

MIRAI MR11-06 Expendable Conductivity-Temperature-Depth Profiler (XCTD)

Last Modified: 2019-08-31

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

Cruise ID: [MR11-06](#)

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/MR11-06_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.

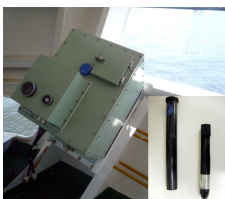
Data Citation

See [Terms and Conditions](#) about data citation.

Instrument

Instrument:

Expendable conductivity temperature
depth measurements (XCTD) (MR11-
04 -)



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

where Q_{TKT} is the depth and Q_{TKD} is the depth error.

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
201108160301	10037386	XCTD-1	Auto	MK-150N
201108160457	10079663	XCTD-1	Auto	MK-150N
201108160630	10037387	XCTD-1	Auto	MK-150N
201108160805	10037385	XCTD-1	Auto	MK-150N
201108160934	10037388	XCTD-1	Auto	MK-150N
201108161104	10079662	XCTD-1	Auto	MK-150N
201108161234	10079674	XCTD-1	Auto	MK-150N
201108161401	10079666	XCTD-1	Auto	MK-150N
201108161646	10079667	XCTD-1	Auto	MK-150N
201108161832	10079673	XCTD-1	Auto	MK-150N
201108162002	10079675	XCTD-1	Auto	MK-150N
201108162129	10079670	XCTD-1	Auto	MK-150N
201108162301	10079672	XCTD-1	Auto	MK-150N
201108170031	10079671	XCTD-1	Auto	MK-150N
201108170200	10079681	XCTD-1	Auto	MK-150N
201108170331	10079669	XCTD-1	Auto	MK-150N
201108170502	10079680	XCTD-1	Auto	MK-150N
201108170631	10079668	XCTD-1	Auto	MK-150N
201108170804	10079679	XCTD-1	Auto	MK-150N
201108170929	10079687	XCTD-1	Auto	MK-150N
201108171100	10079684	XCTD-1	Auto	MK-150N
201108171232	10079676	XCTD-1	Auto	MK-150N
201108171430	10079683	XCTD-1	Auto	MK-150N

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.

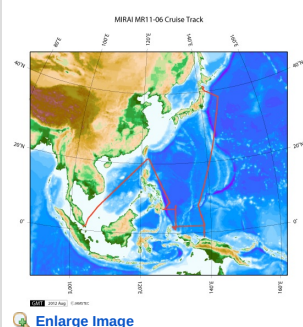
- 1) The gradient check of adjacent depth data
- 2) The density inversion check
- 3) The broad range check set up at given ocean space and depth

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



MR11-06

Ship Name: MIRAI
Period: 2011-08-13 - 2011-09-20
Chief Scientist: Yuji Kashino (JAMSTEC)
Project Name: [Tropical Ocean Climate Study (TOCS), Station KEO]
Proposal ▶ Tropical Ocean Climate Study
Title:

Update History

2019-08-31	An observation data was registered.
2017-06-14	An observation data was registered.
2016-04-07	An observation data was registered.
2014-08-08	An observation data was registered.
2014-02-18	An observation data was registered.
2013-09-26	An observation data was registered.

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URASHIMA
YOKOSUKA DEEP TOW
6K Camera DEEP TOW

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Go to a Dive Information

Dive ID:

6K Sonar DEEP TOW
KM-ROV
POWER GRAB SAMPLER
(SHELL)
POWER GRAB SAMPLER
(CLOW)
BMS

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海洋研究開発機構
JAPAN AGENCY FOR MARINE EARTH SCIENCE AND TECHNOLOGY

MIRAI MR11-06 Expendable Conductivity-Temperature-Depth Profiler (XCTD)

Last Modified: 2019-08-31

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

 Cruise ID: [MR11-06](#)

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

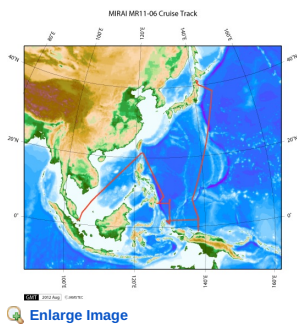
QCed data were added flag according to the NODC (National Oceanographic Data Center) quality control procedure, additionally visually checked. Please see the site of NODC of the following link for quality control procedure.

