

MIRAI MR18-04 Leg2 Expendable Conductivity-Temperature-Depth Profiler (XCTD)

Last Modified: 2020-09-30

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

Cruise ID: [MR18-04 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/MR18-04_leg2_all.pdf

For Using Data

Principal Investigator

Data Management Office

Use Constraints

See [Terms and Conditions](#) about constrain of use.

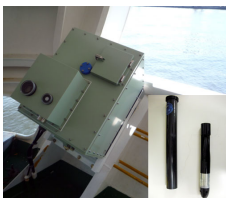
Data Citation

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

Instrument

Instrument:

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



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
201808142012	16070981	XCTD-4	Auto	MK-150N
201808212128	16070982	XCTD-4	Auto	MK-150N
201808241202	18033086	XCTD-1	Auto	MK-150N
201808241503	18033085	XCTD-1	Auto	MK-150N
201808241802	18033087	XCTD-1	Auto	MK-150N
201808242047	18033084	XCTD-1	Auto	MK-150N
201808250000	18033082	XCTD-1	Auto	MK-150N
201808250307	18033083	XCTD-1	Auto	MK-150N
201808250615	18033081	XCTD-1	Auto	MK-150N
201808250903	18033088	XCTD-1	Auto	MK-150N
201808251207	18033089	XCTD-1	Auto	MK-150N
201808271504	18033092	XCTD-1	Auto	MK-150N
201808271759	18033090	XCTD-1	Auto	MK-150N
201808272102	18043295	XCTD-1	Auto	MK-150N
201808280003	18043297	XCTD-1	Auto	MK-150N
201808280302	18043294	XCTD-1	Auto	MK-150N
201808280600	18043293	XCTD-1	Auto	MK-150N
201808280902	18043296	XCTD-1	Auto	MK-150N
201808281202	18043298	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.

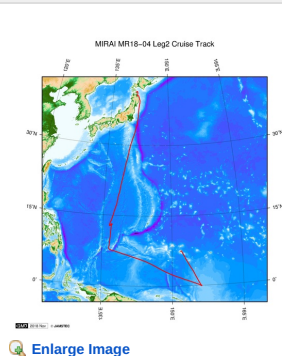
- 1) The gradient check of adjacent depth data
- 2) The density inversion check
- 3) The broad range check set up at given ocean space and depth

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



MR18-04 Leg2

Ship Name: MIRAI

Period: 2018-08-12 - 2018-09-06

Chief Scientist: Masaki Katsumata (JAMSTEC)

Proposal: The observational study to construct and extend the "western Pacific super site network"

Title:

Update History

2020-09-30 An observation data was registerd.

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Update History
Feeds

Lists

Publication List
Amount of Public Info.

Data

Map Search
Data Tree
Detailed Search

Information of the Ships

NATSUSHIMA
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SHINKAI 6500
DEEP TOW
HYPER-DOLPHIN
URASHIMA
YOKOSUKA DEEP TOW
6K Camera DEEP TOW
6K Sonar DEEP TOW
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Cruise ID:

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

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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

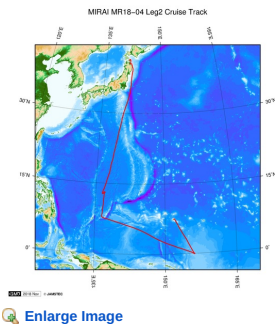
QCed data were added flag according to the NODC (National Oceanographic Data Center) quality control procedure, additionally visually checked. Please see the site of NODC of the following link for quality control procedure.

[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

Period: 2018-08-12 - 2018-09-06

Chief Scientist: Masaki Katsumata (JAMSTEC)

Proposal The observational study to construct and extend the "western Pacific super site network"

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Lists

Publication List

Amount of Public Info.

