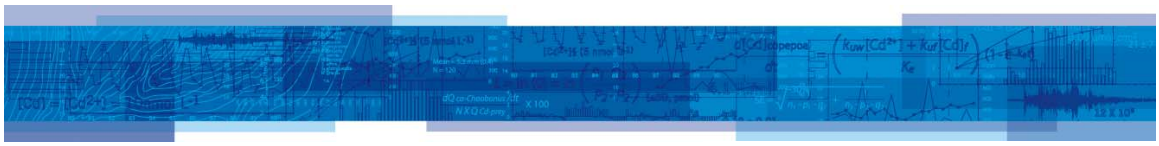


INRS
Université d'avant-garde

DISTRIBUTION OF TEMPERATURE AND SALINITY IN THE CANADIAN ARCTIC ARCHIPELAGO DURING THE 2009 ARCTICNET SAMPLING EXPEDITION

By

Marie-Emmanuelle Rail[1], Yves Gratton[1]
and Louis Prieur[2]

[1]INRS-Eau, Terre et Environnement
490, de la Couronne
Québec, Qc
Canada, G1K 9A9

[2]Laboratoire océanographique de Villefranche
Villefranche-sur-mer
France

MARCH 2011

CORRECT CITATION FOR THIS PUBLICATION :

Rail M.E., Y. Gratton and L. Prieur. 2011. Distribution of temperature and salinity in the Canadian Arctic Archipelago during the 2009 ARCTICNET sampling expedition. Report No R1248, INRS-ETE, Québec (Qc): vii + 69 p.

ABSTRACT

This report presents the CTD (Conductivity, Temperature and Depth) data obtained during the 2009 ArcticNet expedition 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 de la mission ArcticNet qui s'est déroulée dans l'Arctique canadien en 2009. Le rapport contient un exemple des livres de bord 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.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF APPENDICES

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 2009, the ArcticNet sampling expedition were carried out on board the CCGS Amundsen in collaboration with two others research programs. The first one, *Malina* is a French program studying the effects of light penetration on the biodiversity and biogeochemical fluxes in the High Arctic and the second expedition, Canadien IPY *Geotraces*, is a program aiming to improve the understanding of biogeochemical cycles and large-scale distribution of trace elements and their isotopes in the marine environment.

The NGCC Amundsen left Quebec City on the 4th of June 2009 to reach the Beaufort Sea, via the Panama channel and the Bering Sea, on the 16th of July. It sailed into the Beaufort Sea and the Amundsen Gulf until October 16th. Then, it started its journey through the Northwest Passage and the Baffin Bay (see Fig. 1). The Amundsen returned to Quebec City on the 18th of November 2009. The 2009 sampling expedition was divided into three legs of six weeks know as legs 2, 3 and 4. Leg 1 was the transit through Panama channel. Each one of the other legs was subdivided into two parts (a and b). Some ArcticNet participants were on board the ship most of the time, but legs 2b and 3a were dedicated to the *Malina* and *Geotraces* projects while legs 2a and 3b were dedicated to high resolution sampling and mooring deployments in the Mackenzie area by representative of Imperial Oil Limited (ASL Environment) and ArcticNet.

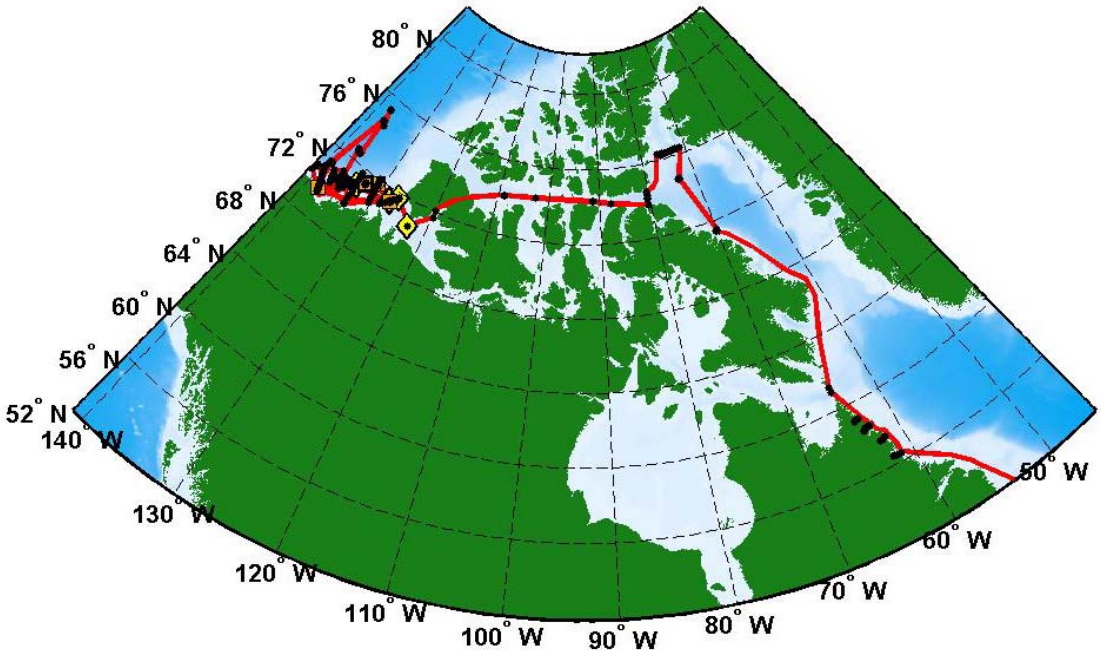


FIGURE 1. ArcticNet 2009 study area. Ship track is illustrated as a red line, Rosette-CTD sampling locations are represented by black dots. Mooring sites are represented by yellow diamond-shaped dots and scamp sites are represented by orange squares.

This report provides the ArcticNet community with a synthesis of the available data resulting from these three expeditions. The data set includes 356 Rosette-CTD (Conductivity, Temperature, Depth) casts, three MVP (Moving Vessel Profiler) sections and 32 SCAMP (Self Contained Autonomous Profiler) profiles. Also included are data recorded by 13 different instruments recovered from four 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 detail 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 2009 expedition, the rosette was equipped with 24 «Niskin» 12 L bottles, a SeaBird 911+ CTD with eight independent sensors (see Table 2 for sensors characteristics) and a 300 kHz LADCP (Lowered Acoustic Doppler Current Profiler). The pH probe was used only during the first 45 casts of leg 2 (0902). Then it was replaced with a CDOM fluorometer. The rosette 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 Beaufort Sea, Northwest Passage, Baffin Bay and Labrador fjords (see Figure 2). High resolution maps of rosette sampling sites and station number are found in Appendix 1A. A total of 356 casts were obtained from 170 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 2009, 20 sections with a minimum of three casts each were sampled. Four sections represent parameter evolution over time. In this case, the data were collected over a period of 24 hours. 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. An example of horizontal velocity data recorded with the LADCP is presented in Appendix 8.

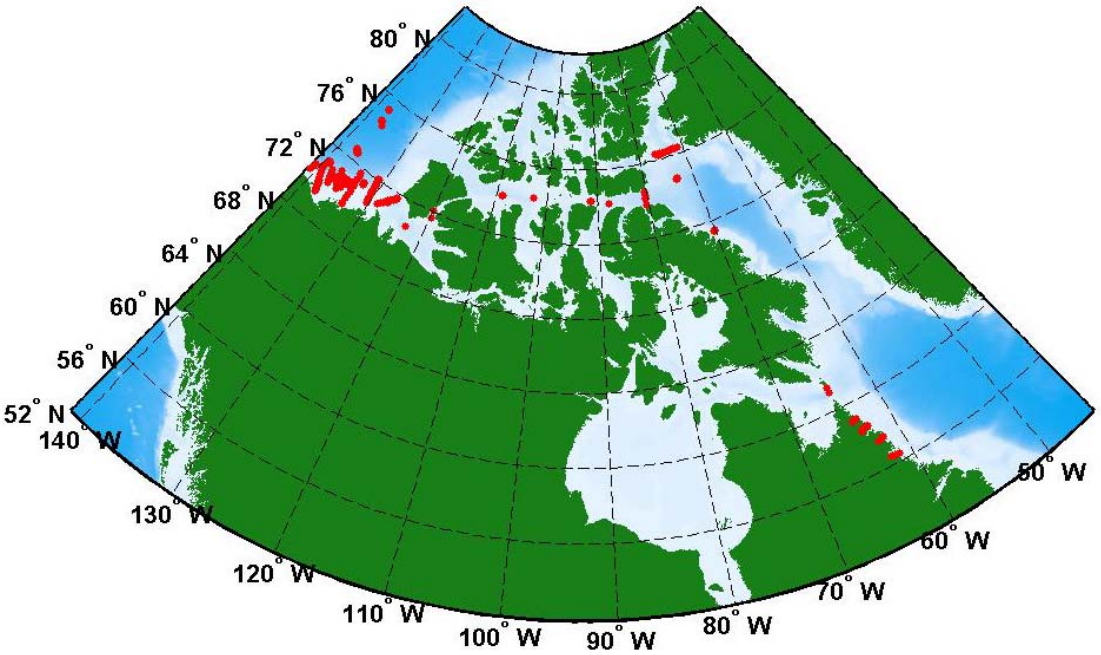
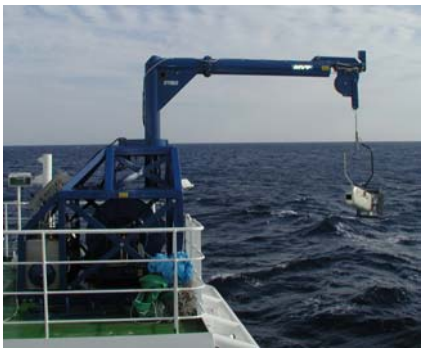


FIGURE 2. Location of 2009 Rosette sampling sites.

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 MVP 300-1700 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. Three sections and 113 profiles were carried out in the Beaufort Sea (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.

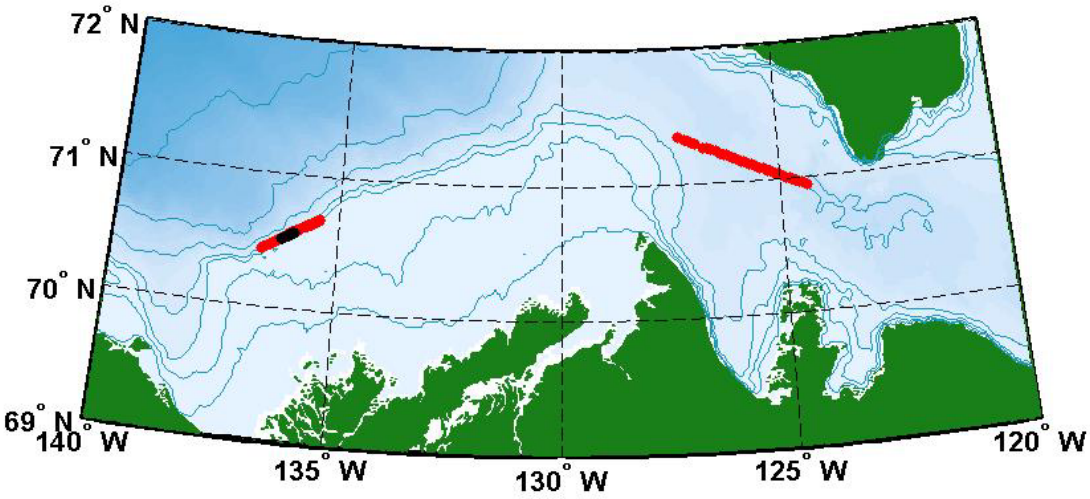
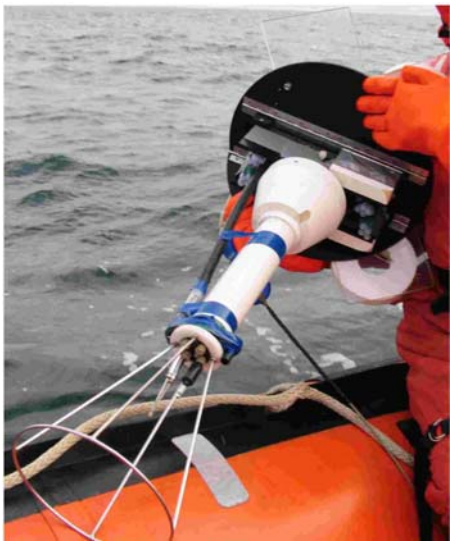


FIGURE 3. Location of the 2009 MVP sections (the black line is a short section on the top of a long red section).

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 Beaufort Sea (see Fig. 4 and Appendix 1C). Measurements were taken on 4 stations (30 casts) during leg 2 (0902). The logbook of SCAMP profiles is presented in Appendix 9 and an example of data profiles is presented in Appendix 10. Scamp data are not available yet. When available, processing and quality control protocols will be provided at the same time as the scamp data.

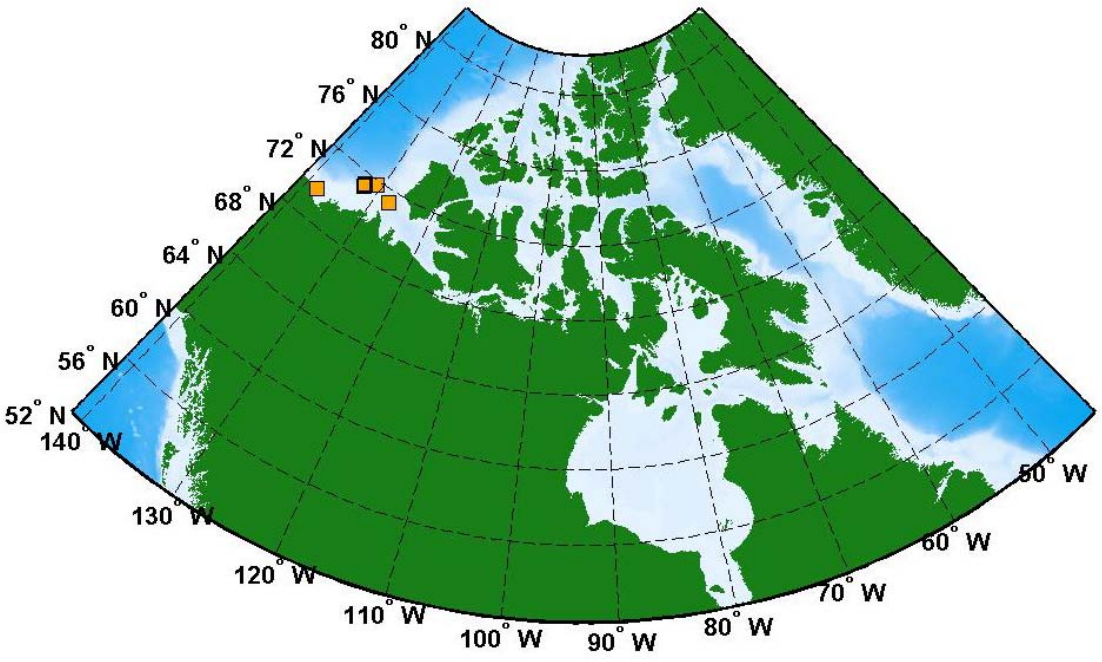


FIGURE 4. SCAMP 2009 sampling sites

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.

Six mooring lines were deployed in the Beaufort Sea in 2008 (see Fig. 5 and Appendix 1D). Two of them were dedicated to a MMP profiler (McLane Moored Profiler). The MMP is a moving profiler sliding up and down along the mooring line recording temperature, salinity and fluorescence data. The MMPs lines were deployed next to the "classic" mooring lines CA05 and CA16. Four of the six lines were recovered in 2009 (CA05, CA05-MMP, CA16 and CA16-MMP). CA04 could not be recover because of the ice cover while CA18 was lost. Unfortunately, the MMPs did not record reliable data. The moorings CA05 and CA16 provided data from ten different instruments. The probes characteristics are presented in Table 3. The summary of the data recovered may be found in Table 4.

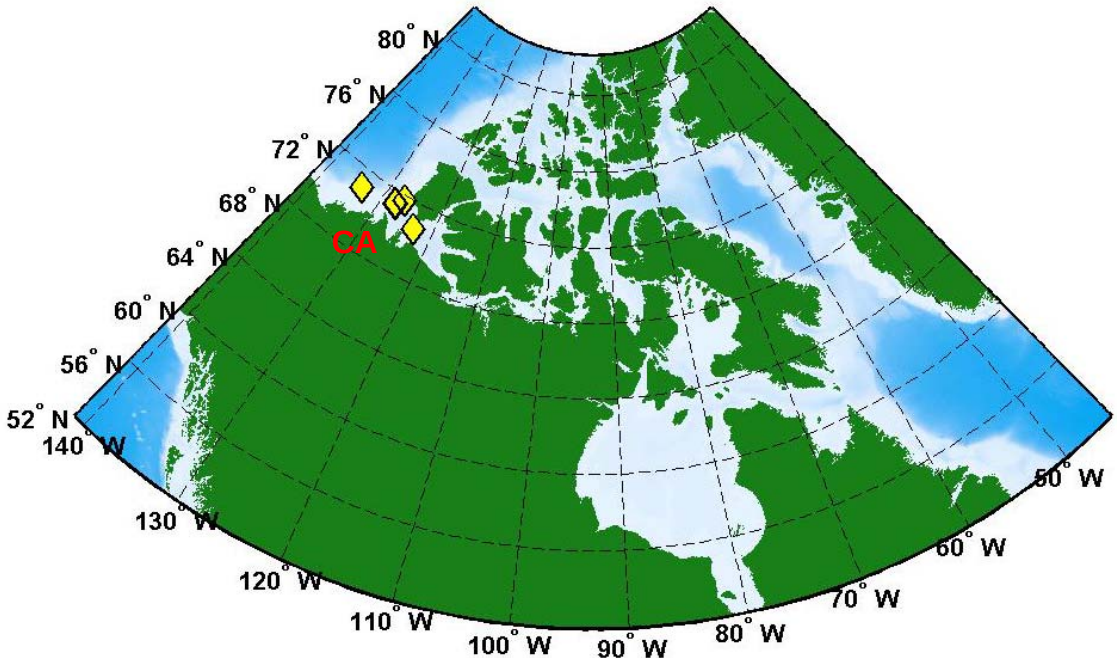


FIGURE 5. Mooring locations are identified by the yellow diamond-shaped dots. In 2008, six moorings were deployed on four different locations. Four were recovered in 2009.

Four moorings were redeployed in the Beaufort Sea during Expedition 0904 (leg 4) and three other were deployed in Hudson Bay (see Fig. 6 and Appendix 1D). The former were deployed during a special expedition of the CCGS Pierre Radisson. This expedition took place between July 27th and August 5th 2009.

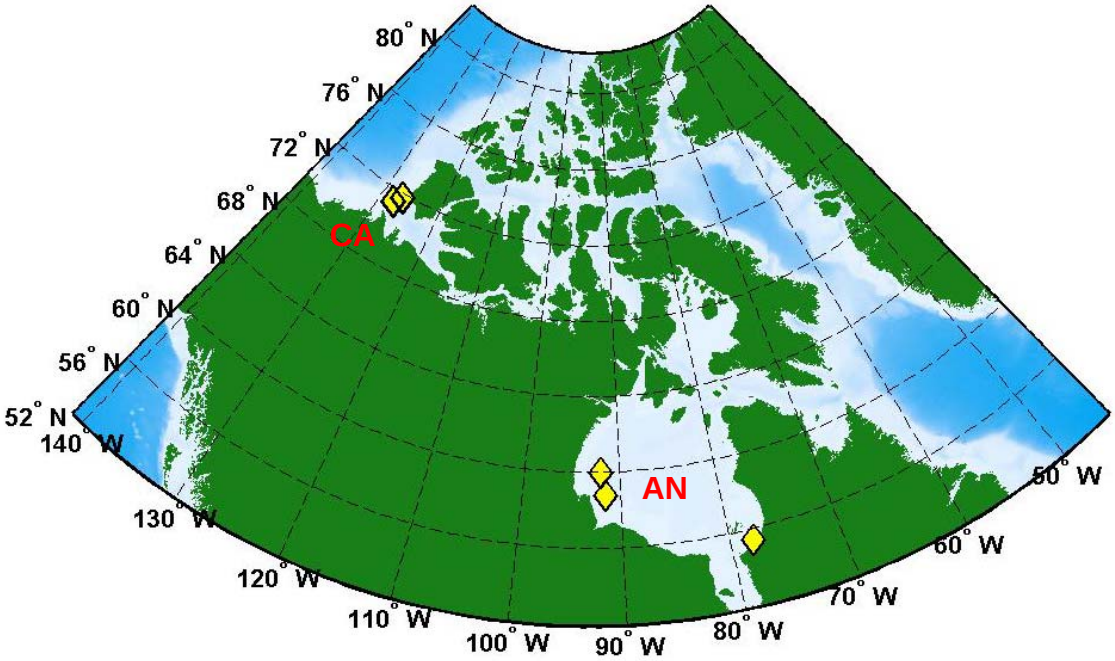


FIGURE 6. Moorings deployed in 2009. Mooring locations are identified by the yellow diamond-shaped dots.

Ship mounted Acoustic Doppler Current Profiler (ADCP)

In 2009, 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 track from the beginning to the end of the expedition (see Fig 7). 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. Note that the raw data is available upon request.

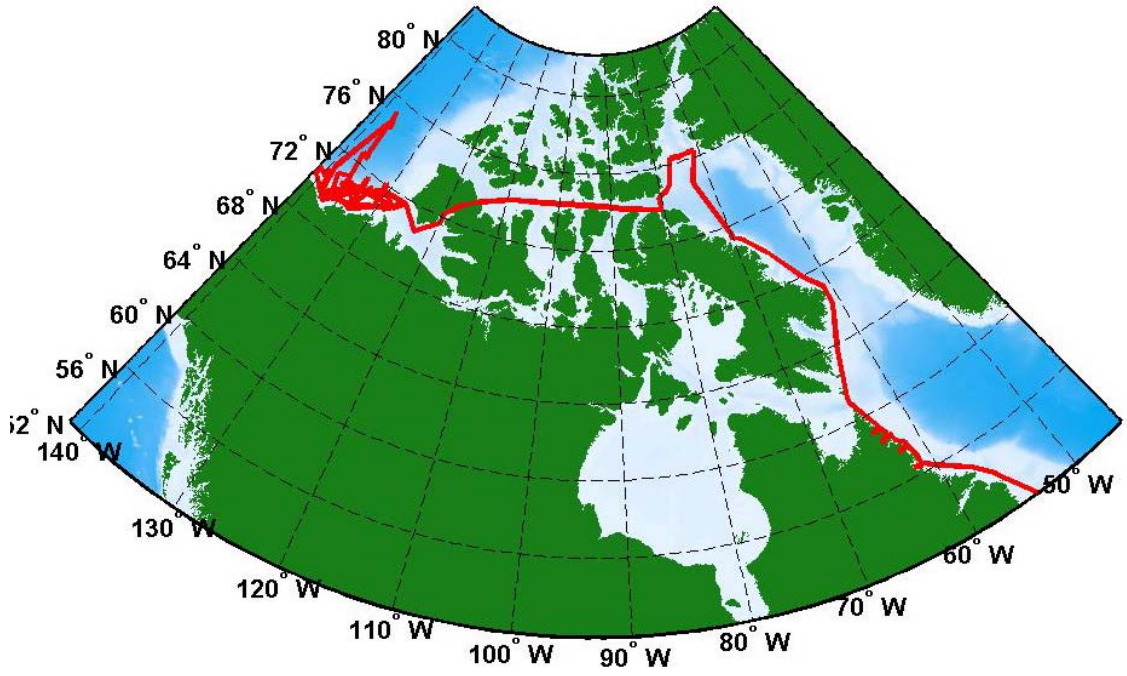


FIGURE 7. Ship-mounted ADCP is illustrated by the red ship track.

3. DATA PROCESSING AND QUALITY CONTROL

Rosette-CTD data

The Rosette data processing and quality control are described in details by Guillot (2007b, 2010a, 2010d and 2010e). 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 (Guillot 2009, 2010b and 2010c) 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 of 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.

The LADCP fixed on the rosette frame is programmed in *individual ping* mode (one every second). The horizontal velocities are averaged over thirty-two, 4 m *bins* for a total (theoretical) range of 100 to 120 m. Since the ADCP is lowered with the rosette, there will be several measurements for each depth interval. The processing is done in Matlab® according to Visbeck (2002).

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 *et al.* (2011). 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 *et al.,* 2011). ASCII files were created for every instrument (see Table 4).

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 2007).

4. DISCUSSION

The 2009 ArcticNet field season saw the addition of two new instruments on our rosette: a CDOM (Colored Dissolved Organic Matter) fluorometer and a LADCP (Lowered ADCP). The fluorometer is the property of Prof. Ronald Benner from University of South Carolina while the LADCP is the property of INSU (Institut National des sciences de l'univers), a French organisation.

The CCGS Amundsen transited through Panama Canal, also a first, since the Northwest Passage is not open in July. This resulted in the earliest sampling of southern Beaufort Sea by ArcticNet since the beginning of the program in 2004. This early sampling was financed through a research agreement with Imperial Oil Limited. Many moorings were deployed on their behalf in the Mackenzie Shelf region in leg 2a and 3b by ASL Environment (see their report). Leg 2b was dedicated to the French Malina project led by Dr. Marcel Babin of CNRS (Conseil national de la recherche scientifique). In four weeks the rosette was deployed 151 times (Appendices 1A and 2A). Leg 3a was dedicated to the IPY Geotraces program. We covered (Appendices 1A and 2B) a section from the Mackenzie mouth to 75.25°N, in more than 3500 m of water where we reached 3000 m with our rosette. Geotraces used their own "clean" rosette and reached a depth of 2955 m at their station L3 (see their report). The 2009 field season provided us with a

very good spatial coverage of the Mackenzie Shelf, plus a deep South-North section up to 75.25°N.

