

5.14 CTDO profiling

(1) Personnel (*: Leg-1, **: Leg-2, ***: Leg-1+2)

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(2) Objective

Investigation of oceanic structure and water sampling.

(3) Parameters

Temperature (Primary and Secondary)
Conductivity (Primary and Secondary)
Pressure
Dissolved Oxygen
Fluorescence

(4) Methods

CTD/Carousel Water Sampling System, which is a 36-position Carousel water sampler (CWS) with Sea-Bird Electronics, Inc. CTD (SBE9plus), was used during this cruise. 12-liter Niskin Bottles (General Oceanics, Inc., Model 1010X NISKIN-X External Spring Niskin Water Sampler), which were washed by neutral detergent, were used for sampling seawater. The sensors attached on the CTD were temperature (Primary and Secondary), conductivity (Primary and Secondary), pressure, dissolved oxygen, and fluorescence. The Practical Salinity was calculated by measured values of pressure, conductivity and temperature. The CTD/CWS was deployed from starboard on working deck.

The CTD raw data were acquired on real time using the Seasave-V7 (ver.7.20g) provided by Sea-Bird Electronics, Inc. and stored on the hard disk of the personal computer. Seawater was sampled during the up cast by sending fire commands from the personal computer. We usually stop at each layer for 30 seconds to stabilize then fire.

423 casts of CTD measurements were conducted (table 5.14-1).

The CTD raw data was processed using SBE Data Processing-Win32 (ver.7.18d) and SEASOFT were as follows:

(The process in order)

DATCNV: Convert the binary raw data to engineering unit data. DATCNV also extracts bottle information where scans were marked with the bottle confirm bit during acquisition. The duration was set to 3.0 seconds, and the offset was set to 0.0 seconds.

BOTTLESUM: Create a summary of the bottle data. The data were averaged over 3.0 seconds.

ALIGNCTD: Convert the time-sequence of sensor outputs into the pressure sequence to ensure that all calculations were made using measurements from the same parcel of water. Dissolved oxygen data are systematically delayed with respect to depth mainly because of the long time constant of the dissolved oxygen sensor and of an additional delay from the transit time of water in the pumped plumbing line. This delay was compensated by 6 seconds advancing dissolved oxygen sensor (SBE43) output (dissolved oxygen voltage) relative to the temperature data.

WILDEDIT: Mark extreme outliers in the data files. The first pass of WILDEDIT obtained an accurate estimate of the true standard deviation of the data. The data were read in blocks of 1000 scans. Data greater than 10 standard deviations were flagged. The second pass computed a standard deviation over the same 1000 scans excluding the flagged values. Values greater than 20 standard deviations were marked bad. This process was applied to pressure, depth, temperature, conductivity and dissolved oxygen voltage (SBE43) and descent rate.
*For 'time bin' data, WILDEDIT was not processed.

CELLTM: Remove conductivity cell thermal mass effects from the measured conductivity. Typical values used were thermal anomaly amplitude $\alpha = 0.03$ and the time constant $1/\beta = 7.0$.

FILTER: Perform a low pass filter on pressure with a time constant of 0.15 second. In order to produce zero phase lag (no time shift) the filter runs forward first then backward.

WFILTER: Perform a median filter to remove spikes in the fluorescence data data. A median value was determined by 49 scans of the window.

SECTIONU: *This process is original module of SECTION.
Select a time span of data based on scan number in order to reduce a file size. The minimum number was set to be the starting time when the

CTD package was beneath the sea-surface after activation of the pump. The maximum number was set to be the end time when the package came up to the sea-surface.

LOOPEDIT: Mark scans where the CTD was moving less than the minimum velocity of 0.0 m/s (traveling backwards due to ship roll).
*For 'time bin' data, LOOPEDIT was not processed.

DERIVE: Compute dissolved oxygen (SBE43).

BINAVG: Two kinds of bin data were created.
Pressure bin : Average the data into 1-dbar bins.
Time bin : Average the data into 1-second bins.

DERIVE: Compute the practical salinity, potential temperature, and sigma-theta.

SPLIT: Separate the data from an input '*.cnv' file into down cast and up cast files.

Configuration file: MR1107A.con

Specifications of the sensors are listed below.

CTD: SBE911plus CTD system

Under water unit:

SBE9plus (S/N 09P27443-0677, Sea-Bird Electronics, Inc.)

Pressure sensor: Digiquartz pressure sensor (S/N 79511)

Calibrated Date: 11 May 2011

Temperature sensors:

Primary: SBE03-04/F (S/N 031524, Sea-Bird Electronics, Inc.)

Calibrated Date: 29 Jul. 2011

Secondary: SBE03-04/F (S/N 031464, Sea-Bird Electronics, Inc.)

Calibrated Date: 02 Mar. 2011

Conductivity sensors:

Primary: SBE04-04/0 (S/N 041206, Sea-Bird Electronics, Inc.)

Calibrated Date: 14 Jun. 2011

Secondary: SBE04C (S/N 042240, Sea-Bird Electronics, Inc.)

Calibrated Date: 08 Jun. 2011

Fluorescence:

Chlorophyll Fluorometer (S/N 3054, Seapoint Sensors, Inc.)

Gain setting: 30X, 0-5 µg/l

Calibrated Date: None

Offset : 0.000

Dissolved Oxygen sensor:

SBE43 (S/N 430330, Sea-Bird Electronics, Inc.)

Calibrated Date: 22 Jul. 2011

Carousel water sampler:

SBE32 (S/N 3221746-0278, Sea-Bird Electronics, Inc.)

Used Cast: from 4SM001 to 8SM242

SBE32 (S/N 3227443-0391, Sea-Bird Electronics, Inc.)

Used Cast: from 8SM243 to 5SM002

Deck unit: SBE11plus(V2) (S/N 11P7030-0272, Sea-Bird Electronics, Inc.)

(5) Preliminary Results

During this cruise, 423 casts of CTD observation (Leg1:195 casts, Leg2:228 casts) were carried out. Date, time and locations of the CTD casts are listed in Table 5.14-1. The time series contours of salinity, temperature, dissolved oxygen and fluorescence are shown in figure 5.14-1. Vertical profiles (down cast) of primary temperature, salinity, dissolved oxygen and fluorescence with pressure are shown in the appendix.

(6) Remarks

In the cast 4SM001, the information of ship position (NMEA) was added in the header file after the cast, because the information was not obtained during the cast. In the cast 8SM130, the data of scan number 66000 was deleted due to the problem of data process. In the cast 8SM203, the data of scan number from 22723 to 23963 was deleted, because the upcast data of about 10m was included during downcast. In the cast 8SM242, water samples of 60m, 40m, 20m and 10m were not collected, due to Carousel Water Sampler trouble. In the cast 8SM334, the fluorescence data at 60m in the CTD bottle data was except for spike and re-processed. In the cast 5SM002, the header information was changed from '8S' to '5S'.

In the cast 8SM009, the Niskin Bottle #20 was not fired correctly at 100m (miss tripped). In the cast 8SM161, the bottom of this cast was changed from 1000m to 500m, because TurboMAP had priority at this cast. In the cast 8SM171, the bottom depth of this cast was changed from 500m to 600m, and the water sampling of 500m was canceled.

Temperature and conductivity sensors of secondary were shifted from downcast 110db to surface in the cast 8SM093, and from down 110db to surface in the cast 8SM095, because something invaded into the TC-duct. DO sensor was noisy from about upcast 220db to 210db in the cast of 8SM115 and 8SM116. DO sensor was drifted from the cast of 8SM117.

(7) Correction of the CTD salinity

The CTD salinity data was corrected by the bottle salinity data obtained at 1000m and measured by AUTOSAL. The bottle salinity data was obtained once a day. The correction coefficient was calculated by “the method of least squares” of the time and the difference between the CTD salinity data and the bottle salinity data of each cast, and the formula of the correction coefficient was as follows:

$$\text{Offset} = \text{CTDSal} - \text{BtlSal}$$

$$\text{CTDSal}_{\text{cal}} = \text{CTDSal}_{\text{raw}} - \text{Offset}$$

Where ,

Offset: correction coefficient at each cast

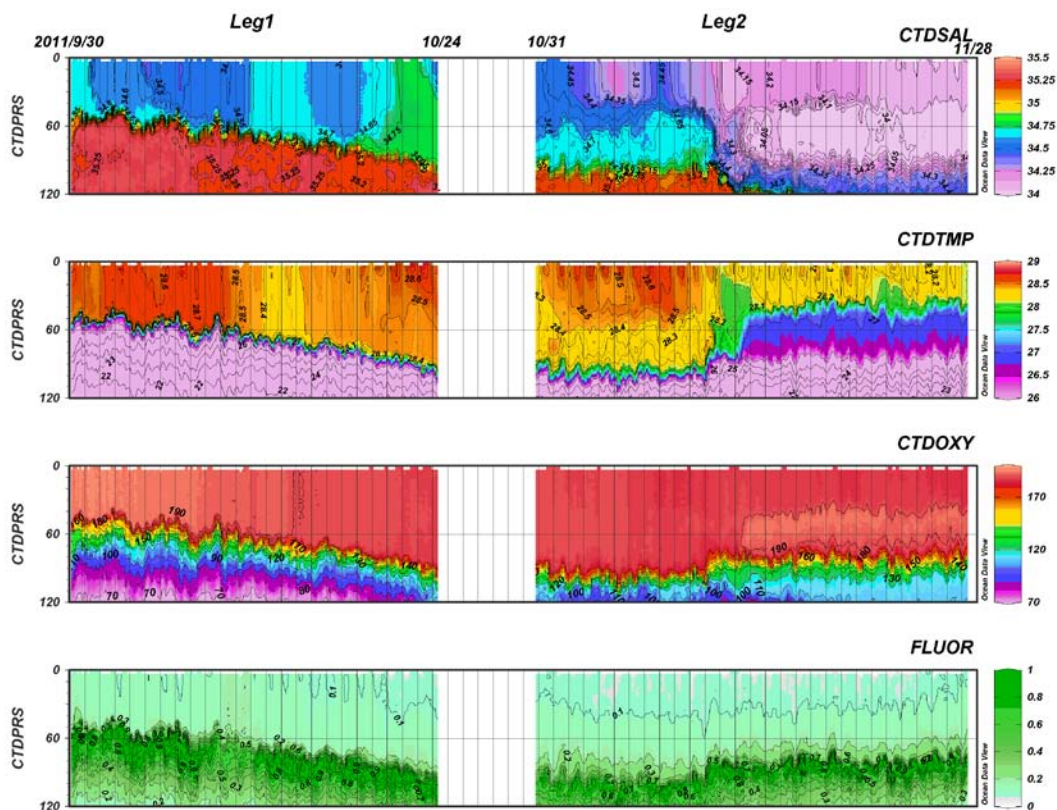
CTDSal : CTD salinity data when fired during upcast
BtlSal : bottle salinity data measured by AUTOSAL
CTDSal_cal : corrected CTD salinity data
CTDSal_raw : noncorrected CTD salinity data

The correction formula was separated between Leg1 and Leg2, because the correction formula was difference between Leg1 and Leg2. In Leg1, Offset of the Primary CTDSal_raw was about -0.004 to -0.005 (psu) and Offset of the secondary CTDSal_raw was from about +0.002 to -0.008 (psu). The results of the corrected salinity data of CTD are summarized in Fig. 5.14-2. In Leg2, Offset of the Primary CTDSal_raw was about -0.004 (psu) and Offset of the secondary CTDSal_raw was from about -0.008 to -0.013 (psu). The results of the corrected salinity data of CTD are summarized in Fig. 5.14-3.

