MIRAI MR03-K03 Leg1 Expendable Conductivity-Temperature-Depth Profiler (XCTD)

Last Modified: 2019-08-29

ReadMe Observation Data   Data Format

Cruise ID: **MR03-K03 Leg1**
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/MR03-K03_leg1-2_all.pdf

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ⓘ **For Using Data**

Principal Investigator
　Data Management Office

　JAMSTEC / BPPT joint cruise in the Indonesian waters.

Use Constraints
　See **Terms and Conditions** about constrain of use.

Data Citation
　See **Terms and Conditions** about data citation.
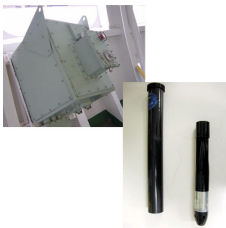

Instrument

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			
Measurment 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
200306090221	02017319	XCTD-1	Auto	MK-100
200306100429	02017322	XCTD-1	Auto	MK-100
200306100826	02017321	XCTD-1	Auto	MK-100
200306110311	02017318	XCTD-1	Auto	MK-100
200306120601	02017315	XCTD-1	Auto	MK-100
200306121005	02017312	XCTD-1	Auto	MK-100
200306130239	02017320	XCTD-1	Auto	MK-100
200306150528	02017311	XCTD-1	Auto	MK-100
200306160313	02017317	XCTD-1	Auto	MK-100
200306181256	02070190	XCTD-1	Auto	MK-100
200306181658	02070193	XCTD-1	Auto	MK-100
200306182054	02017314	XCTD-1	Auto	MK-100
200306190040	02070184	XCTD-1	Auto	MK-100
200306190416	02070191	XCTD-1	Auto	MK-100
200306190743	02070194	XCTD-1	Auto	MK-100
200306191120	02070192	XCTD-1	Auto	MK-100
200306200233	02070185	XCTD-1	Auto	MK-100
200306210535	02070195	XCTD-1	Auto	MK-100
200306210905	02070189	XCTD-1	Auto	MK-100
200306220455	03022136	XCTD-1	Auto	MK-100
200306220709	03022133	XCTD-1	Auto	MK-100
200306220924	02070186	XCTD-1	Auto	MK-100
200306221144	03022116	XCTD-1	Auto	MK-100
200306221400	03022139	XCTD-1	Auto	MK-100
200306221446	03022122	XCTD-1	Auto	MK-100
200306221542	03022123	XCTD-1	Auto	MK-100
200306221639	03022120	XCTD-1	Auto	MK-100
200306221737	03022119	XCTD-1	Auto	MK-100
200306221837	03022115	XCTD-1	Auto	MK-100
200306221935	03022117	XCTD-1	Auto	MK-100
200306222035	03022118	XCTD-1	Auto	MK-100
200306230017	03022130	XCTD-1	Auto	MK-100
200306240331	03022128	XCTD-1	Auto	MK-100
200306250621	03022135	XCTD-1	Auto	MK-100
200306250816	03022132	XCTD-1	Auto	MK-100
200306251014	03022127	XCTD-1	Auto	MK-100
200306251209	02070166	XCTD-1	Auto	MK-100
200306251406	03022138	XCTD-1	Auto	MK-100
200306251604	03022134	XCTD-1	Auto	MK-100
200306251759	02070157	XCTD-1	Auto	MK-100
200306251952	03022131	XCTD-1	Auto	MK-100
200306252149	02070163	XCTD-1	Auto	MK-100
200306252352	03022137	XCTD-1	Auto	MK-100
200306260153	03022121	XCTD-1	Auto	MK-100
200306260355	03022125	XCTD-1	Auto	MK-100
200306260557	02070164	XCTD-1	Auto	MK-100
200306260758	03022126	XCTD-1	Auto	MK-100
200306260959	03022124	XCTD-1	Auto	MK-100
200306261158	03042735	XCTD-1	Auto	MK-100
200306261357	03042736	XCTD-1	Auto	MK-100
200306270253	03042732	XCTD-1	Auto	MK-100
200306270449	03042733	XCTD-1	Auto	MK-100
200306270657	03042734	XCTD-1	Auto	MK-100

Data processing

(1) For sensor's stablility, 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

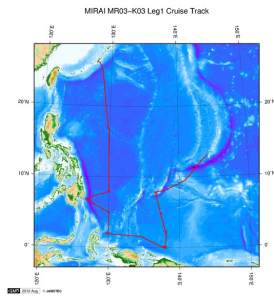QCed data were added flag according to the NODC (National Oceanographic Data Center) quality control procedure.

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 MR03-K03 Leg1 Cruise Track

Enlarge Image

MR03-K03 Leg1
Ship Name: MIRAI
Period: 2003-06-07 - 2003-06-29
Chief Scientist: Hideaki Hase (JAMSTEC)
Project Name: [Tropical Ocean Climate Study (TOCS)]

Update History

2019-08-29	An observation data was registerd.
2017-06-14	An observation data was registerd.
2016-04-07	An observation data was registerd.
2014-07-23	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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KAIREI
CHIKYU
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 MR03-K03 Leg1 Expendable Conductivity-Temperature-Depth Profiler (XCTD)

Last Modified: 2019-08-29

ReadMe **Observation Data** **Data Format**

Cruise ID: **MR03-K03 Leg1**
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

MIRAI MR03-K03 Leg1 Cruise Track

Enlarge Image

MR03-K03 Leg1
Ship Name: MIRAI
Period: 2003-06-07 - 2003-06-29
Chief Scientist: Hideaki Hase (JAMSTEC)
Project Name: [Tropical Ocean Climate Study (TOCS)]

Update History

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Last Modified: 2019-08-29

ReadMe | **Observation Data** | Data Format

Cruise ID: **MR03-K03 Leg1**
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 |

Observation Map

1. Clicking the icon displays a balloon with observation information.
2. Then click the observation name, figures will be displayed.