5. ACKNOWLEDGMENTS

We thank Captains Julien and Thibault and their crew aboard the CCGS Amundsen for their outstanding collaboration. We also thank the «Rosette team», Claudie Marec, Marc Picheral, Louis Prieur, Dominique Boisvert, Véronique Dansereau, and David Huard, 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, Louis Létourneau and Steeve Gagné. And last but not least, many thanks to Pascal Guillot for his data processing efforts.

6. REFERENCES

Anonymous, 2009. CFL Scientific Cruise Report Compendium, Vol. I (legs 3-6) and II (legs 7-10). University of Manitoba Press, 786 p.

Boivert, D. and V. Dansereau. 2009a. GeoTraces 0903 – Leg 3a – Rosette team sampling report from August 27th to September 12th 2009 on board the CCGS Amundsen. Field Report (Unpublished), INRS-ETE, Québec (Qc), 9 p.

Boivert, D. and V. Dansereau. 2009b. IOL 0903 – Leg 3b – Rosette team sampling report from September 12th to October 8th 2009 on board the CCGS Amundsen. Field Report (Unpublished), INRS-ETE, Québec (Qc), 17 p.

Boivert, D. and D. Huard. 2009a. ArcticNet 0904 – Leg 4a – Rosette team sampling report from October 8th to November 6th 2009 on board the CCGS Amundsen. Field Report (Unpublished), INRS-ETE, Québec (Qc), 11 p.

Boivert, D. and D. Huard. 2009b. ArcticNet 0904 – Leg 4b – Rosette team sampling report from November 7th to November 13th 2009 on board the CCGS Amundsen. Field Report (Unpublished), INRS-ETE, Québec (Qc), 9 p.

Boisvert, D., M.E. Rail, C. Bélanger and Y. Gratton. 2011. ArcticNet 2008-2009 Mooring data quality control report. Unpublished internal report, INRS-ETE, Québec (Qc): 92 p.

Fortier, L. D. Barber and J. Michaud [Eds], 2008. On thin Ice. Aboriginal Issues Press, Winnipeg, 215 p.

Gagné, S. and V. Dupuis, 2009. Moorings Retrieval and Deployment, *in : BaySys 2009 – ArcticNet Science Mission on board CCGS Radisson.* Unpublished internal report, Laval University, Québec (Qc): pp. 14-19.

Gratton, Y., M. Ouellet, M.E. Rail, and R.G. Ingram. 2006. Distribution of temperature and salinity in Northern Baffin Bay during the International North Water program (August 1997, April to July 1998, and September 1999). Internal Report No R897, INRS-ETE, Québec (Qc): x + 124 p.

Gratton, Y., C. Marec, M. Picheral and L. Prieur. 2009a. ArcticNet 0902 – Leg 2a – Rosette team sampling report from July 16th to July 30th 2009 on board the CCGS Amundsen. Field Report (Unpublished), INRS-ETE, Québec (Qc), 13 p.

Gratton, Y., C. Marec, M. Picheral and L. Prieur. 2009b. ArcticNet 0902 – Leg 2b – Rosette team sampling report from July 30th to August 27th 2009 on board the CCGS Amundsen. Field Report (Unpublished), INRS-ETE, Québec (Qc), 18 p.

Guillot, P. 2007a. Rapport de traitement de données Workhorse ADCP (Acoustic Doppler Current Profiler). Technical report, draft version, Québec-Océan, Université du Québec à Rimouski, 99 p.

Guillot, P. 2007b. Sea-Bird CTD Processing and Quality Control Procedure. Technical report, draft version, Québec-Océan, Université du Québec à Rimouski: 44 p.

Guillot, P. 2009. Dissolved oxygen data tests - IOL / Malina cruise 0902. Technical Report, Québec-Océan, Université du Québec à Rimouski: 52 p.

Guillot, P. 2010a. ArcticNet 0904 CTD processing notes. Technical Report, Québec-Océan, Université du Québec à Rimouski: 84 p.

Guillot, P. 2010b. Dissolved oxygen data tests – ArcticNet cruise 0904. Technical Report, Québec-Océan, Université du Québec à Rimouski: 53 p.

Guillot, P. 2010c. Dissolved oxygen data tests – Geotraces-IOL cruise 0903. Technical Report, Québec-Océan, Université du Québec à Rimouski: 42 p.

Guillot, P. 2010d. Étalonnage du capteur de nitrate Durant la mission ArcticNet 0904. Technical Report, Québec-Océan, Université du Québec à Rimouski: 39 p.

Guillot, P. 2010e. IOL / Malina 0902 CTD processing notes. Technical Report, Québec-Océan, Université du Québec à Rimouski: 102 p.

Ingram, R.G., E.C. Carmack, F.A. McLaughlin, and S. Nicol. 2005. Polar Ocean Coastal Boundaries, chapter 3 *in: The Sea–Ideas and Observations on Progress in the Study of the Seas, Volume 14 part A*, A.R. Robinson and K.H. Brink (eds), Harvard University Press, Cambridge: pp. 61-81.

Lanos, R., 2009. Circulation générale, masses d'eau, cycles d'évolution et transports entre la mer de Beaufort et le Golfe d'Amundsen. Ph.D. Thesis, INRS-ETE, September 2009.

McLaughlin, F.A., E.C. Carmack, R.G. Ingram, W.J. Williams, and C. Michel. 2005. Oceanography of the Northwest Passage, chapter 31 *in: The Sea–Ideas and Observations on Progress in the Study of Seas, Volume 14 part B*, A.R. Robinson and K.H. Brink (eds), Harvard University Press, Cambridge: pp. 1213-1244.

Melling, H. 1999. Observations by moored instruments in Northern Baffin Bay 1997-1998. Unpub. Rep., Institute of Ocean Sciences, Sydney, B.C.: 37 p.

Rail, M.E. and Y. Gratton. 2011. Distribution of temperature and salinity in the Canadian Arctic Archipelago during the 2007 and 2008 ARCTICNET sampling expeditions. Report No R0001243, INRS-ETE, Québec (Qc): vii + 65 p.

Simard, A., M.E. Rail, and Y. Gratton. 2010a. Distribution of temperature and salinity in the Beaufort Sea during the Canadian Arctic Shelf Exchange Study sampling expeditions 2002-2004. Report No R1187, INRS-ETE, Québec (Qc): vii + 128 p.

Simard, A., M.E. Rail, and Y. Gratton. 2010b. Distribution of temperature and salinity in the Canadian Arctic Archipelago during the 2005 ARCTICNET sampling expedition (from August 5th to October 27th 2005). Report No R1126, INRS-ETE, Québec (Qc): vi + 79 p.

Simard, A., M.E. Rail, and Y. Gratton. 2010c. Distribution of temperature and salinity in the Canadian Arctic Archipelago during the 2006 ARCTICNET sampling expedition (from August 22nd to November 9th 2006). Report No R1127, INRS-ETE, Québec (Qc): vi + 79 p.

Stewart, D.B., and Lockhart, W.L. 2005. An overview of the Hudson Bay marine ecosystem. Can. Tech. Rep. Fish. Aquat. Sci. 2586: vi + 487 p.

Visbeck, M. 2002. Deep velocity profiling using lowered acoustic Doppler current profilers: Bottom track and inverse solutions, J Atmos Ocean Tech, 19(5), 794-807.

TABLE 1. Summary of the three 2009 ArcticNet expedition.

Expedition number	***0902***	***0903***	***0904***
Starting and Ending Date	July 16th, 2009	August 27th, 2009	October 8th, 2009
	August 27th, 2009	October 8th, 2009	November 13th, 2009
Starting and Ending Location	Vancouver, B.C.	Sachs Harbour, Banks Island	Tuktoyaktuk, NWT
	Sachs Harbour, Banks Island	Tuktoyaktuk, NWT	Quebec City, Qc
Chief Scientist	Martin Fortier	David Barber	Keith Lévesque
	Marcel Babin	Steve Blasco	Tim Papakiriakou
CCGS	Amundsen	Amundsen	Amundsen
CCG Captain	Marc Thibault	Stéphane Julien	Marc Thibault
Rosette sampling (including a LADCP)	191 profiles / 74 stations	76 profiles / 39 stations	89 profiles / 57 stations
	10 sections	2 sections	8 sections
MVP sampling	0	97 profiles / 2 sections	42 profiles / 1 section
Rosette and MVP operators	Claudie Marec	Dominique Boisvert	Dominique Boisvert
	Marc Picheral	Véronique Dansereau	David Huard
	Louis Prieur		
SCAMP sampling	32 profiles / 4 stations	0	0
SCAMP operators	Yves Gratton		
Moorings recovered	0	0	4
Moorings deployed	0	0	4
Ship mounted ADCP	operational	operational	operational

TABLE 2. Characteristics of Rosette and MVP sensors used during ArcticNet 2009 sampling expedition.

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
CDOM fluorometer	Wet Labs	FL(RT)D[7]	0.09-500 ppb	unknown	14 bit
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. Specifications of instruments moored in 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 4. Summary of the instruments moored in 2008 and recovered in 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 (uM)	Chl	Luminosity (µmol/m²s)	Comments on data quality. For more details read the report.
CA04-08	307	71° 04.8843' N 133° 37.7787' W	**Never recovered**														
CA05-08	204	71° 18.7468' N 127° 34.9424' W	ALW	69	54	2008-07-26 02:00	2009-10-10 15:00										
			ACLW	888	54	2008-07-26 02:00	2009-10-09 16:00										
			RBR	10419	57	2008-07-26 02:00	2009-10-09 16:10										
			RBR	10424	87	**No usable data**											
			RCM11	272	178	2008-07-26 01:58	2009-10-09 15:46										
CA05MMP-08	235	71° 24.6948' N 127° 38.6778' W	MMP	12138-06	65-155	**No usable data**											
CA16-08	314	71° 47.2067' N 126° 29.8168' W	ACTW	145	56	2008-07-28 03:00	2009-08-31 08:00										
			ACTW	152	67	2008-07-28 04:00	2009-09-05 18:00										
			RBR	10422	88	2008-07-29 01:00	2009-10-01 01:00										
			Aquadopp	2780	223	2008-07-29 01:00	2009-10-12 16:00										
			RBR	13201	230	2008-07-29 01:00	2009-10-01 00:58										
			Aquadopp	2758	301	2008-07-29 01:00	2009-10-12 16:00										
CA16MMP-07	353	71° 45.1516' N 126° 30.4832' W	MMP	12138-08	65-200	**No usable data**											
CA18-08	540	70° 39.8911' N 122° 59.6529' W	**Never recovered**														

Please notice that green is used to indicate reliable data.

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*
2	***0902***	19	35	-2	6
3	***0903***	23	35	-2	4
4	***0904***	27	35	-2	3

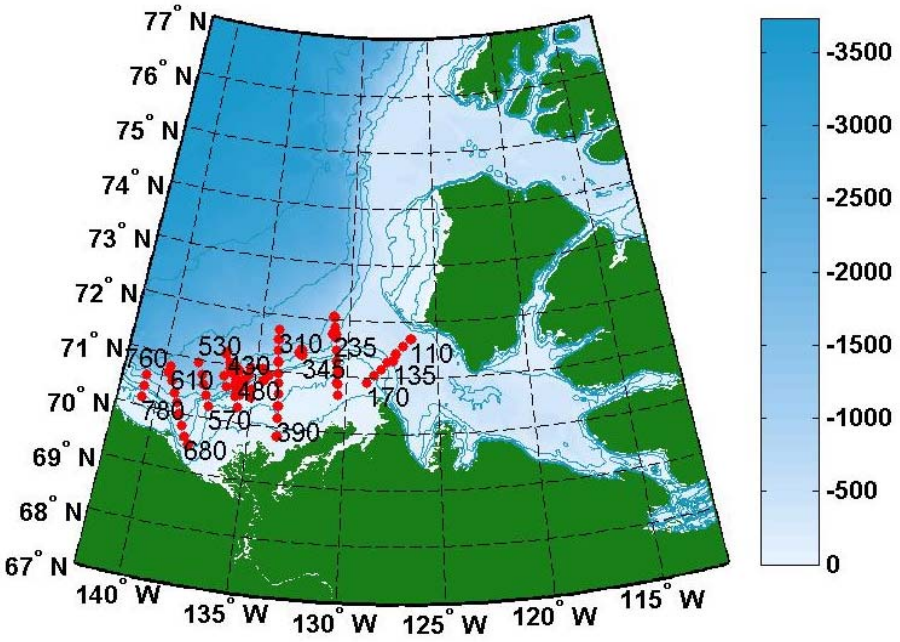
APPENDIX 1. High resolution maps of Arctic areas where Rosette-CTD, MVP, SCAMP and moorings data were collected.

1A. Rosette-CTD sampling sites in Beaufort Sea, Northwest Passage, Baffin Bay and Labrador fjords (Legs 2, 3 and 4).

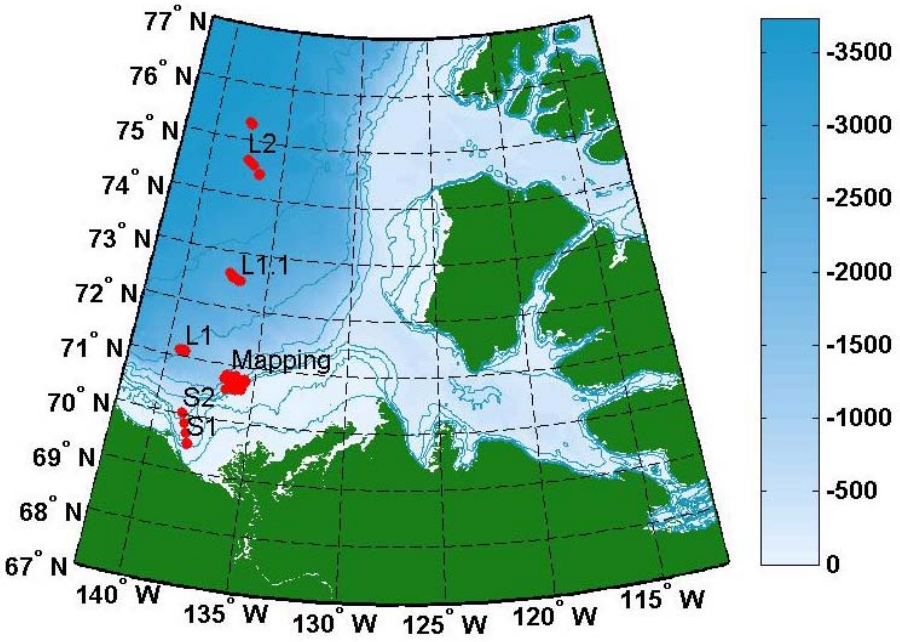
1B. MVP sampling sites in Beaufort Sea (Legs 3 and 4).

1C. SCAMP sampling sites in Beaufort Sea (Leg 2).

1D. Moorings recovered and deployed in Beaufort Sea and Hudson Bay (Leg 4).

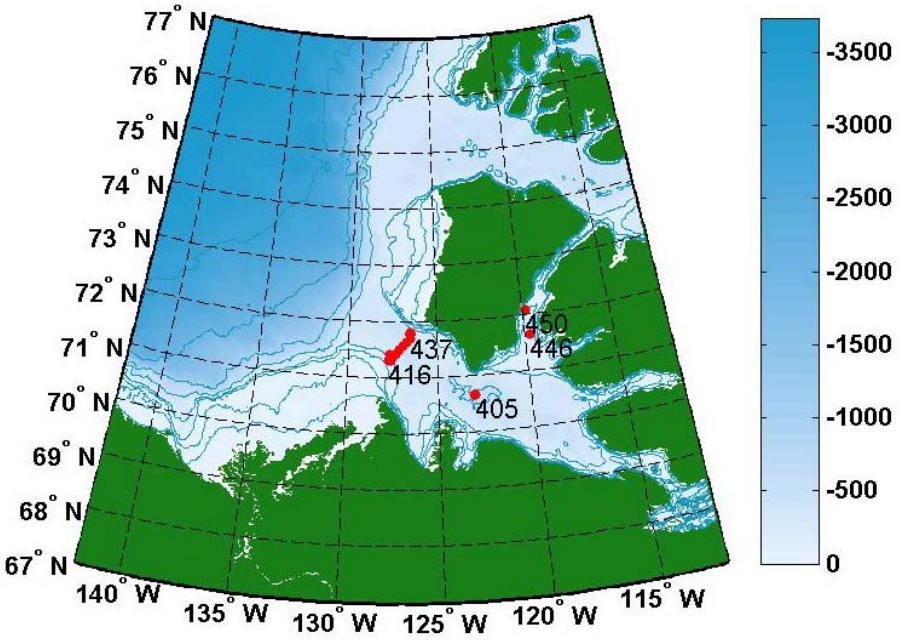


Beaufort Sea (Leg 2 - 0902)

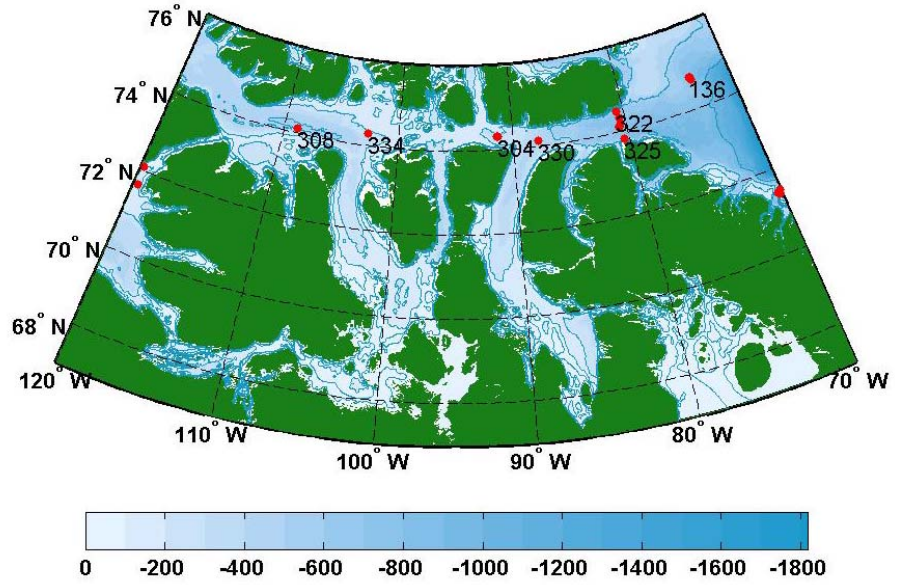


Beaufort Sea (Leg 3 - 0903)

APPENDIX 1A. Location of the Rosette-CTD sampling sites during the 2009 expedition. Numbers represent station name (not to be confused with cast number).

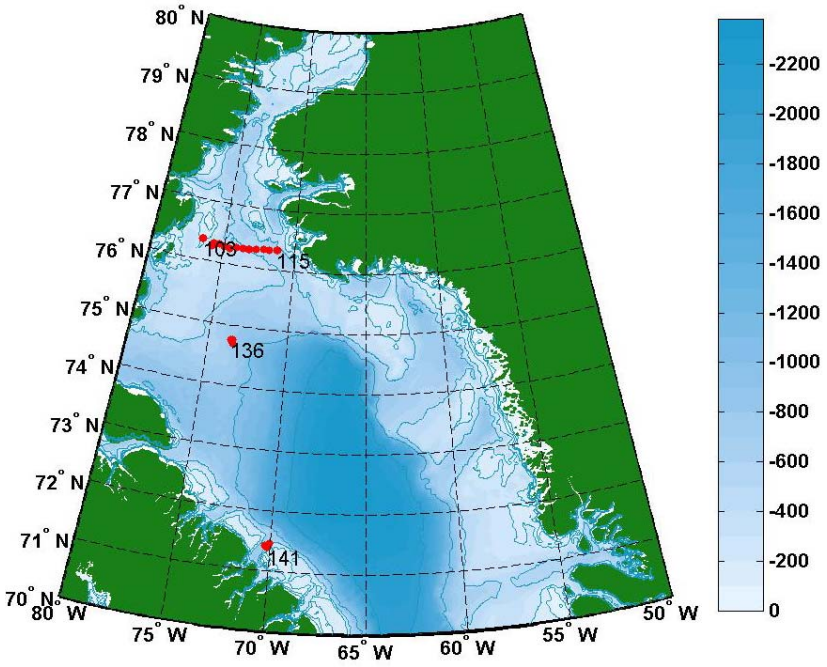


Beaufort Sea (Leg 4 - 0904)

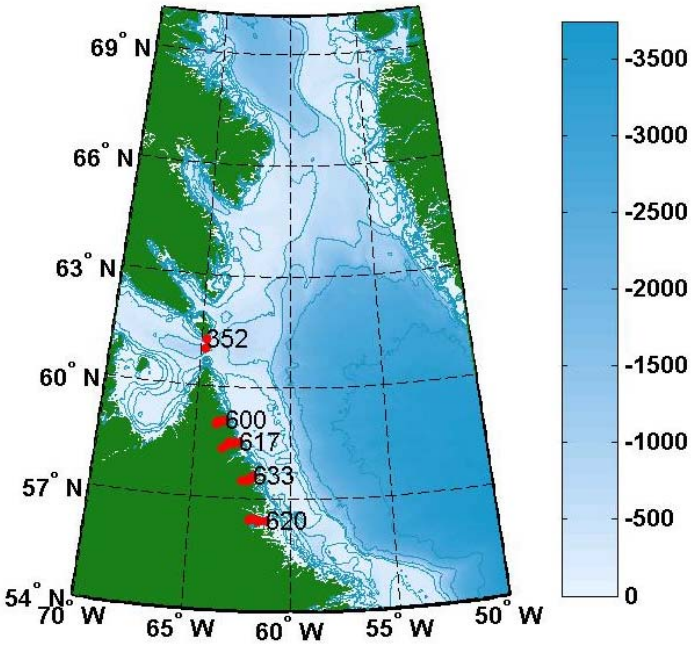


Northwest Passage (Leg 4 - 0904)

APPENDIX 1A. Location of the Rosette-CTD sampling sites during the 2009 expedition. Numbers represent station name (not to be confused with cast number).

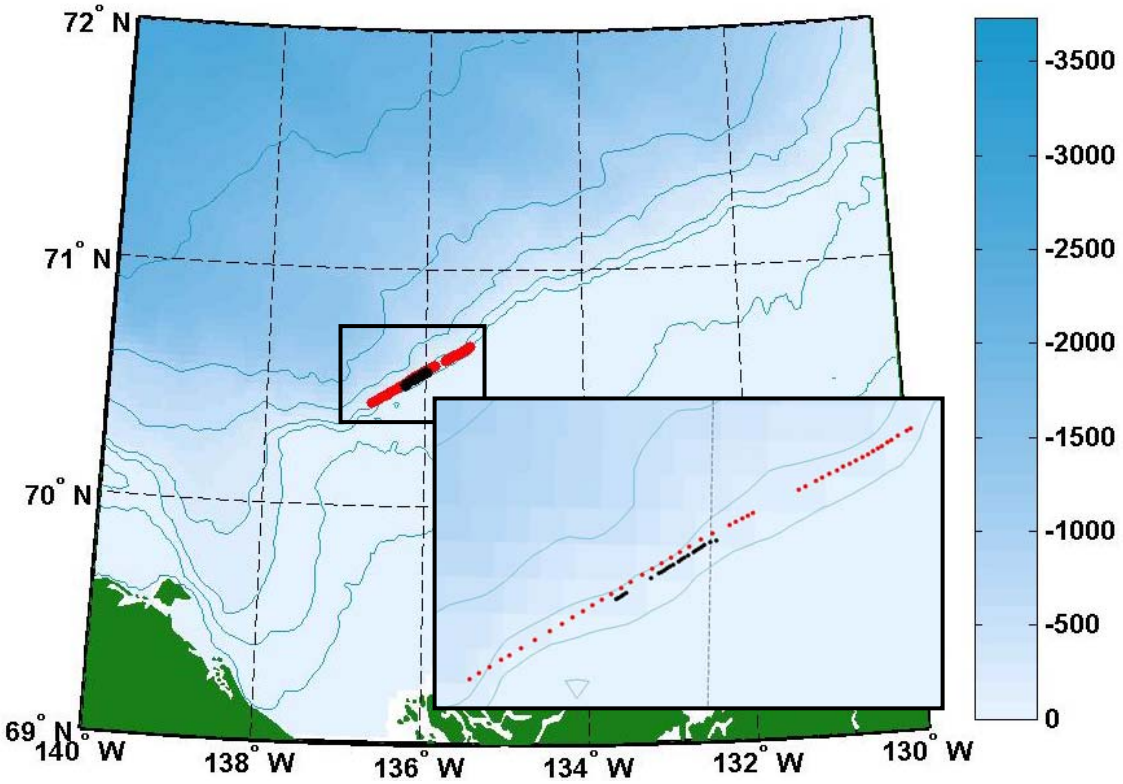


Northern Baffin Bay (Leg 4 - 0904)

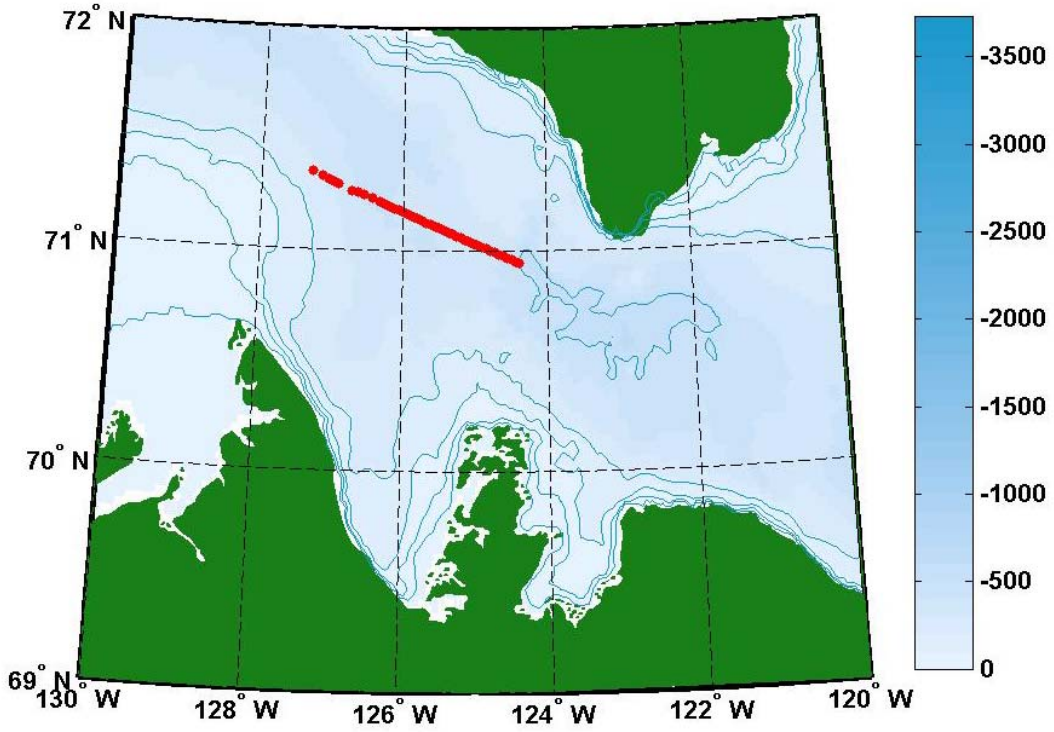


Labrador fjords (Leg 4 - 0904)

APPENDIX 1A. Location of the Rosette-CTD sampling sites during the 2009 expedition. Numbers represent station name (not to be confused with cast number).

