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DISTRIBUTION OF TEMPERATURE AND SALINITY IN THE CANADIAN ARCTIC ARCHIPELAGO DURING THE 2005 ARCTICNET SAMPLING EXPEDITION (FROM AUGUST 5TH TO OCTOBER 27TH 2005)

By

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ABSTRACT

This report presents the CTD (Conductivity, Temperature and Depth) data obtained during the 2005 ArcticNet expedition held between August 5th and October 27th in the Canadian High Arctic. The report also contains information about data obtained by the Moving Vessel Profiler (MVP), Self Contained Autonomous Micro Profiler (SCAMP), moorings and ship mounted Acoustic Doppler Current Profiler (SM-ADCP) which were recorded during the same expedition. Detailed maps of sampling sites for each arctic region are included. CTD's temperature and salinity data are presented as contour plots following West-East or South-North sections. Examples of ADCP and SCAMP data are also included.

RÉSUMÉ

Ce rapport présente les données de CTD (conductivité, température et profondeur) recueillies au cours de la mission ArcticNet 2005 qui s'est déroulée dans l'Arctique canadien du 5 août au 27 octobre 2005. Il présente également de l'information sur les données de Moving Vessel Profiler (MVP), Self Contained Autonomous Micro Profiler (SCAMP), Acoustic Doppler Current Profiler (ADCP) de coque et des données de mouillage enregistrées au cours de la même mission. Des cartes détaillées montrant les sites d'échantillonnage pour chacune des régions arctiques y sont incluses. Les données de température et de salinité du CTD y sont illustrées sous forme de contours effectués le long de sections ouest-est ou sud-nord. Deux exemples des données enregistrées par le SCAMP et un ADCP sont présentés.

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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) – and 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 and brings together scientists and managers in the natural, environmental, social sciences and human health. Several Inuit organizations, northern communities, as well as government and industrial agencies have joined ArcticNet in their mission. More than 100 ArcticNet researchers and students from 28 Canadian universities and 5 Federal departments collaborate on 27 research projects with teams from U.S.A., Japan, Denmark, Norway, Poland, the U.K., Spain, Russia, Greenland and France.

The ArcticNet Network investigators study the impacts of climate change in Canadian Arctic to assess the effect of ongoing warming and modernization on Canadian Arctic ecosystems, economies and societies, and help Canadians face the impacts and opportunities that may occur due to climate change in the Arctic. 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 2004-2005 for more information). (ArcticNet web site at http://www.arcticnet.ulaval.ca)

1. INTRODUCTION

ArcticNet's 2005 expedition was carried out from August 5th to October 27th. During the first six weeks (leg 1 or 0501), the ship covered the coastal Canadian Arctic (Fig. 1) from Beaufort Sea in the West to the coast of Greenland in the East. On September 15th, it sailed to Hudson Bay where the second sampling part (leg 2 or 0502) took place.

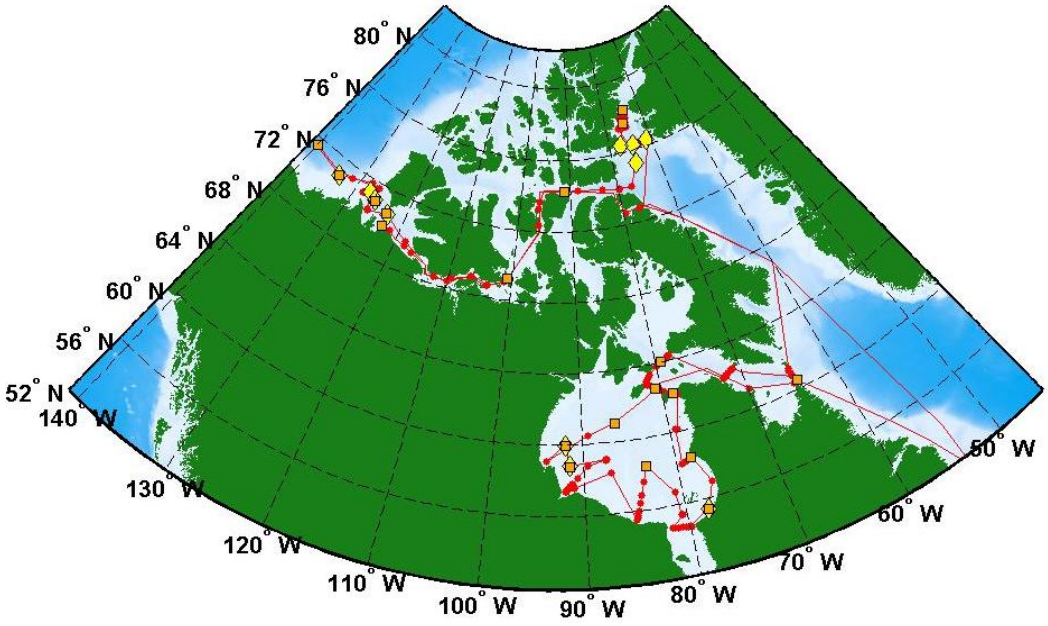


FIGURE 1. ArcticNet 2005 study area. Ship track is illustrated as a red line, Rosette-CTD sampling locations are represented by red dots. Yellow diamond-shaped dots show mooring sites while SCAMP sampling stations are represented by orange squares.

This report provides the ArcticNet community with a synthesis of the available data recorded during this 3-month expedition. The data set includes 263 Rosette-CTD (Conductivity Temperature Depth profiler), 91 MVP (Moving Vessel Profiler) and 86 SCAMP (Self Contained Autonomous Profiler) profiles. Also included are information about the 2004-2005 data recorded by 18 different instruments attached to five (recuperated) mooring lines, and current data recorded along the ship track by a ship mounted ADCP (Acoustic Doppler Current Profiler).

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) presents the NOW program data in their report and two special issues have been

published, Atmosphere-Ocean (volume 29, n°3, 2001) and Deep-Sea Research II (volume 49, n°22-23, 2002), with studies of 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.* presented their comprehensive study of all the oceanographic aspects and processes encountered in the Northwest Passage and explain 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 later on this year during various projects involved with the Circumpolar Flaw Lead System Study (CFL) and the International Polar Year (IPY) programs. All the publications regarding the CASES projects can be found on the CASES website (at http://www.cases.quebec-ocean.ulacal.ca). In 2008, the Journal of Geophysical Research published eleven papers from the CASES program in a special issue, volume 113, number C3. The same year, a book containing a synthesis of the work performed in every main research subject of the program was edited by L. Fortier, D. Barber and J. Michaud. It was titled : *On thin Ice*. 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).

2. SAMPLING PROGRAM

Rosette

During the 2005 expedition, the rosette was equipped with 24 «Niskin» 12 L bottles, a CTD SeaBird 911+ and eight independent sensors (see Table 1 for sensors specifications). It was deployed from the ship and lowered into the water column at a rate of 1 m s^{-1}. CTD profiles were carried out in the Canadian Arctic and Hudson Bay (see Fig. 2 and Appendix 1A) along 8 sections, 80 stations and 137 casts during Leg 0501 and 10 sections, 90 stations and 126 casts during Leg 0502 (see Table 2 and Table 3). A summary and the «Logbook» of the CTD profiles available for all stations are presented in Appendix 2 and in Rail (2005a and 2005b) sampling reports. Appendix 2 also presents the «Logbook» of the 29 CTD profiles performed in 2004 during the first ArcticNet mooring deployment expedition (Leg 0408) on the CCGS Laurier.

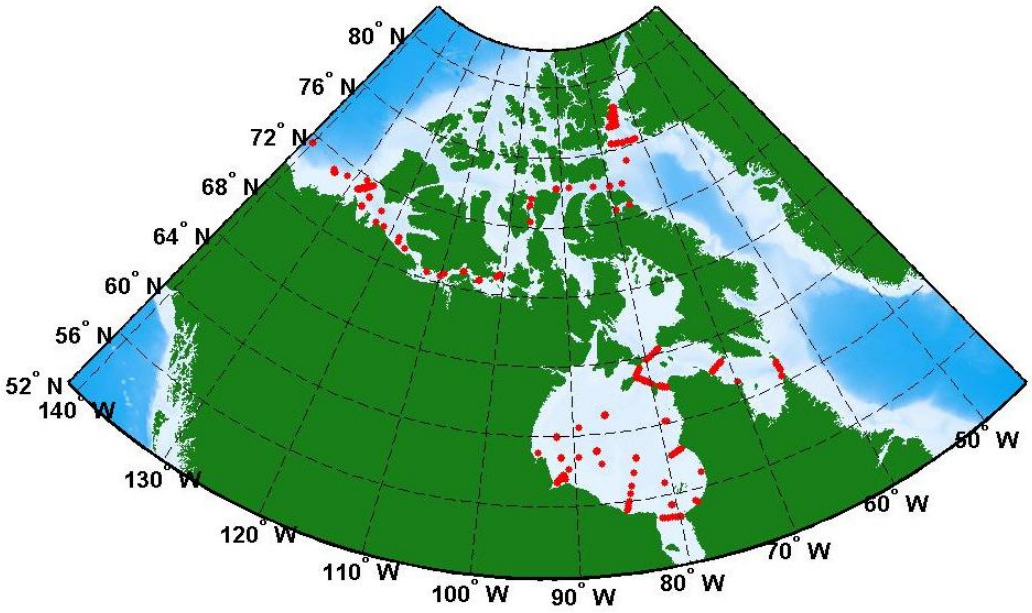
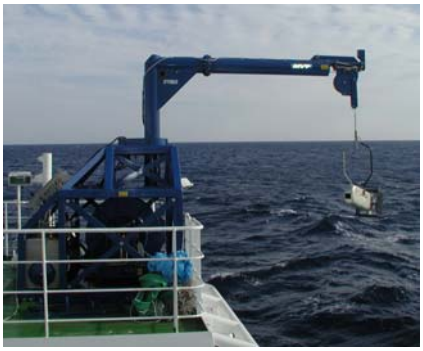


FIGURE 2. 2005 Rosette sampling sites

The processing and quality control of CTD data are 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 Integrated Service Data Management (ISDM) website (http://www.meds-sdmm.dfo-mpo.gc.ca/) and will be available to the international community. All the meta-data may be found in the Polar Data Catalogue (http://www.polardata.ca/).

Moving Vessel Profiler (MVP)



The Moving Vehicle Profiler (MVP) is a towed CTD (with fluorescence and dissolved oxygen sensors). It is usually used 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. We lose the first 10 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.

Few 2005 MVP profiles could be reported because the instrument was lost in Labrador Sea during Leg 0501 (August 9 to August 11). Ninety-one casts of 300 m were performed in the eastern part of the Hudson Strait around 60°N and 60°W at a rate of one cast every 30 minutes. See Table 1 for sensors specifications. Raw data are available upon request.

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 salinity fluctuations at the micro-scale in order to estimate the turbulent mixing occurring in the water column. To properly measure (as opposed to "estimate") turbulence we should also be measuring the velocity fluctuations. Unfortunately, we do not have velocity sensors (due to budget limitations). The current sensors on the SCAMP include temperature (three sensors), salinity (i.e. conductivity; two sensors), a PAR (Photosynthetically Active Radiation) and fluorescence.

SCAMP profiles were carried out in Baffin Bay, Victoria Strait, Beaufort Sea and Amundsen Gulf, Foxe Basin, Hudson Strait and Hudson Bay (see Fig. 3 and Appendix 1B). Measurements were taken at 10 stations (46 casts) during leg 0501 and 11 stations (40 casts) during leg 0502 for a total of 86 different profiles. The logbook of SCAMP

profiles is presented in Appendix 3. An example of data profile is presented in Appendix 4. Scamp data are not available yet. When available, processing and quality control protocols will be provided at the same time as the scamp data.

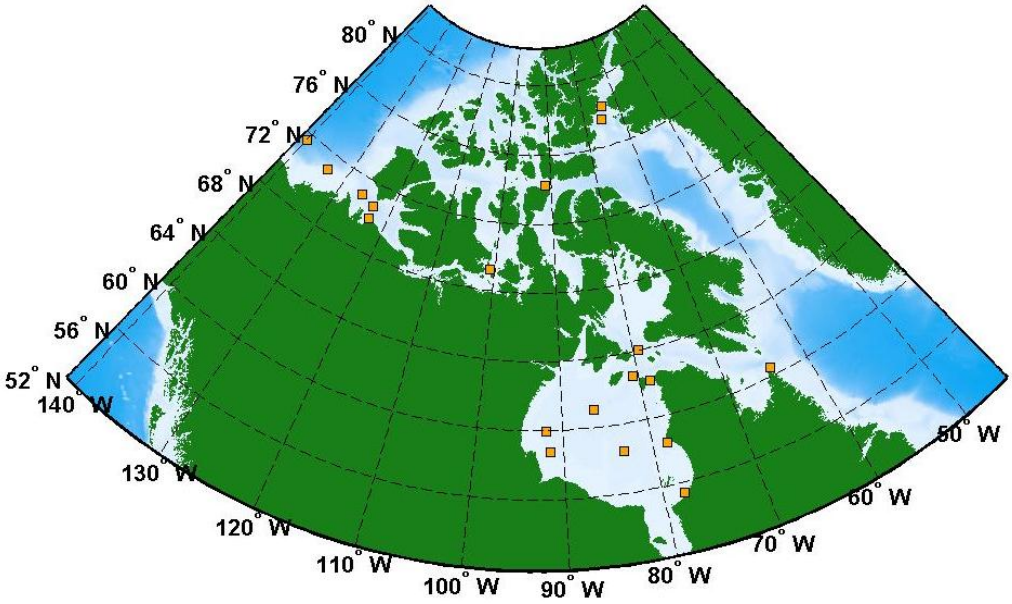


FIGURE 3. SCAMP sampling sites

Moorings

Five moorings deployed in the Beaufort Sea in 2004 were successfully retrieved in August and September of the 2005 expedition (see Fig. 4 and Appendix 1C). A summary of the 18 instruments, the sensors, and the validated data is shown in Table 4. The instruments included four RDI 300 kHz Workhorse ADCPs, seven Aanderaa RCM-11 (Recording Current Meters), one Sea-Bird SBE-37 conductivity-temperature sensor, four Alec conductivity-temperature sensors and two Alec chlorophyll sensors. The data recovery was only partly successful due to instrument malfunctions and one mooring was never recovered (CA05-04). Michaud *et al.* (2005) and Rail *et al.* (2010) have summarized all the problems encountered in their technical report. The recovered moorings were processed and redeployed for another year of measurements. Additional moorings were added to cover the Beaufort Sea, Baffin Bay and Hudson Bay (see Fig. 5 and Appendix 1C). 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.

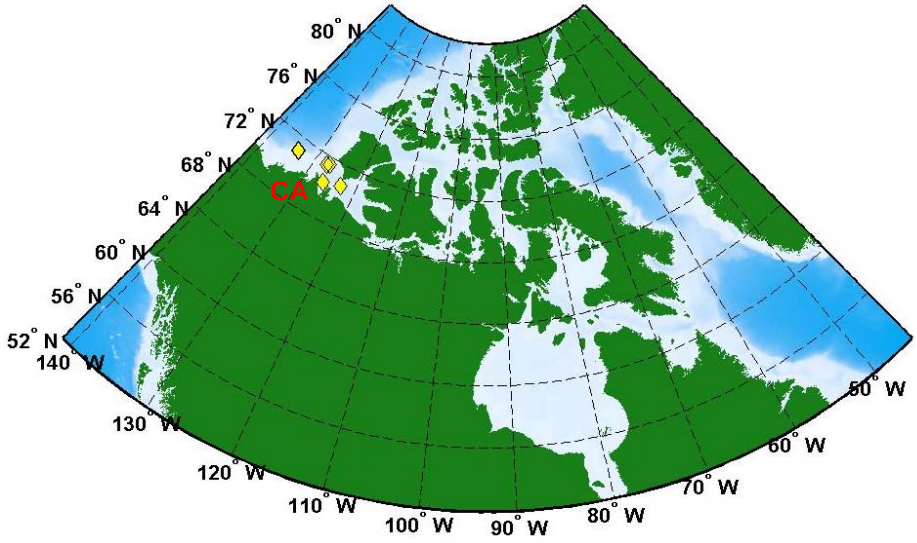


FIGURE 4. Moorings deployed in 2004 and recovered in 2005

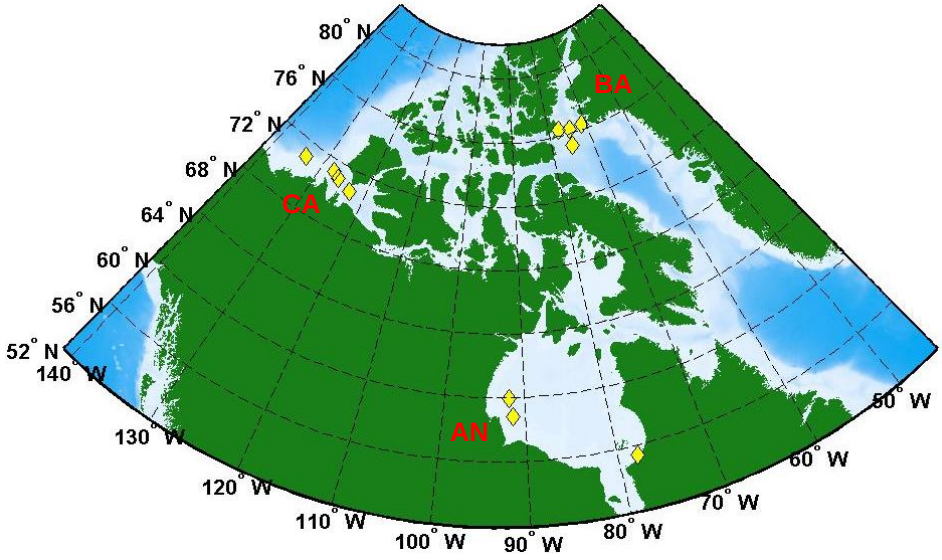


FIGURE 5. Moorings deployed in 2005

Ship mounted Acoustic Doppler Current Profiler (ADCP)

In July 2003, the CCGS Amundsen was equipped with a RDI Ocean Surveyor (ship-mounted) 150 kHz ADCP. Unfortunately, the instrument had a defect and although the flaw was quickly detected, there was nothing we could do to correct the problem until the next dry dock scheduled for April 2006. Regardless, we continue to collect data with the ADCP throughout the 2005 expedition (see ship track on Fig 6). The data set was saved as it may be possible to correct them at a later time. Note that the raw data is available upon request.

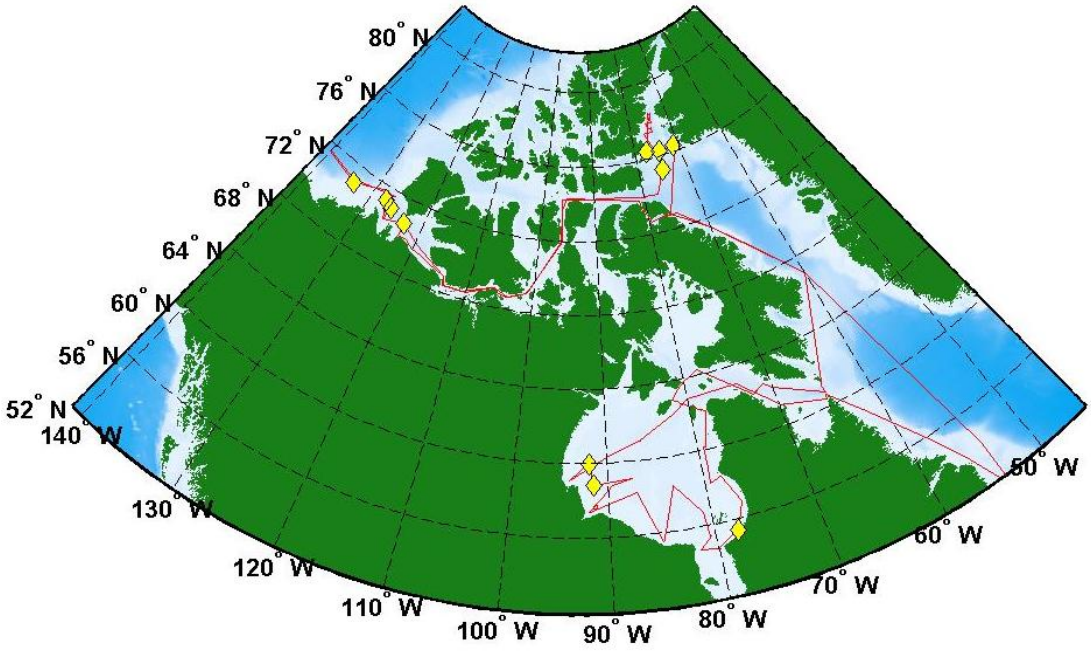


FIGURE 6. Moored-ADCP deployed in 2005 and ship-mounted ADCP sampling sites. The moored-ADCP stations are illustrated by yellow diamond markers and the ship-mounted ADCP is illustrated by the ship track.

3. DATA PROCESSING AND QUALITY CONTROL

Rosette-CTD data

Rosette-CTD data processing and quality control are described in detail by Guillot (2003, 2005a and 2005b). The «READ ME » file attached to each yearly CTD data set also presents the most important processing steps and changes made to the data files. All users should read these files so they can be aware of data limitations.

Processing included the following steps: calibration of 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 quality control test based on UNESCO's algorithm standards (1990). The recorded data were averaged every 1 db. The computed oceanographic parameters (see Table 5) were calculated using the averaged recorded data. Missing data were linearly interpolated. Finally, there is one ASCII file for every CTD cast. The content of a typical ASCII file is 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 shown on Fig. 2 and Appendix 1A. The contours are presented in Appendices 5 and 6. All the profiles along the same section were used 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, Canada is on the left and Greenland 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 Rail *et al.* (2010). 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 depths 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. Users should consult the Quality Control Report (Rail *et al.* 2010). ASCII files were created for every instrument (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*» box of the U.S. Geological Survey's «*Sediment Transport Instrumentation Group*». The «ADCP*tools*» 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 detail the finalized procedures of processing and quality control of ADCP data is available (Guillot 2007). An example of a stick diagram produced with the 2003-2004 ADCP data is shown in Appendix 7.

4. DISCUSSION

The sampling area covered by the ArcticNet 2005 expedition was huge: Hudson Bay and Strait, northern Baffin Bay, Canadian Arctic Archipelago, Amundsen Gulf and southern Beaufort Sea. The associated data base is enormous and will take a few years to process. In a twelve-week (two six-week legs) yearly expedition we can barely obtain a snapshot of the four sub-regions. The CAA is especially under-sampled. Because of the North Water project, we know where to sample in northern Baffin Bay and we are building a long-term time series of temperature and salinity contours along 75°N. This will enable us to monitor freshwater fluxes through Smith Sound, for example. An indication of possible coastal upwelling may be found in the section L4 contours (Appendix 5).

Three on-going studies are also worth mentioning. Romain Lanos has completed his study of southern Beaufort Sea and Amundsen Gulf using the CASES (Canadian Shelf Exchange Study) and ArcticNet 2004-2006 CTD data. In his Ph.D. thesis (Lanos 2009), he describes the regional and seasonal variability in the Beaufort Sea – Amundsen Gulf region. An on-going study of the SCAMP turbulent profiles (C. Sévigny, Ph.D. thesis in progress) show, for example, that the turbulence is dominated by double-diffusive processes in Smith Sound. More SCAMP profiles are needed in CAA and Beaufort Sea. Current pulses were observed in the 2003-2004 and 2004-2005 mooring data at CA04. The pulses have been related to storms in Bering Strait by C. Bélanger (Bélanger et al., submitted). Once the 2007-2008 data has been processed we will have a six year time series of the general conditions in Beaufort Sea and Smith Sound.

5. ACKNOWLEDGMENTS

We thank Captains Julien and Gariépy and their crew aboard the CCGS Amundsen for their outstanding collaboration. We also thank the «Rosette team», Véronique Lago, Pascal Guillot, 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 and Alexandre Forest. Thanks to Sophie Caplanne for her zodiac outings in order to obtain the SCAMP profiles. And last but not least, many thanks to Pascal Guillot and Maryam Kamali Nezhad for their data processing efforts.

