



Université du Québec

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Eau, Terre et Environnement

DISTRIBUTION OF TEMPERATURE AND SALINITY IN THE BEAUFORT SEA  
DURING THE CANADIAN ARCTIC SHELF EXCHANGE STUDY  
SAMPLING EXPEDITIONS 2002-2004

By

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## ABSTRACT

This report presents the CTD (Conductivity, Temperature and Depth) data obtained during the Canadian Arctic Shelf Exchange Study (CASES) expeditions held between 2002 and 2004 in the Beaufort Sea. The report also contains information about data obtained by the Moving Vessel Profiler (MVP), moorings and ship mounted Acoustic Doppler Current Profiler (SM-ADCP) which was recorded during the same expeditions. Detailed maps of sampling sites in the Beaufort Sea and Mackenzie Shelf are included. CTD temperature and salinity data are presented as contour plots following West-East or South-North sections. Stick diagrams of moored ADCP's data are also included.

## RÉSUMÉ

Ce rapport présente les données de CTD (conductivité, température et profondeur) recueillies au cours des différentes missions du programme «*Canadian Arctic Shelf Exchange Study*» (CASES) qui se sont déroulées dans la mer de Beaufort entre 2002 et 2004. Il présente également de l'information sur les données de Moving Vessel Profiler (MVP), du profileur de courant (ADCP) fixé sous la coque et des données de mouillage enregistrées au cours des mêmes missions. Des cartes détaillées montrant les sites d'échantillonnage dans la mer de Beaufort et le long de la marge continentale du Mackenzie y sont incluses. Les données de température et de salinité du CTD et du MVP y sont présentées sous forme de contours le long de sections ouest-est ou sud-nord. Les données enregistrées par les ADCP des mouillages sont présentées sous forme de diagrammes en bâtons.

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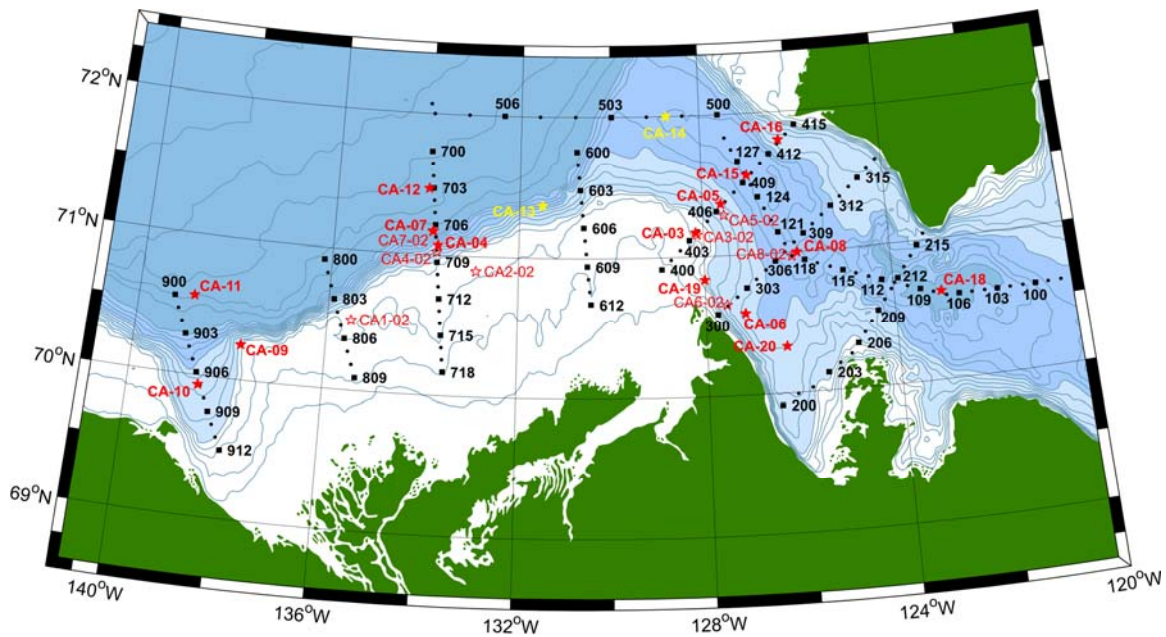
## **FOREWORD: CANADIAN ARCTIC SHELF EXCHANGE STUDY**

Funded by the Natural Sciences and Engineering Research Council of Canada (NSERC), the Canadian Arctic Shelf Exchange Study (CASES) Research Network is an international effort under Canadian leadership to understand the biogeochemical and ecological consequences of sea ice variability and change on the Mackenzie Shelf. The CASES Research Network brought together Canadian and foreign expertises in Arctic oceanography. The Canadian contribution included 42 researchers coming from ten universities, four Federal Departments and the Canadian Museum of Nature. Thirty Arctic experts coming from nine foreign countries (USA, Japan, UK, Denmark, Russia, Poland, Norway, Belgium and Spain) were associated with the CASES Network.

The Canadian contribution was to assess the dynamical aspects of the Mackenzie Shelf ecosystem. The scientific program is focussing on a central hypothesis which states that the atmospheric, oceanic and hydrologic forcing of sea ice variability dictates the nature and magnitude of biogeochemical carbon fluxes on and at the edge of the Mackenzie Shelf. The Canadian-led projects studied: 1) Atmospheric and sea ice forcing of coastal circulation; 2) Ice-atmosphere interactions and biological linkages; 3) Light, nutrients, primary and export production in ice-free waters; 4) Microbial communities and heterotrophy; 5) Pelagic food web: structure, function and contaminants; 6) Organic and inorganic fluxes; 7) Benthic processes and carbon cycling; 8) Millennial-decadal variability in sea ice and carbon fluxes; 9) Coupled bio-physical models of the carbon flows on the Canadian Arctic Shelf.

# 1. INTRODUCTION

The CASES program was carried out from September 2002 to August 2004. The objective of the CASES field expeditions was to perform an extensive sampling of the Southern Beaufort Sea and the Amundsen Gulf coastal shelves (from  $\approx 67^{\circ}\text{N}$  to  $76^{\circ}\text{N}$  and from  $\approx 120^{\circ}\text{W}$  to  $41^{\circ}\text{W}$ ) (see Fig. 1). Two different expeditions were held. The first expedition was conducted on board the CCGS Pierre Radisson between September 20<sup>th</sup> and October 14<sup>th</sup>, 2002 and was identified as leg 0. The second expedition was conducted on board the CCGS Amundsen between September 8<sup>th</sup>, 2003, and August 26<sup>th</sup>, 2004. This last expedition was divided into nine periods of six weeks (four weeks for leg 9) designated legs 1 to 9 (see Table 1).



**FIGURE 1.** CASES study region. The CTD–Rosette sampling stations are identified by black squares or dots, and the mooring sites with yellow and red stars.

This report provides the CASES community with a synthesis of the available physical data recorded during this 13-month sampling campaign. The data set includes 983 Rosette-CTD (Conductivity Temperature Depth) casts and 1924 MVP (Moving Vessel Profiler) profiles. Also included are information about the 2002-2003 and 2003-2004 data recorded by 81 different instruments deployed on 24 (recuperated) mooring lines, and current data recorded along the ship track by a ship mounted ADCP (Acoustic Doppler Current Profiler).

## ***Related Studies***

A significant amount of published studies and scientific papers have reported on the physical oceanographic processes in the Canadian Arctic. 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 program and subsequently during ArcticNet expeditions. 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*. The oceanography of the Beaufort Sea was also discussed by Ingram *et al.* in an issue of «The Sea» (volume 14, part A, 2005). Two thesis present information related to the polynya observations: Galley (2009) and Lanos (2009). The former focuses on ice processes and the latter on water column processes.

## **2. SAMPLING PROGRAM**

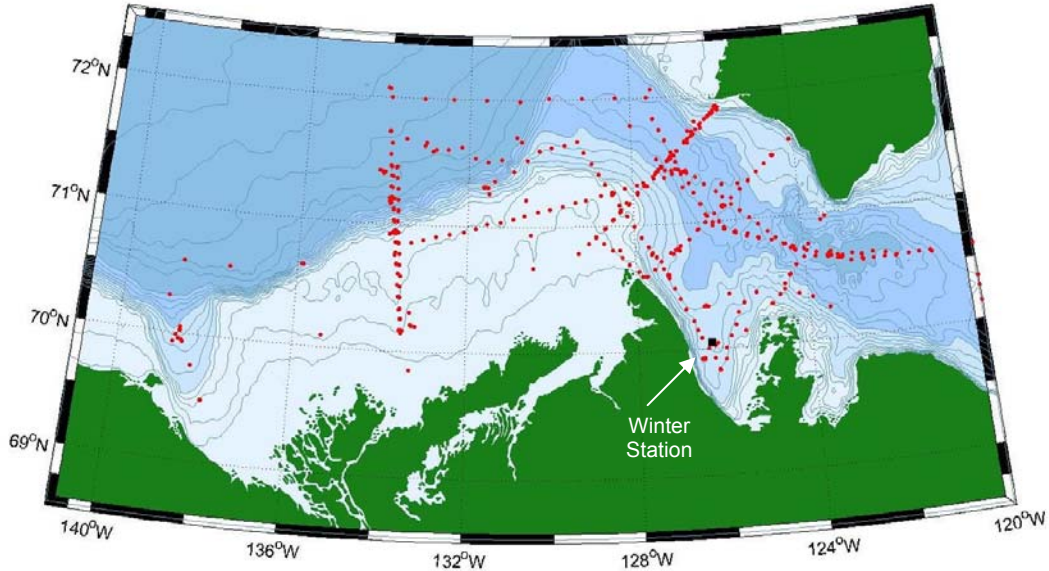
### ***Rosette***

During CASES expeditions, the rosette was equipped with 24 «Niskin» 12 L bottles, a SeaBird 911+ CTD with eight independent sensors (see Table 2 for sensors specifications). Few sensors were changed during the expeditions. No altimeter was used during the first leg in 2002. At that time, the sea-bed proximity was detected with a weight attached to a line. The nitrates sensor was only installed on the rosette at the beginning of leg 3 (expedition 0305). Lastly, the PAR (light sensor) was removed for the winter lightless time period from the middle of leg 3 (expedition 0305) to the middle of leg 7 (expedition 0404).

During legs 0, 1, 2, the second half of 7, 8 and 9, the ship was sailing in open water and the rosette was deployed from the ship boat deck and lowered into the water at a rate of  $1 \text{ m s}^{-1}$ . However, during legs 3, 4, 5, 6 and the first half of 7, the ship remained ice bound at its over-wintering station (Winter 1:  $70^{\circ}02.73'N$  and  $126^{\circ}18.07'W$ , see Fig. 2 and Appendix 1 and 2). For this period, the rosette was deployed from the Moon Pool, a 4 feet by 4 feet opening in the middle of the Amundsen's hull giving access to the water underneath.

CTD profiles were carried out in the Southern Beaufort Sea and Amundsen Gulf along sections (see Fig. 2 and Appendix 2). A summary of the sampling effort is presented in Tables 3a and 4. In open water, the rosette was deployed as often as possible. At the over-wintering station, the sampling schedule was simpler: the Rosette was

deployed at least twice a day, usually 12 hours apart. The CTD spatial coverage from legs 0303 and 0406 is poor because those legs were dedicated to mooring deployment and/or coring.



**FIGURE 2.** CASES Rosette sampling sites. The Winter station is identified by a black square in Franklin Bay ( $70^{\circ} 02.71' N$ ,  $126^{\circ} 18.06' W$ ).

The logbooks of the CTD profiles are presented in Appendix 3. A summary of the CTD processing and quality control is presented in Section 3 of this report, and contour plots of salinity and potential temperature along some sampling sections are presented in Appendices 5 to 8. During the over-wintering months other CASES teams carried out CTD profiles through ice holes using a SBE 19 instrument. Most of those profiles were performed at the following ice "permanent" stations: Dukuduku, Titicaca, Takatuk and Angaguk. The locations of the stations with respect to the ship are shown in Appendix 1. Unfortunately, we don't have a copy of all that CTD data set. A summary of the information on the available ice CTD profiles is presented in Appendix 4. The interested reader should contact the other CASES teams directly.

CTD data are hosted on the Integrated Service Data Management (ISDM) website and are available to the international community.

### *Moving Vessel Profiler (MVP)*

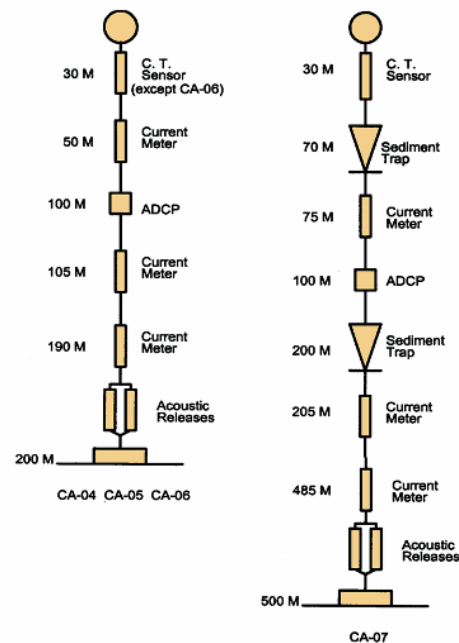
The Moving Vehicle Profiler is a towed CTD with fluorescence and dissolved oxygen sensors. It is used in automatic mode. The “fish” (right, picture credit: CASES Website) freefalls at  $\sim 5 \text{ m s}^{-1}$  and is automatically winched back to 10 m under the surface after each cast. We are unable to sample the first 10 and last 10 meters of the water column. The instrument is a MVP 300-1700 model, meaning that it is equipped with 1700 m of cable and can profile down to 300 m at 12 knots. The slower the cruising speed the deeper the MVP can reach.



This MVP profiler was equipped with sensors similar to the Rosette (see Table 2 for sensors specifications). The MVP was mostly used during legs 0404 and 0405 and only once during leg 0406 between stations 200 and 124. One thousand nine hundred and twenty-four MVP casts were carried out during those legs. A summary of the sampling data is presented in Table 3b and the locations of the MVP sections are shown in Appendix 2. The logbook of the MVP profiles available for all the stations and casts is presented in Appendix 9. Contours plots of salinity and potential temperature recorded along the sections are presented in Appendices 10 to 12.

### *Moorings*

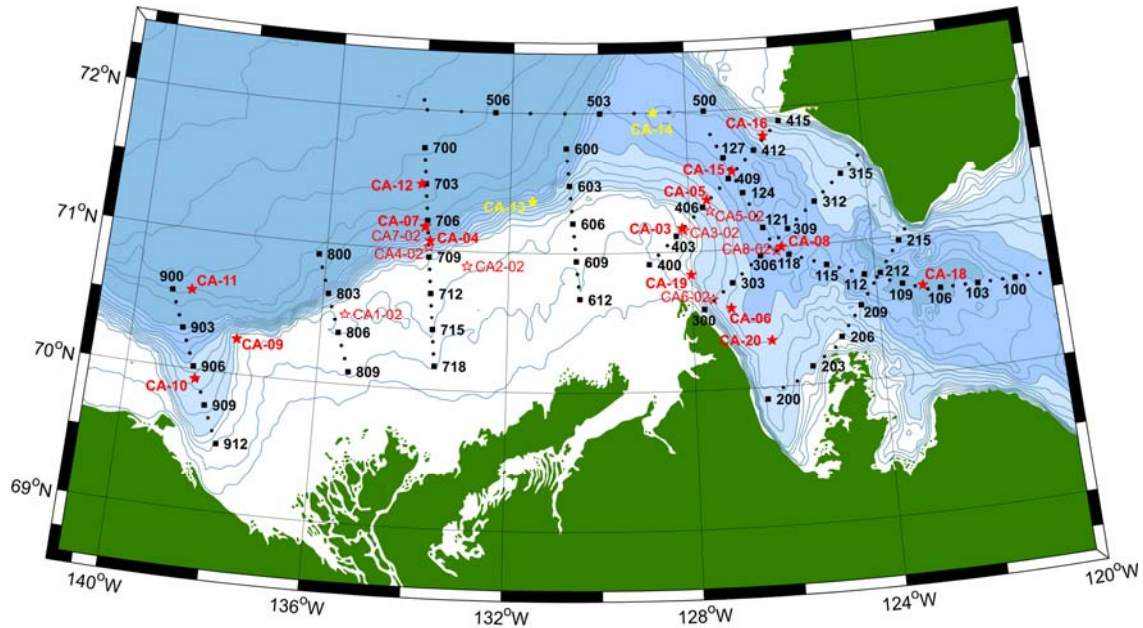
Moorings lines were deployed in 2002 and 2003 to measure ocean currents and long-term variability of the water masses in the Beaufort Sea. Ingram *et al.* (2004) described in detail the CASES mooring activities and van Hardenberg (2004a) presented the general description of the deployment and recovery procedures. The following schematics (Fig. 3) show the different type of instruments and sensors attached to the moorings. A summary of the moorings, the sensors, and the recovered data may be found in Tables 5 and 6.



**FIGURE 3** Example of mooring schematics. (Credits: Bon van Hardenberg, Fisheries and Ocean Canada)

Eight moorings were deployed in 2002 along the Beaufort continental shelf and Amundsen Gulf (see Fig.4). All of them were successfully recovered and redeployed for another year of measurements in 2003 (except CA01 and CA02). A total of seventeen moorings were deployed in October 2003 along the Beaufort continental shelf and in the Amundsen Gulf (see Fig. 4). All the moorings but two (CA13-03 and CA14-03) were

recovered in 2004 (CA13 was recovered in 2005) and six were re-deployed for another year of measurements in the Beaufort Sea and Amundsen Gulf for ArcticNet (CA04, CA05, CA07, CA15, CA18 and CA20).



**FIGURE 4.** Mooring locations (2002-2004). The moorings are identified by the red and yellow stars.

A summary of the 30 instruments recovered in 2003 and the 51 instruments recovered in 2004 and 2005, their sensors, and the periods of valid data are shown in Tables 5 and 6. The instruments included RDI 300 kHz Workhorse ADCPs, Aanderaa RCM-11, RCM-7 and RCM-4 (Recording Current Meters), Sea-Bird SBE-37 conductivity-temperature sensors, Sea-Bird SBE-26 water level recorders, Alec conductivity-temperature sensors, Alec chlorophyll sensors and Alec light sensors. Ingram *et al.* (2004) and van Hardenberg (2004) have summarized all the problems encountered in their technical reports. The stick diagrams of the sea currents recorded by the ADCPs on the different moorings between 2003 and 2004 are presented in Appendix 13.

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

During the entire 2003-2004 CASES sampling season, the CCGS Amundsen was equipped with a RDI Ocean Surveyor (ship-mounted) 150 kHz ADCP, sampling 24 hours a day. 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 2003-2004 expeditions. 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.

### 3. DATA PROCESSING AND QUALITY CONTROL

#### *Rosette-CTD data*

The Rosette data processing and quality control are described in detail by Guillot (2003). 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 to be aware of data limitations.

Processing included the following steps: validation of the calibration coefficients, conversion of data to physical units, alignment correction and extraction of useless data. Oxygen sensor calibration was done using Winkler titrations and salinity data were compared with water samples analysed with a Guildline 8400B Autosal. The CTD data were passed through a quality control test based on UNESCO's algorithm standards (1990). The recorded data were averaged every 1 dbar. The computed oceanographic parameters (see Table 7) were calculated using the averaged data. Missing data were linearly interpolated. Lastly, there is one ASCII file for every CTD cast. The content of a typical ASCII file is shown in Table 7.

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 in Appendix 2. The contours are presented in Appendices 5 to 8. Table 4 presents the stations and casts number used for each section 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 always the westernmost or southernmost cast. For the West-East sections, West is on the left and East on the right; for the South-North sections, South is on the left and North on the right.

#### *MVP data*

MVP profiles cover the water column from 10 meters of the surface down to 10 meters from the sea-bed. The temperature and salinity contours are provided for each section shown in Appendix 2. The contours are presented in Appendices 10 to 12. The temperature and salinity data were averaged every 1 dbar but were not interpolated. The contours plots use the original data. The origin of each section is the westernmost or southernmost cast. For the West-East sections, West is on the left and East on the right; for the South-North sections, South is on the left and North on the right.

### ***Mooring data***

The mooring data were processed by Bon van Hardenberg of the Institute of Ocean Sciences in Sydney, B.C. and distributed as Excel files. Information about the compasses calibration will be found in his report: *Report on the 2003 calibrations of magnetic compasses of Aanderaa current meters and RDI Acoustic Doppler Current Profilers (ADCPs) for use in Arctic mooring deployments.*

The moored ADCP's data were processed by Dave Riedel from True North Scientific Company. The summary of the processing and the quality control performed on the data of 2002 and 2003 will be found in his report: *ADCP Data Processing Summary: CASES 2002-2003 ADCP.* The report also includes an appreciation of the data quality and a few recommendations.

## **4. DISCUSSION**

CASES was a very demanding research program that was characterized by the overwintering of the first Canadian scientific icebreaker, the CCGS Amundsen, in the Amundsen Gulf. The ship was ice-bound in Franklin Bay for six months: from November 2003 to June 2004. The biggest surprise was the observation of a couple of eddies drifting under the ship during this period. A second surprise was the overwintering of an enormous school of Arctic cods under the ship. In February, the density of cods was so great that the ship-mounted ADCP was recording a ship vertical velocity when they were migrating up and down the water column.

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) mooring and CTD data. In his Ph.D. thesis (Lanos 2009), he describes the regional and seasonal variability in the Beaufort Sea – Amundsen Gulf region. Also in his Ph.D. thesis, Ryan Galley dedicates a chapter to the formation of the Cape Bathurst polynya in 2003-2004. Finally, current pulses were observed in the 2003-2004 and 2004-2005 mooring data at CA04. Some pulses were related to storms in Bering.

## 5. ACKNOWLEDGMENTS

We thank Captains Brulé, Thomas, Julien and Tremblay, the officers and crew of the CCGS Pierre Radisson, CCGS Sir Wilfrid Laurier and CCGS Amundsen for their outstanding collaboration throughout the CASES expeditions. We also thank the many members of the «Rosette team» and all the «Rosette monkeys» for their outstanding sampling effort cast after cast after cast. Thanks to the mooring team for their incredible work. And last but not least, thanks to Bon van Hardenberg, Pascal Guillot and Maryam Kamali Nezhad for their data processing efforts.

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**TABLE 1.** Summary of CASES expeditions.

| <b>Leg</b> | <b>Expedition Number</b> | <b>Dates</b>  | <b>Chief Scientists</b>      | <b>CTD Operators</b>                                      |
|------------|--------------------------|---|------------------------------|---|
| 0          | 0202                     | Sept 20 <sup>th</sup> , 2002<br>To<br>Oct 14 <sup>th</sup> , 2002     | Martin Fortier               | Marie Robert<br>Marie-Emmanuelle Rail<br>Gilles Desmeules |
| 1          | 0303                     | Sept 8 <sup>th</sup> , 2003<br>To<br>Oct 15 <sup>th</sup> , 2003      | Martin Fortier               | Yves Gratton<br>Jean-Éric Tremblay                        |
| 2          | 0304                     | Oct 15 <sup>th</sup> , 2003<br>To<br>Nov 25 <sup>th</sup> , 2003      | Lisa Miller                  | Bill Williams<br>Jane Eert                                |
| 3          | 0305                     | Nov 26 <sup>th</sup> , 2003<br>To<br>Jan 6 <sup>th</sup> , 2004       | Christian<br>Nozais          | Marie-Emmanuelle Rail                                     |
| 4          | 0401                     | Jan 7 <sup>th</sup> , 2004<br>To<br>Feb 17 <sup>th</sup> , 2004       | Jody Deming                  | Claude Bélanger   |
| 5          | 0402                     | Feb 18 <sup>th</sup> , 2004<br>To<br>March 30 <sup>th</sup> , 2004    | Jody Deming                  | Mykola Vysotskyy  |
| 6          | 0403                     | March 31 <sup>st</sup> , 2004<br>To<br>May 11 <sup>th</sup> , 2004    | Louis Fortier<br>Dave Barber | Sergey Kirillov   |
| 7          | 0404                     | May 12 <sup>th</sup> , 2004<br>To<br>June 24 <sup>th</sup> , 2004     | Dave Barber<br>Yves Gratton  | Louis Prieur<br>Ian Beliveau                              |
| 8          | 0405                     | June 25 <sup>th</sup> , 2004<br>To<br>August 4 <sup>th</sup> , 2004   | Louis Fortier<br>Dave Scott  | Romain Lanos<br>Christof Konig                            |
| 9          | 0406                     | August 5 <sup>th</sup> , 2004<br>To<br>August 26 <sup>th</sup> , 2004 | André Rochon                 | Marie-Emmanuelle Rail                                     |

**TABLE 2.** Rosette and MVP sensor specifications, CASES 2002-2004.

| Parameter   | Sensor         |                            | Range  | Accuracy                     | Resolution                      |
|---|----------------|----------------------------|--|------------------------------|---------------------------------|
|   | Compagny       | Instrument Type            |  |                              |                                 |
| <b>Attached to the Rosette</b>  |                |                            |  |                              |                                 |
| 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<br>(0-70mmho/cm)                                 | 0.0003 S/m<br>(0.003mmho/cm) | 0.00004 S/m<br>(0.0004 mmho/cm) |
| Pressure  | Paroscientific | 410K-105                   | up to 10 500m<br>(15 000psia) <sup>2</sup>               | 0.015% of full<br>scale      | 0.001% of full scale            |
| Dissolved oxygen  | SeaBird        | SBE-43 <sup>3</sup>        | 120% of surface<br>saturation <sup>4</sup>               | 2% of saturation             | unknown                         |
| pH  | SeaBird        | SBE-18-I <sup>5</sup>      | 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                        | ±0.5 µM                         |
| Light intensity (PAR)   | Biospherical   | QCP2300                    | 1.4×10 <sup>-5</sup> to 0.5<br>µE/(cm <sup>2</sup> -sec) |                              |                                 |
| sPAR  | Biospherical   | QCP2200                    | 1.4×10 <sup>-5</sup> to 0.5<br>µE/(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                          |
| <b>Attached to the MVP</b>  |                |                            |  |                              |                                 |
| 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<br>(0-70mmho/cm)                                 | 0.0003 S/m<br>(0.003mmho/cm) | 0.00004 S/m<br>(0.0004 mmho/cm) |
| Pressure  | Paroscientific | 410K-105                   | up to 10 500m<br>(15 000psia) <sup>2</sup>               | 0.0015% of full<br>scale     | 0.001% of full scale            |
| Dissolved Oxygen  | SeaBird        | SBE-43 <sup>3</sup>        | 120% of surface<br>saturation <sup>4</sup>               | 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: <sup>1</sup> Maximum depth of 6800m<br><sup>2</sup> Depending on the configuration<br><sup>3</sup> Maximum depth of 7,000m<br><sup>4</sup> In all natural waters, fresh and marine<br><sup>5</sup> Maximum depth of 1,200m<br><sup>6</sup> Maximum depth of 1,000m<br><sup>7</sup> Maximum depth of 6,000m |                |                            |  |                              |                                 |

**TABLE 3a.** Summary of Rosette sampling, CASES 2002-2004.

| Expedition number | Leg number | Date         |             | Number of CTD casts | Number of stations | Number of sections |
|-------------------|------------|--------------|-------------|---------------------|--------------------|--------------------|
|                   |            | Start        | End         |                     |                    |                    |
| 0202              | 0          | September 20 | October 14  | 123                 | 109                | 7                  |
| 0303              | 1          | September 8  | October 15  | 37                  | 17                 | n/a                |
| 0304              | 2          | October 15   | November 25 | 147                 | 109                | 6                  |
| 0305              | 3          | November 26  | January 6   | 60                  | 1                  | n/a                |
| 0401              | 4          | January 7    | February 17 | 119                 | 1                  | n/a                |
| 0402              | 5          | February 18  | March 30    | 90                  | 1                  | n/a                |
| 0403              | 6          | March 31     | May 11      | 94                  | 1                  | n/a                |
| 0404              | 7          | May 12       | May 30      | 40                  | 1                  | n/a                |
|                   |            | June 4       | June 24     | 93                  | 47                 | 5                  |
| 0405              | 8          | June 25      | August 4    | 137                 | 53                 | 8                  |
| 0406              | 9          | August 5     | August 26   | 24                  | 8                  | n/a                |

Notes: n/a = not applicable

**TABLE 3b.** Summary of MVP sampling, CASES 2004.

| Expedition number | Leg number | Date     |          | Number of CTD casts | Number of sections |
|-------------------|------------|----------|----------|---------------------|--------------------|
|                   |            | Start    | End      |                     |                    |
| 0404              | 7          | June 17  | June 21  | 276                 | 3                  |
| 0405              | 8          | June 25  | August 1 | 1588                | 20                 |
| 0406              | 9          | August 7 | August 7 | 60                  | 1                  |

**TABLE 4.** List of CASES Rosette sections and their corresponding station and cast numbers in open water (page 1/3).

|         |         |      | <b>Expedition 0202, Leg 0</b> |         |      |         |         |      |
|---------|---------|------|-------------------------------|---------|------|---------|---------|------|
| Section | Station | Cast | Section                       | Station | Cast | Section | Station | Cast |
| 1       | 6       | 124  | 4                             | 48      | 038  | 6       | 89      | 094  |
|         | 7       | 123  |                               | 49      | 039  |         | 90      | 095  |
|         | 8       | 122  |                               | 50      | 043  |         | 91      | 096  |
|         | 9       | 121  |                               | 51      | 044  |         | 92      | 097  |
|         | 10      | 120  |                               | 52      | 045  |         | 93      | 098  |
|         | 11      | 119  |                               | 53      | 046  |         | 94      | 099  |
| 2       | 12      | 115  |                               | 54      | 048  | 95      | 100     |      |
|         | 13      | 114  |                               | 56      | 050  | 96      | 101     |      |
|         | 14      | 113  |                               | 57      | 051  | 97      | 102     |      |
|         | 15      | 112  |                               | 58      | 052  | 98      | 103     |      |
|         | 16      | 111  |                               | 59      | 053  | 99      | 104     |      |
|         | 17      | 110  |                               | 60      | 054  | 100     | 105     |      |
|         | 18      | 003  |                               | 61      | 055  | 101     | 106     |      |
|         | 19      | 004  |                               | 62      | 056  | 7       | 101     | 106  |
|         | 20      | 005  |                               | 63      | 057  |         | 102     | 128  |
|         | 21      | 006  | 64                            | 058     | 103  |         | 129     |      |
|         | 22      | 007  | 65                            | 059     | 104  |         | 130     |      |
|         | 23      | 008  | 66                            | 067     | 105  |         | 131     |      |
|         | 24      | 009  | 67                            | 068     | 106  |         | 132     |      |
|         | 25      | 013  | 68                            | 069     | 107  | 133     |         |      |
|         | 26      | 014  | 69                            | 070     | 108  | 134     |         |      |
|         | 28      | 016  | 70                            | 071     | 109  | 135     |         |      |
|         | 29      | 017  | 71                            | 072     | 110  | 136     |         |      |
|         | 30      | 018  | 72                            | 073     | 5    |         |         |      |
| 31      | 019     | 73   | 074                           | 77      |      | 078     |         |      |
| 32      | 020     | 74   | 075                           | 78      |      | 079     |         |      |
| 33      | 021     | 75   | 076                           | 79      |      | 080     |         |      |
| 34      | 022     | 76   | 077                           | 80      |      | 081     |         |      |
| 3       | 34      | 022  | 77                            | 078     |      | 81      | 082     |      |
|         | 35      | 023  | 78                            | 079     |      | 82      | 083     |      |
|         | 36      | 024  | 79                            | 080     |      | 83      | 086     |      |
|         | 37      | 025  | 80                            | 081     |      | 84      | 088     |      |
|         | 38      | 026  | 81                            | 082     |      | 85      | 089     |      |
|         | 39      | 027  | 82                            | 083     |      | 86      | 090     |      |
|         | 40      | 028  | 83                            | 086     |      | 87      | 091     |      |
|         | 42      | 030  | 84                            | 088     | 88   | 092     |         |      |
|         | 43      | 031  | 85                            | 089     | 89   | 094     |         |      |
|         | 44      | 032  | 86                            | 090     |      |         |         |      |
|         | 45      | 033  | 87                            | 091     |      |         |         |      |
|         | 46      | 035  | 88                            | 092     |      |         |         |      |
|         | 47      | 037  |                               |         |      |         |         |      |
|         | 48      | 038  |                               |         |      |         |         |      |

**TABLE 4.** List of CASES Rosette sections and their corresponding station and cast numbers in open water (page 2/3).

|                    |         |      | <b>Expedition 0304, Leg 2</b> |                    |      |                    |         |      |
|--------------------|---------|------|-------------------------------|--------------------|------|--------------------|---------|------|
| Section            | Station | Cast | Section                       | Station            | Cast | Section            | Station | Cast |
| <b>Section 100</b> | 100     | 065  | <b>Section 300</b>            | 300                | 140  | <b>Section 500</b> | 500     | 038  |
|                    | 101     | 066  |                               | 301                | 137  |                    | 501     | 037  |
|                    | 102     | 067  |                               | 302                | 136  |                    | 502     | 036  |
|                    | 103     | 068  |                               | 303                | 135  |                    | 503     | 035  |
|                    | 104     | 069  |                               | 304                | 134  |                    | 504     | 034  |
|                    | 105     | 070  |                               | 305                | 133  |                    | 505     | 033  |
|                    | 106     | 071  |                               | 306                | 131  |                    | 506     | 032  |
|                    | 107     | 072  |                               | 307                | 130  |                    | 507     | 031  |
|                    | 108     | 073  |                               | 308                | 129  | 508                | 030     |      |
|                    | 109     | 074  |                               | 309                | 127  | <b>Section 700</b> | 700     | 027  |
|                    | 112     | 060  |                               | 310                | 123  |                    | 702     | 025  |
|                    | 113     | 059  |                               | 311                | 122  |                    | 703     | 024  |
|                    | 114     | 058  |                               | 312                | 121  |                    | 705     | 022  |
|                    | 115     | 057  |                               | 313                | 119  |                    | 706     | 020  |
|                    | 116     | 056  |                               | 314                | 118  |                    | 707     | 019  |
|                    | 117     | 055  |                               | 315                | 117  |                    | 708     | 018  |
|                    | 118     | 054  |                               | 317                | 116  |                    | 709     | 016  |
|                    | 119     | 053  | 400                           | 084                | 711  |                    | 012     |      |
|                    | 120     | 052  | 401                           | 085                | 712  |                    | 011     |      |
|                    | 121     | 051  | 402                           | 086                | 714  | 009                |         |      |
| 122                | 050     | 403  | 087                           | 715                | 007  |                    |         |      |
| 123                | 049     | 404  | 088                           | 716                | 006  |                    |         |      |
| 124                | 045     | 405  | 089                           | 717                | 005  |                    |         |      |
| 125                | 044     | 406  | 090                           | 718                | 003  |                    |         |      |
| 126                | 043     | 407  | 091                           | <b>Section 400</b> | 407  | 091                |         |      |
| 127                | 042     | 408  | 092                           |                    | 408  | 092                |         |      |
| 128                | 041     | 409  | 094                           |                    | 409  | 094                |         |      |
| 129                | 040     | 410  | 095                           |                    | 410  | 095                |         |      |
| <b>Section 200</b> | 206     | 079  | 411                           |                    | 096  | 411                | 096     |      |
|                    | 207     | 078  | 412                           |                    | 097  | 412                | 097     |      |
|                    | 208     | 077  | 413                           |                    | 098  | 413                | 098     |      |
|                    | 209     | 076  | 414                           |                    | 099  | 414                | 099     |      |
|                    | 210     | 075  | 415                           | 102                | 415  | 102                |         |      |

**TABLE 4.** List of CASES Rosette sections and their corresponding station and cast numbers in open water (page 3/3).

| <b>Expedition 0404, Leg 7</b> |         |      | <b>Expedition 0405, Leg 8</b> |         |      |
|-------------------------------|---------|------|-------------------------------|---------|------|
| Section                       | Station | Cast | Section                       | Station | Cast |
| <b>Section 100</b>            | 108     | 059  | <b>Section 100</b>            | 109     | 124  |
|                               | 109     | 060  |                               | 112     | 121  |
|                               | 110     | 061  |                               | 115     | 120  |
|                               | 111     | 062  |                               | 118     | 119  |
|                               | 112     | 063  |                               | 121     | 118  |
|                               | 115     | 066  |                               | 124     | 116  |
|                               | 115     | 067  | <b>Section 200</b>            | 203     | 136  |
|                               | 117     | 075  |                               | 206     | 135  |
|                               | 118     | 076  |                               | 209     | 132  |
|                               | 119     | 077  |                               | 212     | 130  |
|                               | 120     | 078  |                               | 215     | 128  |
|                               | 121     | 079  | <b>Section 300</b>            | 309     | 090  |
|                               | 122     | 080  |                               | 312     | 091  |
|                               | 123     | 081  |                               | 315     | 092  |
|                               | 124     | 083  | <b>Section 400</b>            | 400     | 111  |
|                               | 124     | 084  |                               | 403     | 110  |
|                               | 347     | 130  |                               | 406     | 109  |
| <b>Section 300</b>            | 394     | 129  |                               | 409     | 104  |
|                               | 395     | 128  |                               | 412     | 100  |
|                               | 396     | 127  | 415                           | 096     |      |
|                               | 397     | 125  |                               |         |      |
| <b>Section 400 (West)</b>     | 400     | 109  | <b>Section 700</b>            | 703     | 006  |
|                               | 401     | 108  |                               | 704     | 008  |
|                               | 402     | 107  |                               | 705     | 009  |
|                               | 403     | 106  |                               | 706     | 010  |
|                               | 404     | 105  |                               | 707     | 011  |
|                               | 405     | 104  |                               | 708     | 012  |
|                               | 406     | 103  |                               | 709     | 013  |
| 407                           | 095     | 710  |                               | 014     |      |
| 409                           | 093     | 711  |                               | 015     |      |
| <b>Section 400 (East)</b>     | 410     | 085  |                               | 712     | 016  |
|                               | 411     | 086  |                               | 715     | 113  |
|                               | 412     | 087  |                               | 718     | 056  |
|                               | 413     | 088  | 721                           | 112     |      |
|                               | 414     | 089  | <b>Section 900</b>            | 903     | 026  |
|                               | 416     | 091  |                               | 906     | 027  |
|                               |         | 909  |                               | 036     |      |
|                               |         |      | 912                           | 042     |      |

TABLE 5. Summary of moored instruments, CASES 2002-2003.

| Moor.   | Water depth (m) | Position                      | Instr. | Serial No | Instr. Depth (m) | Date of first reliable data | Date of last reliable data | dt (min) | T (°C) | Cond. (m S/cm) | Press. (dbar) | Spd (cm/s) | Dir (true) |
|---------|-----------------|-------------------------------|--------|-----------|------------------|-----------------------------|----------------------------|----------|--------|----------------|---------------|------------|------------|
| CA01-02 | 63              | 70°30.0' N<br>135°30.0' W     | SBE37  | #1695     | 30               | 2002-09-12 15:15            | 2003-10-04 15:00           | 15       | ×      | ×              | ×             |            |            |
|         |                 |                               | RCM7   | #12796    | 50               | 2002-09-12 16:00            | 2003-10-04 14:00           | 60       | ×      | ×              |               | ×          | ×          |
| CA02-02 | 66              | 70°53.707' N<br>132°54.829' W | SBE37  | #1697     | 33               | 2002-09-15 04:15            | 2003-10-01 11:45           | 15       | ×      | ×              | ×             |            |            |
|         |                 |                               | RCM7   | #12800    | 51               | 2002-09-15 04:59            | 2003-10-01 14:58           | 60       | ×      | ×              |               | ×          | ?          |
| CA03-02 | 63              | 71°08.996' N<br>128°08.021' W | SBE-37 | #2426     | 30               | No Data recorded            |                            | -        | -      | -              | -             | -          | -          |
|         |                 |                               | RCM4   | #8859     | 49               | 2002-09-18 22:30            | 2003-03-22 06:30           | 120      | ×      | ×              |               | ×          | ×          |
| CA04-02 | 201             | 71°01.335' N<br>133°46.443' W | SBE37  | #2423     | 28               | 2002-09-15 19:45            | 2003-10-01 20:45           | 15       | ×      | ×              | ×             |            |            |
|         |                 |                               | RCM4   | #4427     | 47               | 2002-09-15 21:00            | 2003-01-16 15:00           | 60       | ×      | ×              |               | ×          | ×          |
|         |                 |                               | ADCP   | #0272     | 93               | 2002-09-15 20:00            | 2003-10-01 20:45           | 30       | ×      |                | ×             | ×          | ×          |
|         |                 |                               | RCM4   | #8214     | 103              | 2002-09-15 21:00            | 2003-10-01 21:00           | 60       | ×      | ×              |               | ×          | ×          |
|         |                 |                               | RCM4   | #8677     | 187              | 2002-09-15 21:00            | 2003-10-01 21:00           | 60       | ×      | ×              |               | ×          | ×          |
| CA05-02 | 201             | 71°16.954' N<br>127°32.139' W | SBE37  | #2427     | 27               | 2002-09-18 16:45            | 2003-10-10 21:15           | 15       | ×      | ×              | ×             |            |            |
|         |                 |                               | RCM4   | #8213     | 47               | 2002-09-18 17:00            | 2003-10-11 01:00           | 60       | ×      | ×              |               | ×          | ×          |
|         |                 |                               | ADCP   | #0335     | 94               | 2002-09-18 16:44            | 2003-10-10 20:45           | 30       | ×      |                | ×             | ×          | ×          |
|         |                 |                               | RCM4   | #8673     | 102              | 2002-09-18 17:00            | 2003-08-18 00:00           | 60       | ×      | ×              |               | ×          | ×          |
|         |                 |                               | RCM4   | #8858     | 185              | 2002-09-18 17:00            | 2003-09-05 14:00           | 60       | ×      | ×              |               | ×          | ×          |
| CA06-02 | 205             | 70°38.996' N<br>127°32.854' W | RCM4   | #2325     | 50               | 2002-09-19 02:00            | 2003-10-11 21:00           | 60       | ×      | ×              |               | ×          | ×          |
|         |                 |                               | ADCP   | #2645     | 95               | 2002-09-19 01:30            | 2003-10-11 19:30           | 30       | ×      |                | ×             | ×          | ×          |
|         |                 |                               | RCM4   | #3229     | 105              | No Data recorded            |                            | -        | -      | -              | -             | -          | -          |
|         |                 |                               | RCM4   | #4645     | 189              | B.D.                        | B.D.                       | B.D.     | B.D.   | B.D.           | B.D.          | B.D.       | B.D.       |
| CA07-02 | 500             | 71°09.745' N<br>133°52.630' W | SBE37  | #2424     | 31               | 2002-09-16 02:44            | 2003-10-03 03:30           | 15       | ×      | ×              | ×             |            |            |
|         |                 |                               | RCM7   | #12213    | 75               | 2002-09-16 03:00            | 2003-10-03 03:00           | 60       | ×      | ×              |               | ×          | ×          |
|         |                 |                               | ADCP   | #0333     | 106              | 2002-09-16 03:00            | 2003-10-03 03:11           | 30       | ×      |                | ×             | ×          | ×          |
|         |                 |                               | RCM4   | #12484    | 207              | 2002-09-16 03:00            | 2003-10-03 03:00           | 60       | ×      | ×              |               | ×          | ×          |
|         |                 |                               | RCM4   | #8857     | 490              | 2002-09-16 03:00            | 2003-09-09 00:00           | 60       | ×      | ×              |               | ×          | ×          |
| CA08-02 | 389             | 70°58.383' N<br>126°06.720' W | SBE37  | #2425     | 30               | 2002-09-19 16:00            | 2003-10-12 07:45           | 15       | ×      | ×              | ×             |            |            |
|         |                 |                               | RCM7   | #12214    | 65               | 2002-09-19 15:00            | 2003-08-11 23:00           | 60       | ×      | ×              |               | ×          | ×          |
|         |                 |                               | ADCP   | #0296     | 98               | 2002-09-19 18:00            | 2003-10-12 07:19           | 20       | ×      |                | ×             | ×          | ×          |
|         |                 |                               | RCM7   | #12273    | 197              | 2002-09-19 16:00            | 2003-10-12 06:00           | 60       | ×      | ×              |               | ×          | ×          |
|         |                 |                               | RCM4   | #8850     | 377              | 2002-12-07 02:00            | 2003-10-12 05:00           | 60       | ×      | ×              |               | ×          | ×          |

Please notice that **B.D.** stands for Bad Data. The data marked with the “?” sign are doubtful.

**TABLE 6.** Summary of moored instruments, CASES 2003-2004 (page 1/2).

| Moor.   | Water depth (m) | Position                      | Instr.           | Serial No        | Instr. Depth (m) | Date of first reliable data | Date of last reliable data | dt (min) | T (°C) | Cond. (m S/cm) | Press. (dbar) | Spd (cm/s) | Dir (true) | Turb (NTU) | Diss. Ox. (µM) | Chl a | Light |   |
|---------|-----------------|-------------------------------|------------------|------------------|------------------|-----------------------------|----------------------------|----------|--------|----------------|---------------|------------|------------|------------|----------------|-------|-------|---|
| CA3-03  | 64              | 71°09.182' N<br>128°07.569' W | ALEC CT          | #592             | 27               | 2003-10-11 00:29            | 2004-09-27 16:00           | 10       | ×      | ×              |               |            |            |            |                |       |       |   |
|         |                 |                               | RCM-11           | #289             | 47               | 2003-10-11 00:30            | 2004-09-29 15:56           | 30       | ×      | ×              | ×             | ×          | ×          | ×          | ×              | B.D   |       |   |
| CA4-03  | 304             | 71°05.158' N<br>133°43.392' W | ALEC CT          | #688             | 34               | 2003-10-04 04:00            | 2004-09-07 13:10           | 10       | ×      | ×              |               |            |            |            |                |       |       |   |
|         |                 |                               | ADCP             | #3844            | 102              | 2003-10-04 04:44            | 2004-09-07 12:14           | 45       | ×      |                | ×             | ×          | ×          |            |                |       |       |   |
|         |                 |                               | RCM-11           | #281             | 202              | 2003-10-04 04:00            | 2004-09-07 12:52           | 30       | ×      | ×              | ×             | ×          | ×          | ×          | ×              | ×     |       |   |
| CA5-03  | 250             | 71°25.225' N<br>127°22.495' W | SBE37            | #2425            | 33               | 2003-10-12 21:45            | 2004-07-28 17:15           | 15       | ×      | B.D            | B.D           |            |            |            |                |       |       |   |
|         |                 |                               | ADCP             | #2645            | 100              | 2003-10-12 21:29            | 2004-07-28 16:30           | 30       | ×      |                | ×             | ×          | ×          |            |                |       |       |   |
|         |                 |                               | RCM-11           | #271             | 202              | 2003-10-12 21:59            | 2004-07-28 16:58           | 30       | ×      | ×              | ×             | ×          | ×          | ×          | ×              | ×     |       |   |
| CA6-03  | 250             | 70°35.324' N<br>127°16.23' W  | SBE37            | #2427            | 35               | 2003-10-11 19:00            | 2004-09-05 21:00           | 15       | ×      | ×              | B.D           |            |            |            |                |       |       |   |
|         |                 |                               | ADCP             | #0333            | 102              | 2003-10-11 19:00            | 2004-09-05 20:30           | 30       | ×      |                | ×             | ×          | ×          |            |                |       |       |   |
|         |                 |                               | SBE26            | #0371            | 243              | 2003-10-11 19:01            | 2004-09-05 20:31           | 30       | ×      |                | ×             |            |            |            |                |       |       |   |
| CA7-03  | 500             | 71°08.99' N<br>133°53.88' W   | SBE37            | #1697            | 17               | 2003-10-03 22:30            | 2004-09-08 14:45           | 15       | ×      | ×              | ×             |            |            |            |                |       |       |   |
|         |                 |                               | ADCP             | #3895            | 80               | 2003-10-03 22:30            | 2004-09-07 14:15           | 45       | ×      |                | ×             | ×          | ×          |            |                |       |       |   |
|         |                 |                               | RCM-11           | #282             | 186              | 2003-10-03 22:30            | 2004-09-07 14:36           | 30       | ×      | ×              | ×             | ×          | ×          | ×          | ×              | ×     |       |   |
|         |                 |                               | RCM-11           | #291             | 389              | 2003-10-03 22:30            | 2004-09-07 14:28           | 30       | ×      | ×              | ×             | ×          | ×          | ×          | ×              | ×     |       |   |
| CA8-03  | 401             | 71°00.048' N<br>125°57.852' W | ADCP             | #0296            | 90               | 2003-10-13 15:29            | 2004-07-18 13:59           | 30       | ×      |                | ×             | ×          | ×          | ×          | ×              | ×     |       |   |
|         |                 |                               | RCM-11           | #276             | 190              | 2003-10-13 04:00            | 2004-05-21 16:02           | 30       | ×      | ×              | ×             | ×          | ×          | ×          | ×              | ×     |       |   |
|         |                 |                               | ALEC CL          | #200523          | 20               | 2003-10-13 03:30            | 2004-07-17 13:50           | 10       |        |                |               |            |            |            |                |       |       | × |
| CA9-03  | 65              | 70°12.58' N<br>137°30.856' W  | RCM-11           | #266             | 47               | 2003-10-06 04:29            | 2004-09-09 21:42           | 30       | ×      | ×              | ×             | ×          | ×          | ×          | ×              |       |       |   |
| CA10-03 | 250             | 69°57.307' N<br>138°40.424' W | ALEC CT          | #684             | 30               | 2003-10-06 23:10            | 2004-09-08 15:00           | 10       | ×      | ×              |               |            |            |            |                |       |       |   |
|         |                 |                               | ADCP             | #3778            | 95               | 2003-10-06 22:59            | 2004-09-08 13:59           | 45       | ×      |                | ×             | ×          | ×          |            |                |       |       |   |
| CA11-03 | 1000            | 70°34.629' N<br>138°39.289' W | SBE37            | #2424            | 54               | 2003-10-05 22:30            | 2003-09-09 14:30           | 15       | ×      | ×              | ×             |            |            |            |                |       |       |   |
|         |                 |                               | ADCP             | #3045            | 122              | 2003-10-05 22:15            | 2003-09-09 13:59           | 45       | ×      |                | ×             | ×          | ×          | ×          |                |       |       |   |
|         |                 |                               | RCM-11           | #273             | 223              | 2003-10-05 22:30            | 2003-09-09 13:53           | 30       | ×      | ×              | ×             | ×          | ×          | ×          | ×              | ×     | ×     |   |
|         |                 |                               | RCM-11           | #280             | 430              | B.D                         | B.D                        | B.D      | B.D    | B.D            | B.D           | B.D        | B.D        | B.D        | B.D            | B.D   |       |   |
|         |                 |                               | RCM-11           | #285             | 840              | 2003-10-05 22:29            | 2004-09-09 13:57           | 30       | ×      | ×              | ×             | ×          | ×          | ×          | ×              | ×     | ×     |   |
| RCM-11  | #290            | 1021                          | 2003-10-05 22:30 | 2004-09-09 13:53 | 30               | ×                           | ×                          | ×        | ×      | ×              | ×             | ×          | ×          | ×          |                |       |       |   |

Please notice that **B.D.** stands for Bad Data. The red color is used for flawed but still available data.

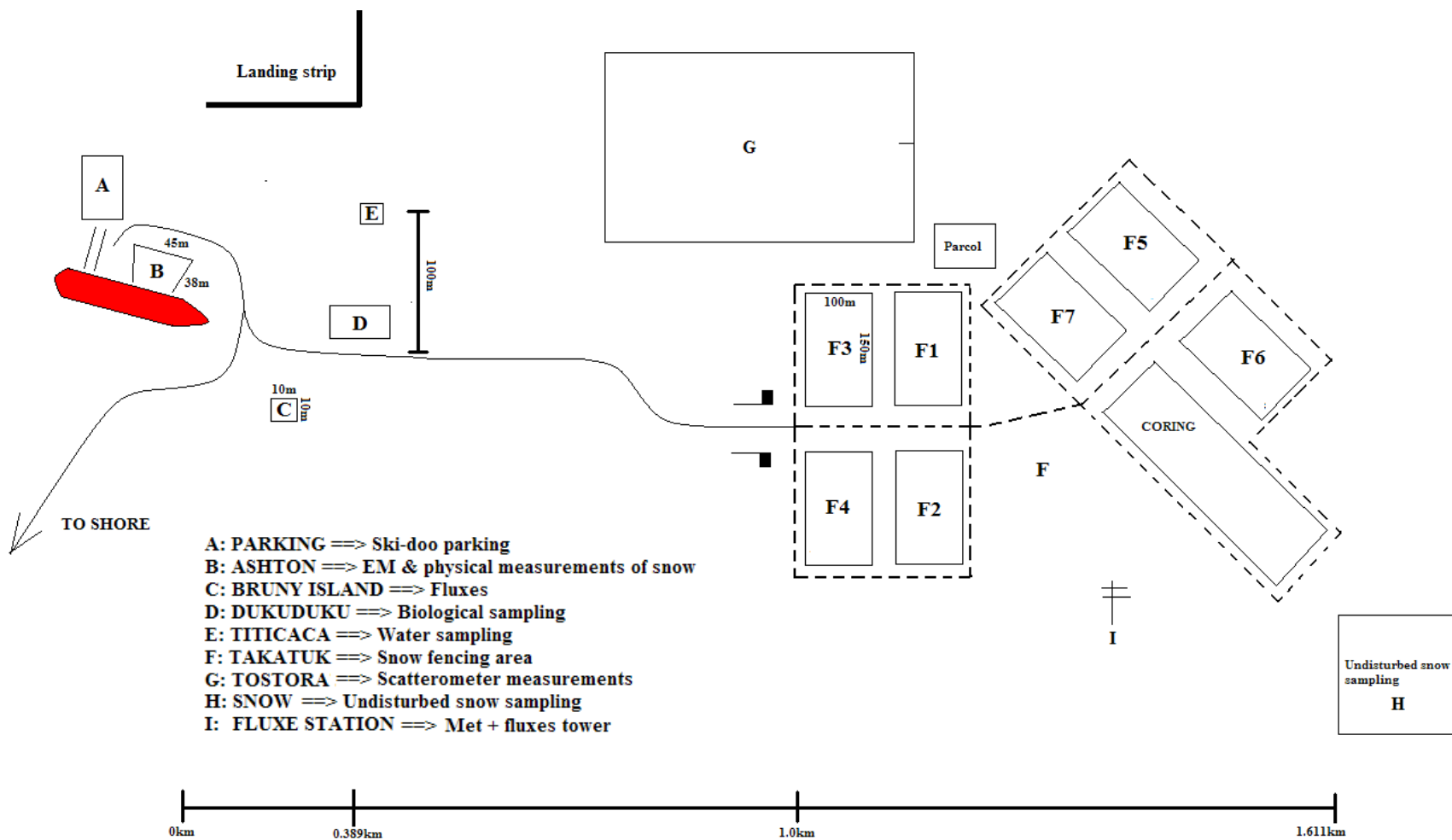
TABLE 6. Summary of moored instruments, CASES 2003-2004 (page 2/2).

| Moor.   | Water depth (m) | Position                      | Instr.   | Serial No | Instr. Depth (m) | Date of first reliable data | Date of last reliable data | dt (min) | T (°C) | Cond. (m S/cm) | Press. (dbar) | Spd (cm/s) | Dir (true) | Turb (NTU) | Diss. Ox. (µM) | Chl a | Light |   |  |
|---------|-----------------|-------------------------------|----------|-----------|------------------|-----------------------------|----------------------------|----------|--------|----------------|---------------|------------|------------|------------|----------------|-------|-------|---|--|
| CA12-03 | 1234            | 71°25.613' N<br>134°12.028' W | ALEC CT  | #685      | 25               | 2003-10-03 00:00            | 2004-02-18 20:30           | 10       | ×      | ×              |               |            |            |            |                |       |       |   |  |
|         |                 |                               | ADCP     | #3543     | 86               | 2003-10-02 22:30            | 2004-07-27 18:44           | 45       | ×      |                | ×             | ×          | ×          |            |                |       |       |   |  |
|         |                 |                               | RCM-11   | #270      | 188              | 2003-10-02 22:29            | 2004-07-27 19:24           | 30       | ×      | ×              | ×             | ×          | ×          | ×          | ×              | ×     |       |   |  |
|         |                 |                               | RCM-11   | #272      | 396              | 2003-10-02 22:30            | 2004-07-27 19:30           | 30       | ×      | ×              | ×             | ×          | ×          | ×          | ×              | ×     | ×     |   |  |
|         |                 |                               | RCM-11   | #287      | 801              | 2003-10-02 22:30            | 2004-07-27 19:29           | 30       | ×      | ×              | ×             | ×          | ×          | ×          | ×              | ×     | ×     |   |  |
|         |                 |                               | RCM-11   | #283      | 1007             | 2003-10-02 22:30            | 2004-07-27 19:29           | 30       | ×      | ×              | ×             | ×          | ×          | ×          | ×              | ×     | ×     |   |  |
| CA13-03 | 300             | 71°21.356' N<br>131°21.824' W | SBE37    | #2423     | 49               | 2003-10-09 01:15            | 2005-09-04 04:30           | 15       | ×      | ×              | ×             |            |            |            |                |       |       |   |  |
|         |                 |                               | ADCP     | #3545     | 119              | 2003-10-09 01:30            | 2005-09-04 03:00           | 45       | ×      |                | ×             | ×          | ×          |            |                |       |       |   |  |
|         |                 |                               | RCM-11   | #274      | 217              | 2003-10-09 01:29            | 2005-02-10 17:28           | 30       | ×      | ×              | ×             | ×          | ×          | ×          | ×              |       |       |   |  |
| CA15-03 | 400             | 71°32.232' N<br>127°01.434' W | ALEC CT  | #687      | 20               | 2003-10-10 17:20            | 2004-07-22 16:10           | 10       | ×      | ×              |               |            |            |            |                |       |       |   |  |
|         |                 |                               | ADCP     | #0272     | 88               | 2003-10-10 18:00            | 2004-07-22 15:44           | 45       | ×      |                |               | ×          | ×          |            |                |       |       |   |  |
|         |                 |                               | RCM-11   | #268      | 189              | 2003-10-10 18:00            | 2004-07-22 16:03           | 30       | ×      | ×              | ×             | ×          | ×          | ×          | ×              |       |       |   |  |
| CA16-03 | 250             | 71°47.886' N<br>126°27.354' W | ALEC CT  | #686      | 36               | 2003-10-10 01:10            | 2004-07-22 13:10           | 10       | ×      | ×              |               |            |            |            |                |       |       |   |  |
|         |                 |                               | ADCP     | #3845     | 100              | 2003-10-10 02:15            | 2004-07-22 12:00           | 45       | ×      |                | ×             | ×          | ×          |            |                |       |       |   |  |
| CA18-03 | 500             | 70°38.56' N<br>123°06.04' W   | ALEC CLW | #286      | 32               | 2003-10-14 00:00            | 2004-07-30 02:00           | 60       | ×      |                |               |            |            | ×          |                |       | ×     |   |  |
|         |                 |                               | RCM-11   | #267      | 100              | 2003-10-13 22:59            | 2004-03-29 20:01           | 30       | ×      | ×              | ×             | ×          | ×          | ×          | ×              |       |       |   |  |
|         |                 |                               | RCM-7    | #12214    | 202              | 2003-10-13 22:29            | 2004-07-30 01:24           | 30       | ×      | B.D            |               | ×          | ×          |            |                |       |       |   |  |
|         |                 |                               | RCM-7    | #12273    | 403              | 2003-10-13 22:30            | 2004-07-30 01:28           | 30       | ×      | B.D            |               | ×          | ×          |            |                |       |       |   |  |
| CA19-03 | 66              | 70°50.180' N<br>128°01.210' W | ALEC CT  | #682      | 30               | 2003-10-11 03:30            | 2004-09-06 03:00           | 10       | ×      | ×              |               |            |            |            |                |       |       |   |  |
|         |                 |                               | ALEC CL  | #200524   | 30               | 2003-10-11 03:30            | 2004-09-06 03:00           | 10       |        |                |               |            |            |            |                |       | ×     |   |  |
|         |                 |                               | RCM-11   | #284      | 50               | No Data recorded            |                            |          | -      | -              | -             | -          | -          | -          | -              | -     | -     | - |  |
| CA20-03 | 250             | 70°20.347' N<br>126°21.293' W | ALEC CT  | #591      | 30               | 2003-10-12 02:00            | 2004-07-16 06:40           | 10       | ×      | ×              |               |            |            |            |                |       |       |   |  |
|         |                 |                               | ALEC CLW | #285      | 30               | 2003-10-12 02:00            | 2004-07-16 06:00           | 60       | ×      |                |               |            |            | ×          |                |       | ×     |   |  |
|         |                 |                               | ADCP     | #0335     | 96               | 2003-10-12 02:15            | 2004-07-16 06:00           | 45       | ×      |                |               | ×          | ×          |            |                |       |       |   |  |

Please notice that **B.D.** stands for Bad Data. The red color is used for flawed but still available data.

