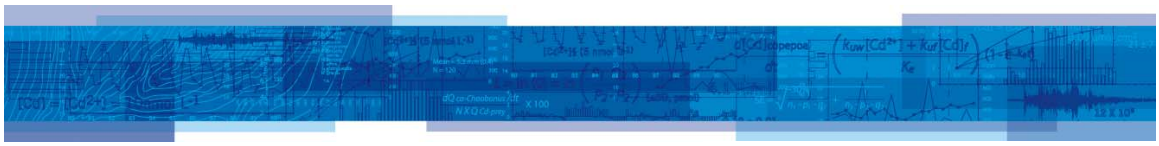

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DISTRIBUTION OF TEMPERATURE AND SALINITY IN THE CANADIAN ARCTIC ARCHIPELAGO DURING THE 2007 AND 2008 ARCTICNET SAMPLING EXPEDITIONS

By

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ABSTRACT

This report presents the CTD (Conductivity, Temperature and Depth) data obtained during the 2007 and 2008 ArcticNet expeditions in the Canadian High Arctic. The report contains the logbooks and detailed maps of sampling sites for the following instruments: a CTD (Conductivity, Temperature and Depth) installed on a Rosette frame, a MVP (Moving Vessel Profiler), a SCAMP (Self Contained Autonomous Micro Profiler), a ship mounted ADCP (Acoustic Doppler Current Profiler) and various instruments attached to mooring lines. Salinity and temperature data are presented as contour plots along West-East or South-North sections. An example of SCAMP data is also included.

RÉSUMÉ

Ce rapport présente un résumé des données échantillonnées lors des missions ArcticNet tenues dans l'Arctique canadien en 2007 et en 2008. Le rapport contient un exemple des logbooks et des cartes détaillées indiquant l'emplacement des sites d'échantillonnage pour chaque instrument utilisé. Les instruments sont les suivants : un CTD (Conductivity, Temperature, Depth) attaché à une Rosette, un MVP (Moving Vessel Profiler), un SCAMP (Self Contained Autonomous Micro Profiler), un profileur de courant (ADCP) fixé sous la coque du navire et plusieurs sondes attachées à des lignes de mouillage. Les données de salinité et de température sont présentées sous forme de contours le long de sections ouest-est ou sud-nord. Un exemple des données du SCAMP est également présenté.

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FOREWORD : ARCTICNET AND THE NETWORK OF CENTRES OF EXCELLENCE

The Canadian Network of Centres of Excellence (NCE) is a unique joint program that brings together several universities, government agencies, industrial companies and non-profit organizations. Their mission is to increase Canada's economy and social benefits through research and entrepreneurial programs. Three Canadian federal granting agencies – the Canadian Institutes for Health Research (CIHR), the Natural Sciences and Engineering Research Council of Canada (NSERC) and the Social Sciences and Humanities Research Council of Canada (SSHRC) – as well as Industry Canada, have combined their efforts to financially support and oversee the initiatives of the NCE. (NCE web site at http://www.nce.gc.ca)

ArcticNet is one of the NCE networks. The central objective of this program is to bring specialists from different fields together in order to improve our understanding of the impacts of climate change on Coastal Canadian Arctic ecosystems. Begun in 2004, ArcticNet now has over 145 researchers from 30 Canadian Universities, as well as researchers from 8 federal and 11 provincial agencies and departments. Those scientists are supported in their work by several Inuit organizations and northern communities, industrial partners, and finally others scientists from 12 different countries.

The ArcticNet Network investigators study the impact of climate change in the Canadian Arctic to assess the effect of ongoing warming and modernization on Canadian Arctic ecosystems, economies and societies, as well as to help Canadians better cope with the changes and opportunities that may occur due to climate change. ArcticNet's structure is set to translate the growing understanding of the changing Arctic ecosystem into national policies, adaptation strategies and impact assessment studies conducted on societies and marine / terrestrial coastal ecosystems in the Canadian High Arctic, the Eastern Arctic, Hudson Bay and Eastern Sub Arctic. (Please see the ArcticNet Annual Report 2007-2009 for more information). (ArcticNet web site at http://www.arcticnet.ulaval.ca)

1. INTRODUCTION

In 2007 and 2008, the ArcticNet sampling expeditions were carried out before and after the expeditions of another research program identified as CFL (Circumpolar Flaw Lead Study). This program included a year round sampling expedition to study the air-sea interactions occurring in the ice-free sections of the southern Beaufort Sea and Amundsen Gulf. Both the ArcticNet and the CFL programs required the services of the CCGS (Canadian Coast Guard Ship) Amundsen which left Quebec City on July 2007 and was set to return on October 2008. ArcticNet's first 2007 sampling expedition (0704), called Leg 1, was held between July 23rd and August 17th. The ship sailed from Quebec City to Churchill, Manitoba. Sampling efforts were made in three Labrador fjords, in the Hudson Strait and the Hudson Bay (see Figure 1). The second 2007 ArcticNet sampling expedition (0706), called Leg 3, began on September 27th, after the ship spent six weeks visiting Inuit villages located on Cornwalis Island in Resolute Bay, allowing ArcticNet medical and social research teams to conduct their research. By mid-October, the ship had sailed into Northern Baffin Bay and had crossed the Northwest Passage. After a few more days of sampling in the Beaufort Sea, Leg 3 of the ArcticNet program ended on October 18th, when ArcticNet students and staff were replaced by CFL participants. The only 2008 ArcticNet expedition began on September 4th. The ship had spent the previous winter and summer sailing in the Beaufort Sea and was now heading to Quebec City. That expedition (0806), called Leg 11, started in Resolute Bay, sailed across the Northern Baffin Bay and ended on September 28th after the ship was called for a Search and Rescue mission.

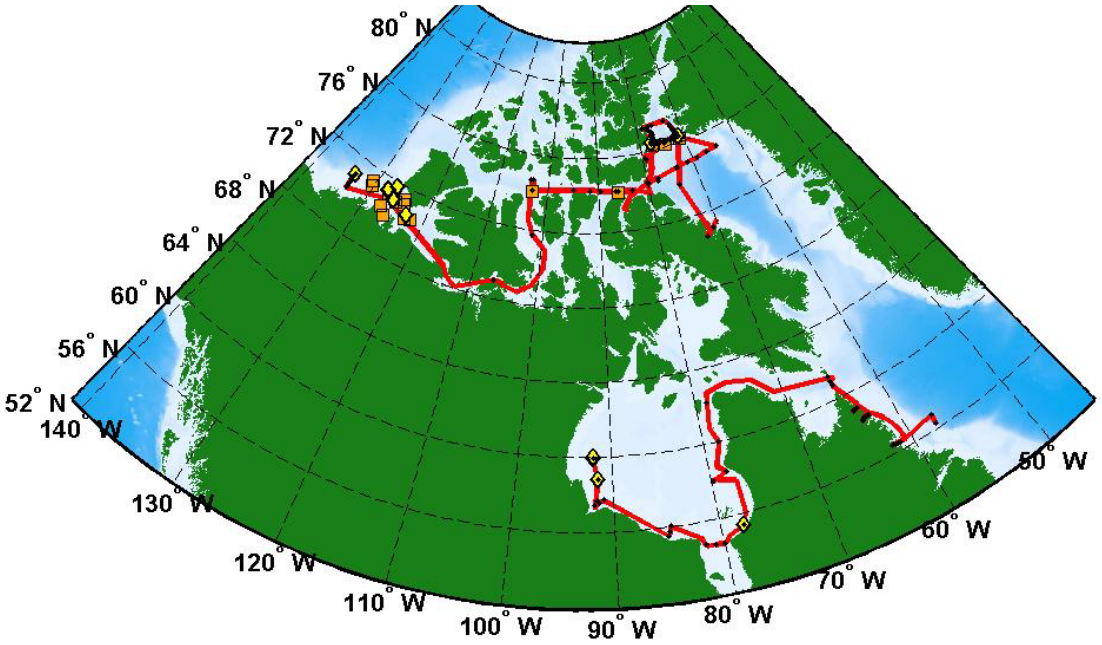


FIGURE 1. ArcticNet 2007 and 2008 study area. Ship track is illustrated as a red line, Rosette-CTD sampling locations are represented by black dots. Mooring sites are represented by yellow diamond-shaped dots and scamp sites are represented by orange squares.

This report provides the ArcticNet community with a synthesis of the available data resulting from these three expeditions. The data set includes 171 Rosette-CTD (Conductivity, Temperature, Depth) casts, five MVP (Moving Vessel Profiler) sections and 66 SCAMP (Self Contained Autonomous Profiler) profiles. Also included are two years of data recorded by 50 different instruments recovered from nine (recuperated) mooring lines as well as current data recorded along the ship track by a ship mounted ADCP (Acoustic Doppler Current Profiler). A summary of the three legs sampling effort may be found in Table 1. High resolution maps of sampling sites are presented in Appendix 1.

Related Studies

Several published studies and scientific papers have reported on the physical oceanographic processes in the Canadian Arctic. Extensive CTD profiles were collected in the polynyas of the North Water (NOW) in northern Baffin Bay. Gratton *et al.* (2006) presented the NOW program data in their report and two special issues have been published, Atmosphere-Ocean (volume 29, n^{o}3, 2001) and Deep-Sea Research II (volume 49, n^{o}22-23, 2002), which also presented studies on the North Water Polynya. Stewart and Lockhart (2005) have recently carried out an extensive study on the Hudson Bay region. The oceanography of the Northwest Passage was the subject of a chapter in a special issue of «The Sea» (volume 14, part B, 2005). In this paper, McLaughlin *et al.* (2005) presented their comprehensive study of all the oceanographic aspects and processes encountered in the Northwest Passage and explained in details the physical and chemical oceanography of this area. The Beaufort Sea and Amundsen Gulf are the Canadian Arctic regions that have been studied the most extensively over the years, especially during the Canadian Arctic Shelf Exchange Study (CASES) program and subsequently during ArcticNet expeditions and various projects involving the Circumpolar Flaw Lead System Study (CFL) and the International Polar Year (IPY) programs. In 2008, the Journal of Geophysical Research published eleven papers from the CASES program in a special issue, volume 113, number C3. That same year, a book entitled *On thin ice* containing a synthesis of the work performed in every main research subject of the CASES program was edited by L. Fortier, D. Barber and J. Michaud. Simard *et al.* (2008) have also prepared a synthesis report regarding the CTD profiles and other physics data generated during the CASES 2002-2004 expeditions. The oceanography of the Beaufort Sea was also discussed by Ingram *et al.* in part «A» of the special issue of «The Sea» (volume 14, part A, 2005). Finally, a Compendium of the CFL Cruise Reports has recently been published by the University of Manitoba (Anonymous, 2009).

2. SAMPLING PROGRAM

Rosette

During the 2007 and 2008 expeditions, the rosette was equipped with 24 «Niskin» 12 L bottles, and a SeaBird 911+ CTD with eight independent sensors (see Table 2 for sensors characteristics). It was deployed from the ship and lowered into the water at a rate of 1 m s^{-1}. CTD profiles were carried out in the Hudson Bay and Canadian Arctic (see Figure 2). High resolution maps of rosette sampling sites and station number are found in Appendix 1A. A total of 171 casts were obtained from 99 different stations. Rosette logbooks are presented in Appendix 2. As often as possible, station positions were selected to form section lines at strategic locations. In 2007-2008, 15 sections with a minimum of three stations each were sampled. The connection between the casts, the stations and the sections is presented in Appendix 3. Contour plots of salinity and potential temperature recorded along these sections are presented in Appendices 5, 6 and 7.

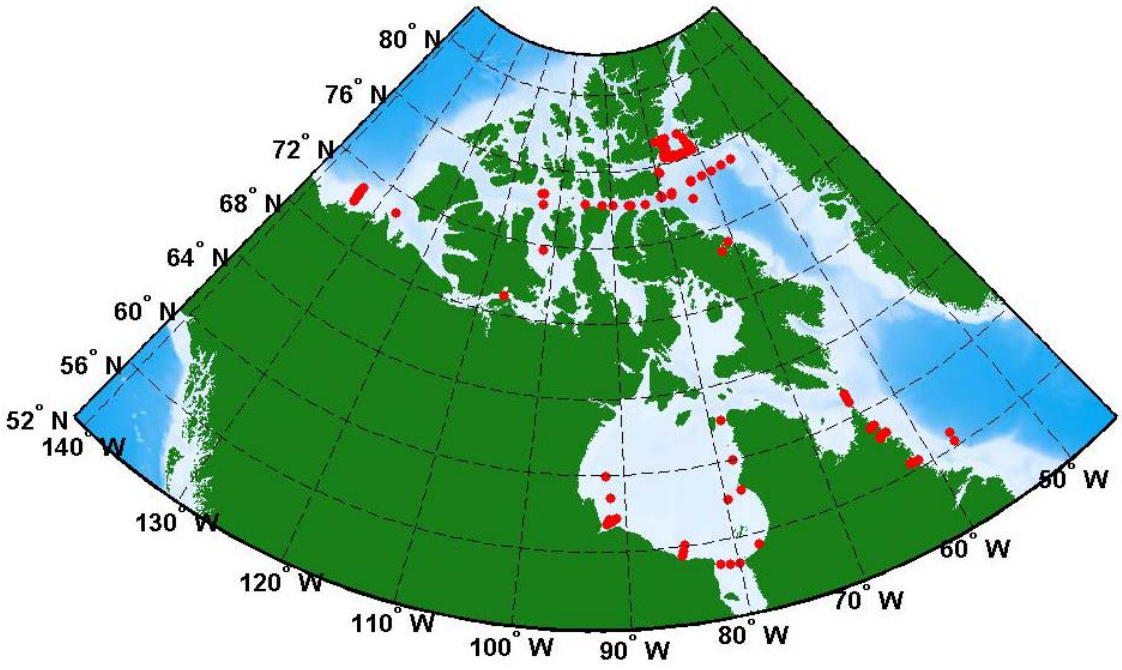
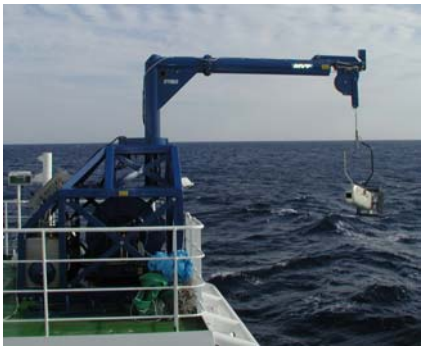


FIGURE 2. Location of the 2007 and 2008 Rosette sampling sites.

A summary of the CTD processing and quality control is presented in section 3 of this report. As a general «rule of thumb» CTD data are reserved for the ArcticNet Network Investigators for a period of 3 years. After this period, data will be hosted on the ArcticNet and/or the Integrated Service Data Management (ISDM) website and will be available to the international community.

Moving Vessel Profiler (MVP)



The Moving Vehicle Profiler (MVP) is a towed CTD. It is usually set in automatic mode. The "fish" (right) freefalls at ~ 5 m s^{-1} and is automatically winched back to 10 m under the surface after each cast. Because of these adjustments, we lose the first and last 10 meters of the water column. It is a MVP300-1700 model, meaning that it is equipped with 1700 m of cable and can profile down to 300 m at 12 knots. The slower the cruising speed the deeper the MVP can reach.

The MVP profiler was equipped with a CTD, a Sound Velocity probe, a fluorometer and a transmissometer. The characteristics of the probes are found in Table 2. Five sections and 465 profiles were carried out in the Hudson Bay and Canadian High Arctic (see Fig. 3 and Appendix 1B). A summary of the sampling data is presented in Appendix 4. Contour plots of the salinity and potential temperature recorded along the sections are presented in Appendices 5, 6 and 7.

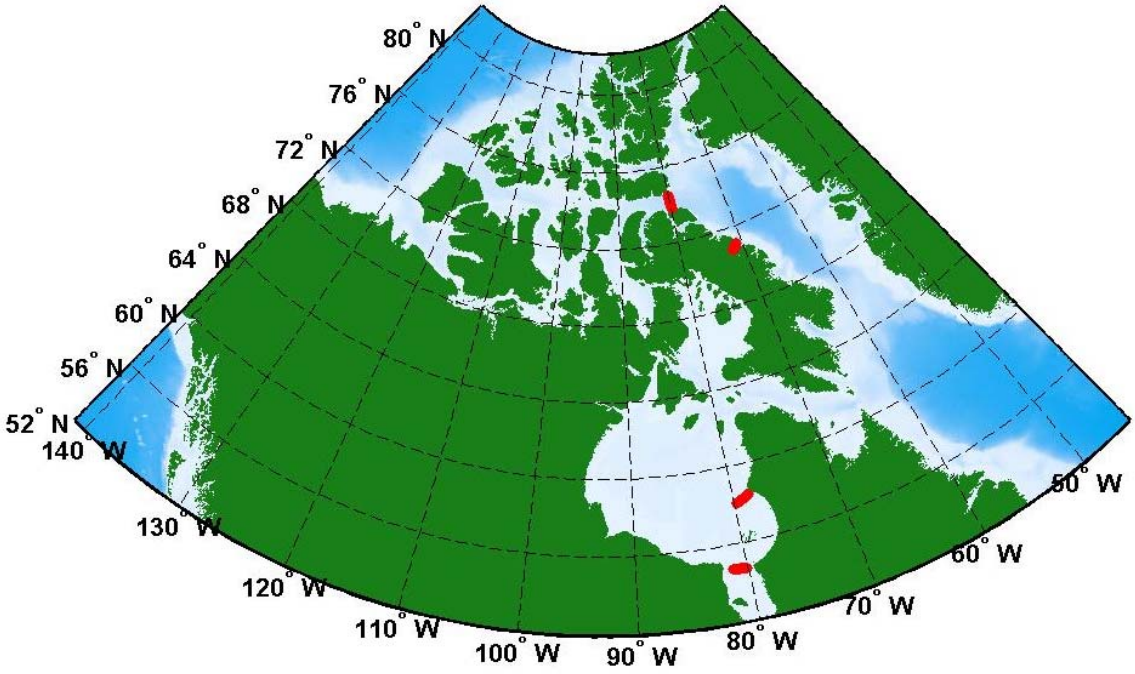
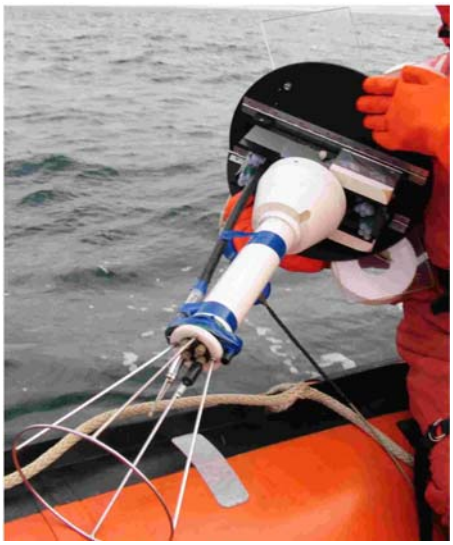


FIGURE 3. Location of the 2007 and 2008 MVP sections.

Self Contained Autonomous Micro Profiler (SCAMP)



The SCAMP is a CTD-type profiler. It samples at a frequency of 100 Hz (i.e. 100 times per second). It free falls at approximately 10 cm s^{-1}, resulting in a vertical resolution of approximately one (1) millimetre, down to a maximum depth of 100 m. The instrument measures the temperature and fluctuations in salinity at a micro-scale in order to estimate the turbulent mixing occurring in the water column. In order to properly measure (as opposed to "estimate") turbulence, we should also be measuring fluctuations in velocity. Unfortunately, due to budget limitations, we do not have access to a velocity sensor. The other sensors on the SCAMP include three temperature sensors, two salinity sensors (i.e. conductivity), a PAR (Photosynthetically Active Radiation) and fluorescence sensors.

SCAMP profiles were carried out in the Baffin Bay area, the Northwest Passage, the Beaufort Sea and the Amundsen Gulf (see Fig. 4 and Appendix 1C). Measurements were taken on 16 stations (66 casts) during leg 3 (0706). The logbook of SCAMP profiles is presented in Appendix 8 and an example of data profiles is presented in Appendix 9. Scamp data are not available yet. When available, processing and quality control protocols will be provided at the same time as the scamp data.

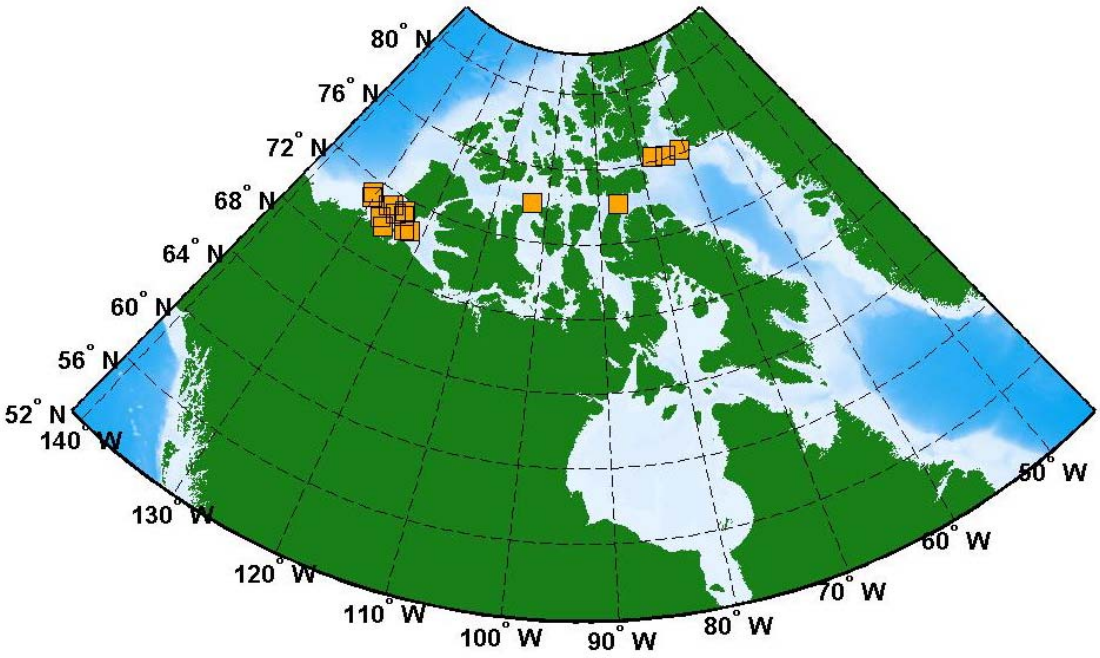


FIGURE 4. SCAMP 2007 and 2008 sampling sites

Moorings

ArcticNet moorings are identified according to the following guidelines: the letters and the first two digits represented the location (CA: Beaufort Sea; BA: Baffin Bay and AN: Hudson Bay); the last two digits are the deployment year.

The year 2006-2007 was a difficult one for moorings. Seven lines (30 instruments) were deployed in the Hudson Bay, Baffin Bay and Beaufort Sea but only two moorings (AN03-06 and CA18-06) and one current meter from AN01-06 were recovered (see Fig. 5 and Appendix 1D). AN03-06 was located in the Hudson Bay. It was recovered during the 0704 expedition. Three of the four probes deployed on this mooring were recovered with the line, but only two RCMs (Recording Current Meter) had recorded data properly. CA18-06 was moored in the Amundsen Gulf in the Western Arctic. Unfortunately, only the two deepest RCMs were recovered. The upper part of the line was apparently snapped by ice. Michaud *et al.* (2007) have summarized all the problems encountered in their technical report.

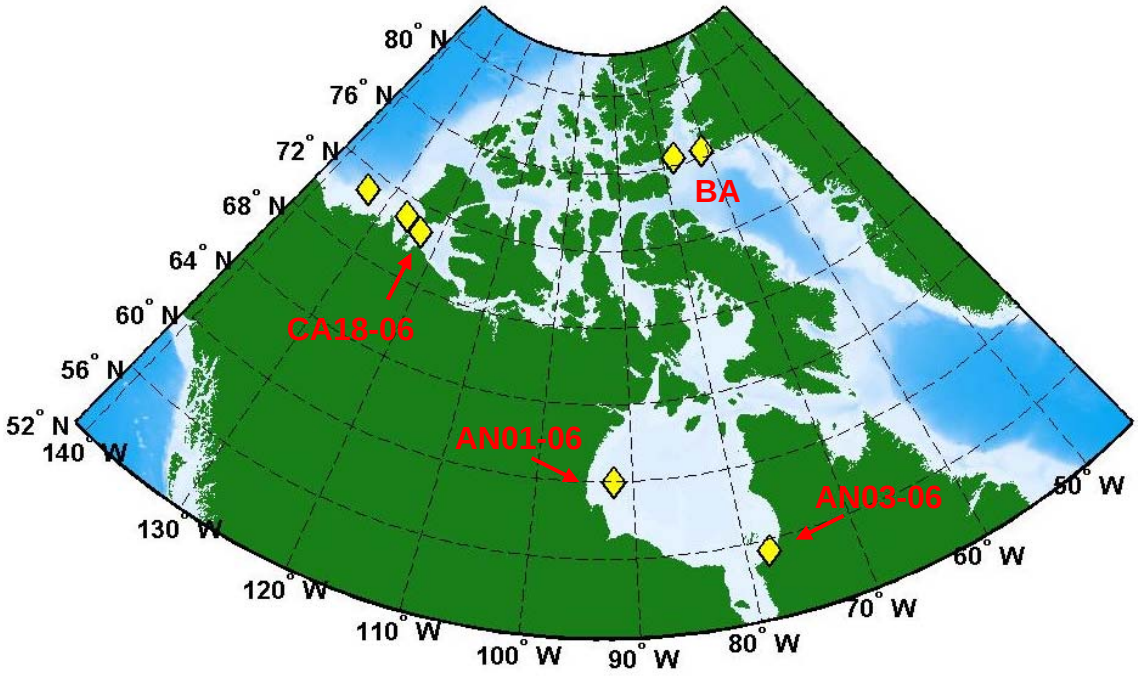


FIGURE 5. Mooring locations are identified by the yellow diamond-shaped dots. Seven moorings were deployed in 2006 but only two were recovered in 2007.

Between ArcticNet expeditions 0706 and 0806, the CCGS Amundsen was mobilized with another research program call CFL (Circumpolar Flaw Lead Study). As many of the principal investigators and technical staff of ArcticNet were also involved with the CFL program, the 2007 and 2008 mooring activities in the Western High Arctic were conducted during the CFL expeditions (second half of 0706 and 0805).

