

MIRAI MR03-K03 Leg2 Expendable Conductivity-Temperature-Depth Profiler (XCTD)

Last Modified: 2019-08-29

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Cruise ID: [MR03-K03 Leg2](#)

Expendable Conductivity-Temperature-Depth Profiler (XCTD): Processed (DMO)-QCed

Data Policy: [JAMSTEC](#)

Observation Items: Depth, Temperature, Salinity

Science Keywords:

OCEANS > OCEAN TEMPERATURE > WATER TEMPERATURE
OCEANS > SALINITY/DENSITY > SALINITY

Cruise Report

http://www.godac.jamstec.go.jp/catalog/data/doc_catalog/media/MR03-K03_leg1-2_all.pdf

For Using Data

Principal Investigator

Data Management Office

JAMSTEC / BPPT joint cruise in the Indonesian waters.

Use Constraints

See [Terms and Conditions](#) about constrain of use.

Data Citation

See [Terms and Conditions](#) about data citation.

Instrument

Instrument:

Expendable conductivity temperature
depth measurements (XCTD) (-
MR11-E02)



Overview

Using XCTD (eXpendable Conductivity Temperature Depth profiler) system, the vertical distribution of water temperature and salinity are observed during free fall of its probe part in the seawater. Observed temperature and conductivity are transmitted to the data processor on board by the digital signal. The digital signal is converted to the temperature, conductivity and depth by data processor as binary data. Binary data is transmitted from data processor to PC. The PC calculates salinity from temperature, conductivity and depth, and those properties are recorded in PC as the ASCII files.

System

(1) Launcher

Hand launcher

Manufacturer : Sippican, Inc.

Operation area : Rear upper deck

Automatic launcher

Manufacturer : Tsurumi Seiki Co., LTD.

Location : Port side of rear upper deck (4m from the sea level). The control panel is installed in the investigation room.

(2) Converter

Manufacturer : Tsurumi Seiki Co., LTD.

Location : Investigation room

Sampling rate : 40 msec

(3) XCTD probe specifications

Probe Type	TSK XCTD-1	TSK XCTD-2	TSK XCTD-3	TSK XCTD-4
Temperature range [deg-C]	-2 to 35			
Temperature accuracy [deg-C]	+/- 0.02			
Temperature resolution [deg-C]	0.01			
Conductivity range [mS/cm]	0 to 60			
Conductivity accuracy [mS/cm]	+/- 0.03			
Conductivity resolution [mS/cm]	0.015			
Measurement depth [m]	1000	1850	1000	1850
Depth accuracy [m]	5 or +/- 2% of depth; whichever is larger			
Maximum elapsed time [sec]	300	600	200	502
Rated ship speed [knot]	12	3.5	20	6

Since XCTD carries no pressure sensor, we need to estimate depth from the elapsed time. The fall-rate equation is as follows.

$$Z = at + 10E^{-3} + bt^2$$

Where Z(m) is the depth and t(sec) is the elapsed time.

In addition, coefficients of the fall-rate equation are different by probe types.

Probe Type	TSK XCTD-1	TSK XCTD-2	TSK XCTD-3	TSK XCTD-4
Coefficient-a	3.42543	3.43898	5.07598	3.68081
Coefficient-b	-0.47	-0.31	-0.72	-0.47

* Coefficients listed above are supplied by Sippican, Inc., in USA.

The list of an XCTD type used in each cast is as follows.

