

MIRAI MR01-K02 Expendable Conductivity-Temperature-Depth Profiler (XCTD)

Last Modified: 2019-08-29

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Cruise ID: [MR01-K02](#)

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/MR01-K02_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
200105261936	00113302	XCTD-1	-	MK-100
200105262024	00113300	XCTD-1	-	MK-100
200105262125	00113297	XCTD-1	-	MK-100
200105262224	00113299	XCTD-1	-	MK-100
200105262327	00113298	XCTD-1	-	MK-100
200105270034	00113304	XCTD-1	-	MK-100
200105270134	00113303	XCTD-1	-	MK-100
200105270234	00113306	XCTD-1	-	MK-100
200105270335	00113360	XCTD-1	-	MK-100
200105270435	00113356	XCTD-1	-	MK-100
200105270535	00113357	XCTD-1	-	MK-100
200105270635	00113309	XCTD-1	-	MK-100
200105270735	00113308	XCTD-1	-	MK-100
200105270847	00113350	XCTD-1	-	MK-100
200105270935	00113349	XCTD-1	-	MK-100
200105271035	00113361	XCTD-1	-	MK-100
200105271136	00113351	XCTD-1	-	MK-100
200105271235	00113355	XCTD-1	-	MK-100
200105271335	00113354	XCTD-1	-	MK-100
200105271435	00113353	XCTD-1	-	MK-100
200105271535	00113352	XCTD-1	-	MK-100
200105271635	00113359	XCTD-1	-	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.

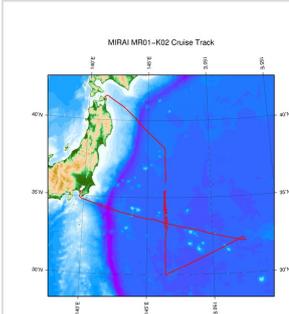
- 1) The gradient check of adjacent depth data
- 2) The density inversion check
- 3) The broad range check set up at given ocean space and depth

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



MR01-K02

Ship Name: MIRAI
 Period: 2001-05-13 - 2001-05-28
 Chief Scientist: Yasushi Yoshikawa (JAMSTEC)

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Update History

2019-08-29	An observation data was registered.
2017-06-14	An observation data was registered.
2014-07-16	An observation data was registered.
2014-02-18	An observation data was registered.
2012-12-25	An observation data was registered.

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 6K Sonar DEEP TOW
 KM-ROV
 POWER GRAB SAMPLER

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Dive ID:

(SHELL)
POWER GRAB SAMPLER
(CLOW)
BMS

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MIRAI MR01-K02 Expendable Conductivity-Temperature-Depth Profiler (XCTD)

Last Modified: 2019-08-29

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Cruise ID: [MR01-K02](#)

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

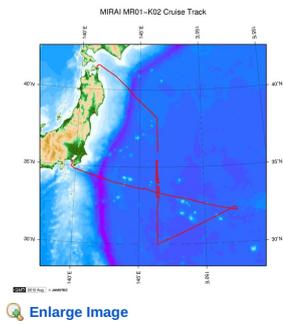
QCed data were added flag according to the NODC (National Oceanographic Data Center) quality control procedure, additionally visually checked. Please see the site of NODC of the following link for quality control procedure.

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

Sample Program

[ex_read2.f](#)

Related Information



MR01-K02
 Ship Name: MIRAI
 Period: 2001-05-13 - 2001-05-28
 Chief Scientist: Yasushi Yoshikawa (JAMSTEC)

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Update History

2019-08-29	An observation data was registerd.
2017-06-14	An observation data was registerd.
2014-07-16	An observation data was registerd.
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- MIRAI
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- KAIMEI
- SHINSEI MARU
- HAKUHO MARU

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- SHINKAI 6500
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- HYPER-DOLPHIN
- URASHIMA
- YOKOSUKA DEEP TOW
- 6K Camera DEEP TOW
- 6K Sonar DEEP TOW
- KM-ROV
- POWER GRAB SAMPLER (SHELL)
- POWER GRAB SAMPLER (CLOW)
- BMS

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MIRAI MR01-K02 Expendable Conductivity-Temperature-Depth Profiler (XCTD)

