

MIRAI MR08-03 Expendable Conductivity-Temperature-Depth Profiler (XCTD)

Last Modified: 2019-08-29

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

Cruise ID: [MR08-03](#)

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/MR08-03_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.

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

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
200807050144	07064653	XCTD-1	Auto	MK-100
200807080213	07064656	XCTD-1	Auto	MK-100
200807100238	07064655	XCTD-1	Auto	MK-100
200807192348	07064654	XCTD-1	Auto	MK-100
200807240147	07064657	XCTD-1	Auto	MK-100
200807250956	08048282	XCTD-1	Auto	MK-100
200807251238	08048281	XCTD-1	Auto	MK-100
200807251838	08048283	XCTD-1	Auto	MK-100
200807252101	08048285	XCTD-1	Auto	MK-100
200807252301	08048284	XCTD-1	Auto	MK-100
200807260629	08048286	XCTD-1	Auto	MK-100
200808011813	06079373	XCTD-1	Auto	MK-100
200808012000	06079371	XCTD-1	Auto	MK-100
200808020009	06079372	XCTD-1	Auto	MK-100
200808020255	06079370	XCTD-1	Auto	MK-100
200808020608	06079374	XCTD-1	Auto	MK-100
200808020745	06079382	XCTD-1	Auto	MK-100
200808020920	06079383	XCTD-1	Auto	MK-100
200808021043	06079379	XCTD-1	Auto	MK-100
200808021212	06079384	XCTD-1	Auto	MK-100
200808021331	06079375	XCTD-1	Auto	MK-100
200808021448	06079380	XCTD-1	Auto	MK-100
200808021601	06079376	XCTD-1	Auto	MK-100
200808021711	06079381	XCTD-1	Auto	MK-100
200808021856	06079388	XCTD-1	Auto	MK-100
200808022010	06079385	XCTD-1	Auto	MK-100
200808022125	07054047	XCTD-1	Auto	MK-100
200808022245	06079386	XCTD-1	Auto	MK-100
200808030129	06079389	XCTD-1	Auto	MK-100
200808030442	06079387	XCTD-1	Auto	MK-100
200808030746	06079390	XCTD-1	Auto	MK-100
200808031025	07054046	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.

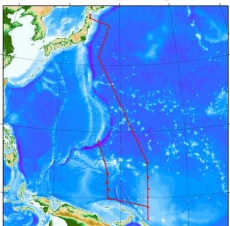
- 1) The gradient check of adjacent depth data
- 2) The density inversion check
- 3) The broad range check set up at given ocean space and depth

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 MR08-03 Cruise Track

MR08-03
Ship Name: MIRAI
Period: 2008-07-02 - 2008-08-06
Chief Scientist: Yuji Kashino (JAMSTEC)
Project Name: [Tropical Ocean Climate Study (TOCS), Station KEO]
Proposal Tropical Ocean Climate Study
Title:

[Enlarge Image](#)

Update History

2019-08-29	An observation data was registerd.
2017-06-14	An observation data was registerd.
2014-07-31	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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Last Modified: 2019-08-29

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

Cruise ID: [MR08-03](#)

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

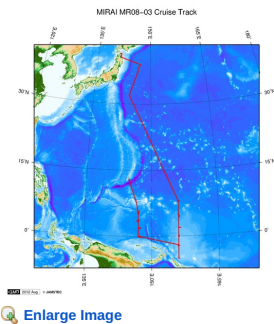
QCed data were added flag according to the NODC (National Oceanographic Data Center) quality control procedure, additionally visually checked. Please see the site of NODC of the following link for quality control procedure.

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

Sample Program

[ex_read2.f](#)

Related Information



MR08-03

Ship Name: MIRAI

Period: 2008-07-02 - 2008-08-06

Chief Scientist: Yuji Kashino (JAMSTEC)

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

Proposal Tropical Ocean Climate Study

Title:

Update History

2019-08-29	An observation data was registerd.
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KM-ROV

POWER GRAB SAMPLER

(SHELL)

POWER GRAB SAMPLER

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BMS

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Data Policy: **JAMSTEC**

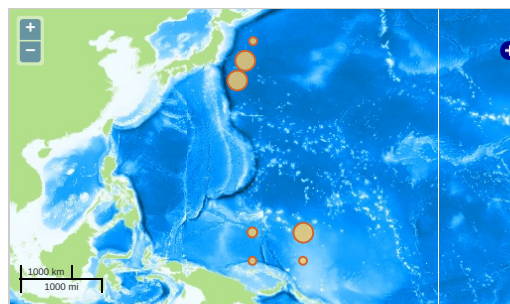
Observation Items: Depth, Temperature, Salinity

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.