**TABLE 7.** Content of the ASCII Rosette data files.

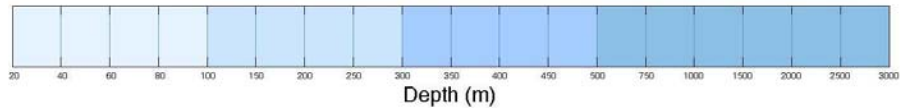
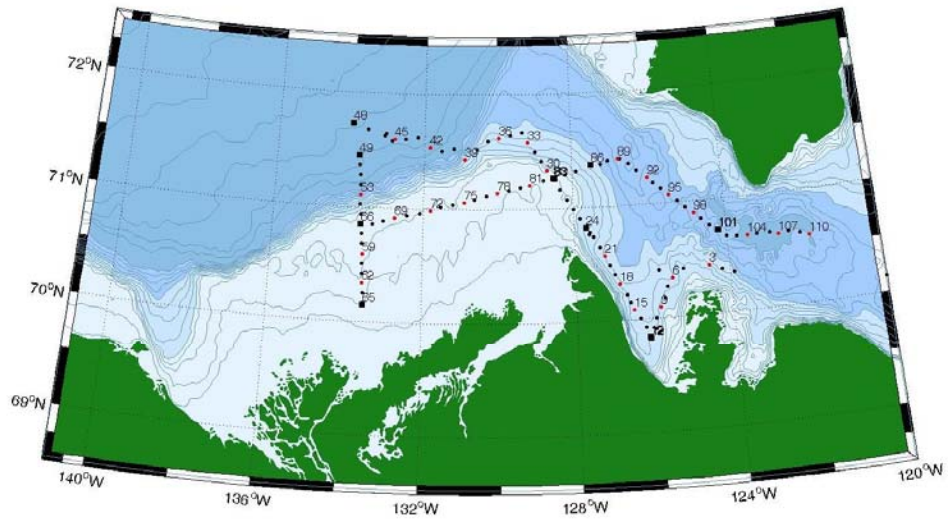
| <b>Parameters</b>                        | <b>Units</b>                        | <b>Number of significant digits</b> |
|--|-------------------------------------|-------------------------------------|
| Pressure (or depth)                      | dbars                               | 2                                   |
| Temperature                              | °C (ITS-90)                         | 3                                   |
| Transmissivity                           | %                                   | 2                                   |
| Fluorescence                             | µg/l                                | 2                                   |
| Salinity                                 | PSS (1978)                          | 3                                   |
| Density, $\sigma$ (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; $\sigma_t$ ; $\sigma(S,T,O)$    | kg/m <sup>3</sup>                   | 3                                   |
| Potential temperature ( $\theta$ )       | °C                                  | 3                                   |
| $\sigma_\theta$ ; $\sigma(S,\theta,O)$   | kg/m <sup>3</sup>                   | 3                                   |
| Freezing temperature                     | °C                                  | 2                                   |
| Dissolved oxygen concentration           | ml/l                                | 4                                   |
| pH                                       | no units                            | 3                                   |
| Nitrates                                 | mmol/m <sup>3</sup>                 | 2                                   |
| PAR pressure                             | dbars                               | 2                                   |
| PAR                                      | µEinsteins/m <sup>2</sup> /sec      | 3                                   |
| Surface PAR                              | µEinsteins/m <sup>2</sup> /sec      | 3                                   |



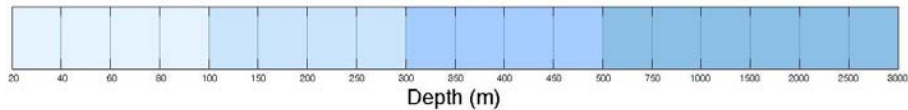
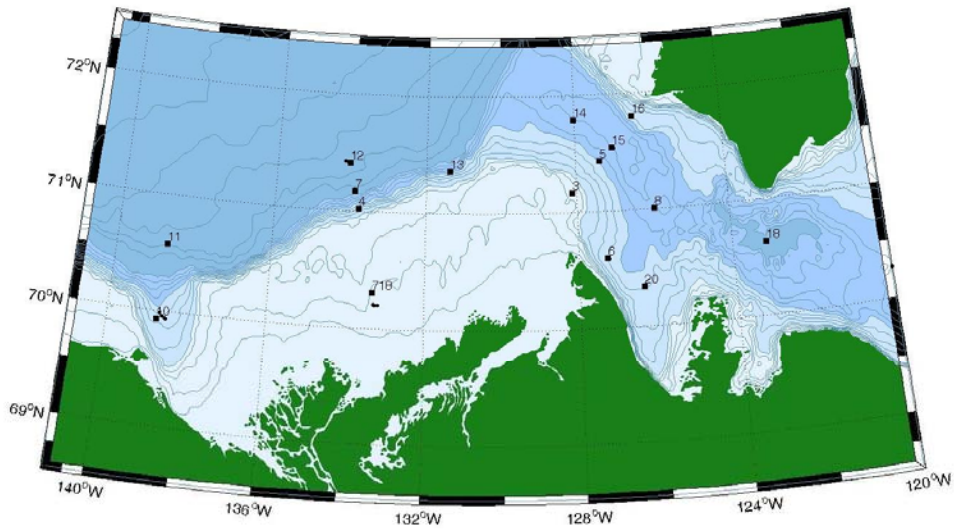
**APPENDIX 1.** Over-wintering station (ship position: 70° 02.71'N, 126° 18.06'W) and activities on the ice during CASES 2003-2004. The station “Angaguk”, not shown on this figure, was located close to Horton River (69° 58.911'N, 126° 43.529'W). The station “River 1” refers to different locations close to “Angaguk” along Horton River.

**APPENDIX 2.** Maps of Beaufort Sea, Mackenzie Shelf and Amundsen Gulf where Rosette and MVP data were collected (Legs 0 to 9).

|     |   |       |
|-----|---|-------|
| 2.1 | Rosette legs 0 and 1.....                           | p. 22 |
| 2.2 | Rosette leg 2 and Winter Station (legs 3 to 7)..... | p. 23 |
| 2.3 | Rosette and MVP leg 7.....                          | p. 24 |
| 2.4 | Rosette and MVP leg 8.....                          | p. 25 |
| 2.5 | Rosette and MVP leg 9.....                          | p. 26 |

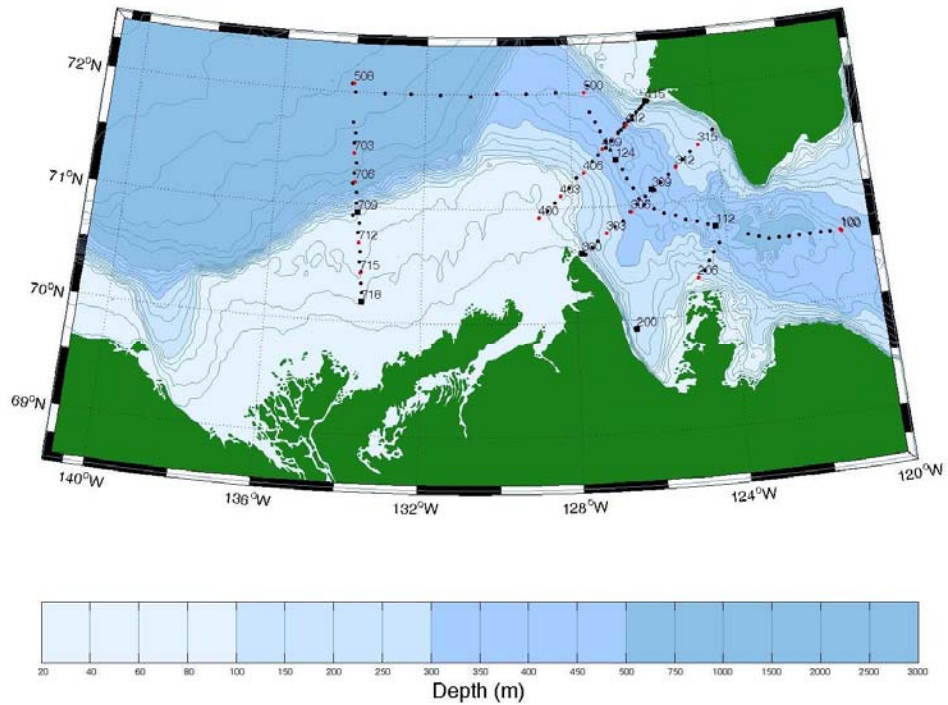


**Leg 0 – Expedition 0202**

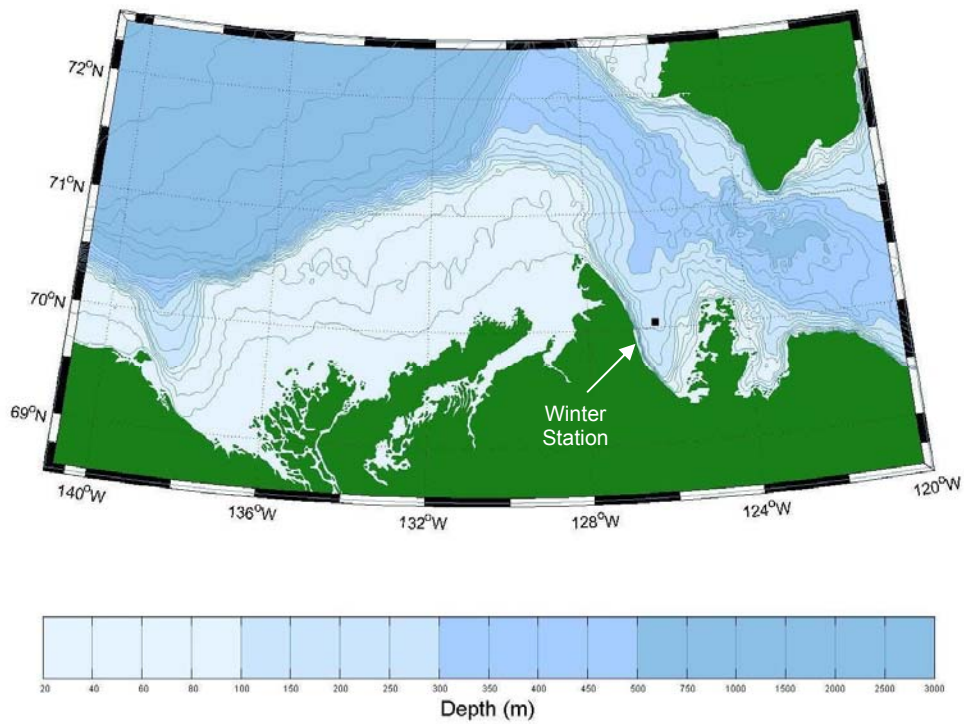


**Leg 1 – Expedition 0303**

**APPENDIX 2.1** Maps of Beaufort Sea, Mackenzie Shelf and Amundsen Gulf Rosette sampling sites, Legs 0 and 1 (Sept-October 2002 and Sept-October 2003).

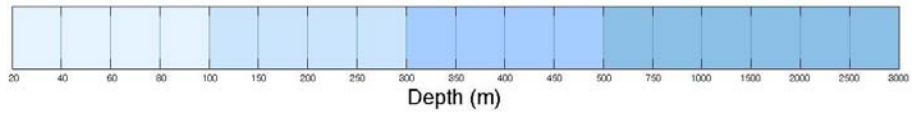
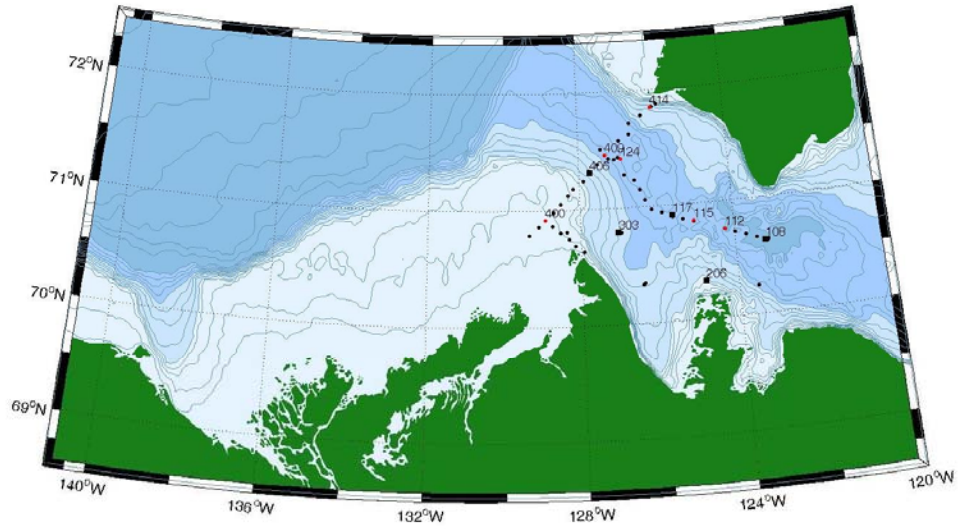


**Leg 2 – Expedition 0304**

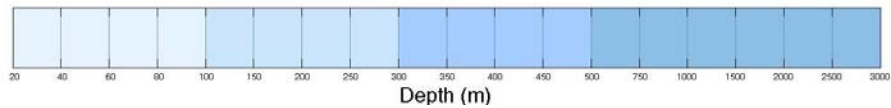
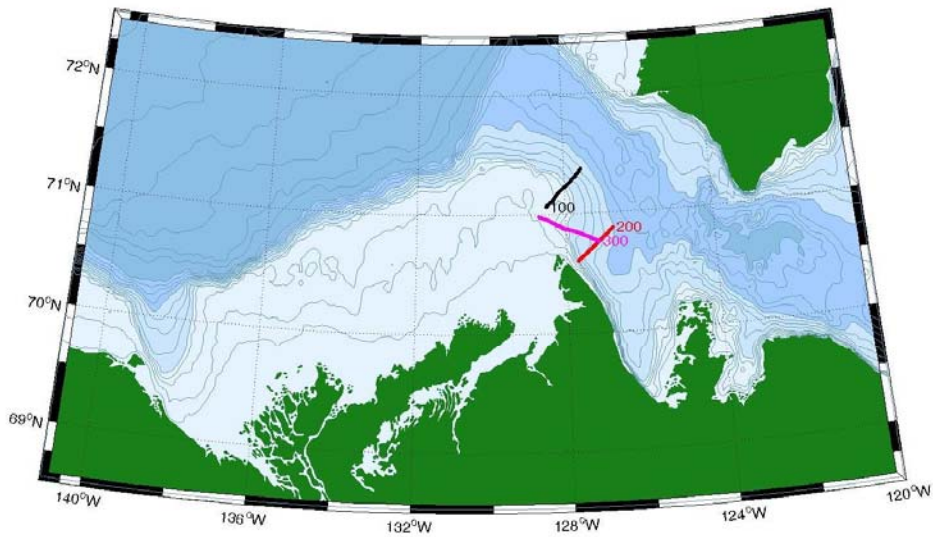


**Legs 3 to the beginning of 7 – Expeditions 0305 to 0404**

**APPENDIX 2.2** Maps of Beaufort Sea, Mackenzie Shelf and Amundsen Gulf Rosette sampling sites, Leg 2 and Winter Station (Oct-November 2003 and December to May 2004).

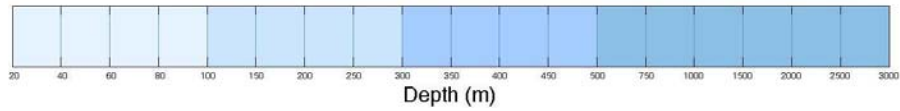
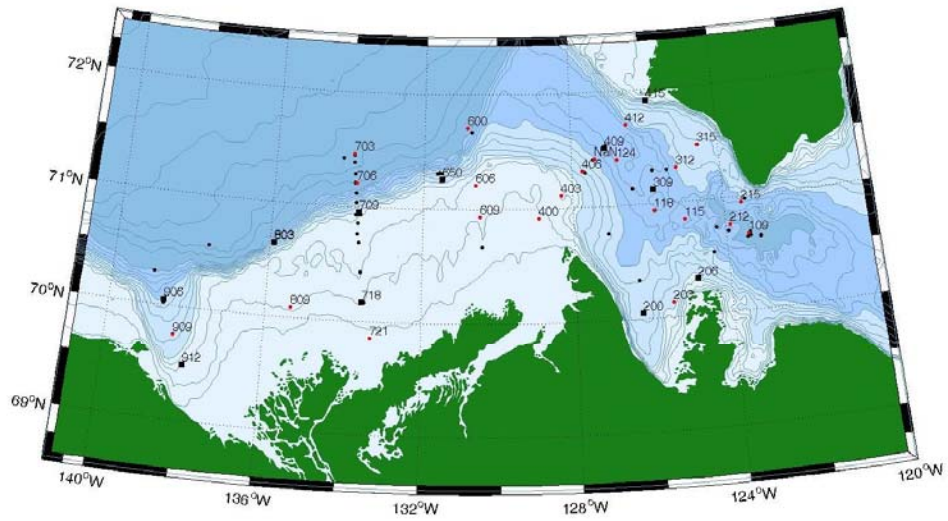


**Rosette sampling stations**

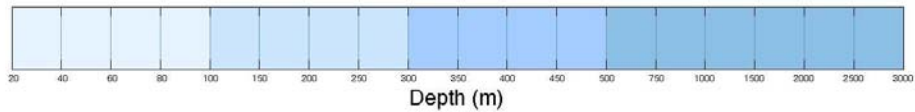
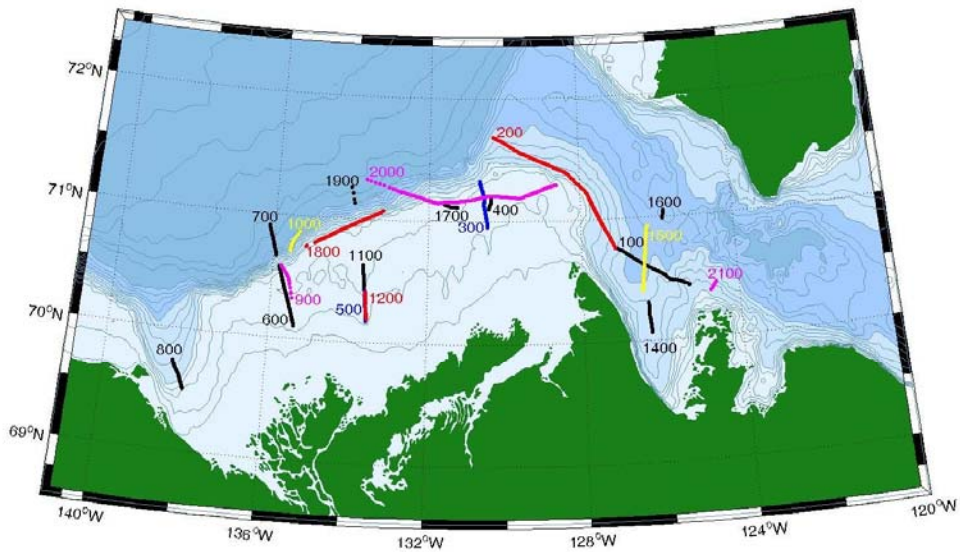


**MVP sections**

**APPENDIX 2.3** Maps of Beaufort Sea, Mackenzie Shelf and Amundsen Gulf Rosette and MVP sampling sites, second half of leg 7 (May-June 2004).

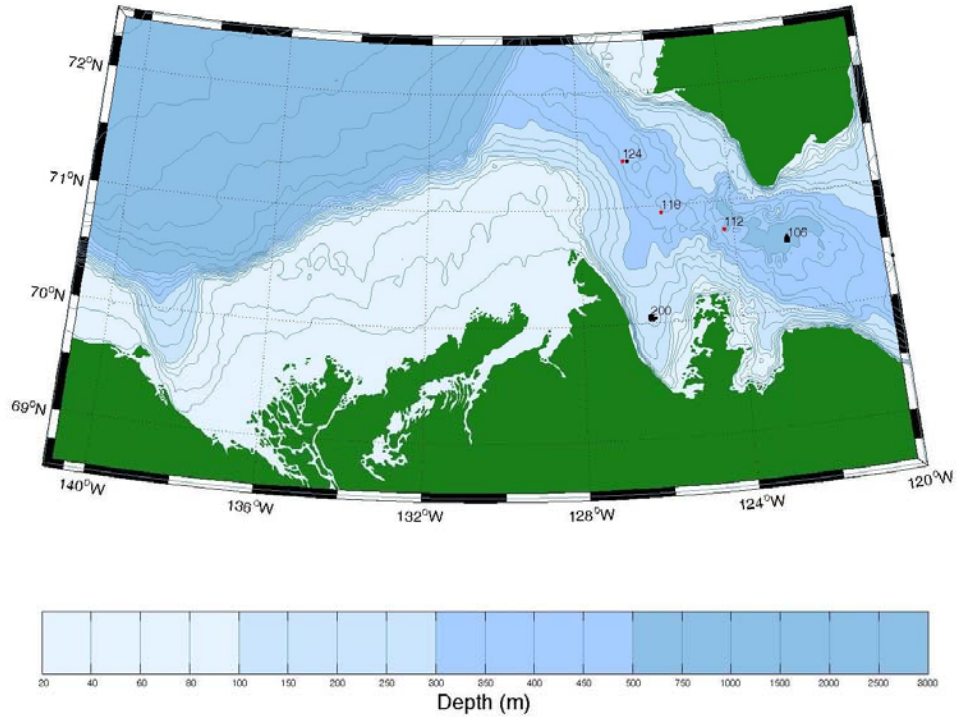


**Rosette sampling stations**

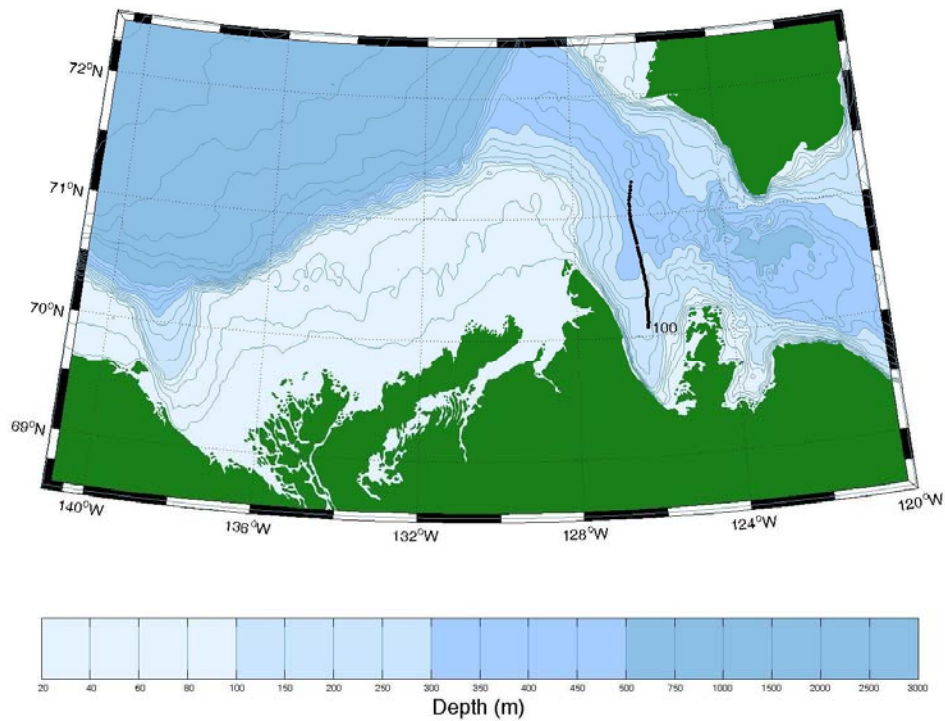


**MVP sections**

**APPENDIX 2.4** Maps of Beaufort Sea, Mackenzie Shelf and Amundsen Gulf Rosette and MVP sampling sites, Leg 8 (June and July 2004).



**Rosette sampling stations**



**MVP sections**

**APPENDIX 2.5** Maps of Beaufort Sea, Mackenzie Shelf and Amundsen Gulf Rosette and MVP sampling sites, Leg 9 (August 2004).

**APPENDIX 3.** Rosette cast locations, sampling time, water depth and corresponding station or mooring numbers for all CASES scientific expeditions 2002-2004.

|      |  |       |
|------|--|-------|
| 3.1  | Rosette logbook for Leg 0 (expedition 0202)..... | p. 28 |
| 3.2  | Rosette logbook for Leg 1 (expedition 0303)..... | p. 31 |
| 3.3  | Rosette logbook for Leg 2 (expedition 0304)..... | p. 32 |
| 3.4  | Rosette logbook for Leg 3 (expedition 0305)..... | p. 35 |
| 3.5  | Rosette logbook for Leg 4 (expedition 0401)..... | p. 37 |
| 3.6  | Rosette logbook for Leg 5 (expedition 0402)..... | p. 40 |
| 3.7  | Rosette logbook for Leg 6 (expedition 0403)..... | p. 42 |
| 3.8  | Rosette logbook for Leg 7 (expedition 0404)..... | p. 44 |
| 3.9  | Rosette logbook for Leg 8 (expedition 0405)..... | p. 47 |
| 3.10 | Rosette logbook for Leg 9 (expedition 0406)..... | p. 50 |

**APPENDIX 3.1** Rosette cast locations, sampling time, water depth and corresponding station or mooring numbers. CASES Leg 0, Expedition 0202 (2002) (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) |
|-------------|--------------------|----------------|----------------|------------------|------------------|----------------|----------------------|
| 001         | 1                  | 2002-09-22     | 16:10          | 70°21.01         | 123°53.88        | 312            | 318                  |
| 002         | 2                  | 2002-09-22     | 19:30          | 70°23.17         | 124°12.26        | 258            | 260                  |
| 003         | 18                 | 2002-09-23     | 06:26          | 70°19.20         | 126°51.42        | 229            | 237                  |
| 004         | 19                 | 2002-09-23     | 10:32          | 70°24.30         | 126°59.06        | 249            | 256                  |
| 005         | 20                 | 2002-09-23     | 11:32          | 70°29.33         | 127°05.99        | 204            | 213                  |
| 006         | 21                 | 2002-09-23     | 13:53          | 70°34.21         | 127°13.03        | 249            | 267                  |
| 007         | 22                 | 2002-09-23     | 17:05          | 70°38.96         | 127°19.87        | 239            | 246                  |
| 008         | 23                 | 2002-09-23     | 18:57          | 70°44.21         | 127°29.91        | 175            | 192                  |
| 009         | 24                 | 2002-09-24     | 09:51          | 70°49.30         | 127°40.39        | 136            | 151                  |
| 010         | 24                 | 2002-09-24     | 12:30          | 70°45.89         | 127°36.55        | 54             | 168                  |
| 011         | 24                 | 2002-09-24     | 13:53          | 70°46.83         | 127°35.02        | 49             | 165                  |
| 012         | 24                 | 2002-09-24     | 17:00          | 70°44.70         | 127°29.26        | 174            | 190                  |
| 013         | 25                 | 2002-09-25     | 03:09          | 70°54.23         | 127°49.61        | 110            | 116                  |
| 014         | 26                 | 2002-09-25     | 05:03          | 70°59.44         | 128°00.01        | 63             | 66                   |
| 015         | 27                 | 2002-09-25     | 06:32          | 71°04.41         | 128°10.07        | 49             | 60                   |
| 016         | 28                 | 2002-09-25     | 09:54          | 71°09.81         | 128°20.65        | 50             | 62                   |
| 017         | 29                 | 2002-09-25     | 11:32          | 71°14.90         | 128°30.30        | 44             | 56                   |
| 018         | 30                 | 2002-09-25     | 13:18          | 71°19.83         | 128°40.13        | 49             | 59                   |
| 019         | 31                 | 2002-09-25     | 16:20          | 71°24.83         | 128°49.45        | 78             | 84                   |
| 020         | 32                 | 2002-09-25     | 18:01          | 71°29.79         | 129°00.05        | 192            | 183                  |
| 021         | 33                 | 2002-09-25     | 20:23          | 71°34.88         | 129°11.02        | 242            | 258                  |
| 022         | 34                 | 2002-09-26     | 00:27          | 71°40.18         | 129°19.92        | 273            | 292                  |
| 023         | 35                 | 2002-09-26     | 01:46          | 71°38.69         | 129°38.98        | 277            | 294                  |
| 024         | 36                 | 2002-09-26     | 03:28          | 71°37.38         | 129°58.02        | 230            | 250                  |
| 025         | 37                 | 2002-09-26     | 07:21          | 71°35.99         | 130°16.49        | 228            | 245                  |
| 026         | 38                 | 2002-09-26     | 08:58          | 71°31.47         | 130°34.45        | 196            | 214                  |
| 027         | 39                 | 2002-09-26     | 10:31          | 71°26.17         | 130°54.71        | 295            | 309                  |
| 028         | 40                 | 2002-09-26     | 15:40          | 71°31.81         | 131°12.44        | 380            | 389                  |
| 029         | 41                 | 2002-09-26     | 18:33          | 71°30.59         | 131°32.52        | 560            | 582                  |
| 030         | 42                 | 2002-09-26     | 21:02          | 71°32.20         | 131°51.48        | 572            | 571                  |
| 031         | 43                 | 2002-09-27     | 05:03          | 71°37.32         | 132°11.26        | 570            | 572                  |
| 032         | 44                 | 2002-09-27     | 07:30          | 71°36.20         | 132°31.89        | 555            | 562                  |
| 033         | 45 a               | 2002-09-27     | 09:38          | 71°36.09         | 132°49.93        | 961            | 1000                 |
| 034         | 45 b               | 2002-09-27     | 12:15          | 71°35.24         | 132°53.79        | 71             | 1036                 |
| 035         | 46                 | 2002-09-27     | 14:43          | 71°37.76         | 133°06.19        | 657            | 662                  |
| 036         | 46                 | 2002-09-27     | 16:08          | 71°39.16         | 133°03.76        | 1162           | 1386                 |
| 037         | 47                 | 2002-09-27     | 19:00          | 71°40.69         | 133°33.86        | 1419           | 1260                 |
| 038         | 48                 | 2002-09-28     | 01:41          | 71°43.87         | 133°58.68        | 1605           | 1372                 |
| 039         | 49                 | 2002-09-28     | 19:56          | 71°27.12         | 133°46.52        | 961            | 1000                 |
| 040         | 49                 | 2002-09-29     | 02:23          | 71°27.07         | 133°47.20        | 401            | 989                  |
| 041         | 49                 | 2002-09-29     | 09:40          | 71°27.01         | 133°46.92        | 92             | 987                  |
| 042         | 49                 | 2002-09-29     | 11:03          | 71°26.82         | 133°46.97        | 91             | 1022                 |
| 043         | 50                 | 2002-09-29     | 18:38          | 71°22.14         | 133°44.98        | 1040           | 1060                 |
| 044         | 51                 | 2002-09-29     | 20:48          | 71°17.02         | 133°43.81        | 878            | 907                  |
| 045         | 52                 | 2002-09-29     | 22:20          | 71°11.64         | 133°43.03        | 662            | 689                  |
| 046         | 53                 | 2002-09-29     | 23:36          | 71°06.58         | 133°42.09        | 388            | 415                  |
| 047         | 53                 | 2002-09-30     | 02:15          | 71°06.48         | 133°42.16        | 78             | 407                  |
| 048         | 54                 | 2002-09-30     | 03:25          | 71°01.51         | 133°41.58        | 153            | 154                  |
| 049         | 55                 | 2002-09-30     | 04:27          | 70°56.30         | 133°40.10        | 73             | 87                   |
| 050         | 56                 | 2002-09-30     | 05:42          | 70°51.20         | 133°39.24        | 66             | 77                   |

**APPENDIX 3.1** Rosette cast locations, sampling time, water depth and corresponding station or mooring numbers. CASES Leg 0, Expedition 0202 (2002) (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) |
|-------------|--------------------|----------------|----------------|------------------|------------------|----------------|----------------------|
| 051         | 57                 | 2002-09-30     | 08:37          | 70°46.16         | 133°37.72        | 60             | 66                   |
| 052         | 58                 | 2002-09-30     | 09:44          | 70°40.94         | 133°36.83        | 58             | 64                   |
| 053         | 59                 | 2002-09-30     | 13:05          | 70°35.56         | 133°35.13        | 60             | 69                   |
| 054         | 60                 | 2002-09-30     | 14:44          | 70°30.76         | 133°34.99        | 57             | 70                   |
| 055         | 61                 | 2002-09-30     | 15:56          | 70°25.50         | 133°34.04        | 51             | 61                   |
| 056         | 62                 | 2002-09-30     | 19:40          | 70°20.39         | 133°33.26        | 51             | 62                   |
| 057         | 63                 | 2002-09-30     | 21:40          | 70°15.37         | 133°32.08        | 41             | 52                   |
| 058         | 64                 | 2002-09-30     | 22:44          | 70°10.08         | 133°30.91        | 33             | 45                   |
| 059         | 65                 | 2002-10-02     | 11:33          | 70°08.75         | 133°30.69        | 31             | 43                   |
| 060         | 65                 | 2002-10-02     | 12:36          | 70°08.68         | 133°30.91        | 31             | 42                   |
| 061         | 65                 | 2002-10-02     | 23:06          | 70°08.81         | 133°31.31        | 31             | 44                   |
| 062         | 65                 | 2002-10-03     | 04:44          | 70°08.74         | 133°30.87        | 30             | 43                   |
| 063         | 65                 | 2002-10-03     | 19:55          | 70°08.79         | 133°30.62        | 31             | 43                   |
| 064         | 66                 | 2002-10-04     | 06:53          | 70°51.23         | 133°39.00        | 65             | 78                   |
| 065         | 66                 | 2002-10-04     | 11:03          | 70°51.16         | 133°38.99        | 50             | 78                   |
| 066         | 66                 | 2002-10-04     | 13:01          | 70°51.22         | 133°38.93        | 41             | 78                   |
| 067         | 66                 | 2002-10-04     | 19:29          | 70°51.05         | 133°39.18        | 65             | 78                   |
| 068         | 67                 | 2002-10-05     | 05:49          | 70°51.59         | 133°21.68        | 57             | 70                   |
| 069         | 68                 | 2002-10-05     | 07:03          | 70°53.12         | 133°04.11        | 56             | 69                   |
| 070         | 69                 | 2002-10-05     | 10:08          | 70°54.78         | 132°45.54        | 56             | 68                   |
| 071         | 70                 | 2002-10-05     | 13:15          | 70°56.21         | 132°26.66        | 52             | 65                   |
| 072         | 71                 | 2002-10-05     | 17:32          | 70°57.59         | 132°06.21        | 54             | 64                   |
| 073         | 72                 | 2002-10-05     | 18:52          | 70°59.10         | 131°48.97        | 56             | 62                   |
| 074         | 73                 | 2002-10-05     | 23:25          | 71°01.24         | 131°33.33        | 60             | 64                   |
| 075         | 74                 | 2002-10-06     | 00:31          | 71°02.34         | 131°13.83        | 50             | 63                   |
| 076         | 75                 | 2002-10-06     | 02:02          | 71°03.76         | 130°55.39        | 54             | 57                   |
| 077         | 76                 | 2002-10-06     | 05:20          | 71°05.27         | 130°38.74        | 39             | 50                   |
| 078         | 77                 | 2002-10-06     | 06:54          | 71°07.09         | 130°18.44        | 37             | 49                   |
| 079         | 78                 | 2002-10-06     | 10:28          | 71°08.42         | 130°01.95        | 34             | 46                   |
| 080         | 79                 | 2002-10-06     | 11:55          | 71°09.75         | 129°42.58        | 34             | 46                   |
| 081         | 80                 | 2002-10-06     | 14:03          | 71°11.36         | 129°23.84        | 36             | 47                   |
| 082         | 81                 | 2002-10-06     | 17:35          | 71°12.38         | 129°09.31        | 36             | 48                   |
| 083         | 82                 | 2002-10-06     | 19:05          | 71°14.64         | 128°47.08        | 43             | 55                   |
| 084         | 83                 | 2002-10-06     | 21:55          | 71°15.52         | 128°27.76        | 43             | 55                   |
| 085         | 83                 | 2002-10-07     | 08:12          | 71°15.89         | 128°28.83        | 10             | 55                   |
| 086         | 83                 | 2002-10-07     | 11:03          | 71°15.82         | 128°30.86        | 43             | 54                   |
| 087         | 83                 | 2002-10-07     | 12:59          | 71°15.73         | 128°30.51        | 30             | 55                   |
| 088         | 84                 | 2002-10-07     | 23:21          | 71°17.44         | 128°11.33        | 68             | 82                   |
| 089         | 85                 | 2002-10-08     | 01:00          | 71°18.92         | 127°53.42        | 150            | 160                  |
| 090         | 86                 | 2002-10-08     | 07:54          | 71°22.04         | 127°29.31        | 252            | 270                  |
| 091         | 87                 | 2002-10-08     | 10:03          | 71°22.17         | 127°13.21        | 305            | 340                  |
| 092         | 88                 | 2002-10-08     | 12:01          | 71°23.74         | 127°01.11        | 368            | 379                  |
| 093         | 89                 | 2002-10-08     | 16:34          | 71°24.82         | 126°40.68        | 140            | 458                  |
| 094         | 89                 | 2002-10-08     | 17:45          | 71°24.55         | 126°44.52        | 429            | 455                  |
| 095         | 90                 | 2002-10-08     | 20:39          | 71°21.63         | 126°28.26        | 450            | 472                  |
| 096         | 91                 | 2002-10-08     | 22:10          | 71°18.06         | 126°15.18        | 435            | 457                  |
| 097         | 92                 | 2002-10-09     | 02:27          | 71°14.07         | 125°58.77        | 386            | 395                  |
| 098         | 93                 | 2002-10-09     | 04:06          | 71°11.31         | 125°49.96        | 381            | 403                  |
| 099         | 94                 | 2002-10-09     | 06:05          | 71°07.76         | 125°38.40        | 400            | 415                  |
| 100         | 95                 | 2002-10-09     | 10:00          | 71°04.24         | 125°26.13        | 329            | 347                  |

**APPENDIX 3.1** Rosette cast locations, sampling time, water depth and corresponding station or mooring numbers. CASES Leg 0, Expedition 0202 (2002) (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         | 96                 | 2002-10-09     | 11:57          | 71°00.85         | 125°13.60        | 328            | 348                  |
| 102         | 97                 | 2002-10-09     | 14:03          | 70°57.30         | 125°01.50        | 372            | 390                  |
| 103         | 98                 | 2002-10-09     | 18:03          | 70°53.73         | 124°49.00        | 351            | 367                  |
| 104         | 99                 | 2002-10-09     | 21:07          | 70°50.36         | 124°37.71        | 411            | 417                  |
| 105         | 100                | 2002-10-09     | 22:57          | 70°46.77         | 124°25.14        | 437            | 459                  |
| 106         | 101                | 2002-10-10     | 02:02          | 70°43.59         | 124°12.47        | 510            | 529                  |
| 107         | 101                | 2002-10-10     | 10:09          | 70°43.70         | 124°11.73        | 479            | 502                  |
| 108         | 101                | 2002-10-10     | 11:28          | 70°43.39         | 124°11.05        | 429            | 446                  |
| 109         | 101                | 2002-10-10     | 12:57          | 70°43.48         | 124°11.19        | 41             | 449                  |
| 110         | 17                 | 2002-10-11     | 05:57          | 70°13.32         | 126°41.32        | 193            | 214                  |
| 111         | 16                 | 2002-10-11     | 07:10          | 70°09.04         | 126°37.14        | 209            | 223                  |
| 112         | 15                 | 2002-10-11     | 08:58          | 70°05.18         | 126°31.78        | 219            | 237                  |
| 113         | 14                 | 2002-10-11     | 13:04          | 70°00.42         | 126°22.60        | 196            | 212                  |
| 114         | 13                 | 2002-10-11     | 14:58          | 69°55.72         | 126°15.37        | 178            | 194                  |
| 115         | 12                 | 2002-10-12     | 00:56          | 69°49.68         | 126°08.47        | 140            | 150                  |
| 116         | 12                 | 2002-10-12     | 08:58          | 69°50.16         | 126°09.15        | 138            | 153                  |
| 117         | 12                 | 2002-10-12     | 10:56          | 69°49.89         | 126°09.89        | 133            | 149                  |
| 118         | 12                 | 2002-10-12     | 12:54          | 69°50.20         | 126°09.77        | 10             | 154                  |
| 119         | 11                 | 2002-10-12     | 18:19          | 69°54.70         | 126°00.32        | 146            | 157                  |
| 120         | 10                 | 2002-10-12     | 19:57          | 70°00.11         | 125°58.62        | 166            | 182                  |
| 121         | 9                  | 2002-10-12     | 22:07          | 70°05.68         | 125°51.49        | 124            | 140                  |
| 122         | 8                  | 2002-10-12     | 23:59          | 70°10.50         | 125°43.40        | 131            | 149                  |
| 123         | 7                  | 2002-10-13     | 01:33          | 70°16.45         | 125°38.49        | 219            | 240                  |
| 124         | 6                  | 2002-10-13     | 04:01          | 70°20.75         | 125°30.00        | 188            | 200                  |
| 125         | 5                  | 2002-10-13     | 06:15          | 70°25.17         | 125°12.17        | 155            | 170                  |
| 126         | 4                  | 2002-10-13     | 07:44          | 70°25.46         | 125°50.40        | 112            | 132                  |
| 127         | 3                  | 2002-10-13     | 10:00          | 70°25.55         | 124°31.28        | 164            | 182                  |
| 128         | 102                | 2002-10-13     | 12:59          | 70°39.98         | 123°59.76        | 450            | 432                  |
| 129         | 103                | 2002-10-13     | 14:28          | 70°39.60         | 123°43.93        | 477            | 503                  |
| 130         | 104                | 2002-10-13     | 16:06          | 70°39.50         | 123°27.14        | 396            | 407                  |
| 131         | 105                | 2002-10-13     | 21:36          | 70°39.40         | 123°11.66        | 526            | 540                  |
| 132         | 106                | 2002-10-13     | 23:06          | 70°39.40         | 122°51.87        | 528            | 552                  |
| 133         | 107                | 2002-10-14     | 01:38          | 70°38.20         | 122°38.18        | 484            | 516                  |
| 134         | 108                | 2002-10-14     | 03:16          | 70°38.98         | 122°21.60        | 520            | 536                  |
| 135         | 109                | 2002-10-14     | 04:29          | 70°37.62         | 122°04.70        | 482            | 571                  |
| 136         | 110                | 2002-10-14     | 07:06          | 70°35.58         | 121°50.17        | 502            | 537                  |
| 137         | 111                | 2002-10-15     | 20:47          | 68°22.47         | 112°45.78        | 92             | 107                  |
| 138         | 112                | 2002-10-17     | 15:51          | 72°08.60         | 096°04.42        | 410            | 430                  |

**APPENDIX 3.2** Rosette cast locations, sampling time, water depth and corresponding station or mooring numbers. CASES Leg 1, Expedition 0303 (2003).

| Cast number | Station or mooring | Start date UTC | Start time UTC | Latitude (North) | Longitude (West) | Cast depth (m) | Sea bottom depth (m) |
|-------------|--------------------|----------------|----------------|------------------|------------------|----------------|----------------------|
| 001         | 0                  | 2003-09-20     | 22:45          | 70°07.27         | 71°04.66         | 500            | 885                  |
| 003         | 718                | 2003-09-30     | 05:05          | 70°18.48         | 133°20.20        | 28             | 31                   |
| 004         | 718                | 2003-09-30     | 07:01          | 70°12.60         | 133°18.56        | 30             | 34                   |
| 005         | 718                | 2003-09-30     | 09:45          | 70°12.27         | 133°15.48        | 27             | 30                   |
| 006         | 718                | 2003-09-30     | 13:48          | 70°12.16         | 133°11.64        | 28             | 32                   |
| 007         | 718                | 2003-09-30     | 20:28          | 70°12.11         | 133°17.19        | 28             | 33                   |
| 008         | 4                  | 2003-10-01     | 19:52          | 71°01.38         | 133°46.56        | 196            | 204                  |
| 009         | 12                 | 2003-10-02     | 04:10          | 71°24.60         | 134°03.90        | 1172           | 1185                 |
| 010         | 12                 | 2003-10-02     | 07:18          | 71°24.14         | 134°06.18        | 1188           | 1217                 |
| 011         | 12                 | 2003-10-02     | 11:41          | 71°25.09         | 134°08.14        | 1198           | 1201                 |
| 012         | 12                 | 2003-10-02     | 17:07          | 71°25.50         | 134°12.37        | 1215           | 1233                 |
| 013         | 7                  | 2003-10-03     | 07:25          | 71°10.06         | 133°53.34        | 500            | 517                  |
| 014         | 7                  | 2003-10-03     | 10:32          | 71°10.33         | 133°53.17        | 526            | 526                  |
| 016         | 7                  | 2003-10-03     | 14:28          | 71°11.08         | 133°55.05        | 584            | 584                  |
| 017         | 11                 | 2003-10-05     | 22:45          | 70°34.50         | 138°40.14        | 979            | 995                  |
| 018         | 10                 | 2003-10-06     | 14:36          | 69°55.74         | 138°44.22        | 192            | 212                  |
| 019         | 10                 | 2003-10-06     | 18:05          | 69°56.51         | 138°32.10        | 233            | 239                  |
| 020         | 10                 | 2003-10-06     | 20:35          | 69°57.30         | 138°36.28        | 235            | 247                  |
| 021         | 10                 | 2003-10-06     | 23:41          | 69°59.16         | 138°40.38        | 256            | 271                  |
| 022         | 10                 | 2003-10-07     | 02:27          | 69°56.01         | 138°30.50        | 227            | 235                  |
| 023         | 10                 | 2003-10-07     | 05:59          | 69°56.26         | 138°30.44        | 230            | 238                  |
| 024         | 13                 | 2003-10-09     | 01:46          | 71°21.60         | 131°22.20        | 330            | 346                  |
| 025         | 14                 | 2003-10-09     | 20:07          | 71°47.27         | 128°00.47        | 378            | 403                  |
| 026         | 16                 | 2003-10-10     | 01:44          | 71°47.84         | 126°24.96        | 220            | 235                  |
| 027         | 15                 | 2003-10-10     | 05:41          | 71°32.49         | 127°00.09        | 389            | 408                  |
| 028         | 15                 | 2003-10-10     | 09:45          | 71°32.20         | 126°57.18        | 395            | 409                  |
| 029         | 15                 | 2003-10-10     | 14:10          | 71°32.71         | 126°59.75        | 394            | 406                  |
| 030         | 15                 | 2003-10-10     | 16:12          | 71°32.76         | 126°58.90        | 390            | 410                  |
| 031         | 3                  | 2003-10-11     | 00:37          | 71°09.92         | 128°06.18        | 57             | 60                   |
| 032         | 6                  | 2003-10-11     | 07:38          | 70°35.83         | 127°14.58        | 243            | 262                  |
| 033         | 6                  | 2003-10-11     | 17:08          | 70°35.75         | 127°12.83        | 250            | 258                  |
| 034         | 20                 | 2003-10-12     | 02:43          | 70°20.17         | 126°20.72        | 245            | 252                  |
| 035         | 5                  | 2003-10-12     | 22:06          | 71°25.81         | 127°20.97        | 300            | 309                  |
| 036         | 8                  | 2003-10-13     | 03:58          | 70°60.00         | 125°57.88        | 383            | 401                  |
| 037         | 18                 | 2003-10-13     | 19:00          | 70°37.87         | 123°06.91        | 480            | 489                  |
| 038         | 18                 | 2003-10-13     | 23:09          | 70°37.74         | 123°06.56        | 526            | 538                  |
| 039         | 18                 | 2003-10-14     | 03:26          | 70°38.38         | 123°05.18        | 500            | 514                  |

**APPENDIX 3.3** Rosette cast locations, sampling time, water depth and corresponding station or mooring numbers. CASES Leg 2, Expedition 0304 (2003) (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) |
|-------------|--------------------|----------------|----------------|------------------|------------------|----------------|----------------------|
| 001         | 718                | 2003-10-18     | 20:13:54       | 70°10.27         | 133°32.28        | 35             | 44                   |
| 002         | 718                | 2003-10-19     | 13:05:24       | 70°10.11         | 133°31.78        | 35             | 44                   |
| 003         | 718                | 2003-10-19     | 14:28:11       | 70°10.24         | 133°33.71        | 36             | 43                   |
| 004         | 718                | 2003-10-19     | 15:50:56       | 70°10.16         | 133°33.06        | 34             | 43                   |
| 005         | 717                | 2003-10-20     | 14:22:25       | 70°15.38         | 133°33.27        | 44             | 52                   |
| 006         | 716                | 2003-10-20     | 15:17:24       | 70°20.06         | 133°35.25        | 48             | 57                   |
| 007         | 715                | 2003-10-20     | 17:37:32       | 70°25.81         | 133°36.73        | 55             | 63                   |
| 008         | 715                | 2003-10-21     | 00:16:42       | 70°25.98         | 133°35.73        | 54             | 64                   |
| 009         | 714                | 2003-10-21     | 02:59:02       | 70°31.39         | 133°39.16        | 58             | 66                   |
| 010         | 713                | 2003-10-21     | 04:19:47       | 70°36.61         | 133°38.80        | 63             | 70                   |
| 011         | 712                | 2003-10-21     | 05:45:14       | 70°41.30         | 133°41.62        | 58             | 67                   |
| 012         | 711                | 2003-10-21     | 09:08:25       | 70°46.64         | 133°43.18        | 64             | 72                   |
| 013         | 710                | 2003-10-21     | 10:54:33       | 70°51.63         | 133°42.02        | 67             | 75                   |
| 014         | 709                | 2003-10-21     | 12:13:43       | 70°56.95         | 133°45.35        | 74             | 82                   |
| 015         | 709                | 2003-10-21     | 14:15:01       | 70°57.03         | 133°45.10        | 72             | 81                   |
| 016         | 709                | 2003-10-21     | 15:49:39       | 70°56.93         | 133°47.38        | 71             | 81                   |
| 017         | 709                | 2003-10-21     | 19:42:34       | 70°55.38         | 133°52.17        | 78             | 85                   |
| 018         | 708                | 2003-10-22     | 04:41:03       | 71°01.83         | 133°48.18        | 220            | 230                  |
| 019         | 707                | 2003-10-22     | 07:51:11       | 71°07.66         | 133°49.18        | 453            | 462                  |
| 020         | 706                | 2003-10-22     | 11:09:48       | 71°13.02         | 133°51.59        | 635            | 651                  |
| 021         | 706                | 2003-10-22     | 16:09:04       | 71°12.47         | 133°55.20        | 673            | 683                  |
| 022         | 705                | 2003-10-22     | 18:54:02       | 71°17.62         | 133°53.93        | 842            | 850                  |
| 023         | 704                | 2003-10-22     | 21:08:56       | 71°22.72         | 133°51.70        | 1077           | 1085                 |
| 024         | 703                | 2003-10-23     | 00:56:32       | 71°27.94         | 133°55.30        | 1187           | 1196                 |
| 025         | 702                | 2003-10-23     | 10:45:09       | 71°33.27         | 133°56.58        | 1108           | 1117                 |
| 026         | 701                | 2003-10-23     | 12:47:58       | 71°38.59         | 133°55.07        | 1186           | 1370                 |
| 027         | 700                | 2003-10-23     | 15:09:42       | 71°44.14         | 133°59.75        | 1187           | 1400                 |
| 028         | 508                | 2003-10-23     | 21:31:54       | 72°04.29         | 134°01.82        | 1186           | 1800                 |
| 029         | 508                | 2003-10-24     | 02:42:44       | 72°04.38         | 134°05.03        | 74             | 1800                 |
| 030         | 508a               | 2003-10-24     | 07:33:54       | 72°00.04         | 133°59.13        | 1186           | 1800                 |
| 031         | 507                | 2003-10-24     | 12:18:54       | 71°59.82         | 133°09.54        | 1186           | 1500                 |
| 032         | 506                | 2003-10-24     | 15:51:00       | 71°59.86         | 132°25.60        | 1186           | 1500                 |
| 033         | 505                | 2003-10-24     | 19:28:12       | 71°59.80         | 131°35.57        | 1116           | 1125                 |
| 034         | 504                | 2003-10-24     | 23:19:54       | 71°59.14         | 130°45.01        | 722            | 730                  |
| 035         | 503                | 2003-10-25     | 02:35:12       | 72°00.58         | 130°01.37        | 352            | 352                  |
| 036         | 502                | 2003-10-25     | 05:44:54       | 72°00.33         | 129°12.03        | 382            | 391                  |
| 037         | 501                | 2003-10-25     | 09:22:48       | 72°00.46         | 128°22.36        | 403            | 410                  |
| 038         | 500                | 2003-10-25     | 12:26:57       | 72°00.05         | 127°34.66        | 379            | 387                  |
| 039         | 500                | 2003-10-25     | 21:39:32       | 72°03.75         | 127°28.74        | 368            | 376                  |
| 040         | 129                | 2003-10-26     | 07:25:06       | 71°49.90         | 127°26.71        | 403            | 419                  |
| 041         | 128                | 2003-10-26     | 09:23:04       | 71°44.59         | 127°18.27        | 410            | 420                  |
| 042         | 127                | 2003-10-26     | 10:53:15       | 71°39.46         | 127°10.74        | 391            | 401                  |
| 043         | 126                | 2003-10-26     | 12:54:11       | 71°34.03         | 127°02.06        | 394            | 402                  |
| 044         | 125                | 2003-10-26     | 14:37:56       | 71°29.31         | 126°55.18        | 391            | 399                  |
| 045         | 124                | 2003-10-26     | 16:06:58       | 71°23.94         | 126°47.74        | 419            | 426                  |
| 046         | 124                | 2003-10-26     | 17:41:33       | 71°23.88         | 126°47.90        | 77             | 442                  |
| 047         | 124                | 2003-10-26     | 20:04:51       | 71°23.63         | 126°48.36        | 415            | 425                  |
| 048         | 124                | 2003-10-27     | 01:11:06       | 71°24.25         | 126°46.45        | 419            | 428                  |
| 049         | 123                | 2003-10-27     | 09:26:30       | 71°18.91         | 126°38.15        | 438            | 447                  |
| 050         | 122                | 2003-10-27     | 14:05:22       | 71°14.03         | 126°31.53        | 416            | 426                  |

**APPENDIX 3.3** Rosette cast locations, sampling time, water depth and corresponding station or mooring numbers. CASES Leg 2, Expedition 0304 (2003) (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) |
|-------------|--------------------|----------------|----------------|------------------|------------------|----------------|----------------------|
| 051         | 121                | 2003-10-27     | 15:40:53       | 71°08.87         | 126°22.55        | 386            | 395                  |
| 052         | 120                | 2003-10-27     | 17:23:49       | 71°03.05         | 126°14.60        | 369            | 379                  |
| 053         | 119                | 2003-10-27     | 19:48:05       | 70°59.69         | 126°06.35        | 378            | 387                  |
| 054         | 118                | 2003-10-27     | 22:08:47       | 70°57.16         | 125°50.67        | 392            | 402                  |
| 055         | 117                | 2003-10-28     | 02:41:32       | 70°54.66         | 125°35.12        | 398            | 408                  |
| 056         | 116                | 2003-10-28     | 04:29:27       | 70°53.21         | 125°17.75        | 320            | 330                  |
| 057         | 115                | 2003-10-28     | 06:06:25       | 70°50.56         | 125°02.58        | 343            | 353                  |
| 058         | 114                | 2003-10-28     | 07:43:33       | 70°49.16         | 124°43.60        | 385            | 393                  |
| 059         | 113                | 2003-10-28     | 09:07:30       | 70°47.07         | 124°27.83        | 472            | 481                  |
| 060         | 112                | 2003-10-28     | 13:59:36       | 70°45.38         | 124°15.27        | 458            | 523                  |
| 061         | 112                | 2003-10-28     | 17:41:56       | 70°45.13         | 124°16.22        | 43             | 456                  |
| 062         | 112                | 2003-10-28     | 19:59:20       | 70°44.78         | 124°17.57        | 426            | 437                  |
| 063         | 88                 | 2003-10-31     | 03:00:18       | 70°36.27         | 117°44.48        | 285            | 294                  |
| 064         | 100                | 2003-10-31     | 15:10:12       | 70°35.95         | 121°00.84        | 357            | 374                  |
| 065         | 100                | 2003-10-31     | 18:22:05       | 70°35.15         | 120°59.47        | 377            | 388                  |
| 066         | 101                | 2003-11-01     | 00:02:57       | 70°35.81         | 121°17.20        | 468            | 477                  |
| 067         | 102                | 2003-11-01     | 01:10:21       | 70°35.97         | 121°32.43        | 447            | 458                  |
| 068         | 103                | 2003-11-01     | 02:14:01       | 70°35.99         | 121°48.91        | 515            | 524                  |
| 069         | 104                | 2003-11-01     | 03:25:00       | 70°35.94         | 122°05.75        | 477            | 486                  |
| 070         | 105                | 2003-11-01     | 04:35:52       | 70°36.00         | 122°22.28        | 498            | 507                  |
| 071         | 106                | 2003-11-01     | 05:49:38       | 70°36.19         | 122°38.47        | 530            | 537                  |
| 072         | 107                | 2003-11-01     | 06:56:54       | 70°36.00         | 122°53.70        | 542            | 563                  |
| 073         | 108                | 2003-11-01     | 08:08:39       | 70°37.84         | 123°09.49        | 470            | 484                  |
| 074         | 109                | 2003-11-01     | 09:21:59       | 70°39.84         | 123°25.56        | 557            | 567                  |
| 075         | 210                | 2003-11-01     | 11:45:22       | 70°36.75         | 124°12.66        | 428            | 438                  |
| 076         | 209                | 2003-11-01     | 13:23:53       | 70°32.11         | 124°22.67        | 220            | 230                  |
| 077         | 208                | 2003-11-01     | 14:11:21       | 70°28.03         | 124°30.45        | 201            | 211                  |
| 078         | 207                | 2003-11-01     | 15:20:23       | 70°23.12         | 124°39.33        | 127            | 137                  |
| 079         | 206                | 2003-11-01     | 19:43:37       | 70°19.48         | 124°50.33        | 86             | 96                   |
| 080         | 200                | 2003-11-04     | 15:49:31       | 69°55.08         | 126°29.42        | 162            | 171                  |
| 081         | 200                | 2003-11-04     | 17:17:51       | 69°55.30         | 126°29.62        | 163            | 171                  |
| 082         | 200                | 2003-11-04     | 19:53:37       | 69°55.74         | 126°29.32        | 164            | 175                  |
| 083         | 200                | 2003-11-05     | 01:21:49       | 69°54.98         | 126°30.50        | 162            | 170                  |
| 084         | 400                | 2003-11-05     | 19:51:06       | 70°55.17         | 128°55.12        | 30             | 34                   |
| 085         | 401                | 2003-11-06     | 00:20:19       | 70°59.05         | 128°41.40        | 35             | 40                   |
| 086         | 402                | 2003-11-06     | 02:32:04       | 71°03.01         | 128°29.69        | 37             | 40                   |
| 087         | 403                | 2003-11-06     | 04:27:12       | 71°06.42         | 128°19.19        | 50             | 56                   |
| 088         | 404                | 2003-11-06     | 08:53:18       | 71°10.59         | 128°05.27        | 62             | 68                   |
| 089         | 405                | 2003-11-06     | 10:12:26       | 71°15.67         | 127°53.28        | 111            | 118                  |
| 090         | 406                | 2003-11-06     | 11:22:31       | 71°18.23         | 127°41.02        | 171            | 177                  |
| 091         | 407                | 2003-11-06     | 17:24:57       | 71°24.12         | 127°25.94        | 273            | 282                  |
| 092         | 408                | 2003-11-06     | 18:41:32       | 71°27.03         | 127°15.79        | 330            | 337                  |
| 093         | 409                | 2003-11-06     | 22:43:47       | 71°29.87         | 127°08.48        | 367            | 371                  |
| 094         | 409                | 2003-11-07     | 03:00:54       | 71°30.84         | 127°02.52        | 379            | 385                  |
| 095         | 410                | 2003-11-07     | 04:46:34       | 71°34.39         | 126°52.96        | 414            | 419                  |
| 096         | 411                | 2003-11-07     | 06:11:25       | 71°37.98         | 126°41.24        | 430            | 436                  |
| 097         | 412                | 2003-11-07     | 08:58:32       | 71°42.00         | 126°27.05        | 368            | 377                  |
| 098         | 413                | 2003-11-07     | 13:39:01       | 71°46.23         | 126°16.51        | 227            | 236                  |
| 099         | 414                | 2003-11-07     | 15:02:42       | 71°49.87         | 126°03.65        | 193            | 201                  |
| 100         | 415                | 2003-11-07     | 16:53:04       | 71°53.59         | 125°51.78        | 41             | 45                   |

**APPENDIX 3.3** Rosette cast locations, sampling time, water depth and corresponding station or mooring numbers. CASES Leg 2, Expedition 0304 (2003) (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         | 415                | 2003-11-07     | 21:18:08       | 71°54.53         | 125°50.58        | 48             | 56                   |
| 102         | 415                | 2003-11-07     | 23:25:10       | 71°54.37         | 125°53.49        | 52             | 57                   |
| 103         | 415                | 2003-11-08     | 00:47:05       | 71°53.84         | 125°49.17        | 40             | 45                   |
| 104         | B1                 | 2003-11-08     | 02:41:03       | 71°54.02         | 125°51.94        | 41             | 45                   |
| 105         | B2                 | 2003-11-08     | 03:20:44       | 71°52.42         | 125°56.56        | 108            | 113                  |
| 106         | B3                 | 2003-11-08     | 04:11:10       | 71°50.88         | 126°00.55        | 198            | 202                  |
| 107         | B4                 | 2003-11-08     | 04:57:49       | 71°49.77         | 126°04.56        | 204            | 207                  |
| 108         | B5                 | 2003-11-08     | 05:41:27       | 71°48.54         | 126°09.40        | 227            | 232                  |
| 109         | B6                 | 2003-11-08     | 06:25:56       | 71°46.81         | 126°15.21        | 231            | 234                  |
| 110         | B7                 | 2003-11-08     | 08:32:51       | 71°44.57         | 126°15.39        | 231            | 237                  |
| 111         | B8                 | 2003-11-08     | 09:35:21       | 71°43.93         | 126°22.68        | 313            | 318                  |
| 112         | B9                 | 2003-11-08     | 10:31:18       | 71°42.87         | 126°28.90        | 368            | 373                  |
| 113         | B10                | 2003-11-08     | 11:40:36       | 71°40.89         | 126°30.87        | 436            | 441                  |
| 114         | B11                | 2003-11-08     | 12:48:35       | 71°39.69         | 126°35.94        | 441            | 444                  |
| 115         | B12                | 2003-11-08     | 13:39:21       | 71°38.55         | 126°40.74        | 434            | 439                  |
| 116         | 317                | 2003-11-11     | 02:44:40       | 71°36.02         | 124°06.08        | 154            | 157                  |
| 117         | 315                | 2003-11-11     | 08:40:07       | 71°29.13         | 124°30.99        | 209            | 218                  |
| 118         | 314                | 2003-11-11     | 12:25:30       | 71°25.62         | 124°45.66        | 215            | 224                  |
| 119         | 313                | 2003-11-11     | 14:09:12       | 71°21.89         | 124°58.53        | 218            | 226                  |
| 120         | 312                | 2003-11-11     | 16:47:18       | 71°18.03         | 125°11.61        | 297            | 306                  |
| 121         | 312                | 2003-11-11     | 20:19:21       | 71°18.35         | 125°10.79        | 301            | 305                  |
| 122         | 311                | 2003-11-12     | 03:31:28       | 71°14.64         | 125°23.82        | 356            | 361                  |
| 123         | 310                | 2003-11-12     | 05:19:26       | 71°10.69         | 125°37.16        | 371            | 378                  |
| 124         | 309                | 2003-11-12     | 10:15:24       | 71°07.42         | 125°52.42        | 378            | 387                  |
| 125         | 309                | 2003-11-12     | 12:30:48       | 71°07.22         | 125°50.71        | 375            | 383                  |
| 126         | 309                | 2003-11-12     | 16:38:08       | 71°07.05         | 125°48.10        | 40             | 390                  |
| 127         | 309                | 2003-11-12     | 18:34:23       | 71°06.67         | 125°50.66        | 382            | 388                  |
| 128         | 309                | 2003-11-13     | 01:25:51       | 71°06.99         | 125°49.76        | 380            | 385                  |
| 129         | 308                | 2003-11-13     | 07:59:31       | 71°03.86         | 126°03.25        | 385            | 394                  |
| 130         | 307                | 2003-11-13     | 09:38:31       | 71°00.11         | 126°16.42        | 362            | 370                  |
| 131         | 306                | 2003-11-13     | 12:45:20       | 70°56.69         | 126°28.47        | 330            | 340                  |
| 132         | 306                | 2003-11-13     | 15:57:28       | 70°56.62         | 126°29.02        | 329            | 338                  |
| 133         | 305                | 2003-11-13     | 18:13:53       | 70°52.10         | 126°41.45        | 292            | 301                  |
| 134         | 304                | 2003-11-13     | 19:52:10       | 70°49.39         | 126°54.95        | 265            | 270                  |
| 135         | 303                | 2003-11-14     | 00:17:02       | 70°46.11         | 127°08.45        | 229            | 234                  |
| 136         | 302                | 2003-11-14     | 05:15:12       | 70°42.25         | 127°22.75        | 202            | 206                  |
| 137         | 301                | 2003-11-14     | 06:44:17       | 70°38.83         | 127°33.05        | 197            | 201                  |
| 138         | 300                | 2003-11-14     | 16:11:29       | 70°35.71         | 127°48.64        | 26             | 33                   |
| 139         | 300                | 2003-11-14     | 17:58:31       | 70°35.64         | 127°49.57        | 21             | 28                   |
| 140         | 300                | 2003-11-14     | 20:09:02       | 70°35.44         | 127°43.33        | 39             | 43                   |
| 141         | 300                | 2003-11-14     | 21:54:29       | 70°35.44         | 127°44.52        | 35             | 40                   |
| 142         | 200                | 2003-11-19     | 22:57:51       | 69°55.44         | 126°32.15        | 163            | 168                  |
| 143         | 200                | 2003-11-20     | 01:06:45       | 69°55.43         | 126°32.13        | 163            | 168                  |
| 144         | 200                | 2003-11-20     | 02:46:20       | 69°55.43         | 126°32.23        | 163            | 168                  |
| 145         | 200                | 2003-11-20     | 16:12:15       | 69°55.35         | 126°32.05        | 167            | 168                  |
| 146         | 200                | 2003-11-20     | 17:40:29       | 69°55.35         | 126°31.98        | 160            | 168                  |
| 147         | 200                | 2003-11-20     | 19:44:53       | 69°55.35         | 126°31.96        | 163            | 168                  |

