

MIRAI MR04-08 Leg2 Expendable Conductivity-Temperature-Depth Profiler (XCTD)

Last Modified: 2019-08-29

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

Cruise ID: [MR04-08 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/MR04-08_leg2_all.pdf

For Using Data

Principal Investigator

Data Management Office

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
200501161820	04037305	XCTD-1	Auto	MK-100
200501162026	04037306	XCTD-1	Auto	MK-100
200501162227	04037304	XCTD-1	Auto	MK-100
200501170031	04037308	XCTD-1	Auto	MK-100
200501170231	04037311	XCTD-1	Auto	MK-100
200501170436	04037307	XCTD-1	Auto	MK-100
200501170639	04037309	XCTD-1	Auto	MK-100
200501170839	04037310	XCTD-1	Auto	MK-100
200501171038	04037313	XCTD-1	Auto	MK-100
200501171236	04037312	XCTD-1	Auto	MK-100
200501181635	04037316	XCTD-1	Auto	MK-100
200501182025	04037314	XCTD-1	Auto	MK-100
200501190016	04037318	XCTD-1	Auto	MK-100
200501190404	04037317	XCTD-1	Auto	MK-100
200501200407	04037320	XCTD-1	Auto	MK-100
200501200817	04037319	XCTD-1	Auto	MK-100
200501240903	04037321	XCTD-1	Auto	MK-100
200501300529	04037323	XCTD-1	Auto	MK-100
200501300924	04037322	XCTD-1	Auto	MK-100
200502010524	04037325	XCTD-1	Auto	MK-100
200502040620	04037326	XCTD-1	Auto	MK-100
200502060607	04037328	XCTD-1	Auto	MK-100
200502061017	04037329	XCTD-1	Auto	MK-100
200502061421	04037327	XCTD-1	Auto	MK-100
200502080944	04037331	XCTD-1	Auto	MK-100
200502081347	04037332	XCTD-1	Auto	MK-100
200502082140	04037330	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.

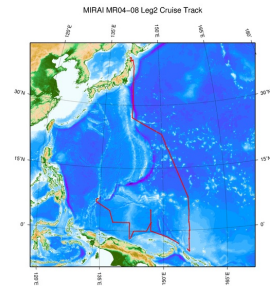
- 1) The gradient check of adjacent depth data
- 2) The density inversion check
- 3) The broad range check set up at given ocean space and depth

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 MR04-08 Leg2 Cruise Track

MR04-08 Leg2
Ship Name: MIRAI
Period: 2005-01-14 - 2005-02-19
Chief Scientist: Shigeki Hosoda (JAMSTEC)
Project Name: [Tropical Ocean Climate Study (TOCS)]

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Update History

2019-08-29	An observation data was registerd.
2017-06-14	An observation data was registerd.
2014-07-25	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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SHINKAI 6500
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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

Dive ID:

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

 Cruise ID: [MR04-08 Leg2](#)

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 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

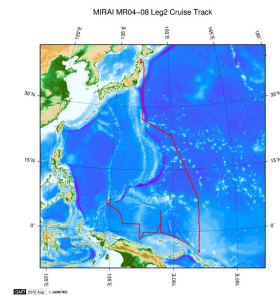
QCed data were added flag according to the NODC (National Oceanographic Data Center) quality control procedure, additionally visually checked. Please see the site of NODC of the following link for quality control procedure.

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

Sample Program

[ex_read2.f](#)

Related Information



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MR04-08 Leg2

Ship Name: MIRAI

Period: 2005-01-14 - 2005-02-19

Chief Scientist: Shigeki Hosoda (JAMSTEC)

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

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KM-ROV

POWER GRAB SAMPLER

(SHELL)

POWER GRAB SAMPLER

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Dive ID:

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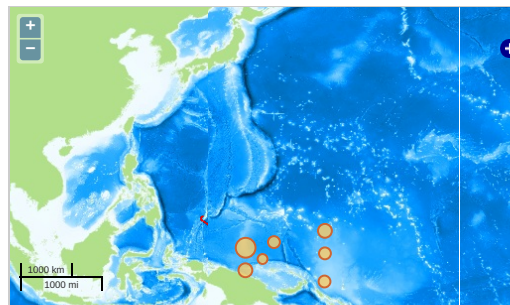
Observation Items: Depth, Temperature, Salinity

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.

