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December 01. 2003

Cruise Report Lance 2003/13

Ship:	RV LANCE
Cruise:	no. 13/2003
Dates:	September 29th – October 17th 2003
Port Calls:	Tromsø/Norway and Tromsø/Norway
Institute:	Institut für Meereskunde, Universität Hamburg
Number of Scientists:	15
Chief Scientist:	Dr. John Mortensen
Principal Project:	SFB 512 C4 (The East Greenland Current, an indicator of the low frequency variability of the outflow of the system Arctic Ocean/Nordic Seas)
Research area:	Greenland Sea
Working Time Zone:	UTC
Master:	Captain Hermod Isaksen

Participants:

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Gradmann, Sofie	CTD	IfM HH
Herbertz, Sara	CTD	IfM HH
Isert, Katja	CTD	IfM HH
Joos, Hanna	CTD	IfM HH
Kieser, Jens	CTD	IfM HH
Lund, Søren W.	CO2	RISØ
Lundsgaard, Claus, Dr.	CO2	DMU
Sedlacek, Stephan	CTD	IfM HH
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Scientific Objectives

The RV LANCE 13/2003 cruise (The East Greenland Current, an indicator of the low frequency variability of the outflow of the system Arctic Ocean/Nordic Seas) was conducted by the *Institut für Meereskunde, Universität Hamburg* with the main objective of collecting hydrographic observations on the East Greenland continental shelf and slope in the Greenland Sea as part of the German project SFB 512, C4. The main goal of SFB 512, C4, is to understand how changes in the outflows of the Arctic Ocean/Nordic Seas system correlate with measured changes in the East Greenland Current. Since 2003, this work is in addition carried out as part of the international Programme “ASOF” (Arctic-Subarctic Ocean Flux Study) and is a none funded part in the ASOF-N project by the European Union “Energy, Environment and Sustainable Development” Programme as Proposal No EVK2-2001-00215 (ASOF-N). The mooring line along 74°N is maintained in close co-operation with the Norwegian Polar Institute and the Alfred Wegener Institute for Polar and Marine Research. The result of the measurements will be used in combination with regional models, to investigate the nature and origin of the transport fluctuations on seasonal to decadal time scales. The LANCE 13/2003 cruise had the following aims:

1. to carry out hydrographic investigations on the East Greenland continental shelf and slope in the Greenland Sea. The investigation included CTD-casts (a Sea-Bird 911 plus CTD, titanium, was used during the cruise in combination with a SeaBird carousel 12 bottle water sampler).

2. to service of 3 deep sea moorings (HH1, HH3 and HH5) on the 74°N mooring section as part of the German project SFB 512.

3. to service of two tube moorings (in Tube9 and Tube10; out Tube14 and Tube15) and deployment of an ADCP on the East Greenland shelf as part of the German project SFB 512.

4. to collect underway ADCP data (150kHz) along hydrographic sections.

5. to collect samples for analysis of CO_2, alkalinity, nutrient and a number of other parameters on a limited number of station (DMU).

6. to collect continuous underway measurements of a number of atmospheric parameters (wind speed and directions, atmospheric turbulence, latent heat flux (water vapour flux), sensible heat flux, atmospheric flux of CO_2, and atmospheric concentration of CO_2) (RISØ).

7. collect continuous underway measurements of surface (ca. 5 m depth) PCO_2 (RISØ).

Narrative of the cruise

The main party for the LANCE 13/2003 cruise arrived according to schedule in Tromsø, Norway, on the afternoon of Sunday September 28th. The Danish parties had already arrived the day before and were in the process of installing their scientific equipment Sunday afternoon. The IfM HH scientific equipment was loaded, installed and made sea safe by late Monday afternoon, September 29th.

RV LANCE left the port of Tromsø Monday evening, September 29th at 2200 UTC (2000 hours local time). Course was set for the first of the three deep sea moorings HH1. Weather and sea state were fine during the night and morning of September 30th and the estimated time of arrival was set to 0800 UTC Thursday morning, October 2nd. RV LANCE arrived at its working area on the morning of October 2nd. The recovery attempt of mooring HH1 started this morning at 0842 UTC, in fair weather conditions for mooring work, with the lowering of the transducer into the water. No return signals were obtained from the releaser within a horizontal distance of 500m from the mooring HH1. Within a smaller distance (~300m) a weak “look like” signal was observed and the release signal was given at 0907 UTC. No mooring broke the surface and the station was abandoned after having waited and swept the area for two hours.

The course was then set for mooring HH3 which was reached at 1300 UTC. Spread Glacial and Polar ice were encountered in the area around HH3 in accordance with ice charts supplied by the Danish Meteorological Institute. During the recovery attempt of mooring HH3 the releaser could again not be heard; this was very similar to what was observed during the LANCE 2002 cruise in September the year before. However, during this cruise, LANCE 2002, “blind” releasing had worked without problem. With near optimal mooring working conditions mooring HH3 was “blind” released at 1324 UTC without success. The station was abandoned at 1500 UTC after a thorough search at the mooring site and downstream. Course was now set for mooring HH5. A “communication” mode search for mooring HH5 was only

conducted due to the approaching darkness and the failure to "blind" release moorings HH1 and HH3. The result of the search for HH5 had the same outcome as for moorings HH1 and HH3, the releaser could not be heard and the acoustics of the near surface water layer were very noisy.

At 1633 UTC course was set for the first of the two tube moorings, Tube 09. A very clear contact was established with Tubes 09's releaser, whereas no contact was established with Tube 10's releaser. A planned recovery of Tube 09 Friday morning October 3rd had to be postponed due to bad weather (northerly winds 15-20m/s, T(air)~ -6°C and T(sea)~ -1.5°C). Small islands and filaments of crowded ice were used as shelter during the day. A minor search for Tube 10 was done in the morning of Saturday October 4th without success during a search for a more protective ice shelter. Work was commenced again Sunday morning at 0800 UTC, October 5th with the successful recovery of Tube 09 in a newly formed pancake ice field. After a calibration CTD cast, Tube 14 was deployed at 1041 UTC without problems as the replacement for Tube 09. A comprehensive search for mooring HH5 was started at 1216 UTC under optimal weather and sea state conditions and ended at 1925 UTC. During this time a number of sequential "blind" release signals were given and two dredging attempts were made without result.

The first CTD section (74°N section) was started with the occupation of CTD station 014 at 2043 UTC, October 5th. The station was occupied problem free after de-freezing the pump of the CTD. A test was carried out the next day, October 6th, to check how deep the acoustical signal from a releaser could be followed. The releaser from the recently recovered Tube 09 was connected to the CTD on station 018 and 019, the two stations representing the approximate location of mooring sites HH3 and HH5, respectively. Near mooring HH3 the releaser was followed to 700m, when contact was lost. Whereas contact was already lost at 300m at mooring HH5, at the bottom (ca. 1488m) it responded to a "blind" release command. After the test stations CTD work was continued along the 74°N section towards Greenland.

The CTD section 74°N, which was started Sunday, October 5th, was completed on Tuesday morning, October 7th, with a CTD station near to the 3 nautical mile (nm) zone of Greenland. The area near Greenland was covered, as was the rest of the shelf, with newly formed pancake ice, referred to as the "soup" by the Norwegian sailors. After finishing the section, course was set for the first CTD station along the 74°30N section, around 30 nm away (74°30N, 18°20W). CTD work commenced along the 74°30N section on Tuesday morning, October 7th at 0710 UTC from near the coast of East Greenland. In the evening, the sea cable connection to the CTD had to be changed as the communication suddenly was lost between the CTD and the deck unit at a time when the CTD was located at a depth of ca. 1600m. In early morning the same problem was encountered at station 049, and course was set for the ADCP mooring deploying site at 74°N, 15°38W.

The deployment of the ADCP mooring started just after lunch on Wednesday, October 8th and was successfully deployed at 1325 UTC. Course was set for the nearby tube mooring, Tube 10, which it was attempted to recover. Release command was given and dredging was carried out without success and the site was abandoned at 1529 UTC. With an unfavourable weather forecast, course was set for the CTD station nearest to Greenland on the 75°N CTD section.

The first station of the 75°N section was reached Thursday night, October 9th at 0030 UTC. A snowstorm postponed the CTD work to the morning, when work could be resumed at 0644 UTC. The first CTD station was finished at 1041 UTC after dealing with a problematic pressure sensor, a frozen pump and a freezing winch. The wind was at the time ca. 15 m/s from the north, with air temperatures of –6.6°C and a humidity of 95.8%. The CTD work was resumed at 1319 UTC after major insulating work on the winch. In the early evening the sea cable connection to the CTD had to be changed again. During the change, the wind had increased to over 20 m/s from the north, combined with snow showers. After station 059 at

2120 UTC, course was set for section 74°30N and the station nearest to Greenland, due to the high winds and increasing areas of open waters at 75°N.

Work along the 74°30N section was first resumed Saturday afternoon, October 10th at 1400 UTC after the ship had been waiting in the ice for reasonable working conditions. The first four CTD stations were occupied in open water, where ice previous covering the area had been blown away. The next morning, on October 11th, the winch remote control suddenly stopped functioning and had to be operated from outside on deck. At the same time, the CTD got problems with its bottle firing control. During the repair work on the winch and CTD, course was set for the inner station of the 75°N section at 1015 UTC. With the growing ice thickness and areal coverage, it was perhaps the last chance to obtain data from this section this year.

The first station of the 75°N section was started in the afternoon of October 11th at 1710 UTC. The ice coverage was dense near Greenland, but after the first four stations ice conditions improved. In early morning October 12th the ice conditions started to change fast and the percentage of multiyear ice increased drastically. The station work on the 75°N section was stopped at 0804 UTC as the imaginary continuation of the section line was packed with lots of multiyear ice from the Pole. Course was set for the outer parts of the 74°N section. On one occasion during the cruise the first mate reports to have counted by the naked eye over 40 icebergs at a particular site. This was a big change compared with the LANCE 2002 cruise the year before, when icebergs were a rare siting and when newly formed ice were not observed at all.

RV LANCE arrived the position 74°N, 12°W on Sunday afternoon October 12th at 1400 UTC and immediately started the CTD work along the 74°N section towards East Greenland. The section was finished on Monday afternoon, October 13th at 1433 UTC. Course was then set for the inner station of the 74°30N section which was started at 1814 UTC. CTD work had to be stopped at 2155 UTC due to high winds and snow. Work was resumed the next morning at 0826 UTC to be stopped at the next station at 1007 UTC due to a worsening in the ice conditions. Course was set for the first of the three un-recovered deep sea moorings, HH5, which was reached on Tuesday afternoon, October 14th at 1605 UTC. Open sea with a very high percentage of multiyear ice and numerous icebergs was met in a wide zone around mooring HH5. A “communication” mode search for mooring HH5 was performed without any contact with the releaser. A similar procedure was performed at moorings HH3 and HH1 with the same result. With the worsening of the ice conditions in the area and having a good weather forecast window, course was set for Tromsø which was reached on Friday morning October 17th at 0845 UTC (1045 local time).

