

## DISTRIBUTION OF TEMPERATURE AND SALINITY IN THE CANADIAN ARCTIC ARCHIPELAGO DURING THE 2006 ARCTICNET SAMPLING EXPEDITION (FROM AUGUST 22<sup>nd</sup> TO NOVEMBER 9<sup>TH</sup> 2006)

By

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#### ABSTRACT

This report presents the CTD (Conductivity, Temperature and Depth) data obtained during the 2006 ArcticNet expedition held between August 22<sup>nd</sup> and November 9<sup>th</sup> in the Canadian High Arctic. The report also contains information on the data obtained by the Self Contained Autonomous Micro Profiler (SCAMP), moorings and ship mounted Acoustic Doppler Current Profiler (SM-ADCP) that 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 2006 qui s'est déroulée dans l'Arctique canadien du 22 août au 9 novembre. Il présente également des informations sur les données du Self Contained Autonomous Micro Profiler (SCAMP), du Acoustic Doppler Current Profiler (ADCP) de coque et des informations sur les données de mouillage récupérées 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 <a href="http://www.nce.gc.ca">http://www.nce.gc.ca</a>)

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 <a href="http://www.arcticnet.ulaval.ca">http://www.arcticnet.ulaval.ca</a>)

#### **1. INTRODUCTION**

ArcticNet's 2006 expedition was carried out from August 22<sup>nd</sup> to November 9<sup>th</sup>. During the first six weeks (leg 1 or 0602), the ship covered the coastal Canadian Arctic (Fig. 1) from Northern Baffin Bay in the East to Beaufort Sea in the West. On September 28<sup>th</sup>, it started a second six weeks journey (leg 2 or 0603) sailing through the Northwest Passage again, but passing through Bellot Strait, Gulf of Boothia and Foxe Basin to end up in Hudson Strait.



FIGURE 1. ArcticNet 2006 study area. Ship track is illustrated as a red line, Rosette-CTD sampling locations are represented by red dots, yellow diamondshaped dots show mooring sites and 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. Enclosed data consists of 253 Rosette-CTD (Conductivity Temperature Depth profiler) and 82 SCAMP (Self Contained Autonomous Profiler) profiles. Also included is information about a year of data recorded by 27 different instruments from nine (recuperated) mooring lines as well as 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, nº3, 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 2006 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<sup>-1</sup>. CTD profiles were carried out in the Canadian Arctic and Hudson Bay (see Fig. 2 and Appendix 1A) following a schedule of 6 sections, 72 stations and 115 casts during Leg 0602 and a schedule of 11 sections, 105 stations and 138 casts during Leg 0603 (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 (2006a and 2006b) sampling reports. Appendix 2 also presents the «Logbook» of the 7 CTD profiles performed in 2006 during a short mooring deployment and recovery expedition in Hudson Bay on the CCGS Pierre Radisson.



FIGURE 2. 2006 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 ArcticNet and/or the Integrated Service Data Management (ISDM) website and will be available to the international community.

#### 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 salinity (three sensors), (i.e. conductivity; PAR two sensors), a (Photosynthetically Active Radiation) and fluorescence.



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SCAMP profiles were carried out in Baffin Bay, Victoria Strait, Beaufort Sea and Amundsen Gulf, Foxe Basin and Labrador fjords (see Fig. 3 and Appendix 1B). Measurements were taken at 8 stations (29 casts) during leg 0602 and 12 stations (53 casts) during leg 0603 for a total of 82 different profiles. The logbook of SCAMP profiles is presented in Appendix 3. Two examples of data profiles are 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 2006 sampling sites

#### Moorings

Nine moorings deployed in Beaufort Sea, Baffin Bay and Hudson Bay in 2005 were retrieved in August, September and October of the 2006 (see Fig. 4 and Appendix 1C). A summary of the 34 instruments, sensors, and validated data is presented in Table 4. The instruments included five RDI 300 kHz Workhorse ADCPs, two RDI 75 kHz Long Ranger ADCPs, eight Aanderaa RCM-11 (Recording Current Meters), six Aanderaa RCM-4 (Recording Current Meters), four Aanderaa RCM-7, three Alec conductivity-temperature sensors, four Sea-Bird SBE-37 conductivity-temperature sensors and two Sea-Bird SBE-26 wave and tide recorders. The data recovery was only partly successful due to instrument malfunctions and two moorings were never recovered (BA04-05 and AN02-05). Michaud *et al.* (2006) and Rail *et al.* (2010) have summarized all the problems encountered in their technical report. Some of the recovered moorings were processed and redeployed for another year of measurements (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 5. Moorings deployed in 2006

#### Ship mounted Acoustic Doppler Current Profiler (ADCP)

In 2006, the CCGS Amundsen was equipped with a new RDI Ocean Surveyor (ship-mounted) 150 kHz ADCP. The settings used for the 2006 expedition were chosen according to RDI technical staff recommendations. The hull ADCP has recorded current data along the ship track from the beginning to the end of the 2006 expedition (see Fig 6). Note that the ship track in the Hudson Bay is for the CCGS Pierre Radisson which is not equipped with a hull-mounted ADCP. Ship-mounted ADCP data included date and time, ship localisation, and finally an average of current speed and current direction for every 8 m cell from 8 m under the ship hull to maximum bottom tracking depth. Averages are available for a five and a ten minutes period. The ADCP setting was changed at the end of the first leg in an attempt to synchronize the hull ADCP with another sensor (an EK-60) mounted close to the ADCP on the Amundsen's hull. Because of sound attenuation by the ice window, the maximum bottom-tracking depth is around 240 m. This value is reduced to 100-150 m when the ship is steaming.

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



**FIGURE 6.** Moored-ADCP deployed in 2006 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 red 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, 2006a and 2006b). 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<sup>®</sup>. 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 requested. 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 «ADCPtools» box of the U.S. Geological Survey's «Sediment Transport Instrumentation Group». The «ADCPtools» 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 2006 expedition was huge (as usual): Hudson Bay and Strait, Foxe Basin, 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 much better sampled this year. Of special interest are the first and only ArcticNet sections in Foxe Basin (Appendix 6).

Three on-going studies are 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 from the 2005 data, that the turbulence is dominated by double-diffusive processes in Smith Sound. Additional SCAMP profiles were obtained in CAA and Beaufort Sea in 2006. We observed that the turbulent mechanical processes (probably wind and tidal mixing) are dominating the double-diffusive processes in Beaufort Sea and Amundsen Gulf. 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**

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Parameter		Sensor	Range	Accuracy	Resolution			
	Compagny	Instrument Type	)	-				
Attached to the Rose	tte							
CTD	SeaBird	SBE-9plus <sup>1</sup>						
Temperature	SeaBird	SBE-03 <sup>1</sup>	-5°C à +35°C	0.001°C	0.0002°C			
Conductivity	SeaBird	SBE-4C <sup>1</sup>	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) <sup>2</sup>	0.015% of full scale	0.001% of full scale			
Dissolved oxygen	SeaBird	SBE-43 <sup>3</sup>	120% of surface saturation <sup>4</sup>	2% of saturation	unknown			
рН	SeaBird	SBE-18-I ⁵	0-14 pH units	0,1 pH unit	unknown			
Nitrates concentration	Satlantic	MBARI-ISUS 5T <sup>6</sup>	0.5 to 2000 μM	±2 μM	$\pm 0.5~\mu M$			
Light intensity (PAR)	Biospherical	QCP2300	1.4×10 <sup>-5</sup> to 0.5 µE/(cm <sup>2</sup> ⋅sec)					
sPAR	Biospherical	QCP2200	1.4×10 <sup>-5</sup> to 0.5 μΕ/(cm <sup>2</sup> ·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 <sup>7</sup>	0 - 100 m	unknown	0.01 m			
Authorization     Benthos     PSA-918     0 - 100 m     Unknown     0.01 m       Notes: <sup>1</sup> Maximum depth of 6800m <sup>2</sup> Depending on the configuration <sup>3</sup> Maximum depth of 7,000m <sup>4</sup> In all natural waters, fresh and marine <sup>5</sup> Maximum depth of 1,200m <sup>6</sup> Maximum depth of 1,200m <sup>6</sup> Maximum depth of 1,200m <sup>6</sup> Maximum depth of 1,200m								