(8) Data archive

All raw and processed data will be submitted to the Data Management Office (DMO), JAMSTEC, and will be opened to public via “R/V MIRAI Data Web Page” in JAMSTEC home page.

MR11-07 from Sep 30th to Nov 28th (120m range)



MR11-07 from Sep 30th to Nov 28th (500m range)

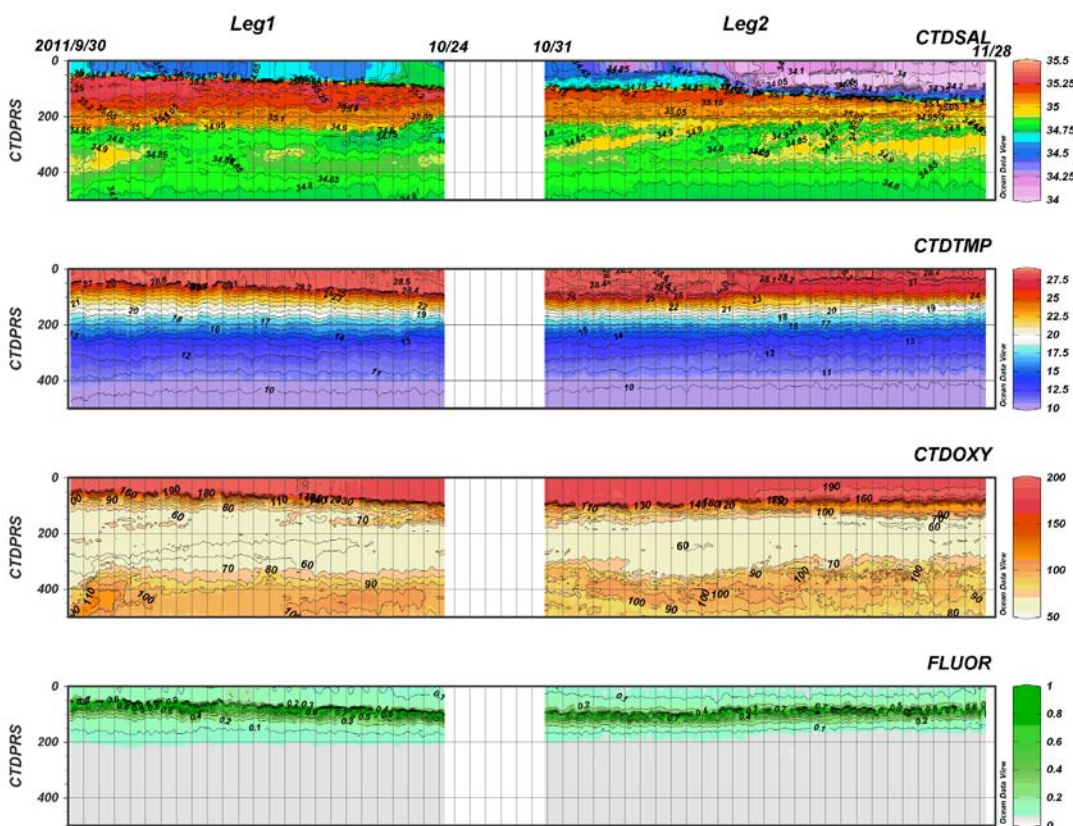


Fig. 5.14-1 the time series contours shows salinity, temperature, dissolved oxygen and fluorescence. Upper shows 120m range and lower shows 500m range, respectively.