CTD (SBE 911plus CTD system) Sensor Status

Sensor	Serial	Calibration date
Temperature	4022	28. Nov. 2001
Salinity	2433	30. Nov. 2001
Pressure	86555	17. Jul. 2001

Preliminary Results

The CTD data were obtained along three east-west sections along 74°N, 74°30N and 75°N. All of these sections started near the coast of East Greenland and continued onto the East Greenland continental slope and deep part of the Greenland Sea Gyre (for the location of the sections and stations see Figure 1 and the list of stations below). Note that the CTD data from

2003 presented below are un-calibrated data. Potential temperature and salinity sections for 74°N, 74°30N and 75°N are shown below in Figure 2, Figure 3 and Figure 4, respectively. The preliminary findings are the following:

- winter cooling of the surface layer had started. The warm (T~1 to 4°C) and relative fresh (S~29-33) summer heat surface layer with a thickness of approximately 20-30m, which had been observed the year before in September 2002, had disappeared. The surface layer was cold this year (T~ -1 to 1°C) and relatively saline (S~32-33), and the thickness had increased.

- sea ice was observed to be formed on the East Greenland shelf and upper parts of the continental slope on all three sections.

- below the surface layer the general trend from 2002 to 2003 of the temperature field in the upper 500m is towards higher values. This was most distinct over the shallower parts of the shelf and deeper parts of the slope (see Figure 5).

- at depth, Greenland Sea Deep Water (GSDW) is observed to climb the East Greenland continental slope reaching depths less than 2000m at the 74°N section (see Figure 2 upper).

The distribution of water masses along the 74°N section is schematically shown in Figure 6 and Figure 7, showing the salinity section and TS-diagram of the 74°N section in September 2002, respectively. Polar Surface Water (PSW) is found over the shelf and upper slope. A thin low salinity surface layer occupies the deeper part of the section, which is more saline than the rest of the section. Below the PSW on the shelf there are traces of Arctic Atlantic Water (AAW) near the bottom. On the slope and deeper part of the section Re-circulating Atlantic Water (RAW) is present below the surface layer. The next water masses to be encountered with increasing depth after RAW are upper Polar Deep Water (uPDW) in the upper part of the slope and Greenland Sea Arctic Intermediate Water (GSAIW) in the deep part of the slope and central part of the Greenland Sea. In the Deep Water, Canadian Basin Deep Water (CBDW) overlays Eurasian Basin Deep Water (EBDW) and Greenland Sea Deep Water (GSDW) on the slope. For a more thorough discussion of the water masses see e.g. Rudels et al. (2002).

Figure 8 shows preliminary data from the tube mooring, Tube 09, recovered during the cruise. Time series of pressure and temperature, for the upper (blue) and lower (red) microcat, are shown in Figure 8. Depth excursions of the tube (Fig. 8 upper) of up to 40m are not uncommon. However, on two occasions depth excursions of more than 100m were observed. Whether the excursions are associated with iceberg contact or strong current events is still unknown. The temperature time series (Fig. 8 lower) reveals a seasonal signal in the upper microcat, whereas it is not obvious if it exist in the lower microcat. For the upper instrument maximum temperatures are found in September and minimum in winter. The onset of the winter cooling of the surface layer is observed to have started around a month earlier in year 2003 than in year 2002.

References

Rudels, B., E. Fahrbach, J. Meincke, G. Budéus and P. Eriksson, The East Greenland Current and its contribution to the Denmark Strait overflow. ICES Journal Marine Science, 59, 1133-1154, 2002.

Further Remarks

We would like to thank Captain Isaksen and his crew for the good co-operation on board RV Lance. Financial support came from the *Deutsche Forschungsgemeinschaft* (SFB 512), Bonn.

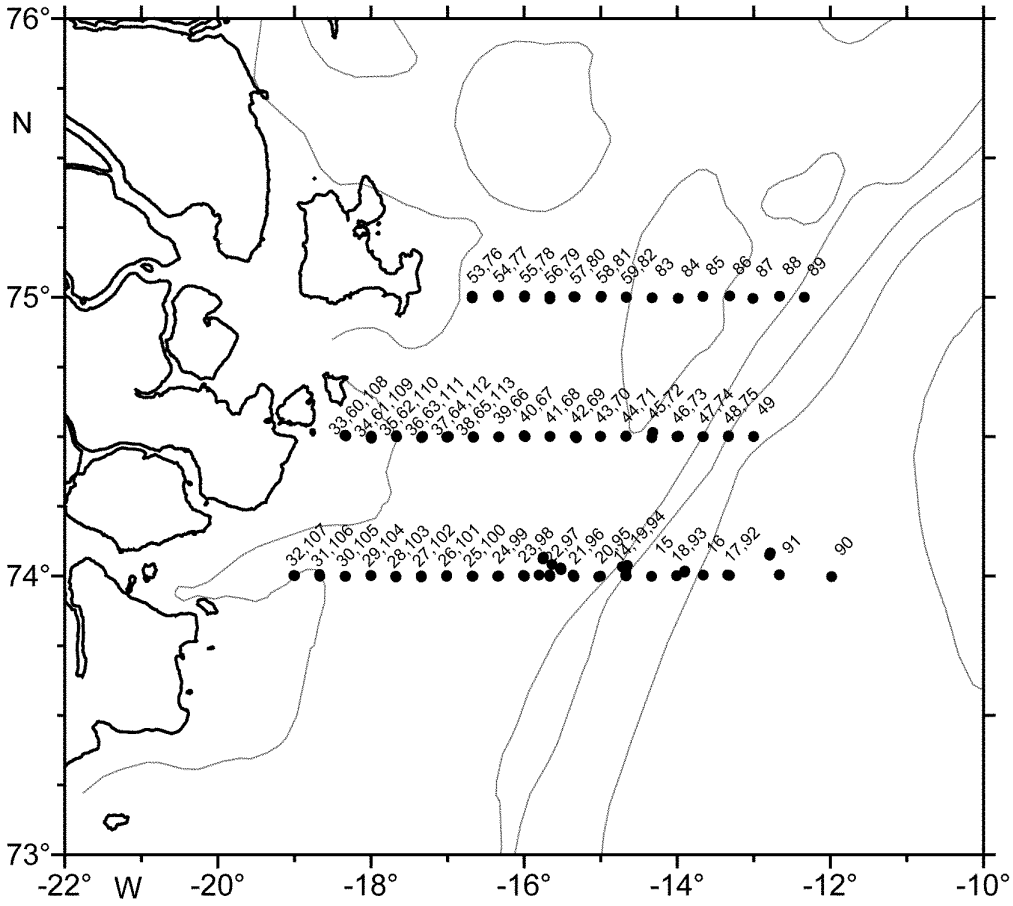

Figure 1. Position of the “Lance” sections and stations taken in October 2003.

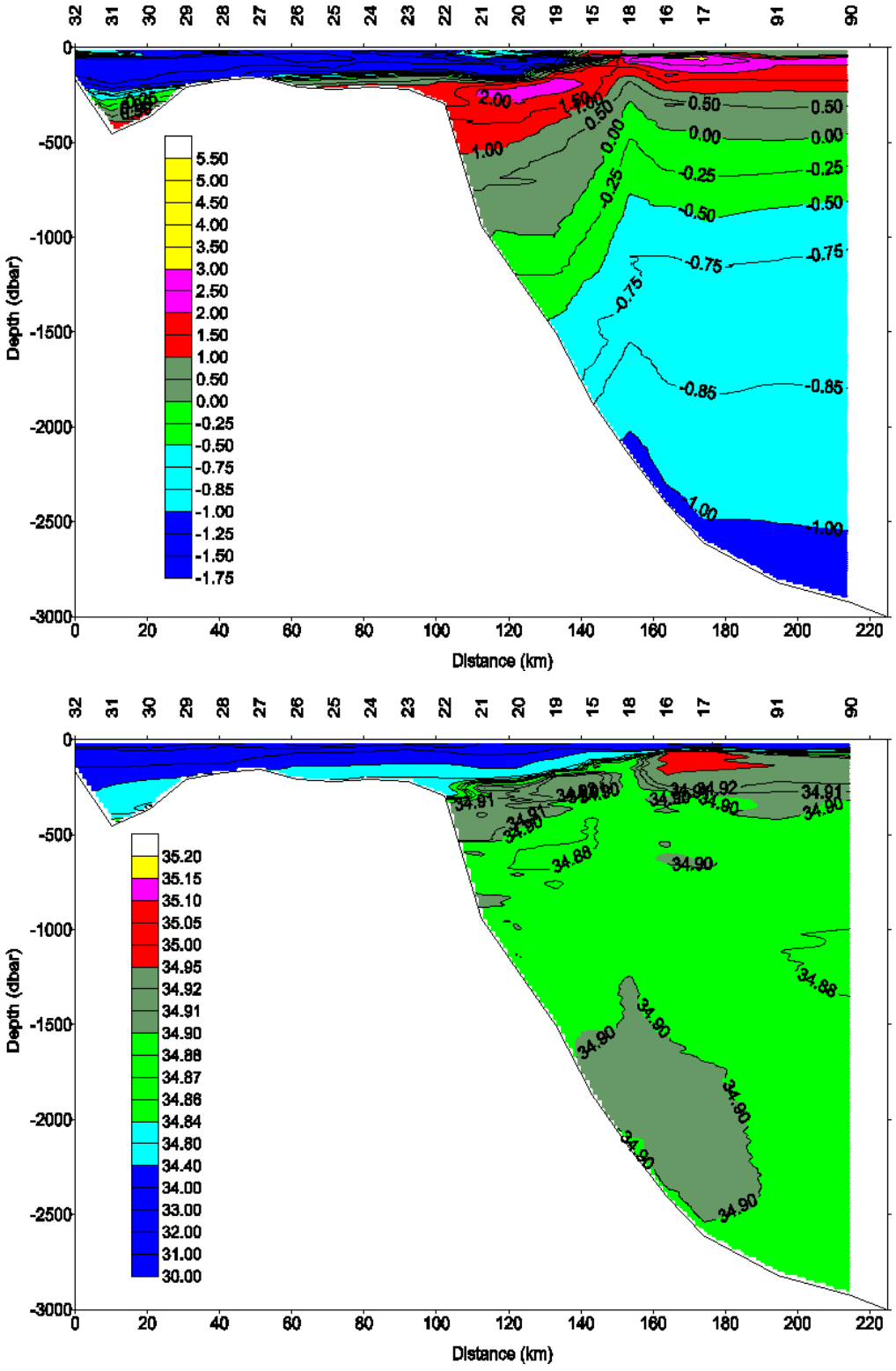

Figure 2. Potential temperature (upper) and salinity (lower) distribution along the 74°N section in October 2003.

