

MIRAI MR00-K01 Expendable Conductivity-Temperature-Depth Profiler (XCTD)

Last Modified: 2019-08-28

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

Cruise ID: [MR00-K01](#)

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-K01_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
200001070927	-	XCTD-1	-	MK-100
200001080050	-	XCTD-1	-	MK-100
200001081859	-	XCTD-1	-	MK-100
200001101419	-	XCTD-1	-	MK-100
200001111923	-	XCTD-1	-	MK-100
200001120250	-	XCTD-1	-	MK-100
200001121228	-	XCTD-1	-	MK-100
200001121833	-	XCTD-1	-	MK-100
200001122138	-	XCTD-1	-	MK-100
200001130921	-	XCTD-1	-	MK-100
200001131308	-	XCTD-1	-	MK-100
200001131647	-	XCTD-1	-	MK-100
200001131650	-	XCTD-1	-	MK-100
200001132026	-	XCTD-1	-	MK-100
200001140014	-	XCTD-1	-	MK-100
200001140422	-	XCTD-1	-	MK-100
200001140843	-	XCTD-1	-	MK-100
200001141327	-	XCTD-1	-	MK-100
200001141604	-	XCTD-1	-	MK-100
200001190227	-	XCTD-1	-	MK-100
200001190708	-	XCTD-1	-	MK-100
200001230210	-	XCTD-1	-	MK-100
200001231822	-	XCTD-1	-	MK-100
200001232304	-	XCTD-1	-	MK-100
200001240357	-	XCTD-1	-	MK-100
200001240912	-	XCTD-1	-	MK-100
200001240909	-	XCTD-1	-	MK-100
200001241353	-	XCTD-1	-	MK-100
200001250520	-	XCTD-1	-	MK-100
200001270244	-	XCTD-1	-	MK-100
200001270706	-	XCTD-1	-	MK-100
200001271133	-	XCTD-1	-	MK-100
200001271556	-	XCTD-1	-	MK-100
200001281717	-	XCTD-1	-	MK-100
200001282104	-	XCTD-1	-	MK-100
200001290048	-	XCTD-1	-	MK-100
200001310156	-	XCTD-1	-	MK-100
200001310207	-	XCTD-1	-	MK-100
200001310612	-	XCTD-1	-	MK-100
200001311122	-	XCTD-1	-	MK-100
200001311634	-	XCTD-1	-	MK-100
200001312219	-	XCTD-1	-	MK-100
200002010340	-	XCTD-1	-	MK-100
200002011036	-	XCTD-1	-	MK-100
200002011518	-	XCTD-1	-	MK-100
200002012008	-	XCTD-1	-	MK-100
200002020111	-	XCTD-1	-	MK-100
200002020606	-	XCTD-1	-	MK-100
200002021216	-	XCTD-1	-	MK-100
200002021612	-	XCTD-1	-	MK-100
200002041559	-	XCTD-1	-	MK-100
200002050432	-	XCTD-1	-	MK-100
200002050745	-	XCTD-1	-	MK-100
200002051055	-	XCTD-1	-	MK-100
200002051402	-	XCTD-1	-	MK-100
200002051704	-	XCTD-1	-	MK-100
200002052002	-	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.

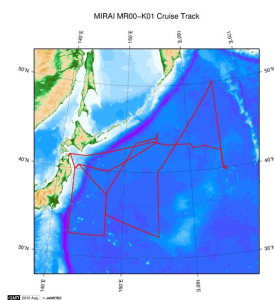
- 1) The gradient check of adjacent depth data
- 2) The density inversion check
- 3) The broad range check set up at given ocean space and depth

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



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MR00-K01

Ship Name: MIRAI

Period: 2000-01-05 - 2000-02-06

Chief Scientist: Makio Honda (JAMSTEC)

Project Name: [Station KEO, Station KNOT]

Update History

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

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国立研究開発法人
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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

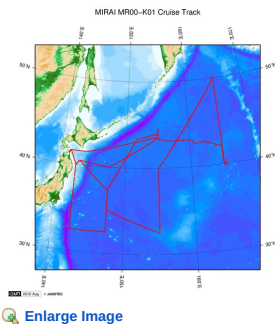
QCed data were added flag according to the NODC (National Oceanographic Data Center) quality control procedure, additionally visually checked. Please see the site of NODC of the following link for quality control procedure.

[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: 2000-01-05 - 2000-02-06
 Chief Scientist: Makio Honda (JAMSTEC)
 Project Name: [Station KEO, Station KNOT]

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国立研究開発法人
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Last Modified: 2019-08-28

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Data Policy: **JAMSTEC**

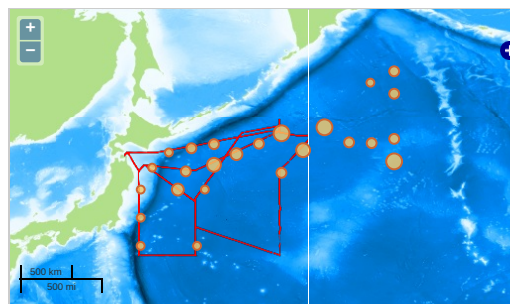
Observation Items: Depth, Temperature, Salinity

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

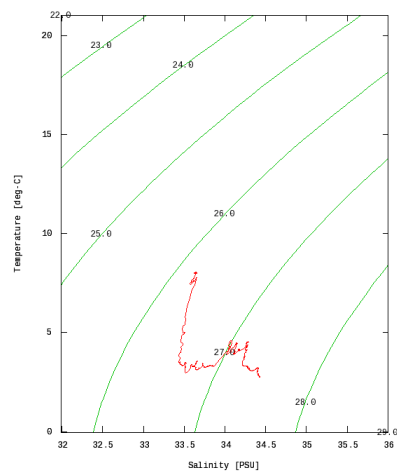
Imagery reproduced from ...

