

MIRAI MR03-K04 Leg6 Expendable Conductivity-Temperature-Depth Profiler (XCTD)

Last Modified: 2019-08-29

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

Cruise ID: [MR03-K04 Leg6](#)

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

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
200402111431	03104997	XCTD-1	-	MK-100
200402111445	03105007	XCTD-1	Auto	MK-100
200402111716	03105008	XCTD-1	Auto	MK-100
200402112005	03105005	XCTD-1	Auto	MK-100
200402112253	03105004	XCTD-1	-	MK-100
200402112301	03104998	XCTD-1	Auto	MK-100
200402120133	03105001	XCTD-1	Auto	MK-100
200402120411	03105002	XCTD-1	Auto	MK-100
200402120653	03073835	XCTD-1	Auto	MK-100
200402120922	03105006	XCTD-1	-	MK-100
200402121152	03105003	XCTD-1	Auto	MK-100
200402121511	03105009	XCTD-1	Auto	MK-100
200402121906	03073834	XCTD-1	Auto	MK-100
200402122234	03073836	XCTD-1	Auto	MK-100
200402130122	03105000	XCTD-1	Auto	MK-100
200402130525	03073837	XCTD-1	-	MK-100
200402131003	03073844	XCTD-1	-	MK-100
200402131357	03073842	XCTD-1	-	MK-100
200402131752	03073838	XCTD-1	-	MK-100
200402132152	03073840	XCTD-1	-	MK-100
200402140235	03073839	XCTD-1	-	MK-100
200402140305	03073845	XCTD-1	-	MK-100
200402140332	03073841	XCTD-1	-	MK-100
200402140359	03073843	XCTD-1	-	MK-100
200402140420	03063818	XCTD-1	-	MK-100
200402140450	03063815	XCTD-1	-	MK-100
200402140515	03063820	XCTD-1	-	MK-100
200402140541	03063816	XCTD-1	-	MK-100
200402140607	03063821	XCTD-1	-	MK-100
200402140634	03063817	XCTD-1	-	MK-100
200402140700	03063810	XCTD-1	-	MK-100
200402140726	03063824	XCTD-1	-	MK-100
200402140753	03063811	XCTD-1	-	MK-100
200402140819	03063814	XCTD-1	-	MK-100
200402140833	03063809	XCTD-1	-	MK-100
200402140846	03063808	XCTD-1	-	MK-100
200402140859	03063807	XCTD-1	-	MK-100
200402140912	03063822	XCTD-1	-	MK-100
200402140924	03063823	XCTD-1	-	MK-100
200402140937	03063828	XCTD-1	-	MK-100
200402140950	03063829	XCTD-1	-	MK-100
200402141003	03063825	XCTD-1	-	MK-100
200402141016	03063827	XCTD-1	-	MK-100
200402141028	03063826	XCTD-1	-	MK-100
200402141041	03073832	XCTD-1	-	MK-100
200402141053	03073833	XCTD-1	-	MK-100
200402141117	03063830	XCTD-1	-	MK-100
200402141140	03063795	XCTD-1	-	MK-100
200402141204	03063794	XCTD-1	-	MK-100
200402141233	03063793	XCTD-1	-	MK-100
200402141304	03073831	XCTD-1	-	MK-100
200402141338	03063796	XCTD-1	-	MK-100
200402141413	03063798	XCTD-1	-	MK-100
200402141446	03063797	XCTD-1	-	MK-100
200402141517	03063802	XCTD-1	-	MK-100
200402141751	03063799	XCTD-1	Auto	MK-100
200402142126	03063805	XCTD-1	Auto	MK-100
200402150043	03063801	XCTD-1	Auto	MK-100
200402150346	03063804	XCTD-1	Auto	MK-100
200402150647	03063800	XCTD-1	-	MK-100
200402150944	03105011	XCTD-1	-	MK-100
200402151239	03105016	XCTD-1	-	MK-100
200402151556	03105013	XCTD-1	-	MK-100
200402151911	03105010	XCTD-1	-	MK-100
200402152227	03105017	XCTD-1	-	MK-100
200402160139	03105014	XCTD-1	Auto	MK-100
200402160427	03105021	XCTD-1	Auto	MK-100
200402160715	03105012	XCTD-1	-	MK-100
200402161005	03105019	XCTD-1	-	MK-100

Cruise Name	Probe Serial No.	Probe Type	Launcher	Converter
200402161255	03105019	XCTD-1	-	MK-100
200402161548	03105020	XCTD-1	-	MK-100
200402161855	03105018	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.

