

## JR186 cruise report

JR186 set out from Stanley on the 15/04/2008. Requirements for the cruise were to deploy the CPR from Stanley to South Georgia, to undertake the Western Core Box science programme and to recover 5 whale pop-ups (ARPs) that had been deployed just north of South Georgia during JR177 (02/08). Cruises JR222, JR224 and JR214 will take place as the JCR heads home from South Georgia to Ascension (and then on to the UK). We are grateful to the ships officers and crew who enabled all the science tasks to be completed successfully.

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### 1. Personnel

FIELDING, Sophie	BSD, Scientist
GREGORY, Susan	BSD, Fish nurse
KLEPACKI, Julian E	AME
McCabe, Ruth E	Doctor
PRESTON, Mark O	AME
PROVOST, Paul G	NMF-SS
TULLIS, Benjamin CH	IT support engineer
<b>Ships officers and crew</b>	
BURGAN, Michael JS	Master
PAGE, Timothy S	Ch Officer
COX, Joanna L	2nd Officer
LLOYD - JENNINGS, James D	3rd Officer
GLOISTEIN, Michael EP	ETO Comms
ANDERSON, Duncan E	Ch Engineer
ELLIOTT Thomas R	2nd Engineer
STEVENSON, James S	3rd Engineer
TULLOCH, Ralph H	4th Engineer
TREVETT, Douglas P	Deck Engineer
ROWE, Anthony Keith	ETO Engineer
TURNER, Richard J	Purser
PECK, David J	Bosun
BOWEN, Albert Martin	Bosun's Mate
ROWE, Martin T	SG1
RAPER, Ian	SG1
DALE, George A	SG1
ESTIBEIRO, Anthony John J	SG1
HOLMES, Kevin J	SG2
ALLAN, Erwin	MG1
COUTTS, John	MG1
HUNTLEY, Ashley Alan	Chief Cook
LEE, Jamie Edward	2nd Cook
JONES, Lee J	Sr Steward
GREENWOOD, Nicholas R	Steward
RAWORTH, Graham	Steward
WEIRS, Michael	Steward

## 2. Continuous Plankton Recorder (CPR)

The CPR was deployed for Pete Ward in a transect from Stanley to South Georgia. It was put in the water at 11:23 (GMT) 16/04/2008 52.26438 S and 52.09040 W. The ship travelled quite quickly and the CPR is limited to a 500 nmile transect, because of the Bird Island relief early morning on the 18<sup>th</sup> the CPR was retrieved the night before. It was brought on deck at 23:00 17/04/2008 53.54599 S and 40.97632 W having travelled 412 miles. The internal CPR unit was 140/0 and the gauze wind on was at 68 on retrieval.

## 3. Opportunistic swath bathymetry

The swath bathymetry system (EM120) was switched on from Stanley to South Georgia (Survey JR186\_b) and from South Georgia to the UK (JR186\_c). This is an opportunistic occasion, following procedures of work outlined in the cue cards, and no comment is made here regarding the data.

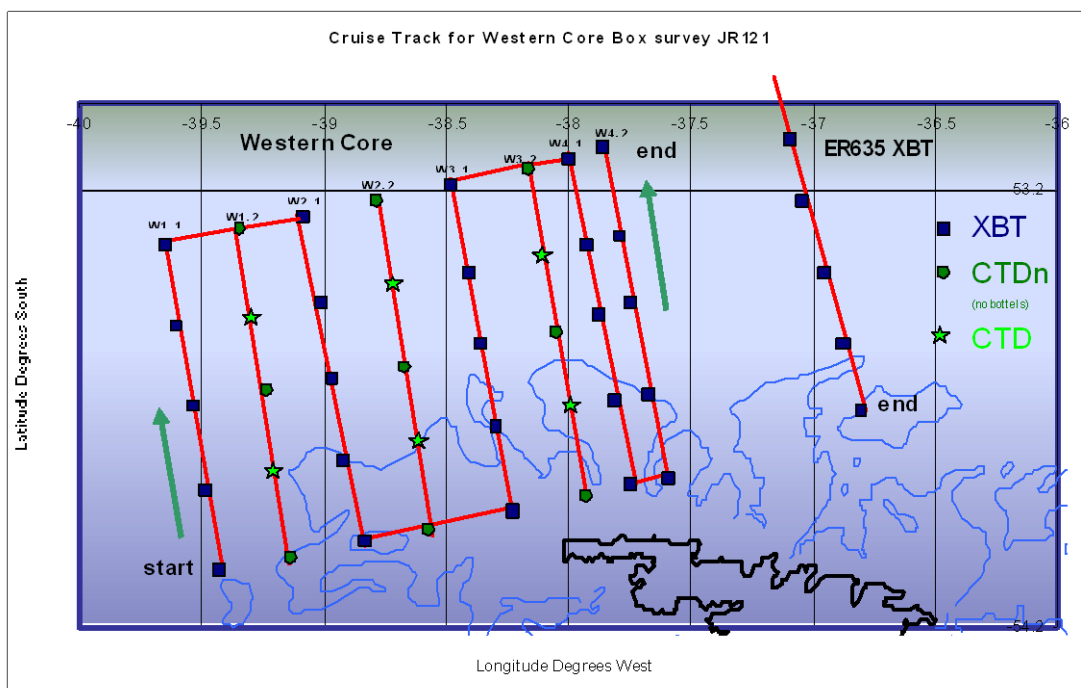
Time	Latitude	Longitude	Settings	Comment
25/04/2008 23:30	-47.2202	-34.39031		Line 54/55 French drifters deployed
24/04/2008 16:12	-49.99385	-33.98775		Passed over NOA mooring site. Survey JR186_c line 23
23/04/2008 17:48	-53.23985	-38.43307		min depth 2000 max depth set to 6000
23/04/2008 17:26	-53.69123	-38.28195	EM120 and EA600 synced	South Georgia to Ascension start logging min depth 2000 max 5000
18/04/2008 15:31	-54.01934	-38.05667		Swath off
17/04/2008 17:29	-53.24844	-42.85591	min depth changed to 200	Depth changed as going past Shag Rocks
16/04/2008 12:18	-52.29326	-51.81427	EA600 passive	Swath turned on and commenced logging

