

## MIRAI MR07-07 Leg1 Expendable Conductivity-Temperature-Depth Profiler (XCTD)

Last Modified: 2019-08-29

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

Cruise ID: [MR07-07 Leg1](#)

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/MR07-07\\_leg1\\_all.pdf](http://www.godac.jamstec.go.jp/catalog/data/doc_catalog/media/MR07-07_leg1_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.

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

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
200801070252	07033418	XCTD-1	Auto	MK-100
200801090322	07033414	XCTD-1	Auto	MK-100
200801092227	07033421	XCTD-1	Auto	MK-100
200801110423	07033404	XCTD-1	Auto	MK-100
200801121540	07033419	XCTD-1	Auto	MK-100
200801130153	07033390	XCTD-1	Auto	MK-100
200801150803	07033423	XCTD-1	Auto	MK-100
200801151257	07033392	XCTD-1	Auto	MK-100
200801151723	07033422	XCTD-1	Auto	MK-100
200801151730	07033391	XCTD-1	Auto	MK-100
200801152212	07033393	XCTD-1	Auto	MK-100
200801160951	07033399	XCTD-1	Auto	MK-100
200801161501	07033397	XCTD-1	Auto	MK-100
200801161725	07033395	XCTD-1	Auto	MK-100
200801161849	07033396	XCTD-1	Auto	MK-100
200801162017	07033394	XCTD-1	Auto	MK-100
200801162140	07064598	XCTD-1	Auto	MK-100
200801162325	07033398	XCTD-1	Auto	MK-100
200801162354	07064599	XCTD-1	Auto	MK-100
200801170452	07064592	XCTD-1	Auto	MK-100
200801170615	07064596	XCTD-1	Auto	MK-100
200801170702	07064595	XCTD-1	Auto	MK-100
200801170749	07064591	XCTD-1	Auto	MK-100
200801170900	07064597	XCTD-1	Auto	MK-100
200801171009	07064593	XCTD-1	Auto	MK-100
200801171232	07064594	XCTD-1	Auto	MK-100
200801171653	07064588	XCTD-1	Auto	MK-100
200801180422	07064589	XCTD-1	Auto	MK-100
200801180511	07064590	XCTD-1	Auto	MK-100
200801190747	07064602	XCTD-1	Auto	MK-100
200801191213	07064605	XCTD-1	Auto	MK-100
200801191622	07064603	XCTD-1	Auto	MK-100
200801192039	07064600	XCTD-1	Auto	MK-100
200801200152	07064604	XCTD-1	Auto	MK-100
200801200616	07064606	XCTD-1	Auto	MK-100
200801201039	07064611	XCTD-1	Auto	MK-100
200801201508	07064607	XCTD-1	Auto	MK-100
200801201925	07064610	XCTD-1	Auto	MK-100
200801202205	07064608	XCTD-1	Auto	MK-100
200801210148	07064609	XCTD-1	Auto	MK-100
200801210536	07064616	XCTD-1	Auto	MK-100
200801210921	07064612	XCTD-1	Auto	MK-100
200801211301	07064615	XCTD-1	Auto	MK-100
200801211639	07064613	XCTD-1	Auto	MK-100
200801212152	07064614	XCTD-1	Auto	MK-100
200801220120	07064646	XCTD-1	Auto	MK-100
200801220311	07064645	XCTD-1	Auto	MK-100
200801220408	07064647	XCTD-1	Auto	MK-100
200801220503	07064644	XCTD-1	Auto	MK-100
200801220601	07064650	XCTD-1	Auto	MK-100
200801220732	07064648	XCTD-1	Auto	MK-100
200801220808	07064649	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.

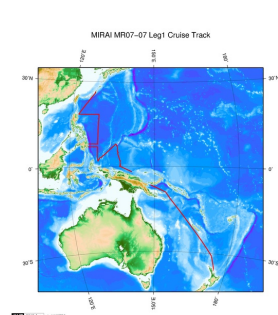
- 1) The gradient check of adjacent depth data
- 2) The density inversion check
- 3) The broad range check set up at given ocean space and depth

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](#)

### MR07-07 Leg1

Ship Name: MIRAI

Period: 2007-12-27 - 2008-01-25

Chief Scientist: Yuji Kashino (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.
2014-07-30	An observation data was registerd.
2014-02-18	An observation data was registerd.
2012-10-27	An observation data was registerd.