**TABLE 1.** Rosette sensors specifications, ArcticNet scientific 2006 expedition

TABLE 2. Summary of the Rosette sampling, ArcticNet scientific 2006 expedition

<sup>7</sup> Maximum depth of 6,000m

Expedition number	Leg number	number		Number of CTD casts	Number of stations	Number of sections
0602	1	August 22	September 28	115	72	6
0603	2	September 28	November 9	138	105	11

Section	Station	Cast	Section	Station	Cast	Section	Station	Cast
Leg 0602			Leg 0603			Leg 0603		
	В	11		420	31		356	117
	С	12		419	29	Hudson	355	118
Oliver Sound	A	10		418	28	Strait	354	119
	D	14		417	27		353	120
	E	15	Desufart	416	26		352	121
		27	S400	415	25		605	125
	127	20	3400	414	24	Nachvak	602	120
NOW S1		28		412	20	fjord	601	123
	129	33		411	21		606	127
	130	34		410	20		615	128
	131	38		409	19		614	129
	117	56		433	49	Saglek fiord	613	130
	118	53		432	48	Saglek ijolu	612	131
	119	50		431	47		610	132
	120	49		430	46		617	133
NOW S2	121	48		429	45		624	137
	122	47	Beaufort	428	44	Anaktalak	623	130
	123	46	S700	427	43	fjord	621	135
	124	43		425	39		620	134
	126	39		424	38		020	100
	101	79		423	37			
	102	74		422	36			
	103	73		421	34			
	104	72		407	70			
	105	71		405	71			
	106	70		404	72			
NOW S3	108	68	Northwest	403	73			
	109	67	Passage		74 75			
	112	65			76			
	112	64			77			
	114	63		320	81			
	115	59	Dellet Chreit	319	80			
	116	57	Bellot Strait	318	79			
	Belcher6	80		317	78			
Belcher	Belcher5	81		321	82			
glacier	Belcher2	82	0 16 6	322	83			
	Beicher3	83	Gulf of Reathin	323	85			
	315	115	Bootnia	324	80 97			
	314	114		326	88			
	313	112		332	94			
	312	111	Igloolik	331	93			
	311	110	Island	330	92			
	310.5	109		329	91			
	310	107		335	98			
	309.5	105		336	99			
	309	104		337	100			
Northwest	308.5	103		338	101			
Passage	308	101		339	103			
	307.5	95		341	104			
	306	94		342	106			
	DecoluteDec		Foxe Basin					
	кезошевау	93		343	107			
	305	92		344	108			
	304	91		345	109			
	303	89		346	110			
	302	88		347	111			
	301 300	00 84		348 340	112			
L	300	04		549	110			

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

	_	Pos	ition							Parameters measured															
Mooring	Water depth	North Latitude	West Longitude	Instr.	Serial No	Instr. Depth (m)	Date of first reliable data	Date of last reliable data	Sampling frequency (min)	Water Temp. (°C)	Cond. (m S/cm)	Pressure (dbar)	Current Speed (cm/s)	Current Direction (true)	Turbidity (NTU)	Dissolved Oxygen (µM)	Quality Control Comments								
				ALEC CT	688	39	2005-09-06 21:00	2006-10-07 19:00	10	Х	Х						WARNNG: this line as tilted								
				WH-ADCP	333	82	2005-09-06 20:52	2006-10-07 17:50	60	Х			Х	Х											
CA04-05	307	71º 04.81	133º 37.75	RCM 11	289	210	2005-09-06 20:59	2006-10-07 18:27	30	х	х	х	х	х	х		WARNNG: this line as tilted; some missing data points; offset correction on salinity data								
				SBE37	1697	38	2005-09-09 05:00	2006-10-02 21:10	10	х	х	х					suspicious salinity data point on February 10th, 2006								
				WH-ADCP	2645	90	2005-09-09 04:54	2006-07-11 09:14	20	Х			Х	Х											
CA05-05	201	71º 16.84	127º 32.18	RCM 11	285	163	2005-09-09 05:01	2006-10-02 20:58	30	х	half of them	х	х	х	x	х	some missing data points; many missing salinity data point; turbidity data are negative								
				SBE26	372	179	2005-09-09 05:07	2006-10-02 20:37	30			Х													
				SBE37	3463		NO DAT	A RECORDED																	
				WH-ADCP	2646	73	2005-09-10 04:52	2006-07-18 02:12	20	Х			Х	Х											
<b></b>	007	740.00.44	1000 0 1 10	RCM 4	8677	91	?	?	?	b.d.	b.d.		b.d.	b.c.											
CA08-05	397	71º 00.41 126º 04.40	71º 00.41 126º 04.4	71° 00.41 126° 04.4	71° 00.41 126° 04.	71° 00.41 126° 0	71° 00.41 126° 04	7 71º 00.41 12	71º 00.41	71*00.41 126*04.46	126° 04.46	RCM 11	290	194	2005-09-10 05:00	2006-10-02 14:21	30	Х	х	х	х	Х	Х	Х	some missing data points; offset correction on salinity data
				RCM 11	287	370	2005-09-10 04:59	2006-08-25 11:53	30	х	х	х	х	х	х	х	some missing data points; offset correction on salinity data								
				RCM 11	280	32	2005-09-12 23:00	2006-10-01 17:50	30	Х	Х	Х	Х	Х	Х	Х	some missing oxygen data points								
				RCM 11	266	106	2005-09-12 23:00	2006-10-01 17:55	30	Х	Х	Х	Х	Х	Х	Х	some missing data points								
CA18-05	540	70° 39.94	94 122° 59.30	RCM 11	273	203	2005-09-12 23:00	2006-10-01 17:52	30	х	х	х	х	Х	х	х	some missing data points; offset correction on salinity data								
				RCM 7	10301	399	2005-09-12 23:30	2006-08-14 16:30	60	Х	Х		Х	Х			offset correction on salinity data								
				RCM 4	8859			LOST	-																
				RCM 4	8214	195	2005-08-17 07:00	2006-09-15 19:00	180	Х	b.c.		Х	b.c.			3 hours sampling interval								
BA01-05	649	76º 19.62	071º 11.90	SBE26	371	200	2005-08-17 05:49	2006-05-29 08:49	30	Х		Х					weird pressure data after May 29th, 2006								
				RCM 7	12800		CORR	UPTED FILE																	
				LR-ADCP	3883		in p	progress				-	In progres	s											
				RCM 4	8572	104	2005-08-18 01:30	2006-09-08 02:30	60	X	b.c.		X	X											
BA02-05	444	76° 16.06	074° 34.50	RCM 4	8672	211	?	?	?	b.d.	b.d.		b.d.	b.c.											
				LR-ADCP	3815	427	2005-08-17 23:17	2006-09-08 00:47	60	X	X	× ×	X	X											
BA02.05	250	760 00 00	0770 04 06	SBE37	1695	96/3	2005-08-18 23:00	2006-08-29 19:15	15	×	X	X					dragged by sea ice on January 6th, 2006								
BA03-03	300	70. 23.03	077*24.00	RCIVI 7	10298			LOST																	
BA04.05	475	759 15 21	0749 59 65	ROWITI	0264		Never recovere	d																	
BA04-03	475	75 15.21	074 30.03		684		Nevel lecovere																		
AN01-05	107	59º 58 67	0919 56 62	ALEC CT	507		NO DAT																		
A101 00	107	00 00.01	001 00.02		3045	80	2005-10-13 03:05	2006-09-16 20:25	20	X			X	X											
AN02-05	80	58° 46.92	091º 31.39		0040		Never recovere	d						~											
		20 10.02	201 01.00	SBE-37	2424		NO DAT	ARECORDED																	
AN03-05	130	55° 24.47	077° 55.79	RCM 7	12796	35	2005-10-01 19:00	2006-09-13 13:00	60	х	b.c.		х	b.c.			temperature reachs its detection limit few time								
				RCM 4	8850	75	?	?	?	b.d.	b.d.		b.d.	b.c.											
				WH-ADCP	23	96	2005-10-01 17:54	2006-07-22 22:54	20	Х			Х	Х											

**TABLE 4.** Summary of moored instruments, ArcticNet 2005-2006

Please notice that **b.d.** stands for Bad Data and **b.c.** stands for Bad Calibration.