Figures

200001070927



MR00-K01: 200001070927
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"/>	200001070927.dat
<input type="checkbox"/>	200001080050.dat
<input type="checkbox"/>	200001081859.dat
<input type="checkbox"/>	200001101419.dat
<input type="checkbox"/>	200001111923.dat
<input type="checkbox"/>	200001120250.dat
<input type="checkbox"/>	200001121228.dat
<input type="checkbox"/>	200001121833.dat
<input type="checkbox"/>	200001122138.dat
<input type="checkbox"/>	200001130921.dat
<input type="checkbox"/>	200001131308.dat
<input type="checkbox"/>	200001131647.dat
<input type="checkbox"/>	200001131650.dat
<input type="checkbox"/>	200001132026.dat

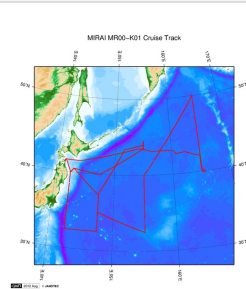
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 200001141604.dat
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 200001190708.dat
 200001230210.dat
 200001231822.dat
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 200002050432.dat
 200002050745.dat
 200002051055.dat
 200002051402.dat
 200002051704.dat
 200002052002.dat
 ex_read2.f (Sample Program)

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

Observation	Time and Date	Lat. [°]	Lon. [°]
200001070927	2000-01-07 09:22	38.4980	142.5008
200001080050	2000-01-08 00:45	36.0020	142.4993
200001081859	2000-01-08 18:54	33.4998	142.4915
200001101419	2000-01-10 14:14	33.4995	147.4951
200001111923	2000-01-11 19:18	38.4990	145.7953
200001120250	2000-01-12 02:45	39.5035	144.3968
200001121228	2000-01-12 12:22	40.4408	143.5178
200001121833	2000-01-12 18:28	40.2185	145.5035
200001122138	2000-01-12 21:33	40.1113	146.5000
200001130921	2000-01-13 09:16	40.2415	147.9983
200001131308	2000-01-13 13:03	40.6968	149.0026
200001131647	2000-01-13 16:42	41.1663	150.0011
200001131650	2000-01-13 16:42	41.1663	150.0011
200001132026	2000-01-13 20:21	41.6440	151.0001
200001140014	2000-01-14 00:09	42.1116	152.0025
200001140422	2000-01-14 04:16	42.5685	152.9925
200001140843	2000-01-14 08:38	43.0438	154.0000
200001141327	2000-01-14 13:22	43.4955	154.9973
200001141604	2000-01-14 15:59	43.9998	155.0135
200001190227	2000-01-19 02:22	39.4940	148.9323
200001190708	2000-01-19 07:03	38.4968	148.1980
200001230210	2000-01-23 02:04	39.9871	154.9923
200001231822	2000-01-23 18:17	41.0021	155.9975
200001232304	2000-01-23 22:58	41.9973	156.9145
200001240357	2000-01-24 03:53	42.9945	157.8348
200001240909	2000-01-24 09:04	44.0276	158.8148
200001240912	2000-01-24 09:04	44.0276	158.8148
200001241353	2000-01-24 13:48	45.0078	159.8053
200001250520	2000-01-25 05:15	47.9893	162.8913
200001270244	2000-01-27 02:39	48.9998	165.0003
200001270706	2000-01-27 07:01	48.0000	165.0118
200001271133	2000-01-27 11:27	47.0056	165.0016
200001271556	2000-01-27 15:51	46.0005	165.0011
200001281717	2000-01-28 17:12	43.0003	165.0045
200001282104	2000-01-28 20:58	42.0003	165.0008

Observation	Time and Date	Lat (°N)	Lon (°E)
200001250048	2000-01-25 00:43	40.9995	164.9193
200001310156	2000-01-31 01:55	40.9995	164.9216
200001310207	2000-01-31 02:02	41.0213	164.9225
200001310612	2000-01-31 06:07	41.9998	164.9158
200001311122	2000-01-31 11:17	42.3365	164.0003
200001311634	2000-01-31 16:30	42.6240	163.0003
200001312219	2000-01-31 22:15	42.7771	162.0000
200002010340	2000-02-01 03:35	42.6888	161.0000
200002011036	2000-02-01 10:31	43.1248	160.0003
200002011518	2000-02-01 15:14	43.1448	159.0008
200002012008	2000-02-01 20:04	43.1463	158.0006
200002020111	2000-02-02 01:07	43.1216	156.9995
200002020606	2000-02-02 06:01	43.2209	156.0001
200002021216	2000-02-02 12:12	43.4993	155.0046
200002021612	2000-02-02 16:07	43.9991	154.9958
200002041559	2000-02-04 15:54	43.4985	154.0004
200002050432	2000-02-05 04:28	42.7396	150.0006
200002050745	2000-02-05 07:40	42.5305	149.0004
200002051055	2000-02-05 10:50	42.3208	148.0001
200002051402	2000-02-05 13:57	42.1651	146.9996
200002051704	2000-02-05 16:59	41.9580	145.9980
200002052002	2000-02-05 19:57	41.7930	144.9998

Related Information



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Period: 2000-01-05 - 2000-02-06
Chief Scientist: Makio Honda (JAMSTEC)
Project Name: [Station KEO, Station KNOT]

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