## 4. WCB Acoustic survey cruise report JR186

### Narrative

JR186 WCB acoustic survey (Figure 1, not line ER635 XBT) was run in the normal west to east direction, commencing the 19/04/2008. The core box was started from the southwest end of W1.1, with typical beam on weather (westerlies) that resulted in poor data on transect 1.1 and 1.2. The first two XBTs (WPT 1 and 2) along transect 1.1 read the wrong temperature. The XBT gun was changed and after that all XBTs worked fine (the problem appeared to be a damp connector) apart from the last XBT point on 4.2 (WPT 4) where it is thought that bad weather shorted the XBTs. The 5 transect CTDs were conducted overnight along W1.2 with no problems. Transects 2.1 and 2.2 were undertaken in good weather resulting in clean data. All W2.1 and 2.2 XBTs and CTDs occurred without a problem. Overnight the wind increased, blowing from the north. W3.1 (21/04/2008) was undertaken from South to North heading into the wind. Acoustic data quality was okay because there was little "slippage" in the direction of the ship. Overnight the weather deteriorated and the water bottle annex doors wouldn't shut. One CTD was undertaken (CTD\_36) before it was decided to protect the CTD by moving it into the wet lab and cancel further CTDs that night. Transect 4.1 commenced at the second waypoint due to ice coverage and transect 4.2 terminated slightly before the second to last waypoint due to ice coverage. The 5 CTDs along transect 3.2 were run overnight without mishap (bar a fuse).

### Figure 1.



## Transect log

Time	Latitude	Longitude	Speed (av	Comment
23/04/2008 17:10	-53.3823	-38.3907		Stopped recording to set swath up
22/04/2008 17:22	-53.3669	-37.7732	10	End of transect 4.2 early due to ice - LOTS!!
22/04/2008 14:30	-53.7401	-37.6344		Speed variable due to weather
22/04/2008 13:39	-53.8529	-37.5923	10	Start of transect 4.2
22/04/2008 13:00	-53.8692	-37.7276	10	End of transect 4.1
22/04/2008 10:05	-53.42	-37.8918	10	Ships echosounders off. EA600 back on and EA600 off - need to put ships echosounders (
22/04/2008 09:51	-53.3807	-37.8893		Start of transect 4.1 running North to South s
22/04/2008 09:33	-53.8692	-37.7276		Start of transect 4.1 running North to South s
21/04/2008 19:29	-53.891	-37.9063	10.5	Transect 3.2 end
21/04/2008 15:29	-53.4203	-38.3573	10.5	Start of transect 3.2 - heading on and off tran
21/04/2008 14:16	-53.2218	-38.449	10	End of transect 3.1
21/04/2008 12:50	-53.4203	-38.3573	10	Deviating off transect due to icebergs
21/04/2008 09:30	-53.9268	-38.2202	10	Start of transect W3.1 (South to North)
20/04/2008 19:37	-53.2544	-38.7513	10.5	End of transect 2.2
20/04/2008 15:22	-53.9619	-38.5281	10	Start of transect 2.2 (South to North)
20/04/2008 14:16	-53.9933	-38.8193	10	End of transect 2.1 Very nice weather - are w
20/04/2008 09:41	-53.3054	-39.0301	10	Need to deviate off track for iceberg - lots of
20/04/2008 09:31	-53.2878	-39.0377	6	Start of transect 2.1 (North to South)
19/04/2008 20:20	-54.0251	-39.0884	10	End transect 1.2 - fully dark!
19/04/2008 19:40	-53.9142	-39.1221	10	Twilight
19/04/2008 16:47	-53.447	-39.2719	10	Speed up but slight deviation to avoid iceber
19/04/2008 16:26	-53.3907	-39.2831	8.5	Struggling to maintain speed. Ship power set
19/04/2008 15:57	-53.3214	-39.3047	10	Start of transect 1.2 (North to South)
19/04/2008 15:54	-53.3136	-39.3174		Krill swarm 120 m depth
19/04/2008 14:36	-53.3468	-39.6028	10	WPT 5 passed W1.1 transect end
19/04/2008 14:04	-53.4251	-39.5827	10	Back up to speed and heading along transect
19/04/2008 13:48	-53.5235	-39.551	5	Alter course to close vents
19/04/2008 09:45	-53.8776	-39.4452	10	Start of W1.1. (South to North) XBT 00002 w
19/04/2008 09:40	-54.0637	-39.3867		EK60 switched to record. Synced with EA600