**APPENDIX 3.4** Rosette cast locations, sampling time, water depth and corresponding station or mooring numbers. CASES Leg 3, Expedition 0305 (2003) (page 1/2).

| Cast number | Station or mooring | Start date UTC | Start time UTC | Latitude (North) | Longitude (West) | Cast depth (m) | Sea bottom depth (m) |
|-------------|--------------------|----------------|----------------|------------------|------------------|----------------|----------------------|
| 001         | winter1            | 2003-12-09     | 15:20          | 70°02.62         | 126°12.04        | 212            | 227                  |
| 002         | winter1            | 2003-12-09     | 17:50          | 70°02.73         | 126°11.815       | 216            | 227                  |
| 003         | winter1            | 2003-12-10     | 01:45          | 70°02.33         | 126°11.42        | 213            | 227                  |
| 004         | winter1            | 2003-12-10     | 13:41          | 70°01.18         | 126°25.12        | 213            | 227                  |
| 005         | winter1            | 2003-12-10     | 16:06          | 70°01.18         | 126°26.12        | 213            | 227                  |
| 006         | winter1            | 2003-12-11     | 02:10          | 70°01.17         | 126°25.12        | 213            | 227                  |
| 007         | winter1            | 2003-12-11     | 13:28          | 70°02.17         | 126°11.29        | 213            | 227                  |
| 008         | winter1            | 2003-12-12     | 01:30          | 70°02.36         | 126°13.03        | 215            | 229                  |
| 009         | winter1            | 2003-12-12     | 13:30          | 70°02.74         | 126°17.42        | 220            | 234                  |
| 010         | winter1            | 2003-12-13     | 14:18          | 70°02.73         | 126°18.07        | 218            | 232                  |
| 011         | winter1            | 2003-12-14     | 01:44          | 70°02.73         | 126°18.07        | 218            | 232                  |
| 012         | winter1            | 2003-12-14     | 15:40          | 70°02.73         | 126°18.07        | 218            | 232                  |
| 013         | winter1            | 2003-12-15     | 01:38          | 70°02.73         | 126°18.07        | 219            | 232                  |
| 014         | winter1            | 2003-12-15     | 13:36          | 70°02.73         | 126°18.07        | 218            | 232                  |
| 015         | winter1            | 2003-12-16     | 01:35          | 70°02.73         | 126°18.07        | 218            | 232                  |
| 016         | winter1            | 2003-12-16     | 13:33          | 70°02.73         | 126°18.07        | 219            | 232                  |
| 017         | winter1            | 2003-12-16     | 15:36          | 70°02.73         | 126°18.08        | 218            | 232                  |
| 018         | winter1            | 2003-12-17     | 01:40          | 70°02.73         | 126°18.07        | 218            | 232                  |
| 019         | winter1            | 2003-12-17     | 13:30          | 70°02.73         | 126°18.07        | 218            | 232                  |
| 020         | winter1            | 2003-12-18     | 01:50          | 70°02.73         | 126°18.07        | 219            | 232                  |
| 021         | winter1            | 2003-12-18     | 13:44          | 70°02.73         | 126°18.08        | 219            | 232                  |
| 022         | winter1            | 2003-12-19     | 01:40          | 70°02.73         | 126°18.07        | 219            | 232                  |
| 023         | winter1            | 2003-12-19     | 13:39          | 70°02.73         | 126°18.08        | 218            | 232                  |
| 024         | winter1            | 2003-12-20     | 01:44          | 70°02.73         | 126°18.07        | 219            | 232                  |
| 025         | winter1            | 2003-12-20     | 13:26          | 70°02.73         | 126°18.07        | 219            | 232                  |
| 026         | winter1            | 2003-12-21     | 01:37          | 70°02.73         | 126°18.07        | 218            | 232                  |
| 027         | winter1            | 2003-12-21     | 15:36          | 70°02.73         | 126°18.07        | 218            | 232                  |
| 028         | winter1            | 2003-12-22     | 01:40          | 70°02.74         | 126°18.07        | 219            | 232                  |
| 029         | winter1            | 2003-12-22     | 13:30          | 70°02.73         | 126°18.11        | 220            | 232                  |
| 030         | winter1            | 2003-12-22     | 15:40          | 70°02.73         | 126°18.07        | 219            | 232                  |
| 031         | winter1            | 2003-12-23     | 01:43          | 70°02.73         | 126°18.07        | 219            | 232                  |
| 032         | winter1            | 2003-12-23     | 13:27          | 70°02.73         | 126°18.07        | 219            | 232                  |
| 033         | winter1            | 2003-12-24     | 02:11          | 70°02.73         | 126°18.07        | 219            | 232                  |
| 034         | winter1            | 2003-12-24     | 13:46          | 70°02.73         | 126°18.07        | 219            | 232                  |
| 035         | winter1            | 2003-12-24     | 23:46          | 70°02.73         | 126°18.07        | 219            | 232                  |
| 036         | winter1            | 2003-12-25     | 20:08          | 70°02.73         | 126°18.07        | 219            | 232                  |
| 037         | winter1            | 2003-12-27     | 01:37          | 70°02.73         | 126°18.07        | 219            | 232                  |
| 039         | winter1            | 2003-12-27     | 13:39          | 70°02.74         | 126°18.07        | 219            | 232                  |
| 040         | winter1            | 2003-12-28     | 01:37          | 70°02.73         | 126°18.07        | 219            | 232                  |
| 041         | winter1            | 2003-12-28     | 15:45          | 70°02.73         | 126°18.07        | 219            | 232                  |
| 042         | winter1            | 2003-12-28     | 17:50          | 70°02.73         | 126°18.07        | 219            | 232                  |
| 043         | winter1            | 2003-12-29     | 01:40          | 70°02.73         | 126°18.07        | 218            | 232                  |
| 044         | winter1            | 2003-12-29     | 13:57          | 70°02.73         | 126°18.08        | 219            | 232                  |
| 045         | winter1            | 2003-12-30     | 01:35          | 70°02.73         | 126°18.07        | 219            | 232                  |
| 046         | winter1            | 2003-12-30     | 13:37          | 70°02.73         | 126°18.07        | 219            | 232                  |
| 047         | winter1            | 2003-12-31     | 01:52          | 70°02.73         | 126°18.07        | 219            | 232                  |
| 048         | winter1            | 2003-12-31     | 14:07          | 70°02.73         | 126°18.07        | 219            | 232                  |
| 049         | winter1            | 2003-12-31     | 23:35          | 70°02.73         | 126°18.07        | 219            | 232                  |
| 050         | winter1            | 2004-01-01     | 20:35          | 70°02.73         | 126°18.07        | 220            | 232                  |

**APPENDIX 3.4** Rosette cast locations, sampling time, water depth and corresponding station or mooring numbers. CASES Leg 3, Expedition 0305 (2003) (page 2/2).

| Cast number | Station or mooring | Start date UTC | Start time UTC | Latitude (North) | Longitude (West) | Cast depth (m) | Sea bottom depth (m) |
|-------------|--------------------|----------------|----------------|------------------|------------------|----------------|----------------------|
| 051         | winter1            | 2004-01-02     | 13:42          | 70°02.73         | 126°18.07        | 219            | 232                  |
| 052         | winter1            | 2004-01-03     | 01:38          | 70°02.73         | 126°18.07        | 219            | 232                  |
| 053         | winter1            | 2004-01-03     | 13:40          | 70°02.73         | 126°18.07        | 219            | 232                  |
| 054         | winter1            | 2004-01-03     | 15:42          | 70°02.73         | 126°18.07        | 218            | 232                  |
| 055         | winter1            | 2004-01-04     | 02:09          | 70°02.73         | 126°18.07        | 219            | 232                  |
| 056         | winter1            | 2004-01-04     | 15:40          | 70°02.73         | 126°18.07        | 219            | 232                  |
| 057         | winter1            | 2004-01-05     | 02:01          | 70°02.73         | 126°18.07        | 219            | 232                  |
| 058         | winter1            | 2004-01-05     | 13:39          | 70°02.73         | 126°18.07        | 219            | 232                  |
| 059         | winter1            | 2004-01-06     | 01:42          | 70°02.73         | 126°18.07        | 219            | 232                  |
| 060         | winter1            | 2004-01-06     | 14:09          | 70°02.73         | 126°18.07        | 220            | 232                  |
| 061         | winter1            | 2004-01-07     | 01:30          | 70°02.73         | 126°18.07        | 220            | 233                  |

**APPENDIX 3.5** Rosette cast locations, sampling time, water depth and corresponding station or mooring numbers. CASES Leg 4, Expedition 0401 (2004) (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) |
|-------------|--------------------|----------------|----------------|------------------|------------------|----------------|----------------------|
| 001         | Winter 1           | 2004-01-09     | 14:43          | 70°02.71         | 126°18.06        | 221            | 231                  |
| 002         | Winter 1           | 2004-01-10     | 13:45          | 70°02.71         | 126°18.06        | 220            | 231                  |
| 003         | Winter 1           | 2004-01-10     | 16:30          | 70°02.71         | 126°18.06        | 222            | 232                  |
| 004         | Winter 1           | 2004-01-11     | 01:55          | 70°02.71         | 126°18.06        | 221            | 232                  |
| 005         | Winter 1           | 2004-01-11     | 14:08          | 70°02.71         | 126°18.06        | 221            | 231                  |
| 006         | Winter 1           | 2004-01-12     | 01:50          | 70°02.71         | 126°18.06        | 221            | 232                  |
| 007         | Winter 1           | 2004-01-12     | 14:15          | 70°02.71         | 126°18.06        | 221            | 231                  |
| 008         | Winter 1           | 2004-01-13     | 01:37          | 70°02.71         | 126°18.06        | 221            | 231                  |
| 009         | Winter 1           | 2004-01-13     | 13:49          | 70°02.71         | 126°18.06        | 221            | 232                  |
| 010         | Winter 1           | 2004-01-14     | 02:03          | 70°02.71         | 126°18.06        | 221            | 231                  |
| 011         | Winter 1           | 2004-01-14     | 13:39          | 70°02.71         | 126°18.06        | 223            | 231                  |
| 012         | Winter 1           | 2004-01-15     | 01:35          | 70°02.71         | 126°18.06        | 223            | 231                  |
| 013         | Winter 1           | 2004-01-15     | 13:33          | 70°02.71         | 126°18.06        | 223            | 231                  |
| 014         | Winter 1           | 2004-01-16     | 01:50          | 70°02.71         | 126°18.06        | 223            | 231                  |
| 015         | Winter 1           | 2004-01-16     | 13:51          | 70°02.71         | 126°18.06        | 223            | 231                  |
| 016         | Winter 1           | 2004-01-16     | 15:50          | 70°02.71         | 126°18.06        | 223            | 231                  |
| 017         | Winter 1           | 2004-01-16     | 18:13          | 70°02.71         | 126°18.06        | 225            | 231                  |
| 018         | Winter 1           | 2004-01-17     | 01:47          | 70°02.71         | 126°18.06        | 222            | 231                  |
| 019         | Winter 1           | 2004-01-17     | 14:01          | 70°02.71         | 126°18.06        | 223            | 231                  |
| 020         | Winter 1           | 2004-01-18     | 01:43          | 70°02.71         | 126°18.06        | 223            | 232                  |
| 021         | Winter 1           | 2004-01-18     | 13:53          | 70°02.71         | 126°18.06        | 223            | 231                  |
| 022         | Winter 1           | 2004-01-19     | 01:43          | 70°02.71         | 126°18.06        | 223            | 232                  |
| 023         | Winter 1           | 2004-01-19     | 13:43          | 70°02.71         | 126°18.06        | 223            | 232                  |
| 024         | Winter 1           | 2004-01-20     | 01:41          | 70°02.71         | 126°18.06        | 223            | 232                  |
| 025         | Winter 1           | 2004-01-20     | 13:40          | 70°02.71         | 126°18.06        | 223            | 231                  |
| 026         | Winter 1           | 2004-01-21     | 01:41          | 70°02.71         | 126°18.06        | 223            | 231                  |
| 027         | Winter 1           | 2004-01-21     | 13:41          | 70°02.71         | 126°18.06        | 223            | 232                  |
| 028         | Winter 1           | 2004-01-22     | 01:37          | 70°02.71         | 126°18.06        | 223            | 231                  |
| 029         | Winter 1           | 2004-01-22     | 13:38          | 70°02.71         | 126°18.06        | 223            | 232                  |
| 030         | Winter 1           | 2004-01-22     | 15:51          | 70°02.71         | 126°18.06        | 224            | 231                  |
| 031         | Winter 1           | 2004-01-22     | 18:24          | 70°02.71         | 126°18.06        | 224            | 231                  |
| 032         | Winter 1           | 2004-01-23     | 01:43          | 70°02.71         | 126°18.06        | 223            | 231                  |
| 033         | Winter 1           | 2004-01-23     | 14:14          | 70°02.71         | 126°18.06        | 223            | 232                  |
| 034         | Winter 1           | 2004-01-24     | 01:42          | 70°02.71         | 126°18.06        | 223            | 232                  |
| 035         | Winter 1           | 2004-01-24     | 13:48          | 70°02.71         | 126°18.06        | 223            | 231                  |
| 036         | Winter 1           | 2004-01-25     | 13:43          | 70°02.71         | 126°18.06        | 223            | 231                  |
| 037         | Winter 1           | 2004-01-25     | 13:45          | 70°02.71         | 126°18.06        | 223            | 231                  |
| 038         | Winter 1           | 2004-01-26     | 01:50          | 70°02.71         | 126°18.06        | 223            | 231                  |
| 039         | Winter 1           | 2004-01-26     | 13:42          | 70°02.71         | 126°18.06        | 223            | 231                  |
| 040         | Winter 1           | 2004-01-27     | 01:36          | 70°02.71         | 126°18.06        | 223            | 231                  |
| 041         | Winter 1           | 2004-01-27     | 13:37          | 70°02.71         | 126°18.06        | 223            | 231                  |
| 042         | Winter 1           | 2004-01-28     | 01:39          | 70°02.71         | 126°18.06        | 223            | 231                  |
| 043         | Winter 1           | 2004-01-28     | 13:51          | 70°02.71         | 126°18.06        | 223            | 232                  |
| 044         | Winter 1           | 2004-01-28     | 15:52          | 70°02.71         | 126°18.06        | 223            | 232                  |
| 045         | Winter 1           | 2004-01-28     | 18:27          | 70°02.71         | 126°18.06        | 223            | 232                  |
| 046         | Winter 1           | 2004-01-29     | 01:46          | 70°02.71         | 126°18.06        | 223            | 232                  |
| 047         | Winter 1           | 2004-01-29     | 14:00          | 70°02.71         | 126°18.06        | 223            | 232                  |
| 048         | Winter 1           | 2004-01-30     | 01:42          | 70°02.71         | 126°18.06        | 223            | 232                  |
| 049         | Winter 1           | 2004-01-30     | 13:36          | 70°02.71         | 126°18.06        | 223            | 232                  |
| 050         | Winter 1           | 2004-01-31     | 01:35          | 70°02.71         | 126°18.06        | 223            | 232                  |

**APPENDIX 3.5** Rosette cast locations, sampling time, water depth and corresponding station or mooring numbers. CASES Leg 4, Expedition 0401 (2004) (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) |
|-------------|--------------------|----------------|----------------|------------------|------------------|----------------|----------------------|
| 051         | Winter 1           | 2004-01-31     | 13:38          | 70°02.71         | 126°18.06        | 223            | 232                  |
| 052         | Winter 1           | 2004-02-01     | 01:45          | 70°02.71         | 126°18.06        | 223            | 232                  |
| 053         | Winter 1           | 2004-02-01     | 13:39          | 70°02.71         | 126°18.06        | 223            | 232                  |
| 054         | Winter 1           | 2004-02-02     | 01:41          | 70°02.71         | 126°18.06        | 223            | 232                  |
| 055         | Winter 1           | 2004-02-02     | 13:44          | 70°02.71         | 126°18.06        | 223            | 232                  |
| 056         | Winter 1           | 2004-02-03     | 01:44          | 70°02.71         | 126°18.06        | 223            | 232                  |
| 057         | Winter 1           | 2004-02-03     | 13:37          | 70°02.71         | 126°18.06        | 223            | 232                  |
| 058         | Winter 1           | 2004-02-03     | 15:07          | 70°02.71         | 126°18.06        | 223            | 232                  |
| 059         | Winter 1           | 2004-02-03     | 17:31          | 70°02.71         | 126°18.06        | 223            | 232                  |
| 060         | Winter 1           | 2004-02-03     | 19:18          | 70°02.71         | 126°18.06        | 223            | 232                  |
| 061         | Winter 1           | 2004-02-04     | 01:44          | 70°02.71         | 126°18.06        | 223            | 232                  |
| 062         | Winter 1           | 2004-02-04     | 13:41          | 70°02.71         | 126°18.06        | 223            | 232                  |
| 063         | Winter 1           | 2004-02-05     | 01:45          | 70°02.71         | 126°18.06        | 223            | 232                  |
| 064         | Winter 1           | 2004-02-05     | 13:38          | 70°02.71         | 126°18.06        | 223            | 232                  |
| 065         | Winter 1           | 2004-02-06     | 01:41          | 70°02.71         | 126°18.06        | 223            | 232                  |
| 066         | Winter 1           | 2004-02-06     | 13:38          | 70°02.71         | 126°18.06        | 223            | 232                  |
| 067         | Winter 1           | 2004-02-06     | 14:38          | 70°02.71         | 126°18.06        | 223            | 232                  |
| 068         | Winter 1           | 2004-02-06     | 15:43          | 70°02.71         | 126°18.06        | 223            | 232                  |
| 069         | Winter 1           | 2004-02-06     | 16:47          | 70°02.71         | 126°18.06        | 223            | 232                  |
| 070         | Winter 1           | 2004-02-06     | 17:36          | 70°02.71         | 126°18.06        | 223            | 232                  |
| 071         | Winter 1           | 2004-02-06     | 18:36          | 70°02.71         | 126°18.06        | 223            | 232                  |
| 072         | Winter 1           | 2004-02-06     | 20:04          | 70°02.71         | 126°18.06        | 224            | 232                  |
| 073         | Winter 1           | 2004-02-06     | 20:42          | 70°02.71         | 126°18.06        | 223            | 232                  |
| 074         | Winter 1           | 2004-02-06     | 21:36          | 70°02.71         | 126°18.06        | 223            | 232                  |
| 075         | Winter 1           | 2004-02-06     | 22:37          | 70°02.71         | 126°18.06        | 223            | 232                  |
| 076         | Winter 1           | 2004-02-06     | 23:35          | 70°02.71         | 126°18.06        | 223            | 232                  |
| 077         | Winter 1           | 2004-02-07     | 00:35          | 70°02.71         | 126°18.06        | 223            | 232                  |
| 078         | Winter 1           | 2004-02-07     | 01:42          | 70°02.71         | 126°18.06        | 223            | 232                  |
| 079         | Winter 1           | 2004-02-07     | 02:37          | 70°02.71         | 126°18.06        | 223            | 232                  |
| 080         | Winter 1           | 2004-02-07     | 13:43          | 70°02.71         | 126°18.06        | 223            | 232                  |
| 081         | Winter 1           | 2004-02-08     | 01:39          | 70°02.71         | 126°18.06        | 224            | 232                  |
| 082         | Winter 1           | 2004-02-08     | 13:36          | 70°02.71         | 126°18.06        | 223            | 232                  |
| 083         | Winter 1           | 2004-02-09     | 01:43          | 70°02.71         | 126°18.06        | 223            | 232                  |
| 084         | Winter 1           | 2004-02-09     | 13:46          | 70°02.71         | 126°18.06        | 223            | 231                  |
| 085         | Winter 1           | 2004-02-09     | 15:15          | 70°02.71         | 126°18.06        | 223            | 231                  |
| 086         | Winter 1           | 2004-02-09     | 17:15          | 70°02.71         | 126°18.06        | 223            | 231                  |
| 087         | Winter 1           | 2004-02-09     | 19:15          | 70°02.71         | 126°18.06        | 223            | 231                  |
| 088         | Winter 1           | 2004-02-10     | 01:48          | 70°02.71         | 126°18.06        | 223            | 231                  |
| 089         | Winter 1           | 2004-02-10     | 13:51          | 70°02.71         | 126°18.06        | 223            | 231                  |
| 090         | Winter 1           | 2004-02-11     | 01:42          | 70°02.71         | 126°18.06        | 223            | 231                  |
| 091         | Winter 1           | 2004-02-11     | 13:40          | 70°02.71         | 126°18.06        | 223            | 231                  |
| 092         | Winter 1           | 2004-02-12     | 01:38          | 70°02.71         | 126°18.06        | 223            | 231                  |
| 093         | Winter 1           | 2004-02-12     | 13:38          | 70°02.71         | 126°18.06        | 223            | 231                  |
| 094         | Winter 1           | 2004-02-13     | 01:42          | 70°02.71         | 126°18.06        | 223            | 231                  |
| 095         | Winter 1           | 2004-02-13     | 13:44          | 70°02.71         | 126°18.06        | 223            | 231                  |
| 096         | Winter 1           | 2004-02-13     | 14:48          | 70°02.71         | 126°18.06        | 223            | 232                  |
| 097         | Winter 1           | 2004-02-13     | 15:35          | 70°02.71         | 126°18.06        | 223            | 232                  |
| 098         | Winter 1           | 2004-02-13     | 16:33          | 70°02.71         | 126°18.06        | 223            | 232                  |
| 099         | Winter 1           | 2004-02-13     | 17:33          | 70°02.71         | 126°18.06        | 223            | 232                  |
| 100         | Winter 1           | 2004-02-13     | 18:30          | 70°02.71         | 126°18.06        | 223            | 232                  |

**APPENDIX 3.5** Rosette cast locations, sampling time, water depth and corresponding station or mooring numbers. CASES Leg 4, Expedition 0401 (2004) (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         | Winter 1           | 2004-02-13     | 19:36          | 70°02.71         | 126°18.06        | 223            | 232                  |
| 102         | Winter 1           | 2004-02-13     | 20:32          | 70°02.71         | 126°18.06        | 223            | 232                  |
| 103         | Winter 1           | 2004-02-13     | 21:36          | 70°02.71         | 126°18.06        | 223            | 232                  |
| 104         | Winter 1           | 2004-02-13     | 22:33          | 70°02.71         | 126°18.06        | 224            | 232                  |
| 105         | Winter 1           | 2004-02-13     | 23:33          | 70°02.71         | 126°18.06        | 223            | 232                  |
| 106         | Winter 1           | 2004-02-14     | 00:33          | 70°02.71         | 126°18.06        | 224            | 232                  |
| 107         | Winter 1           | 2004-02-14     | 01:38          | 70°02.71         | 126°18.06        | 223            | 232                  |
| 108         | Winter 1           | 2004-02-14     | 02:33          | 70°02.71         | 126°18.06        | 224            | 232                  |
| 109         | Winter 1           | 2004-02-14     | 13:35          | 70°02.71         | 126°18.06        | 223            | 232                  |
| 110         | Winter 1           | 2004-02-14     | 17:14          | 70°02.71         | 126°18.06        | 223            | 232                  |
| 111         | Winter 1           | 2004-02-14     | 19:30          | 70°02.71         | 126°18.06        | 223            | 232                  |
| 112         | Winter 1           | 2004-02-14     | 20:56          | 70°02.71         | 126°18.06        | 223            | 232                  |
| 113         | Winter 1           | 2004-02-15     | 01:48          | 70°02.71         | 126°18.06        | 224            | 232                  |
| 114         | Winter 1           | 2004-02-15     | 13:46          | 70°02.71         | 126°18.06        | 223            | 231                  |
| 115         | Winter 1           | 2004-02-16     | 01:41          | 70°02.71         | 126°18.06        | 223            | 232                  |
| 116         | Winter 1           | 2004-02-16     | 13:41          | 70°02.71         | 126°18.06        | 223            | 232                  |
| 117         | Winter 1           | 2004-02-17     | 02:14          | 70°02.71         | 126°18.06        | 223            | 232                  |
| 119         | Winter 1           | 2004-02-18     | 01:37          | 70°02.71         | 126°18.06        | 223            | 232                  |
| 120         | Winter 1           | 2004-02-18     | 13:44          | 70°02.71         | 126°18.06        | 223            | 232                  |

**APPENDIX 3.6** Rosette cast locations, sampling time, water depth and corresponding station or mooring numbers. CASES Leg 5, Expedition 0402 (2004) (page 1/2).

| Cast number | Station or mooring | Start date UTC | Start time UTC | Latitude (North) | Longitude (West) | Cast depth (m) | Sea bottom depth (m) |
|-------------|--------------------|----------------|----------------|------------------|------------------|----------------|----------------------|
| 001         | Winter 1           | 2004-02-19     | 13:30          | 70°02.71         | 126°18.06        | 223            | 232                  |
| 002         | Winter 1           | 2004-02-20     | 01:29          | 70°02.71         | 126°18.06        | 221            | 232                  |
| 003         | Winter 1           | 2004-02-20     | 13:34          | 70°02.71         | 126°18.06        | 223            | 232                  |
| 004         | Winter 1           | 2004-02-20     | 15:58          | 70°02.71         | 126°18.06        | 225            | 232                  |
| 005         | Winter 1           | 2004-02-21     | 01:43          | 70°02.71         | 126°18.06        | 225            | 232                  |
| 006         | Winter 1           | 2004-02-21     | 13:30          | 70°02.71         | 126°18.06        | 224            | 232                  |
| 007         | Winter 1           | 2004-02-22     | 01:41          | 70°02.71         | 126°18.06        | 226            | 232                  |
| 008         | Winter 1           | 2004-02-22     | 13:45          | 70°02.71         | 126°18.06        | 228            | 232                  |
| 009         | Winter 1           | 2004-02-23     | 01:39          | 70°02.71         | 126°18.06        | 221            | 232                  |
| 010         | Winter 1           | 2004-02-23     | 13:32          | 70°02.71         | 126°18.06        | 223            | 232                  |
| 011         | Winter 1           | 2004-02-24     | 01:29          | 70°02.71         | 126°18.06        | 222            | 232                  |
| 012         | Winter 1           | 2004-02-24     | 13:27          | 70°02.71         | 126°18.06        | 224            | 232                  |
| 013         | Winter 1           | 2004-02-25     | 01:30          | 70°02.71         | 126°18.06        | 223            | 232                  |
| 014         | Winter 1           | 2004-02-25     | 13:34          | 70°02.71         | 126°18.06        | 224            | 232                  |
| 015         | Winter 1           | 2004-02-26     | 01:30          | 70°02.71         | 126°18.06        | 222            | 232                  |
| 016         | Winter 1           | 2004-02-26     | 13:34          | 70°02.71         | 126°18.06        | 222            | 232                  |
| 017         | Winter 1           | 2004-02-26     | 15:48          | 70°02.71         | 126°18.06        | 223            | 232                  |
| 018         | Winter 1           | 2004-02-27     | 01:37          | 70°02.71         | 126°18.06        | 223            | 232                  |
| 019         | Winter 1           | 2004-02-27     | 13:38          | 70°02.71         | 126°18.06        | 223            | 232                  |
| 020         | Winter 1           | 2004-02-28     | 01:28          | 70°02.71         | 126°18.06        | 222            | 232                  |
| 021         | Winter 1           | 2004-02-28     | 13:34          | 70°02.71         | 126°18.06        | 225            | 232                  |
| 022         | Winter 1           | 2004-02-29     | 01:31          | 70°02.71         | 126°18.06        | 222            | 232                  |
| 023         | Winter 1           | 2004-02-29     | 13:30          | 70°02.71         | 126°18.06        | 222            | 232                  |
| 024         | Winter 1           | 2004-03-01     | 01:29          | 70°02.71         | 126°18.06        | 222            | 232                  |
| 025         | Winter 1           | 2004-03-01     | 13:31          | 70°02.71         | 126°18.06        | 223            | 232                  |
| 026         | Winter 1           | 2004-03-02     | 01:30          | 70°02.71         | 126°18.06        | 223            | 232                  |
| 027         | Winter 1           | 2004-03-02     | 13:31          | 70°02.71         | 126°18.06        | 223            | 232                  |
| 028         | Winter 1           | 2004-03-03     | 01:35          | 70°02.71         | 126°18.06        | 224            | 232                  |
| 029         | Winter 1           | 2004-03-03     | 13:34          | 70°02.71         | 126°18.06        | 224            | 232                  |
| 030         | Winter 1           | 2004-03-03     | 15:33          | 70°02.71         | 126°18.06        | 225            | 232                  |
| 031         | Winter 1           | 2004-03-04     | 01:36          | 70°02.71         | 126°18.06        | 224            | 232                  |
| 032         | Winter 1           | 2004-03-04     | 13:30          | 70°02.71         | 126°18.06        | 224            | 232                  |
| 033         | Winter 1           | 2004-03-05     | 01:27          | 70°02.71         | 126°18.06        | 225            | 232                  |
| 034         | Winter 1           | 2004-03-05     | 13:39          | 70°02.71         | 126°18.06        | 223            | 232                  |
| 035         | Winter 1           | 2004-03-06     | 01:26          | 70°02.71         | 126°18.06        | 225            | 232                  |
| 036         | Winter 1           | 2004-03-06     | 13:34          | 70°02.71         | 126°18.06        | 223            | 232                  |
| 037         | Winter 1           | 2004-03-06     | 21:13          | 70°02.71         | 126°18.06        | 215            | 232                  |
| 038         | Winter 1           | 2004-03-07     | 15:41          | 70°02.71         | 126°18.06        | 224            | 232                  |
| 039         | Winter 1           | 2004-03-08     | 01:29          | 70°02.71         | 126°18.06        | 225            | 232                  |
| 040         | Winter 1           | 2004-03-08     | 13:39          | 70°02.71         | 126°18.06        | 223            | 232                  |
| 041         | Winter 1           | 2004-03-09     | 01:37          | 70°02.71         | 126°18.06        | 225            | 232                  |
| 042         | Winter 1           | 2004-03-09     | 13:36          | 70°02.71         | 126°18.06        | 224            | 232                  |
| 043         | Winter 1           | 2004-03-09     | 15:38          | 70°02.71         | 126°18.06        | 227            | 232                  |
| 044         | Winter 1           | 2004-03-10     | 01:27          | 70°02.71         | 126°18.06        | 226            | 232                  |
| 045         | Winter 1           | 2004-03-10     | 13:37          | 70°02.71         | 126°18.06        | 226            | 232                  |
| 046         | Winter 1           | 2004-03-11     | 01:30          | 70°02.71         | 126°18.06        | 224            | 232                  |
| 047         | Winter 1           | 2004-03-11     | 13:41          | 70°02.71         | 126°18.06        | 226            | 232                  |
| 048         | Winter 1           | 2004-03-12     | 01:31          | 70°02.71         | 126°18.06        | 225            | 232                  |
| 049         | Winter 1           | 2004-03-12     | 13:34          | 70°02.71         | 126°18.06        | 225            | 232                  |
| 050         | Winter 1           | 2004-03-13     | 01:28          | 70°02.71         | 126°18.06        | 224            | 232                  |

**APPENDIX 3.6** Rosette cast locations, sampling time, water depth and corresponding station or mooring numbers. CASES Leg 5, Expedition 0402 (2004) (page 2/2).

| Cast number | Station or mooring | Start date UTC | Start time UTC | Latitude (North) | Longitude (West) | Cast depth (m) | Sea bottom depth (m) |
|-------------|--------------------|----------------|----------------|------------------|------------------|----------------|----------------------|
| 051         | Winter 1           | 2004-03-13     | 13:38          | 70°02.71         | 126°18.06        | 226            | 232                  |
| 052         | Winter 1           | 2004-03-14     | 01:41          | 70°02.71         | 126°18.06        | 227            | 232                  |
| 053         | Winter 1           | 2004-03-14     | 15:35          | 70°02.71         | 126°18.06        | 225            | 232                  |
| 054         | Winter 1           | 2004-03-15     | 01:38          | 70°02.71         | 126°18.06        | 224            | 232                  |
| 055         | Winter 1           | 2004-03-15     | 13:38          | 70°02.71         | 126°18.06        | 224            | 232                  |
| 056         | Winter 1           | 2004-03-15     | 15:29          | 70°02.71         | 126°18.06        | 223            | 232                  |
| 057         | Winter 1           | 2004-03-16     | 01:29          | 70°02.71         | 126°18.06        | 224            | 232                  |
| 058         | Winter 1           | 2004-03-16     | 13:32          | 70°02.71         | 126°18.06        | 224            | 232                  |
| 059         | Winter 1           | 2004-03-17     | 01:29          | 70°02.71         | 126°18.06        | 224            | 232                  |
| 060         | Winter 1           | 2004-03-17     | 13:34          | 70°02.71         | 126°18.06        | 227            | 232                  |
| 061         | Winter 1           | 2004-03-18     | 01:35          | 70°02.71         | 126°18.06        | 224            | 232                  |
| 062         | Winter 1           | 2004-03-18     | 13:32          | 70°02.71         | 126°18.06        | 224            | 232                  |
| 063         | Winter 1           | 2004-03-18     | 21:25          | 70°02.71         | 126°18.06        | 224            | 232                  |
| 064         | Winter 1           | 2004-03-19     | 13:40          | 70°02.71         | 126°18.06        | 224            | 232                  |
| 065         | Winter 1           | 2004-03-20     | 01:32          | 70°02.71         | 126°18.06        | 224            | 232                  |
| 066         | Winter 1           | 2004-03-20     | 13:37          | 70°02.71         | 126°18.06        | 224            | 232                  |
| 067         | Winter 1           | 2004-03-21     | 01:27          | 70°02.71         | 126°18.06        | 224            | 232                  |
| 068         | Winter 1           | 2004-03-21     | 13:30          | 70°02.71         | 126°18.06        | 224            | 232                  |
| 069         | Winter 1           | 2004-03-21     | 15:30          | 70°02.71         | 126°18.06        | 224            | 232                  |
| 070         | Winter 1           | 2004-03-22     | 01:30          | 70°02.71         | 126°18.06        | 224            | 232                  |
| 071         | Winter 1           | 2004-03-22     | 13:34          | 70°02.71         | 126°18.06        | 224            | 232                  |
| 072         | Winter 1           | 2004-03-23     | 01:29          | 70°02.71         | 126°18.06        | 224            | 232                  |
| 073         | Winter 1           | 2004-03-23     | 13:33          | 70°02.71         | 126°18.06        | 224            | 232                  |
| 074         | Winter 1           | 2004-03-24     | 01:26          | 70°02.71         | 126°18.06        | 224            | 232                  |
| 075         | Winter 1           | 2004-03-24     | 13:30          | 70°02.71         | 126°18.06        | 225            | 232                  |
| 076         | Winter 1           | 2004-03-25     | 01:30          | 70°02.71         | 126°18.06        | 224            | 232                  |
| 077         | Winter 1           | 2004-03-25     | 13:32          | 70°02.71         | 126°18.06        | 225            | 232                  |
| 078         | Winter 1           | 2004-03-26     | 01:30          | 70°02.71         | 126°18.06        | 226            | 232                  |
| 079         | Winter 1           | 2004-03-26     | 13:29          | 70°02.71         | 126°18.06        | 226            | 232                  |
| 080         | Winter 1           | 2004-03-27     | 01:38          | 70°02.71         | 126°18.06        | 226            | 232                  |
| 081         | Winter 1           | 2004-03-27     | 13:31          | 70°02.71         | 126°18.06        | 225            | 232                  |
| 082         | Winter 1           | 2004-03-27     | 15:32          | 70°02.71         | 126°18.06        | 225            | 232                  |
| 083         | Winter 1           | 2004-03-28     | 01:36          | 70°02.71         | 126°18.06        | 224            | 232                  |
| 084         | Winter 1           | 2004-03-28     | 15:28          | 70°02.71         | 126°18.06        | 224            | 232                  |
| 085         | Winter 1           | 2004-03-29     | 02:12          | 70°02.71         | 126°18.06        | 224            | 232                  |
| 086         | Winter 1           | 2004-03-29     | 13:45          | 70°02.71         | 126°18.06        | 225            | 232                  |
| 087         | Winter 1           | 2004-03-30     | 01:29          | 70°02.71         | 126°18.06        | 222            | 232                  |
| 088         | Winter 1           | 2004-03-30     | 13:29          | 70°02.71         | 126°18.06        | 224            | 232                  |
| 089         | Winter 1           | 2004-03-31     | 01:33          | 70°02.71         | 126°18.06        | 224            | 232                  |
| 090         | Winter 1           | 2004-03-31     | 13:33          | 70°02.71         | 126°18.06        | 224            | 232                  |

**APPENDIX 3.7** Rosette cast locations, sampling time, water depth and corresponding station or mooring numbers. CASES Leg 6, Expedition 0403 (2004) (page 1/2).

| Cast number | Station or mooring | Start date UTC | Start time UTC | Latitude (North) | Longitude (West) | Cast depth (m) | Sea bottom depth (m) |
|-------------|--------------------|----------------|----------------|------------------|------------------|----------------|----------------------|
| 001         | Winter 1           | 2004-04-01     | 01:31          | 70°02.71         | 126°18.06        | 224            | 232                  |
| 002         | Winter 1           | 2004-04-01     | 13:35          | 70°02.71         | 126°18.06        | 223            | 232                  |
| 003         | Winter 1           | 2004-04-01     | 22:31          | 70°02.71         | 126°18.06        | 224            | 232                  |
| 004         | Winter 1           | 2004-04-02     | 13:27          | 70°02.71         | 126°18.06        | 225            | 232                  |
| 005         | Winter 1           | 2004-04-03     | 01:30          | 70°02.71         | 126°18.06        | 224            | 232                  |
| 006         | Winter 1           | 2004-04-03     | 13:31          | 70°02.71         | 126°18.06        | 225            | 232                  |
| 007         | Winter 1           | 2004-04-03     | 17:08          | 70°02.71         | 126°18.06        | 225            | 332                  |
| 008         | Winter 1           | 2004-04-04     | 01:28          | 70°02.71         | 126°18.06        | 225            | 332                  |
| 009         | Winter 1           | 2004-04-04     | 12:32          | 70°02.71         | 126°18.06        | 225            | 232                  |
| 010         | Winter 1           | 2004-04-04     | 15:01          | 70°02.71         | 126°18.06        | 226            | 232                  |
| 011         | Winter 1           | 2004-04-05     | 00:55          | 70°02.71         | 126°18.06        | 225            | 232                  |
| 012         | Winter 1           | 2004-04-05     | 12:38          | 70°02.71         | 126°18.06        | 226            | 232                  |
| 013         | Winter 1           | 2004-04-06     | 00:22          | 70°02.71         | 126°18.06        | 225            | 232                  |
| 014         | Winter 1           | 2004-04-06     | 12:24          | 70°02.71         | 126°18.06        | 226            | 232                  |
| 015         | Winter 1           | 2004-04-07     | 00:29          | 70°02.71         | 126°18.06        | 226            | 232                  |
| 016         | Winter 1           | 2004-04-07     | 12:26          | 70°02.71         | 126°18.06        | 225            | 232                  |
| 017         | Winter 1           | 2004-04-07     | 14:52          | 70°02.71         | 126°18.06        | 227            | 232                  |
| 018         | Winter 1           | 2004-04-08     | 00:30          | 70°02.71         | 126°18.06        | 226            | 232                  |
| 019         | Winter 1           | 2004-04-08     | 12:31          | 70°02.71         | 126°18.06        | 225            | 232                  |
| 020         | Winter 1           | 2004-04-09     | 00:35          | 70°02.71         | 126°18.06        | 227            | 232                  |
| 021         | Winter 1           | 2004-04-09     | 12:27          | 70°02.71         | 126°18.06        | 226            | 232                  |
| 022         | Winter 1           | 2004-04-10     | 00:28          | 70°02.71         | 126°18.06        | 225            | 232                  |
| 023         | Winter 1           | 2004-04-10     | 12:27          | 70°02.71         | 126°18.06        | 225            | 232                  |
| 024         | Winter 1           | 2004-04-10     | 14:49          | 70°02.71         | 126°18.06        | 226            | 232                  |
| 025         | Winter 1           | 2004-04-11     | 00:25          | 70°02.71         | 126°18.06        | 225            | 232                  |
| 026         | Winter 1           | 2004-04-11     | 12:41          | 70°02.71         | 126°18.06        | 226            | 232                  |
| 027         | Winter 1           | 2004-04-11     | 14:30          | 70°02.71         | 126°18.06        | 227            | 232                  |
| 028         | Winter 1           | 2004-04-12     | 00:40          | 70°02.71         | 126°18.06        | 225            | 232                  |
| 029         | Winter 1           | 2004-04-12     | 12:25          | 70°02.71         | 126°18.06        | 226            | 232                  |
| 030         | Winter 1           | 2004-04-13     | 00:24          | 70°02.71         | 126°18.06        | 226            | 232                  |
| 031         | Winter 1           | 2004-04-13     | 12:24          | 70°02.71         | 126°18.06        | 226            | 232                  |
| 032         | Winter 1           | 2004-04-14     | 00:25          | 70°02.71         | 126°18.06        | 226            | 232                  |
| 033         | Winter 1           | 2004-04-14     | 12:28          | 70°02.71         | 126°18.06        | 226            | 232                  |
| 034         | Winter 1           | 2004-04-15     | 00:26          | 70°02.71         | 126°18.06        | 226            | 232                  |
| 035         | Winter 1           | 2004-04-15     | 12:23          | 70°02.71         | 126°18.06        | 226            | 232                  |
| 036         | Winter 1           | 2004-04-16     | 00:26          | 70°02.71         | 126°18.06        | 226            | 232                  |
| 037         | Winter 1           | 2004-04-16     | 12:24          | 70°02.71         | 126°18.06        | 226            | 232                  |
| 038         | Winter 1           | 2004-04-16     | 14:27          | 70°02.71         | 126°18.06        | 227            | 232                  |
| 039         | Winter 1           | 2004-04-17     | 00:32          | 70°02.71         | 126°18.06        | 226            | 232                  |
| 040         | Winter 1           | 2004-04-17     | 12:25          | 70°02.71         | 126°18.06        | 226            | 232                  |
| 041         | Winter 1           | 2004-04-18     | 00:29          | 70°02.71         | 126°18.06        | 225            | 232                  |
| 042         | Winter 1           | 2004-04-18     | 12:27          | 70°02.71         | 126°18.06        | 226            | 232                  |
| 043         | Winter 1           | 2004-04-19     | 00:27          | 70°02.71         | 126°18.06        | 226            | 232                  |
| 044         | Winter 1           | 2004-04-19     | 12:25          | 70°02.71         | 126°18.06        | 226            | 232                  |
| 045         | Winter 1           | 2004-04-20     | 00:20          | 70°02.71         | 126°18.06        | 225            | 232                  |
| 046         | Winter 1           | 2004-04-20     | 12:25          | 70°02.71         | 126°18.06        | 225            | 232                  |
| 047         | Winter 1           | 2004-04-21     | 00:30          | 70°02.71         | 126°18.06        | 226            | 232                  |
| 048         | Winter 1           | 2004-04-21     | 12:22          | 70°02.71         | 126°18.06        | 225            | 232                  |
| 049         | Winter 1           | 2004-04-22     | 00:24          | 70°02.71         | 126°18.06        | 226            | 232                  |
| 050         | Winter 1           | 2004-04-22     | 12:26          | 70°02.71         | 126°18.06        | 226            | 232                  |

**APPENDIX 3.7** Rosette cast locations, sampling time, water depth and corresponding station or mooring numbers. CASES Leg 6, Expedition 0403 (2004) (page 2/2).

| Cast number | Station or mooring | Start date UTC | Start time UTC | Latitude (North) | Longitude (West) | Cast depth (m) | Sea bottom depth (m) |
|-------------|--------------------|----------------|----------------|------------------|------------------|----------------|----------------------|
| 051         | Winter 1           | 2004-04-22     | 14:23          | 70°02.71         | 126°18.06        | 227            | 232                  |
| 052         | Winter 1           | 2004-04-23     | 00:22          | 70°02.71         | 126°18.06        | 225            | 231                  |
| 053         | Winter 1           | 2004-04-23     | 12:18          | 70°02.71         | 126°18.06        | 226            | 232                  |
| 054         | Winter 1           | 2004-04-24     | 01:25          | 70°02.71         | 126°18.06        | 226            | 232                  |
| 055         | Winter 1           | 2004-04-24     | 12:20          | 70°02.71         | 126°18.06        | 226            | 232                  |
| 056         | Winter 1           | 2004-04-25     | 00:19          | 70°02.71         | 126°18.06        | 226            | 232                  |
| 057         | Winter 1           | 2004-04-25     | 12:21          | 70°02.71         | 126°18.06        | 226            | 232                  |
| 058         | Winter 1           | 2004-04-26     | 00:33          | 70°02.71         | 126°18.06        | 226            | 232                  |
| 059         | Winter 1           | 2004-04-26     | 12:31          | 70°02.71         | 126°18.06        | 226            | 232                  |
| 060         | Winter 1           | 2004-04-27     | 00:36          | 70°02.71         | 126°18.06        | 226            | 232                  |
| 061         | Winter 1           | 2004-04-27     | 12:38          | 70°02.71         | 126°18.06        | 226            | 232                  |
| 062         | Winter 1           | 2004-04-28     | 00:29          | 70°02.71         | 126°18.06        | 226            | 232                  |
| 063         | Winter 1           | 2004-04-28     | 12:23          | 70°02.71         | 126°18.06        | 226            | 233                  |
| 064         | Winter 1           | 2004-04-28     | 14:23          | 70°02.71         | 126°18.06        | 227            | 233                  |
| 065         | Winter 1           | 2004-04-29     | 00:30          | 70°02.71         | 126°18.06        | 227            | 233                  |
| 066         | Winter 1           | 2004-04-29     | 12:21          | 70°02.71         | 126°18.06        | 226            | 233                  |
| 067         | Winter 1           | 2004-04-30     | 00:27          | 70°02.71         | 126°18.06        | 227            | 233                  |
| 068         | Winter 1           | 2004-04-30     | 12:23          | 70°02.71         | 126°18.06        | 226            | 233                  |
| 069         | Winter 1           | 2004-05-01     | 00:19          | 70°02.71         | 126°18.06        | 226            | 233                  |
| 070         | Winter 1           | 2004-05-01     | 12:19          | 70°02.71         | 126°18.06        | 226            | 233                  |
| 071         | Winter 1           | 2004-05-02     | 00:33          | 70°02.71         | 126°18.06        | 226            | 233                  |
| 072         | Winter 1           | 2004-05-02     | 12:30          | 70°02.71         | 126°18.06        | 226            | 233                  |
| 073         | Winter 1           | 2004-05-03     | 00:24          | 70°02.71         | 126°18.06        | 227            | 233                  |
| 074         | Winter 1           | 2004-05-03     | 12:19          | 70°02.71         | 126°18.06        | 227            | 233                  |
| 075         | Winter 1           | 2004-05-04     | 01:24          | 70°02.71         | 126°18.06        | 226            | 233                  |
| 076         | Winter 1           | 2004-05-04     | 12:20          | 70°02.71         | 126°18.06        | 227            | 233                  |
| 077         | Winter 1           | 2004-05-04     | 14:26          | 70°02.71         | 126°18.06        | 227            | 233                  |
| 078         | Winter 1           | 2004-05-05     | 00:29          | 70°02.71         | 126°18.06        | 227            | 233                  |
| 079         | Winter 1           | 2004-05-05     | 12:19          | 70°02.71         | 126°18.06        | 226            | 233                  |
| 080         | Winter 1           | 2004-05-06     | 00:19          | 70°02.71         | 126°18.06        | 227            | 233                  |
| 081         | Winter 1           | 2004-05-06     | 12:22          | 70°02.71         | 126°18.06        | 227            | 233                  |
| 082         | Winter 1           | 2004-05-07     | 00:33          | 70°02.71         | 126°18.06        | 227            | 233                  |
| 083         | Winter 1           | 2004-05-07     | 12:23          | 70°02.71         | 126°18.06        | 226            | 233                  |
| 084         | Winter 1           | 2004-05-08     | 00:21          | 70°02.71         | 126°18.06        | 227            | 233                  |
| 085         | Winter 1           | 2004-05-08     | 12:26          | 70°02.71         | 126°18.06        | 226            | 233                  |
| 086         | Winter 1           | 2004-05-09     | 00:21          | 70°02.71         | 126°18.06        | 227            | 233                  |
| 087         | Winter 1           | 2004-05-09     | 12:22          | 70°02.71         | 126°18.06        | 226            | 233                  |
| 088         | Winter 1           | 2004-05-09     | 14:28          | 70°02.71         | 126°18.06        | 228            | 233                  |
| 089         | Winter 1           | 2004-05-09     | 16:25          | 70°02.71         | 126°18.06        | 227            | 233                  |
| 090         | Winter 1           | 2004-05-10     | 00:25          | 70°02.71         | 126°18.06        | 227            | 233                  |
| 091         | Winter 1           | 2004-05-10     | 12:24          | 70°02.71         | 126°18.06        | 227            | 233                  |
| 092         | Winter 1           | 2004-05-11     | 00:22          | 70°02.71         | 126°18.06        | 227            | 233                  |
| 093         | Winter 1           | 2004-05-11     | 12:23          | 70°02.71         | 126°18.06        | 226            | 233                  |
| 094         | Winter 1           | 2004-05-12     | 00:24          | 70°02.71         | 126°18.06        | 227            | 233                  |

**APPENDIX 3.8** Rosette cast locations, sampling time, water depth and corresponding station or mooring numbers. CASES Leg 7, Expedition 0404 (2004) (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) |
|-------------|--------------------|----------------|----------------|------------------|------------------|----------------|----------------------|
| 001         | Winter 1           | 2004-05-12     | 12:24          | 70°02.74         | 126°18.08        | 226            | 233                  |
| 002         | Winter 1           | 2004-05-14     | 12:43          | 70°02.74         | 126°18.08        | 221            | 232                  |
| 003         | Winter 1           | 2004-05-15     | 00:46          | 70°02.74         | 126°18.08        | 222            | 227                  |
| 004         | Winter 1           | 2004-05-15     | 12:31          | 70°02.74         | 126°18.08        | 221            | 227                  |
| 005         | Winter 1           | 2004-05-15     | 15:02          | 70°02.74         | 126°18.08        | 221            | 227                  |
| 006         | Winter 1           | 2004-05-16     | 00:34          | 70°02.74         | 126°18.08        | 222            | 227                  |
| 007         | Winter 1           | 2004-05-16     | 12:27          | 70°02.74         | 126°18.08        | 220            | 227                  |
| 008         | Winter 1           | 2004-05-17     | 00:35          | 70°02.74         | 126°18.08        | 221            | 227                  |
| 009         | Winter 1           | 2004-05-17     | 12:30          | 70°02.74         | 126°18.08        | 206            | 227                  |
| 010         | Winter 1           | 2004-05-17     | 12:43          | 70°02.74         | 126°18.08        | 221            | 227                  |
| 011         | Winter 1           | 2004-05-18     | 00:35          | 70°02.74         | 126°18.08        | 221            | 227                  |
| 012         | Winter 1           | 2004-05-18     | 12:42          | 70°02.74         | 126°18.08        | 223            | 227                  |
| 013         | Winter 1           | 2004-05-19     | 00:34          | 70°02.74         | 126°18.08        | 223            | 227                  |
| 014         | Winter 1           | 2004-05-20     | 00:28          | 70°02.74         | 126°18.08        | 221            | 227                  |
| 015         | Winter 1           | 2004-05-20     | 12:37          | 70°02.74         | 126°18.08        | 222            | 232                  |
| 016         | Winter 1           | 2004-05-20     | 14:30          | 70°02.74         | 126°18.08        | 221            | 232                  |
| 017         | Winter 1           | 2004-05-21     | 00:34          | 70°02.74         | 126°18.08        | 221            | 226                  |
| 018         | Winter 1           | 2004-05-21     | 12:30          | 70°02.74         | 126°18.08        | 223            | 227                  |
| 019         | Winter 1           | 2004-05-21     | 14:59          | 70°02.74         | 126°18.08        | 222            | 227                  |
| 020         | Winter 1           | 2004-05-22     | 00:29          | 70°02.74         | 126°18.08        | 224            | 227                  |
| 021         | Winter 1           | 2004-05-22     | 12:34          | 70°02.74         | 126°18.08        | 223            | 227                  |
| 022         | Winter 1           | 2004-05-23     | 00:30          | 70°02.74         | 126°18.08        | 223            | 227                  |
| 023         | Winter 1           | 2004-05-23     | 12:26          | 70°02.74         | 126°18.08        | 223            | 227                  |
| 024         | Winter 1           | 2004-05-24     | 00:30          | 70°02.74         | 126°18.08        | 223            | 227                  |
| 025         | Winter 1           | 2004-05-24     | 12:45          | 70°02.74         | 126°18.08        | 223            | 227                  |
| 026         | Winter 1           | 2004-05-24     | 13:35          | 70°02.74         | 126°18.08        | 224            | 227                  |
| 027         | Winter 1           | 2004-05-25     | 00:29          | 70°02.74         | 126°18.08        | 224            | 227                  |
| 028         | Winter 1           | 2004-05-25     | 12:32          | 70°02.74         | 126°18.08        | 223            | 227                  |
| 029         | Winter 1           | 2004-05-26     | 00:24          | 70°02.74         | 126°18.08        | 223            | 227                  |
| 030         | Winter 1           | 2004-05-26     | 12:30          | 70°02.74         | 126°18.08        | 223            | 227                  |
| 031         | Winter 1           | 2004-05-27     | 00:30          | 70°02.74         | 126°18.08        | 224            | 227                  |
| 032         | Winter 1           | 2004-05-27     | 12:30          | 70°02.74         | 126°18.08        | 223            | 227                  |
| 033         | Winter 1           | 2004-05-27     | 14:59          | 70°02.74         | 126°18.08        | 223            | 227                  |
| 034         | Winter 1           | 2004-05-28     | 00:25          | 70°02.74         | 126°18.08        | 224            | 227                  |
| 035         | Winter 1           | 2004-05-28     | 12:35          | 70°02.74         | 126°18.08        | 223            | 227                  |
| 036         | Winter 1           | 2004-05-29     | 00:30          | 70°02.74         | 126°18.08        | 224            | 227                  |
| 037         | Winter 1           | 2004-05-29     | 12:34          | 70°02.74         | 126°18.08        | 223            | 227                  |
| 038         | Winter 1           | 2004-05-30     | 00:35          | 70°02.74         | 126°18.08        | 224            | 227                  |
| 039         | Winter 1           | 2004-05-30     | 12:35          | 70°02.74         | 126°18.08        | 223            | 227                  |
| 040         | Winter 1           | 2004-05-30     | 22:15          | 70°02.74         | 126°18.08        | 223            | 227                  |
| 041         | 206                | 2004-06-04     | 02:09          | 70°19.33         | 123°50.40        | 86             | 90                   |
| 042         | 206                | 2004-06-04     | 06:15          | 70°19.34         | 124°51.52        | 95             | 98                   |
| 043         | 206                | 2004-06-04     | 08:36          | 70°19.28         | 124°50.59        | 95             | 95                   |
| 044         | 206                | 2004-06-04     | 12:10          | 70°19.29         | 124°50.50        | 88             | 92                   |
| 045         | 206                | 2004-06-04     | 15:47          | 70°19.23         | 124°50.30        | 89             | 95                   |
| 046         | 206                | 2004-06-04     | 20:00          | 70°19.28         | 124°50.71        | 95             | 95                   |
| 047         | 206                | 2004-06-04     | 22:05          | 70°19.80         | 124°50.40        | 93             | 95                   |
| 048         | 206                | 2004-06-05     | 01:43          | 70°19.26         | 124°50.33        | 83             | 92                   |
| 050         | 256                | 2004-06-06     | 01:32          | 70°15.09         | 123°30.16        | 337            | 341                  |

**APPENDIX 3.8** Rosette cast locations, sampling time, water depth and corresponding station or mooring numbers. CASES Leg 7, Expedition 0404 (2004) (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) |
|-------------|--------------------|----------------|----------------|------------------|------------------|----------------|----------------------|
| 051         | 256                | 2004-06-06     | 04:25          | 70°15.10         | 123°30.16        | 280            | 341                  |
| 052         | 108                | 2004-06-06     | 21:15          | 70°37.68         | 123°12.54        | 521            | 538                  |
| 053         | 108                | 2004-06-07     | 02:04          | 70°37.91         | 123°10.13        | 478            | 482                  |
| 054         | 108                | 2004-06-07     | 07:30          | 70°37.67         | 123°09.10        | 496            | 507                  |
| 055         | 108                | 2004-06-07     | 10:46          | 70°38.63         | 123°10.17        | 479            | 484                  |
| 056         | 108                | 2004-06-07     | 15:28          | 70°37.75         | 123°10.53        | 497            | 495                  |
| 057         | 108                | 2004-06-07     | 17:41          | 70°38.01         | 123°09.50        | 488            | 487                  |
| 058         | 108                | 2004-06-07     | 20:21          | 70°38.12         | 123°08.40        | 491            | 490                  |
| 059         | 108                | 2004-06-08     | 01:14          | 70°37.77         | 123°10.29        | 484            | 488                  |
| 060         | 109                | 2004-06-08     | 07:33          | 70°39.61         | 123°25.91        | 557            | 566                  |
| 061         | 110                | 2004-06-08     | 08:55          | 70°41.61         | 123°42.09        | 486            | 490                  |
| 062         | 111                | 2004-06-08     | 09:52          | 70°43.50         | 123°58.49        | 429            | 428                  |
| 063         | 112                | 2004-06-08     | 12:42          | 70°45.48         | 124°14.64        | 517            | 519                  |
| 064         | 112                | 2004-06-08     | 16:21          | 70°45.37         | 123°14.27        | 504            | 519                  |
| 065         | 115                | 2004-06-09     | 06:45          | 70°51.03         | 125°01.67        | 354            | 359                  |
| 066         | 115                | 2004-06-09     | 10:01          | 70°50.83         | 125°02.25        | 346            | 358                  |
| 067         | 115                | 2004-06-09     | 15:36          | 70°52.33         | 125°19.05        | 328            | 329                  |
| 068         | 117                | 2004-06-09     | 23:39          | 70°54.72         | 125°34.59        | 405            | 410                  |
| 069         | 117                | 2004-06-10     | 02:57          | 70°54.82         | 125°34.44        | 401            | 410                  |
| 070         | 117                | 2004-06-10     | 09:00          | 70°54.80         | 125°35.00        | 402            | 404                  |
| 071         | 117                | 2004-06-10     | 12:27          | 70°54.67         | 123°34.36        | 404            | 410                  |
| 072         | 117                | 2004-06-10     | 14:55          | 70°54.59         | 125°36.33        | 401            | 410                  |
| 073         | 117                | 2004-06-10     | 16:53          | 70°54.03         | 125°34.11        | 399            | 402                  |
| 074         | 117                | 2004-06-10     | 19:37          | 70°54.03         | 125°34.78        | 401            | 404                  |
| 075         | 117                | 2004-06-11     | 00:44          | 70°54.70         | 125°34.81        | 406            | 410                  |
| 076         | 118                | 2004-06-11     | 06:55          | 70°56.44         | 125°50.68        | 377            | 378                  |
| 077         | 119                | 2004-06-11     | 08:08          | 70°58.29         | 126°06.76        | 384            | 387                  |
| 078         | 120                | 2004-06-11     | 09:38          | 71°03.52         | 126°15.92        | 380            | 384                  |
| 079         | 121                | 2004-06-11     | 11:14          | 71°08.82         | 126°22.92        | 390            | 384                  |
| 080         | 122                | 2004-06-11     | 13:07          | 71°14.00         | 126°31.45        | 426            | 430                  |
| 081         | 123                | 2004-06-11     | 16:37          | 71°16.90         | 126°47.46        | 368            | 373                  |
| 082         | 124                | 2004-06-11     | 19:40          | 71°25.30         | 126°51.89        | 404            | 403                  |
| 083         | 124                | 2004-06-12     | 02:02          | 71°25.92         | 126°55.82        | 386            | 388                  |
| 084         | 124                | 2004-06-12     | 05:01          | 71°34.16         | 126°53.08        | 364            | 376                  |
| 085         | 410                | 2004-06-12     | 10:11          | 71°34.46         | 126°53.08        | 413            | 376                  |
| 086         | 411                | 2004-06-12     | 13:06          | 71°37.76         | 126°36.73        | 444            | 445                  |
| 087         | 412                | 2004-06-12     | 14:36          | 71°43.42         | 126°35.07        | 412            | 413                  |
| 088         | 413                | 2004-06-12     | 16:40          | 71°46.93         | 126°15.65        | 234            | 236                  |
| 089         | 414                | 2004-06-12     | 21:59          | 71°51.00         | 125°59.46        | 196            | 206                  |
| 090         | 414                | 2004-06-13     | 02:54          | 71°51.27         | 125°56.67        | 173            | 175                  |
| 091         | 416                | 2004-06-13     | 05:08          | 71°52.37         | 125°48.50        | 70             | 70                   |
| 092         | 409                | 2004-06-14     | 22:43          | 71°27.52         | 127°17.82        | 329            | 330                  |
| 093         | 409                | 2004-06-15     | 03:05          | 71°30.84         | 127°23.72        | 337            | 330                  |
| 094         | 408                | 2004-06-15     | 08:44          | 71°25.55         | 127°12.23        | 346            | 343                  |
| 095         | 407                | 2004-06-15     | 10:24          | 71°22.77         | 127°29.63        | 262            | 263                  |
| 096         | 406                | 2004-06-15     | 12:04          | 71°18.62         | 127°42.00        | 176            | 173                  |
| 097         | 406                | 2004-06-15     | 16:26          | 71°18.66         | 127°42.22        | 175            | 173                  |
| 098         | 406                | 2004-06-15     | 17:27          | 71°18.37         | 127°42.95        | 171            | 173                  |
| 099         | 406                | 2004-06-15     | 19:55          | 71°18.52         | 127°42.15        | 174            | 174                  |
| 100         | 406                | 2004-06-15     | 23:34          | 71°18.64         | 127°41.71        | 176            | 177                  |