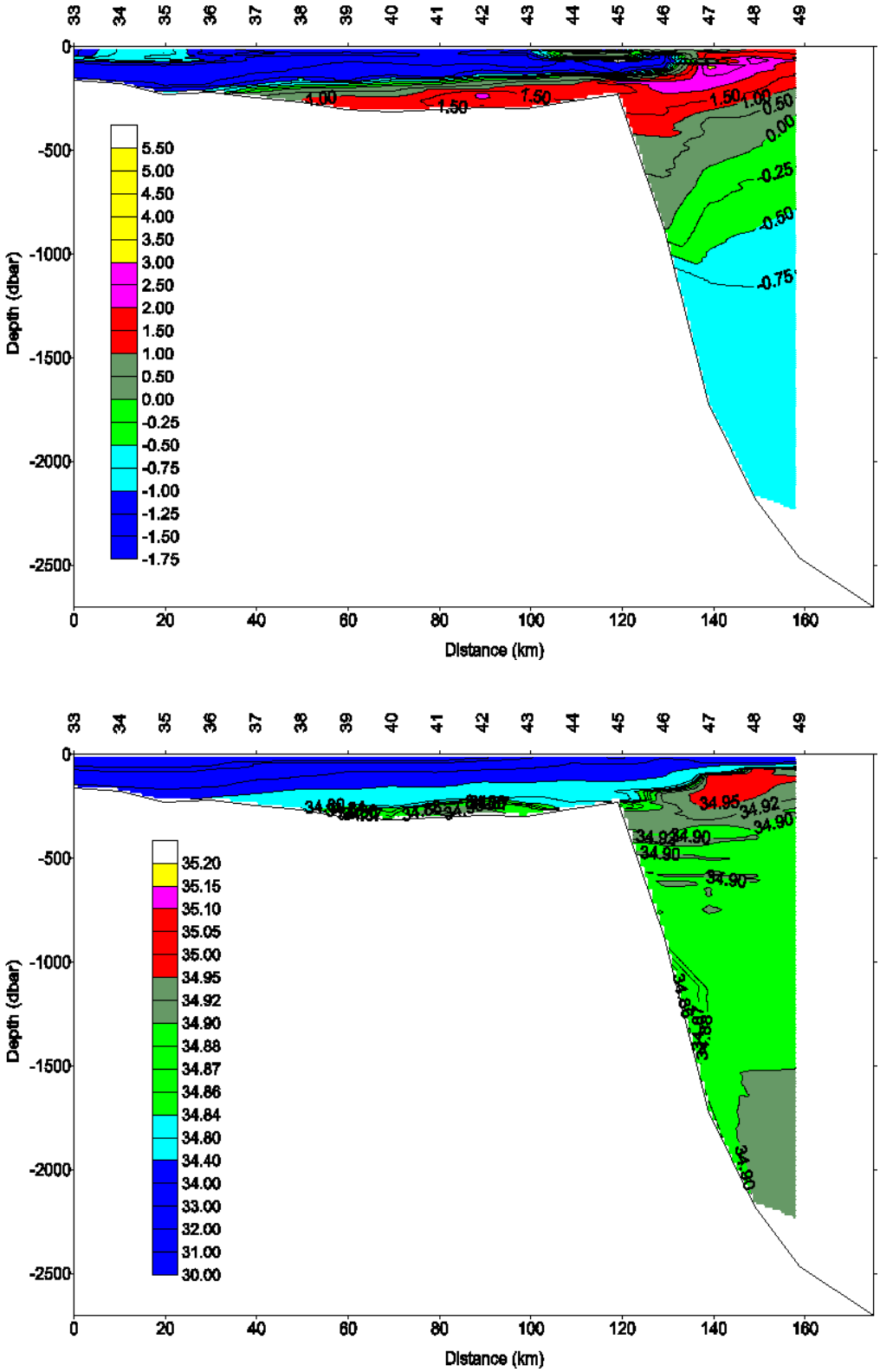

Figure 3. Potential temperature (upper) and salinity (lower) distribution along the 74°30N section in October 2003.

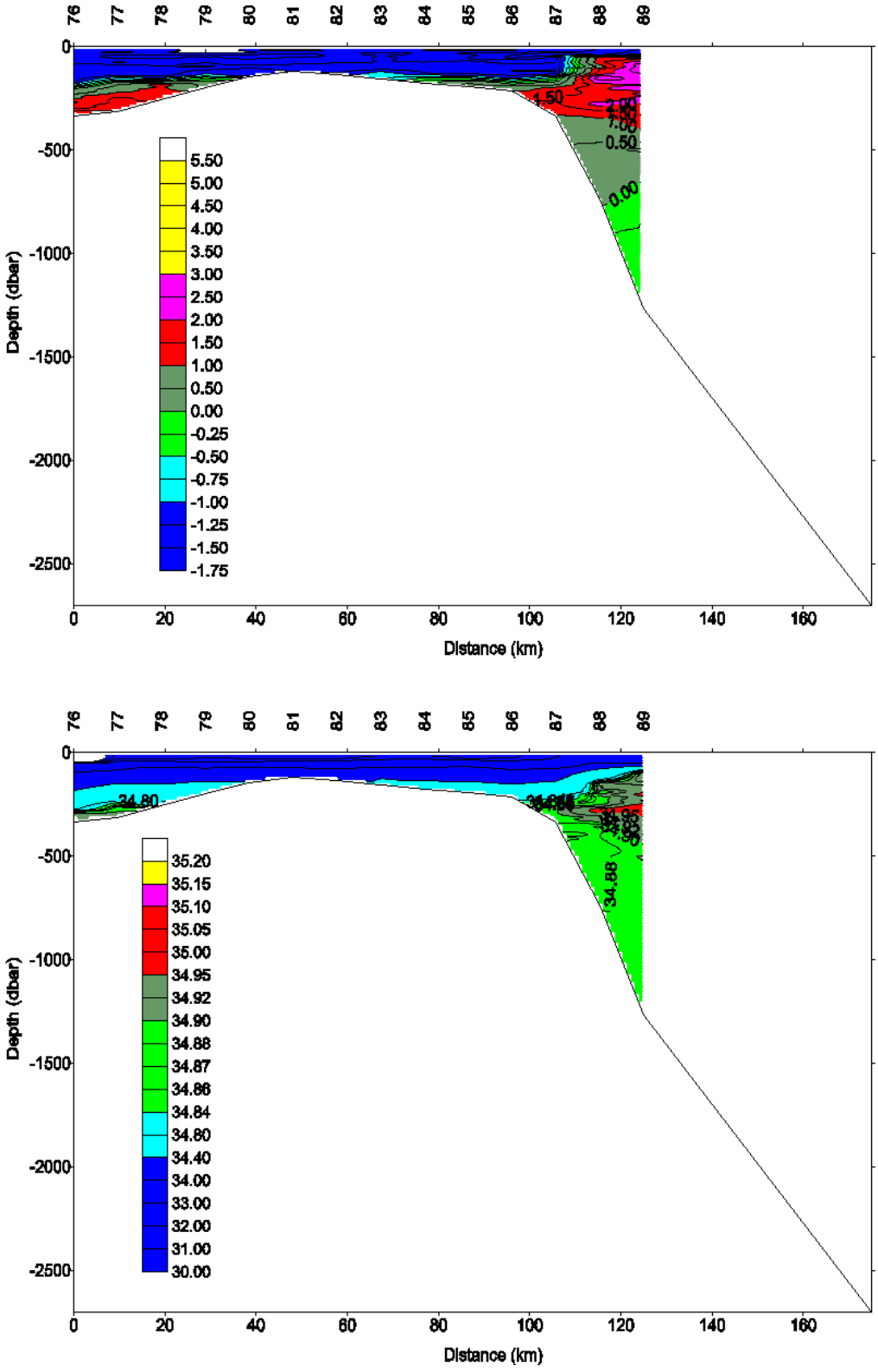

Figure 4. Potential temperature (upper) and salinity (lower) distribution along the 75°N section in October 2003.

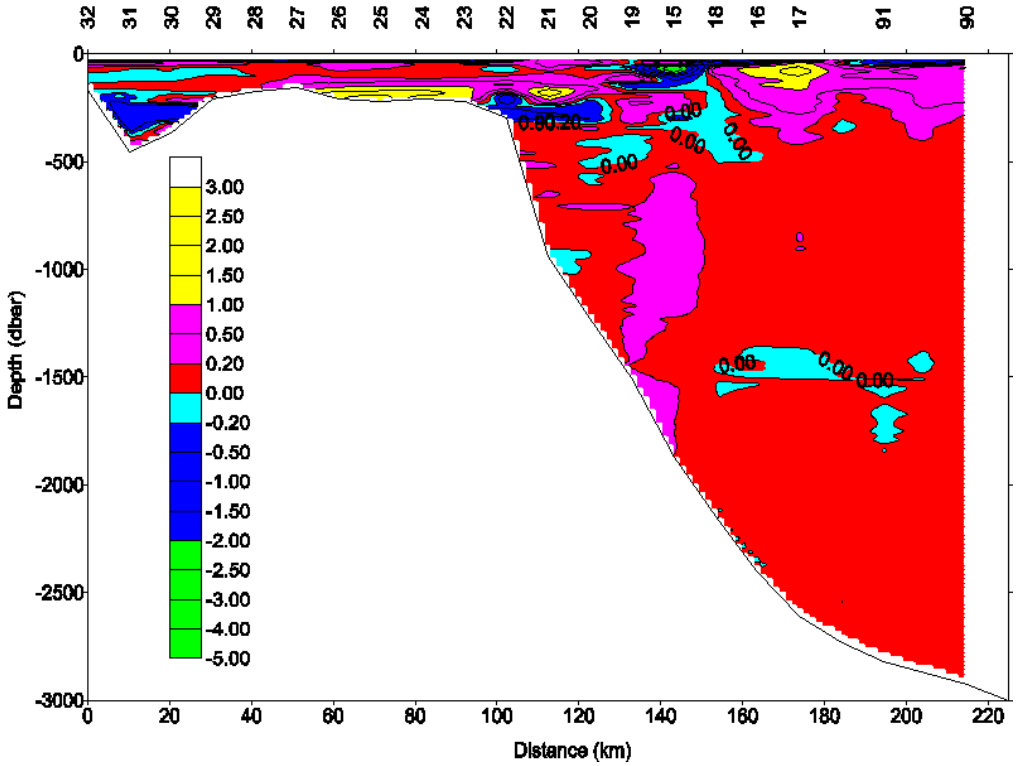

Figure 5. Potential temperature difference between the October 2003 and September 2002 occupations of the 74°N section.