Ten moorings were deployed in 2007 (expedition 0704 and second half of 0706 during the CFL program). Three lines (ten instruments) were deployed in the Hudson Bay and seven lines (49 instruments) were deployed in the southern Beaufort Sea (see Fig. 6 and Appendix 1D) including two MMPs. The MMP is a moving profiler sliding up and down along the mooring line recording temperature, salinity and fluorescence data. These two moorings were deployed next to the "classic" moorings CA05 and CA16 and were named accordingly CA05mmp and CA16mmp.

Two of the moorings located in the Hudson Bay, AN01-07 and AN03-07 were recovered in 2009 during the BaySys expedition conducted on the CCGS Pierre Radisson. Only one instrument provided reliable data. Six of the seven moorings located in the Beaufort Sea were recovered in 2008 (expedition 0805) and redeployed for another year of measurements (see Fig. 7 and Appendix 1D). The instruments characteristics are presented in Table 3 and the details about the 41 recovered instruments are found in Table 4a and 4b.

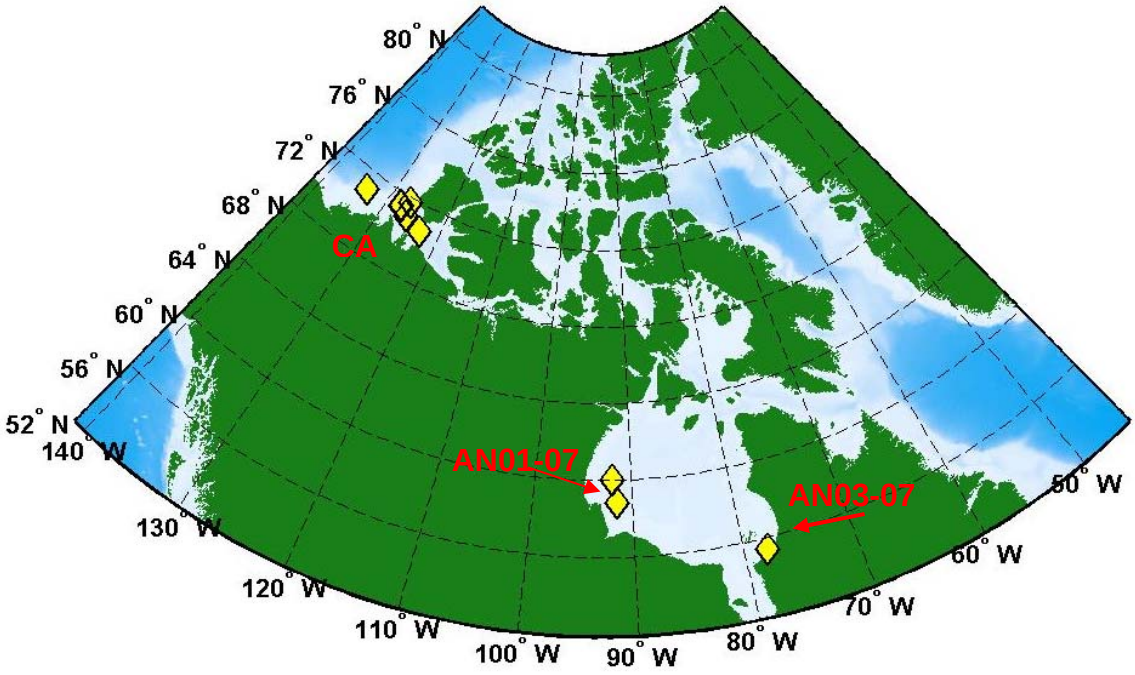


FIGURE 6. Moorings deployed in 2007 and recovered in 2008 (or 2009). Mooring locations are identified by the yellow diamond-shaped dots.

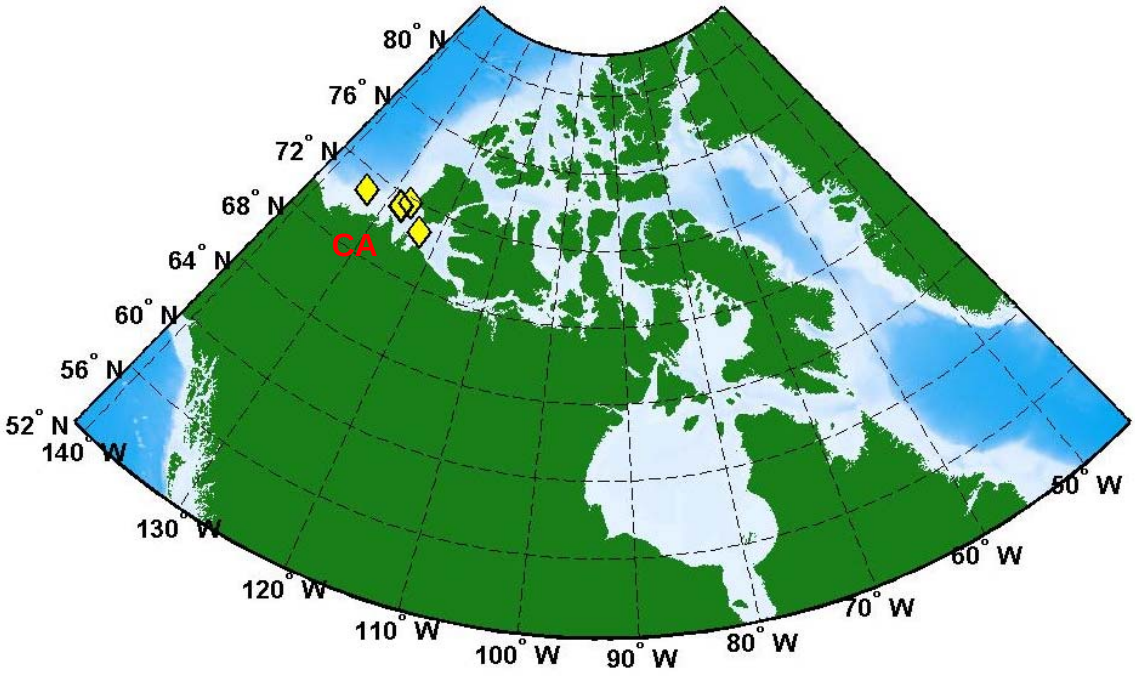


FIGURE 7. Six moorings were deployed in 2008. Mooring locations are identified by the yellow diamond-shaped dots.

Ship mounted Acoustic Doppler Current Profiler (ADCP)

In 2007 and 2008, the CCGS Amundsen was equipped with a ship-mounted RDI Ocean Surveyor 150 kHz ADCP. The settings used for these expeditions were chosen according to the recommendations of the RDI technical staff. Attempts were done to synchronize the hull ADCP with another sensor (an EK-60) mounted close to the ADCP on the Amundsen's hull but interferences were still occurring.

The hull ADCP recorded current data along the ship's track from the beginning to the end of the expeditions (see Fig 8). Ship-mounted ADCP data includes date and time, ship location, and finally an average of current speed and current direction for every 8 m cell from 8 m under the ship hull to maximum 250 m. Averages are available for a 5-minute and 10-minute periods. Because of sound attenuation by the ice window, the maximum bottom-tracking depth is around 240 m. This value is reduced to 100-150 m when the ship is steaming.

Data validation was not performed. Tests were done at the beginning of the 2006 expedition in the St Lawrence River near Sept-Îles and the collected data was saved for use in future data validation processes. Note that the raw data is available upon request.

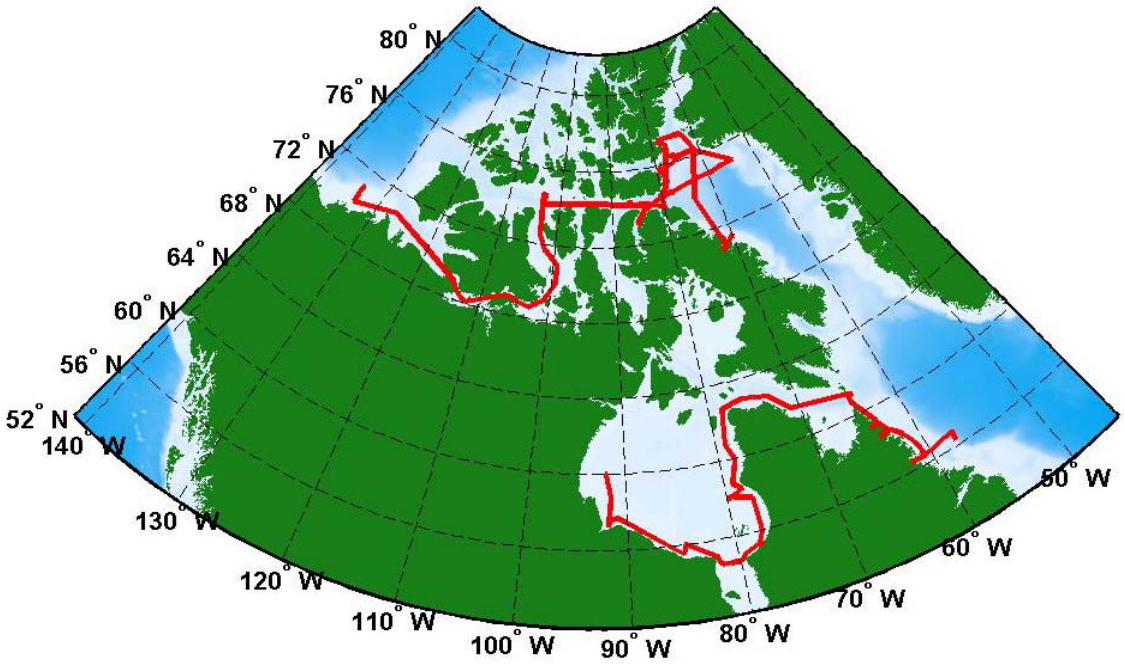


FIGURE 8. Ship-mounted ADCP is illustrated by the red ship track.

3. DATA PROCESSING AND QUALITY CONTROL

Rosette-CTD data

The Rosette data processing and quality control are described in details by Guillot (2007a, 2007b, 2007d and 2008). The «READ ME » file attached to each yearly CTD data set also presents the most important processing steps and corrections applied to the data files. All users should read these files so they can be aware of data limitations.

Processing included the following steps: validation of the calibration coefficients, conversion of data to physical units, alignment correction and extraction of useless data. Oxygen sensor calibration was done using Winkler titrations and salinity data were compared with water samples analysed with a Guildline 8400B Autosal. The CTD data were passed through a set of quality control tests based on UNESCO's algorithm standards (1990). The recorded data were averaged every 1 dbar. The computed oceanographic parameters were calculated using the averaged data. Missing data were linearly interpolated. Lastly, there is one ASCII file for every CTD cast. The variables and units in a typical ASCII file are shown in Table 5.

CTD profiles cover the water column down to 10 meters from the sea-bed. To reduce the amount of information presented in this report, temperature and salinity contours are only provided for each section presented in Appendix 3. The contours are presented in Appendices 5, 6 and 7. One cast was selected for every station location in the interpolation process. The temperature and salinity data were interpolated on a 5 km by 5 m grid with a triangle-based cubic interpolation method and contoured in Matlab®. The origin of each section is the westernmost or southernmost cast. For the West-East sections, West is on the left and East on the right; for the South-North sections, South is on the left and North on the right. The colorbar scales are the same for all sections of a same expedition regardless of the instrument used. More information is found in Table 6.

MVP data

MVP profiles cover the water column from 10 meters of the surface down to 10 meters from the sea-bed. The temperature and salinity contours are provided for each section shown in Appendix 4. The contours are presented in Appendices 5, 6 and 7. The temperature and salinity data were averaged every 1 dbar but were not interpolated. The contours plots use the original data. The origin of each section is the westernmost or southernmost cast. For the West-East sections, West is on the left and East on the right; for the South-North sections, South is on the left and North on the right.

Mooring data

Processing steps for mooring data are described in Boisvert (2010a and 2010b). It consisted of meta-data and calibration coefficients validation, control of the instrument depth and clock, and comparison of mooring data with Rosette-CTD data recorded at the same location. Instrument depth and salinity data were corrected by adding an offset

when needed. Erroneous time tags were corrected. Missing data and questionable data are mentioned in the quality control report, and they were replaced by NaNs (Not a Number). Users should consult the Quality Control Report (Boisvert 2010a and 2010b). ASCII files were created for each instrument (see Table 4a and 4b).

Moored ADCP data

The processing and quality control of ArcticNet ADCP data are still ongoing. The quality control procedures on ADCP data were adapted from the «ADCP*tools*» toolbox of the U.S. Geological Survey's «*Sediment Transport Instrumentation Group*». The «ADCP*tool*s» functions used by the USGS were adapted to the peculiarities of ArcticNet's data. The tests include the validation of the calibration, data and meta-data. The modified tests used are based on comparisons between data and defined «thresholds». If a data point does not meet the thresholds it is rejected and all its associated data points are then considered as «questionable». A document presenting in details the finalized procedures of processing and quality control of ADCP data is available (Guillot, 2007c).

4. DISCUSSION

The International Polar Year 2007-2008 was a major sampling year for the CCGS Amundsen: three ArcticNet, six-week legs and eight CFL six-week legs. The sampling area covered by the ArcticNet 2007 expedition was huge (as usual): Hudson Bay and Strait, northern Baffin Bay, Canadian Arctic Archipelago, Amundsen Gulf and southern Beaufort Sea. Between legs 0706 and 0806 the CCGS Amundsen spent the winter of 2007-2008 in Amundsen Gulf. We also obtained, for the first time, a section across the Northwest Passage: from 65°W to 130° W, roughly. The eastern part of the section was sampled in expedition 0706 and the western part of the section was covered in expedition 0804.

The CFL expeditions (legs 0707 to 0805) are not covered in this report. However, it is worth mentioning that McLure Strait was sampled for the first time in history in leg 0804. That year (2008) we have "closed" Parry Channel with two MVP sections: one at the mouth of Lancaster Sound (leg 0806) and one at the mouth of McLure Strait (leg 0804). Numerous eddies were also observed in the winter of 2007-2008 from ship-based data (CTD) and mooring data (MMPs).

Hudson Bay was covered at large for a second time. The first time was in ArcticNet expedition 0502. In 2008, a set of four moorings were deployed across Hudson Strait in collaboration with Woods Hole Oceanographic Institute (Dr. Fiamma Straneo). Details will be presented in the 2009 ArcticNet report.

5. ACKNOWLEDGMENTS

We thank Captains Julien and Marchand and their crew aboard the CCGS Amundsen for their outstanding collaboration. We also thank the «Rosette team», Véronique Lago, Amélie Janin, Dominique Boisvert and Alexandra Jahn, and all the «Rosette monkeys» for their outstanding sampling effort cast after cast after cast. Thanks to the mooring team: Luc Michaud, Pascal Massot, Sylvain Blondeau, Alexandre Forest, Louis Létourneau and Steeve Gagné. Thanks to Caroline Sévigny for its zodiac outings in order to obtain the SCAMP profiles. And last but not least, many thanks to Pascal Guillot for his data processing efforts.

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TABLE 1. Summary of the three 2007 and 2008 ArcticNet expeditions.

Year	**2007**		**2008**
Leg	**1**	**3**	**11**
Expedition number	**0704**	**0706**	**0806**
Starting and Ending Date	July 23rd, 2007	September 27th, 2007	September 4th, 2008
	August 17th, 2007	October 18th, 2007	September 28th, 2008
Starting and Ending Location	Quebec City	Resolute Bay	Resolute Bay
	Churchill, MB	Sachs Harbour, Banks Island	Nain, Labrador
Chief Scientist	David Barber University of Manitoba	Jean-Éric Tremblay Laval University	Martin Fortier Laval University
CCGS	Amundsen	Amundsen	Amundsen
CCG Captain	Lise Marchand	Lise Marchand	Lise Marchand
Rosette sampling	40 casts / 37 stations	48 casts / 27 stations	83 casts / 45 stations
	8 sections	3 sections	4 sections
MVP sampling	2 sections	1 section	2 sections
Rosette and MVP operators	Véronique Lago	Véronique Lago	Véronique Lago
	Marie-Emmanuelle Rail	Amélie Janin	Dominique Boisvert
			Alexandra Jahn
SCAMP sampling	0	66	few casts attempted
SCAMP operators		Caroline Sévigny	
Moorings deployed	3	1	0
Moorings recovered	1	0	few instruments recovered from 2005 and 2006 lines
Ship mounted ADCP	operational	operational	operational

TABLE 2. Characteristics of Rosette and MVP sensors used during ArcticNet 2007-2008 sampling expeditions.

Parameter	Sensor		Range	Accuracy	Resolution
	Compagny	Instrument Type			
Attached to the Rosette					
CTD	SeaBird	SBE-9plus [1]			
Temperature	SeaBird	SBE-03 [1]	-5°C to +35°C	0.001°C	0.0002°C
Conductivity	SeaBird	SBE-4C [1]	0-7 S/m (0-70mmho/cm)	0.0003 S/m (0.003mmho/cm)	0.00004 S/m (0.0004 mmho/cm)
Pressure	Paroscientific	Digiquartz 410K-105	up to 10 500m (15 000psia)[2]	0.015% of full scale	0.001% of full scale
Dissolved oxygen	SeaBird	SBE-43 [3]	120% of surface saturation[4]	2% of saturation	unknown
pH	SeaBird	SBE-18-I [5]	0-14 pH units	0,1 pH unit	unknown
Nitrates concentration	Satlantic	MBARI-ISUS 5T [6]	0.5 to 2000 μM	±2 μM	±0.5 μM
Light intensity (PAR)	Biospherical	QCP2300	1.4×10^{-5} to 0.5 μE/(cm^2·sec)		
sPAR	Biospherical	QCP2200	1.4×10^{-5} to 0.5 μE/(cm^2·sec)		
Fluorometer	Seapoint	Chlorophyll-fluorometer	0.02-15 μg/l	unknown	0.33 V/μg/l
Transmissometer	Wet Labs	C-Star	0-5 V	unknown	1.25 mV
Altimeter	Benthos	PSA-916 [7]	0 - 100 m	unknown	0.01 m
Attached to the MVP					
CTD					
Temperature	AML		-2 to 32°C	± 0.002°C	0.0006°C
Conductivity	AML		0 to 7.0 S/m	± 0.0005 S/m	0.00012 S/m
Pressure	AML		6000 dbar	± 0.05% of full scale	0.002% of full scale
SV&P					
Sound Velocity	AML		1400-1550 m/s	± 0.05 m/s	0.015 m/s
Pressure	AML		6000 dbar	± 0.05% of full scale	0.01 dbar
Transmissometer	Wet Labs	C-Star	0-5 V	unknown	1.25 mV
Fluorometer	Wet Labs	FL-Eco-chlorophyll	0.01 to 125 ug/L chl-a		0.01ug/L chl-a

Notes: [1] Maximum depth of 6800m

[2] Depending on the configuration

[3] Maximum depth of 7,000m

[4] In all natural waters, fresh and marine

[5] Maximum depth of 1,200m

[6] Maximum depth of 1,000m

[7] Maximum depth of 6,000m

TABLE 3. Characteristics of instruments moored in 2006, 2007 and 2008.

		Parameters	Range	Resolution	Accuracy
Aanderaa Data Instruments	RCM-4	Current speed	2.5 to 250 cm/sec		± 1 cm/sec
		Current direction		0.35°	± 7.5° / ± 5°
		Temperature	-2.46°C to 21.48°C	0.1% of selected Range	± 0.05°C
		Conductivity	0 to 77 mmho/cm	0.1% of Range	± 0.025 mmho/cm
	RCM-7	Current speed	2 to 250 cm/sec		± 1 cm/sec
		Current direction		0.35°	± 7.5° / ± 5°
		Temperature	-2.46°C to 5.62°C	0.1% of selected Range	± 0.05°C
		Conductivity	0 to 74 mmho/cm	0.1% of Range	± 0.025 mmho/cm
	RCM-11	Current speed	0-300 cm/s	0.3 cm/s	± 1% of reading
		Current direction		0.35°	± 7.5° / ± 5°
		Temperature	-3.01 to 5.92 °C	0.1% of Range	± 0.05°C
		Conductivity	24 to 38 mS/cm	0.002 mS/cm	± 0.05 mS/cm
		Pressure	0 to 20 Mpa	0.1% of Range	± 0.25% Range
		Turbidity	0 to 20 NTU	0.1% of full scale	2% of full scale
		Oxygen	0 to 500µM	<1 µM	<8µM
Rockland Oceanographic Services Inc.	ACTW	Conductivity	0 to 60 mS/cm	0.001 mS/cm	±0.05 mS/cm
		Temperature	-5 to 40°C	0.001°C	±0.05°C
	ALW	Luminosity	0-5000 µmol/s/m²	0.1µmol/s/m²	±1%
	ACLW	Temperature	-5 to 40 °C	0.001°C	±0.05°C
		Chlorophyll	0-400 ppb	0.01 ppb	±1%
		Turbidity	0-1000 NTU	0.03 NTU	±2%
RBR	XR-420	Conductivity	0-85mS/cm	~1µS/cm	±0.003 mS/cm
		Temperature	-5˚C to 35˚C	<0.00005˚C	±0.002˚C
		Pressure	0-2000 dbar	<0.001% full scale	±0.05% full scale
		Turbidity	0 to 2,500 NTU	-	±2% of value
		Oxygen	0-200%	-	±2%
Nortek Inc.	Aquadopp	Temperature	-4 to 40 °C	0.01°C	0.1°C
		Pressure	200 dbar	<0.005%	0.5%
		Velocity	±5m/s	-	1% ±0.5cm/s
		Direction		0.1°	2°
Sea-Bird Electronics Inc.	CTD 911+	Temperature	-5°C to 35°C	0.0002°C	0.001°C
		Conductivity	0-70 mS/cm	0.0004 mS/cm	0.003 mS/cm
		Pressure	0 to 10 500 m	0.001% of full scale	0.015% of full scale
	SBE-26	Temperature	-5 to 35°C	0.001°C	0.01°C
		Pressure Tide	0 to 270 m	0.2 mm / 0.01 mm	0.01% of full Range
		Pressure Wave	0 to 270 m	0.4 mm / 0.1 mm	0.01% of full Range
	SBE37	Conductivity	0 to 70 mS/cm	0.0001 mS/cm	0.003 mS/cm
		Temperature	-5 to 35°C	0.0001°C	0.002°C
		Pressure	0 to 7000 m	0.002% of full Range	0.1% of full Range

TABLE 4a. Summary of the instruments moored in 2006 or 2007 and recovered a year after for the benefit of the ArcticNet program.

Mooring	Water depth	Position	Instrument	Serial No	Instr. Depth (m)	Date of first reliable data	Date of last reliable data	T (°C)	Cond (mS/cm)	Press (dbar)	Spd (m/s)	Dir (true)	Turb (FTU)	Oxy (% or µmol)	Chl	Luminosity (µmol/m²s)	Quality Control Comments
AN03-06	134	55° 24.44' N 077° 55.70' W	ALEC CT	686	14	LOST											
			RCM4	4640	25	2006-09-14 17:02	2007-08-03 12:10										Approximative time tags
			RCM4	740	69	2006-09-16 14:55	2007-08-09 17:04										Speed and direction invalid before 2006-10-12 20:27:52; Approximative time tags
			WH-ADCP	296	89	NO DATA RECORDED											
CA18-06	543	70° 39.91' N 122° 59.55' W	ALEC CLW	285	17	LOST											
			RCM 11	274	48	LOST											
			WH-ADCP	7844	89	LOST											
			RCM 11	272	216	2006-10-18 17:29	2007-05-16 18:54										Data was still recorded following 2007-05-16 18:54 but seemed unreliable. Pressure inconsistent.
			RCM 7	10301	501	2006-10-18 18:00	2007-10-25 15:00										Speed and pressure recorded, but no valid calibration available

Mooring	Water depth	Position	Instrument	Serial No	Instr. Depth (m)	Date of first reliable data	Date of last reliable data	T (°C)	Cond (mS/cm)	Press (dbar)	Spd (m/s)	Dir (true)	Turb (FTU)	Oxy (% or µmol)	Chl	Luminosity (µmol/m²s)	Quality Control Comments
CA04-07	306	71° 04.87' N 133° 38.11' W	RBR-XR	10421	34	2007-10-18 01:30	2008-07-29 03:55										
			Aquadopp	2752	34	NO DATA RECORDED											
			RBR-XR	13210	92	2007-10-18 01:24	2008-07-29 04:02										Problems with pressure sensor
			Continental	6075	79	2007-10-18 01:40	2008-07-29 03:40										
			SBE 37	1697	213	2007-10-18 01:40	2008-07-29 03:50										
			Aquadopp	2747	213	NO DATA RECORDED											
			RBR-XR	13209	285	NO DATA RECORDED											
			Aquadopp	2688	285	2007-10-18 02:00	2008-06-26 00:30										Several data points are missing
CA05-07	200	71° 18.82' N 127° 36.14' W	ACLW	877	34	2007-10-23 00:00	2008-07-25 00:00										
			RBR-XR	10424	35	2007-10-23 00:00	2008-07-25 01:00										
			ALW	71	35	2007-10-23 00:00	2008-07-25 00:00										
			ACLW	883	46	2007-10-23 00:00	2008-07-25 00:00										
			ACTW	151	46	2007-10-23 00:00	2008-07-25 00:00										
			RBR-XR	10420	89	2007-10-23 00:00	2008-02-19 22:30										Several data points are missing; Offset correction applied to salinity data
			Continental	6088	88	2007-10-23 01:00	2008-07-25 00:40										
			RCM11	285	178	2007-10-22 21:29	2008-01-10 00:29										Several data points are missing
			SBE26	371	192	NO DATA RECORDED											

TABLE 4b. Summary of the instruments moored in 2007 and recovered in 2008 for the benefit of the ArcticNet program. (Lines were actually deployed in October 2007 and recovered in July 2008 during CFL expeditions). AN01-07 was recovered in Summer 2009.