## Acoustic Methods/System specification

Software versions

Simrad ER60 v. 2.0  
 Sonardata Echolog 60 v 4.05.6208  
 Sonardata Echoview v 4.0.75.6342 Live viewing  
 Sonardata Echoview v 4.20.59.8698 Processing

HASP Dongle BAS3 licensed for base, bathymetry, analysis export, live viewing, school detection and virtual echogram was used to run the echolog and echoview in live viewing mode. The echosounder pc AP10 and the EK60 workstation 2 are integrated into the ship's LAN. ER60 .raw data files were logged to a Sun workstation jrua, using a Samba connection, which is backed up at regular intervals. All raw data was collected to 1000 m. Echolog was run on workstation 2 and wrote compressed files also directly to the Sun workstation via a Samba connection.

*Echolog compression settings*

Final compression settings used in Echolog for all frequencies:

- 1) Power data only (angle data is still available from the raw files)
- 2) From 0 - 300 m (38 kHz), 0 – 300 (120 kHz) and 0 – 300 (200 kHz) data only (data from deeper is available from the raw files)
- 3) Average samples where both Sv below -100 and TS below -20
- 4) Maximum number of samples to average: 50
- 5) DO NOT use average samples below echosounder detected bottom unless sure of bottom detection

*File locations*

All raw data was saved in a general folder JR186\rawdata, all echolog data was saved in the folder JR186 \echolog. All files were prefixed with JR186.

*EK60 (ER60) settings*

The EK60 was run with the same settings as JR177. Table Acoustics\_1 lists the settings the EK60 was run with during JR186.

Table Acoustics\_1 EK60 settings

<b>Variable</b>	<b>38 kHz</b>	<b>120 kHz</b>	<b>200 kHz</b>
<b>Ping interval (per sec)</b>	2	2	2
<b>Salinity (PSU)</b>	34	34	34
<b>Temperature (°C)</b>	1	1	1
<b>Sound velocity (m/s)</b>	1453	1453	1453
<b>Mode</b>	Active	Active	Active
<b>Transducer type</b>	ES38	ES120-7	ES200-7
<b>Transceiver Serial no.</b>	009072033fa5	00907203422d	009072033f91
<b>Transducer depth (m)</b>	0	0	0
<b>Absorption coef. (dB/km)</b>	10.07	26.27	39.8
<b>Pulse length (ms)</b>	1.024	1.024	1.024
<b>Max Power (W)</b>	2000	500	300
<b>2-way beam angle (dB)</b>	-20.70	-20.70	-19.60
<b>Sv transducer gain (dB)</b>	24.07	21.38	22.03
<b>Sa correction (dB)</b>	-0.63	-0.39	-0.31
<b>Angle sensitivity along</b>	22	21	23

<b>Angle athwart</b>	22	21	23
<b>3 dB Beam along</b>	-0.02	-0.12	0.17
<b>3 dB Beam athwart</b>	0	-0.07	-0.24
<b>Along offset</b>	6.96	7.48	6.44
<b>Athwart offset</b>	6.88	7.48	6.43

The EK60 was controlled through the SSU, under a group EK60, EA600 and ADCP. The EK60 was the master, with a ping rate set to 2 seconds. The EA600 was set to external trigger and the ADCP remained off for the core box.

#### *SSU settings*

EA600 external trigger Tx pulse  
EK60 external trigger Calculated (Set to 2 seconds in ER60 software)

Table Acoustics\_2 Echoview calibration

<b>Parameter</b>	<b>38 kHz</b>	<b>120 kHz</b>	<b>200 kHz</b>
Alpha (dB/km)	10.33	29.416	42.635
Theoretical TS (dB)	-33.70	-40.3	-44.85
TS gain	23.88	21.70	22.50
Sa correction	-0.02	0.02	0.05

#### *Data processing in echoview*

Post-processing was undertaken in Echoview. The standard WCB template was used utilising echolog data to 300 m. The echoview calibration from JR177 was applied to the data.