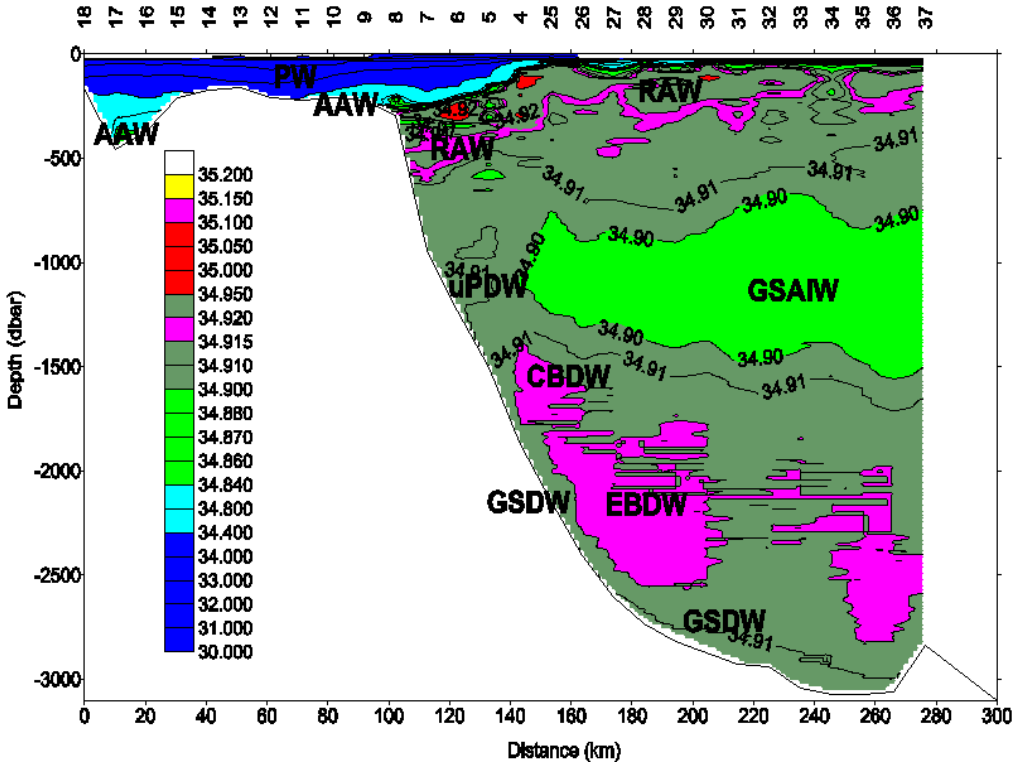

Figure 6. Salinity distribution along the 74°N section, September 2002. Water masses is schematic shown. Polar Surface Water (PSW), Arctic Atlantic Water (AAW), Re-circulating Atlantic Water (RAW), upper Polar Deep Water (uPDW), Greenland Sea Arctic Intermediate Water (GSAIW), Canadian Basin Deep Water (CBDW), Eurasian Basin Deep Water (EBDW) and Greenland Sea Deep Water (GSDW).

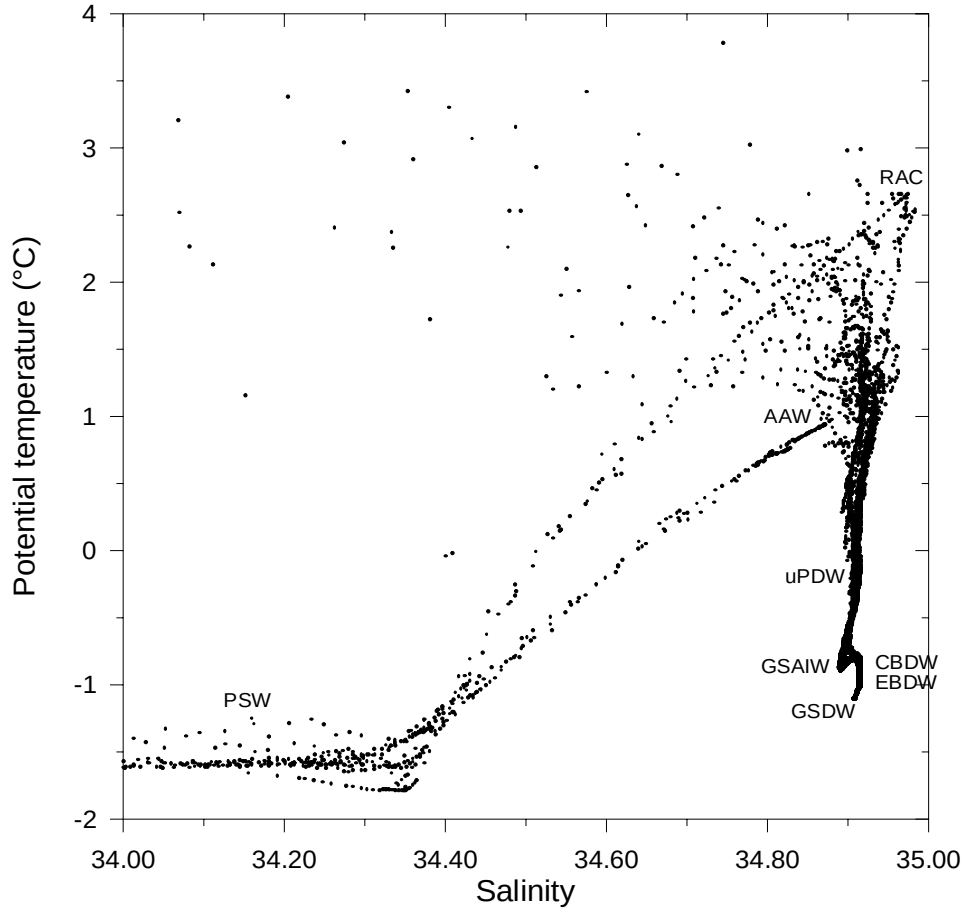

Figure 7. TS-diagram for the 74°N section, September 2002. Water masses is schematic shown. Polar Surface Water (PSW), Arctic Atlantic Water (AAW), Re-circulating Atlantic Water (RAW), upper Polar Deep Water (uPDW), Greenland Sea Arctic Intermediate Water (GSAIW), Canadian Basin Deep Water (CBDW), Eurasian Basin Deep Water (EBDW) and Greenland Sea Deep Water (GSDW).

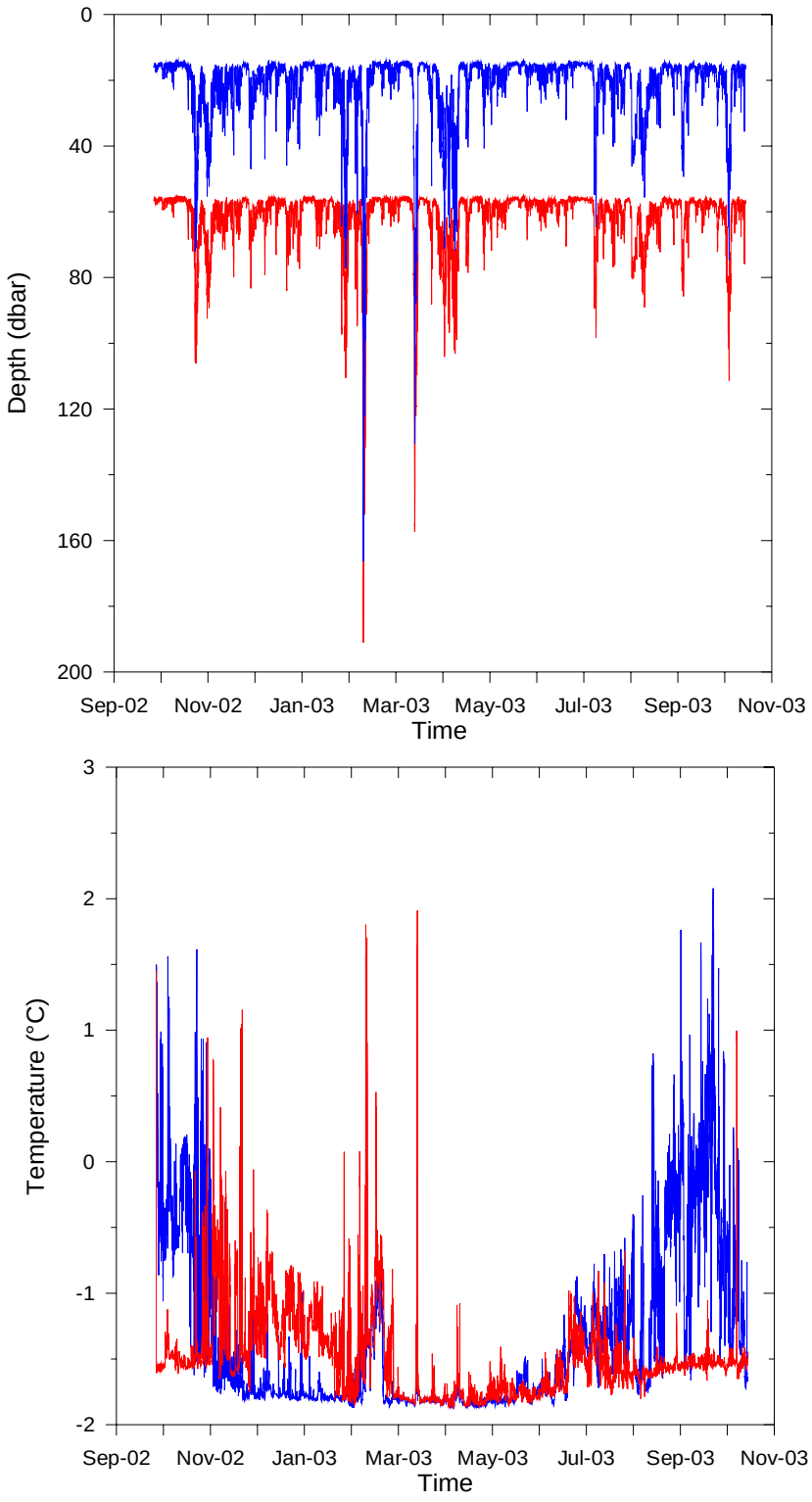

Figure 8. Time series of pressure (upper) and temperature (lower) for Tube 09, upper microcat blue and lower microcat red.

