

MIRAI MR10-06 Expendable Conductivity-Temperature-Depth Profiler (XCTD)

Last Modified: 2019-08-31

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

Cruise ID: [MR10-06](#)

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/MR10-06_all.pdf

For Using Data

Principal Investigator

Data Management Office

Use Constraints

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

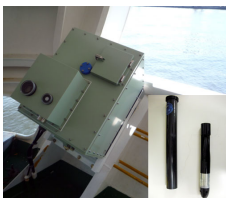
Data Citation

See [Terms and Conditions](#) about data citation.

Instrument

Instrument:

Expendable conductivity temperature
depth measurements (XCTD) (MR11-
04 -)



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

In addition, coefficients of the air rate equation are different by probe type.

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
201011041209	10069412	XCTD-1	Auto	MK-130
201011041409	10069411	XCTD-1	Auto	MK-130
201011041502	10069414	XCTD-1	Auto	MK-130
201011041555	10069418	XCTD-1	Auto	MK-130
201011041646	10069417	XCTD-1	Auto	MK-130
201011041746	10069409	XCTD-1	Auto	MK-130
201011041824	10069416	XCTD-1	Auto	MK-130
201011041913	10069415	XCTD-1	Auto	MK-130
201011042002	10069410	XCTD-1	Auto	MK-130
201011042044	10069413	XCTD-1	Auto	MK-130
201011042126	10069419	XCTD-1	Auto	MK-130
201011042207	10069420	XCTD-1	Auto	MK-130
201011042246	10069422	XCTD-1	Auto	MK-130
201011042327	10069421	XCTD-1	Auto	MK-130
201011050008	10069407	XCTD-1	Auto	MK-130
201011050052	10069408	XCTD-1	Auto	MK-130
201011050135	10069424	XCTD-1	Auto	MK-130
201011050218	10069427	XCTD-1	Auto	MK-130
201011050301	10069423	XCTD-1	Auto	MK-130
201011050343	10069426	XCTD-1	Auto	MK-130
201011050427	10069425	XCTD-1	Auto	MK-130
201011050511	10069428	XCTD-1	Auto	MK-130
201011050555	10037432	XCTD-1	Auto	MK-130
201011050639	10037427	XCTD-1	Auto	MK-130
201011050823	10069431	XCTD-1	Auto	MK-130
201011050955	10037426	XCTD-1	Auto	MK-130
201011051040	10037424	XCTD-1	Auto	MK-130
201011051123	10069430	XCTD-1	Auto	MK-130
201011051206	10037423	XCTD-1	Auto	MK-130
201011051248	10037431	XCTD-1	Auto	MK-130
201011051330	10037433	XCTD-1	Auto	MK-130
201011051412	10037430	XCTD-1	Auto	MK-130
201011051454	10037428	XCTD-1	Auto	MK-130
201011051537	10037429	XCTD-1	Auto	MK-130
201011051603	10037425	XCTD-1	Auto	MK-130
201011120432	10027089	XCTD-1	Auto	MK-130
201011120508	10027092	XCTD-1	Auto	MK-130
201011120600	10027086	XCTD-1	Auto	MK-130
201011120651	10027093	XCTD-1	Auto	MK-130
201011120741	10027088	XCTD-1	Auto	MK-130
201011120832	10027087	XCTD-1	Auto	MK-130
201011120922	10027083	XCTD-1	Auto	MK-130
201011121014	10027084	XCTD-1	Auto	MK-130
201011121106	10027091	XCTD-1	Auto	MK-130
201011121157	10037422	XCTD-1	Auto	MK-130
201011121247	10027094	XCTD-1	Auto	MK-130
201011121337	10027090	XCTD-1	Auto	MK-130
201011121427	10037434	XCTD-1	Auto	MK-130
201011121517	10037442	XCTD-1	Auto	MK-130
201011121607	10037438	XCTD-1	Auto	MK-130
201011121656	10037435	XCTD-1	Auto	MK-130
201011121745	10037436	XCTD-1	Auto	MK-130
201011121835	10037439	XCTD-1	Auto	MK-130
201011121924	10027085	XCTD-1	Auto	MK-130
201011122014	10037440	XCTD-1	Auto	MK-130
201011122103	10069383	XCTD-1	Auto	MK-130
201011122152	10069386	XCTD-1	Auto	MK-130
201011122242	10037441	XCTD-1	Auto	MK-130
201011122331	10037437	XCTD-1	Auto	MK-130
201011130021	10069385	XCTD-1	Auto	MK-130
201011130113	10069388	XCTD-1	Auto	MK-130
201011130204	10069387	XCTD-1	Auto	MK-130
201011130255	10069384	XCTD-1	Auto	MK-130
201011130346	10069394	XCTD-1	Auto	MK-130
201011130435	10069390	XCTD-1	Auto	MK-130
201011130525	10069432	XCTD-1	Auto	MK-130
201011130615	10069433	XCTD-1	Auto	MK-130
201011130712	10069393	XCTD-1	Auto	MK-130