<b>Variable name</b>	<b>Operator</b>	<b>Operand1</b>	<b>Operand2</b>
Freq resampled even	Resample by number of pings	Fileset1: Sv raw pings T?	
Freq bad data	Region bitmap	Freq resampled even	
Freq surface bottom	Line bitmap	Freq resampled even	
Freq all bad	And	Freq bad data	Freq surface bottom
Freq bad masked	Mask	Freq resampled even	Freq all bad
Freq resample 1ping	Resample by number of pings	Freq bad masked	
Freq resample original	Resample by number of pings	Freq resample 1ping	
Freq dropout range	Data range bitmap	Freq resample original	
Freq no dropout	Mask	Freq bad masked	Freq dropout range
Freq noise	Data generator	Freq no dropout	
Freq-noise	Linear minus	Freq no dropout	Freq noise
Freq convolute	3x3 convolution	Freq-noise	
Freq spike detect	Minus	Freq-noise	Freq convolute
Freq spike mask	Data range bitmap	Freq spike detect	
Freq-noise-spike	Mask	Freq-noise	Freq spike mask
Freq-500m	Resample by distance interval	Freq-noise-spike	
120-38	Minus	120-500m	38-500m
200-38	Minus	200-500m	38-500m
200-120	Minus	200-500m	120-500m
Fish -10-0.5	Data range bitmap	120-38	
38 fish	Mask	38-500m	fish -10-0.5
CCAMLR krill 2-16	Data range bitmap	120-38	
120 CCAMLR krill	Mask	120-500m	CCAMLR krill 2-16
Demer krill range	Data range bitmap	120-38	

## **5. XBT system**

The XBT system was tested prior to the WCB, whilst the CPR was deployed. It failed quickly (probably shorting on the CPR) and the temperature read spuriously high. Since the CPR remained out until Bird Island it was decided not to test again as the system had behaved well

on the previous cruise JR179 and would possibly short again on the CPR. On deployment of the first XBT of the WCB it was noted that the temperature reading was still high. A new box of XBTs was used for the second deployment in case it was a faulty batch. Since the temperature reading was still high the XBT gun was replaced (and found to have a damp connection). After this, the XBTs were deployed successfully at all waypoints bar the last where bad weather was assumed to short the system.

Time	Latitude	Longitude	Depth	Comment
22/04/2008 17:25	-53.3679	-37.78158	2357.77	WPT 39 XBT 00026 failed
22/04/2008 17:22	-53.36689	-37.77302	2326.69	WPT 39 XBT 00025 failed
22/04/2008 16:18	-53.50263	-37.73028	1743.83	WPT 38 XBT 00024 XBT failed at 1200m
22/04/2008 16:13	-53.50263	-37.73028	1743.83	WPT 38 XBT 00023 failed at about 600 m
22/04/2008 14:58	-53.67732	-37.65664	126.86	WPT 37 XBT 00022 all ok
22/04/2008 13:39	-53.85334	-37.59195	111.59	WPT 36 XBT 00021 all fine
22/04/2008 13:00	-53.8694	-37.72755	114.44	WPT 35 XBT 00020 all fine
22/04/2008 11:51	-53.69195	-37.78768	111.34	WPT 34 XBT 00019 all fine
22/04/2008 10:45	-53.51804	-37.84599	1348.1	WPT 33 XBT 00018 all okay
22/04/2008 09:33	-53.8694	-37.72755	114.44	WPT 32 XBT 00017 all fine
21/04/2008 14:16	-53.22096	-38.44918	3766.55	WPT 25 XBT 00016 all fine
21/04/2008 13:01	-53.3949	-38.3575	2852.36	WPT 24 XBT 00015 parallel with transect
21/04/2008 11:50	-53.57299	-38.33547	2160.42	WPT 23 XBT 00014 all fine
21/04/2008 10:40	-53.75032	-38.27829	214.21	WPT 22 XBT 00013 all fine
21/04/2008 09:30	-53.92669	-38.22018	0	WPT 21 XBT 00012 all fine
20/04/2008 14:16	-53.99298	-38.81939	192.96	WPT 15 XBT 00011 all fine
20/04/2008 13:05	-53.81798	-38.87413	213.89	WPT 14 XBT 00010 all fine
20/04/2008 11:51	-53.63906	-38.92957	1630.86	WPT 13 XBT 00009 all fine
20/04/2008 10:41	-53.46349	-38.9834	3004.29	WPT 12 XBT 00008 all fine
20/04/2008 09:31	-53.46349	-38.9834	3004.29	WPT 11 XBT 00007 deployed okay
19/04/2008 14:36	-53.34691	-39.60278	3452.92	WPT5 XBT 00006 worked fine.
19/04/2008 13:11	-53.52358	-39.55094	0	WPT4 XBT 00005 all ok
19/04/2008 12:02	-53.52358	-39.55094	0	WPT3 XBT T5.00004 worked fine
19/04/2008 10:53	-53.8764	-39.44565	0	WPT2 XBT 00003 Temperature reading wrong 10 deg

## 6. CTD system

15 CTDs were completed during the WCB – all the required CTDs. All CTDs were completed to within 10 m of the bottom or to 1015 m – whichever the shallower. CTD file names are JR186\_eventnumber. No bottles were fired on the CTD casts. Serial numbers of the sensors used are listed below as well as stations and positions.