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 <sup>3</sup>	2
Specific volume anomaly	10 <sup>-8</sup> m <sup>3</sup> /kg	0
N <sup>2</sup> : Brunt-Väisälä frequency	1/sec <sup>2</sup>	2
Density; σ <sub>τ</sub> ; σ(S,T,O)	kg/m3	3
Potential temperature (θ)	°C	3
σ <sub>θ</sub> ; σ(S,θ,Ο)	kg/m <sup>3</sup>	3
Freezing temperature	°C	2
Dissolved oxygen concentration	ml/l	4
рН	no units	3
Nitrates	mmol/m <sup>3</sup>	2
PAR pressure	dbars	2
PAR	µEinsteins/m²/sec	3
Surface PAR	µEinsteins/m²/sec	3

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

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, Northwest Passage, Beaufort Sea, Hudson Bay, Hudson Strait and Labrador Sea (Legs 1 and 2).
- 1B. SCAMP sampling sites in Baffin Bay, Northwest Passage, Beaufort Sea, Hudson Bay and Labrador fjords (Legs 1 and 2).
- 1C. Moorings recovered and deployed in Baffin Bay, Beaufort Sea and Hudson Bay (Legs 1 and from NGCC Pierre Radisson).



Northwest Passage (Legs 1 & 2)

APPENDIX 1A. Rosette-CTD sampling sites in Baffin Bay and Northwest Passage



Beaufort Sea (Legs 1 & 2)



Hudson Bay (Leg 2)

APPENDIX 1A. Rosette-CTD sampling sites in Beaufort Sea and Hudson Bay



Labrador Sea (Leg 2)

APPENDIX 1A. Rosette-CTD sampling sites in Hudson Strait and Labrador Sea.



**APPENDIX 1B.** SCAMP sampling sites in Baffin Bay and Northwest Passage.



Beaufort Sea (Legs 1 & 2)



**Hudson Bay** 

APPENDIX 1B. SCAMP sampling sites in Beaufort Sea and Hudson Bay.



APPENDIX 1B. SCAMP sampling sites in Labrador fjords.



Moorings recovered in Baffin Bay.









Moorings recovered in Beaufort Sea.









Moorings recovered in Hudson Bay.



Moorings deployed in Hudson Bay.

APPENDIX 1C. Moorings recovered and deployed in Hudson Bay (from NGCC Radisson).

**APPENDIX 2.** Rosette-CTD cast locations, sampling times, water depths and corresponding station or mooring numbers during 2006 ArcticNet scientific expeditions.

- 2A. Rosette logbook for Leg 1 (expedition 0602)
- 2B. Rosette logbook for Leg 2 (expedition 0603)

Cast	Station or	Start date	Start time	Latitude	Longitude	Cast depth	Sea bottom
number	mooring	UTC	UTC	(North)	(West)	(m)	depth (m)
1	Saguenay	2006-08-22	23:43	48° 15.52	069° 19.74	331	310
2	Sept-Iles	2006-08-25	00:41	50° 03.22	065° 58.24	179	167
3	Makkovik-1	2006-08-27	10:05	55° 30.99	056° 31.78	1539	1000
4	Makkovik-2	2006-08-27	22:16	56° 09.75	057° 16.34	1212	1000
5	Makkovik-3	2006-08-28	10:17	56° 06.92	057° 02.16	1820	1000
6	Makkovik-4	2006-08-28	22:17	55° 57.11	056° 36.99	2167	1000
7		2006-08-30	10:12	61° 26.36	060° 22.45	1463	1000
8		2006-08-30	22:14	61° 03.09	060° 48.24	1217	1000
9		2006-08-31	10:19	61° 25.40	060° 40.28	619	610
10	OliverS.A	2006-09-04	13:31	72° 15.23	077° 47.19	372	358
11	OliverS.B	2006-09-05	00:51	72° 24.34	078° 45.05	466	450
12	OliverS.C	2006-09-05	02:17	72° 19.53	078° 15.26	267	258
13	OliverS.A	2006-09-05	03:38	72° 15.36	077° 47.21	372	358
14	OliverS.D	2006-09-05	06:58	72° 11.41	077° 27.84	236	211
15	OliverS.E	2006-09-05	08:21	72° 09.62	077° 06.43	127	110
16	BA04	2006-09-07	02:05	75° 16.62	074° 56.89	489	467
17	BA04	2006-09-07	04:08	75° 16.36	074° 58.68	485	467
18	BA04	2006-09-07	06:07	75° 16.36	074° 58.39	484	467
19	BA02	2006-09-08	02:30	76° 15.94	074° 33.95	460	450
20		2006-09-08	15:07	78° 25.16	073° 51.02	512	502
21	132	2006-09-09	00:39	78° 59.73	072° 19.99	248	243
22	132	2006-09-09	07:09	79° 01.30	072° 01.88	193	181
23	132	2006-09-09	09:35	78° 59.80	072° 20.25	247	243
24	132	2006-09-09	12:40	78° 59.73	072° 20.55	241	236
25	132	2006-09-09	14:30	79° 00.14	072° 17.24	250	242
26	127	2006-09-10	03:14	78° 17.75	074° 35.69	604	278
27	127	2006-09-10	03:45	78° 17.10	074° 38.30	602	598
28	127	2006-09-10	17:28	78° 20.22	074° 11.42	512	502
29	127	2006-09-10	19:28	78° 19.06	074° 17.52	532	522
31	127	2006-09-11	00:55	78° 09.87	074° 44.27	600	602
32	129	2006-09-11	05:17	78° 19.75	074° 00.87	577	571
33	129	2006-09-11	07:01	78° 19.74	073° 59.70	566	555
34	130	2006-09-11	08:59	78° 19.45	073° 37.51	705	675
35	131	2006-09-11	11:17	78° 18.89	073° 07.80	245	239
36	131	2006-09-11	13:49	78° 19.36	073° 11.18	333	328
37	131	2006-09-12	03:40	78° 19.12	073° 11.01	257	260
38	131	2006-09-12	05:14	78° 19.09	073° 11.19	306	302
39	126	2006-09-12	17:53	77° 20.71	073° 24.88	334	325
40	126	2006-09-12	19:29	77° 20.81	073° 25.35	327	320
41	126	2006-09-13	02:14	77° 21.80	073° 25.16	317	312
42	126	2006-09-13	04:07	77° 21.54	073° 25.51	321	313
43	126	2006-09-13	05:57	77° 20.64	073° 25.66	323	319
44	125	2006-09-13	10:06	77° 20.52	073° 55.25	491	484
45	124	2006-09-13	11:02	77° 20.61	074° 18.11	705	696
46	123	2006-09-13	12:55	77° 20.55	074° 38.44	697	692
47	122	2006-09-13	17:05	77° 20.07	075° 00.72	653	645
48	121	2006-09-13	19:06	77° 20.25	075° 22.40	584	575
49	120	2006-09-13	20:23	77° 19.90	075° 41.19	563	560
50	119	2006-09-13	23:06	77° 20.17	076° 04.26	526	520

**APPENDIX 2A.** Rosette casts locations, sampling times, water depths and corresponding stations or mooring numbers during ArcticNet expedition 0602 (page 1/3).

