

## MIRAI MR01-K05 Leg1 Expendable Conductivity-Temperature-Depth Profiler (XCTD)

Last Modified: 2019-08-29

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Cruise ID: [MR01-K05 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/MR01-K05\\_leg1\\_all.pdf](http://www.godac.jamstec.go.jp/catalog/data/doc_catalog/media/MR01-K05_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.

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

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
200109280824	01055260	XCTD-1	Auto	MK-100
200109281225	01055257	XCTD-1	Auto	MK-100
200109281235	01055379	XCTD-1	Auto	MK-100
200109290913	01055261	XCTD-1	Hand	MK-100
200109291320	01055406	XCTD-1	Auto	MK-100
200110020821	01055410	XCTD-1	Auto	MK-100
200110020843	01055407	XCTD-1	Auto	MK-100
200110050717	01055421	XCTD-1	Auto	MK-100
200110050907	01055412	XCTD-1	Auto	MK-100
200110051100	01055423	XCTD-1	Auto	MK-100
200110051251	01055325	XCTD-1	Auto	MK-100
200110051441	01055415	XCTD-1	Auto	MK-100
200110051629	01055414	XCTD-1	Auto	MK-100
200110052014	01055422	XCTD-1	Auto	MK-100
200110060007	01055413	XCTD-1	Auto	MK-100
200110060409	01055424	XCTD-1	Hand	MK-100
200110060804	01055326	XCTD-1	Auto	MK-100
200110070604	01055328	XCTD-1	Auto	MK-100
200110070627	01055329	XCTD-1	Auto	MK-100
200110071029	01055330	XCTD-1	Auto	MK-100
200110071423	01055331	XCTD-1	Auto	MK-100
200110080810	01055333	XCTD-1	Auto	MK-100
200110081257	01055332	XCTD-1	Auto	MK-100
200110081732	01055334	XCTD-1	Auto	MK-100
200110090609	01055335	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



MIRAI MR01-K05 Leg1 Cruise Track

**MR01-K05 Leg1**  
Ship Name: MIRAI  
Period: 2001-09-20 - 2001-10-16  
Chief Scientist: Yoshifumi Kuroda (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.
2016-10-11	An observation data was registered.

Optical history  
Feeds

SHINSEI MARU  
HAKUHO MARU

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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JAPAN AGENCY FOR MARINE-EARTH SCIENCE AND TECHNOLOGY

## MIRAI MR01-K05 Leg1 Expendable Conductivity-Temperature-Depth Profiler (XCTD)

Last Modified: 2019-08-29

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 Cruise ID: [MR01-K05 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

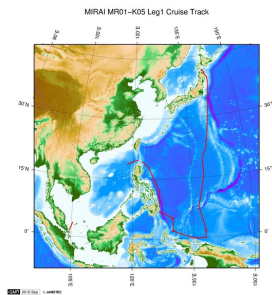
QCed data were added flag according to the NODC (National Oceanographic Data Center) quality control procedure, additionally visually checked. Please see the site of NODC of the following link for quality control procedure.

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

#### Sample Program

[ex\\_read2.f](#)

#### Related Information



[Enlarge Image](#)

#### MR01-K05 Leg1

Ship Name: MIRAI

Period: 2001-09-20 - 2001-10-16

Chief Scientist: Yoshifumi Kuroda (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.
2016-10-11	An observation data was registerd.

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Cruise ID:

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Dive ID:

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Data Policy: [JAMSTEC](#)

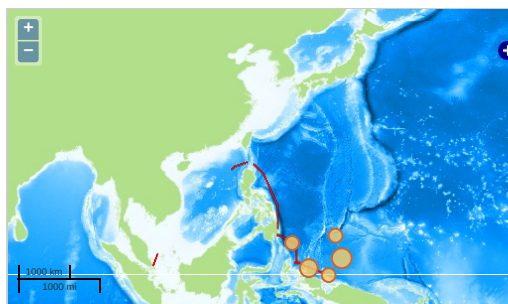
Observation Items: Depth, Temperature, Salinity

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.

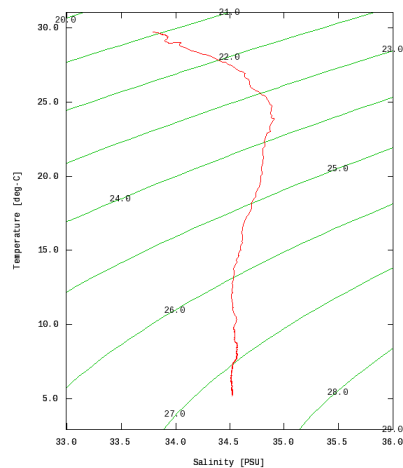


### Figures

200109280824



MR01-K05 Leg1: 200109280824  
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

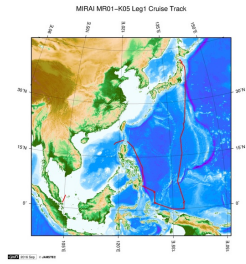
<input type="checkbox"/>	200109280824.dat
<input type="checkbox"/>	200109281225.dat
<input type="checkbox"/>	200109281235.dat
<input type="checkbox"/>	200109290913.dat
<input type="checkbox"/>	200109291320.dat
<input type="checkbox"/>	200110020821.dat
<input type="checkbox"/>	200110020843.dat
<input type="checkbox"/>	200110050717.dat
<input type="checkbox"/>	200110050907.dat
<input type="checkbox"/>	200110051100.dat
<input type="checkbox"/>	200110051251.dat
<input type="checkbox"/>	200110051441.dat
<input type="checkbox"/>	200110051629.dat
<input type="checkbox"/>	200110052014.dat

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-  [200110081257.dat](#)
-  [200110081732.dat](#)
-  [200110090609.dat](#)
-  [ex\\_read2.f \(Sample Program\)](#)

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

Observation	Time and Date	Lat. [°]	Lon. [°]
200109280824	2001-09-28 08:18	6.9976	136.7241
200109281225	2001-09-28 12:20	5.9988	137.0008
200109281235	2001-09-28 12:30	5.9676	137.0101
200109290913	2001-09-29 09:08	3.9998	137.5448
200109291320	2001-09-29 13:15	2.9971	137.8195
200110020821	2001-10-02 08:16	0.9980	138.0573
200110020843	2001-10-02 08:38	0.9141	138.0548
200110050717	2001-10-05 07:12	0.0026	137.4876
200110050907	2001-10-05 09:02	-0.0040	136.9981
200110051100	2001-10-05 10:55	0.0005	136.4986
200110051251	2001-10-05 12:46	0.0028	135.9993
200110051441	2001-10-05 14:36	0.0028	135.4991
200110051629	2001-10-05 16:24	0.0093	134.9990
200110052014	2001-10-05 20:10	0.3978	133.9988
200110060007	2001-10-06 00:02	0.8049	133.0006
200110060409	2001-10-06 04:04	1.2308	131.9713
200110060804	2001-10-06 07:58	1.5978	130.9856
200110070604	2001-10-07 05:59	1.9418	129.9285
200110070627	2001-10-07 06:22	1.9411	129.9288
200110071029	2001-10-07 10:24	3.0013	129.9868
200110071423	2001-10-07 14:18	4.0008	130.0389
200110080810	2001-10-08 08:05	5.7025	129.0000
200110081257	2001-10-08 12:52	6.2255	128.0001
200110081732	2001-10-08 17:27	6.7606	126.9998
200110090609	2001-10-09 06:04	6.8333	126.7123

Related Information



MR01-K05 Leg1 Cruise Track

**MR01-K05 Leg1**  
Ship Name: MIRAI  
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