

## MIRAI MR00-K06 Expendable Conductivity-Temperature-Depth Profiler (XCTD)

Last Modified: 2019-08-28

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

Cruise ID: [MR00-K06](#)

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
200009080404	-	XCTD-1	Hand	MK-100
200009080428	-	XCTD-1	Hand	MK-100
200009080453	-	XCTD-1	Hand	MK-100
200009080517	-	XCTD-1	Hand	MK-100
200009080541	-	XCTD-1	Hand	MK-100
200009080605	-	XCTD-1	Hand	MK-100
200009080628	-	XCTD-1	Hand	MK-100
200009080651	-	XCTD-1	Hand	MK-100
200009080714	-	XCTD-1	Hand	MK-100
200009080737	-	XCTD-1	-	MK-100
200009080759	-	XCTD-1	Hand	MK-100
200009080822	-	XCTD-1	Hand	MK-100
200009080840	-	XCTD-1	Hand	MK-100
200009100107	-	XCTD-1	Hand	MK-100
200009100118	-	XCTD-1	Hand	MK-100
200009100416	-	XCTD-1	Hand	MK-100
200009120025	-	XCTD-1	Hand	MK-100
200009120051	-	XCTD-1	Hand	MK-100
200009120117	-	XCTD-1	Hand	MK-100
200009120151	-	XCTD-1	-	MK-100
200009120219	-	XCTD-1	Hand	MK-100
200009120247	-	XCTD-1	Hand	MK-100
200009120317	-	XCTD-1	Hand	MK-100
200009120345	-	XCTD-1	Hand	MK-100
200009120415	-	XCTD-1	Hand	MK-100
200009120445	-	XCTD-1	Hand	MK-100
200009120515	-	XCTD-1	Hand	MK-100
200009120546	-	XCTD-1	Hand	MK-100
200009120618	-	XCTD-1	Hand	MK-100
200009120647	-	XCTD-1	Hand	MK-100
200009120726	-	XCTD-1	Hand	MK-100
200009120754	-	XCTD-1	Hand	MK-100
200009120826	-	XCTD-1	Hand	MK-100
200009120856	-	XCTD-1	Hand	MK-100
200009120925	-	XCTD-1	Hand	MK-100
200009120953	-	XCTD-1	Hand	MK-100
200009121021	-	XCTD-1	Hand	MK-100
200009121053	-	XCTD-1	Hand	MK-100
200009121127	-	XCTD-1	Hand	MK-100
200009121152	-	XCTD-1	Hand	MK-100
200009121221	-	XCTD-1	Hand	MK-100
200009121251	-	XCTD-1	Hand	MK-100
200009121329	-	XCTD-1	Hand	MK-100
200009121408	-	XCTD-1	Hand	MK-100
200009121444	-	XCTD-1	Hand	MK-100
200009121506	-	XCTD-1	Hand	MK-100
200009121817	-	XCTD-1	Hand	MK-100
200009121854	-	XCTD-1	Hand	MK-100
200009121947	-	XCTD-1	Hand	MK-100
200009122022	-	XCTD-1	Hand	MK-100
200009122059	-	XCTD-1	Hand	MK-100
200009122138	-	XCTD-1	Hand	MK-100
200009122215	-	XCTD-1	Hand	MK-100
200009122250	-	XCTD-1	Hand	MK-100
200009122326	-	XCTD-1	-	MK-100
200009130002	-	XCTD-1	-	MK-100
200009130040	-	XCTD-1	-	MK-100
200009130114	-	XCTD-1	-	MK-100
200009130246	-	XCTD-1	-	MK-100
200009130321	-	XCTD-1	-	MK-100
200009130357	-	XCTD-1	-	MK-100
200009130438	-	XCTD-1	-	MK-100
200009130521	-	XCTD-1	-	MK-100
200009130547	-	XCTD-1	-	MK-100
200009130632	-	XCTD-1	-	MK-100
200009130659	-	XCTD-1	-	MK-100
200009130725	-	XCTD-1	-	MK-100
200009150116	-	XCTD-1	-	MK-100
200009150127	-	XCTD-1	-	MK-100

Cast name	Probe Serial No.	Probe Type	Launcher	Converter
200009150138	-	XCTD-1	-	MK-100
200009150149	-	XCTD-1	-	MK-100
200009150201	-	XCTD-1	-	MK-100
200009250351	-	XCTD-1	-	MK-100
200009250417	-	XCTD-1	-	MK-100
200009250626	-	XCTD-1	-	MK-100
200009250658	-	XCTD-1	-	MK-100
200009250727	-	XCTD-1	-	MK-100
200009250756	-	XCTD-1	-	MK-100
200009250824	-	XCTD-1	-	MK-100
200009252225	99094032	XCTD-1	-	MK-100
200009252252	99094028	XCTD-1	-	MK-100
200009260108	99094029	XCTD-1	-	MK-100
200009260134	99094031	XCTD-1	Hand	MK-100
200009260200	-	XCTD-1	-	MK-100
200009260224	-	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.

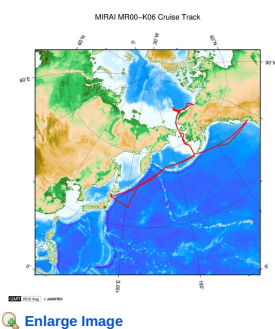
- 1) The gradient check of adjacent depth data
- 2) The density inversion check
- 3) The broad range check set up at given ocean space and depth

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



#### MR00-K06

Ship Name: MIRAI  
 Period: 2000-08-03 - 2000-10-13  
 Chief Scientist: Takatoshi Takizawa (JAMSTEC)  
 Project Name: [Arctic Ocean Climate System Reaserch]

#### 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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 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

#### Go to a Cruise Information

Cruise ID:

#### Go to a Dive Information

Dive ID:



## MIRAI MR00-K06 Expendable Conductivity-Temperature-Depth Profiler (XCTD)

Last Modified: 2019-08-28

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Cruise ID: [MR00-K06](#)

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

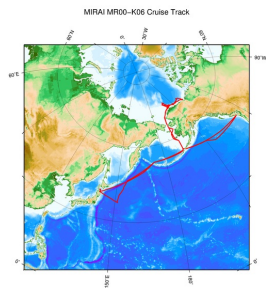
QCed data were added flag according to the NODC (National Oceanographic Data Center) quality control procedure, additionally visually checked. Please see the site of NODC of the following link for quality control procedure.

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

#### Sample Program

[ex\\_read2.f](#)

#### Related Information



[Enlarge Image](#)

#### MR00-K06

Ship Name: MIRAI

Period: 2000-08-03 - 2000-10-13

Chief Scientist: Takatoshi Takizawa (JAMSTEC)

Project Name: [Arctic Ocean Climate System Research]

#### Update History

2019-08-28	An observation data was registered.
2017-06-14	An observation data was registered.
2014-07-12	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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#### Data

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[KAIYO](#)

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[CHIKYU](#)

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#### Information of the Submersibles

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[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 MR00-K06 Expendable Conductivity-Temperature-Depth Profiler (XCTD)

Last Modified: 2019-08-28

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Cruise ID: **MR00-K06**

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

Data Policy: **JAMSTEC**

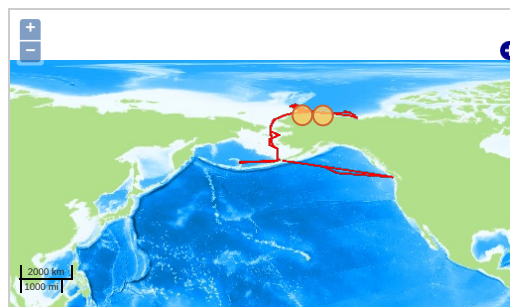
Observation Items: Depth, Temperature, Salinity

Science Keywords:

OCEANS > OCEAN > WATER  
TEMPERATURE  
OCEANS > SALINITY/DENSITY > SALINITY

### Observation Map

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



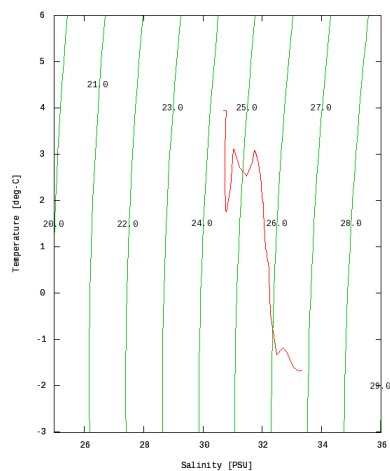
— ... Observation Line — ... Navigation ● ... Observation, Dive Point, Hole

### Figures

200009080404



MR00-K06: 200009080404  
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"/>	200009080404.dat
<input type="checkbox"/>	200009080428.dat
<input type="checkbox"/>	200009080453.dat
<input type="checkbox"/>	200009080517.dat
<input type="checkbox"/>	200009080541.dat
<input type="checkbox"/>	200009080605.dat
<input type="checkbox"/>	200009080628.dat
<input type="checkbox"/>	200009080651.dat
<input type="checkbox"/>	200009080714.dat
<input type="checkbox"/>	200009080737.dat
<input type="checkbox"/>	200009080759.dat
<input type="checkbox"/>	200009080822.dat
<input type="checkbox"/>	200009080840.dat
<input type="checkbox"/>	200009100107.dat

	200009118.dat
	200009100416.dat
	200009120025.dat
	200009120051.dat
	200009120117.dat
	200009120151.dat
	200009120219.dat
	200009120247.dat
	200009120317.dat
	200009120345.dat
	200009120415.dat
	200009120445.dat
	200009120515.dat
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	200009120856.dat
	200009120925.dat
	200009120953.dat
	200009121021.dat
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	200009121127.dat
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	200009121251.dat
	200009121329.dat
	200009121408.dat
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	200009122215.dat
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	200009122326.dat
	200009130002.dat
	200009130040.dat
	200009130114.dat
	200009130246.dat
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	200009130547.dat
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	200009150138.dat
	200009150149.dat
	200009150201.dat
	200009250351.dat
	200009250417.dat
	200009250626.dat
	200009250658.dat
	200009250727.dat
	200009250756.dat
	200009250824.dat
	200009252225.dat
	200009252252.dat
	200009260108.dat
	200009260134.dat
	200009260200.dat
	200009260224.dat
	ex_read2.f (Sample Program)

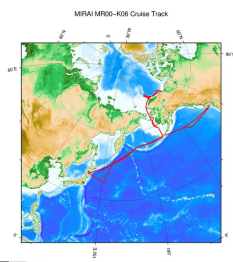
● Observation List  
The list of observation is shown as follows.

Observation	Time and Date	Lat. [°]	Lon. [°]
200009080404	2000-09-08 04:04	71.3379	-157.9824
200009080428	2000-09-08 04:28	71.3760	-157.7423
200009080453	2000-09-08 04:52	71.4138	-157.4966
200009080517	2000-09-08 05:16	71.4509	-157.2540
200009080541	2000-09-08 05:41	71.4876	-157.0000
200009080605	2000-09-08 06:05	71.5231	-156.7498
200009080628	2000-09-08 06:28	71.5583	-156.5001