Sensor	Serial number
T1 (Temperature)	03P2366
T2	032307
C1 (Conductivity)	042289
C2	042222
Altimeter	21302700
Reference thermometer	3527735
Light	7274
Fluorometer	088249
Transmissometer	CST846DR
Dissolved Oxygen	430245
Underwater unit (depth)	09P20391/0541

Time	Latitude	Longitude	Depth (m)	Comment
23/04/2008 08:26	-53.8906	-37.9061	142.4	CTD to 130m. W3.2(South). JR186_50
23/04/2008 06:17	-53.714	-37.9663	130.86	CTD to 120m. W3.2 JR186_49
23/04/2008 03:23	-53.5253	-38.0267	1877.6	CTD to 1015m. W3.2 JR186_48
23/04/2008 00:41	-53.356	-38.0688	2684.87	CTD to 1015m. W3.2 JR186_47
22/04/2008 20:27	-53.1851	-38.1403	3715.46	CTD to 1015m. W3.2(North) JR186_46
21/04/2008 19:58	-53.8909	-37.9068	140	CTD to 130m. W3.2(South) JR186_36
21/04/2008 04:54	-53.9623	-38.5272	150.03	CTD to 132m. W2.2(South) JR186_28
21/04/2008 03:12	-53.7865	-38.5874	203.81	CTD to 190m. W2.2 JR186_27
21/04/2008 00:40	-53.6083	-38.6397	2112.39	CTD to 1015m. W2.2 JR186_26
20/04/2008 22:18	-53.4318	-38.6959	3494.41	CTD to 1015m. W2.2 JR186_25
20/04/2008 19:56	-53.2551	-38.7513	3797.76	CTD to 1015m. W2.2(north) JR186_24
20/04/2008 05:56	-53.3152	-39.3063	3987.57	CTD to 1015m W1.2(north) JR186_15
20/04/2008 03:29	-53.4926	-39.253	3148.09	CTD to 1015 m. W1.2 JR186_14

## 7. ARPS acoustic recording packages

5 ARPs deployed on JR177 were recovered. Prior to recovery a light bulb was lowered on two different occasions at a point within the diamond of ARPs. After recovery of all 5 ARPs that went smoothly (bar a little searching for number 4!), the units were put in a circle on the afterdeck and a series of bangs with a metal hammer on a piece of metal on the deck were made.

Time	Latitude	Longitude	Comment
23/04/2008 15:32:03	-53.6912	-38.282	5 taps with a hammer 1 every second
23/04/2008 15:31:33	-53.6912	-38.2819	4 taps with a hammer 1 every second
23/04/2008 15:31:03	-53.6912	-38.2819	3 taps with a hammer 1 every second
23/04/2008 15:30:43	-53.6912	-38.2819	2 taps with a hammer 1 every second
23/04/2008 15:30:23	-53.6912	-38.2819	1 tap with a hammer 1 every second
23/04/2008 15:28:03	-53.6912	-38.2819	1 tap with a hammer 1 every second
23/04/2008 15:27:43	-53.6912	-38.2819	2 taps with a hammer 1 every second
23/04/2008 15:27:23	-53.6912	-38.2819	3 taps with a hammer 1 every second
23/04/2008 15:27:03	-53.6912	-38.2819	4 taps with a hammer 1 every second
23/04/2008 15:26:33	-53.6912	-38.2819	5 taps with a hammer 1 every second (forgot to stop at 4)
23/04/2008 15:26:03	-53.6912	-38.2819	5 taps with a hammer 1 every second
23/04/2008 15:21:00	-53.6912	-38.2824	Pop up 73 retrieved
23/04/2008 14:35:00	-53.716	-38.1649	Pop up 75 retrieved
23/04/2008 13:26:00	-53.7404	-38.1855	Pop up 76 retrieved
23/04/2008 12:54:00	-53.7583	-38.2071	Pop up 80 retrieved
23/04/2008 11:30:00	-53.7916	-38.1146	Pop up 54 retrieved
23/04/2008 10:33:08	-53.7571	-38.1478	Light bulb 2 deployed
23/04/2008 10:28:08	-53.7571	-38.1478	Light bulb 1 deployed

