

MIRAI MR14-05 Expendable Conductivity-Temperature-Depth Profiler (XCTD)

Last Modified: 2019-08-31

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

Cruise ID: [MR14-05](#)

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/MR14-05_all.pdf

For Using Data

Principal Investigator

Data Management Office

Use Constraints

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

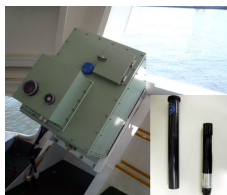
Data Citation

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
201409052106	14046683	XCTD-1	Hand	MK-150N
201409052133	14046686	XCTD-1	Auto	MK-150N
201409052203	14046688	XCTD-1	Auto	MK-150N
201409052232	14046684	XCTD-1	Auto	MK-150N
201409060111	12057588	XCTD-1	Auto	MK-150N
201409060139	14046693	XCTD-1	Auto	MK-150N
201409060215	14046694	XCTD-1	Auto	MK-150N
201409060248	14046690	XCTD-1	Auto	MK-150N
201409060325	13114414	XCTD-1	Auto	MK-150N
201409060411	14046691	XCTD-1	Auto	MK-150N
201409060458	13114413	XCTD-1	Auto	MK-150N
201409060924	14046689	XCTD-1	Auto	MK-150N
201409061042	14046687	XCTD-1	Auto	MK-150N
201409061454	12057590	XCTD-1	Auto	MK-150N
201409061537	12057594	XCTD-1	Auto	MK-150N
201409111005	12057589	XCTD-1	Auto	MK-150N
201409111036	12057593	XCTD-1	Auto	MK-150N
201409111510	12057592	XCTD-1	Auto	MK-150N
201409111559	12057597	XCTD-1	Auto	MK-150N
201409140856	12057596	XCTD-1	Auto	MK-150N
201409140922	12057599	XCTD-1	Auto	MK-150N
201409140948	12057595	XCTD-1	Auto	MK-150N
201409141455	14046598	XCTD-1	Auto	MK-150N
201409141520	12057598	XCTD-1	Auto	MK-150N
201409141546	14046599	XCTD-1	Auto	MK-150N
201409180349	14046597	XCTD-1	Auto	MK-150N
201409180427	14046675	XCTD-1	Auto	MK-150N
201409180440	14046676	XCTD-1	Auto	MK-150N
201409180452	14046682	XCTD-1	Auto	MK-150N
201409180505	14046679	XCTD-1	Auto	MK-150N
201409180516	14046678	XCTD-1	Auto	MK-150N
201409180834	14046600	XCTD-1	Auto	MK-150N
201409180846	14046681	XCTD-1	Auto	MK-150N
201409180859	14046680	XCTD-1	Auto	MK-150N
201409180911	11011574	XCTD-1	Auto	MK-150N
201409180924	11011575	XCTD-1	Auto	MK-150N
201409180936	11011573	XCTD-1	Auto	MK-150N
201409190253	11011578	XCTD-1	Auto	MK-150N
201409190306	11011579	XCTD-1	Auto	MK-150N
201409190320	11011577	XCTD-1	Auto	MK-150N
201409190333	11011581	XCTD-1	Auto	MK-150N
201409190353	11011580	XCTD-1	Auto	MK-150N
201409210118	14015279	XCTD-1	Auto	MK-150N
201409240352	14046685	XCTD-1	Auto	MK-150N
201409240405	12057600	XCTD-1	Auto	MK-150N
201409240417	14046677	XCTD-1	Auto	MK-150N
201409240428	12036666	XCTD-1	Auto	MK-150N
201409240441	12036664	XCTD-1	Auto	MK-150N
201409240453	11011576	XCTD-1	Auto	MK-150N
201409250204	14015282	XCTD-1	Auto	MK-150N
201409250245	14015277	XCTD-1	Auto	MK-150N
201409250319	12036663	XCTD-1	Auto	MK-150N
201409250554	14046692	XCTD-1	Auto	MK-150N
201409250623	14015276	XCTD-1	Auto	MK-150N
201409250651	14015280	XCTD-1	Auto	MK-150N
201409250717	14015285	XCTD-1	Auto	MK-150N
201409251839	14015278	XCTD-1	Auto	MK-150N
201409252157	14015286	XCTD-1	Auto	MK-150N
201409252302	14015284	XCTD-1	Auto	MK-150N
201409260011	14015281	XCTD-1	Auto	MK-150N
201410031300	14015283	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