Cast name	Probe Serial No.	Probe Type	Launcher	Converter
200307081714	03042846	XCTD-1	Auto	MK-100
200307081956	03042675	XCTD-1	Auto	MK-100
200307082248	03042674	XCTD-1	Auto	MK-100
200307090137	03042678	XCTD-1	Auto	MK-100
200307090426	03042679	XCTD-1	Auto	MK-100
200307090721	03042677	XCTD-1	Auto	MK-100
200307091010	03042676	XCTD-1	Auto	MK-100
200307091219	03042731	XCTD-1	Auto	MK-100
200307091454	03042845	XCTD-1	Auto	MK-100
200307091728	03042847	XCTD-1	Auto	MK-100
200307100144	03042848	XCTD-1	Auto	MK-100
200307100738	03042842	XCTD-1	Auto	MK-100
200307101339	03042844	XCTD-1	Auto	MK-100
200307101950	03042840	XCTD-1	Auto	MK-100
200307110211	03042836	XCTD-1	Auto	MK-100
200307110408	03042837	XCTD-1	Auto	MK-100
200307111000	03042838	XCTD-1	Auto	MK-100
200307111211	03042820	XCTD-1	Auto	MK-100
200307120026	03063951	XCTD-1	Hand	MK-100
200307120041	03063955	XCTD-1	Hand	MK-100
200307120102	03063958	XCTD-1	Hand	MK-100
200307131342	03042821	XCTD-1	Auto	MK-100
200307131942	03042839	XCTD-1	Auto	MK-100
200307140144	03042818	XCTD-1	Auto	MK-100
200307140525	03042815	XCTD-1	Auto	MK-100
200307140744	03042822	XCTD-1	Auto	MK-100
200307141343	03042816	XCTD-1	Auto	MK-100
200307141950	03042819	XCTD-1	Auto	MK-100
200307150157	03042813	XCTD-1	Auto	MK-100
200307150817	03063457	XCTD-1	Auto	MK-100
200307170032	03063961	XCTD-1	Hand	MK-100
200307170037	03063458	XCTD-1	Hand	MK-100
200307170328	03063462	XCTD-1	Auto	MK-100
200307170551	03063465	XCTD-1	Auto	MK-100
200307170811	03063463	XCTD-1	Auto	MK-100
200307171032	03063460	XCTD-1	Auto	MK-100
200307171246	03063454	XCTD-1	Auto	MK-100
200307171456	03063452	XCTD-1	Auto	MK-100
200307171705	03063459	XCTD-1	Auto	MK-100
200307171919	03063466	XCTD-1	Auto	MK-100
200307172126	03063467	XCTD-1	Auto	MK-100
200307172340	03063464	XCTD-1	Auto	MK-100
200307180150	03063451	XCTD-1	Auto	MK-100
200307180404	03063448	XCTD-1	Auto	MK-100
200307180626	03063446	XCTD-1	Auto	MK-100
200307180848	03063450	XCTD-1	Auto	MK-100
200307181106	03063455	XCTD-1	Auto	MK-100
200307181327	03063470	XCTD-1	Auto	MK-100
200307181540	03063473	XCTD-1	Auto	MK-100
200307181752	03063445	XCTD-1	Auto	MK-100
200307182003	03063447	XCTD-1	Auto	MK-100
200307182215	03063453	XCTD-1	Auto	MK-100
200307190026	03063449	XCTD-1	Auto	MK-100
200307190244	03063444	XCTD-1	Auto	MK-100
200307190503	03063472	XCTD-1	Auto	MK-100
200307190722	03063474	XCTD-1	Auto	MK-100
200307190938	03063477	XCTD-1	Auto	MK-100
200307191146	03063468	XCTD-1	Auto	MK-100
200307191349	03063479	XCTD-1	Auto	MK-100
200307191550	03063475	XCTD-1	Auto	MK-100
200307191746	03063476	XCTD-1	Auto	MK-100
200307191942	03063478	XCTD-1	Auto	MK-100
200307192139	03063471	XCTD-1	Auto	MK-100
200307192336	03063956	XCTD-1	Auto	MK-100
200307200135	03063469	XCTD-1	Auto	MK-100

Cast name	Probe Serial No.	Probe Type	Launcher	Converter
200307200338	03063960	XCTD-1	Auto	MK-100
200307200510	03063962	XCTD-1	Hand	MK-100
200307200519	03063963	XCTD-1	Hand	MK-100
200307200529	03063953	XCTD-1	Hand	MK-100
200307200557	03063957	XCTD-1	Auto	MK-100
200307200816	03063461	XCTD-1	Auto	MK-100
200307201036	03063456	XCTD-1	Auto	MK-100
200307201250	03063959	XCTD-1	Auto	MK-100

Data processing

(1) For sensor's stability, values of less than 1 m for temperature and less than 3 m for salinity are replaced by missing values, respectively, based on manufacturer's recommendation.

(2) Quality control

QCed data were added flag according to the NODC (National Oceanographic Data Center) quality control procedure.

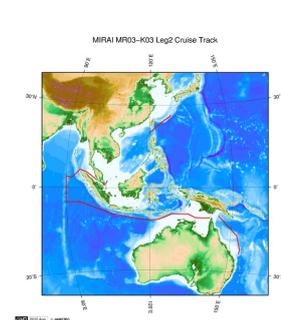
- 1) The gradient check of adjacent depth data
- 2) The density inversion check
- 3) The broad range check set up at given ocean space and depth

Please see the site of NODC of the following link for quality control procedure in detail.

[QUALITY CONTROL AND PROCESSING OF HISTORICAL OCEANOGRAPHIC TEMPERATURE, SALINITY, AND OXYGEN DATA](#)

In addition, an abnormal value is identified by a visual check, and the data after visual QC is released.

Related Information



MR03-K03 Leg2

Ship Name: MIRAI

Period: 2003-07-01 - 2003-07-30

Chief Scientist: Shinya Minato (JAMSTEC)

Project Name: [Tropical Ocean Climate Study (TOCS)]

[Enlarge Image](#)

Update History

2019-08-29	An observation data was registered.
2017-06-14	An observation data was registered.
2016-04-07	An observation data was registered.
2014-07-23	An observation data was registered.
2014-02-18	An observation data was registered.
2012-12-25	An observation data was registered.

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MIRAI MR03-K03 Leg2 Expendable Conductivity-Temperature-Depth Profiler (XCTD)

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Cruise ID: [MR03-K03 Leg2](#)

Expendable Conductivity-Temperature-Depth Profiler (XCTD): Processed (DMO)-QCed

Data Policy: [JAMSTEC](#)

XCTD DMO

Format Description for the Corrected Data

Provided in the Exchange Format of CCHDO (CLIVAR and Carbon Hydrographic Data Office). Please see the following link for details of Exchange Format.

[CCHDO | CLIVAR & Carbon Hydrographic Data Office](#)

Data in following cruise is not expressed with Exchange Format. Please see the site of each cruise for format.

MR02-K05 Leg1

MR04-05

Format Description for the QCed Data

Each data file contains one line header (meta data) followed by data lines for each cast.

The number of data lines are recorded in the header.

Header part

No.	Column	Content	Format	Remarks
1	1	Header ID	a1	fixed as '#'
2	3 - 6	Data ID	a4	XCTD
3	8 - 22	Cruise ID	a15	
4	33 - 40	Date	i8	YYYYMMDD (UTC)
5	42 - 45	Time	i4	hhmm (UTC)
6	47 - 55	Latitude	i2,a1,f5.2,a1	dd-mm.mmN(S)
7	57 - 66	Longitude	i3,a1,f5.2,a1	ddd-mm.mmE(W)
8	68 - 71	Number of data lines	i4	
9	72 - 73	Terminator	-	CR+LF

Data part

No.	Column	Content	Unit	Format	Remarks
1	1 - 11	Depth	m	f11.1	
2	12 - 22	Temperature	deg-C	f11.2	ITS-90
3	23 - 33	Salinity	PSU	f11.3	PSS-78
4	45 - 55	Flag	-	i11	1 - 7 : space 8 : flag of depth 9 : flag of temperature 10 : flag of salinity 11 : space * reference : 'Definition of Quality Control Flags'
5	56 - 57	Terminator	-	-	CR+LF

Each contents of the data part is stored in 11 bytes.