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### Information of the Submersibles

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Dive ID:

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**JAMSTEC**

国立研究開発法人  
海洋研究開発機構  
JAPAN AGENCY FOR MARINE-EARTH SCIENCE AND TECHNOLOGY

## MIRAI MR07-07 Leg1 Expendable Conductivity-Temperature-Depth Profiler (XCTD)

Last Modified: 2019-08-29

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Cruise ID: [MR07-07 Leg1](#)

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 : <a href="#">Definition of Quality Control Flags</a>
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

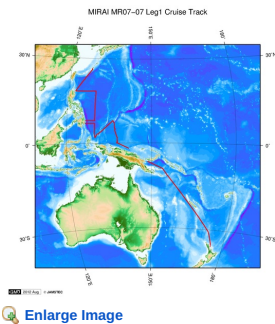
QCed data were added flag according to the NODC (National Oceanographic Data Center) quality control procedure, additionally visually checked. Please see the site of NODC of the following link for quality control procedure.

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

#### Sample Program

[ex\\_read2.f](#)

#### Related Information



#### MR07-07 Leg1

Ship Name: MIRAI

Period: 2007-12-27 - 2008-01-25

Chief Scientist: Yuji Kashino (JAMSTEC)

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

#### Update History

2019-08-29	An observation data was registerd.
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2016-04-07	An observation data was registerd.
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2014-02-18	An observation data was registerd.
2012-10-27	An observation data was registerd.

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#### Information of the Submersibles

KAICO  
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)  
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## MIRAI MR07-07 Leg1 Expendable Conductivity-Temperature-Depth Profiler (XCTD)

Last Modified: 2019-08-29

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Cruise ID: [MR07-07 Leg1](#)

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

Data Policy: [JAMSTEC](#)

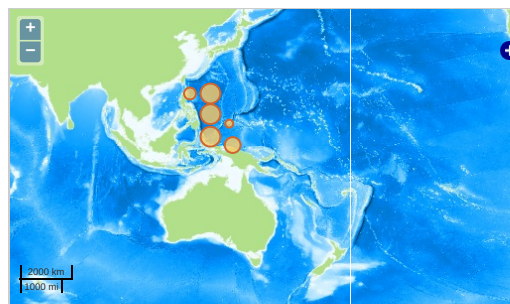
Observation Items: Depth, Temperature, Salinity

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.



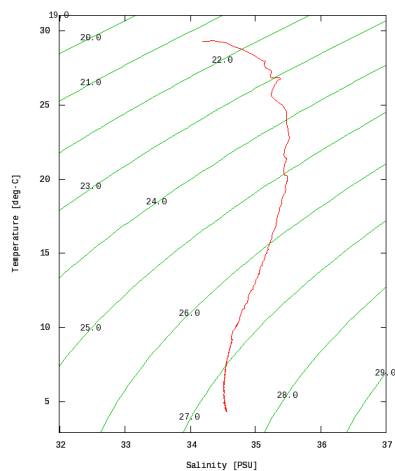
— ... Observation Line — ... Navigation ● ... Observation, Dive Point, Hole

### Figures

200801070252



MR07-07 Leg1: 200801070252  
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

<input type="checkbox"/>	200801070252.dat
<input type="checkbox"/>	200801090322.dat
<input type="checkbox"/>	200801092227.dat
<input type="checkbox"/>	200801110423.dat
<input type="checkbox"/>	200801121540.dat
<input type="checkbox"/>	200801130153.dat
<input type="checkbox"/>	200801150803.dat
<input type="checkbox"/>	200801151257.dat
<input type="checkbox"/>	200801151723.dat
<input type="checkbox"/>	200801151730.dat
<input type="checkbox"/>	200801152212.dat
<input type="checkbox"/>	200801160951.dat
<input type="checkbox"/>	200801161501.dat
<input type="checkbox"/>	200801161725.dat

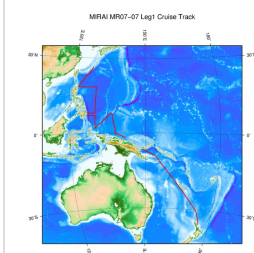
	20080116049.dat
	200801162017.dat
	200801162140.dat
	200801162325.dat
	200801162354.dat
	200801170452.dat
	200801170615.dat
	200801170702.dat
	200801170749.dat
	200801170900.dat
	200801171009.dat
	200801171232.dat
	200801171653.dat
	200801180422.dat
	200801180511.dat
	200801190747.dat
	200801191213.dat
	200801191622.dat
	200801192039.dat
	200801200152.dat
	200801200616.dat
	200801201039.dat
	200801201508.dat
	200801201925.dat
	200801202205.dat
	200801210148.dat
	200801210536.dat
	200801210921.dat
	200801211301.dat
	200801211639.dat
	200801212152.dat
	200801220120.dat
	200801220311.dat
	200801220408.dat
	200801220503.dat
	200801220601.dat
	200801220732.dat
	200801220808.dat
	ex_read2.f (Sample Program)