QC'd data were added (for ascending to the NODC (National Oceanographic Data Center) multi-control procedure.

QCed data were added flag according to the NODC (National Oceanographic Data Center) quality control procedure.

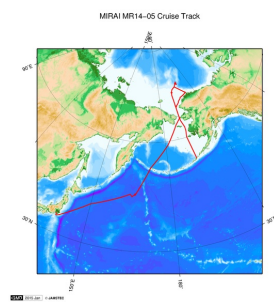
- 1) The gradient check of adjacent depth data
- 2) The density inversion check
- 3) The broad range check set up at given ocean space and depth

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



[Enlarge Image](#)

MR14-05

Ship Name: MIRAI

Period: 2014-08-31 - 2014-10-10

Chief Scientist: Jun Inoue (JAMSTEC)

Project Name: [Arctic Ocean Climate System Research]

Proposal ▶ Predictability study of Arctic cyclones

Title:

Update History

2019-08-31	An observation data was registered.
2017-06-14	An observation data was registered.
2016-10-31	An observation data was registered.

JAMSTEC

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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

Go to a Cruise Information

Cruise ID:

Go

Go to a Dive Information

Dive ID:

Go

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JAPAN AGENCY FOR MARINE-EARTH SCIENCE AND TECHNOLOGY

MIRAI MR14-05 Expendable Conductivity-Temperature-Depth Profiler (XCTD)

Last Modified: 2019-08-31

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

Cruise ID: [MR14-05](#)

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

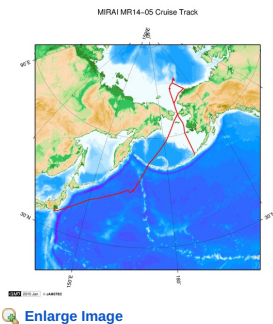
QCed data were added flag according to the NODC (National Oceanographic Data Center) quality control procedure, additionally visually checked. Please see the site of NODC of the following link for quality control procedure.

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

Sample Program

[ex_read2.f](#)

Related Information



MR14-05

Ship Name: MIRAI
Period: 2014-08-31 - 2014-10-10
Chief Scientist: Jun Inoue (JAMSTEC)
Project Name: [Arctic Ocean Climate System Reaserch]
Proposal ▶ Predictability study of Arctic cyclones
Title:

Update History

2019-08-31	An observation data was registerd.
2017-06-14	An observation data was registerd.
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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

Go to a Cruise Information

Cruise ID:

Go to a Dive Information

Dive ID:

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JAMSTEC 国立研究開発法人
海洋研究開発機構
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MIRAI MR14-05 Expendable Conductivity-Temperature-Depth Profiler (XCTD)

Last Modified: 2019-08-31

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

Cruise ID: **MR14-05**

Expendable Conductivity-Temperature-Depth Profiler (XCTD): Processed (DMO)-QCed

Data Policy: **JAMSTEC**

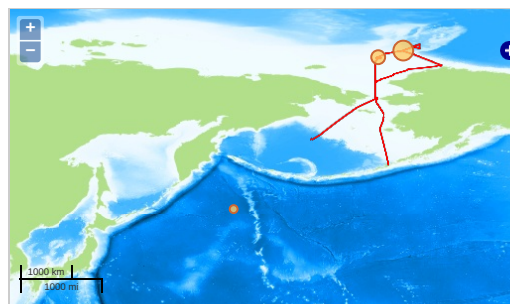
Observation Items: Depth, Temperature, Salinity

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.