## 8. JR186 Eventlog

Time	Event	Lat	Lon	Comment
23/04/2008 15:44		-53.69105	-38.28241	All secure on deck
23/04/2008 15:21	56	-53.69123	-38.28235	Pop up 73 recovered to deck
23/04/2008 15:12	56	-53.69257	-38.27926	Pop 73 sighted
23/04/2008 15:06	56	-53.69259	-38.27924	Pop up 73 released
23/04/2008 15:03		-53.69259	-38.27924	V/L on DP ready to deploy hydrophone
23/04/2008 14:37		-53.7143	-38.16932	Vessel off DP
23/04/2008 14:35	55	-53.71595	-38.1649	Buoy recovered
23/04/2008 14:25	55	-53.71849	-38.16323	Buoy sighted. POP 75
23/04/2008 13:53	55	-53.71844	-38.16247	Signal released from hydrophone
23/04/2008 13:52	55	-53.71842	-38.16245	Hydrophone in water
23/04/2008 13:51		-53.71843	-38.16246	Vessel on DP
23/04/2008 13:36		-53.73629	-38.18708	Vessel off DP
23/04/2008 13:33	54	-53.73712	-38.1868	Buoy recovered
23/04/2008 13:26	54	-53.74044	-38.1855	Buoy sighted. POP 76
23/04/2008 13:13	54	-53.74046	-38.18549	Hydrophone in water
23/04/2008 13:11		-53.74045	-38.18551	Vessel set up in DP
23/04/2008 12:56		-53.75744	-38.20702	Vessel off DP
23/04/2008 12:54	53	-53.75826	-38.20708	Buoy recovered
23/04/2008 12:45	53	-53.761	-38.21019	Buoy sighted. POP 80
23/04/2008 12:35	53	-53.76102	-38.21014	Hydrophone in water
23/04/2008 12:05		-53.76105	-38.21017	Vessel set up in DP
23/04/2008 11:38		-53.78473	-38.11407	Vessel out of DP
23/04/2008 11:30	52	-53.79163	-38.11463	POP Buoy 54 recovered
23/04/2008 11:21	52	-53.79548	-38.11523	Buoy sighted. POP 54
23/04/2008 11:15	52	-53.79549	-38.11521	Signal released from hydrophone
23/04/2008 11:05		-53.79561	-38.1155	Vessel set up in DP for buoy recovery
23/04/2008 10:35		-53.75706	-38.14783	Vessel out of DP and repositioning for buoy recovery
23/04/2008 10:34	51	-53.75705	-38.14779	2nd Light Bulb burst
23/04/2008 10:28	51	-53.75705	-38.14776	1st Light Bulb burst