List of stations

EXPO-CODE	Section Name	Stat. No.	Cast No.	Cast Type	Date mmddyy	Time UTC	Code	Position Latitude	Position Longitude	Code	Bottom depth	Meter Wheel	Max Press.	Bottom Dist.	Comments
58LA1303		001	01	MOR	100203	0842	BE	74 04.93 N	12 47.08 W	GPS	2838				Recovery of mooring HH1 failed
58LA1303		001	01	MOR	100203	1055	EN	74 04.93 N	12 47.08 W	GPS	2838				no contact
58LA1303		002	01	MOR	100203	1300	BE	74 01.04 N	13 54.11 W	GPS					Recovery of mooring HH3 failed
58LA1303		002	01	MOR	100203	1500	EN	73 58.04 N	14 05.35 W	GPS	2169				no contact
58LA1303		003	01	MOR	100203	1617	BE	74 02.03 N	14 40.15 W	GPS	1360				Search for mooring HH5
58LA1303		003	01	MOR	100203	1633	EN	74 02.03 N	14 40.15 W	GPS	1360				no contact
58LA1303		004	01	MOR	100203	1815	BE	74 01.61 N	15 31.19 W	GPS	360				Search for Tube 9
58LA1303		004	01	MOR	100203	1820	EN	74 01.61 N	15 31.19 W	GPS	360				contact
58LA1303		005	01	MOR	100203	1851	BE	74 03.91 N	15 45.04 W	GPS	202				Search for Tube 10
58LA1303		005	01	MOR	100203	1903	EN	74 03.91 N	15 45.04 W	GPS	202				no contact
58LA1303		006	01	MOR	100203	1910	BE	74 04.03 N	15 44.95 W	GPS	200				Search for Tube 10
58LA1303		006	01	MOR	100203	1915	EN	74 04.03 N	15 44.95 W	GPS	200				no contact
58LA1303		007	01	MOR	100403	0952	BE	74 00.20 N	15 48.32 W	GPS	197				Search for Tube 10
58LA1303		007	01	MOR	100403	1115	EN	74 03.93 N	15 45.05 W	GPS	202				no contact
58LA1303		008	01	MOR	100503	0803	BE	74 01.66 N	15 31.82 W	GPS	338				Recovery of Tube 9
58LA1303		008	01	MOR	100503	0851	EN	74 01.69 N	15 30.30 W	GPS	405				
58LA1303		009	01	ROS/CTD	100503	0940	BE	74 01.70 N	15 31.26 W	GPS	343				
58LA1303		009	01	ROS/CTD	100503	0959	BO	74 01.63 N	15 31.30 W	GPS	350			8	
58LA1303		009	01	ROS/CTD	100503	1006	EN	74 01.59 N	15 31.37 W	GPS	351				
58LA1303		010	01	MOR	100503	1015	BE	74 01.36 N	15 31.01 W	GPS	422				Deployment of Tube 14
58LA1303		010	01	MOR	100503	1043	EN	74 01.62 N	15 31.38 W	GPS	353				
58LA1303		011	01	MOR	100503	1216	BE	74 01.96 N	14 43.14 W	GPS	1300				Search for mooring HH5
58LA1303		011	01	MOR	100503	1222	EN	74 01.96 N	14 43.14 W	GPS	1300				no contact
58LA1303		012	01	MOR	100503	1237	BE	74 02.28 N	14 39.16 W	GPS	1365				Recovery of mooring HH5 failed
58LA1303		012	01	MOR	100503	1443	EN	74 02.28 N	14 39.16 W	GPS	1365				
58LA1303		013	01	MOR	100503	1455	BE	74 01.18 N	14 40.25 W	GPS	1412				Two times dredging for mooring HH5 failed
58LA1303		013	01	MOR	100503	1925	EN	74 01.18 N	14 40.25 W	GPS	1412				
58LA1303		014	01	ROS/CTD	100503	2043	BE	74 01.93 N	14 39.66 W	GPS	1384				
58LA1303		014	01	ROS/CTD	100503	2116	BO	74 01.96 N	14 41.45 W	GPS	1384		1374	10	
58LA1303		014	01	ROS/CTD	100503	2149	EN	74 01.94 N	14 40.06 W	GPS	1379				
58LA1303		015	01	ROS/CTD	100503	2333	BE	73 59.91 N	14 20.17 W	GPS	1871				
58LA1303		015	01	ROS/CTD	100603	0017	BO	74 00.03 N	14 20.04 W	GPS	1889	1870	1866	8	
58LA1303		015	01	ROS/CTD	100603	0056	EN	73 58.28 N	14 22.27 W	GPS	1896				

58LA1303	016	01	ROS/CTD	100603	0223	BE	74 00.17 N	13 39.65 W	GPS	2421				
58LA1303	016	01	ROS/CTD	100603	0335	BO	73 59.53 N	13 40.04 W	GPS	2432	2361	2376	32	stopped 30 minutes at 1300 depth
58LA1303	016	01	ROS/CTD	100603	0431	EN	73 59.01 N	13 40.00 W	GPS	2425				
58LA1303	017	01	ROS/CTD	100603	0517	BE	74 00.12 N	13 19.12 W	GPS	2612				
58LA1303	017	01	ROS/CTD	100603	0613	BO	73 59.03 N	13 19.75 W	GPS	2606	2722	2599	9	
58LA1303	017	01	ROS/CTD	100603	0705	EN	73 59.04 N	13 19.65 W	GPS	2622				
58LA1303	018	01	ROS/CTD	100603	0828	BE	74 00.04 N	14 00.55 W	GPS	2155				
58LA1303	018	01	ROS/CTD	100603	0915	BO	73 59.45 N	14 01.37 W	GSP	2173	2167	2141	9	with releaser
58LA1303	018	01	ROS/CTD	100603	0956	EN	73 58.98 N	14 02.15 W	GPS	2176				
58LA1303	019	01	ROS/CTD	100603	1126	BE	74 00.00 N	14 40.04 W	GPS	1488				
58LA1303	019	01	ROS/CTD	100603	1203	BO	73 59.09 N	14 40.25 W	GPS	1549	1756	1488	17	with releaser
58LA1303	019	01	ROS/CTD	100603	1247	EN	73 58.70 N	14 40.25 W	GPS	1531				
58LA1303	020	01	ROS/CTD	100603	1323	BE	73 59.97 N	15 00.19 W	GPS	1209				
58LA1303	020	01	ROS/CTD	100603	1358	BO	73 59.60 N	14 59.57 W	GPS	1257	1243	1218	12	
58LA1303	020	01	ROS/CTD	100603	1428	EN	73 59.27 N	14 59.15 W	GPS	1284				
58LA1303	021	01	ROS/CTD	100603	1513	BE	73 59.85 N	15 20.94 W	GPS	936				
58LA1303	021	01	ROS/CTD	100603	1537	BO	73 59.72 N	15 20.68 W	GPS	951	924	929	11	
58LA1303	021	01	ROS/CTD	100603	1610	EN	73 59.68 N	15 20.01 W	GPS	967				
58LA1303	022	01	ROS/CTD	100603	1659	BE	73 59.93 N	15 39.82 W	GPS	276				
58LA1303	022	01	ROS/CTD	100603	1712	BO	73 59.87 N	15 39.72 W	GPS	296	280	285	10	
58LA1303	022	01	ROS/CTD	100603	1725	EN	73 59.76 N	15 39.71 W	GPS	308				
58LA1303	023	01	ROS/CTD	100603	1814	BE	74 00.12 N	16 00.46 W	GPS	216				
58LA1303	023	01	ROS/CTD	100603	1824	BO	74 00.05 N	16 00.74 W	GPS	216	201	204	12	
58LA1303	023	01	ROS/CTD	100603	1837	EN	74 00.02 N	16 00.75 W	GPS	218				
58LA1303	024	01	ROS/CTD	100603	1913	BE	73 59.94 N	16 20.68 W	GPS	205				
58LA1303	024	01	ROS/CTD	100603	1923	BO	73 59.85 N	16 21.17 W	GPS	208	197	200	9	
58LA1303	024	01	ROS/CTD	100603	1937	EN	73 59.65 N	16 21.42 W	GPS	209				
58LA1303	025	01	ROS/CTD	100603	2019	BE	73 59.97 N	16 40.71 W	GPS	222				
58LA1303	025	01	ROS/CTD	100603	2029	BO	73 59.90 N	16 40.48 W	GPS	223	214	215	8	
58LA1303	025	01	ROS/CTD	100603	2039	EN	73 59.90 N	16 40.53 W	GPS	223				
58LA1303	026	01	ROS/CTD	100603	2116	BE	74 00.07 N	17 00.67 W	GPS	219				
58LA1303	026	01	ROS/CTD	100603	2130	BO	74 00.02 N	17 01.01 W	GPS	209	199	202	8	
58LA1303	026	01	ROS/CTD	100603	2143	EN	73 59.99 N	17 01.04 W	GPS	206				
58LA1303	027	01	ROS/CTD	100603	2215	BE	73 59.98 N	17 20.67 W	GPS	150				
58LA1303	027	01	ROS/CTD	100603	2222	BO	73 59.91 N	17 21.05 W	GPS	148	139	138	11	
58LA1303	027	01	ROS/CTD	100603	2233	EN	73 59.84 N	17 21.24 W	GPS	150				
58LA1303	028	01	ROS/CTD	100603	2304	BE	73 59.78 N	17 40.43 W	GPS	172				
58LA1303	028	01	ROS/CTD	100603	2312	BO	73 59.75 N	17 40.50 W	GPS	173	161	163	10	
58LA1303	028	01	ROS/CTD	100603	2322	EN	73 59.66 N	17 40.80 W	GPS	174				