Mooring	Water depth	Position	Instrument	Serial No	Instr. Depth (m)	Date of first reliable data	Date of last reliable data	T (°C)	Cond (mS/cm)	Press (dbar)	Spd (m/s)	Dir (true)	Turb (FTU)	Oxy (% or µmol)	Chl	Luminosity (µmol/m²s)	Quality Control Comments
CA05 MMP-07	234	71° 24.20' N 127° 38.11' W	MMP	12138-05	40-130	2007-10-23	2008-07-24										
CA08-07	397	71° 03.23' N 126° 01.36' W	ACLW	886	24	2007-10-31 06:00	2008-07-27 00:00										
			ALW	67	29	2007-10-31 06:00	2008-07-27 00:00										
			ACTW	146	40	2007-10-31 06:00	2008-07-27 00:00										
			ACLW	885	40	2007-10-31 06:00	2008-07-27 00:00										
			ALW	72	40	2007-10-31 06:00	2008-07-27 00:00										
			RBR-XR	13203	79	2007-10-31 06:00	2008-07-27 00:47										Offset correction applied to salinity data
			Continental	6081	79	2007-10-31 06:00	2008-07-28 00:40										
			Aquadopp	2754	222	2007-10-31 06:00	2008-07-27 00:00										
			SBE 37	1695	222	2007-10-31 06:00	2008-07-27 00:40										Problems with pressure sensor
			RBR-XR	13206	377	2007-10-31 06:00	2008-07-27 00:47										Offset correction applied to salinity data
			Aquadopp	2793	383	2007-10-31 06:00	2008-07-27 00:00										
CA16-07	309	71° 47.42' N 126° 29.58' W	ACTW	150	26	**NO DATA RECORDED**											
			ACTW	149	41	2007-10-21 01:00	2008-07-22 18:00										Conductivity data are not reliable after 2008-07-04 21:00
			RBR-XR	10422	87	2007-10-21 01:00	2008-07-22 19:05										
			Continental	6085	85	2007-10-21 01:00	2008-07-22 19:00										
			Aquadopp	2778	222	2007-10-21 01:00	2008-07-15 01:00										Some data points are missing
			RBR-XR	13205	222	**BROKEN**											
			RBR-XR	13211	291	2007-10-21 01:00	2008-07-22 19:05										Problems with pressure sensor; Offset correction applied to salinity data
			Aquadopp	2746	291	2007-10-21 01:00	2008-07-22 19:00										
CA16 MMP-07	356	71° 45.21' N 126° 30.33' W	MMP	12138-03	40-190	2007-10-21	2008-07-23										
AN01-07	106	59° 58.64' N 91° 56.63' W	RCM11	280	23	**No reliable data**											
			ACTW	148	77	2007-08-16 08:00	2008-09-19 10:59										
			WH-ADCP	333	77	**NO DATA RECORDED**											

Please notice that green is used to indicate reliable data and purple represented data for which no reliable calibration is available.

TABLE 5. Content of the ASCII Rosette-CTD data files.

Parameters	Units	Number of significant digits
Pressure (or depth)	dbars	2
Temperature	°C (ITS-90)	3
Transmissivity	%	2
Fluorescence	µg/l	2
Salinity	PSS (1978)	3
Density, σ (S,T,P)	kg/m^3	2
Specific volume anomaly	10^{-8} m^3/kg	0
N^2: Brunt-Väisälä frequency	$1/sec^2$	2
Density; σ_τ ; σ(S,T,O)	kg/m3	3
Potential temperature (θ)	°C	3
σ_θ ; σ(S,θ,O)	kg/m^3	3
Freezing temperature	°C	2
Dissolved oxygen concentration	ml/l	4
pH	no units	3
Nitrates	$mmol/m^3$	2
PAR pressure	dbars	2
PAR	µEinsteins/m^2/sec	3
Surface PAR	µEinsteins/m^2/sec	3

TABLE 6. Maximum and minimum values used to draw salinity and temperature contour plots from the Rosette-CTD and the MVP data (appendices 5, 6 and 7). Values were fixed for all sections of a same expedition regardless of the instrument used.

Leg	*Expedition*	*Salinité*		*Temperature (^{o}C)*	
Number	*Number*	*Minimum*	*Maximum*	*Minimum*	*Maximum*
1	***0704***	21	35	-2	12
3	***0706***	26	35	-2	2
11	***0806***	28	35	-2	5

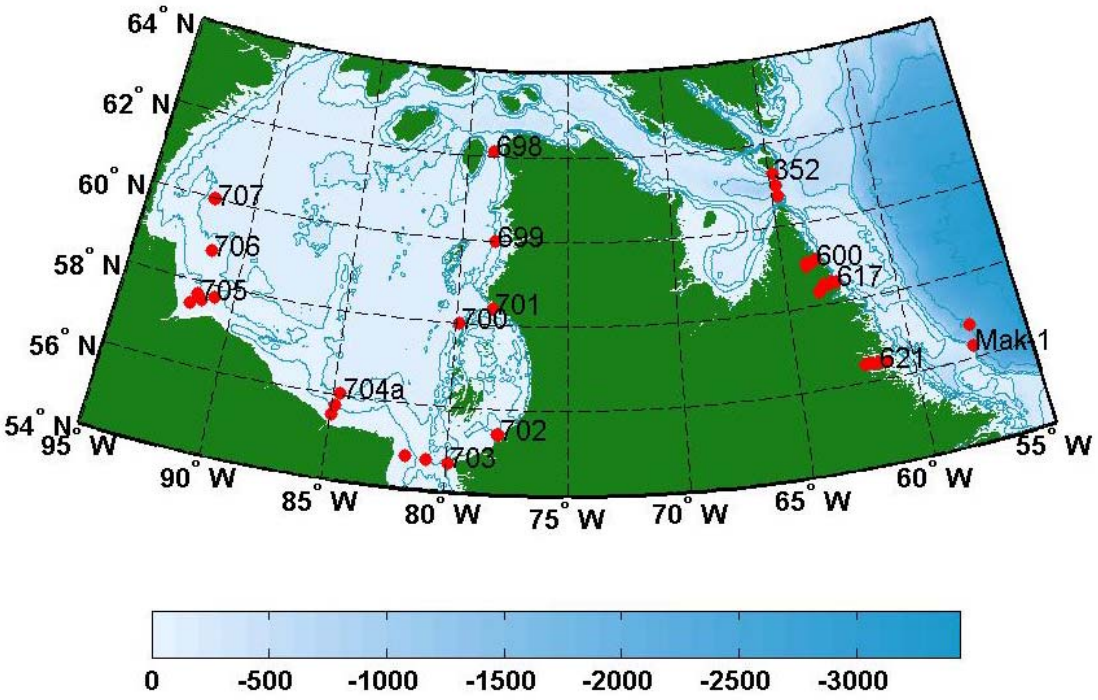
APPENDIX 1. High resolution maps of Arctic areas where Rosette-CTD, MVP, SCAMP and moorings data were collected.

1A. Rosette-CTD sampling sites in Labrador fjords, Hudson Bay, Baffin Bay, Northwest Passage and Beaufort Sea (Legs 1, 3 and 11).

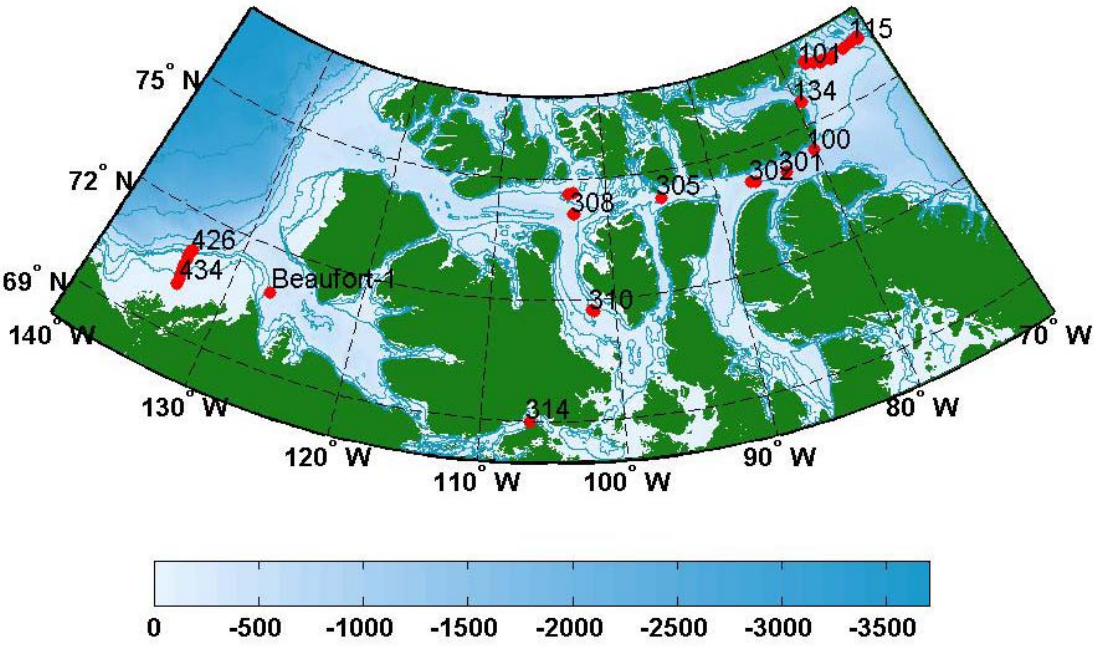
1B. MVP sampling sites in Hudson Bay, Baffin Bay, Northwest Passage and Beaufort Sea (Legs 1, 3 and 11).

1C. SCAMP sampling sites in Baffin Bay, Northwest Passage and Beaufort Sea (Leg 3).

1D. Moorings recovered and deployed in Hudson Bay, Baffin Bay and Beaufort Sea (Legs 1, 3 and 11).

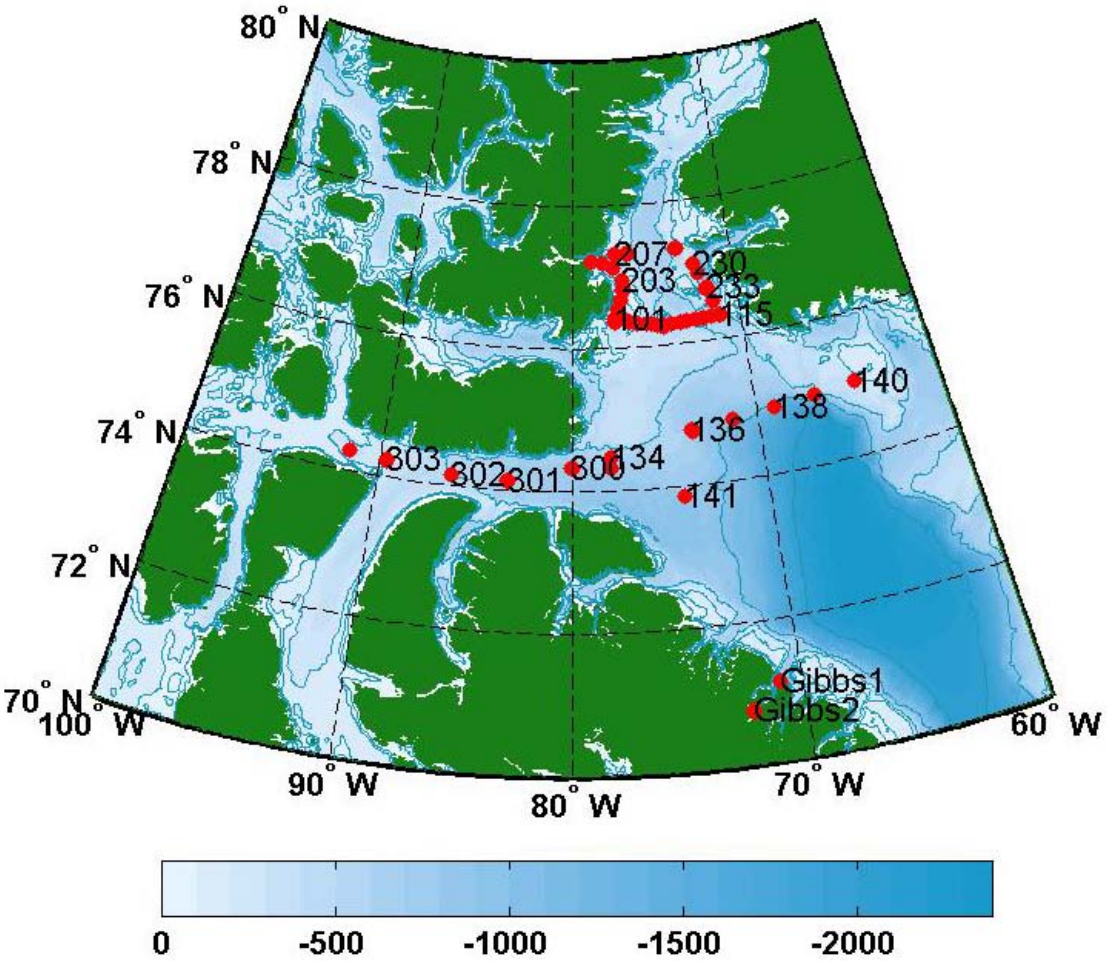


Hudson Bay and Labrador fjords (Leg 1 - 0704)



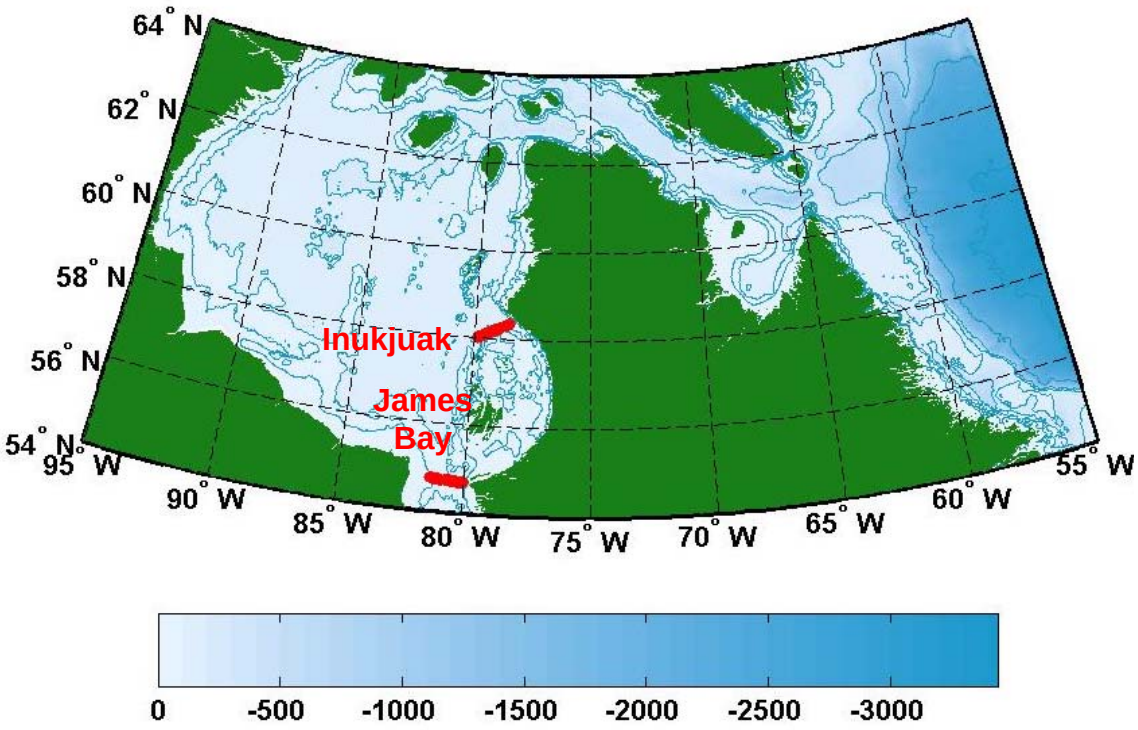
Baffin Bay, Northwest Passage and Beaufort Sea (Leg 3 - 0706)

APPENDIX 1A. Location of the Rosette-CTD sampling sites during the 2007 expeditions. Numbers represent station name (not to be confused with cast number).

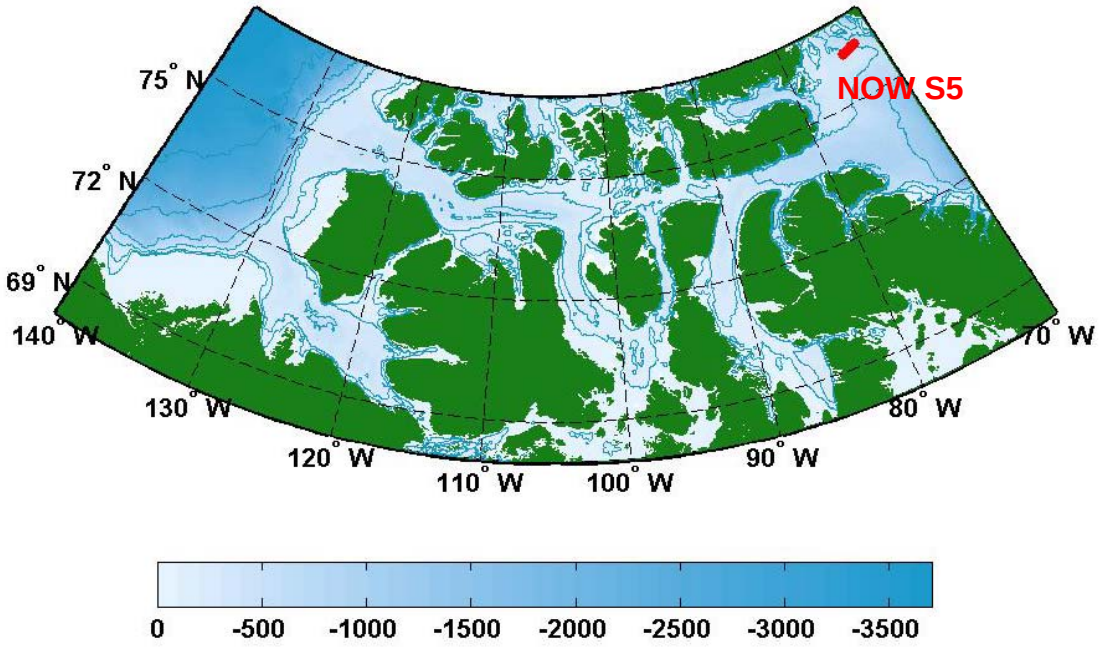


Baffin Bay (Leg 11)

APPENDIX 1A. Location of the Rosette-CTD sampling sites during the 2008 expedition. Numbers represent station name (not to be confused with cast number).

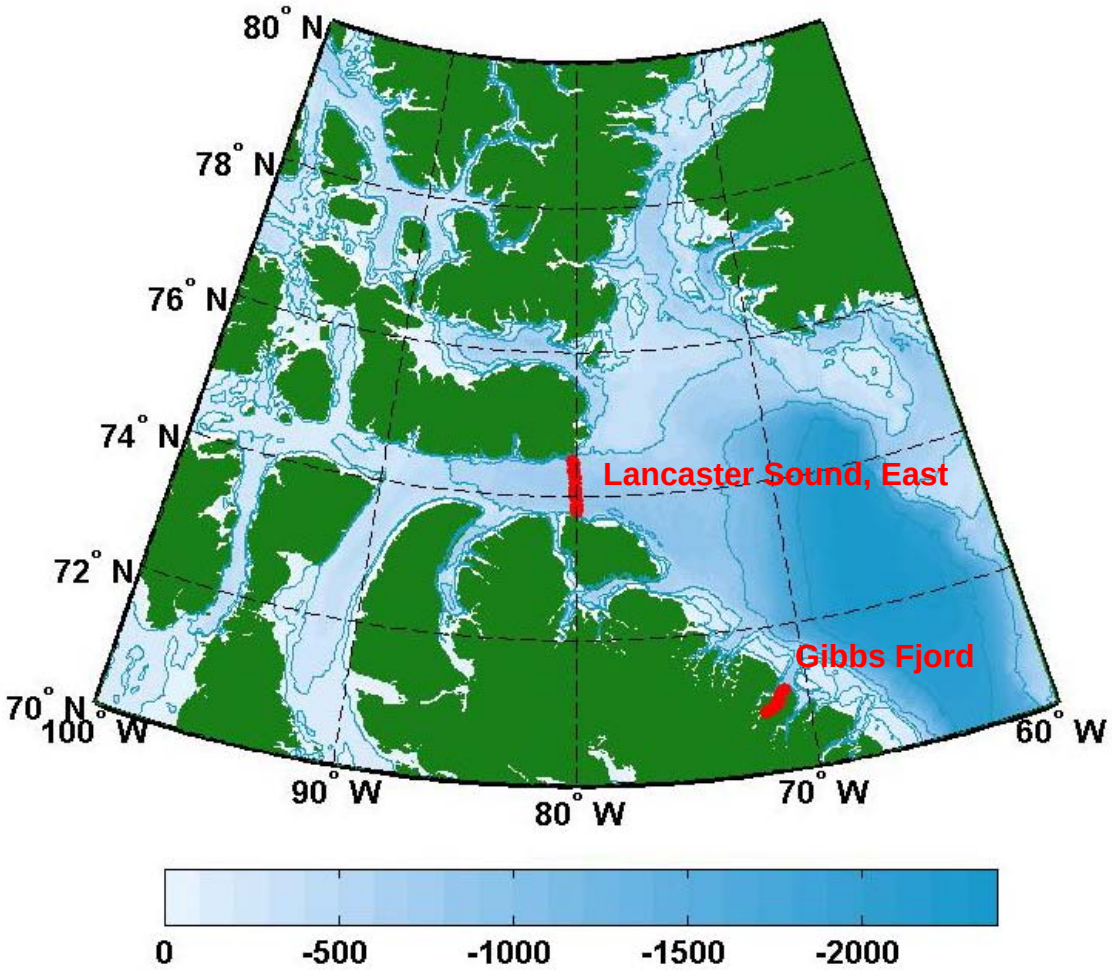


Hudson Bay and Labrador fjords (Leg 1 - 0704)



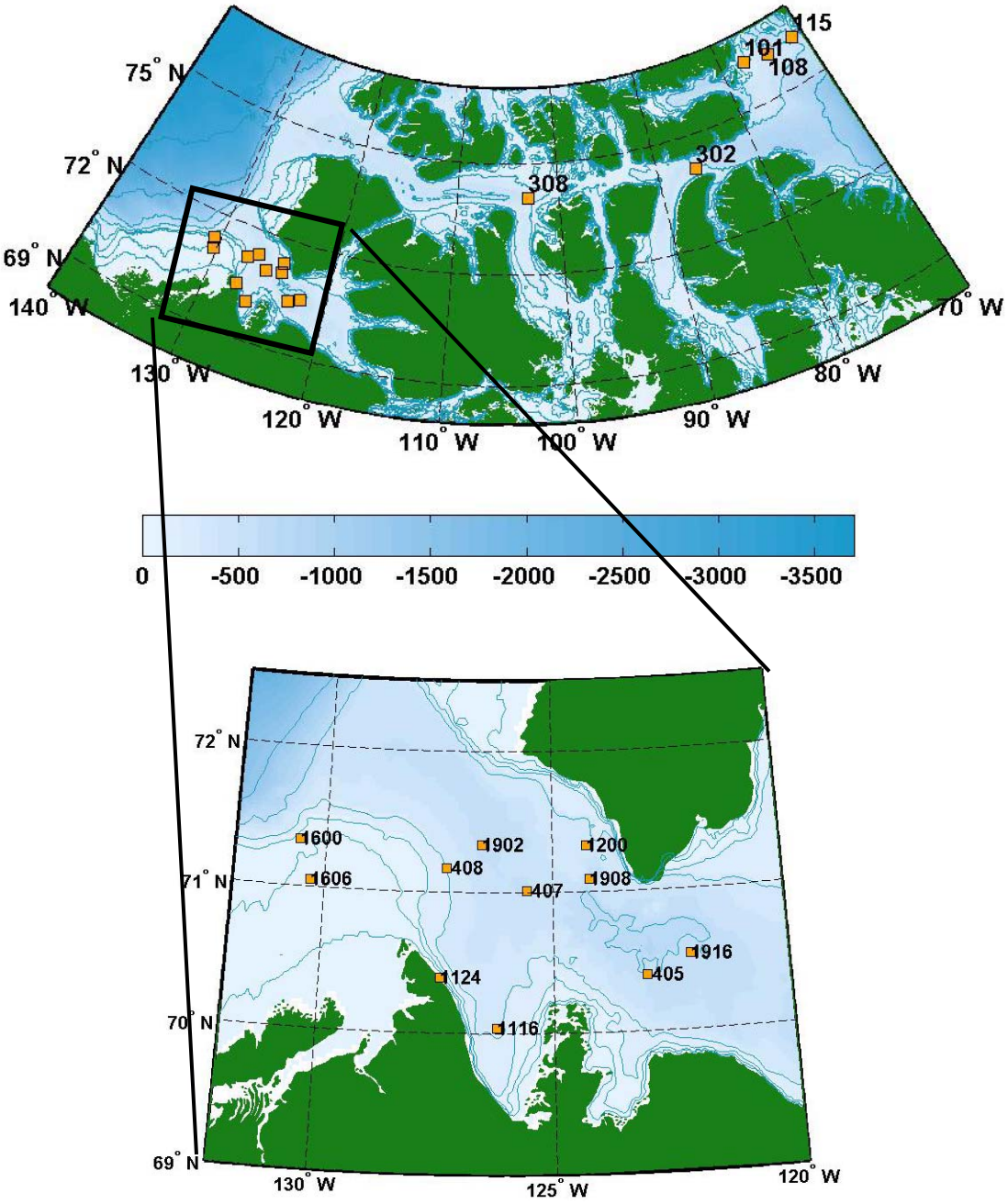
Baffin Bay, Northwest Passage and Beaufort Sea (Leg 3 - 0706)

APPENDIX 1B. Location of the MVP sections during the 2007 expeditions.