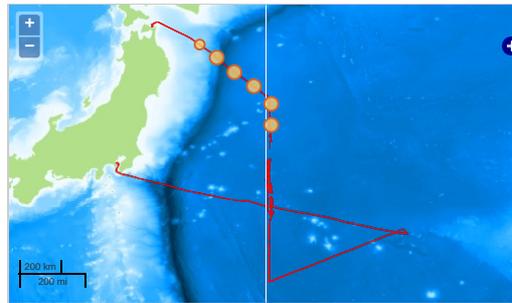
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Cruise ID: **MR01-K02**
 Expendable Conductivity-Temperature-Depth Profiler (XCTD): Processed (DMO)-QCed
 Data Policy: **JAMSTEC**
 Observation Items: Depth, Temperature, Salinity
 Science Keywords:
 OCEANS > OCEAN > WATER
 TEMPERATURE TEMPERATURE
 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

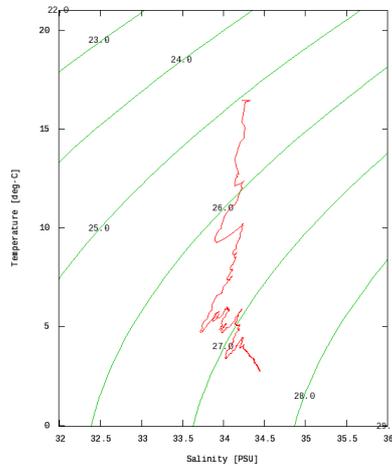
Imagery reproduced from ...

Figures

200105261936



MR01-K02: 200105261936
 Expendable Conductivity-Temperature-Depth Profiler (XCTD): Salinity



Only values evaluated as "good" : all flags are "0" are plotted in profiles.
 Please see Forast Page for the definition of quality flags.

Data List

[Add to Basket](#)

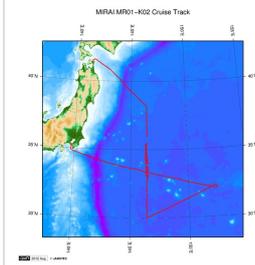
File names
<input type="checkbox"/> 200105261936.dat
<input type="checkbox"/> 200105262024.dat
<input type="checkbox"/> 200105262125.dat
<input type="checkbox"/> 200105262224.dat
<input type="checkbox"/> 200105262327.dat
<input type="checkbox"/> 200105270034.dat
<input type="checkbox"/> 200105270134.dat
<input type="checkbox"/> 200105270234.dat
<input type="checkbox"/> 200105270335.dat
<input type="checkbox"/> 200105270435.dat
<input type="checkbox"/> 200105270535.dat
<input type="checkbox"/> 200105270635.dat
<input type="checkbox"/> 200105270735.dat
<input type="checkbox"/> 200105270847.dat

 200105271035.dat
 200105271035.dat
 200105271136.dat
 200105271235.dat
 200105271335.dat
 200105271435.dat
 200105271535.dat
 200105271635.dat
 ex_read2.f (Sample Program)

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

Observation	Time and Date	Lat. [°]	Lon. [°]
200105261936	2001-05-26 19:31	37.0583	146.4186
200105262024	2001-05-26 20:18	37.2508	146.4165
200105262125	2001-05-26 21:20	37.5003	146.4188
200105262224	2001-05-26 22:19	37.7500	146.4143
200105262327	2001-05-26 23:21	38.0000	146.4160
200105270034	2001-05-27 00:29	38.2298	146.3593
200105270134	2001-05-27 01:29	38.4211	146.1121
200105270234	2001-05-27 02:29	38.6140	145.8685
200105270335	2001-05-27 03:30	38.7868	145.6496
200105270435	2001-05-27 04:30	38.9451	145.4440
200105270535	2001-05-27 05:30	39.0993	145.2308
200105270635	2001-05-27 06:30	39.2533	145.0083
200105270735	2001-05-27 07:30	39.4096	144.7889
200105270847	2001-05-27 08:41	39.6066	144.5458
200105270935	2001-05-27 09:29	39.7370	144.3868
200105271035	2001-05-27 10:30	39.9015	144.1913
200105271136	2001-05-27 11:30	40.0613	144.0110
200105271235	2001-05-27 12:30	40.1791	143.9176
200105271335	2001-05-27 13:30	40.3328	143.6891
200105271435	2001-05-27 14:29	40.4853	143.4696
200105271535	2001-05-27 15:30	40.6386	143.2581
200105271635	2001-05-27 16:30	40.7898	143.0461

Related Information



MR01-K02
Ship Name: MIRAI
Period: 2001-05-13 - 2001-05-28
Chief Scientist: Yasushi Yoshikawa (JAMSTEC)

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