Missing value is presented by '-5', and error value is presented by '-9'.

Definition of Quality Control Flags

1. Depth Flags

- 0 - accepted value
- 1 - error in recorded depth (same or less than previous depth)
- 2 - density inversion

2. Observed Level Flags

- N - missing value
- 0 - accepted value
- 1 - range outlier (outside of broad range check)
- 2 - failed inversion check
- 3 - failed gradient check
- 4 - zero anomaly
- 5 - failed combined gradient and inversion checks
- 6 - failed range and inversion checks
- 7 - failed range and gradient checks
- 8 - failed range and zero anomaly checks
- 9 - failed range and combined gradient and inversion checks
- A - failed visual check

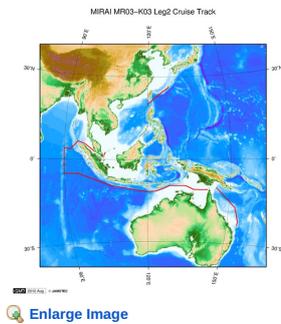
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[QUALITY CONTROL AND PROCESSING OF HISTORICAL OCEANOGRAPHIC TEMPERATURE, SALINITY, AND OXYGEN DATA](#)

Sample Program

[ex_read2.f](#)

Related Information



MR03-K03 Leg2

Ship Name: MIRAI

Period: 2003-07-01 - 2003-07-30

Chief Scientist: Shinya Minato (JAMSTEC)

Project Name: [Tropical Ocean Climate Study (TOCS)]

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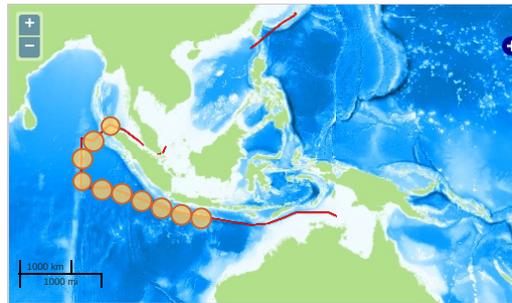
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 Expendable Conductivity-Temperature-Depth Profiler (XCTD): Processed (DMO)-QCed
 Data Policy: [JAMSTEC](#)
 Observation Items: Depth, Temperature, Salinity
 Science Keywords:
 OCEANS > OCEAN > WATER
 TEMPERATURE
 OCEANS > SALINITY/DENSITY > SALINITY

Observation Map

1. Clicking the icon displays a balloon with observation information.
2. Then click the observation name, figures will be displayed.



— ... Observation Line — ... Navigation ● ... Observation, Dive Point, Hole

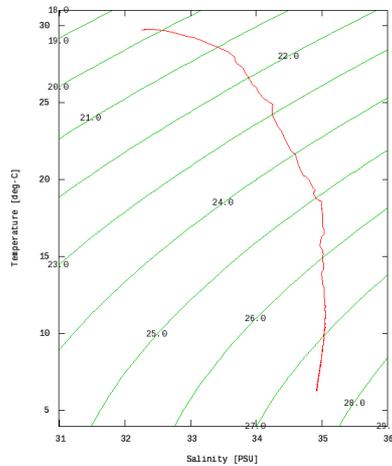
Imagery reproduced from ...

Figures

200307081714



MR03-K03 Leg2: 200307081714
 Expendable Conductivity-Temperature-Depth Profiler (XCTD): Salinity



Only values evaluated as "good" : all flags are 0" are plotted in profiles.
 Please see Forast Page for the definition of quality flags.