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TABLE 1. Rosette and MVP sensors specifications, ArcticNet scientific expedition 2005

Parameter	Sensor		Range	Accuracy	Resolution
	Compagny	Instrument Type			
Attached to the Rosette					
CTD	SeaBird	SBE-9plus [1]			
Temperature	SeaBird	SBE-03 [1]	-5°C à +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	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)		
Fluorescence	Seapoint	Chlorophyll-fluorometer	0.02-150 µg/l	unknown	30
Transmissiometer	Wetlabs	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	SeaBird	SBE-9plus [1]			
Temperature	SeaBird	SBE-03 [1]	-5°C à +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	410K-105	up to 10 500m (15 000psia)[2]	0.0015% of full scale	0.001% of full scale
Dissolved Oxygen	SeaBird	SBE-43 [3]	120% of surface saturation[4]	2% of saturation	unknown
Fluorescence	Seapoint	Chlorophyll-fluorometer	0.02-150 µg/l	unknown	30
Light transmission	Wetlabs	C-Star	0-5 V	unknown	1.25 mV

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 2. Summary of the Rosette sampling, ArcticNet scientific expedition 2005

Expedition number	Leg number	Date		Number of CTD casts	Number of stations	Number of sections
		Start	End			
0501	1	August 5	September 15	137	80	8
0502	2	September 15	October 27	126	90	10

TABLE 3. List of Rosette sections and their corresponding stations and casts numbers

Section	Station	Cast
Leg 0501		
L1	L1	24
	L2	26
	L3	28
L2	L4	23
	L5	22
	L6	29
L3	L7	35
	L8	34
	L9	33
	L10	32
	L11	31
L4	L14	37
	L15	36
	L16	38
	L17	39
L5	L18	46
	L19	45
	L20	44
	L21	43
	L22	42
	L23	41
	L24	40
NOW S5	100	7
	102	8
	104	9
	106	10
	108	11
	110	14
	112	15
	114	16
	116	17
Beaufort S400-South	201	88
	202	87
	203	86
	204	84
	205	83
	206	82
	207	81
	208	80
	209	79
	210	78
	211	77
Beaufort S400-North	221	107
	222	106
	223	105
	224	104

Section	Station	Cast
Leg 0502		
S13	a	5
	b	6
	c	7
	d	8
	e	9
S14	a	10
	b	11
	c	12
	d	13
	e	14
	f	17
	g	18
S15	a	19
	b	20
	c	21
	d	22
	e	23
	f	25
	g	26
	h	27
S15-16	ctd1	28
	ctd2	29
	ctd3	30
	ctd4	31
S16	a	32
	b	33
	c	34
	d	35
	e	36
	f	38
	g	39
	h	40
S17	a	41
	b	42
	c	43
	d	46
	e	47
S19	a	52
	b	53
	c	54
	d	55
	e	57
S21 James Bay	a	66
	b	65
	c	67
	d	68
	e	69
	f	72
	g	73
	h	74
S Winisk	ctd12	84
	ctd13	85
	ctd14	86
	ctd15	87
	ctd16	88
	ctd17	89
	ctd18	90
	ctd19	91
S Nelson	ctd25	99
	ctd26	98
	ctd27	97
	ctd28	96
	ctd29	95
	ctd30	106

TABLE 4. Summary of moored instruments, ArcticNet 2004-2005

Mooring	Water depth	Position	Instrument	Serial No	Instr. Depth (m)	Date of first reliable data	Date of last reliable data	dt (min)	T (°C)	Cond (mS/cm)	Press (dbar)	Spd (cm/s)	Dir (true)	Turb NTU	Oxy uM	Chl	Quality Control Comments
CA04-04	306	71°05.146'N 133°43.271'W	ALEC C/T	682	28	07-09-2004 21:20	04-09-2005 15:00	10	x	x							WARNING: this line as bended
			WH-ADCP	3844	94.5	07-09-2004 21:30	04-09-2005 14:00	60	x		x	x	**b.d.**				WARNING: NO GOOD COMPASS CALIBRATION; this line as bended
			RCM-11	281	198	07-09-2004 22:00	29-08-2005 14:51	60	x	x	x	x	x	x	x		many salinity data points replaced by NaNs; clock problems; some data missing; this line as bended
CA05-04		MOORING LOST															
CA07-04	490	71°08.944'N 133°53.635'W	SBE37	3463	17 / 154	08-09-2004 01:29	04-09-2005 17:30	15	x	x	x						WARNING: this line as bended and slided along the slope
			WH-ADCP	3895	In progress												
			RCM-11	282	184 / 321	08-09-2004 02:00	04-09-2005 17:05	60	x	x	x	x	x	x	x		WARNING: this line as bended and slided along the slope
			RCM-11	291	387 / 524	08-09-2004 02:00	27-06-2005 23:58	60	x	x	x	x	x	x	x		WARNING: this line as bended and slided along the slope; offset correction applied to salinity data; clock problems; several data missing
CA15-04	400	71°32.269'N 127°01.458'W	ALEC C/T	686	17	24-07-2004 03:50	03-09-2005 09:40	10	x	x							good data
			WH-ADCP	296	86.4	24-07-2004 04:00	03-09-2005 09:00	60	x			x	**b.d.**				WARNING: NO GOOD COMPASS CALIBRATION
			RCM-11	276	189	24-07-2004 04:00	03-09-2005 09:34	30	x	x	x	x	x	x	x		WARNING: huge clock problems; offset correction applied on salinity data.
CA18-04	540	70°39.940'N 122°59.300'W	ALEC C/T	687	43	30-07-2004 22:30	01-09-2005 10:50	10	x	x							good data
			ACLW	286	43	30-07-2004 23:00	02-12-2004 02:00	1 sec 60s/1h	x					x		x	WARNING: NO GOOD CALIBRATION
			RCM-11	271	111	30-07-2004 22:59	08-06-2005 23:59	60	x	x	x	x	x	x	x		WARNING: clock problems; several data missing
			RCM-11	272	216	30-07-2004 22:59	17-08-2005 19:01	60	x	x	x	x	x	x	x		WARNING: clock problems; several data missing
			RCM-11	283	418	30-07-2004 22:59	01-09-2005 09:58	60	x	x	x	x	x	x	x		WARNING: clock problems; several data missing; offset correction applied to salinity data
CA20-04	251	70°20.356'N 126°21.421'W	ACLW	285	26	17-07-2004 21:12	19-07-2004 21:46	1 sec	x					x		x	WARNING: NO GOOD CALIBRATION
			ALEC C/T	591													Data were impossible to download
			WH-ADCP	335	95	17-07-2004 21:30	01-09-2005 17:01	60	x			x	**b.d.**				WARNING: NO GOOD COMPASS CALIBRATION

Please notice that **b.d.** stands for Bad Data

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

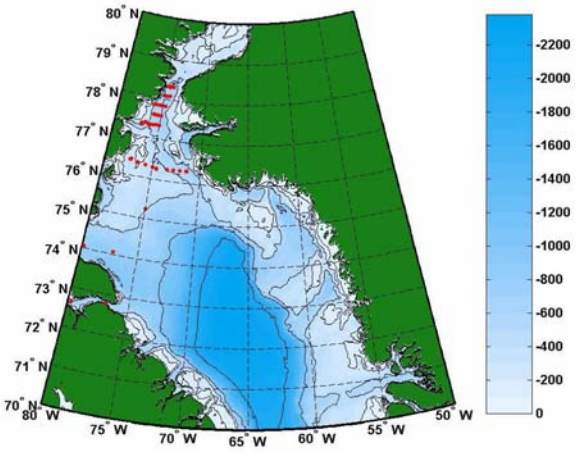
Parameters	Units	Number of significant digits
Pressure (or depth)	dbars	2
Temperature	°C (ITS-90)	3
Transmissivity	%	2
Fluorescence	µg/l	2
Salinity	PSS (1978)	3
Density, σ (S,T,P)	kg/m^3	2
Specific volume anomaly	10^{-8} m^3/kg	0
N^2: Brunt-Väisälä frequency	$1/sec^2$	2
Density; σ_τ ; σ(S,T,O)	kg/m3	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

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

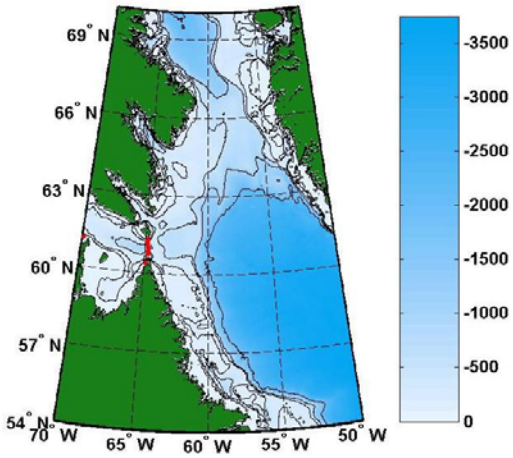
1A. Rosette-CTD sampling sites in Baffin Bay, Labrador, Hudson Bay and Hudson Strait, Northwest Passage and Beaufort Sea (Legs 1 and 2).

1B. SCAMP sampling sites in Baffin Bay, Labrador Sea, Hudson Bay and Hudson Strait, Northwest Passage and Beaufort Sea (Legs 1 and 2).

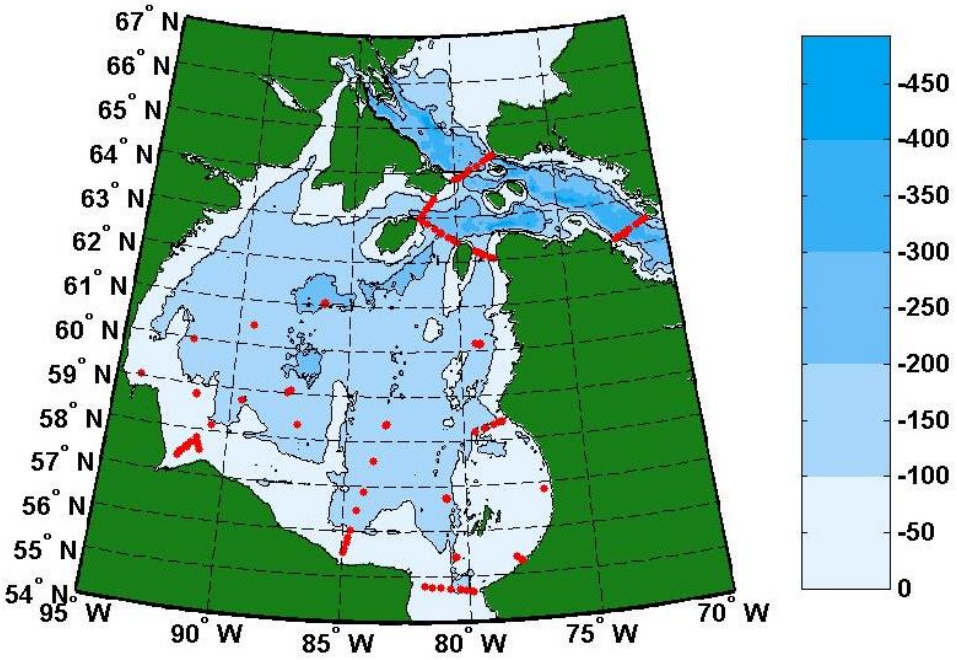
1C. Moorings recovered and deployed in Beaufort Sea; and deployed in Baffin Bay and Hudson Bay (Legs 1 and 2).



Baffin Bay

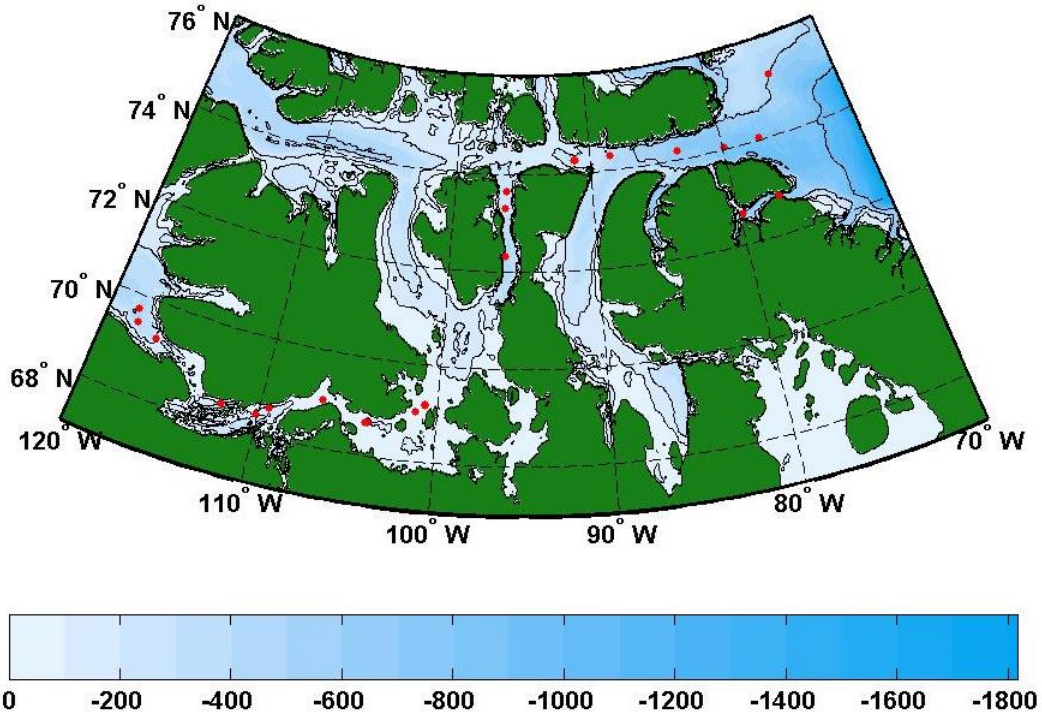


Labrador Sea

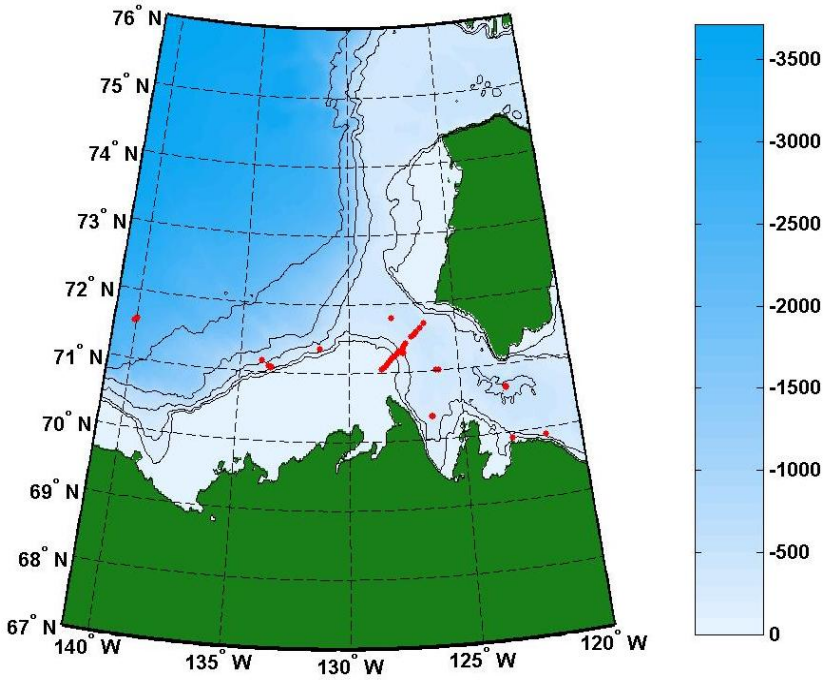


Hudson Bay and Hudson Strait

APPENDIX 1A. Rosette-CTD sampling sites in Baffin Bay, Labrador and Hudson Bay. (Legs 1 and 2)

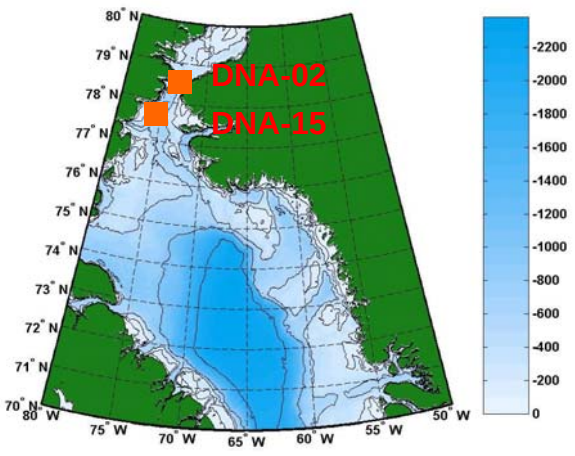


Northwest Passage

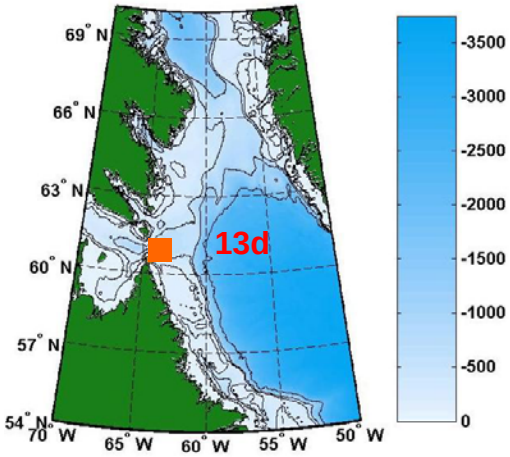


Beaufort Sea

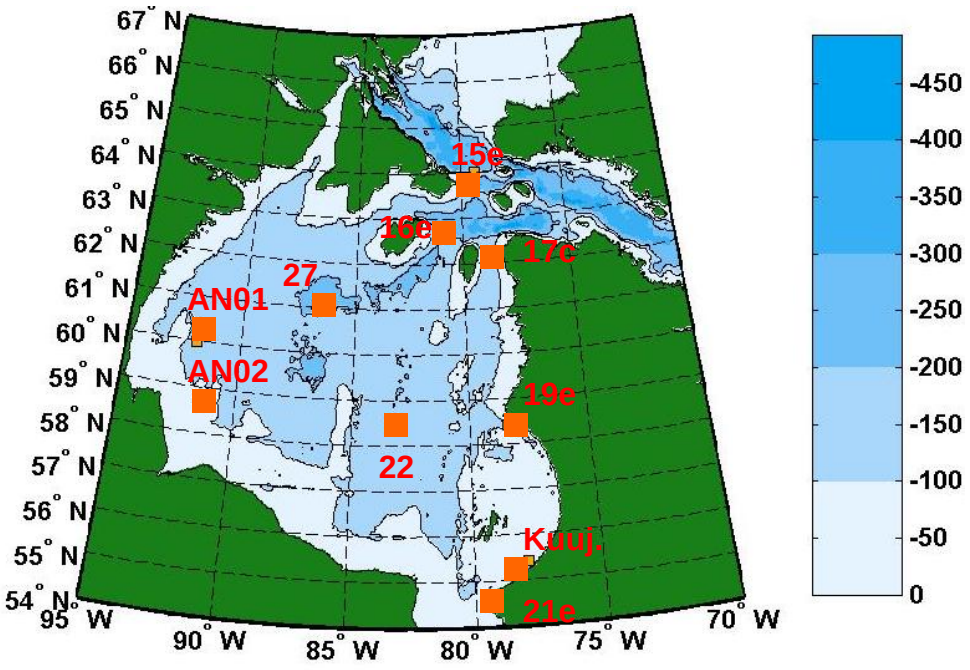
APPENDIX 1A. Rosette-CTD sampling sites in Northwest Passage and Beaufort Sea. (Legs 1 and 2)



Baffin Bay

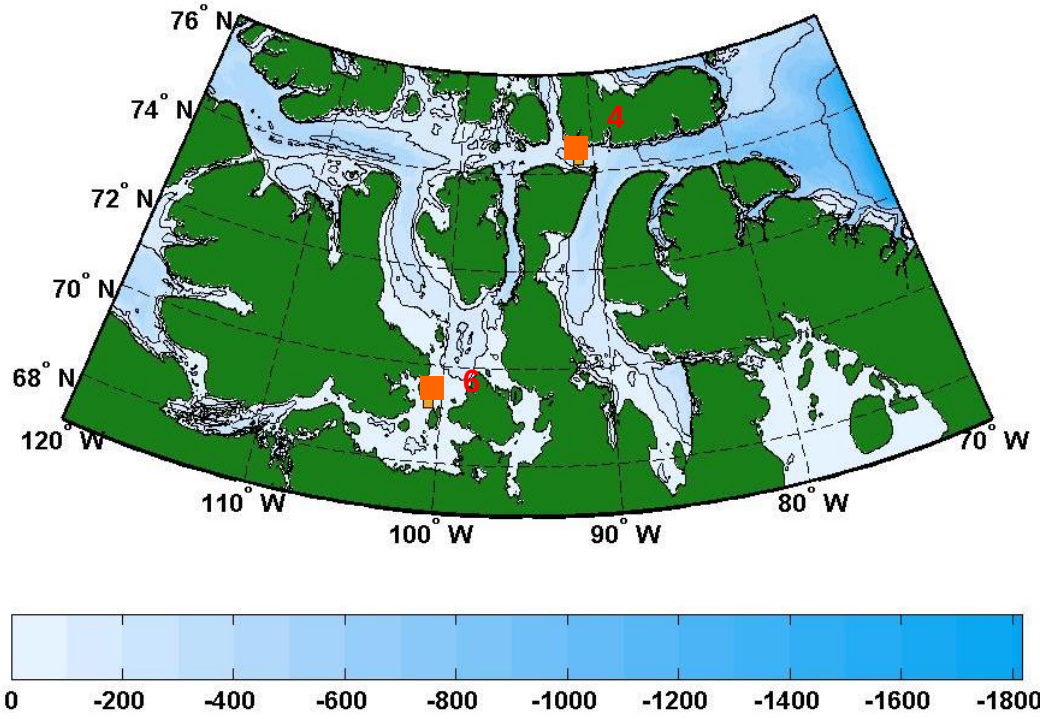


Labrador Sea

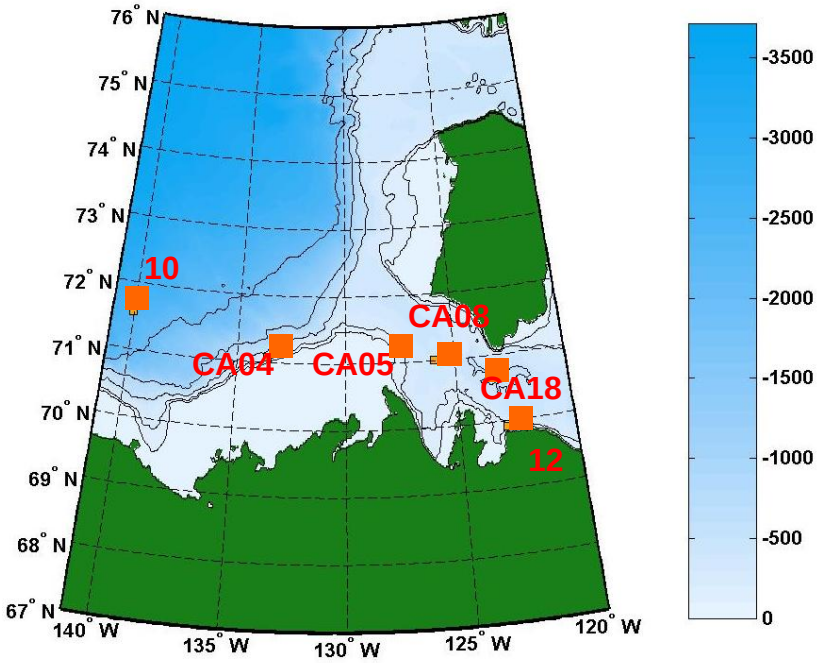


Hudson Bay and Hudson Strait

APPENDIX 1B. SCAMP sampling sites in Baffin Bay, Labrador Sea and Hudson Bay. (Legs 1 and 2)

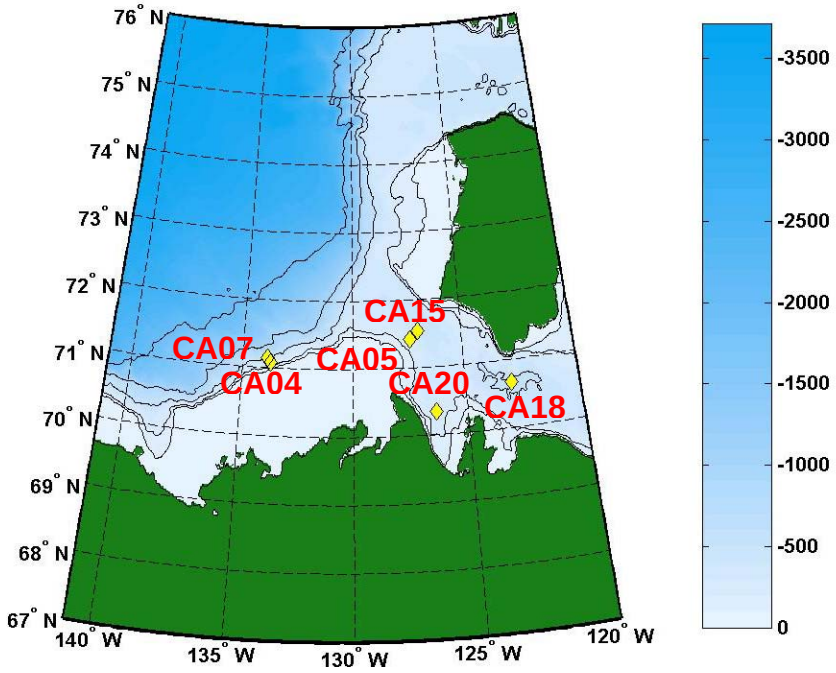


Northwest Passage

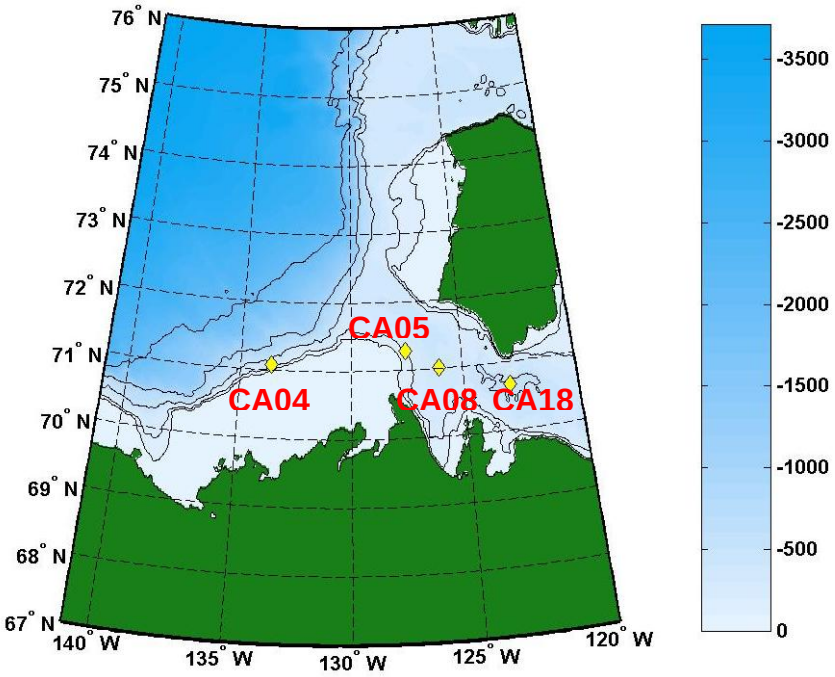


Beaufort Sea

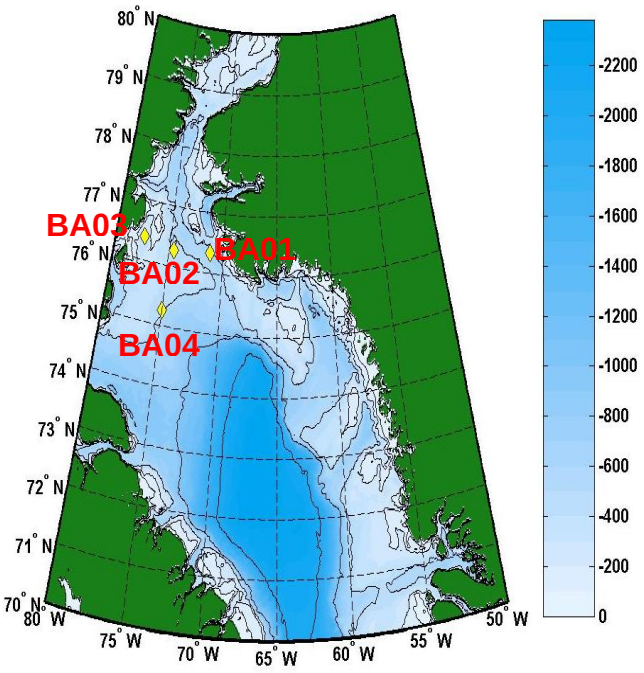
APPENDIX 1B. SCAMP sampling sites in Northwest Passage and Beaufort Sea. (Legs 1 and 2)



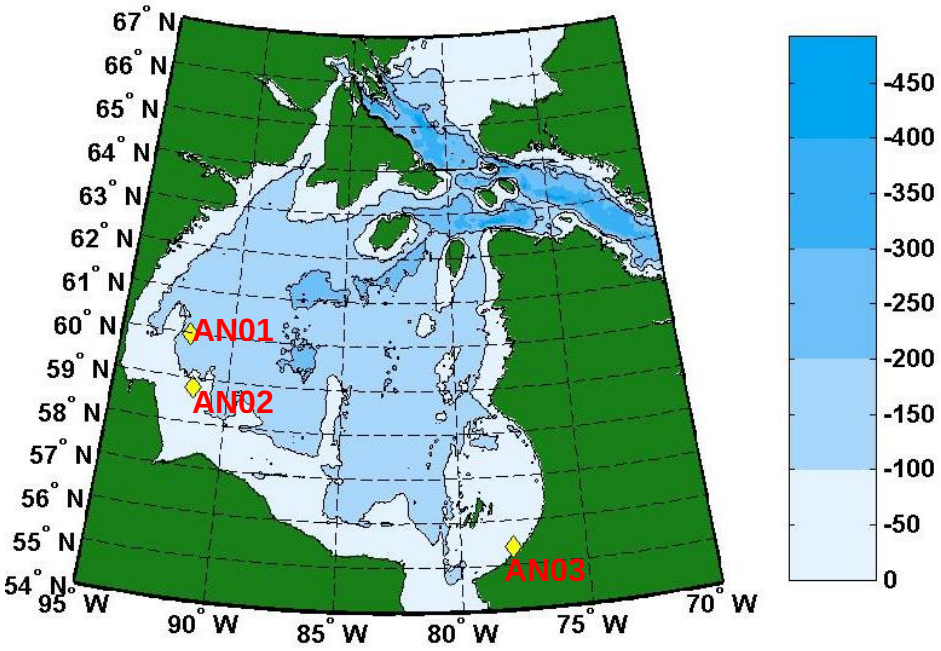
APPENDIX 1C. Moorings recovered in Beaufort Sea (Legs 1 and 2).



APPENDIX 1C. Moorings deployed in Beaufort Sea (Legs 1 and 2).



