoy	6402571	Aug	Dec	3051	1F 1E 1D 1C 0B 2G

USA	Drifting Buoy	6402572	Aug	Dec	3032	1F 1E 1D 1C 0B 2G 2H 2J 3K
USA	Drifting Buoy	6402573	Aug	Dec	2990	1F 1E 1D 1C 0B 2G 2H 2J
USA	Drifting Buoy	6501500	Feb	Dec	7071	1F 1E 0B 2G 1F 1E 2G 0B 2H 2J
USA	Drifting Buoy	6501501	Feb	Dec	7089	3K
USA	Drifting Buoy	6501502	Feb	Dec	7118	1F 1E 1D 0B 2G 2H 2J 3K 3L 3M
USA	Drifting Buoy	6501503	Feb	Jun	2242	1F 1E 1D 0B 1F 1E 2G 1D 1C 1B
USA	Drifting Buoy	6501504	Feb	Oct	5122	0B
USA	Drifting Buoy	6501535	Feb	Sep	4707	1F 1E
USA	Drifting Buoy	6501536	Feb	Dec	6860	1F 1E 0B 2G 2H 2J 3K 3L 3M
USA	Drifting Buoy	6501537	Feb	Dec	7070	1F 1E 1D 0B 2G 2H 2J 3K
USA	Drifting Buoy	6501538	Feb	May	1563	1F 1E 1D 1C
USA	Drifting Buoy	6501539	Feb	Jun	2367	1F 1E 1D 0B 2G 1F 1E 0B 2G 2H 2J
USA	Drifting Buoy	6501540	Feb	Dec	6951	3K 3L 3M
USA	Drifting Buoy	6501541	Feb	Dec	6997	1F 1E 1D 0B 2G 2H 2J 3K 3L 3M
USA	Drifting Buoy	6501542	Feb	Oct	5086	1F 1E 2G 2H 2J 3K
USA	Drifting Buoy	6501543	Feb	Dec	7120	1F 1E 1D 0B 2G 2H 2J 3K 3L 3M
USA	Drifting Buoy	6501544	Feb	Dec	7019	1F 1E 1D 0B 2G 2H
USA	Drifting Buoy	6501695	Aug	Dec	2964	1F 1E 1D 1C 0B 2G
USA	Drifting Buoy	6501696	Aug	Dec	3020	1F 1E 1D 1C 1B 0B 2G 2H 2J
USA	Drifting Buoy	6501697	Aug	Dec	2966	1F 1E 1D 1C 0B 2G 2H 2J
USA	Drifting Buoy	6501698	Aug	Dec	3003	1F 1E 0B 2G
USA	Drifting Buoy	6501699	Aug	Dec	3096	1F 1E 1D 0B 2G
USA	Drifting Buoy	6501700	Aug	Dec	3053	1F 1E 1D 0B 2G 2H
USA	Drifting Buoy	6501701	Aug	Dec	2976	1F 1E 1D 0B 2G 2H
USA	Drifting Buoy	6501702	Aug	Dec	2993	1F 1E 1D 1C 0B 2G
USA	Drifting Buoy	6501703	Aug	Dec	2954	1F 1E 1D 0B
USA	Drifting Buoy	6501704	Aug	Dec	3040	1F 1E 1D 0B

* 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 2020.

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	Jan-Dec	66.117	43.833	-
491	Bedford Institute	Jan-Dec	63.617	44.683	4W
612	North Sydney	Jan-Dec	60.250	46.217	-
665	Port aux Basques	Jan-Dec	59.133	47.567	-
755	St. Lawrence	Mar-Dec	55.390	46.917	-
835	Argentia	Jan-Dec	53.983	47.300	3Ps
905	St. John's	Jan-Dec	52.717	47.567	-
990	Bonavista	Jan-Dec	53.115	48.651	-
1430	Nain	Jan-Dec	61.683	56.550	-
1700	Charlottetown	Jan-Dec	63.117	46.233	4T
1805	Shediac Bay	Jan-Dec	64.546	46.227	4T
1970	Cap-aux-Meules	Jan-Dec	61.857	47.379	-
2000	Lower Escuminac	Jan-Dec	64.883	47.083	4T
2145	Belledune	Jan-Dec	65.850	47.900	-
2330	Rivière-au-Renard	Jan-Dec	64.381	48.997	4T
2780	Sept-Îles	Jan-Dec	66.377	50.195	-
2985	Rimouski	Jan-Dec	68.514	48.478	4T
3057	Saint-Joseph-de-la-Rive	Jan-Dec	70.366	47.449	4T
3075	Banc du Cap Brûlé	Jan-Nov	70.711	47.090	4T
3100	Saint-Francois Île d'Orléans	Jan-Dec	70.808	46.997	4T
3110	Saint-Laurent île d'Orléans	Jan-Dec	71.003	46.858	4T
3248	Vieux-Québec	Jan-Dec	71.202	46.811	-
3980	Qikiqtarjuaq	Jan-May	64.032	67.561	0A