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

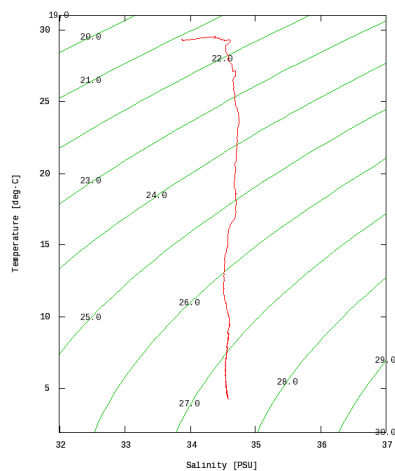
Imagery reproduced from ...

Figures

200807050144



MR08-03: 200807050144
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

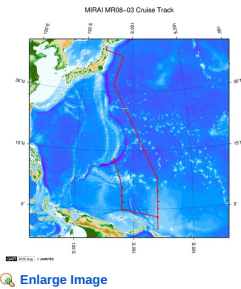
☐ 200807050144.dat
☐ 200807080213.dat
☐ 200807100238.dat
☐ 200807192348.dat
☐ 200807240147.dat
☐ 200807250956.dat
☐ 200807251238.dat
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☐ 200808020009.dat

-  20080802255.dat
-  200808020608.dat
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-  200808021856.dat
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-  200808022125.dat
-  200808022245.dat
-  200808030129.dat
-  200808030442.dat
-  200808030746.dat
-  200808031025.dat
-  ex_read2.f (Sample Program)

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

Observation	Time and Date	Lat. [°]	Lon. [°]
200807050144	2008-07-05 01:39	5.0330	146.9475
200807080213	2008-07-08 02:08	1.9996	147.0295
200807100238	2008-07-10 02:33	-0.0173	146.9816
200807192348	2008-07-19 23:43	-0.0065	155.9566
200807240147	2008-07-24 01:42	4.9770	156.0166
200807250956	2008-07-25 09:51	5.5001	156.0000
200807251238	2008-07-25 12:33	6.0000	156.0000
200807251838	2008-07-25 18:33	6.5036	155.9986
200807252101	2008-07-25 20:56	7.0001	156.0000
200807252301	2008-07-25 22:56	7.5001	156.0000
200807260629	2008-07-26 06:24	8.0305	155.9556
200808011813	2008-08-01 18:08	32.0001	144.3003
200808012000	2008-08-01 19:55	32.2698	144.5108
200808020009	2008-08-02 00:04	33.0001	144.7000
200808020255	2008-08-02 02:50	33.5000	144.9003
200808020608	2008-08-02 06:03	33.9996	145.0998
200808020745	2008-08-02 07:40	34.2496	145.2000
200808020920	2008-08-02 09:14	34.4998	145.3000
200808021043	2008-08-02 10:38	34.7500	145.4000
200808021212	2008-08-02 12:07	35.0000	145.5000
200808021331	2008-08-02 13:26	35.2500	145.6000
200808021448	2008-08-02 14:43	35.5001	145.6998
200808021601	2008-08-02 15:56	35.7500	145.8001
200808021711	2008-08-02 17:06	36.0000	145.8996
200808021856	2008-08-02 18:51	36.2500	146.0001
200808022010	2008-08-02 20:05	36.5000	146.1000
200808022125	2008-08-02 21:20	36.7500	146.1998
200808022245	2008-08-02 22:40	37.0000	146.3000
200808030129	2008-08-03 01:24	37.5000	146.5000
200808030442	2008-08-03 04:37	38.0655	146.3841
200808030746	2008-08-03 07:41	38.5001	146.9000
200808031025	2008-08-03 10:20	39.0001	147.1001

Related Information



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Ship Name: MIRAI
Period: 2008-07-02 - 2008-08-06
Chief Scientist: Yuji Kashino (JAMSTEC)
Project Name: [Tropical Ocean Climate Study (TOCS), Station KEO]
Proposal Tropical Ocean Climate Study
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