Baffin Bay



Hudson Bay

APPENDIX 1C. Moorings deployed in Baffin Bay and Hudson Bay (Legs 1 and 2).

APPENDIX 2. Rosette-CTD cast locations, sampling times, water depths and corresponding stations or mooring numbers during the 2004 and 2005 ArcticNet scientific expeditions.

2A. Rosette logbook for the mooring deployment expedition of 2004 (0408)

2B. Rosette logbook for Leg 1 (expedition 0501)

2C. Rosette logbook for Leg 2 (expedition 0502)

APPENDIX 2A. Rosette casts locations, sampling times, water depths and corresponding stations or mooring numbers during ArcticNet expedition 0408.

Cast number	Station or mooring	Start date UTC	Start time UTC	Latitude (North)	Longitude (West)	Cast depth (m)	Sea bottom depth (m)
1	CA-6	2004-09-05	20:15	70° 35.29	127° 44.07	249	256
2	CA-19	2004-09-06	02:36	70° 50.08	128° 59.03	63	73
3	CA-4	2004-09-07	12:32	71° 05.28	133° 16.97	304	315
4	Ca-07	2004-09-07	14:14	71° 09.04	133° 06.47	478	502
5	HM-S1	2004-09-07	16:29	71° 02.52	133° 34.86	128	139
6	CA-07	2004-09-08	01:28	71° 08.80	133° 06.29	470	X
7	CA-10	2004-09-08	14:38	69° 57.26	138° 20.95	246	256
8	CA-11	2004-09-09	13:14	70° 34.68	138° 21.54	1068	1114
9	CA-11B	2004-09-09	17:30	70° 34.61	138° 20.88	594	1114
11	CA09	2004-09-09	20:52	70° 12.62	137° 29.29	58	66
12	12	2004-09-09	20:52	70° 12.62	137° 29.29	58	66
13	HM-S1B	2004-09-10	07:46	70° 19.68	133° 15.64	50	51
14	MH-S10	2004-09-10	21:26	70° 53.52	129° 14.41	27	34
15	15	2004-09-10	21:22	70° 53.52	129° 14.41	27	34
16	C-203	2004-09-11	20:44	70° 08.32	125° 57.00	107	113
17	C-205	2004-09-11	23:08	70° 15.12	124° 01.56	56	60
18	C-205	2004-09-12	00:38	70° 19.35	124° 09.67	91	85
19	C-208	2004-09-12	02:37	70° 19.35	124° 31.43	239	250
20	C-209	2004-09-12	05:27	70° 31.50	124° 36.60	224	X
21	C-210	2004-09-12	14:16	70° 36.72	124° 48.01	422	425
22	C-212	2004-09-12	16:12	70° 45.26	123° 06.26	422	428
23	C-109	2004-09-12	19:29	70° 39.72	123° 32.70	564	592
24	CA18-04	2004-09-12	21:12	70° 40.04	122° 01.88	563	576
25	C107	2004-09-12	22:10	70° 36.26	122° 07.53	568	593
26	C107	2004-09-13	00:35	70° 36.13	122° 23.33	536	558
27	C104	2004-09-13	02:42	70° 35.99	122° 54.71	483	505
28	C103	2004-09-13	13:03	70° 35.96	121° 10.94	520	537
29	C100	2004-09-13	16:27	70° 35.95	121° 59.12	366	320

APPENDIX 2B. Rosette casts locations, sampling times, water depths and corresponding stations or mooring numbers during Leg 1 of 2005 ArcticNet scientific expedition (page 1:3).

Cast number	Station or mooring	Start date UTC	Start time UTC	Latitude (North)	Longitude (West)	Cast depth (m)	Sea bottom depth (m)
1	Pond Inlet	2005-08-14	14:07	72° 47.10	076° 59.05	975	989
3	100	2005-08-16	07:07	76° 17.98	071° 24.64	656	666
4	100	2005-08-16	11:00	76° 18.14	071° 24.58	663	685
5	100	2005-08-16	16:36	76° 17.93	071° 25.81	652	678
6	100	2005-08-16	18:55	76° 17.66	071° 26.30	656	672
7	100	2005-08-17	06:39	76° 17.98	071° 24.41	660	678
8	102	2005-08-17	08:31	76° 17.98	072° 06.21	540	557
9	104	2005-08-17	09:58	76° 16.97	072° 47.42	569	577
10	106	2005-08-17	11:52	76° 16.96	073° 28.67	538	547
11	108	2005-08-17	13:56	76° 15.98	074° 35.25	443	460
12	108	2005-08-17	17:06	76° 16.01	074° 34.72	442	450
13	108	2005-08-17	20:30	76° 15.32	074° 35.61	439	448
14	110	2005-08-18	02:57	76° 17.35	075° 00.58	433	443
15	112	2005-08-18	04:36	76° 19.42	075° 47.02	332	342
16	114	2005-08-18	08:03	76° 21.24	076° 35.38	137	151
17	116	2005-08-18	09:05	76° 22.92	077° 23.30	344	352
18	116	2005-08-18	11:58	76° 22.94	077° 23.85	345	360
19	116	2005-08-18	15:05	76° 23.00	077° 22.94	347	355
20	116	2005-08-18	23:38	76° 24.84	077° 20.94	268	280
21	L 9	2005-08-19	09:03	77° 49.96	075° 20.77	604	607
22	L 5	2005-08-19	13:49	78° 04.70	074° 39.70	661	671
23	L 4	2005-08-19	15:25	78° 04.96	075° 00.22	607	614
24	L 1	2005-08-19	18:05	78° 20.32	074° 39.48	636	645
25	L 2	2005-08-19	19:13	78° 19.68	074° 21.33	487	493
26	L 2	2005-08-19	21:39	78° 18.13	074° 28.79	517	530
28	L 3	2005-08-20	01:24	78° 19.15	074° 00.58	626	643
29	L 6	2005-08-20	03:56	78° 05.10	074° 19.55	700	709
30	L 11	2005-08-20	06:22	77° 49.98	074° 39.70	695	705
31	L 11	2005-08-20	07:54	77° 49.98	074° 39.25	695	704
32	L 10	2005-08-20	10:05	77° 49.78	075° 01.03	661	671
33	L 9	2005-08-20	11:08	77° 50.08	075° 20.72	597	608
34	L 8	2005-08-20	12:19	77° 49.83	075° 40.13	536	550
35	L 7	2005-08-20	14:24	77° 49.50	075° 59.24	562	572
36	L 15	2005-08-20	17:10	77° 34.57	075° 39.60	653	663
37	L 14	2005-08-20	18:12	77° 34.94	075° 54.01	600	609
38	L 16	2005-08-20	19:41	77° 35.03	075° 19.83	632	636
39	L 17	2005-08-20	20:54	77° 34.57	074° 58.96	655	663
40	L 24	2005-08-20	22:43	77° 20.11	075° 01.78	644	648
41	L 23	2005-08-21	01:10	77° 19.99	075° 22.69	540	561
42	L 22	2005-08-21	02:38	77° 19.97	075° 43.01	548	564
43	L 21	2005-08-21	03:39	77° 20.08	076° 01.24	522	540
44	L 20	2005-08-21	06:52	77° 19.97	076° 20.28	448	456
45	L 19	2005-08-21	07:48	77° 22.00	076° 39.33	422	430
46	L 18	2005-08-21	08:50	77° 19.21	077° 00.23	436	445
47	K	2005-08-21	16:07	77° 19.82	077° 00.63	384	384
48	BA04-05	2005-08-21	23:45	75° 14.40	074° 58.92	470	477
49	BA04-05	2005-08-22	04:17	75° 14.42	074° 59.53	470	479
50	BA04-05	2005-08-22	06:05	75° 14.45	075° 00.27	467	478

APPENDIX 2B. Rosette casts locations, sampling times, water depths and corresponding stations or mooring numbers during Leg 1 of 2005 ArcticNet scientific expedition (page 2:3).

Cast number	Station or mooring	Start date UTC	Start time UTC	Latitude (North)	Longitude (West)	Cast depth (m)	Sea bottom depth (m)
51	L	2005-08-22	15:21	74° 03.65	077° 13.22	819	838
52	3	2005-08-22	23:53	74° 03.05	079° 55.24	808	912
53	3	2005-08-23	04:12	74° 03.38	079° 54.09	788	804
54	3	2005-08-23	12:40	74° 02.81	079° 53.66	780	814
55	3a	2005-08-23	18:44	74° 11.79	083° 20.76	680	700
56	4a	2005-08-24	02:25	74° 18.15	088° 29.43	333	346
57	4	2005-08-24	07:43	74° 15.99	091° 11.80	322	334
58	4	2005-08-24	12:39	74° 15.75	091° 11.53	324	335
59	4	2005-08-24	15:00	74° 16.38	091° 09.72	325	333
60	4	2005-08-24	16:26	74° 16.63	091° 07.59	329	339
61	O	2005-08-25	22:45	73° 19.05	096° 20.57	211	222
62	P	2005-08-26	04:47	72° 19.85	096° 17.96	442	458
63	6	2005-08-27	10:19	69° 10.03	100° 41.97	54	65
64	6	2005-08-27	12:36	69° 10.46	100° 41.88	57	68
65	6	2005-08-27	15:41	69° 11.05	100° 42.62	63	72
66	R	2005-08-28	04:31	69° 02.06	101° 13.90	58	68
67	S	2005-08-28	10:49	68° 41.18	103° 59.57	93	105
68	7	2005-08-30	04:43	68° 59.86	106° 33.99	108	118
69	7	2005-08-30	08:31	69° 00.05	106° 34.33	100	111
70	7	2005-08-30	10:40	68° 59.88	106° 34.81	104	117
71	T	2005-08-31	05:44	68° 35.55	109° 28.10	137	151
72	U	2005-08-31	10:42	68° 25.18	112° 08.26	190	206
73	V	2005-09-01	00:12	69° 42.20	118° 23.63	479	489
74	CA18-05	2005-09-01	10:15	70° 39.97	122° 58.43	537	548
75	CA20-04	2005-09-01	17:40	70° 20.41	126° 20.55	242	254
76	CA05-04	2005-09-02	01:43	71° 24.84	127° 23.48	292	301
77	211	2005-09-02	02:45	71° 22.64	127° 29.70	253	263
78	210	2005-09-02	03:48	71° 20.57	127° 32.48	226	233
79	209	2005-09-02	05:00	71° 18.42	127° 41.95	165	175
80	208	2005-09-02	06:07	71° 16.45	127° 48.48	134	140
81	207	2005-09-02	07:07	71° 14.94	127° 54.56	98	103
82	206	2005-09-02	09:10	71° 12.85	128° 00.46	70	82
83	205	2005-09-02	09:51	71° 10.81	128° 06.24	62	70
84	204	2005-09-02	10:52	71° 08.85	128° 12.22	53	64
85	204	2005-09-02	12:51	71° 08.86	128° 12.04	54	64
86	203	2005-09-02	14:25	71° 06.79	128° 18.37	47	58
87	202	2005-09-02	15:03	71° 04.90	128° 24.63	44	54
88	201	2005-09-02	15:41	71° 02.95	128° 30.51	32	43
89	CA05-05	2005-09-02	22:37	71° 16.66	127° 31.41	195	201
90	CA05-05	2005-09-03	01:57	71° 16.80	127° 30.29	202	209
91	CA05-05	2005-09-03	04:54	71° 17.19	127° 30.13	201	210
92	CA15-04	2005-09-03	08:53	71° 32.02	126° 58.36	396	407
93	CA14-03	2005-09-03	15:19	71° 47.75	127° 59.87	389	409
94	CA13-03	2005-09-04	02:40	71° 21.78	131° 20.91	341	348
95	CA04-04	2005-09-04	12:21	71° 05.62	133° 42.53	324	331
96	CA07-04	2005-09-04	19:07	71° 10.44	133° 59.76	617	625
97	10	2005-09-05	14:20	71° 35.02	139° 59.00	976	2481
98	10	2005-09-05	16:59	71° 33.85	139° 59.50	975	2478
99	10	2005-09-05	20:49	71° 33.65	140° 06.71	975	2503
100	CA04-05	2005-09-06	21:46	71° 05.22	133° 37.01	326	334

APPENDIX 2B. Rosette casts locations, sampling times, water depths and corresponding stations or mooring numbers during Leg 1 of 2005 ArcticNet scientific expedition (page 3:3).

Cast number	Station or mooring	Start date UTC	Start time UTC	Latitude (North)	Longitude (West)	Cast depth (m)	Sea bottom depth (m)
101	CA04-05	2005-09-07	01:40	71° 03.75	133° 36.07	257	265
102	CA04-05	2005-09-07	04:35	71° 04.94	133° 34.48	196	331
103	CA07-04	2005-09-07	08:10	71° 10.75	134° 01.83	628	634
104	224	2005-09-08	07:57	71° 42.26	126° 28.96	385	397
105	223	2005-09-08	10:02	71° 38.31	126° 40.97	430	442
106	222	2005-09-08	11:02	71° 34.42	126° 52.99	412	428
107	221	2005-09-08	12:03	71° 30.47	127° 05.14	370	384
108	CA05-05	2005-09-09	05:31	71° 17.13	127° 32.74	190	198
109	CA08-05	2005-09-09	12:17	71° 00.90	125° 56.13	393	404
110	CA08-05	2005-09-09	14:05	71° 00.28	125° 55.93	394	402
111	CA08-05	2005-09-09	15:56	71° 00.24	125° 55.49	394	415
112	CA08-05	2005-09-10	02:46	71° 00.51	126° 03.23	386	395
113	11	2005-09-10	23:43	70° 20.37	126° 21.47	246	255
114	11	2005-09-11	02:59	70° 20.49	126° 21.74	246	263
115	11	2005-09-11	04:00	70° 20.76	126° 21.86	247	254
116	11	2005-09-11	05:00	70° 20.49	126° 21.74	246	252
117	11	2005-09-11	05:58	70° 20.53	126° 21.53	246	253
118	11	2005-09-11	06:56	70° 20.36	126° 21.43	247	256
119	11	2005-09-11	07:56	70° 20.36	126° 21.46	245	255
120	11	2005-09-11	08:56	70° 20.37	126° 21.45	245	255
121	11	2005-09-11	10:02	70° 20.36	126° 21.46	244	256
122	11	2005-09-11	10:59	70° 20.36	126° 21.46	244	256
123	11	2005-09-11	11:58	70° 20.36	126° 21.42	247	256
125	11	2005-09-11	13:02	70° 20.36	126° 21.44	245	256
126	11	2005-09-11	14:18	70° 20.37	126° 21.34	248	255
127	11	2005-09-11	16:49	70° 20.34	126° 21.69	246	254
128	11	2005-09-11	22:22	70° 20.36	126° 21.49	244	252
129	CA18-05	2005-09-12	15:49	70° 39.99	122° 59.37	537	544
130	CA18-05	2005-09-12	19:14	70° 39.98	122° 59.58	535	542
131	CA18-05	2005-09-13	03:39	70° 39.07	122° 59.69	598	608
132	12	2005-09-13	18:04	69° 54.80	122° 57.39	196	205
133	12	2005-09-13	21:18	69° 54.87	122° 56.98	186	193
134	12	2005-09-14	01:52	69° 54.86	122° 57.28	197	199
135	X	2005-09-14	04:48	69° 54.27	121° 30.21	261	266
136	Y	2005-09-14	10:35	69° 27.40	118° 11.33	454	465
137	Z	2005-09-14	14:12	69° 16.24	116° 50.76	186	192

APPENDIX 2C. Rosette cast locations, sampling times, water depths and corresponding stations or mooring numbers during Leg 2 of 2005 ArcticNet scientific expedition (page 1:3).

Cast number	Station or mooring	Start date UTC	Start time UTC	Latitude (North)	Longitude (West)	Cast depth (m)	Sea bottom depth (m)
1	T2	2005-09-16	12:43	68° 23.62	110° 05.87	236	246
2	S2	2005-09-17	02:06	68° 40.65	103° 52.15	102	108
3	O2	2005-09-18	16:39	73° 39.21	096° 17.01	240	252
4	Pond Inlet 2	2005-09-19	22:28	72° 38.15	079° 45.18	535	545
5	13a	2005-09-22	13:05	61° 16.38	064° 49.03	245	262
6	13 b	2005-09-22	15:25	61° 09.20	064° 49.49	435	450
7	13c	2005-09-22	18:23	61° 00.23	064° 44.63	502	518
8	13d	2005-09-22	22:04	60° 50.91	064° 42.47	377	387
9	13e	2005-09-23	00:44	60° 44.87	064° 41.71	291	303
10	14a	2005-09-23	16:22	62° 31.47	070° 52.08	330	344
11	14b	2005-09-23	17:53	62° 29.30	071° 02.42	330	342
12	14c	2005-09-23	19:21	62° 25.74	071° 17.84	324	331
13	14d	2005-09-23	20:48	62° 21.40	071° 39.38	334	343
14	14e	2005-09-23	23:17	62° 16.47	071° 58.70	330	338
15	14e	2005-09-24	01:46	62° 16.11	071° 56.92	330	343
16	14e	2005-09-24	04:15	62° 15.08	071° 52.53	340	342
17	14f	2005-09-24	10:07	62° 13.23	072° 14.98	225	233
18	14g	2005-09-24	11:13	62° 10.90	072° 24.94	179	200
19	15a	2005-09-25	07:54	64° 19.69	078° 05.02	108	115
20	15b	2005-09-25	08:46	64° 16.98	078° 15.09	202	209
21	15c	2005-09-25	09:53	64° 12.91	078° 31.01	261	271
22	15d	2005-09-25	11:24	64° 07.23	078° 52.26	237	245
23	15e	2005-09-25	14:44	64° 01.75	079° 12.88	304	311
24	15e	2005-09-25	16:39	64° 01.42	079° 16.30	303	312
25	15f	2005-09-25	21:54	63° 56.30	079° 33.70	310	325
26	15g	2005-09-25	23:09	63° 51.90	079° 49.16	290	292
27	15h	2005-09-26	00:08	63° 49.25	079° 59.27	211	216
28	CTD1	2005-09-26	04:15	63° 24.18	081° 06.25	61	69
29	CTD2	2005-09-26	05:15	63° 18.73	081° 15.11	112	120
30	CTD3	2005-09-26	06:22	63° 11.27	081° 27.08	173	182
31	CTD4	2005-09-26	07:33	63° 03.64	081° 39.02	216	230
32	16a	2005-09-26	08:27	62° 58.30	081° 47.59	206	220
33	16b	2005-09-26	09:22	62° 55.24	081° 37.94	209	218
34	16c	2005-09-26	10:28	62° 51.15	081° 23.29	198	205
35	16d	2005-09-26	11:59	62° 45.46	081° 03.44	189	198
36	16e	2005-09-26	14:26	62° 38.56	080° 44.78	197	205
37	16e	2005-09-26	17:10	62° 39.41	080° 47.26	209	220
38	16f	2005-09-26	23:48	62° 33.36	080° 24.86	195	205
39	16g	2005-09-27	00:58	62° 28.98	080° 10.42	179	187
40	16h	2005-09-27	01:58	62° 25.86	080° 01.34	160	174
41	17a	2005-09-27	10:49	62° 13.85	079° 08.55	129	140
42	17b	2005-09-27	11:44	62° 11.63	078° 58.11	175	186
43	17c	2005-09-27	13:00	62° 08.07	078° 42.87	147	156
44	17c	2005-09-27	16:38	62° 07.32	078° 47.09	164	176
45	17c	2005-09-27	18:23	62° 08.27	078° 42.86	141	153
46	17d	2005-09-27	19:45	62° 04.86	078° 27.25	60	71
47	17e	2005-09-27	20:53	62° 02.62	078° 17.24	37	47
48	18	2005-09-28	07:12	60° 07.51	079° 09.95	128	140
49	18	2005-09-28	10:27	60° 07.76	079° 07.70	123	136
50	18	2005-09-28	12:25	60° 09.44	079° 07.46	126	140

APPENDIX 2C. Rosette cast locations, sampling times, water depths and corresponding stations or mooring numbers during Leg 2 of 2005 ArcticNet scientific expedition (page 2:3).

Cast number	Station or mooring	Start date UTC	Start time UTC	Latitude (North)	Longitude (West)	Cast depth (m)	Sea bottom depth (m)
51	18	2005-09-28	15:49	60° 10.96	079° 20.78	145	155
52	19a	2005-09-29	05:38	58° 11.08	079° 30.23	95	107
53	19b	2005-09-29	06:58	58° 15.85	079° 06.82	66	75
54	19c	2005-09-29	08:15	58° 20.53	078° 43.39	91	106
55	19d	2005-09-29	09:12	58° 22.78	078° 31.56	93	103
56	19e	2005-09-29	10:16	58° 25.20	078° 19.89	96	106
57	19e	2005-09-29	11:55	58° 25.16	078° 19.94	104	116
58	19e	2005-09-29	18:42	58° 25.14	078° 20.35	102	114
59	20	2005-09-30	06:11	56° 50.40	076° 50.06	112	118
60	AN-03-05	2005-09-30	20:20	55° 17.08	077° 53.93	82	92
61	AN-03-05	2005-10-01	02:04	55° 17.70	077° 54.72	76	86
62	AN-03-05	2005-10-01	03:21	55° 17.72	077° 53.45	75	89
63	AN-03-05	2005-10-01	11:49	55° 17.07	077° 53.75	77	87
64	AN-03-05	2005-10-01	13:57	55° 22.48	078° 06.37	87	98
65	21b	2005-10-02	11:19	54° 41.11	079° 58.84	57	67
66	21a	2005-10-02	12:07	54° 37.93	079° 51.61	39	49
67	21c	2005-10-02	13:34	54° 41.32	080° 07.79	52	60
68	21d	2005-10-02	14:58	54° 42.20	080° 21.10	102	112
69	21e	2005-10-02	22:02	54° 42.94	080° 43.77	91	99
70	21e	2005-10-02	23:52	54° 43.02	080° 43.78	89	100
71	21e	2005-10-03	01:49	54° 43.20	080° 45.12	87	98
72	21f	2005-10-03	04:04	54° 44.80	081° 06.45	58	68
73	21g	2005-10-03	05:28	54° 45.77	081° 28.43	33	43
74	21h	2005-10-03	06:25	54° 46.37	081° 42.85	22	32
75	BI-1	2005-10-04	23:04	55° 25.79	080° 30.43	82	99
76	BI-1	2005-10-05	00:14	55° 25.75	080° 29.24	84	97
77	BI-1	2005-10-05	01:29	55° 25.81	080° 32.18	87	103
78	BI-2	2005-10-06	01:18	56° 45.07	080° 49.75	163	178
79	BI-2	2005-10-06	03:01	56° 43.68	080° 48.56	128	141
80	BI-2	2005-10-06	04:28	56° 43.05	080° 48.44	170	185
81	22	2005-10-06	20:51	58° 23.89	083° 17.49	168	181
82	22	2005-10-06	22:43	58° 23.25	083° 17.35	169	181
83	22	2005-10-07	00:34	58° 22.81	083° 18.53	165	178
84	CTD12	2005-10-07	06:35	57° 33.58	083° 49.16	170	181
85	CTD13	2005-10-07	10:21	56° 51.89	084° 13.23	165	178
86	CTD14	2005-10-07	12:44	56° 27.07	084° 27.12	128	146
87	CTD15	2005-10-07	15:19	56° 01.93	084° 40.99	90	100
88	CTD16	2005-10-07	16:39	55° 52.02	084° 46.29	80	91
89	CTD17	2005-10-07	17:43	55° 44.49	084° 50.40	53	64
90	CTD18	2005-10-07	18:43	55° 37.06	084° 54.34	31	41
91	CTD19	2005-10-07	19:37	55° 31.73	084° 57.04	22	30
92	CTD21	2005-10-08	14:06	58° 18.13	087° 04.22	170	180
93	24	2005-10-09	22:03	57° 21.86	091° 57.29	23	33
94	CTD29	2005-10-10	00:31	57° 26.83	091° 53.43	25	35
95	CTD29	2005-10-10	00:49	57° 26.92	091° 53.34	25	35
96	CTD28	2005-10-10	01:34	57° 30.66	091° 46.93	31	41
97	CTD27	2005-10-10	02:24	57° 34.68	091° 40.35	42	52
98	CTD26	2005-10-10	03:24	57° 40.45	091° 30.40	50	56
99	CTD25	2005-10-10	04:37	57° 48.12	091° 16.73	55	64
100	CTD24	2005-10-10	05:19	57° 43.29	091° 13.51	38	48

APPENDIX 2C. Rosette cast locations, sampling times, water depths and corresponding stations or mooring numbers during Leg 2 of 2005 ArcticNet scientific expedition (page 3:3).