Data

Map Search

Data Tree

Detailed Search

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POWER GRAB SAMPLER

(SHELL)

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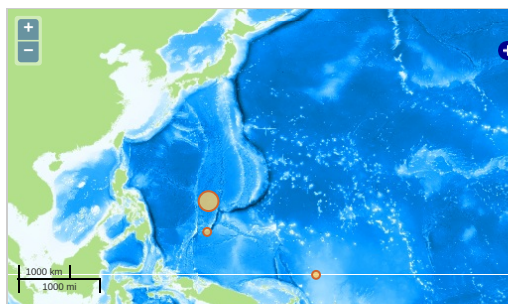
Observation Items: Depth, Temperature, Salinity

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.



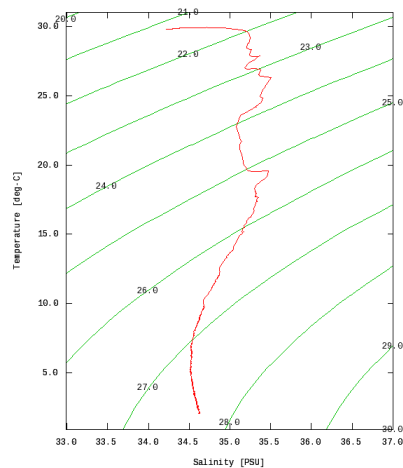
— ... Observation Line — ... Navigation ● ... Observation, Dive Point, Hole

Figures

201808142012



MR18-04 Leg2: 201808142012
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

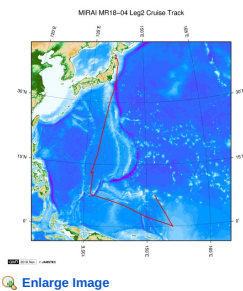
<input type="checkbox"/>	201808142012.dat
<input type="checkbox"/>	201808212128.dat
<input type="checkbox"/>	201808241202.dat
<input type="checkbox"/>	201808241503.dat
<input type="checkbox"/>	201808241802.dat
<input type="checkbox"/>	201808242047.dat
<input type="checkbox"/>	201808250000.dat
<input type="checkbox"/>	201808250307.dat
<input type="checkbox"/>	201808250615.dat
<input type="checkbox"/>	201808250903.dat
<input type="checkbox"/>	201808251207.dat
<input type="checkbox"/>	201808271504.dat
<input type="checkbox"/>	201808271759.dat
<input type="checkbox"/>	201808272102.dat

-  2018082803003.dat
-  201808280302.dat
-  201808280600.dat
-  201808280902.dat
-  201808281202.dat
-  ex_read2.f (Sample Program)

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

Observation	Time and Date	Lat. [°]	Lon. [°]
201808142012	2018-08-14 20:13	0.0358	156.0303
201808212128	2018-08-21 21:29	7.6546	136.6975
201808241202	2018-08-24 12:04	13.1186	136.9421
201808241503	2018-08-24 15:04	13.1226	136.9323
201808241802	2018-08-24 18:03	13.1080	136.9319
201808242047	2018-08-24 20:48	13.0823	137.0820
201808250000	2018-08-25 00:05	13.1563	136.8211
201808250307	2018-08-25 03:08	13.1228	136.9106
201808250615	2018-08-25 06:17	13.1428	136.8930
201808250903	2018-08-25 09:04	13.1581	136.8975
201808251207	2018-08-25 12:08	13.0023	136.6938
201808271504	2018-08-27 15:05	12.9853	136.7210
201808271759	2018-08-27 18:02	12.9060	136.8856
201808272102	2018-08-27 21:04	12.8441	136.8763
201808280003	2018-08-28 00:05	12.8770	136.8779
201808280302	2018-08-28 03:04	12.8866	136.8865
201808280600	2018-08-28 06:01	12.7975	136.4300
201808280902	2018-08-28 09:03	12.8113	136.4261
201808281202	2018-08-28 12:03	12.8234	136.4185

Related Information



 [Enlarge Image](#)

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