

MIRAI MR05-03 Leg2 Expendable Conductivity-Temperature-Depth Profiler (XCTD)

Last Modified: 2019-08-29

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

Cruise ID: [MR05-03 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/MR05-03_leg1-3_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
200508030415	04109963	XCTD-1	Auto	MK-100
200508031006	04109957	XCTD-1	Auto	MK-100
200508031533	04109958	XCTD-1	Auto	MK-100
200508032125	04109956	XCTD-1	Auto	MK-100
200508081057	04109960	XCTD-1	Auto	MK-100
200508081321	04109961	XCTD-1	Auto	MK-100
200508101042	04109962	XCTD-1	Auto	MK-100
200508101641	04109964	XCTD-1	Auto	MK-100
200508101648	04109965	XCTD-1	Auto	MK-100
200508102252	05022124	XCTD-1	Auto	MK-100
200508110455	05022126	XCTD-1	Auto	MK-100
200508111058	05022125	XCTD-1	Auto	MK-100
200508111641	05022127	XCTD-1	Auto	MK-100
200508112240	05022128	XCTD-1	Auto	MK-100
200508120439	05022129	XCTD-1	Auto	MK-100
200508141347	05022130	XCTD-1	Auto	MK-100
200508141837	05022133	XCTD-1	Auto	MK-100
200508142320	05022132	XCTD-1	Auto	MK-100
200508150427	05022131	XCTD-1	Auto	MK-100
200508150929	05022134	XCTD-1	Auto	MK-100
200508151407	05022135	XCTD-1	Auto	MK-100
200508151847	04109987	XCTD-1	Auto	MK-100
200508152320	04109985	XCTD-1	Auto	MK-100
200508160353	04109989	XCTD-1	Auto	MK-100
200508160831	04109984	XCTD-1	Auto	MK-100
200508161241	04109990	XCTD-1	Auto	MK-100
200508161646	04100031	XCTD-1	Auto	MK-100
200508162045	04109988	XCTD-1	Auto	MK-100
200508170058	04100032	XCTD-1	Auto	MK-100
200508170525	04100034	XCTD-1	Auto	MK-100
200508170945	04100033	XCTD-1	Auto	MK-100
200508171401	04100036	XCTD-1	Auto	MK-100
200508171836	04100035	XCTD-1	Auto	MK-100
200508172302	05022100	XCTD-1	Auto	MK-100
200508180324	05022101	XCTD-1	Auto	MK-100
200508180740	05022102	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.

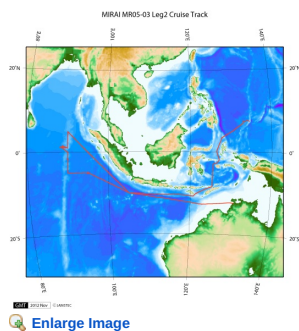
- 1) The gradient check of adjacent depth data
- 2) The density inversion check
- 3) The broad range check set up at given ocean space and depth

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



MR05-03 Leg2
Ship Name: MIRAI
Period: 2005-07-26 - 2005-08-24
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.
2014-07-26	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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Expendable Conductivity-Temperature-Depth Profiler (XCTD): Processed (DMO)-QCed

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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

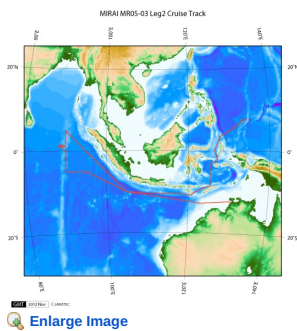
QCed data were added flag according to the NODC (National Oceanographic Data Center) quality control procedure, additionally visually checked. Please see the site of NODC of the following link for quality control procedure.

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

Sample Program

[ex_read2.f](#)

Related Information



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Period: 2005-07-26 - 2005-08-24

Chief Scientist: Hideaki Hase (JAMSTEC)

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

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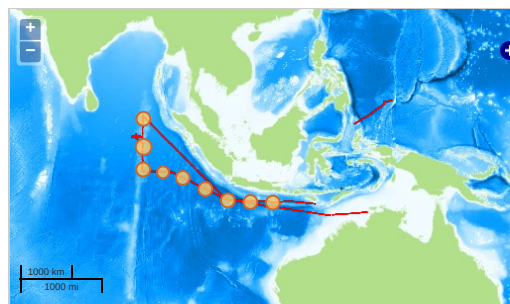
Observation Items: Depth, Temperature, Salinity

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.