Cast number	Station or mooring	Start date UTC	Start time UTC	Latitude (North)	Longitude (West)	Cast depth (m)	Sea bottom depth (m)
101	CTD23	2005-10-10	05:58	57° 38.39	091° 09.93	30	40
102	CTD22	2005-10-10	06:45	57° 33.44	091° 05.97	20	29
103	MH01-05	2005-10-10	12:00	57° 34.41	091° 37.18	50	60
104	MH01-05	2005-10-10	13:09	57° 34.43	091° 36.72	60	74
105	MH01-05	2005-10-10	16:18	57° 33.65	091° 37.97	52	59
106	CTD30	2005-10-11	02:06	57° 22.86	092° 00.02	11	21
107	CTD31	2005-10-11	06:55	58° 07.50	090° 43.20	70	81
108	CTD32	2005-10-11	11:09	58° 45.23	089° 32.93	85	95
109	23	2005-10-11	16:48	59° 00.68	087° 36.68	40	192
110	23	2005-10-11	17:04	59° 01.20	087° 36.71	179	194
111	23	2005-10-11	19:33	59° 01.70	087° 34.45	185	199
112	23	2005-10-11	21:36	59° 03.00	087° 30.96	188	200
113	23	2005-10-11	23:10	59° 03.57	087° 28.94	188	200
114	AN02-05	2005-10-12	13:37	58° 46.90	091° 31.25	70	80
115	AN02-05	2005-10-12	15:45	58° 46.58	091° 30.77	73	83
116	AN02-05	2005-10-12	17:56	58° 45.64	091° 30.06	73	85
117	AN01-05	2005-10-13	03:52	59° 58.64	091° 57.36	91	104
118	AN01-05	2005-10-13	06:31	59° 59.38	091° 58.13	103	115
119	25	2005-10-13	18:58	59° 02.46	094° 02.46	45	55
120	26	2005-10-16	02:24	60° 26.79	089° 22.29	133	141
121	26	2005-10-16	04:00	60° 26.67	089° 22.00	129	141
122	27	2005-10-16	14:08	61° 03.96	086° 10.89	229	242
123	27	2005-10-16	16:43	61° 02.58	086° 11.24	229	242
124	27	2005-10-16	18:50	61° 02.82	086° 12.39	229	244
125	HS-17	2005-10-18	19:20	61° 06.58	069° 54.33	150	165
126	HS-18	2005-10-21	21:06	60° 23.59	064° 54.55	55	65

APPENDIX 3. SCAMP cast locations, sampling times, water depths and corresponding station numbers during the 2005 ArcticNet scientific expedition

3A. SCAMP logbook for Leg 1 (expedition 0501)

3B. SCAMP logbook for Leg 2 (expedition 0502)

APPENDIX 3.A. Logbook of SCAMP profiles during ArcticNet Leg 1 (page 1:2)

STATION	DNA-02	DNA-15	4	6	CA05-05
LOCALISATION	Baffin Bay	Baffin Bay	Baffin Bay	Victoria Strait	Beaufort Sea
Lat.	78.2944751	77.5631172	74.2654163	69.2080629	71.1406
Long.	-74.4666410	-75.6357623	-91.1614663	-100.7248504	-127.31812
DEPARTURE					
date (TU)	2005-08-19	2005-08-20	2005-08-24	2005-08-27	2005-09-02
time (TU)	21:00	17:00	13:30	13:00	21:30
RETURN					
date (TU)					
time (TU)	23:15	19:15	16:00	15:30	23:55
CONDITIONS					
Wind Dir	350°	0°	290°	120°	205°
Wind speed	6 m/s	8 m/s	6 m/s	7 m/s and increasing	5 m/s
Pa	1005.45	100.86	1001.5	1007.89	1005.07
Rel. Hum.	80%	74%	97%	99%	94%
air temp. (°C)	0.8	1.6	1.2°	1.4°	3.3°
water temp. (°C) (SST)	-0.2°	0.15°	0.89°	1.02°	0.5°
Sea state	Beaufort 2	3 ou 4	3	4	3
Ice (1/10)		3	0	1 small piece	2
clouds (1/8)	8		Heavy fog	fog	1
CTD casts #	28	39	58, 59, 60	63, 64, 65	89, 90, 91
Water depth (m)	643	663	335	62	201
SCAMP 1	19AUG2005_213617	20AUG2005_172446	24AUG2005_142739	27AUG2005_132040	02SEP2005_214048
SCAMP 2	19AUG2005_220438	20AUG2005_175600	24AUG2005_145000	27AUG2005_133407	02SEP2005_220021
SCAMP 3	19AUG2005_223337		24AUG2005_151244	27AUG2005_135735	02SEP2005_222022
SCAMP 4				27AUG2005_140825	02SEP2005_223752
SCAMP 5				27AUG2005_142042	02SEP2005_225851
SCAMP 6				27AUG2005_143135	02SEP2005_231924
SCAMP 7				27AUG2005_144216	
MISCELLANEOUS					
Target depth (m)	100	100	100	30	70
Max # scans	110000	110000	110000	36000	76000
Chrono (min)	15	12 or 15	15	5	12
Start of GPS (UTC)	21:18:25	17:03:07	13:37:02	13:12:25	missing
COMMENTS			Optimum configuration: 3 plexiglass + 2 rings; all of this monted above the drag plate.	All ~ 10 cm/s	Forgot to start the GPS
Person in charge:	Y. Gratton				Calm sea

APPENDIX 3.A. Logbook of SCAMP profiles during ArcticNet Leg 1 (page 2:2)

STATION	10	CA04-05	CA08-05	CA18-05	12
LOCALISATION	Beaufort Sea	Beaufort Sea	Amundsen Gulf	Amundsen Gulf	Amundsen Gulf
Lat.	71.5567499	71.0749930	71.0052931	70.6923223	69.9172068
Long.	-140.0389374	-133.5912503	-125.9148700	-123.1471200	-122.9631043
DEPARTURE					
date (TU)	2005-09-05	2005-09-06	2005-09-09	2005-09-12	2005-09-13
time (TU)	18:45	22:45	14:45	18:30	18:45
RETURN					
date (TU)		2005-09-07			
time (TU)	22:15	1:45	17h00	20:15	21:00
CONDITIONS					
Wind Dir	230°	070°	310°	290°	080°
Wind speed	3 m/s	7 m/s and increasing	8 m/s	2 m/s	1 m/s
Pa	1009.62	30.05 in	1030	1029	1024,8
Rel. Hum.	92%	89%	99%	69%	77%
air temp. (°C)	0.5	-0.9°	-0.2°	1.7°	2.9°
water temp. (°C) (SST	-0.2°	-0.33°	0.60	3.3°	4.33°
Sea state	2		3-4	2	4
Ice (1/10)	6 with a pond	4	2	0	0
clouds (1/8)	3	6	8	2	8
CTD casts #	97, 98, 99	100, 101, 102	109, 110, 111	129, 130, 131	132, 133, 134
Water depth (m)	2500	250	400	540	204
SCAMP 1	05SEP2005_191656	06SEP2005_225640	09SEP2005_153142	12SEP2005_185837	13SEP2005_190230
SCAMP 2	05SEP2005_193659	06SEP2005_232605	09SEP2005_160453	12SEP2005_191613	13SEP2005_191826
SCAMP 3	05SEP2005_195529	06SEP2005_234721		12SEP2005_193146	13SEP2005_193701
SCAMP 4	05SEP2005_201358	07SEP2005_005045		13SEP2005_194529	13SEP2005_195413
SCAMP 5	05SEP2005_203249				13SEP2005_201022
SCAMP 6	05SEP2005_205004				13SEP2005_202631
SCAMP 7	05SEP2005_212657				
MISCELLANEOUS					
Target depth (m)	70	70	80	60	60
Max # scans	7600	7600	102000	63000	63000
Chrono (min)	12	12	15	10	10
Start of GPS (UTC)	19:56:20	22:08:31	14:46:07	18:55:36	18:24:31
COMMENTS	The speed was faster than 12-15 cm/s		The winch broke. Had to manualy wind up the SCAMP	Speed stable at 15cm/s	Still a stable speed at 15cm/s
Person in charge:	Y. Gratton				

APPENDIX 3.B. Logbook of SCAMP profiles during ArcticNet Leg 2 (page 1:2)

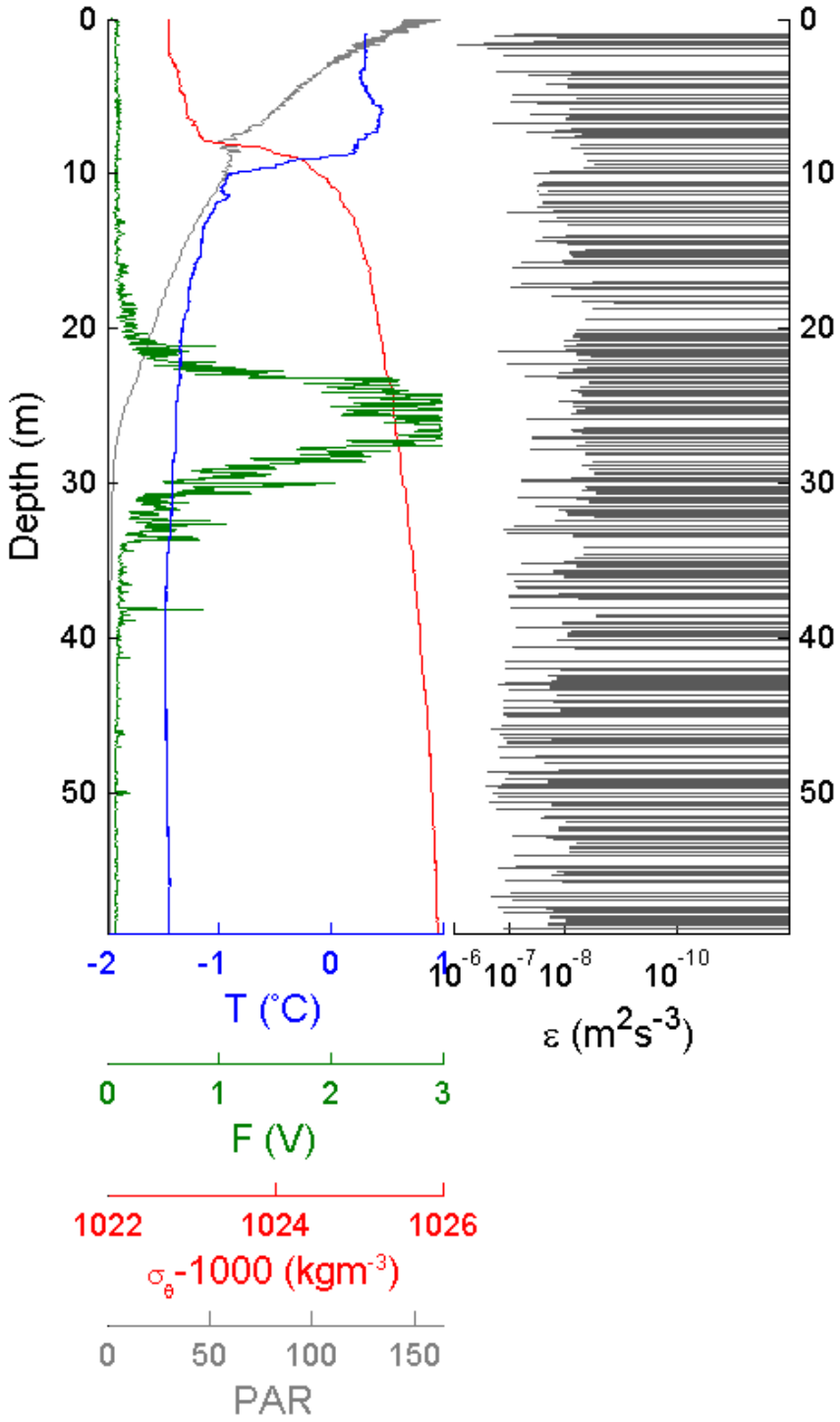
STATION	13 d	15e	16e	17c	19 e
LOCALISATION	Hudson Strait	Southern Foxe Basin	idem		North-eastern Hudson Bay
Lat.	60.8485	64.0251017	62.6395959	62.1334094	58.4187162
Long.	-64.7079	-79.3192614	-80.7531382	-78.8024051	-78.3807565
DEPARTURE					
date (TU)	2005-09-22	2005-09-25	2005-09-26	2005-09-27	2005-09-29
time (TU)	20:00	18:00	15:00	18:00	16:00
RETURN					
date (TU)					
time (TU)	22:00	20:00	16:30	20:15	18:00
CONDITIONS					
Wind Dir	80	70	65	105	North
Wind speed	20 nds	20-25nds	10nds	10nds	20nds
Pa	1009	1002	1005	1011	993
Rel. Hum.	88%	99%	76%	86%	89%
air temp. (°C)	3,2	1,3	3,2	7	3,9
water temp. (°C) (SST)	2,1	1,8	5	6.8	8.5
Sea state	Beaufort 4	Beaufort 6	Beaufort 2-3	1	4
Ice (1/10)	0	0	0	0	0
clouds (1/8)	8	8 brouillard	7	4	5
CTD casts #	8	24	37	45-46	57-58
Water depth (m)	377	350	185	135	90
SCAMP 1	22SEP2005_203212	25sep2005_180308	26sep2005_151339	27sep2005_180758	29sep2005_160543
SCAMP 2	22SEP2005_220438	25sep2005_182037	26sep2005_153410	27sep2005_183425	29sep2005_162503
SCAMP 3	22SEP2005_211600	25sep2005_183759	26sep2005_155420	27sep2005_190327	29sep2005_164243
SCAMP 4		25sep2005_185530			29sep2005_165938
SCAMP 5					
MISCELLANEOUS					
Target depth (m)	100	80	70	70	70
Max # scans	100000	80000	70000	70000	70000
Chrono (min)	8.5	6.3	10	14	8 to 9
Start of GPS (UTC)	20:19:00				
Person in charge:	S. Caplanne				

APPENDIX 3.B. Logbook of SCAMP profiles during ArcticNet Leg 2 (page 2:2)

STATION	Kuujjuarapik A0305	21 e	22	AN02-05	AN01-05	27
LOCALISATION	Kuujjuarapik	James Bay	Central Hudson Bay	South-western Hudson Bay	Mooring station	Central Hudson Bay
Lat.	55.4090577	55.4121047	58.4048277	58.7763512	59.9726164	61.0420507
Long.	-77.8983451	-77.8973580	-83.2867689	-91.5395988	-91.9354821	-86.1987306
DEPARTURE						
date (TU)	2005-10-01	2005-10-02	2005-10-06	2005-10-12	2005-10-13	2005-10-16
time (TU)	12:15	17:45	17:50	13:30	3:30	18:00
RETURN						
date (TU)						
time (TU)	14:30	19:30	20:20	15:30	5:00	20:00
CONDITIONS						
Wind Dir	150	100	45	320	170	340
Wind speed	10nds	15nds	10nds	15nds	7nds	15nds
Pa	998	1012	1024	1010	1016	1010
Rel. Hum.	85%	87%	60%	91%	84	71
air temp. (°C)	9	7.2	0.8	5.3	2.5	-1,3
water temp. (°C) (SST)	9	8	4.6	4.3	4.6	4.2
Sea state	1	3	3 swell	2	1	0
Ice (1/10)	0	0	0	0	0	0
clouds (1/8)	4	100	8	3	0	5
CTD casts #	64	68-69	81	114		124
Water depth (m)	70-80	90	190	80	100	240
SCAMP 1	01oct2005_124839	02oct2005_175956	06oct2005_181606	12oct2005_134206	13oct2005_034204	16oct2005_181127
SCAMP 2	01oct2005_191643	02oct2005_181757	06oct2005_184804	12oct2005_140302	13oct2005_035944	16oct2005_183357
SCAMP 3	01oct2005_193121	02oct2005_183634	06oct2005_191704	12oct2005_141943	13oct2005_041546	16oct2005_185353
SCAMP 4	01oct2005_194541	02oct2005_185736		12oct2005_143759		16oct2005_191549
SCAMP 5				12oct2005_145546		
MISCELLANEOUS						
Target depth (m)	40	60	100	60	80	90
Max # scans	80000	60000	100000	60000	80000	90 000
Chrono (min)	6 to 7	10	16	10	12	15
Start of GPS (UTC)						
Person in charge:	S. Caplanne					

APPENDIX 4. Example of SCAMP data

APPENDIX 4. SCAMP data profile. The data set is from profile #142739 recorded on station 4 during leg 0501. The blue line represented the temperature (^{o}C), the green one is fluorescence (volts), the red one is density (kg m^{-3}), and finally the black one is the turbulent kinetic energy dissipation (m^{2} s^{-3}).



APPENDIX 5. Sections of salinity and potential temperature for ArcticNet expedition 0501 (Leg 1).

The same color scale is used for all sections. For the West to East sections, Canada is on the left and Greenland is on the right.

5.1. Section L1 in northern Baffin Bay

5.2. Section L2 in northern Baffin Bay

5.3. Section L3 in northern Baffin Bay

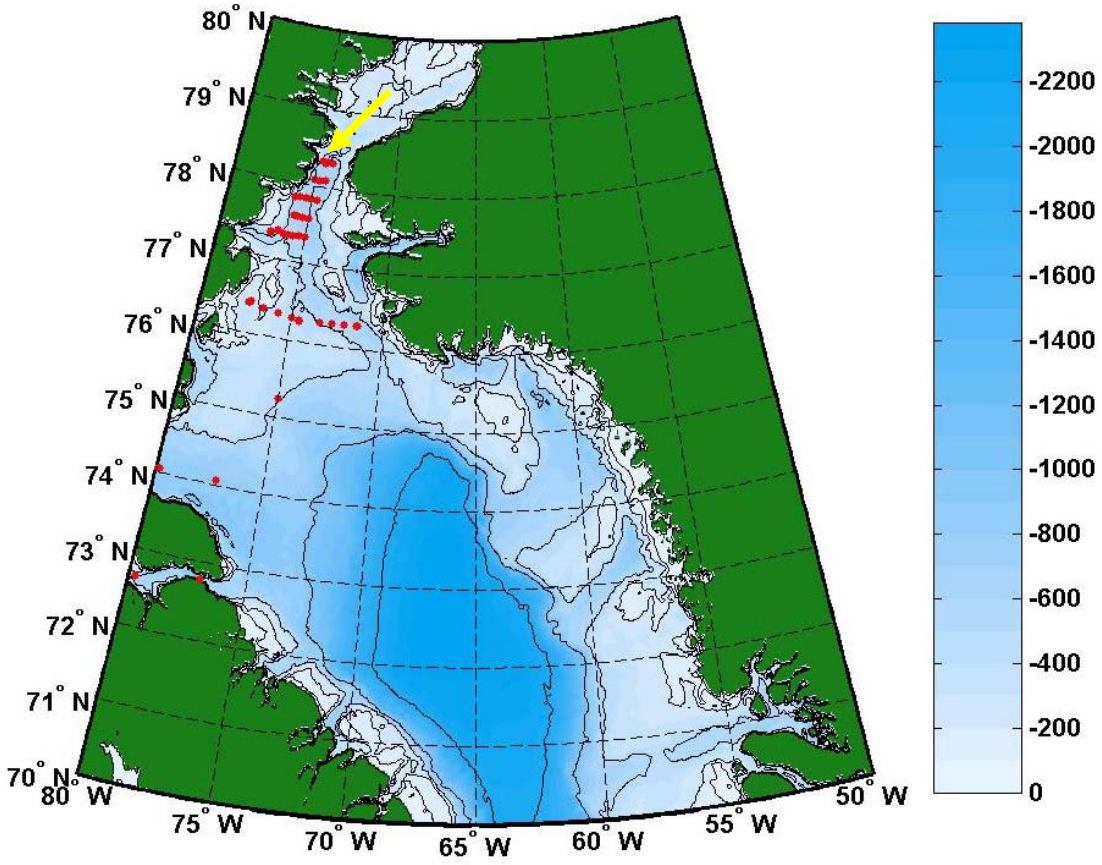
5.4. Section L4 in northern Baffin Bay

5.5. Section L5 in northern Baffin Bay

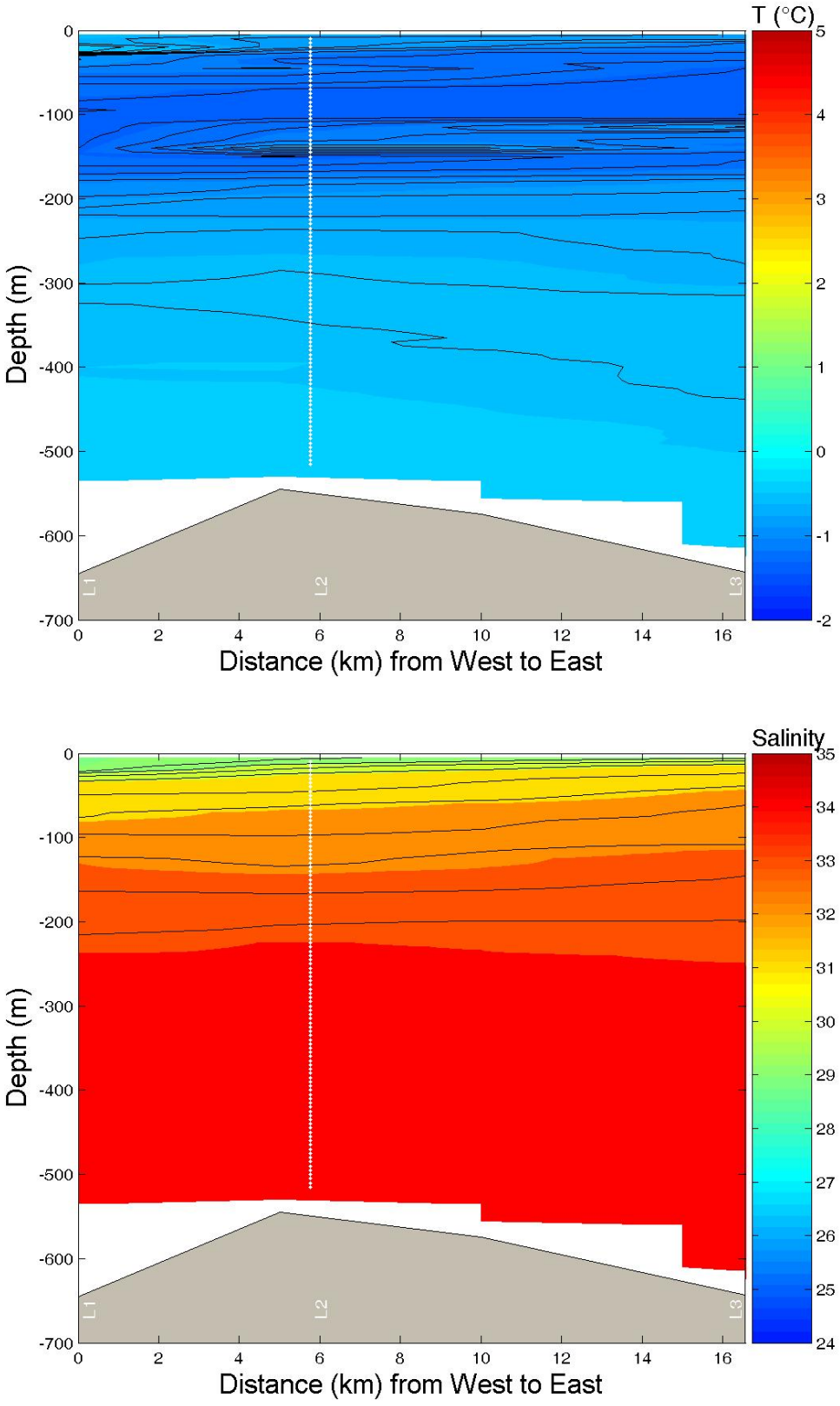
5.6. Section NOW S5 in northern Baffin Bay

5.7. Section Beaufort S400 south in Beaufort Sea

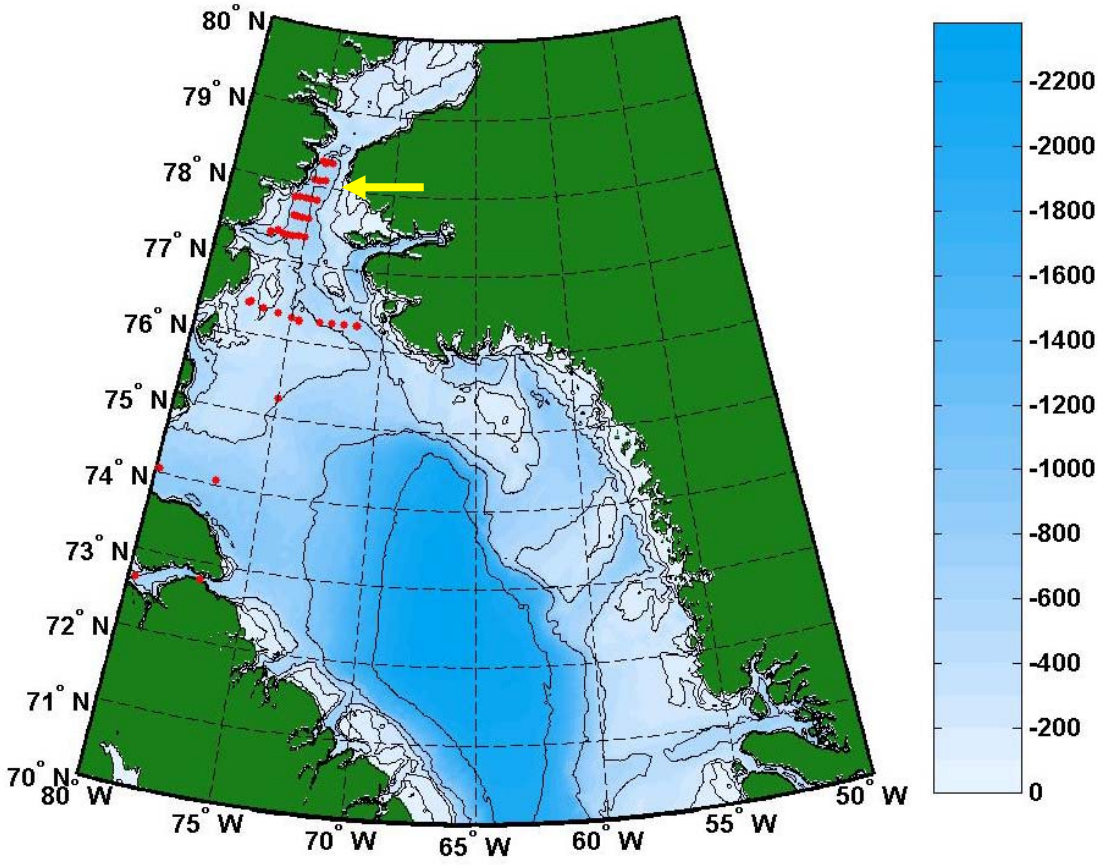
5.8. Section Beaufort S400 north in Beaufort Sea



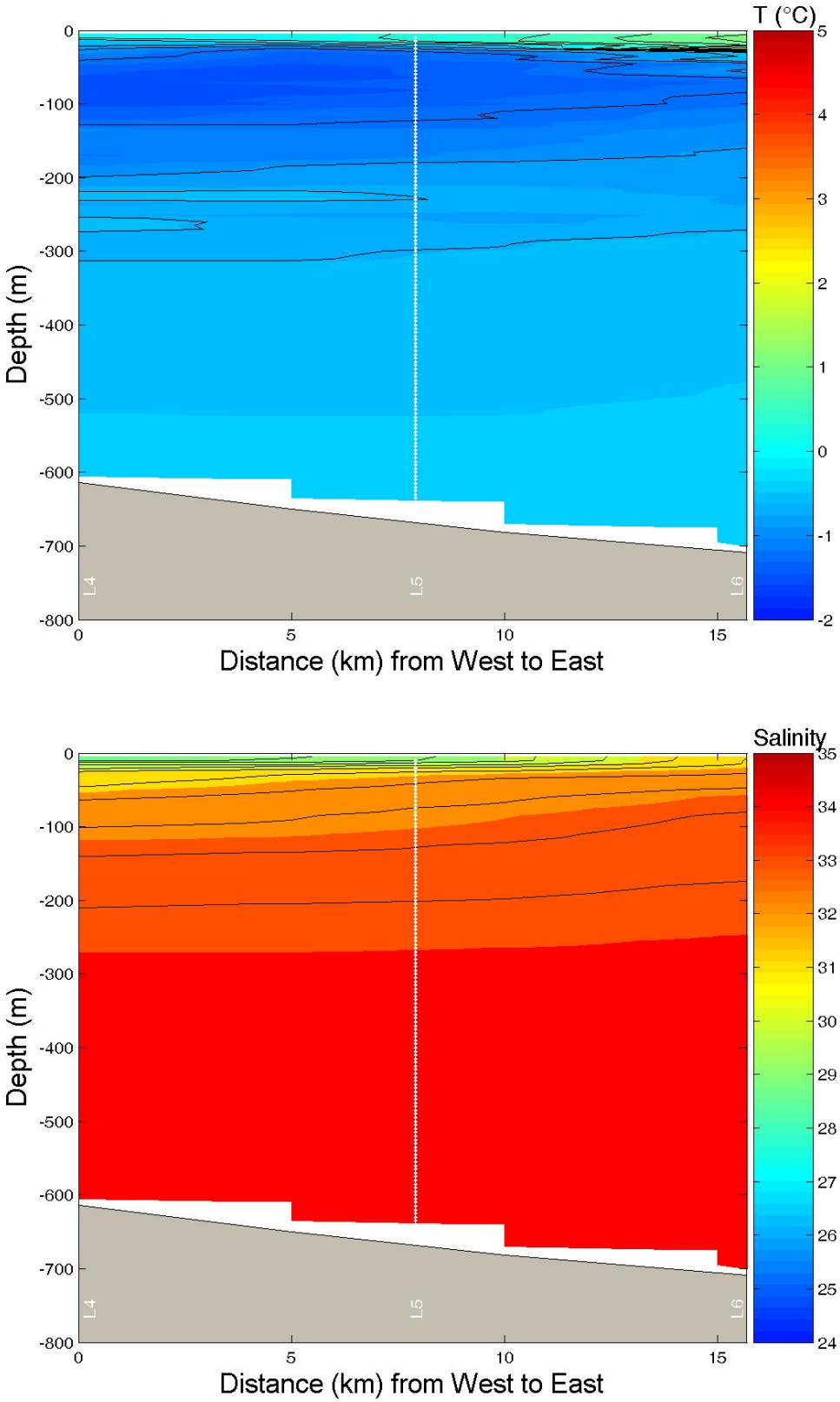
APPENDIX 5.1.A. The yellow arrow identifies the location of section L1 in northern Baffin Bay. This section is contoured on the next page.



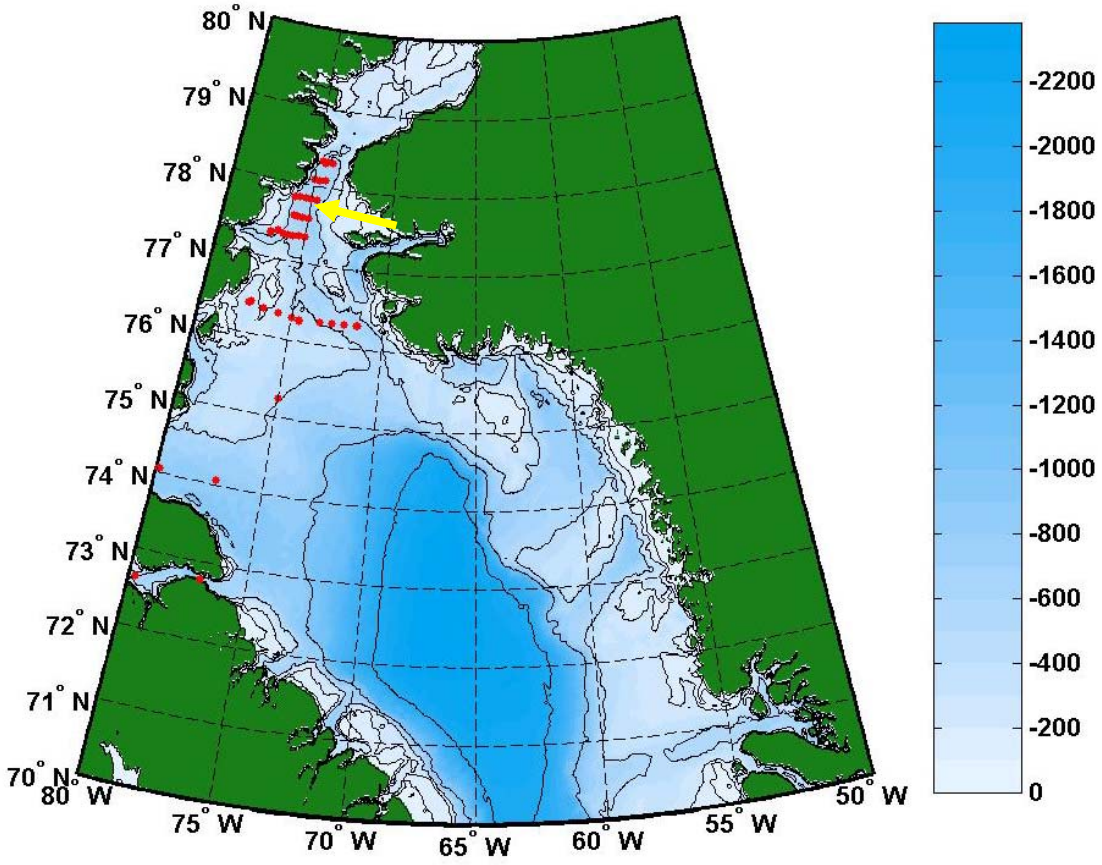
APPENDIX 5.1.B. Salinity and potential temperature along section L1. The western sites are on the left and the eastern sites are on the right.



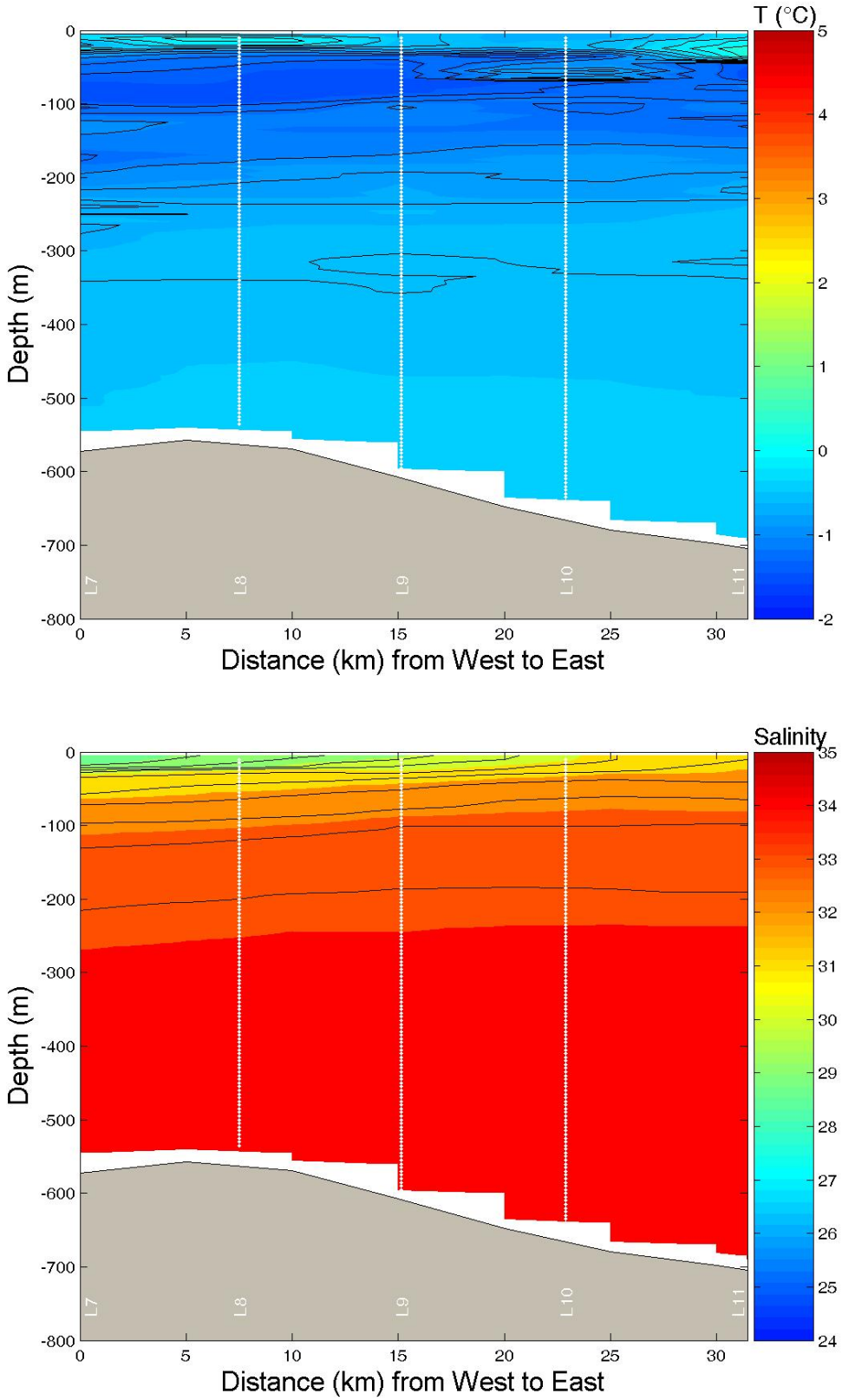
APPENDIX 5.2.A. The yellow arrow identifies the location of section L2 in northern Baffin Bay. This section is contoured on the next page.



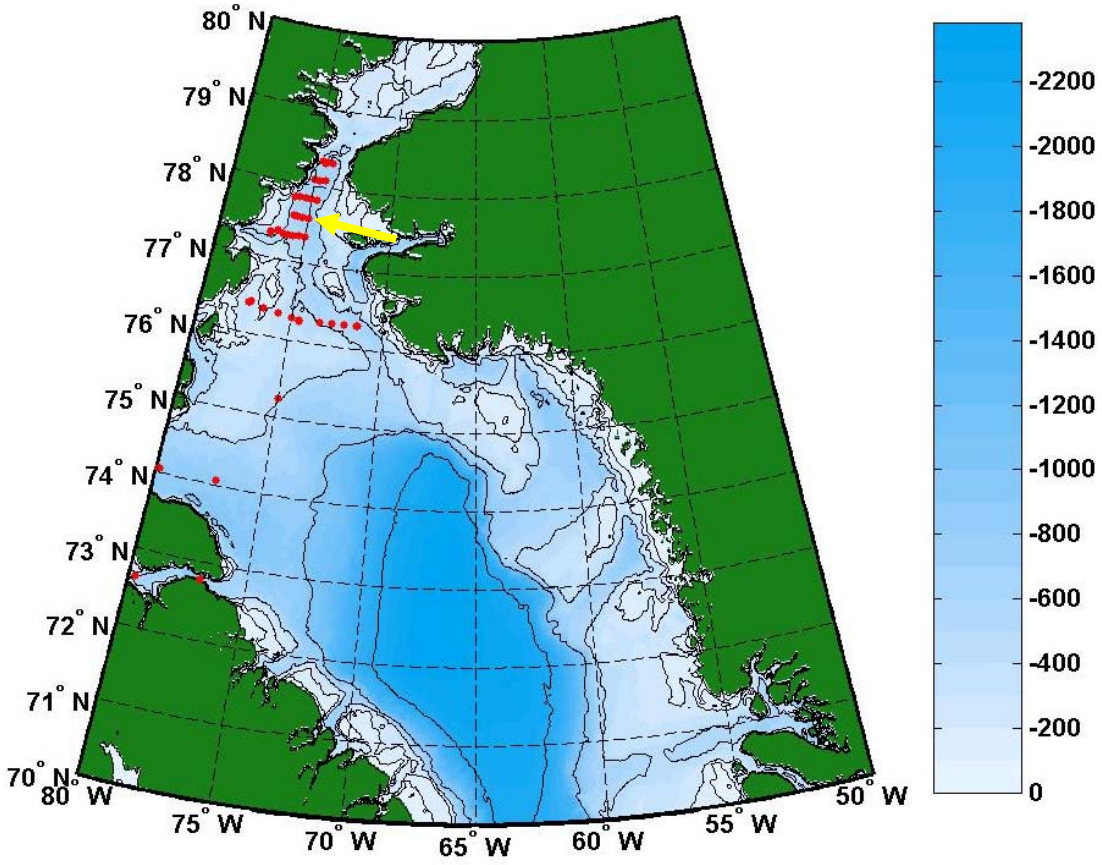
APPENDIX 5.2.B. Salinity and potential temperature along section L2. The western sites are on the left and the eastern sites are on the right.



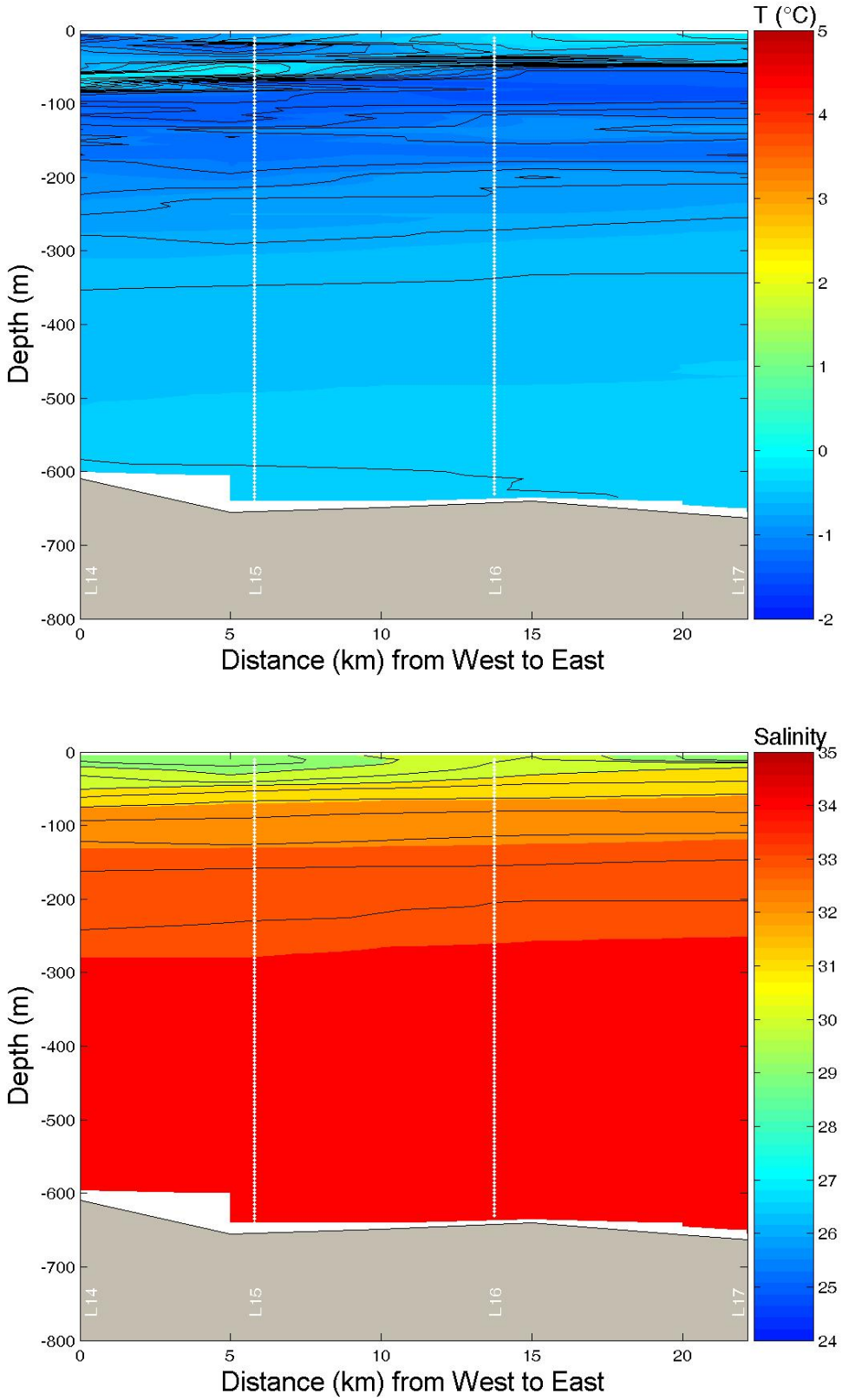
APPENDIX 5.3.A. The yellow arrow identifies the location of section L3 in northern Baffin Bay. This section is contoured on the next page.



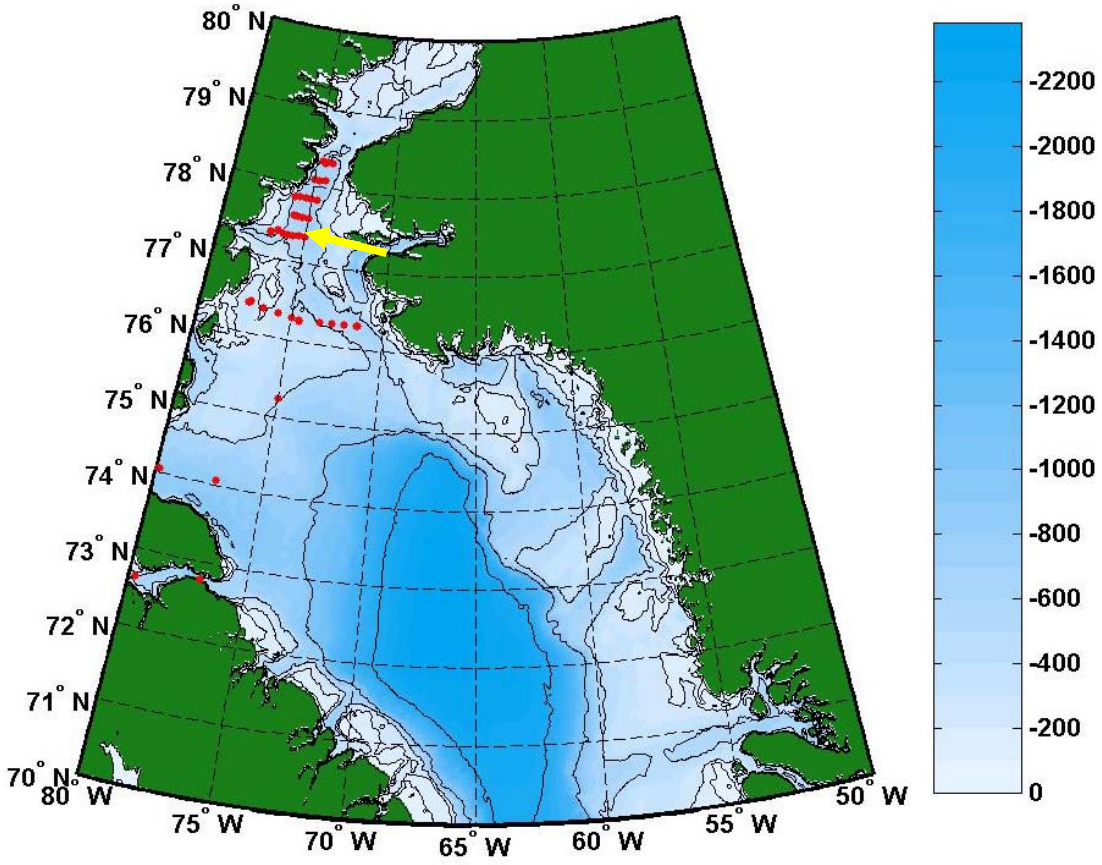
APPENDIX 5.3.B. Salinity and potential temperature along section L3. The western sites are on the left and the eastern sites are on the right.



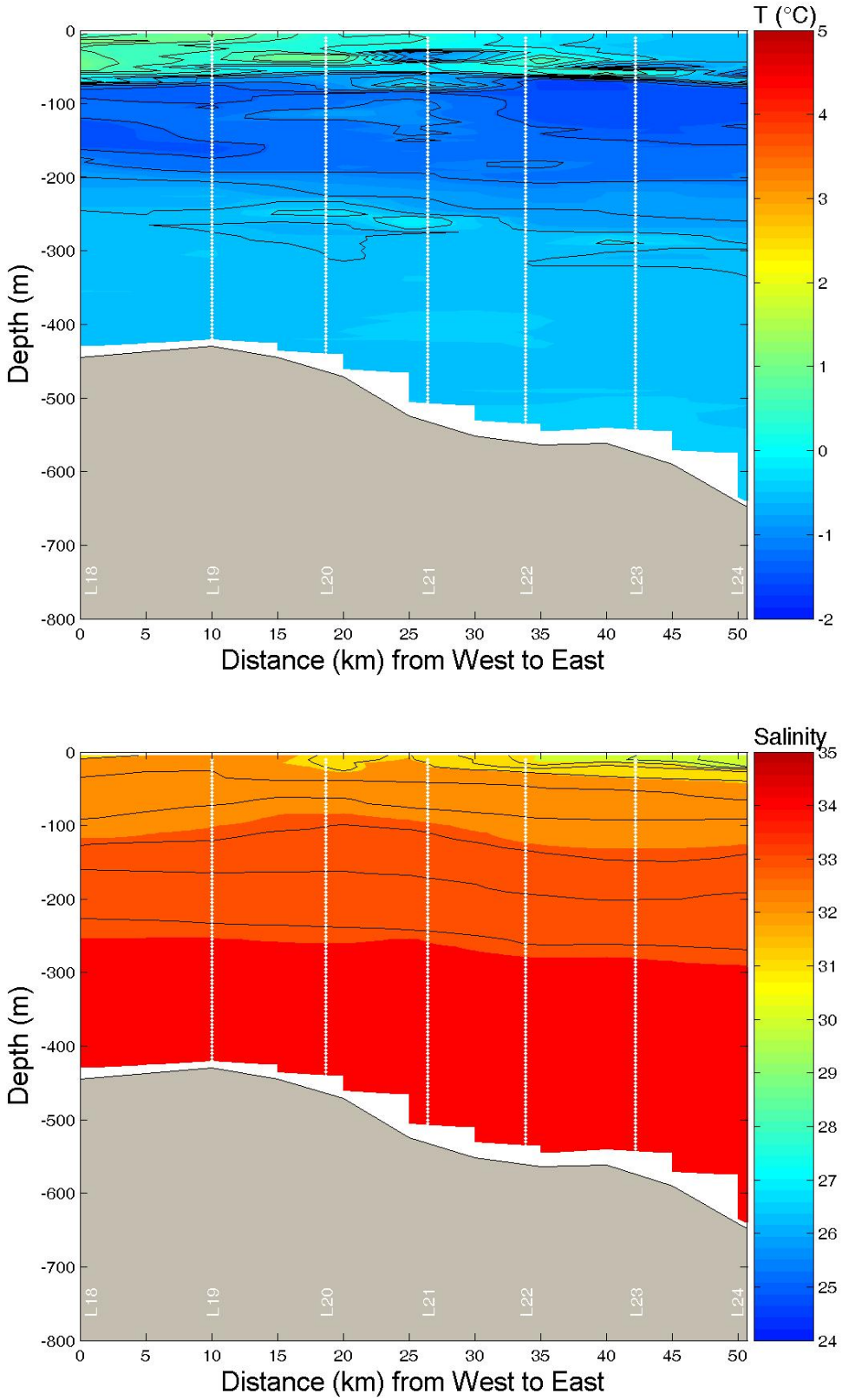
APPENDIX 5.4.A. Location of section L4 in northern Baffin Bay. The yellow arrow identifies the section contoured on the next page.



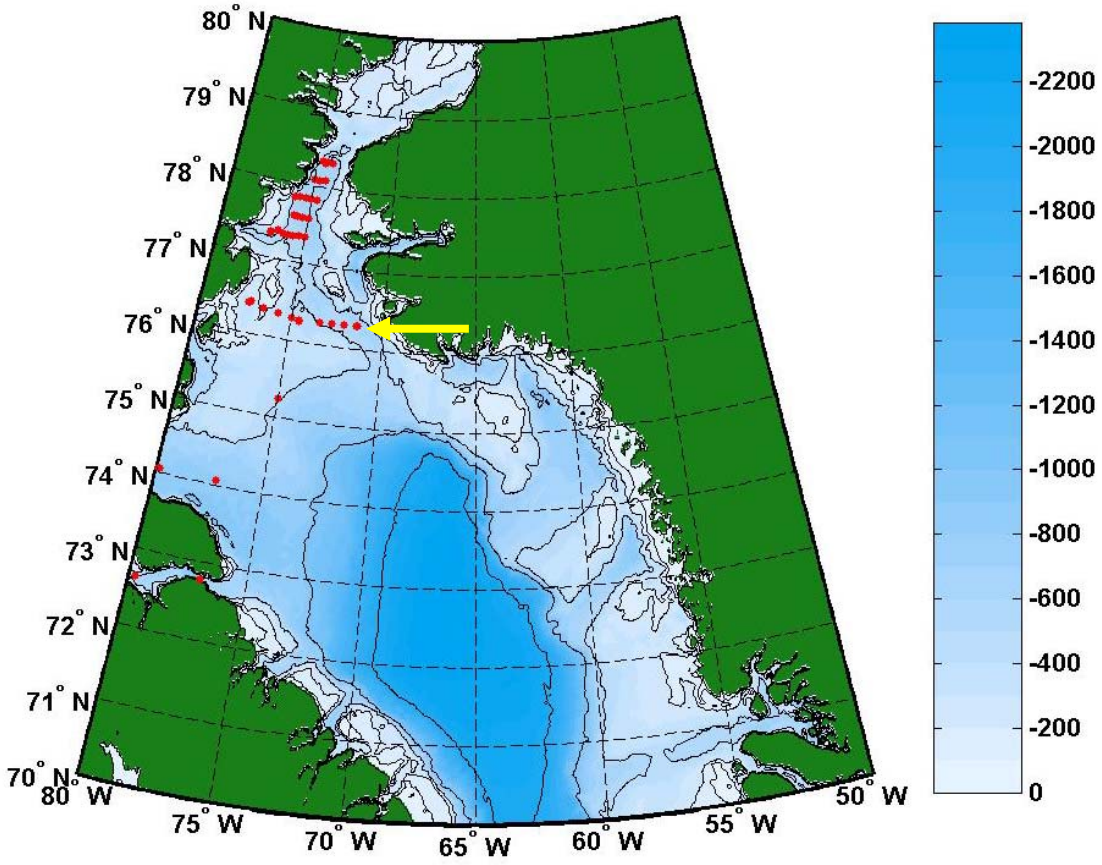
APPENDIX 5.4.B. Salinity and potential temperature along section L4. The western sites are on the left and the eastern sites are on the right.



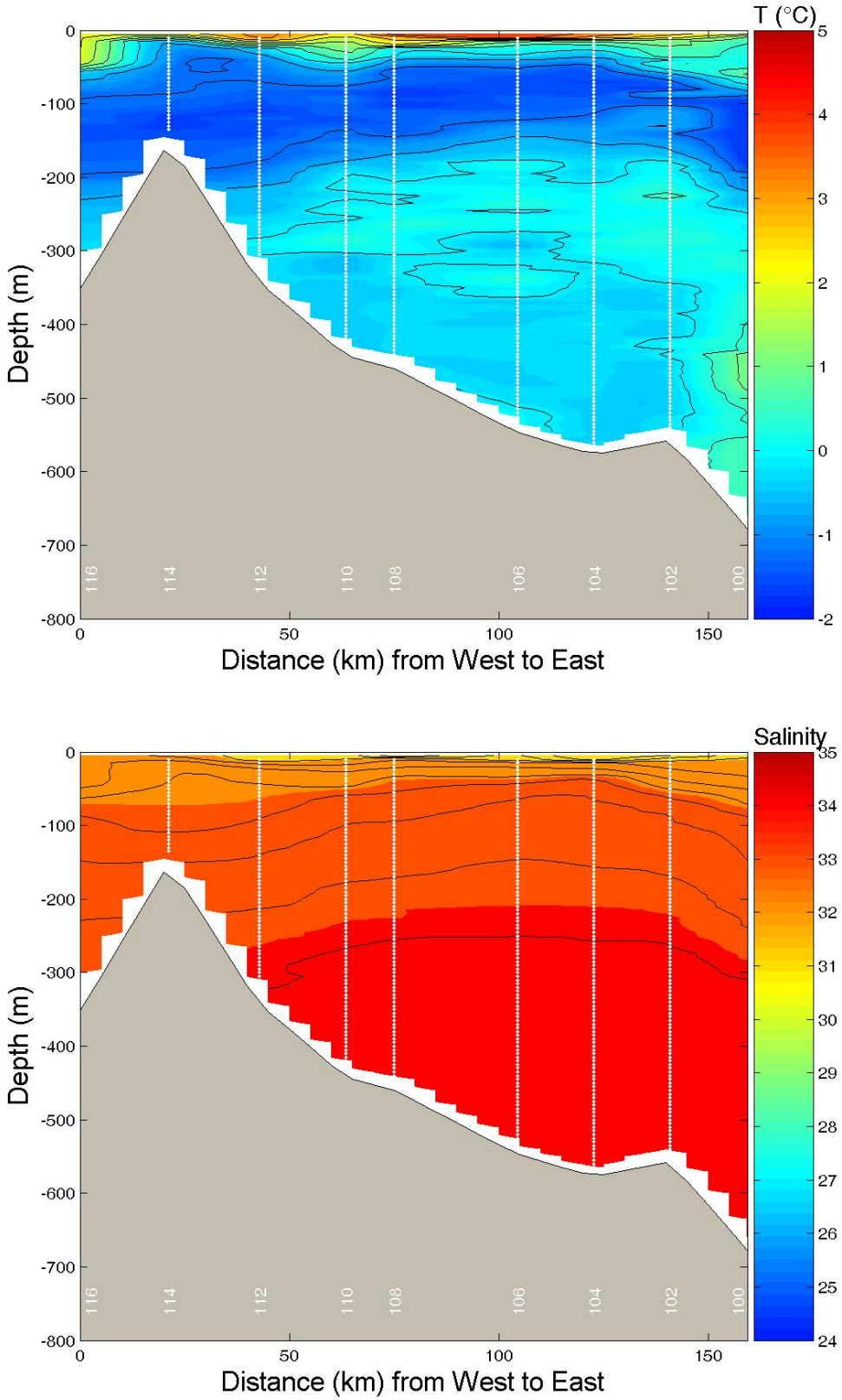
APPENDIX 5.5.A. The yellow arrow identifies the location of section L5 in northern Baffin Bay. This section is contoured on the next page.



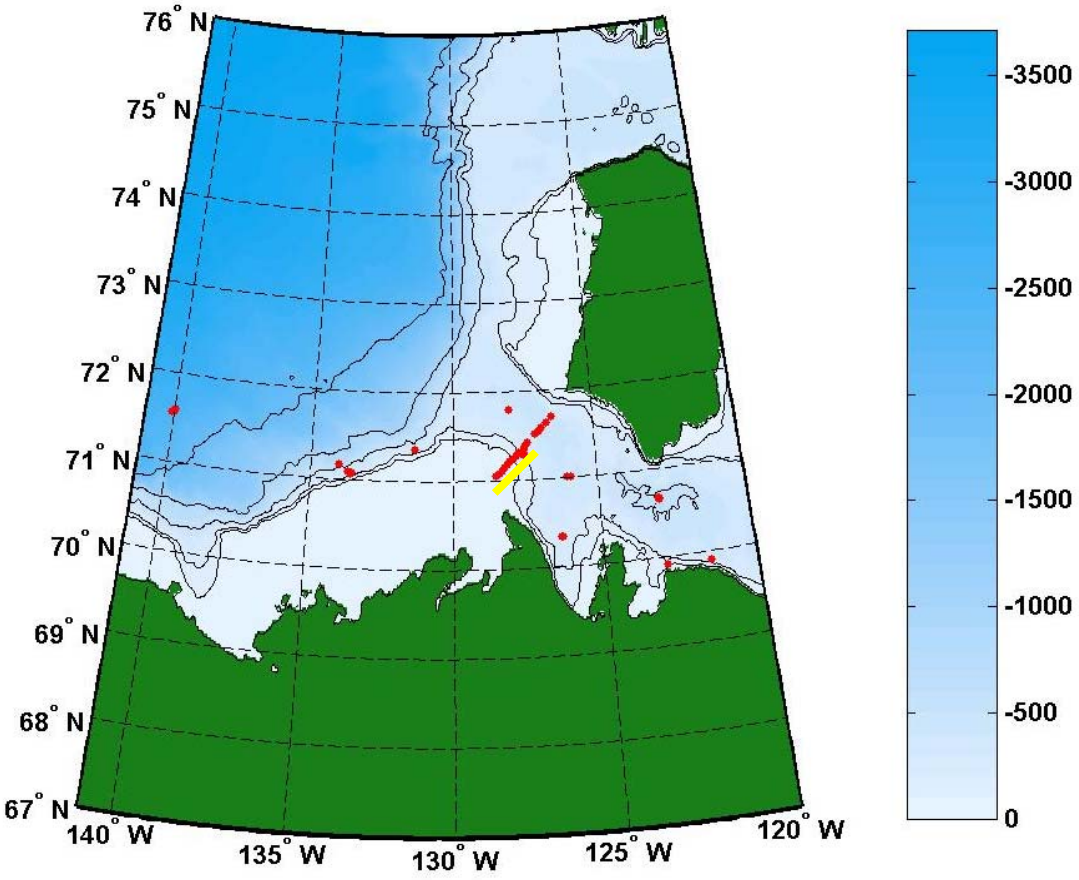
APPENDIX 5.5.B. Salinity and potential temperature along section L5. The western sites are on the left and the eastern sites are on the right.



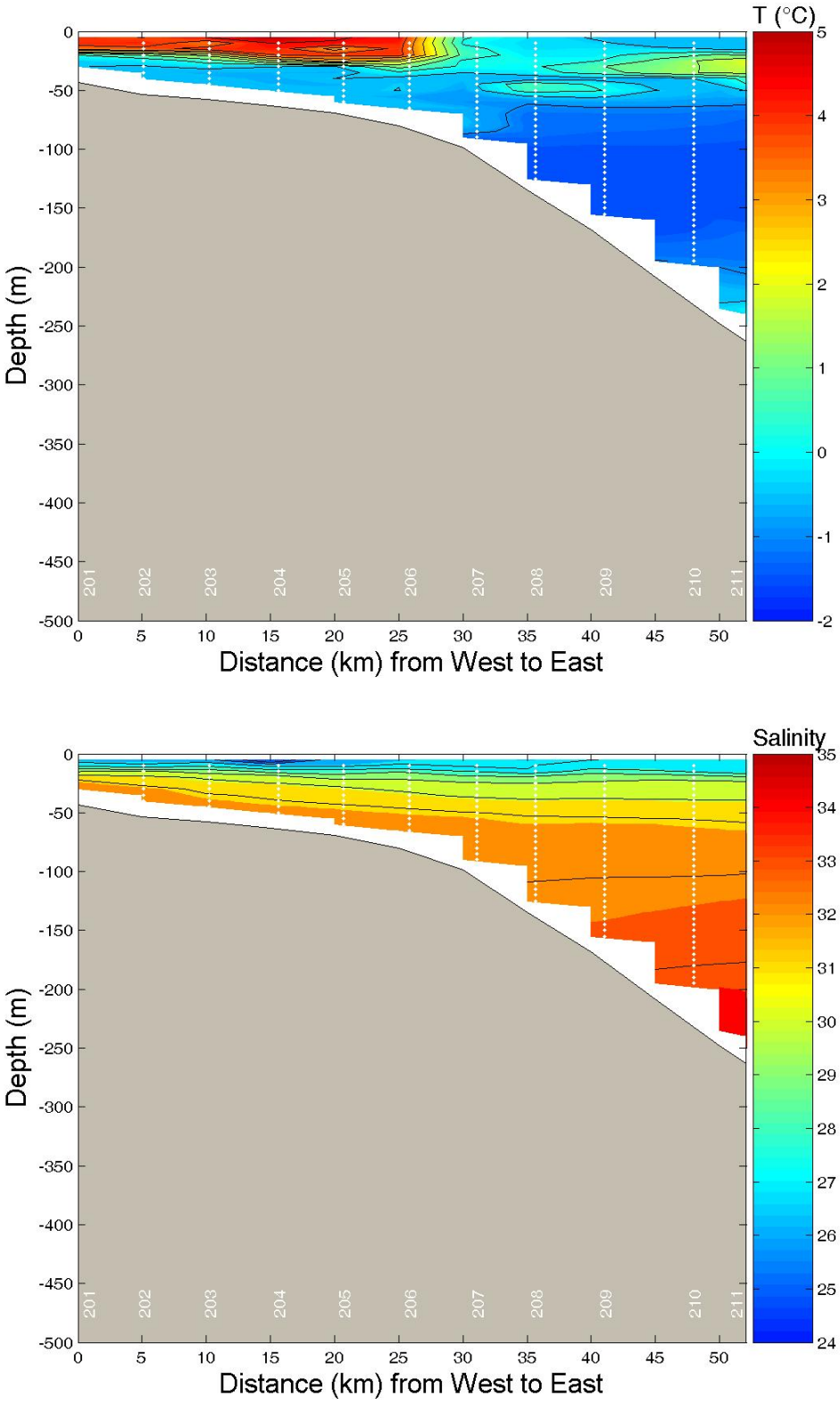
APPENDIX 5.6.A. The yellow arrow identifies the location of section NOW S5 in northern Baffin Bay. This section is contoured on the next page.



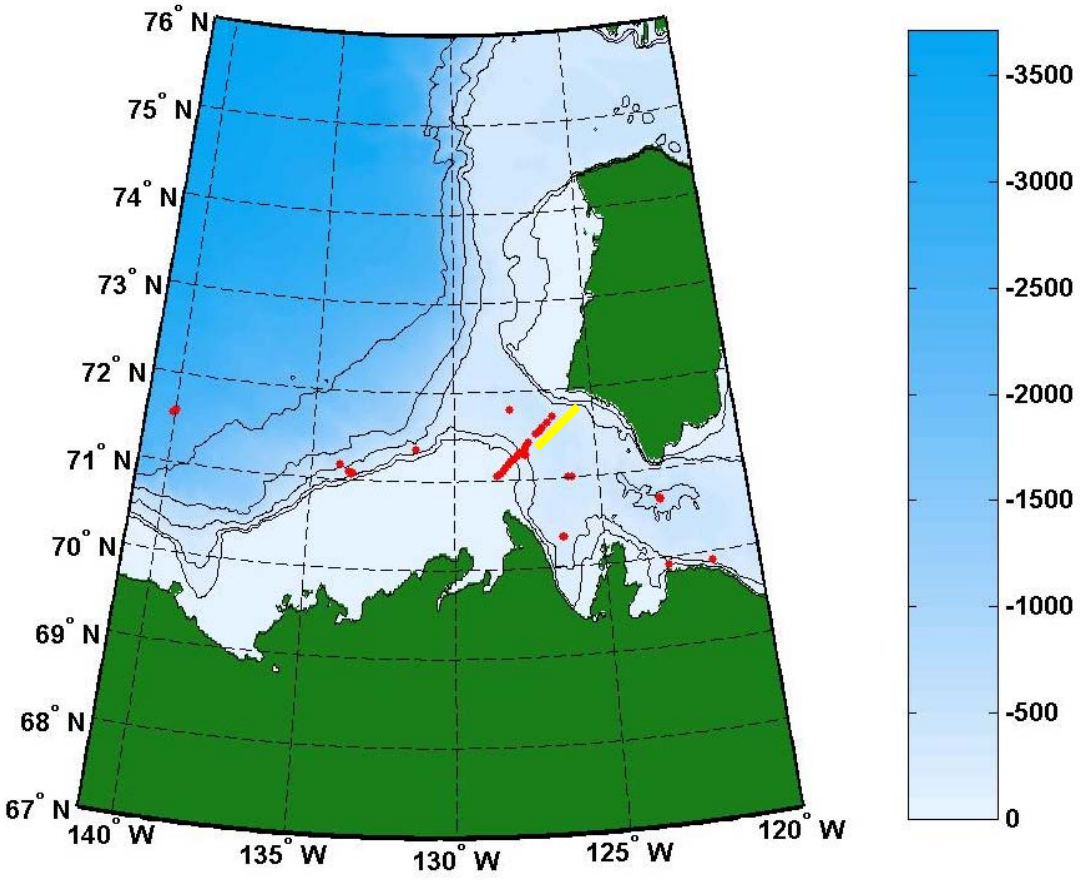
APPENDIX 5.6.B. Salinity and potential temperature along section NOW S5. The western sites are on the left and the eastern sites are on the right.



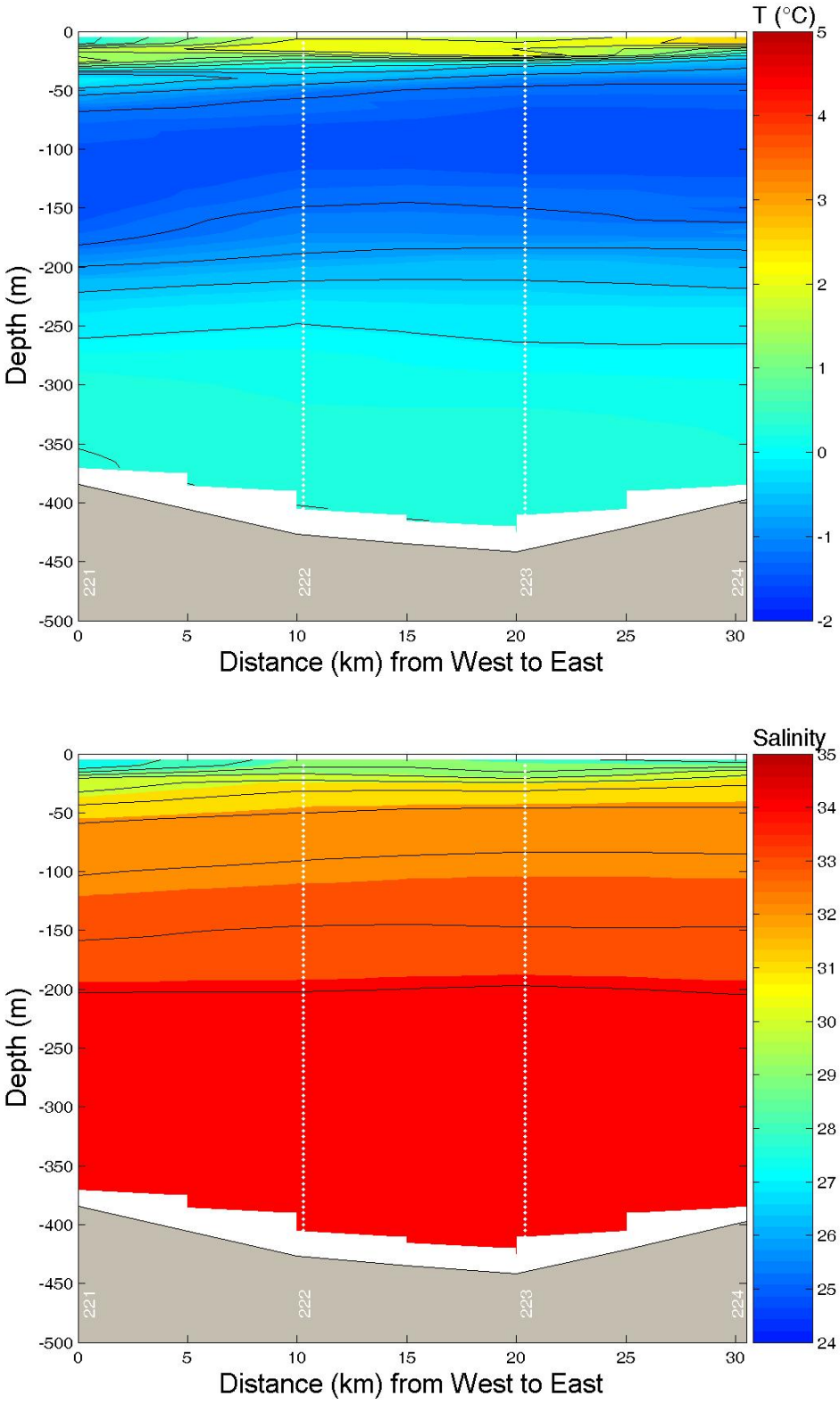
APPENDIX 5.7.A. The yellow line identifies the location of section Beaufort S400 south in Beaufort Sea. This section is contoured on the next page.



APPENDIX 5.7.B. Salinity and potential temperature along section Beaufort S400 south. The south-western sites are on the left and the north-eastern sites are on the right.



APPENDIX 5.8.A. The yellow line identifies the location of section Beaufort S400 north in Beaufort Sea. This section is contoured on the next page.



APPENDIX 5.8.B. Salinity and potential temperature along section Beaufort S400 north. The south-western sites are on the left and the north-eastern sites are on the right.

APPENDIX 6. Contours of salinity and potential temperature for the different sections of ArcticNet expedition 0502 (Leg 2).

The same color scale is used for all sections. For West to East sections, West is on the left and East is on the right. For South to North sections, South is on the left and North is on the right.

6.1. Section 13 in Hudson Strait

6.2. Section 14 in Hudson Strait

6.3. Section 15 across Foxe Channel

6.4. Section 15-16 across Evans Strait

6.5. Section 16 in Hudson Bay

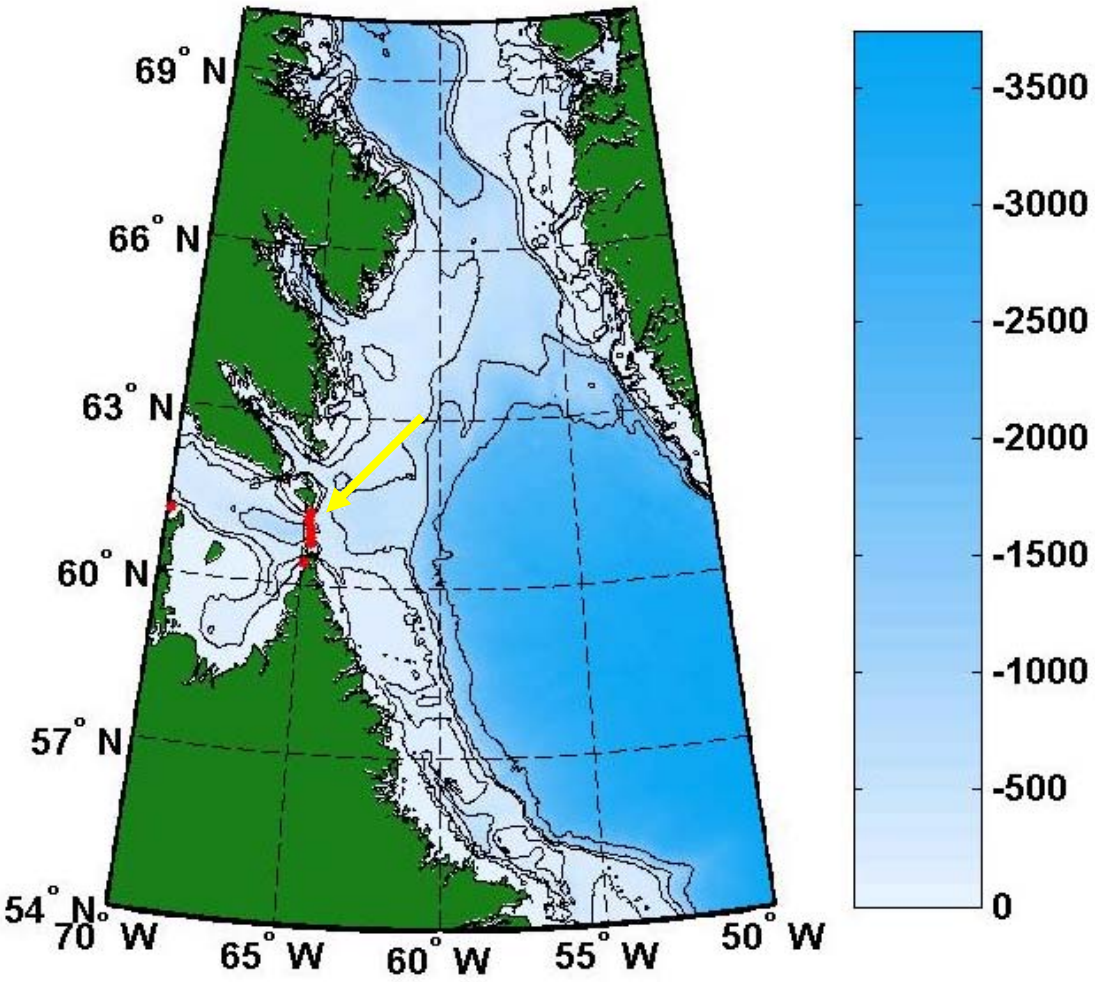
6.6. Section 17 in Hudson Bay

6.7. Section 19 in Hudson Bay

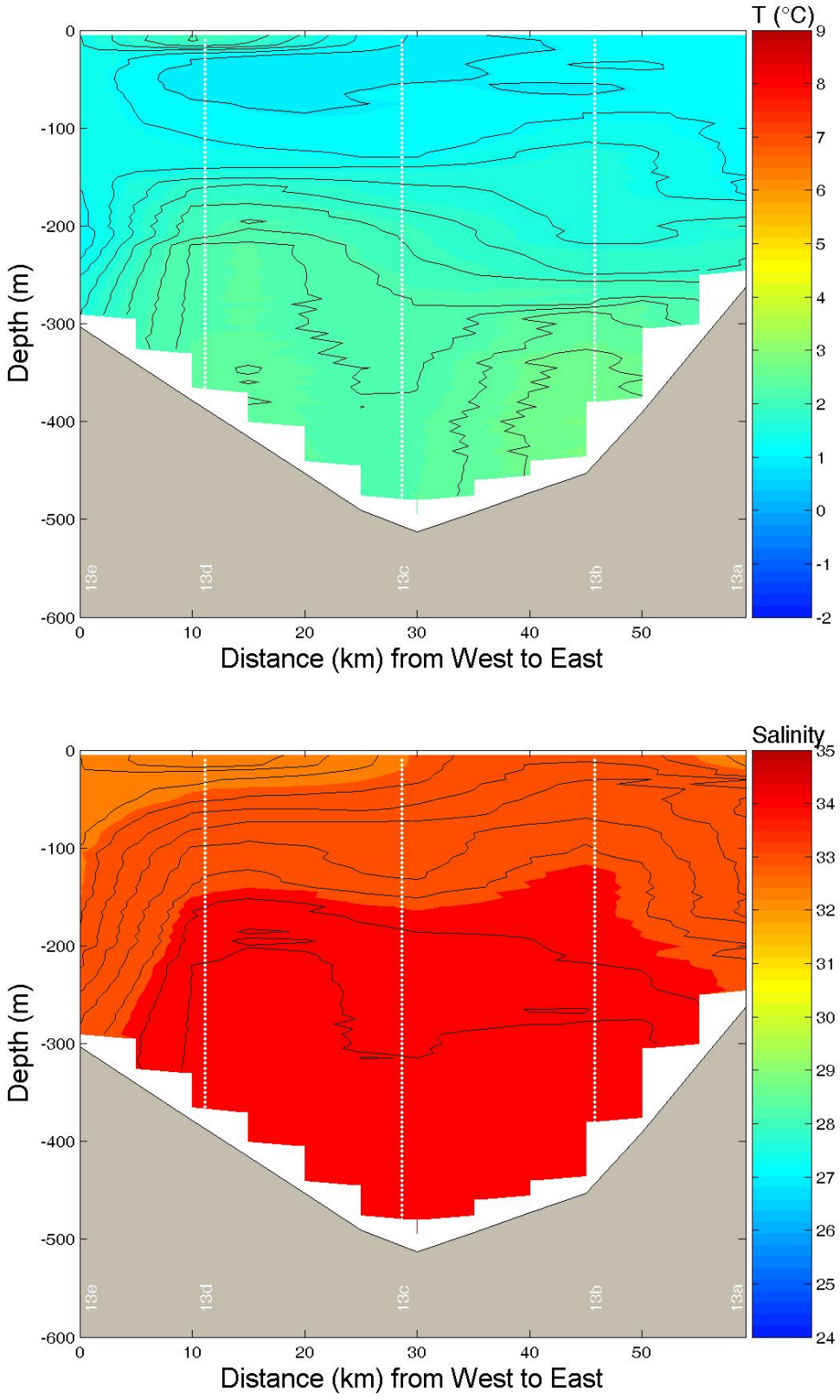
6.8. Section 21 at the mouth of James Bay

6.9. Section Winisk River in Hudson Bay

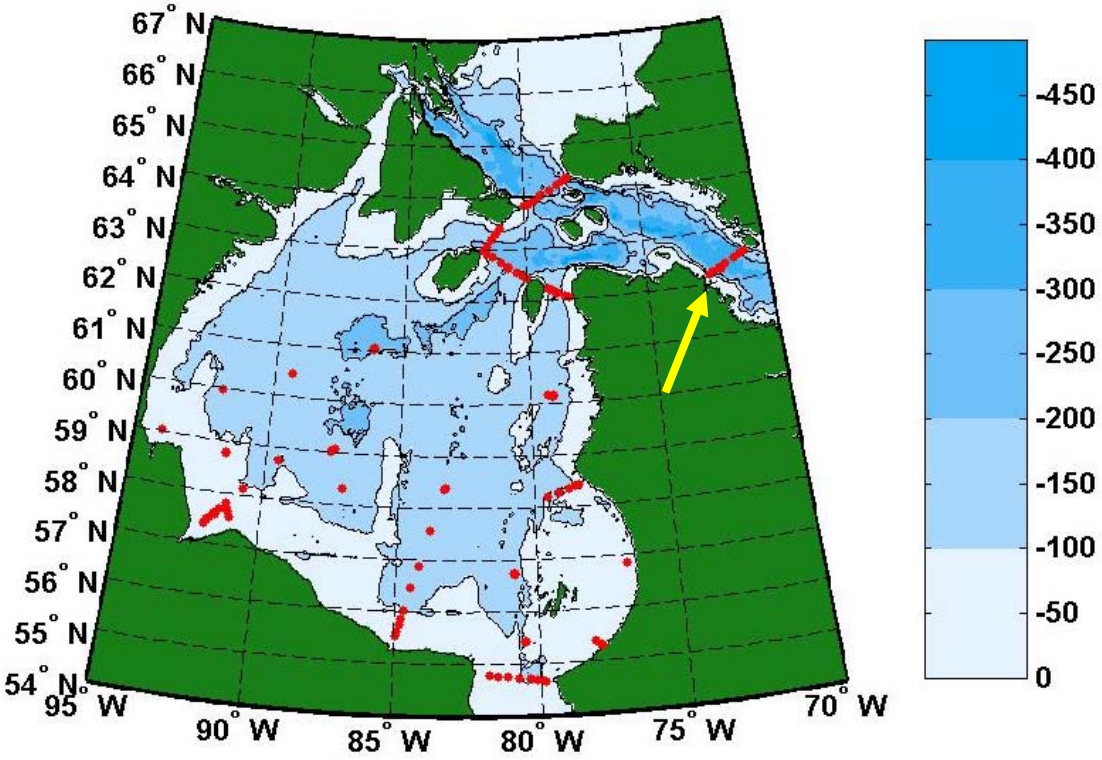
6.10. Section Nelson River in Hudson Bay



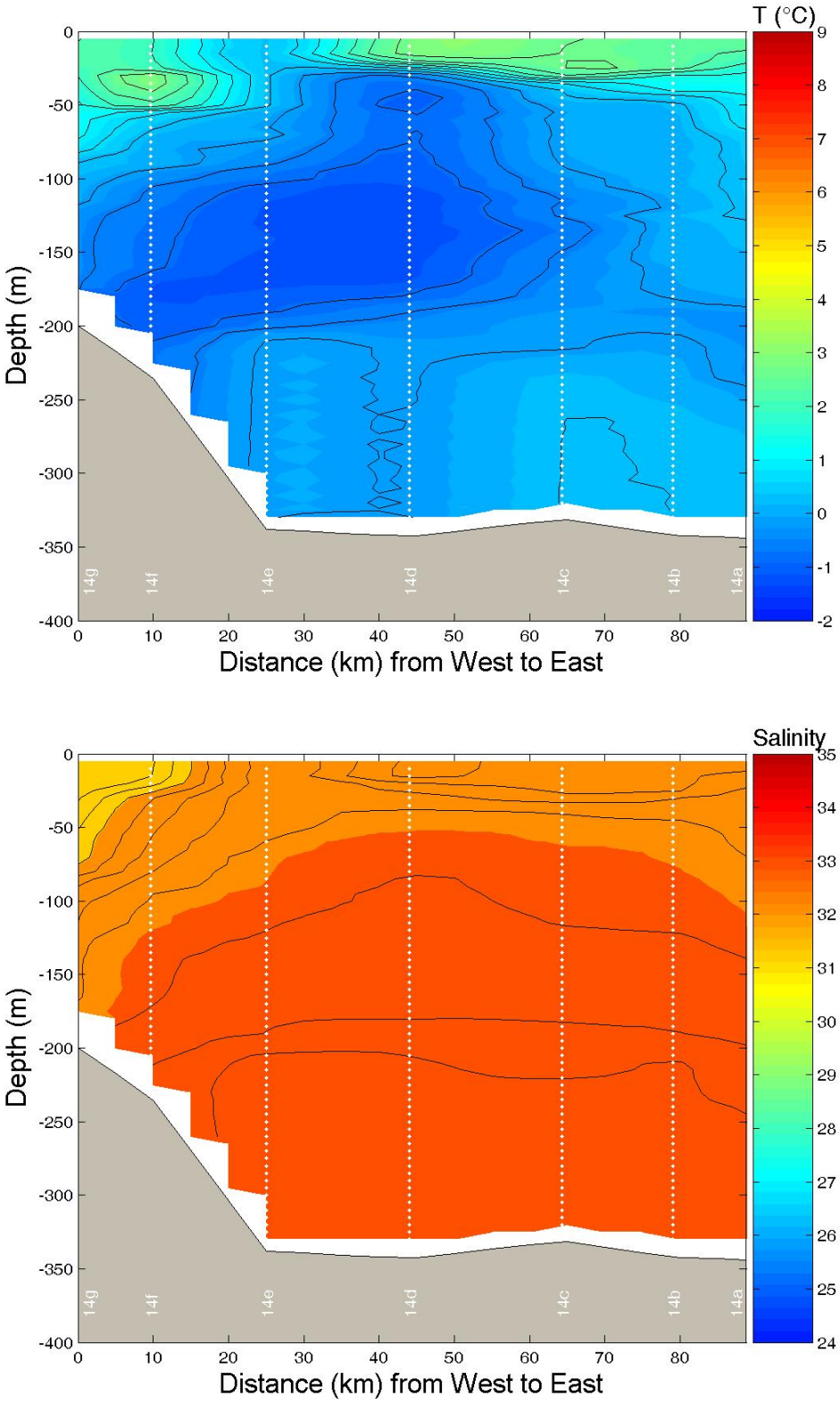
APPENDIX 6.1.A. The yellow arrow identifies the location of section 13 in Hudson Strait. This section is contoured on the next page.