**APPENDIX 3.8** Rosette cast locations, sampling time, water depth and corresponding station or mooring numbers. CASES Leg 7, Expedition 0404 (2004) (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         | 406                | 2004-06-16     | 03:46          | 71°19.86         | 127°44.18        | 186            | 184                  |
| 102         | 406                | 2004-06-16     | 09:42          | 71°18.82         | 127°42.65        | 174            | 175                  |
| 103         | 406                | 2004-06-16     | 12:48          | 71°18.57         | 127°41.96        | 177            | 176                  |
| 104         | 405                | 2004-06-17     | 03:13          | 71°14.67         | 127°53.65        | 107            | 105                  |
| 105         | 404                | 2004-06-17     | 04:20          | 71°10.73         | 128°10.11        | 63             | 66                   |
| 106         | 403                | 2004-06-17     | 06:43          | 71°07.56         | 128°18.97        | 54             | 55                   |
| 107         | 402                | 2004-06-17     | 09:00          | 71°03.00         | 128°30.51        | 38             | 41                   |
| 108         | 401                | 2004-06-17     | 10:15          | 70°58.81         | 128°42.81        | 39             | 40                   |
| 109         | 400                | 2004-06-17     | 13:38          | 70°55.02         | 128°54.85        | 32             | 33                   |
| 110         | 400                | 2004-06-17     | 18:50          | 70°54.98         | 128°55.18        | 31             | 31                   |
| 111         | 399                | 2004-06-17     | 20:03          | 70°51.76         | 129°06.37        | 27             | 29                   |
| 112         | 407                | 2004-06-18     | 06:13          | 70°54.98         | 128°55.18        | 260            | 257                  |
| 113         | 303                | 2004-06-19     | 03:46          | 70°47.52         | 127°00.25        | 252            | 255                  |
| 114         | 303                | 2004-06-19     | 09:03          | 70°47.99         | 126°58.79        | 262            | 260                  |
| 115         | 303                | 2004-06-19     | 13:32          | 70°47.86         | 126°59.68        | 255            | 255                  |
| 116         | 303                | 2004-06-19     | 15:25          | 70°47.73         | 127°00.13        | 252            | 255                  |
| 117         | 303                | 2004-06-19     | 17:23          | 70°47.45         | 126°58.45        | 256            | 260                  |
| 118         | 303                | 2004-06-19     | 21:15          | 70°47.35         | 126°56.02        | 265            | 260                  |
| 119         | 303                | 2004-06-20     | 00:41          | 70°47.81         | 126°59.95        | 252            | 255                  |
| 120         | 303                | 2004-06-20     | 03:19          | 70°47.67         | 127°02.22        | 246            | 248                  |
| 121         | 303                | 2004-06-20     | 09:29          | 70°47.94         | 126°59.07        | 254            | 258                  |
| 122         | 401                | 2004-06-21     | 02:10          | 70°58.83         | 128°42.44        | 40             | 41                   |
| 123         | 398                | 2004-06-21     | 05:10          | 70°47.39         | 129°21.52        | 21             | 24                   |
| 124         | 400                | 2004-06-21     | 11:59          | 70°54.99         | 128°55.07        | 33             | 33                   |
| 125         | 397                | 2004-06-21     | 12:52          | 70°51.86         | 128°44.66        | 29             | 29                   |
| 126         | 396                | 2004-06-21     | 14:11          | 70°48.53         | 128°21.80        | 39             | 39                   |
| 127         | 396-1              | 2004-06-21     | 15:02          | 70°48.53         | 128°31.92        | 38             | 35                   |
| 128         | 395                | 2004-06-21     | 16:06          | 70°45.02         | 128°19.07        | 39             | 40                   |
| 129         | 394                | 2004-06-21     | 17:09          | 70°41.53         | 128°08.37        | 32             | 36                   |
| 130         | 347                | 2004-06-21     | 18:40          | 70°38.06         | 127°55.38        | 29             | 32                   |
| 132         | CA-20              | 2004-06-22     | 03:40          | 70°20.67         | 126°23.55        | 254            | 255                  |
| 133         | CA-20              | 2004-06-22     | 07:15          | 70°20.20         | 126°25.60        | 252            | 254                  |

**APPENDIX 3.9** Rosette cast locations, sampling time, water depth and corresponding station or mooring numbers. CASES Leg 8, Expedition 0405 (2004) (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) |
|-------------|--------------------|----------------|----------------|------------------|------------------|----------------|----------------------|
| 002         | 303                | 2004-06-25     | 22:13          | 70° 45.82        | 127° 05.81       | 235            | 242                  |
| 003         | 600                | 2004-06-26     | 20:27          | 71° 42.40        | 130° 49.69       | 552            | 562                  |
| 004         | 600                | 2004-06-27     | 02:55          | 71° 40.32        | 130° 42.78       | 425            | 442                  |
| 005         | 609                | 2004-06-27     | 19:45          | 70° 56.23        | 130° 28.88       | 34             | 47                   |
| 006         | 703                | 2004-06-28     | 18:06          | 71° 27.60        | 133° 54.00       | 1149           | 1160                 |
| 007         | 703                | 2004-06-29     | 00:24          | 71° 27.05        | 133° 54.22       | 1000           | 1180                 |
| 008         | 704                | 2004-06-29     | 07:35          | 71° 23.11        | 133° 53.37       | 1000           | 1100                 |
| 009         | 705                | 2004-06-29     | 09:09          | 71° 12.39        | 133° 50.37       | 609            | 619                  |
| 010         | 706                | 2004-06-29     | 10:35          | 71° 17.38        | 133° 52.03       | 836            | 846                  |
| 011         | 707                | 2004-06-29     | 11:55          | 71° 07.08        | 133° 48.26       | 437            | 440                  |
| 012         | 708                | 2004-06-29     | 13:03          | 71° 02.30        | 133° 47.52       | 227            | 236                  |
| 013         | 709                | 2004-06-29     | 14:44          | 70° 56.09        | 133° 47.84       | 74             | 83                   |
| 014         | 710                | 2004-06-29     | 15:44          | 70° 51.63        | 133° 44.14       | 67             | 76                   |
| 015         | 711                | 2004-06-29     | 16:46          | 70° 45.80        | 133° 43.97       | 63             | 73                   |
| 016         | 712                | 2004-06-29     | 17:24          | 70° 41.46        | 133° 41.44       | 60             | 69                   |
| 018         | 709                | 2004-06-30     | 11:33          | 70° 57.12        | 133° 43.04       | 71             | 83                   |
| 019         | 709                | 2004-06-30     | 14:18          | 70° 56.65        | 133° 41.23       | 70             | 81                   |
| 020         | 709                | 2004-06-30     | 16:30          | 70° 56.14        | 133° 40.65       | 72             | 81                   |
| 021         | 709                | 2004-07-01     | 00:49          | 70° 56.44        | 133° 43.71       | 70             | 80                   |
| 022         | 709                | 2004-07-01     | 01:52          | 70° 56.01        | 133° 43.49       | 70             | 80                   |
| 023         | 709                | 2004-07-01     | 07:08          | 70° 57.15        | 133° 45.36       | 73             | 84                   |
| 024         | 803                | 2004-07-02     | 13:44          | 70° 38.69        | 135° 53.47       | 245            | 260                  |
| 025         | 850                | 2004-07-03     | 05:48          | 70° 34.03        | 137° 35.50       | 985            | 1122                 |
| 026         | 903                | 2004-07-03     | 17:05          | 70° 17.30        | 138° 55.57       | 481            | 491                  |
| 027         | 906                | 2004-07-04     | 01:40          | 70° 02.82        | 138° 35.07       | 273            | 280                  |
| 028         | 906                | 2004-07-04     | 06:22          | 70° 01.19        | 138° 35.78       | 265            | 270                  |
| 029         | 906                | 2004-07-04     | 09:26          | 70° 01.30        | 138° 35.90       | 264            | 270                  |
| 030         | 906                | 2004-07-04     | 11:29          | 70° 01.17        | 138° 35.70       | 263            | 281                  |
| 031         | 906                | 2004-07-04     | 13:09          | 70° 01.14        | 138° 36.02       | 265            | 282                  |
| 032         | 906                | 2004-07-04     | 15:15          | 70° 01.55        | 138° 35.23       | 265            | 272                  |
| 033         | 906                | 2004-07-04     | 20:16          | 70° 01.43        | 138° 35.51       | 263            | 273                  |
| 034         | 906                | 2004-07-04     | 22:21          | 70° 01.21        | 138° 35.52       | 264            | 282                  |
| 035         | 909                | 2004-07-05     | 09:26          | 69° 45.09        | 138° 16.11       | 160            | 170                  |
| 036         | 909                | 2004-07-05     | 13:04          | 69° 45.29        | 138° 16.19       | 162            | 175                  |
| 037         | 912                | 2004-07-06     | 00:42          | 69° 29.29        | 137° 56.41       | 45             | 54                   |
| 038         | 912                | 2004-07-06     | 02:19          | 69° 29.30        | 137° 56.35       | 45             | 55                   |
| 039         | 912                | 2004-07-06     | 04:30          | 69° 29.32        | 137° 56.47       | 44             | 54                   |
| 040         | 912                | 2004-07-06     | 06:57          | 69° 29.33        | 137° 56.35       | 44             | 55                   |
| 041         | 912                | 2004-07-06     | 09:25          | 69° 29.28        | 137° 56.32       | 43             | 53                   |
| 042         | 912                | 2004-07-06     | 12:30          | 69° 29.34        | 137° 57.12       | 46             | 56                   |
| 043         | 809                | 2004-07-07     | 23:18          | 70° 05.53        | 135° 20.53       | 35             | 43                   |
| 044         | 803                | 2004-07-08     | 10:02          | 70° 38.48        | 135° 53.40       | 235            | 243                  |
| 045         | 803                | 2004-07-08     | 11:59          | 70° 38.62        | 135° 54.29       | 250            | 251                  |
| 046         | 803                | 2004-07-08     | 14:29          | 70° 38.61        | 135° 53.35       | 239            | 252                  |
| 048         | 803                | 2004-07-08     | 18:16          | 70° 38.50        | 135° 53.15       | 230            | 235                  |
| 049         | 803                | 2004-07-08     | 22:19          | 70° 38.45        | 135° 53.43       | 230            | 239                  |
| 050         | 803                | 2004-07-09     | 00:12          | 70° 38.45        | 135° 53.58       | 233            | 241                  |

**APPENDIX 3.9** Rosette cast locations, sampling time, water depth and corresponding station or mooring numbers. CASES Leg 8, Expedition 0405 (2004) (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) |
|-------------|--------------------|----------------|----------------|------------------|------------------|----------------|----------------------|
| 051         | 803                | 2004-07-09     | 05:32          | 70° 38.59        | 135° 52.94       | 237            | 251                  |
| 052         | 706                | 2004-07-10     | 03:40          | 71° 12.41        | 133° 47.99       | 615            | 623                  |
| 053         | 706                | 2004-07-10     | 06:16          | 71° 12.62        | 133° 50.98       | 620            | 630                  |
| 054         | 712                | 2004-07-10     | 12:08          | 70° 41.43        | 133° 40.93       | 59             | 68                   |
| 055         | 715                | 2004-07-10     | 21:23          | 70° 25.71        | 133° 36.46       | 55             | 65                   |
| 056         | 718                | 2004-07-11     | 04:53          | 70° 10.14        | 133° 31.83       | 36             | 46                   |
| 057         | 718                | 2004-07-11     | 07:37          | 70° 10.19        | 133° 32.12       | 35             | 44                   |
| 058         | 718                | 2004-07-11     | 11:12          | 70° 10.22        | 133° 31.96       | 35             | 45                   |
| 059         | 718                | 2004-07-11     | 13:30          | 70° 09.93        | 133° 29.34       | 34             | 43                   |
| 060         | 718                | 2004-07-11     | 15:23          | 70° 10.08        | 133° 32.09       | 34             | 48                   |
| 061         | 718                | 2004-07-11     | 19:13          | 70° 10.25        | 133° 32.15       | 35             | 45                   |
| 062         | 612                | 2004-07-12     | 06:07          | 70° 40.44        | 130° 26.39       | 26             | 32                   |
| 063         | 606                | 2004-07-12     | 13:53          | 71° 12.73        | 130° 35.98       | 39             | 53                   |
| 064         | 650                | 2004-07-13     | 05:26          | 71° 15.61        | 131° 30.50       | 93             | 102                  |
| 065         | 650                | 2004-07-13     | 07:38          | 71° 18.88        | 131° 38.13       | 255            | 260                  |
| 066         | 650                | 2004-07-13     | 09:16          | 71° 18.66        | 131° 36.89       | 234            | 240                  |
| 067         | 650                | 2004-07-13     | 11:00          | 71° 18.87        | 131° 36.07       | 242            | 259                  |
| 068         | 650                | 2004-07-13     | 12:41          | 71° 19.11        | 131° 34.95       | 247            | 257                  |
| 069         | 650                | 2004-07-13     | 17:17          | 71° 18.82        | 131° 31.13       | 215            | 223                  |
| 070         | 650                | 2004-07-13     | 20:10          | 71° 18.62        | 131° 37.21       | 239            | 248                  |
| 071         | CA-20              | 2004-07-16     | 05:38          | 70° 20.36        | 126° 21.44       | 243            | 253                  |
| 072         | 200                | 2004-07-16     | 13:23          | 70° 02.83        | 126° 18.14       | 220            | 235                  |
| 073         | 200                | 2004-07-16     | 15:09          | 70° 02.72        | 126° 18.15       | 220            | 228                  |
| 074         | 200                | 2004-07-16     | 16:52          | 70° 02.76        | 126° 17.77       | 221            | 230                  |
| 075         | 200                | 2004-07-16     | 18:58          | 70° 02.68        | 126° 18.12       | 219            | 227                  |
| 076         | 200                | 2004-07-17     | 00:48          | 70° 02.87        | 126° 17.90       | 221            | 237                  |
| 077         | 200                | 2004-07-17     | 02:39          | 70° 02.71        | 126° 17.94       | 220            | 221                  |
| 078         | 200                | 2004-07-17     | 05:00          | 70° 02.58        | 126° 17.65       | 220            | 231                  |
| 079         | 200                | 2004-07-17     | 06:21          | 70° 02.82        | 126° 17.60       | 221            | 230                  |
| 080         | CA-20              | 2004-07-17     | 18:50          | 70° 20.25        | 126° 21.27       | 243            | 254                  |
| 081         | 118                | 2004-07-18     | 08:04          | 70° 56.55        | 125° 50.87       | 381            | 385                  |
| 082         | 118                | 2004-07-18     | 11:16          | 70° 56.60        | 125° 50.69       | 378            | 387                  |
| 083         | 309                | 2004-07-19     | 01:18          | 71° 07.49        | 125° 49.92       | 388            | 395                  |
| 084         | 309                | 2004-07-19     | 03:30          | 71° 17.50        | 125° 50.16       | 389            | 385                  |
| 085         | 309                | 2004-07-19     | 05:23          | 71° 07.56        | 125° 50.00       | 384            | 394                  |
| 086         | 309                | 2004-07-19     | 07:20          | 71° 07.57        | 125° 50.36       | 389            | 390                  |
| 087         | 309                | 2004-07-19     | 09:43          | 71° 07.63        | 125° 49.87       | 375            | 387                  |
| 088         | 309                | 2004-07-19     | 11:30          | 71° 07.53        | 125° 50.04       | 388            | 392                  |
| 089         | 309                | 2004-07-19     | 13:27          | 71° 07.41        | 125° 50.71       | 390            | 399                  |
| 090         | 309                | 2004-07-19     | 15:23          | 71° 07.47        | 125° 50.21       | 390            | 399                  |
| 091         | 312                | 2004-07-20     | 02:39          | 71° 18.06        | 125° 11.51       | 299            | 307                  |
| 092         | 315                | 2004-07-20     | 10:05          | 71° 29.22        | 124° 33.38       | 217            | 224                  |
| 093         | 315                | 2004-07-20     | 13:23          | 71° 29.01        | 124° 32.29       | 216            | 227                  |
| 094         | 415                | 2004-07-21     | 01:48          | 71° 54.04        | 125° 51.93       | 36             | 45                   |
| 095         | 415                | 2004-07-21     | 03:09          | 71° 54.26        | 125° 51.96       | 39             | 48                   |
| 096         | 415                | 2004-07-21     | 04:12          | 71° 54.54        | 125° 52.31       | 42             | 52                   |
| 097         | 415                | 2004-07-21     | 10:04          | 71° 54.19        | 125° 52.36       | 38             | 46                   |
| 098         | 415                | 2004-07-21     | 11:35          | 71° 54.09        | 125° 52.23       | 36             | 46                   |
| 099         | 415                | 2004-07-21     | 13:34          | 71° 54.08        | 125° 51.84       | 38             | 46                   |
| 100         | 412                | 2004-07-22     | 01:05          | 71° 42.09        | 126° 28.88       | 388            | 400                  |

**APPENDIX 3.9** Rosette cast locations, sampling time, water depth and corresponding station or mooring numbers. CASES Leg 8, Expedition 0405 (2004) (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         | 409                | 2004-07-22     | 21:05          | 71° 30.36        | 127° 05.36       | 372            | 380                  |
| 102         | 409                | 2004-07-23     | 03:25          | 71° 30.36        | 127° 05.77       | 371            | 378                  |
| 103         | 409                | 2004-07-23     | 10:00          | 71° 30.22        | 127° 06.18       | 370            | 380                  |
| 104         | 409                | 2004-07-23     | 11:22          | 71° 31.82        | 127° 03.50       | 381            | 387                  |
| 105         | 409                | 2004-07-23     | 13:49          | 71° 30.89        | 127° 04.81       | 375            | 385                  |
| 106         | 409                | 2004-07-23     | 15:50          | 71° 30.37        | 127° 05.69       | 370            | 380                  |
| 107         | 409                | 2004-07-23     | 21:10          | 71° 30.60        | 127° 05.31       | 373            | 382                  |
| 108         | 406                | 2004-07-24     | 09:04          | 71° 18.83        | 127° 42.75       | 168            | 178                  |
| 109         | 406                | 2004-07-24     | 14:46          | 71° 18.25        | 127° 38.69       | 175            | 186                  |
| 110         | 403                | 2007-07-25     | 04:22          | 71° 06.77        | 128° 18.46       | 47             | 56                   |
| 111         | 400                | 2007-07-25     | 14:42          | 70° 55.04        | 128° 54.93       | 31             | 36                   |
| 112         | 721                | 2007-07-27     | 02:57          | 69° 51.35        | 133° 17.14       | 10             | 14                   |
| 113         | 715                | 2007-07-27     | 08:14          | 70° 25.88        | 133° 36.48       | 57             | 65                   |
| 114         | CA12               | 2007-07-27     | 22:27          | 71° 25.33        | 134° 12.25       | 1001           | 1230                 |
| 115         | CA05               | 2007-07-28     | 18:15          | 71° 25.06        | 127° 22.50       | 293            | 303                  |
| 116         | 124                | 2007-07-28     | 20:57          | 71° 24.09        | 126° 46.41       | 425            | 434                  |
| 117         | CA05               | 2007-07-29     | 06:23          | 71° 24.78        | 127° 24.51       | 271            | 298                  |
| 118         | 121                | 2007-07-29     | 09:18          | 71° 08.57        | 126° 23.01       | 370            | 392                  |
| 119         | 118                | 2007-07-29     | 11:18          | 70° 56.48        | 125° 50.56       | 370            | 384                  |
| 120         | 115                | 2007-07-29     | 14:23          | 70° 50.95        | 125° 02.81       | 350            | 355                  |
| 121         | 112                | 2007-07-29     | 21:47          | 70° 45.32        | 124° 14.50       | 505            | 515                  |
| 122         | 109                | 2004-07-30     | 00:00          | 70° 39.26        | 123° 21.93       | 558            | 568                  |
| 123         | CA18               | 2004-07-30     | 03:33          | 70° 38.21        | 123° 06.08       | 478            | 483                  |
| 124         | 109                | 2004-07-30     | 05:15          | 70° 40.56        | 123° 24.69       | 560            | 564                  |
| 125         | 109                | 2004-07-30     | 10:04          | 70° 41.20        | 123° 21.76       | 517            | 523                  |
| 126         | 109                | 2004-07-30     | 14:09          | 70° 38.60        | 123° 26.23       | 560            | 569                  |
| 127         | CA18               | 2004-07-30     | 18:56          | 70° 38.73        | 123° 06.01       | 571            | 581                  |
| 128         | 215                | 2004-07-31     | 04:34          | 70° 56.69        | 123° 31.37       | 361            | 365                  |
| 129         | 215                | 2004-07-31     | 08:02          | 70° 58.44        | 123° 24.96       | 283            | 300                  |
| 130         | 212                | 2004-07-31     | 11:03          | 70° 45.93        | 123° 52.71       | 443            | 447                  |
| 131         | 212                | 2004-07-31     | 15:28          | 70° 42.79        | 123° 55.83       | 440            | 450                  |
| 132         | 209                | 2004-07-31     | 23:38          | 70° 32.35        | 124° 22.01       | 232            | 241                  |
| 133         | 206                | 2004-08-01     | 09:06          | 70° 19.24        | 124° 50.31       | 83             | 90                   |
| 134         | 206                | 2004-08-01     | 12:31          | 70° 19.22        | 124° 50.67       | 85             | 95                   |
| 135         | 206                | 2004-08-01     | 18:58          | 70° 19.32        | 124° 50.41       | 87             | 96                   |
| 136         | 203                | 2004-08-01     | 23:55          | 70° 07.81        | 125° 30.65       | 99             | 107                  |
| 137         | 311                | 2004-08-02     | 18:39          | 71° 17.35        | 125° 26.52       | 349            | 359                  |

**APPENDIX 3.10** Rosette cast locations, sampling time, water depth and corresponding station or mooring numbers. CASES Leg 9, Expedition 0406 (2004).

| Cast number | Station or mooring | Start date UTC | Start time UTC | Latitude (North) | Longitude (West) | Cast depth (m) | Sea bottom depth (m) |
|-------------|--------------------|----------------|----------------|------------------|------------------|----------------|----------------------|
| 001         | 200                | 2004-08-06     | 06:10          | 70°03.87         | 126°18.06        | 230            | 242                  |
| 002         | 200                | 2004-08-06     | 10:19          | 70°02.66         | 126°17.18        | 226            | 236                  |
| 003         | 200                | 2004-08-06     | 12:13          | 70°02.39         | 126°16.74        | 225            | 237                  |
| 004         | 200                | 2004-08-06     | 14:40          | 70°02.50         | 126°15.61        | 221            | 238                  |
| 005         | 200                | 2004-08-06     | 20:09          | 70°01.61         | 126°14.19        | 217            | 225                  |
| 006         | 200                | 2004-08-07     | 02:21          | 70°02.43         | 126°10.65        | 221            | 232                  |
| 007         | 200                | 2004-08-07     | 09:50          | 70°02.00         | 126°18.00        | 222            | 236                  |
| 008         | 200                | 2004-08-07     | 11:52          | 70°02.72         | 126°17.56        | 225            | 238                  |
| 009         | 124                | 2004-08-08     | 02:40          | 71°24.22         | 126°47.80        | 417            | 426                  |
| 010         | 124                | 2004-08-08     | 07:34          | 71°23.78         | 126°40.65        | 436            | 446                  |
| 011         | 118                | 2004-08-08     | 18:08          | 70°56.40         | 125°51.14        | 372            | 380                  |
| 012         | 118                | 2004-08-09     | 00:19          | 70°56.45         | 125°51.03        | 378            | 386                  |
| 013         | 112                | 2004-08-09     | 08:02          | 70°45.29         | 124°14.32        | 500            | 513                  |
| 014         | 112                | 2004-08-09     | 13:33          | 70°45.20         | 124°14.40        | 491            | 508                  |
| 015         | 106                | 2004-08-09     | 23:10          | 70°36.07         | 122°37.99        | 527            | 537                  |
| 016         | 106                | 2004-08-10     | 03:06          | 70°38.34         | 122°08.72        | 524            | 534                  |
| 017         | 106                | 2004-08-10     | 10:32          | 70°36.02         | 122°37.90        | 530            | 541                  |
| 018         | 106                | 2004-08-10     | 12:49          | 70°36.06         | 122°37.22        | 532            | 542                  |
| 019         | 106                | 2004-08-10     | 16:42          | 70°35.67         | 122°36.75        | 535            | 544                  |
| 020         | 106                | 2004-08-10     | 21:42          | 70°35.97         | 122°37.37        | 532            | 541                  |
| 021         | 2                  | 2004-08-12     | 08:47          | 69°00.03         | 106°35.00        | 103            | 113                  |
| 022         | 7                  | 2004-08-18     | 08:04          | 74°17.22         | 085°35.22        | 524            | 534                  |
| 023         | 7                  | 2004-08-18     | 19:18          | 74°13.51         | 083°20.57        | 692            | 702                  |
| 024         | 9                  | 2004-08-18     | 23:00          | 74°09.58         | 081°14.56        | 758            | 764                  |

**APPENDIX 4. Ice-CTD data logbook (over-wintering station Winter 1).**

|     |  |       |
|-----|--|-------|
| 4.1 | Ice-CTD logbook for Legs 3, 4 and 5..... | p. 52 |
| 4.2 | Ice-CTD logbook for Leg 7.....           | p. 53 |

**APPENDIX 4.1** Ice-CTD casts sampling date and time, water depth and corresponding station. CASES Leg 3 (0305), 4 (0401) and 5 (0402).

**Leg 0305**

| <b>Station or mooring</b> | <b>Start date UTC</b> | <b>Start time UTC</b> | <b>Cast depth (m)</b> |
|---------------------------|-----------------------|-----------------------|-----------------------|
| Dukuduku                  | 2003-12-14            | 20:29                 | 220                   |
| Dukuduku                  | 2003-12-17            | 21:00                 | 12                    |
| Dukuduku                  | 2003-12-20            | 20:00                 | 24                    |
| Dukuduku                  | 2003-12-20            | 13:39                 | 230                   |
| Dukuduku                  | 2003-12-26            | 13:15                 | 232                   |
| Dukuduku                  | 2003-12-23            | 20:35                 | 26                    |
| Dukuduku                  | 2003-12-29            | 19:57                 | 29                    |
| Dukuduku                  | 2004-01-04            | 13:35                 | 233                   |

**Leg 0401**

| <b>Station or mooring</b> | <b>Start date UTC</b> | <b>Start time UTC</b> | <b>Cast depth (m)</b> |
|---------------------------|-----------------------|-----------------------|-----------------------|
| Dukuduku                  | 2004-01-29            | 14:35                 | 20                    |
| Dukuduku                  | 2004-02-14            | 15:38                 | 233                   |

**Leg 0402**

| <b>Station or mooring</b> | <b>Start date UTC</b> | <b>Start time UTC</b> | <b>Cast depth (m)</b> |
|---------------------------|-----------------------|-----------------------|-----------------------|
| Angaguk                   | 2004-03-05            | 16:00                 | 100                   |
| Angaguk                   | 2004-03-08            | 15:00                 | 107                   |
| Angaguk                   | 2004-03-09            | 11:15                 | 106                   |
| Angaguk                   | 2004-03-12            | 11:17                 | 106                   |
| Dukuduku                  | 2004-02-21            | 09:37                 | 109                   |
| Dukuduku                  | 2004-02-29            | 11:40                 | 229                   |
| Dukuduku                  | 2004-03-07            | 14:00                 | 227                   |
| Takatuk                   | 2004-02-22            | 16:53                 | -2                    |
| Takatuk                   | 2004-02-24            | 14:47                 | 150                   |
| Takatuk                   | 2004-03-05            | 09:40                 | 150                   |
| Takatuk                   | 2004-03-08            | 13:50                 | 150                   |

APPENDIX 4.2 Ice-CTD casts sampling date and time, water depth and corresponding station. CASES Leg 7 (0404).

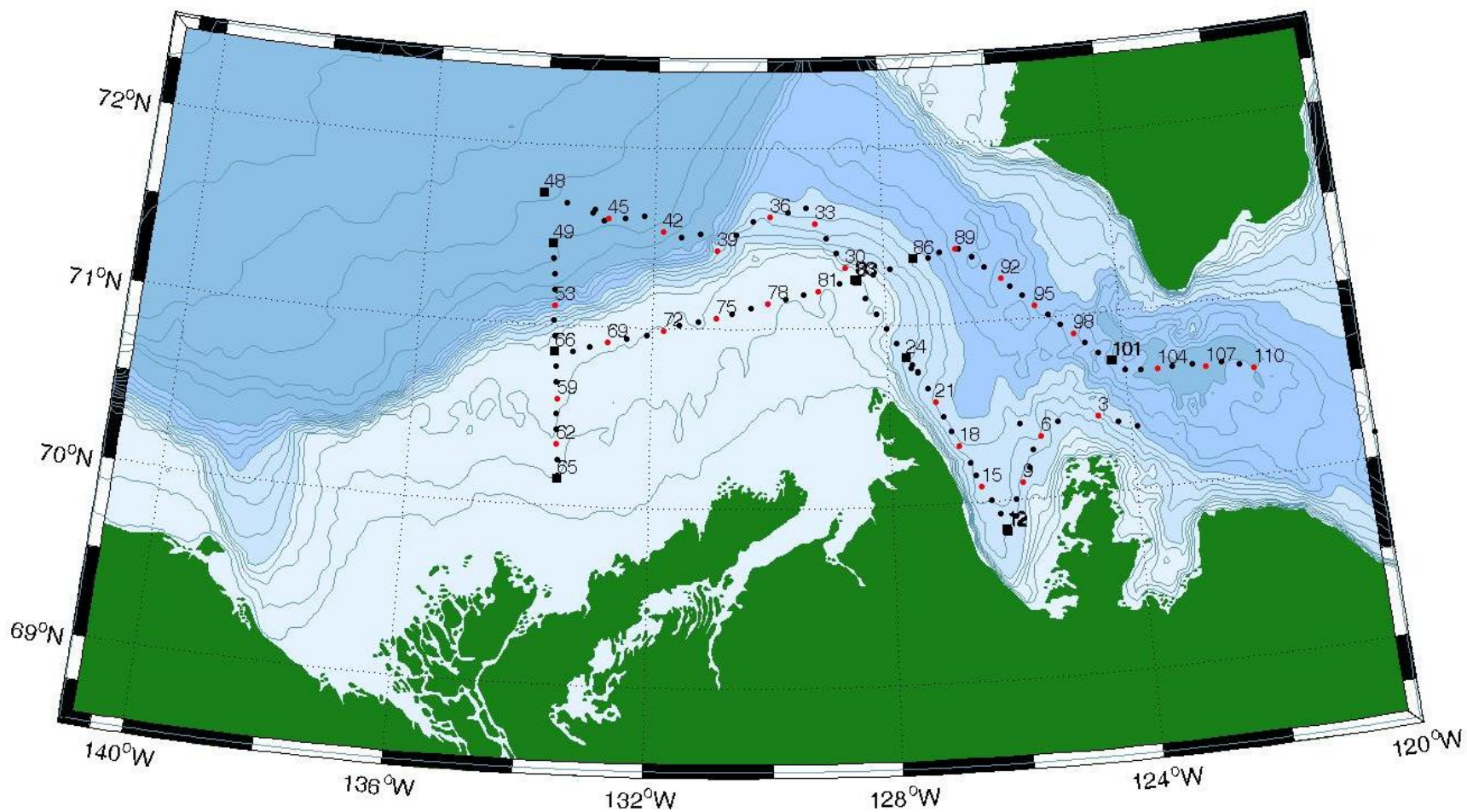
**Leg 0404**

| <b>Station or mooring</b> | <b>Start date UTC</b> | <b>Start time UTC</b> | <b>Cast depth (m)</b> |
|---------------------------|-----------------------|-----------------------|-----------------------|
| Dukuduku                  | 2004-05-24            | 10:54                 | 15                    |
| Dukuduku                  | 2004-05-24            | 10:57                 | 37                    |
| Dukuduku                  | 2004-05-24            | 11:00                 | 38                    |
| Dukuduku                  | 2004-05-26            | 13:50                 | 25                    |
| Dukuduku                  | 2004-05-26            | 14:25                 | 45                    |
| Dukuduku                  | 2004-05-26            | 14:46                 | 41                    |
| Dukuduku                  | 2004-05-26            | 15:20                 | 7                     |
| Dukuduku                  | 2004-05-26            | 15:33                 | 0                     |
| Dukuduku                  | 2004-05-26            | 15:34                 | 67                    |
| Dukuduku                  | 2004-05-26            | 15:54                 | 65                    |
| Dukuduku                  | 2004-06-06            | 14:22                 | 62                    |
| Dukuduku                  | 2004-06-06            | 14:35                 | 62                    |
| Dukuduku                  | 2004-06-06            | 14:45                 | 58                    |
| Dukuduku                  | 2004-06-06            | 14:56                 | 63                    |
| Dukuduku                  | 2004-06-06            | 15:03                 | 60                    |
| Titicaca                  | 2004-05-16            | 11:00                 | 0                     |
| Titicaca                  | 2004-05-19            | 08:57                 | 8                     |
| River 1                   | 2004-05-27            | 20:01                 | 16                    |
| River 1                   | 2004-05-27            | 21:38                 | 80                    |
| River 1                   | 2004-05-27            | 22:31                 | 108                   |
| River 1                   | 2004-05-27            | 23:30                 | 138                   |
| River 1                   | 2004-05-28            | 00:42                 | 192                   |

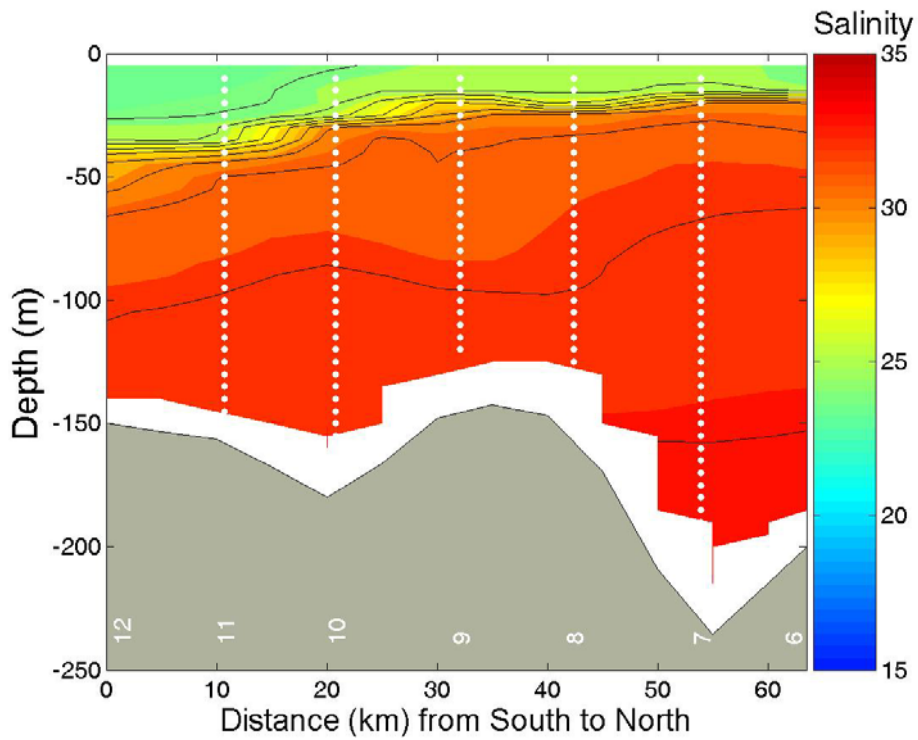
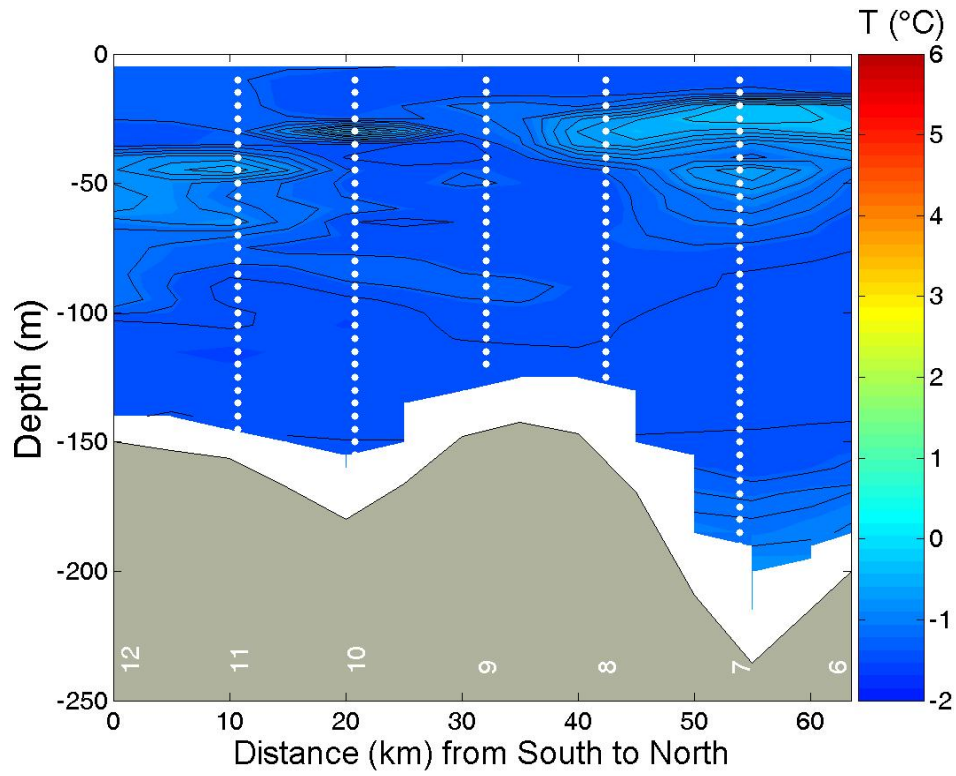
**APPENDIX 5.** Sections of salinity and potential temperature from CASES Rosette data.  
Leg 0 (September-October 2002).

The same color scale is used for all sections.

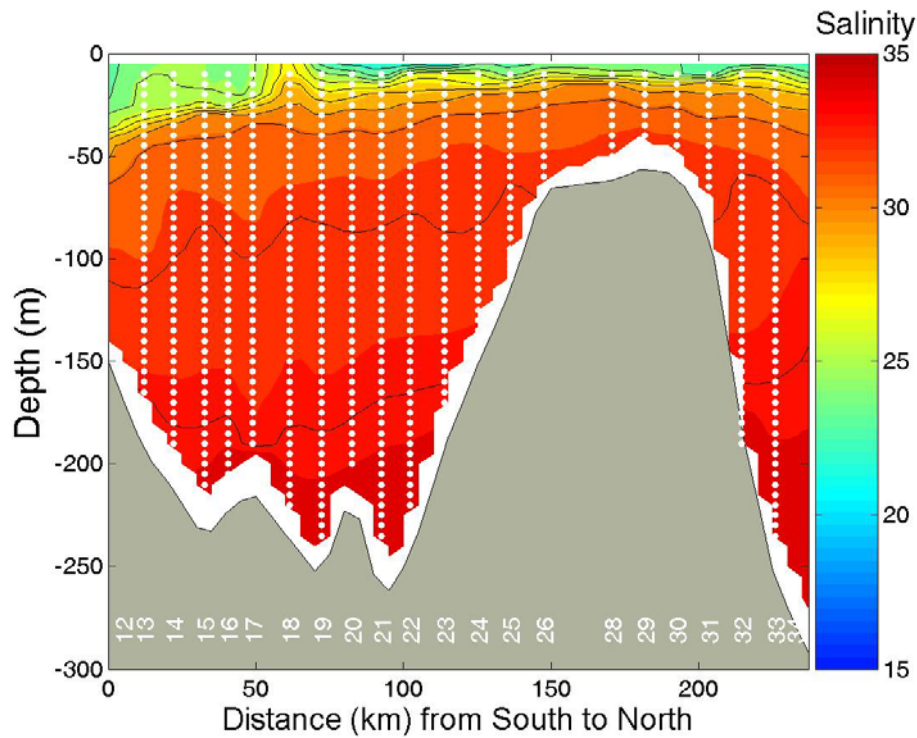
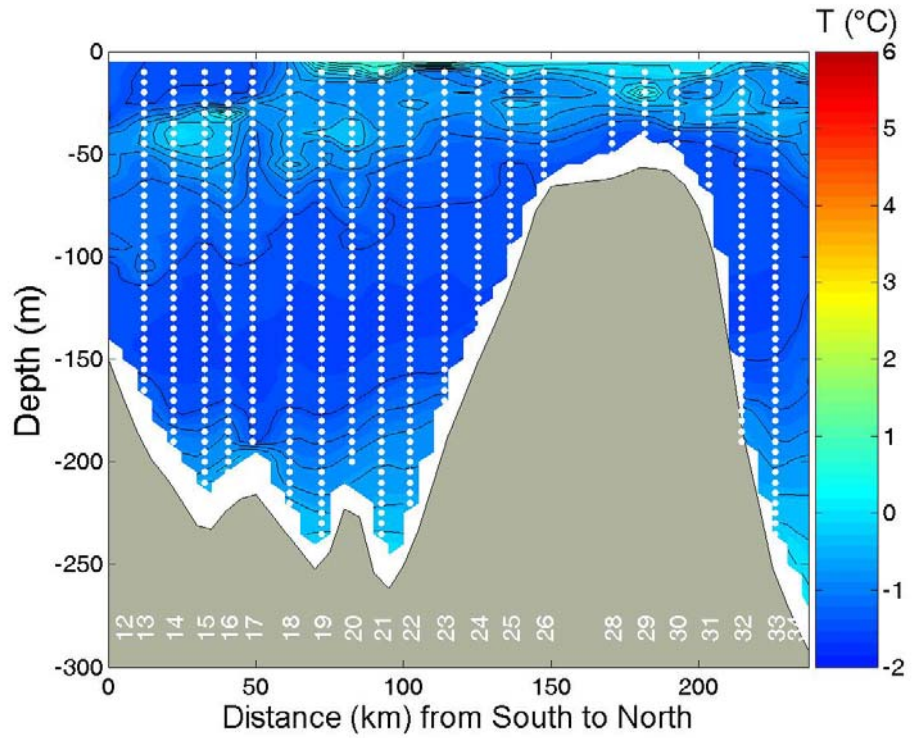
|     |   |       |
|-----|---|-------|
| 5.1 | Map of station locations.....             | p. 55 |
| 5.2 | Section between stations 12 and 6.....    | p. 56 |
| 5.3 | Section between stations 12 and 34.....   | p. 57 |
| 5.4 | Section between stations 48 and 34.....   | p. 58 |
| 5.5 | Section between stations 65 and 48.....   | p. 59 |
| 5.6 | Section between stations 66 and 89.....   | p. 60 |
| 5.7 | Section between stations 89 and 101.....  | p. 61 |
| 5.8 | Section between stations 101 and 110..... | p. 62 |



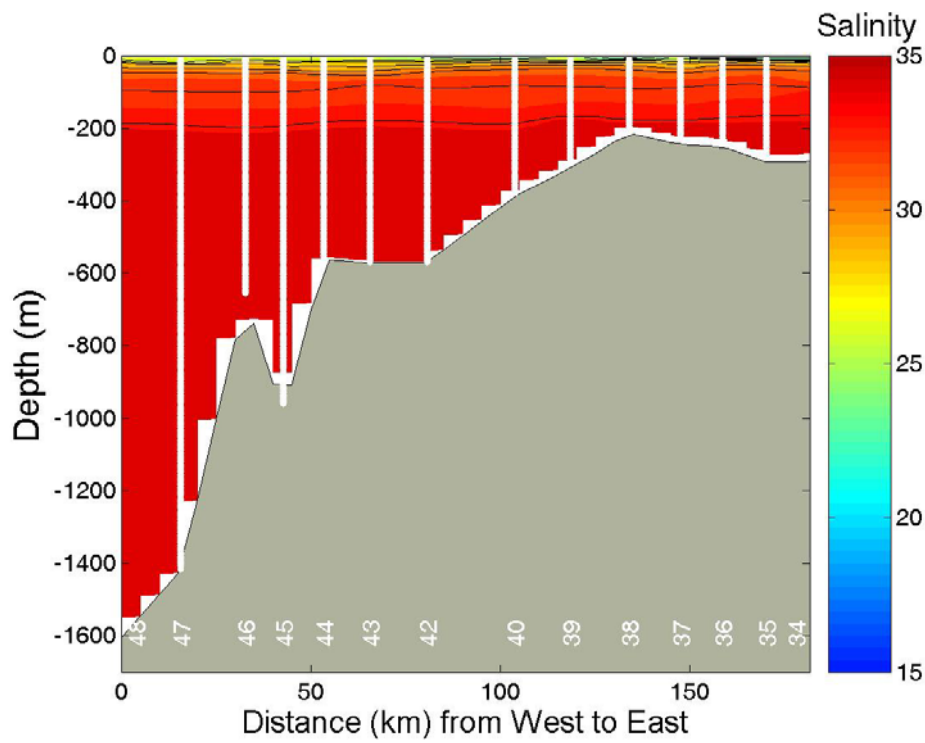
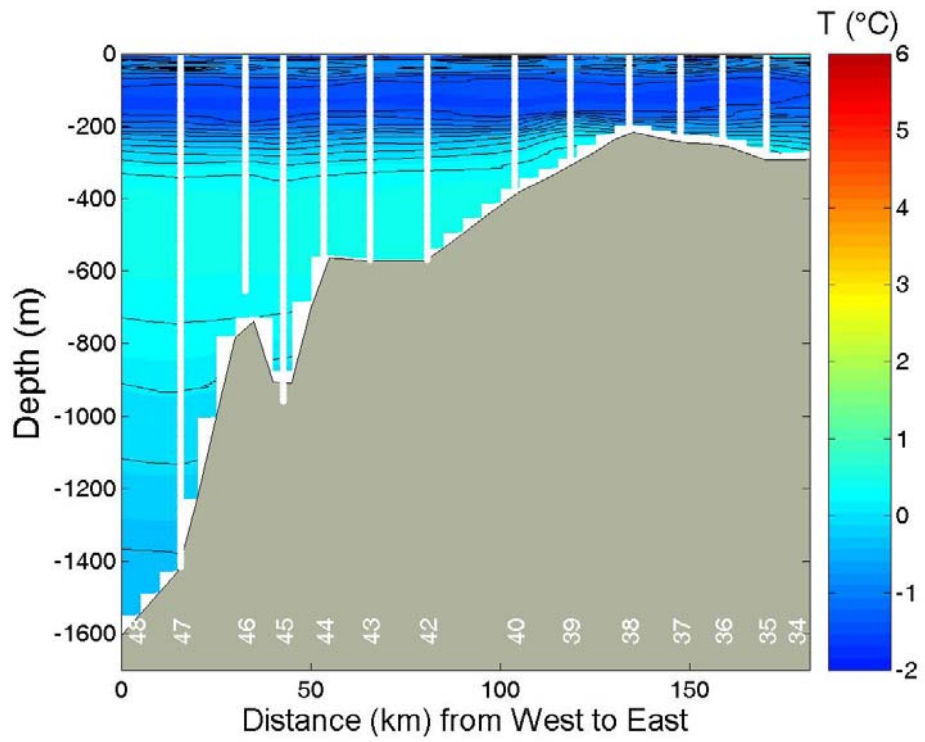
APPENDIX 5.1 Rosette sampling stations for Leg 0 (September-October 2002).



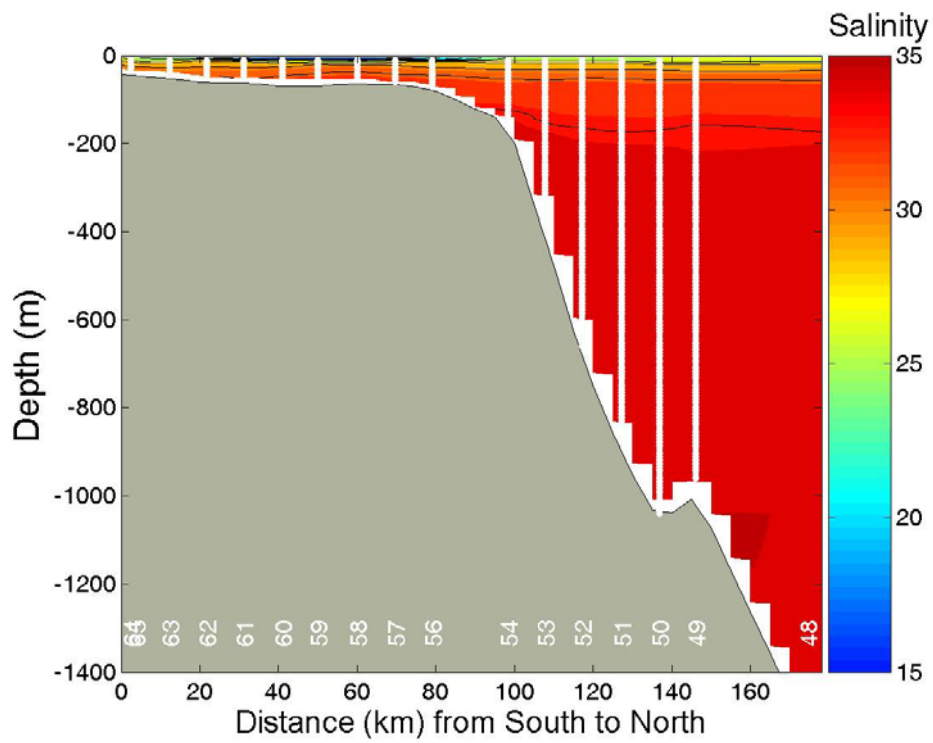
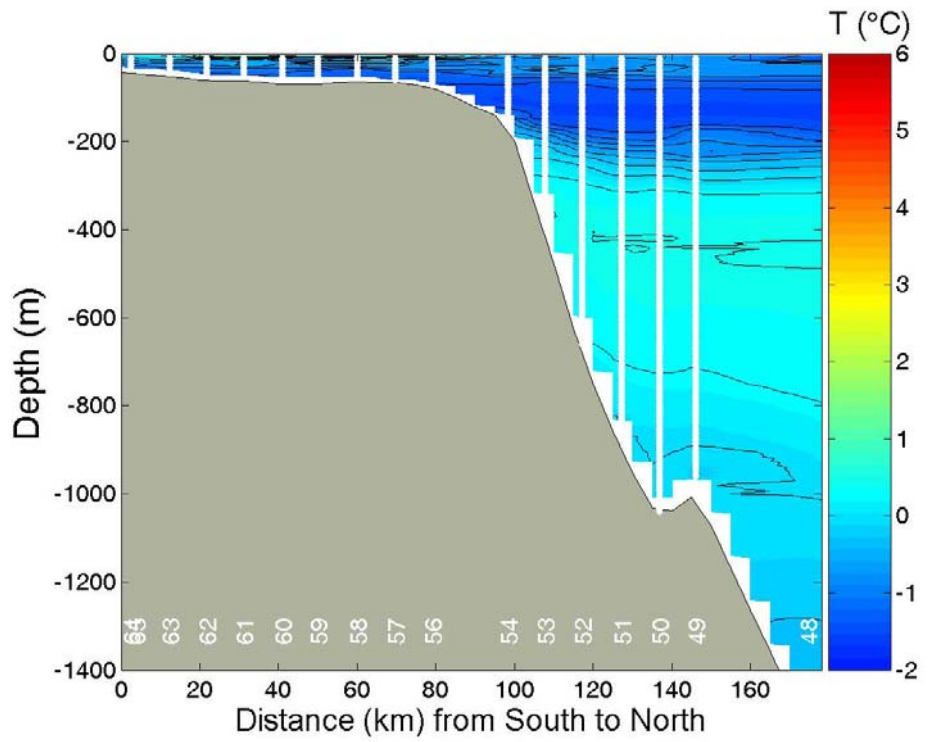
**APPENDIX 5.2** Potential temperature and salinity between stations 12 and 6, Leg 0. South-West is on the left and North-East is on the right.



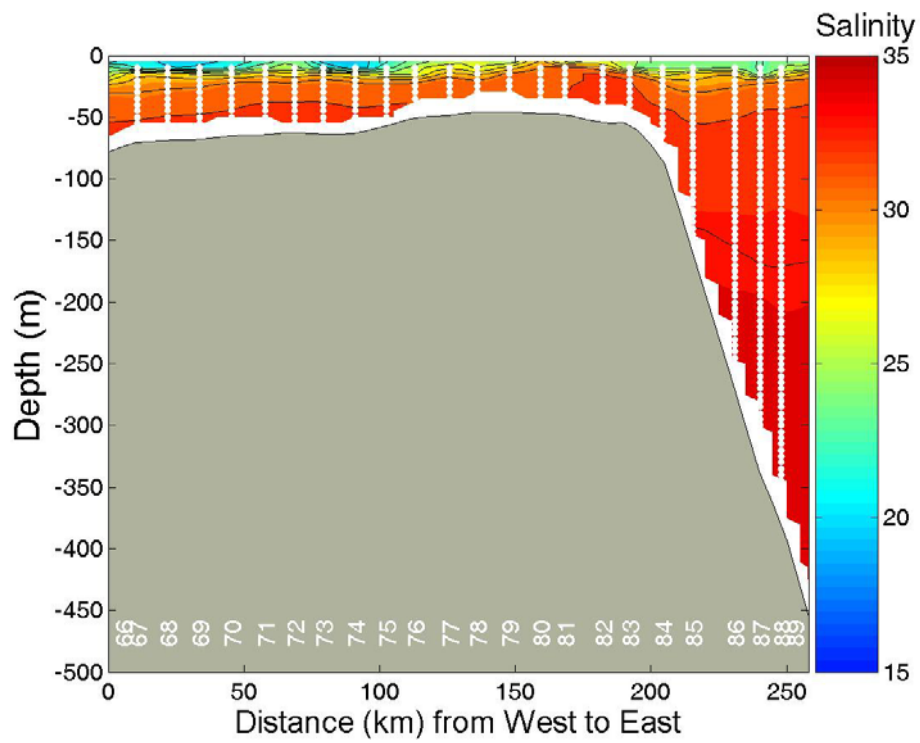
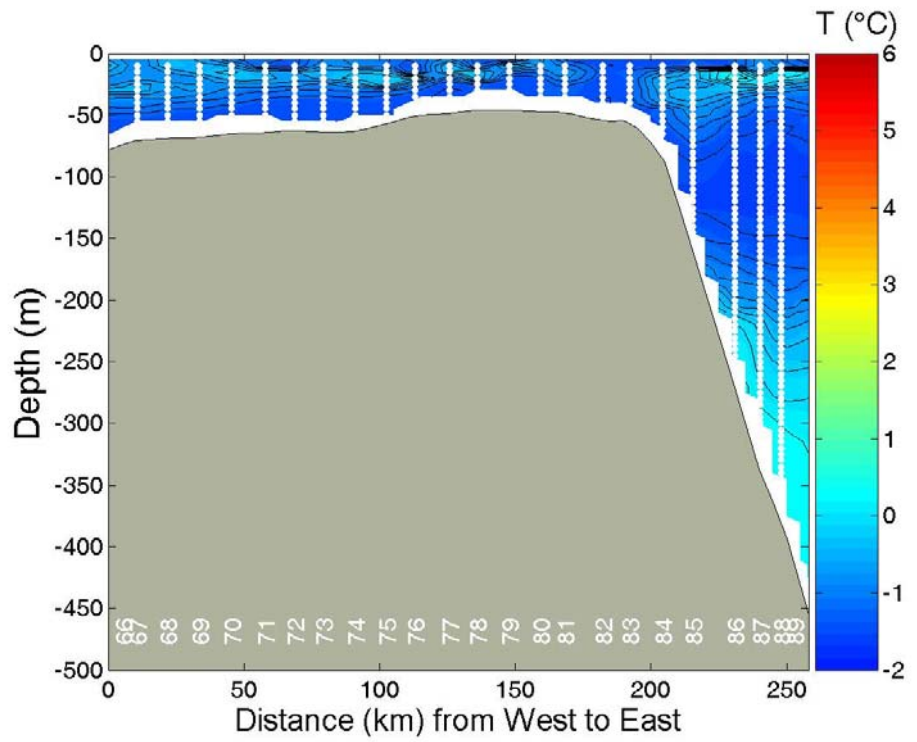
**APPENDIX 5.3** Potential temperature and salinity between stations 12 and 34, Leg 0. South-East is on the left and North-West is on the right.



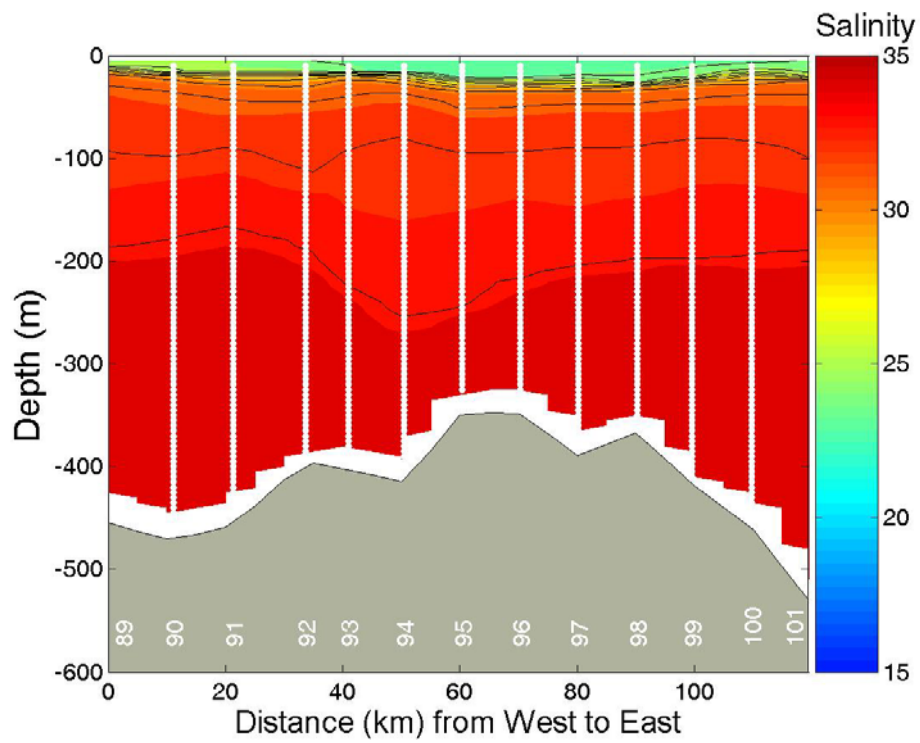
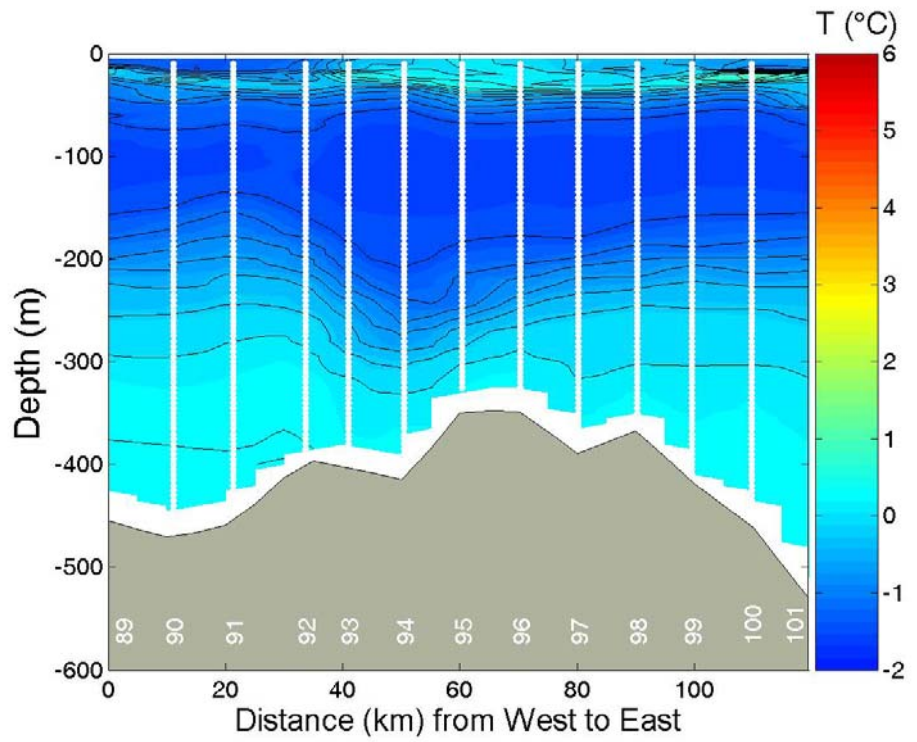
**APPENDIX 5.4** Potential temperature and salinity between stations 48 and 34, Leg 0. West is on the left and East is on the right.



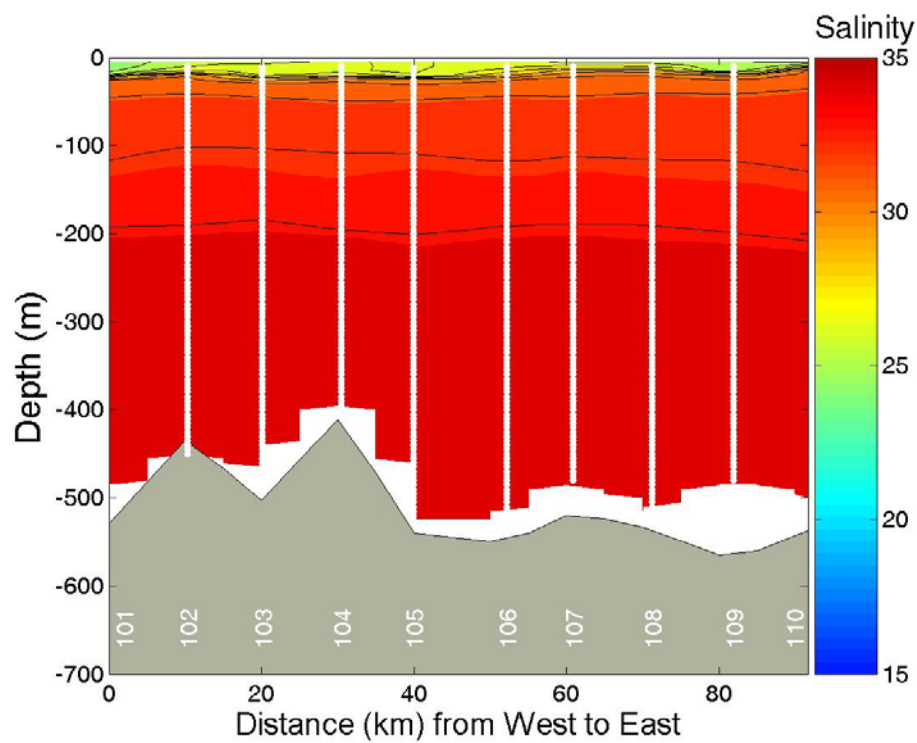
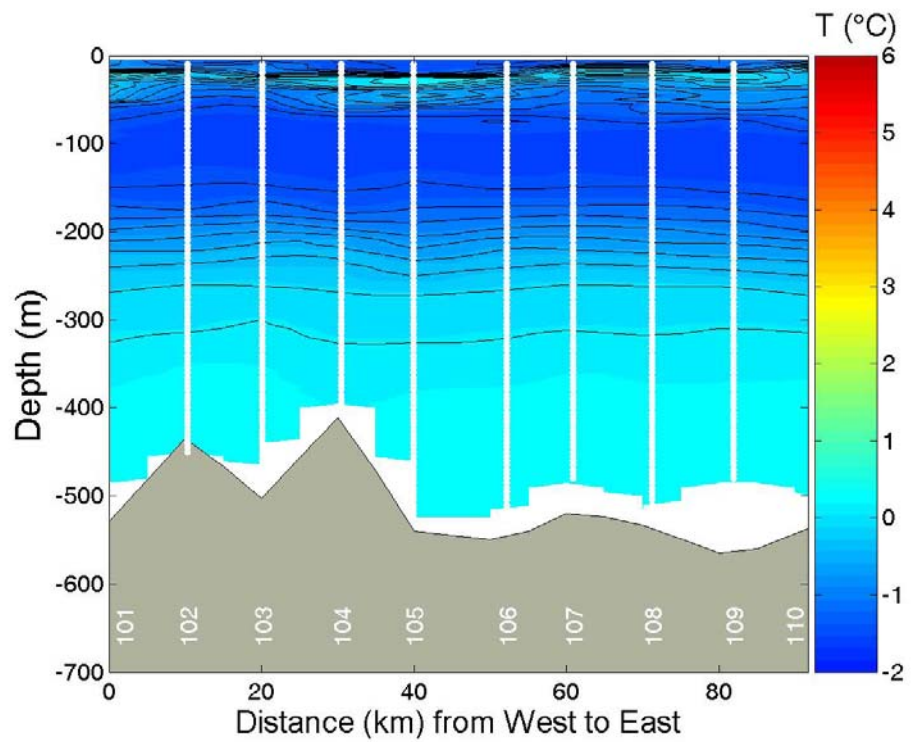
**APPENDIX 5.5** Potential temperature and salinity between stations 65 and 48, Leg 0. South is on the left and North is on the right.