23/04/2008 10:13	-53.75756	-38.14713	Vessel set up on station in DP for Light Bulb bursting
23/04/2008 08:56	-53.89068	-37.90611	Vessel out of DP and Proceeding to POP Buoy site
23/04/2008 08:39	50 -53.89063	-37.90614	CTD on deck
23/04/2008 08:38	50 -53.89063	-37.90614	CTD at the surface
23/04/2008 08:34	50 -53.89064	-37.90611	CTD at depth 130m
23/04/2008 08:26	50 -53.89066	-37.9061	CTD deployed
23/04/2008 08:24	50 -53.89064	-37.90608	CTD off the deck
23/04/2008 08:20	-53.89065	-37.90567	Vessel set up in DP for CTD deployment
23/04/2008 06:55	-53.71403	-37.96635	All secure
23/04/2008 06:40	49 -53.71402	-37.96633	CTD recovered
23/04/2008 06:35	49 -53.71401	-37.96637	CTD @ 120m
23/04/2008 06:30	49 -53.71403	-37.96632	CTD @ surface
23/04/2008 06:25	49 -53.71402	-37.96636	CTD @ 100m
23/04/2008 06:17	49 -53.71401	-37.96634	CTD deployed - water depth 130m
23/04/2008 06:06	-53.71416	-37.96624	V/L on DP for CTD
23/04/2008 04:22	-53.52536	-38.02668	all secure v/l off DP
23/04/2008 04:07	48 -53.52535	-38.02668	CTD recovered
23/04/2008 03:46	48 -53.52532	-38.02671	CTD @ 1015m
23/04/2008 03:23	48 -53.52534	-38.02672	CTD deployed - water depth 1877m
23/04/2008 03:17	-53.52529	-38.02627	V/L on DP for CTD
23/04/2008 01:41	-53.35516	-38.07069	Vessel out of DP
23/04/2008 01:25	47 -53.35521	-38.0707	CTD on deck
23/04/2008 01:02	47 -53.356	-38.06875	CTD @ 1015m
23/04/2008 00:41	47 -53.35602	-38.06877	CTD Deployed
23/04/2008 00:25	-53.35608	-38.06874	Vessel set up in DP
22/04/2008 21:25	-53.18734	-38.14024	Vessel out of DP and proceeding to next CTD site
22/04/2008 20:50	46 -53.18502	-38.14031	CTD at depth 1015m
22/04/2008 20:27	46 -53.18508	-38.14034	CTD deployed
22/04/2008 20:25	46 -53.18507	-38.14031	CTD off the deck
22/04/2008 20:13	-53.18486	-38.14002	Vessel set up on station in DP at the northern end of Transect 3.2 to resume CTD's
22/04/2008 17:25	45 -53.36774	-37.78024	XBT no.23 redeployed (failed)
22/04/2008 17:22	45 -53.36684	-37.77258	XBT no.23 deployed (failed) - Break off from transect 4.2
22/04/2008 16:18	44 -53.50264	-37.72946	XBT no.22 redeployed
22/04/2008 16:12	44 -53.50181	-37.71476	XBT no.22 deployed (failed)
22/04/2008 14:58	43 -53.67759	-37.65542	XBT No. 21 Deployed
22/04/2008 13:40	42 -53.85284	-37.59236	XBT No. 20 Deployed. Transect 4.2 Commenced
22/04/2008 13:00	41 -53.8686	-37.72786	XBT No. 19 Deployed. Transect 4.1 Complete
22/04/2008 11:52	40 -53.69362	-37.78714	XBT No. 18 deployed
22/04/2008 10:45	39 -53.51696	-37.84635	XBT No. 17 Deployed
22/04/2008 09:33	38 -53.33708	-37.90349	XBT No. 16 Deployed
22/04/2008 09:33	37 -53.33708	-37.90349	Commenced Transect 4.1
22/04/2008 09:00	-53.31212	-37.92343	Vessel out of DP and moving off to start Transect 4.1
22/04/2008 06:49	-53.33637	-38.01138	Vessel set up in DP to await start of Transect 4.1
21/04/2008 21:39	-53.89092	-37.90681	Vessel out of DP and proceeding
21/04/2008 20:09	36 -53.89089	-37.90678	CTD on deck
21/04/2008 20:07	36 -53.89088	-37.90679	CTD at the surface
21/04/2008 20:05	36 -53.8909	-37.90683	CTD at depth 130m. Commenced recovery
21/04/2008 19:58	36 -53.8909	-37.90677	CTD deployed
21/04/2008 19:56	36 -53.89089	-37.90685	CTD off the deck
21/04/2008 19:41	-53.89155	-37.90674	Vessel set up on station in DP for CTD deployment
21/04/2008 19:29	35 -53.88994	-37.90669	Completed Transect 3.2
21/04/2008 15:27	35 -53.18239	-38.14517	Commence transect 3.2 heading 169 degrees
21/04/2008 14:23	29 -53.20948	-38.45382	Transect 3.1 Complete
21/04/2008 14:17	34 -53.22058	-38.44935	XBT No. 15 Deployed
21/04/2008 13:02	33 -53.394	-38.35844	XBT No. 14 Deployed
21/04/2008 11:50	32 -53.57398	-38.33531	XBT No. 13 Deployed
21/04/2008 10:40	31 -53.75069	-38.27818	XBT No. 12 Deployed
21/04/2008 09:30	29 -53.9273	-38.22015	Commenced Transect 3.1
21/04/2008 09:30	30 -53.9273	-38.22015	XBT No. 11 Deployed
21/04/2008 05:08	28 -53.96228	-38.52715	CTD recovered
21/04/2008 05:01	28 -53.9623	-38.52715	CTD @ 132m
21/04/2008 04:54	28 -53.96232	-38.52719	CTD Deployed - water depth 150m