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

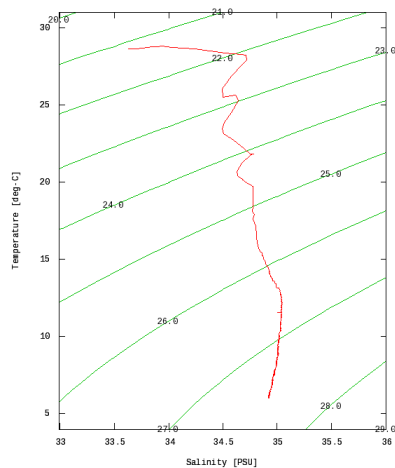
Imagery reproduced from ...

Figures

200508030415



MR05-03 Leg2: 200508030415
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

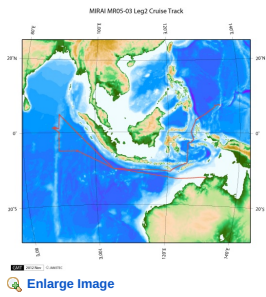
<input type="checkbox"/>	200508030415.dat
<input type="checkbox"/>	200508031006.dat
<input type="checkbox"/>	200508031533.dat
<input type="checkbox"/>	200508032125.dat
<input type="checkbox"/>	200508081057.dat
<input type="checkbox"/>	200508081321.dat
<input type="checkbox"/>	200508101042.dat
<input type="checkbox"/>	200508101641.dat
<input type="checkbox"/>	200508101648.dat
<input type="checkbox"/>	200508102252.dat
<input type="checkbox"/>	200508110455.dat
<input type="checkbox"/>	200508111058.dat
<input type="checkbox"/>	200508111641.dat
<input type="checkbox"/>	200508112240.dat

 20050814139.dat
 200508141347.dat
 200508141837.dat
 200508142320.dat
 200508150427.dat
 200508150929.dat
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 200508151847.dat
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 200508170525.dat
 200508170945.dat
 200508171401.dat
 200508171836.dat
 200508172302.dat
 200508180324.dat
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 ex_read2.f (Sample Program)

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

Observation	Time and Date	Lat. [°]	Lon. [°]
200508030415	2005-08-03 04:10	4.4963	90.0166
200508031006	2005-08-03 10:01	3.5001	89.9993
200508031533	2005-08-03 15:28	2.4998	89.9951
200508032125	2005-08-03 21:20	1.4996	89.9990
200508081057	2005-08-08 10:52	-0.5008	90.0496
200508081321	2005-08-08 13:16	-0.9996	89.9978
200508101042	2005-08-10 10:37	-2.5000	89.9961
200508101641	2005-08-10 16:36	-3.4998	89.9933
200508101648	2005-08-10 16:43	-3.5216	89.9926
200508102252	2005-08-10 22:47	-4.5000	89.9696
200508110455	2005-08-11 04:50	-5.0063	90.5005
200508111058	2005-08-11 10:53	-4.9941	91.5001
200508111641	2005-08-11 16:36	-4.9945	92.5000
200508112240	2005-08-11 22:35	-4.9988	93.5006
200508120439	2005-08-12 04:34	-5.0001	94.5000
200508141347	2005-08-14 13:42	-5.4783	95.9998
200508141837	2005-08-14 18:32	-5.9941	96.9998
200508142320	2005-08-14 23:15	-6.4940	97.9998
200508150427	2005-08-15 04:22	-6.9700	98.9998
200508150929	2005-08-15 09:24	-7.4780	100.0000
200508151407	2005-08-15 14:02	-7.9760	100.9996
200508151847	2005-08-15 18:42	-8.4901	102.0001
200508152320	2005-08-15 23:15	-8.9938	103.0000
200508160353	2005-08-16 03:48	-9.4955	104.0001
200508160831	2005-08-16 08:26	-9.9960	105.0003
200508161241	2005-08-16 12:36	-10.0425	106.0001
200508161646	2005-08-16 16:41	-10.0993	107.0000
200508162045	2005-08-16 20:40	-10.1498	108.0001
200508170058	2005-08-17 00:53	-10.2851	109.0000
200508170525	2005-08-17 05:20	-10.2521	109.9971
200508170945	2005-08-17 09:40	-10.2981	111.0001
200508171401	2005-08-17 13:56	-10.3338	112.0000
200508171836	2005-08-17 18:31	-10.3851	112.9980
200508172302	2005-08-17 22:57	-10.4303	114.0000
200508180324	2005-08-18 03:19	-10.3800	114.9998
200508180740	2005-08-18 07:35	-10.2460	116.0006

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