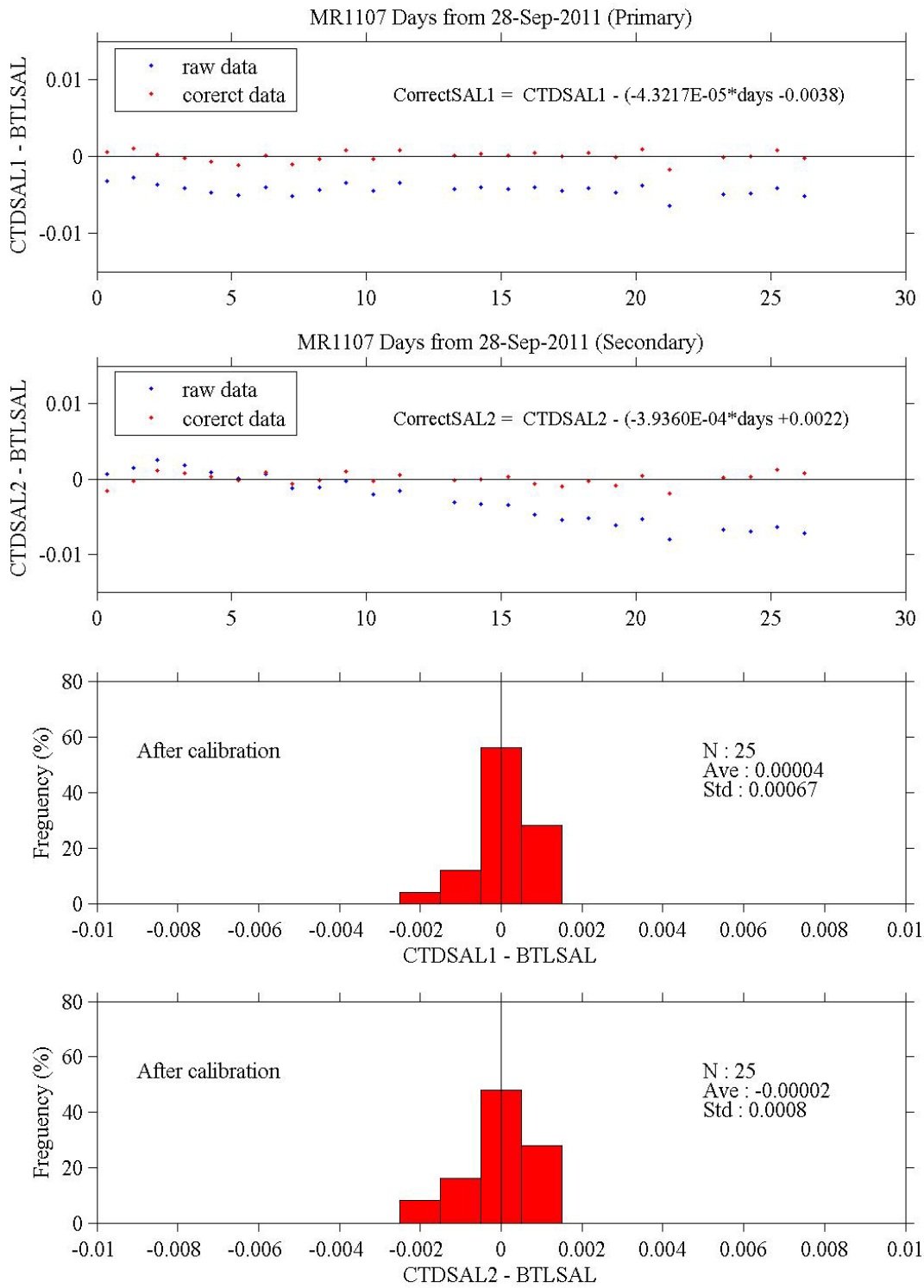


Fig. 5.14-2 the result of CTD salinity correction in Leg1

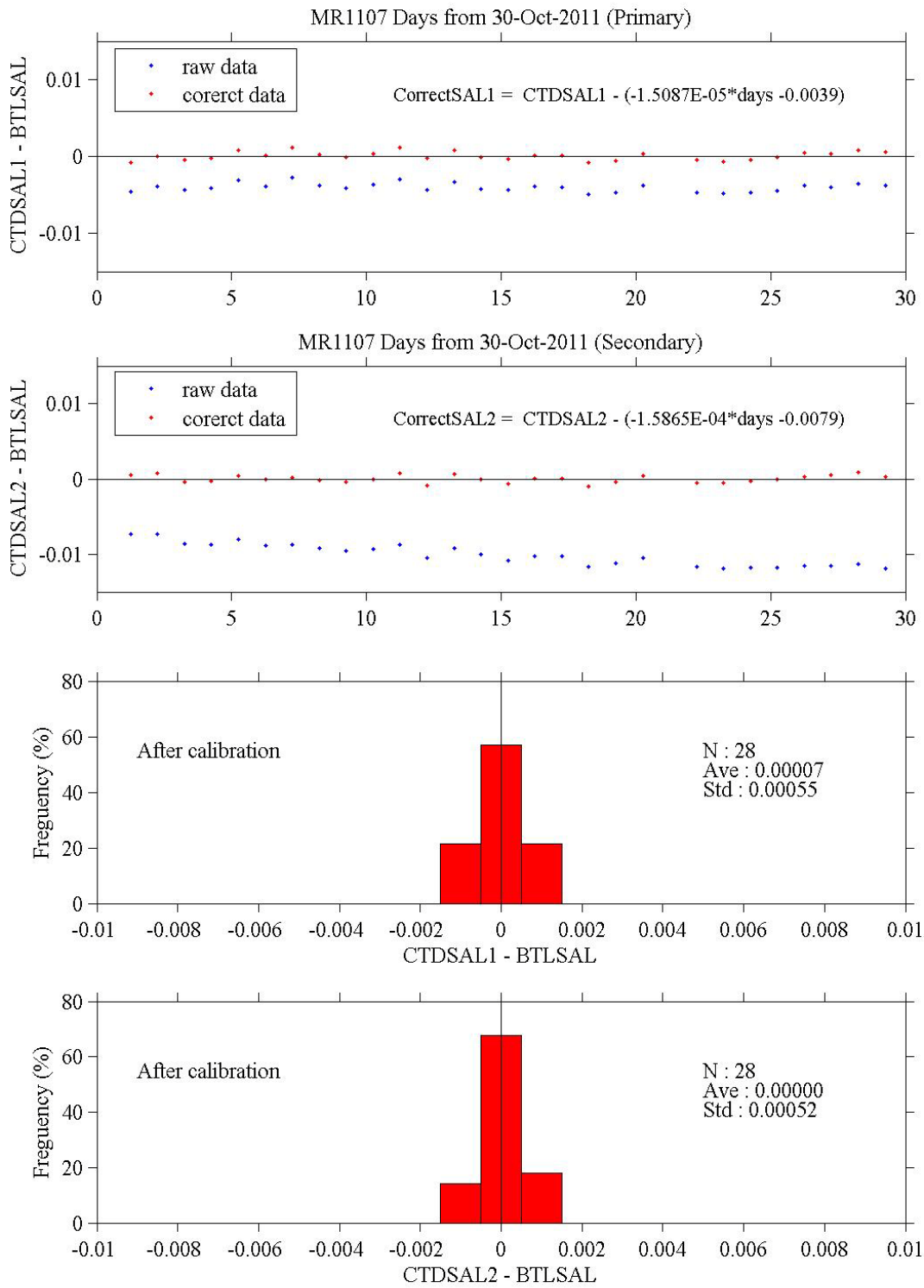


Fig. 5.14-3 the result of CTD salinity correction in Leg2

Table 5.14-1 CTD Cast table

Stnno	Castno	Date(UTC) (mmddyy)	Time(UTC)		BottomPosition		Depth	Wire Out	Max Depth	Max Pressure	CTD Filename	COR Filename	Sampling	Remark
			Start	End	Latitude	Longitude								
4S	1	092811	08:39	09:24	03-59.85S	080-29.72E	5028.0	998.1	1000.1	1009.6	4SM001	-	Sal, pH	Start of Leg 1 The information of ship position (NMEA) was added in the header file, because the information was not collected during this cast.
5S	1	092911	08:04	08:50	05-06.64S	078-06.54E	4980.0	999.6	1000.4	1008.6	5SM001	-	Sal, pH, Pig	
8S	1	093011	05:40	06:35	07-59.40S	080-30.56E	5391.0	1000.9	1001.9	1008.0	8SM001	2011093006	DO,Sal,pH,Nuts,Pig	
8S	2	093011	08:37	08:55	08-00.04S	080-29.93E	5383.0	497.0	501.0	503.6	8SM002	2011093009	-	
8S	3	093011	11:38	12:12	08-00.08S	080-29.71E	5380.0	498.7	502.4	505.3	8SM003	2011093012	DO,pH,Nuts,Pig	
8S	4	093011	14:37	14:55	07-59.90S	080-29.74E	5382.0	497.4	501.2	504.1	8SM004	2011093015	-	
8S	5	093011	17:38	18:14	07-59.93S	080-29.74E	5381.0	496.8	500.3	502.6	8SM005	2011093018	DO,pH,Nuts,Pig	
8S	6	093011	20:36	20:54	08-00.01S	080-29.83E	5384.0	498.9	502.4	505.8	8SM006	2011093021	-	
8S	7	093011	23:39	00:14	07-59.88S	080-29.74E	5383.0	496.1	499.9	503.1	8SM007	2011100100	DO,pH,Nuts,Pig	
8S	8	100111	02:39	02:57	08-00.03S	080-29.78E	5382.0	499.4	501.2	505.3	8SM008	2011100103	-	
8S	9	100111	05:41	06:32	07-59.89S	080-29.89E	5383.0	1000.0	1001.3	1008.2	8SM009	2011100106	DO,Sal,pH,Nuts,Pig	Bottle #20 (100m) was miss tripped
8S	10	100111	08:41	08:59	08-00.12S	080-29.74E	5382.0	495.7	501.6	504.0	8SM010	2011100109	-	
8S	11	100111	11:48	12:24	07-59.89S	080-29.19E	5380.0	500.0	502.7	504.8	8SM011	2011100112	DO,pH,Nuts,Pig	
8S	12	100111	14:45	15:03	08-00.06S	080-29.27E	5381.0	495.9	501.4	504.8	8SM012	2011100115	-	
8S	13	100111	17:45	18:20	07-59.99S	080-29.07E	5382.0	496.1	501.2	504.6	8SM013	2011100118	DO,pH,Nuts,Pig	
8S	14	100111	20:43	21:01	07-59.95S	080-29.63E	5381.0	497.0	501.0	504.3	8SM014	2011100121	-	
8S	15	100111	23:43	00:17	07-59.79S	080-29.77E	5382.0	499.6	500.7	504.1	8SM015	2011100200	DO,pH,Nuts,Pig	
8S	16	100211	02:45	03:06	07-59.64S	080-30.19E	5387.0	499.0	501.8	505.0	8SM016	2011100203	-	
8S	17	100211	05:40	06:28	08-00.12S	080-30.25E	5382.0	998.9	1001.7	1010.0	8SM017	2011100206	DO,Sal,pH,Nuts,Pig	
8S	18	100211	08:43	09:04	08-00.04S	080-29.68E	5383.0	497.8	502.3	504.6	8SM018	2011100209	-	
8S	19	100211	11:43	12:16	08-00.13S	080-29.48E	5381.0	498.3	500.1	503.6	8SM019	2011100212	DO,pH,Nuts,Pig	
8S	20	100211	14:44	15:04	08-00.06S	080-29.41E	5381.0	496.8	501.2	504.3	8SM020	2011100215	-	
8S	21	100211	17:44	18:19	07-59.96S	080-29.74E	5383.0	496.6	500.4	501.6	8SM021	2011100218	DO,pH,Nuts,Pig	
8S	22	100211	20:41	21:03	08-00.28S	080-29.76E	5382.0	499.8	503.5	507.2	8SM022	2011100221	-	
8S	23	100211	23:42	00:20	08-00.01S	080-29.99E	5385.0	498.1	501.0	503.5	8SM023	2011100300	DO,pH,Nuts,Pig	
8S	24	100311	02:42	03:03	08-00.08S	080-30.54E	5383.0	496.1	500.5	503.9	8SM024	2011100303	-	
8S	25	100311	05:40	06:31	08-00.19S	080-30.58E	5382.0	999.8	1001.4	1008.7	8SM025	2011100306	DO,Sal,pH,Nuts,Pig	
8S	26	100311	08:40	09:01	08-00.21S	080-30.44E	5383.0	498.3	500.4	501.4	8SM026	2011100309	-	
8S	27	100311	11:42	12:19	08-00.10S	080-29.97E	5383.0	496.1	501.4	505.3	8SM027	2011100312	DO,pH,Nuts,Pig	
8S	28	100311	14:43	15:04	07-59.37S	080-29.38E	5383.0	497.0	500.3	505.0	8SM028	2011100315	-	
8S	29	100311	17:42	18:17	07-59.81S	080-30.11E	5382.0	498.3	501.2	504.5	8SM029	2011100318	DO,pH,Nuts,Pig	
8S	30	100311	20:40	21:03	08-00.16S	080-30.57E	5384.0	501.2	501.9	505.7	8SM030	2011100321	-	