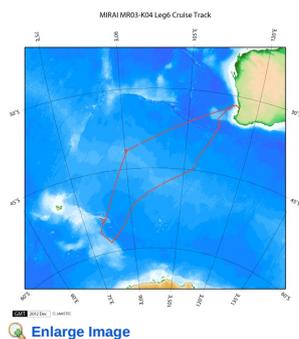
- 1) The gradient check of adjacent depth data
- 2) The density inversion check
- 3) The broad range check set up at given ocean space and depth

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



MR03-K04 Leg6

Ship Name: MIRAI

Period: 2004-01-27 - 2004-02-19

Chief Scientist: Shuichi Watanabe (JAMSTEC)

Project Name: [Blue Earth Global Expedition 2003]

Update History

2019-08-29	An observation data was registered.
2017-06-14	An observation data was registered.
2014-07-24	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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YOKOSUKA

MIRAI

KAIREI

CHIKYU

KAIMEI

SHINSEI MARU

HAKUHO MARU

Information of the Submersibles

KAIKO

SHINKAI 2000

SHINKAI 6500

DEEP TOW

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 MR03-K04 Leg6 Expendable Conductivity-Temperature-Depth Profiler (XCTD)

Last Modified: 2019-08-29

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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

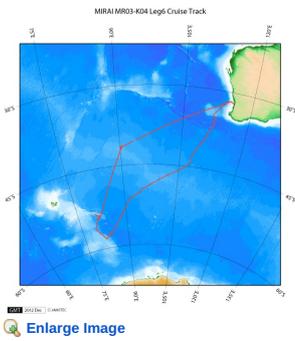
QCed data were added flag according to the NODC (National Oceanographic Data Center) quality control procedure, additionally visually checked. Please see the site of NODC of the following link for quality control procedure.

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Sample Program

[ex_read2.f](#)

Related Information



MR03-K04 Leg6

Ship Name: MIRAI

Period: 2004-01-27 - 2004-02-19

Chief Scientist: Shuichi Watanabe (JAMSTEC)

Project Name: [Blue Earth Global Expedition 2003]

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 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.



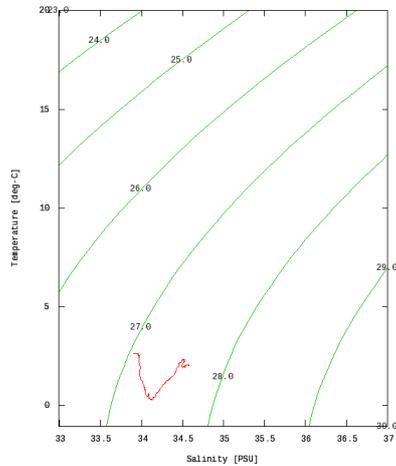
— ... Observation Line — ... Navigation ● ... Observation, Dive Point, Hole

Figures

200402111431



MR03-K04 Leg6: 200402111431
 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"/> 200402111431.dat
<input type="checkbox"/> 200402111445.dat
<input type="checkbox"/> 200402111716.dat
<input type="checkbox"/> 200402112005.dat
<input type="checkbox"/> 200402112253.dat
<input type="checkbox"/> 200402112301.dat
<input type="checkbox"/> 200402120133.dat
<input type="checkbox"/> 200402120411.dat
<input type="checkbox"/> 200402120653.dat
<input type="checkbox"/> 200402120922.dat
<input type="checkbox"/> 200402121152.dat
<input type="checkbox"/> 200402121511.dat
<input type="checkbox"/> 200402121906.dat
<input type="checkbox"/> 200402122234.dat

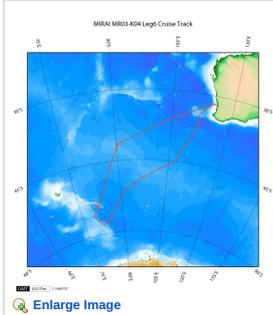
 File names122.dat
 200402130525.dat
 200402131003.dat
 200402131357.dat
 200402131752.dat
 200402132152.dat
 200402140235.dat
 200402140305.dat
 200402140332.dat
 200402140359.dat
 200402140420.dat
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 200402140515.dat
 200402140541.dat
 200402140607.dat
 200402140634.dat
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 200402140726.dat
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 200402151239.dat
 200402151556.dat
 200402151911.dat
 200402152227.dat
 200402160139.dat
 200402160427.dat
 200402160715.dat
 200402161005.dat
 200402161255.dat
 200402161548.dat
 200402161855.dat
 ex_read2.f (Sample Program)