Cast	Station or	Start date	Start time	Latitude	Longitude	Cast depth	Sea bottom
number	mooring	UTC	UTC	(North)	(West)	(m)	depth (m)
51	118	2006-09-14	05:11	77° 21.87	076° 32.69	277	261
52	118	2006-09-14	06:41	77° 22.18	076° 35.73	233	229
53	118	2006-09-14	08:30	77° 22.26	076° 40.60	255	250
55	117	2006-09-14	18:22	77° 20.40	076° 56.94	417	390
56	117	2006-09-14	20:16	77° 21.82	076° 58.31	184	173
57	116	2006-09-15	10:55	76° 20.03	070° 38.49	174	160
58	115	2006-09-15	14:13	76° 19.39	071° 10.13	660	650
59	115	2006-09-16	01:09	76° 19.92	071° 12.09	673	673
60	115	2006-09-16	08:05	76° 19.93	071° 11.98	672	660
61	115	2006-09-16	11:03	76° 20.61	071° 12.12	654	649
62	115	2006-09-16	13:06	76° 20.82	071° 12.50	653	651
63	114	2006-09-17	04:01	76° 19.37	071° 46.86	613	605
64	113	2006-09-17	05:11	76° 19.01	072° 13.29	553	544
65	112	2006-09-17	06:54	76° 18.81	072° 42.36	561	557
66	111	2006-09-17	08:50	76° 18.43	073° 12.77	596	586
67	109	2006-09-17	14:19	76° 15.28	074° 10.39	446	440
68	108	2006-09-17	16:03	76° 15.62	074° 35.41	446	440
69	108	2006-09-17	18:36	76° 16.13	074° 36.65	448	Х
70	106	2006-09-17	22:34	76° 18.33	075° 20.78	383	376
71	105	2006-09-17	23:33	76° 19.47	075° 46.92	346	339
72	104	2006-09-18	01:12	76° 20.42	076° 10.82	197	188
73	103	2006-09-18	02:09	76° 21.66	076° 33.90	153	143
74	102	2006-09-18	03:21	76° 22.65	076° 59.00	243	236
75	101	2006-09-18	06:36	76° 23.47	077° 18.37	324	320
76	101	2006-09-18	08:10	76° 22.98	077° 23.76	351	344
77	101	2006-09-18	15:51	76° 24.63	077° 16.67	311	304
78	101	2006-09-18	19:38	76° 24.37	077° 17.46	309	305
79	101	2006-09-18	21:35	76° 22.94	077° 25.63	393	385
80	Belcher-6	2006-09-19	20:07	75° 40.22	081° 15.74	180	169
81	Belcher-5	2006-09-19	21:09	75° 42.35	081° 00.62	215	209
82	Belcher-2	2006-09-19	22:46	75° 42.70	080° 48.51	627	625
83	Belcher - 3	2006-09-20	00:09	75° 39.93	080° 33.99	630	626
84	300	2006-09-20	08:30	74° 22.33	079° 58.25	690	688
85	301	2006-09-20	19:24	74° 07.48	083° 19.43	676	674
86	301	2006-09-20	23:03	74° 07.44	083° 20.69	680	672
87	301	2006-09-21	01:21	74° 08.55	083° 22.83	678	675
88	302	2006-09-21	07:57	74° 09.22	086° 16.29	519	516
89	303	2006-09-21	13:24	74° 14.19	089° 40.65	229	219
90	303	2006-09-21	17:32	74° 14.12	089° 39.78	229	223
91	304	2006-09-22	00:28	74° 21.75	093° 18.97	173	165
92	305	2006-09-22	03:24	74° 19.75	094° 59.77	170	162
93	Resolute Bay	2006-09-22	10:17	74° 40.92	095° 11.43	152	140
94	306	2006-09-23	05:47	74° 20.96	097° 35.01	132	125
95	307	2006-09-23	12:07	74° 24,15	100° 35.05	167	158
96	307	2006-09-23	14:22	74° 24 25	100° 35.39	168	159
97	307	2006-09-23	22.21	74° 26 55	100° 27 52	154	144
98	307	2006-09-23	23.30	74° 23 84	100° 25 20	172	166
99	307	2006-09-24	00:52	74° 23 97	100° 34 46	168	163
100	307.5	2006-09-24	10:37	73° 53.97	101° 58.86	130	122

**APPENDIX 2A.** Rosette casts location, sampling time, water depth and corresponding stations or mooring numbers during ArcticNet expedition 0602 (page 2/3).

Cast	Station or	Start date	Start time	Latitude	Longitude	Cast depth	Sea bottom
number	mooring	UTC	UTC	(North)	(West)	(m)	depth (m)
101	308	2006-09-24	13:49	73° 30.44	103° 29.16	325	318
102	308	2006-09-24	14:57	73° 30.44	103° 28.99	325	316
103	308.5	2006-09-24	19:41	73° 03.32	103° 32.59	348	338
104	309	2006-09-25	01:10	72° 30.30	103° 30.32	280	270
105	309.5	2006-09-25	04:14	71° 59.94	102° 59.88	247	237
106	310	2006-09-25	09:44	71° 29.66	102° 15.36	215	205
107	310	2006-09-25	11:28	71° 29.47	102° 13.43	210	202
108	310	2006-09-25	22:46	71° 29.92	102° 14.48	213	201
109	310.5	2006-09-26	06:04	71° 09.94	099° 45.13	139	131
110	311	2006-09-26	12:02	70° 16.38	098° 27.51	149	144
111	312	2006-09-26	18:34	69° 09.52	100° 42.13	57	53
112	313	2006-09-27	01:22	68° 40.81	103° 59.26	106	91
113	314	2006-09-27	06:45	68° 59.88	106° 35.57	110	103
114	315	2006-09-27	14:29	68° 32.85	109° 23.03	170	162
115	316	2006-09-28	02:41	68° 06.87	111° 09.24	294	281

**APPENDIX 2A.** Rosette casts locations, sampling times, water depths and corresponding stations or mooring numbers during ArcticNet expedition 0602 (page 3/3).