**APPENDIX 5.6** Potential temperature and salinity between stations 66 and 89, Leg 0. West is on the left and East is on the right.



**APPENDIX 5.7** Potential temperature and salinity between stations 89 and 101, Leg 0. North-West is on the left and South-East is on the right.

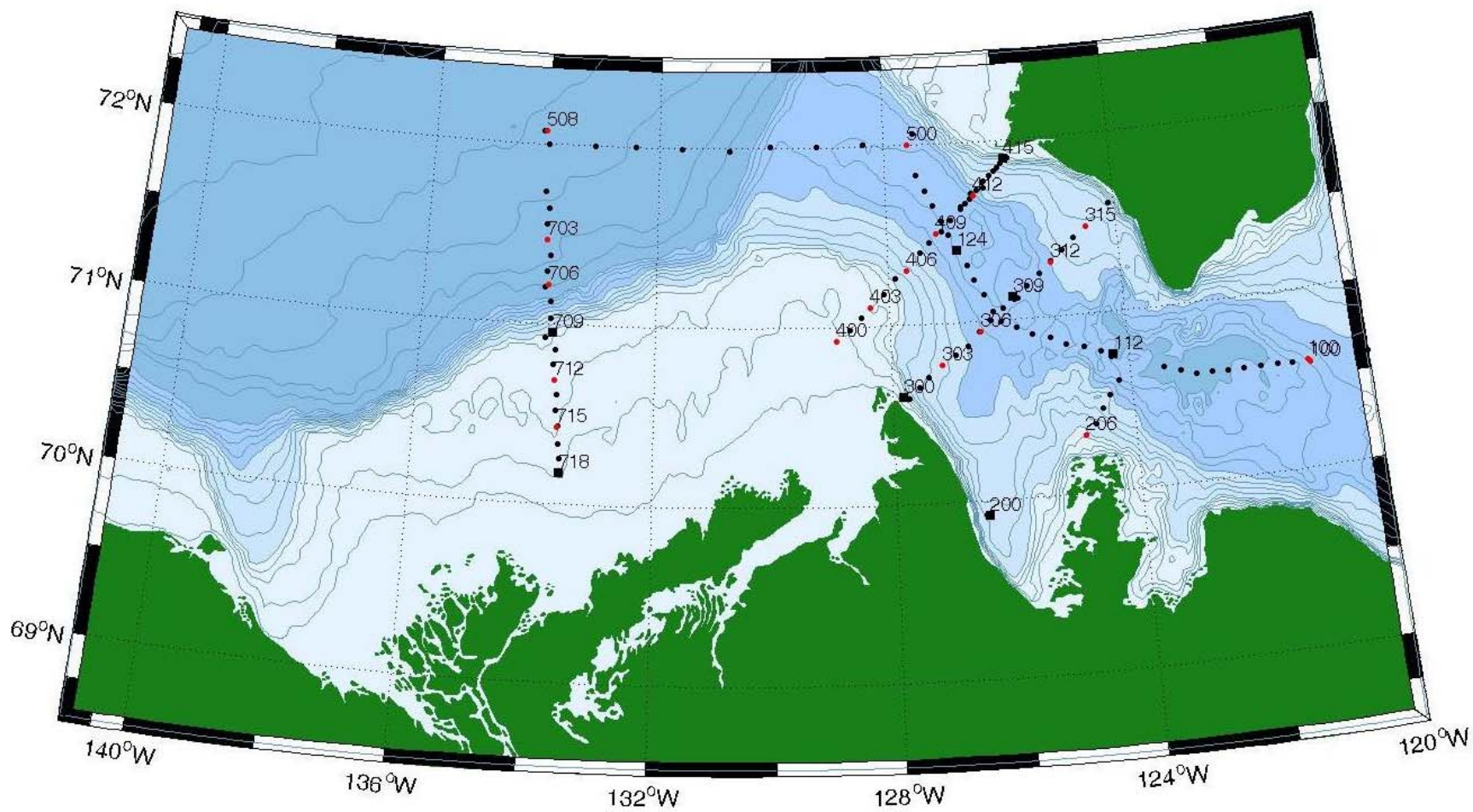


**APPENDIX 5.8** Potential temperature and salinity between stations 101 and 110, Leg 0. West is on the left and East is on the right.

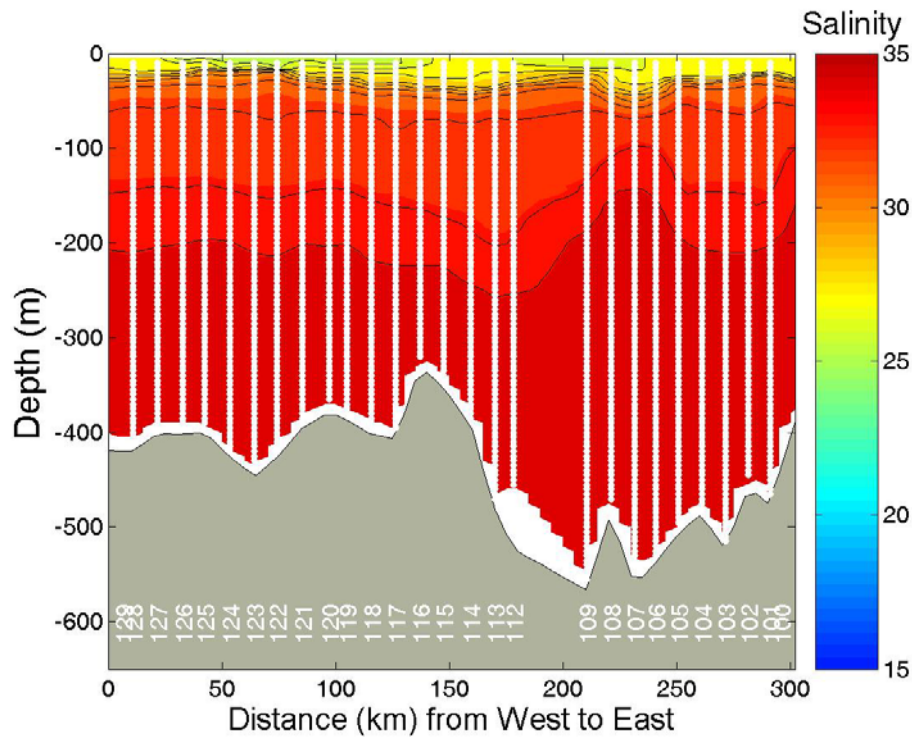
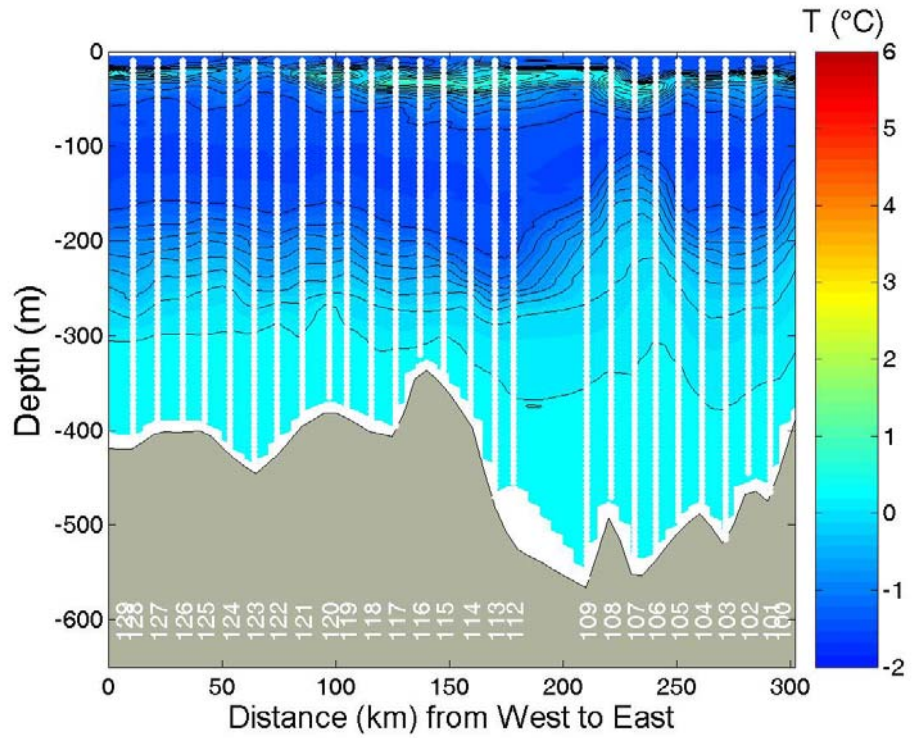
**APPENDIX 6.** Sections of salinity and potential temperature from CASES Rosette data.  
Leg 2 (October-November 2003).

The same color scale is used for all sections.

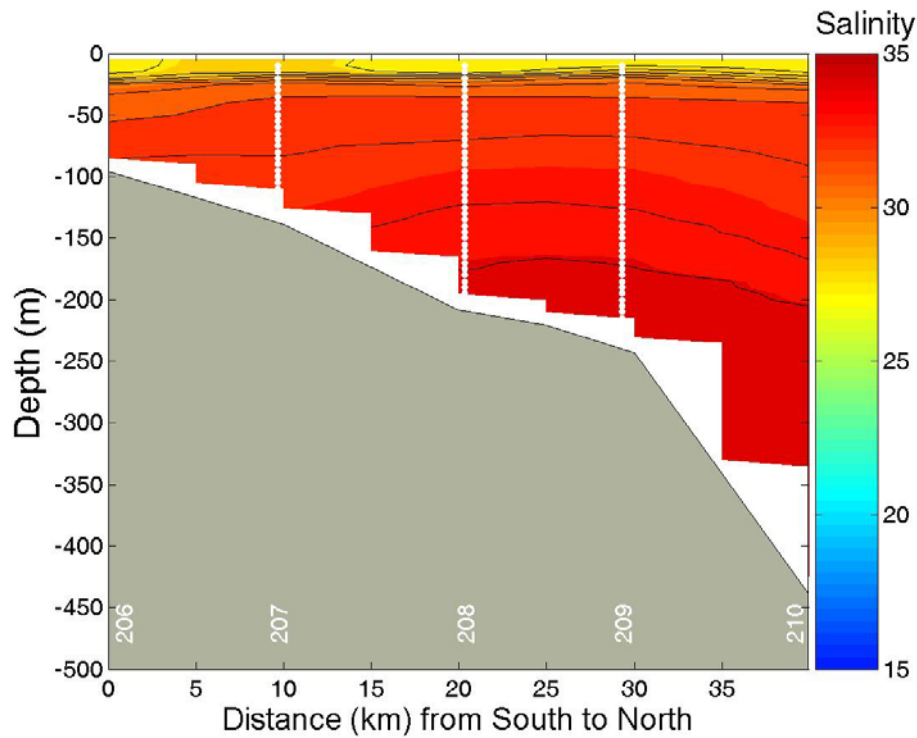
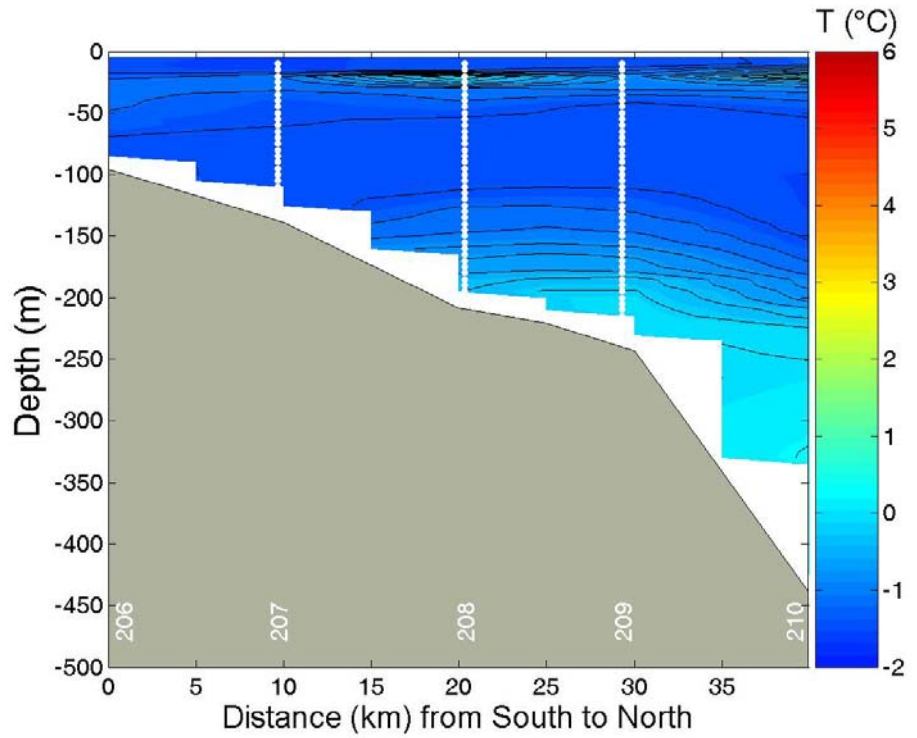
|     |                               |       |
|-----|-------------------------------|-------|
| 6.1 | Map of station locations..... | p. 64 |
| 6.2 | Section 100.....              | p. 65 |
| 6.3 | Section 200.....              | p. 66 |
| 6.4 | Section 300.....              | p. 67 |
| 6.5 | Section 400.....              | p. 68 |
| 6.6 | Section 500.....              | p. 69 |
| 6.7 | Section 700.....              | p. 70 |



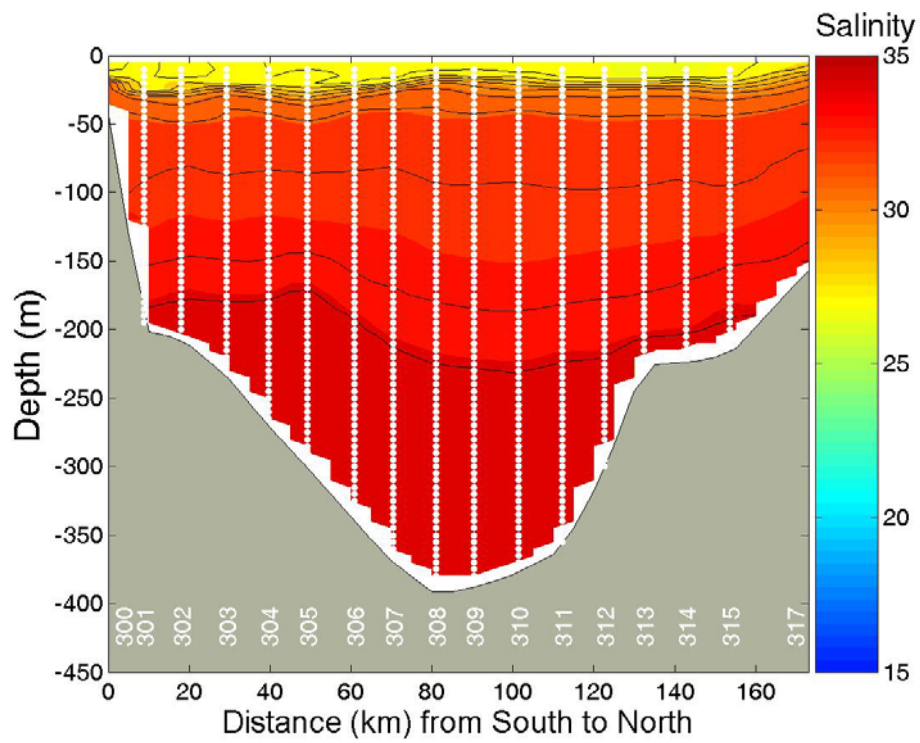
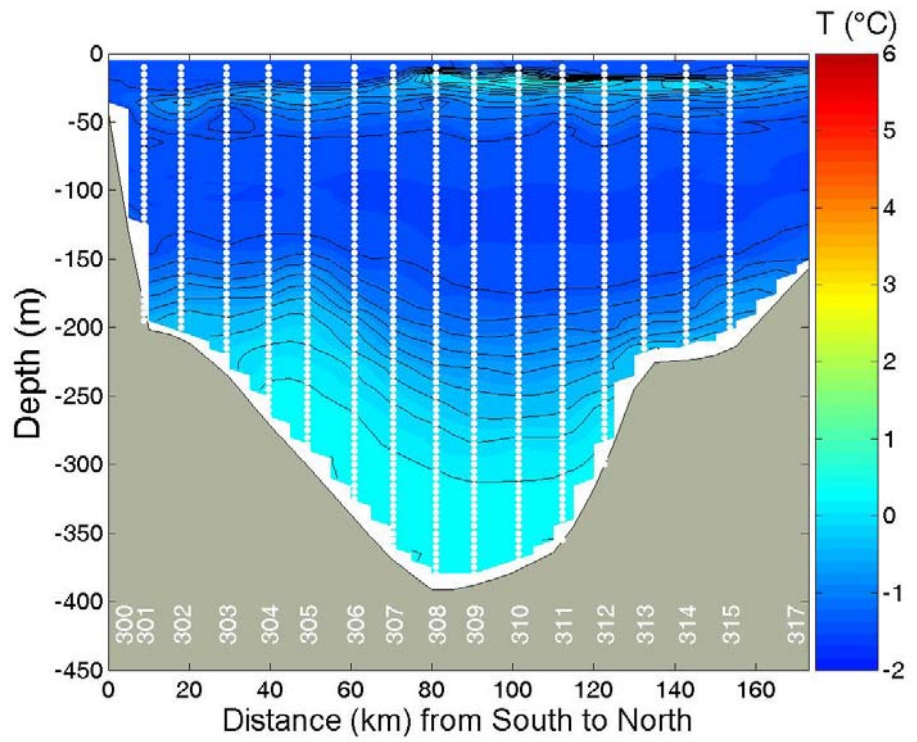
APPENDIX 6.1 Rosette sampling stations for Leg 2 (October-November 2003).



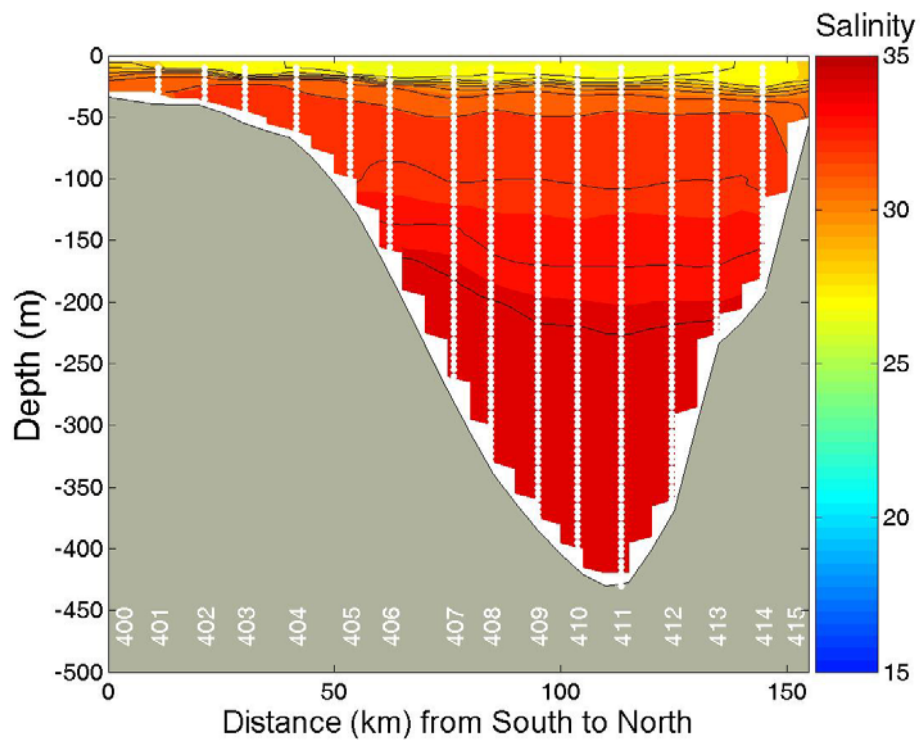
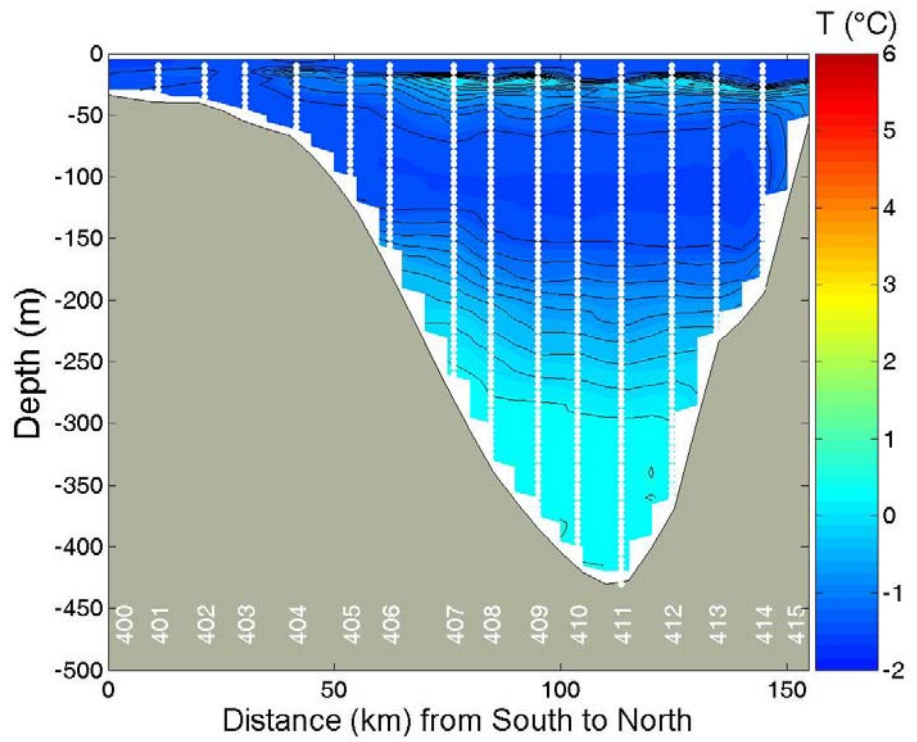
**APPENDIX 6.2** Potential temperature and salinity along section 100, Leg 2. North-West is on the left and South-East is on the right.



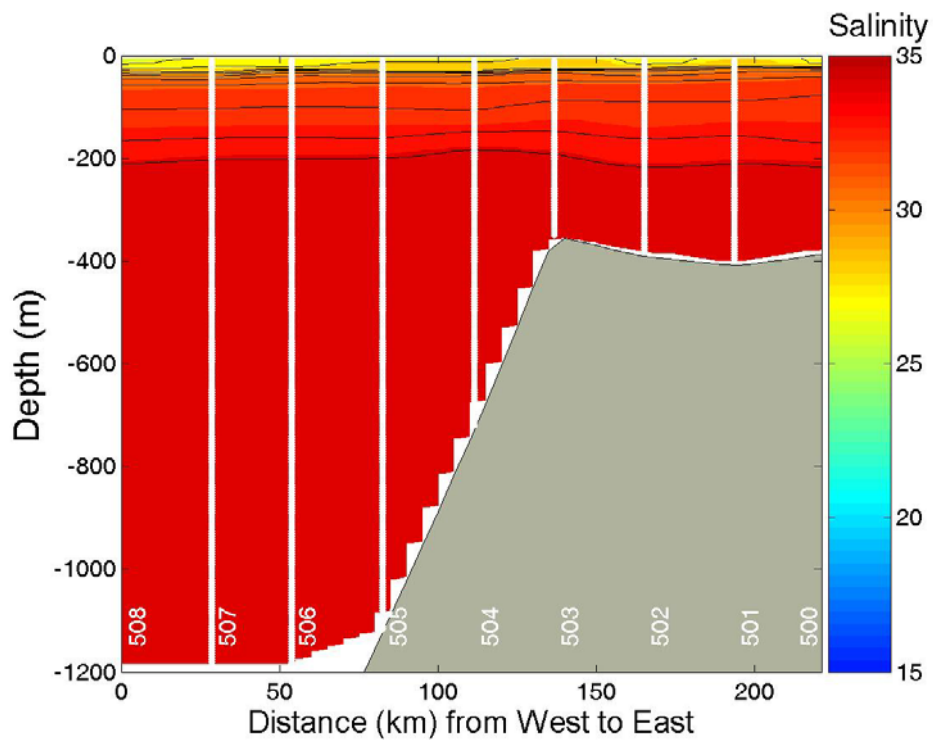
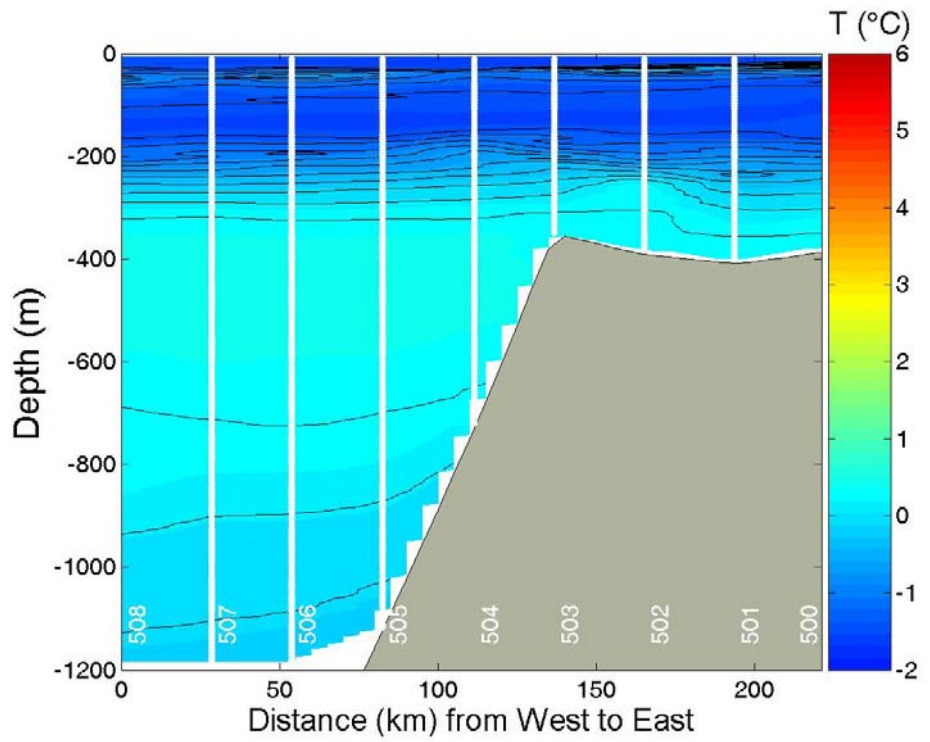
**APPENDIX 6.3** Potential temperature and salinity along section 200, Leg 2. South-West is on the left and North-East is on the right.



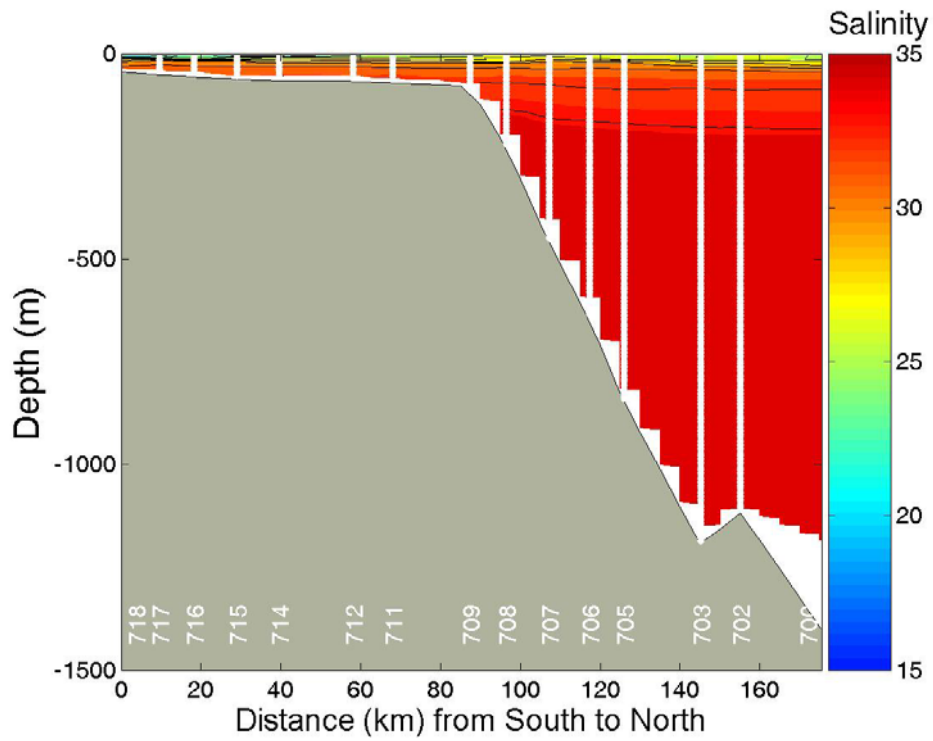
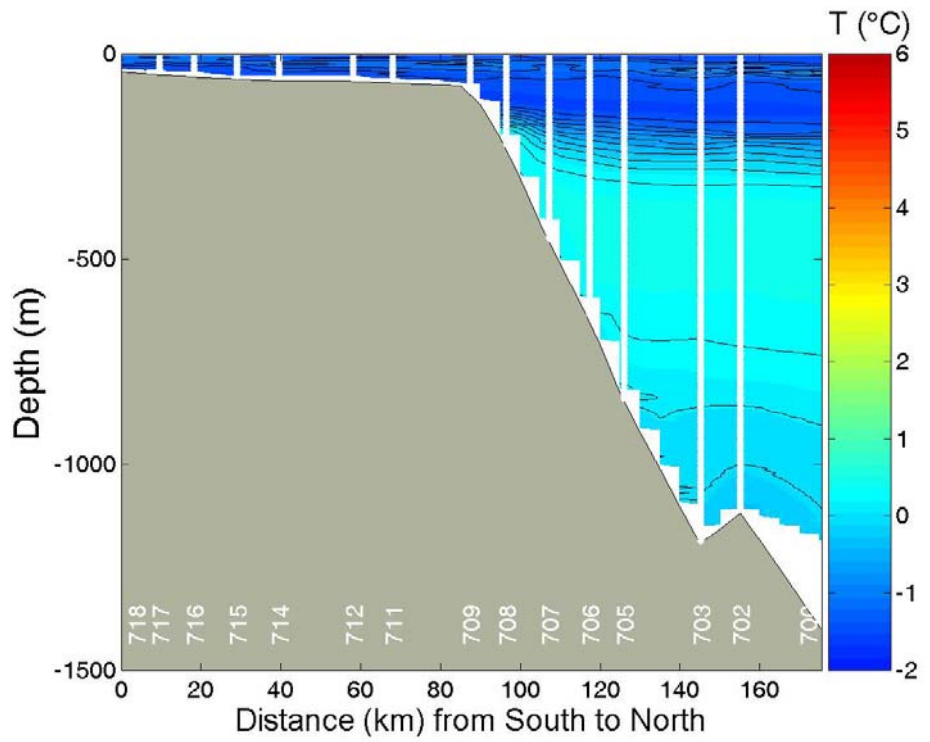
**APPENDIX 6.4** Potential temperature and salinity along section 300, Leg 2. South-West is on the left and North-East is on the right.



**APPENDIX 6.5** Potential temperature and salinity along section 400, Leg 2. South-West is on the left and North-East is on the right.



**APPENDIX 6.6** Potential temperature and salinity along section 500, Leg 2. West is on the left and East is on the right.

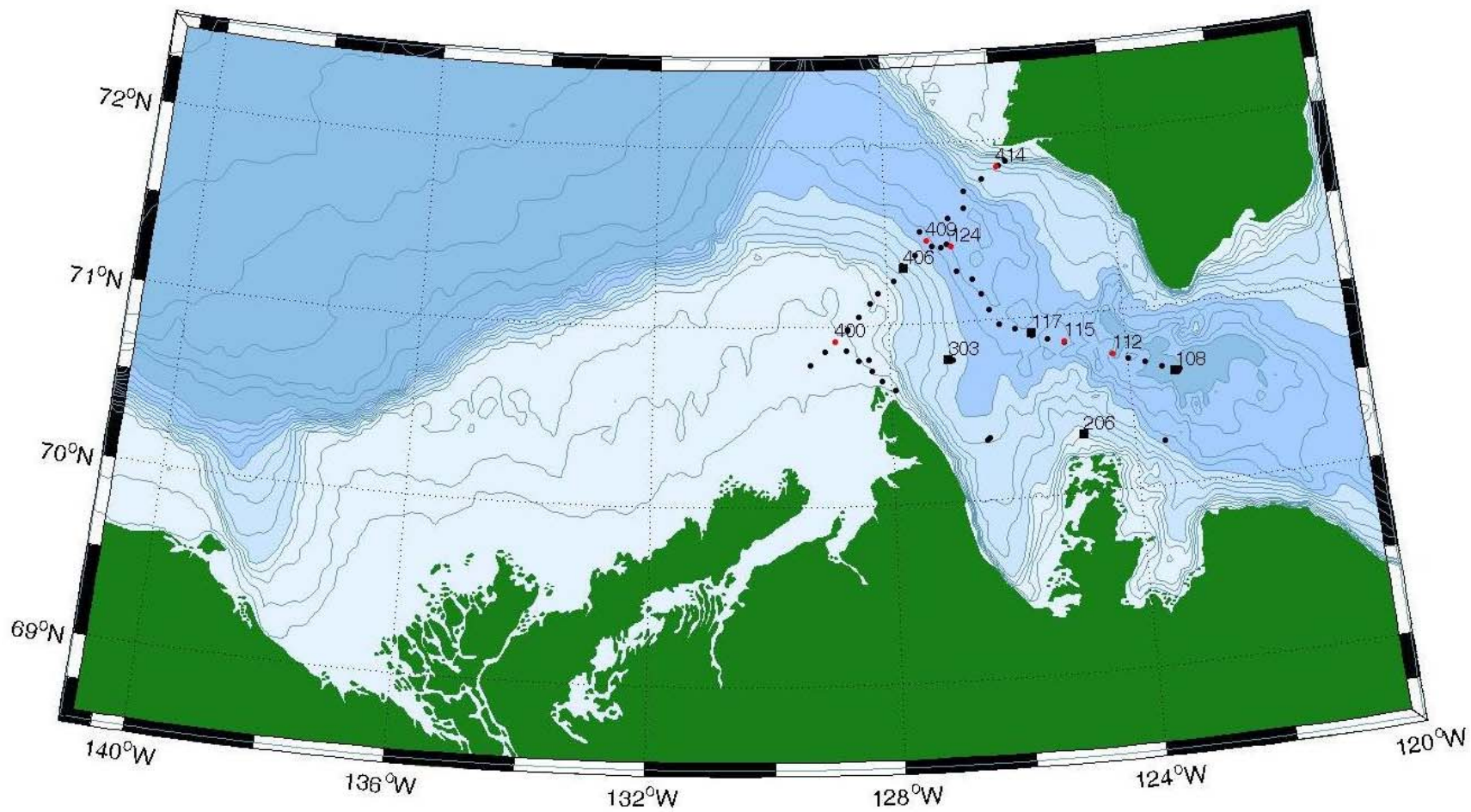


**APPENDIX 6.7** Potential temperature and salinity along section 700, Leg 2. South is on the left and North is on the right.

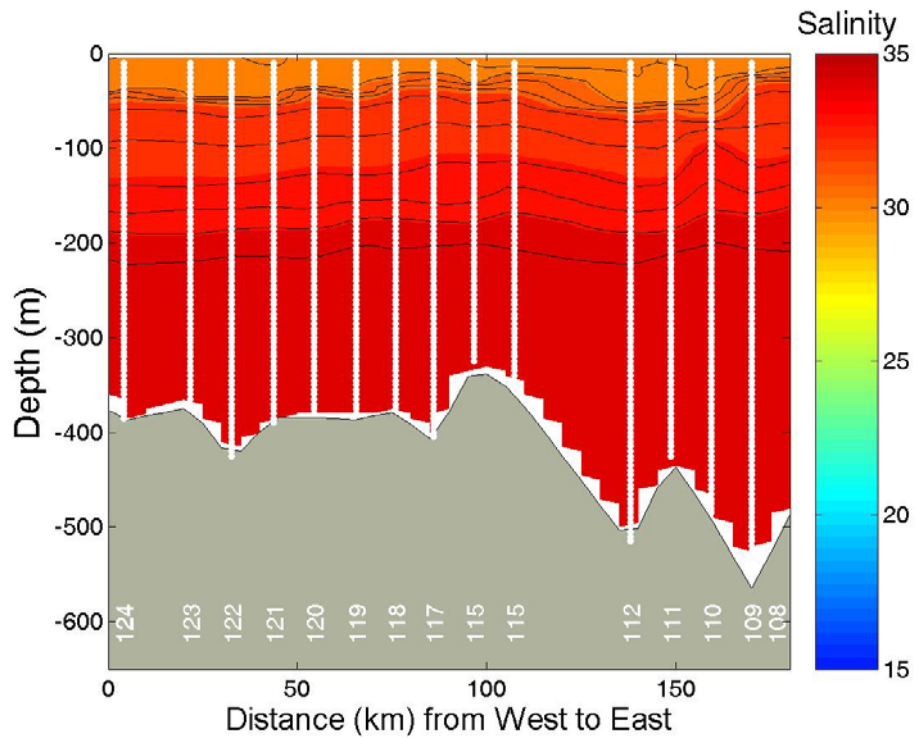
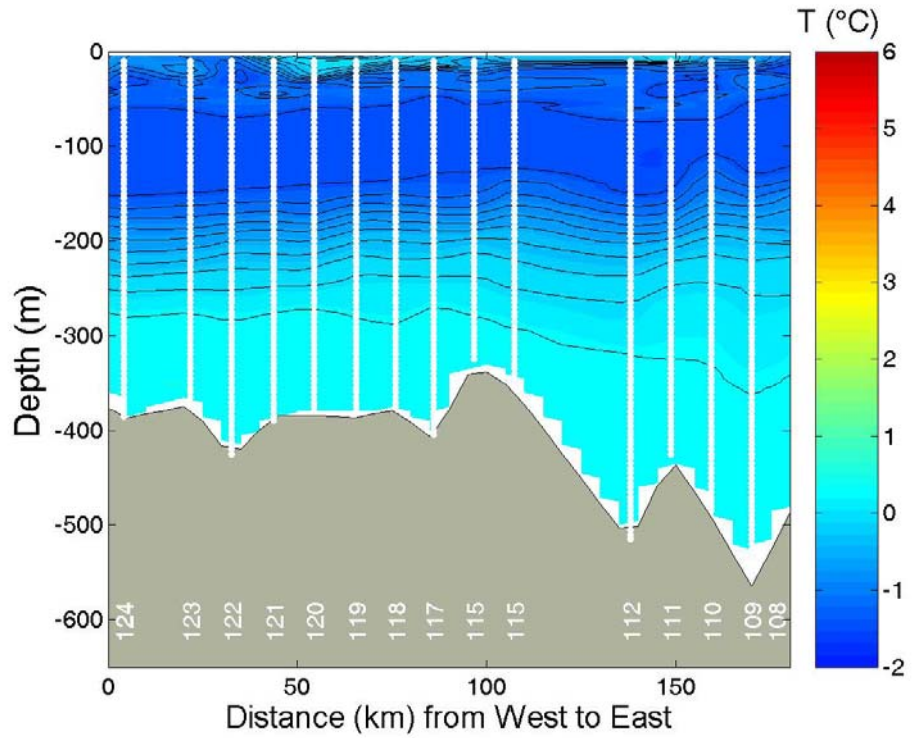
**APPENDIX 7.** Sections of salinity and potential temperature from CASES Rosette data.  
Leg 7 (May-June 2004).

The same color scale is used for all sections.

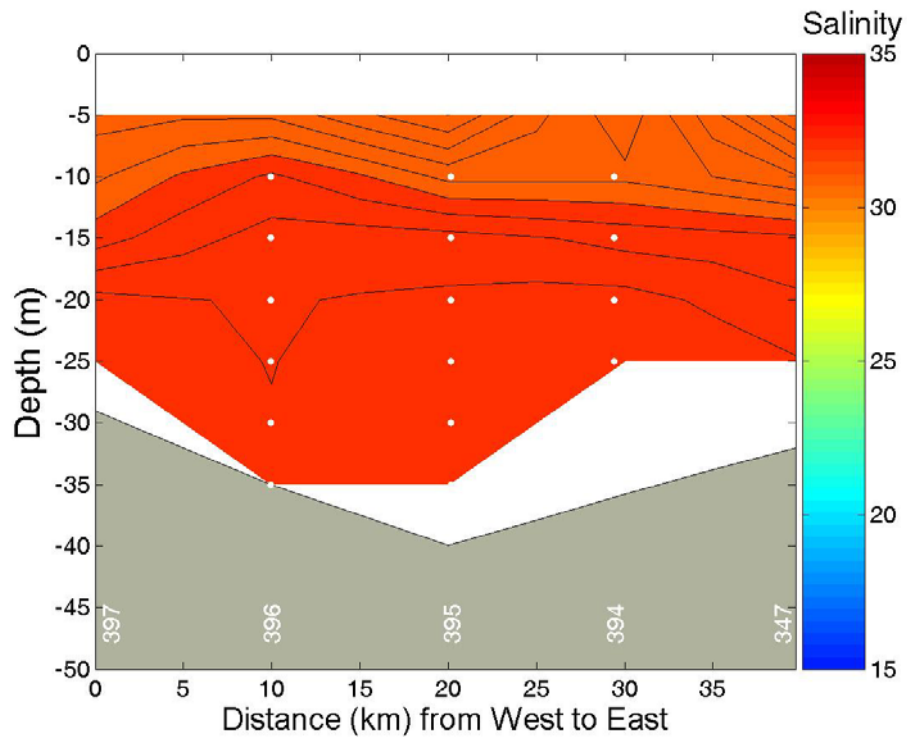
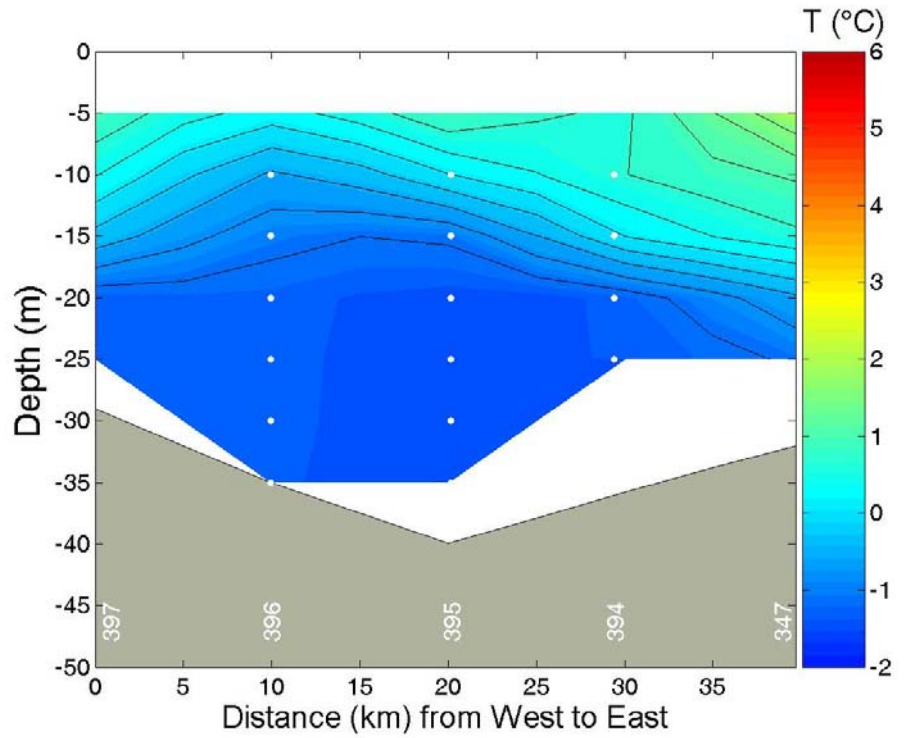
|     |                               |       |
|-----|-------------------------------|-------|
| 7.1 | Map of station locations..... | p. 72 |
| 7.2 | Section 100.....              | p. 73 |
| 7.3 | Section 300.....              | p. 74 |
| 7.4 | Section 400 (west part).....  | p. 75 |
| 7.5 | Section 400 (east part).....  | p. 76 |



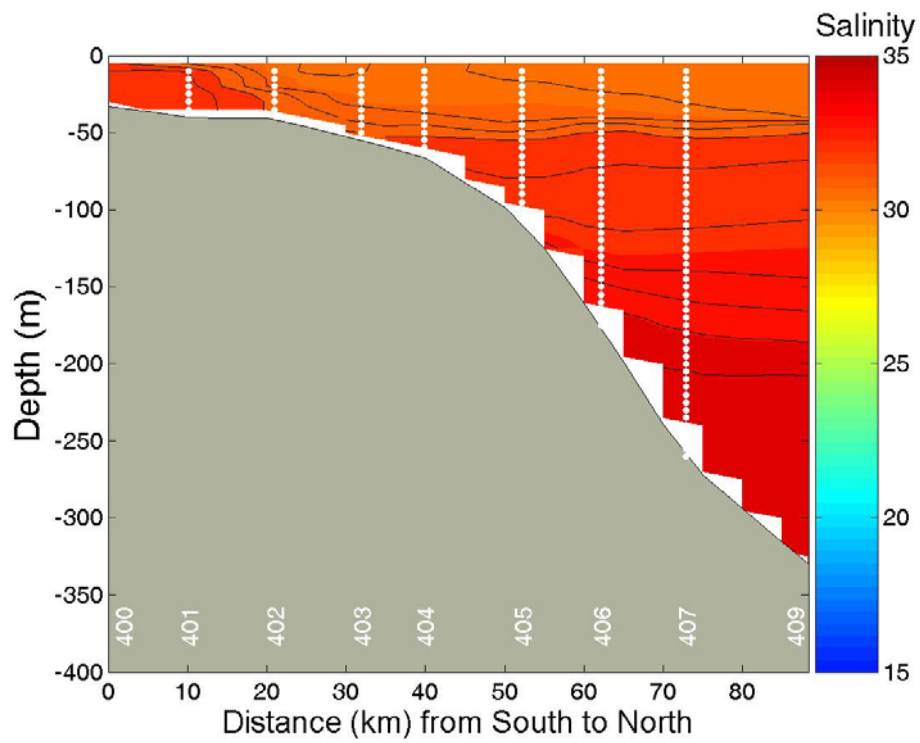
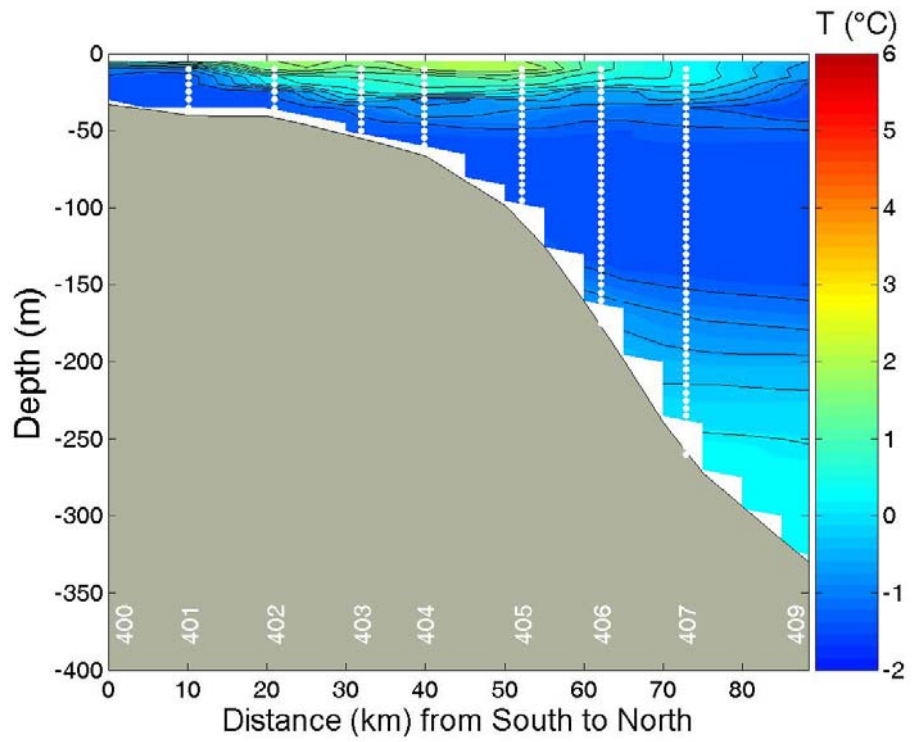
**APPENDIX 7.1** Rosette sampling stations for Leg 7 (May-June 2004).



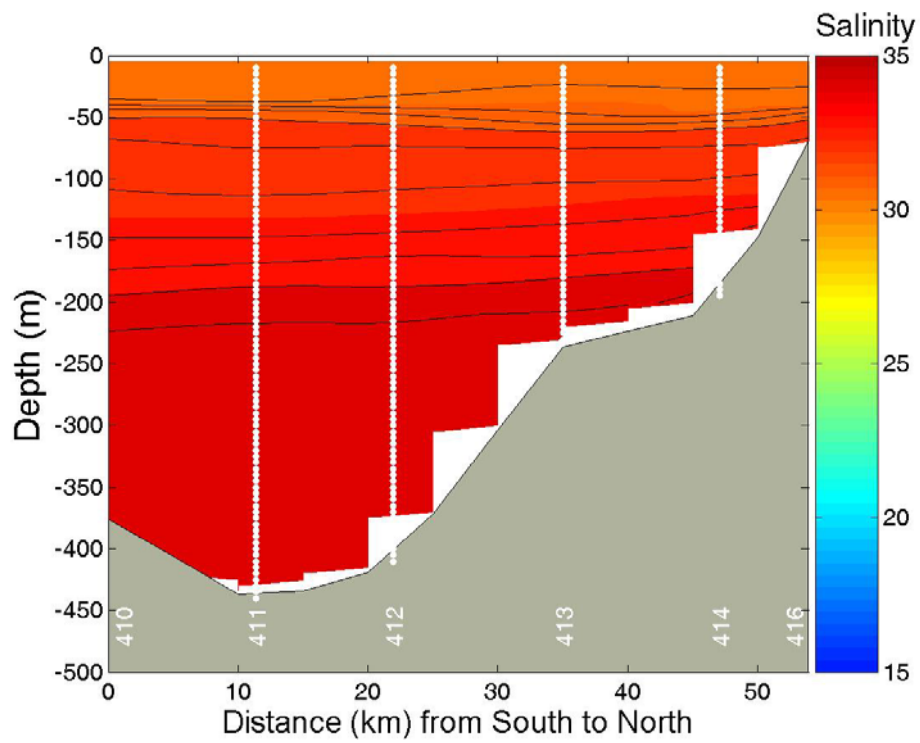
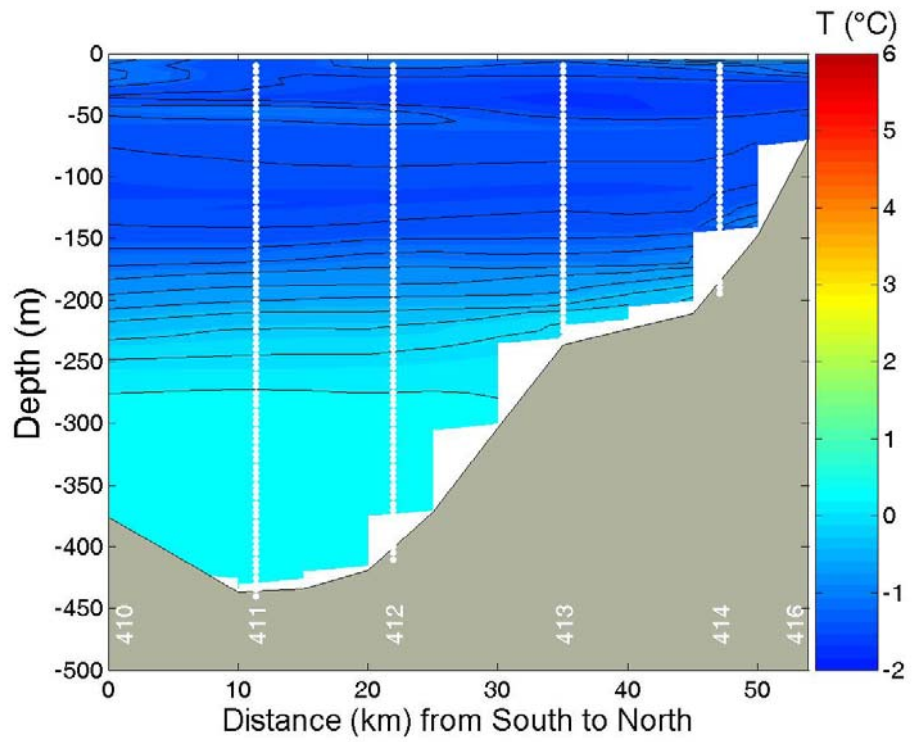
**APPENDIX 7.2** Potential temperature and salinity along section 100 Leg 7. West is on the left and East is on the right.



**APPENDIX 7.3** Potential temperature and salinity along section 300, Leg 7. North-West is on the left and South-East is on the right.



**APPENDIX 7.4** Potential temperature and salinity along western part of section 400, Leg 7. South-West is on the left and North-East is on the right.

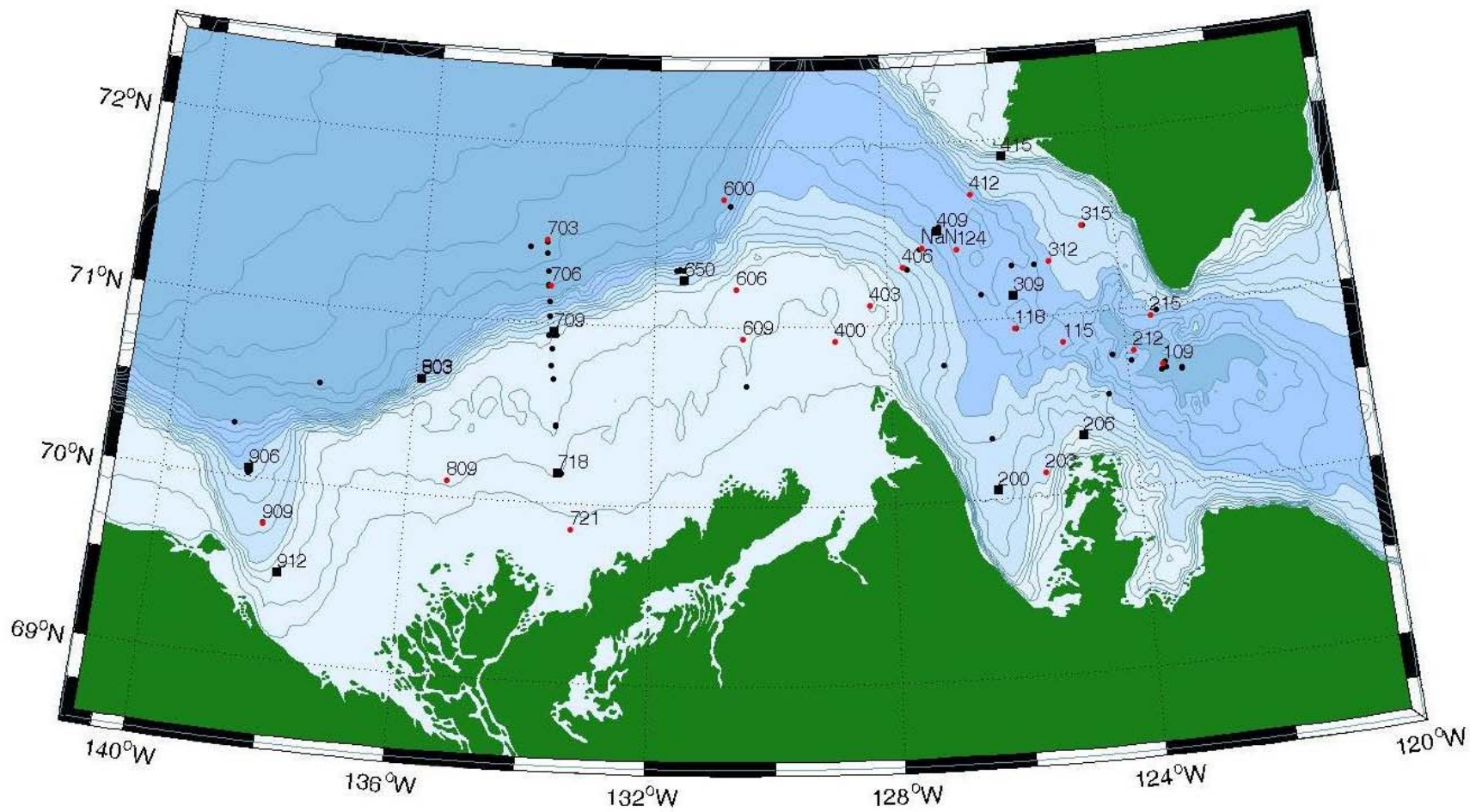


**APPENDIX 7.5** Potential temperature and salinity along eastern part of section 400, Leg 7. South-West is on the left and North-East is on the right.

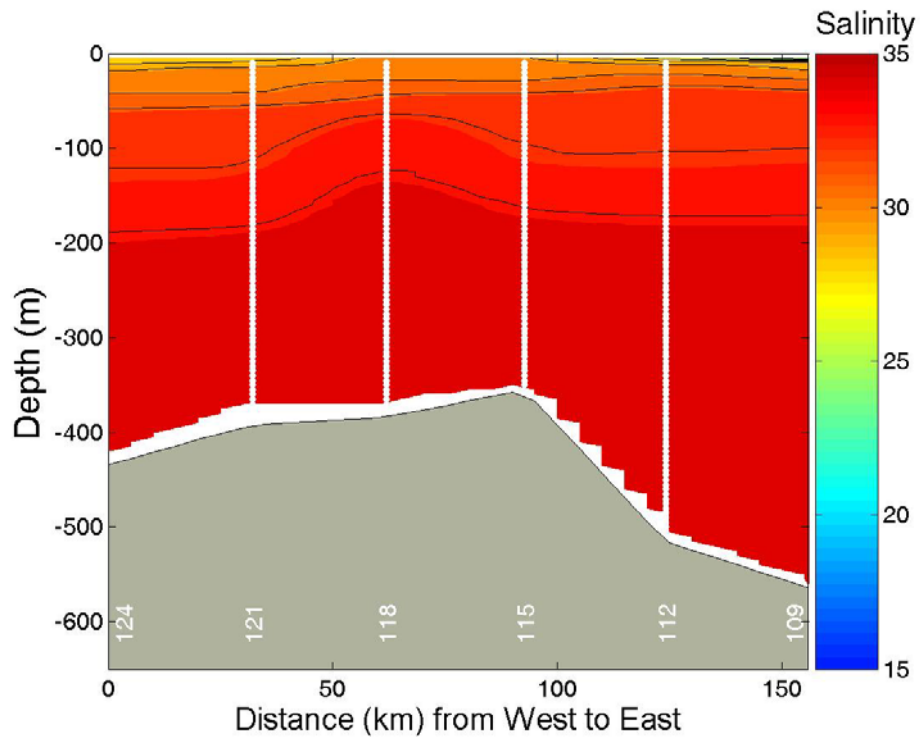
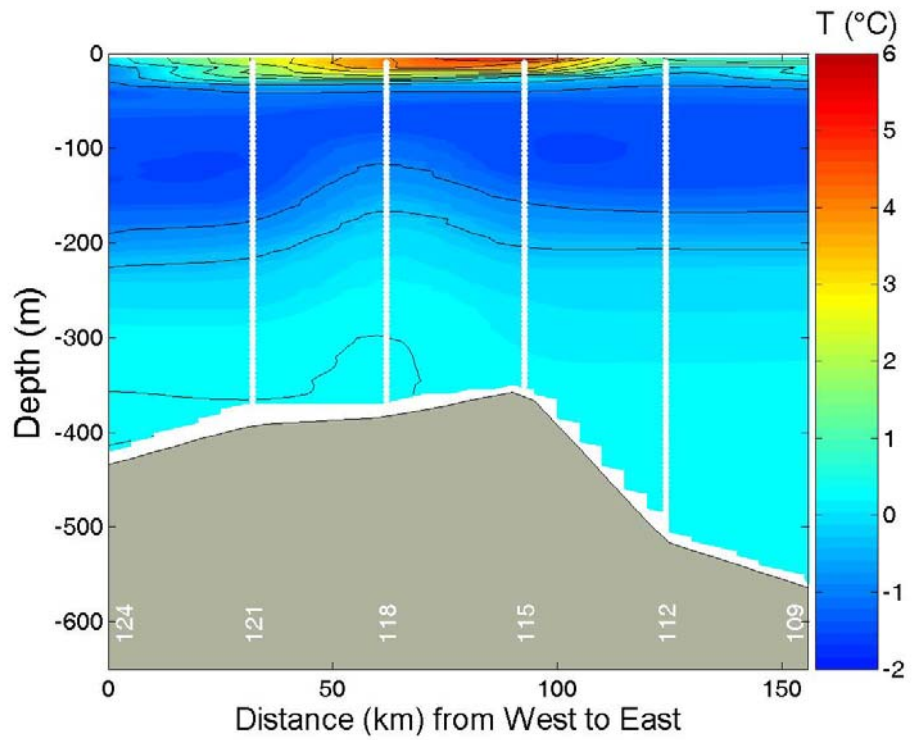
**APPENDIX 8.** Sections of salinity and potential temperature from CASES Rosette data.  
Leg 8 (June-July 2004).

The same color scale is used for all sections.