Data List

[Add to Basket](#)

- File names**
- 200307081714.dat
 - 200307081956.dat
 - 200307082248.dat
 - 200307090137.dat
 - 200307090426.dat
 - 200307090721.dat
 - 200307091010.dat
 - 200307091219.dat
 - 200307091454.dat
 - 200307091728.dat
 - 200307100144.dat
 - 200307100738.dat
 - 200307101339.dat
 - 200307101950.dat

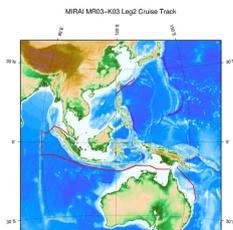
<input type="checkbox"/>	File names
<input type="checkbox"/>	200307110408.dat
<input type="checkbox"/>	200307111000.dat
<input type="checkbox"/>	200307111211.dat
<input type="checkbox"/>	200307120026.dat
<input type="checkbox"/>	200307120041.dat
<input type="checkbox"/>	200307120102.dat
<input type="checkbox"/>	200307131342.dat
<input type="checkbox"/>	200307131942.dat
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<input type="checkbox"/>	200307140525.dat
<input type="checkbox"/>	200307140744.dat
<input type="checkbox"/>	200307141343.dat
<input type="checkbox"/>	200307141950.dat
<input type="checkbox"/>	200307150157.dat
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<input type="checkbox"/>	200307170032.dat
<input type="checkbox"/>	200307170037.dat
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<input type="checkbox"/>	200307181752.dat
<input type="checkbox"/>	200307182003.dat
<input type="checkbox"/>	200307182215.dat
<input type="checkbox"/>	200307190026.dat
<input type="checkbox"/>	200307190244.dat
<input type="checkbox"/>	200307190503.dat
<input type="checkbox"/>	200307190722.dat
<input type="checkbox"/>	200307190938.dat
<input type="checkbox"/>	200307191146.dat
<input type="checkbox"/>	200307191349.dat
<input type="checkbox"/>	200307191550.dat
<input type="checkbox"/>	200307191746.dat
<input type="checkbox"/>	200307191942.dat
<input type="checkbox"/>	200307192139.dat
<input type="checkbox"/>	200307192336.dat
<input type="checkbox"/>	200307200135.dat
<input type="checkbox"/>	200307200338.dat
<input type="checkbox"/>	200307200510.dat
<input type="checkbox"/>	200307200519.dat
<input type="checkbox"/>	200307200529.dat
<input type="checkbox"/>	200307200557.dat
<input type="checkbox"/>	200307200816.dat
<input type="checkbox"/>	200307201036.dat
<input type="checkbox"/>	200307201250.dat
<input type="checkbox"/>	ex_read2.f (Sample Program)

- Observation List
The list of observation is shown as follows.

Observation	Time and Date	Lat. [°]	Lon. [°]
200307081714	2003-07-08 17:09	6.3339	95.0003
200307081956	2003-07-08 19:51	5.8833	94.4998
200307082248	2003-07-08 22:43	5.3536	93.9998
200307090137	2003-07-09 01:33	4.8750	93.5000
200307090426	2003-07-09 04:21	4.4066	92.9991
200307090721	2003-07-09 07:16	3.9293	92.4998
200307091010	2003-07-09 10:05	3.6160	91.9996
200307091219	2003-07-09 12:14	3.7085	91.4995
200307091454	2003-07-09 14:49	3.8015	90.9998
200307091728	2003-07-09 17:23	3.9066	90.5001
200307100144	2003-07-10 01:39	3.5000	90.0043
200307100738	2003-07-10 07:33	2.5000	90.0150
200307101339	2003-07-10 13:34	1.5000	90.0003
200307101950	2003-07-10 19:45	0.5001	90.0326
200307110211	2003-07-11 02:06	-0.0020	90.0383
200307110408	2003-07-11 04:03	-0.0065	90.0101
200307111000	2003-07-11 09:55	-0.5005	90.0340
200307111211	2003-07-11 12:06	-1.0001	89.9906
200307120026	2003-07-12 00:22	-1.7323	90.0351