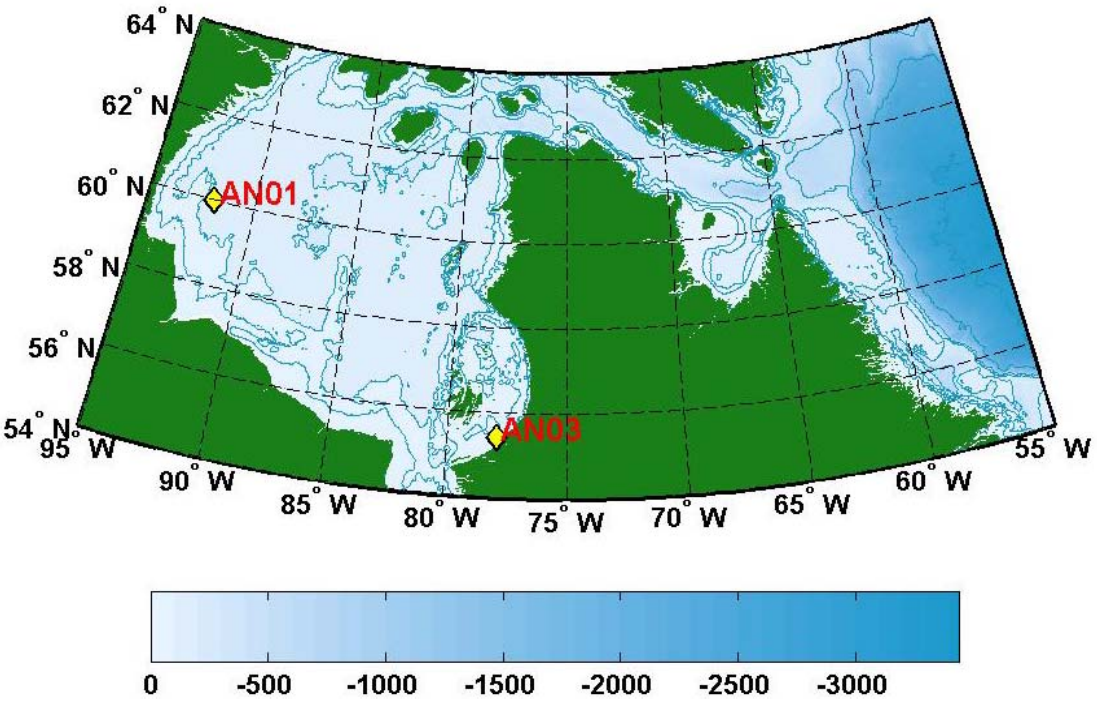


Baffin Bay (Leg 11)

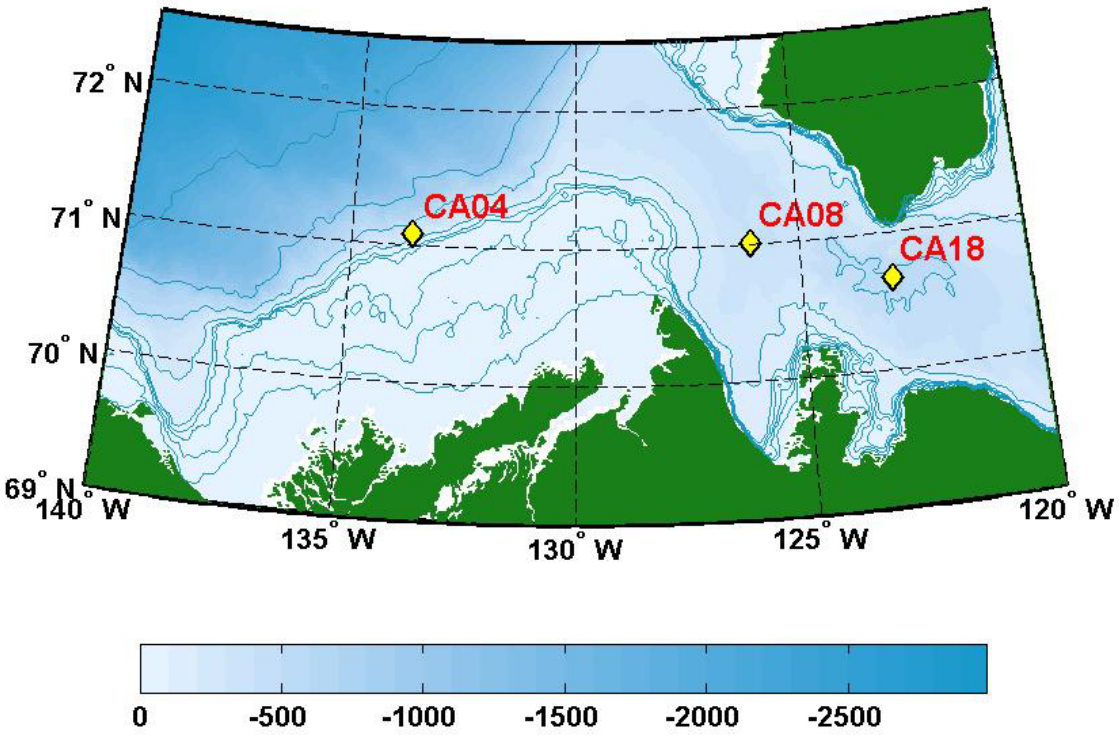
APPENDIX 1B. Location of the MVP sections during the 2008 expedition.



APPENDIX 1C. Location of the SCAMP stations during the 0706 expedition.

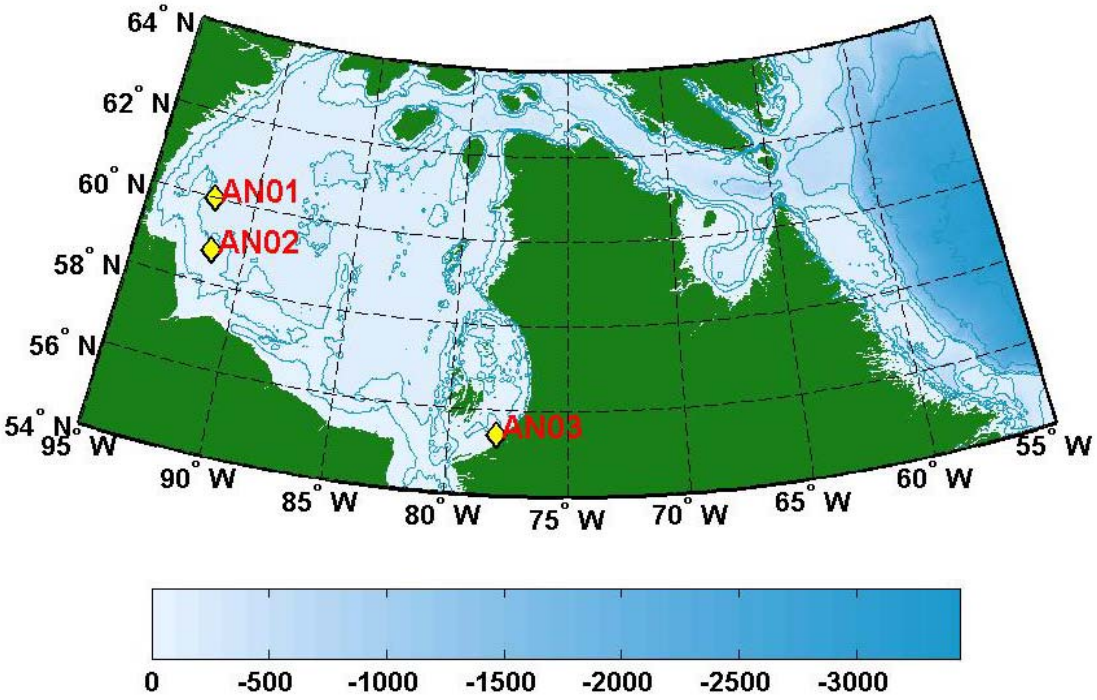


Hudson Bay (2006-2007)

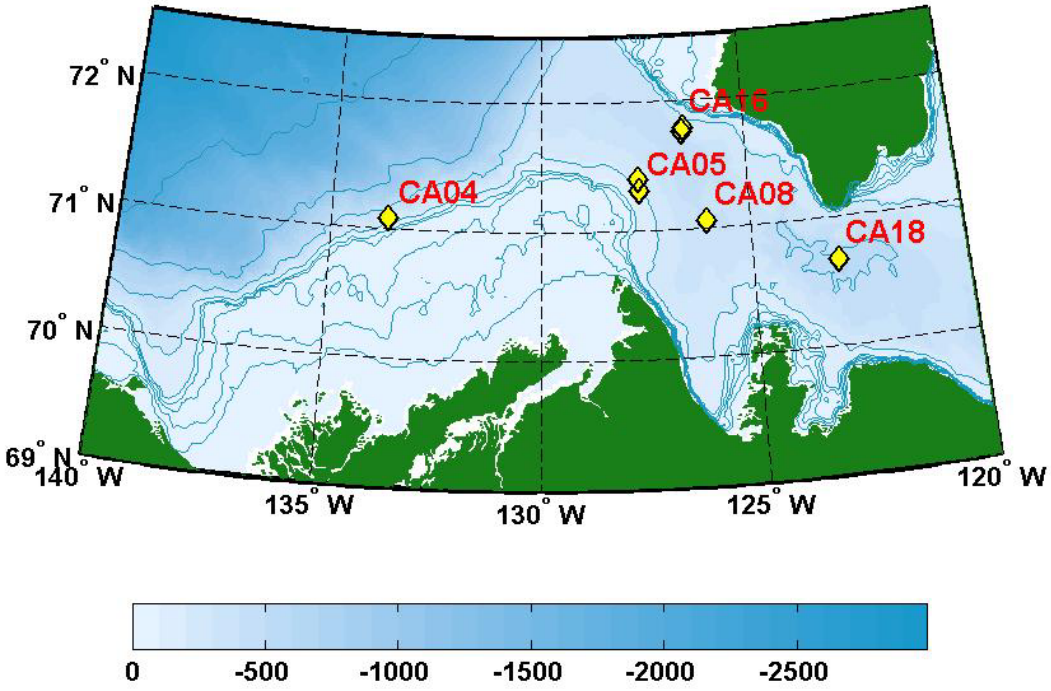


Beaufort Sea (2006-2007)

APPENDIX 1D. Moorings deployed in September and October 2006. Only two lines (AN03 and CA18) were recovered in 2007.

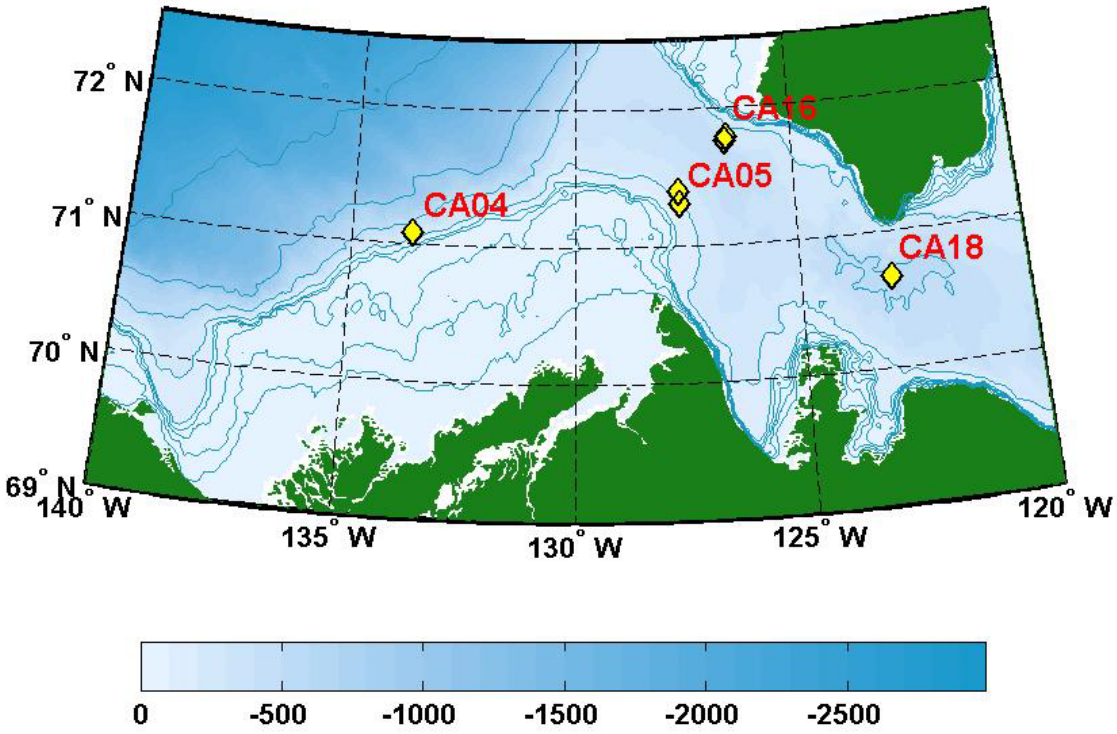


Hudson Bay (2007-2009)



Beaufort Sea (2007-2008)

APPENDIX 1D. Moorings deployed in 2007 and recovered in 2008. There were two different lines deployed on station CA05 and CA16. The second line was used for a single instrument know as a MMP. Moorings in Hudson Bay were recovered in 2009. AN02-07 and CA18-07 were lost.



Beaufort Sea (2008-2009)

APPENDIX 1D. Six moorings were deployed in 2008. As for the 2007-2008 sampling year, there were two different lines deployed on station CA05 and CA16. The second line was used for a single instrument know as a MMP.

APPENDIX 2. Rosette-CTD logs, they included cast locations, sampling time, water depth and corresponding station or mooring numbers during 2007 and 2008 ArcticNet scientific expeditions.

2A. Rosette logbook for Leg 1 (expedition 0704)

2B. Rosette logbook for Leg 3 (expedition 0706)

2C. Rosette logbook for Leg 11 (expedition 0806)

APPENDIX 2A. Rosette cast locations, sampling time, water depth and corresponding stations or mooring numbers during ArcticNet expedition 0704.

Cast number	*Station or mooring*	*Start date UTC*	*Start time UTC*	*Latitude (North)*	*Longitude (West)*	*Sea bottom depth (m)*	*Cast depth (m)*
001	mak-1	2007-07-30	02:05	56° 18.338	057° 23.092	1466	899
002	mak-2	2007-07-30	21:11	56° 47.155	057° 17.816	2027	901
003	621	2007-07-31	11:06	56° 24.994	061° 30.986	110	102
004	622	2007-07-31	12:20	56° 24.980	061° 44.012	83	78
005	623	2007-07-31	13:54	56° 26.579	061° 55.992	95	82
006	624	2007-07-31	15:28	56° 25.141	062° 04.411	62	50
007	620	2007-07-31	22:02	56° 24.044	061° 13.112	70	59
008	617	2007-08-01	16:10	58° 29.975	062° 41.417	139	124
009	610	2007-08-01	20:08	58° 31.324	062° 50.332	120	117
010	612	2007-08-01	20:57	58° 28.175	062° 59.275	33	29
011	613	2007-08-01	21:54	58° 28.973	063° 13.979	253	230
012	614	2007-08-01	23:34	58° 24.006	063° 23.311	113	106
013	615	2007-08-02	00:49	58° 19.174	063° 32.261	130	121
014	600	2007-08-02	10:33	59° 05.310	063° 25.832	202	192
015	601	2007-08-02	13:34	59° 02.666	063° 37.258	140	139
016	602	2007-08-02	15:26	59° 03.230	063° 52.069	158	142
017	604	2007-08-02	19:25	58° 59.518	063° 53.663	55	50
018	356	2007-08-03	08:25	60° 44.660	064° 40.870	296	279
019	354	2007-08-03	11:08	60° 59.947	064° 45.760	518	500
020	352	2007-08-03	14:03	61° 15.962	064° 48.901	268	258
021	698	2007-08-05	06:24	62° 08.082	078° 42.427	149	143
022	699	2007-08-05	17:19	59° 59.968	078° 26.099	88	80
023	701	2007-08-06	06:46	58° 23.272	078° 22.415	84	80
024	700	2007-08-06	19:22	58° 00.588	079° 52.943	140	134
025	702	2007-08-09	18:21	55° 24.533	077° 55.261	122	116
026	702	2007-08-09	20:47	55° 24.612	077° 55.766	142	131
027	702	2007-08-10	13:12	55° 24.420	077° 55.850	136	122
028	703	2007-08-10	21:33	54° 40.608	079° 57.199	46	32
029	703a	2007-08-11	05:01	54° 42.988	080° 50.074	92	80
030	704	2007-08-11	10:45	54° 45.800	081° 43.022	34	23
031	704a	2007-08-12	03:33	56° 02.264	084° 41.699	100	95
032	704b	2007-08-12	07:39	55° 44.351	084° 50.087	67	53
033	704c	2007-08-12	11:27	55° 31.586	084° 57.194	33	22
034	705c	2007-08-13	21:46	57° 42.587	090° 54.085	37	25
035	705b	2007-08-13	23:52	57° 34.124	091° 23.939	41	32
036	705	2007-08-14	06:51	57° 41.658	091o 38.488	44	36
037	705a	2007-08-14	16:25	57° 26.726	091° 53.507	44	31
038	706	2007-08-15	10:56	58° 46.854	091° 31.177	81	68
039	707	2007-08-15	22:04	59° 58.640	091° 56.772	102	92
040	707	2007-08-16	09:20	59° 58.654	091° 57.235	100	92

APPENDIX 2B. Rosette cast locations, sampling time, water depth and corresponding stations or mooring numbers during ArcticNet expedition 0706.

Cast number	*Station or mooring*	*Start date UTC*	*Start time UTC*	*Latitude (North)*	*Longitude (West)*	*Sea bottom depth (m)*	*Cast depth (m)*
001	100	2007-09-28	22:39	74° 23.333	080° 12.150	716	690
002	101	2007-09-29	18:10	76° 24.223	077° 25.227	336	320
003	101	2007-09-29	20:29	76° 26.057	077° 27.409	316	304
004	101	2007-09-29	23:14	76° 27.749	077° 25.250	266	254
005	103	2007-09-30	09:11	76° 21.473	076° 37.382	146	136
006	105	2007-09-30	14:51	76° 17.722	075° 44.075	320	309
007	105	2007-09-30	16:47	76° 16.298	075° 50.742	347	344
008	105	2007-09-30	17:43	76° 15.391	075° 54.569	357	350
009	115	2007-10-01	14:53	76° 19.873	071° 14.452	684	660
010	115	2007-10-01	18:48	76° 22.224	071° 18.236	633	615
011	115	2007-10-01	23:38	76° 19.657	071° 22.121	687	663
012	113	2007-10-02	07:04	76° 19.123	072° 11.852	570	550
013	111	2007-10-02	09:33	76° 18.370	073° 13.616	600	595
014	111	2007-10-02	12:41	76° 18.380	073° 13.060	596	588
015	111	2007-10-02	15:32	76° 18.054	073° 05.908	591	597
016	108	2007-10-03	02:08	76° 13.537	074° 43.343	451	442
017	108	2007-10-03	10:07	76° 15.467	074° 37.379	447	440
018	108	2007-10-03	12:25	76° 14.543	074° 40.309	438	431
019	108	2007-10-03	17:06	76° 13.111	074° 50.264	441	436
020	134	2007-10-04	07:23	75° 38.267	079° 29.094	547	530
021	134	2007-10-04	12:51	75° 35.526	079° 28.192	541	526
022	301	2007-10-07	10:37	74° 07.226	083° 19.632	690	671
023	302	2007-10-07	18:04	74° 09.019	086° 11.442	529	513
024	302	2007-10-07	20:34	74° 09.011	086° 13.186	526	516
025	302	2007-10-08	02:03	74° 11.885	086° 36.796	501	489
026	305	2007-10-08	23:52	74° 19.828	094° 58.834	167	164
027	308	2007-10-09	14:36	74° 07.565	103° 01.634	351	343
028	308	2007-10-09	17:41	74° 08.297	103° 06.713	346	334
029	308	2007-10-09	20:24	74° 07.902	103° 08.978	353	345
030	309	2007-10-10	11:43	74° 39.234	103° 06.870	166	162
031	309	2007-10-10	16:05	74° 38.580	103° 33.346	175	165
032	310	2007-10-11	18:26	71° 42.383	101° 44.785	199	194
033	310	2007-10-11	21:09	71° 43.772	101° 53.616	216	202
034	314	2007-10-12	21:11	68° 59.966	106° 36.186	107	99
035	Beaufort-1	2007-10-15	02:54	70° 54.925	126° 55.093	260	241
036	434	2007-10-15	17:20	70° 10.414	133° 30.948	45	35
037	434	2007-10-15	19:14	70° 10.781	133° 32.774	40	35
038	433	2007-10-15	22:38	70° 17.206	133° 34.018	48	44
039	432	2007-10-15	23:24	70° 24.336	133° 35.867	56	52
040	431	2007-10-16	00:23	70° 29.386	133° 37.160	61	55
041	430	2007-10-16	01:12	70° 35.548	133° 39.211	66	58
042	429	2007-10-16	02:17	70° 41.054	133° 40.360	53	57
043	428	2007-10-16	03:24	70° 47.174	133° 41.684	71	63
044	427	2007-10-16	06:16	70° 52.430	133° 42.427	76	69
045	426	2007-10-16	07:33	70° 59.004	133° 43.638	89	84
046	435	2007-10-16	09:54	71° 04.933	133° 39.072	302	279
047	435	2007-10-17	19:01	71° 04.741	133° 38.872	295	279
048	435	2007-10-17	21:03	71° 03.532	133° 42.678	252	237

APPENDIX 2C. Rosette cast locations, sampling time, water depth and corresponding stations or mooring numbers during ArcticNet expedition 0806 (page 1/2).

Cast number	*Station or mooring*	*Start date UTC*	*Start time UTC*	*Latitude (North)*	*Longitude (West)*	*Sea bottom depth (m)*	*Cast depth (m)*
001	Resolute	2008-09-05	20:17	74° 39.580	094° 50.430	17	8
002	BarrowStrait	2008-09-06	11:21	74° 16.531	091° 39.007	320	303
003	303	2008-09-07	07:10	74° 14.324	089° 39.738	230	223
004	303	2008-09-07	09:01	74° 14.338	089° 39.667	228	222
005	303	2008-09-07	12:33	74° 14.495	089° 38.396	227	212
006	303	2008-09-07	14:39	74° 14.243	089° 40.154	228	218
007	303	2008-09-07	17:18	74° 13.991	089° 38.748	228	219
008	303	2008-09-07	19:13	74° 13.919	089° 37.967	229	220
009	302	2008-09-08	03:26	74° 09.389	086° 16.188	522	515
010	301	2008-09-08	09:10	74° 07.405	083° 20.687	682	676
011	301	2008-09-08	13:08	74° 07.422	083° 19.805	678	669
012	301	2008-09-08	15:26	74° 08.142	083° 23.833	678	667
013	300	2008-09-09	09:38	74° 19.126	080° 06.653	655	643
014	134	2008-09-09	14:35	74° 19.208	080° 00.668	620	619
015	134	2008-09-09	18:03	74° 28.768	078° 00.358	622	617
016	134	2008-09-09	20:10	74° 19.208	078° 00.890	625	619
017	134	2008-09-09	22:13	74° 28.812	078° 00.241	639	620
018	136	2008-09-10	08:52	74° 46.492	073° 37.108	780	773
019	136	2008-09-10	11:55	74° 46.253	073° 36.328	782	775
020	136	2008-09-10	16:18	74° 45.654	073° 36.127	779	778
021	137	2008-09-10	20:25	74° 51.772	071° 20.544	928	920
022	138	2008-09-11	03:06	74° 56.183	069° 04.009	1068	951
023	138	2008-09-11	05:15	74° 56.189	069° 04.132	1080	950
024	139	2008-09-11	10:55	74° 59.362	066° 46.674	546	536
025	140	2008-09-11	15:40	75° 02.190	064° 29.128	280	272
026	140	2008-09-11	18:32	75° 02.153	064° 28.967	282	271
027	115	2008-09-12	08:28	76° 19.710	071° 16.456	678	666
028	115	2008-09-12	11:01	76° 20.012	071° 18.688	670	667
029	115	2008-09-12	22:51	76° 19.669	071° 13.801	672	666
030	115	2008-09-13	01:46	76° 19.714	071° 13.490	670	660
031	115	2008-09-13	04:34	76° 19.646	071° 13.322	673	660
032	114	2008-09-13	14:43	76° 19.576	071° 47.068	631	604
033	113	2008-09-13	16:21	76° 19.253	072° 13.133	568	554
034	112	2008-09-13	18:10	76° 18.887	072° 42.246	572	556
035	111	2008-09-13	20:24	76° 18.395	073° 14.110	613	591
036	111	2008-09-14	00:00	76° 18.174	073° 13.369	600	578
037	110	2008-09-14	03:19	76° 18.064	073° 37.813	532	526
038	109	2008-09-14	05:35	76° 17.330	074° 06.970	449	444
039	108	2008-09-14	08:22	76° 15.502	074° 34.992	443	433
040	108	2008-09-14	11:38	76° 16.132	074° 34.841	448	439
041	108	2008-09-14	14:20	76° 16.019	074° 34.756	444	438
042	108	2008-09-14	18:00	76° 15.828	074° 36.112	450	442
043	107	2008-09-14	23:01	76° 17.384	074° 56.578	460	447
044	106	2008-09-15	01:08	76° 18.545	075° 21.336	386	378
045	105	2008-09-15	02:43	76° 19.104	075° 37.434	324	318
046	104	2008-09-15	07:21	76° 20.284	076° 10.309	190	180
047	103	2008-09-15	08:48	76° 21.658	076° 34.768	147	137
048	102	2008-09-15	10:56	76° 23.999	076° 59.927	245	237
049	101	2008-09-15	17:38	76° 21.386	077° 26.815	387	382
050	101	2008-09-15	20:06	76° 22.294	077° 26.668	392	382

APPENDIX 2C. Rosette cast locations, sampling time, water depth and corresponding stations or mooring numbers during ArcticNet expedition 0806 (page 2/2).