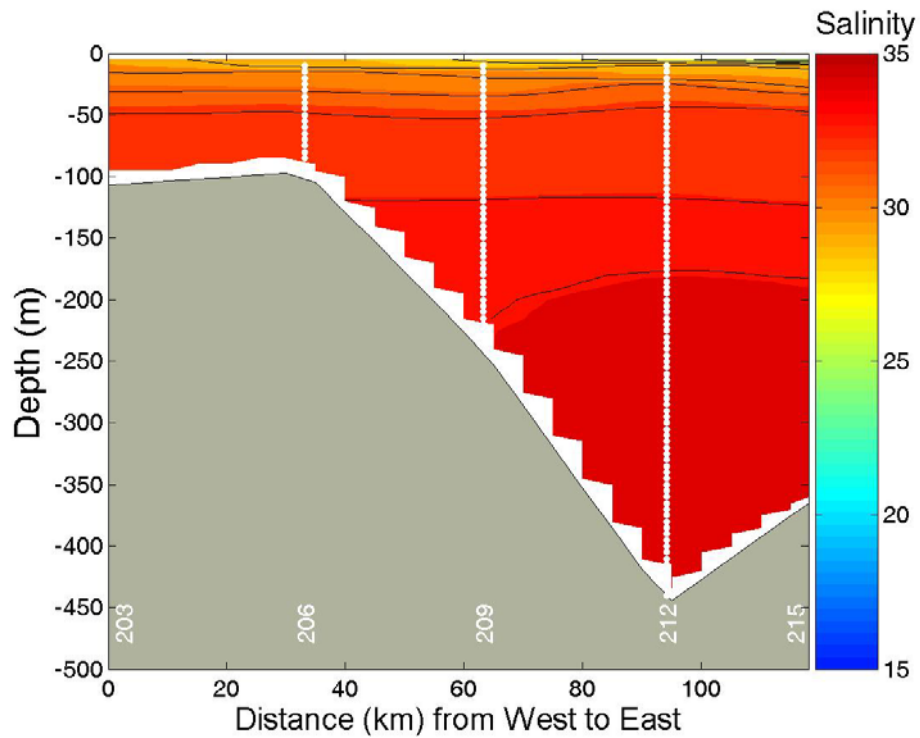
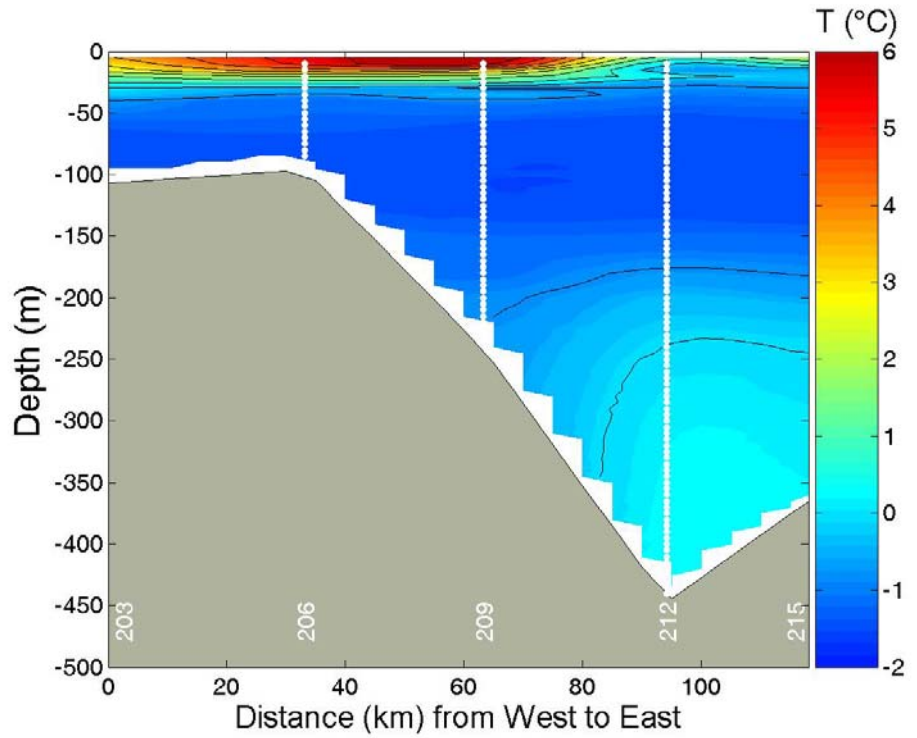
|     |                               |       |
|-----|-------------------------------|-------|
| 8.1 | Map of station locations..... | p. 78 |
| 8.2 | Section 100.....              | p. 79 |
| 8.3 | Section 200.....              | p. 80 |
| 8.4 | Section 300.....              | p. 81 |
| 8.5 | Section 400.....              | p. 82 |
| 8.6 | Section 700.....              | p. 83 |
| 8.7 | Section 900.....              | p. 84 |



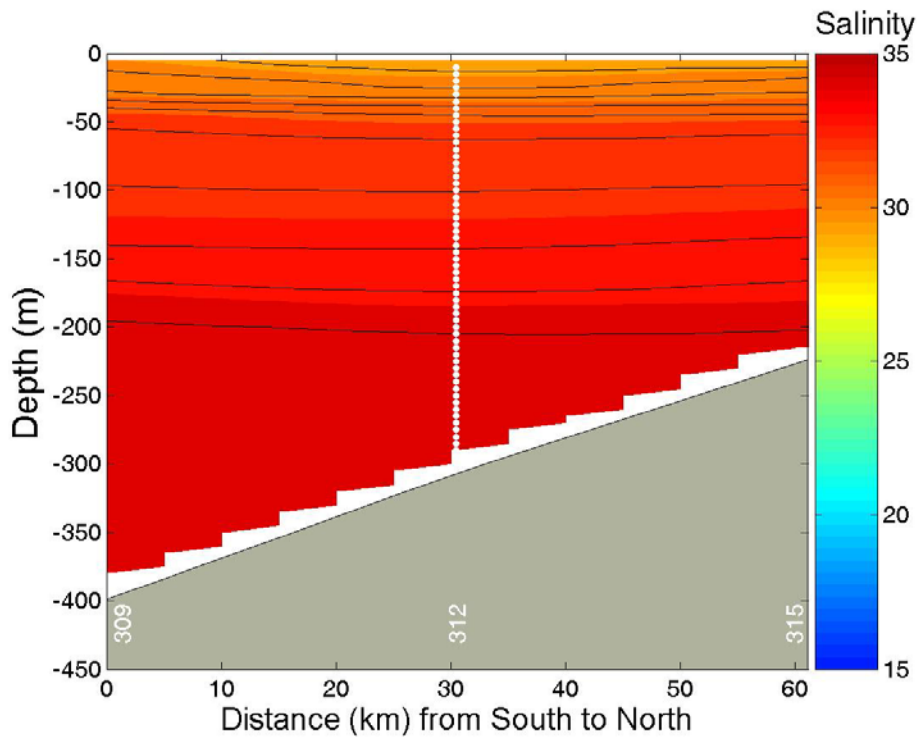
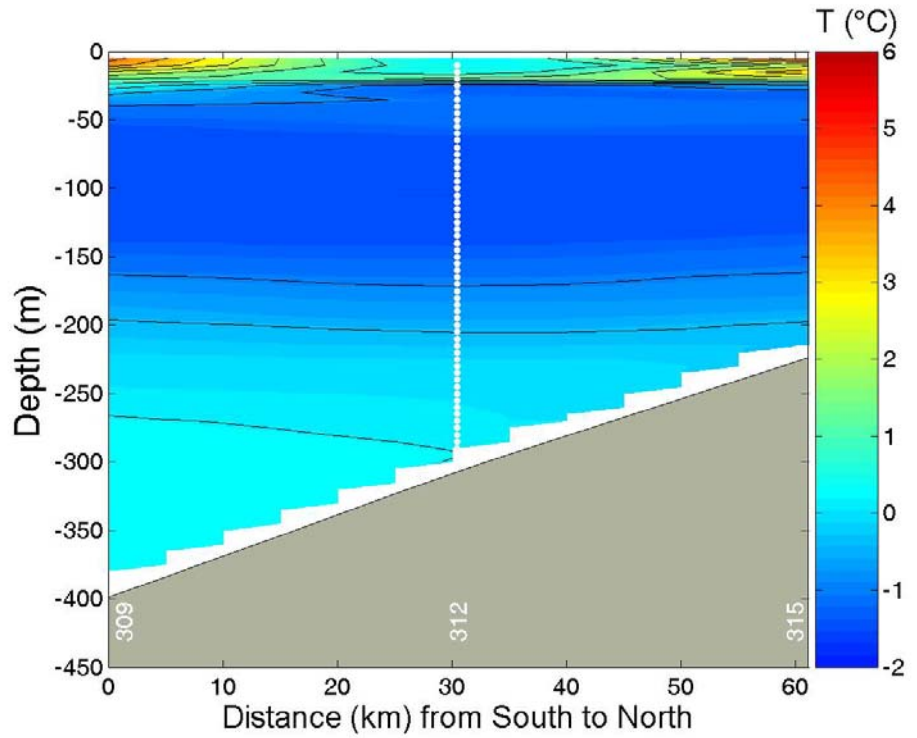
**APPENDIX 8.1** Rosette sampling stations for Leg 8 (June-July 2004).



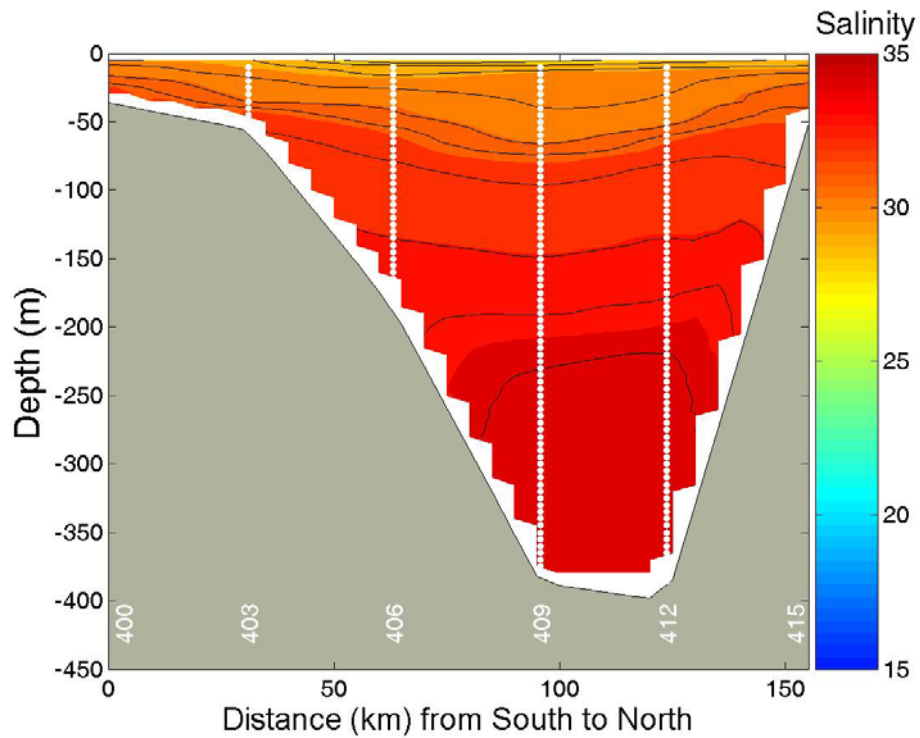
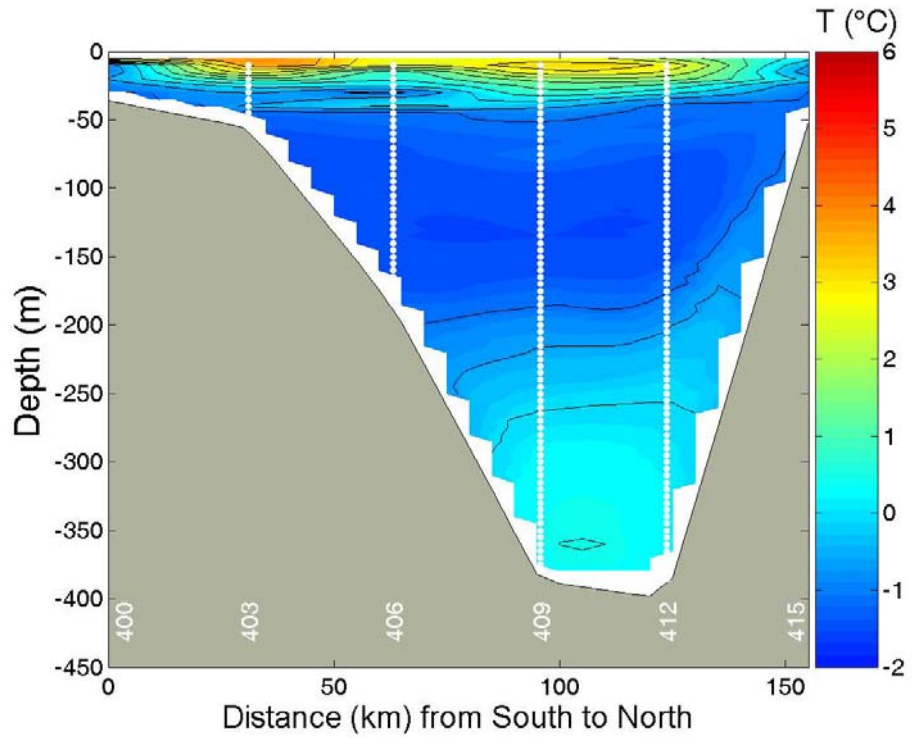
**APPENDIX 8.2** Potential temperature and salinity along section 100 of Leg 8. North-West is on the left and South-East is on the right.



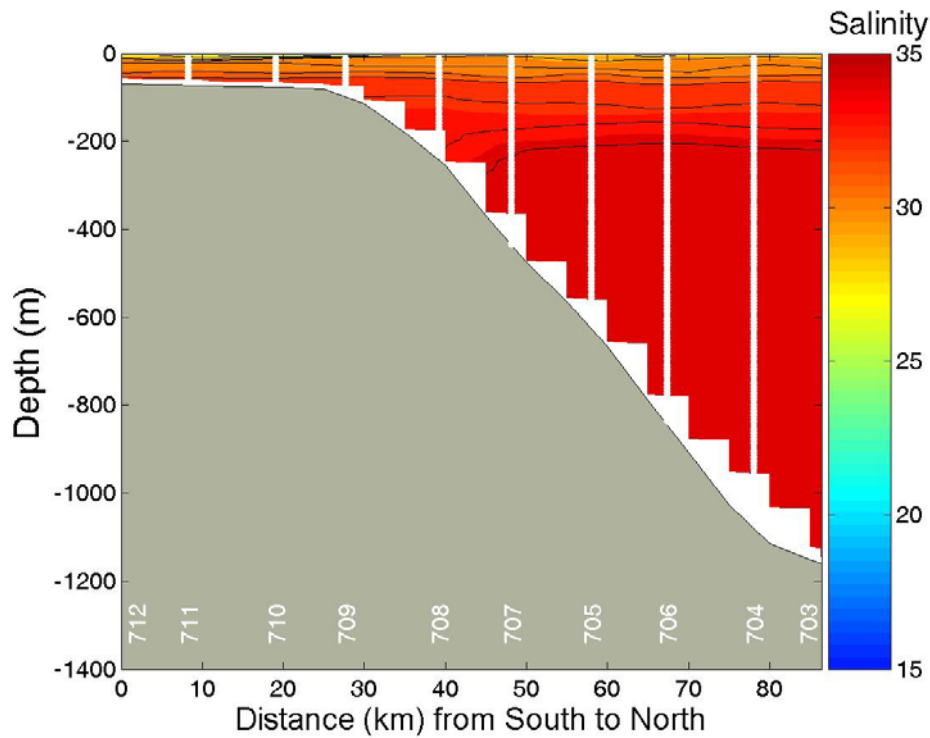
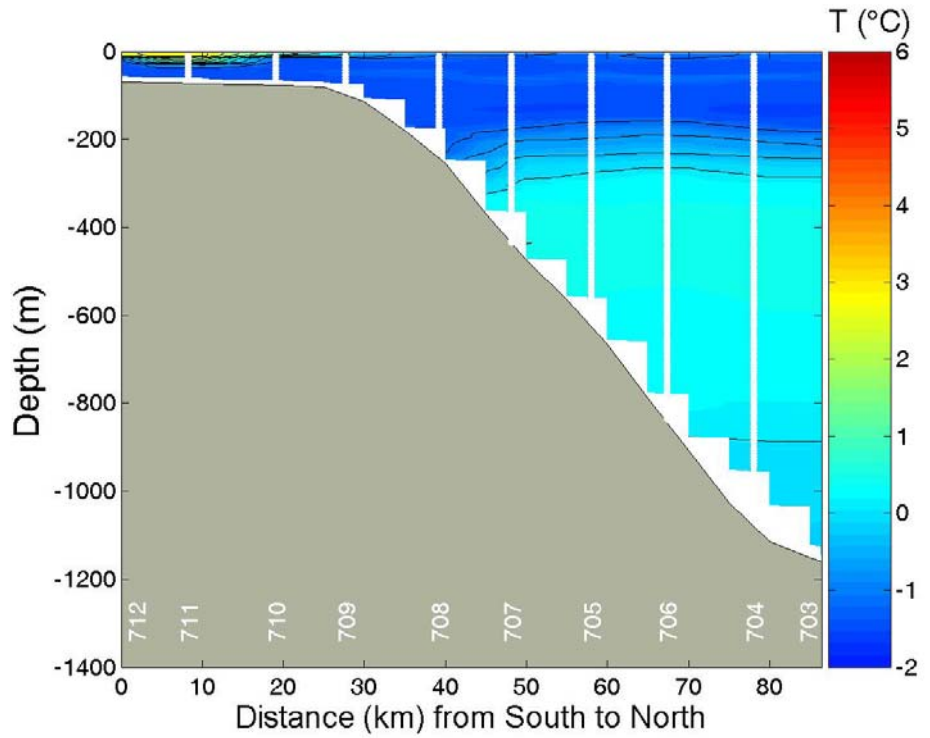
**APPENDIX 8.3** Potential temperature and salinity along section 200 of Leg 8. South-West is on the left and North-East is on the right.



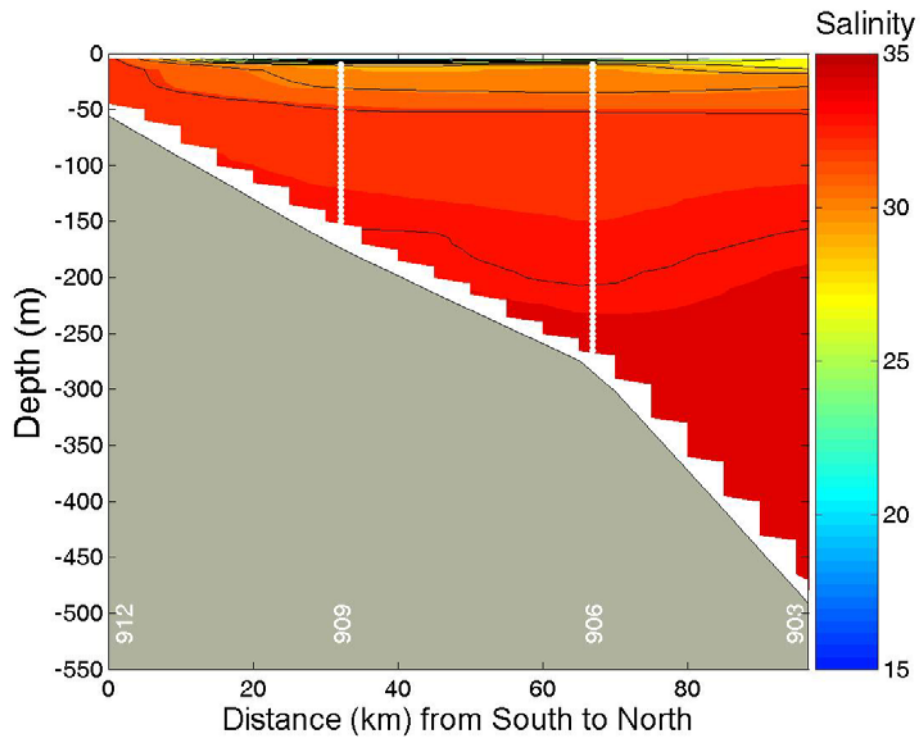
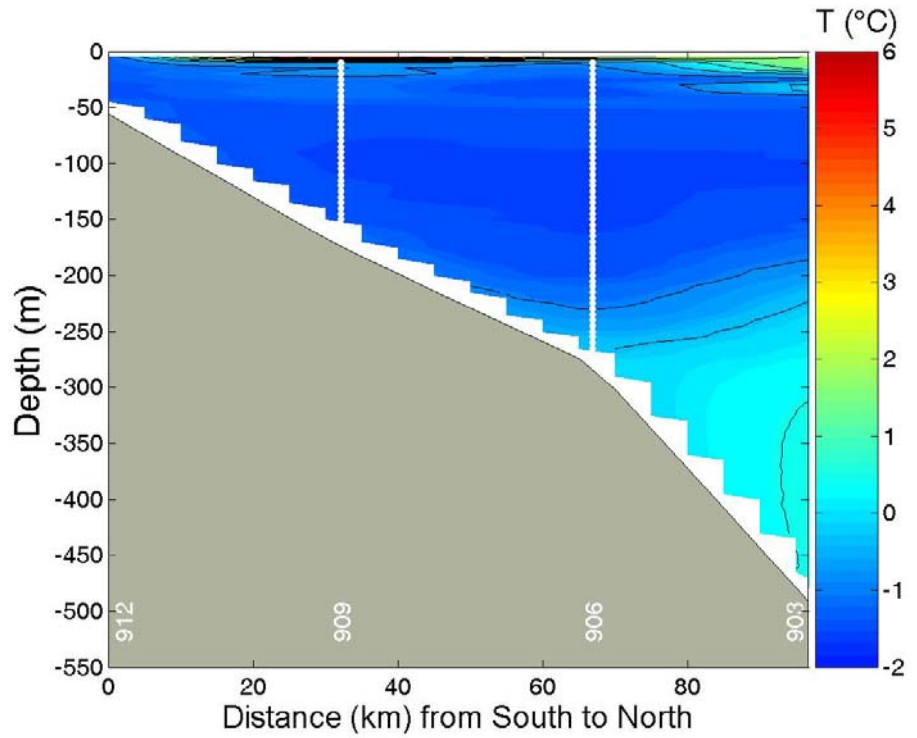
**APPENDIX 8.4** Potential temperature and salinity along section 300 of Leg 8. South-West is on the left and North-East is on the right.



**APPENDIX 8.5** Potential temperature and salinity along section 400 of Leg 8. South-West is on the left and North-East is on the right.



**APPENDIX 8.6** Potential temperature and salinity along section 700 of Leg 8. South is on the left and North is on the right.



**APPENDIX 8.7** Potential temperature and salinity along section 900 of Leg 8. South is on the left and North is on the right.

**APPENDIX 9.** MVP section locations, sampling time, water depth and corresponding station or mooring numbers, CASES scientific expeditions 2004.

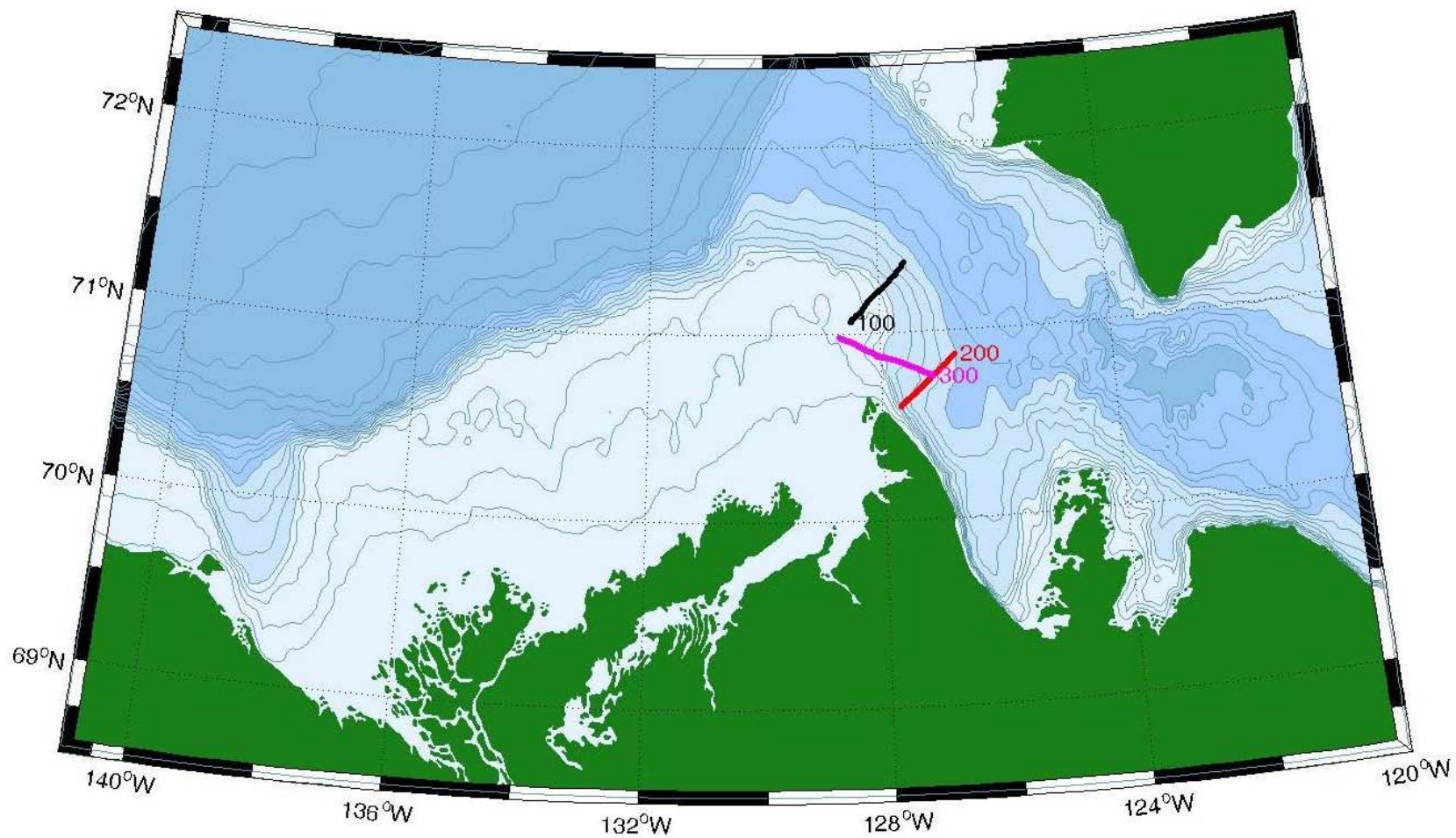
**APPENDIX 9.** Summary of MVP logbook, CASES scientific Legs 2004.

| Leg Number  | Section I.D. | Date        |           | Sampling time |           | Coordonates  |           |               |           | Number of casts |
|-------------|--------------|-------------|-----------|---------------|-----------|--------------|-----------|---------------|-----------|-----------------|
|             |              | Start (UTC) | End (UTC) | Start (UTC)   | End (UTC) | Latitude (N) |           | Longitude (W) |           |                 |
|             |              |             |           |               |           | Start        | End       | Start         | End       |                 |
| 7           | 0404mvp100   | June 17     | June 18   | 23:15         | 05:54     | 71°07.53     | 71°22.33  | 128°17.33     | 127°31.46 | 86              |
|             | 0404mvp200   | June 18     | June 19   | 17:36         | 03:21     | 70°52.36     | 70°43.99  | 126°43.44     | 127°12.85 | 98              |
|             | 0404mvp300   | June 20     | June 21   | 12:22         | 01:39     | 70°45.91     | 70°58.90  | 127°07.04     | 128°42.23 | 131             |
| 8           | 0405mvp100   | June 25     | June 25   | 05:02         | 15:27     | 70°25.88     | 70°45.77  | 125°15.57     | 127°06.06 | 88              |
|             | 0405mvp200   | June 26     | June 26   | 02:09         | 16:44     | 70°45.81     | 71°41.09  | 127°06.07     | 130°17.01 | 192             |
|             | 0405mvp300   | June 27     | June 27   | 10:08         | 15:34     | 71°19.82     | 70°57.35  | 130°39.23     | 130°26.66 | 84              |
|             | 0405mvp400   | June 28     | June 28   | 03:11         | 04:07     | 71°06.28     | 71°10.97  | 130°25.00     | 130°20.76 | 17              |
|             | 0405mvp500   | June 29     | June 29   | 19:21         | 23:47     | 70°30.65     | 70°10.47  | 133°37.82     | 133°32.16 | 76              |
|             | 0405mvp600   | July 2      | July 2    | 06:43         | 12:53     | 70°06.01     | 70°34.56  | 135°21.14     | 135°49.53 | 84              |
|             | 0405mvp700   | July 2      | July 3    | 20:53         | 00:54     | 70°39.81     | 70°54.55  | 135°55.92     | 136°09.43 | 56              |
|             | 0405mvp800   | July 5      | July 5    | 17:21         | 21:21     | 69°44.00     | 69°30.17  | 138°17.37     | 137°57.54 | 102             |
|             | 0405mvp900   | July 8      | July 8    | 03:49         | 05:34     | 70°18.66     | 70°35.00  | 135°26.73     | 135°46.37 | 23              |
|             | 0405mvp1000  | July 9      | July 9    | 11:26         | 12:29     | 70°43.83     | 70°51.98  | 135°34.46     | 135°21.26 | 8               |
|             | 0405mvp1100  | July 10     | July 10   | 04:24         | 20:14     | 70°37.25     | 70°26.47  | 133°39.62     | 133°37.13 | 50              |
|             | 0405mvp1200  | July 11     | July 11   | 01:03         | 04:18     | 70°24.66     | 70°11.32  | 133°34.73     | 133°31.21 | 63              |
|             | 0405mvp 1400 | July 16     | July 16   | 08:41         | 12:14     | 70°18.48     | 70°03.81  | 126°20.24     | 126°17.91 | 34              |
|             | 0405mvp1500  | July 17     | July 18   | 22:30         | 01:41     | 70°24.27     | 70°55.75  | 126°27.76     | 126°14.80 | 26              |
|             | 0405mvp1600  | July 18     | July 18   | 13:29         | 14:00     | 70°59.29     | 71°03.15  | 125°51.06     | 125°48.66 | 5               |
|             | 0405mvp1700  | July 25     | July 25   | 21:39         | 22:58     | 71°05.47     | 71°08.32  | 130°57.86     | 131°36.20 | 58              |
|             | 0405mvp1800  | July 26     | July 26   | 02:44         | 07:54     | 71°04.48     | 70°45.35  | 133°11.71     | 135°10.28 | 98              |
|             | 0405mvp1900  | July 27     | July 27   | 16:34         | 17:22     | 71°07.82     | 71°15.46  | 133°57.00     | 134°03.57 | 5               |
| 0405mvp2000 | July 28      | July 28     | 01:21     | 11:41         | 71°19.27  | 71°17.37     | 133°39.80 | 128°36.41     | 137       |                 |
| 0405mvp2100 | August 1     | August 1    | 05:45     | 06:15         | 70°26.30  | 70°22.44     | 124°35.05 | 124°43.56     | 7         |                 |
| 9           | 0406mvp100   | August 7    | August 7  | 16:26         | 23:53     | 70°04.35     | 71°16.69  | 126°11.14     | 126°23.35 | 60              |

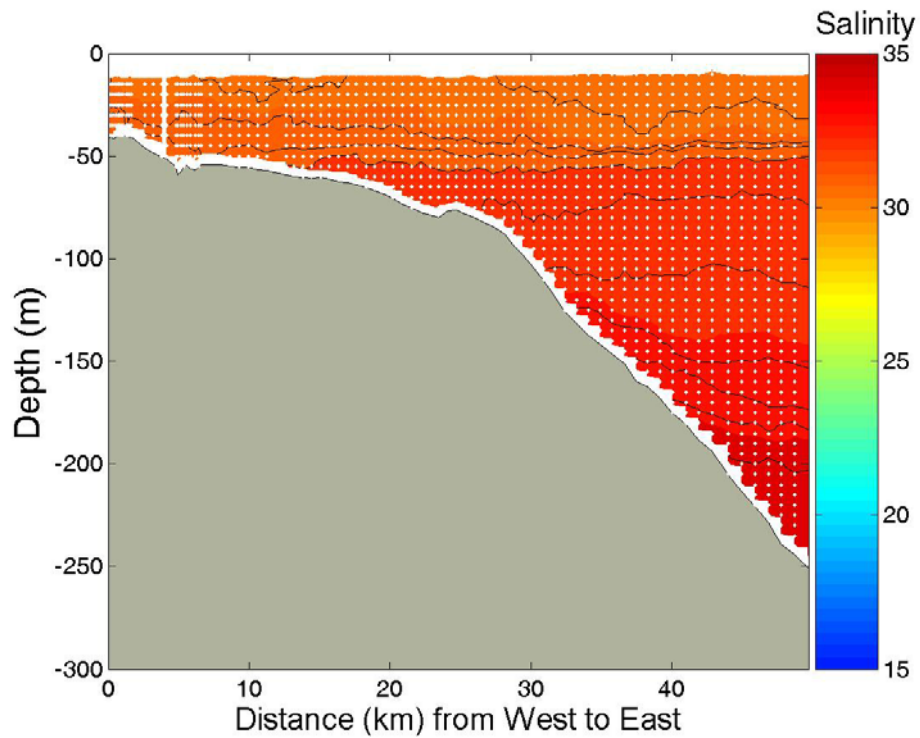
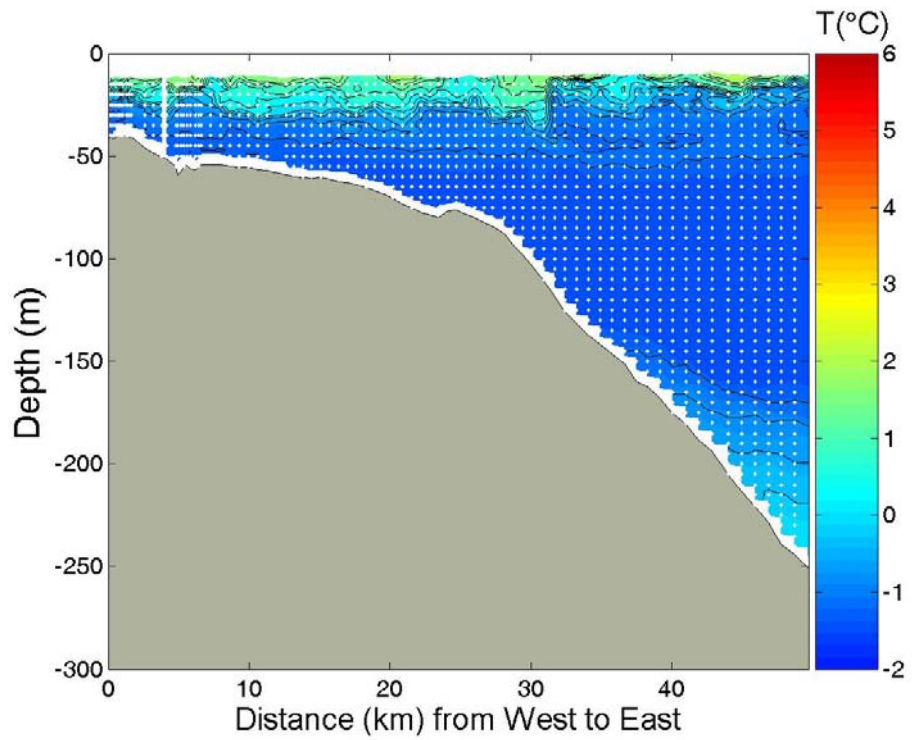
**APPENDIX 10.** Sections of salinity and potential temperature from MVP data.  
Leg 7 (May-June 2004).

The same color scale is used for all sections.

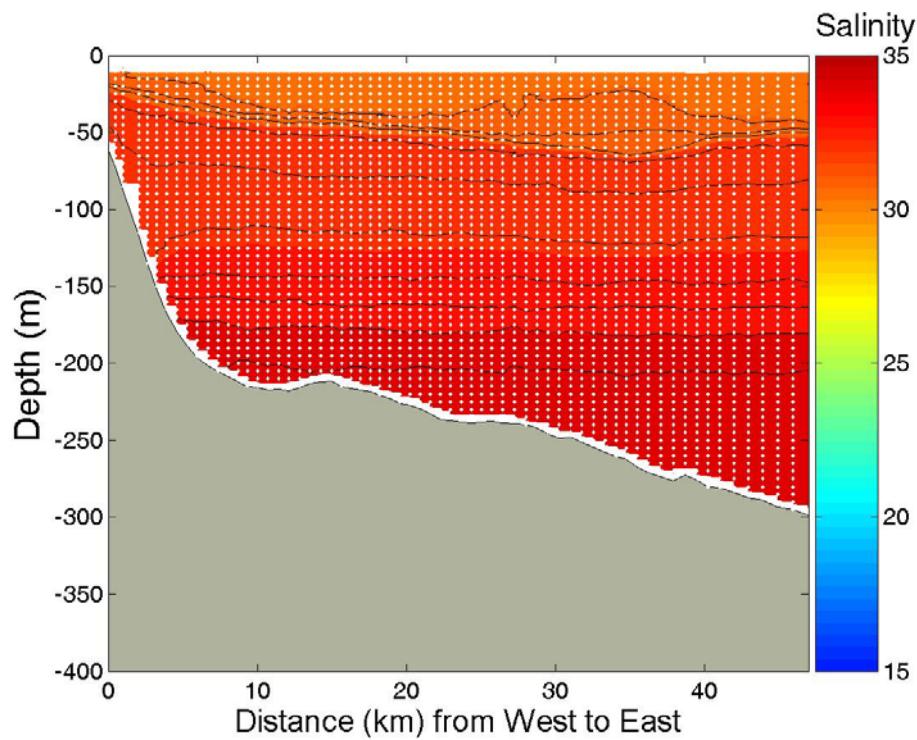
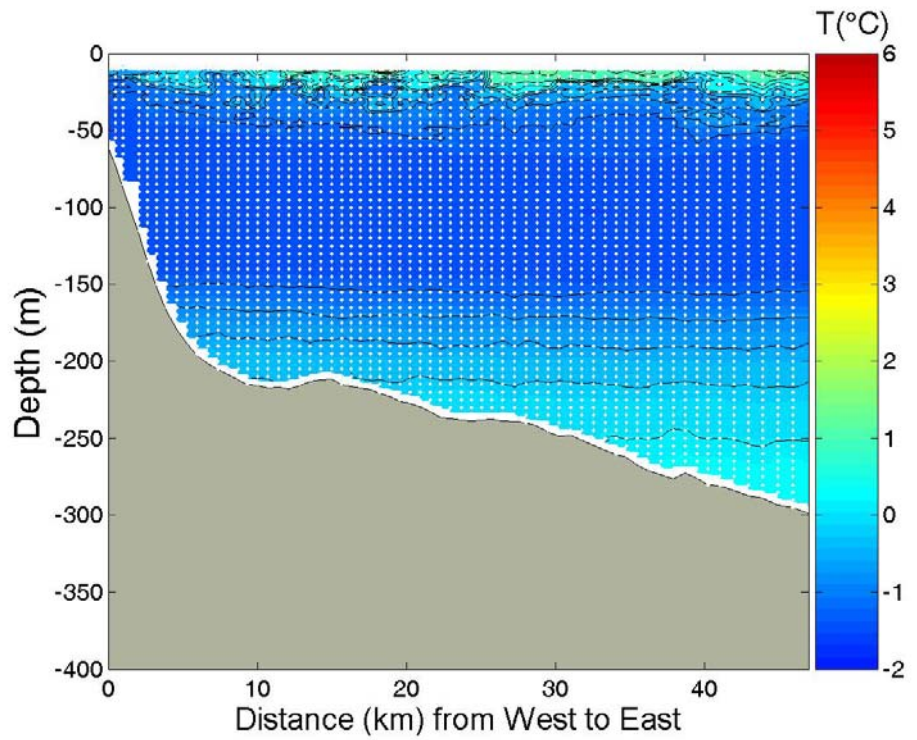
|      |                               |       |
|------|-------------------------------|-------|
| 10.1 | Map of section locations..... | p. 88 |
| 10.2 | Section 100.....              | p. 89 |
| 10.3 | Section 200.....              | p. 90 |
| 10.4 | Section 300.....              | p. 91 |



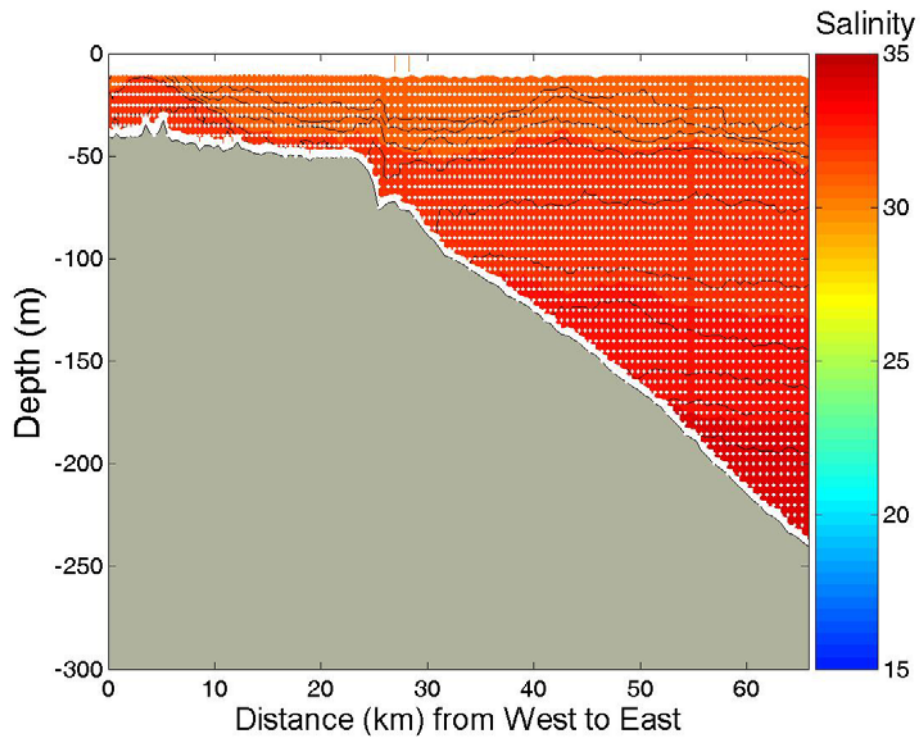
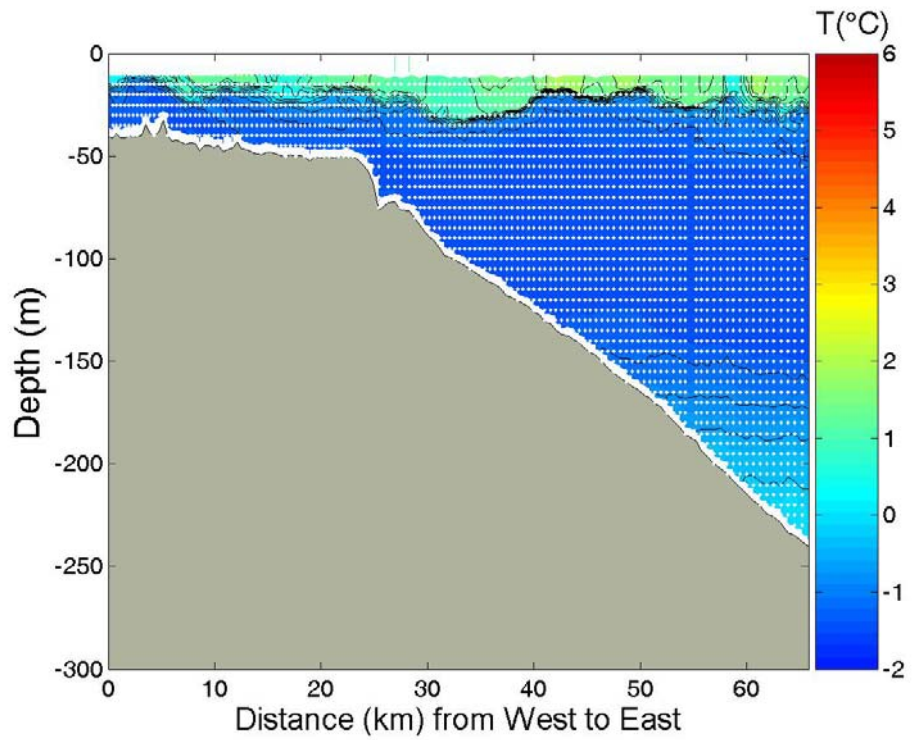
APPENDIX 10.1 MVP sections for Leg 7 (May-June 2004).



**APPENDIX 10.2** Potential temperature and salinity along section 100, Leg 7. South-West is on the left and North-East is on the right.



**APPENDIX 10.3** Potential temperature and salinity along section 200, Leg 7. South-West is on the left and North-East is on the right.

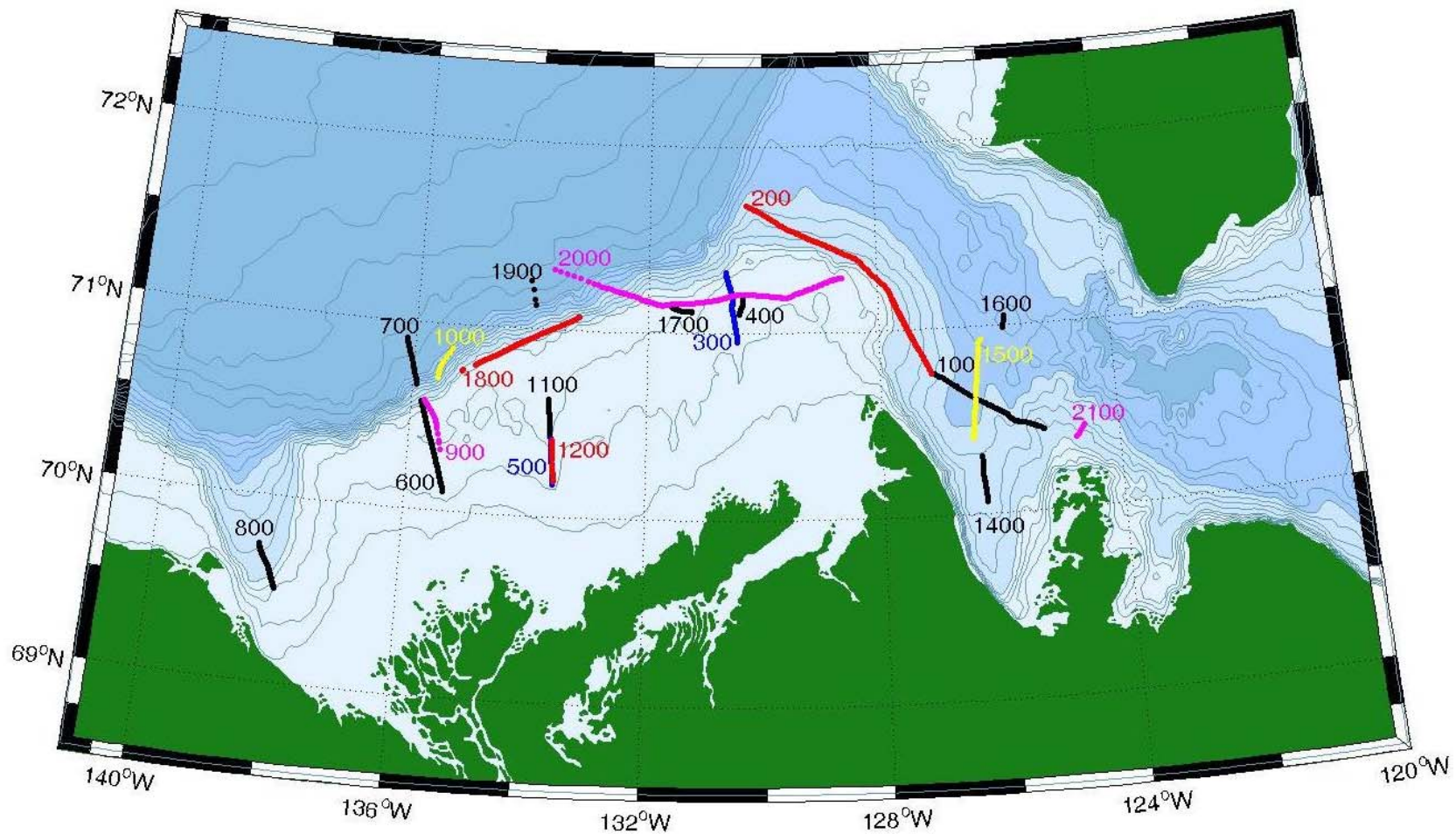


**APPENDIX 10.4** Potential temperature and salinity along section 300, Leg 7. North-West is on the left and South-East is on the right.

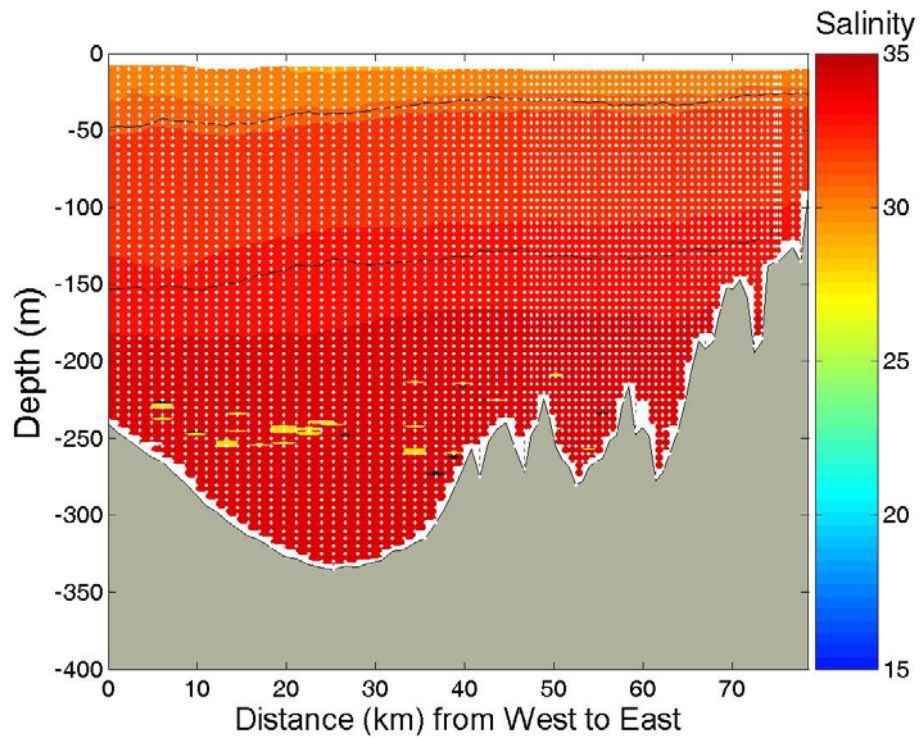
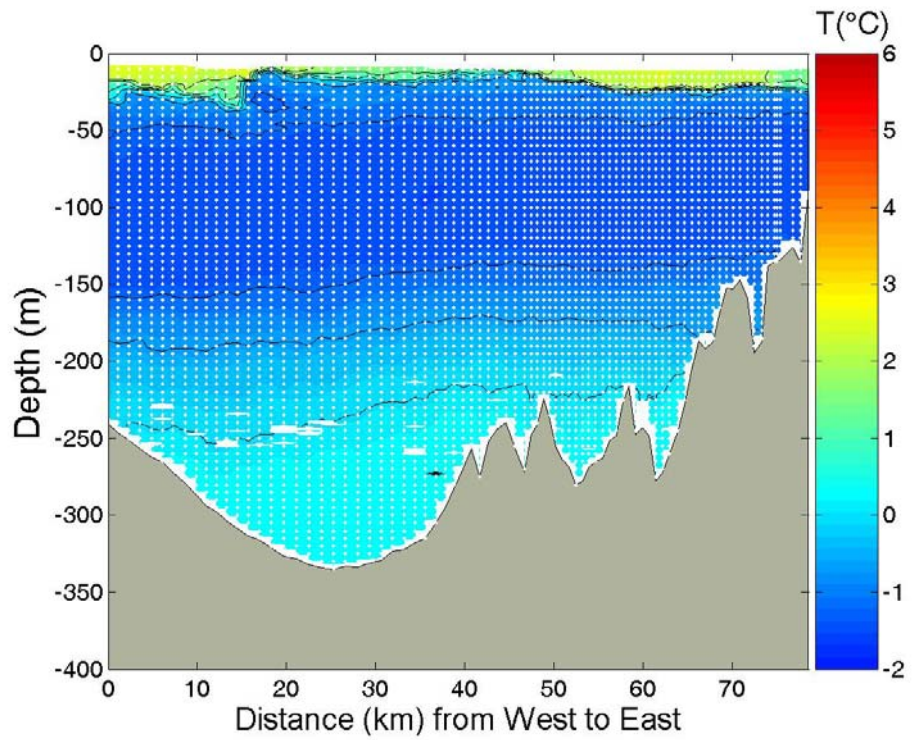
**APPENDIX 11. Sections of salinity and potential temperature from MVP data.  
Leg 8 (June-July 2004).**

The same color scale is used for all sections.

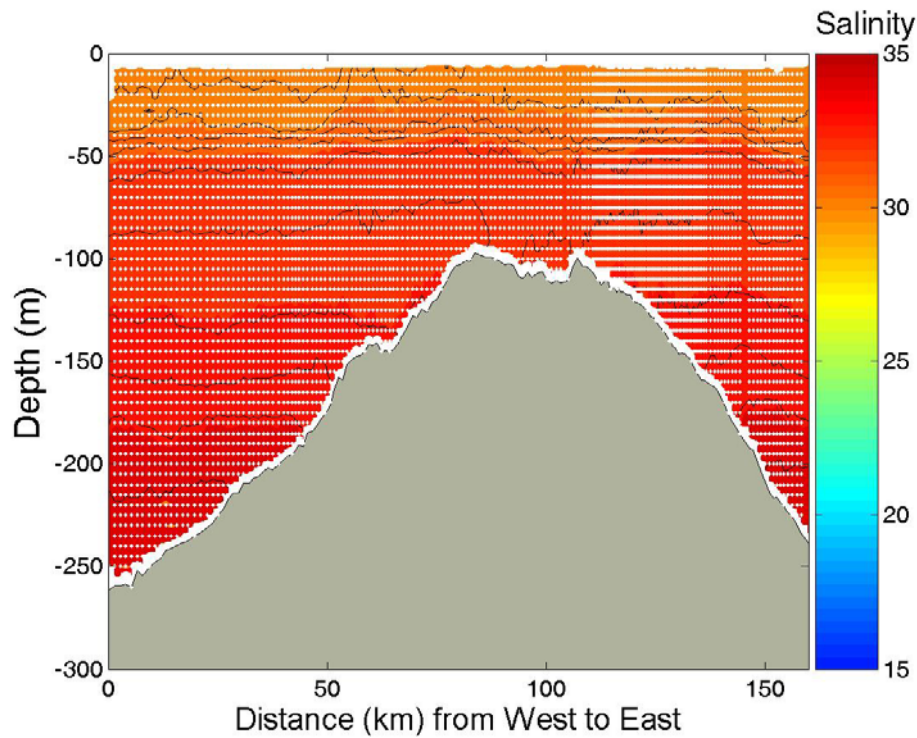
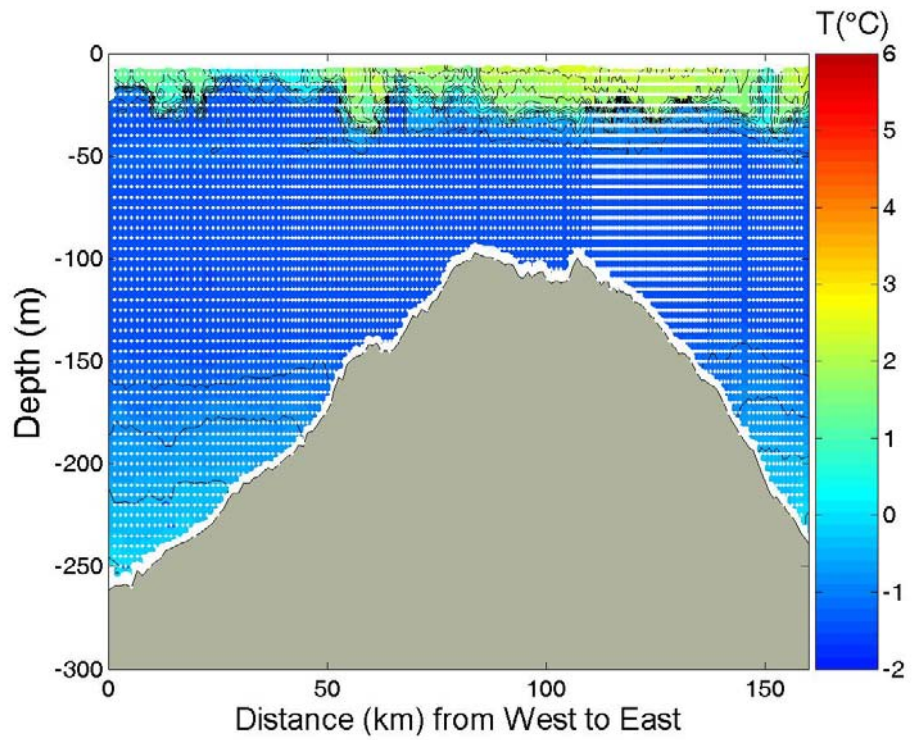
|       |                               |        |
|-------|-------------------------------|--------|
| 11.1  | Map of section locations..... | p. 93  |
| 11.2  | Section 100.....              | p. 94  |
| 11.3  | Section 200.....              | p. 95  |
| 11.4  | Section 300.....              | p. 96  |
| 11.5  | Section 400.....              | p. 97  |
| 11.6  | Section 500.....              | p. 98  |
| 11.7  | Section 600.....              | p. 99  |
| 11.8  | Section 700.....              | p. 100 |
| 11.9  | Section 800.....              | p. 101 |
| 11.10 | Section 900.....              | p. 102 |
| 11.11 | Section 1000.....             | p. 103 |
| 11.12 | Section 1100.....             | p. 104 |
| 11.13 | Section 1200.....             | p. 105 |
| 11.14 | Section 1400.....             | p. 106 |
| 11.15 | Section 1500.....             | p. 107 |
| 11.16 | Section 1600.....             | p. 108 |
| 11.17 | Section 1700.....             | p. 109 |
| 11.18 | Section 1800.....             | p. 110 |
| 11.19 | Section 1900.....             | p. 111 |
| 11.20 | Section 2000.....             | p. 112 |
| 11.21 | Section 2100.....             | p. 113 |



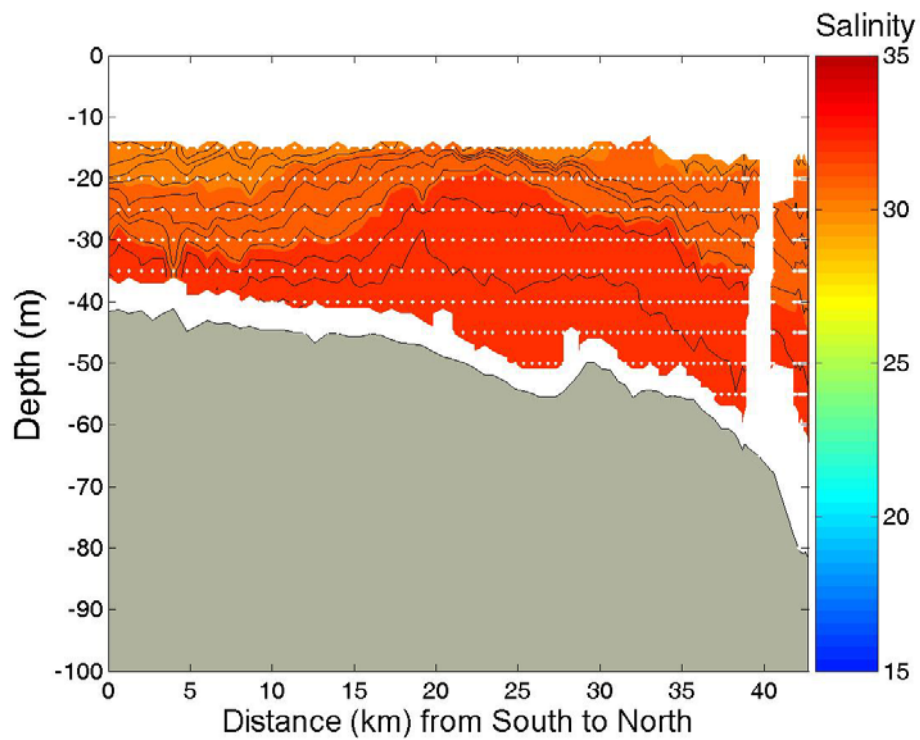
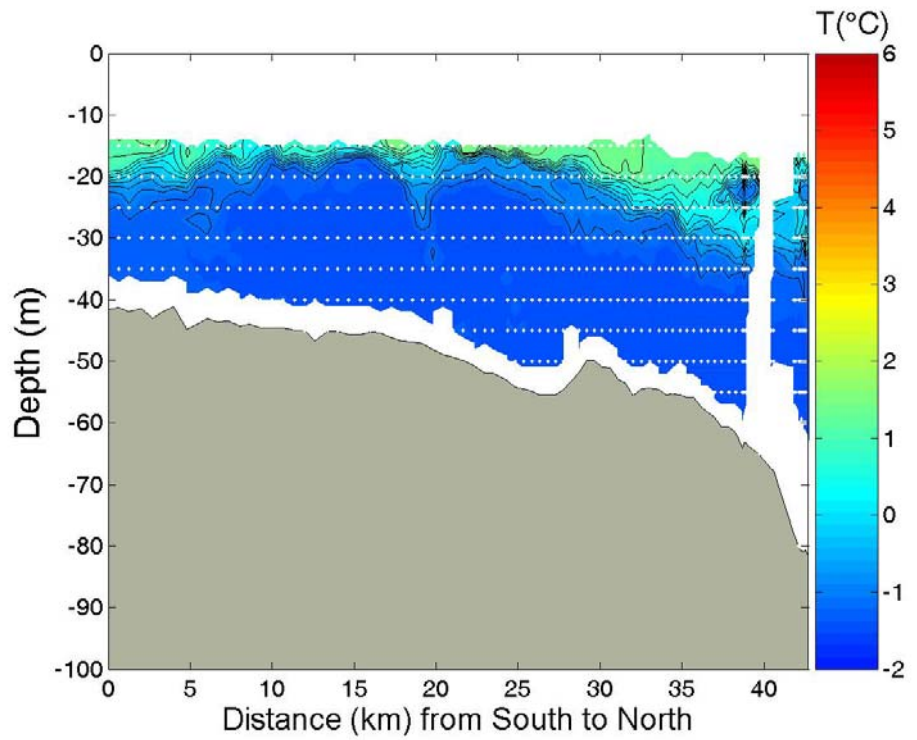
APPENDIX 11.1 MVP sections for Leg 8 (June-July 2004).