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

Observation	Time and Date	Lat. [°]	Lon. [°]
200402111431	2004-02-11 14:26	-55.5003	87.0971
200402111445	2004-02-11 14:40	-55.4550	87.1473
200402111716	2004-02-11 17:11	-55.0006	87.6563
200402112005	2004-02-11 20:00	-54.5005	88.1821
200402112253	2004-02-11 22:50	-54.0066	88.7275
200402112301	2004-02-11 22:56	-53.9911	88.7433
200402120133	2004-02-12 01:28	-53.5005	89.2555
200402120411	2004-02-12 04:06	-53.0003	89.7518
200402120653	2004-02-12 06:48	-52.5006	90.2906
200402120922	2004-02-12 09:17	-51.9993	90.7910
200402121152	2004-02-12 11:47	-51.5001	91.2748
200402121511	2004-02-12 15:06	-51.0006	92.1956
200402121906	2004-02-12 19:01	-50.5003	93.6070
200402122234	2004-02-12 22:29	-50.0003	94.8400
200402130122	2004-02-13 01:17	-49.5008	95.5903
200402130525	2004-02-13 05:20	-49.0006	96.9281
200402131003	2004-02-13 09:58	-48.5001	98.2131
200402131357	2004-02-13 13:52	-48.0001	99.5014
200402131752	2004-02-13 17:47	-47.5001	100.7931
200402132152	2004-02-13 21:47	-47.0003	102.0313

Observation ID	Time and Date	Lat (°N)	Long (°E)
200402140305	2004-02-14 03:00	-46.4586	103.5848
200402140332	2004-02-14 03:27	-46.4170	103.6928
200402140359	2004-02-14 03:54	-46.3753	103.7998
200402140420	2004-02-14 04:19	-46.3338	103.8950
200402140450	2004-02-14 04:45	-46.2913	104.0011
200402140515	2004-02-14 05:10	-46.2500	104.1020
200402140541	2004-02-14 05:36	-46.2086	104.2020
200402140607	2004-02-14 06:02	-46.1670	104.3043
200402140634	2004-02-14 06:29	-46.1255	104.4058
200402140700	2004-02-14 06:55	-46.0835	104.5053
200402140726	2004-02-14 07:21	-46.0421	104.6033
200402140753	2004-02-14 07:48	-46.0001	104.7045
200402140819	2004-02-14 08:14	-45.9586	104.8040
200402140833	2004-02-14 08:28	-45.9376	104.8558
200402140846	2004-02-14 08:41	-45.9166	104.9058
200402140859	2004-02-14 08:54	-45.8958	104.9553
200402140912	2004-02-14 09:07	-45.8751	105.0023
200402140924	2004-02-14 09:19	-45.8543	105.0496
200402140937	2004-02-14 09:32	-45.8338	105.0966
200402140950	2004-02-14 09:45	-45.8128	105.1453
200402141003	2004-02-14 09:58	-45.7918	105.1930
200402141016	2004-02-14 10:11	-45.7710	105.2413
200402141028	2004-02-14 10:23	-45.7501	105.2886
200402141041	2004-02-14 10:36	-45.7291	105.3353
200402141053	2004-02-14 10:48	-45.7083	105.3810
200402141117	2004-02-14 11:12	-45.6668	105.4676
200402141140	2004-02-14 11:35	-45.6250	105.5521
200402141204	2004-02-14 11:59	-45.5833	105.6363
200402141233	2004-02-14 12:28	-45.5418	105.7403
200402141304	2004-02-14 12:59	-45.5010	105.8480
200402141338	2004-02-14 13:33	-45.4586	105.9681
200402141413	2004-02-14 14:08	-45.4170	106.0935
200402141446	2004-02-14 14:41	-45.3751	106.2098
200402141517	2004-02-14 15:12	-45.3335	106.3146
200402141751	2004-02-14 17:47	-45.0003	107.0111
200402142126	2004-02-14 21:21	-44.5001	107.4921
200402150043	2004-02-15 00:39	-44.0000	107.9005
200402150346	2004-02-15 03:42	-43.4990	107.9528
200402150647	2004-02-15 06:42	-43.0118	108.0098
200402150944	2004-02-15 09:39	-42.4996	108.2393
200402151239	2004-02-15 12:34	-41.9986	108.6156
200402151556	2004-02-15 15:51	-41.4993	108.9725
200402151911	2004-02-15 19:06	-40.9995	109.3823
200402152227	2004-02-15 22:22	-40.5001	109.8261
200402160139	2004-02-16 01:34	-40.0000	110.2541
200402160427	2004-02-16 04:22	-39.5000	110.5485
200402160715	2004-02-16 07:10	-39.0000	110.8105
200402161005	2004-02-16 10:00	-38.4995	111.0786
200402161255	2004-02-16 12:50	-37.9993	111.3393
200402161548	2004-02-16 15:43	-37.4998	111.6133
200402161855	2004-02-16 18:50	-36.9998	111.8833

Related Information



MR03-K04 Leg6
 Ship Name: MIRAI
 Period: 2004-01-27 - 2004-02-19
 Chief Scientist: Shuichi Watanabe (JAMSTEC)
 Project Name: [Blue Earth Global Expedition 2003]

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 KAIMEI

Information of the Submersibles

KAIKO
 SHINKAI 2000
 SHINKAI 6500
 DEEP TOW
 HYPER-DOLPHIN
 URASHIMA

Go to a Cruise Information

Cruise ID:

Go to a Dive Information

Dive ID:

Feeds

SHINSEI MARU
HAKUHO MARU

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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