Cast	Station or	Start date	Start time	Latitude	Longitude	Cast depth	Sea bottom
number	mooring	UTC	UTC	(North)	(West)	(m)	depth (m)
1	400	2006-09-29	09:28	69° 05.49	114° 48.32	160	154
2	401	2006-09-29	13:02	69° 14.14	116° 36.20	177	168
3	402	2006-09-29	16:35	69° 35.74	118° 08.03	410	411
4	403	2006-09-30	00:53	70° 06.04	120° 05.94	417	406
5	403	2006-09-30	03:35	70° 06.05	120° 05.76	416	392
6	403	2006-09-30	06:00	70° 06.36	120° 05.42	408	407
7	405	2006-10-01	08:47	70° 39.07	122° 56.67	583	575
8	405	2006-10-01	12:10	70° 39.22	122° 59.24	610	592
9	405	2006-10-01	16:44	70° 39.49	123° 00.15	594	587
10	405	2006-10-01	20:44	70° 39.06	122° 56.90	579	570
11	405	2006-10-02	01:43	70° 38.56	122° 58.08	595	592
12	405	2006-10-02	04:37	70° 39.15	122° 58.33	598	584
13	407	2006-10-02	12:31	71° 01.24	126° 05.20	390	380
14	408	2006-10-02	20:20	71° 15.91	127° 31.00	187	186
15	408	2006-10-02	22:26	71° 15.92	127° 31.03	187	187
16	408	2006-10-03	01:09	71° 15.77	127° 29.93	193	187
17	408	2006-10-03	02:46	71° 15.81	127° 29.82	197	194
18	408	2006-10-03	04:43	71° 15.30	127° 29.20	194	186
19	409	2006-10-04	13:08	71° 52.14	125° 52.14	108	109
20	410	2006-10-05	10:15	71° 41.97	126° 29.37	400	400
21	411	2006-10-05	11:57	71° 37.76	126° 41.82	430	420
22	412	2006-10-05	13:31	71° 33.96	126° 54.44	410	400
23	413	2006-10-05	15:06	71° 29.60	127° 08.75	373	360
24	414	2006-10-05	16:50	71° 25.29	127° 22.04	305	299
25	415	2006-10-06	01:14	71° 21.72	127° 33.28	238	235
26	416	2006-10-06	02:03	71° 17.52	127° 46.08	158	149
27	417	2006-10-06	03:12	71° 13.30	127° 58.94	84	74
28	418	2006-10-06	03:58	71° 09.65	128° 09.85	65	58
29	419	2006-10-06	04:46	71° 06.39	128° 20.26	56	47
30	420	2006-10-06	05:31	71° 03.17	128° 31.03	40	33
31	420	2006-10-06	07:48	71° 03.19	128° 30.86	42	33
32	421	2006-10-06	18:58	71° 28.18	133° 56.17	1196	990
33	421	2006-10-06	20:57	71° 28.75	133° 56.14	1128	990
34	421	2006-10-06	22:59	71° 28.73	133° 56.91	1120	991
35	421	2006-10-07	04:11	71° 28.05	133° 54.47	1150	1000
36	422	2006-10-07	08:36	71° 22.20	133° 52.95	1083	1000
37	423	2006-10-07	10:51	71° 16.35	133° 51.14	790	790
38	424	2006-10-07	12:28	71° 10.24	133° 49.84	560	560
39	425	2006-10-07	14:17	71° 04.12	133° 47.18	286	272
40	425	2006-10-07	15:16	71° 03.75	133° 49.87	288	274
41	435	2006-10-07	18:30	71° 04.60	133° 38.86	285	275
42	426	2006-10-07	21:00	70° 59.22	133° 45.00	113	98
43	427	2006-10-07	22:24	70° 52.76	133° 43.79	70	69
44	428	2006-10-07	23:34	70° 47.42	133° 42.24	67	64
45	429	2006-10-08	01:20	70° 41.56	133° 41.35	62	58
46	430	2006-10-08	02:49	70° 35.77	133° 39.33	71	61
47	431	2006-10-08	04:44	70° 29.71	133° 37.89	66	58
48	432	2006-10-08	06:10	70° 24.37	133° 36.42	62	53
49	433	2006-10-08	08:05	70° 17.09	133° 36.00	66	58
50	436	2006-10-09	10:54	70° 20.82	126° 20.96	247	240

**APPENDIX 2B.** Rosette casts locations, sampling times, water depths and corresponding stations or mooring numbers during ArcticNet expedition 0603 (page 1/3).

Cast	Station or	Start date	Start time	Latitude	Longitude	Cast depth	Sea bottom
number	mooring	UTC	UTC	(North)	(West)	(m)	depth (m)
51	436	2006-10-09	13:43	70° 20.13	126° 21.18	246	242
52	436	2006-10-09	16:26	70° 20.18	126° 21.23	252	240
53	436	2006-10-09	18:30	70° 19.60	126° 23.21	254	242
54	436	2006-10-09	20:06	70° 20.39	126° 20.73	251	243
55	436	2006-10-10	00:17	70° 20.04	126° 26.77	253	246
56		2006-10-11	22:21	70° 39.04	127° 12.19	251	242
57	435	2006-10-12	13:36	71° 04.55	133° 34.94	310	299
58	435	2006-10-12	15:34	71° 50.00	133° 33.42	333	313
59	435	2006-10-12	17:35	71° 04.28	133° 34.10	290	279
60	435	2006-10-13	01:32	71° 05.03	133° 34.58	333	318
61		2006-10-13	21:41	70° 22.73	137° 36.39	432	423
62	437?	2006-10-15	20:49	70° 37.67	136° 14.83	548	546
63		2006-10-16	17:43	70° 36.89	136° 24.62	693	680
64	434	2006-10-17	00:22	70° 10.60	133° 33.40	46	39
65	434	2006-10-17	02:37	70° 10.86	133° 34.64	43	35
66	407	2006-10-17	22:15	71° 00.53	126° 04.32	391	384
67	407	2006-10-18	01:22	71° 00.67	126° 02.88	397	392
68	407	2006-10-18	03:11	71° 01.03	125° 57.12	395	389
69	407	2006-10-18	05:03	71° 00.45	126° 03.73	390	381
70	407	2006-10-18	07:30	71° 01.21	126° 00.50	398	388
71	405	2006-10-18	17:50	70° 39.65	122° 59.79	591	583
72	404	2006-10-18	20:54	70° 20.79	121° 36.05	464	458
73	403	2006-10-19	00:29	70° 05.86	120° 06.67	414	405
74		2006-10-20	07:26	68° 05.02	111° 57.51	226	218
75		2006-10-21	12:39	69° 40.66	099° 35.95	75	64
76		2006-10-21	18:34	69° 51.48	099° 16.74	119	110
77		2006-10-22	02:20	71° 07.29	097° 30.09	99	90
78	317	2006-10-22	16:49	72° 05.14	093° 54.25	112	103
79	318	2006-10-22	18:12	71° 59.21	093° 48.95	83	72
80	319	2006-10-22	19:09	71° 52.96	093° 42.68	100	91
81	320	2006-10-22	20:16	71° 48.23	093° 37.05	91	82
82	321	2006-10-23	04:47	70° 20.94	091° 33.99	96	87
83	322	2006-10-23	05:58	70° 24.06	091° 06.07	222	213
84	322	2006-10-23	08:40	70° 24 06	091° 05 95	222	212
85	323	2006-10-23	12.15	70° 26 95	090° 38 54	134	122
86	324	2006-10-23	13.22	70° 30 10	090° 08 64	134	122
87	325	2006-10-23	14:52	70° 33 17	089° 40 36	164	154
88	326	2006-10-23	16:06	70° 36 11	089° 13 53	86	74
89	327	2006-10-24	03:52	69° 57 12	085° 45 63	236	225
90	328	2006-10-24	05:12	69° 53 03	085° 44 25	114	108
91	329	2006-10-24	21.24	69° 22 02	080° 23 40	36	29
92	330	2006-10-24	21.24	60° 10 12	080° 23.40	58	50
92	331	2006-10-24	23.20	69° 15 11	080° 45 83	71	64
0/	332	2006-10-24	00.14	60° 10.11	080° -0.00 080° 50 88	77	72
05	333	2000-10-20	02.41	68° 45 Q4	081° 00 87	34	26
90	334	2000-10-20	02.41	67° 52 77	001 00.07 080° 47 00	85 85	20 75
07	334	2000-10-20	11.10	67° 53 02	080° 47.39	82	77
08	335	2000-10-20	20.06	66° 32 02	000 47.47 082° 08 11	02	02
00	336	2000-10-20	20.00	66° 25 22	002 00.11	99 1/1	92 130
100	337	2006-10-25	23:06	66° 16.88	081° 36.89	70	61