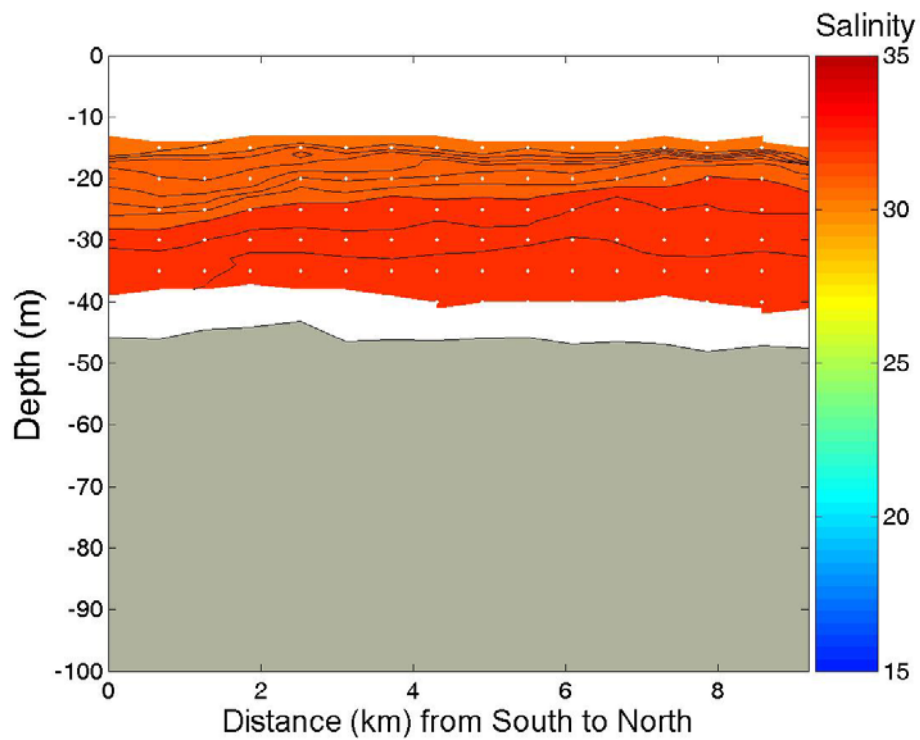
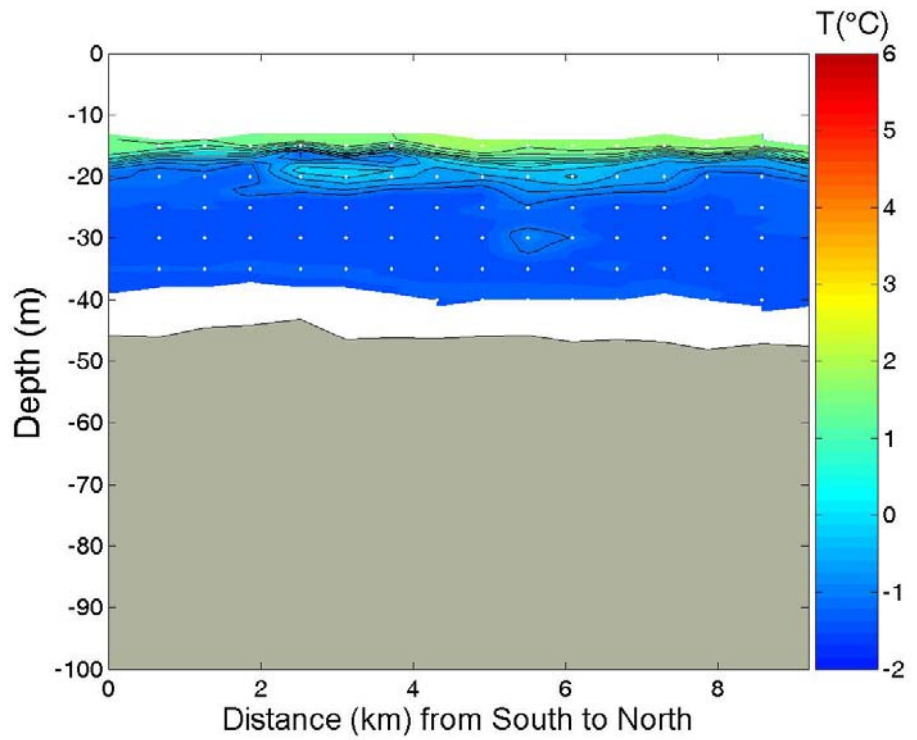
**APPENDIX 11.2** Potential temperature and salinity along section 100, Leg 8. North-West is on the left and South-East is on the right.



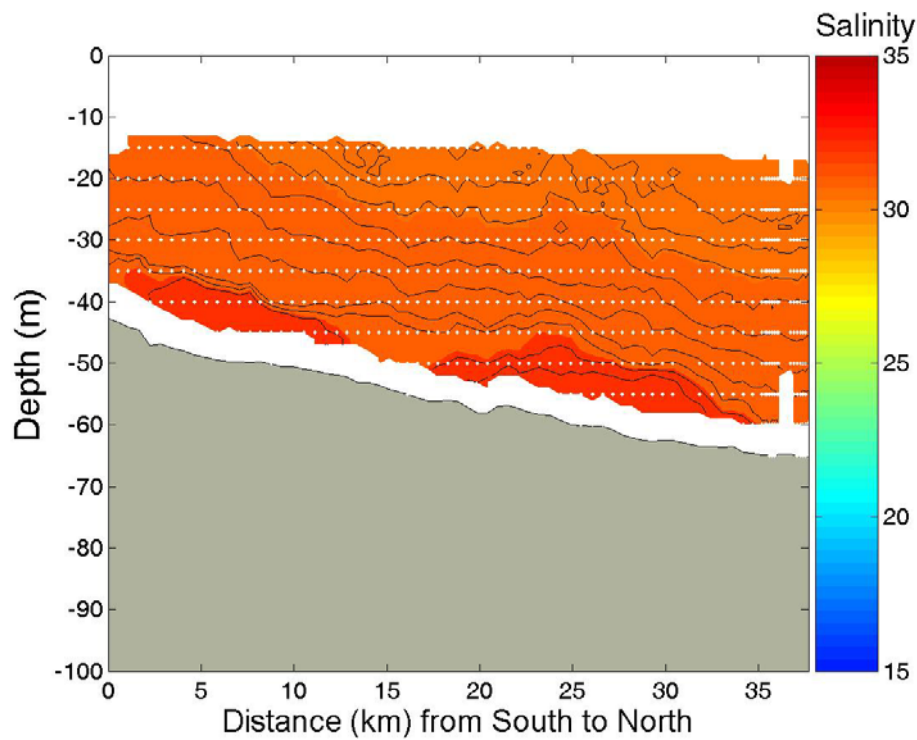
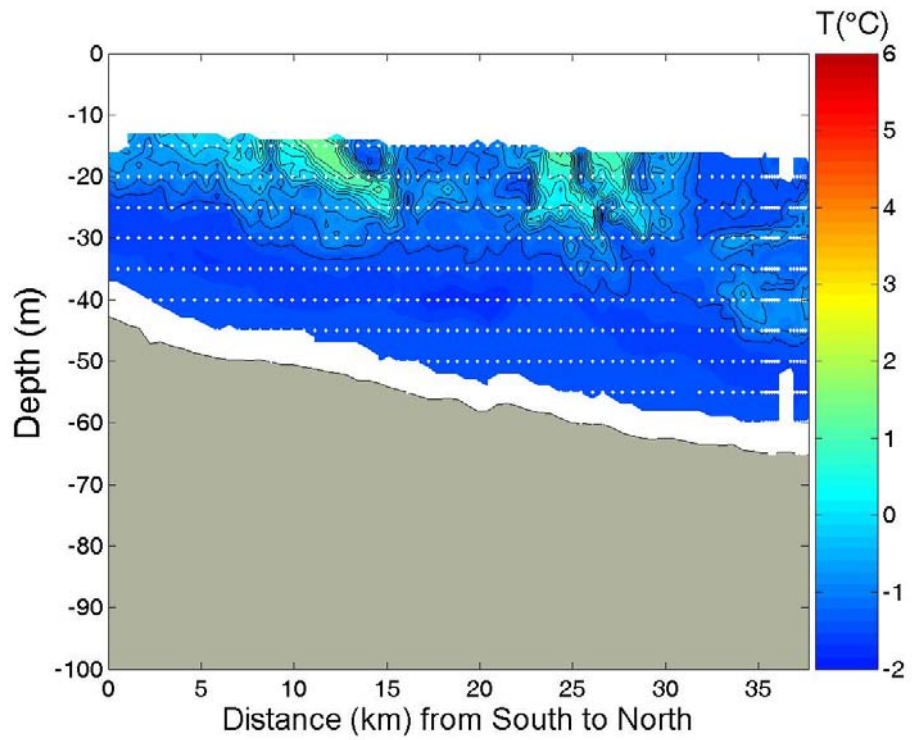
**APPENDIX 11.3** Potential temperature and salinity along section 200, Leg 8. North-West is on the left and South-East is on the right.



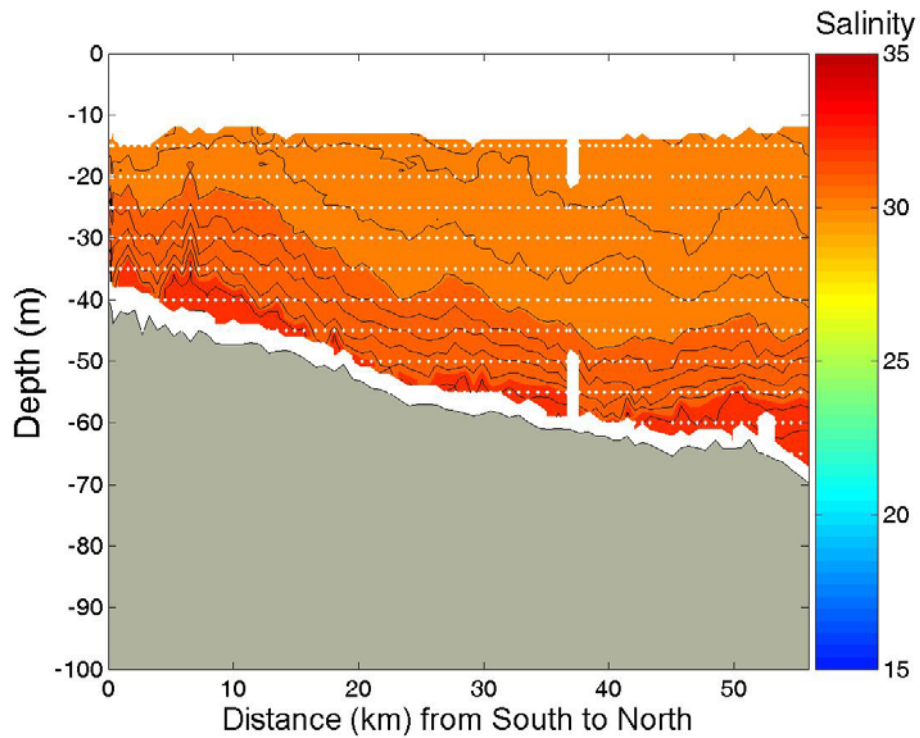
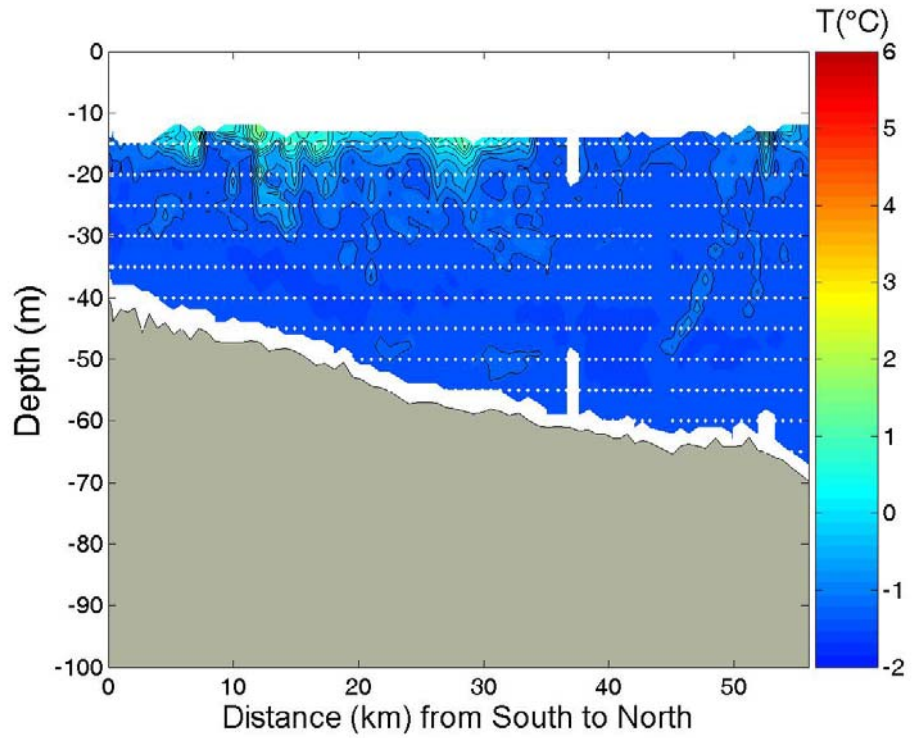
**APPENDIX 11.4** Potential temperature and salinity along section 300, Leg 8. South is on the left and North is on the right.



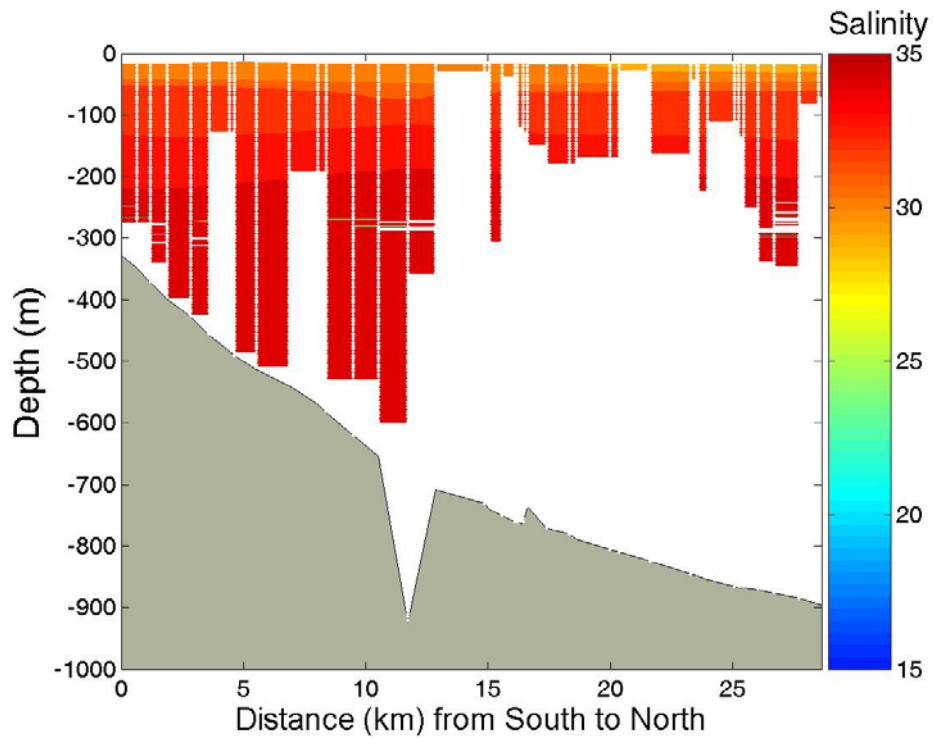
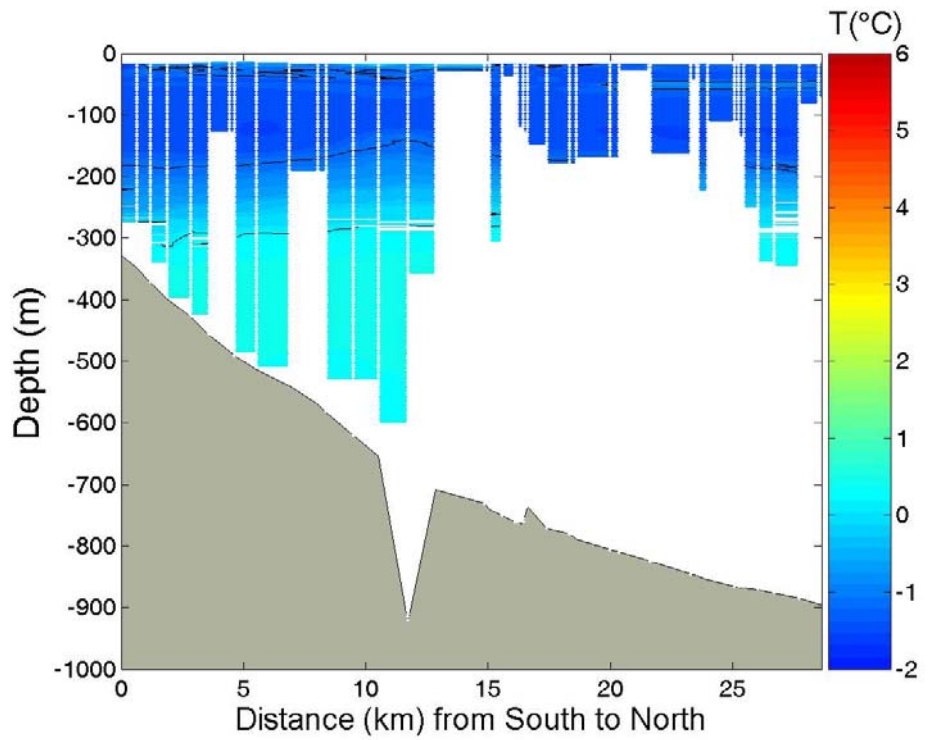
**APPENDIX 11.5** Potential temperature and salinity along section 400, Leg 8. South is on the left and North is on the right.



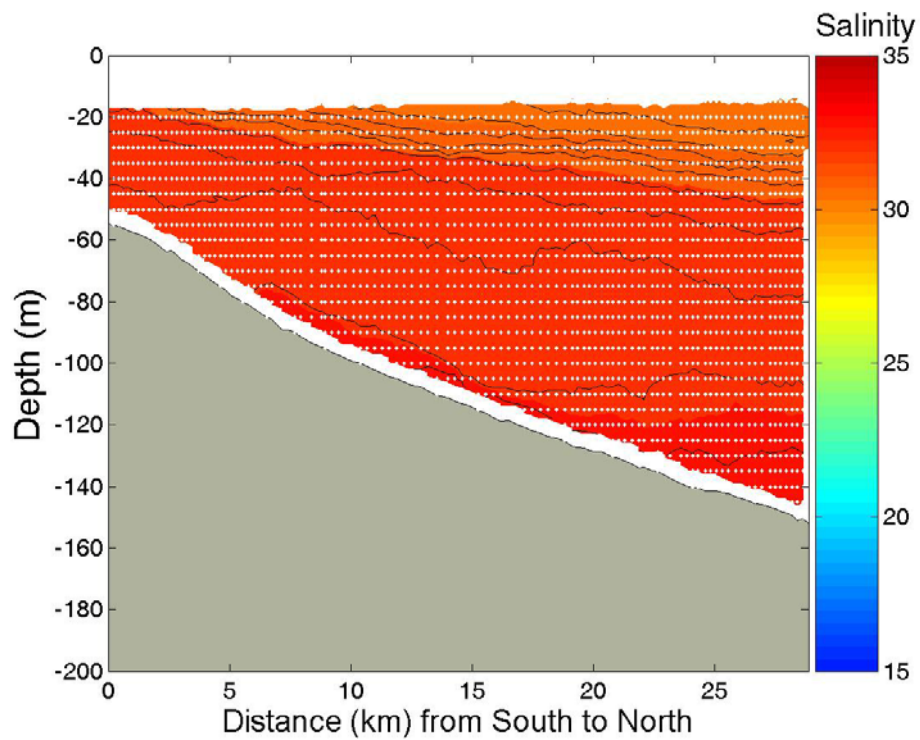
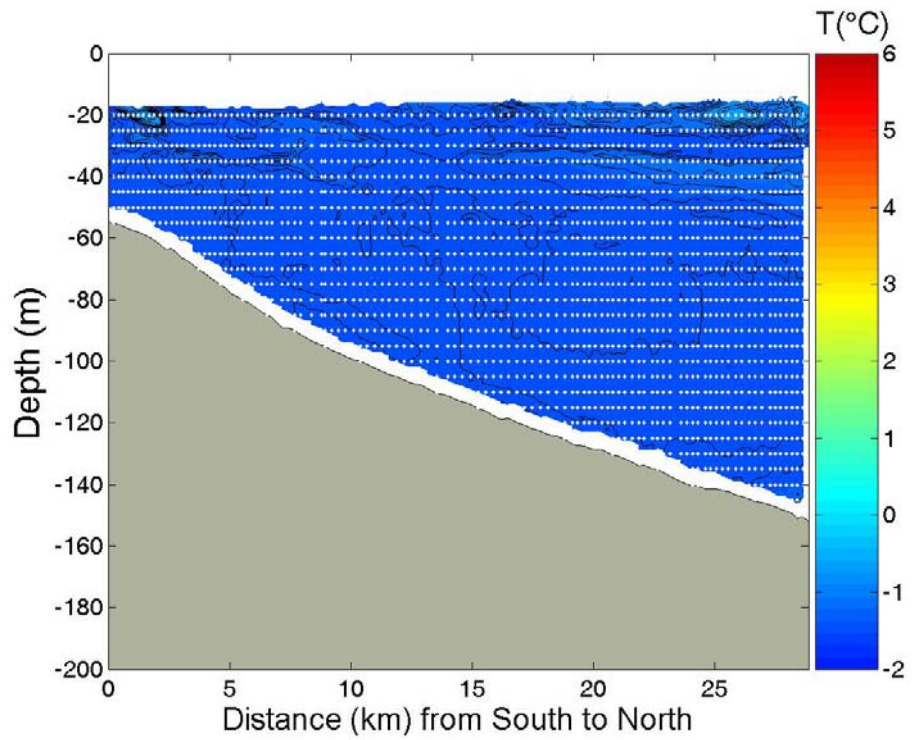
**APPENDIX 11.6** Potential temperature and salinity along section 500, Leg 8. South is on the left and North is on the right.



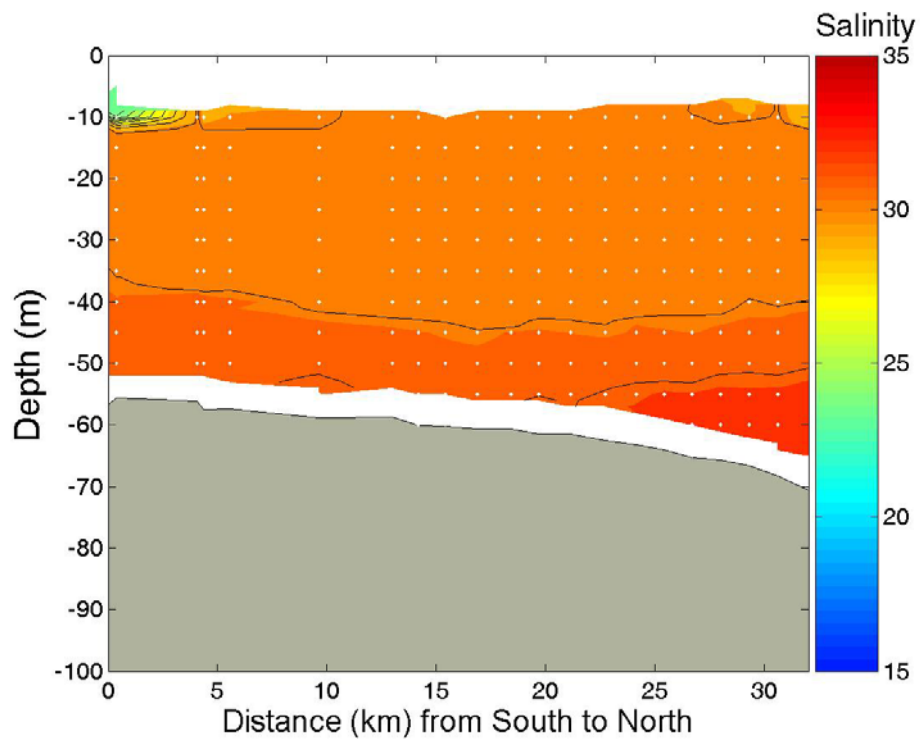
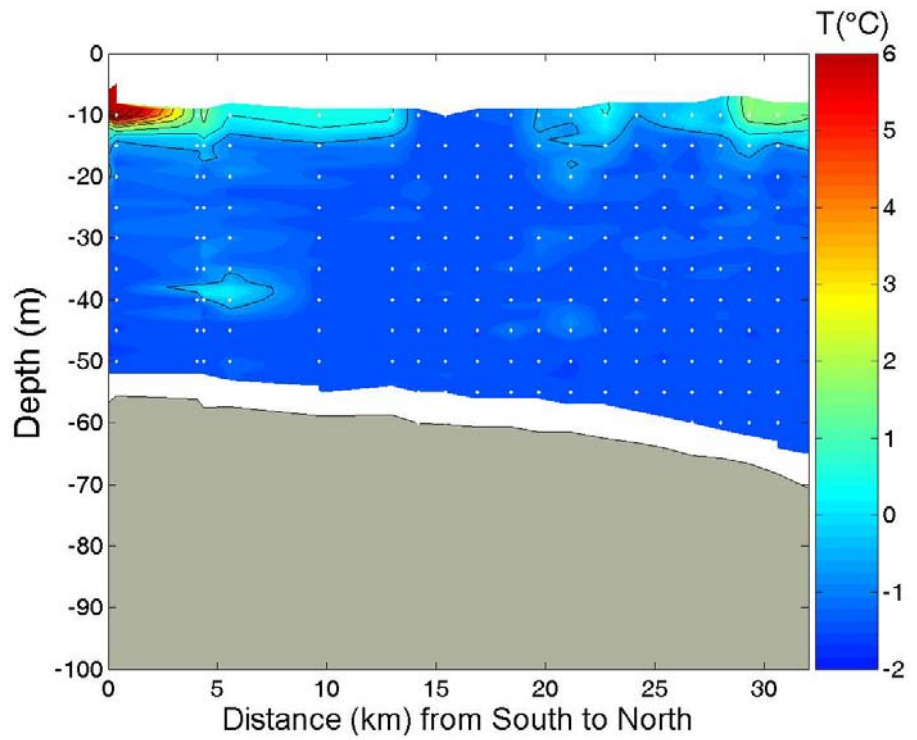
**APPENDIX 11.7** Potential temperature and salinity along section 600, Leg 8. South is on the left and North is on the right.



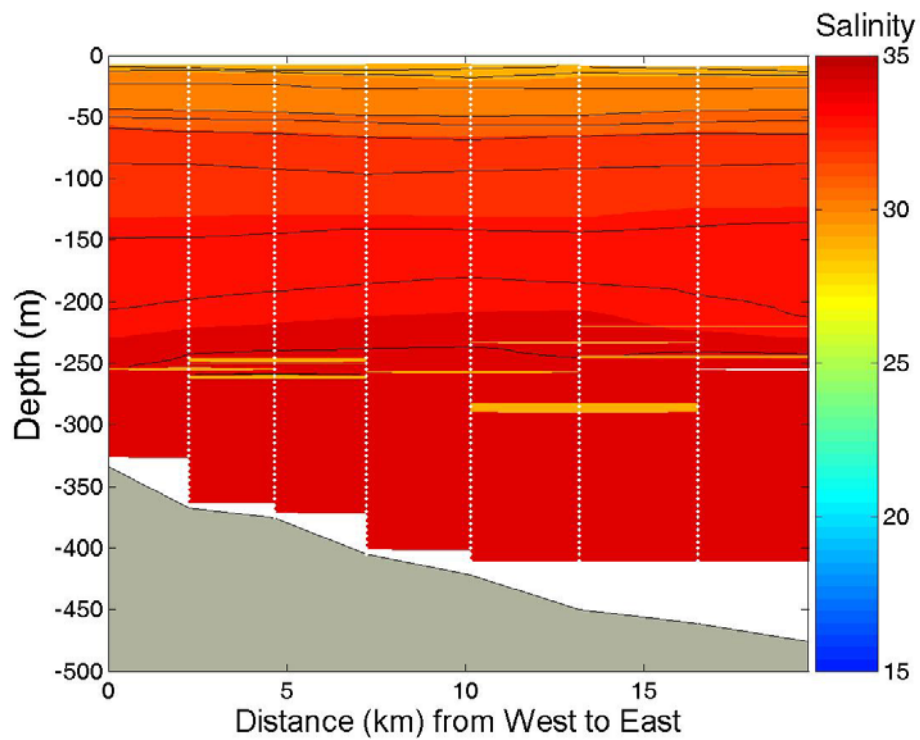
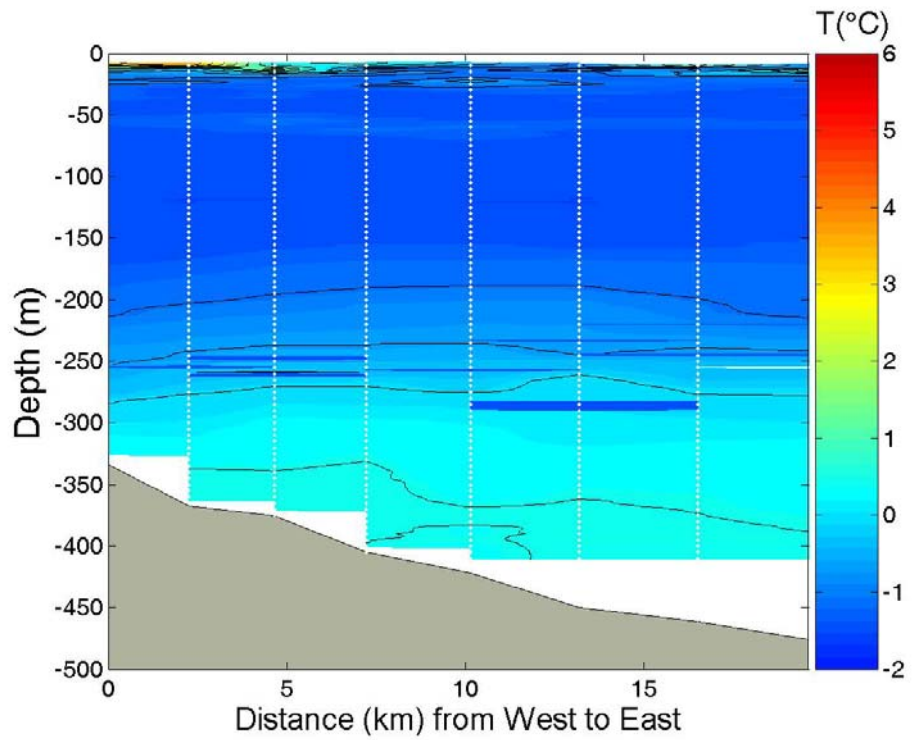
**APPENDIX 11.8** Potential temperature and salinity along section 700, Leg 8. South is on the left and North is on the right.



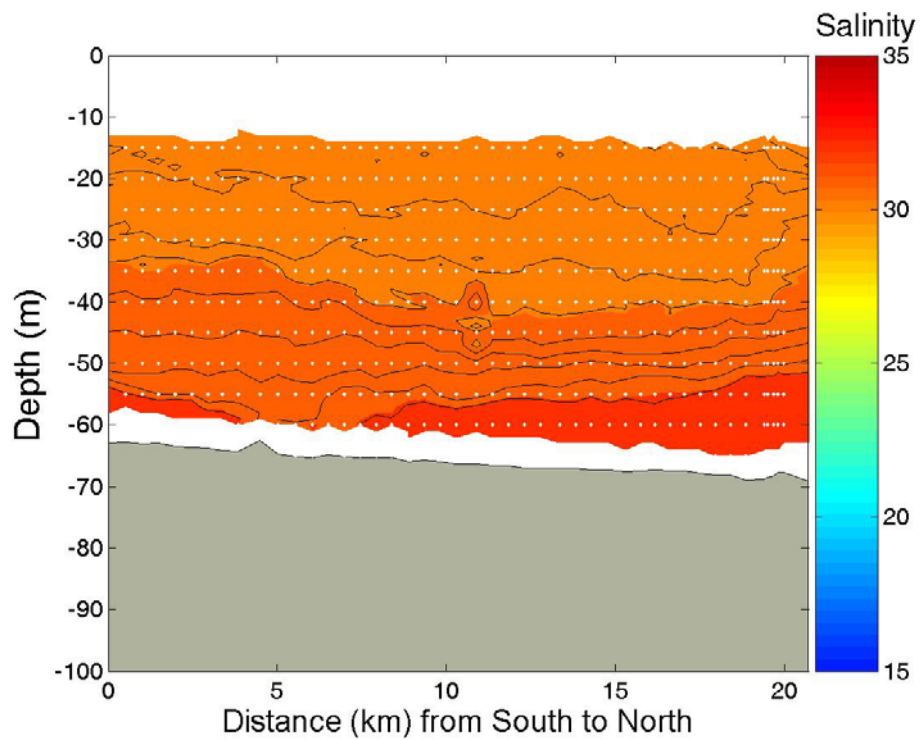
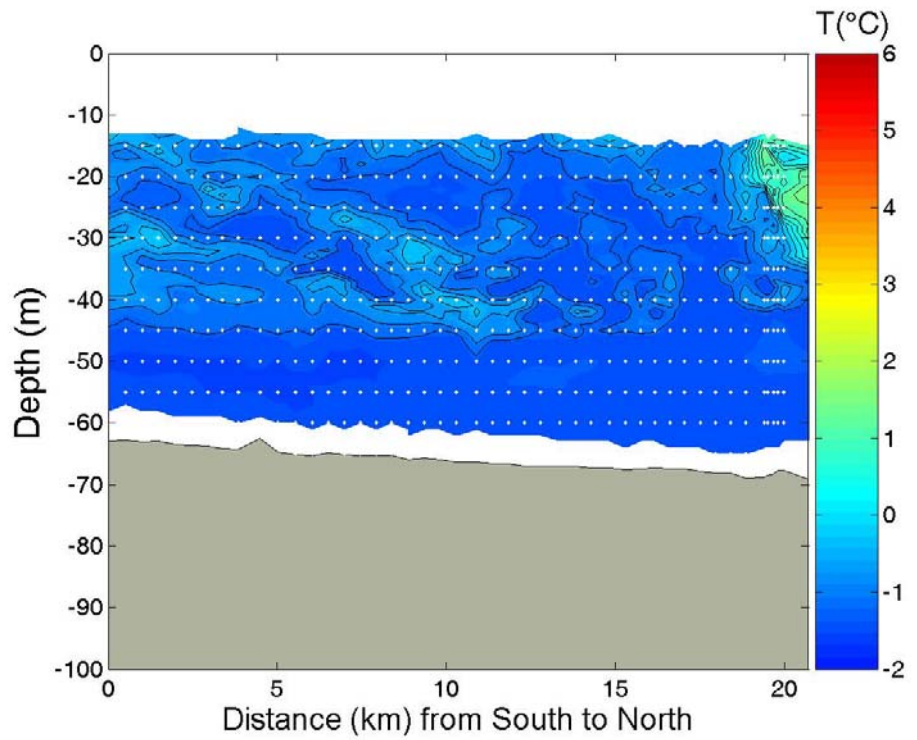
**APPENDIX 11.9** Potential temperature and salinity along section 800, Leg 8. South is on the left and North is on the right.



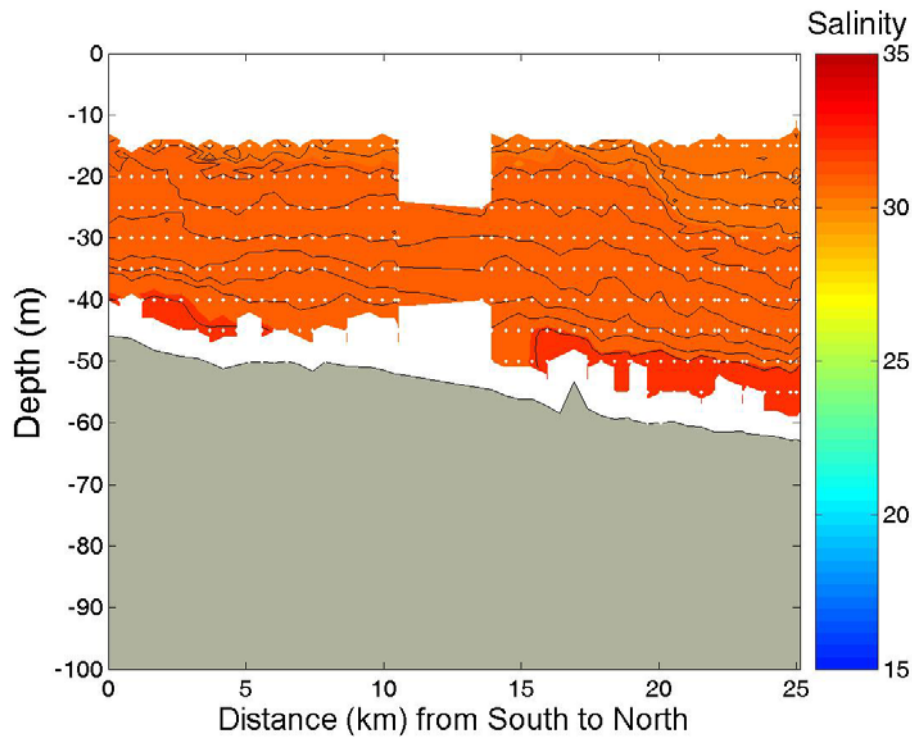
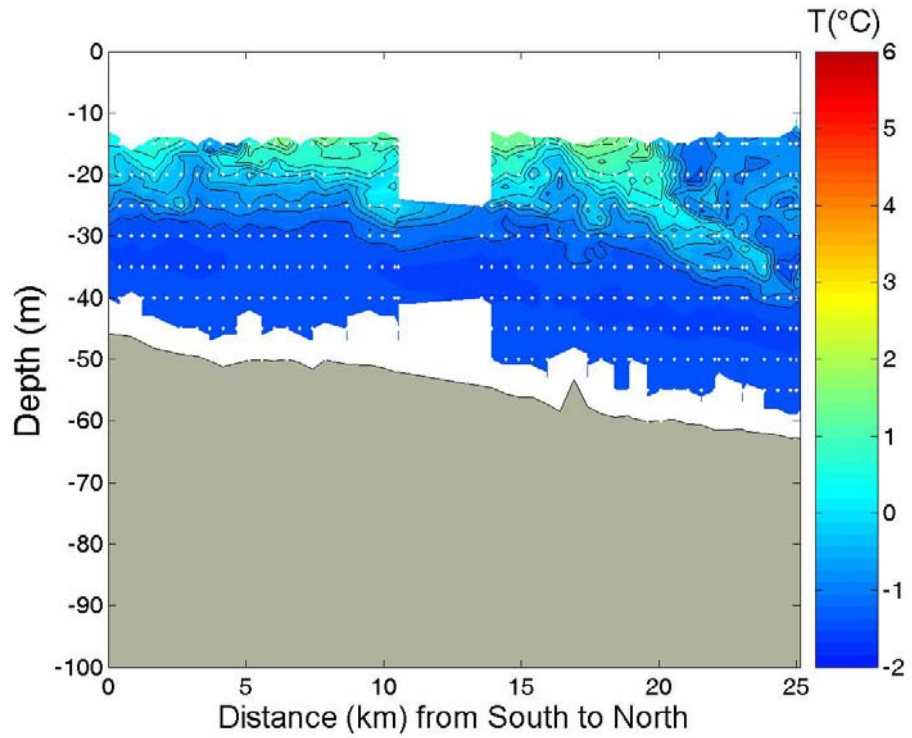
**APPENDIX 11.10** Potential temperature and salinity along section 900, Leg 8. South is on the left and North is on the right.



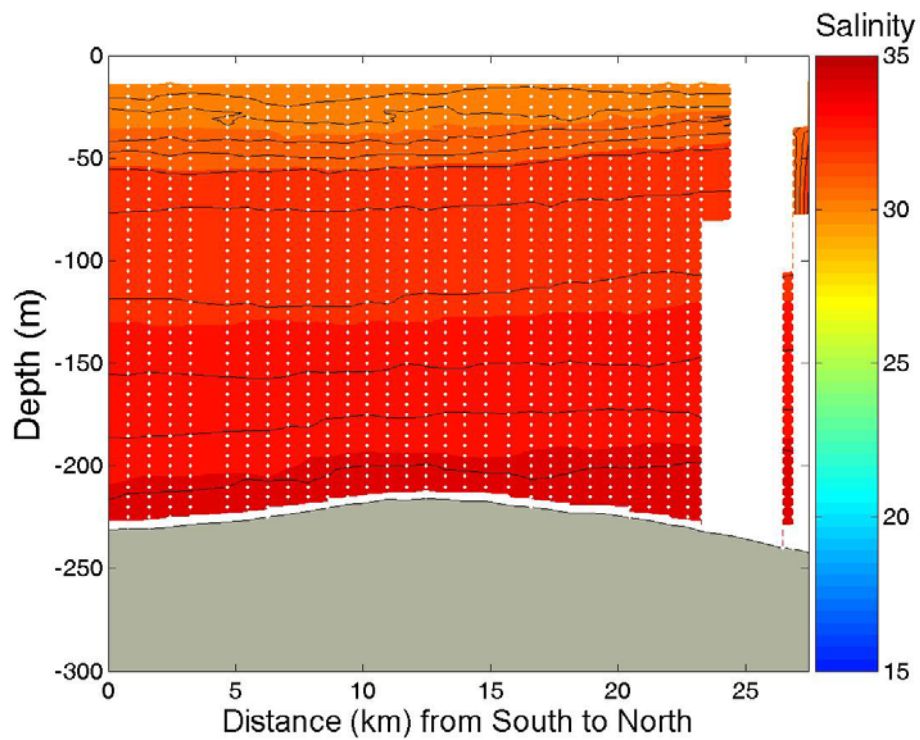
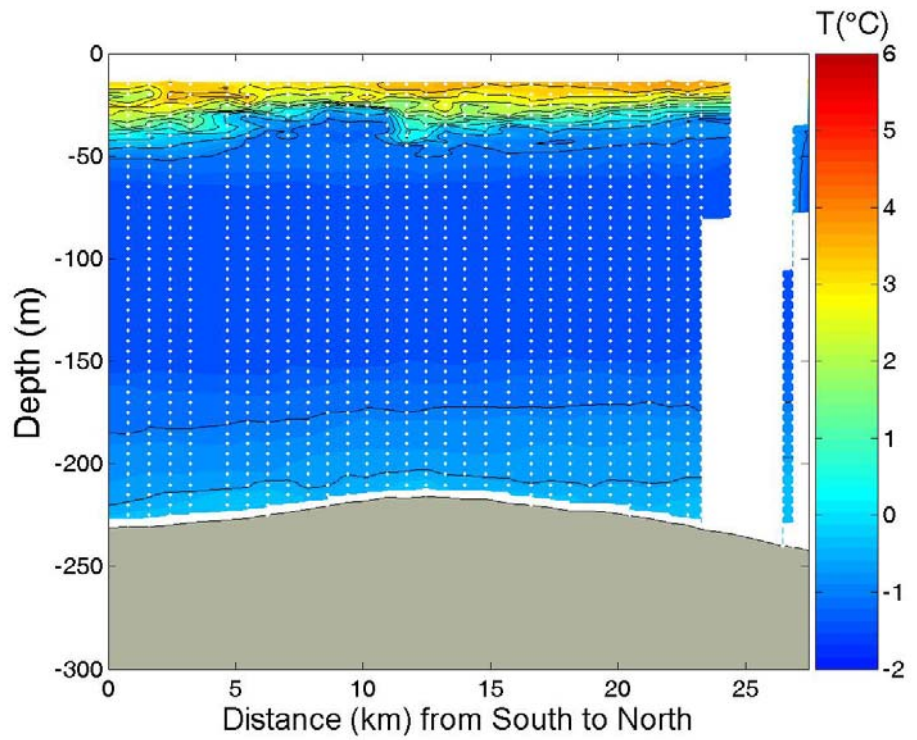
**APPENDIX 11.11** Potential temperature and salinity along section 1000, Leg 8. South-West is on the left and North-East is on the right.



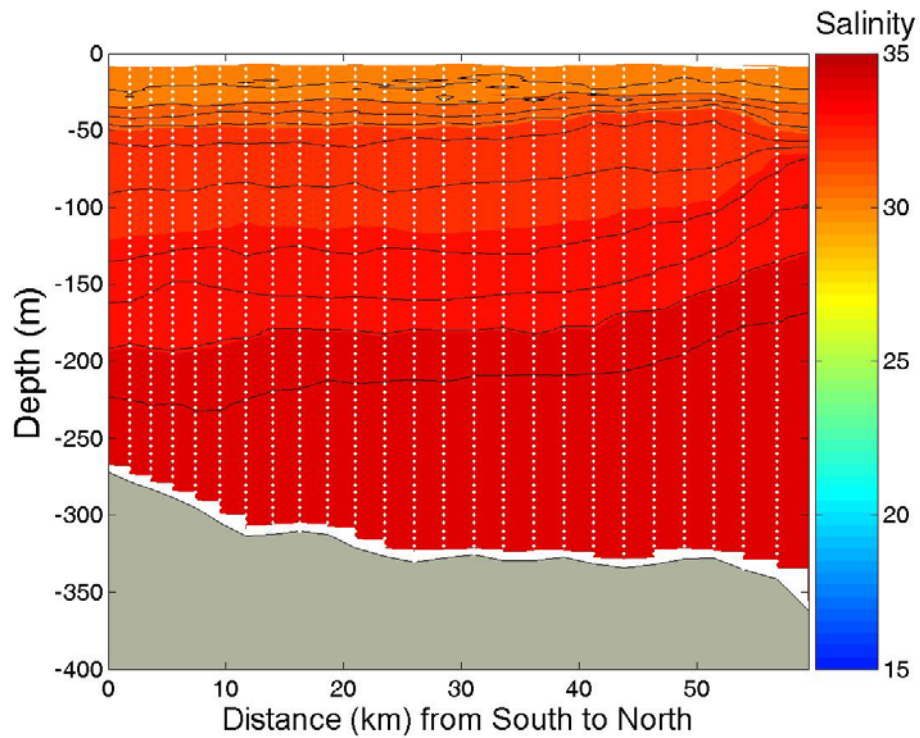
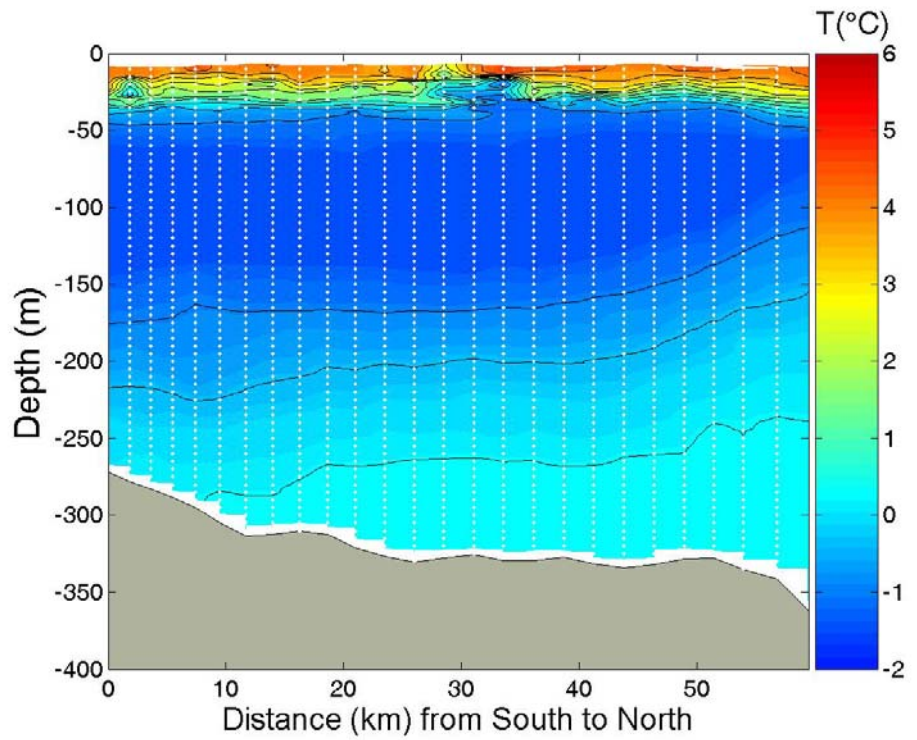
**APPENDIX 11.12** Potential temperature and salinity along section 1100, Leg 8. South is on the left and North is on the right.



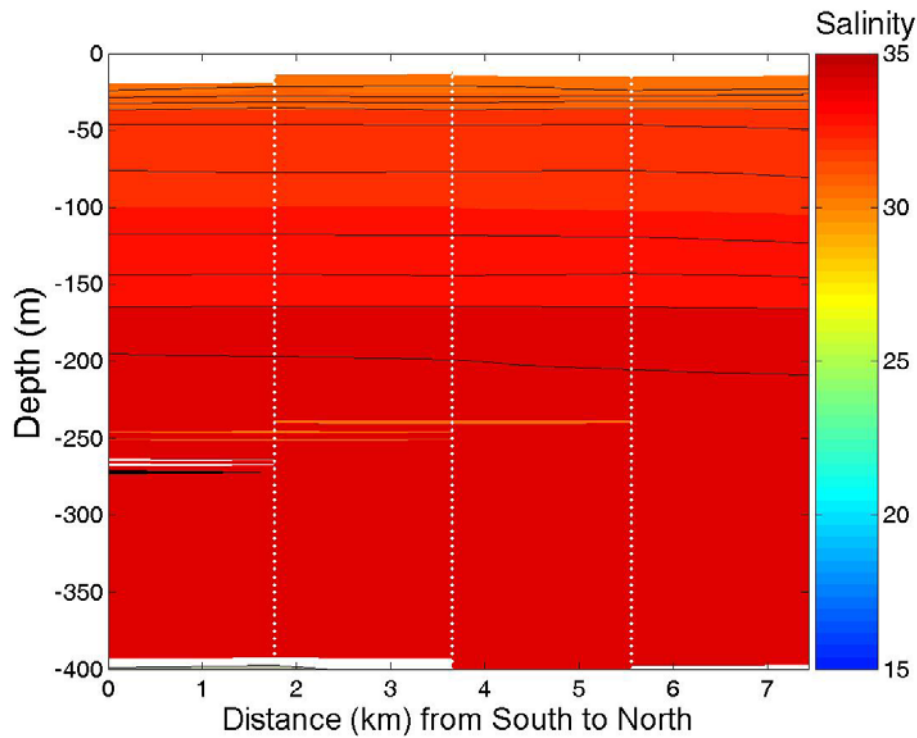
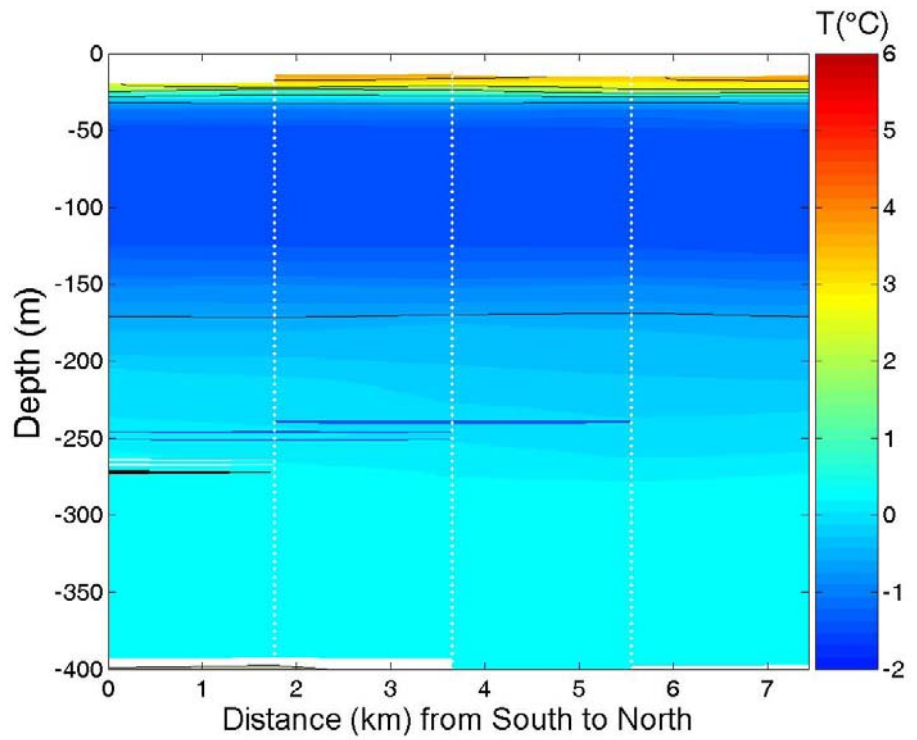
**APPENDIX 11.13** Potential temperature and salinity along section 1200, Leg 8. South is on the left and North is on the right.



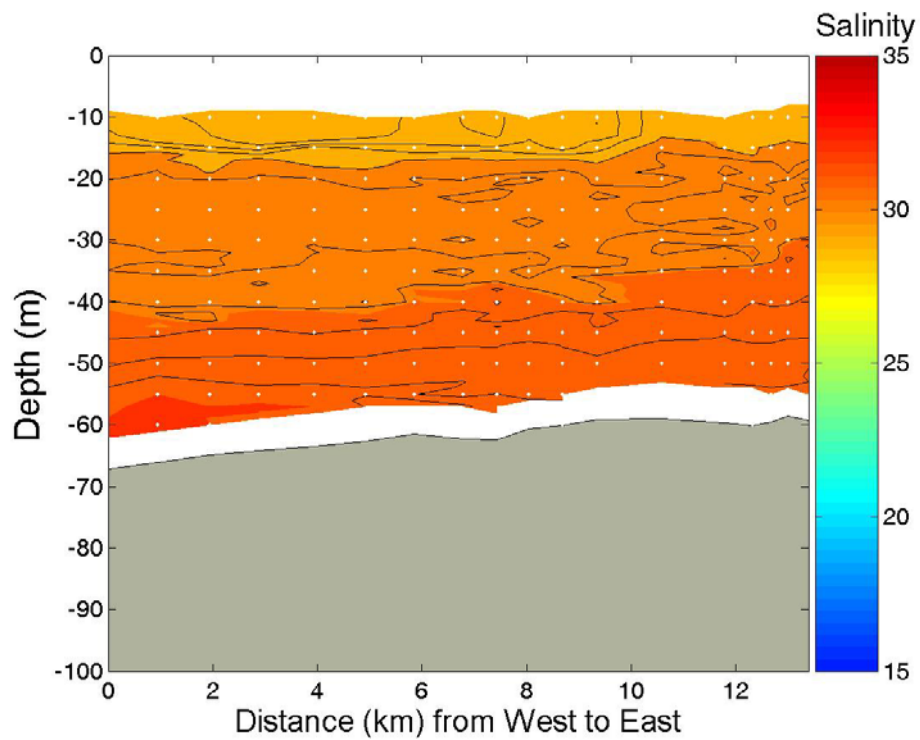
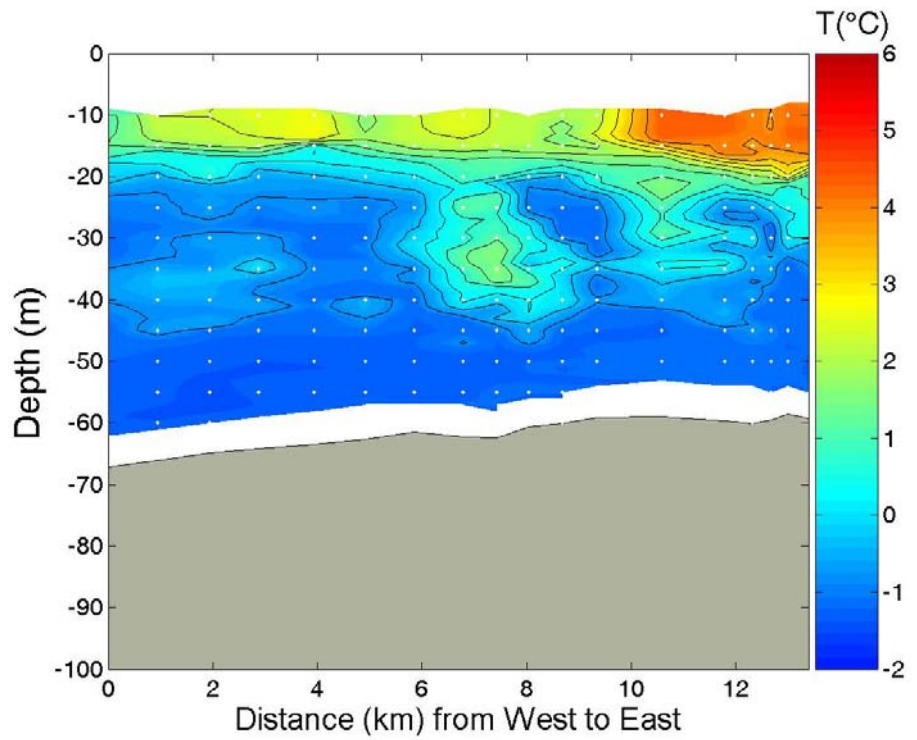
**APPENDIX 11.14** Potential temperature and salinity along section 1400, Leg 8. South is on the left and North is on the right.



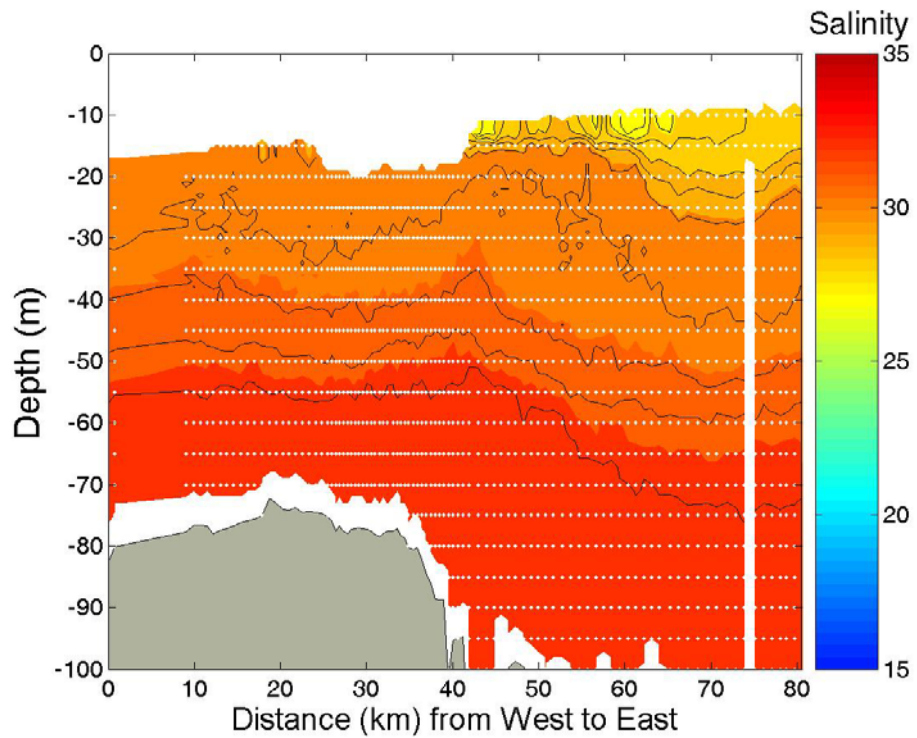
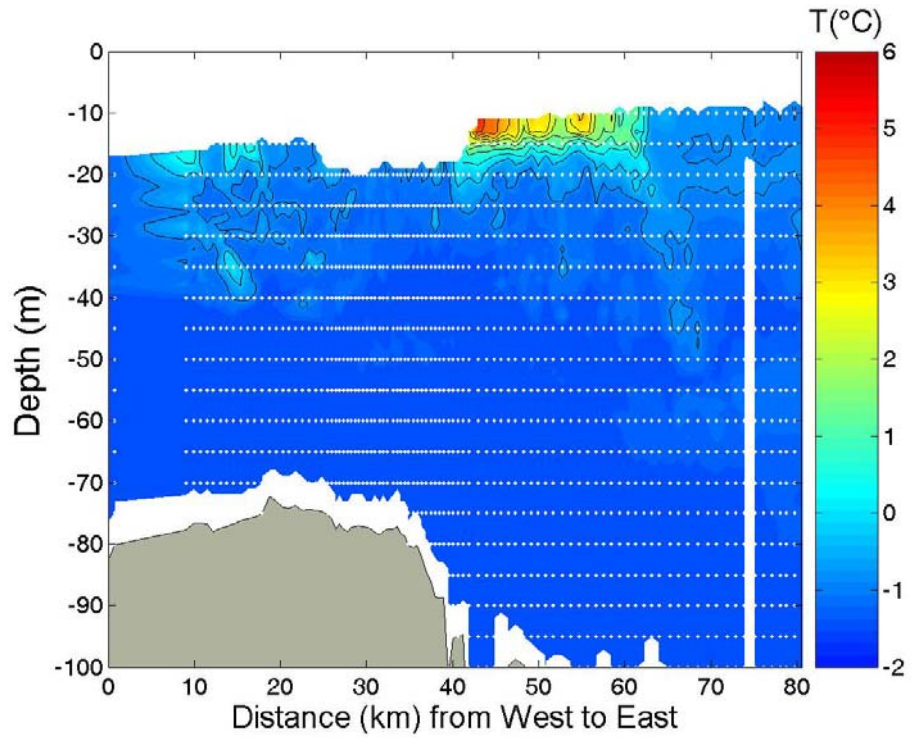
**APPENDIX 11.15** Potential temperature and salinity along section 1500, Leg 8. South is on the left and North is on the right.



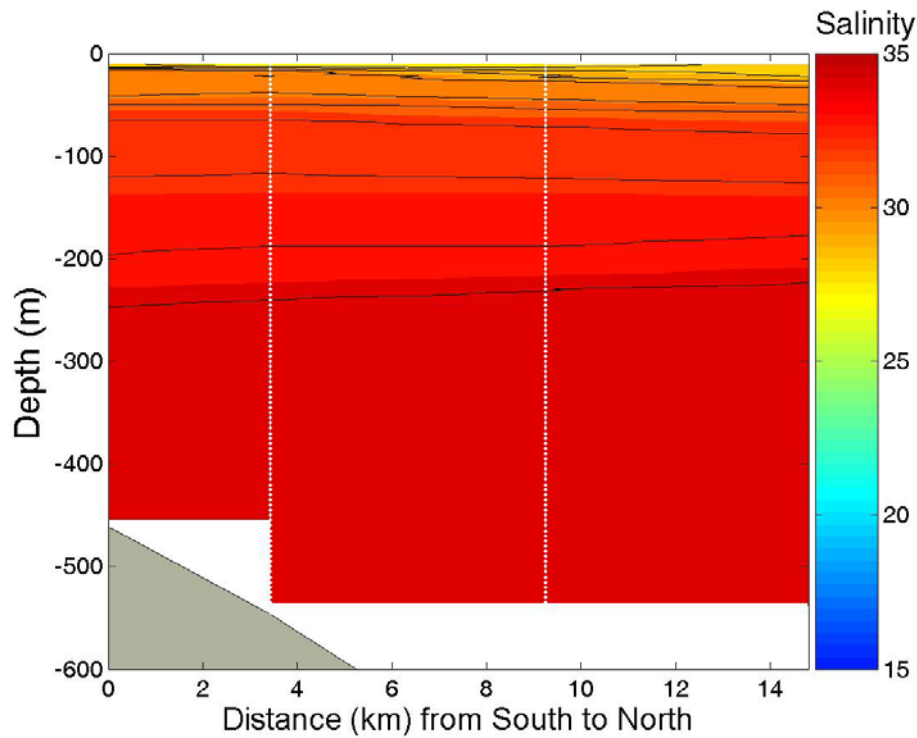
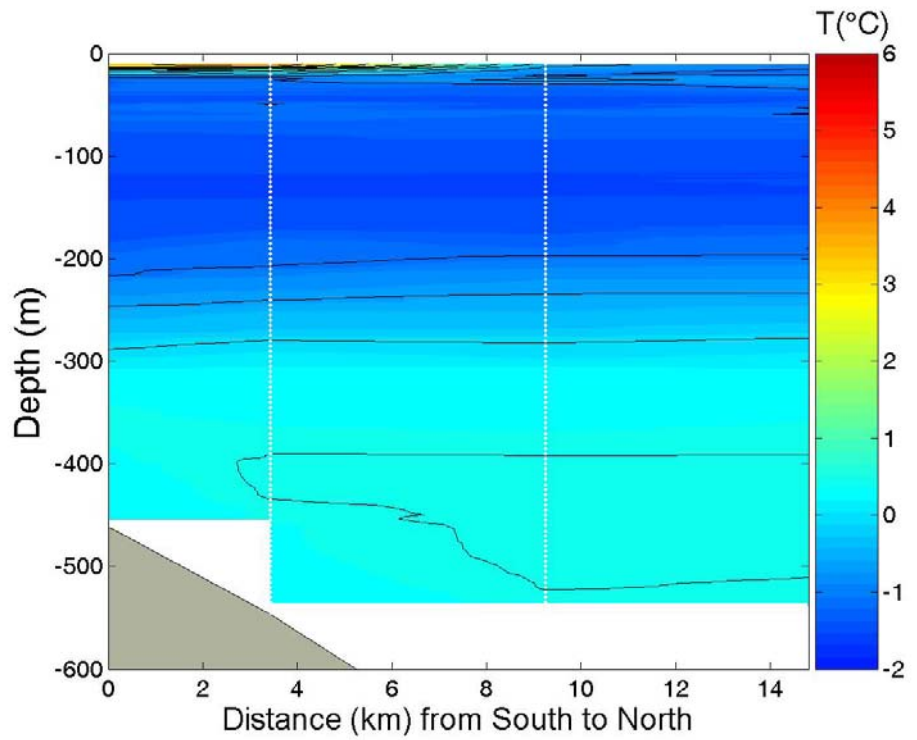
**APPENDIX 11.16** Potential temperature and salinity along section 1600, Leg 8. South is on the left and North is on the right.