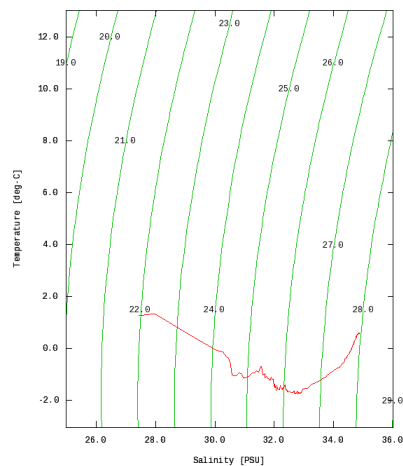
— ... Observation Line — ... Navigation ● ... Observation, Dive Point, Hole

Figures

201409052106



MR14-05: 201409052106
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

☐ 201409052106.dat
☐ 201409052133.dat
☐ 201409052203.dat
☐ 201409052232.dat
☐ 201409060111.dat
☐ 201409060139.dat
☐ 201409060215.dat
☐ 201409060248.dat
☐ 201409060325.dat
☐ 201409060411.dat
☐ 201409060458.dat
☐ 201409060924.dat
☐ 201409061042.dat
☐ 201409061454.dat

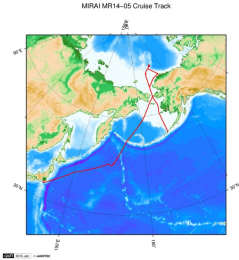
	File names
	201409111005.dat
	201409111036.dat
	201409111510.dat
	201409111559.dat
	201409140856.dat
	201409140922.dat
	201409140948.dat
	201409141455.dat
	201409141520.dat
	201409141546.dat
	201409180349.dat
	201409180427.dat
	201409180440.dat
	201409180452.dat
	201409180505.dat
	201409180516.dat
	201409180834.dat
	201409180846.dat
	201409180859.dat
	201409180911.dat
	201409180924.dat
	201409180936.dat
	201409190253.dat
	201409190306.dat
	201409190320.dat
	201409190333.dat
	201409190353.dat
	201409210118.dat
	201409240352.dat
	201409240405.dat
	201409240417.dat
	201409240428.dat
	201409240441.dat
	201409240453.dat
	201409250204.dat
	201409250245.dat
	201409250319.dat
	201409250554.dat
	201409250623.dat
	201409250651.dat
	201409250717.dat
	201409251839.dat
	201409252157.dat
	201409252302.dat
	201409260011.dat
	201410031300.dat
	ex_read2.f (Sample Program)

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

Observation	Time and Date	Lat. [°]	Lon. [°]
201409052106	2014-09-05 21:08	74.0755	-163.7988
201409052133	2014-09-05 21:37	74.1523	-163.5996
201409052203	2014-09-05 22:06	74.2288	-163.3998
201409052232	2014-09-05 22:34	74.3045	-163.2003
201409060111	2014-09-06 01:12	74.3870	-162.9305
201409060139	2014-09-06 01:41	74.4621	-162.7496
201409060215	2014-09-06 02:17	74.5665	-162.5000
201409060248	2014-09-06 02:51	74.6563	-162.2511
201409060325	2014-09-06 03:26	74.7486	-162.0004
201409060411	2014-09-06 04:12	74.8773	-161.6618
201409060458	2014-09-06 04:59	75.0036	-161.3308
201409060924	2014-09-06 09:25	74.8746	-161.0000
201409061042	2014-09-06 10:43	74.6250	-160.9955
201409061454	2014-09-06 14:55	74.5040	-161.3345
201409061537	2014-09-06 15:39	74.6231	-161.6661
201409111005	2014-09-11 10:06	74.5678	-162.4996
201409111036	2014-09-11 10:39	74.6563	-162.2506
201409111510	2014-09-11 15:11	74.8661	-161.6673
201409111559	2014-09-11 16:00	75.0003	-161.3343
201409140856	2014-09-14 09:00	74.6836	-162.1660
201409140922	2014-09-14 09:25	74.6171	-162.3325
201409140948	2014-09-14 09:50	74.5500	-162.5000
201409141455	2014-09-14 14:56	74.8171	-161.8340
201409141520	2014-09-14 15:21	74.8821	-161.6673
201409141546	2014-09-14 15:47	74.9503	-161.5008
201409180349	2014-09-18 03:51	74.9511	-161.4996
201409180427	2014-09-18 04:28	74.9186	-161.5831
201409180440	2014-09-18 04:41	74.8835	-161.6680
201409180452	2014-09-18 04:53	74.8515	-161.7490
201409180505	2014-09-18 05:06	74.8165	-161.8343
201409180516	2014-09-18 05:18	74.7836	-161.9168