Cast number	Station or mooring	Start date UTC	Start time UTC	Latitude (North)	Longitude (West)	Sea bottom depth (m)	Cast depth (m)
051	101	2008-09-15	22:22	76° 21.521	077° 30.334	377	367
052	101	2008-09-16	00:08	76° 24.271	077° 29.447	403	393
053	200	2008-09-16	03:28	76° 32.472	077° 16.250	244	238
054	201	2008-09-16	05:26	76° 39.974	077° 03.204	267	264
055	202	2008-09-16	07:05	76° 48.926	076° 54.258	192	183
056	202	2008-09-16	11:43	76° 48.594	076° 55.578	179	167
057	202	2008-09-16	12:31	76° 48.511	076° 57.208	184	175
058	203	2008-09-16	14:34	76° 56.899	076° 55.412	155	145
059	204	2008-09-16	16:20	77° 07.748	077° 27.569	177	165
060	205	2008-09-16	22:53	77° 13.558	078° 49.052	489	484
061	205	2008-09-17	01:54	77° 12.560	078° 49.091	583	581
062	206	2008-09-17	06:48	77° 11.719	078° 06.425	491	487
063	207	2008-09-17	08:58	77° 18.642	077° 20.615	515	498
064	118	2008-09-17	13:03	77° 19.398	076° 31.681	475	465
065	118	2008-09-17	15:58	77° 18.936	076° 34.037	470	467
066	126	2008-09-18	05:17	77° 20.573	073° 26.220	326	319
067	126	2008-09-18	07:37	77° 20.587	073° 25.634	325	319
068	126	2008-09-18	11:49	77° 20.803	073° 25.469	330	321
069	126	2008-09-18	14:52	77° 20.299	073° 22.951	350	344
070	126	2008-09-18	17:40	77° 20.689	073° 25.454	326	318
071	230	2008-09-19	14:13	77° 06.004	072° 25.074	592	571
072	232	2008-09-19	16:45	76° 56.706	072° 11.980	835	834
073	233	2008-09-19	20:50	76° 44.366	071° 47.504	746	739
074	233	2008-09-20	00:11	76° 43.950	071° 51.935	658	627
075	233	2008-09-20	02:49	76° 44.318	071° 49.518	706	700
076	233	2008-09-20	07:36	76° 44.168	071° 49.459	704	701
077	234	2008-09-20	09:37	76° 32.390	071° 32.154	464	456
078	115	2008-09-22	22:33	76° 19.870	071° 13.364	663	646
079	141	2008-09-23	12:52	73° 52.344	074° 17.500	850	838
080	Gibbs2	2008-09-24	20:44	70° 45.880	072° 15.618	454	439
081	Gibbs2	2008-09-24	22:33	70° 45.793	072° 15.910	455	445
082	Gibbs2	2008-09-25	01:16	70° 46.063	072° 16.519	451	436
083	Gibbs1	2008-09-25	06:56	71° 07.307	070° 57.880	449	445

APPENDIX 3. List of Rosette sections and their related stations and casts. Some of these sections have been sampled during previous ArcticNet expeditions. When relevant, the section name as been preserved.

Leg 0704		
Section	**Station**	**Cast**
Anaktalak fjord	621	3
	622	4
	623	5
	624	6
	620	7
Saglek fjord	617	8
	610	9
	612	10
	613	11
	614	12
	615	13
Nachvak fjord	600	14
	601	15
	602	16
	604	17
Hudson Strait	356	18
	354	19
	352	20
James Bay	703	28
	703a	29
	704	30
Winisk River	704a	31
	704b	32
	704c	33
Nelson River	705c	34
	705b	35
	705a	37
Moorings	705a	37
	706	38
	707	40

Leg 0706		
Section	**Station**	**Cast**
Northern Baffin Bay Section 5	101	2
	103	5
	105	6
	115	9
	113	12
	111	14
	108	17
Eastern North-West Passage	301	22
	302	23
	305	26
	308	27
Beaufort Sea Line 700	434	37
	433	38
	432	39
	431	40
	430	41
	429	42
	428	43
	427	44
	426	45
	435	47

Leg 0806		
Section	**Station**	**Cast**
Eastern North-West Passage	Barrow Strait	2
	303	8
	302	9
	301	10
	300	13
	134	17
	136	20
	137	21
	138	22
	139	24
	140	25
Northern Baffin Bay Section 5	115	29
	114	32
	113	33
	112	34
	111	35
	110	37
	109	38
	108	42
	107	43
	106	44
	105	45
	104	46
	103	47
	102	48
	101	52
Northern Baffin Bay western coast	101	52
	200	53
	201	54
	202	55
	203	58
	118	64
Northern Baffin Bay eastern coast	115	78
	234	77
	233	73
	232	72
	230	71
	126	66

APPENDIX 4. List of the MVP sections and their related casts and metadata.

Sections of 0704	# of Casts	first and last cast	Date	Time	Latitude	Longitude	Bottom (m)	Cast depth (m)
Inukjuak	164	36	August 6th, 2007	10:22	58.362	-78.475	109.9	88.5
		221	August 6th, 2007	18:21	58.015	-79.862	122.9	106.2
Bay James	221	224	August11th, 2007	00:10	54.686	-80.028	51.8	40.8
		449	August11th, 2007	08:32	54.742	-81.394	41.2	28.5

Sections of 0706	# of Casts	first and last cast	Date	Time	Latitude	Longitude	Bottom (m)	Cast depth (m)
Now S5	30	1	October 1st, 2007	02:44	76.203	-73.789	426.6	80.2
		58	October 1st, 2007	05:48	76.287	-72.167	535.8	131.4

Sections of 0806	# of Casts	first and last cast	Date	Time	Latitude	Longitude	Bottom (m)	Cast depth (m)
Lancaster Sound, east	32	1	September 9th, 2008	00:03	73.785	-79.992	795.6	82.5
		39	September 9th, 2008	07:17	74.511	-80.202	645.2	620.2
Gibbs Fjord	18	40	September 24th, 2008	13:41	71.116	-70.976	454.3	87.7
		58	September 24th, 2008	16:58	70.826	-71.895	688	569.4

APPENDIX 5. Sections of salinity and potential temperature from the expedition 0704 (Leg 1). It includes data from the Rosette-CTD and from the MVP. The list of the stations and casts selected for each section is found in Appendices 3 and 4.

The same color scale is used for all sections of this leg regardless of the sensor used. However, it is different from one leg to another. Details are found in Table 6.

5. Location of CTD and MVP sections during expedition 0704

Rosette-CTD sections

5.1 Section in the Anaktalak fjord, Labrador (previously sampled in 2006)

5.2 Section in the Saglek fjord, Labrador (previously sampled in 2006)

5.3 Section in the Nachvak fjord, Labrador (previously sampled in 2006)

5.4 Section 13 across Hudson Strait (previously sampled in 2005 and 2006)

5.5 Section 21 at the mouth of James Bay (previously sampled in 2005)

5.6 Section offshore of the Winisk River, in Hudson Bay (previously sampled in 2005)

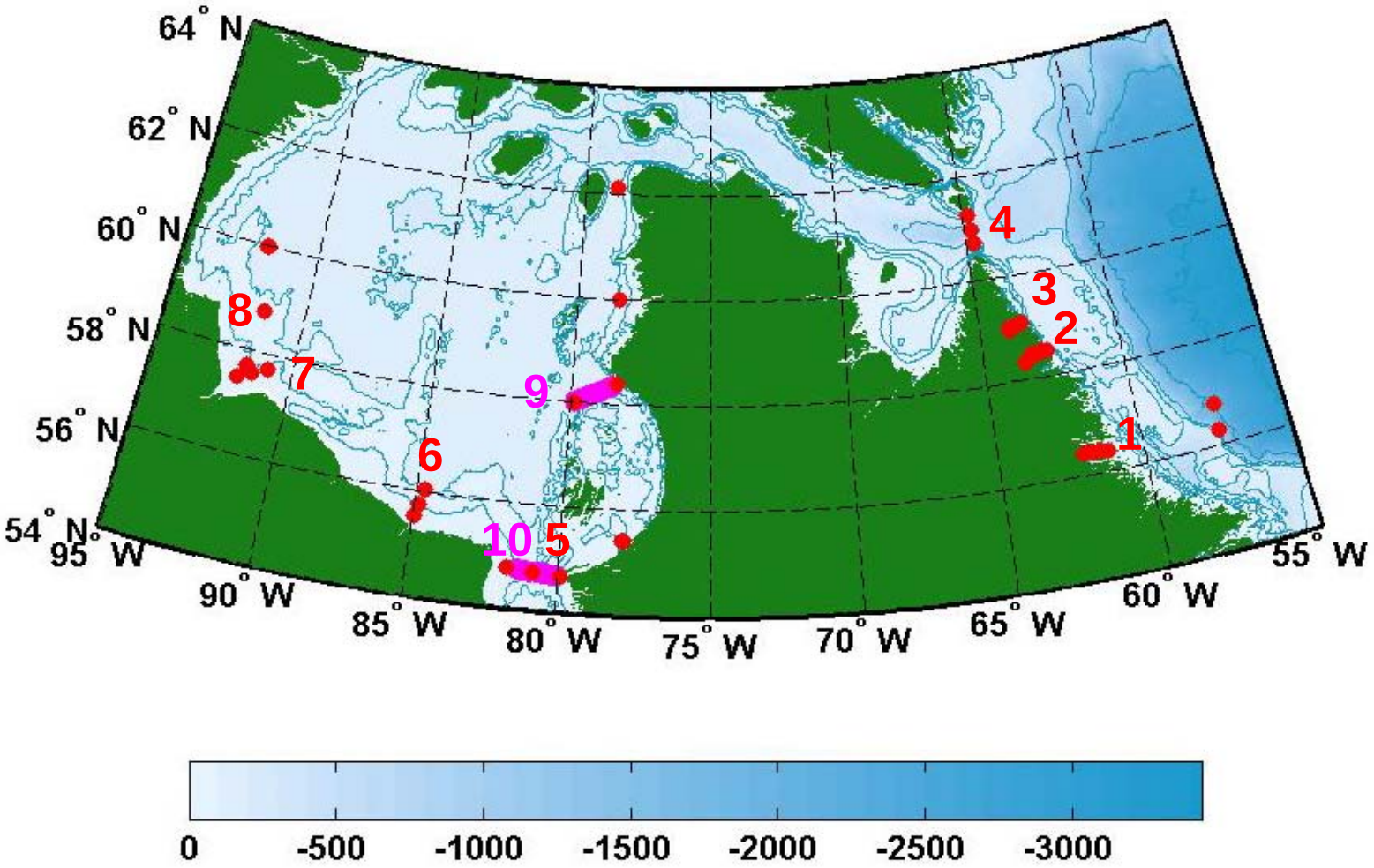
5.7 Section offshore of the Nelson River, in Hudson Bay (previously sampled in 2005)

5.8 Section along the Western coast of Hudson Bay between moorings lines

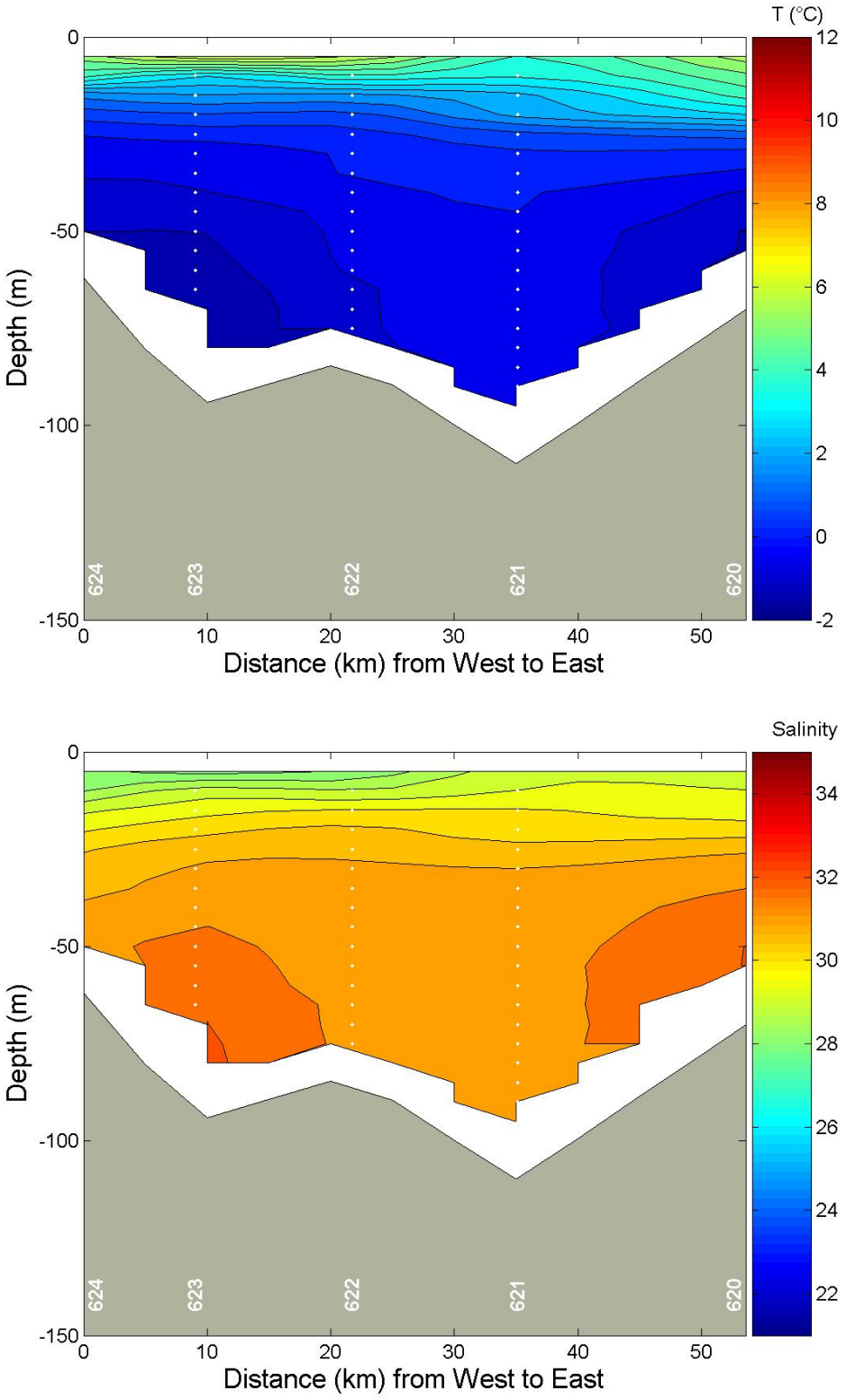
MVP sections

5.9 Section offshore of Inukjuak, Eastern coast of Hudson Bay (previously sampled in 2005)

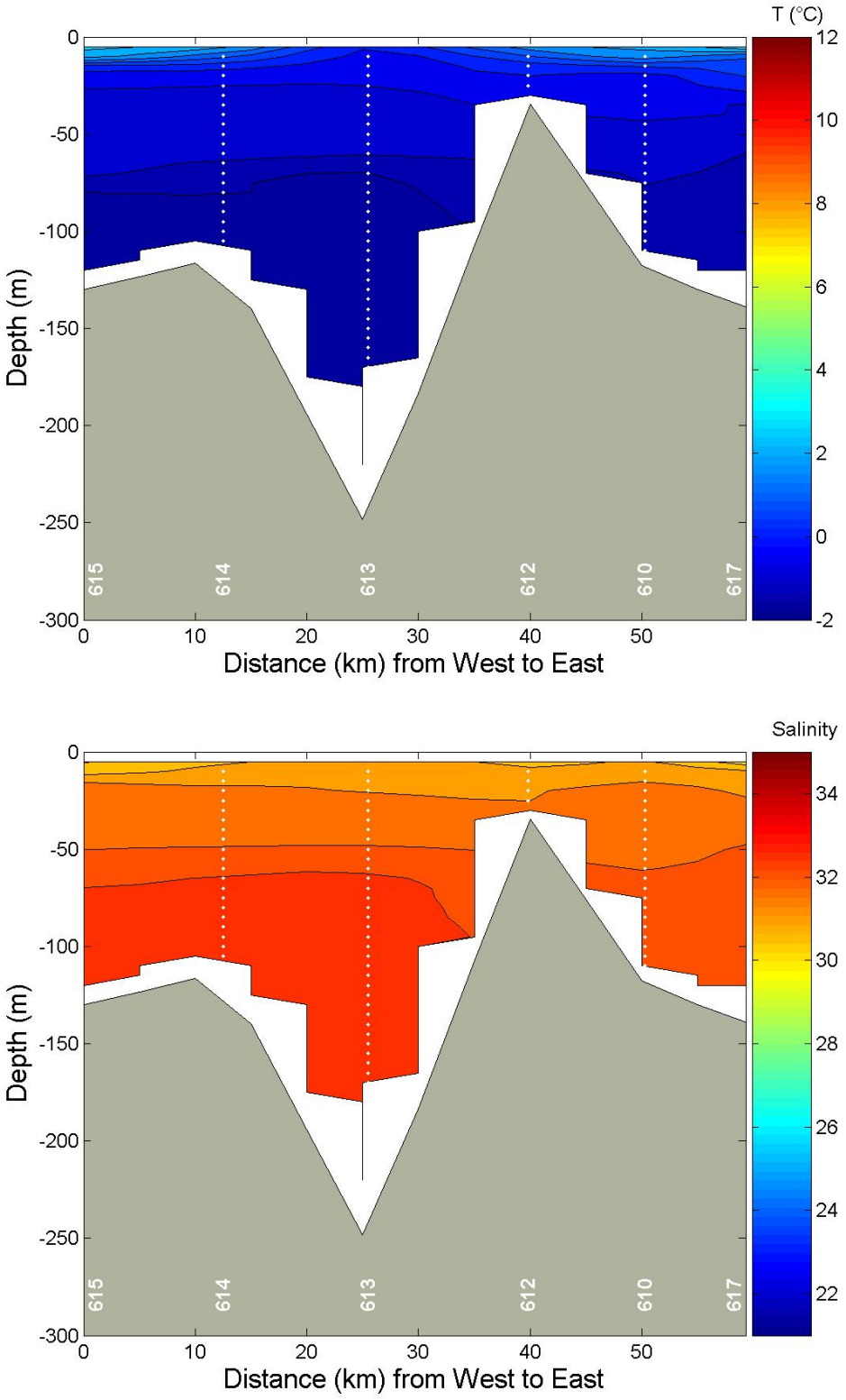
5.10 Section at the mouth of James Bay (previously sampled in 2005)



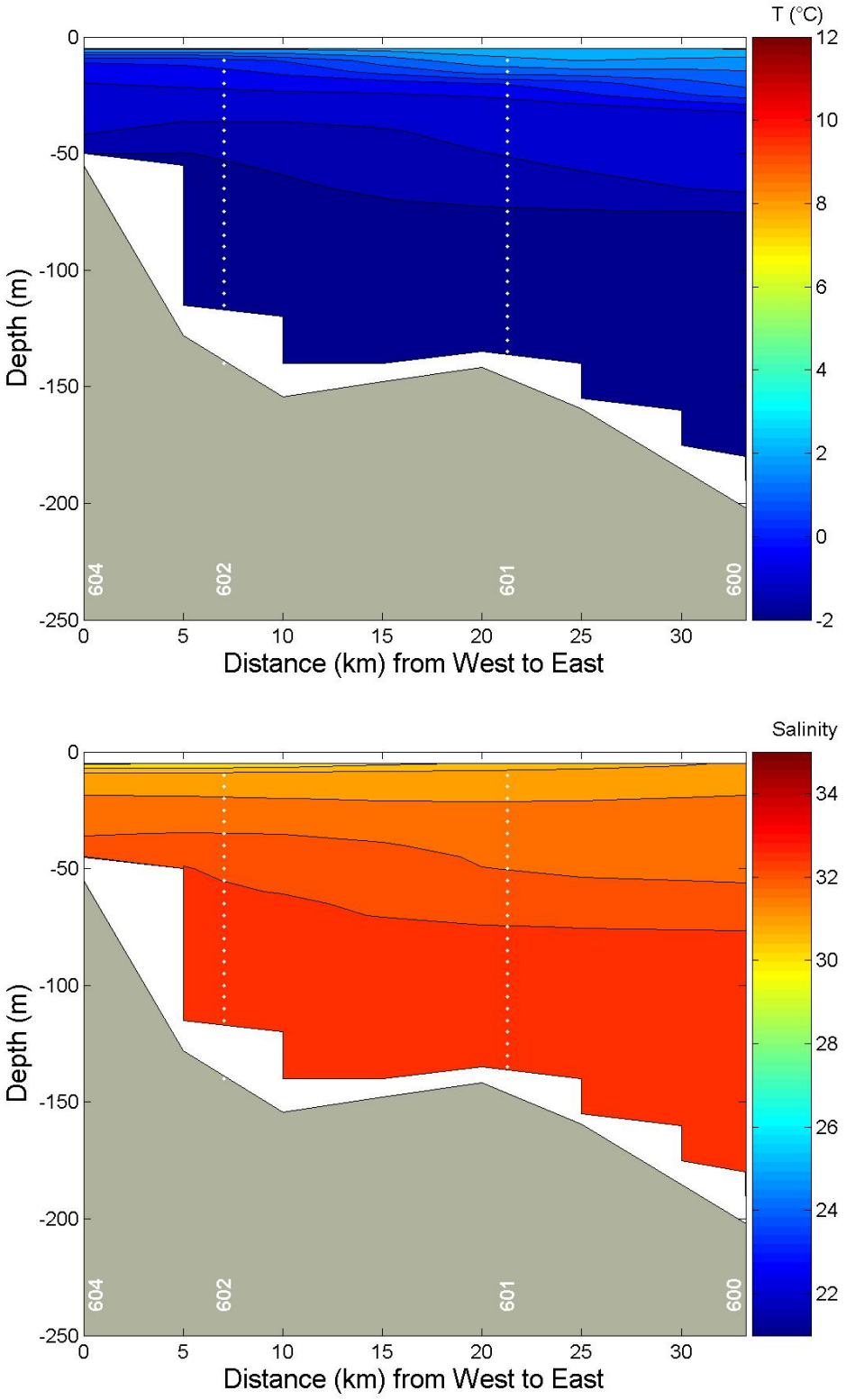
APPENDIX 5. Location of CTD (red) and MVP (purple) sampling sites during the expedition 0704 (Leg 1). The letters identify the sections presented as salinity and temperature contour plots on the next pages.



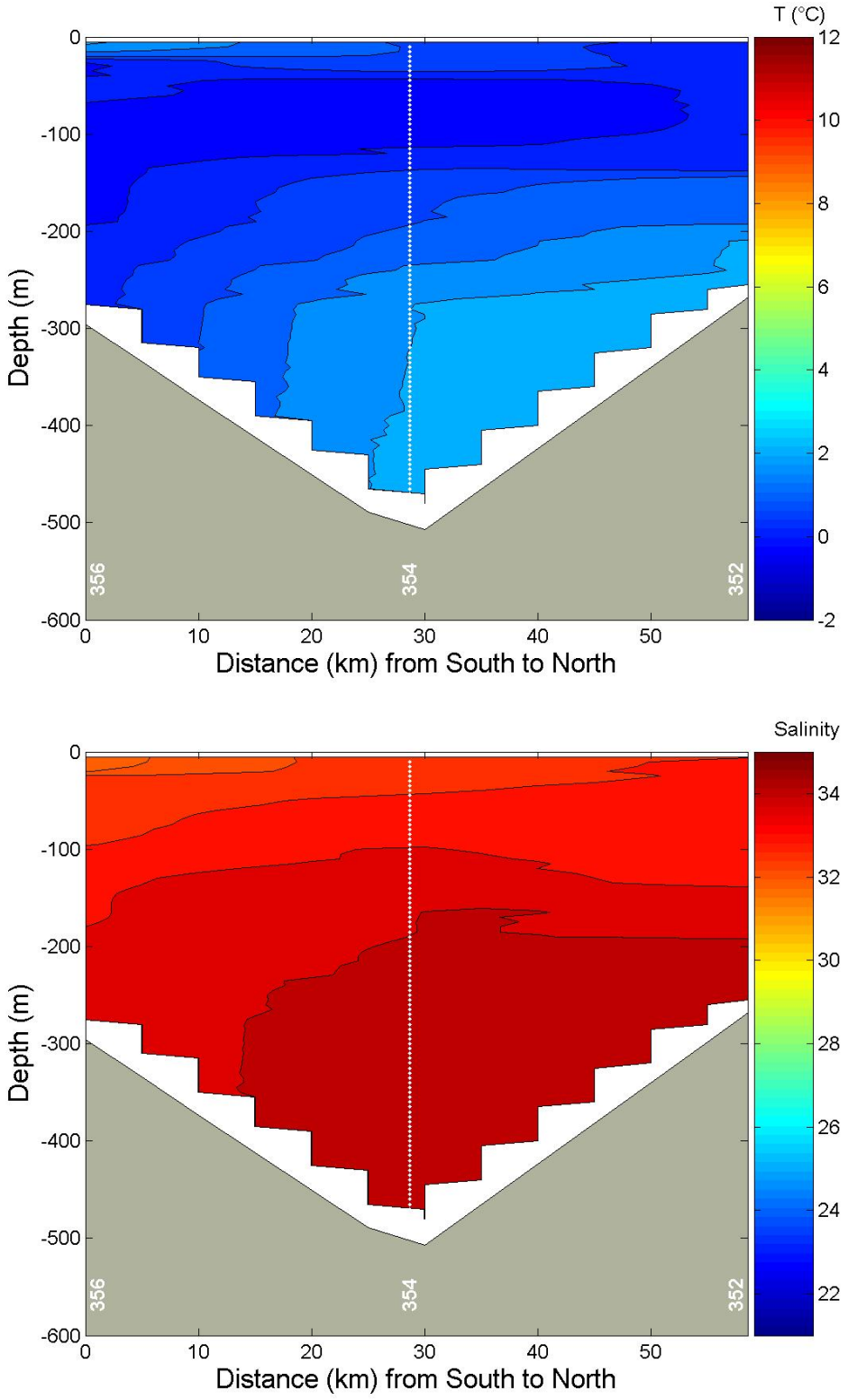
APPENDIX 5.1. Potential temperature and salinity along the section in the Anaktalak fjord. The western sites are on the left and the eastern sites are on the right.



