

MIRAI MR04-03 Leg2 Expendable Conductivity-Temperature-Depth Profiler (XCTD)

Last Modified: 2019-08-29

[ReadMe](#) [Observation Data](#) [Data Format](#)

Cruise ID: [MR04-03 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/MR04-03_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			
Measurment 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
200407130751	03084505	XCTD-1	Auto	MK-100
200407130946	03084508	XCTD-1	Auto	MK-100
200407131208	03084542	XCTD-1	Auto	MK-100
200407131426	03084537	XCTD-1	Auto	MK-100
200407131645	03084536	XCTD-1	Auto	MK-100
200407131910	03084540	XCTD-1	Auto	MK-100
200407132130	03084541	XCTD-1	Auto	MK-100
200407132356	03084538	XCTD-1	Auto	MK-100
200407140220	03084539	XCTD-1	Auto	MK-100
200407140447	03105210	XCTD-1	Auto	MK-100
200407140716	03084545	XCTD-1	Auto	MK-100
200407140940	03105209	XCTD-1	Auto	MK-100
200407141205	03084544	XCTD-1	Auto	MK-100
200407141437	03105208	XCTD-1	Auto	MK-100
200407141659	03084543	XCTD-1	Auto	MK-100
200407141926	03105212	XCTD-1	Auto	MK-100
200407142157	03105211	XCTD-1	Auto	MK-100
200407150022	03105207	XCTD-1	Auto	MK-100
200407150249	03105204	XCTD-1	Auto	MK-100
200407150512	03105206	XCTD-1	Auto	MK-100
200407150753	03105205	XCTD-1	Auto	MK-100
200407151023	03105203	XCTD-1	Auto	MK-100
200407151254	03105217	XCTD-1	Auto	MK-100
200407151522	03105213	XCTD-1	Auto	MK-100
200407151805	03105202	XCTD-1	Auto	MK-100
200407152027	03105214	XCTD-1	Auto	MK-100
200407152257	03105215	XCTD-1	Auto	MK-100
200407160122	03105201	XCTD-1	Auto	MK-100
200407160346	03105219	XCTD-1	Auto	MK-100
200407160611	03105216	XCTD-1	Auto	MK-100
200407160836	03115222	XCTD-1	Auto	MK-100
200407161037	03115223	XCTD-1	Auto	MK-100
200407161236	03115226	XCTD-1	Auto	MK-100
200407161436	03115227	XCTD-1	Auto	MK-100
200407161636	03115228	XCTD-1	Auto	MK-100
200407161837	03115230	XCTD-1	Auto	MK-100
200407162037	03115229	XCTD-1	Auto	MK-100
200407162237	03115225	XCTD-1	Auto	MK-100
200407170042	03115224	XCTD-1	Auto	MK-100
200407170248	03115232	XCTD-1	Auto	MK-100
200407170453	03115231	XCTD-1	Auto	MK-100
200407170701	03115234	XCTD-1	Auto	MK-100
200407170911	03115235	XCTD-1	Auto	MK-100
200407171123	04037290	XCTD-1	Auto	MK-100
200407171332	03115233	XCTD-1	Auto	MK-100
200407171545	03115236	XCTD-1	Auto	MK-100
200407171753	04037291	XCTD-1	Auto	MK-100
200407171959	03115238	XCTD-1	Auto	MK-100
200407172203	03105220	XCTD-1	Auto	MK-100
200407180008	04037292	XCTD-1	Auto	MK-100
200407180214	03115237	XCTD-1	Auto	MK-100
200407180425	04037293	XCTD-1	Auto	MK-100
200407180632	04037298	XCTD-1	Auto	MK-100
200407180835	04037294	XCTD-1	Auto	MK-100
200407181037	04037295	XCTD-1	Auto	MK-100
200407181242	04037300	XCTD-1	Auto	MK-100
200407181454	04037297	XCTD-1	Auto	MK-100
200407181703	04037301	XCTD-1	Auto	MK-100
200407181905	04037299	XCTD-1	Auto	MK-100
200407181913	04037302	XCTD-1	Auto	MK-100
200407182110	04037296	XCTD-1	Auto	MK-100
200407182315	04037303	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.

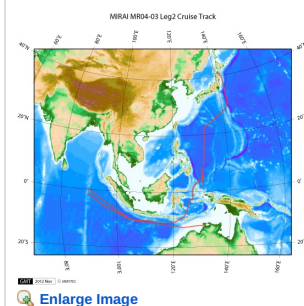
- 1) The gradient check of adjacent depth data
- 2) The density inversion check
- 3) The broad range check set up at given ocean space and depth

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



[Enlarge Image](#)

MR04-03 Leg2

Ship Name: MIRAI

Period: 2004-07-03 - 2004-08-03

Chief Scientist: Hideaki Hase (JAMSTEC)

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

Update History

2019-08-29	An observation data was registerd.
2017-06-14	An observation data was registerd.
2016-04-07	An observation data was registerd.
2014-07-24	An observation data was registerd.
2014-02-18	An observation data was registerd.
2012-11-25	An observation data was registerd.