8S	31	100311	23:41	00:18	07-59.98S	080-29.98E	5382.0	498.9	501.4	504.8	8SM031	2011100400	DO,pH,Nuts,Pig	
8S	32	100411	02:42	03:02	08-00.19S	080-30.05E	5381.0	498.1	500.1	503.9	8SM032	2011100403	-	
8S	33	100411	05:41	06:33	08-00.38S	080-30.29E	5380.0	1000.1	1001.0	1006.9	8SM033	2011100406	DO,Sal,pH,Nuts,Pig	
8S	34	100411	08:42	09:03	08-00.14S	080-30.09E	5382.0	497.8	501.8	505.9	8SM034	2011100409	-	
8S	35	100411	11:41	12:14	07-59.92S	080-29.81E	5383.0	498.9	500.7	501.6	8SM035	2011100412	DO,pH,Nuts,Pig	
8S	36	100411	14:42	15:01	07-58.98S	080-29.39E	5386.0	496.8	500.0	502.3	8SM036	2011100415	-	
8S	37	100411	17:42	18:16	07-59.86S	080-29.76E	5383.0	495.4	500.4	503.2	8SM037	2011100418	DO,pH,Nuts,Pig	
8S	38	100411	20:41	21:02	07-59.78S	080-29.93E	5384.0	497.9	500.5	504.1	8SM038	2011100421	-	
8S	39	100411	23:39	00:17	07-59.93S	080-30.07E	5383.0	500.5	502.1	505.5	8SM039	2011100500	DO,pH,Nuts,Pig	
8S	40	100511	02:42	03:02	07-59.91S	080-29.98E	5383.0	496.1	500.3	503.7	8SM040	2011100503	-	
8S	41	100511	05:40	06:32	08-00.20S	080-30.02E	5382.0	993.2	1000.5	1008.1	8SM041	2011100506	DO,Sal,pH,Nuts,Pig	
8S	42	100511	08:40	09:01	08-00.06S	080-29.85E	5382.0	496.5	501.2	504.6	8SM042	2011100509	-	
8S	43	100511	11:41	12:15	08-00.10S	080-29.15E	5382.0	499.0	500.6	504.4	8SM043	2011100512	DO,pH,Nuts,Pig	
8S	44	100511	14:43	15:03	08-00.23S	080-29.57E	5381.0	496.6	500.7	503.3	8SM044	2011100515	-	
8S	45	100511	17:42	18:14	08-00.08S	080-29.57E	5381.0	499.6	501.2	505.1	8SM045	2011100518	DO,pH,Nuts,Pig	
8S	46	100511	20:40	21:01	08-00.26S	080-29.67E	5388.0	497.9	502.1	505.6	8SM046	2011100521	-	
8S	47	100511	23:41	00:18	07-59.89S	080-29.85E	5384.0	498.1	501.5	504.8	8SM047	2011100600	DO,pH,Nuts,Pig	
8S	48	100611	02:41	03:01	08-00.17S	080-29.96E	5383.0	495.7	500.8	503.9	8SM048	2011100603	-	
8S	49	100611	05:41	06:35	08-00.30S	080-30.10E	5381.0	998.9	1001.6	1008.3	8SM049	2011100606	DO,Sal,pH,Nuts,Pig	
8S	50	100611	08:41	09:01	08-00.41S	080-29.96E	5381.0	495.9	501.2	504.5	8SM050	2011100609	-	
8S	51	100611	11:40	12:13	07-59.94S	080-29.97E	5384.0	499.2	502.6	506.0	8SM051	2011100612	DO,pH,Nuts,Pig	
8S	52	100611	14:42	15:02	07-59.24S	080-28.95E	5383.0	495.9	500.3	503.0	8SM052	2011100615	-	
8S	53	100611	17:42	18:14	08-00.14S	080-29.82E	5383.0	497.9	500.6	505.0	8SM053	2011100618	DO,pH,Nuts,Pig	
8S	54	100611	20:42	21:03	08-00.24S	080-29.86E	5380.0	498.3	502.5	506.1	8SM054	2011100621	-	
8S	55	100611	23:41	00:16	07-59.95S	080-30.23E	5384.0	497.4	500.7	504.0	8SM055	2011100700	DO,pH,Nuts,Pig	
8S	56	100711	02:41	03:02	08-00.06S	080-30.21E	5384.0	498.3	501.9	505.3	8SM056	2011100703	-	
8S	57	100711	05:41	06:31	08-00.29S	080-30.01E	5382.0	1000.5	1001.9	1009.2	8SM057	2011100706	DO,Sal,pH,Nuts,Pig	
8S	58	100711	08:41	09:02	08-00.28S	080-29.98E	5382.0	497.6	502.2	506.7	8SM058	2011100709	-	
8S	59	100711	11:40	12:14	08-00.08S	080-29.99E	5382.0	500.0	502.5	505.3	8SM059	2011100712	DO,pH,Nuts,Pig	
8S	60	100711	14:41	15:01	07-58.99S	080-29.27E	5382.0	499.0	500.6	504.3	8SM060	2011100715	-	
8S	61	100711	17:41	18:13	07-59.79S	080-30.05E	5386.0	500.7	501.9	505.0	8SM061	2011100718	DO,pH,Nuts,Pig	
8S	62	100711	20:32	20:53	08-00.00S	080-30.18E	5383.0	497.4	500.4	503.8	8SM062	2011100721	-	
8S	63	100711	23:42	00:17	07-59.91S	080-30.14E	5383.0	499.2	500.8	504.1	8SM063	2011100800	DO,pH,Nuts,Pig	
8S	64	100811	02:39	03:00	08-00.16S	080-30.19E	5383.0	500.0	501.3	504.8	8SM064	2011100803	-	
8S	65	100811	05:42	06:32	07-59.96S	080-30.14E	5383.0	1001.6	1002.4	1011.3	8SM065	2011100806	DO,Sal,pH,Nuts,Pig	
8S	66	100811	08:41	09:01	08-00.03S	080-29.80E	5384.0	496.5	501.9	504.3	8SM066	2011100809	-	
8S	67	100811	11:40	12:12	07-59.95S	080-29.89E	5387.0	499.4	503.3	506.8	8SM067	2011100		