58LA1303	029	01	ROS/CTD	100603	2356	BE	74 00.06 N	18 00.00 W	GPS	203				
58LA1303	029	01	ROS/CTD	100703	0005	BO	74 00.02 N	18 00.52 W	GPS	205	191	194	11
58LA1303	029	01	ROS/CTD	100703	0016	EN	73 59.98 N	18 00.77 W	GPS	206			
58LA1303	030	01	ROS/CTD	100703	0059	BE	73 59.93 N	18 20.30 W	GPS	369			
58LA1303	030	01	ROS/CTD	100703	0110	BO	73 59.89 N	18 20.28 W	GPS	369	346	351	13
58LA1303	030	01	ROS/CTD	100703	0124	EN	73 59.85 N	18 20.27 W	GPS	370			
58LA1303	031	01	ROS/CTD	100703	0229	BE	73 59.96 N	18 40.08 W	GPS	447			
58LA1303	031	01	ROS/CTD	100703	0243	BO	73 59.91 N	18 39.90 W	GPS	444	426	427	12
58LA1303	031	01	ROS/CTD	100703	0259	EN	73 59.85 N	18 39.78 W	GPS	434			
58LA1303	032	01	ROS/CTD	100703	0341	BE	74 00.07 N	18 59.93 W	GPS	168			
58LA1303	032	01	ROS/CTD	100703	0350	BO	74 00.04 N	18 59.74 W	GPS	172	153	159	10
58LA1303	032	01	ROS/CTD	100703	0404	EN	73 59.94 N	18 59.29 W	GPS	188			
58LA1303	033	01	ROS/CTD	100703	0710	BE	74 30.14 N	18 19.73 W	GPS	165			
58LA1303	033	01	ROS/CTD	100703	0720	BO	74 30.07 N	18 19.93 W	GPS	163	150	155	8
58LA1303	033	01	ROS/CTD	100703	0731	EN	74 30.08 N	18 20.50 W	GPS	160			
58LA1303	034	01	ROS/CTD	100703	0811	BE	74 29.66 N	17 59.71 W	GPS	184			
58LA1303	034	01	ROS/CTD	100703	0822	BO	74 29.75 N	18 00.66 W	GPS	176	175	170	8
58LA1303	034	01	ROS/CTD	100703	0834	EN	74 29.88 N	18 00.47 W	GPS	179			
58LA1303	035	01	ROS/CTD	100703	0909	BE	74 29.95 N	17 39.95 W	GPS	235			
58LA1303	035	01	ROS/CTD	100703	0921	BO	74 29.92 N	17 39.36 W	GPS	234	223	222	10
58LA1303	035	01	ROS/CTD	100703	0931	EN	74 29.92 N	17 39.29 W	GPS	231			
58LA1303	036	01	ROS/CTD	100703	1003	BE	74 29.96 N	17 19.67 W	GPS	219			
58LA1303	036	01	ROS/CTD	100703	1014	BO	74 29.79 N	17 18.99 W	GPS	216	226	210	10
58LA1303	036	01	ROS/CTD	100703	1025	EN	74 29.63 N	17 18.56 W	GPS	221			
58LA1303	037	01	ROS/CTD	100703	1056	BE	74 30.01 N	16 59.35 W	GPS	245			
58LA1303	037	01	ROS/CTD	100703	1105	BO	74 29.93 N	16 58.94 W	GPS	247	242	236	8
58LA1303	037	01	ROS/CTD	100703	1115	EN	74 29.81 N	16 58.28 W	GPS	252			
58LA1303	038	01	ROS/CTD	100703	1145	BE	74 29.97 N	16 39.89 W	GPS	268			
58LA1303	038	01	ROS/CTD	100703	1154	BO	74 29.89 N	16 39.12 W	GPS	273	264	260	10
58LA1303	038	01	ROS/CTD	100703	1206	EN	74 29.85 N	16 38.81 W	GPS	273			
58LA1303	039	01	ROS/CTD	100703	1242	BE	74 29.94 N	16 19.97 W	GPS	307			
58LA1303	039	01	ROS/CTD	100703	1252	BO	74 29.84 N	16 19.36 W	GPS	307	293	292	11
58LA1303	039	01	ROS/CTD	100703	1307	EN	74 29.77 N	16 18.97 W	GPS	307			
58LA1303	040	01	ROS/CTD	100703	1344	BE	74 30.20 N	16 00.00 W	GPS	319			
58LA1303	040	01	ROS/CTD	100703	1355	BO	74 30.07 N	15 59.61 W	GPS	315	297	303	11
58LA1303	040	01	ROS/CTD	100703	1411	EN	74 30.02 N	15 59.63 W	GPS	318			
58LA1303	041	01	ROS/CTD	100703	1441	BE	74 30.05 N	15 39.74 W	GPS	302			
58LA1303	041	01	ROS/CTD	100703	1458	BO	74 30.05 N	15 39.72 W	GPS	301	285	292	10
58LA1303	041	01	ROS/CTD	100703	1511	EN	74 30.02 N	15 39.53 W	GPS	301			

58LA1303	042	01	ROS/CTD	100703		BE	74 30.06 N	15 19.94 W	GPS	293				
58LA1303	042	01	ROS/CTD	100703	1553	BO	74 29.99 N	15 19.69 W	GPS	296	282	281	12	
58LA1303	042	01	ROS/CTD	100703	1607	EN	74 29.85 N	15 19.43 W	GPS	292				
58LA1303	043	01	ROS/CTD	100703	1646	BE	74 30.07 N	15 00.33 W	GPS	298				
58LA1303	043	01	ROS/CTD	100703	1658	BO	74 30.13 N	15 00.47 W	GPS	299	289	290	10	
58LA1303	043	01	ROS/CTD	100703	1712	EN	74 30.21 N	15 00.78 W	GPS	299				
58LA1303	044	01	ROS/CTD	100703	1750	BE	74 30.11 N	14 40.06 W	GPS	262				
58LA1303	044	01	ROS/CTD	100703	1801	BO	74 30.16 N	14 40.45 W	GPS	262	254	253	10	
58LA1303	044	01	ROS/CTD	100703	1812	EN	74 30.23 N	14 40.76 W	GPS	260				
58LA1303	045	01	ROS/CTD	100703	1853	BE	74 30.89 N	14 19.15 W	GPS	231				
58LA1303	045	01	ROS/CTD	100703	1903	BO	74 30.82 N	14 19.31 W	GPS	228	221	219	10	
58LA1303	045	01	ROS/CTD	100703	1917	EN	74 29.66 N	14 19.61 W	GPS	232				
58LA1303	046	01	ROS/CTD	100703	1957	BE	74 29.98 N	14 00.27 W	GPS	893				
58LA1303	046	01	ROS/CTD	100703	2019	BO	74 29.56 N	14 01.24 W	GPS	867	883	860	12	
58LA1303	046	01	ROS/CTD	100703	2041	EN	74 29.19 N	14 02.02 W	GPS	852				
58LA1303	047	01	ROS/CTD	100703	2121	BE	74 30.00 N	13 39.63 W	GPS	1724				
58LA1303	047	01	ROS/CTD	100703	9999	BO	99 99.99 N	99 99.99 W	GPS	9999	9999	9999	99	CTD failure at ca. 1600m
58LA1303	047	01	ROS/CTD	100703	9999	EN	99 99.99 N	99 99.99 W	GPS	9999				cable termination changed.
58LA1303	048	01	ROS/CTD	100803	0044	BE	74 30.00 N	13 20.01 W	GPS	2194				
58LA1303	048	01	ROS/CTD	100803	0133	BO	74 29.21 N	13 21.34 W	GPS	2185	2266	2167	10	
58LA1303	048	01	ROS/CTD	100803	0224	EN	74 28.33 N	13 22.46 W	GPS	2182				
58LA1303	049	01	ROS/CTD	100803	0309	BE	74 30.00 N	13 00.19 W	GPS	2463				
58LA1303	049	01	ROS/CTD	100803	0405	BO	99 99.99 N	99 99.99 W	GPS	9999	2250	2251	99	CTD failure at ca. 2251m
58LA1303	049	01	ROS/CTD	100803	0455	EN	74 29.40 N	13 03.79 W	GPS	2443				cable termination changed and CTD plug
58LA1303	050	01	MOR	100803	1248	BE	74 02.48 N	15 38.18 W	GPS	197	Deployment of ADCP			
58LA1303	050	01	MOR	100803	1325	EN	74 02.78 N	15 38.29 W	GPS	199	plus ca. 5m			
58LA1303	051	01	MOR	100803	1410	BE	74 03.87 N	15 45.12 W	GPS	9999	recovery of Tube 10 failed			
58LA1303	051	01	MOR	100803	1419	EN	74 03.87 N	15 45.12 W	GPS	9999	release command given			
58LA1303	052	01	MOR	100803	1426	BE	74 03.67 N	15 45.26 W	GPS	189	dredging for Tube 10			
58LA1303	052	01	MOR	100803	1529	EN	74 03.71 N	15 44.64 W	GPS	202	without result			
58LA1303	053	01	ROS/CTD	100903	0644	BE	74 59.17 N	16 39.97 W	GPS	327	pressure sensor problems			
58LA1303	053	01	ROS/CTD	100903	9999	EN	99 99.99 N	99 99.99 W	GPS	9999	data file: l030050.dat			
58LA1303	053	02	ROS/CTD	100903	0739	BE	74 59.54 N	16 40.25 W	GPS	332	pressure sensor problems			
58LA1303	053	02	ROS/CTD	100903	9999	EN	99 99.99 N	99 99.99 W	GPS	9999	data file: l030053.dat			
58LA1303	053	03	ROS/CTD	100903	0944	BE	75 00.52 N	16 41.07 W	GPS	319	frozen pump			
58LA1303	053	03	ROS/CTD	100903	1000	EN	75 00.06 N	16 41.58 W	GPS	321	data file: l030053a.dat			
58LA1303	053	04	ROS/CTD	100903	1013	BE	75 00.20 N	16 40.77 W	GPS	320	winch problems, low temp.			

58LA1303	053	04	ROS/CTD	100903	1025	BO	74	59.88	N	16	40.98	W	GPS	333	385	315	11
58LA1303	053	04	ROS/CTD	100903	1041	EN	74	59.36	N	16	41.52	W	GPS	344	data file: l030053b.dat		
58LA1303	054	01	ROS/CTD	100903	1319	BE	75	00.39	N	16	20.21	W	GPS	318			
58LA1303	054	01	ROS/CTD	100903	1335	BO	75	00.06	N	16	21.28	W	GPS	322	337	308	12
58LA1303	054	01	ROS/CTD	100903	1351	EN	74	59.73	N	16	21.74	W	GPS	331			
58LA1303	055	01	ROS/CTD	100903	1432	BE	75	00.30	N	15	59.62	W	GPS	253			
58LA1303	055	01	ROS/CTD	100903	1447	BO	74	59.75	N	16	00.22	W	GPS	255	266	243	10
58LA1303	055	01	ROS/CTD	100903	1500	EN	74	59.57	N	16	00.78	W	GPS	256			
58LA1303	056	01	ROS/CTD	100903	1542	BE	75	00.15	N	15	39.83	W	GPS	190			
58LA1303	056	01	ROS/CTD	100903	9999	BO	75	00.04	N	15	40.07	W	GPS	195	179	185	10
58LA1303	056	01	ROS/CTD	100903	1604	EN	74	59.95	N	15	40.57	W	GPS	195			
58LA1303	057	01	ROS/CTD	100903	1647	BE	75	00.07	N	15	20.07	W	GPS	147			
58LA1303	057	01	ROS/CTD	100903	1654	BO	74	59.95	N	15	20.03	W	GPS	147	143	132	10
58LA1303	057	01	ROS/CTD	100903	1705	EN	74	59.80	N	15	20.87	W	GPS	147			
58LA1303	058	01	ROS/CTD	100903	1745	BE	75	00.19	N	14	59.51	W	GPS	147			
58LA1303	058	01	ROS/CTD	100903	1754	BO	75	00.03	N	14	59.84	W	GPS	147	112	9	cable problems
58LA1303	058	01	ROS/CTD	100903	1759	EN	74	59.09	N	15	00.00	W	GPS	147	termination changed		
58LA1303	059	01	ROS/CTD	100903	2058	BE	75	00.05	N	14	40.07	W	GPS	147			
58LA1303	059	01	ROS/CTD	100903	2110	BO	74	59.85	N	14	40.37	W	GPS	147	138	125	9
58LA1303	059	01	ROS/CTD	100903	2120	EN	74	59.68	N	14	40.01	W	GPS	147			
58LA1303	060	01	ROS/CTD	101003	1557	BE	74	30.28	N	18	20.09	W	GPS	166			
58LA1303	060	01	ROS/CTD	101003	1606	BO	74	30.25	N	18	20.19	W	GPS	159	185	149	9
58LA1303	060	01	ROS/CTD	101003	1616	EN	74	30.38	N	18	19.97	W	GPS	165			
58LA1303	061	01	ROS/CTD	101003	1652	BE	74	30.08	N	17	59.82	W	GPS	183			
58LA1303	061	01	ROS/CTD	101003	1700	BO	74	30.04	N	18	00.03	W	GPS	180	173	170	10
58LA1303	061	01	ROS/CTD	101003	1705	EN	74	30.07	N	18	00.10	W	GPS	182			
58LA1303	062	01	ROS/CTD	101003	1743	BE	74	30.18	N	17	40.21	W	GPS	232			
58LA1303	062	01	ROS/CTD	101003	1751	BO	74	30.12	N	17	40.47	W	GPS	232	233	220	9
58LA1303	062	01	ROS/CTD	101003	1757	EN	74	30.06	N	17	40.40	W	GPS	233			
58LA1303	063	01	ROS/CTD	101003	1835	BE	74	30.04	N	17	19.61	W	GPS	218			
58LA1303	063	01	ROS/CTD	101003	1844	BO	74	29.78	N	17	19.81	W	GPS	214	226	212	10
58LA1303	063	01	ROS/CTD	101003	1852	EN	74	29.61	N	17	10.19	W	GPS	215			
58LA1303	064	01	ROS/CTD	101003	1932	BE	74	29.86	N	17	00.07	W	GPS	247			
58LA1303	064	01	ROS/CTD	101003	1941	BO	74	29.72	N	17	00.19	W	GPS	246	239	237	10
58LA1303	064	01	ROS/CTD	101003	1948	EN	74	29.78	N	17	00.35	W	GPS	246			
58LA1303	065	01	ROS/CTD	101003	2027	BE	74	29.86	N	16	39.91	W	GPS	280			
58LA1303	065	01	ROS/CTD	101003	2039	BO	74	29.61	N	16	39.69	W	GPS	289	307	276	10
58LA1303	065	01	ROS/CTD	101003	2047	EN	74	29.43	N	16	39.68	W	GPS	283			
58LA1303	066	01	ROS/CTD	101003	2130	BE	74	29.93	N	16	19.82	W	GPS	304			