**APPENDIX 2B.** Rosette casts locations, sampling times, water depths and corresponding stations or mooring numbers during ArcticNet expedition 0603 (page 2/3).
Cast	Station or	Start date	Start time	Latitude	Longitude	Cast depth	Sea bottom
number	mooring	UTC	UTC	(North)	(West)	(m)	depth (m)
101	338	2006-10-26	00:29	66° 09.98	081° 19.77	135	124
102	338	2006-10-26	02:30	66° 09.35	081° 19.81	134	125
103	339	2006-10-26	05:26	66° 00.97	081° 04.99	147	140
104	340	2006-10-26	06:36	65° 52.98	080° 46.93	133	126
105	341	2006-10-26	07:52	65° 47.08	080° 34.93	136	130
106	342	2006-10-26	09:09	65° 37.07	080° 16.81	113	107
107	343	2006-10-26	10:19	65° 31.01	080° 03.49	95	85
108	344	2006-10-26	11:53	65° 21.83	079° 47.52	93	88
109	345	2006-10-26	13:05	65° 14.98	079° 32.67	113	106
110	346	2006-10-26	14:19	65° 06.04	079° 18.66	90	80
111	347	2006-10-26	17:50	64° 59.13	079° 05.98	88	76
112	348	2006-10-26	19:07	64° 50.11	078° 51.08	133	120
113	349	2006-10-26	20:35	64° 41.07	078° 35.10	135	127
114	350	2006-10-27	01:00	64° 29.94	080° 30.08	385	378
115	350	2006-10-27	03:23	64° 29.66	080° 31.22	384	379
116	351	2006-10-27	18:08	63° 32.11	075° 50.09	353	343
117	356	2006-10-28	21:30	60° 44.53	064° 41.79	283	280
118	355	2006-10-28	23:02	60° 50.98	064° 42.73	410	417
119	354	2006-10-29	00:45	61° 00.10	064° 44.65	495	491
120	353	2006-10-29	02:19	61° 09.05	064° 47.40	397	401
121	352	2006-10-29	04:13	61° 15.98	064° 48.67	294	273
122		2006-10-29	15:46	63° 03.10	067° 22.78	449	433
123	601	2006-11-01	13:47	59° 02.90	063° 37.33	162	153
124	602	2006-11-01	16:28	59° 03.42	063° 51.72	155	147
125	605	2006-11-01	20:00	58° 58.43	063° 53.23	49	43
126	604	2006-11-01	23:10	59° 00.01	063° 53.71	67	60
127	606	2006-11-02	03:57	59° 05.52	063° 26.15	213	195
128	615	2006-11-02	18:57	58° 18.67	063° 33.71	132	128
129	614	2006-11-02	23:42	58° 23.57	063° 23.92	171	166
130	613	2006-11-03	05:17	58°29.07	063° 13.32	238	234
131	612	2006-11-03	07:47	58° 28.31	062° 58.05	80	80
132	610	2006-11-03	08:34	58° 31.99	062° 50.39	113	103
133	617	2006-11-03	10:31	58° 30.04	062° 41.32	130	129
134	621	2006-11-04	08:40	56° 24.88	061° 31.56	114	108
135	622	2006-11-04	09:42	56° 25.00	061° 43.89	79	78
136	623	2006-11-04	10:34	56° 26.83	061° 56.31	111	109
137	624	2006-11-04	11:26	56° 25.32	062° 04.17	70	66
138	620	2006-11-04	22:26	56° 23.85	061° 13.00	95	86

**APPENDIX 2B.** Rosette casts locations, sampling times, water depths and corresponding stations or mooring numbers during ArcticNet expedition 0603 (page 3/3).

**APPENDIX 3.** SCAMP cast locations, sampling times, water depths and corresponding station numbers during 2006 ArcticNet scientific expedition

- 3A. SCAMP logbook for Leg 1 (expedition 0602)
- 3B. SCAMP logbook for Leg 2 (expedition 0603)

STATION	132	131	126	117
LOCALISATION Lat. Long.	<b>Kane Basin</b> 78° 59.837' -072° 18.714'	<b>Baffin Bay</b> 78° 19.541' -073° 14.802'	<b>Baffin Bay</b> 77° 20.717' -073° 24.880'	<b>Baffin Bay</b> 77° 22.432' -076° 57.619'
<b>DEPARTURE</b> date (TU) time (TU)	2006-09-09 13:39	2006-09-11 18:30	2006-09-12 17:00	2006-09-14 19:45
<b>RETURN</b> time (TU)	15:39	21:10	19:00	21:26
CONDITIONS wind direction wind speed Pa Rel. Hum. air temp. (°C) water temp. (°C) (SST) sea state ice (1/10) clouds (1/8)	235/240 14 996.85/996.78 87% -0.0/-0.3 -0.17/-0.15 2 2 6	$20 \\ 30 \\ 1003 \\ 74\% \\ -1.7 \\ 1.0 \\ 5-6 \\ 1 \\ 6$	130 15 1000.48 61% 1.4 2.87 5-6 iceberg 3	330 12 1019.8 82% -2.6 -1.05 4 1 6
CTD CAST # Water depth (m) SCAMP 1 SCAMP 2 SCAMP 3 SCAMP 4 SCAMP 5	25 250 143245 145827 151519	36 333 202509 204001	39 334 171111 173943 175740	55 417 203450 205146 210658
MISCELLANEOUS Profil depth (m) Max # scans Chrono (min) Start of GPS UTC GPS file name	50 50000 8.5 13h39 09092006gps	50 50000 8.5 18h32 11092006gps	50 50000 8.5 17h01 12092006gps	50-60 80000 9 19h45 14092006gps
MINILOGS File name	09092006Top.txt 09092006Middle.txt 09092006Bottom.txt	none	12092006Top.xt 12092006Bottom.txt	14092006Top.txt 14092006Middle.txt 14092006Bottom.txt
COMMENTS Person in charge:	Problem with the connector. Caroline Sévigny	Ongoing problems with data salvaging. Two important shearing «areas» are illustrated in the first profile, they are less evident in the second profile. Heavy seas.	Installation of the USB connection in the SCAMP. Impossible to download the data from the «middle» minilog.	

## APPENDIX 3.A. Logbook of SCAMP profiles during Leg 1 (page 1/2)

STATION	115	101	307	310
LOCALISATION Lat. Long.	<b>Baffin Bay</b> 76° 20.553' -071° 12.072'	<b>Baffin Bay</b> 76° 24.630' -077° 16.668'	<b>Barrow Strait</b> 74° 25.290' -100° 33.131'	<b>McClintock Channel</b> 71° 21.369' -102° 10.194'
<b>DEPARTURE</b> date (TU) time (TU)	2005-09-16 13:00	2006-09-18 12:43	2006-09-23 17:25	2006-09-25 19:00
<b>RETURN</b> time (TU)	15:15	15:26	19:59	20:44
CONDITIONS wind direction wind speed Pa Rel. Hum. air temp. (°C) water temp. (°C) (SST) sea state ice (1/10) clouds (1/8)	135 6 1006.28 83% 2.5 2.54 3 iceberg 1	275 11 1015 91% 0.1 0.16 3 iceberg 1	$ \begin{array}{r} 160\\ 8\\ 1012.83\\ 99\%\\ -3.3\\ -0.59\\ 1\\ 2\\ 0\\ \end{array} $	30 18 1014.66 99% -2,4 -0,55 3 3 fog, 7
CTD CAST # Water depth (m) SCAMP 1 SCAMP 2 SCAMP 3 SCAMP 4 SCAMP 5	62 654 134341 140206 141702 143053 144528	77 311 134341 140206 141702 143053 144528	96 168 181847 183312 184937 190336 192324	108 216 194516 200012 201712
MISCELLANEOUS Profil depth (m) Max # scans Chrono (min) Start of GPS UTC GPS file name	50-60 80000 9 13h03 16092006gps	50-60 80000 10 18092006gps	80-90 80000 9-10 17h25 23092006gps	80-90 80000 8 19h07 25092006gps
MINILOGS File name	16092006Top.txt 16092006Middle.txt 16092006Bottom.txt	18092006Top.txt 18092006Middle.txt 18092006Bottom.txt	none	none
COMMENTS Person in charge:	Potential problems with one of the temperature sensors. Had to add a rubber ring. Caroline Sévigny	Speed still too fast. Will have to change all the batteries before the next sampling.		Stong currents. Drill overheating while recovering.