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Information of the Submersibles

KAIKO
SHINKAI 2000
SHINKAI 6500
DEEP TOW
HYPER-DOLPHIN
URASHIMA
YOKOSUKA DEEP TOW
6K Camera DEEP TOW
6K Sonar DEEP TOW
KM-ROV
POWER GRAB SAMPLER (SHELL)
POWER GRAB SAMPLER (CLOW)
BMS

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Dive ID:

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MIRAI MR04-03 Leg2 Expendable Conductivity-Temperature-Depth Profiler (XCTD)

Last Modified: 2019-08-29

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Cruise ID: [MR04-03 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

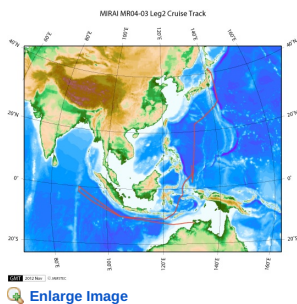
QCed data were added flag according to the NODC (National Oceanographic Data Center) quality control procedure, additionally visually checked. Please see the site of NODC of the following link for quality control procedure.

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

Sample Program

[ex_read2.f](#)

Related Information



MR04-03 Leg2

Ship Name: MIRAI

Period: 2004-07-03 - 2004-08-03

Chief Scientist: Hideaki Hase (JAMSTEC)

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

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KAIKO
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SHINKAI 6500
DEEP TOW
HYPER-DOLPHIN
URASHIMA
YOKOSUKA DEEP TOW
6K Camera DEEP TOW
6K Sonar DEEP TOW
KM-ROV
POWER GRAB SAMPLER (SHELL)
POWER GRAB SAMPLER (CLOW)
BMS

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Dive ID:

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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.



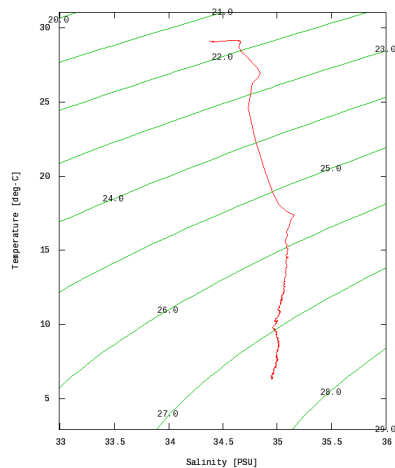
— ... Observation Line — ... Navigation ● ... Observation, Dive Point, Hole

Figures

200407130751



MR04-03 Leg2: 200407130751
Expendable Conductivity-Temperature-Depth Profiler (XCTD): Salinity




















































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

Data List

[Add to Basket](#)

☐ File names

☐ 200407130751.dat
☐ 200407130946.dat
☐ 200407131208.dat
☐ 200407131426.dat
☐ 200407131645.dat
☐ 200407131910.dat
☐ 200407132130.dat
☐ 200407132356.dat
☐ 200407140220.dat
☐ 200407140447.dat
☐ 200407140716.dat
☐ 200407140940.dat
☐ 200407141205.dat
☐ 200407141437.dat

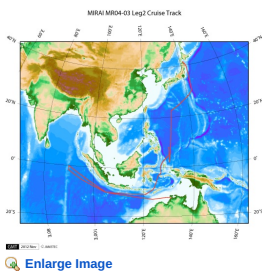
 File names	2004071419259.dat
 200407141926.dat	
 200407142157.dat	
 200407150022.dat	
 200407150249.dat	
 200407150512.dat	
 200407150753.dat	
 200407151023.dat	
 200407151254.dat	
 200407151522.dat	
 200407151805.dat	
 200407152027.dat	
 200407152257.dat	
 200407160122.dat	
 200407160346.dat	
 200407160611.dat	
 200407160836.dat	
 200407161037.dat	
 200407161236.dat	
 200407161436.dat	
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 200407161837.dat	
 200407162037.dat	
 200407162237.dat	
 200407170042.dat	
 200407170248.dat	
 200407170453.dat	
 200407170701.dat	
 200407170911.dat	
 200407171123.dat	
 200407171332.dat	
 200407171545.dat	
 200407171753.dat	
 200407171959.dat	
 200407172203.dat	
 200407180008.dat	
 200407180214.dat	
 200407180425.dat	
 200407180632.dat	
 200407180835.dat	
 200407181037.dat	
 200407181242.dat	
 200407181454.dat	
 200407181703.dat	
 200407181905.dat	
 200407181913.dat	
 200407182110.dat	
 200407182315.dat	
 ex_read2.f (Sample Program)	