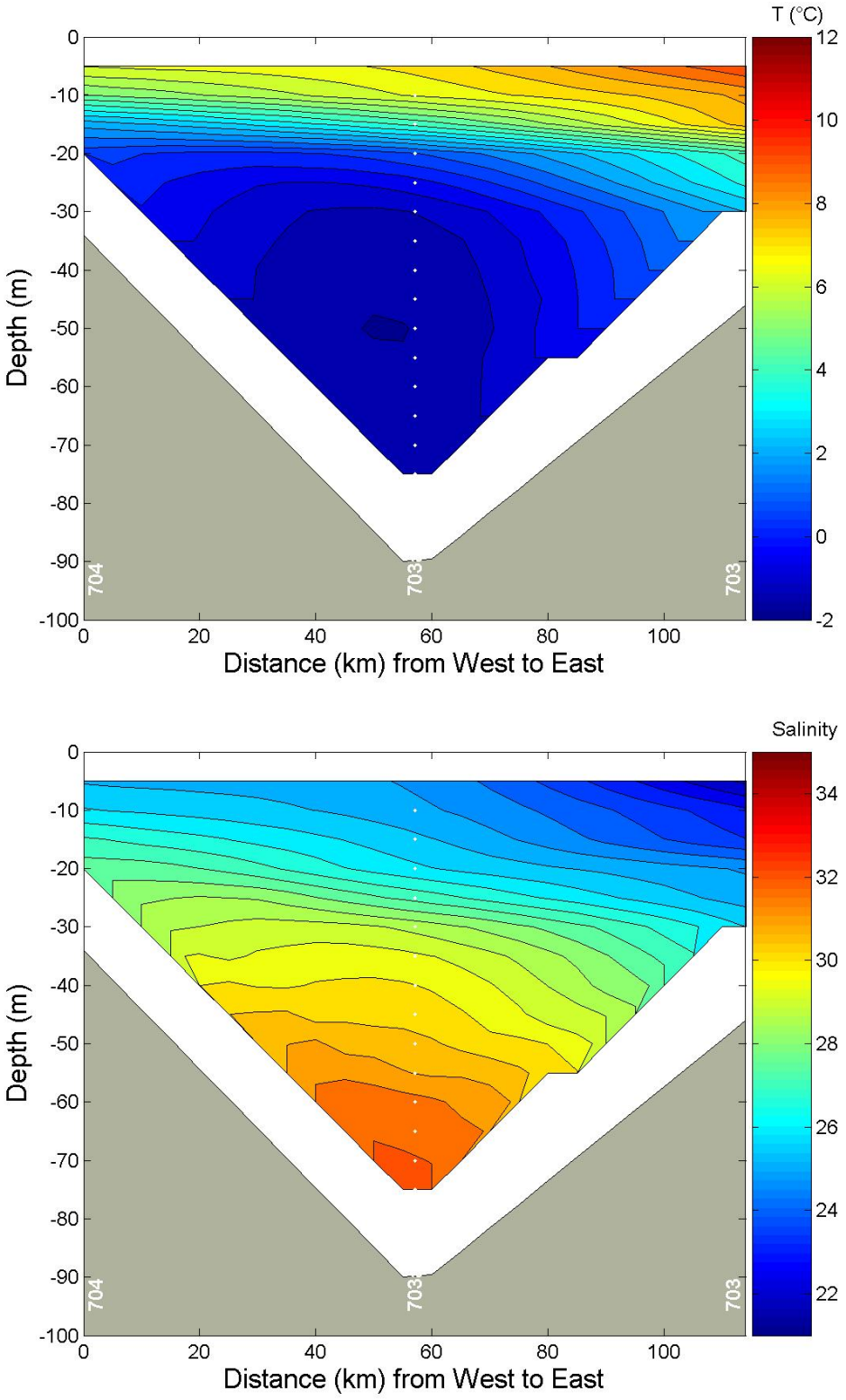
APPENDIX 5.2. Potential temperature and salinity along the section in the Saglek fjord. The western sites are on the left and the eastern sites are on the right.



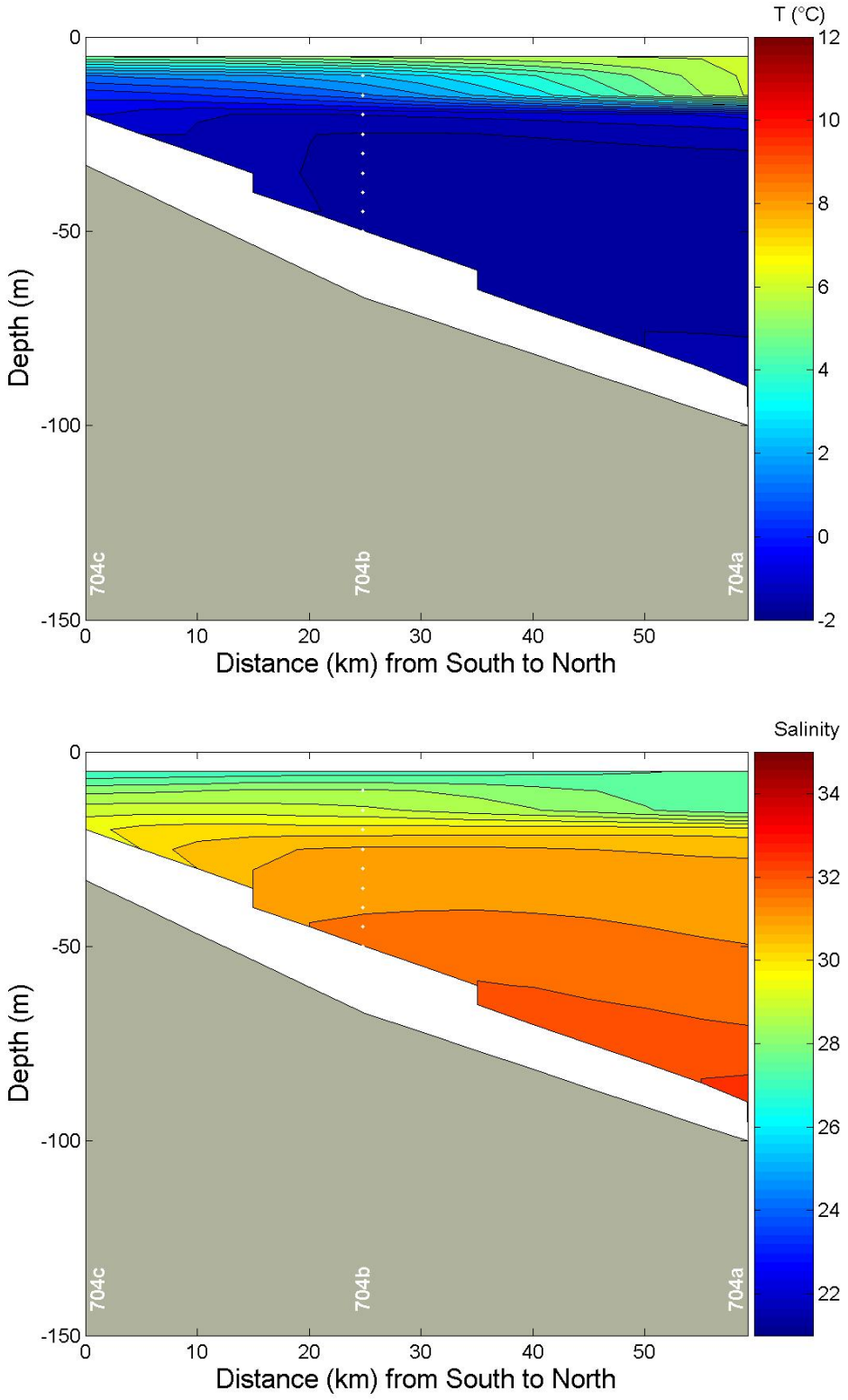
APPENDIX 5.3. Potential temperature and salinity along the section in the Nachvak fjord. The western sites are on the left and the eastern sites are on the right.



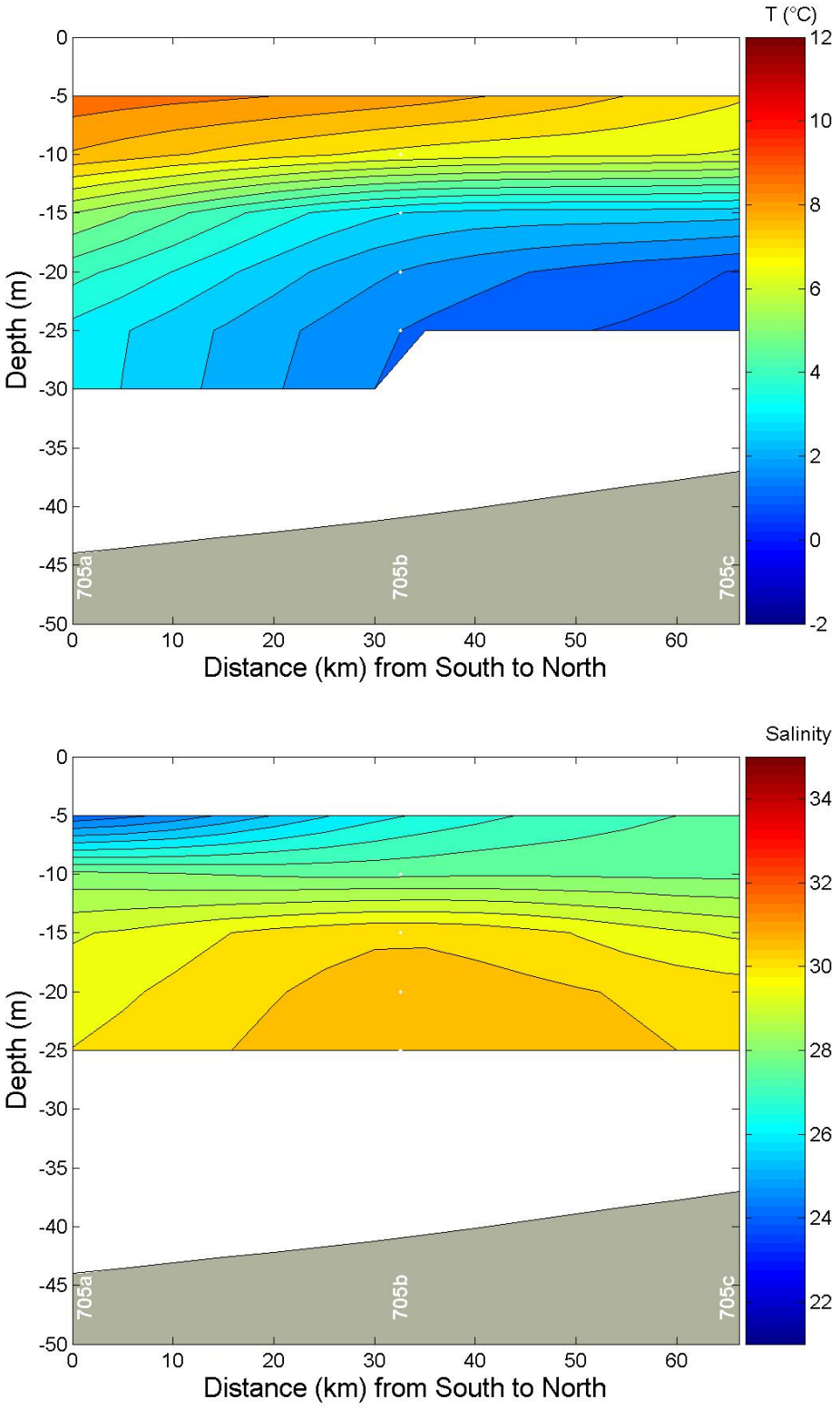
APPENDIX 5.4. Potential temperature and salinity along the section 13 across Hudson Strait. The southern sites are on the left and the northern sites are on the right.



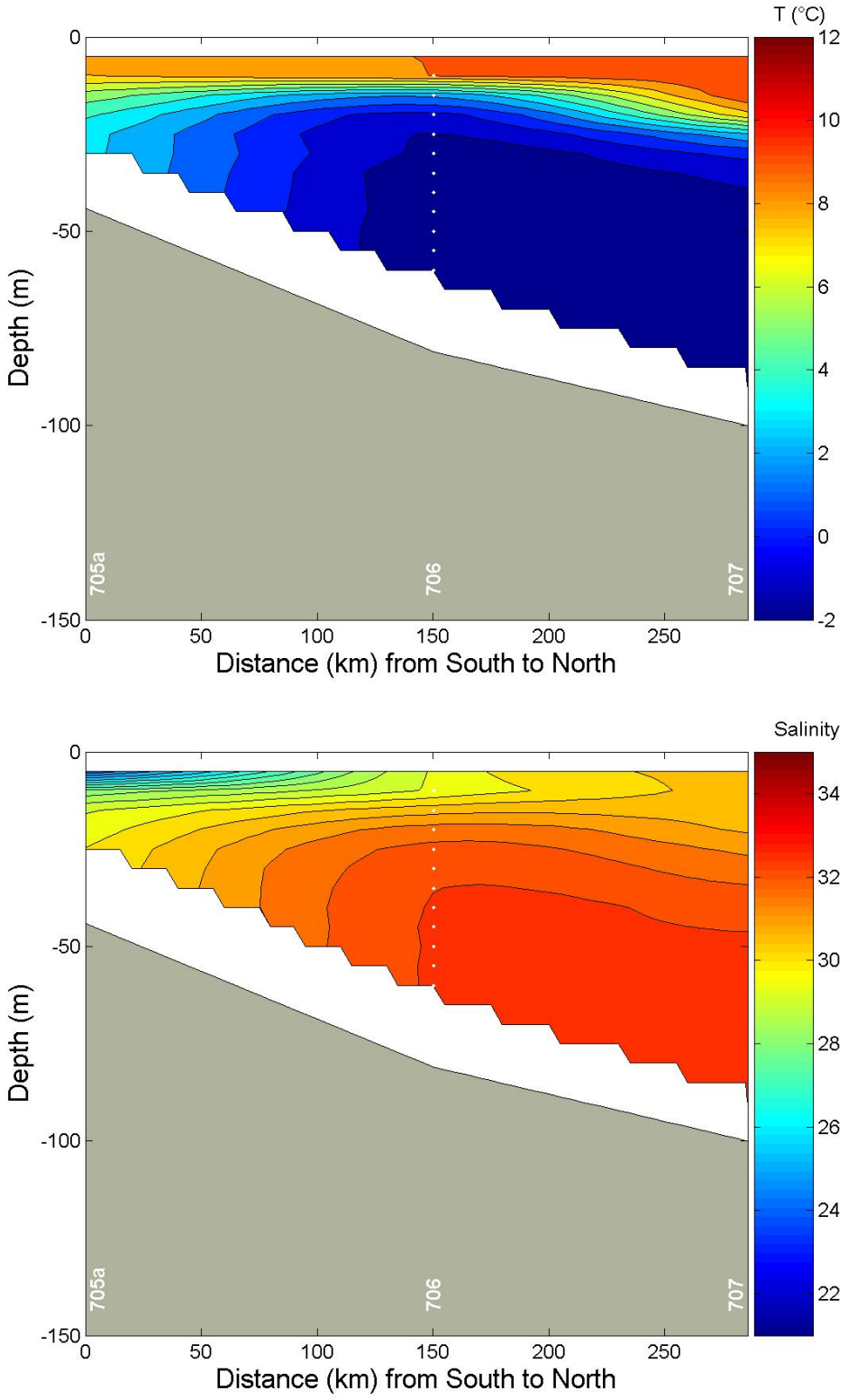
APPENDIX 5.5. Potential temperature and salinity along the section 21 at the mouth of James Bay. The western sites are on the left and the eastern sites are on the right.



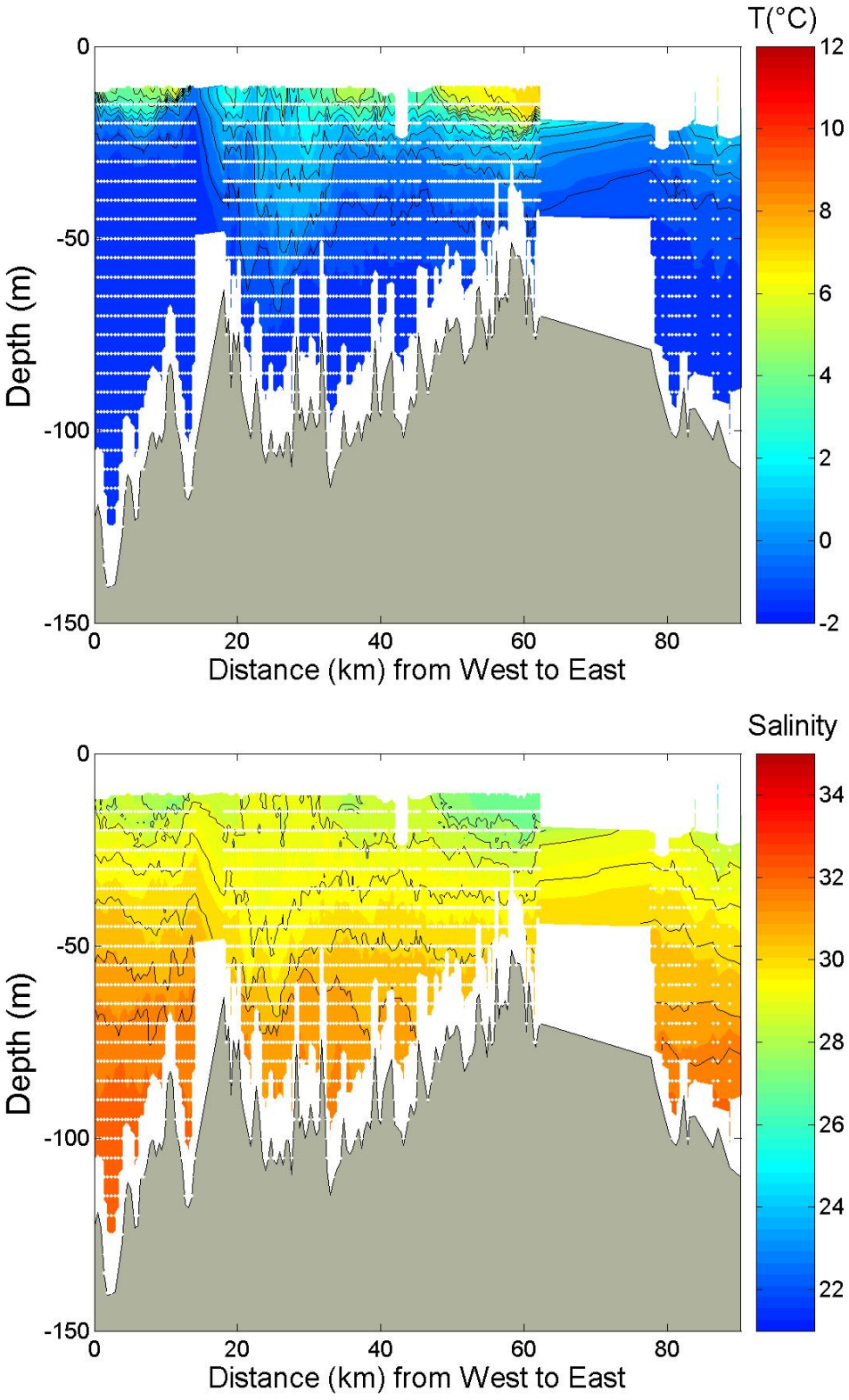
APPENDIX 5.6. Potential temperature and salinity along the section offshore of the Winisk River. The southern sites are on the left and the northern sites are on the right.



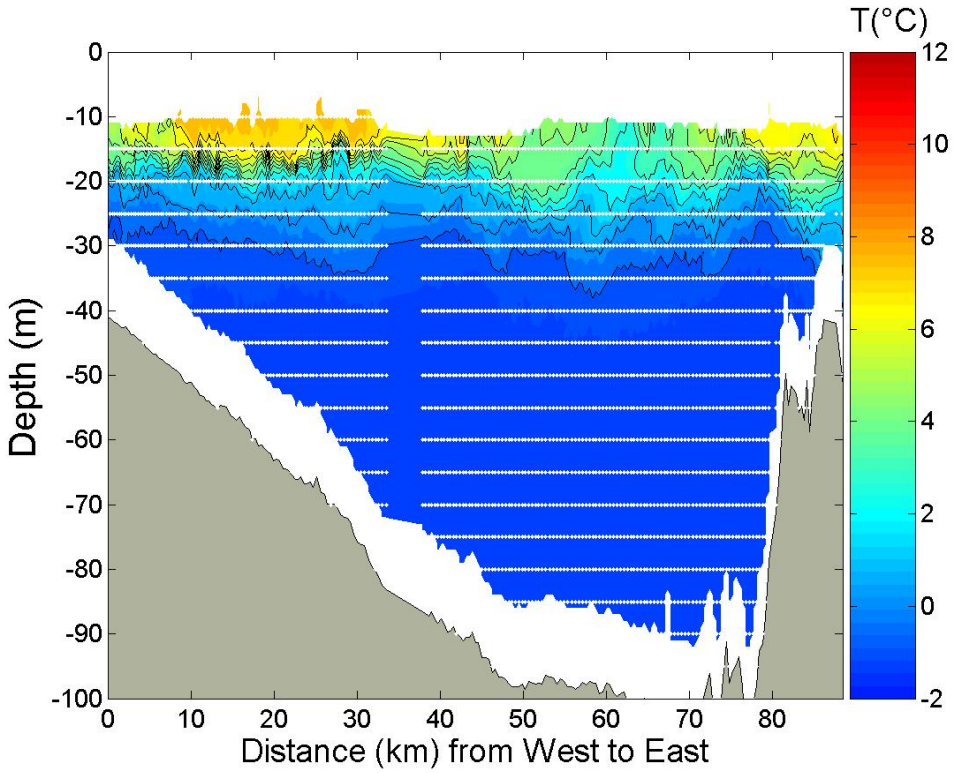
APPENDIX 5.7. Potential temperature and salinity along the section offshore of the Nelson River. The southern sites are on the left and the northern sites are on the right.

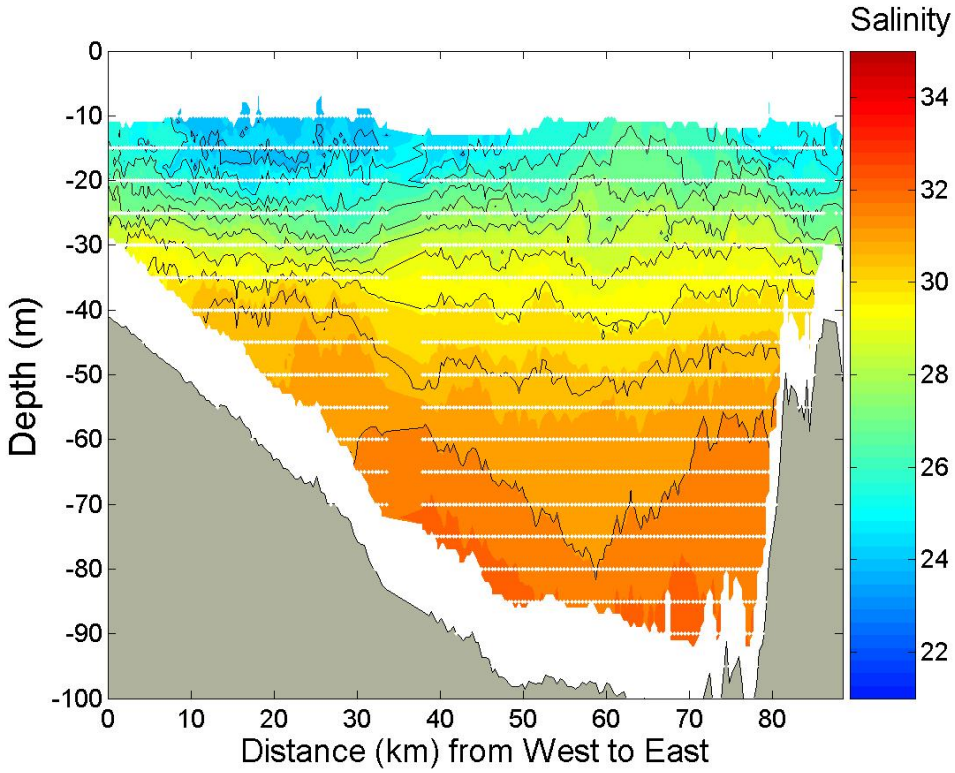


APPENDIX 5.8. Potential temperature and salinity along the Western coast of Hudson Bay. The southern sites are on the left and the northern sites are on the right.



APPENDIX 5.9. Potential temperature and salinity along the section offshore of Inukjuak. The western sites are on the left and the eastern sites are on the right.





APPENDIX 5.10. Potential temperature and salinity along the section at the mouth of James Bay. The western sites are on the left and the eastern sites are on the right.

APPENDIX 6. Sections of salinity and potential temperature from the expedition 0706 (Leg 3). It includes data from the Rosette-CTD and from the MVP. The list of the stations and casts selected for each section is found in Appendices 3 and 4.

The same color scale is used for all sections of this leg regardless of the sensor used. However, it is different from one leg to another. Details are found in Table 6.

6. Location of CTD and MVP sections during expedition 0706

Rosette-CTD sections

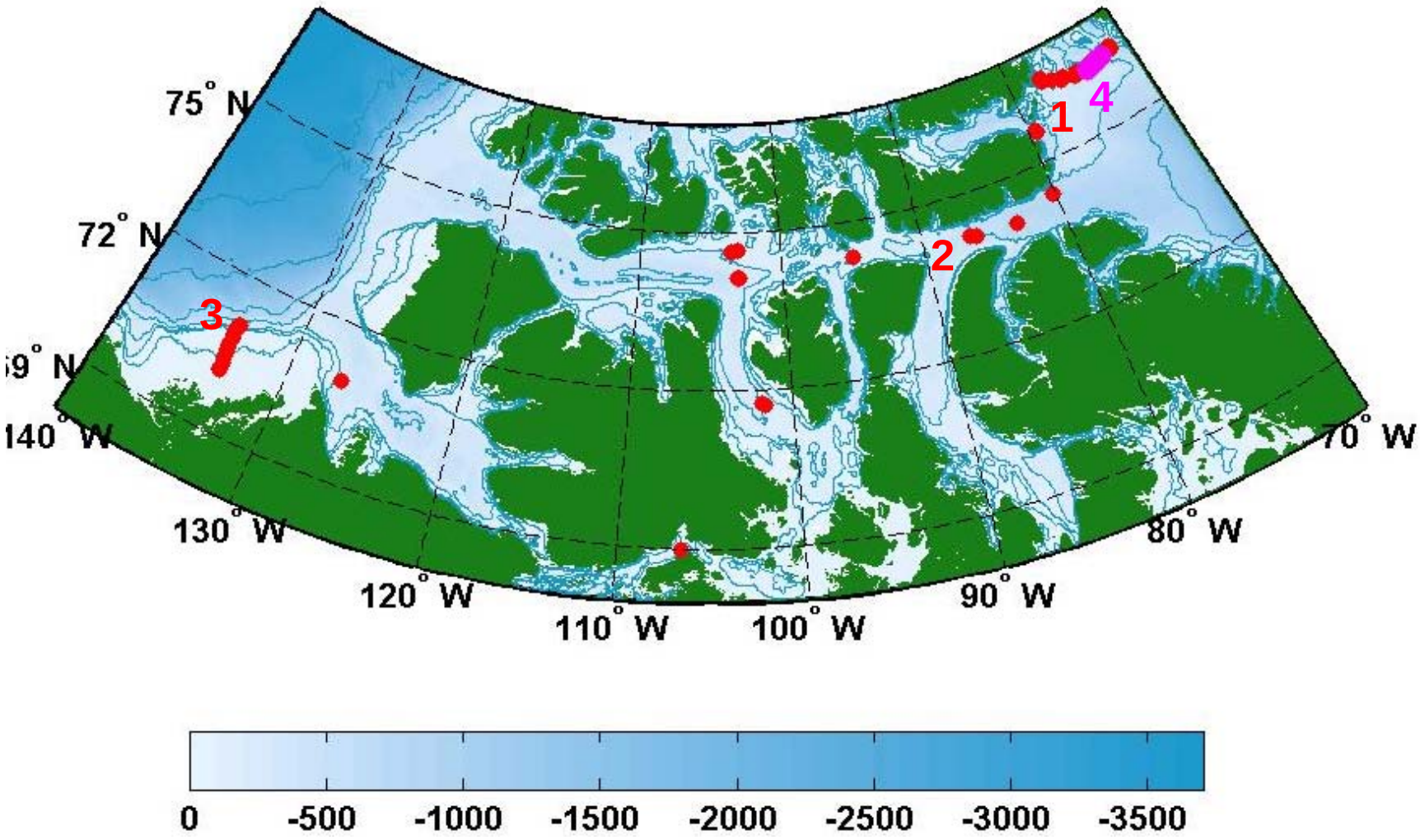
6.1. Section 5 in the Northern Baffin Bay (previously sampled in 2005 and 2006)

6.2. Section across the Eastern Northwest Passage in Lancaster Sound (between Resolute Bay and Baffin Bay) (previously sampled in 2006)

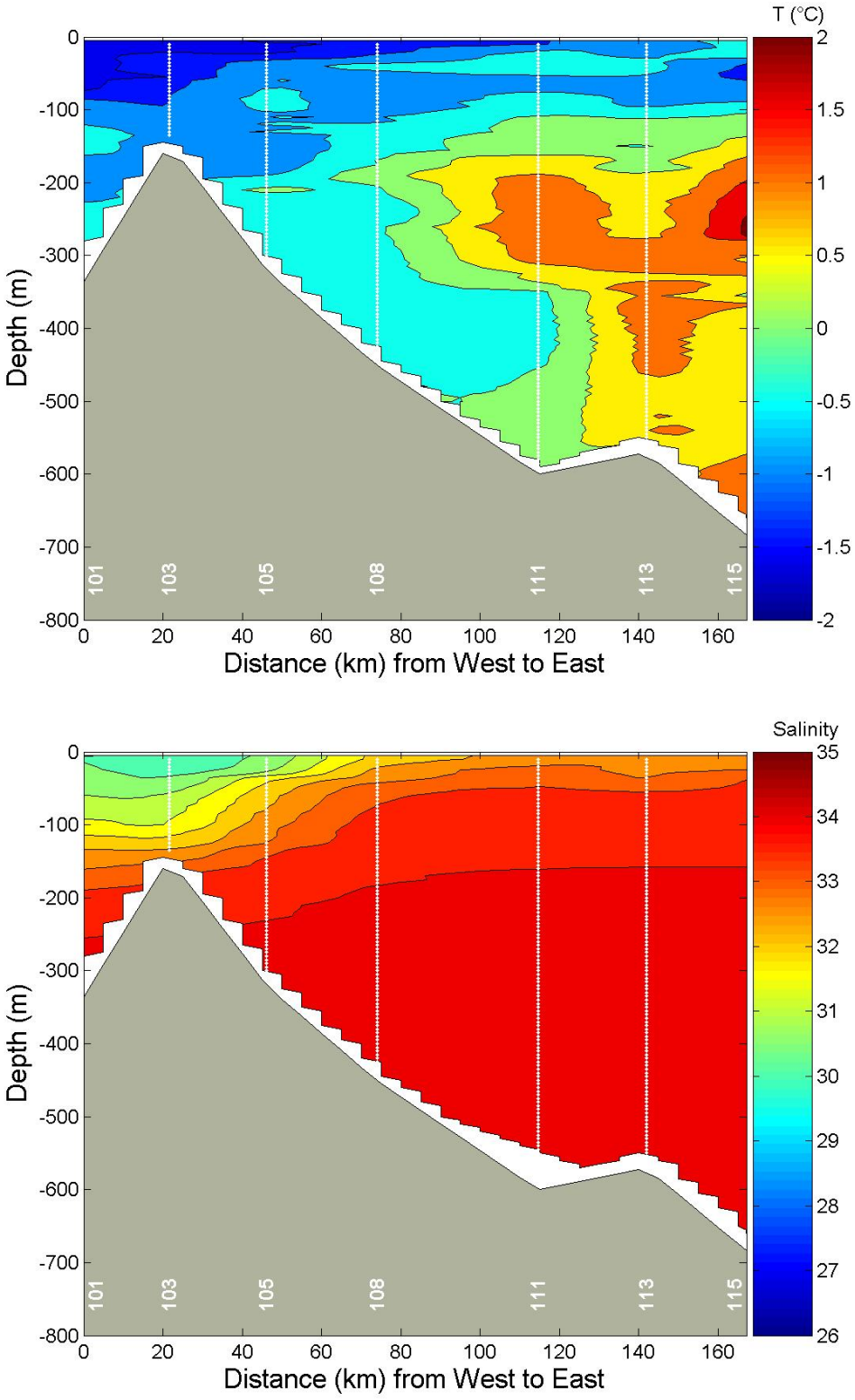
6.3. Section 700 in Beaufort Sea (previously sampled in 2006)

MVP sections

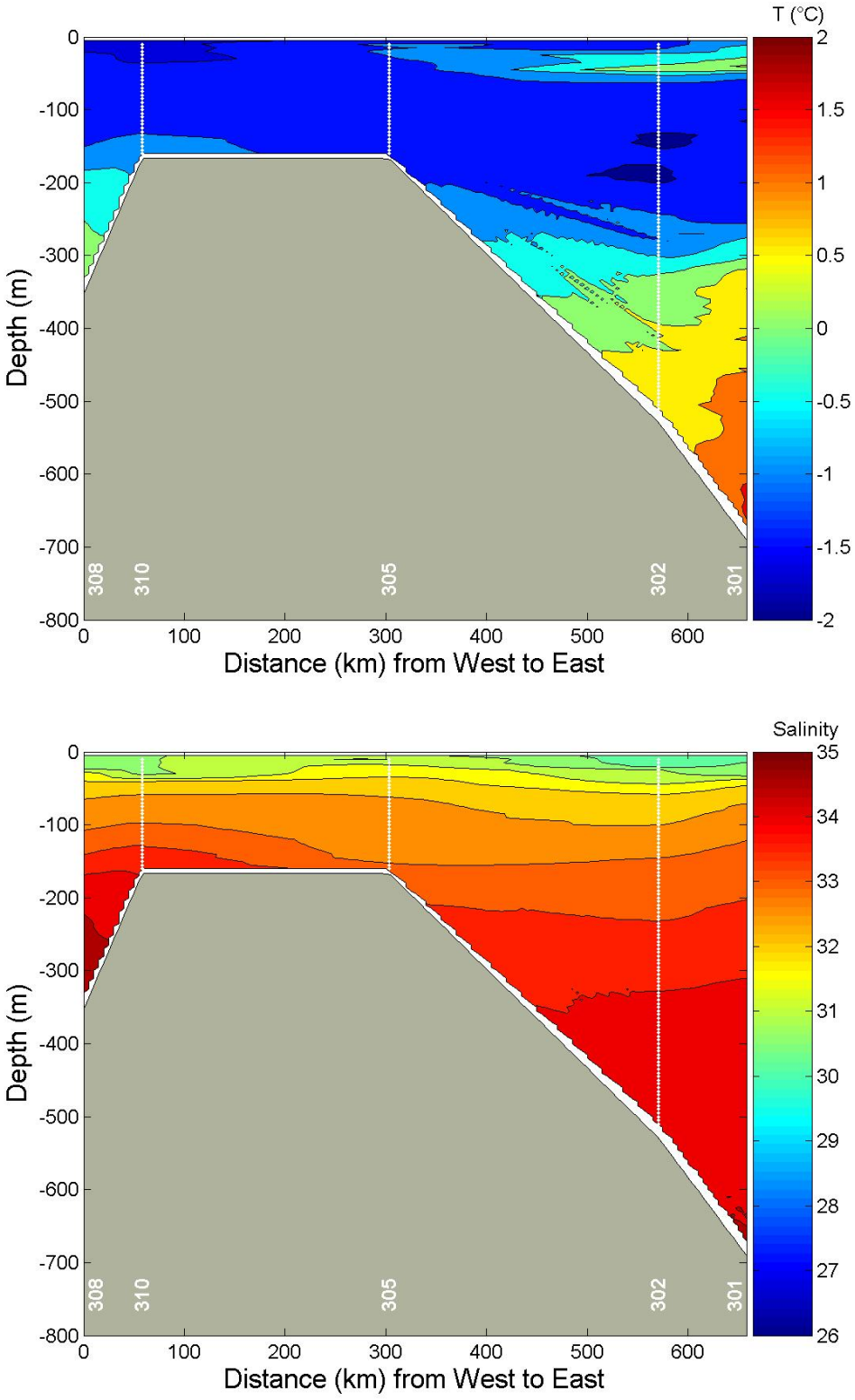
6.4. Section 5 in the Northern Baffin Bay (previously sampled in 2005 and 2006)



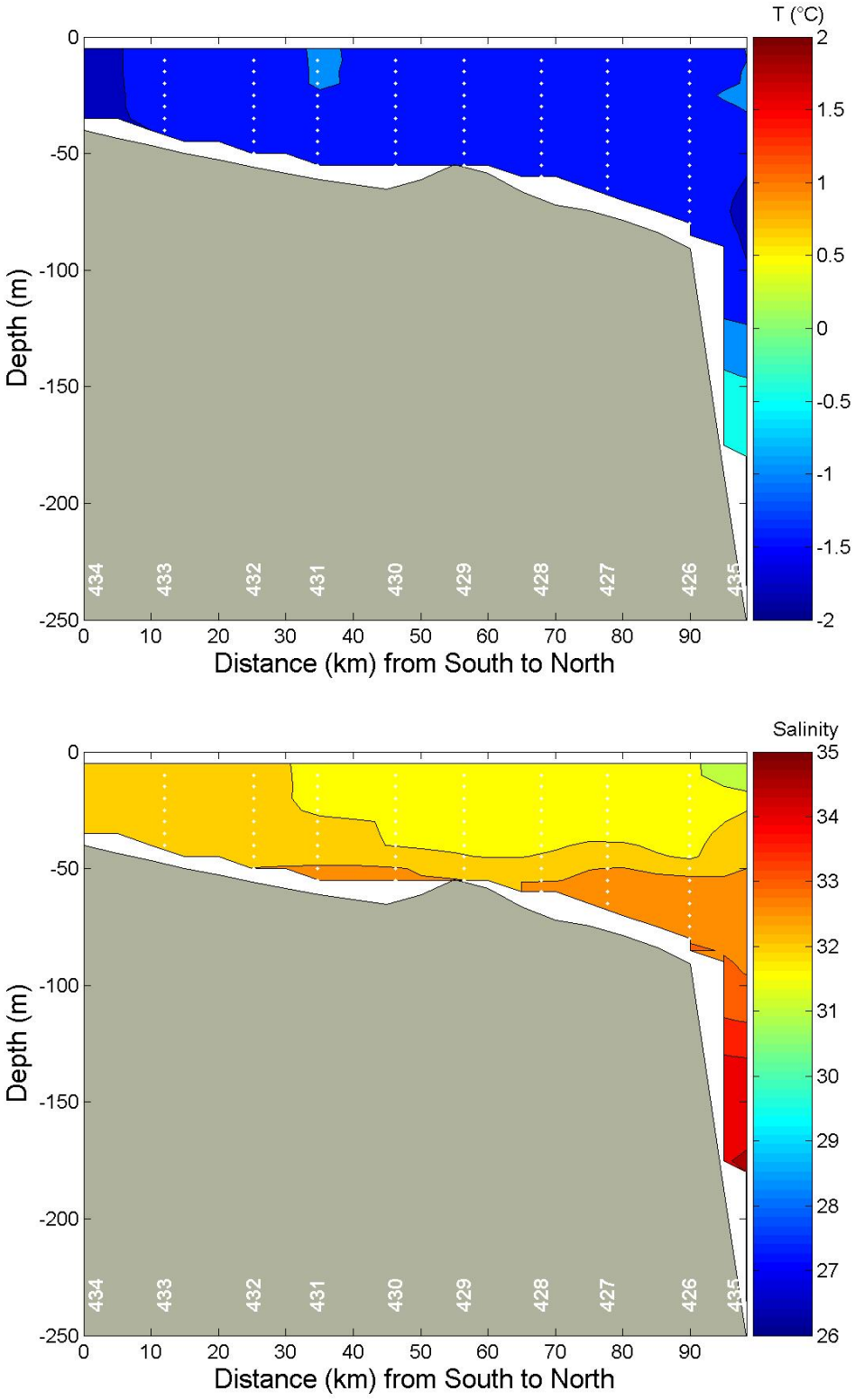
APPENDIX 6. Location of CTD (red) and MVP (purple) sampling sites during the expedition 0706 (Leg 3). The letters identify the sections presented as salinity and temperature contour plots on the next pages.



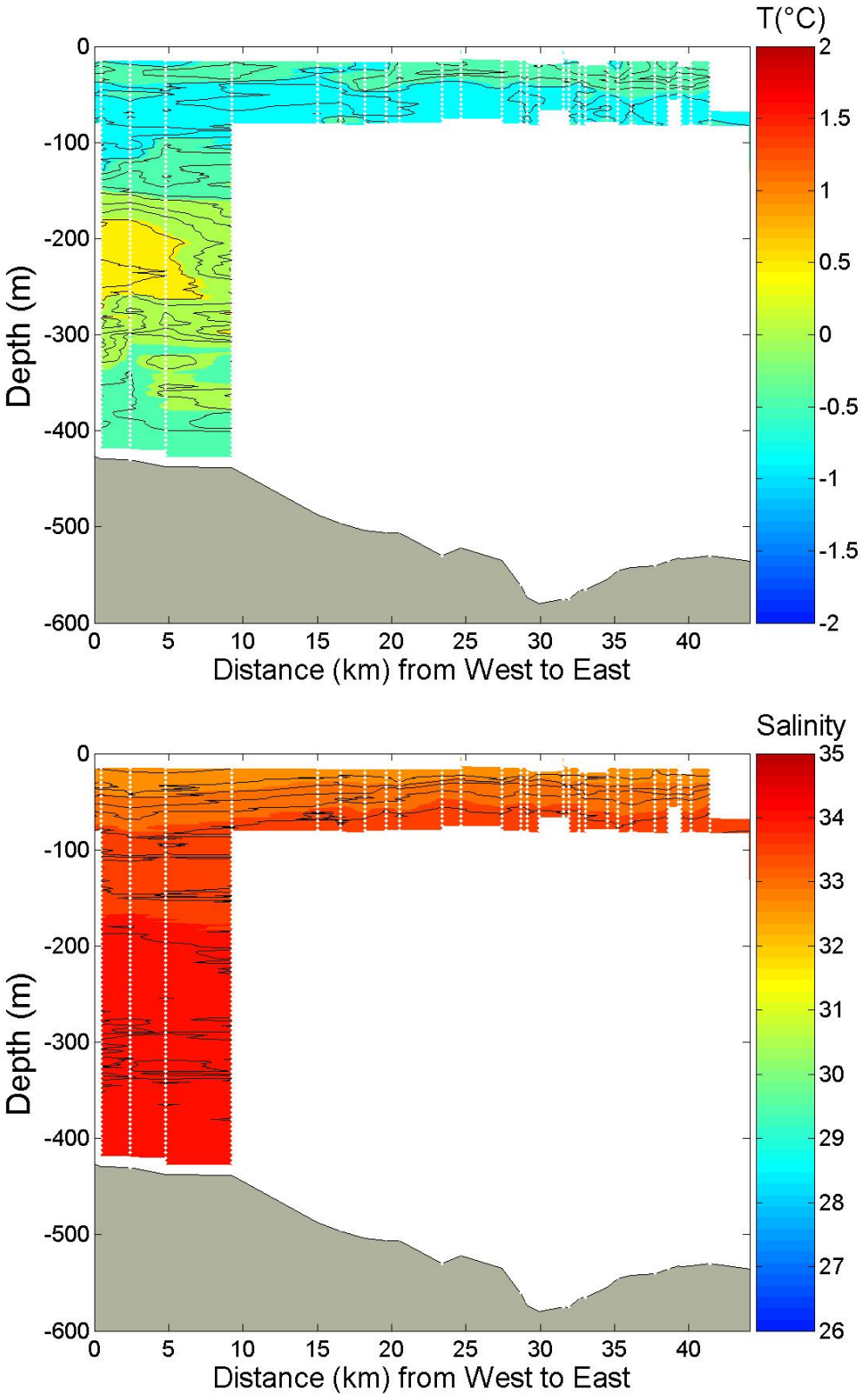
APPENDIX 6.1. Potential temperature and salinity along section 5 in the Northern Baffin Bay. The western sites are on the left and the eastern sites are on the right.



APPENDIX 6.2. Potential temperature and salinity along the section across the Eastern Northwest Passage. The western sites are on the left and the eastern sites are on the right.



APPENDIX 6.3. Potential temperature and salinity along the section 700 in Beaufort Sea. The southern sites are on the left and the northern sites are on the right.



APPENDIX 6.4. Potential temperature and salinity along section 5 in the Northern Baffin Bay. The western sites are on the left and the eastern sites are on the right.

APPENDIX 7. Sections of salinity and potential temperature from the expedition 0806 (Leg 11). It includes data from the Rosette-CTD and from the MVP. The list of the stations and casts selected for each section is found in Appendices 3 and 4.

The same color scale is used for all sections of this leg regardless of the sensor used. However, it is different from one leg to another. Details are found in Table 6.