#### APPENDIX 3.A. Logbook of SCAMP profiles during Leg 1 (page 2/2)

STATION	405	408	414	436
LOCALISATION Lat. Long.	<b>Amundsen Gulf</b> 70° 39.08' -122° 56.86'	<b>Amundsen Gulf</b> 71° 15.91' -127° 31.04'	<b>Amundsen Gulf</b> 71° 25.27' -127° 22.02'	<b>Franklin Bay</b> 70° 19.76' -126° 22.46'
<b>DEPARTURE</b> date (TU) time (TU)	2006-10-01 20:38	2006-10-03 00:12	2006-10-05 16:34	2006-10-09 19:25
<b>RETURN</b> time (TU)	22:15	01:58	18:20	21:30
CONDITIONS wind direction wind speed Pa Rel. Hum. air temp. (°C) water temp. (°C) (SST) sea state ice (1/10) clouds (1/8)	160 8 1011.2 86% 0.0 3.9 3  4	150     10     1009.7     93%     0.8     2.1     4      6	53 21 1011.3 83% -2.5 1.9 6  6	70 8 1033.5 67% -5.0 1.3 2  5
CTD CAST # Water depth (m) SCAMP 1 SCAMP 2 SCAMP 3 SCAMP 4 SCAMP 5	10 579 205319* 212222 213809 215430	16 193 232156 233927 235554 001510 003205	24 305 165743 171456 172950 174620	53 254 022441 023826 025213 030932 032417
MISCELLANEOUS Profil depth (m) Max # scans Chrono (min) Start of GPS UTC GPS file name	85-88 80000 8 19:34 01102006gps	88 80000 8 00:12 02102006gps	30-40 80000 7 15:34 05102006gps	65-70 80000 8 19:26 09102006gps
MINILOGS File name	Bin01102006top.003 Bin01102006middle.000 B12-01102006bottom.003	Bin02102006top.004 Bin02102006middle.001 B12-02102006bottom.004	Bin05102006top.004  B12-05102006bottom.004	Bin09102006top.005  B12-09102006bottom.005
COMMENTS Person in charge:	Rapid descent speed (>0.2m/s) following Caroline's last configuration or «tune up». *The first cast (205319) is incomplete due to a deployment delay. Dany Dumont	Descent speed of >0.2m/s.	Descent speed of ~ 0.1m/s. The blue carrier box got stock in the zodiac during the recovering. The box has a crack on his cover. Had to change the SCAMP's batteries after sampling. Unable to download the data from the middle minolog.	Replacement of a blue plastic link/chain that broke off due to cold weather. The hour and date registered in the SCAMP files (09OCT2006_?????.txt) are not valid date. Descente spedd of ~0.15m/s. Unable to download data from the middle minilog.

## APPENDIX 3.B. Logbook of SCAMP profiles during Leg 2 (page 1/3)

STATION	407	334	338	345
LOCALISATION	Amundsen Gulf	Foxe Basin	Foxe Basin	Foxe Basin
Lat.	71° 00.69'	67° 53.00'	66° 09.29'	65° 05.96'
Long.	-126° 02.82'	-080° 47.47'	-081° 19.14'	-079° 18.36'
DEPARTURE				
date (TU)	2006-10-18	2006-10-25	2006-10-26	2006-10-26
time (TU)	00:55	11:00	01:12	14:12
RETURN				
time (TU)	02:57	12:45	03:20	15:24
CONDITIONS				
CONDITIONS	10		200	10
wind direction	18	253	308	10
wind speed	1010.0	10	9	9
Pa	1012.9	1021.5	1025	1022.2
Kel. Hum.	81%	92%	87%	86%
air temp. (°C)	-2.7	1.1	-1.1	-1.3
water temp. (°C) (SST)	1.58	1.94	1.49	0.48
sea state	1	1	3	3
1 ce (1/10)				
clouds (1/8)	8	8	6	7
	<b>70</b>		105	110
CTD CAST #	69	97	102	110
Water depth (m)	390	82	134	84
SCAMP 1	010610	112024	012512	142620
SCAMP 2	012053	113209	013916	143900
SCAMP 3	013519	114414	015453	145125
SCAMP 4	014932	120019	020903	150235
SCAMP 5	020414	121250	022305	
MISCELLANEOUS				
Profil depth (m)	55-60	55-70	50-65	55-75
Max # scans	80000	50000	50000	60000
Chrono (min)	8	7	8	8
Start of GPS UTC	00:53	10:56	01:12	
GPS file name	18102006gps	25102006gps	26102006gps	
MINILOGS				
File name	Bin18102006top.005	Bin25102006top.005	Bin26102006top.005	Bin26102006top(2).005
			Bin26102006middle.001	
	B12-18102006bottom.005	B12-25102006bottom.005	B12-26102006bottom.005	B12-26102006bottom(2).005
COMMENTS		Cat out hafor- Jame	Compling during the wish	Did not used the CDC I -
COMMENTS		Got out before dawn.	Sampling during the night.	Did not used the GPS. Le
		Nothing to report.	The GPS fell at the bottom of	coordonates of the station
			the zodiac and got wet with	were noted at the end of the
			sea water. It's not working	last
			anymore and will have to be	casts:#4:65°9.8N/79°19.9W.
			rinced thoroughly before the	
			next sampling.	
Person in charge	Dany Dumont			
i ci son in charge.	Daily Dunion		1	

## APPENDIX 3.B. Logbook of SCAMP profiles during Leg 2 (page 2/3)

STATION	350	602	615	624
LOCALISATION Lat. Long.	Foxe Basin 64° 29.96' -080° 30.00'	<b>Nachvak Fjord</b> 59° 03.30' -063° 51.40'	<b>Saglek Fjord</b> 58° 20.60' -063° 30.90'	<b>Anaktalak Fjord</b> 56° 25.30' -062° 04.10'
<b>DEPARTURE</b> date (TU) time (TU)	2006-10-27 00:54	2006-11-01 18:30	2006-11-02 18:40	2006-11-04 15:00
<b>RETURN</b> time (TU)	02:30	20:30	20:30	17:00
CONDITIONS wind direction wind speed Pa Rel. Hum. air temp. (°C) (SST) sea state ice (1/10) clouds (1/8)	124 7 1017.2 84% -1.2 1.03 1  8	calm calm 999.8 83% 1.6 1.92 0 beginning to form 6	221 28 997.8 64% -0.1 1.58 4  6	292 9 1004.7 72% -3.3 3  0
CTD CAST # Water depth (m) SCAMP 1 SCAMP 2 SCAMP 3 SCAMP 4 SCAMP 5	114 350 010500 011804 013102 014519 020020	124 162 172919 174944 180726 182133 184224	129 131 181047 183437 185723	137 70 142407 145032 151102
MISCELLANEOUS Profil depth (m) Max # scans Chrono (min) Start of GPS UTC GPS file name	52-72 60000 8 	40-50 60000 8 	24-33 80000 10 19:01 02112006gpsqo	33-50 80000 8 14:54 04112006gpsqo
MINILOGS File name	Bin27102006top.005  B12-27102006bottom.005		Bin02112006top.005  B12-02112006top.005	Bin04112006top.005  B1204112006bottom.005
COMMENTS Person in charge:	The GPS was not used (getting repared). The postion of the station was noted between casts 2 and 5: #2:64°30.1N/80°30.1W; #3:64°30.1N/80°30.2W; #4:64°30.1N/80°30.2W; #5:64°30.1N/80°30.3W. Will be able to use the GPS for the next sampling. I rinced it toroughly with distilled water.	The minilogs were not deployed. The GPS is not receiving the satellite signal. The sea surface is like a mirror and crystal ice is forming.	The zodiac is rapidly drifting due to winds. I had to unwind 500m of cable in 10 minutes. The spedd descent slowed significantly at 15-20m, probably due to cable drag. The GPS still cannot receive the satellite signal (maybe there is an internal malfunction?!).	