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

Observation	Time and Date	Lat. [°]	Lon. [°]
200407130751	2004-07-13 07:46	-0.0136	90.0821
200407130946	2004-07-13 09:41	-0.2528	90.4960
200407131208	2004-07-13 12:03	-0.6313	91.0003
200407131426	2004-07-13 14:21	-0.9741	91.4985
200407131645	2004-07-13 16:40	-1.2985	92.0005
200407131910	2004-07-13 19:05	-1.6400	92.5046
200407132130	2004-07-13 21:25	-1.9668	93.0000
200407132356	2004-07-13 23:51	-2.3183	93.5001
200407140220	2004-07-14 02:15	-2.6485	94.0000
200407140447	2004-07-14 04:42	-2.9836	94.5001
200407140716	2004-07-14 07:11	-3.3168	95.0000
200407140940	2004-07-14 09:35	-3.6561	95.5000
200407141205	2004-07-14 12:00	-3.9873	95.9986
200407141437	2004-07-14 14:32	-4.3351	96.5166
200407141659	2004-07-14 16:54	-4.6594	97.0000
200407141926	2004-07-14 19:21	-4.9951	97.5000
200407142157	2004-07-14 21:52	-5.3626	98.0000
200407150022	2004-07-15 00:17	-5.6883	98.5000
200407150249	2004-07-15 02:44	-5.9921	99.0121
200407150512	2004-07-15 05:07	-6.3358	99.4998
200407150753	2004-07-15 07:48	-6.6733	99.9993
200407151023	2004-07-15 10:18	-7.0085	100.5001
200407151254	2004-07-15 12:49	-7.3455	100.9998
200407151522	2004-07-15 15:17	-7.6736	101.5001
200407151805	2004-07-15 18:00	-8.0165	102.0000
200407152027	2004-07-15 20:22	-8.3410	102.4958
200407152257	2004-07-15 22:52	-8.6715	102.9998
200407160122	2004-07-16 01:17	-9.0046	103.5000
200407160346	2004-07-16 03:41	-9.3301	103.9998
200407160611	2004-07-16 06:06	-9.6673	104.5000

Observation	Time and Date	Lat (°N)	Long (°E)
20040716036	2004-07-16 09:31	-10.0310	105.0003
200407161037	2004-07-16 10:32	-10.0211	105.4996
200407161236	2004-07-16 12:31	-10.0421	106.0008
200407161436	2004-07-16 14:31	-10.0671	106.4998
200407161636	2004-07-16 16:31	-10.0963	107.0000
200407161837	2004-07-16 18:32	-10.1245	107.5000
200407162037	2004-07-16 20:32	-10.1548	107.9998
200407162237	2004-07-16 22:32	-10.1826	108.5001
200407170042	2004-07-17 00:37	-10.2038	109.0000
200407170248	2004-07-17 02:43	-10.2208	109.5003
200407170453	2004-07-17 04:48	-10.2460	110.0000
200407170701	2004-07-17 06:56	-10.2806	110.5000
200407170911	2004-07-17 09:06	-10.3061	111.0000
200407171123	2004-07-17 11:18	-10.3330	111.5003
200407171332	2004-07-17 13:27	-10.3481	112.0000
200407171545	2004-07-17 15:40	-10.3841	112.4996
200407171753	2004-07-17 17:48	-10.4170	112.9998
200407171959	2004-07-17 19:54	-10.4436	113.5000
200407172203	2004-07-17 21:58	-10.4563	114.0000
200407180008	2004-07-18 00:03	-10.4720	114.5001
200407180214	2004-07-18 02:09	-10.5073	114.9998
200407180425	2004-07-18 04:20	-10.5305	115.5000
200407180632	2004-07-18 06:27	-10.5516	116.0001
200407180835	2004-07-18 08:30	-10.5751	116.5000
200407181037	2004-07-18 10:32	-10.6021	117.0018
200407181242	2004-07-18 12:37	-10.6313	117.5003
200407181454	2004-07-18 14:49	-10.6508	118.0003
200407181703	2004-07-18 16:58	-10.6785	118.5000
200407181905	2004-07-18 19:02	-10.7058	119.0001
200407181913	2004-07-18 19:08	-10.7061	119.0198
200407182110	2004-07-18 21:05	-10.7240	119.5001
200407182315	2004-07-18 23:10	-10.7508	119.9998

Related Information



MR04-03 Leg2
Ship Name: MIRAI
Period: 2004-07-03 - 2004-08-03
Chief Scientist: Hideaki Hase (JAMSTEC)
Project Name: [Tropical Ocean Climate Study (TOCS)]

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YOKOSUKA
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KAIREI
CHIKYU
KAIMEI
SHINSEI MARU
HAKUHO MARU

Information of the Submersibles

KAIKO
SHINKAI 2000
SHINKAI 6500
DEEP TOW
HYPER-DOLPHIN
URASHIMA
YOKOSUKA DEEP TOW
6K Camera DEEP TOW
6K Sonar DEEP TOW
KM-ROV
POWER GRAB SAMPLER (SHELL)
POWER GRAB SAMPLER (CLOW)
BMS

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Dive ID:

