

## MIRAI MR01-K05 Leg2 Expendable Conductivity-Temperature-Depth Profiler (XCTD)

Last Modified: 2019-08-29

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

Cruise ID: [MR01-K05 Leg2](#)

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-K05\\_leg2\\_all.pdf](http://www.godac.jamstec.go.jp/catalog/data/doc_catalog/media/MR01-K05_leg2_all.pdf)

### 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
200110191812	01055316	XCTD-1	Auto	MK-100
200110192027	01055318	XCTD-1	Auto	MK-100
200110192318	01055315	XCTD-1	-	MK-100
200110200204	01055311	XCTD-1	Auto	MK-100
200110200450	01055317	XCTD-1	Auto	MK-100
200110200734	01055313	XCTD-1	Auto	MK-100
200110201015	01075632	XCTD-1	Auto	MK-100
200110201025	01055314	XCTD-1	Auto	MK-100
200110201252	01055312	XCTD-1	Auto	MK-100
200110201526	01055351	XCTD-1	Auto	MK-100
200110201536	01055350	XCTD-1	Auto	MK-100
200110201545	01055352	XCTD-1	Auto	MK-100
200110201555	01075634	XCTD-1	Auto	MK-100
200110201803	01075631	XCTD-1	-	MK-100
200110202345	01075635	XCTD-1	-	MK-100
200110210139	01075636	XCTD-1	-	MK-100
200110210819	01055320	XCTD-1	-	MK-100
200110211404	01055319	XCTD-1	Auto	MK-100
200110211946	01075575	XCTD-1	-	MK-100
200110220147	01075629	XCTD-1	-	MK-100
200110220708	01075633	XCTD-1	-	MK-100
200110221319	01075628	XCTD-1	Auto	MK-100
200110221515	01075574	XCTD-1	Auto	MK-100
200110231334	01075626	XCTD-1	Auto	MK-100
200110232002	01075624	XCTD-1	Auto	MK-100
200110240148	01075627	XCTD-1	-	MK-100
200110240413	01075630	XCTD-1	-	MK-100
200110240738	01075576	XCTD-1	-	MK-100
200110240748	01055327	XCTD-1	-	MK-100
200110241330	01055321	XCTD-1	Auto	MK-100
200110241528	01075581	XCTD-1	Auto	MK-100
200110241726	01055322	XCTD-1	-	MK-100
200110242313	01075584	XCTD-1	-	MK-100
200110250109	01075580	XCTD-1	-	MK-100
200110250305	01075578	XCTD-1	-	MK-100
200110260511	01075583	XCTD-1	-	MK-100
200110260907	01075577	XCTD-1	-	MK-100
200110261113	01075582	XCTD-1	Auto	MK-100
200110261319	01075621	XCTD-1	Auto	MK-100
200110261525	01075623	XCTD-1	Auto	MK-100
200110261731	01075585	XCTD-1	Auto	MK-100
200110261940	01075594	XCTD-1	Auto	MK-100
200110262148	01075622	XCTD-1	Auto	MK-100
200110262354	01075579	XCTD-1	Auto	MK-100
200110270157	01075592	XCTD-1	Auto	MK-100
200110270359	01075593	XCTD-1	Auto	MK-100
200110270611	01075590	XCTD-1	Auto	MK-100
200110270825	01075589	XCTD-1	Auto	MK-100
200110271033	01075586	XCTD-1	Auto	MK-100
200110271242	01075587	XCTD-1	Auto	MK-100
200110271523	01075564	XCTD-1	Auto	MK-100
200110271801	01075591	XCTD-1	Auto	MK-100
200110272040	01075567	XCTD-1	Auto	MK-100
200110272325	01075561	XCTD-1	-	MK-100
200110280211	01075563	XCTD-1	-	MK-100
200110280500	01075562	XCTD-1	-	MK-100
200110280745	01075588	XCTD-1	-	MK-100
200110281028	01075568	XCTD-1	Auto	MK-100
200110281309	01075572	XCTD-1	Auto	MK-100
200110281559	01055378	XCTD-1	Auto	MK-100
200110281856	01075565	XCTD-1	Auto	MK-100
200110282144	01075570	XCTD-1	Auto	MK-100
200110290029	01075569	XCTD-1	-	MK-100
200110290318	01075573	XCTD-1	-	MK-100
200110290604	01075571	XCTD-1	-	MK-100

Cast name	Probe Serial No.	Probe Type	Launcher	Converter
200110290846	01055374	XCTD-1	Auto	MK-100
200110291340	01055382	XCTD-1	Auto	MK-100
200110291854	01055377	XCTD-1	Auto	MK-100
200110300001	01055381	XCTD-1	-	MK-100
200110300459	01055371	XCTD-1	-	MK-100
200110300923	01055375	XCTD-1	Auto	MK-100
200110301326	01055383	XCTD-1	Auto	MK-100
200110301717	01055372	XCTD-1	-	MK-100
200110302119	01055373	XCTD-1	-	MK-100
200110302131	01055258	XCTD-1	-	MK-100
200110310131	01055384	XCTD-1	-	MK-100
200110310600	01055259	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.

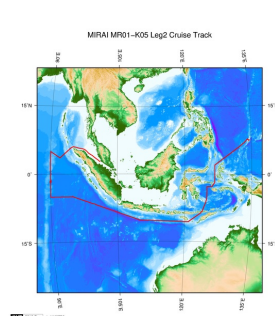
- 1) The gradient check of adjacent depth data
- 2) The density inversion check
- 3) The broad range check set up at given ocean space and depth

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



[Enlarge Image](#)

#### MR01-K05 Leg2

Ship Name: MIRAI  
Period: 2001-10-18 - 2001-11-05  
Chief Scientist: Keisuke Mizuno (JAMSTEC)  
Project Name: [Tropical Ocean Climate Study (TOCS)]

#### Update History

2019-08-29	An observation data was registered.
2017-06-14	An observation data was registered.
2016-10-11	An observation data was registered.

#### JAMSTEC

Site Policy  
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Application for Data and Samples  
Data Policy  
What's New  
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Feeds

#### 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

KAICO  
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:



## MIRAI MR01-K05 Leg2 Expendable Conductivity-Temperature-Depth Profiler (XCTD)

Last Modified: 2019-08-29

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

 Cruise ID: [MR01-K05 Leg2](#)

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 : <a href="#">'Definition of Quality Control Flags'</a>
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

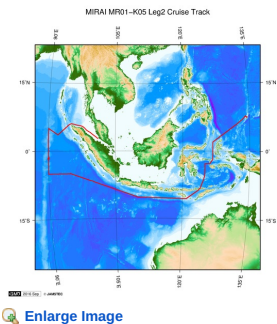
QCed data were added flag according to the NODC (National Oceanographic Data Center) quality control procedure, additionally visually checked. Please see the site of NODC of the following link for quality control procedure.

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

#### Sample Program

[ex\\_read2.f](#)

#### Related Information



#### MR01-K05 Leg2

Ship Name: MIRAI

Period: 2001-10-18 - 2001-11-05

Chief Scientist: Keisuke Mizuno (JAMSTEC)

Project Name: [Tropical Ocean Climate Study (TOCS)]

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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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JAPAN AGENCY FOR MARINE-EARTH SCIENCE AND TECHNOLOGY

## MIRAI MR01-K05 Leg2 Expendable Conductivity-Temperature-Depth Profiler (XCTD)

Last Modified: 2019-08-29

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Cruise ID: [MR01-K05 Leg2](#)

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

Data Policy: [JAMSTEC](#)

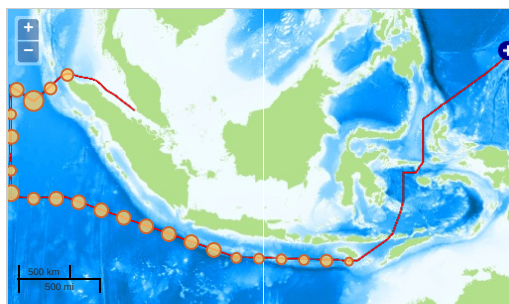
Observation Items: Depth, Temperature, Salinity

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.

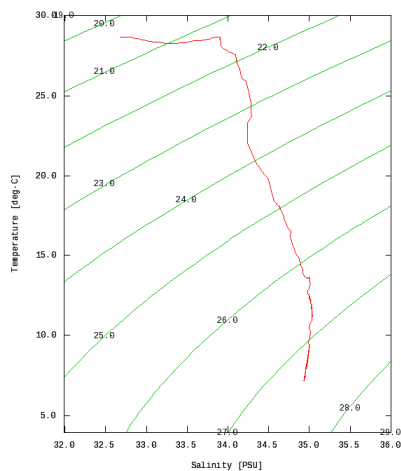


### Figures

200110191812



MR01-K05 Leg2: 200110191812  
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"/>	200110191812.dat
<input type="checkbox"/>	200110192027.dat
<input type="checkbox"/>	200110192318.dat
<input type="checkbox"/>	200110200204.dat
<input type="checkbox"/>	200110200450.dat
<input type="checkbox"/>	200110200734.dat
<input type="checkbox"/>	200110201015.dat
<input type="checkbox"/>	200110201025.dat
<input type="checkbox"/>	200110201252.dat
<input type="checkbox"/>	200110201526.dat
<input type="checkbox"/>	200110201536.dat
<input type="checkbox"/>	200110201545.dat
<input type="checkbox"/>	200110201555.dat
<input type="checkbox"/>	200110201803.dat

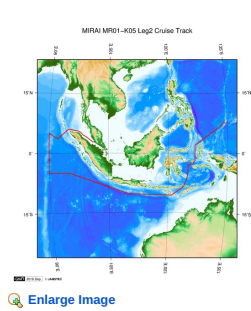
	200110210345.dat
	200110210139.dat
	200110210819.dat
	200110211404.dat
	200110211946.dat
	200110220147.dat
	200110220708.dat
	200110221319.dat
	200110221515.dat
	200110231334.dat
	200110232002.dat
	200110240148.dat
	200110240413.dat
	200110240738.dat
	200110240748.dat
	200110241330.dat
	200110241528.dat
	200110241726.dat
	200110242313.dat
	200110250109.dat
	200110250305.dat
	200110260511.dat
	200110260907.dat
	200110261113.dat
	200110261319.dat
	200110261525.dat
	200110261731.dat
	200110261940.dat
	200110262148.dat
	200110262354.dat
	200110270157.dat
	200110270359.dat
	200110270611.dat
	200110270825.dat
	200110271033.dat
	200110271242.dat
	200110271523.dat
	200110271801.dat
	200110272040.dat
	200110272325.dat
	200110280211.dat
	200110280500.dat
	200110280745.dat
	200110281028.dat
	200110281309.dat
	200110281559.dat
	200110281856.dat
	200110282144.dat
	200110290029.dat
	200110290318.dat
	200110290604.dat
	200110290846.dat
	200110291340.dat
	200110291854.dat
	200110300001.dat
	200110300459.dat
	200110300923.dat
	200110301326.dat
	200110301717.dat
	200110302119.dat
	200110302131.dat
	200110310131.dat
	200110310600.dat
	ex_read2.f (Sample Program)

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

Observation	Time and Date	Lat. [°]	Lon. [°]
200110191812	2001-10-19 18:07	5.9958	95.0005
200110192027	2001-10-19 20:22	5.7071	94.5010
200110192318	2001-10-19 23:12	5.2485	94.0010
200110200204	2001-10-20 01:59	4.7926	93.5008
200110200450	2001-10-20 04:45	4.3425	93.0011
200110200734	2001-10-20 07:29	3.8790	92.5010
200110201015	2001-10-20 10:10	3.6908	92.0006
200110201025	2001-10-20 10:20	3.7055	91.9766
200110201252	2001-10-20 12:47	4.0178	91.5000
200110201526	2001-10-20 15:21	4.3531	91.0000
200110201536	2001-10-20 15:30	4.3678	90.9760
200110201545	2001-10-20 15:40	4.3826	90.9520
200110201555	2001-10-20 15:50	4.3975	90.9276
200110201803	2001-10-20 17:58	4.6686	90.5003
200110202345	2001-10-20 23:39	4.9855	89.9966

Observations	Time and Date	Lat (°N)	Long (°E)
200110210139	2001-10-21 01:34	3.5001	90.0014
200110210819	2001-10-21 08:14	3.5001	90.0014
200110211404	2001-10-21 13:59	2.4891	89.9991
200110211946	2001-10-21 19:41	1.5001	90.0023
200110220147	2001-10-22 01:41	0.5001	90.0311
200110220708	2001-10-22 07:03	0.0015	90.0510
200110221319	2001-10-22 13:13	-0.4996	89.9970
200110221515	2001-10-22 15:10	-1.0028	89.9983
200110231334	2001-10-23 13:28	-2.5000	90.0021
200110232002	2001-10-23 19:57	-3.4996	90.0038
200110240148	2001-10-24 01:43	-4.5000	89.9965
200110240413	2001-10-24 04:07	-5.0003	90.0010
200110240738	2001-10-24 07:33	-5.0048	90.4996
200110240748	2001-10-24 07:43	-5.0050	90.5318
200110241330	2001-10-24 13:25	-4.9986	91.5001
200110241528	2001-10-24 15:23	-4.9991	91.9996
200110241726	2001-10-24 17:21	-4.9973	92.5000
200110242313	2001-10-24 23:08	-4.9986	93.5000
200110250109	2001-10-25 01:04	-4.9988	94.0003
200110250305	2001-10-25 02:59	-4.9998	94.4998
200110260511	2001-10-26 05:06	-4.9621	94.9821
200110260907	2001-10-26 09:02	-5.1375	95.5003
200110261113	2001-10-26 11:08	-5.3120	95.9998
200110261319	2001-10-26 13:14	-5.4908	96.4998
200110261525	2001-10-26 15:19	-5.6661	97.0003
200110261731	2001-10-26 17:25	-5.8446	97.5001
200110261940	2001-10-26 19:35	-6.0228	97.9998
200110262148	2001-10-26 21:43	-6.1968	98.4998
200110262354	2001-10-26 23:49	-6.3743	99.0000
200110270157	2001-10-27 01:52	-6.5496	99.4996
200110270359	2001-10-27 03:54	-6.6785	100.0000
200110270611	2001-10-27 06:06	-6.9056	100.5001
200110270825	2001-10-27 08:19	-7.0826	100.9998
200110271033	2001-10-27 10:28	-7.2618	101.4998
200110271242	2001-10-27 12:37	-7.4398	102.0001
200110271523	2001-10-27 15:18	-7.6150	102.5001
200110271801	2001-10-27 17:56	-7.7843	103.0001
200110272040	2001-10-27 20:35	-7.9615	103.4998
200110272325	2001-10-27 23:20	-8.1351	103.9996
200110280211	2001-10-28 02:06	-8.3183	104.5000
200110280500	2001-10-28 04:55	-8.5055	104.9998
200110280745	2001-10-28 07:39	-8.6688	105.5000
200110281028	2001-10-28 10:22	-8.8455	105.9998
200110281309	2001-10-28 13:04	-9.0115	106.5000
200110281559	2001-10-28 15:53	-9.1943	107.0000
200110281856	2001-10-28 18:50	-9.3713	107.5000
200110282144	2001-10-28 21:39	-9.5433	108.0003
200110290029	2001-10-29 00:24	-9.7178	108.5000
200110290318	2001-10-29 03:13	-9.8971	109.0001
200110290604	2001-10-29 05:59	-10.0711	109.5000
200110290846	2001-10-29 08:41	-10.2475	109.9998
200110291340	2001-10-29 13:35	-10.2863	111.0000
200110291854	2001-10-29 18:49	-10.3176	112.0003
200110300001	2001-10-29 23:56	-10.3463	113.0001
200110300459	2001-10-30 04:54	-10.3716	113.9995
200110300923	2001-10-30 09:18	-10.4056	114.9996
200110301326	2001-10-30 13:21	-10.4370	116.0001
200110301717	2001-10-30 17:12	-10.4605	117.0000
200110302119	2001-10-30 21:14	-10.4983	118.0001
200110302131	2001-10-30 21:25	-10.4998	118.0358
200110310131	2001-10-31 01:26	-10.5205	119.0000
200110310600	2001-10-31 05:54	-10.5770	120.0000

Related Information



**MR01-K05 Leg2**  
Ship Name: MIRAI  
Period: 2001-10-18 - 2001-11-05  
Chief Scientist: Keisuke Mizuno (JAMSTEC)  
Project Name: [Tropical Ocean Climate Study (TOCS)]

Update History



2019-08-29	An observation data was registered.
2017-06-14	An observation data was registered.
2016-10-11	An observation data was registered.

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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 to a Dive Information

Dive ID:

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