7. Location of CTD and MVP sections during expedition 0806

Rosette-CTD sections

7.1 Eastern Northwest Passage, Lancaster Sound (previously sampled in 2006 and 2007)

7.2 Section 5 in Northern Baffin Bay (previously sampled in 2005, 2006 and 2007)

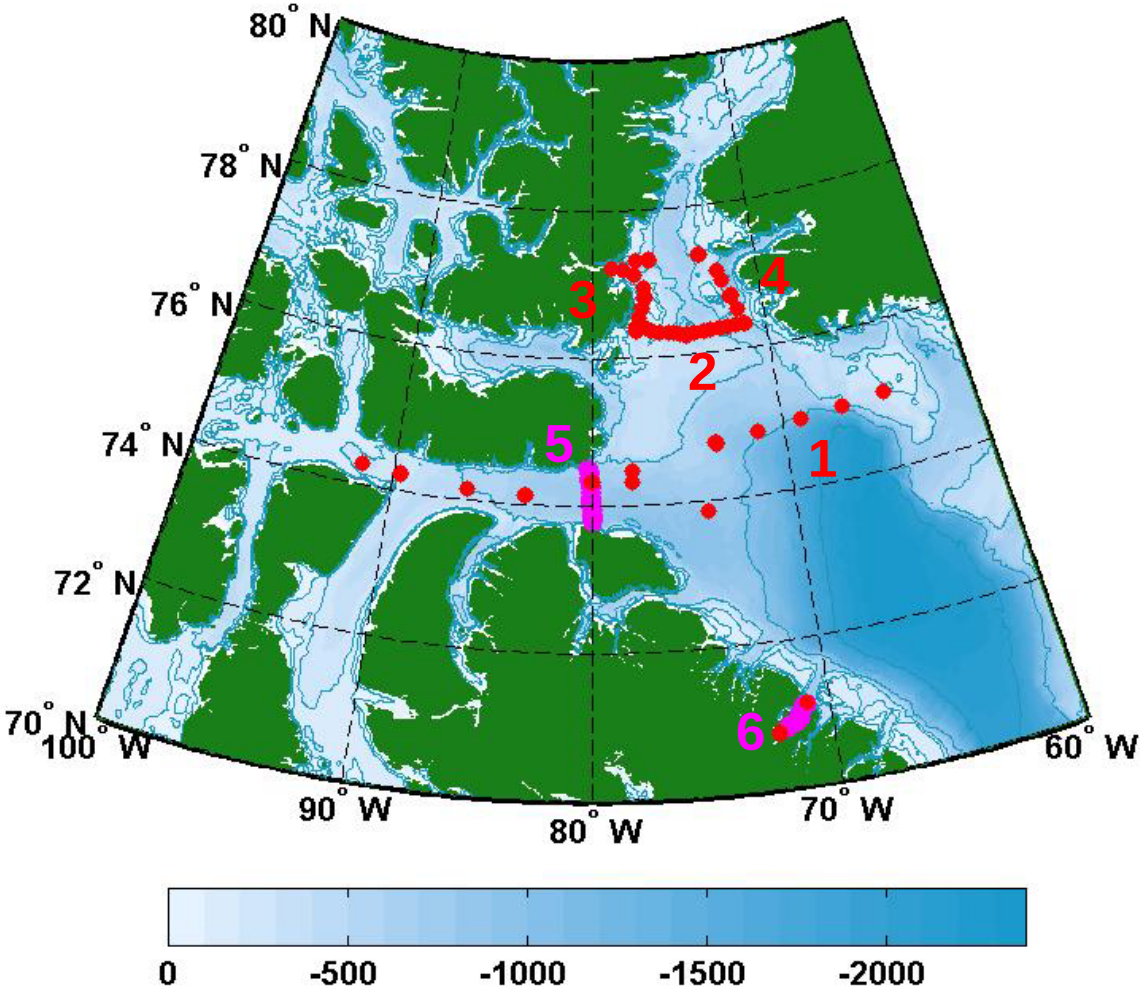
7.3 West coast of Northern Baffin Bay

7.4 East coast of Northern Baffin Bay

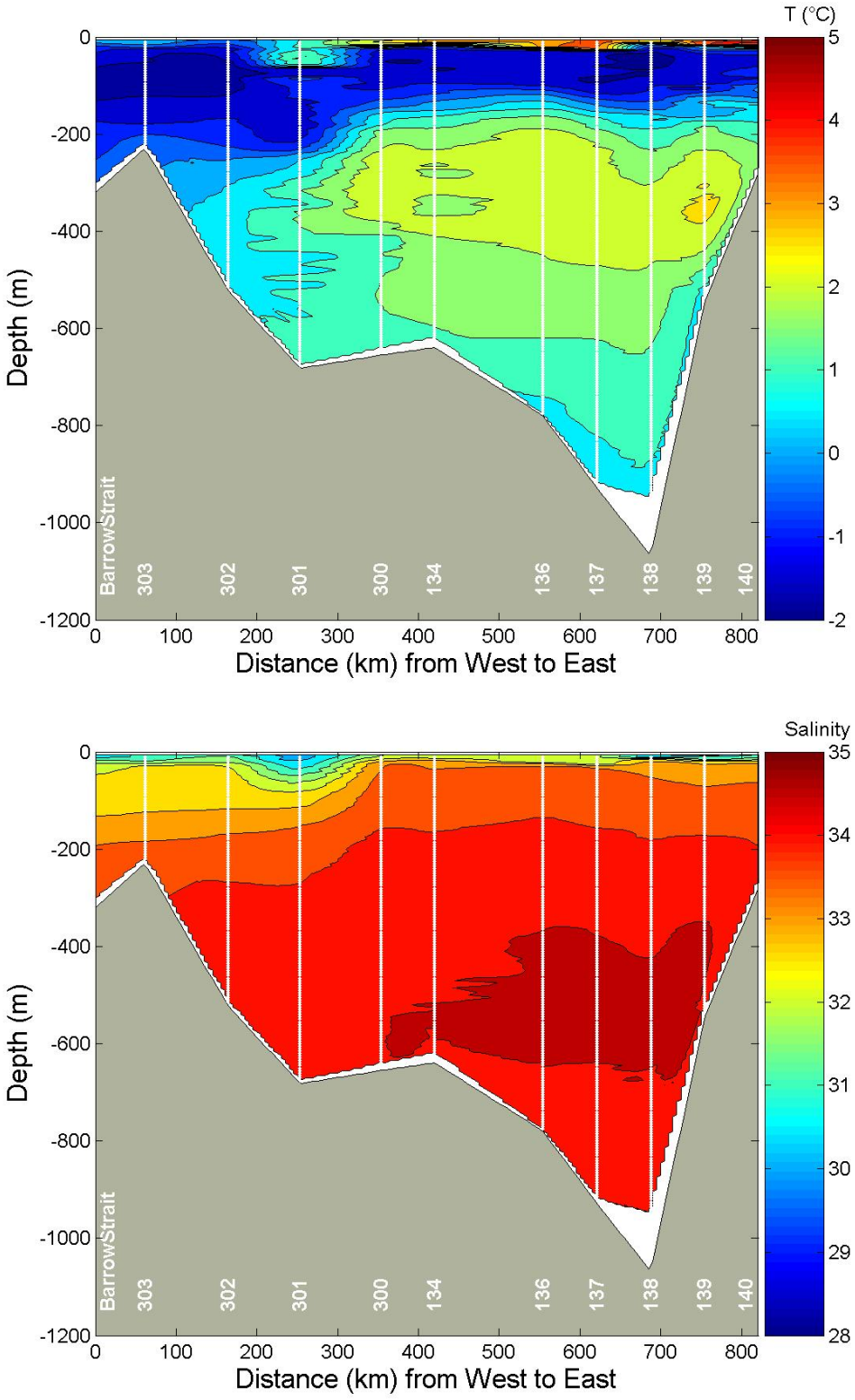
MVP sections

7.5 Eastern Northwest Passage, the Lancaster Sound

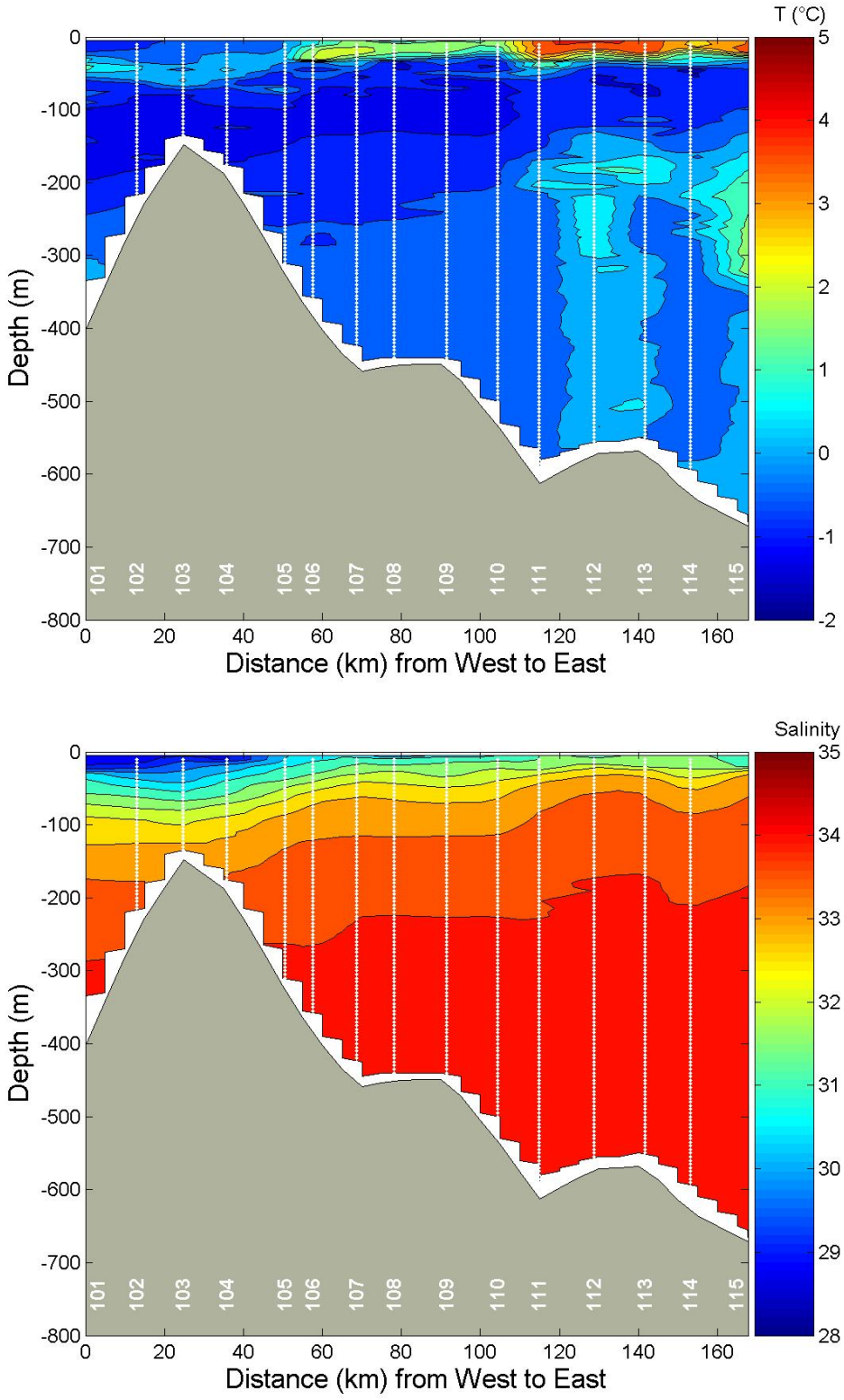
7.6 Gibbs Fjord



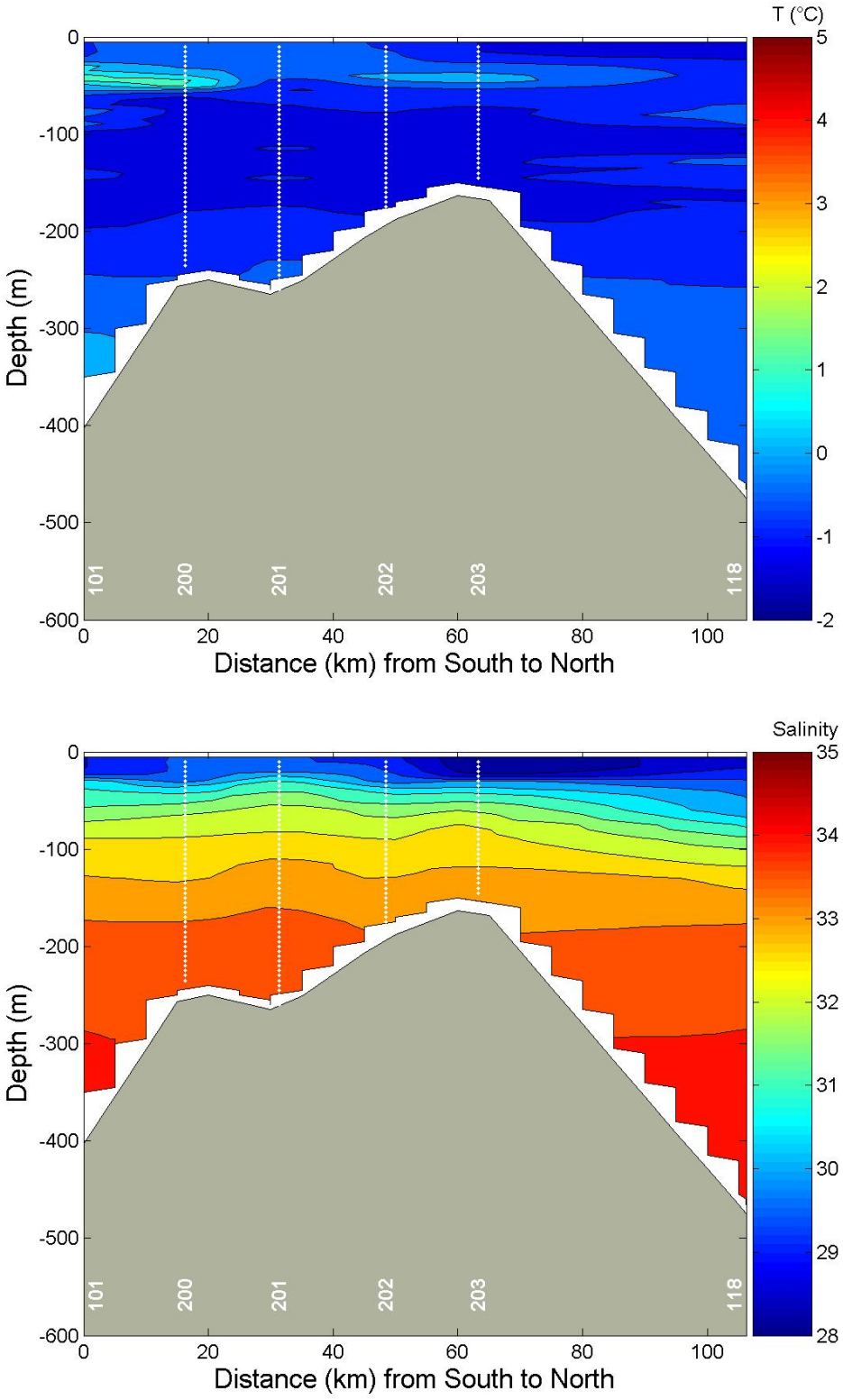
APPENDIX 7. Location of CTD (red) and MVP (purple) sampling sites during the expedition 0806 (Leg 11). The letters identify the sections presented as salinity and temperature contour plots on the next pages.



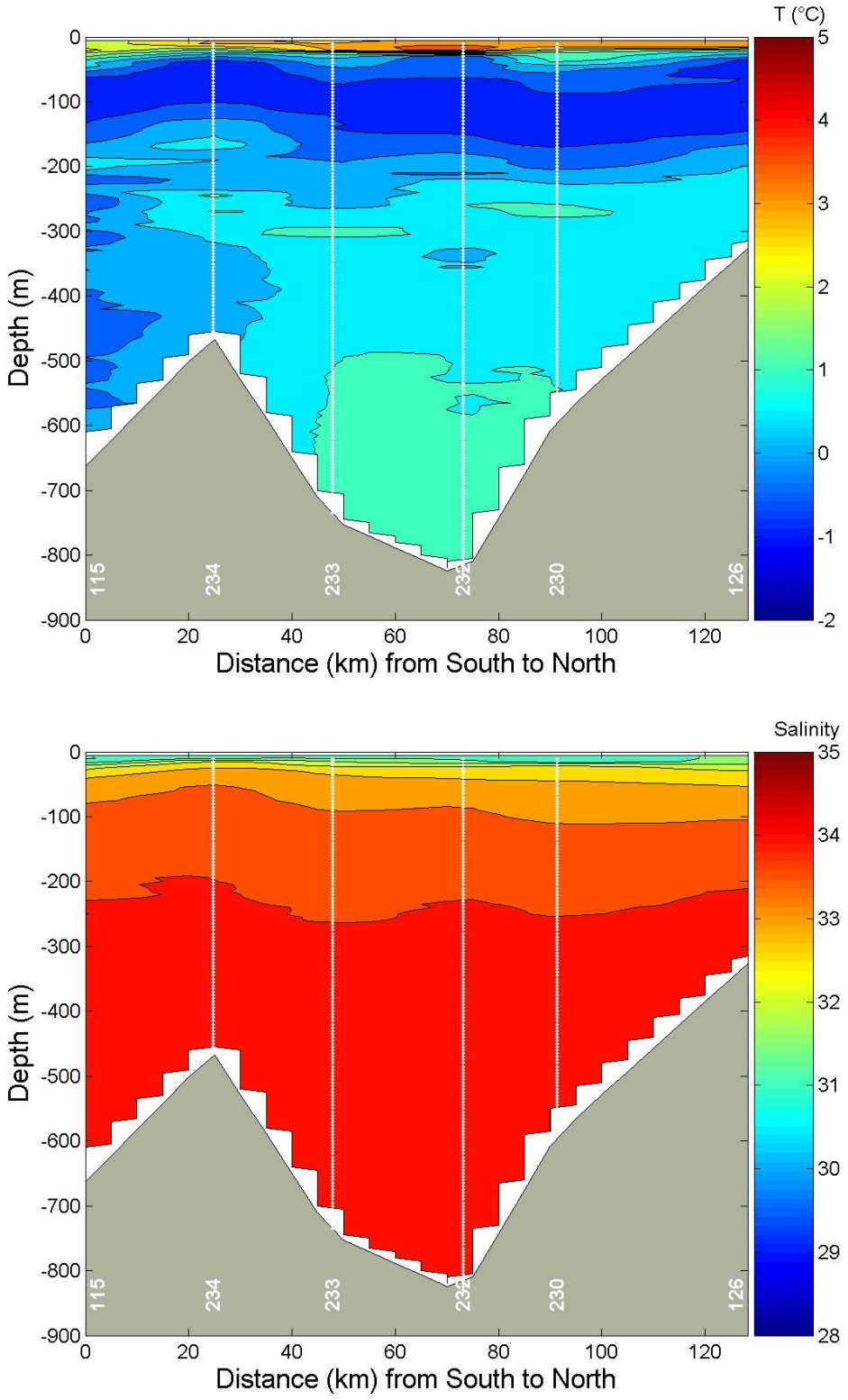
APPENDIX 7.1. Potential temperature and salinity along the Lancaster section in the Eastern Northwest Passage. The western sites are on the left and the eastern sites are on the right.



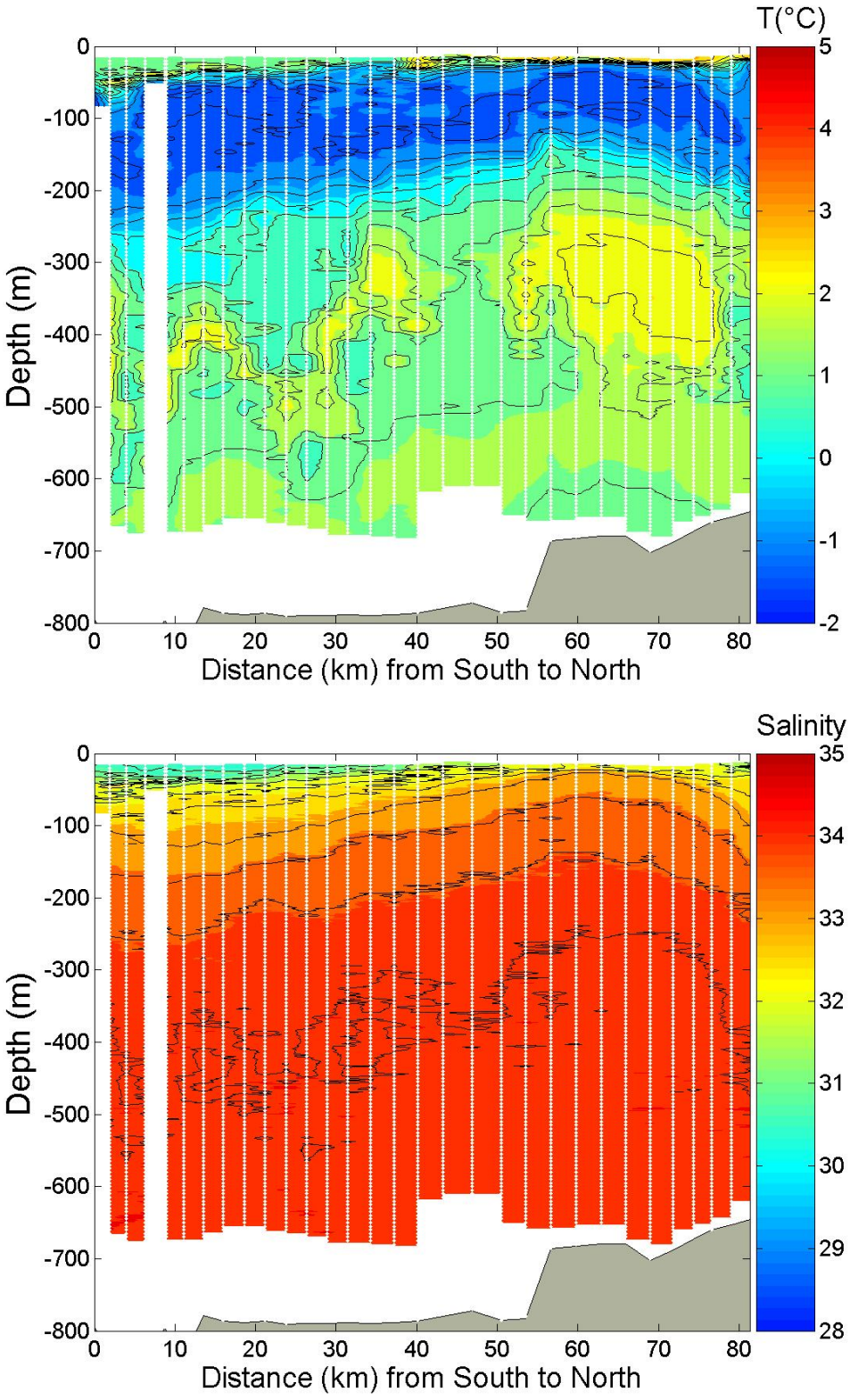
APPENDIX 7.2. Potential temperature and salinity along section 5 in the Northern Baffin Bay. The western sites are on the left and the eastern sites are on the right.



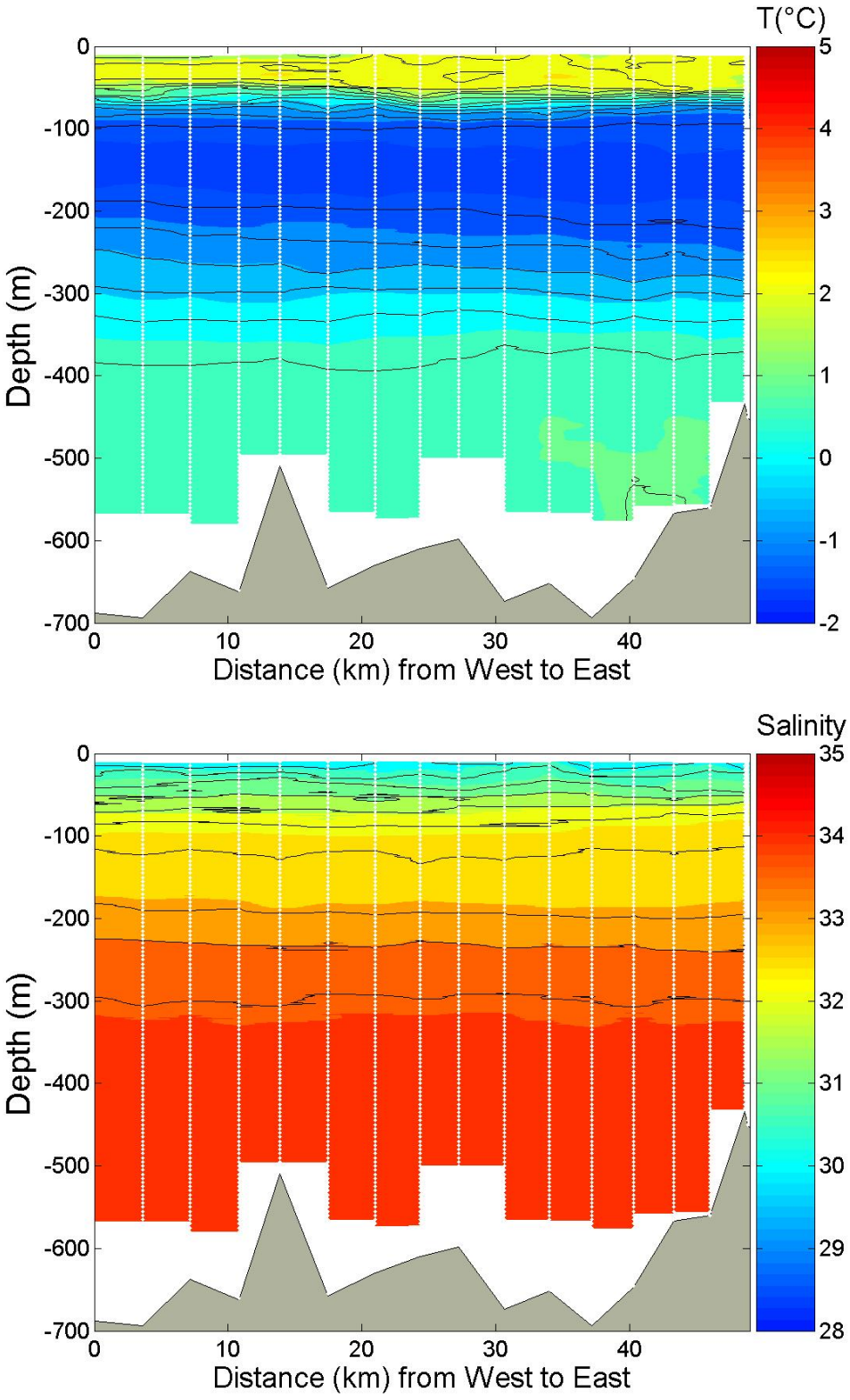
APPENDIX 7.3. Potential temperature and salinity along the section on the West coast of Northern Baffin Bay. The western sites are on the left and the eastern sites are on the right.



APPENDIX 7.4. Potential temperature and salinity along the section on the East coast of Northern Baffin Bay. The western sites are on the left and the eastern sites are on the right.



APPENDIX 7.5. Potential temperature and salinity along the section across the mouth of Lancaster Sound. The western sites are on the left and the eastern sites are on the right.



APPENDIX 7.6. Potential temperature and salinity along the section in Gibbs fjord. The western sites are on the left and the eastern sites are on the right.

APPENDIX 8. List of the SCAMP stations and their metadata (page 1/2).

STATION	101	115	108	302	308	408	407	405
LOCALISATION	Baffin Bay	Baffin Bay	Baffin Bay	North-West Passage	North-West Passage	Amundsen Gulf	Amundsen Gulf	Amundsen Gulf
Latitude	76.2675	76.2212	76.1309	74.0899	74.0744	71.1700	71.0085	70.39.97
Longitude	-077.26669	-071.1903	-074.5035	-086.1330	-103.0284	-127.3218	-125.5759	-123.0193
DEPARTURE								
date (TU)	2007-09-29	2007-10-01	2007-10-03	2007-10-07	2007-10-09	2007-10-22	2007-10-23	2007-10-25
time (TU)	19h15	19h30	16h45	19h00	15h45	16h30	16h00	19h00
RETURN								
time (TU)	21h15	21h15	18h45	19h55	17h15	18h00	18h02	21h00
CONDITIONS								
Wind Direction (°)	310	351	6	85	70	100	310	165
Wind Speed (m/s)	5	10	8	19	21	14	9	7
Pressure (Pa)	1001.7	1000.92	1014	1020.9	1013.0	1006.3	1009.3	1018.42
Relative Humidity (%)	89%	76%	61%	83%	81%	82%	90%	83%
Air Temperature (°C)	-3.9	-2.5	-3.1	-2.1	-1.4	-2.2	-2.7	-4.9
Water Temp. (°C) (SST)	-1.2	-0.09	-1.08	-0.71	-1.33	-0.88	-0.64	-0.86
Sea State	1	3-4	2	5-6	2	3	3-4	2
Ice (1/10)	7	icebergs	icebergs	2	8	0	0	0
Clouds (1/8)	7	3	1	8	8	8	7	7
CTD cast#	**0706002**	**0706010 and 0706011**	**0706019**	**0706023**	**0706028 and 0706029**	**0706069 and 0706070**	**0706074**	**0706084 and 0706085**
Water depth (m)	336	615	446	529	352	202	406	560
SCAMP 1	29SEP2007_200230	01OCT2007_195432	03OCT_170322	07OCT2007_191353	09OCT2007_154507	22OCT2007_164246	23OCT2007_160504	25OCT2007_191511
SCAMP 2	29SEP2007_202106	01OCT2007_201304	03OCT_172513	07OCT2007_193534	09OCT2007_160504	22OCT2007_170226	23OCT2007_162221	25OCT2007_193223
SCAMP 3	29SEP2007_204712	01OCT2007_203543	03OCT_174534		09OCT2007_162653	22OCT2007_171941	23OCT2007_163937	25OCT2007_194740
SCAMP 4		01OCT2007_205510	03OCT_180317		09OCT2007_165806	22OCT2007_173657	23OCT2007_165654	25OCT2007_200414
SCAMP 5			03OCT_182116				23OCT2007_171528	25OCT2007_202039
SCAMP 6							23OCT2007_173428	25OCT2007_203830
MISCELLANEOUS								
Target Depth (m)	90	90-100	90-100	80-90	80-90	90	90	90
Responsable:								
C. Sévigny								

APPENDIX 8. List of the SCAMP stations and their metadata (page 2/2).

STATION	1116	1124	1200	1600	1606	1902	1908	1916
LOCALISATION	Amundsen Gulf	Amundsen Gulf	Amundsen Gulf	Beaufort Sea	Beaufort Sea	Amundsen Gulf	Amundsen Gulf	Amundsen Gulf
Latitude	70.0383	70.3953	71.3292	71.3301	71.0474	71.3345	71.08865	70.5400
Longitude	-126.2075	-127.4292	-124.2591	-130.5776	-130.3107	-126.5600	-124.19222	-122.0858
DEPARTURE								
date (TU)	2007-10-28	2007-10-29	2007-10-31	2007-11-02	2007-11-02	2007-11-03	2007-11-05	2007-11-06
time (TU)	19h35	22h54	20h18	00h44	16h21	18h46	12h38	05h03
RETURN								
time (TU)	21h01	23h42	21h29	02h34	17h20	19h07	14h03	06h56
CONDITIONS								
Wind Direction (°)	130	91	114	90	60	22	130	30
Wind Speed (m/s)	17	22	30	19	19	18	9	8
Pressure (Pa)	1018.6	1012.12	1007.25	1003	1001	1012.8	1024.9	1024.7
Relative Humidity (%)	81%	86%	76%	83%	85%	85%	76%	69%
Air Temperature (°C)	-10.6	-8.2	-12.3	-5.3	-5.2	-18	-15.4	-21.6
Water Temp. (°C) (SST)	-1.31	-1.42	-1.21	-1	-1.5	-1.3	-1.5	-1.3
Sea State	3	3	2	1	1	1	1	1
Ice (1/10)	5	8	9	8	9	9	9	9+
Clouds (1/8)	7	7	4	-99	7	1	-99	-99
CTD cast#	**0706104 and 0706105**	**0706108 and 0706109**	**0706118 and 0706119**	**0706127**	**0706129 and 0706130**	**0706135 and 0706136**	**0706139**	**0706143**
Water depth (m)	228	123	202	618	49	373	295	418
SCAMP 1	28OCT2007_193325	29OCT2007_223930	31OCT2007_201738	02NOV2007_004259	02NOV2007_162024	03NOV2007_184432	05NOV2007_120432	06NOV2007_050214
SCAMP 2	28OCT2007_200258	29OCT2007_224858	31OCT2007_204131	02NOV2007_010910	02NOV2007_164506	03NOV2007_191030	05NOV2007_122551	06NOV2007_052406
SCAMP 3	28OCT2007_202255	29OCT2007_231026	31OCT2007_210530	02NOV2007_013735	02NOV2007_165613	03NOV2007_193907	05NOV2007_124713	06NOV2007_054721
SCAMP 4	28OCT2007_204133	29OCT2007_231926		02NOV2007_020602	02NOV2007_170733		05NOV2007_130846	06NOV2007_060940
SCAMP 5		29OCT2007_232911						06NOV2007_063121
SCAMP 6								
MISCELLANEOUS								
Target Depth (m)	80-90	30-40	90	90	40	70	90	90
Responsable:								
C. Sévigny								

APPENDIX 9. SCAMP data profile. The data is from the profile #07OCT2007_193534 recorded on station 302 in the Northwest Passage during the leg 0706. The blue line represents the temperature (^{o}C), the green line represents the fluorescence (Volts), the red line indicates salinity (psu), the yellow line indicates nitrate concentration (micro mol • m^{-3}) and the black line represents the turbulent kinetic energy dissipation (m^2 • s^{-3}).