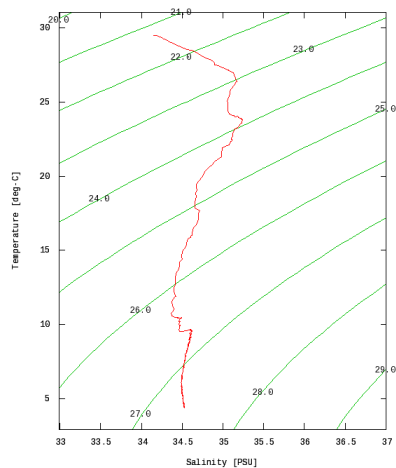


Figures

200501161820



MR04-08 Leg2: 200501161820
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](#)

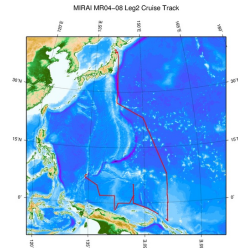
File names
<input type="checkbox"/> 200501161820.dat
<input type="checkbox"/> 200501162026.dat
<input type="checkbox"/> 200501162227.dat
<input type="checkbox"/> 200501170031.dat
<input type="checkbox"/> 200501170231.dat
<input type="checkbox"/> 200501170436.dat
<input type="checkbox"/> 200501170639.dat
<input type="checkbox"/> 200501170839.dat
<input type="checkbox"/> 200501171038.dat
<input type="checkbox"/> 200501171236.dat
<input type="checkbox"/> 200501181635.dat
<input type="checkbox"/> 200501182025.dat
<input type="checkbox"/> 200501190016.dat
<input type="checkbox"/> 200501190404.dat

 Files
 200501200817.dat
 200501240903.dat
 200501300529.dat
 200501300924.dat
 200502010524.dat
 200502040620.dat
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 200502061017.dat
 200502061421.dat
 200502080944.dat
 200502081347.dat
 200502082140.dat
 ex_read2.f (Sample Program)


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

Observation	Time and Date	Lat. [°]	Lon. [°]
200501161820	2005-01-16 18:15	1.9995	141.9963
200501162026	2005-01-16 20:21	1.5055	142.0205
200501162227	2005-01-16 22:22	1.0075	141.9915
200501170031	2005-01-17 00:26	0.4998	141.9820
200501170231	2005-01-17 02:26	0.0088	141.9788
200501170436	2005-01-17 04:31	-0.4996	141.9740
200501170639	2005-01-17 06:34	-1.0001	141.9735
200501170839	2005-01-17 08:34	-1.5001	141.9611
200501171038	2005-01-17 10:33	-2.0000	141.9518
200501171236	2005-01-17 12:31	-2.4998	141.9480
200501181635	2005-01-18 16:30	0.0003	142.9998
200501182025	2005-01-18 20:20	0.0071	144.0000
200501190016	2005-01-19 00:11	-0.0003	145.0006
200501190404	2005-01-19 03:59	-0.0013	145.9998
200501200407	2005-01-20 04:02	3.0005	147.0243
200501200817	2005-01-20 08:12	3.9996	147.0371
200501240903	2005-01-24 08:58	1.0001	147.0093
200501300529	2005-01-30 05:24	-4.0003	155.9981
200501300924	2005-01-30 09:19	-3.0001	155.9791
200502010524	2005-02-01 05:19	-0.9733	156.0320
200502040620	2005-02-04 06:15	0.9998	156.0813
200502060607	2005-02-06 06:02	2.9998	156.0053
200502061017	2005-02-06 10:12	4.0000	156.0610
200502061421	2005-02-06 14:16	5.0005	156.0758
200502080944	2005-02-08 09:39	6.0000	156.0043
200502081347	2005-02-08 13:42	6.9996	155.9751
200502082140	2005-02-08 21:35	8.0003	155.9353

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Chief Scientist: Shigeaki Hosoda (JAMSTEC)
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