58LA1303	066	01	ROS/CTD	101003	2140	BO	74 29.83 N	16 19.69 W	GPS	306	305	298	10		
58LA1303	066	01	ROS/CTD	101003	2149	EN	74 29.74 N	16 19.57 W	GPS	306					
58LA1303	067	01	ROS/CTD	101003	2230	BE	74 29.98 N	15 59.22 W	GPS	317					
58LA1303	067	01	ROS/CTD	101003	2241	BO	74 29.79 N	15 58.99 W	GPS	317	324	306	11		
58LA1303	067	01	ROS/CTD	101003	2251	EN	74 29.68 N	15 58.86 W	GPS	319					
58LA1303	068	01	ROS/CTD	101003	2323	BE	74 30.02 N	15 39.81 W	GPS	304					
58LA1303	068	01	ROS/CTD	101003	2333	BO	74 29.94 N	15 39.87 W	GPS	307	306	299	8		
58LA1303	068	01	ROS/CTD	101003	2344	EN	74 29.88 N	15 39.92 W	GPS	308					
58LA1303	069	01	ROS/CTD	101103	0024	BE	74 29.73 N	15 18.99 W	GPS	292					
58LA1303	069	01	ROS/CTD	101103	0035	BO	74 29.47 N	15 19.30 W	GPS	293	337	290	10		
58LA1303	069	01	ROS/CTD	101103	0052	EN	74 29.77 N	15 19.51 W	GPS	295					
58LA1303	070	01	ROS/CTD	101103	9999	BE	74 30.03 N	15 00.05 W	GPS	300					
58LA1303	070	01	ROS/CTD	101103	0154	BO	74 29.82 N	15 00.13 W	GPS	301	297	294	10		
58LA1303	070	01	ROS/CTD	101103	0206	EN	74 29.65 N	15 00.17 W	GPS	302					
58LA1303	071	01	ROS/CTD	101103	0250	BE	74 30.06 N	14 40.35 W	GPS	264					
58LA1303	071	01	ROS/CTD	101103	0302	BO	74 29.94 N	14 40.49 W	GPS	260	262	254	11		
58LA1303	071	01	ROS/CTD	101103	0314	EN	74 29.80 N	14 40.88 W	GPS	266					
58LA1303	072	01	ROS/CTD	101103	0358	BE	74 29.80 N	14 19.91 W	GPS	228					
58LA1303	072	01	ROS/CTD	101103	0407	BO	74 29.68 N	14 19.65 W	GPS	221	229	224	10		
58LA1303	072	01	ROS/CTD	101103	0415	EN	74 29.39 N	14 19.65 W	GPS	229					
58LA1303	073	01	ROS/CTD	101103	0453	BE	74 30.07 N	13 59.08 W	GPS	910					
58LA1303	073	01	ROS/CTD	101103	0515	BO	74 29.59 N	13 59.84 W	GPS	925	950	899	10		
58LA1303	073	01	ROS/CTD	101103	0538	EN	74 29.09 N	13 59.76 W	GPS	948					
58LA1303	074	01	ROS/CTD	101103	0620	BE	74 29.98 N	13 39.97 W	GPS	1712					
58LA1303	074	01	ROS/CTD	101103	0657	BO	74 29.08 N	13 41.31 W	GPS	1692	1992	1696	10		
58LA1303	074	01	ROS/CTD	101103	0738	EN	74 28.16 N	13 43.00 W	GPS	1638					
58LA1303	075	01	ROS/CTD	101103	0824	BE	74 30.15 N	13 19.84 W	GPS	2195	winch problems				
58LA1303	075	01	ROS/CTD	101103	0910	BO	74 29.04 N	13 19.82 W	GPS	2218	2550	2172	10	firing problems	
58LA1303	075	01	ROS/CTD	101103	1004	EN	74 27.68 N	13 19.81 W	GPS	2230	cable from CTD to rosette changed				
58LA1303	076	01	ROS/CTD	101103	1710	BE	74 59.85 N	16 40.76 W	GPS	340					
58LA1303	076	01	ROS/CTD	101103	1723	BO	74 59.53 N	16 40.66 W	GPS	335	341	325	10		
58LA1303	076	01	ROS/CTD	101103	1735	EN	74 59.31 N	16 40.16 W	GPS	335					
58LA1303	077	01	ROS/CTD	101103	1824	BE	75 00.13 N	16 20.10 W	GPS	317					
58LA1303	077	01	ROS/CTD	101103	1834	BO	74 59.95 N	16 20.12 W	GPS	317	330	308	5		
58LA1303	077	01	ROS/CTD	101103	1842	EN	74 59.86 N	16 20.15 W	GPS	318					
58LA1303	078	01	ROS/CTD	101103	1932	BE	75 00.02 N	15 59.74 W	GPS	253					
58LA1303	078	01	ROS/CTD	101103	1940	BO	74 59.97 N	15 59.85 W	GPS	254	251	245	10		
58LA1303	078	01	ROS/CTD	101103	1947	EN	74 59.93 N	15 59.94 W	GPS	251					
58LA1303	079	01	ROS/CTD	101103	2032	BE	74 59.64 N	15 39.86 W	GPS	198					

58LA1303	079	01	ROS/CTD	101103	2041	BO	74 59.58 N	15 40.05 W	GPS	191	200	190	10
58LA1303	079	01	ROS/CTD	101103	2048	EN	74 59.54 N	15 40.34 W	GPS	196			
58LA1303	080	01	ROS/CTD	101103	2125	BE	75 00.12 N	15 21.03 W	GPS	143			
58LA1303	080	01	ROS/CTD	101103	2133	BO	75 00.09 N	15 21.09 W	GPS	137	143	138	9
58LA1303	080	01	ROS/CTD	101103	2138	EN	75 00.08 N	15 21.17 W	GPS	145			
58LA1303	081	01	ROS/CTD	101103	2220	BE	75 00.01 N	14 59.78 W	GPS	114			
58LA1303	081	01	ROS/CTD	101103	2227	BO	74 59.94 N	14 59.34 W	GPS	114	123	114	8
58LA1303	081	01	ROS/CTD	101103	2233	EN	74 59.89 N	14 59.56 W	GPS	113			
58LA1303	082	01	ROS/CTD	101103	2312	BE	74 59.96 N	14 39.79 W	GPS	131			
58LA1303	082	01	ROS/CTD	101103	2318	BO	74 59.85 N	14 39.57 W	GPS	129	141	125	10
58LA1303	082	01	ROS/CTD	101103	2324	EN	74 59.82 N	14 39.32 W	GPS	131			
58LA1303	083	01	ROS/CTD	101203	0004	BE	74 59.87 N	14 19.72 W	GPS	156			
58LA1303	083	01	ROS/CTD	101203	0011	BO	74 59.77 N	14 19.88 W	GPS	156	149	149	10
58LA1303	083	01	ROS/CTD	101203	0018	EN	74 59.68 N	14 19.35 W	GPS	155			
58LA1303	084	01	ROS/CTD	101203	0105	BE	74 59.76 N	13 59.23 W	GPS	174			
58LA1303	084	01	ROS/CTD	101203	0113	BO	74 59.69 N	13 59.12 W	GPS	174	168	168	11
58LA1303	084	01	ROS/CTD	101203	0122	EN	74 59.64 N	13 59.07 W	GPS	170			
58LA1303	085	01	ROS/CTD	101203	0211	BE	75 00.17 N	13 39.90 W	GPS	191			
58LA1303	085	01	ROS/CTD	101203	0224	BO	75 00.03 N	13 39.80 W	GPS	192	188	186	10
58LA1303	085	01	ROS/CTD	101203	0233	EN	74 59.94 N	13 39.73 W	GPS	192			
58LA1303	086	01	ROS/CTD	101203	0324	BE	75 00.26 N	13 18.90 W	GPS	213			
58LA1303	086	01	ROS/CTD	101203	0332	BO	75 00.14 N	13 18.79 W	GPS	213	206	206	9
58LA1303	086	01	ROS/CTD	101203	0341	EN	75 00.03 N	13 18.73 W	GPS	213			
58LA1303	087	01	ROS/CTD	101203	0424	BE	74 59.73 N	13 00.73 W	GPS	328			
58LA1303	087	01	ROS/CTD	101203	0434	BO	74 59.42 N	13 00.74 W	GPS	337	367	324	10
58LA1303	087	01	ROS/CTD	101203	0443	EN	74 59.16 N	13 00.88 W	GPS	346			
58LA1303	088	01	ROS/CTD	101203	0543	BE	75 00.21 N	12 39.83 W	GPS	726			
58LA1303	088	01	ROS/CTD	101203	0559	BO	74 59.86 N	12 39.93 W	GPS	756	756	731	10
58LA1303	088	01	ROS/CTD	101203	0617	EN	74 59.53 N	12 39.91 W	GPS	782			
58LA1303	089	01	ROS/CTD	101203	0710	BE	75 00.00 N	12 20.43 W	GPS	1267			
58LA1303	089	01	ROS/CTD	101203	0737	BO	74 59.53 N	12 20.90 W	GPS	1293	1305	1259	10
58LA1303	089	01	ROS/CTD	101203	0804	EN	74 59.05 N	12 20.40 W	GPS	1322			
58LA1303	090	01	ROS/CTD	101203	1359	BE	73 59.85 N	11 59.03 W	GPS	2931			
58LA1303	090	01	ROS/CTD	101203	1455	BO	73 59.48 N	11 59.48 W	GPS	2927	2925	2919	10
58LA1303	090	01	ROS/CTD	101203	1554	EN	73 59.16 N	12 00.47 W	GPS	2920			
58LA1303	091	01	ROS/CTD	101203	1659	BE	74 00.24 N	12 40.00 W	GPS	2812			
58LA1303	091	01	ROS/CTD	101203	1753	BO	74 00.37 N	12 39.58 W	GPS	2818	2784	2808	10
58LA1303	091	01	ROS/CTD	101203	1852	EN	74 00.60 N	12 38.19 W	GPS	2821			
58LA1303	092	01	ROS/CTD	101203	2002	BE	74 00.22 N	13 20.46 W	GPS	2597			