Table 5.14-1 CTD Cast table

Stnno	Castno	Date(UTC) (mmddyy)	Time(UTC)		BottomPosition		Depth	Wire Out	Max Depth	Max Pressure	CTD Filename	COR Filename	Sampling	Remark
			Start	End	Latitude	Longitude								
8S	89	101111	05:41	06:31	08-00.03S	080-30.09E	5384.0	997.4	1000.8	1007.7	8SM089	2011101106	DO,Sal,pH,Nuts,Pig	
8S	90	101111	08:42	09:03	08-00.15S	080-30.27E	5384.0	495.7	501.4	505.5	8SM090	2011101109	-	
8S	91	101111	11:41	12:16	08-00.01S	080-29.69E	5385.0	498.3	502.2	503.1	8SM091	2011101112	DO,pH,Nuts,Pig	
8S	92	101111	14:41	15:03	07-59.66S	080-29.17E	5381.0	496.6	501.3	504.9	8SM092	2011101115	-	
8S	93	101111	17:40	18:15	07-59.89S	080-29.85E	5385.0	499.4	502.8	505.7	8SM093	2011101118	DO,pH,Nuts,Pig	Secondary sensor was shifted from downcast 110db to surface, because something invaded into the TC-duct.
8S	94	101111	20:40	21:01	08-00.02S	080-29.94E	5384.0	497.8	501.2	504.7	8SM094	2011101121	-	
8S	95	101111	23:43	00:20	08-00.09S	080-29.78E	5381.0	497.6	500.5	503.9	8SM095	2011101200	DO,pH,Nuts,Pig	Secondary sensor was shifted from downcast 60db to surface, because something invaded into the TC-duct.
8S	96	101211	02:42	03:04	07-59.99S	080-29.96E	5382.0	497.4	501.1	504.5	8SM096	2011101203	-	
8S	97	101211	05:40	06:29	08-00.03S	080-29.92E	5384.0	998.5	1001.2	1008.7	8SM097	2011101206	DO,Sal,pH,Nuts,Pig	
8S	98	101211	08:41	09:02	08-00.07S	080-30.16E	5383.0	493.9	502.1	503.7	8SM098	2011101209	-	
8S	99	101211	11:40	12:15	08-00.13S	080-29.83E	5382.0	497.8	501.1	502.8	8SM099	2011101212	DO,pH,Nuts,Pig	
8S	100	101211	14:41	15:02	07-58.82S	080-29.25E	5358.0	496.1	500.2	503.3	8SM100	2011101215	-	
8S	101	101211	17:41	18:14	08-00.02S	080-29.79E	5383.0	497.6	501.9	504.8	8SM101	2011101218	DO,pH,Nuts,Pig	
8S	102	101211	20:40	21:01	08-00.02S	080-29.98E	5384.0	498.9	502.1	505.4	8SM102	2011101221	-	
8S	103	101211	23:42	00:21	08-00.00S	080-29.99E	5382.0	498.5	500.8	504.5	8SM103	2011101300	DO,pH,Nuts,Pig	
8S	104	101311	02:41	03:03	07-59.91S	080-30.02E	5384.0	494.6	500.1	503.0	8SM104	2011101303	-	
8S	105	101311	05:41	06:30	08-00.03S	080-29.71E	5384.0	999.2	100.4	1007.9	8SM105	2011101306	DO,Sal,pH,Nuts,Pig	
8S	106	101311	08:41	09:01	07-59.93S	080-29.80E	5385.0	495.4	502.5	505.2	8SM106	2011101309	-	
8S	107	101311	11:52	12:27	08-00.13S	080-29.83E	5383.0	495.7	500.2	502.7	8SM107	2011101312	DO,pH,Nuts,Pig	
8S	108	101311	14:41	15:02	07-59.54S	080-28.62E	5388.0	495.9	501.1	505.0	8SM108	2011101315	-	
8S	109	101311	17:42	18:15	08-00.05S	080-29.94E	5383.0	500.3	504.4	508.6	8SM109	2011101318	DO,pH,Nuts,Pig	
8S	110	101311	20:40	21:00	08-00.07S	080-29.92E	5384.0	497.9	500.2	503.7	8SM110	2011101321	-	
8S	111	101311	23:41	00:18	08-00.06S	080-30.05E	5382.0	499.6	501.0	505.0	8SM111	2011101400	DO,pH,Nuts,Pig	
8S	112	101411	02:42	03:03	08-00.24S	080-29.73E	5379.0	497.6	500.3	503.7	8SM112	2011101403	-	
8S	113	101411	05:40	06:30	08-00.18S	080-29.84E	5382.0	997.6	1001.9	1008.4	8SM113	2011101406	DO,Sal,pH,Nuts,Pig	
8S	114	101411	08:40	09:01	08-00.04S	080-30.18E	5384.0	495.9	500.3	504.5	8SM114	2011101409	-	
8S	115	101411	11:40	12:15	08-00.37S	080-30.14E	5381.0	499.4	502.9	506.9	8SM115	2011101412	DO,pH,Nuts,Pig	DO sensor was noisy from upcast 217db to 208db.
8S	116	101411	14:41	15:02	08-00.09S	080-30.01E	5382.0	499.0	502.6	506.3	8SM116	2011101415	-	DO sensor was noisy from upcast 221db to 208db.
8S	117	101411	17:40	18:13	08-00.19S	080-29.87E	5382.0	496.8	501.2	504.9	8SM117	2011101418	DO,pH,Nuts,Pig	DO sensor was drifted from this cast.
8S	118	101411	20:40	21:01	07-59.97S	080-30.08E	5385.0	495.4	501.1	504.4	8SM118	2011101421	-	
8S	119	101411	23:43	00:20	08-00.01S	080-29.98E	5384.0	499.0	502.3	505.7	8SM119	2011101500	DO,pH,Nuts,Pig	
8S	120	101511	02:42	03:02	07-59.96S	080-30.11E	5382.0	495.5	500.8	504.2	8SM120	2011101503	-	
8S	121	101511	05:41	06:30	08-00.08S	080-30.06E	5382.0	998.9	1000.2	1007.8	8SM121	2011101506	DO,Sal,pH,Nuts,Pig	
8S	122	101511	08:40	09:01	08-00.02S	080-29.92E	5384.0	494.8	502.3	505.0	8SM122	2011101509	-	
8S	123	101511	11:40	12:17	08-00.01S	080-29.91E	5385.0	497.6	501.4	504.4	8SM123	2011101512	DO,pH,Nuts,Pig	
8S	124	101511	14:41	15:02	07-59.06S	080-29.14E	5382.0	497.8	500.8	504.5	8SM124	2011101515	-	
8S	125	101511	17:40	18:12	08-00.14S	080-29.98E	5382.0	497.0	500.3	503.8	8SM125	2011101518	DO,pH,Nuts,Pig	
8S	126	101511	20:40	21:00	07-59.94S	080-30.03E	5383.0	497.2	500.8	504.5	8SM126	2011101521	-	
8S	127	101511	23:41	00:16	08-00.02S	080-29.98E	5383.0	498.1	503.3	506.8	8SM127	2011101600	DO,pH,Nuts,Pig	
8S	128	101611	02:42	03:02	07-59.97S	080-30.08E	5383.0	498.5	501.7	505.1	8SM128	2011101603	-	
8S	129	101611	05:39	06:29	08-00.09S	080-30.02E	5381.0	999.8	1000.8	1010.0	8SM129	2011101606	DO,Sal,pH,Nuts,Pig	
8S	130	101611	08:40	09:00	08-00.06S	080-30.11E	5383.0	494.8	500.6	504.3	8SM130	2011101609	-	The data of scan number 66000 was deleted due to the problem of data process.
8S	131	101611	11:39	12:13	07-59.96S	080-29.91E	5383.0	498.7	500.8	504.0	8SM131	2011101612	DO,pH,Nuts,Pig	
8S	132	101611	14:40	15:01	07-58.99S	080-29.15E	5382.0	495.5	501.3	503.2	8SM132	2011101615	-	
8S	133	101611	17:40	18:13	08-00.08S	080-29.92E	5382.0	497.6	501.1	504.6	8SM133	2011101618	DO,pH,Nuts,Pig	
8S	134	101611	20:39	21:00	08-00.20S	080-29.85E	5382.0	496.5	500.9	504.5	8SM134	2011101621	-	
8S	135	101611	23:41	00:17	08-00.06S	080-29.97E	5383.0	497.8	500.7	503.4	8SM135	2011101700	DO,pH,Nuts,Pig	
8S	136	101711	02:42	03:03	08-00.10S	080-29.95E	5381.0	497.6	501.5	505.1	8SM136	2011101703	-	
8S	137	101711	05:40	06:30	08-00.21S	080-30.02E	5381.0	998.7	1000.2	1009.4	8SM137	2011101706	DO,Sal,pH,Nuts,Pig	
8S	138	101711	08:40	09:00	08-00.12S	080-29.95E	5383.0	496.8	500.5	507.4	8SM138	2011101709	-	
8S	139	101711	12:00	12:34	08-00.32S	080-29.57E	5382.0	498.7	502.5	504.6	8SM139	2011101712	DO,pH,Nuts,Pig	
8S	140	101711	14:42	15:02	07-59.95S	080-29.87E	5384.0	498.5	500.2	503.0	8SM140	2011101715	-	
8S	141	101711	17:42	18:16	08-00.13S	080-29.74E	5382.0	498.3	502.4	505.3	8SM141	2011101718	DO,pH,Nuts,Pig	
8S	142	101711	20:39	21:00	07-59.93S	080-29.99E	5383.0	498.5	501.7	505.1	8SM142	2011101721	-	
8S	143	101711	23:41	00:16	08-00.04S	080-29.94E	5383.0	499.4	501.5	505.2	8SM143	2011101800	DO,pH,Nuts,Pig	
8S	144	101811	02:43	03:03	08-00.17S	080-29.52E	5381.0	497.9	501.7	505.1	8SM144	2011101803	-	
8S	145	101811	05:41	06:30	08-00.27S	080-30.08E	5383.0	999.8	1001.3	1009.0	8SM145	2011101806	DO,Sal,pH,Nuts,Pig	
8S	146	101811	08:40	09:01	08-00.02S	080-29.96E	5384.0	495.2	501.8	503.6	8SM146	2011101809	-	
8S	147	101811	11:39	12:15	08-00.06S	080-29.85E	5383.0	497.8	501.8	505.9	8SM147	2011101812	DO,pH,Nuts,Pig	
8S	148	101811	14:41	15:01	07-58.81S	080-29.20E	5362.0	496.6	500.5	502.1	8SM148	2011101815	-	
8S	149	101811	17:40	18:13	07-59.94S	080-29.93E	5383.0	498.1	501.6	505.0	8SM149	2011101818	DO,pH,Nuts,Pig	
8S	150	101811	20:40	21:00	08-00.03S	080-30.01E	5383.0	499.4	501.5	505.1	8SM150	2011101821	-	
8S	151	101811	23:41	00:17	08-00.07S	080-30.02E	5382.0	498.1	501.1	504.5	8SM151	2011101900	DO,pH,Nuts,Pig	
8S	152	101911	02:41	03:02	08-00.02S	080-30.08E	5384.0	497.6	500.4	503.8	8SM152	2011101903	-	
8S	153	101911	05:40	06:29	08-00.09S	080-29.82E	5384.0	998.5	1002.6	1008.4	8SM153	2011101906	DO,Sal,pH,Nuts,Pig	
8S	154	101911	08:40	09:00	08-00.03S	080-30.06E	5382.0	496.6	501.5	504.7	8SM154	2011101909	-	
8S	155	101911	11:40	12:15	07-59.96S	080-30.03E	5382.0	498.5	500.9	504.7	8SM155	2011101912	DO,pH,Nuts,Pig	
8S	156	101911	14:40	15:01	07-58.72S	080-29.58E	5303.0	498.9	501.5	505.2	8SM156	2011101915	-	
8S	157	101911	17:40	18:12	08-00.01S	080-30.06E	5383.0	496.8	500.3	503.4	8SM157	2011101918	DO,pH,Nuts,Pig	
8S	158	101911	20:40	21:01	07-59.93S	080-30.10E	5383.0	497.4	500.6	503.9	8SM158	2011101921	-	
8S	159	101911	23:41	00:17	07-59.95S	080-30.04E	5384.0	498.5	501.6	505.0	8SM159	2011102000	DO,pH,Nuts,Pig	
8S	160	102011	02:41	03:01	07-59.99S	080-30.28E	5385.0	497.9	501.3	504.7	8SM160	2011102003	-	
8S	161	102011	05:40	06:12	07-59.99S	080-31.92E	5386.0	497.4	500.2	503.6	8SM161	2011102006	DO,pH,Nuts,Pig	The bottom depth of this cast was changed from 1000db to 500db, because TurboMAP had priority at this cast.
8S	162	102011	08:41	09:10	08-00.06S	080-31.80E	5384.0	497.6	501.9	504.3	8SM162	2011102009	-	
8S	163	102011	11:39	12:14	07-59.97S	080-31.67E	5389.0	498.1	501.0	504.4	8SM163	2011102012	DO,pH,Nuts,Pig	
8S	164	102011												