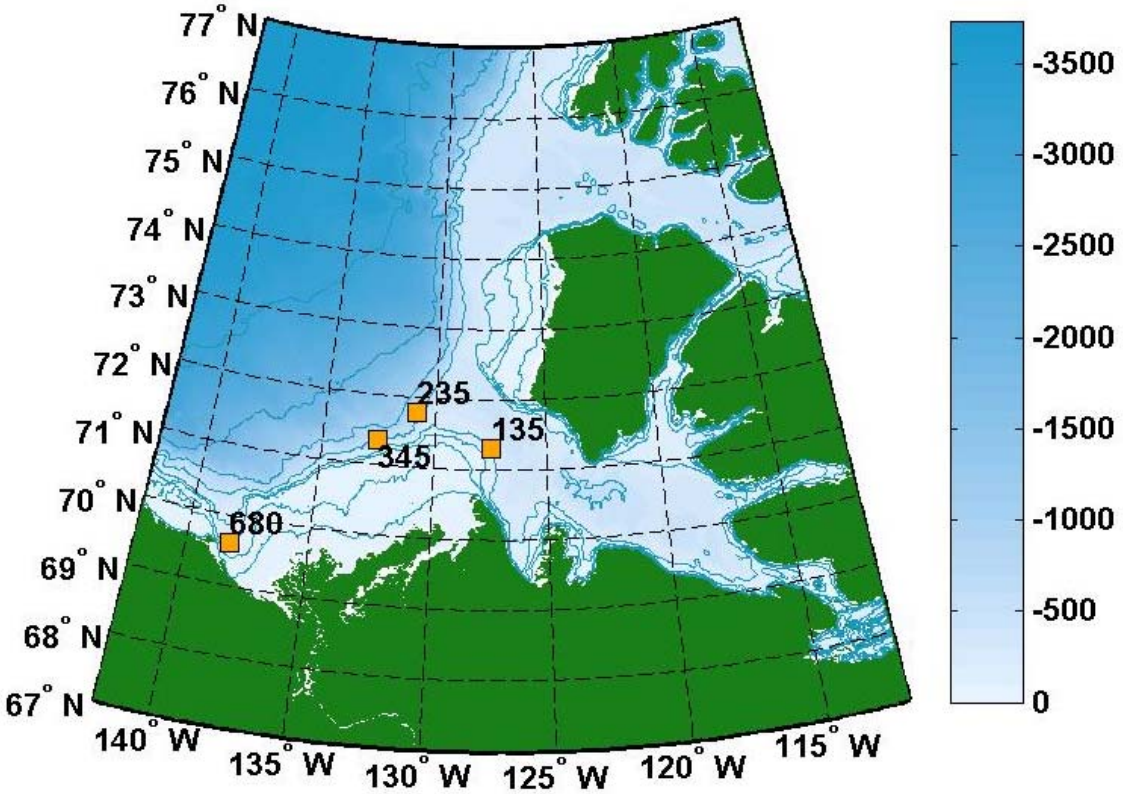


Beaufort Sea (Leg 3 - 0903)



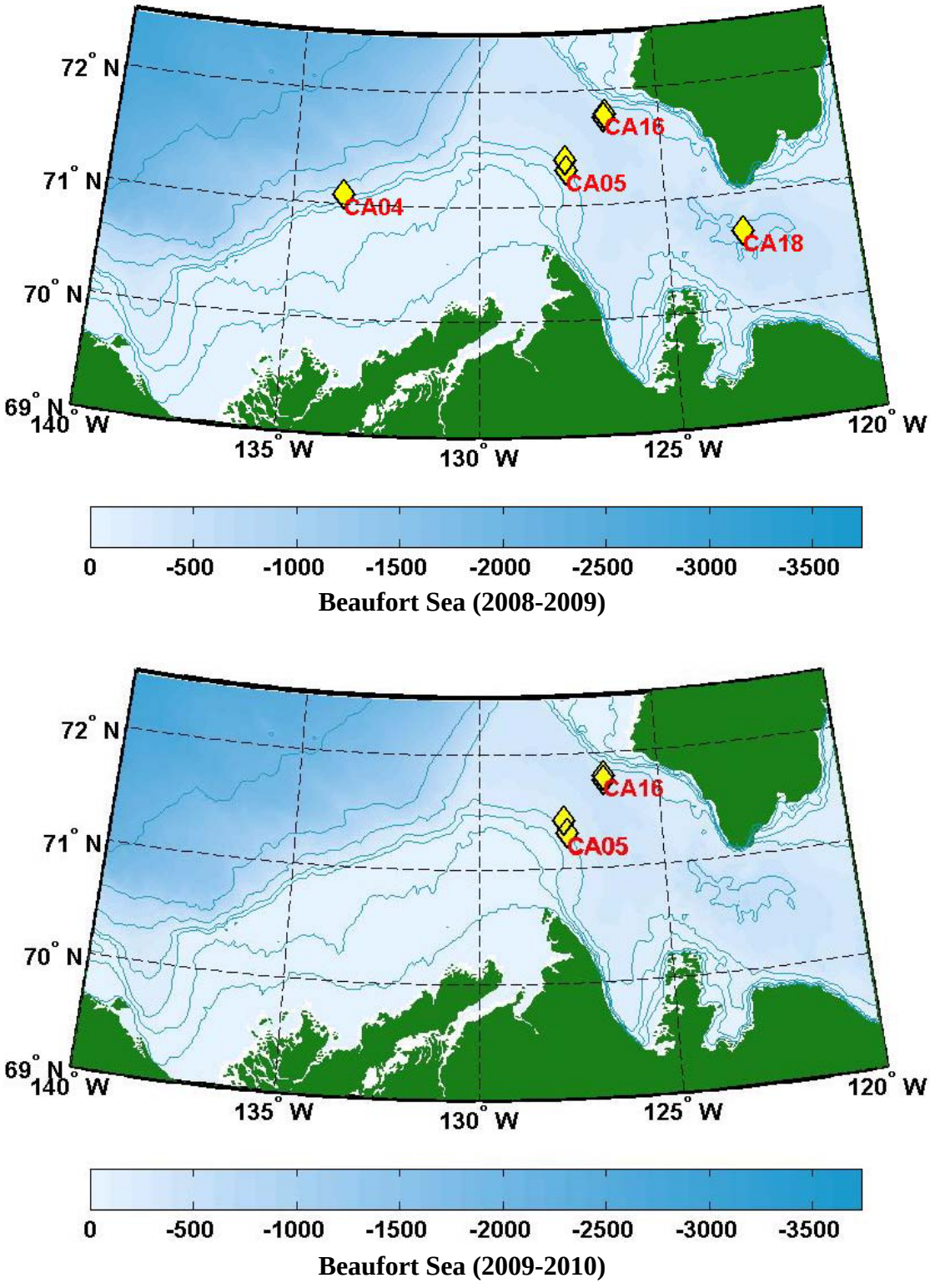
Beaufort Sea (Leg 4 - 0904)

APPENDIX 1B. Location of the MVP sections during the 2009 expedition.

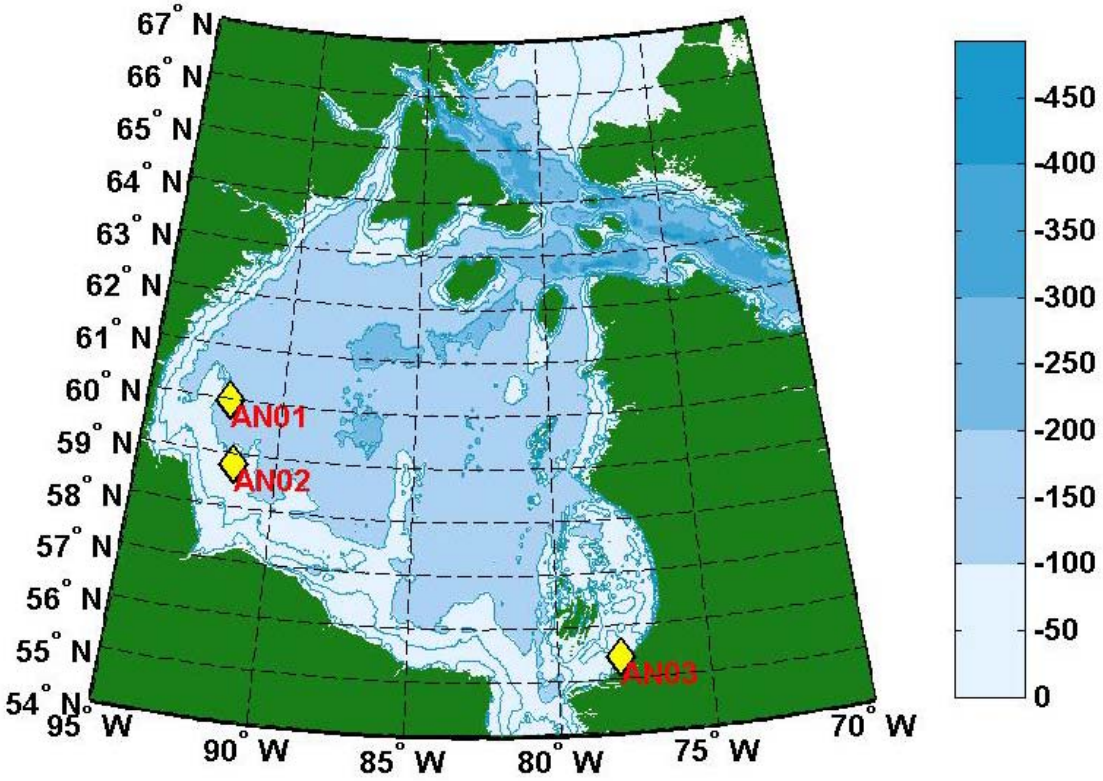


Beaufort Sea (Leg 2 - 0902)

APPENDIX 1C. Location of the scamp stations during the 2009 expedition.



APPENDIX 1D. Moorings deployed (and recovered) from the CCGS Amundsen in the Beaufort Sea. 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.



Hudson Bay (2009-2010)

APPENDIX 1D. Moorings deployed in the Hudson Bay from the CCGS Pierre Radisson between July 27th and August 5th 2009.

APPENDIX 2. Rosette-CTD logs, they included cast locations, sampling time, water depth and corresponding station or mooring numbers during 2009 ArcticNet scientific expedition.

2A. Rosette logbook for Leg 2 (expedition 0902)

2B. Rosette logbook for Leg 3 (expedition 0903)

2C. Rosette logbook for Leg 4 (expedition 0904)

APPENDIX 2A. Rosette cast locations, sampling time, water depth and corresponding stations or mooring numbers during ArcticNet expedition 0902 (page 1/4).

Cast number	*Station or mooring*	*Start date UTC*	*Start time UTC*	*Latitude (North)*	*Longitude (West)*	*Sea bottom depth (m)*	*Cast depth (m)*
001	1 (B)	2009-07-18	11:50	70º 28.81	135º 06.62	62	51
002	1 (B)	2009-07-18	12:06	70º 28.81	135º 07.04	62	51
003	2 (B)	2009-07-19	00:26	70º 39.35	135º 38.27	148	140
004	11 (B)	2009-07-19	06:22	70º 44.15	135º 33.65	363	101
005	11 (B)	2009-07-19	08:21	70º 44.27	135º 32.21	363	355
006	3 (B)	2009-07-19	12:54	70º 42.34	135º 48.13	400	392
007	14 (B)	2009-07-20	00:26	70º 34.83	135º 57.25	94	85
008	15 (B)	2009-07-20	06:19	70º 39.27	135º 55.88	294	286
009	17 (B)	2009-07-20	12:51	70º 36.59	136º 28.45	730	715
010	4 (B)	2009-07-21	02:34	70º 45.76	136º 01.26	688	665
011	10 (B)	2009-07-21	12:46	70º 47.24	135º 31.72	432	416
012	I (09)	2009-07-21	21:47	70º 48.90	134º 32.99	73	65
013	23 (B)	2009-07-22	00:52	70º 53.82	134º 16.05	82	75
014	22 (B)	2009-07-22	07:41	70º 49.10	134º 30.61	72	62
015	21 (B)	2009-07-22	16:29	71º 01.11	134º 37.95	337	331
016	18 (B)	2009-07-23	01:07	70º 52.50	135º 21.43	495	480
017	08 (B)	2009-07-23	07:42	70º 55.22	135º 51.82	782	767
018	20 (B)	2009-07-23	15:54	71º 00.94	135º 20.74	645	642
019	16 (B)	2009-07-24	14:15	70º 47.69	136º 39.45	1084	991
020	6 (B)	2009-07-25	06:57	70º 56.16	136º 25.77	1024	988
021	7 (B)	2009-07-25	14:19	70º 59.31	136º 07.71	1018	988
022	M (09)	2009-07-26	02:47	70º 44.23	135º 55.10	583	564
023	13 (B)	2009-07-27	03:55	70º 30.00	135º 40.00	66	60
024	12 (B)	2009-07-27	14:11	70º 38.39	135º 06.01	61	50
025	390	2009-07-31	21:08	70º 10.81	133º 33.83	58	45
026	390	2009-07-31	23:06	70º 10.51	133º 34.01	43	38
027	390	2009-08-01	00:31	70º 10.69	133º 34.73	43	36
028	689	2009-08-01	12:28	69º 29.27	137º 56.67	52	46
029	690	2009-08-01	15:11	69º 29.05	137º 55.99	51	46
030	690	2009-08-01	16:50	69º 28.30	137º 57.26	53	48
031	690	2009-08-01	20:21	69º 29.13	137º 56.33	55	46
032	680	2009-08-02	16:46	69º 36.46	138º 12.47	120	115
033	680	2009-08-02	19:14	69º 36.42	138º 13.32	122	115
035	680	2009-08-02	20:59	69º 36.60	138º 13.20	124	115
036	680	2009-08-02	22:51	69º 36.57	138º 14.26	124	101
037	394	2009-08-03	20:29	69º 50.83	133º 29.52	14	10
038	394	2009-08-03	22:47	69º 50.91	133º 29.86	14	10
039	290	2009-08-04	12:21	70º 40.34	130º 26.06	32	28
040	280	2009-08-04	14:56	70º 52.17	130º 30.41	38	33
041	280	2009-08-04	16:28	70º 52.26	130º 30.42	42	38
042	280	2009-08-04	18:13	70º 52.84	130º 31.71	42	37
043	270	2009-08-04	19:51	71º 04.41	130º 32.85	50	43
044	260	2009-08-04	22:06	71º 16.00	130º 36.51	58	50
045	260	2009-08-05	00:00	71º 16.00	130º 36.00	59	50
046	250	2009-08-05	04:20	71º 28.31	130º 41.75	219	210
047	240	2009-08-05	06:20	71º 40.37	130º 44.47	460	450
048	230	2009-08-05	08:03	71º 51.95	130º 50.27	702	684
049	220	2009-08-05	10:15	72º 03.49	130º 53.53	890	871
050	220	2009-08-05	14:11	72º 02.74	130º 49.51	834	400

APPENDIX 2A. Rosette cast locations, sampling time, water depth and corresponding stations or mooring numbers during ArcticNet expedition 0902 (page 2/4).

Cast number	*Station or mooring*	*Start date UTC*	*Start time UTC*	*Latitude (North)*	*Longitude (West)*	*Sea bottom depth (m)*	*Cast depth (m)*
051	220	2009-08-05	15:48	72º 03.22	130º 52.62	880	200
052	220	2009-08-05	17:28	72º 02.98	130º 56.69	911	225
053	240	2009-08-05	22:17	71º 40.29	130º 43.67	465	200
054	240	2009-08-06	00:31	71º 40.31	130º 44.19	459	395
055	110	2009-08-06	11:09	71º 42.06	126º 28.90	400	386
056	110	2009-08-06	13:38	71º 41.84	126º 28.70	399	300
057	110	2009-08-06	15:23	71º 42.05	126º 28.78	397	250
058	110	2009-08-06	18:05	71º 41.83	126º 28.68	395	300
059	120	2009-08-06	22:58	71º 33.88	126º 54.55	419	410
060	130	2009-08-07	00:51	71º 25.63	127º 21.97	311	250
061	130	2009-08-07	03:27	71º 25.44	127º 21.41	313	250
062	140	2009-08-07	09:05	71º 17.04	127º 47.42	148	140
063	150	2009-08-07	11:17	71º 09.66	128º 09.64	66	60
064	160	2009-08-07	12:39	71º 03.03	128º 29.82	43	40
065	170	2009-08-07	14:35	70º 54.83	128º 55.09	35	30
066	170	2009-08-07	16:12	70º 54.92	128º 55.43	35	30
067	170	2009-08-07	17:38	70º 55.04	128º 55.14	35	30
068	150	2009-08-07	22:57	71º 09.74	128º 09.59	66	62
069	150	2009-08-08	01:09	71º 09.66	128º 09.60	66	60
070	390	2009-08-08	11:37	70º 10.65	133º 33.59	44	40
071	380	2009-08-08	13:10	70º 23.78	133º 36.55	63	57
072	380	2009-08-08	14:48	70º 23.77	133º 35.98	63	56
073	380	2009-08-08	16:12	70º 23.56	133º 35.72	62	55
074	370	2009-08-08	19:13	70º 35.92	133º 39.00	70	65
075	360	2009-08-08	21:58	70º 48.03	133º 43.83	75	70
076	360	2009-08-08	23:36	70º 48.14	133º 43.94	74	70
077	350	2009-08-09	04:24	70º 58.29	133º 44.04	90	85
078	340	2009-08-09	06:22	71º 10.38	133º 50.04	575	564
079	330	2009-08-09	08:05	71º 22.39	133º 53.50	1080	1000
080	320	2009-08-09	10:13	71º 34.30	133º 56.23	1159	989
081	310	2009-08-09	12:36	71º 44.53	133º 57.05	1614	988
082	320	2009-08-09	15:00	71º 34.33	133º 56.89	1160	300
083	320	2009-08-09	16:57	71º 33.83	133º 57.22	1141	300
084	320	2009-08-09	19:03	71º 33.80	133º 57.24	1115	300
085	330	2009-08-09	21:31	71º 22.24	133º 53.23	1070	300
086	340	2009-08-09	23:45	71º 10.31	133º 49.50	562	300
087	340	2009-08-10	02:08	71º 10.06	133º 50.18	553	300
088	680	2009-08-10	16:44	69º 36.35	138º 14.10	125	120
089	670	2009-08-10	19:22	69º 47.85	138º 26.24	174	167
090	670	2009-08-10	21:00	69º 47.98	138º 26.15	174	167
091	670	2009-08-10	22:55	69º 47.83	138º 25.67	173	165
092	660	2009-08-11	01:00	69º 59.08	138º 39.09	268	260
093	660	2009-08-11	03:14	69º 58.23	138º 38.24	260	250
094	650	2009-08-11	05:37	70º 10.12	138º 54.51	374	368
095	640	2009-08-11	07:35	70º 20.42	139º 08.78	564	558
096	630	2009-08-11	09:11	70º 32.01	139º 22.78	839	826
097	620	2009-08-11	11:08	70º 42.21	139º 36.52	1736	1684
098	610	2009-08-11	14:27	70º 47.69	139º 36.18	1823	1780
099	620	2009-08-11	18:43	70º 40.88	139º 37.29	1740	300
100	620	2009-08-11	20:56	70º 40.10	139º 39.43	1740	300

APPENDIX 2A. Rosette cast locations, sampling time, water depth and corresponding stations or mooring numbers during ArcticNet expedition 0902 (page 3/4).

Cast number	*Station or mooring*	*Start date UTC*	*Start time UTC*	*Latitude (North)*	*Longitude (West)*	*Sea bottom depth (m)*	*Cast depth (m)*
101	620	2009-08-11	22:49	70º 40.42	139º 37.96	1538	300
102	630	2009-08-12	00:53	70º 31.88	139º 22.47	840	300
103	640	2009-08-12	02:50	70º 20.35	139º 08.23	573	300
105	760	2009-08-12	13:49	70º 33.24	140º 47.86	579	565
106	760	2009-08-12	15:21	70º 33.25	140º 47.78	560	300
107	760	2009-08-12	16:50	70º 32.83	140º 47.62	566	300
108	760	2009-08-12	19:11	70º 32.38	140º 47.08	566	300
109	770	2009-08-12	23:03	70º 20.93	140º 48.40	223	215
110	780	2009-08-13	01:58	70º 09.21	140º 48.35	49	45
111	780	2009-08-13	03:38	70º 09.22	140º 48.04	50	45
112	345	2009-08-14	16:26	71º 19.80	132º 33.80	479	460
113	345	2009-08-14	18:19	71º 20.50	132º 35.53	502	500
114	345	2009-08-14	20:27	71º 20.95	132º 36.39	517	500
115	345	2009-08-14	22:25	71º 21.26	132º 36.52	530	500
116	345	2009-08-15	00:23	71º 21.16	132º 37.29	519	500
117	345	2009-08-15	02:19	71º 21.28	132º 37.03	529	500
118	345	2009-08-15	04:20	71º 21.15	132º 36.61	524	495
119	345	2009-08-15	06:21	71º 21.62	132º 36.64	536	500
120	345	2009-08-15	08:17	71º 21.83	132º 36.46	539	500
121	345	2009-08-15	10:23	71º 21.11	132º 35.12	519	494
122	345	2009-08-15	12:20	71º 21.39	132º 34.92	525	500
123	345	2009-08-15	14:24	71º 22.03	132º 41.24	559	500
124	345	2009-08-15	16:23	71º 22.88	132º 43.48	612	300
125	345	2009-08-15	18:19	71º 23.56	132º 39.80	602	500
126	345	2009-08-15	20:18	71º 24.54	132º 38.32	580	495
127	345	2009-08-15	22:23	71º 25.33	132º 37.09	615	500
128	345	2009-08-16	00:21	71º 25.15	132º 35.52	625	594
129	345	2009-08-16	02:19	71º 24.76	132º 35.01	606	590
130	345	2009-08-16	04:26	71º 26.07	132º 36.31	654	641
131	570	2009-08-17	10:43	70º 12.32	137º 15.33	55	50
132	560	2009-08-17	12:13	70º 23.32	137º 28.61	400	395
133	550	2009-08-17	14:07	70º 34.31	137º 42.63	1076	1064
134	540	2009-08-17	17:18	70º 45.15	137º 53.64	1514	1512
135	540	2009-08-17	20:07	70º 45.30	137º 53.11	1514	300
136	540	2009-08-17	22:06	70º 45.37	137º 52.26	1522	300
137	530	2009-08-18	04:32	70º 56.42	138º 08.79	1602	1597
138	430	2009-08-18	15:00	71º 13.16	136º 42.76	1351	1339
139	430	2009-08-18	17:27	71º 12.21	136º 44.20	1334	300
140	430	2009-08-18	19:29	71º 11.03	136º 44.89	1300	300
141	440	2009-08-19	00:11	71º 02.07	136º 27.67	1149	990
142	450	2009-08-19	02:29	70º 51.31	136º 14.16	840	824
143	470	2009-08-19	06:06	70º 28.32	135º 54.75	62	55
144	480	2009-08-19	07:29	70º 16.69	135º 45.10	56	50
145	460	2009-08-19	13:46	70º 40.62	136º 03.29	468	300
146	460	2009-08-19	15:44	70º 41.03	135º 59.31	434	58
147	460	2009-08-19	16:16	70º 41.01	135º 58.06	420	300
148	460	2009-08-19	18:16	70º 40.91	135º 53.47	362	355
149	135	2009-08-20	18:45	71º 18.62	127º 28.62	231	222
150	135	2009-08-20	20:24	71º 18.74	127º 29.34	230	222

APPENDIX 2A. Rosette cast locations, sampling time, water depth and corresponding stations or mooring numbers during ArcticNet expedition 0902 (page 4/4).