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

Sample Program

[ex_read2.f](#)

Related Information



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Ship Name: MIRAI
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 Chief Scientist: Yuji Kashino (JAMSTEC)
 Project Name: [Tropical Ocean Climate Study (TOCS), Station KEO]
 Proposal ▶ Tropical Ocean Climate Study
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 6K Sonar DEEP TOW
 KM-ROV
 POWER GRAB SAMPLER (SHELL)
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国立研究開発法人
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Data Policy: **JAMSTEC**

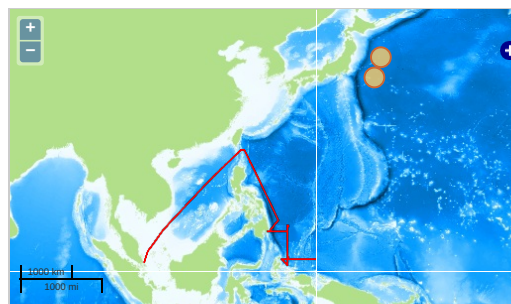
Observation Items: Depth, Temperature, Salinity

Science Keywords:

OCEANS > OCEAN > WATER
TEMPERATURE
OCEANS > SALINITY/DENSITY > SALINITY

Observation Map

- Clicking the icon displays a balloon with observation information.
- Then click the observation name, figures will be displayed.

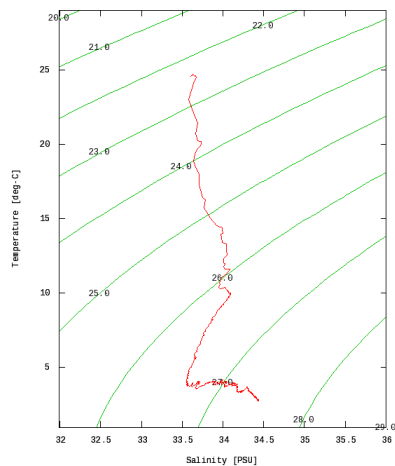


Figures

201108160301



MR11-06: 201108160301
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

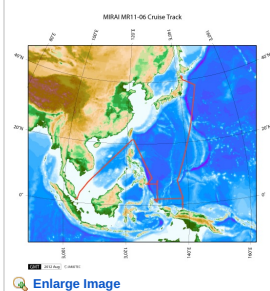
<input type="checkbox"/>	201108160301.dat
<input type="checkbox"/>	201108160457.dat
<input type="checkbox"/>	201108160630.dat
<input type="checkbox"/>	201108160805.dat
<input type="checkbox"/>	201108160934.dat
<input type="checkbox"/>	201108161104.dat
<input type="checkbox"/>	201108161234.dat
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<input type="checkbox"/>	201108162002.dat
<input type="checkbox"/>	201108162129.dat
<input type="checkbox"/>	201108162301.dat
<input type="checkbox"/>	201108170031.dat

 File: 201108170331.dat
 201108170331.dat
 201108170502.dat
 201108170631.dat
 201108170804.dat
 201108170929.dat
 201108171100.dat
 201108171232.dat
 201108171430.dat
 ex_read2.f (Sample Program)

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

Observation	Time and Date	Lat. [°]	Lon. [°]
201108160301	2011-08-16 03:03	38.0959	146.3940
201108160457	2011-08-16 05:06	37.7620	146.3133
201108160630	2011-08-16 06:34	37.4998	146.2371
201108160805	2011-08-16 08:06	37.2471	146.1488
201108160934	2011-08-16 09:35	36.9970	146.0640
201108161104	2011-08-16 11:05	36.7501	145.9890
201108161234	2011-08-16 12:35	36.4960	145.9025
201108161401	2011-08-16 14:05	36.2470	145.8129
201108161646	2011-08-16 16:49	35.9983	145.7616
201108161832	2011-08-16 18:35	35.7435	145.6731
201108162002	2011-08-16 20:03	35.5011	145.5906
201108162129	2011-08-16 21:31	35.2541	145.4978
201108162301	2011-08-16 23:05	35.0143	145.4071
201108170031	2011-08-17 00:34	34.7553	145.3248
201108170200	2011-08-17 02:03	34.5015	145.2440
201108170331	2011-08-17 03:36	34.2506	145.1483
201108170502	2011-08-17 05:05	34.0036	145.0681
201108170631	2011-08-17 06:35	33.7540	144.9930
201108170804	2011-08-17 08:05	33.5005	144.9116
201108170929	2011-08-17 09:35	33.2525	144.8181
201108171100	2011-08-17 11:04	32.9981	144.7341
201108171232	2011-08-17 12:33	32.7455	144.6533
201108171430	2011-08-17 14:33	32.4465	144.5401

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