Cast name	Probe Serial No.	Probe Type	Launcher	Converter
201011130826	10069436	XCTD-1	Auto	MK-130
201011130930	10069392	XCTD-1	Auto	MK-130
201011131022	10069389	XCTD-1	Auto	MK-130
201011131115	10069391	XCTD-1	Auto	MK-130
201011131206	10069435	XCTD-1	Auto	MK-130
201011131257	10069438	XCTD-1	Auto	MK-130
201011131346	10069434	XCTD-1	Auto	MK-130
201011131433	10069437	XCTD-1	Auto	MK-130
201011131521	10069397	XCTD-1	Auto	MK-130
201011131610	10069441	XCTD-1	Auto	MK-130
201011131700	10069440	XCTD-1	Auto	MK-130
201011131749	10069439	XCTD-1	Auto	MK-130
201011131838	10069396	XCTD-1	Auto	MK-130
201011131926	10069442	XCTD-1	Auto	MK-130

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.

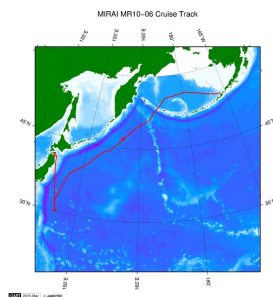
- 1) The gradient check of adjacent depth data
- 2) The density inversion check
- 3) The broad range check set up at given ocean space and depth

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](#)

MR10-06

Ship Name: MIRAI

Period: 2010-10-18 - 2010-11-16

Chief Scientist: Makio Honda (JAMSTEC)

Project Name: [Station K2, Station S1, Station KEO, Station KNOT]

Proposal ▶ Change in material cycles and ecosystem by the climate change and its feedback

Title:

Update History

2019-08-31	An observation data was registered.
2017-06-14	An observation data was registered.
2014-08-08	An observation data was registered.
2014-02-18	An observation data was registered.
2012-11-27	An observation data was registered.

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Dive ID:



MIRAI MR10-06 Expendable Conductivity-Temperature-Depth Profiler (XCTD)

Last Modified: 2019-08-31

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

Cruise ID: [MR10-06](#)

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

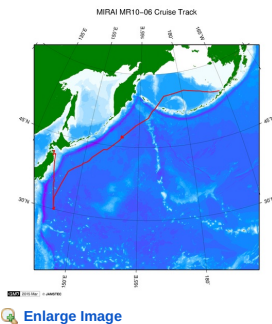
QCed data were added flag according to the NODC (National Oceanographic Data Center) quality control procedure, additionally visually checked. Please see the site of NODC of the following link for quality control procedure.