Cast number	Station or mooring	Start date UTC	Start time UTC	Latitude (North)	Longitude (West)	Sea bottom depth (m)	Cast depth (m)
151	135	2009-08-20	22:51	71º 18.63	127º 29.15	228	221
152	135	2009-08-21	00:31	71º 18.56	127º 30.11	223	220
153	135	2009-08-21	02:30	71º 18.68	127º 29.62	230	223
154	135	2009-08-21	04:18	71º 18.79	127º 29.48	231	227
155	135	2009-08-21	06:19	71º 18.71	127º 29.80	228	220
156	135	2009-08-21	08:19	71º 18.60	127º 29.54	227	221
157	135	2009-08-21	10:19	71º 18.66	127º 29.51	230	228
158	135	2009-08-21	12:50	71º 18.46	127º 29.38	227	222
159	135	2009-08-21	14:24	71º 18.41	127º 29.76	224	220
160	135	2009-08-21	16:20	71º 18.60	127º 30.30	222	215
161	135	2009-08-21	18:23	71º 18.69	127º 29.68	227	222
162	135	2009-08-21	20:31	71º 18.81	127º 29.93	227	225
163	135	2009-08-21	22:51	71º 18.54	127º 29.88	225	225
164	235	2009-08-22	08:36	71º 45.87	130º 49.97	619	514
165	235	2009-08-22	10:41	71º 45.63	130º 45.79	567	522
166	235	2009-08-22	12:18	71º 45.77	130º 48.38	599	526
167	235	2009-08-22	14:15	71º 45.94	130º 48.13	598	520
168	235	2009-08-22	16:25	71º 45.76	130º 50.09	617	520
169	235	2009-08-22	18:27	71º 46.11	130º 53.93	666	530
170	235	2009-08-22	20:24	71º 46.02	130º 56.38	681	677
171	235	2009-08-22	22:31	71º 46.54	130º 51.29	637	627
172	235	2009-08-23	00:19	71º 46.63	130º 51.16	640	628
173	235	2009-08-23	02:26	71º 46.47	130º 50.24	626	613
174	235	2009-08-23	04:24	71º 45.98	130º 53.69	670	654
175	235	2009-08-23	06:20	71º 46.19	130º 56.80	686	680
176	235	2009-08-23	08:15	71º 46.48	130º 56.38	687	680
177	235	2009-08-23	10:23	71º 46.08	130º 51.07	626	618
178	235	2009-08-23	12:18	71º 46.08	130º 51.08	629	618
179	235	2009-08-23	14:15	71º 45.86	130º 51.17	634	621
180	235	2009-08-23	16:22	71º 45.61	130º 53.80	657	647
181	235	2009-08-23	18:29	71º 45.23	130º 54.04	650	643
182	235	2009-08-23	20:23	71º 45.29	130º 54.61	655	647
183	235	2009-08-23	22:21	71º 45.03	130º 54.30	652	500
184	235	2009-08-24	00:21	71º 44.55	130º 54.41	633	500
185	235	2009-08-24	02:20	71º 44.80	130º 50.42	611	495
186	235	2009-08-24	04:43	71º 43.65	130º 50.51	576	500
187	235	2009-08-24	06:32	71º 43.88	130º 52.13	597	495
188	235	2009-08-24	08:21	71º 43.93	130º 52.27	600	505
189	235	2009-08-24	10:40	71º 44.20	130º 45.05	547	514
190	235	2009-08-24	12:29	71º 43.08	130º 49.77	560	300
191	235	2009-08-24	14:36	71º 42.73	130º 47.87	593	300

APPENDIX 2B. Rosette cast locations, sampling time, water depth and corresponding stations or mooring numbers during ArcticNet expedition 0903 (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	S1	2009-08-30	00:09	69º 30.05	137º 59.79	60	54
002	S1	2009-08-30	05:34	69º 29.95	137º 59.70	59	54
003	S1	2009-08-30	07:08	69º 29.94	137º 59.48	58	56
004	S1	2009-08-30	09:06	69º 29.98	137º 58.97	56	54
005	S1.1	2009-08-30	10:40	69º 40.17	138º 09.17	126	120
006	S1.1	2009-08-30	11:57	69º 40.44	138º 09.72	128	123
007	S1.2	2009-08-30	13:25	69º 49.89	138º 19.63	189	181
008	S1.2	2009-08-30	14:35	69º 50.06	138º 20.62	191	100
009	S1.2	2009-08-30	15:42	69º 50.31	138º 21.15	191	10
010	S2	2009-08-30	17:05	70º 00.08	138º 30.31	258	247
011	S2	2009-08-30	20:23	70º 00.52	138º 30.40	260	252
012	S2	2009-08-31	00:13	69º 59.68	138º 29.53	256	248
013	S2	2009-08-31	06:54	70º 01.39	138º 32.94	271	261
014	L1	2009-08-31	20:22	71º 05.53	139º 00.54	1914	1874
015	L1	2009-09-01	02:18	71º 06.35	139º 01.53	1913	1879
016	L1	2009-09-01	15:26	71º 07.38	139º 11.90	1988	1949
017	L1	2009-09-01	21:03	71º 06.37	139º 18.25		2036
018	L1	2009-09-02	01:08	71º 07.60	139º 20.00		2046
019	L1	2009-09-02	09:19	71º 06.27	139º 20.62	2045	2043
020	L1	2009-09-02	13:04	71º 06.80	139º 20.96	2049	2045
021	L1	2009-09-02	17:25	71º 06.22	139º 17.84	2034	2028
022	L2	2009-09-04	00:08	74º 39.16	137º 22.95		3391
023	L2	2009-09-04	06:23	74º 38.67	137º 17.07	3000	989
024	L2	2009-09-04	14:18	74º 35.62	137º 07.34	3000	500
025	L2	2009-09-04	18:31	74º 34.87	137º 03.55	3000	1000
026	L2	2009-09-04	21:30	74º 34.17	136º 54.81		3296
027	L2	2009-09-05	03:35	74º 26.50	136º 28.11	3000	100
028	L2	2009-09-05	04:37	74º 25.96	136º 28.80	3000	39
029	L2	2009-09-05	05:36	74º 25.47	136º 29.59	3000	99
030	L2	2009-09-05	07:24	74º 25.06	136º 29.98	3000	59
031	L2	2009-09-05	08:49	74º 25.92	136º 30.03		3266
032	L3	2009-09-07	14:02	75º 19.54	137º 39.64		3457
033	L3	2009-09-07	21:26	75º 16.78	137º 33.85	3000	200
034	L3	2009-09-08	00:17	75º 16.89	137º 28.59		3501
035	L1.1	2009-09-09	01:00	72º 30.83	136º 35.91	2530	2534
036	L1.1	2009-09-09	10:22	72º 29.54	136º 43.60	2527	1000
037	L1.1	2009-09-09	14:29	72º 30.95	136º 47.40	2533	200
038	L1.1	2009-09-10	02:48	72º 32.21	136º 56.01	2551	2556
039	L1.1	2009-09-10	07:59	72º 32.59	136º 59.25	2554	600
040	L1.1	2009-09-10	09:15	72º 32.55	137º 03.23	2558	600
041	L1.1	2009-09-10	10:10	72º 32.92	137º 04.14	2560	10
042	L1.1	2009-09-10	10:56	72º 33.27	137º 05.60	2560	10
043	L1.1	2009-09-10	16:11	72º 35.27	137º 08.72	2590	2594
044	L1.1	2009-09-10	23:19	72º 37.37	137º 19.63	2626	100
045	L1.1	2009-09-10	23:52	72º 37.65	137º 19.98	2630	85
046	Mapping 1	2009-09-14	09:45	70º 49.03	136º 16.49	745	735
047	Mapping 2	2009-09-14	15:47	70º 50.15	136º 02.89	794	787
048	Mapping 3	2009-09-15	00:08	70º 34.95	135º 38.83	69	61
049	Mapping 4	2009-09-15	04:25	70º 48.77	136º 32.74	1000	971
050	Mapping 5	2009-09-15	15:46	70º 44.39	135º 26.83	269	262

APPENDIX 2B. Rosette cast locations, sampling time, water depth and corresponding stations or mooring numbers during ArcticNet expedition 0903 (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	USBL	2009-09-15	20:38	70º 44.56	136º 22.77	811	800
052	Mapping 6	2009-09-16	13:20	70º 46.55	136º 06.87	727	717
053	Mooring b	2009-09-16	17:31	70º 39.32	135º 36.59	122	113
054	Mapping 7	2009-09-17	04:30	70º 44.54	136º 21.84	765	742
055	Mapping 8	2009-09-17	21:45	70º 44.59	135º 52.01	559	546
056	Mapping 9	2009-09-20	03:06	70º 47.99	136º 06.05	744	736
057	Mapping 10	2009-09-21	11:38	70º 43.79	136º 16.97	612	609
058	Mapping 11	2009-09-22	02:03	70º 35.56	136º 01.88	190	182
059	Mapping 12	2009-09-22	13:10	70º 33.43	135º 57.46	66	64
060	Mapping 13	2009-09-23	03:02	70º 45.16	136º 38.98	1212	959
061	Mapping 14	2009-09-24	01:50	70º 47.60	135º 33.93	418	413
062	Mapping 15	2009-09-24	13:23	70º 35.64	136º 02.74	194	184
063	Mapping 16	2009-09-25	01:15	70º 38.95	135º 56.72	279	269
064	Mapping 17	2009-09-25	13:03	70º 38.80	136º 10.41	496	486
065	Mapping 18	2009-09-26	00:55	70º 41.27	136º 16.49	594	579
066	Mapping 19	2009-09-26	13:01	70º 44.77	136º 11.80	611	600
067	Mapping 20	2009-09-27	01:11	70º 40.55	136º 02.50	457	457
068	Mapping 21	2009-09-27	16:21	70º 35.41	135º 44.95	74	64
069	Mapping 22	2009-09-27	21:44	70º 40.55	136º 05.88	462	453
070	Mapping 23	2009-09-28	13:04	70º 47.95	136º 11.72	749	743
071	Mapping 24	2009-09-29	01:02	70º 45.46	135º 33.83	387	200
072	Mapping 25	2009-09-29	13:05	70º 33.26	136º 28.79	484	481
073	Mapping 26	2009-10-01	14:28	70º 45.03	136º 38.43	1212	983
074	Mooring A1	2009-10-01	16:24	70º 45.61	136º 00.60	668	661
075	Mooring C	2009-10-03	14:07	70º 35.14	136º 05.51	212	210
076	Mapping 27	2009-10-04	21:32	70º 47.98	136º 18.77	687	680

APPENDIX 2C. Rosette cast locations, sampling time, water depth and corresponding stations or mooring numbers during ArcticNet expedition 0904 (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	408	2009-10-09	15:39	71° 18.73	127° 34.86	213	197
002	408	2009-10-09	17:27	71° 24.66	127° 38.49	243	228
003	437	2009-10-12	05:04	71° 47.07	126° 29.21	318	308
004	437	2009-10-12	08:00	71° 47.72	126° 29.51	295	287
005	437	2009-10-12	15:32	71° 46.94	126° 29.09	323	314
006	437	2009-10-12	21:53	71° 47.05	126° 29.80	319	309
007	408	2009-10-13	10:07	71° 18.44	127° 35.18	201	194
008	408	2009-10-13	12:39	71° 18.96	127° 35.47	205	198
009	408	2009-10-13	19:16	71° 18.68	127° 34.68	205	200
010	408	2009-10-14	01:50	71° 19.32	127° 35.40	208	200
011	416	2009-10-14	05:51	71° 18.11	127° 44.22	167	159
012	415	2009-10-14	07:00	71° 21.67	127° 33.22	243	231
013	414	2009-10-14	07:48	71° 25.30	127° 21.68	306	295
014	413	2009-10-14	09:12	71° 29.68	127° 08.10	375	365
015	412	2009-10-14	10:11	71° 33.84	126° 55.50	418	408
016	411	2009-10-14	11:52	71° 37.77	126° 42.51	436	427
017	410	2009-10-14	12:57	71° 41.92	126° 29.38	408	399
018	437	2009-10-14	18:48	71° 45.24	126° 30.32	367	357
019	437	2009-10-14	21:10	71° 47.19	126° 29.12	311	303
020	437	2009-10-15	03:13	71° 45.44	126° 31.16	355	351
021	405	2009-10-15	11:32	70° 39.87	122° 59.88	560	555
022	405	2009-10-15	14:09	70° 39.85	122° 59.77	567	557
023	405	2009-10-15	17:07	70° 39.77	123° 00.25	585	571
024	405	2009-10-16	16:31	70° 39.81	123° 03.11	558	549
025	446	2009-10-17	07:27	71° 39.03	119° 41.43	142	133
026	450	2009-10-17	11:05	72° 05.57	119° 47.48	95	86
027	308	2009-10-19	23:17	74° 06.16	108° 49.72	587	536
028	308	2009-10-20	02:48	74° 06.16	108° 49.95	544	535
029	334	2009-10-22	17:00	74° 17.81	102° 44.94	225	217
030	304	2009-10-23	23:20	74° 18.73	091° 20.02	340	330
031	304	2009-10-24	01:56	74° 18.89	091° 22.95	332	324
032	330	2009-10-24	11:38	74° 08.38	087° 51.35	419	413
033	325	2009-10-25	03:40	74° 49.11	080° 29.89	684	672
035	323	2009-10-25	11:21	74° 09.70	080° 30.50	786	777
037	323	2009-10-25	21:30	74° 08.22	080° 38.96	801	793
038	323	2009-10-25	23:36	74° 06.98	080° 40.68	786	779
039	300	2009-10-26	02:08	74° 19.39	080° 31.13	703	688
040	322	2009-10-26	05:24	74° 29.65	080° 36.19	660	624
041	103	2009-10-27	00:44	76° 21.24	076° 32.23	155	149
042	103	2009-10-27	06:03	76° 20.63	076° 35.27	161	157
043	105	2009-10-27	19:05	76° 14.83	075° 50.58	353	343
044	105	2009-10-28	00:35	76° 17.96	075° 44.91	313	310
045	106	2009-10-28	02:37	76° 18.48	075° 21.26	380	375
046	107	2009-10-28	03:39	76° 16.86	074° 59.33	446	433
047	108	2009-10-28	05:03	76° 15.78	074° 36.10	447	441
048	109	2009-10-28	10:18	76° 17.23	074° 06.94	447	444
049	109	2009-10-28	13:14	76° 17.21	074° 08.14	448	438
050	110	2009-10-28	19:12	76° 17.72	073° 37.55	524	518

APPENDIX 2C. Rosette cast locations, sampling time, water depth and corresponding stations or mooring numbers during ArcticNet expedition 0904 (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	111	2009-10-28	21:14	76º 17.70	073º 12.63	559	548
052	111	2009-10-29	00:26	76º 17.31	073º 14.17	560	557
053	112	2009-10-29	03:44	76º 18.90	072º 42.35	560	552
054	113	2009-10-29	04:57	76º 19.34	072º 13.72	550	546
055	114	2009-10-29	06:40	76º 19.44	071º 46.78	614	604
056	115	2009-10-29	16:01	76º 19.92	071º 11.73	672	665
057	115	2009-10-29	19:04	76º 20.02	071º 11.74	654	648
058	115	2009-10-29	22:53	76º 19.99	071º 14.42	667	661
059	136	2009-10-30	16:29	74º 45.83	073º 26.59	808	808
060	136	2009-10-30	19:21	74º 45.46	073º 33.47	779	775
061	136	2009-10-30	23:19	74º 42.46	073º 24.34	804	799
062	141	2009-11-01	02:00	71º 27.92	070º 02.56	615	603
063	141	2009-11-01	14:28	71º 24.87	070º 15.35	680	672
064	141	2009-11-01	21:14	71º 23.66	070º 08.77	423	417
065	141	2009-11-02	13:43	71º 23.95	070º 09.30	475	466
066	352	2009-11-07	14:13	61º 15.87	064º 44.92		276
067	354	2009-11-07	16:37	61º 00.50	064º 44.27	497	485
068	600	2009-11-08	10:45	59º 05.21	063º 25.75	204	192
069	601	2009-11-08	14:39	59º 02.91	063º 36.21	166	157
070	602	2009-11-09	00:09	59º 03.15	063º 52.31	151	142
071	604	2009-11-09	03:56	58º 59.58	063º 53.70	62	53
072	612	2009-11-09	11:33	58º 28.16	062º 59.06	44	36
073	613	2009-11-09	13:16	58º 28.99	063º 13.19	239	232
074	613	2009-11-09	18:08	58º 29.08	063º 13.08	241	233
075	614	2009-11-09	21:43	58º 24.13	063º 23.40	100	91
076	615	2009-11-09	23:13	58º 19.38	063º 32.49	138	130
077	610	2009-11-10	07:21	58º 31.27	062º 50.41	127	119
078	617	2009-11-10	12:14	58º 30.00	062º 41.21	135	127
079	633	2009-11-11	04:57	57º 36.20	061º 53.49	165	160
080	632	2009-11-11	10:12	57º 34.01	062º 03.40	83	80
081	631	2009-11-11	19:42	57º 29.57	062º 11.64	91	83
082	630	2009-11-11	23:09	57º 28.34	062º 26.52	51	42
083	630	2009-11-12	02:10	57º 28.15	062º 26.38	51	43
084	634	2009-11-12	06:50	57º 34.12	061º 56.41	102	92
085	620	2009-11-12	20:44	56º 23.81	061º 12.98	96	87
086	621	2009-11-13	03:14	56º 24.92	061º 31.08	113	102
087	622	2009-11-13	04:10	56º 24.99	061º 43.92	85	77
088	623	2009-11-13	05:26	56º 26.84	061º 56.41	119	110
089	624	2009-11-13	06:29	56º 25.23	061º 04.36	71	55

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 0902		
Section	**Station**	**Cast**
Section 600	290	39
	280	40
	270	43
	260	44
	250	46
	240	47
	230	48
	220	49
Section 400	110	55
	120	59
	130	61
	140	62
	150	63
	160	64
	170	66
Section 700	390	70
	380	71
	370	74
	360	75
	350	77
	340	78
	330	79
	320	80
	310	81
Section 900	680	88
	670	89
	660	92
	650	94
	640	95
	630	96
	620	97
	610	98
Section 950	780	110
	770	109
	760	105
Stn 345	345	112 to 130
Section 850	570	131
	560	132
	550	133
	540	134
	530	137
Section 800	430	138
	440	141
	450	142
	460	145
	470	143
	480	144
Stn 135	135	149 to 163
Stn 235	235	164 to 191

Leg 0903		
Section	**Station**	**Cast**
Section 900	S1	1
	S1.1	5
	S1.2	7
	S2	10
Stn L1	L1	14 to 21

Leg 0904		
Section	**Station**	**Cast**
Section 400	416	11
	415	12
	414	13
	413	14
	412	15
	411	16
	410	17
	437	18
Eastern North-West Passage	308	27
	334	29
	304	30
	330	32
	323	35
Lancaster	325	33
	323	35
	300	39
	322	40
Northern Baffin Bay Section 5	103	41
	105	44
	106	45
	107	46
	108	47
	109	48
	110	50
	111	51
	112	53
	113	54
	114	55
	115	58
Nachvak fjord	600	68
	601	69
	602	70
	604	71
Saglek fjord	615	76
	614	75
	613	73
	612	72
	610	77
	617	78
Okak fjord	633	79
	634	84
	632	80
	631	81
	630	83
Anaktalak fjord	620	85
	621	86
	622	87
	624	89

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

Transects of 0903	# of Casts	first and last cast	Date	Time	Latitude	Longitude	Bottom (m)	Cast depth (m)
Beaufort Sea 100 m talus	48	22	September 29th, 2009	02:56	70,675	-135,44	79	51,6
		76	September 29th, 2009	05:02	70,433	-136,67	89	60,4
Beaufort Sea 100 m talus	23	84	October 6th, 2009	03:00	70,568	-135,98	95,4	51,3
		107	October 6th, 2009	03:47	70,511	-136,26	71,8	55,7

Transects of 0904	# of Casts	first and last cast	Date	Time	Latitude	Longitude	Bottom (m)	Cast depth (m)
Section 100	42	1	October 16th, 2009	04:10	71,355	-127,29	289,3	72,1
		50	October 16th, 2009	09:13	70,945	-124,38	500,1	224,4

APPENDIX 5. Sections of salinity and potential temperature from Expedition 0902 (Leg 2). 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 sections during Expedition 0902

Rosette-CTD sections

5.1 Section 600

5.2 Section 400 (previously sampled in 2003-04-05-06)

5.3 Section 700 (previously sampled in 2002-03-04-06-07)

5.4 Section 900 (previously sampled in 2004)

5.5 Section 950

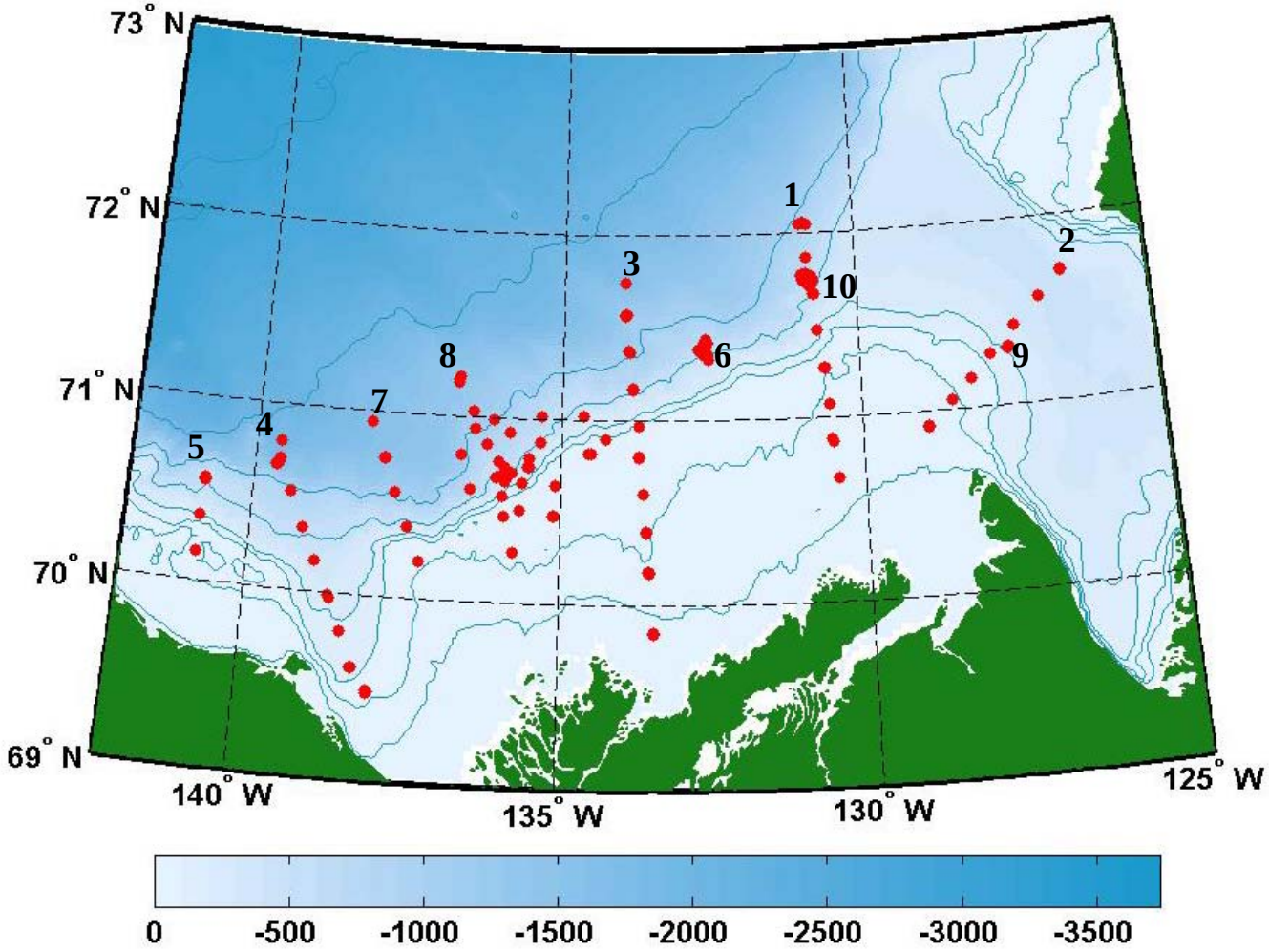
5.6 Station 345 (parameters evolution over 36 hours)

5.7 Section 850

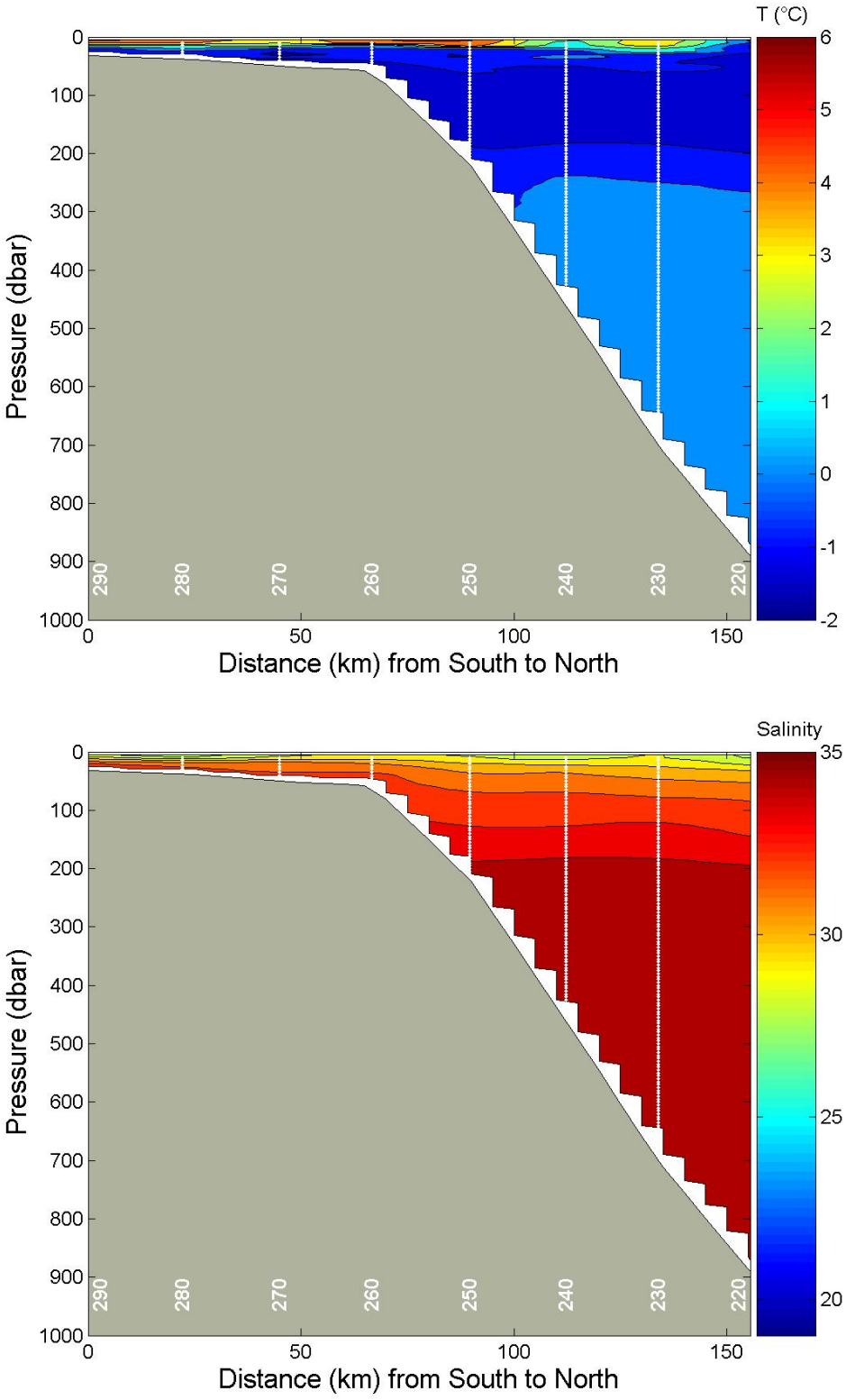
5.8 Section 800

5.9 Station 135 (parameters evolution over 28 hours)

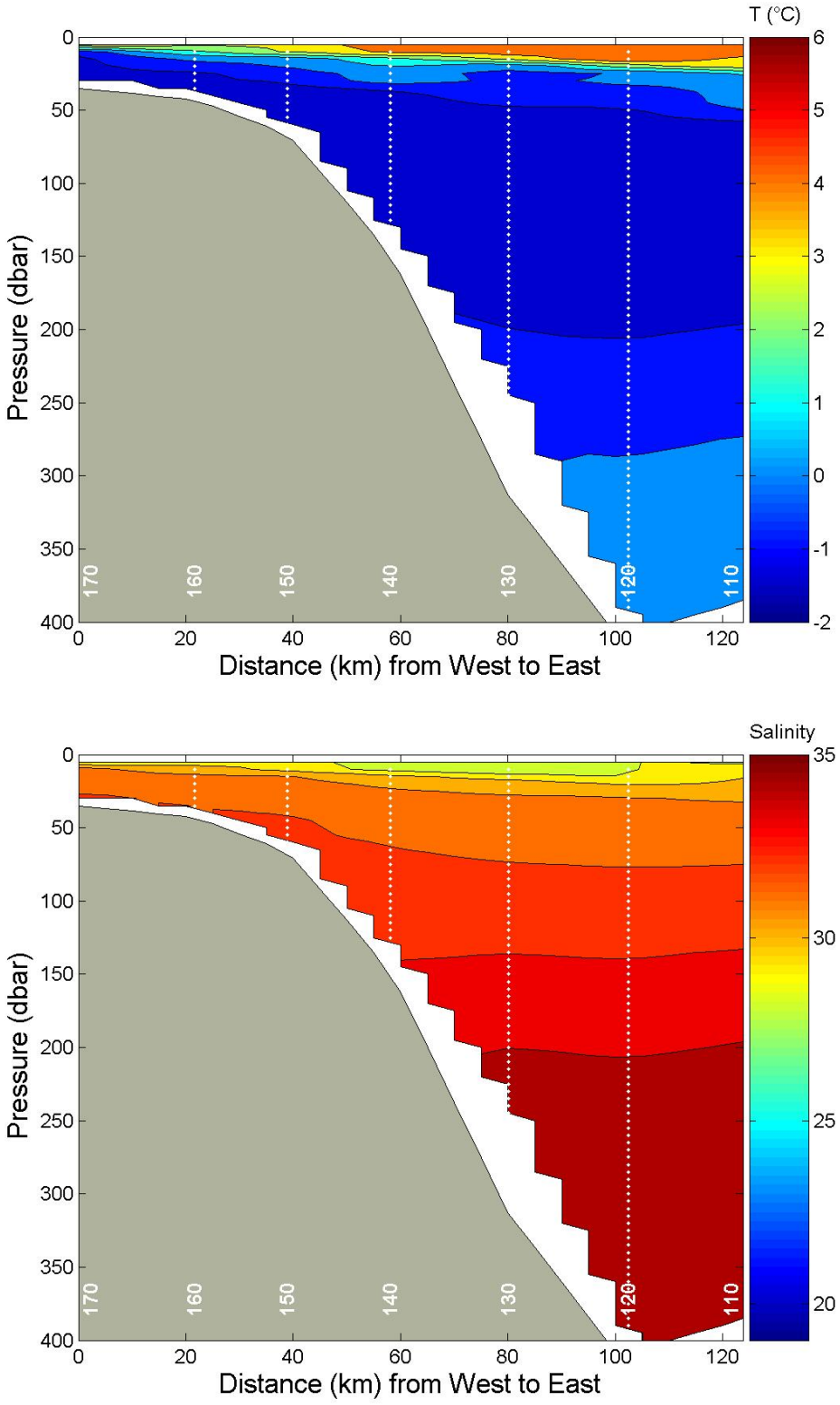
5.10 Station 235 (parameters evolution over 54 hours)



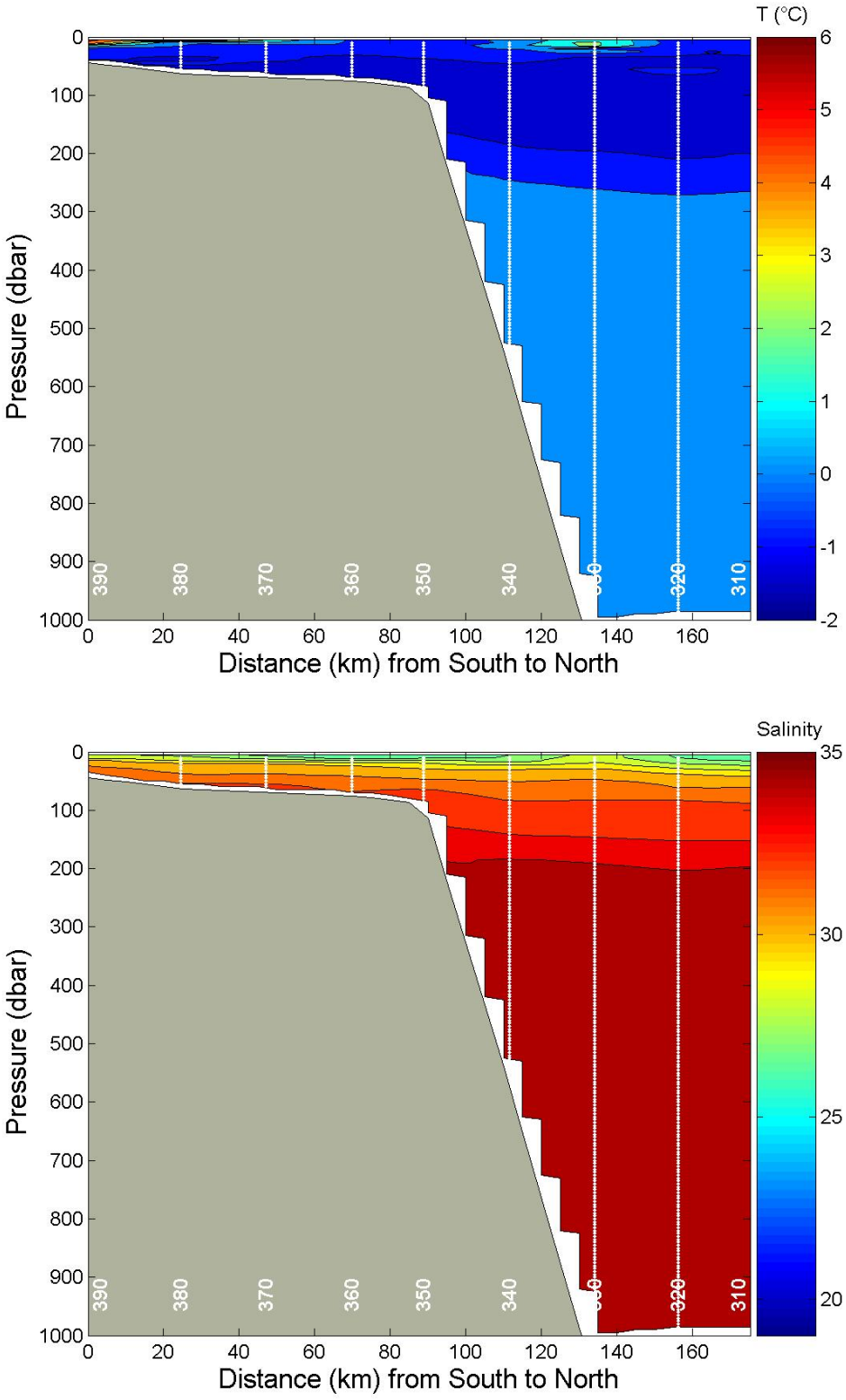
APPENDIX 5. Location of CTD (red) sampling sites during Expedition 0902 (Leg 2). The numbers identify the sections presented as salinity and temperature contour plots on the next pages.



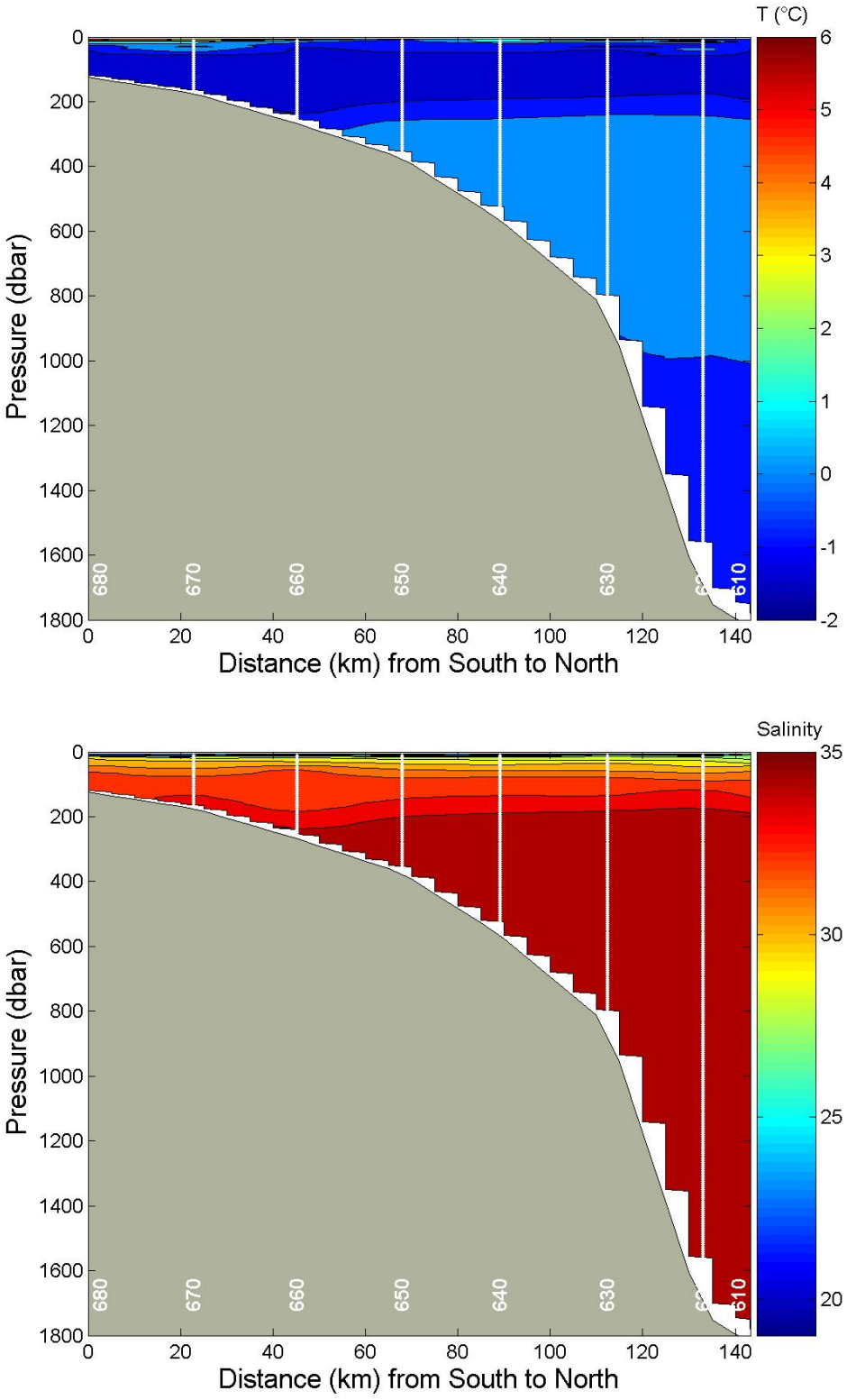
APPENDIX 5.1. Potential temperature and salinity along section 600. The southern sites are on the left and the northern sites are on the right.



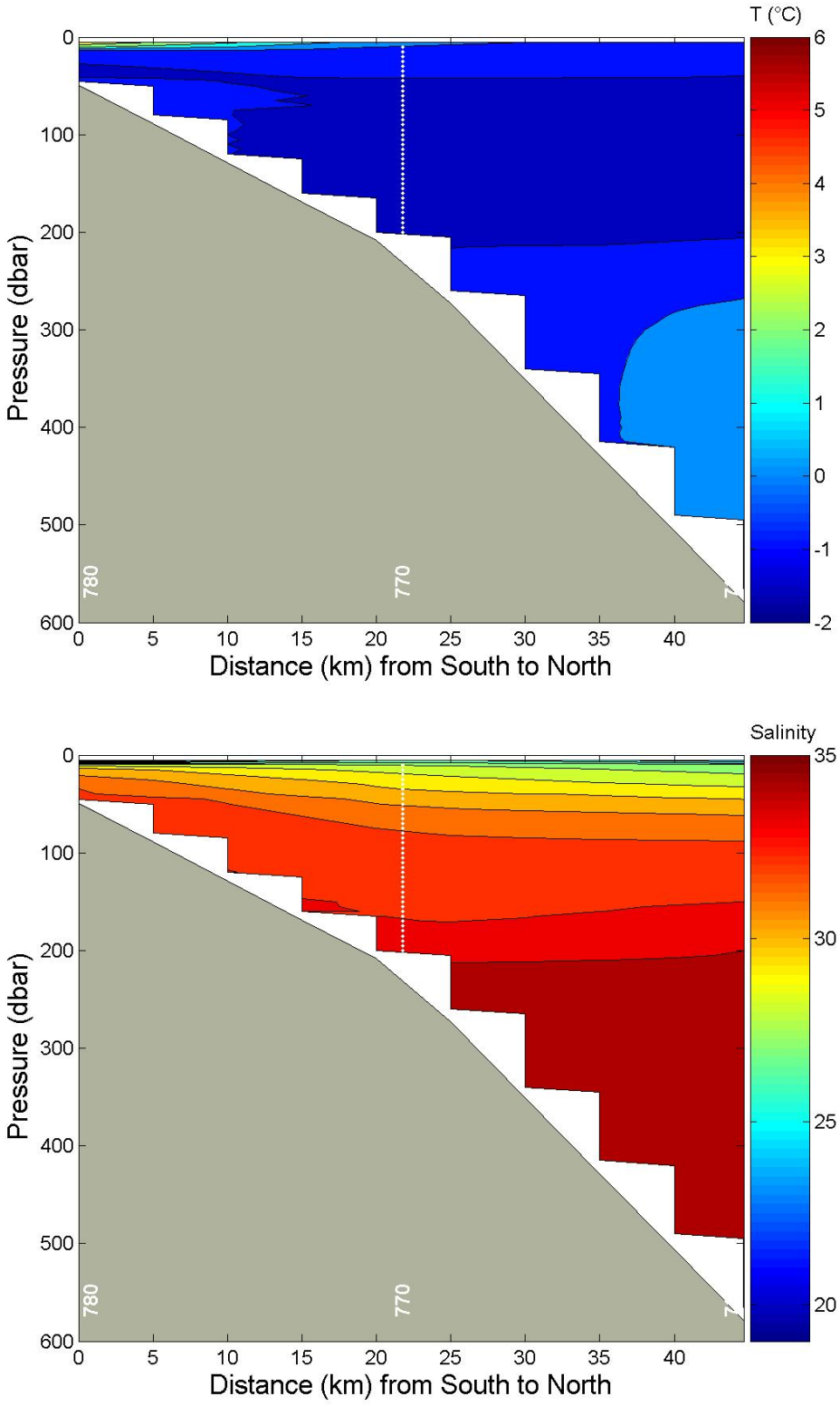
APPENDIX 5.2. Potential temperature and salinity along section 400. The western sites are on the left and the eastern sites are on the right.



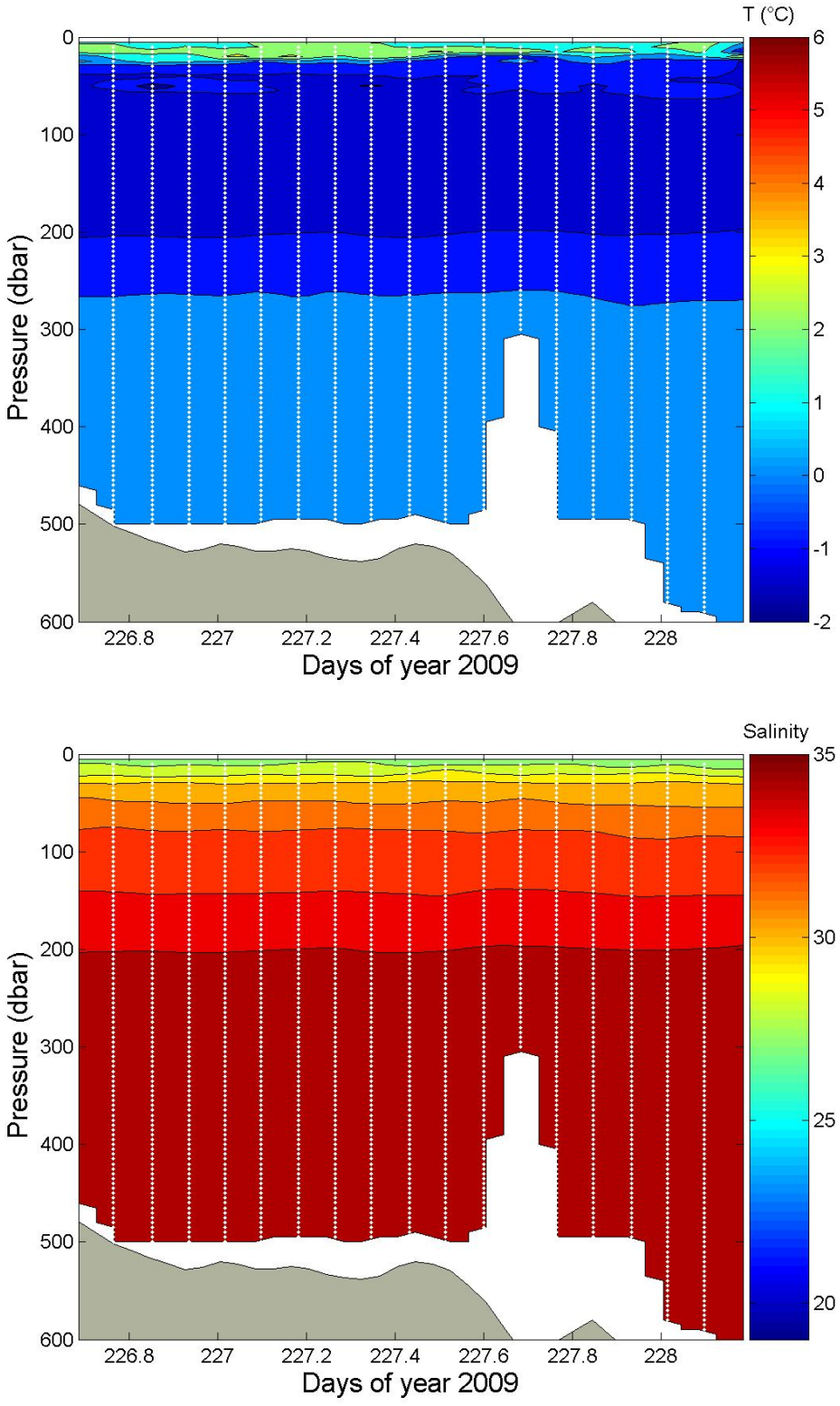
APPENDIX 5.3. Potential temperature and salinity along section 700. The southern sites are on the left and the northern sites are on the right.



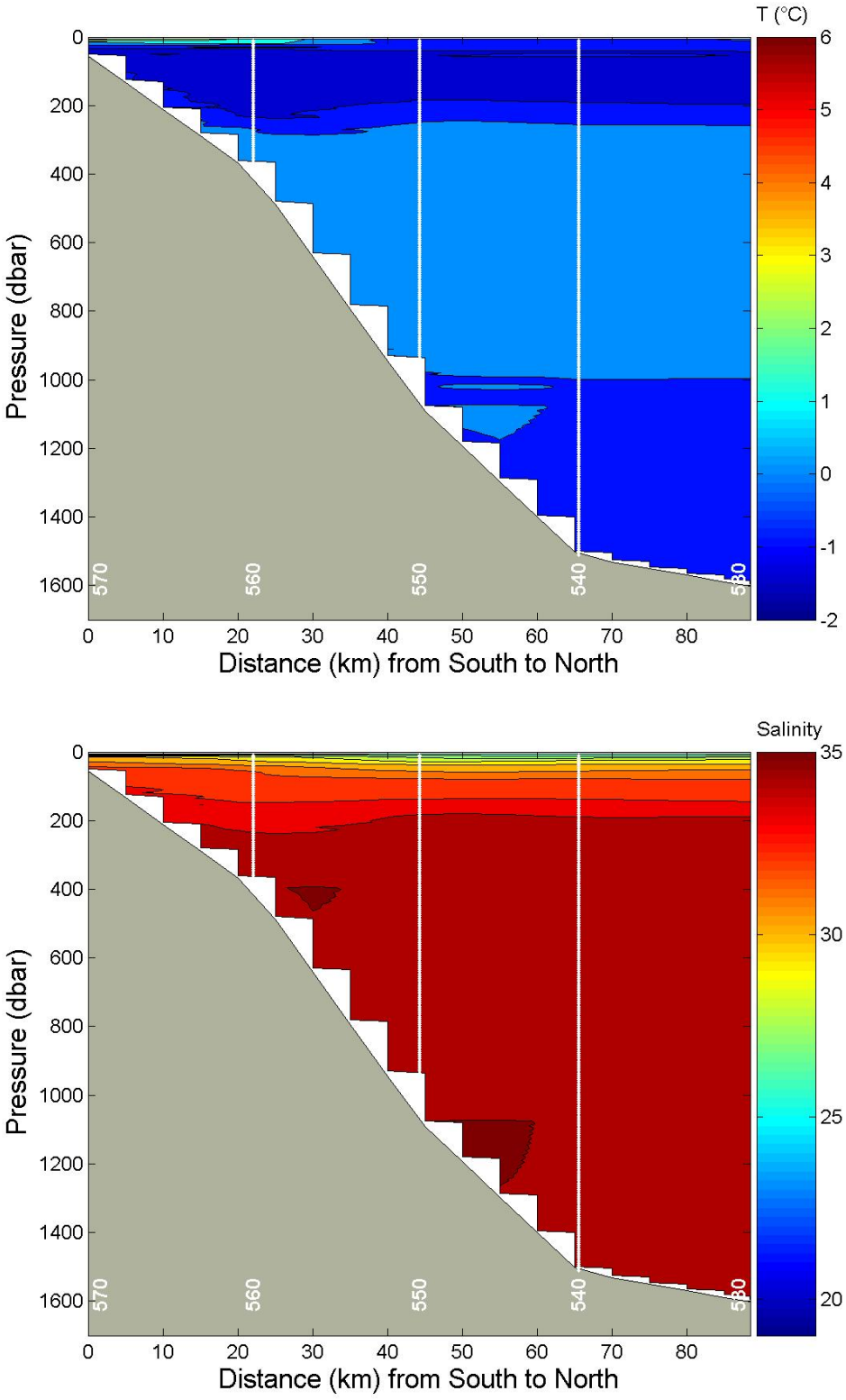
APPENDIX 5.4. Potential temperature and salinity along section 900. The southern sites are on the left and the northern sites are on the right.



