

MIRAI MR00-K03 Expendable Conductivity-Temperature-Depth Profiler (XCTD)

Last Modified: 2019-08-28

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

Cruise ID: [MR00-K03](#)

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/MR00-K03_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
200005160603	-	XCTD-1	Auto	MK-100
200005160802	-	XCTD-1	Auto	MK-100
200005161145	-	XCTD-1	Auto	MK-100
200005161442	-	XCTD-1	Auto	MK-100
200005161603	-	XCTD-1	Auto	MK-100
200005171518	-	XCTD-1	Auto	MK-100
200005171737	-	XCTD-1	Auto	MK-100
200005171840	-	XCTD-1	Auto	MK-100
200005181541	-	XCTD-1	Auto	MK-100
200005191432	-	XCTD-1	Auto	MK-100
200005201229	-	XCTD-1	Auto	MK-100
200005211010	-	XCTD-1	Auto	MK-100
200005211554	-	XCTD-1	Auto	MK-100
200005281549	-	XCTD-1	Auto	MK-100
200005281949	-	XCTD-1	Auto	MK-100
200005282303	-	XCTD-1	Auto	MK-100
200005290007	-	XCTD-1	Auto	MK-100
200005290040	-	XCTD-1	Auto	MK-100
200005290152	-	XCTD-1	Auto	MK-100
200005311228	-	XCTD-1	Auto	MK-100
200005311416	-	XCTD-1	Auto	MK-100
200005311530	-	XCTD-1	Auto	MK-100
200006031610	-	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 MR00-K03 Cruise Track

MR00-K03
Ship Name: MIRAI
Period: 2000-05-09 - 2000-06-09
Chief Scientist: Masashi Kusakabe (JAMSTEC)
Project Name: [Station KNOT]

Update History

2019-08-28	An observation data was registered.
2017-06-14	An observation data was registered.
2014-07-12	An observation data was registered.
2014-02-18	An observation data was registered.
2012-12-25	An observation data was registered.

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

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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

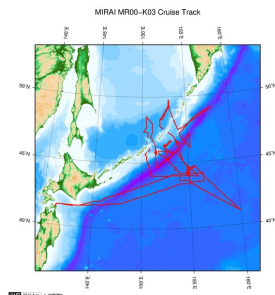
QCed data were added flag according to the NODC (National Oceanographic Data Center) quality control procedure, additionally visually checked. Please see the site of NODC of the following link for quality control procedure.

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

Sample Program

[ex_read2.f](#)

Related Information



[Enlarge Image](#)

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Cruise ID:

Go to a Dive Information

Dive ID:

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Cruise ID: **MR00-K03**

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Data Policy: **JAMSTEC**

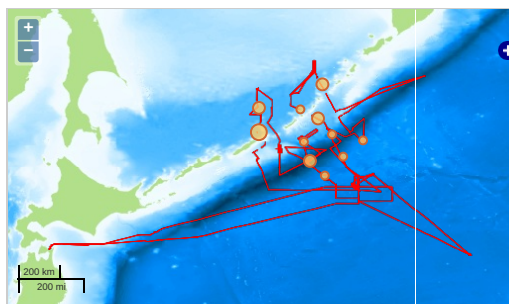
Observation Items: Depth, Temperature, Salinity

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

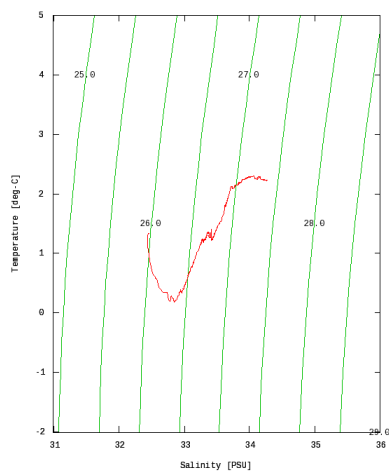
Imagery reproduced from ...

Figures

200005160603



MR00-K03: 200005160603
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"/>	200005160603.dat
<input type="checkbox"/>	200005160802.dat
<input type="checkbox"/>	200005161145.dat
<input type="checkbox"/>	200005161442.dat
<input type="checkbox"/>	200005161603.dat
<input type="checkbox"/>	200005171518.dat
<input type="checkbox"/>	200005171737.dat
<input type="checkbox"/>	200005171840.dat
<input type="checkbox"/>	200005181541.dat
<input type="checkbox"/>	200005191432.dat
<input type="checkbox"/>	200005201229.dat
<input type="checkbox"/>	200005211010.dat
<input type="checkbox"/>	200005211554.dat
<input type="checkbox"/>	200005281549.dat

 200005160603.dat
 200005160802.dat
 200005161145.dat
 200005161442.dat
 200005161603.dat
 200005171518.dat
 200005171737.dat
 200005171840.dat
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 200005211554.dat
 200005281549.dat
 200005281949.dat
 200005282303.dat
 200005290007.dat
 200005290040.dat
 200005290152.dat
 200005311228.dat
 200005311416.dat
 200005311530.dat
 200006031610.dat
 ex_read2.f (Sample Program)

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

Observation	Time and Date	Lat. [°]	Lon. [°]
200005160603	2000-05-16 05:58	46.5898	150.5013
200005160802	2000-05-16 07:57	47.0651	150.6658
200005161145	2000-05-16 11:40	47.3500	150.6450
200005161442	2000-05-16 14:37	47.6703	150.5061
200005161603	2000-05-16 15:58	47.9988	150.4976
200005171518	2000-05-17 15:13	47.2761	151.1383
200005171737	2000-05-17 17:31	46.7363	151.1703
200005171840	2000-05-17 18:35	46.4965	151.3583
200005181541	2000-05-18 15:36	45.3146	152.7691
200005191432	2000-05-19 14:26	45.4171	152.4655
200005201229	2000-05-20 12:23	46.1620	152.5011
200005211010	2000-05-21 10:05	45.0420	152.9535
200005211554	2000-05-21 15:49	44.6651	153.4298
200005281549	2000-05-28 15:44	45.5053	154.2451
200005281949	2000-05-28 19:44	46.4956	153.7473
200005282303	2000-05-28 22:58	47.2008	153.1286
200005290007	2000-05-29 00:02	47.3683	152.8394
200005290040	2000-05-29 00:35	47.4521	152.6991
200005290152	2000-05-29 01:47	47.6028	152.3443
200005311228	2000-05-31 12:23	48.7138	153.3225
200005311416	2000-05-31 14:11	48.2933	153.5636
200005311530	2000-05-31 15:25	48.0065	153.7121
200006031610	2000-06-03 16:04	46.2269	155.1254

Related Information



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