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

Observation	Time and Date	Lat. [°]	Lon. [°]
200801070252	2008-01-07 02:47	0.0354	137.8953
200801090322	2008-01-09 03:17	2.0486	138.0741
200801092227	2008-01-09 22:22	2.9946	137.6536
200801110423	2008-01-11 04:18	4.9383	137.3076
200801121540	2008-01-12 15:35	6.9996	137.0000
200801130153	2008-01-13 01:48	7.6446	136.6935
200801150803	2008-01-15 07:58	2.9998	130.0000
200801151257	2008-01-15 12:52	4.0001	130.0000
200801151723	2008-01-15 17:21	4.9965	130.0000
200801151730	2008-01-15 17:25	5.0121	130.0001
200801152212	2008-01-15 22:07	6.0000	130.0000
200801160951	2008-01-16 09:46	6.9988	128.9993
200801161501	2008-01-16 14:56	6.9993	127.9998
200801161725	2008-01-16 17:20	7.0000	127.5038
200801161849	2008-01-16 18:44	6.9998	127.2500
200801162017	2008-01-16 20:12	7.0203	127.0000
200801162140	2008-01-16 21:34	6.9921	126.7500
200801162325	2008-01-16 23:20	6.9798	126.5733
200801162354	2008-01-16 23:49	7.0136	126.5000
200801170452	2008-01-17 04:47	7.9998	126.5991
200801170615	2008-01-17 06:10	7.9868	126.6975
200801170702	2008-01-17 06:57	7.9998	126.8336
200801170749	2008-01-17 07:44	8.0001	127.0000
200801170900	2008-01-17 08:55	8.0005	127.2501
200801171009	2008-01-17 10:04	8.0000	127.5000
200801171232	2008-01-17 12:27	8.0000	128.0001
200801171653	2008-01-17 16:48	8.0000	129.0000
200801180422	2008-01-18 04:17	7.9351	130.0555
200801180511	2008-01-18 05:06	7.9856	129.9911
200801190747	2008-01-19 07:42	9.0003	129.9998
200801191213	2008-01-19 12:08	10.0000	129.9998
200801191622	2008-01-19 16:17	11.0001	130.0000
200801192039	2008-01-19 20:34	12.0075	130.0006
200801200152	2008-01-20 01:47	13.0196	129.9948
200801200616	2008-01-20 06:11	14.0000	130.0001
200801201039	2008-01-20 10:34	15.0000	130.0001
200801201508	2008-01-20 15:03	15.9996	129.9998
200801201925	2008-01-20 19:20	17.0000	130.0001
200801202205	2008-01-20 22:00	17.6666	130.0008
200801210148	2008-01-21 01:43	18.3410	129.9930

Observation	Time and Date	Lat. (N)	Long. (E)
200801210936	2008-01-21 09:31	18.3331	128.0000
200801210921	2008-01-21 09:16	18.3331	128.0000
200801211301	2008-01-21 12:56	18.3333	126.9998
200801211639	2008-01-21 16:34	18.3333	125.9998
200801212152	2008-01-21 21:47	18.3363	124.9708
200801220120	2008-01-22 01:15	18.3350	123.9998
200801220311	2008-01-22 03:06	18.3333	123.5000
200801220408	2008-01-22 04:03	18.3333	123.2500
200801220503	2008-01-22 04:58	18.3329	123.0001
200801220601	2008-01-22 05:56	18.3335	122.7498
200801220732	2008-01-22 07:27	18.3535	122.5973
200801220808	2008-01-22 08:03	18.3370	122.5015

#### Related Information



Enlarge Image

#### MR07-07 Leg1

Ship Name: MIRAI  
Period: 2007-12-27 - 2008-01-25  
Chief Scientist: Yuji Kashino (JAMSTEC)  
Project Name: [Tropical Ocean Climate Study (TOCS)]

#### Update History

2019-08-29	An observation data was registered.
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#### What's New

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Amount of Public Info.

#### Data

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#### Information of the Ships

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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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