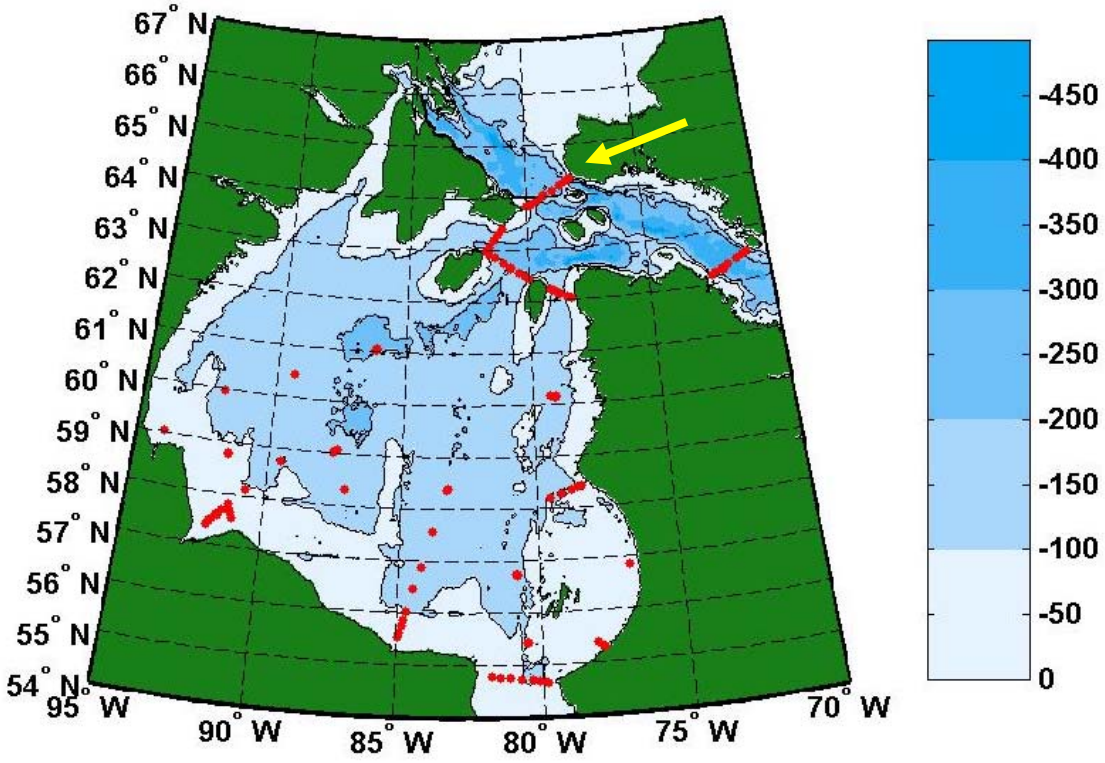
APPENDIX 6.1.B. Salinity and potential temperature along section 13. The southern sites are on the left and the northern sites are on the right.



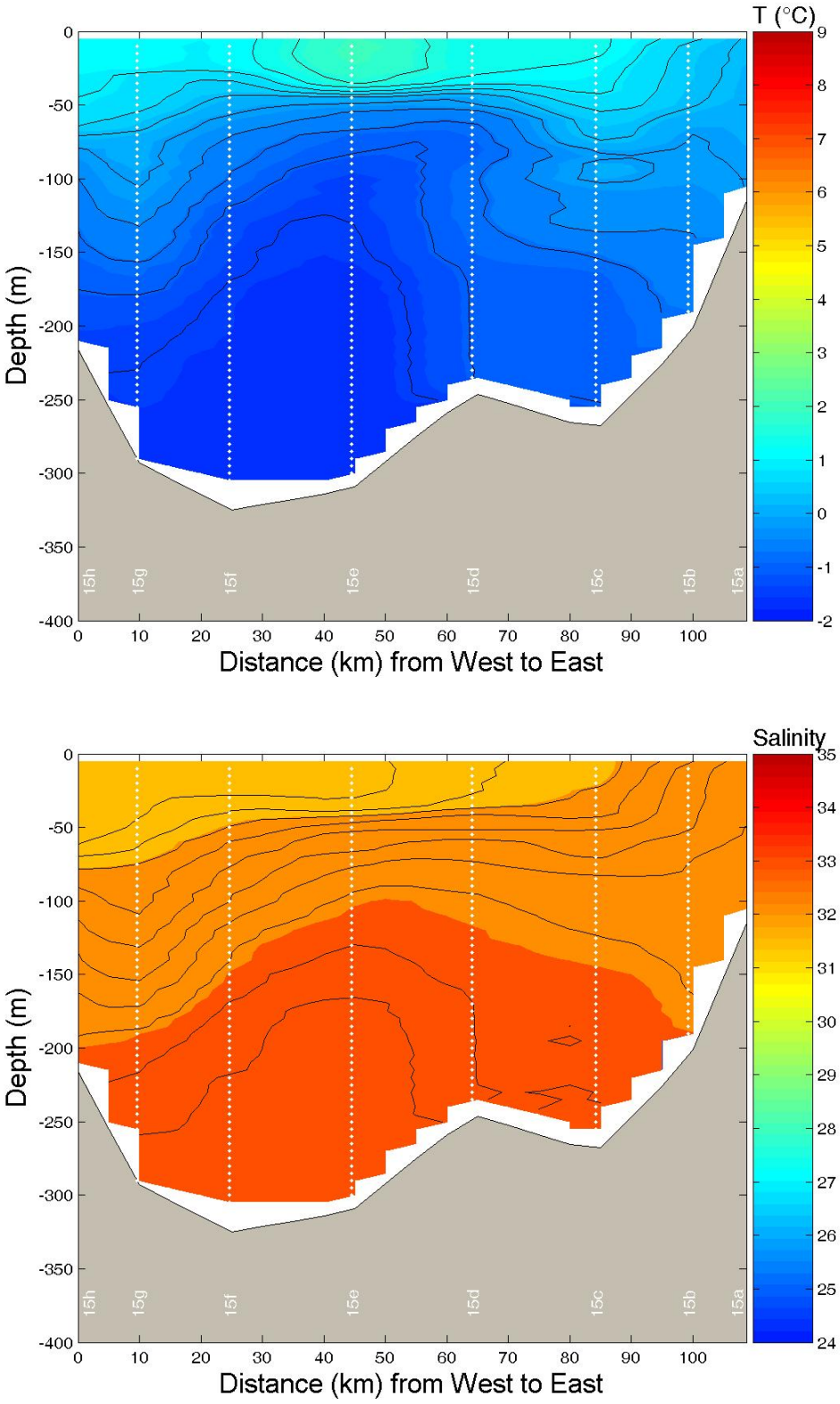
APPENDIX 6.2.A. The yellow arrow identifies the location of section 14 in Hudson Strait. This section is contoured on the next page.



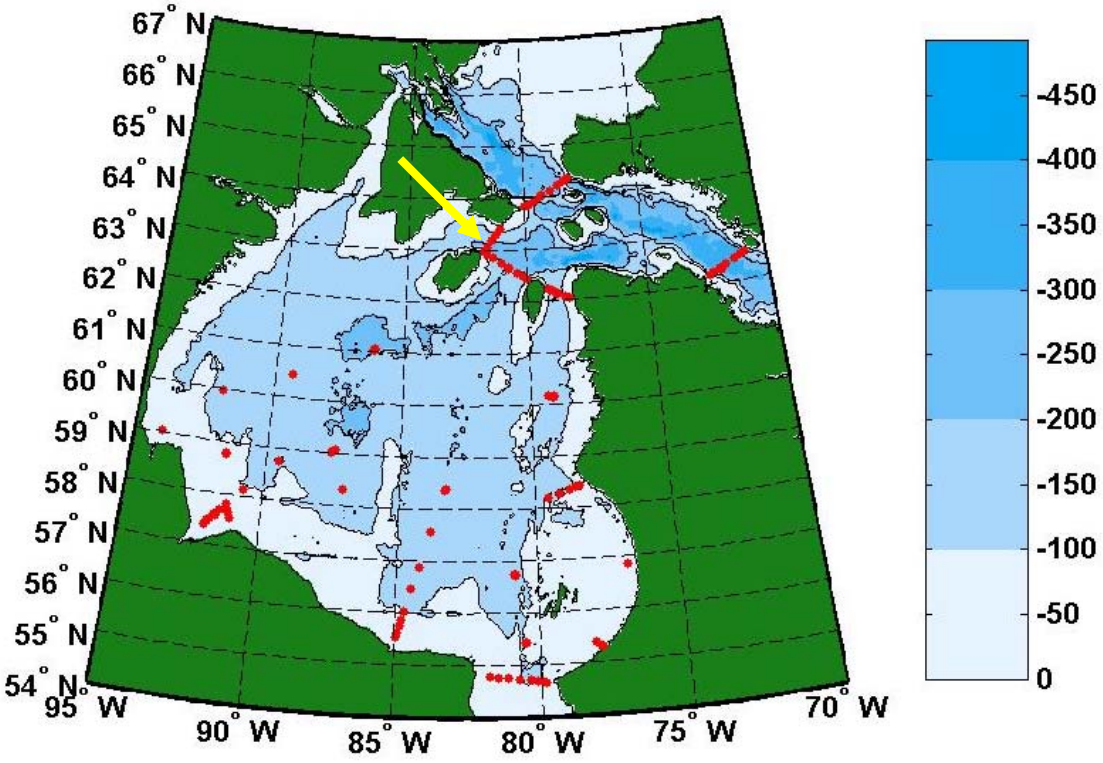
APPENDIX 6.2.B. Salinity and potential temperature along section 14. The south-western sites are on the left and the north-eastern sites are on the right.



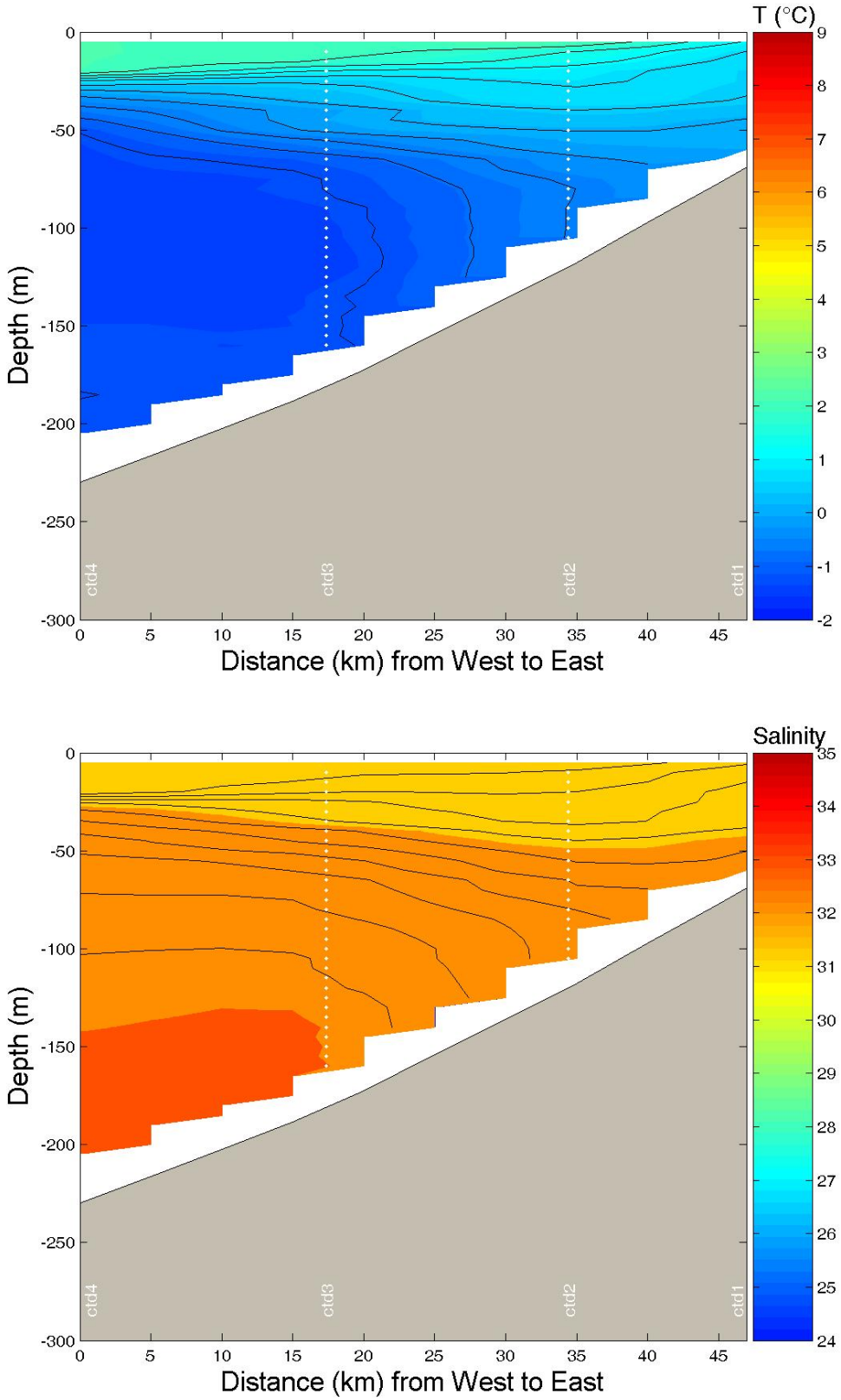
APPENDIX 6.3.A. The yellow arrow identifies the location of section 15 across Foxe Channel. This section is contoured on the next page.



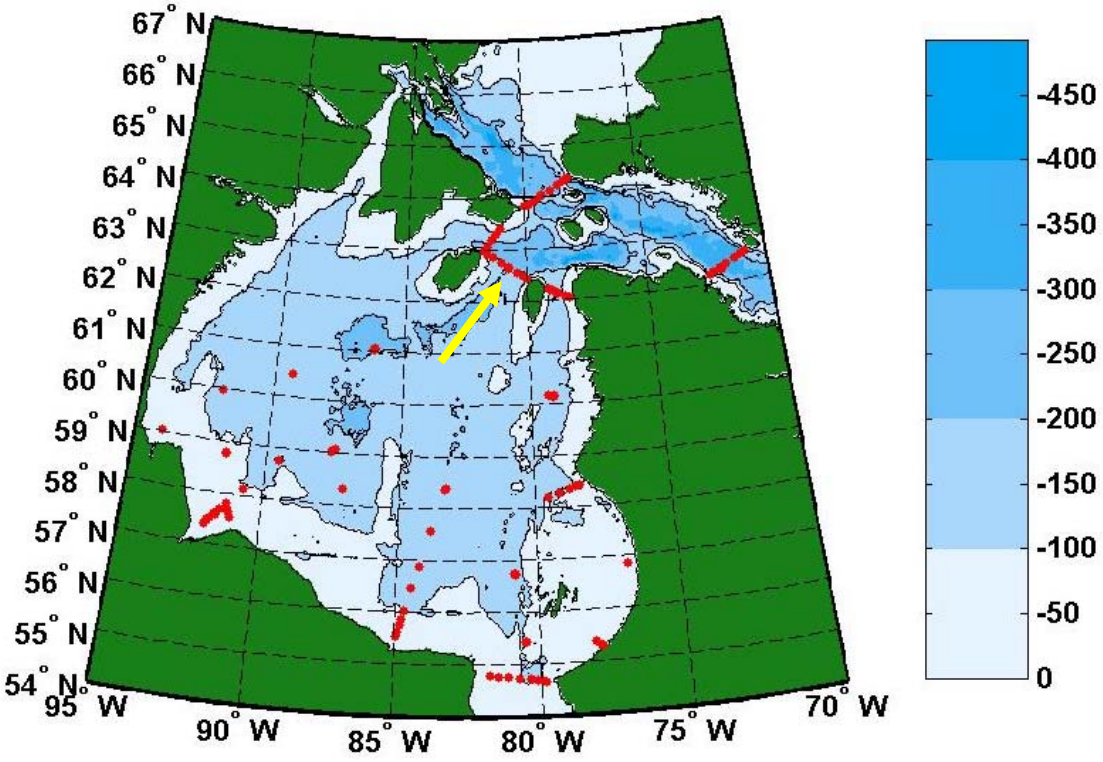
APPENDIX 6.3.B. Salinity and potential temperature along section 15. The south-western sites are on the left and the north-eastern sites are on the right.



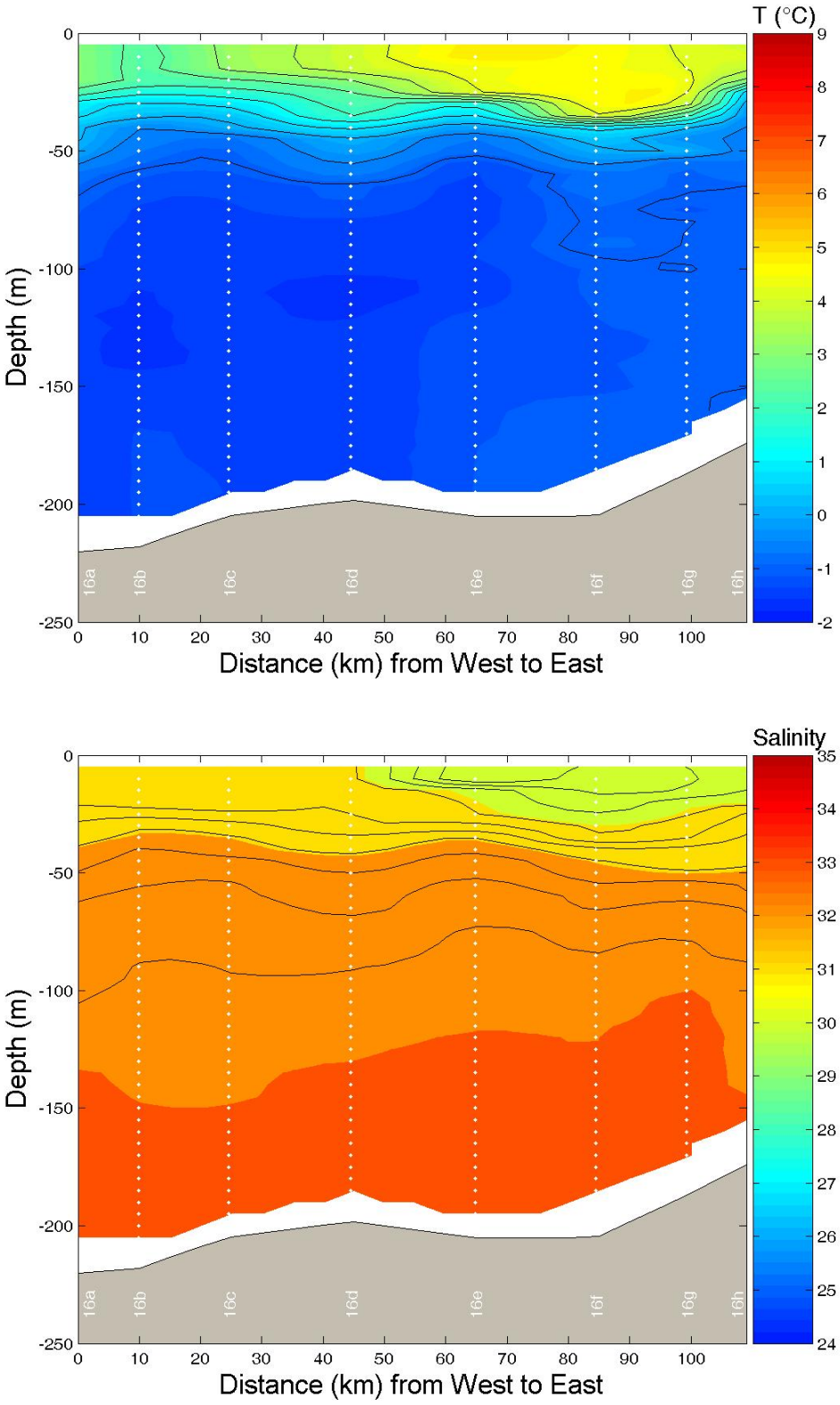
APPENDIX 6.4.A. The yellow arrow identifies the location of section 15-16 across Evans Strait. This section is contoured on the next page.



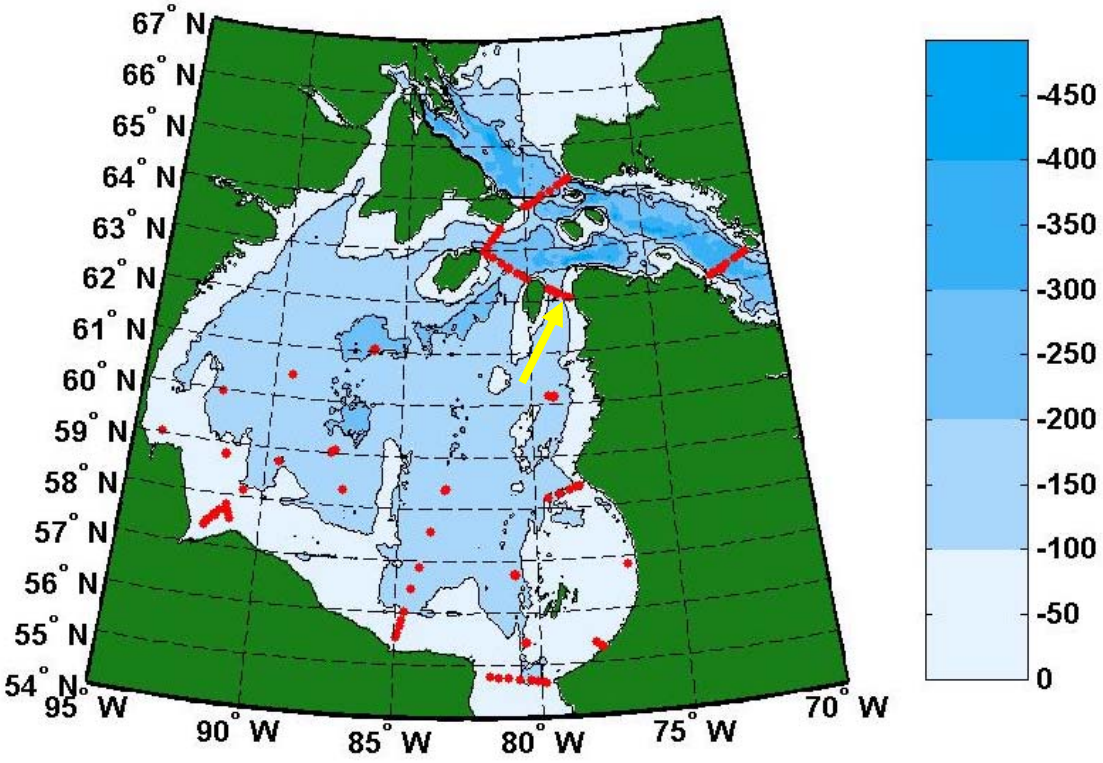
APPENDIX 6.4.B. Salinity and potential temperature along section 15-16. The southern sites are on the left and the northern sites are on the right.



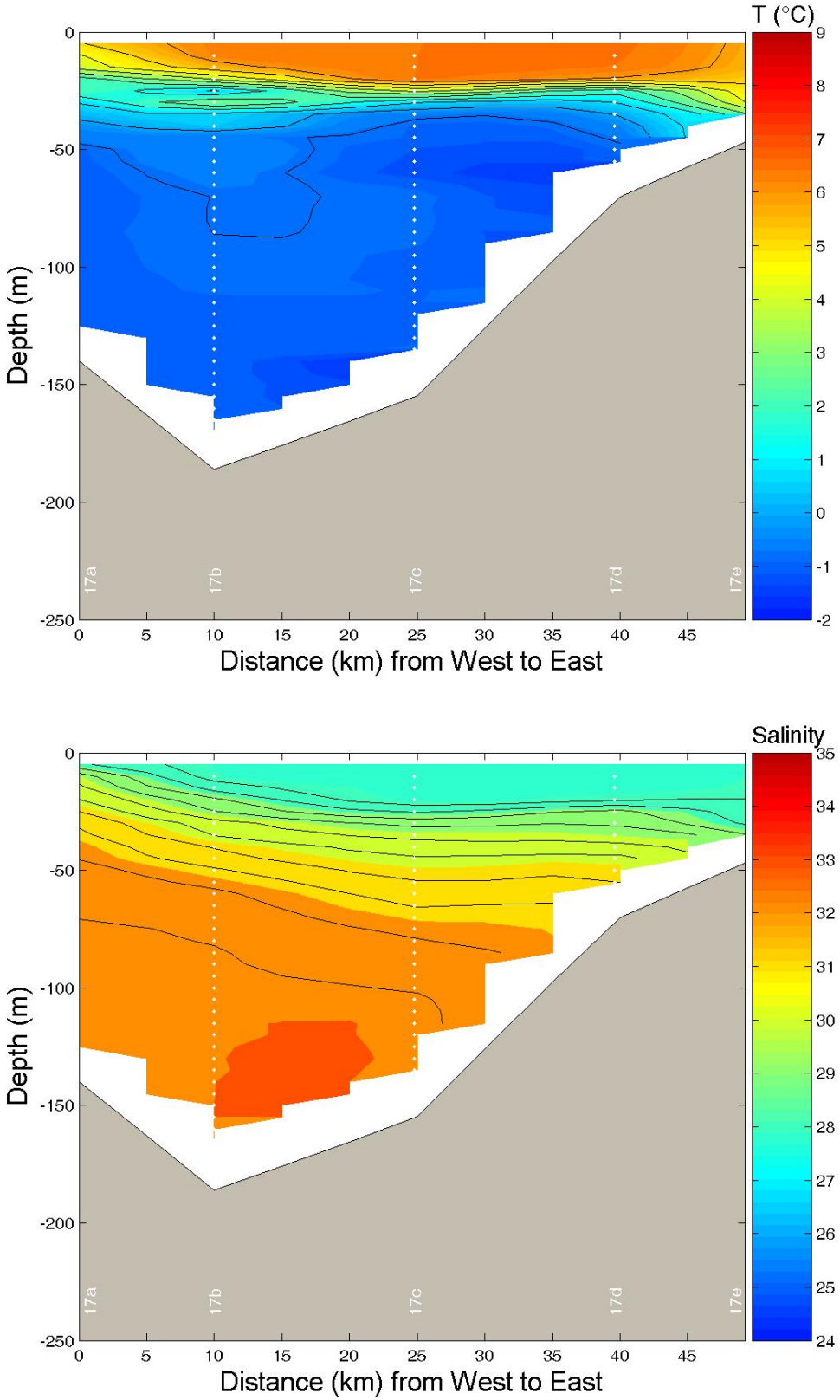
APPENDIX 6.5.A. The yellow arrow identifies the location of section 16 in Hudson Bay. This section is contoured on the next page.