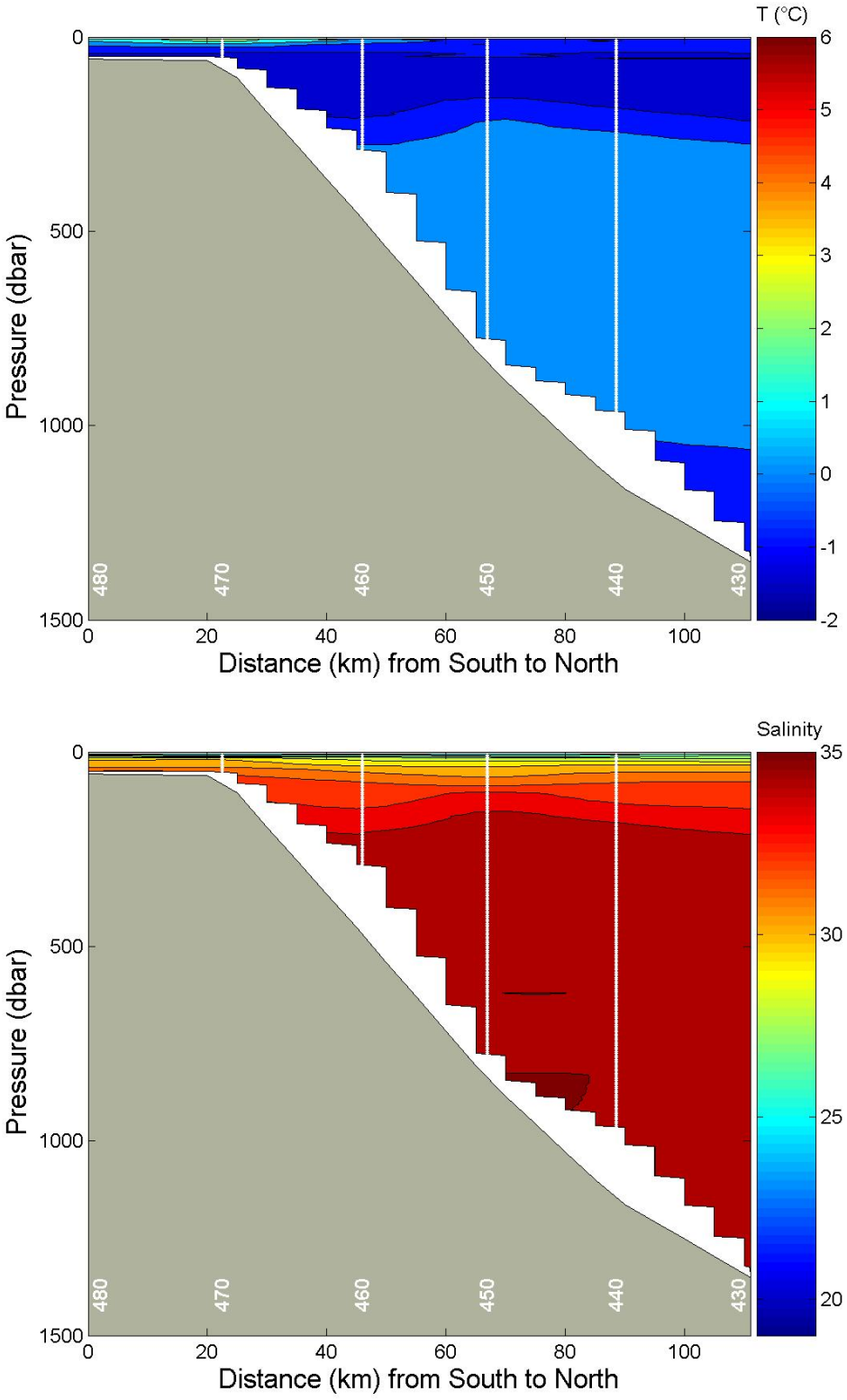
APPENDIX 5.5. Potential temperature and salinity along section 950. The southern sites are on the left and the northern sites are on the right.



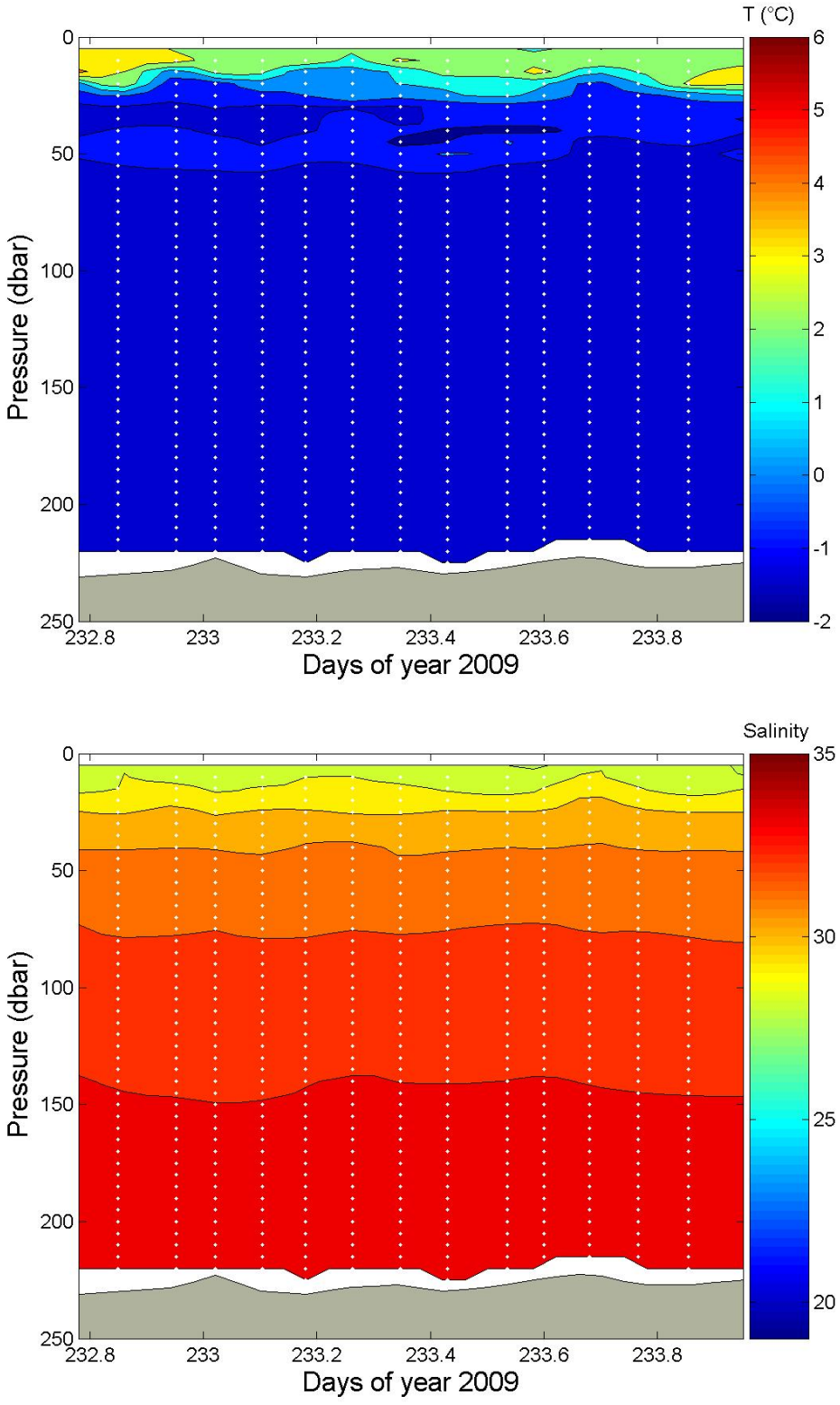
APPENDIX 5.6. Potential temperature and salinity at station 345.



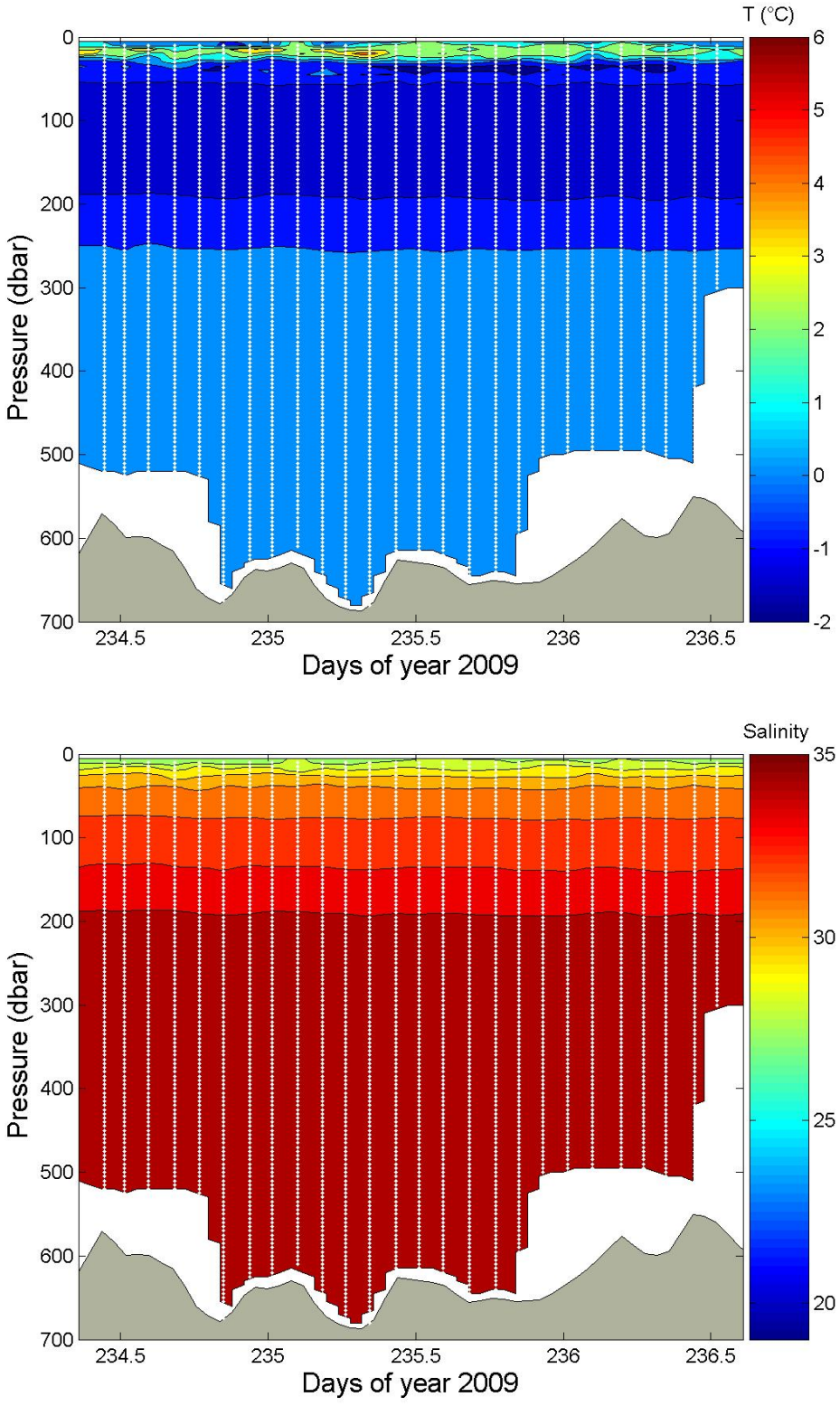
APPENDIX 5.7. Potential temperature and salinity along section 850. The southern sites are on the left and the northern sites are on the right.



APPENDIX 5.8. Potential temperature and salinity along section 800. The southern sites are on the left and the northern sites are on the right.



APPENDIX 5.9. Potential temperature and salinity at station 135.



APPENDIX 5.10. Potential temperature and salinity at station 235.

APPENDIX 6. Sections of salinity and potential temperature from Expedition 0903 (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 0903

Rosette-CTD sections

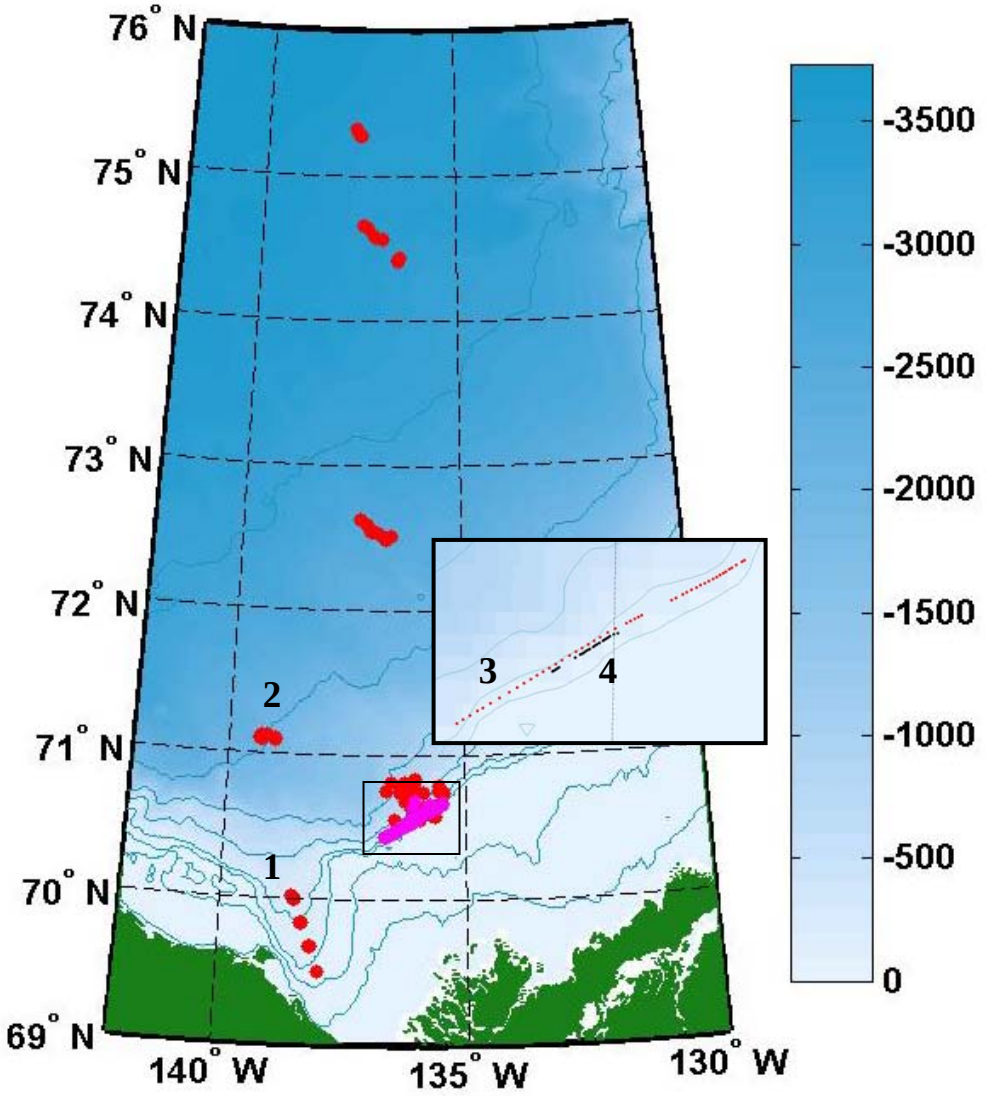
6.1. Section 900

6.2. Station L1 (parameters evolution over 45 hours)

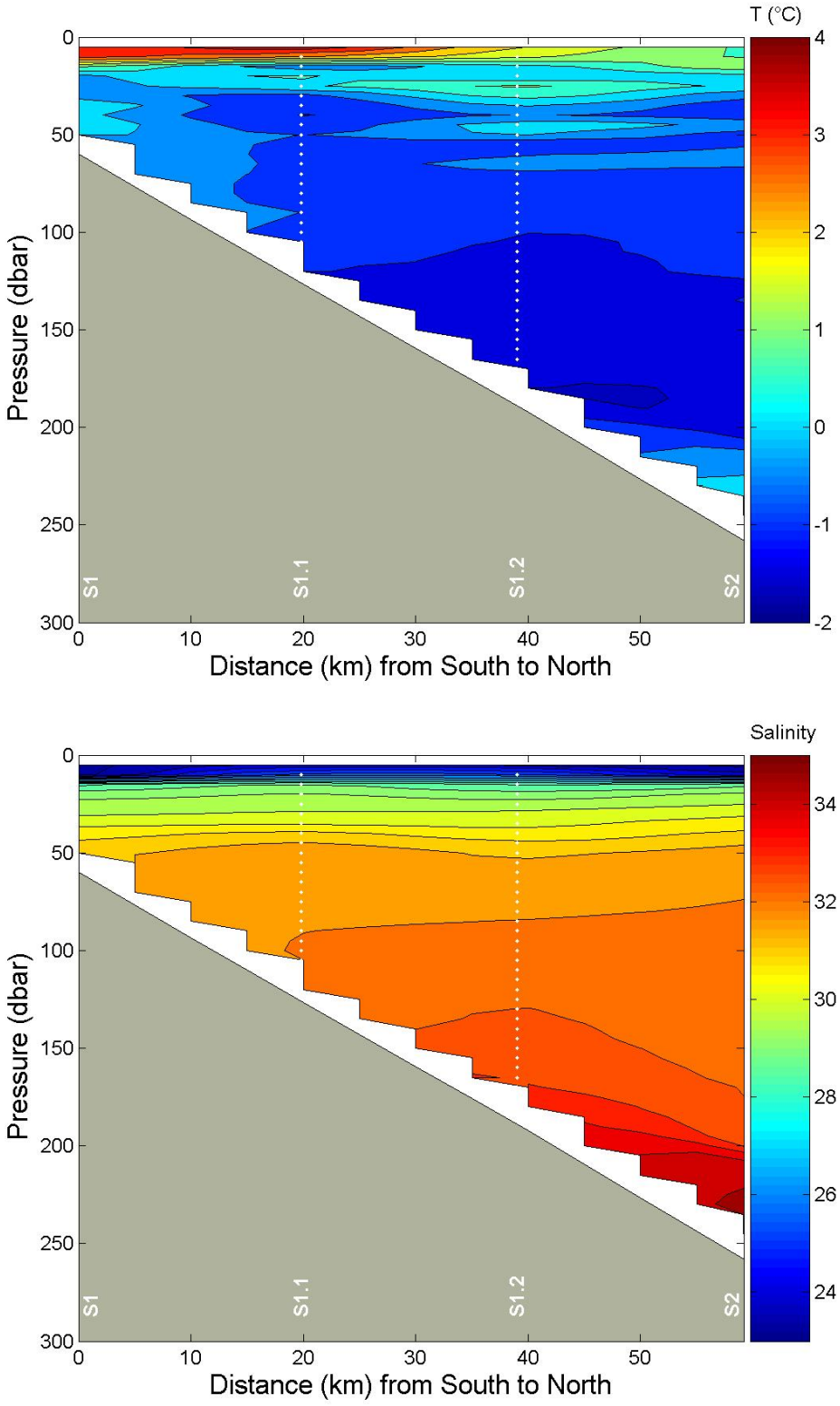
MVP sections

6.3. Section Beaufort Iso100m

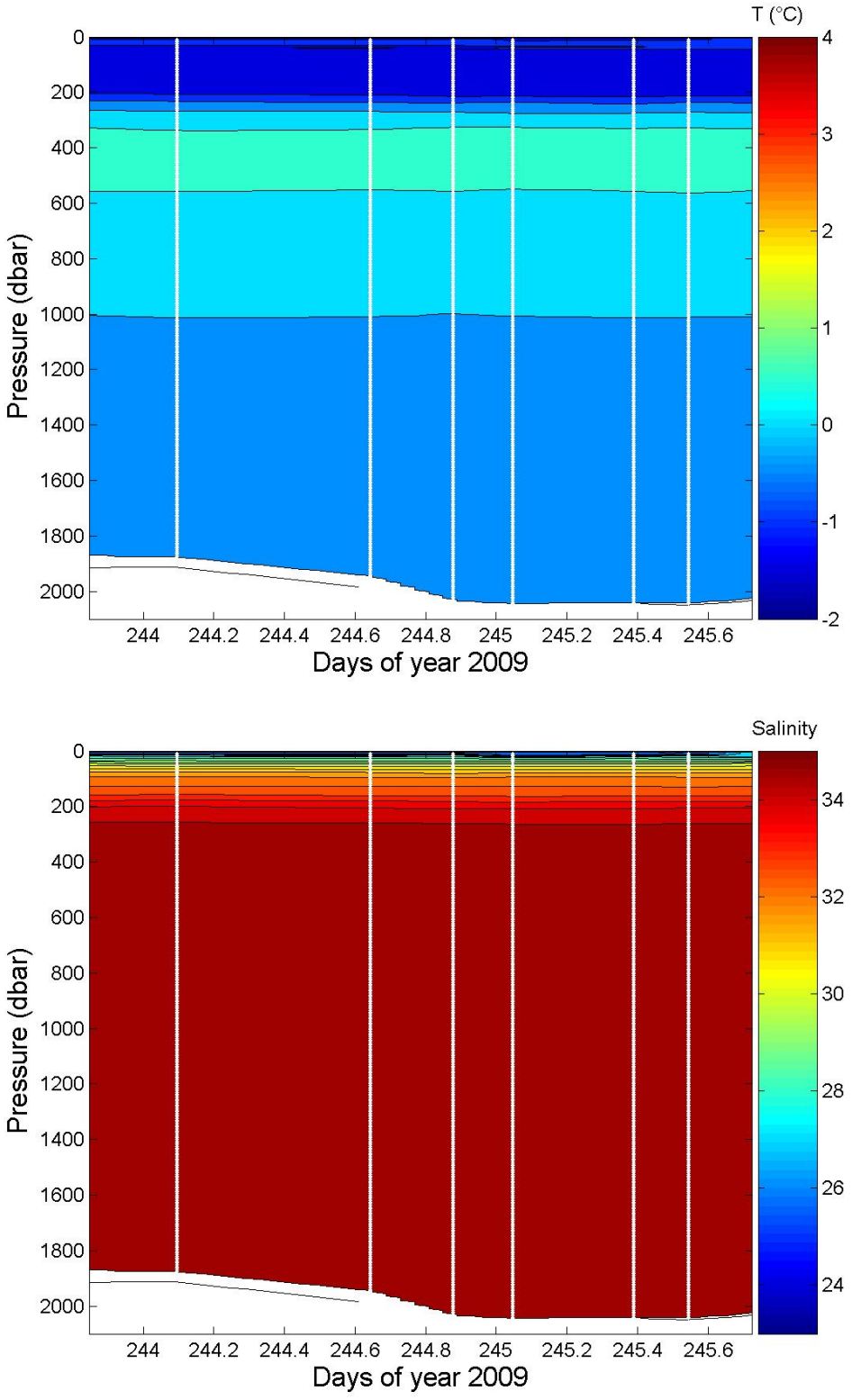
6.4. Section Beaufort Iso100m(2)



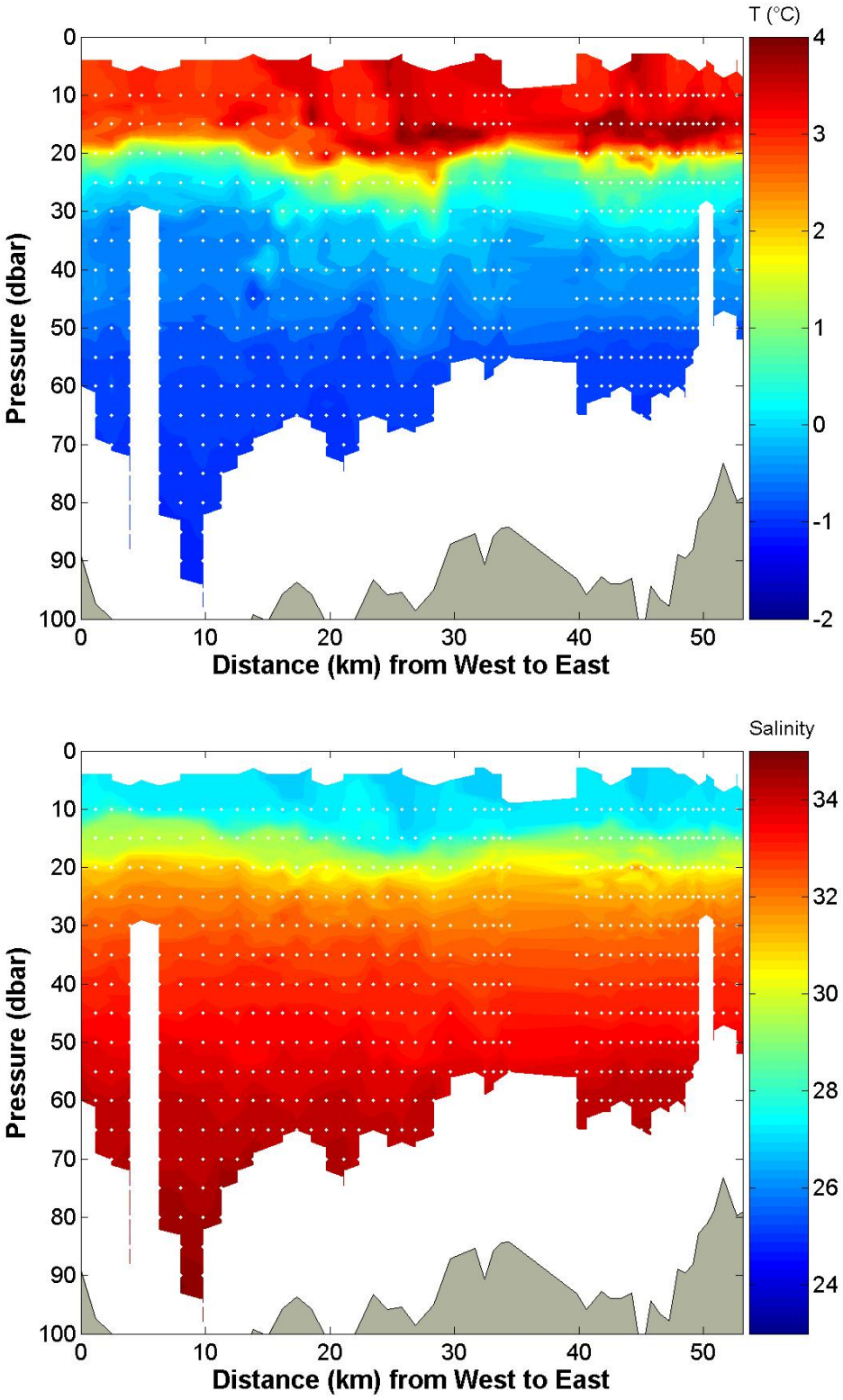
APPENDIX 6. Location of CTD (red) and MVP (purple) sampling sites during Expedition 0903 (Leg 3). The numbers identify the sections presented as salinity and temperature contour plots on the next pages.