Observation ID	Time and Date	Lat (°N)	Long (°E)
200307120102	2003-07-12 01:00	-1.7185	90.0275
200307131342	2003-07-13 13:37	-2.5001	90.0108
200307131942	2003-07-13 19:37	-3.5001	89.9950
200307140144	2003-07-14 01:39	-4.5000	89.9988
200307140525	2003-07-14 05:20	-4.9943	89.9935
200307140744	2003-07-14 07:39	-4.9980	90.5001
200307141343	2003-07-14 13:37	-5.0051	91.5000
200307141950	2003-07-14 19:45	-4.9958	92.5005
200307150157	2003-07-15 01:52	-4.9935	93.5000
200307150817	2003-07-15 08:12	-5.0173	94.5155
200307170032	2003-07-17 00:31	-4.9353	94.9016
200307170037	2003-07-17 00:35	-4.9351	94.9018
200307170328	2003-07-17 03:23	-4.9955	95.0254
200307170551	2003-07-17 05:46	-5.1986	95.5000
200307170811	2003-07-17 08:06	-5.3801	96.0001
200307171032	2003-07-17 10:27	-5.5366	96.5000
200307171246	2003-07-17 12:41	-5.7070	97.0001
200307171456	2003-07-17 14:51	-5.8871	97.4998
200307171705	2003-07-17 17:00	-6.0756	98.0001
200307171919	2003-07-17 19:14	-6.2591	98.5001
200307172126	2003-07-17 21:21	-6.4473	99.0000
200307172340	2003-07-17 23:35	-6.6406	99.5000
200307180150	2003-07-18 01:45	-6.8235	100.0000
200307180404	2003-07-18 03:59	-7.0126	100.5001
200307180626	2003-07-18 06:21	-7.2076	101.0000
200307180848	2003-07-18 08:43	-7.3946	101.5000
200307181106	2003-07-18 11:01	-7.5675	102.0001
200307181327	2003-07-18 13:22	-7.7505	102.5000
200307181540	2003-07-18 15:35	-7.9343	103.0000
200307181752	2003-07-18 17:47	-8.1178	103.5000
200307182003	2003-07-18 19:58	-8.2980	104.0000
200307182215	2003-07-18 22:10	-8.4804	104.5003
200307190026	2003-07-19 00:21	-8.6581	105.0000
200307190244	2003-07-19 02:39	-8.8366	105.5000
200307190503	2003-07-19 04:58	-9.0101	106.0000
200307190722	2003-07-19 07:17	-9.1848	106.4998
200307190938	2003-07-19 09:33	-9.3661	107.0000
200307191146	2003-07-19 11:41	-9.4545	107.5003
200307191349	2003-07-19 13:44	-9.5440	108.0001
200307191550	2003-07-19 15:45	-9.6365	108.5001
200307191746	2003-07-19 17:41	-9.7280	109.0000
200307191942	2003-07-19 19:37	-9.8135	109.5000
200307192139	2003-07-19 21:34	-9.9205	110.0001
200307192336	2003-07-19 23:31	-10.0050	110.5001
200307200135	2003-07-20 01:30	-10.0891	111.0000
200307200338	2003-07-20 03:33	-10.1813	111.5000
200307200510	2003-07-20 05:04	-10.2495	111.8650
200307200519	2003-07-20 05:13	-10.2553	111.8915
200307200529	2003-07-20 05:23	-10.2613	111.9205
200307200557	2003-07-20 05:52	-10.2736	112.0028
200307200816	2003-07-20 08:11	-10.3539	112.5001
200307201036	2003-07-20 10:31	-10.4513	113.0000
200307201250	2003-07-20 12:45	-10.5313	113.5000

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Ship Name: MIRAI
 Period: 2003-07-01 - 2003-07-30
 Chief Scientist: Shinya Minato (JAMSTEC)
 Project Name: [Tropical Ocean Climate Study (TOCS)]

Update History

2019-08-29 An observation data was registered.
 2017-06-14 An observation data was registered.
 2016-04-07 An observation data was registered.
 2014-07-23 An observation data was registered.
 2014-02-18 An observation data was registered.
 2012-12-25 An observation data was registered.

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