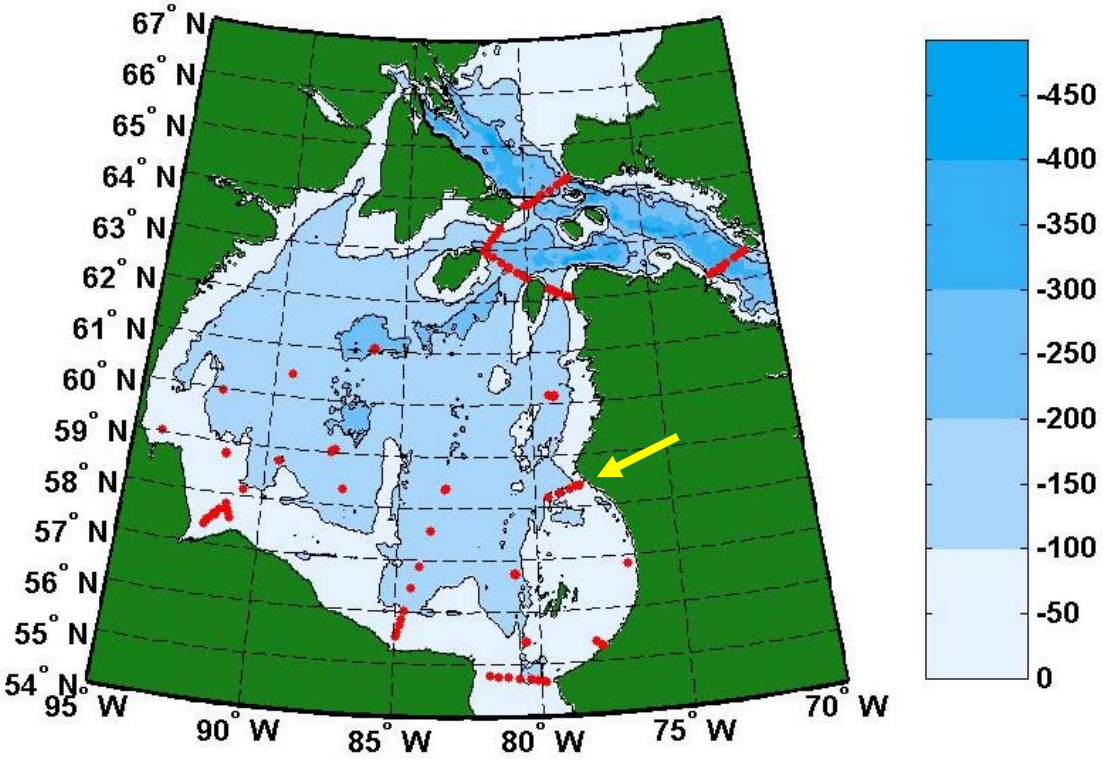
APPENDIX 6.5.B. Salinity and potential temperature along section 16. The north-western sites are on the left and the south-eastern sites are on the right.



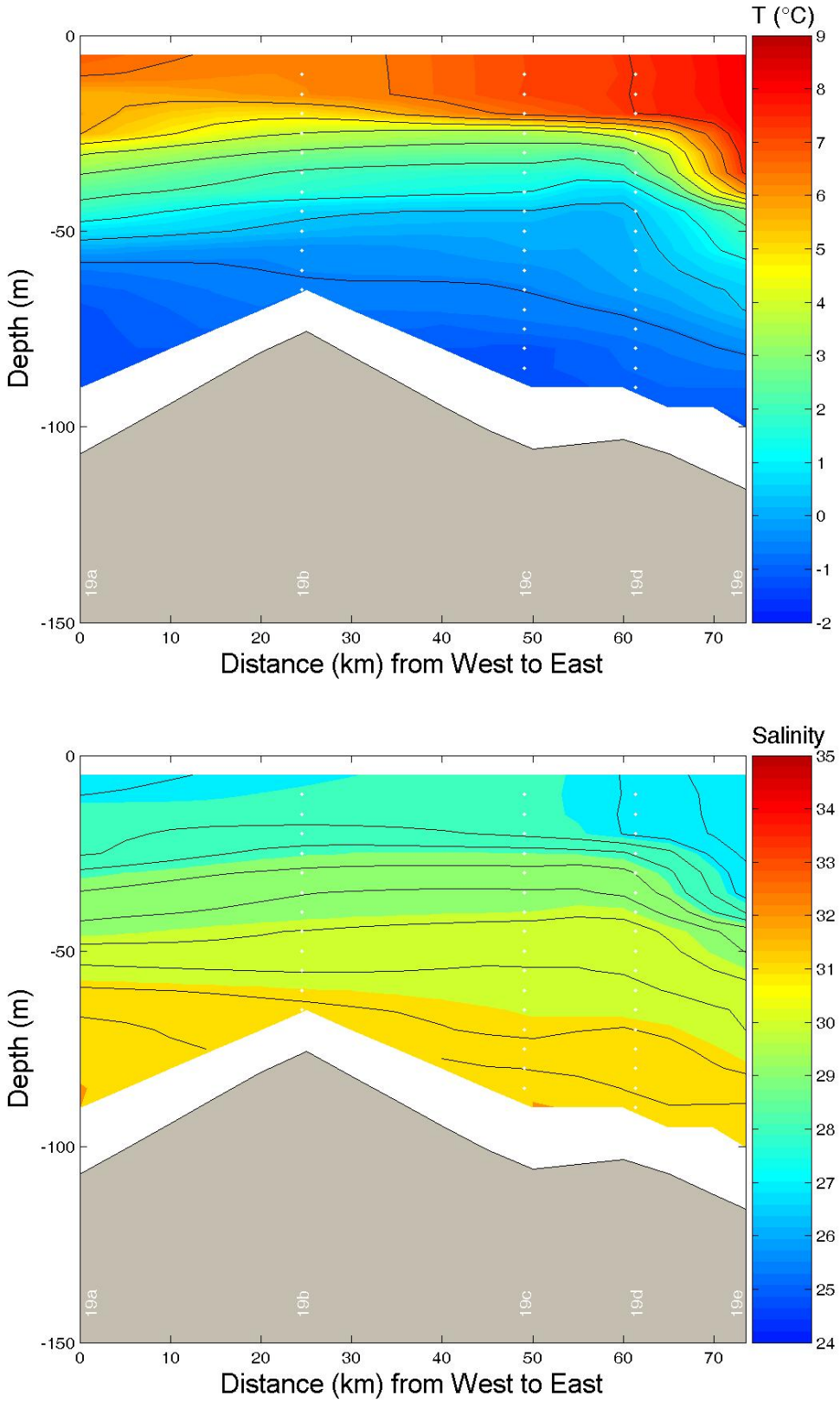
APPENDIX 6.6.A. The yellow arrow identifies the location of section 17 in Hudson Bay. This section is contoured on the next page.



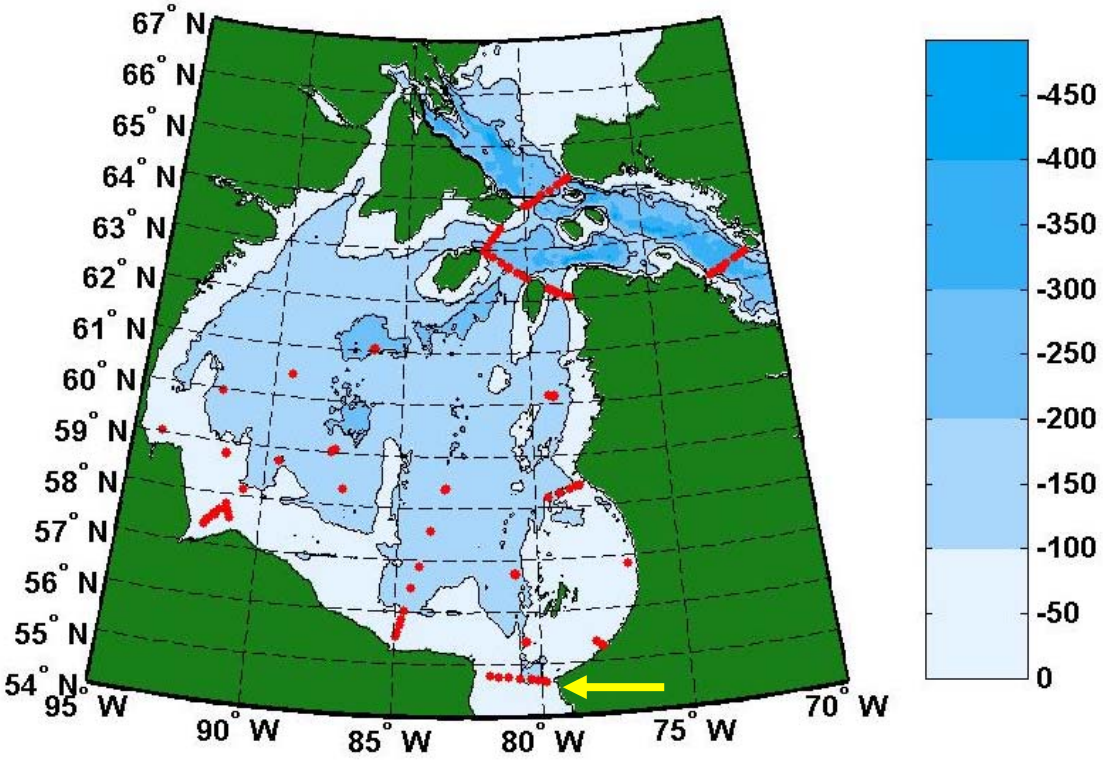
APPENDIX 6.6.B. Salinity and potential temperature along section 17. The western sites are on the left and the eastern sites are on the right.



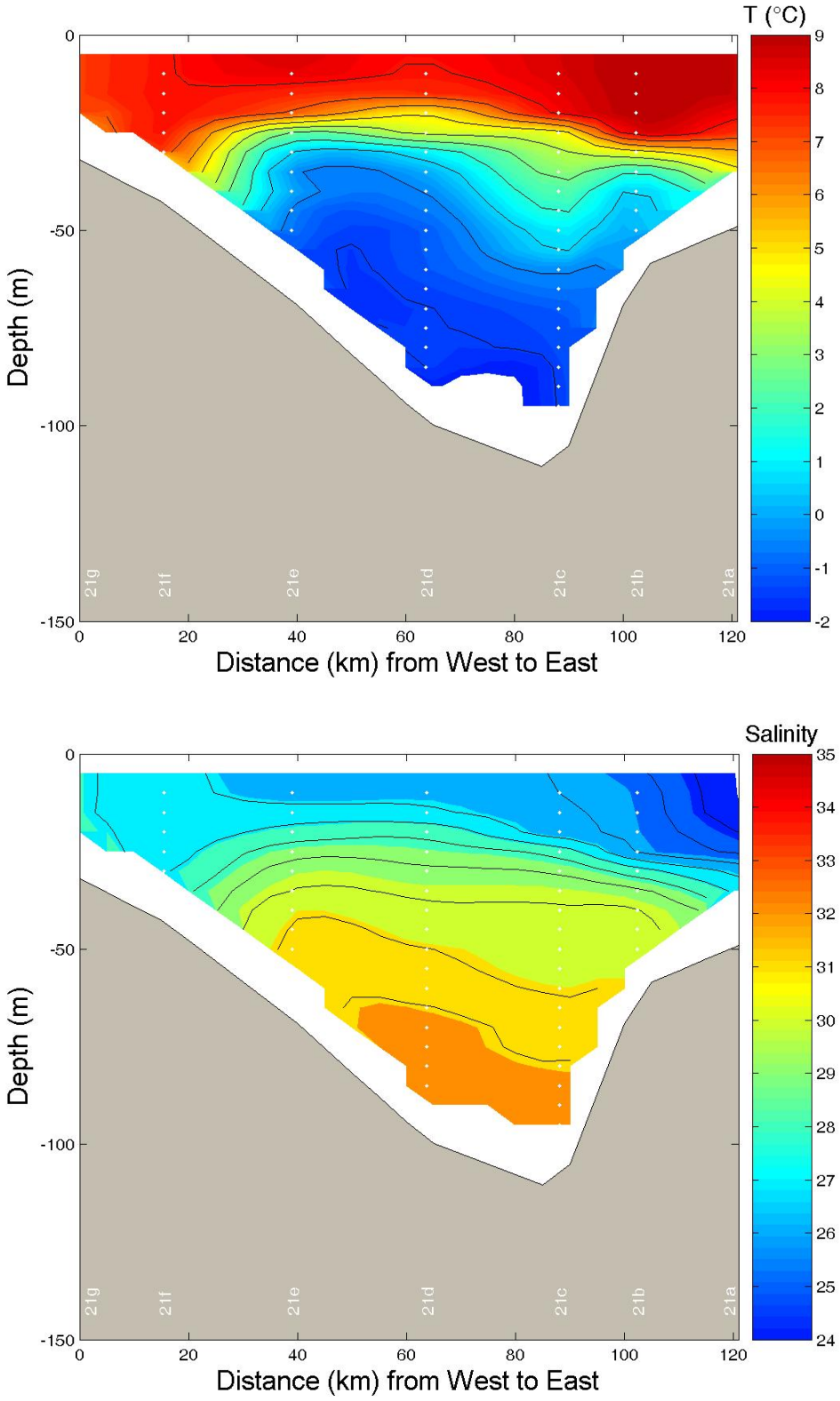
APPENDIX 6.7.A. The yellow arrow identifies the location of section 19 in Hudson Bay. This section is contoured on the next page.



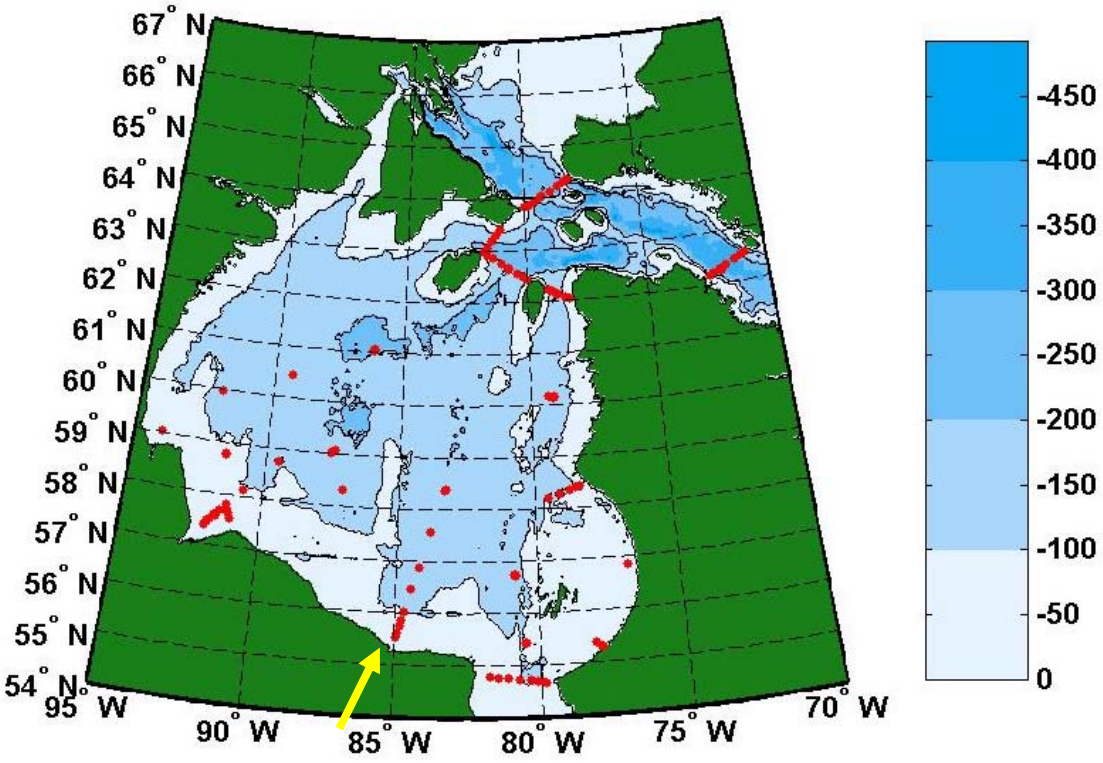
APPENDIX 6.7.B. Salinity and potential temperature along section 19. The western sites are on the left and the eastern sites are on the right.



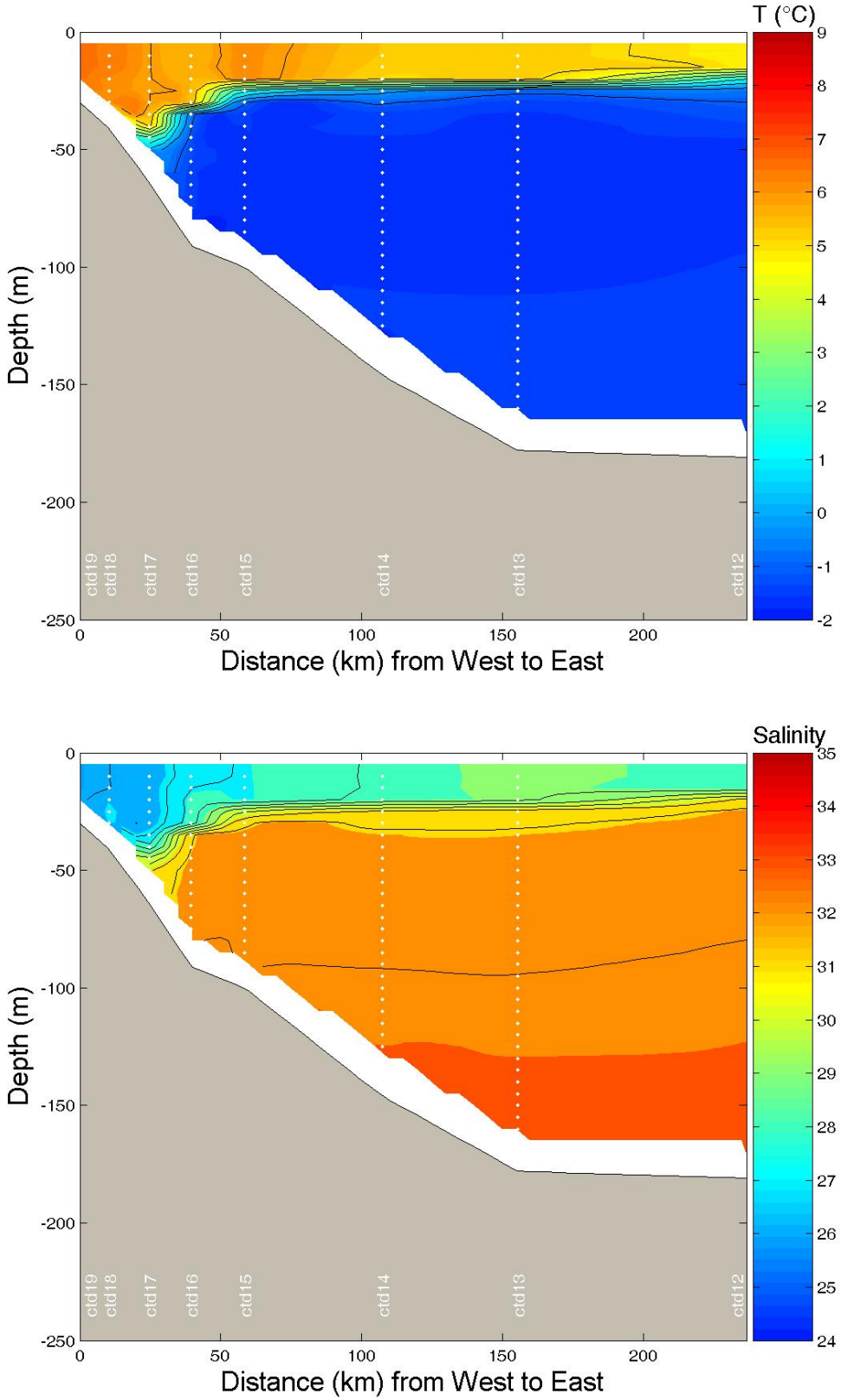
APPENDIX 6.8.A. The yellow arrow identifies the location of section 21 at the mouth of James Bay. This section is contoured on the next page.



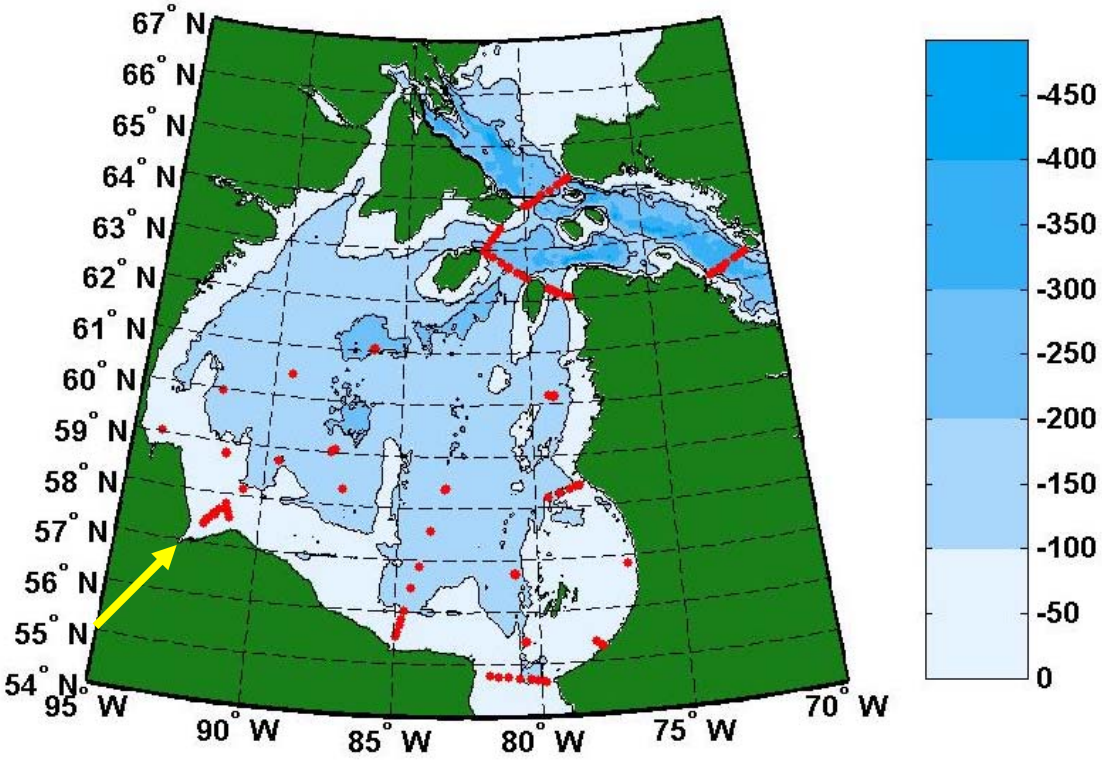
APPENDIX 6.8.B. Salinity and potential temperature along section 21 James Bay. The western sites are on the left and the eastern sites are on the right.



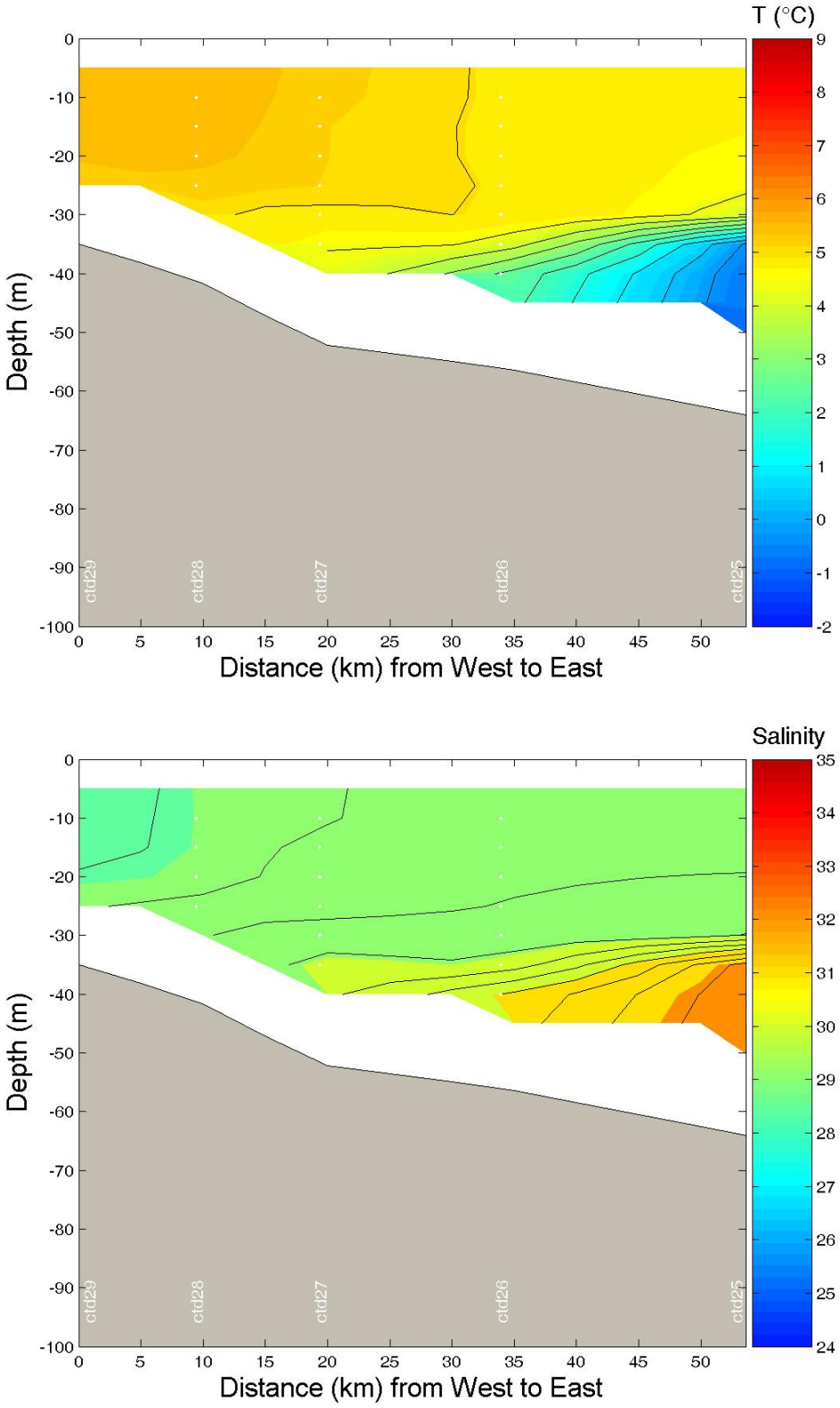
APPENDIX 6.9.A. The yellow arrow identifies the location of section Winisk River in Hudson Bay. This section is contoured on the next page.



APPENDIX 6.9.B. Salinity and potential temperature along section Winisk River. The southern sites are on the left and the northern sites are on the right.



APPENDIX 6.10.A. The yellow arrow identifies the location of section Nelson River in Hudson Bay. This section is contoured on the next page.



APPENDIX 6.10.B. Salinity and potential temperature along section Nelson River. The south-western sites are on the left and the north-eastern sites are on the right.

APPENDIX 7. Example of an ADCP stick diagram from 2003-2004.

APPENDIX 7. Example of 2003-2004 ADCP data from the mooring CA08 showing the ADCP velocity between 16 and 80 meters.