Table 5.14-1 CTD Cast table

Stnnbr	Castno	Date(UTC) (mmdyyy)	Time(UTC)		BottomPosition		Depth	Wire Out	Max Depth	Max Pressure	CTD Filename	COR Filename	Sampling	Remark
			Start	End	Latitude	Longitude								
8S	171	102111	12:31	13:10	07-59.84S	080-29.78E	5384.0	599.2	600.2	605.0	8SM171	2011102112	DO,pH,Nuts,Pig	The bottom depth of this cast changed from 500db to 600db, and the water sampling of 500m was canceled.
8S	172	102111	14:41	15:05	07-58.70S	080-29.93E	5291.0	497.8	500.3	503.8	8SM172	2011102115	-	-
8S	173	102111	17:41	18:16	07-59.98S	080-29.96E	5384.0	498.7	500.8	504.2	8SM173	2011102118	DO,pH,Nuts,Pig	-
8S	174	102111	20:39	20:59	07-59.97S	080-30.00E	5383.0	497.9	501.1	503.6	8SM174	2011102121	-	-
8S	175	102111	23:57	00:32	08-00.01S	080-29.90E	5382.0	500.3	502.9	506.4	8SM175	2011102200	DO,pH,Nuts,Pig	-
8S	176	102211	02:40	03:02	08-00.13S	080-29.75E	5388.0	498.7	500.8	504.3	8SM176	2011102203	-	-
8S	177	102211	05:39	06:30	08-00.00S	080-29.96E	5383.0	997.9	1001.7	1007.6	8SM177	2011102206	DO,Sal,pH,Nuts,Pig	-
8S	178	102211	08:40	09:00	08-00.17S	080-29.88E	5381.0	497.8	502.9	506.0	8SM178	2011102209	-	-
8S	179	102211	11:40	12:13	08-00.04S	080-29.86E	5384.0	499.6	502.0	506.5	8SM179	2011102212	DO,pH,Nuts,Pig	-
8S	180	102211	14:41	15:02	07-58.96S	080-29.36E	5384.0	499.4	502.0	505.4	8SM180	2011102215	-	-
8S	181	102211	17:51	18:24	08-00.00S	080-30.04E	5386.0	497.6	502.2	506.7	8SM181	2011102218	DO,pH,Nuts,Pig	-
8S	182	102211	20:39	21:00	08-00.10S	080-30.12E	5384.0	499.6	502.3	505.7	8SM182	2011102221	-	-
8S	183	102211	23:41	00:17	08-00.01S	080-30.04E	5385.0	500.5	502.2	505.7	8SM183	2011102300	DO,pH,Nuts,Pig	-
8S	184	102311	02:40	03:01	08-00.13S	080-29.99E	5382.0	499.0	502.2	505.6	8SM184	2011102303	-	-
8S	185	102311	05:40	06:29	08-00.06S	080-29.98E	5382.0	997.4	1000.6	1007.3	8SM185	2011102306	DO,Sal,pH,Nuts,Pig	-
8S	186	102311	08:39	09:00	08-00.19S	080-29.95E	5381.0	500.0	503.7	506.4	8SM186	2011102309	-	-
8S	187	102311	11:39	12:13	07-59.97S	080-30.03E	5384.0	499.6	501.8	505.3	8SM187	2011102312	DO,pH,Nuts,Pig	-
8S	188	102311	14:40	15:01	07-59.88S	080-30.01E	5383.0	498.1	500.4	503.8	8SM188	2011102315	-	-
8S	189	102311	17:41	18:12	08-00.02S	080-29.86E	5383.0	499.8	502.4	504.9	8SM189	2011102318	DO,pH,Nuts,Pig	-
8S	190	102311	20:38	21:00	08-00.07S	080-30.09E	5384.0	500.1	502.6	506.0	8SM190	2011102321	-	-
8S	191	102311	23:40	00:15	08-00.04S	080-30.02E	5382.0	500.0	502.1	505.7	8SM191	2011102400	DO,pH,Nuts,Pig	-
8S	192	102411	02:40	03:01	08-00.26S	080-29.92E	5382.0	498.9	501.9	505.2	8SM192	2011102403	-	-
8S	193	102411	05:42	06:33	08-00.39S	080-29.81E	5384.0	997.6	1000.4	1008.1	8SM193	2011102406	DO,Sal,pH,Nuts,Pig	End of Leg 1
8S	194	103011	23:39	00:15	08-00.01S	080-29.83E	5385.0	500.3	501.1	504.5	8SM194	2011103100	DO,pH,Nuts,Pig	Start of Leg 2
8S	195	103111	02:41	03:02	08-00.12S	080-29.91E	5381.0	495.9	499.7	502.8	8SM195	2011103103	-	-
8S	196	103111	05:39	06:29	08-00.06S	080-30.01E	5384.0	998.1	1000.8	1008.9	8SM196	2011103106	DO,Sal,pH,Nuts,Pig	-
8S	197	103111	08:38	08:59	08-00.10S	080-30.01E	5384.0	497.9	502.0	505.0	8SM197	2011103109	-	-
8S	198	103111	11:40	12:15	08-00.04S	080-30.02E	5382.0	499.2	502.6	506.5	8SM198	2011103112	DO,pH,Nuts,Pig	-
8S	199	103111	14:39	15:00	07-59.94S	080-29.64E	5383.0	499.4	501.2	504.4	8SM199	2011103115	-	-
8S	200	103111	17:38	18:12	08-00.10S	080-29.96E	5384.0	497.9	502.5	506.0	8SM200	2011103118	DO,pH,Nuts,Pig	-
8S	201	103111	20:39	20:59	08-00.07S	080-29.93E	5383.0	500.7	503.1	506.5	8SM201	2011103121	-	-
8S	202	103111	23:39	00:15	08-00.03S	080-30.01E	5382.0	499.2	500.7	503.5	8SM202	2011110100	DO,pH,Nuts,Pig	-
8S	203	110111	02:39	03:00	07-59.91S	080-30.10E	5390.0	497.2	500.7	504.3	8SM203	2011110103	-	The data of scan number from 22723 to 23963 was deleted, because the upcast data of about 10m was included during downcast.
8S	204	110111	05:39	06:29	07-59.93S	080-29.99E	5385.0	999.8	1001.0	1009.2	8SM204	2011110106	DO,Sal,pH,Nuts,Pig	-
8S	205	110111	08:39	08:59	08-00.00S	080-30.08E	5384.0	498.5	500.8	504.4	8SM205	2011110109	-	-
8S	206	110111	11:42	12:16	07-59.93S	080-29.95E	5384.0	497.4	502.4	505.7	8SM206	2011110112	DO,pH,Nuts,Pig	-
8S	207	110111	14:39	15:00	08-00.00S	080-29.77E	5385.0	497.6	501.6	505.5	8SM207	2011110115	-	-
8S	208	110111	17:39	18:14	08-00.23S	080-30.02E	5383.0	499.0	501.4	504.7	8SM208	2011110118	DO,pH,Nuts,Pig	-
8S	209	110111	20:39	21:00	07-59.95S	080-29.99E	5382.0	498.9	502.5	506.0	8SM209	2011110121	-	-
8S	210	110111	23:38	00:13	08-00.05S	080-29.83E	5383.0	497.4	501.1	504.2	8SM210	2011110200	DO,pH,Nuts,Pig	-
8S	211	110211	02:39	03:01	07-59.98S	080-29.97E	5383.0	497.2	501.0	504.2	8SM211	2011110203	-	-
8S	212	110211	05:39	06:29	08-00.06S	080-29.97E	5382.0	999.6	1002.0	1010.1	8SM212	2011110206	DO,Sal,pH,Nuts,Pig	-
8S	213	110211	08:39	08:59	08-00.10S	080-29.82E	5383.0	498.3	501.1	504.3	8SM213	2011110209	-	-
8S	214	110211	11:38	12:13	07-59.93S	080-29.62E	5384.0	498.1	501.3	504.8	8SM214	2011110212	DO,pH,Nuts,Pig	-
8S	215	110211	14:45	15:07	07-59.90S	080-29.96E	5384.0	495.5	500.8	503.3	8SM215	2011110215	-	-
8S	216	110211	17:43	18:17	08-00.02S	080-29.99E	5383.0	496.6	502.9	505.9	8SM216	2011110218	DO,pH,Nuts,Pig	-
8S	217	110211	20:43	21:04	07-59.98S	080-30.10E	5383.0	498.3	502.7	506.1	8SM217	2011110221	-	-
8S	218	110211	23:40	00:15	07-59.95S	080-29.96E	5384.0	498.5	501.8	505.4	8SM218	2011110300	DO,pH,Nuts,Pig	-
8S	219	110311	02:45	03:07	07-59.98S	080-30.12E	5383.0	499.0	502.3	505.1	8SM219	2011110303	-	-
8S	220	110311	05:45	06:34	08-00.08S	080-29.97E	5383.0	998.3	1001.5	1009.4	8SM220	2011110306	DO,Sal,pH,Nuts,Pig	-
8S	221	110311	08:44	09:04	07-59.87S	080-30.11E	5387.0	498.9	501.8	505.4	8SM221	2011110309	-	-
8S	222	110311	11:45	12:19	08-00.17S	080-29.96E	5382.0	496.3	502.5	505.3	8SM222	2011110312	DO,pH,Nuts,Pig	-
8S	223	110311	14:45	15:07	08-00.02S	080-29.97E	5384.0	497.9	502.8	506.0	8SM223	2011110315	-	-
8S	224	110311	17:42	18:17	08-00.05S	080-30.06E	5383.0	499.0	501.2	505.0	8SM224	2011110318	DO,pH,Nuts,Pig	-
8S	225	110311	20:43	21:03	07-59.98S	080-30.23E	5383.0	498.1	502.5	505.1	8SM225	2011110321	-	-
8S	226	110311	23:45	00:19	07-59.86S	080-30.17E	5384.0	499.4	501.5	504.7	8SM226	2011110400	DO,pH,Nuts,Pig	-
8S	227	110411	02:46	03:07	08-00.12S	080-29.93E	5383.0	497.0	501.4	504.2	8SM227	2011110403	-	-
8S	228	110411	05:44	06:35	08-00.06S	080-30.07E	5383.0	998.7	1000.9	1008.8	8SM228	2011110406	DO,Sal,pH,Nuts,Pig	-
8S	229	110411	08:43	09:04	08-00.00S	080-30.13E	5383.0	497.9	500.4	504.7	8SM229	2011110409	-	-
8S	230	110411	11:43	12:17	08-00.14S	080-29.97E	5382.0	497.0	501.6	504.6	8SM230	2011110412	DO,pH,Nuts,Pig	-
8S	231	110411	14:44	15:05	08-00.13S	080-29.78E	5383.0	496.1	500.4	504.2	8SM231	2011110415	-	-
8S	232	110411	17:42	18:17	08-00.17S	080-30.09E	5382.0	498.1	500.9	504.4	8SM232	2011110418	DO,pH,Nuts,Pig	-
8S	233	110411	20:41	21:02	08-00.00S	080-30.31E	5383.0	497.6	501.6	505.0	8SM233	2011110421	-	-
8S	234	110411	23:43	00:17	08-00.00S	080-30.10E	5384.0	497.6	501.4	504.8	8SM234	2011110500	DO,pH,Nuts,Pig	-
8S	235	110511	02:44	03:05	07-59.98S	080-29.91E	5384.0	496.1	500.4	504.2	8SM235	2011110503	-	-
8S	236	110511	05:45	06:35	07-59.90S	080-30.21E	5384.0	999.6	1001.6	1008.7	8SM236	2011110506	DO,Sal,pH,Nuts,Pig	-
8S	237	110511	08:43	09:03	08-00.03S	080-30.00E	5383.0	497.0	501.4	505.1	8SM237	2011110509	-	-
8S	238	110511	11:44	12:18	07-59.78S	080-29.99E	5387.0	496.8	500.4	503.7	8SM238	2011110512	DO,pH,Nuts,Pig	-
8S	239	110511	14:44	15:05	08-00.65S	080-29.73E	5382.0	496.5	500.4	504.2	8SM239	2011110515	-	-
8S	240	110511	17:41	18:17	07-59.93S	080-30.30E	5383.0	497.6	501.0	504.5	8SM240	2011110518	DO,pH,Nuts,Pig	-
8S	241	110511	20:41	21:02	07-59.99S	080-30.08E	5383.0	497.2	501.2	505.2	8SM241	2011110521	-	-
8S	242	110511	23:43	00:20	08-00.13S	080-30.02E	5383.0	498.5	501.7	505.2	8SM242	2011110600	DO,pH,Nuts,Pig	Water samples of 60m, 40m, 20m and 10m were not collected, due to water sampler trouble.
8S	243	110611	03:32	03:52	07-59.69S	080-29.75E	5384.0	498.7	502.4	505.3	8SM243	2011110603	-	-
8S	244	110611	05:44	06:34	07-59.99S	080-30.08E	5383.0	999.0	1001.8	1009.8	8SM244	2011110606	DO,Sal,pH,Nuts,Pig	-
8S	245	110611	08:45	09:05	08-00.05S	080-29.95E	5383.0							