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

Sample Program

[ex_read2.f](#)

Related Information



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Chief Scientist: Makio Honda (JAMSTEC)

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BMS

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Cruise ID:

Go

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Go

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MIRAI MR10-06 Expendable Conductivity-Temperature-Depth Profiler (XCTD)

Last Modified: 2019-08-31

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Cruise ID: **MR10-06**

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

Data Policy: **JAMSTEC**

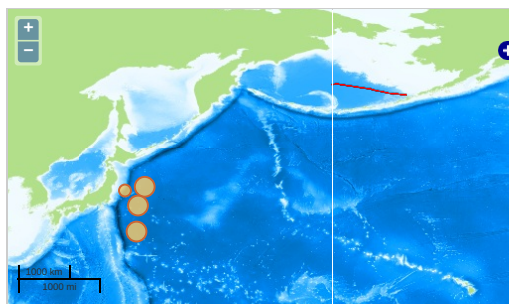
Observation Items: Depth, Temperature, Salinity

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

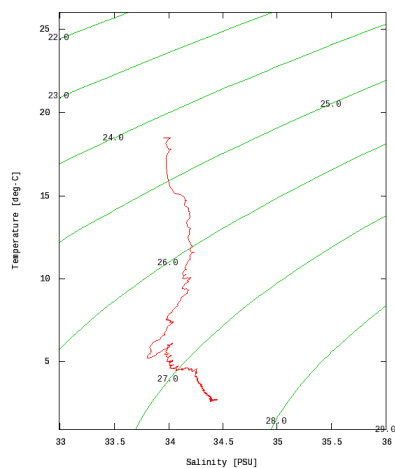
Imagery reproduced from ...

Figures

201011041209



MR10-06: 201011041209
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

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<input type="checkbox"/>	201011041409.dat
<input type="checkbox"/>	201011041502.dat
<input type="checkbox"/>	201011041555.dat
<input type="checkbox"/>	201011041646.dat
<input type="checkbox"/>	201011041746.dat
<input type="checkbox"/>	201011041824.dat
<input type="checkbox"/>	201011041913.dat
<input type="checkbox"/>	201011042002.dat
<input type="checkbox"/>	201011042044.dat
<input type="checkbox"/>	201011042126.dat
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<input type="checkbox"/>	201011042246.dat
<input type="checkbox"/>	201011042327.dat

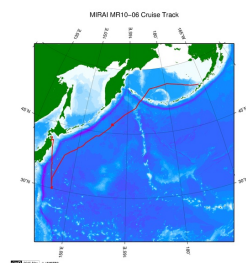
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	201011050052.dat
	201011050135.dat
	201011050218.dat
	201011050301.dat
	201011050343.dat
	201011050427.dat
	201011050511.dat
	201011050555.dat
	201011050639.dat
	201011050823.dat
	201011050955.dat
	201011051040.dat
	201011051123.dat
	201011051206.dat
	201011051248.dat
	201011051330.dat
	201011051412.dat
	201011051454.dat
	201011051537.dat
	201011051603.dat
	201011120432.dat
	201011120508.dat
	201011120600.dat
	201011120651.dat
	201011120741.dat
	201011120832.dat
	201011120922.dat
	201011121014.dat
	201011121106.dat
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	201011121247.dat
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	201011121607.dat
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	201011122103.dat
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	201011122242.dat
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	201011130255.dat
	201011130346.dat
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	201011130712.dat
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	201011131206.dat
	201011131257.dat
	201011131346.dat
	201011131433.dat
	201011131521.dat
	201011131610.dat
	201011131700.dat
	201011131749.dat
	201011131838.dat
	201011131926.dat
	ex_read2.f (Sample Program)

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

Observation	Time and Date	Lat. [°]	Lon. [°]
201011041209	2010-11-04 12:11	37.9988	146.4900
201011041409	2010-11-04 14:13	37.8331	146.4665
201011041502	2010-11-04 15:05	37.6666	146.3980
201011041555	2010-11-04 15:57	37.4998	146.3243
201011041646	2010-11-04 16:47	37.3331	146.2523
201011041746	2010-11-04 17:47	37.1293	146.1748
201011041824	2010-11-04 18:25	37.0001	146.1278
201011041913	2010-11-04 19:14	36.8331	146.0666
201011042002	2010-11-04 20:03	36.6665	146.0021
201011042044	2010-11-04 20:45	36.4998	145.9385