Observation ID	Time and Date	Lat (°N)	Lon (°E)
201409180834	2014-09-18 08:36	74.6830	-162.6813
201409180846	2014-09-18 08:48	74.6830	-162.1658
201409180859	2014-09-18 09:00	74.6504	-162.2503
201409180911	2014-09-18 09:13	74.6165	-162.3330
201409180924	2014-09-18 09:26	74.5818	-162.4170
201409180936	2014-09-18 09:38	74.5486	-162.4993
201409190253	2014-09-19 02:54	74.7200	-161.9171
201409190306	2014-09-19 03:08	74.6881	-161.8338
201409190320	2014-09-19 03:22	74.6556	-161.7488
201409190333	2014-09-19 03:35	74.6256	-161.6645
201409190353	2014-09-19 03:55	74.5930	-161.5861
201409210118	2014-09-21 01:19	74.7580	-162.0311
201409240352	2014-09-24 03:54	74.9500	-161.5058
201409240405	2014-09-24 04:06	74.9146	-161.5830
201409240417	2014-09-24 04:18	74.8798	-161.6663
201409240428	2014-09-24 04:30	74.8506	-161.7488
201409240441	2014-09-24 04:42	74.8168	-161.8331
201409240453	2014-09-24 04:54	74.7860	-161.9161
201409250204	2014-09-25 02:06	74.6551	-162.2508
201409250245	2014-09-25 02:46	74.5603	-162.5036
201409250319	2014-09-25 03:20	74.4668	-162.7540
201409250554	2014-09-25 05:56	74.3001	-163.1995
201409250623	2014-09-25 06:24	74.2265	-163.3991
201409250651	2014-09-25 06:52	74.1521	-163.5993
201409250717	2014-09-25 07:20	74.0753	-163.7993
201409251839	2014-09-25 18:40	72.8991	-168.2506
201409252157	2014-09-25 21:59	72.7498	-168.7506
201409252302	2014-09-25 23:04	72.5996	-168.2561
201409260011	2014-09-26 00:12	72.7503	-167.7501
201410031300	2014-10-03 13:02	45.9228	166.0831

Related Information



MIRAI MR14-05 Cruise Track

MR14-05
Ship Name: MIRAI
Period: 2014-08-31 - 2014-10-10
Chief Scientist: Jun Inoue (JAMSTEC)
Project Name: [Arctic Ocean Climate System Reaserch]
Proposal ▶ Predictability study of Arctic cyclones
Title:


[Enlarge Image](#)

Update History

2019-08-31	An observation data was registered.
2017-06-14	An observation data was registered.
2016-10-31	An observation data was registered.

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Lists

- Publication List
- Amount of Public Info.
- Data
- Map Search
- Data Tree
- Detailed Search

Information of the Ships

- NATSUSHIMA
- KAIYO
- 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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Cruise ID:

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Go to a Dive Information

Dive ID:

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