Observation	Time and Date	Lat. (°)	Lon. (°)
20000908051	2000-09-08 08:50	71.6530	-158.1911
200009080714	2000-09-08 07:14	71.6276	-156.0000
200009080737	2000-09-08 07:36	71.6615	-155.7470
200009080759	2000-09-08 07:58	71.6946	-155.4981
200009080822	2000-09-08 08:21	71.7341	-155.2498
200009080840	2000-09-08 08:38	71.7610	-155.0680
200009100107	2000-09-10 01:02	72.0641	-154.5073
200009100118	2000-09-10 01:13	72.0628	-154.5081
200009100416	2000-09-10 04:10	72.0641	-154.5080
200009120025	2000-09-12 00:20	74.1135	-159.5571
200009120051	2000-09-12 00:46	74.0565	-159.7833
200009120117	2000-09-12 01:12	74.0011	-160.0029
200009120151	2000-09-12 01:45	73.9651	-160.3628
200009120219	2000-09-12 02:14	73.9425	-160.6870
200009120247	2000-09-12 02:41	73.8860	-160.9385
200009120317	2000-09-12 03:11	73.8125	-161.1730
200009120345	2000-09-12 03:41	73.7201	-161.3350
200009120415	2000-09-12 04:12	73.6406	-161.1788
200009120445	2000-09-12 04:42	73.5661	-160.9503
200009120515	2000-09-12 05:12	73.4798	-160.7975
200009120546	2000-09-12 05:41	73.3928	-160.6525
200009120618	2000-09-12 06:12	73.3303	-160.4048
200009120647	2000-09-12 06:41	73.2841	-160.1190
200009120726	2000-09-12 07:20	73.2291	-159.7380
200009120754	2000-09-12 07:48	73.1728	-159.5025
200009120826	2000-09-12 08:21	73.0956	-159.2496
200009120856	2000-09-12 08:52	73.0284	-159.0010
200009120925	2000-09-12 09:21	72.9688	-158.7515
200009120953	2000-09-12 09:48	72.9235	-158.5001
200009121021	2000-09-12 10:15	72.8775	-158.2506
200009121053	2000-09-12 10:48	72.8100	-158.0001
200009121127	2000-09-12 11:23	72.7306	-157.7510
200009121152	2000-09-12 11:49	72.6966	-157.4998
200009121221	2000-09-12 12:16	72.6605	-157.2503
200009121251	2000-09-12 12:45	72.6081	-157.0013
200009121329	2000-09-12 13:24	72.5151	-156.7515
200009121408	2000-09-12 14:04	72.4158	-156.5011
200009121444	2000-09-12 14:39	72.3409	-156.2513
200009121506	2000-09-12 15:02	72.2925	-156.0898
200009121817	2000-09-12 18:14	72.1085	-156.5918
200009121854	2000-09-12 18:51	72.2039	-156.3470
200009121947	2000-09-12 19:42	72.2856	-155.9900
200009122022	2000-09-12 20:17	72.2490	-155.6655
200009122059	2000-09-12 20:54	72.1940	-155.3348
200009122138	2000-09-12 21:33	72.1356	-155.0050
200009122215	2000-09-12 22:09	72.0933	-154.6710
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200009130002	2000-09-12 23:57	71.9436	-153.6665
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200009130114	2000-09-13 01:10	71.8100	-153.0411
200009130246	2000-09-13 02:42	71.7191	-152.6606
200009130321	2000-09-13 03:16	71.6726	-152.3343
200009130357	2000-09-13 03:53	71.5980	-152.0001
200009130438	2000-09-13 04:33	71.5185	-151.6660
200009130521	2000-09-13 05:17	71.4106	-151.3333
200009130547	2000-09-13 05:45	71.3843	-150.9988
200009130632	2000-09-13 06:31	71.2506	-150.6540
200009130659	2000-09-13 06:58	71.2265	-150.3328
200009130725	2000-09-13 07:24	71.2213	-150.0004
200009150116	2000-09-15 01:10	71.2278	-146.9411
200009150127	2000-09-15 01:22	71.2293	-146.9356
200009150138	2000-09-15 01:33	71.2281	-146.9295
200009150149	2000-09-15 01:44	71.2270	-146.9228
200009150201	2000-09-15 01:56	71.2256	-146.9160
200009250351	2000-09-25 03:45	73.4175	-158.4704
200009250417	2000-09-25 04:12	73.3341	-158.4943
200009250626	2000-09-25 06:21	73.1673	-158.5558
200009250658	2000-09-25 06:53	73.0836	-158.5148
200009250727	2000-09-25 07:22	73.0005	-158.5156
200009250756	2000-09-25 07:51	72.9170	-158.5080
200009250824	2000-09-25 08:21	72.8256	-158.4961
200009252225	2000-09-25 22:20	72.9173	-156.9955
200009252252	2000-09-25 22:47	72.8336	-157.0073
200009260108	2000-09-26 01:03	72.6641	-156.9905
200009260134	2000-09-26 01:29	72.5838	-156.9808
200009260200	2000-09-26 01:55	72.5003	-156.9925
200009260224	2000-09-26 02:22	72.4168	-157.0075



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### MR00-K06

Ship Name: MIRAI

Period: 2000-08-03 - 2000-10-13

Chief Scientist: Takatoshi Takizawa (JAMSTEC)

Project Name: [Arctic Ocean Climate System Reaserch]

## 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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Cruise ID:

### Go to a Dive Information

Dive ID:

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