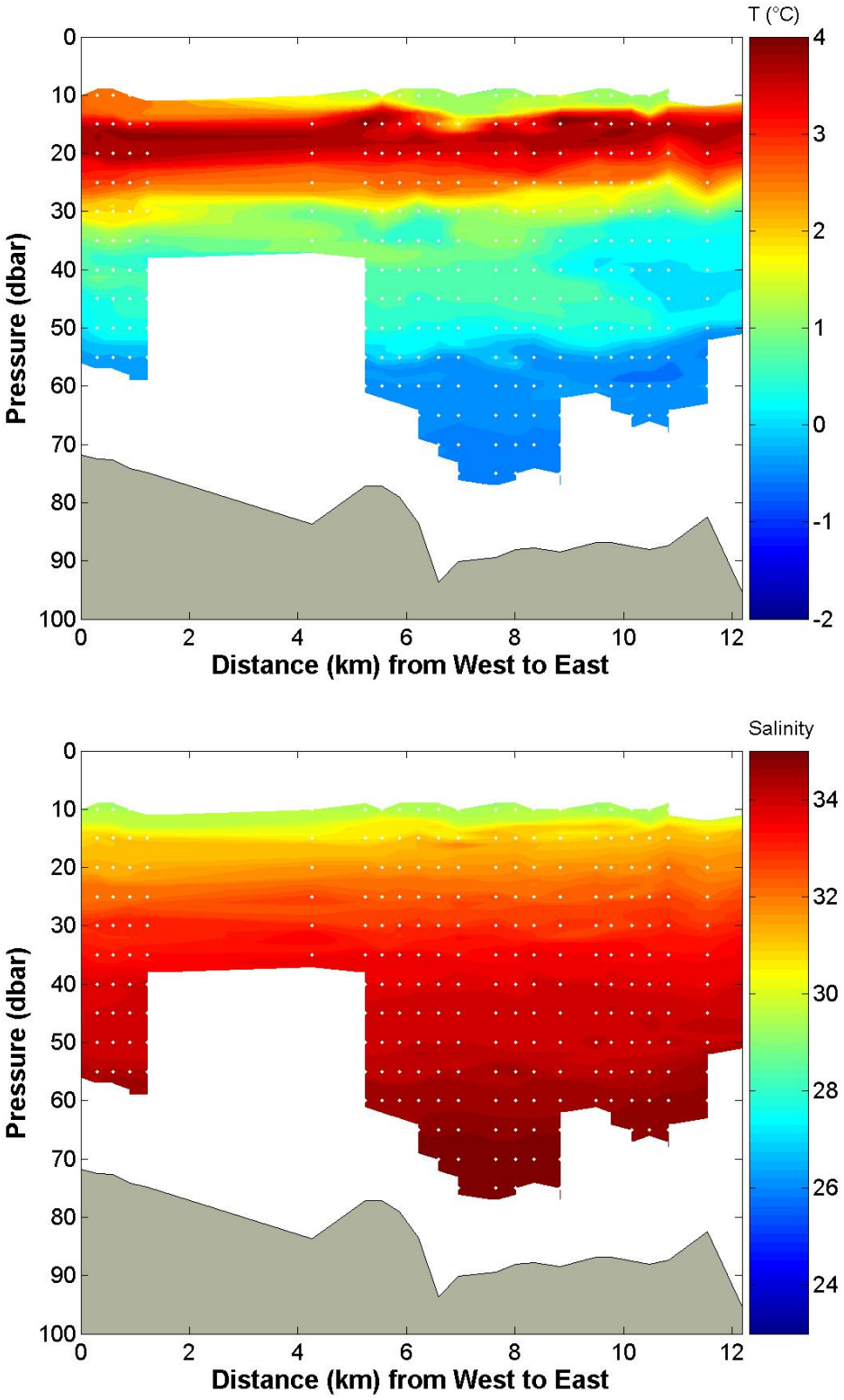
APPENDIX 6.1. Potential temperature and salinity along section 900. The southern sites are on the left and the northern sites are on the right.



APPENDIX 6.2. Potential temperature and salinity at station L1.



APPENDIX 6.3. Potential temperature and salinity along section Beaufort Iso100m. The western sites are on the left and the eastern sites are on the right.



APPENDIX 6.4. Potential temperature and salinity along section Beaufort Iso100m(2). The western sites are on the left and the eastern sites are on the right.

APPENDIX 7. Sections of salinity and potential temperature from Expedition 0904 (Leg 4). It included 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 0904

Rosette-CTD sections

7.1 Section 400 (previously sampled in 2003-04-05-06)

7.2 Section across eastern Northwest Passage (previously sampled in 2006-07-08-09)

7.3 Section across Lancaster mouth

7.4 Section 5 in Northern Baffin Bay (previously sampled in 1997-98-99-2005-06-07-08)

7.5 Section in Nachvak fjord (previously sampled in 2006-07)

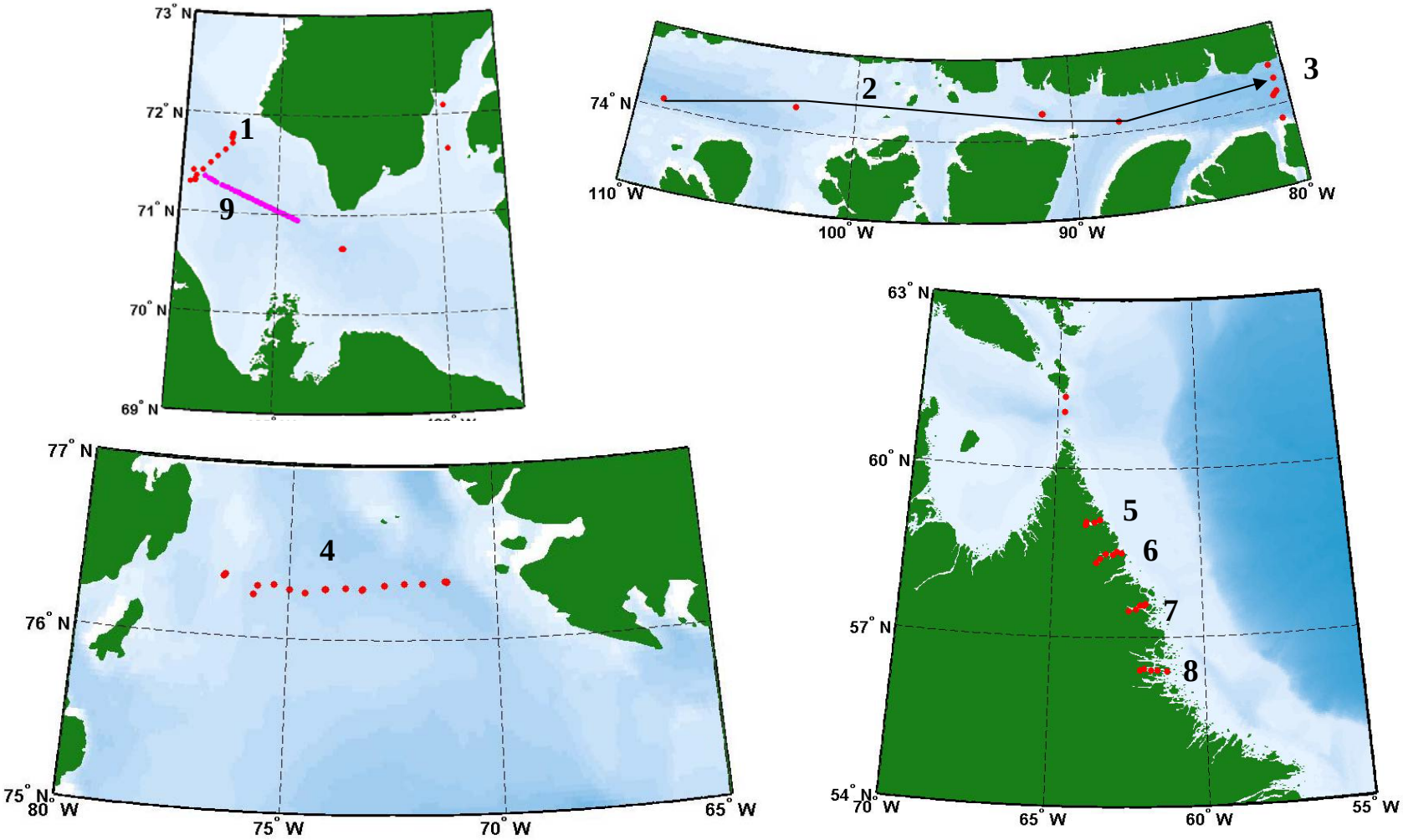
7.6 Section in Saglek fjord (previously sampled in 2006-07)

7.7 Section in Okak fjord

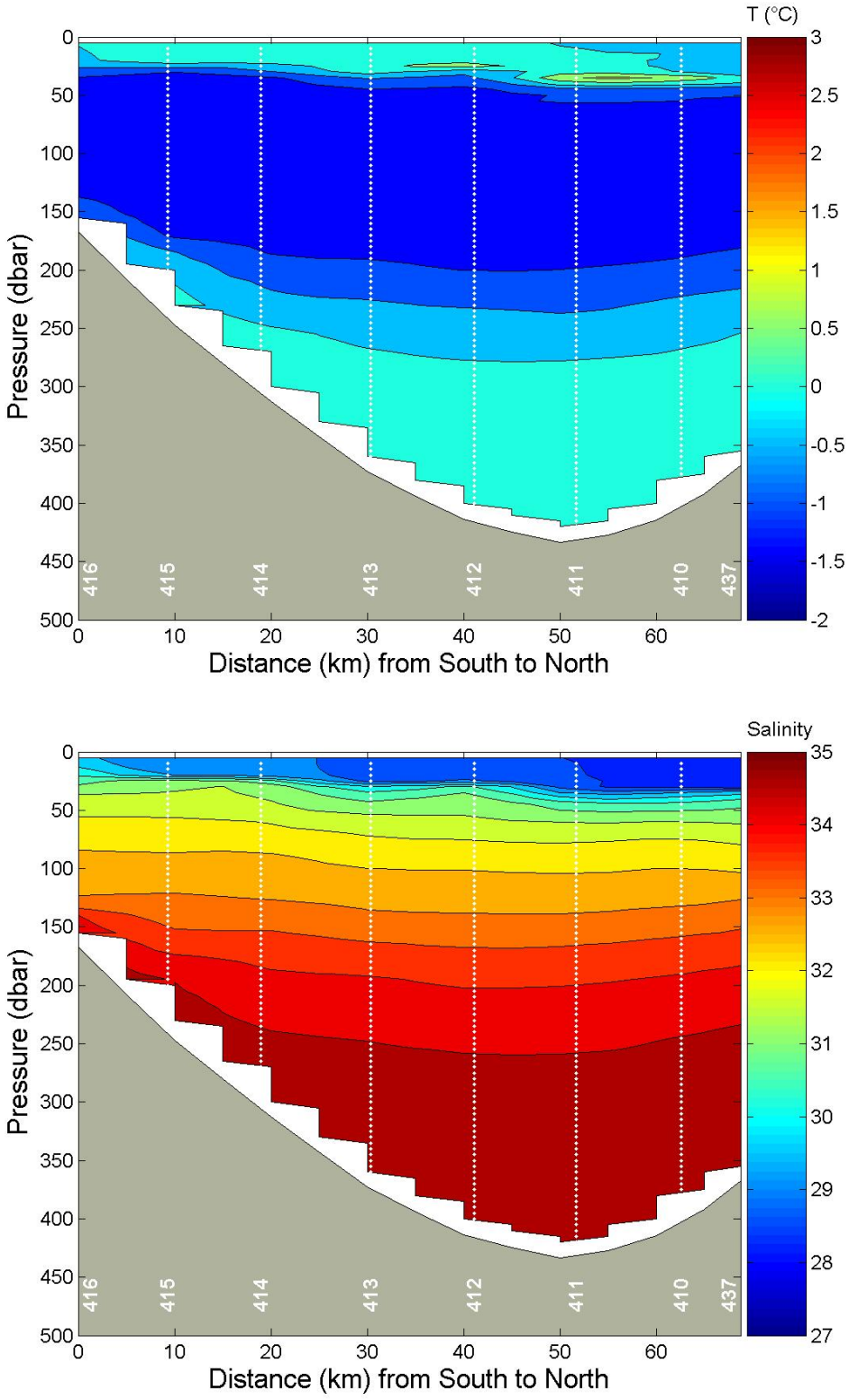
7.8 Section Anaktalak fjord (previously sampled in 2006-07)

MVP sections

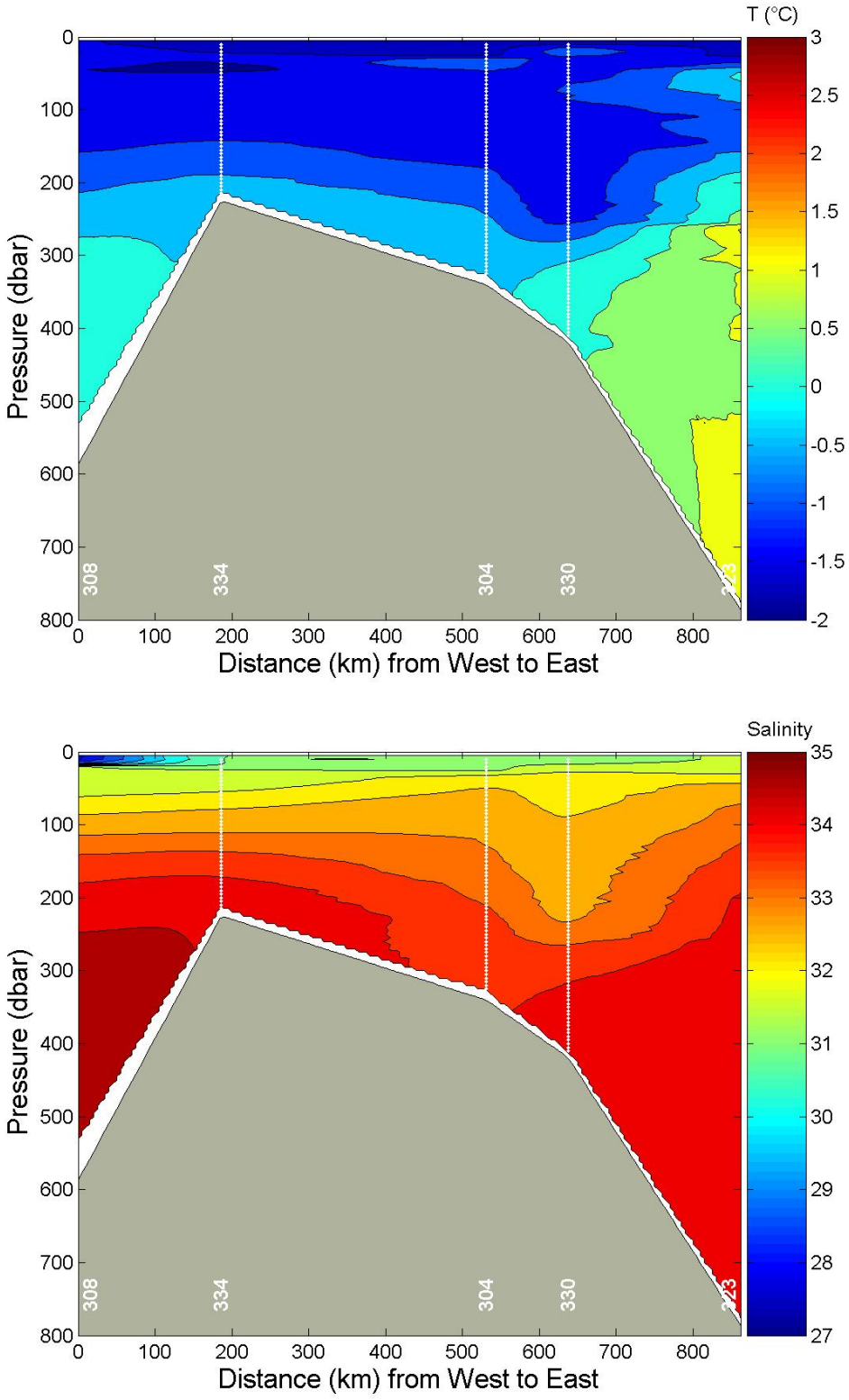
7.9 Section 100 (previously sampled in 2002-03-04)



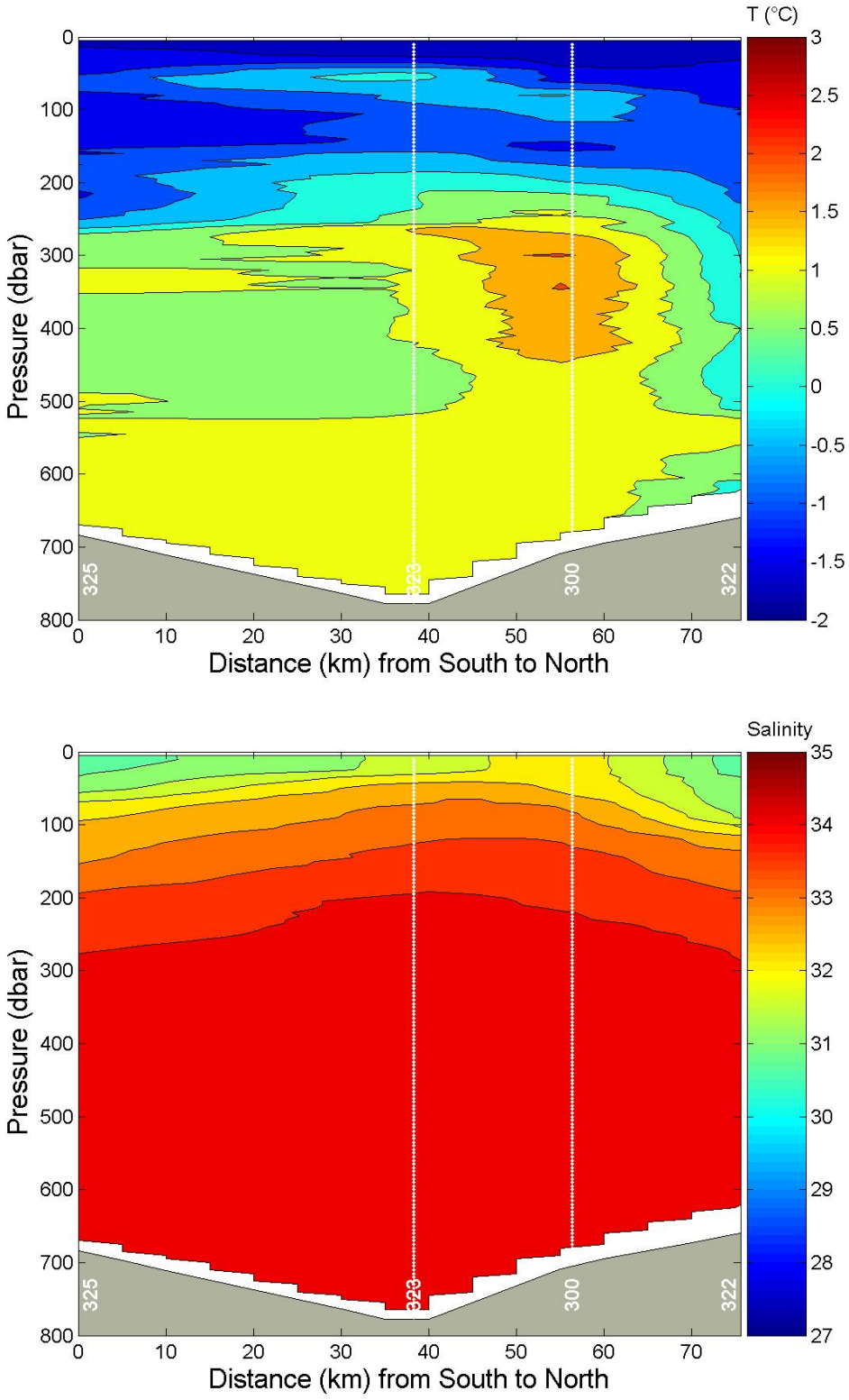
APPENDIX 7. Location of CTD (red) and MVP (purple) sampling sites during Expedition 0904 (Leg 4). The numbers identify the sections presented as salinity and temperature contour plots on the next pages.



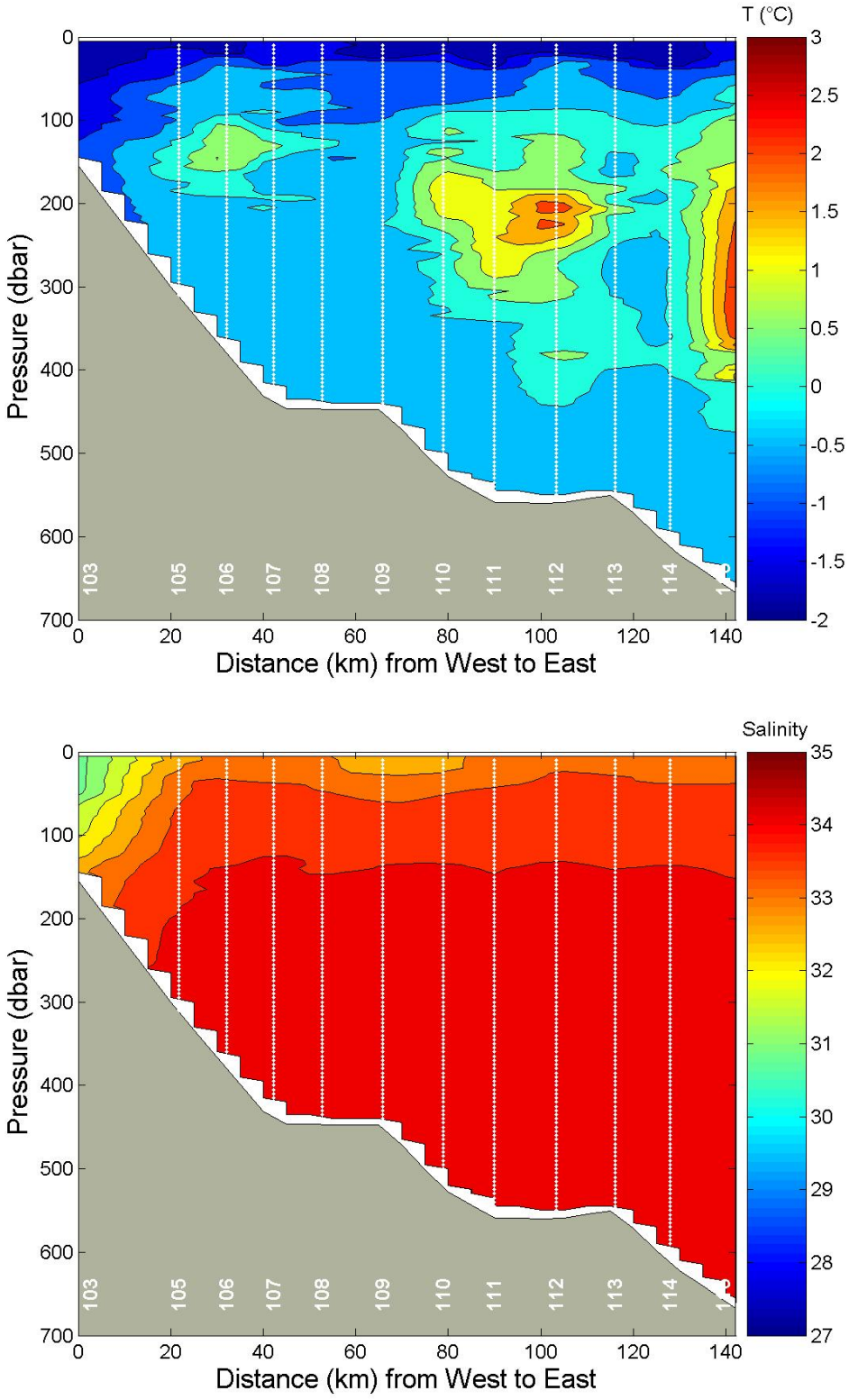
APPENDIX 7.1. Potential temperature and salinity along section 400. The southern sites are on the left and the northern sites are on the right.



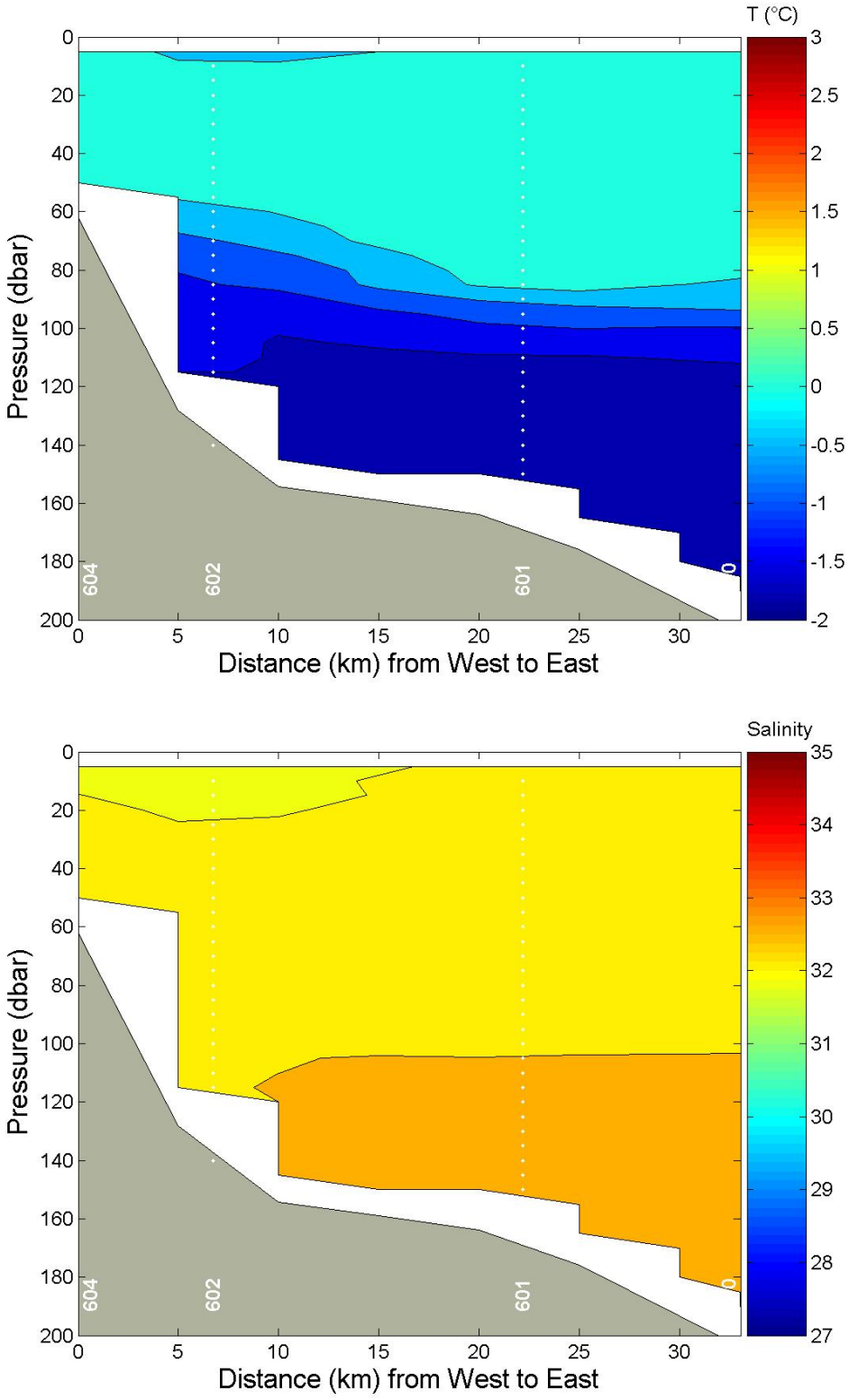
APPENDIX 7.2. Potential temperature and salinity along section across eastern Northwest Passage. The western sites are on the left and the eastern sites are on the right.