## **APPENDIX 3.B.** Logbook of SCAMP profiles during Leg 2 (page 3/3)

#### APPENDIX 4. SCAMP data plots

- 4A. Example of SCAMP data from Leg 1 (expedition 0602)
- 4B. Example of SCAMP data from Leg 2 (expedition 0603)

**APPENDIX 4.A** SCAMP data profile. The data is from the profile #134341 recorded on station 115 during leg 0602. The blue line represented the temperature (°C), the green one is fluorescence (volts), the red one is density (kg m<sup>-3</sup>), the gray is light penetration and finally the black one is the turbulent kinetic energy dissipation (m<sup>2</sup> s<sup>-3</sup>).



**APPENDIX 4.B** SCAMP data profile. The data is from the profile #013519 recorded on station 407 during leg 0603. The blue line represented the temperature (°C), the green one is fluorescence (volts), the red one is density (kg m<sup>-3</sup>), the gray is light penetration and finally the black one is the turbulent kinetic energy dissipation (m<sup>2</sup> s<sup>-3</sup>).



# **APPENDIX 5.** Sections of salinity and potential temperature for ArcticNet expedition 0602 (Leg 1).

The same color scale is used for all sections except 5.6 where fresher water was recorded. For the sections in northern Baffin Bay, Canada is on the left and Greenland is on the right.

- 5.1. Section in Oliver Sound
- 5.2. Section NOW S1 in northern Baffin Bay (same as named location than during NOW program in 1998)
- 5.3. Section NOW S3 in northern Baffin Bay (same as named location than during NOW program in 1998)
- 5.4. Section NOW S5 in northern Baffin Bay (same as named location than during NOW program in 1998)
- 5.5. Section in front of Belcher Glacier in northern Baffin Bay
- 5.6. Section along Northwest Passage.



**APPENDIX 5.1.A.** The yellow arrow identifies the location of the section in Oliver Sound. This section is contoured on the next page.



**APPENDIX 5.1.B.** Salinity and potential temperature along the section in Oliver Sound. 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 the section NOW S1 in northern Baffin Bay. This section is contoured on the next page. (NOW referring to North Water polynya expedition).



**APPENDIX 5.2.B.** Salinity and potential temperature along the section NOW S1. 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 the section NOW S3 in northern Baffin Bay. This section is contoured on the next page.



**APPENDIX 5.3.B.** Salinity and potential temperature along the section NOW S3. The western sites are on the left and the eastern sites are on the right.



**APPENDIX 5.4.A.** The yellow arrow identifies the location of the section NOW S5 in northern Baffin Bay. This section is contoured on the next page.



**APPENDIX 5.4.B.** Salinity and potential temperature along the section NOW S5. 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 the section in front of Belcher Glacier in northern Baffin Bay. This section is contoured on the next page.



**APPENDIX 5.5.B.** Salinity and potential temperature along the section in front of Belcher Glacier. 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 the section along the Northwest Passage. This section is contoured on the next page. The boat sailed from East to West, but the section is plot from West (left) to East (right).



**APPENDIX 5.6.B.** Salinity and potential temperature along the section along the Northwest Passage. The western sites are on the left and the eastern sites are on the right.

APPENDIX 6. Contours of salinity and potential temperature for the different sections of ArcticNet expedition 0603 (Leg 2).

The same color scale is used for all sections except 6.2 where fresher water was recorded. 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 S400 in Beaufort Sea (same location than in 2003-2004 during CASES program)
- 6.2. Section S700 in Beaufort Sea (same location than in 2003-2004 during CASES program)
- 6.3. Section along the Northwest Passage
- 6.4. Section on the eastern side of Bellot Strait
- 6.5. Section across the Gulf of Boothia
- 6.6. Section in front of Igloolik Island
- 6.7. Section across Foxe Basin
- 6.8. Section 13 across Hudson Strait (as named in 2005)
- 6.9. Section in Nachvak fjord along Labrador coast
- 6.10. Section in Saglek fjord along Labrador coast
- 6.11. Section in Anaktalak fjord along Labrador coast



**APPENDIX 6.1.A.** The yellow arrow identifies the location of section S400 in Beaufort Sea. This section is contoured on the next page.



**APPENDIX 6.1.B.** Salinity and potential temperature along section S400. 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 the section S700 in Beaufort Sea. This section is contoured on the next page.



**APPENDIX 6.2.B.** Salinity and potential temperature along S700. The southern sites are on the left and the northern sites are on the right.



**APPENDIX 6.3.A.** The yellow arrow identifies the location of the section along the Northwest Passage. This section is contoured on the next page.



**APPENDIX 6.3.B.** Salinity and potential temperature along the section along the Northwest Passage. The western sites are on the left and the eastern sites are on the right.



**APPENDIX 6.4.A.** The yellow arrow identifies the location of the section on the eastern side of Bellot Strait. This section is contoured on the next page.



**APPENDIX 6.4.B.** Salinity and potential temperature along the section on the eastern side of Bellot Strait. The southern sites are on the left and the northern sites on the right.



**APPENDIX 6.5.A.** The yellow arrow identifies the location of the section across the gulf of Boothia. This section is contoured on the next page.



**APPENDIX 6.5.B.** Salinity and potential temperature along the section across the gulf of Boothia. The western sites are on the left and the eastern sites are on the right.



**APPENDIX 6.6.A.** The yellow arrow identifies the location of the section in front of Igloolik Island. This section is contoured on the next page.


**APPENDIX 6.6.B.** Salinity and potential temperature along the section in front of Igloolik Island. 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 the section across Foxe Basin. This section is contoured on the next page.



**APPENDIX 6.7.B.** Salinity and potential temperature along the section across Foxe Basin. 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 the section 13 across Hudson Strait. This section is contoured on the next page.



**APPENDIX 6.8.B.** Salinity and potential temperature along section 13 across Hudson Strait. The southern sites are on the left and the northern sites are on the right.



**APPENDIX 6.9.A.** The yellow arrow identifies the location of the section in Nachvak fjord along Labrador coast. This section is contoured on the next page.



**APPENDIX 6.9.B.** Salinity and potential temperature along the section in Nachvak fjord. The western sites are on the left and the eastern sites are on the right.



**APPENDIX 6.10.A.** The yellow arrow identifies the location of the section in Saglek fjord along Labrador coast. This section is contoured on the next page.



**APPENDIX 6.10.B.** Salinity and potential temperature along the section in Saglek fjord. The western sites are on the left and the eastern sites are on the right.



**APPENDIX 6.10.A.** The yellow arrow identifies the location of the section in Anaktalak fjord along Labrador coast. This section is contoured on the next page.



**APPENDIX 6.10.B.** Salinity and potential temperature along the section in Anaktalak fjord. The western sites are on the left and the eastern sites are on the right.

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



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