58LA1303	092	01	ROS/CTD	101203	2025	BO	74 00.14 N	13 20.75 W	GPS	2597	1015	1008	cast to 1000m	
58LA1303	092	01	ROS/CTD	101203	2045	EN	74 00.04 N	13 20.99 W	GPS	2598				
58LA1303	093	01	ROS/CTD	101203	2152	BE	74 00.05 N	14 00.48 W	GPS	2154				
58LA1303	093	01	ROS/CTD	101203	2213	BO	73 59.92 N	14 00.51 W	GPS	2153	1013	1010	cast to 1000m	
58LA1303	093	01	ROS/CTD	101203	2232	EN	73 59.83 N	14 00.92 W	GPS	2151				
58LA1303	094	01	ROS/CTD	101203	2336	BE	74 00.08 N	14 40.37 W	GPS	1477				
58LA1303	094	01	ROS/CTD	101203	2357	BO	73 59.87 N	14 41.05 W	GPS	1484	1034	1011	cast to 1000m	
58LA1303	094	01	ROS/CTD	101303	0020	EN	73 59.73 N	14 42.39 W	GPS	1473				
58LA1303	095	01	ROS/CTD	101303	0104	BE	73 59.83 N	15 01.53 W	GPS	1212				
58LA1303	095	01	ROS/CTD	101303	0127	BO	73 59.41 N	15 02.54 W	GPS	1230	1287	1200	11	
58LA1303	095	01	ROS/CTD	101303	0154	EN	73 59.00 N	15 03.71 W	GPS	1242				
58LA1303	096	01	ROS/CTD	101303	9999	BE	74 00.18 N	15 21.63 W	GPS	892				
58LA1303	096	01	ROS/CTD	101303	0251	BO	74 00.07 N	15 21.82 W	GPS	894	874	885	9	
58LA1303	096	01	ROS/CTD	101303	0311	EN	74 00.01 N	15 21.92 W	GPS	897				
58LA1303	097	01	ROS/CTD	101303	0415	BE	74 00.22 N	15 39.91 W	GPS	220				
58LA1303	097	01	ROS/CTD	101303	0427	BO	74 00.46 N	15 40.12 W	GPS	195	182	187	10	
58LA1303	097	01	ROS/CTD	101303	0437	EN	74 00.54 N	15 40.28 W	GPS	193				
58LA1303	098	01	ROS/CTD	101303	0525	BE	73 59.95 N	15 59.78 W	GPS	217				
58LA1303	098	01	ROS/CTD	101303	0534	BO	73 59.91 N	15 59.91 W	GPS	219	210	210	10	
58LA1303	098	01	ROS/CTD	101303	0542	EN	73 59.88 N	16 00.03 W	GPS	219				
58LA1303	099	01	ROS/CTD	101303	0631	BE	73 59.99 N	16 20.00 W	GPS	206				
58LA1303	099	01	ROS/CTD	101303	0640	BO	73 59.87 N	16 21.15 W	GPS	207	208	197	10	
58LA1303	099	01	ROS/CTD	101303	0647	EN	73 59.81 N	16 21.49 W	GPS	208				
58LA1303	100	01	ROS/CTD	101303	0726	BE	73 59.94 N	16 40.13 W	GPS	223				
58LA1303	100	01	ROS/CTD	101303	0734	BO	73 59.88 N	16 40.31 W	GPS	223	217	214	10	
58LA1303	100	01	ROS/CTD	101303	0742	EN	73 59.82 N	16 40.55 W	GPS	219				
58LA1303	101	01	ROS/CTD	101303	0827	BE	73 59.93 N	17 00.79 W	GPS	203				
58LA1303	101	01	ROS/CTD	101303	0835	BO	73 59.89 N	17 00.79 W	GPS	205	214	201	8	
58LA1303	101	01	ROS/CTD	101303	0843	EN	73 59.86 N	17 00.98 W	GPS	206				
58LA1303	102	01	ROS/CTD	101303	9999	BE	73 59.78 N	17 20.59 W	GPS	150				
58LA1303	102	01	ROS/CTD	101303	0932	BO	73 59.69 N	17 20.86 W	GPS	156	152	149	10	
58LA1303	102	01	ROS/CTD	101303	0938	EN	73 59.65 N	17 21.06 W	GPS	148				
58LA1303	103	01	ROS/CTD	101303	1021	BE	73 59.93 N	17 40.68 W	GPS	171				
58LA1303	103	01	ROS/CTD	101303	1028	BO	73 59.97 N	17 41.34 W	GPS	173	172	162	11	
58LA1303	103	01	ROS/CTD	101303	1036	EN	73 59.84 N	17 41.93 W	GPS	173				
58LA1303	104	01	ROS/CTD	101303	1110	BE	74 00.11 N	18 00.14 W	GPS	203				
58LA1303	104	01	ROS/CTD	101303	1118	BO	74 00.19 N	18 00.80 W	GPS	204	217	198	10	
58LA1303	104	01	ROS/CTD	101303	1125	EN	74 00.21 N	18 01.20 W	GPS	205				
58LA1303	105	01	ROS/CTD	101303	1205	BE	73 59.91 N	18 19.97 W	GPS	367				

58LA1303	105	01	ROS/CTD	101303	1215	BO	74 00.11 N	18 20.60 W	GPS	370	410	356	10		
58LA1303	105	01	ROS/CTD	101303	1226	EN	74 00.27 N	18 21.20 W	GPS						
58LA1303	106	01	ROS/CTD	101303	1310	BE	74 00.31 N	18 40.42 W	GPS	460					
58LA1303	106	01	ROS/CTD	101303	1320	BO	74 00.61 N	18 40.61 W	GPS	460	447	448	9		
58LA1303	106	01	ROS/CTD	101303	1333	EN	74 00.38 N	18 40.72 W	GPS	460					
58LA1303	107	01	ROS/CTD	101303	1418	BE	74 00.10 N	19 00.42 W	GPS	161					
58LA1303	107	01	ROS/CTD	101303	1426	BO	74 00.11 N	19 00.49 W	GPS	160	148	154	10		
58LA1303	107	01	ROS/CTD	101303	1433	EN	74 00.12 N	19 00.53 W	GPS	154					
58LA1303	108	01	ROS/CTD	101303	1814	BE	74 30.29 N	18 20.45 W	GPS	157					
58LA1303	108	01	ROS/CTD	101303	1823	BO	74 30.28 N	18 20.74 W	GPS	156	149	148	10		
58LA1303	108	01	ROS/CTD	101303	1829	EN	74 30.26 N	18 20.86 W	GPS	155					
58LA1303	109	01	ROS/CTD	101303	1930	BE	74 29.95 N	18 00.03 W	GPS	181					
58LA1303	109	01	ROS/CTD	101303	1938	BO	74 29.99 N	18 00.40 W	GPS	178	178	169	10		
58LA1303	109	01	ROS/CTD	101303	1944	EN	74 30.03 N	18 00.66 W	GPS	174					
58LA1303	110	01	ROS/CTD	101303	2036	BE	74 29.98 N	17 40.01 W	GPS	232					
58LA1303	110	01	ROS/CTD	101303	2044	BO	74 29.92 N	17 40.52 W	GPS	234	237	222	12		
58LA1303	110	01	ROS/CTD	101303	2053	EN	74 29.86 N	17 41.03 W	GPS	237					
58LA1303	111	01	ROS/CTD	101303	2148	BE	74 29.76 N	17 20.41 W	GPS	221					
58LA1303	111	01	ROS/CTD	101303	2155	EN	99 99.99 N	99 99.99 W	GPS		stopped due to weather				
58LA1303	112	01	ROS/CTD	101403	0826	BE	74 29.92 N	17 00.71 W	GPS	251					
58LA1303	112	01	ROS/CTD	101403	0836	BO	74 29.61 N	17 00.99 W	GPS	245	255	230	11		
58LA1303	112	01	ROS/CTD	101403	0844	EN	74 29.37 N	17 01.33 W	GPS	243	data file: l030111a.dat				
58LA1303	113	01	ROS/CTD	101403	0948	BE	74 29.87 N	16 39.59 W	GPS	270					
58LA1303	113	01	ROS/CTD	101403	0958	BO	74 29.70 N	16 39.97 W	GPS	289	281	272	11		
58LA1303	113	01	ROS/CTD	101403	1007	EN	74 29.58 N	16 40.29 W	GPS	279					
58LA1303	114	01	MOR	101403	1605	BE	74 01.99 N	14 39.56 W	GPS	1372	listing for HH5				
58LA1303	114	01	MOR	101403	1610	EN	74 01.99 N	14 39.56 W	GPS	1372	no signal				
58LA1303	115	01	MOR	101403	1732	BE	74 00.81 N	13 54.36 W	GPS	2232	listing for HH3				
58LA1303	115	01	MOR	101403	1738	EN	74 00.81 N	13 54.36 W	GPS	2232	no signal				
58LA1303	116	01	MOR	101403	1926	BE	74 04.49 N	12 47.65 W	GPS	2832	listing for HH5				
58LA1303	116	01	MOR	101403	1935	EN	74 04.49 N	12 47.65 W	GPS	2832	no signal				