Table 5.14-1 CTD Cast table

Stnbnr	Castno	Date(UTC) (mmddy)	Time(UTC)		BottomPosition		Depth	Wire Out	Max Depth	Max Pressure	CTD Filename	COR Filename	Sampling	Remark
			Start	End	Latitude	Longitude								
8S	259	110811	02:45	03:06	07-59.83S	080-29.85E	5385.0	497.9	502.3	505.0	8SM259	2011110803	-	
8S	260	110811	05:45	06:35	07-59.99S	080-29.99E	5386.0	999.8	1000.3	1009.7	8SM260	2011110806	DO,Sal,pH,Nuts,Pig	
8S	261	110811	08:43	09:03	08-00.12S	080-29.92E	5383.0	496.5	500.5	504.3	8SM261	2011110809	-	
8S	262	110811	11:43	12:17	08-00.13S	080-29.87E	5382.0	497.4	501.3	505.0	8SM262	2011110812	DO,pH,Nuts,Pig	
8S	263	110811	14:43	15:05	07-59.96S	080-29.96E	5383.0	497.0	500.8	504.4	8SM263	2011110815	-	
8S	264	110811	17:42	18:16	08-00.14S	080-29.93E	5383.0	497.8	501.3	504.8	8SM264	2011110818	DO,pH,Nuts,Pig	
8S	265	110811	20:42	21:03	07-59.96S	080-29.97E	5384.0	496.3	499.5	502.6	8SM265	2011110821	-	
8S	266	110811	23:42	00:16	08-00.08S	080-29.98E	5382.0	497.9	501.2	504.6	8SM266	2011110900	DO,pH,Nuts,Pig	
8S	267	110911	02:44	03:05	07-59.98S	080-29.91E	5384.0	498.7	500.3	503.8	8SM267	2011110903	-	
8S	268	110911	05:43	06:33	08-00.01S	080-29.93E	5383.0	1000.5	1003.1	1011.4	8SM268	2011110906	DO,Sal,pH,Nuts,Pig	
8S	269	110911	08:43	09:03	08-00.12S	080-30.00E	5384.0	498.3	500.4	505.4	8SM269	2011110909	-	
8S	270	110911	11:44	12:17	08-00.02S	080-29.97E	5384.0	498.9	502.0	504.5	8SM270	2011110912	DO,pH,Nuts,Pig	
8S	271	110911	14:44	15:05	08-00.17S	080-29.93E	5383.0	498.1	503.0	505.9	8SM271	2011110915	-	
8S	272	110911	17:43	18:18	08-00.27S	080-29.75E	5382.0	500.9	502.8	506.1	8SM272	2011110918	DO,pH,Nuts,Pig	
8S	273	110911	20:40	21:01	08-00.14S	080-29.90E	5384.0	498.5	501.4	505.2	8SM273	2011110921	-	
8S	274	110911	23:44	00:17	08-00.13S	080-29.76E	5383.0	499.6	502.2	505.5	8SM274	2011111000	DO,pH,Nuts,Pig	
8S	275	111011	02:45	03:06	08-00.09S	080-29.76E	5382.0	499.6	500.9	504.7	8SM275	2011111003	-	
8S	276	111011	05:44	06:33	08-00.02S	080-29.83E	5386.0	999.0	1000.4	1008.7	8SM276	2011111006	DO,Sal,pH,Nuts,Pig	
8S	277	111011	08:43	09:03	08-00.05S	080-30.03E	5383.0	499.2	502.4	505.9	8SM277	2011111009	-	
8S	278	111011	11:44	12:18	08-00.00S	080-29.71E	5385.0	498.3	501.2	504.7	8SM278	2011111012	DO,pH,Nuts,Pig	
8S	279	111011	14:43	15:04	08-00.03S	080-29.57E	5382.0	499.0	502.7	506.3	8SM279	2011111015	-	
8S	280	111011	17:41	18:15	08-00.02S	080-30.02E	5383.0	498.5	500.8	504.2	8SM280	2011111018	DO,pH,Nuts,Pig	
8S	281	111011	20:40	21:00	07-59.95S	080-30.02E	5386.0	499.2	502.7	506.1	8SM281	2011111021	-	
8S	282	111011	23:43	00:16	07-59.97S	080-30.01E	5383.0	498.5	502.0	505.3	8SM282	2011111100	DO,pH,Nuts,Pig	
8S	283	111111	02:43	03:04	07-59.99S	080-29.93E	5382.0	495.9	500.2	503.9	8SM283	2011111103	-	
8S	284	111111	05:44	06:34	08-00.00S	080-29.88E	5384.0	998.3	1000.4	1007.3	8SM284	2011111106	DO,Sal,pH,Nuts,Pig	
8S	285	111111	08:50	09:11	08-00.06S	080-29.81E	5385.0	499.0	501.2	504.1	8SM285	2011111109	-	
8S	286	111111	11:43	12:18	07-59.95S	080-30.04E	5383.0	497.8	501.3	504.6	8SM286	2011111112	DO,pH,Nuts,Pig	
8S	287	111111	14:44	15:05	07-59.96S	080-29.96E	5382.0	497.8	501.5	504.1	8SM287	2011111115	-	
8S	288	111111	17:41	18:16	08-00.13S	080-30.10E	5382.0	499.4	503.0	506.7	8SM288	2011111118	DO,pH,Nuts,Pig	
8S	289	111111	20:41	21:03	08-00.09S	080-30.09E	5384.0	497.6	500.7	504.1	8SM289	2011111121	-	
8S	290	111111	23:43	00:18	07-59.96S	080-29.94E	5384.0	499.2	501.8	505.4	8SM290	2011111200	DO,pH,Nuts,Pig	
8S	291	111211	02:44	03:05	08-00.09S	080-29.94E	5382.0	495.7	499.9	503.6	8SM291	2011111203	-	
8S	292	111211	05:45	06:35	08-00.22S	080-29.75E	5382.0	998.7	1000.3	1007.9	8SM292	2011111206	DO,Sal,pH,Nuts,Pig	
8S	293	111211	08:45	09:06	08-00.18S	080-30.05E	5383.0	497.4	500.7	504.4	8SM293	2011111209	-	
8S	294	111211	11:38	12:13	08-00.15S	080-29.90E	5384.0	498.9	502.0	505.4	8SM294	2011111212	DO,pH,Nuts,Pig	
8S	295	111211	14:44	15:05	08-00.09S	080-29.97E	5381.0	498.1	502.7	505.5	8SM295	2011111215	-	
8S	296	111211	17:42	18:17	07-59.99S	080-29.92E	5385.0	500.1	501.6	505.0	8SM296	2011111218	DO,pH,Nuts,Pig	
8S	297	111211	20:56	21:17	07-59.78S	080-29.87E	5387.0	500.1	503.8	506.0	8SM297	2011111221	-	
8S	298	111211	23:44	00:19	07-59.72S	080-29.91E	5384.0	498.3	501.0	504.3	8SM298	2011111300	DO,pH,Nuts,Pig	
8S	299	111311	02:40	03:01	07-59.78S	080-29.93E	5384.0	498.7	501.3	504.9	8SM299	2011111303	-	
8S	300	111311	05:47	06:37	07-59.86S	080-29.97E	5385.0	998.9	1000.8	1008.8	8SM300	2011111306	DO,Sal,pH,Nuts,Pig	
8S	301	111311	08:39	09:00	07-59.88S	080-29.97E	5383.0	497.6	501.3	505.7	8SM301	2011111309	-	
8S	302	111311	11:42	12:17	07-59.90S	080-29.99E	5385.0	497.6	500.5	504.2	8SM302	2011111312	DO,pH,Nuts,Pig	
8S	303	111311	14:48	15:08	08-00.02S	080-29.99E	5383.0	497.4	501.4	504.8	8SM303	2011111315	-	
8S	304	111311	17:42	18:17	08-00.05S	080-30.03E	5382.0	500.5	502.7	506.3	8SM304	2011111318	DO,pH,Nuts,Pig	
8S	305	111311	20:40	21:01	08-00.12S	080-30.03E	5383.0	499.0	503.0	505.4	8SM305	2011111321	-	
8S	306	111311	23:43	00:18	07-59.98S	080-29.84E	5384.0	497.8	501.6	504.2	8SM306	2011111400	DO,pH,Nuts,Pig	
8S	307	111411	02:43	03:04	07-59.96S	080-29.87E	5384.0	495.9	500.2	503.7	8SM307	2011111403	-	
8S	308	111411	05:42	06:32	07-59.98S	080-29.90E	5384.0	1000.1	1002.4	1010.3	8SM308	2011111406	DO,Sal,pH,Nuts,Pig	
8S	309	111411	08:42	09:02	08-00.04S	080-29.68E	5385.0	498.1	501.6	504.5	8SM309	2011111409	-	
8S	310	111411	11:43	12:18	08-00.08S	080-29.79E	5382.0	497.0	500.4	503.2	8SM310	2011111412	DO,pH,Nuts,Pig	
8S	311	111411	14:42	15:03	08-00.02S	080-29.70E	5384.0	496.5	500.5	504.4	8SM311	2011111415	-	
8S	312	111411	17:42	18:17	08-00.10S	080-29.84E	5382.0	497.0	500.2	504.3	8SM312	2011111418	DO,pH,Nuts,Pig	
8S	313	111411	20:43	21:05	08-00.25S	080-30.01E	5383.0	497.2	501.8	503.2	8SM313	2011111421	-	
8S	314	111411	23:43	00:18	08-00.03S	080-29.87E	5385.0	497.8	501.4	504.6	8SM314	2011111500	DO,pH,Nuts,Pig	
8S	315	111511	02:44	03:05	07-59.92S	080-29.88E	5384.0	497.6	500.8	504.6	8SM315	2011111503	-	
8S	316	111511	05:43	06:33	08-00.37S	080-29.93E	5383.0	998.7	1002.6	1010.7	8SM316	2011111506	DO,Sal,pH,Nuts,Pig	
8S	317	111511	08:43	09:04	08-00.26S	080-30.00E	5388.0	498.7	501.5	504.6	8SM317	2011111509	-	
8S	318	111511	11:45	12:20	07-59.99S	080-29.88E	5390.0	497.9	501.0	504.3	8SM318	2011111512	DO,pH,Nuts,Pig	
8S	319	111511	14:42	15:03	08-00.17S	080-29.92E	5381.0	497.4	501.2	504.0	8SM319	2011111515	-	
8S	320	111511	17:41	18:17	08-00.06S	080-30.02E	5383.0	499.2	501.8	505.7	8SM320	2011111518	DO,pH,Nuts,Pig	
8S	321	111511	20:43	21:03	08-00.11S	080-29.97E	5383.0	496.5	501.0	505.7	8SM321	2011111521	-	
8S	322	111511	23:43	00:18	08-00.16S	080-29.99E	5382.0	497.6	500.4	503.5	8SM322	2011111600	DO,pH,Nuts,Pig	
8S	323	111611	02:42	03:04	08-00.08S	080-29.81E	5385.0	496.6	500.7	504.1	8SM323	2011111603	-	
8S	324	111611	05:42	06:32	08-00.05S	080-29.84E	5384.0	999.6	1001.0	1009.0	8SM324	2011111606	DO,Sal,pH,Nuts,Pig	
8S	325	111611	08:42	09:03	08-00.24S	080-29.95E	5383.0	498.1	500.2	503.7	8SM325	2011111609	-	
8S	326	111611	11:43	12:19	07-59.93S	080-30.03E	5385.0	498.7	501.3	504.2	8SM326	2011111612	DO,pH,Nuts,Pig	
8S	327	111611	14:42	15:03	08-00.25S	080-29.98E	5383.0	497.4	500.5	503.7	8SM327	2011111615	-	
8S	328	111611	17:41	18:16	08-00.11S	080-29.92E	5383.0	499.4	501.5	505.0	8SM328	2011111618	DO,pH,Nuts,Pig	
8S	329	111611	20:42	21:03	08-00.19S	080-29.98E	5383.0	497.8	500.8	504.3	8SM329	2011111621	-	
8S	330	111611	23:43	00:17	08-00.27S	080-30.03E	5383.0	497.2	500.0	503.3	8SM330	2011111700	DO,pH,Nuts,Pig	
8S	331	111711	02:43	03:04	08-00.12S	080-30.17E	5388.0	497.0	500.1	502.7	8SM331	2011111703	-	
8S	332	111711	05:42	06:32	08-00.14S	080-29.96E	5382.0	1000.0	1001.4	1009.5	8SM332	2011111706	DO,Sal,pH,Nuts,Pig	
8S	333	111711	08:44	09:04	08-00.04S	080-30.02E	5383.0	496.5	500.4	503.3	8SM333	2011111709	-	
8S	334	111711	11:42	12:17	08-00.01S	080-30.04E	5386.0	498.3	500.6	504.0	8SM334	2011111712	DO,pH,Nuts,Pig	The fluorescence data at