21/04/2008 04:54	28	-53.96232	-38.52719 CTD Deployed - water depth 150m
21/04/2008 04:50		-53.9623	-38.52715 V/L on DP for CTD
21/04/2008 03:31		-53.78646	-38.58737 All secure
21/04/2008 03:25	27	-53.78646	-38.58733 CTD recovered
21/04/2008 03:18	27	-53.78647	-38.58736 CTD @ 190m
21/04/2008 03:12	27	-53.78646	-38.58741 CTD deployed water depth 203m
21/04/2008 03:05		-53.78645	-38.58731 V/L on DP for CTD
21/04/2008 01:21	26	-53.60831	-38.63971 CTD on deck
21/04/2008 01:00	26	-53.60825	-38.63968 CTD @ 1015m
21/04/2008 00:40	26	-53.60829	-38.6397 CTD Deployed
21/04/2008 00:32		-53.60788	-38.6397 Vessel set up in DP
20/04/2008 23:05		-53.43177	-38.69582 Vessel off DP
20/04/2008 22:56	25	-53.43176	-38.69579 CTD on deck
20/04/2008 22:55	25	-53.43176	-38.69577 CTD at the surface
20/04/2008 22:38	25	-53.4318	-38.69582 CTD at depth 1015m
20/04/2008 22:18	25	-53.4318	-38.69587 CTD Deployed
20/04/2008 22:16	25	-53.4318	-38.69586 CTD off the deck
20/04/2008 22:10		-53.43183	-38.69583 Vessel set up on station in DP for CTD deployment
20/04/2008 20:47		-53.25504	-38.7513 Vessel off DP and relocating for next CTD station
20/04/2008 20:42		-53.25506	-38.75129 Midships gantry secured
20/04/2008 20:36	24	-53.25504	-38.75127 CTD on deck
20/04/2008 20:34	24	-53.25504	-38.75127 CTD at the surface
20/04/2008 20:17	24	-53.25507	-38.7513 CTD at depth 1015m
20/04/2008 19:56	24	-53.25507	-38.75132 CTD deployed
20/04/2008 19:54	24	-53.25507	-38.75133 CTD off the deck
20/04/2008 19:49		-53.25507	-38.75134 Vessel set up on station in DP for CTD deployment
20/04/2008 19:37	23	-53.25447	-38.75129 Completed Transect 2.2
20/04/2008 15:22	23	-53.96342	-38.52738 Commence transect 2.2- Heading 350
20/04/2008 14:15	21	-53.99084	-38.82013 XBT No. 10 Deployed
20/04/2008 14:15	22	-53.5462	-38.95808 Completed Transect 2.1
20/04/2008 13:05	20	-53.81705	-38.8743 XBT No. 9 Deployed
20/04/2008 11:52	19	-53.6403	-38.92923 XBT No. 8 deployed
20/04/2008 10:42	18	-53.46455	-38.98316 XBT No. 7 deployed
20/04/2008 09:31	16	-53.28657	-39.03819 Commenced Transect 2.1
20/04/2008 09:31	17	-53.28657	-39.03819 XBT No. 6 deployed
20/04/2008 07:20		-53.31525	-39.30633 Vessel off DP and repositioning clear of ice for start of transect 2.1
20/04/2008 06:45		-53.31527	-39.30631 All secure on deck
20/04/2008 06:39	15	-53.31518	-39.30626 CTD recovered
20/04/2008 06:18	15	-53.3152	-39.30627 CTD @ 1015m
20/04/2008 05:56	15	-53.31521	-39.30627 CTD deployed - water depth 3988m
20/04/2008 05:48		-53.31508	-39.30602 Vessel on DP for CTD
20/04/2008 04:22		-53.49261	-39.25311 All secure
20/04/2008 04:13	14	-53.49256	-39.25312 CTD recovered
20/04/2008 03:52	14	-53.49259	-39.25309 CTD @ depth 1015m
20/04/2008 03:29	14	-53.49265	-39.25297 CTD deployed - water depth 3148m
20/04/2008 03:16		-53.49247	-39.25329 V/L stopped on DP for CTD
20/04/2008 01:52		-53.66936	-39.19941 Vessel off DP
20/04/2008 01:40	13	-53.66937	-39.19948 CTD on deck
20/04/2008 01:20	13	-53.66937	-39.19945 CTD @ 1015m
20/04/2008 01:00	13	-53.66934	-39.19937 CTD Deployed
20/04/2008 00:55	13	-53.6693	-39.19939 CTD off the deck
20/04/2008 00:50		-53.66934	-39.19937 Vessel Set Up In D.P.
19/04/2008 23:21		-53.84573	-39.14541 Vessel off DP
19/04/2008 23:12	12	-53.84577	-39.14527 CTD on deck

19/04/2008 23:04	12	-53.84567	-39.14524	CTD @ 276m
19/04/2008 22:53	12	-53.84567	-39.14535	CTD deployed
19/04/2008 22:51	12	-53.84565	-39.14516	CTD off the deck
19/04/2008 22:47		-53.84575	-39.14508	Vessel set up on station for CTD deployment
19/04/2008 21:23		-54.02314	-39.08978	Vessel out of DP and proceeding to next CTD sight.
19/04/2008 20:57	11	-54.02315	-39.08978	CTD on deck
19/04/2008 20:56	11	-54.02315	-39.08976	CTD at the surface
19/04/2008 20:52	11	-54.02316	-39.08981	CTD at depth 204m. Commenced recovery
19/04/2008 20:41	11	-54.02314	-39.08971	CTD deployed
19/04/2008 20:40	11	-54.02313	-39.08973	CTD off the deck
19/04/2008 20:34		-54.023	-39.08987	Vessel set up on station for CTD deployment
19/04/2008 20:20	10	-54.02321	-39.08888	Completed Transect 1.2
19/04/2008 15:57	10	-53.31458	-39.30771	Commence transect 1.2
19/04/2008 14:36	9	-53.347	-39.60277	XBT No. 5 Deployed
19/04/2008 14:35	4	-53.34833	-39.6025	Complete transect 1.1
19/04/2008 13:11	8	-53.52467	-39.5507	XBT No. 4 Deployed
19/04/2008 12:02	7	-53.69997	-39.49836	XBT No. 3 Deployed
19/04/2008 10:53	6	-53.87777	-39.44509	XBT No.2 Deployed (Failed)
19/04/2008 09:45	5	-54.05659	-39.39115	XBT No.1 Deployed (Failed)
19/04/2008 09:45	4	-54.05659	-39.39115	Commenced Transect 1.1
17/04/2008 23:00	3	-53.54599	-40.97632	CPR Recovered
17/04/2008 22:56	3	-53.5436	-40.98798	Start recovery of CPR
16/04/2008 16:01	2	-52.42705	-50.59577	XBT deployed @ 6 knots
16/04/2008 11:23	1	-52.26438	-52.0904	CPR Deployed