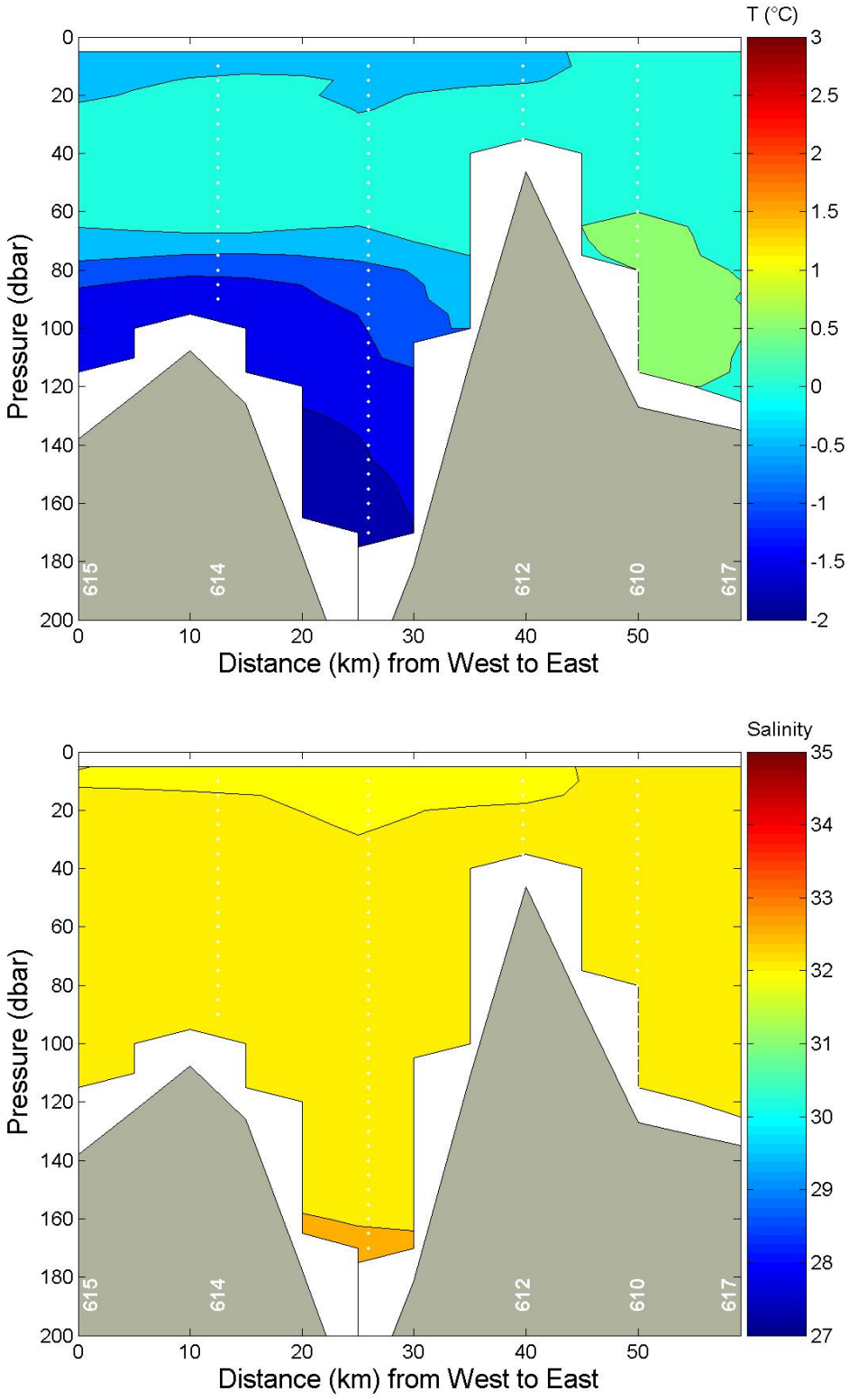
APPENDIX 7.3. Potential temperature and salinity along the section across the mouth of Lancaster Sound. The southern sites are on the left and the northern sites are on the right.



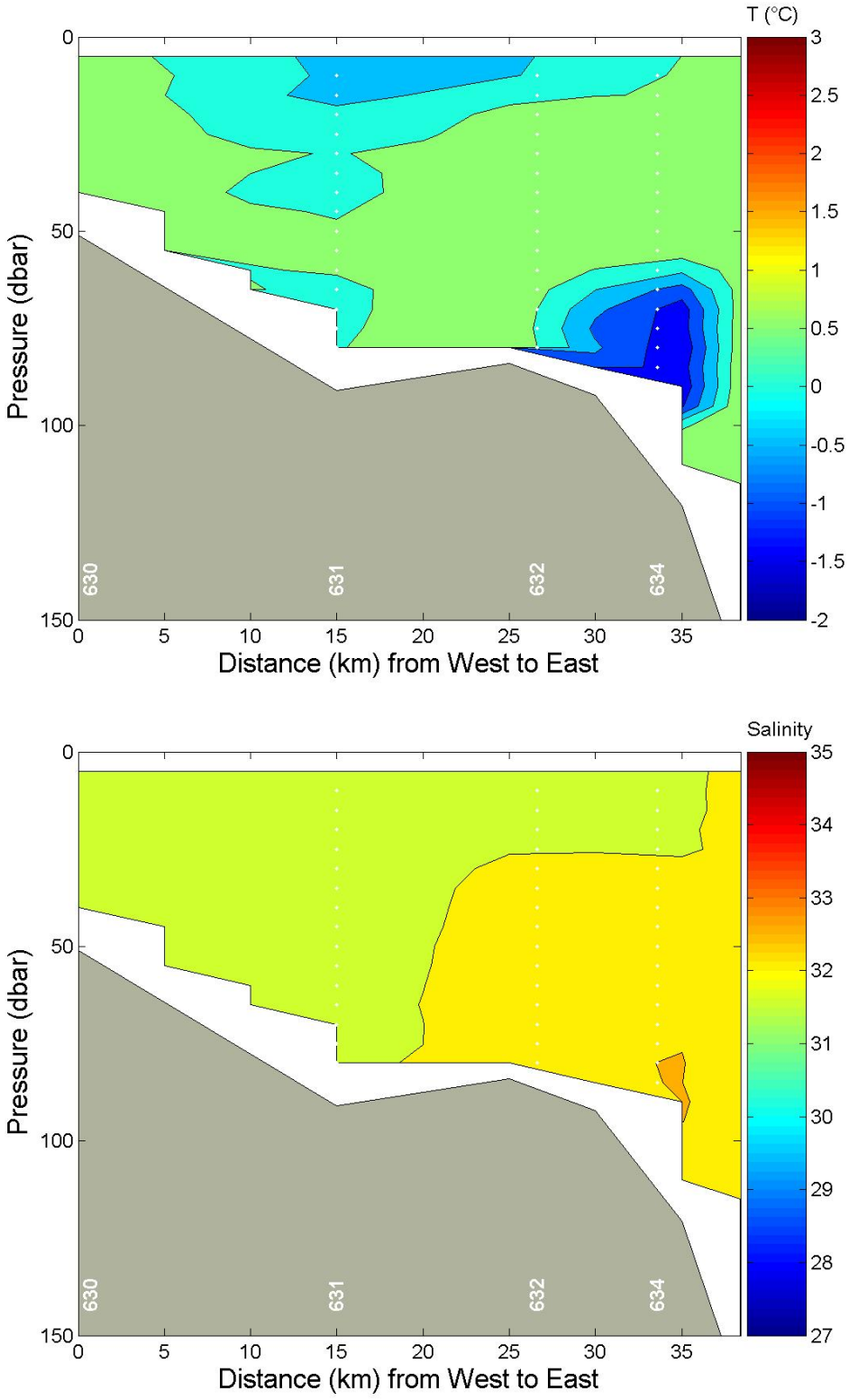
APPENDIX 7.4. Potential temperature and salinity along section 5 in Northern Baffin Bay. The western sites are on the left and the eastern sites are on the right.



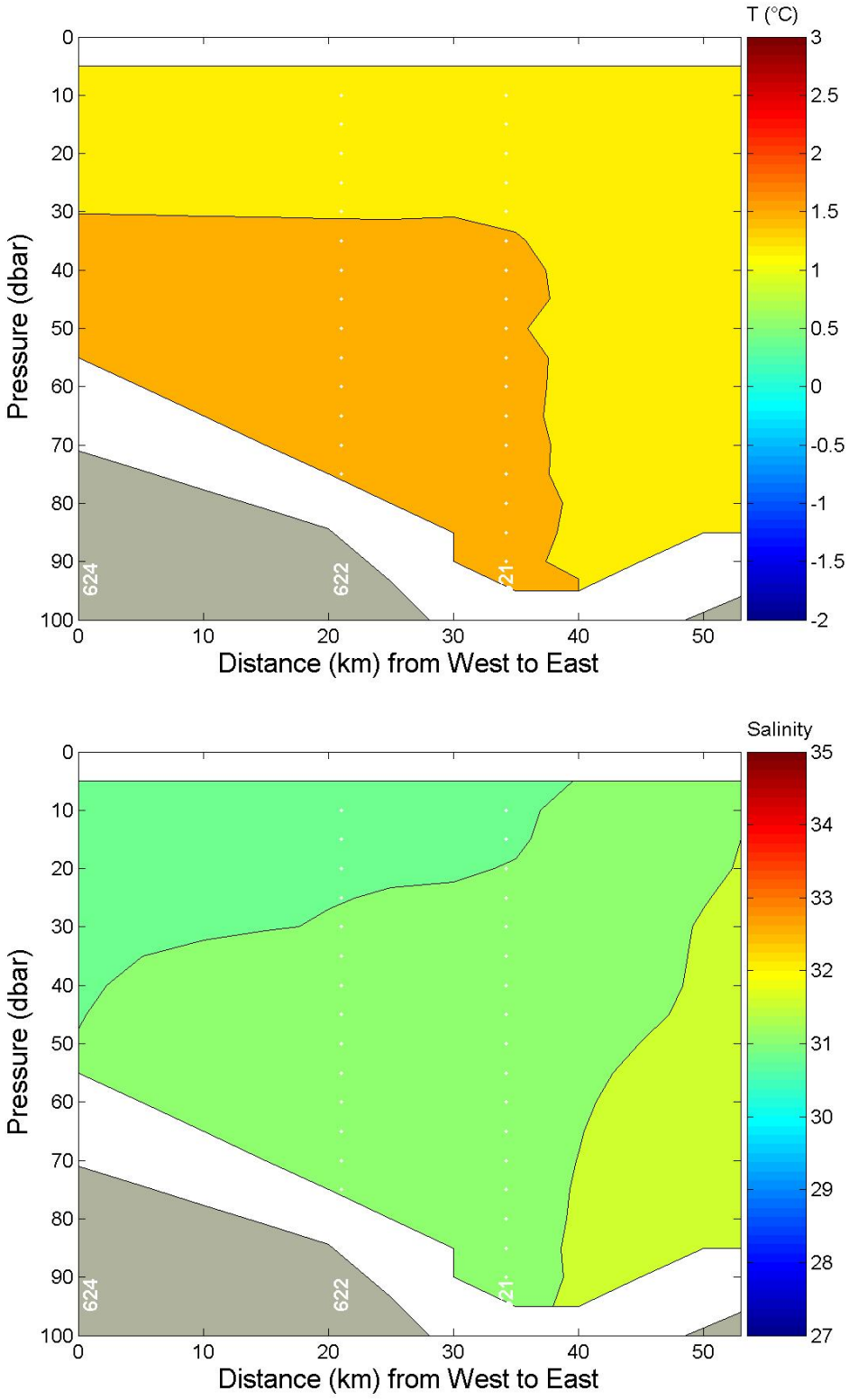
APPENDIX 7.5. Potential temperature and salinity along the section in the Nachvak fjord. The western sites are on the left and the eastern sites are on the right.



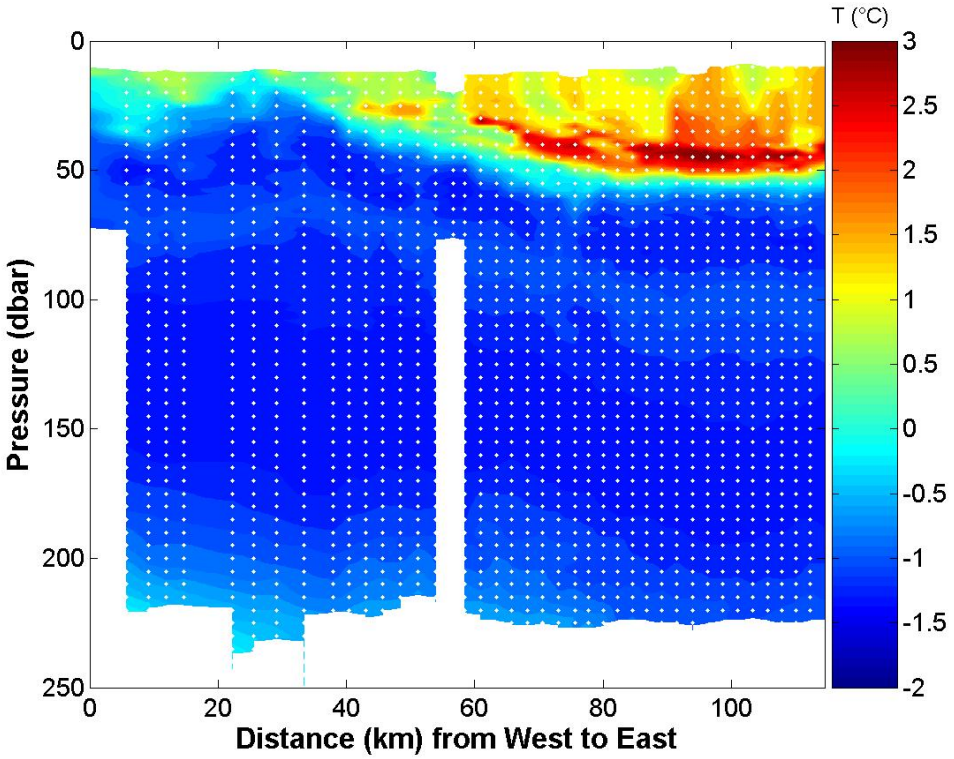
APPENDIX 7.6. Potential temperature and salinity along the section in the Saglek fjord. The western sites are on the left and the eastern sites are on the right.

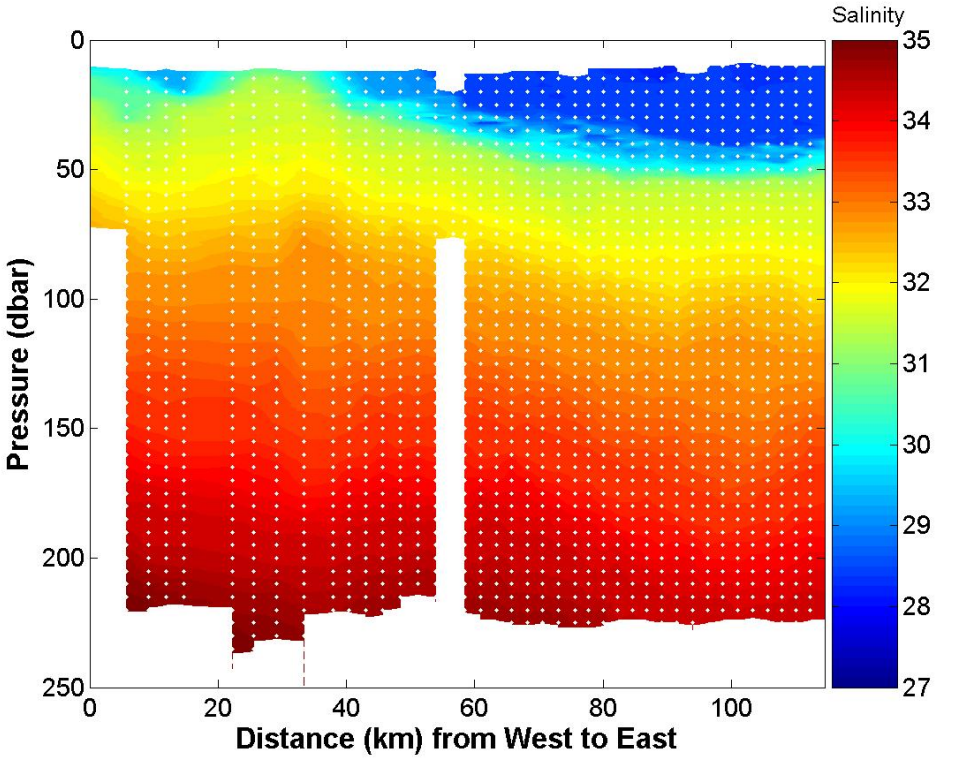


APPENDIX 7.7. Potential temperature and salinity along the section in the Okak fjord. The western sites are on the left and the eastern sites are on the right.



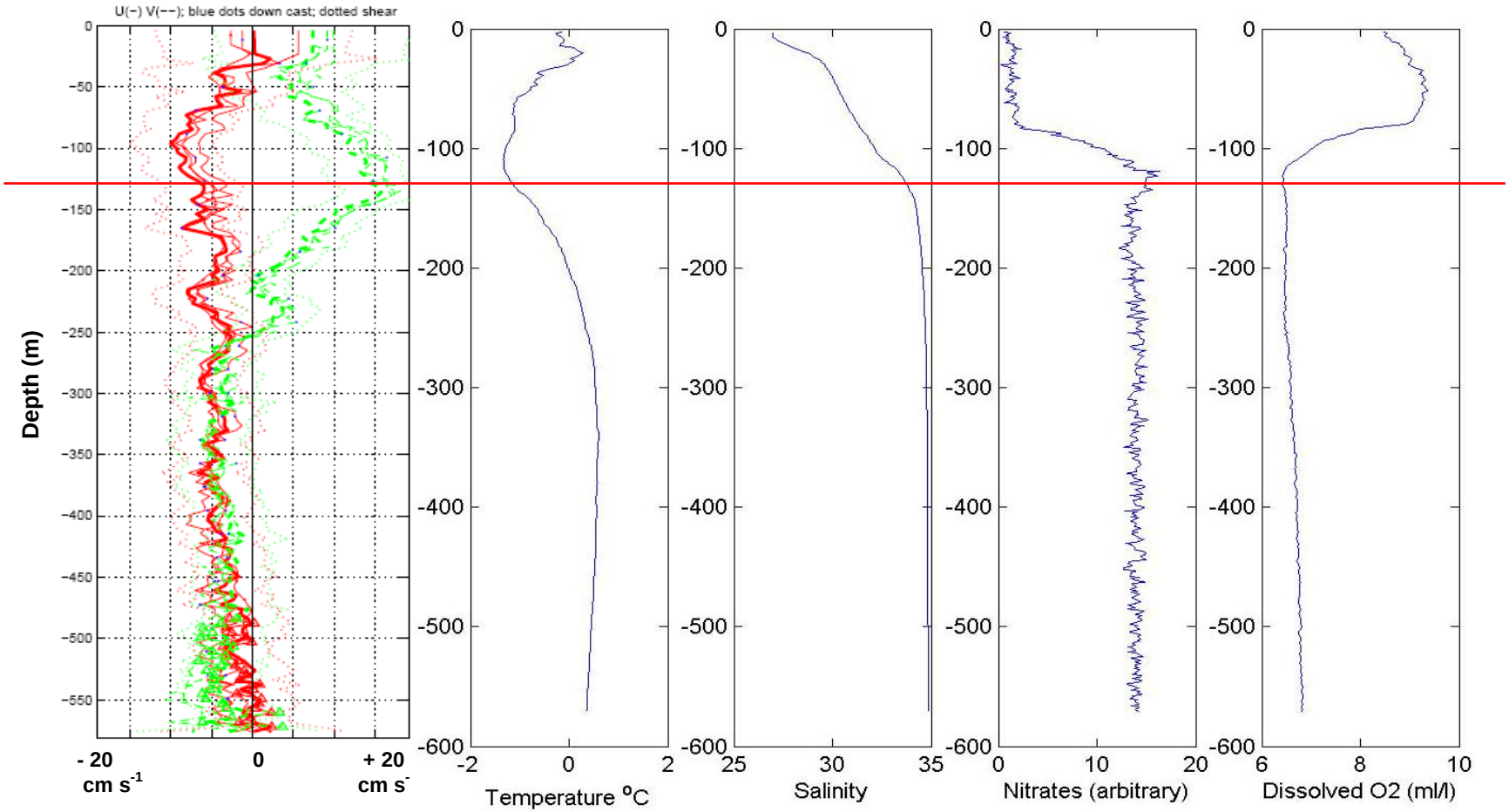
APPENDIX 7.8. Potential temperature and salinity along the section in the Anaktalak fjord. The western sites are on the left and the eastern sites are on the right.





APPENDIX 7.9. Potential temperature and salinity along section 100. The western sites are on the left and the eastern sites are on the right.

APPENDIX 8. Example of a LADCP profile recorded during Leg 2 at the station M09 (cast 0902022). The LADCP horizontal velocity data are presented in the first plot on the left. The green line represented V the northward velocity and the solid red line represented U the eastward velocity. The four plots on the right are CTD data. The currents are observed to be towards the North - Northwest at approximately 20 cm s^{-1}. The maximum velocities are reach around 130 m deep just under the cline.



APPENDIX 9. SCAMP cast locations, sampling time, water depth and corresponding station numbers during 2009 ArcticNet scientific expedition.

Station related CTD cast	Malina 680 R0902036	Malina 345 R0902115	Malina 345 R0902123	Malina 345 R0902127	Malina 345 R0902129	Malina 135 R0902151	Malina 135 R0902153	Malina 135 R0902158	Malina 235 R0902172	Malina 235 R0902180	Malina 235 R0902183
Position											
Latitude (°N)	69° 36.570	71° 21.262	71° 21.262	71° 25.293	71° 25.150	71° 18.623	71° 18.685	71º 18.60	71° 46.628	71° 45.622	71° 45.038
Longitude (°W)	138° 14.260	132° 32.520	132° 32.520	132° 36.664	132° 35.515	127° 29.253	127° 29.594	127º 30.30	130° 51.142	130° 53.735	130° 54.300
Departure											
date (TU)	2009-08-03	2009-08-14	2009-08-15	2009-08-15	2009-08-16	2009-08-20	2009-08-21	2009-08-21	2009-08-23	2009-08-23	2009-08-23
time (TU)	0:16	20:15	13:15	21:15	2:10	21:50 16:00 local	0:50 19:00 local	16:10 morning after	00:10 17:00 local	15:10 09:10 local	22:00 16:00 local
Conditions											
Wind Dir	100	345	129	265	263	258	230	120	120	124	96
Wind (kt)	4.00	7.0	19	11	13	14	10	14	15	11	13
Pa	1025.31	1007.75	999.93	998.23	998.47	1019.16	1020.02	1011.81	1004.45	1007.46	1008.89
Rel. Hum.	94	75	99	97	96	91	89	86	93	98	92
T° air	9.2	3.5	3.4	2.4	3.4	4.2	4.9	4.1	3.5	2.6	3.9
T° eau (SST)	7.21	3.03		2.44		3.91	3.33	1.26	1.09	1.34	1.56
Sea state	2	3	5	4	4	3	2	5	3	1	2
Ice (1/10)	0	0	0	0	0	2	2	4		1	3
clouds (1/8)	4	8	8	8	7	6	8		8		
Water depth (m)	122	530	559	625	602	229	224	617	636	637	656
CTD casts #											
SCAMP 1	03AUG2009002626	14AUG2009213859	15AUG2009133939	15AUG2009214112	16AUG2009021612	20AUG2009223658	21AUG2009015003	22AUG154928	23AUG002307	23AUG151413	23AUG220518
SCAMP 2	03AUG2009010057	14AUG2009220553	15AUG2009140848	15AUG2009220935	16AUG2009024402	20AUG2009225626	21AUG2009021301	22AUG162235	23AUG005420	23AUG155116	23AUG222419
SCAMP 3	03AUG2009012722	14AUG2009223435	15AUG2009143532			20AUG2009233004	21AUG2009024436	22AUG165648		23AUG162523	
SCAMP 4										23AUG165605	
Miscellaneous											
Target depth (m)	80	80	80	80	80	80	80	80	80	80	80
Max # scans	80000	80000	80000	80000	80000	80000	80000	80000	80000	80000	80000
Chrono (min)	14	14	14	14	14	14	14	14	14	14	14
Start GPS	23:30:00										
Person in charge:	Yves Gratton										

APPENDIX 10. Example of SCAMP data profiles from Leg 2 (expedition 0902). The data is from profile # *20Aug2009233004* recorded at station Malina 135 in the Beaufort Sea during leg 0902. In the first panel, the green line represents the fluorescence (volts), the blue line is temperature (^{o}C) and the red one is salinity. The second panel is the temperature variation ($^{o}C \bullet m^{-1}$). The third panel is the turbulent kinetic energy dissipation ($m^2 \bullet s^{-3}$). Finally, the fourth panel represented the diffusion of temperature variance ($^{o}C^2 \bullet s^{-1}$).