Table 5.14-1 CTD Cast table

Stnnbr	Castno	Date(UTC) (mmddyy)	Time(UTC)		BottomPosition		Depth	Wire Out	Max Depth	Max Pressure	CTD Filename	COR Filename	Sampling	Remark
			Start	End	Latitude	Longitude								
8S	355	112011	02:44	03:06	08-00.18S	080-30.57E	5384.0	497.0	501.0	504.4	8SM355	2011112003	-	
8S	356	112011	05:42	06:33	07-59.99S	080-30.27E	5384.0	1000.1	1000.8	1009.1	8SM356	2011112006	DO,Sal,pH,Nuts,Pig	
8S	357	112011	08:42	09:03	08-00.22S	080-30.02E	5385.0	497.6	500.6	505.1	8SM357	2011112009	-	
8S	358	112011	11:42	12:17	07-59.98S	080-30.07E	5384.0	497.9	500.8	504.1	8SM358	2011112012	DO,pH,Nuts,Pig	
8S	359	112011	14:47	15:08	08-00.15S	080-30.04E	5384.0	496.8	501.7	504.5	8SM359	2011112015	-	
8S	360	112011	17:43	18:19	08-00.13S	080-30.04E	5382.0	497.9	501.2	504.3	8SM360	2011112018	DO,pH,Nuts,Pig	
8S	361	112011	20:41	21:03	07-59.97S	080-30.00E	5384.0	495.0	499.9	503.5	8SM361	2011112021	-	
8S	362	112011	23:43	00:18	08-00.04S	080-29.92E	5384.0	497.2	500.2	503.5	8SM362	2011112100	DO,pH,Nuts,Pig	
8S	363	112111	02:42	03:04	08-00.07S	080-29.87E	5383.0	498.5	501.0	504.0	8SM363	2011112103	-	
8S	364	112111	05:42	06:32	07-59.91S	080-30.04E	5385.0	998.9	1001.4	1009.4	8SM364	2011112106	DO,Sal,pH,Nuts,Pig	
8S	365	112111	08:42	09:03	08-00.03S	080-29.85E	5385.0	499.4	500.5	505.8	8SM365	2011112109	-	
8S	366	112111	11:41	12:17	08-00.16S	080-29.84E	5383.0	497.2	501.8	505.4	8SM366	2011112112	DO,pH,Nuts,Pig	
8S	367	112111	14:45	15:06	08-00.19S	080-29.55E	5382.0	499.2	502.2	505.7	8SM367	2011112115	-	
8S	368	112111	17:44	18:16	08-00.07S	080-29.81E	5385.0	498.7	501.4	504.8	8SM368	2011112118	DO,pH,Nuts,Pig	
8S	369	112111	20:43	21:05	08-00.07S	080-30.13E	5384.0	497.9	502.1	505.4	8SM369	2011112121	-	
8S	370	112111	23:42	00:15	08-00.02S	080-29.93E	5384.0	498.5	501.7	505.1	8SM370	2011112200	DO,pH,Nuts,Pig	
8S	371	112211	02:43	03:04	08-00.09S	080-29.86E	5384.0	500.0	501.6	504.8	8SM371	2011112203	-	
8S	372	112211	05:43	06:31	08-00.01S	080-30.00E	5385.0	999.2	1000.1	1007.2	8SM372	2011112206	DO,Sal,pH,Nuts,Pig	
8S	373	112211	08:42	09:03	08-00.22S	080-29.85E	5384.0	499.0	502.3	506.6	8SM373	2011112209	-	
8S	374	112211	11:42	12:16	08-00.07S	080-29.81E	5383.0	498.3	501.8	505.2	8SM374	2011112212	DO,pH,Nuts,Pig	
8S	375	112211	14:42	15:03	08-00.05S	080-29.62E	5383.0	498.5	501.8	505.3	8SM375	2011112215	-	
8S	376	112211	17:42	18:16	08-00.20S	080-30.02E	5384.0	499.4	501.6	505.1	8SM376	2011112218	DO,pH,Nuts,Pig	
8S	377	112211	20:44	21:06	08-00.07S	080-29.90E	5383.0	498.1	500.9	504.1	8SM377	2011112221	-	
8S	378	112211	23:45	00:19	08-00.09S	080-30.08E	5383.0	497.9	503.0	506.5	8SM378	2011112300	DO,pH,Nuts,Pig	
8S	379	112311	02:42	03:03	08-00.24S	080-30.14E	5381.0	498.9	501.3	505.0	8SM379	2011112303	-	
8S	380	112311	05:42	06:32	08-00.08S	080-29.94E	5384.0	999.8	1001.2	1009.2	8SM380	2011112306	DO,Sal,pH,Nuts,Pig	
8S	381	112311	08:42	09:04	08-00.19S	080-29.86E	5383.0	498.7	500.4	504.1	8SM381	2011112309	-	
8S	382	112311	11:41	12:16	08-00.15S	080-29.90E	5383.0	499.4	501.2	504.8	8SM382	2011112312	DO,pH,Nuts,Pig	
8S	383	112311	14:42	15:03	08-00.04S	080-29.97E	5383.0	499.0	501.5	504.6	8SM383	2011112315	-	
8S	384	112311	17:43	18:17	08-00.24S	080-29.80E	5384.0	499.2	502.3	505.9	8SM384	2011112318	DO,pH,Nuts,Pig	
8S	385	112311	20:43	21:05	08-00.09S	080-29.97E	5384.0	498.5	501.7	504.5	8SM385	2011112321	-	
8S	386	112311	23:43	00:16	08-00.16S	080-30.04E	5383.0	498.5	501.1	504.5	8SM386	2011112400	DO,pH,Nuts,Pig	
8S	387	112411	02:56	03:17	08-00.24S	080-29.56E	5381.0	497.4	500.4	503.9	8SM387	2011112403	-	
8S	388	112411	05:44	06:33	08-00.18S	080-29.91E	5383.0	998.5	1000.2	1008.3	8SM388	2011112406	DO,Sal,pH,Nuts,Pig	
8S	389	112411	08:42	09:04	08-00.07S	080-29.90E	5382.0	497.4	501.0	505.3	8SM389	2011112409	-	
8S	390	112411	11:43	12:18	07-59.97S	080-30.09E	5382.0	499.4	502.2	505.6	8SM390	2011112412	DO,pH,Nuts,Pig	
8S	391	112411	14:44	15:05	08-00.02S	080-29.81E	5383.0	497.0	501.9	504.5	8SM391	2011112415	-	
8S	392	112411	17:46	18:20	08-00.20S	080-29.68E	5383.0	498.7	502.2	505.7	8SM392	2011112418	DO,pH,Nuts,Pig	
8S	393	112411	20:45	21:07	08-00.23S	080-29.93E	5386.0	497.8	502.2	505.6	8SM393	2011112421	-	
8S	394	112411	23:48	00:22	08-00.21S	080-29.97E	5383.0	498.5	501.6	505.5	8SM394	2011112500	DO,pH,Nuts,Pig	
8S	395	112511	02:44	03:06	08-00.16S	080-29.76E	5385.0	499.2	502.3	506.0	8SM395	2011112503	-	
8S	396	112511	05:44	06:37	08-00.15S	080-29.84E	5383.0	999.0	1001.7	1009.5	8SM396	2011112506	DO,Sal,pH,Nuts,Pig	
8S	397	112511	08:44	09:06	08-00.10S	080-29.92E	5384.0	499.4	501.7	506.3	8SM397	2011112509	-	
8S	398	112511	11:41	12:16	07-59.95S	080-30.00E	5383.0	497.9	501.1	504.7	8SM398	2011112512	DO,pH,Nuts,Pig	
8S	399	112511	14:41	15:04	07-59.88S	080-30.03E	5385.0	499.0	501.3	505.5	8SM399	2011112515	-	
8S	400	112511	17:44	18:23	07-59.92S	080-29.78E	5384.0	499.6	503.1	506.2	8SM400	2011112518	DO,pH,Nuts,Pig	
8S	401	112511	20:36	20:58	08-00.15S	080-30.01E	5385.0	497.8	501.3	505.3	8SM401	2011112521	-	
8S	402	112511	23:44	00:18	08-00.00S	080-30.11E	5384.0	499.0	501.9	505.3	8SM402	2011112600	DO,pH,Nuts,Pig	
8S	403	112611	02:41	03:03	08-00.16S	080-29.90E	5383.0	498.3	501.2	504.9	8SM403	2011112603	-	
8S	404	112611	05:43	06:35	08-00.16S	080-29.96E	5383.0	997.6	1000.3	1008.3	8SM404	2011112606	DO,Sal,pH,Nuts,Pig	
8S	405	112611	08:42	09:05	08-00.18S	080-30.25E	5386.0	498.3	500.2	506.1	8SM405	2011112609	-	
8S	406	112611	11:41	12:15	08-00.18S	080-29.81E	5384.0	498.5	501.2	504.6	8SM406	2011112612	DO,pH,Nuts,Pig	
8S	407	112611	14:41	15:03	08-00.03S	080-29.86E	5383.0	497.4	501.5	504.7	8SM407	2011112615	-	
8S	408	112611	17:43	18:19	07-59.97S	080-30.03E	5383.0	498.5	502.6	506.0	8SM408	2011112618	DO,pH,Nuts,Pig	
8S	409	112611	20:43	21:05	08-00.13S	080-30.04E	5384.0	496.5	502.0	504.7	8SM409	2011112621	-	
8S	410	112611	23:44	00:18	08-00.05S	080-29.88E	5383.0	498.9	500.9	505.5	8SM410	2011112700	DO,pH,Nuts,Pig	
8S	411	112711	02:42	03:04	08-00.15S	080-30.01E	5384.0	498.3	500.7	505.0	8SM411	2011112703	-	
8S	412	112711	05:42	06:35	08-00.18S	080-30.01E	5383.0	999.2	1001.3	1009.2	8SM412	2011112706	DO,Sal,pH,Nuts,Pig	
8S	413	112711	08:42	09:04	08-00.22S	080-29.88E	5384.0	495.7	500.8	503.6	8SM413	2011112709	-	
8S	414	112711	11:43	12:18	08-00.14S	080-29.85E	5385.0	498.5	502.2	505.6	8SM414	2011112712	DO,pH,Nuts,Pig	
8S	415	112711	14:41	15:02	08-00.03S	080-29.68E	5384.0	496.6	500.9	504.7	8SM415	2011112715	-	
8S	416	112711	17:43	18:19	08-00.06S	080-30.08E	5384.0	500.1	502.6	506.0	8SM416	2011112718	DO,pH,Nuts,Pig	
8S	417	112711	20:44	21:06	07-59.97S	080-29.84E	5386.0	497.8	501.3	505.1	8SM417	2011112721	-	
8S	418	112711	23:41	00:15	08-00.14S	080-29.81E	5383.0	498.5	502.2	505.6	8SM418	2011112800	DO,pH,Nuts,Pig	
8S	419	112811	02:42	03:04	08-00.23S	080-29.80E	5383.0	498.7	502.7	506.1	8SM419	2011112803	-	
8S	420	112811	05:41	06:34	07-59.92S	080-29.80E	5384.0	1003.3	1000.7	1009.3	8SM420	2011112806	DO,Sal,pH,Nuts,Pig	
5S	2	112911	06:06	06:44	05-07.70S	078-06.28E	4973.0	997.6	1000.5	1008.4	5SM002	2011112906	DO,Sal,pH,Nuts,Pig	End of Leg 2 The header information was changed from '8S' to '5S'.