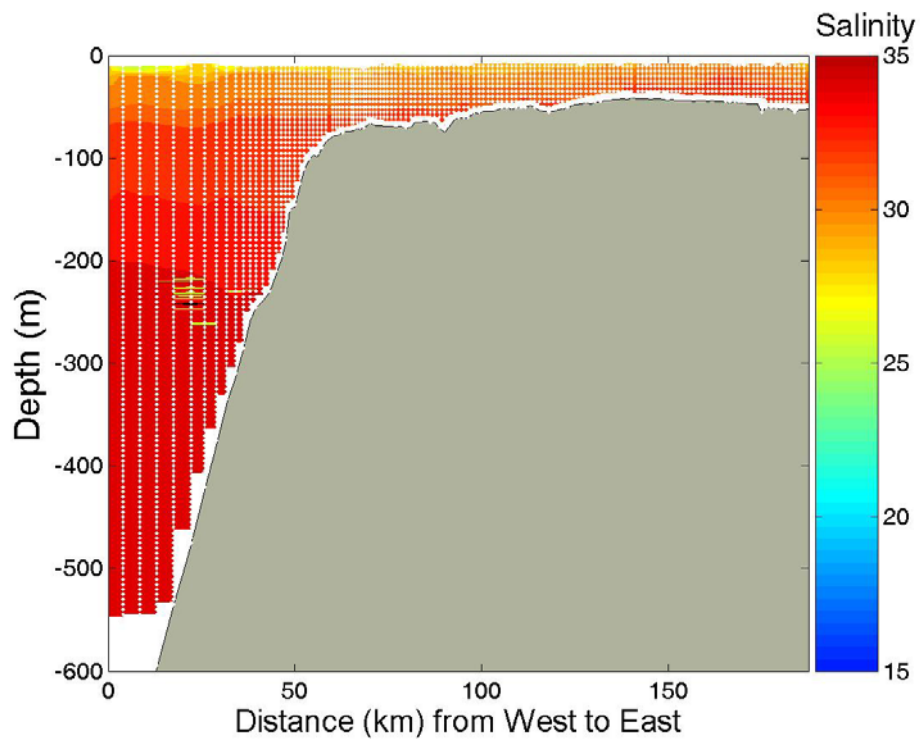
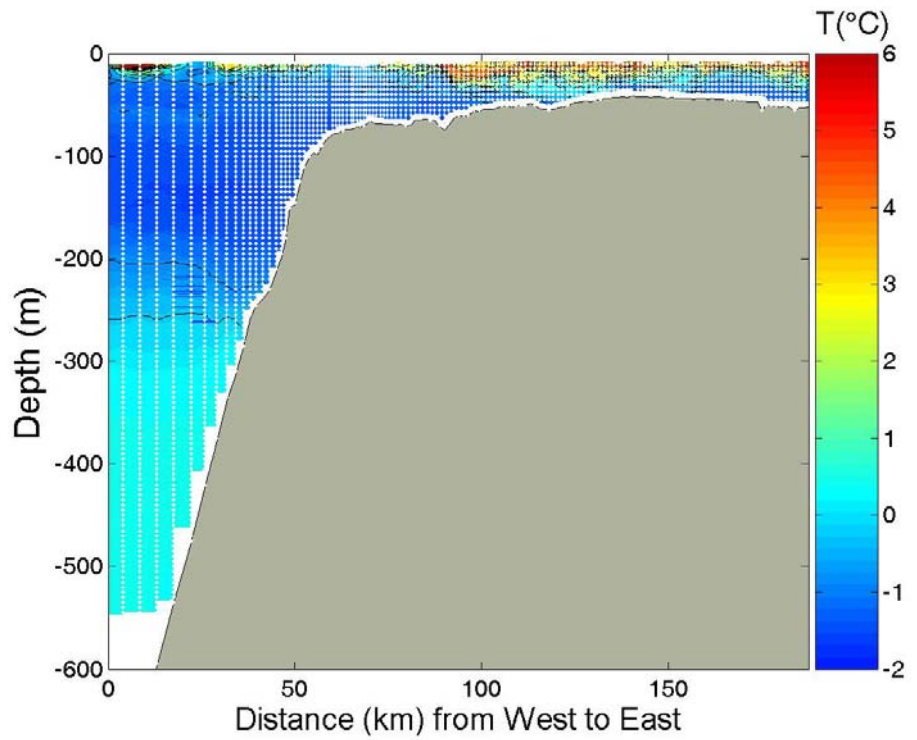
**APPENDIX 11.17** Potential temperature and salinity along section 1700, Leg 8. South is on the left and North is on the right.



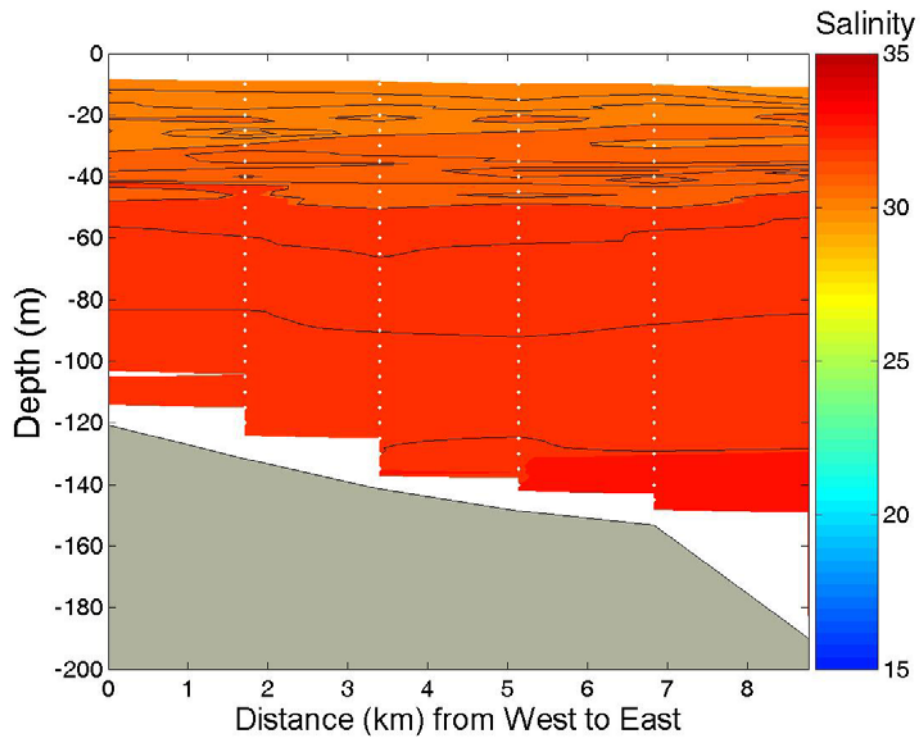
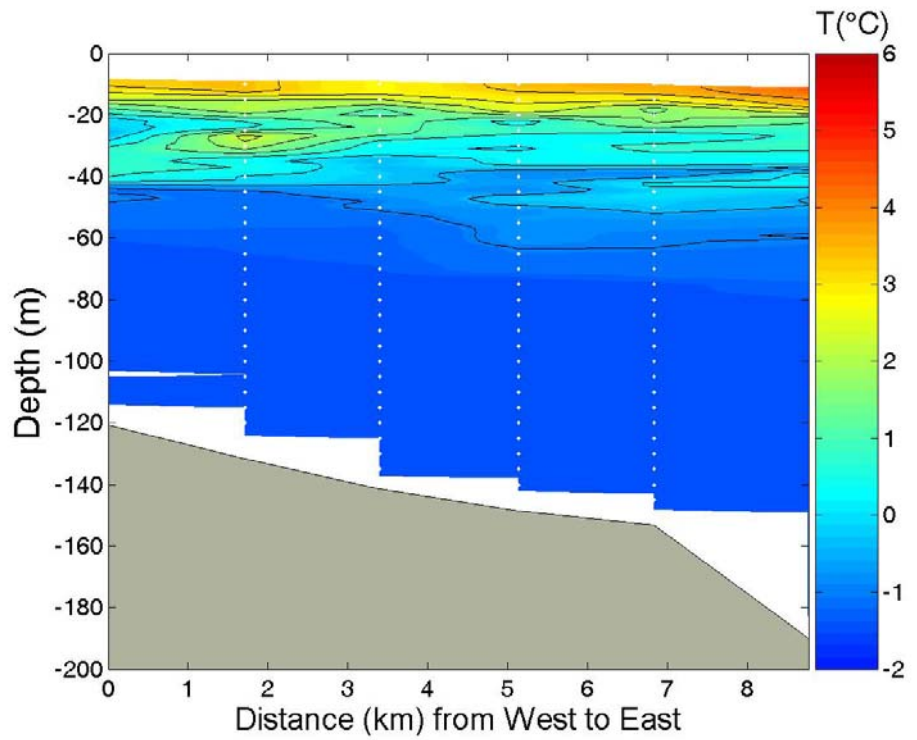
**APPENDIX 11.18** Potential temperature and salinity along section 1800, Leg 8. South-West is on the left and North-East is on the right.



**APPENDIX 11.19** Potential temperature and salinity along section 1900, Leg 8. South is on the left and North is on the right.



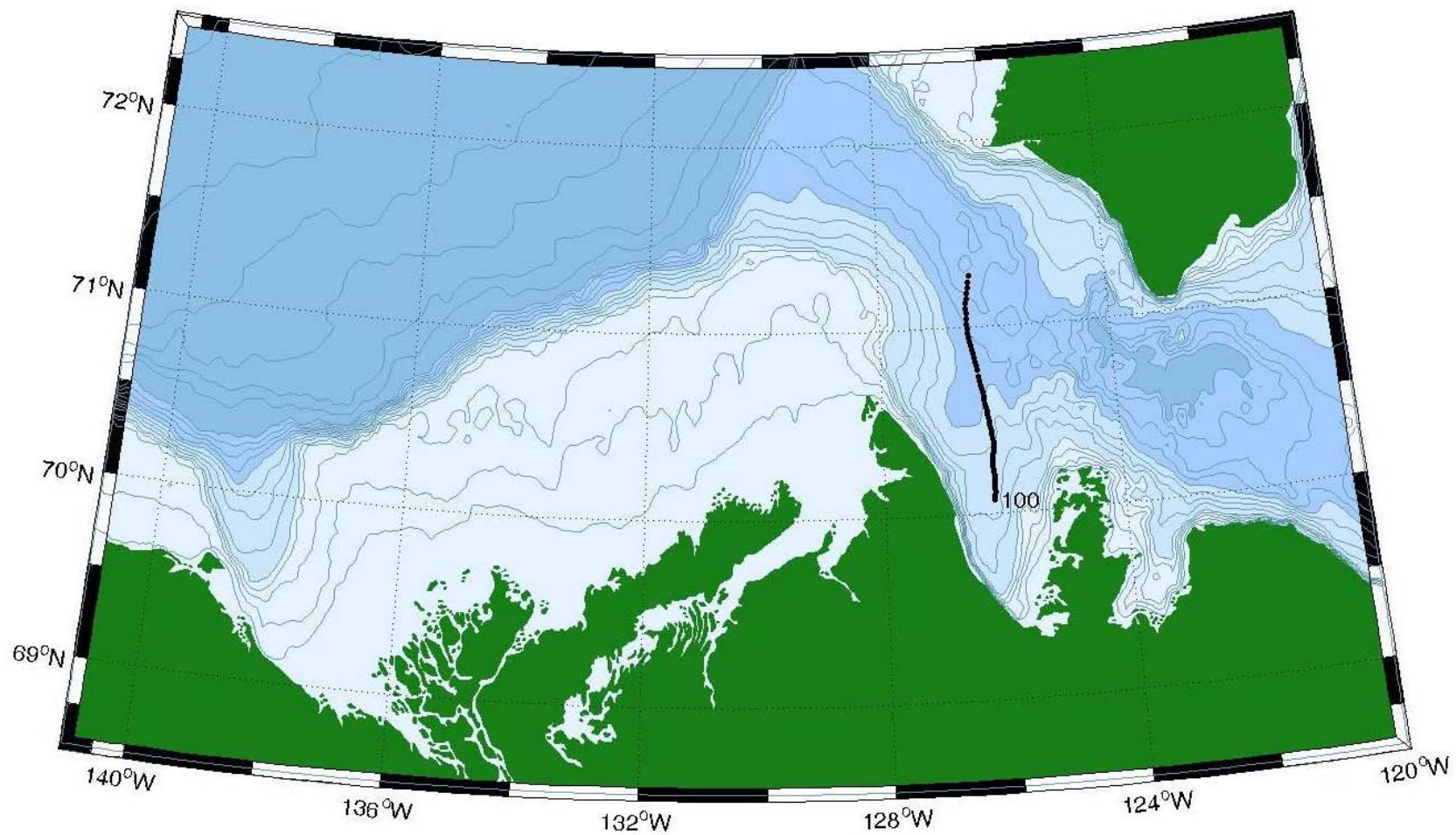
**APPENDIX 11.20** Potential temperature and salinity along section 2000, Leg 8. West is on the left and East is on the right.



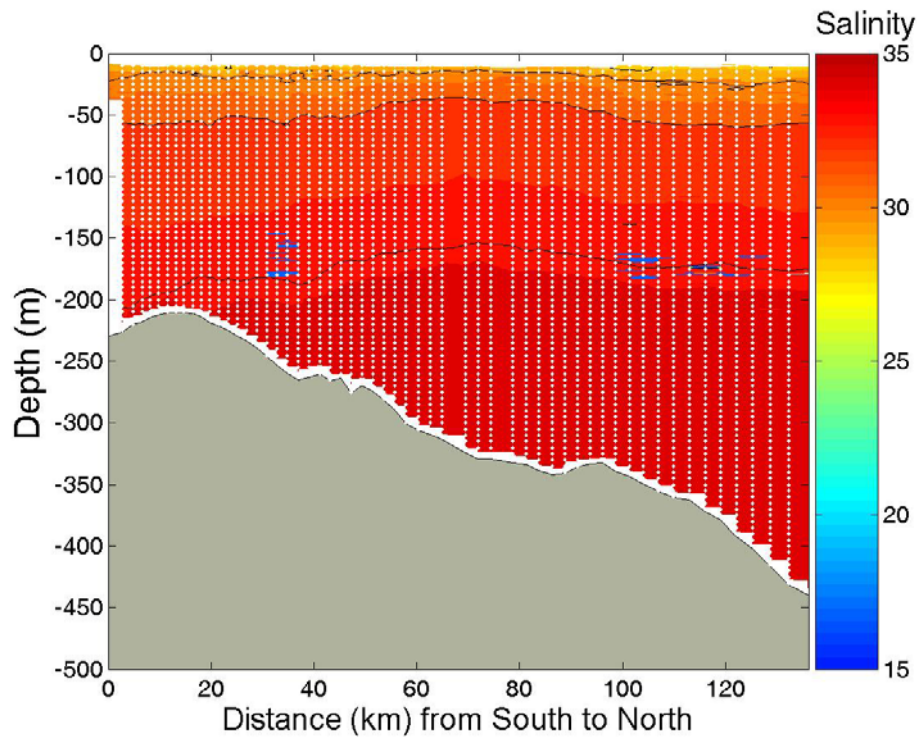
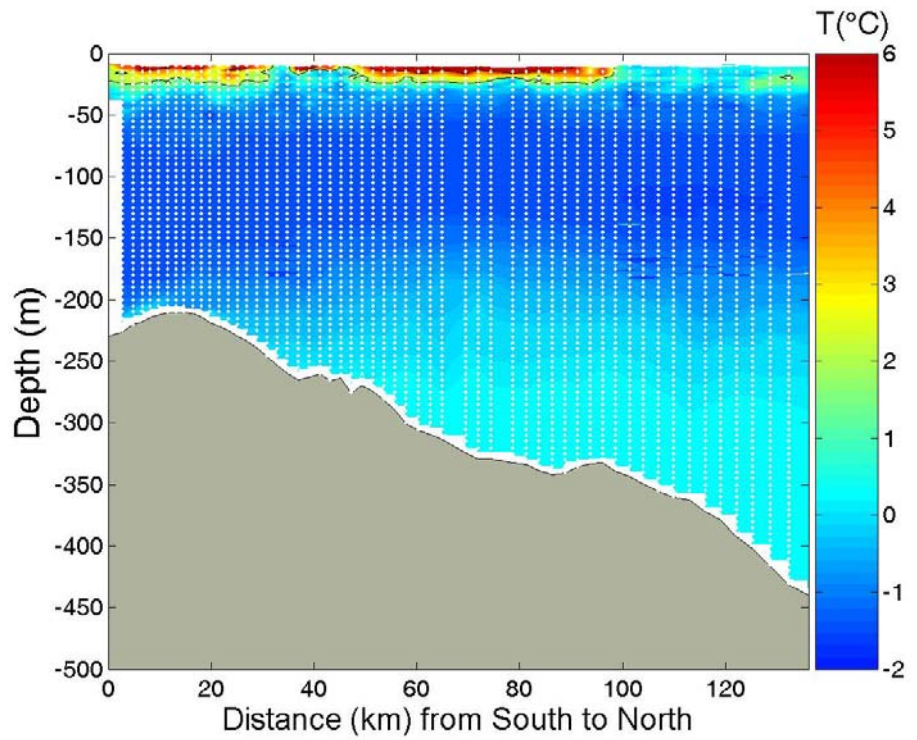
**APPENDIX 11.21** Potential temperature and salinity along section 2100, Leg 8. South-West is on the left and North-East is on the right.

**APPENDIX 12.** Sections of salinity and potential temperature from MVP data.  
Leg 9 (August 2004).

|      |                              |        |
|------|------------------------------|--------|
| 12.1 | Map of section location..... | p. 115 |
| 12.2 | Section 100.....             | P. 116 |



**APPENDIX 12.1 MVP section for Leg 9 (August 2004).**

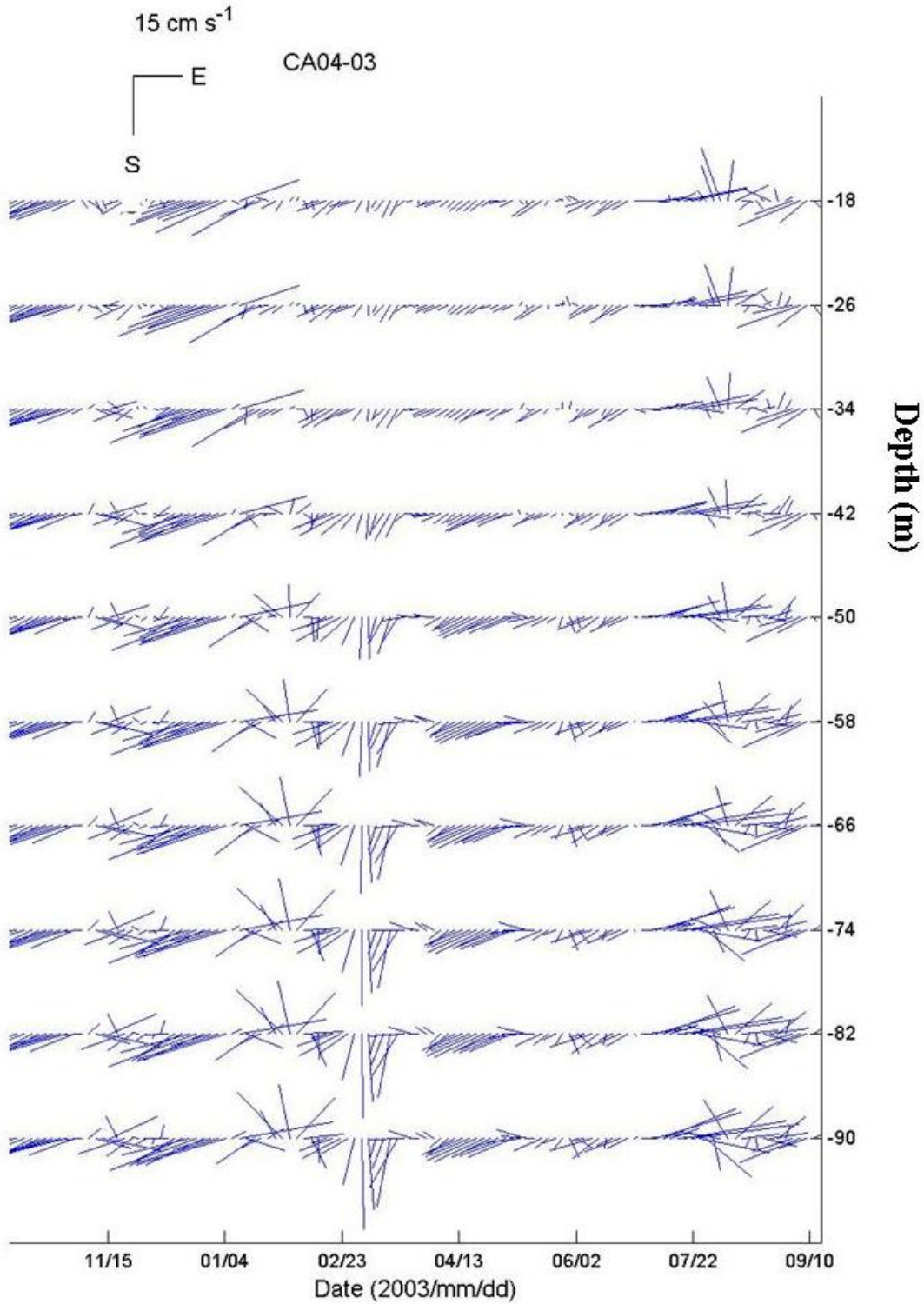


**APPENDIX 12.2** Potential temperature and salinity along section 100, Leg 9. South is on the left and North is on the right.

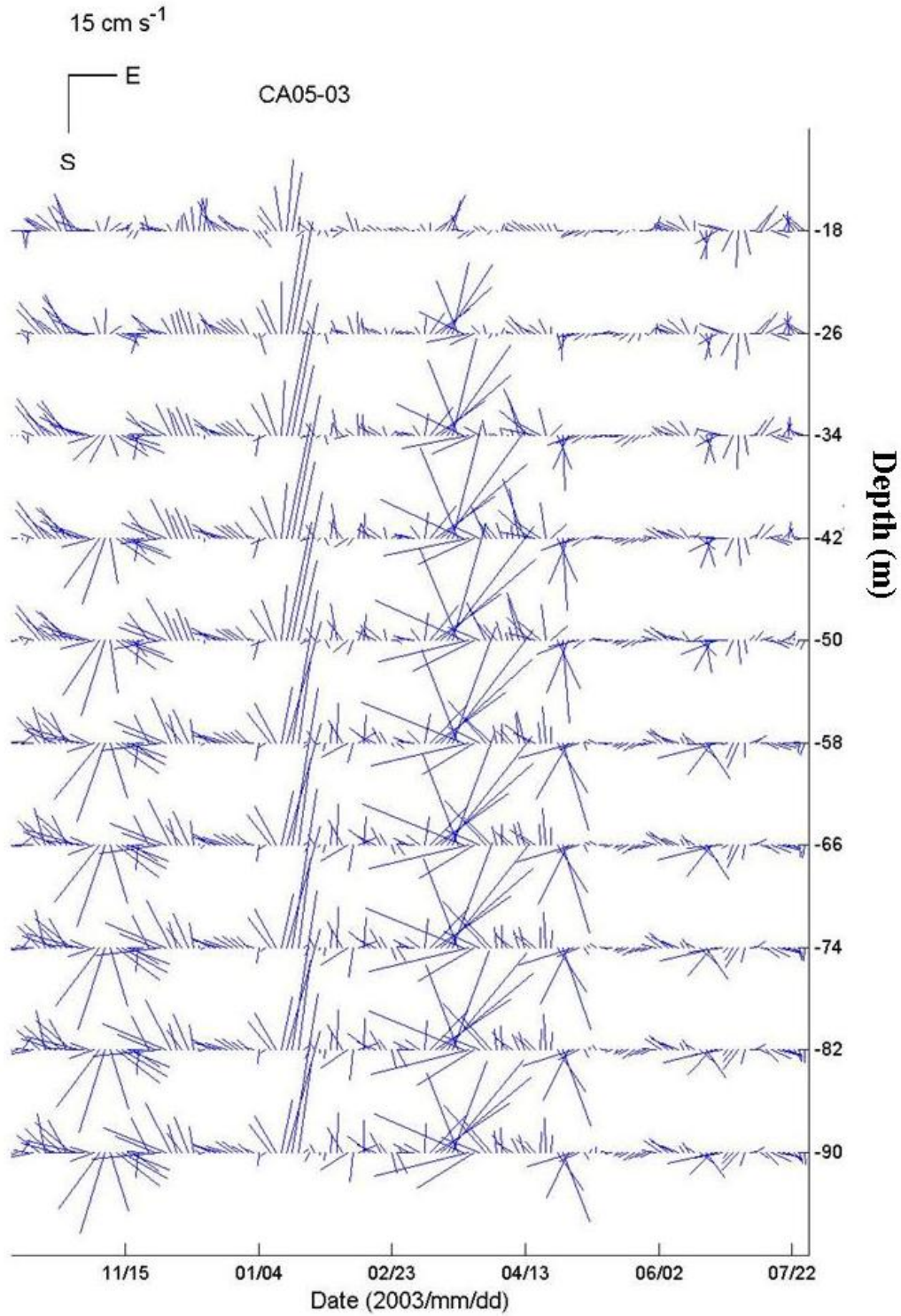
**APPENDIX 13** ADCP data recorded between October 2003 and September 2004.

Data are presented as stick diagram plot every 8 m of depth. There is one figure for every mooring. Moorings location will be found on fig. 4 and in table 6. Eastward is to the right and the velocity scale is shown at the top of each figure.

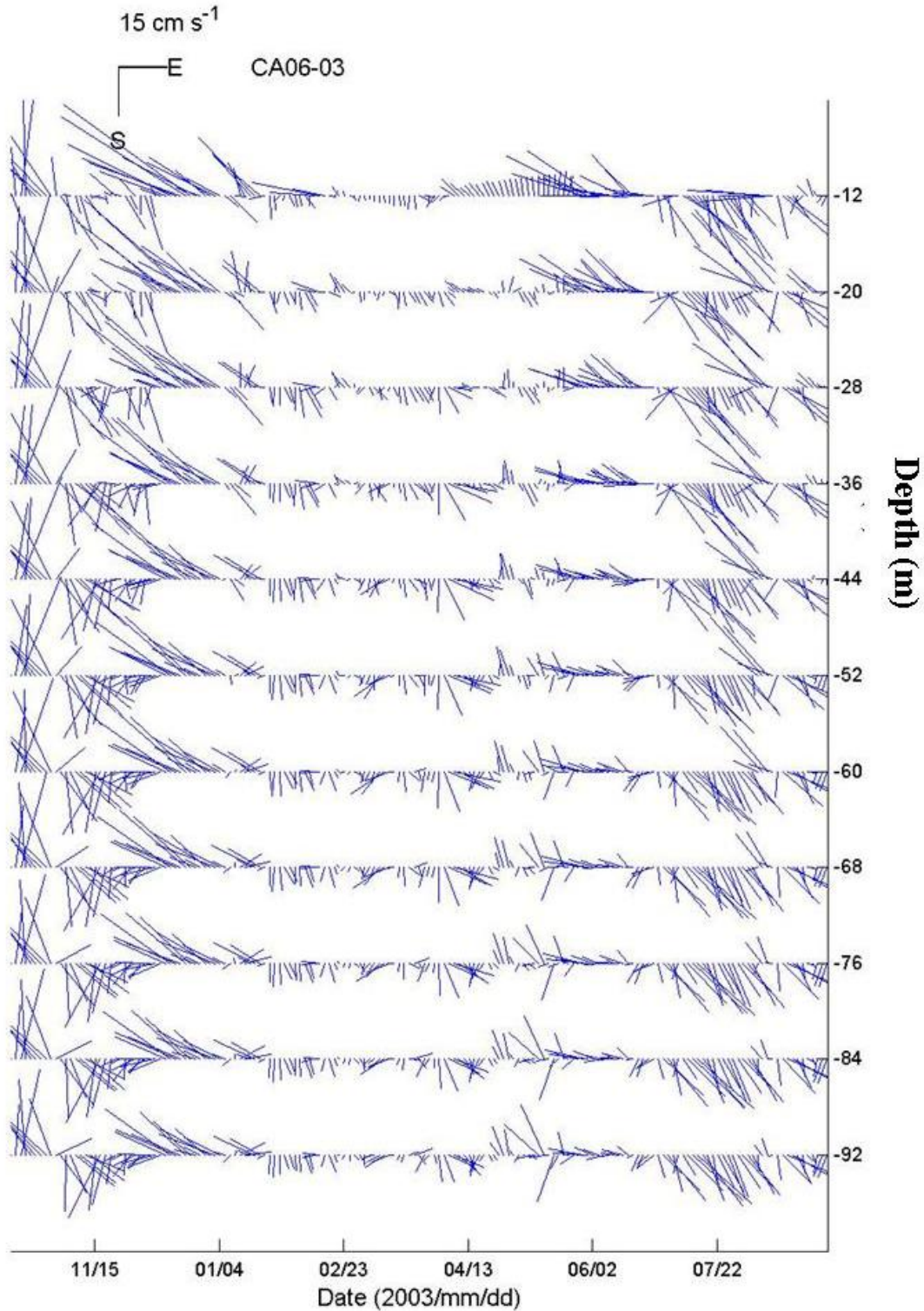
|       |                                   |        |
|-------|-----------------------------------|--------|
| 13.1  | CA04-03 between 18 and 90 m.....  | p. 118 |
| 13.2  | CA05-03 between 18 and 90 m.....  | p. 119 |
| 13.3  | CA06-03 between 12 and 92 m.....  | p. 120 |
| 13.4  | CA07-03 between 17 and 73 m.....  | p. 121 |
| 13.5  | CA08-03 between 16 and 80 m.....  | p. 122 |
| 13.6  | CA10-03 between 12 and 84 m.....  | p. 123 |
| 13.7  | CA11-03 between 15 and 111 m..... | p. 124 |
| 13.8  | CA12-03 between 11 and 79 m.....  | p. 125 |
| 13.9  | CA15-03 between 11 and 75 m.....  | p. 126 |
| 13.10 | CA16-03 between 11 and 91 m.....  | p. 127 |
| 13.11 | CA20-03 between 14 and 86 m.....  | p. 128 |



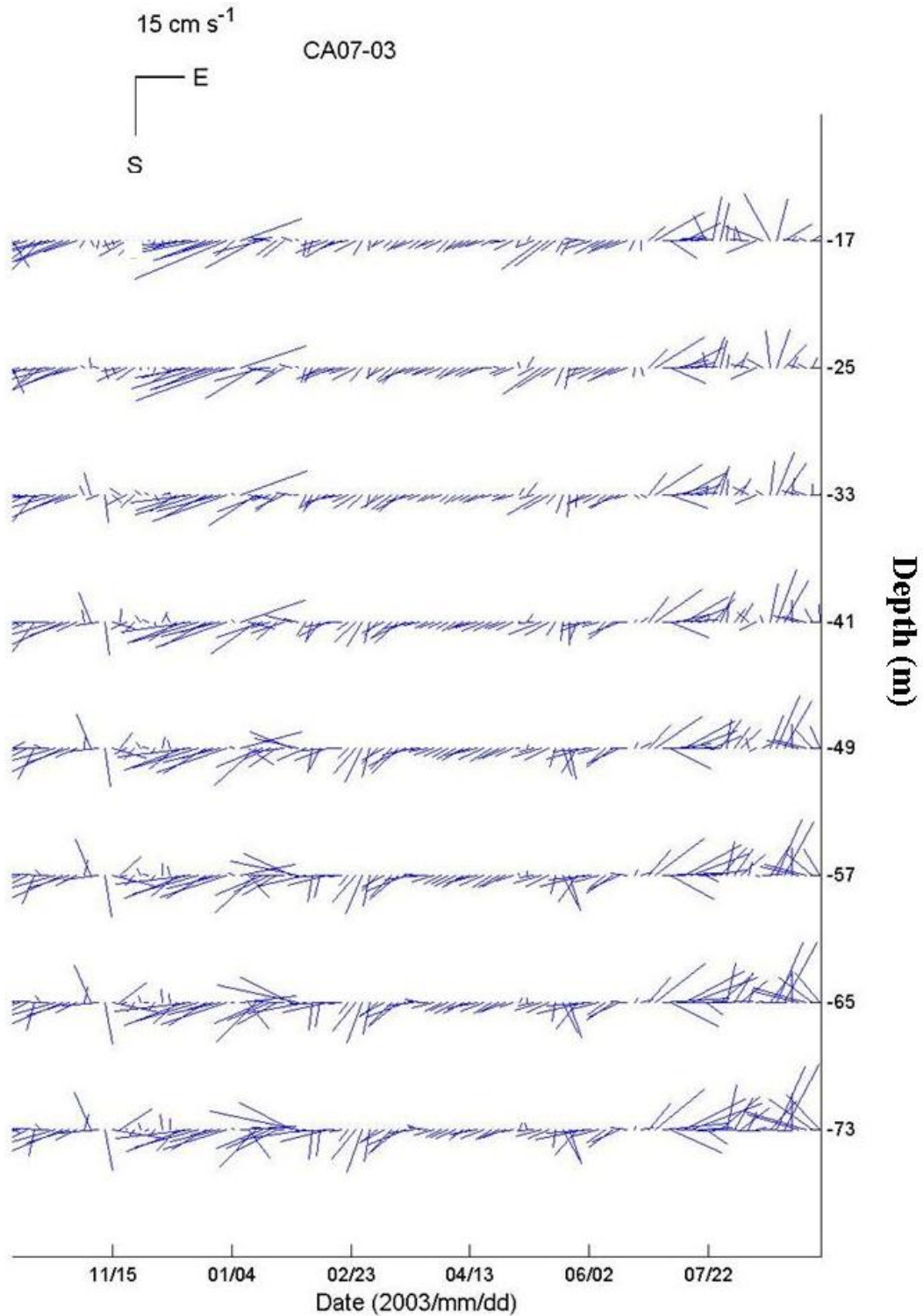
**APPENDIX 13.1** Stick diagram showing the ADCP velocity recorded every 8 m between 18 m and 90 m from the mooring CA04-03 between October 4<sup>th</sup>, 2003 and September 17<sup>th</sup>, 2004.



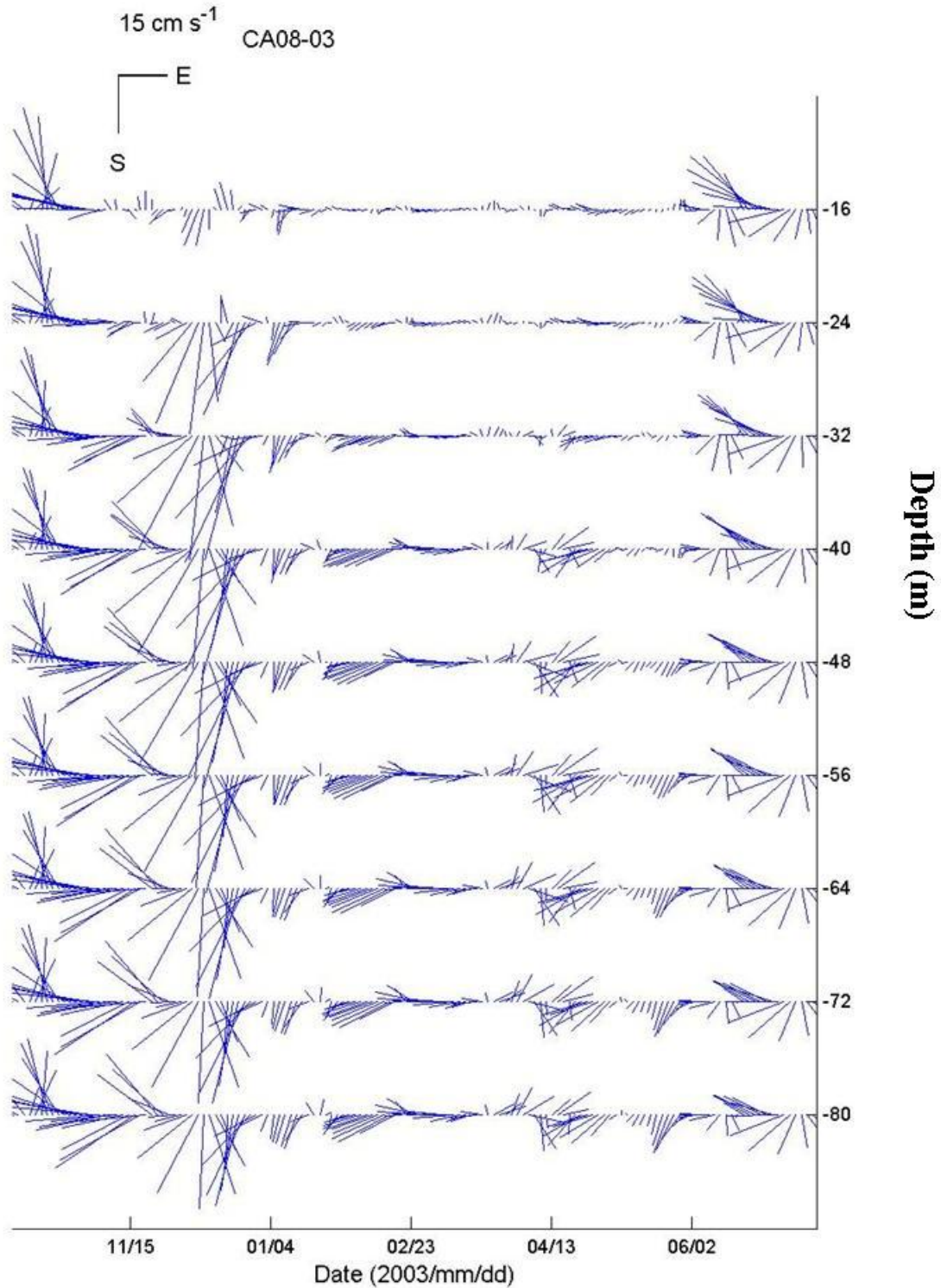
**APPENDIX 13.2** Stick diagram showing the ADCP velocity recorded every 8 m between 18 m and 90 m from the mooring CA05-03 between October 12<sup>th</sup>, 2003 and July 28<sup>th</sup>, 2004.



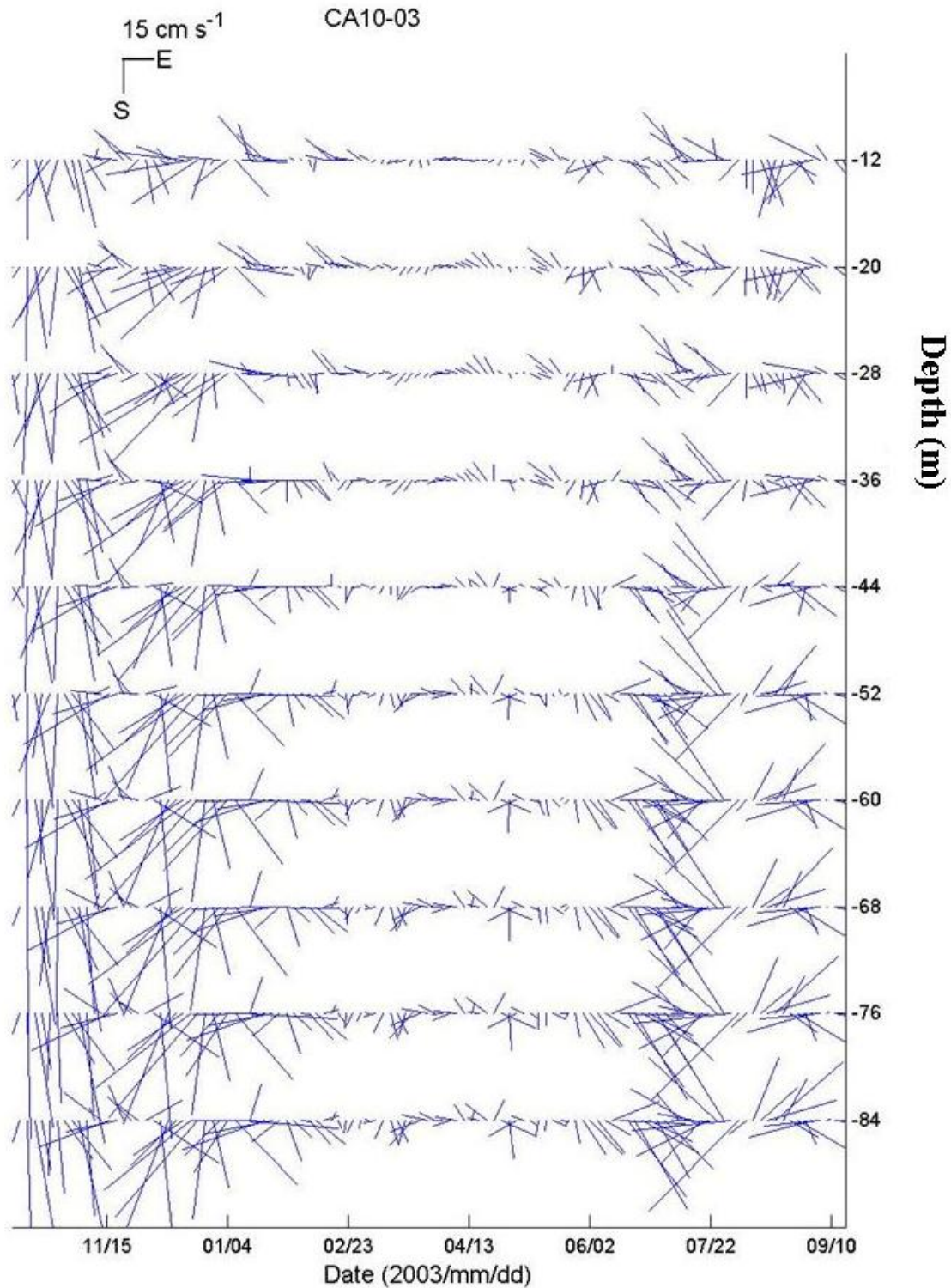
**APPENDIX 13.3** Stick diagram showing the ADCP velocity recorded every 8 m between 12 m and 92 m from the mooring CA06-03 between October 11<sup>th</sup>, 2003 and September 5<sup>th</sup>, 2004.



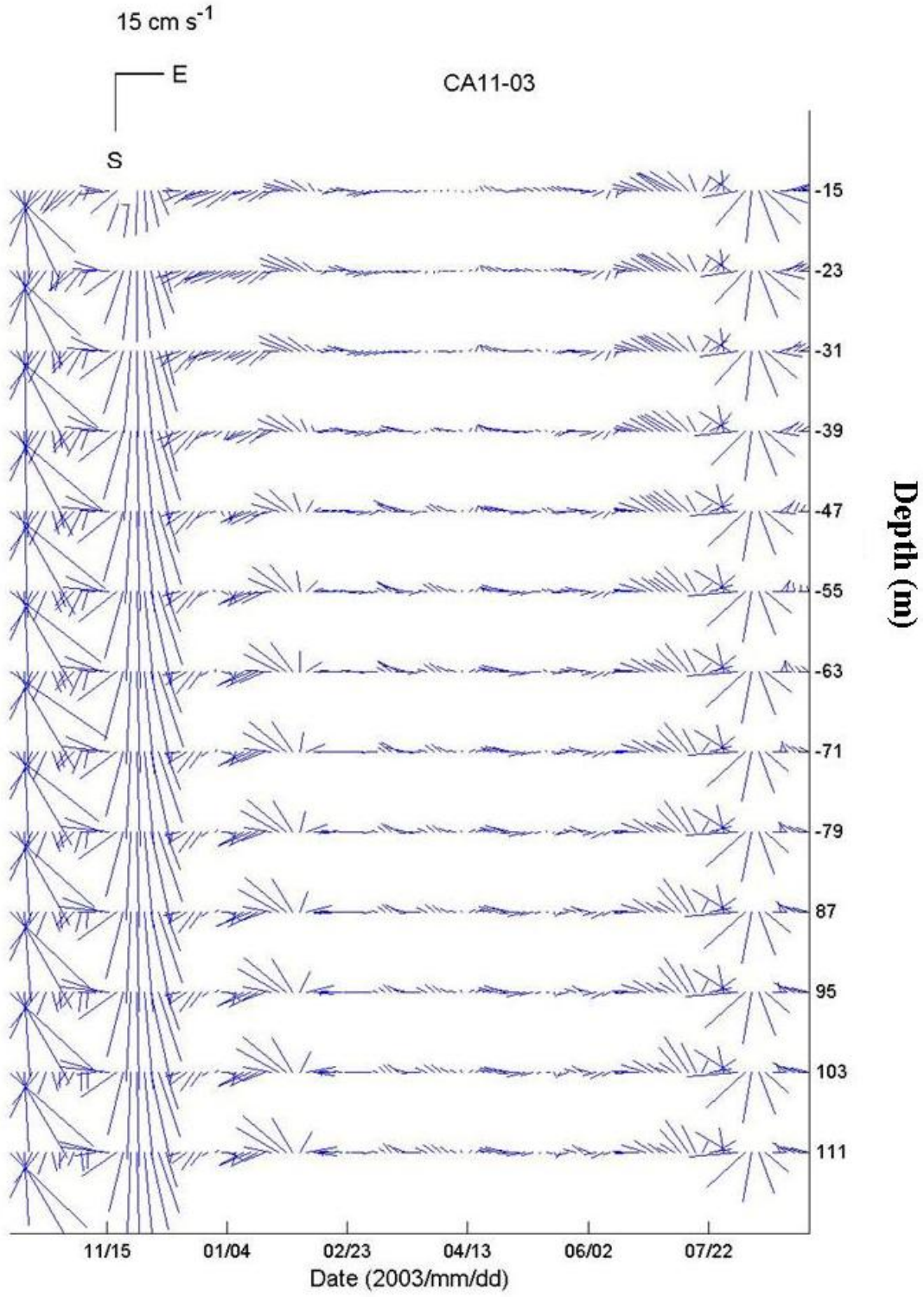
**APPENDIX 13.4** Stick diagram showing the ADCP velocity recorded every 8 m between 17 m and 73 m from the mooring CA07-03 between October 3<sup>rd</sup>, 2003 and September 7<sup>th</sup>, 2004.



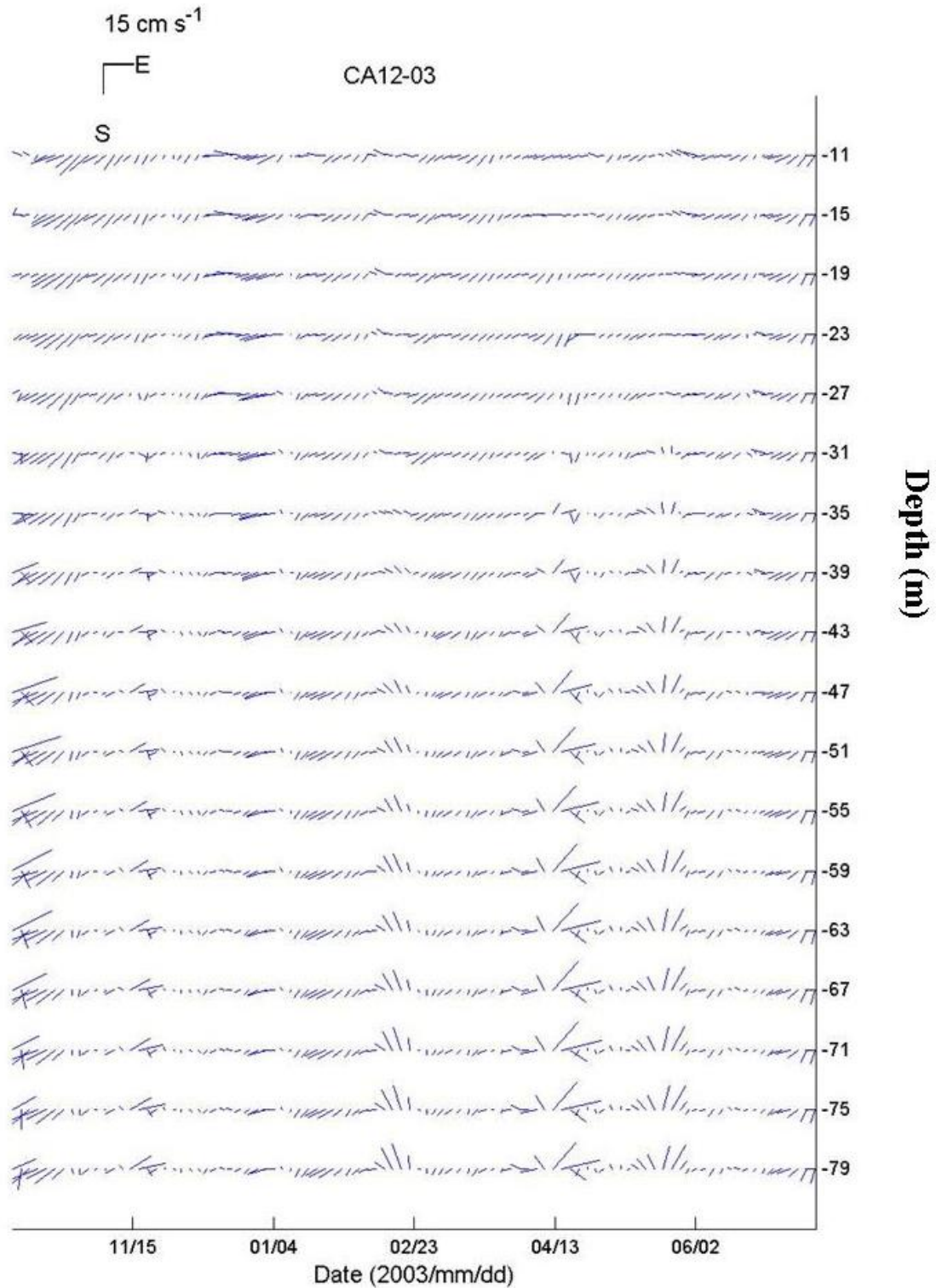
**APPENDIX 13.5** Stick diagram showing the ADCP velocity recorded every 8 m between 16 m and 80 m from the mooring CA08-03 between October 13<sup>th</sup>, 2003 and July 18<sup>th</sup>, 2004.



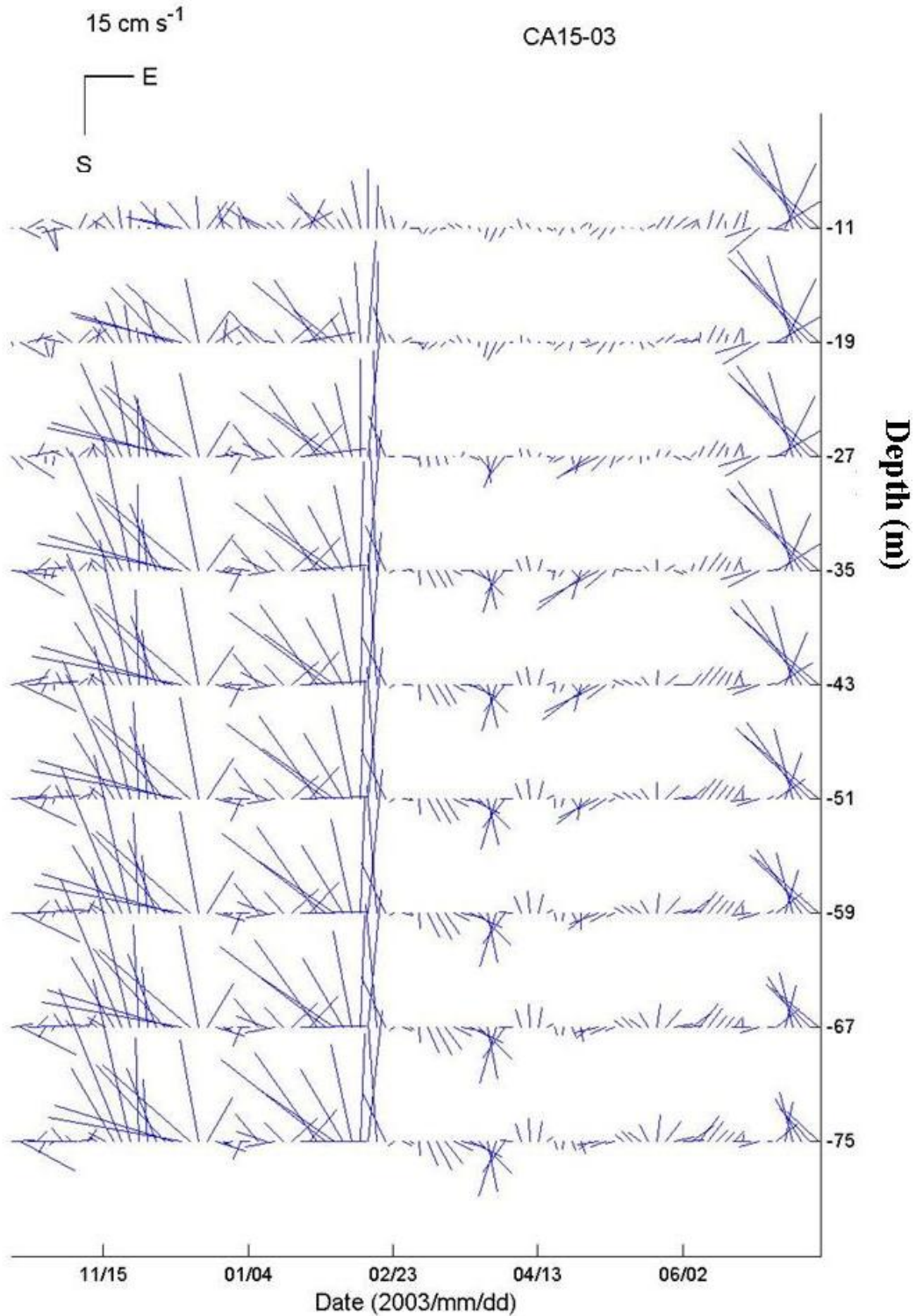
**APPENDIX 13.6** Stick diagram showing the ADCP velocity recorded every 8 m between 12 m and 84 m from the mooring CA10-03 between October 6<sup>th</sup>, 2003 and September 8<sup>th</sup>, 2004.



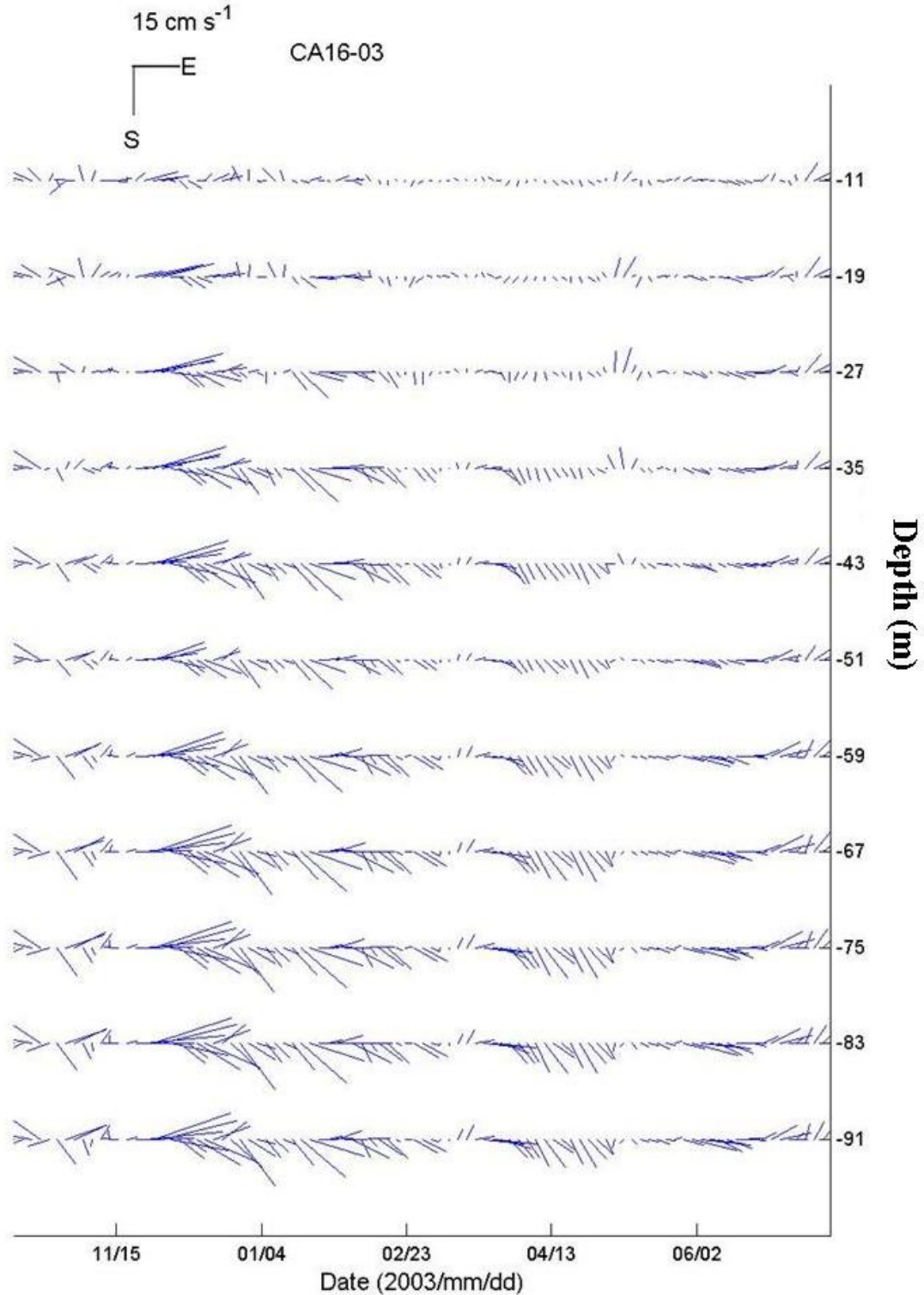
**APPENDIX 13.7** Stick diagram showing the ADCP velocity recorded every 8 m between 15 m and 111 m from the mooring CA11-03 between October 5<sup>th</sup>, 2003 and September 9<sup>th</sup>, 2004.



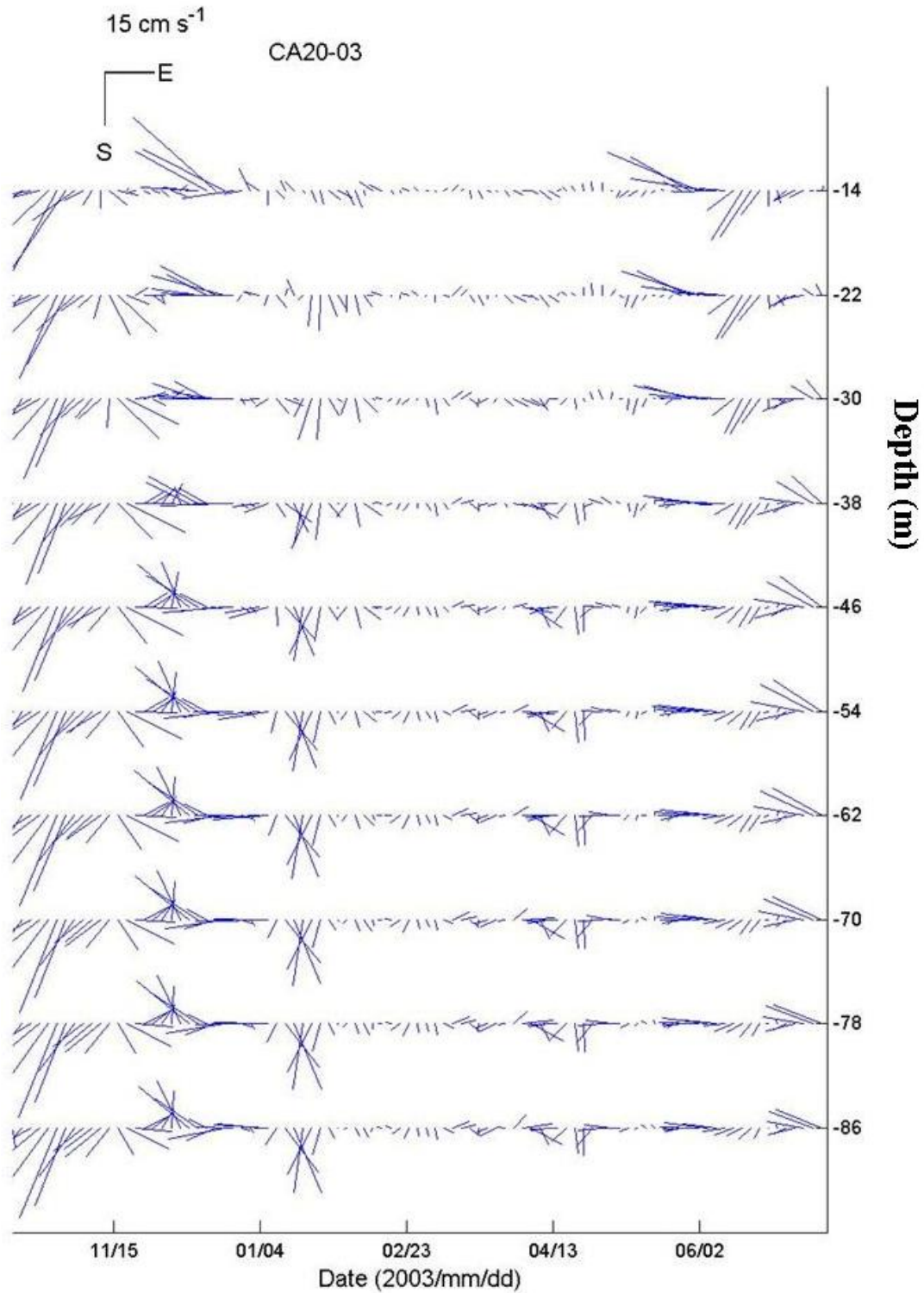
**APPENDIX 13.8** Stick diagram showing the ADCP velocity recorded every 8 m between 11 m and 79 m from the mooring CA12-03 between October 2<sup>nd</sup>, 2003 and July 27<sup>th</sup>, 2004.



**APPENDIX 13.9** Stick diagram showing the ADCP velocity recorded every 8 m between 11 m and 75 m from the mooring CA15-03 between October 10<sup>th</sup>, 2003 and July 22<sup>nd</sup>, 2004.



**APPENDIX 13.10** Stick diagram showing the ADCP velocity recorded every 8 m between 11 m and 91 m from the mooring CA16-03 between October 10<sup>th</sup>, 2003 and July 22<sup>nd</sup>, 2004.



**APPENDIX 13.11** Stick diagram showing the ADCP velocity recorded every 8 m between 14 m and 86 m from the mooring CA20-03 between October 12<sup>th</sup>, 2003 and July 16<sup>th</sup>, 2004.