1000 km
1000 mi

Imagery reproduced from ...

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

Figures

200306090221

MR03-K03 Leg1: 200306090221
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
☐	200306090221.dat
☐	200306100429.dat
☐	200306100826.dat
☐	200306110311.dat
☐	200306120601.dat
☐	200306121005.dat
☐	200306130239.dat
☐	200306150528.dat
☐	200306160313.dat
☐	200306181256.dat
☐	200306181658.dat
☐	200306182054.dat
☐	200306190040.dat
☐	200306190416.dat

- [ ] File3081005743.dat
- [ ] 200306191120.dat
- [ ] 200306200233.dat
- [ ] 200306210535.dat
- [ ] 200306210905.dat
- [ ] 200306220455.dat
- [ ] 200306220709.dat
- [ ] 200306220924.dat
- [ ] 200306221144.dat
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- [ ] 200306221639.dat
- [ ] 200306221737.dat
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- [ ] 200306252352.dat
- [ ] 200306260153.dat
- [ ] 200306260355.dat
- [ ] 200306260557.dat
- [ ] 200306260758.dat
- [ ] 200306260959.dat
- [ ] 200306261158.dat
- [ ] 200306261357.dat
- [ ] 200306270253.dat
- [ ] 200306270449.dat
- [ ] 200306270657.dat
- [ ] ex_read2.f (Sample Program)

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

Observation	Time and Date	Lat. [°]	Lon. [°]
200306090221	2003-06-09 02:16	7.8538	136.5001
200306100429	2003-06-10 04:24	6.9970	136.8390
200306100826	2003-06-10 08:20	6.0005	137.0648
200306110311	2003-06-11 03:06	4.9425	137.3008
200306120601	2003-06-12 05:56	3.9980	137.5585
200306121005	2003-06-12 10:00	3.0003	137.7998
200306130239	2003-06-13 02:34	2.0666	138.0770
200306150528	2003-06-15 05:23	1.0008	138.0670
200306160313	2003-06-16 03:08	0.0560	138.0201
200306181256	2003-06-18 12:51	0.3250	137.0001
200306181658	2003-06-18 16:53	0.8478	135.9828
200306182054	2003-06-18 20:49	1.3633	135.0003
200306190040	2003-06-19 00:35	1.6296	133.9995
200306190416	2003-06-19 04:11	1.7070	133.0000
200306190743	2003-06-19 07:38	1.7805	132.0001
200306191120	2003-06-19 11:15	1.8613	130.9668
200306200233	2003-06-20 02:28	1.9521	129.9268
200306210535	2003-06-21 05:30	3.0008	130.0131
200306210905	2003-06-21 09:00	3.9978	130.0325
200306220455	2003-06-22 04:50	5.0298	129.9856
200306220709	2003-06-22 07:04	5.2873	129.5004
200306220924	2003-06-22 09:19	5.5446	129.0004
200306221144	2003-06-22 11:39	5.8164	128.5004
200306221400	2003-06-22 13:55	6.0926	127.9985
200306221446	2003-06-22 14:41	6.1820	127.8333
200306221542	2003-06-22 15:37	6.2758	127.6666
200306221639	2003-06-22 16:34	6.3675	127.5000
200306221737	2003-06-22 17:32	6.4615	127.3335
200306221837	2003-06-22 18:32	6.5603	127.1668
200306221935	2003-06-22 19:30	6.6506	127.0003
200306222035	2003-06-22 20:31	6.7445	126.8333
200306230017	2003-06-23 00:12	6.7858	126.7058
200306240331	2003-06-24 03:26	7.9248	130.0654
200306250621	2003-06-25 06:16	8.5000	130.0095
200306250816	2003-06-25 08:11	9.0001	129.9915
200306251014	2003-06-25 10:09	9.5001	129.9890
200306251209	2003-06-25 12:04	10.0001	129.9753
200306251406	2003-06-25 14:01	10.5001	129.9668
200306251604	2003-06-25 15:59	11.0003	129.9655

Observation	Time and Date	Lat. [°]	Lon. [°]
2003062517 59	2003-06-25 17:54	11.5005	129.9646
200306251952	2003-06-25 19:47	11.9998	129.9558
200306252149	2003-06-25 21:44	12.5001	129.9511
200306252352	2003-06-25 23:47	12.9998	129.9383
200306260153	2003-06-26 01:48	13.5001	129.9259
200306260355	2003-06-26 03:50	13.9996	129.9118
200306260557	2003-06-26 05:52	14.5000	129.8953
200306260758	2003-06-26 07:53	14.9998	129.9010
200306260959	2003-06-26 09:54	15.5001	129.8931
200306261158	2003-06-26 11:53	16.0001	129.8938
200306261357	2003-06-26 13:52	16.5003	129.8793
200306270253	2003-06-27 02:48	17.0156	129.7761
200306270449	2003-06-27 04:44	17.5005	129.7010
200306270657	2003-06-27 06:52	18.0000	129.6225

Related Information

MIRAI MR03-K03 Leg1 Cruise Track

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MR03-K03 Leg1
Ship Name: MIRAI
Period: 2003-06-07 - 2003-06-29
Chief Scientist: Hideaki Hase (JAMSTEC)
Project Name: [Tropical Ocean Climate Study (TOCS)]

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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)
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