Observation	Time and Date	Lat (°)	Lon (°)
201011042126	2010-11-04 21:27	36.3331	145.5718
201011042207	2010-11-04 22:08	36.1666	145.8201
201011042246	2010-11-04 22:47	36.0000	145.7561
201011042327	2010-11-04 23:28	35.8335	145.6941
201011050008	2010-11-05 00:09	35.6666	145.6333
201011050052	2010-11-05 00:53	35.4998	145.5714
201011050135	2010-11-05 01:36	35.3331	145.5151
201011050218	2010-11-05 02:19	35.1666	145.4578
201011050301	2010-11-05 03:02	34.9998	145.4025
201011050343	2010-11-05 03:44	34.8331	145.3465
201011050427	2010-11-05 04:28	34.6665	145.2975
201011050511	2010-11-05 05:12	34.4998	145.2446
201011050555	2010-11-05 05:56	34.3331	145.1908
201011050639	2010-11-05 06:40	34.1666	145.1375
201011050823	2010-11-05 08:25	34.0001	145.0820
201011050955	2010-11-05 09:58	33.8331	145.0295
201011051040	2010-11-05 10:42	33.6665	144.9703
201011051123	2010-11-05 11:25	33.4996	144.9160
201011051206	2010-11-05 12:07	33.3325	144.8616
201011051248	2010-11-05 12:49	33.1665	144.8045
201011051330	2010-11-05 13:31	33.0000	144.7508
201011051412	2010-11-05 14:14	32.8333	144.6966
201011051454	2010-11-05 14:57	32.6668	144.6446
201011051537	2010-11-05 15:38	32.4996	144.5893
201011051603	2010-11-05 16:05	32.3946	144.5561
201011120432	2010-11-12 04:33	30.0478	145.0396
201011120508	2010-11-12 05:09	30.1668	144.9963
201011120600	2010-11-12 06:01	30.3335	144.9328
201011120651	2010-11-12 06:52	30.5001	144.8768
201011120741	2010-11-12 07:42	30.6668	144.8268
201011120832	2010-11-12 08:33	30.8363	144.7813
201011120922	2010-11-12 09:24	31.0003	144.7345
201011121014	2010-11-12 10:15	31.1676	144.6898
201011121106	2010-11-12 11:07	31.3335	144.6525
201011121157	2010-11-12 11:58	31.5001	144.6016
201011121247	2010-11-12 12:49	31.6670	144.5556
201011121337	2010-11-12 13:38	31.8333	144.5098
201011121427	2010-11-12 14:29	32.0001	144.4650
201011121517	2010-11-12 15:19	32.1665	144.4193
201011121607	2010-11-12 16:09	32.3333	144.3726
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201011121745	2010-11-12 17:47	32.6665	144.2846
201011121835	2010-11-12 18:37	32.8333	144.2383
201011121924	2010-11-12 19:26	33.0001	144.1946
201011122014	2010-11-12 20:15	33.1668	144.1505
201011122103	2010-11-12 21:04	33.3333	144.1050
201011122152	2010-11-12 21:53	33.5000	144.0583
201011122242	2010-11-12 22:43	33.6668	144.0136
201011122331	2010-11-12 23:32	33.8333	143.9686
201011130021	2010-11-13 00:22	34.0005	143.9230
201011130113	2010-11-13 01:14	34.1666	143.8748
201011130204	2010-11-13 02:05	34.3335	143.8246
201011130255	2010-11-13 02:56	34.5001	143.7826
201011130346	2010-11-13 03:47	34.6666	143.7383
201011130435	2010-11-13 04:36	34.8336	143.6896
201011130525	2010-11-13 05:26	35.0003	143.6420
201011130615	2010-11-13 06:16	35.1668	143.5953
201011130712	2010-11-13 07:14	35.3335	143.5871
201011130826	2010-11-13 08:27	35.5000	143.6398
201011130930	2010-11-13 09:31	35.6668	143.6313
201011131022	2010-11-13 10:23	35.8335	143.5350
201011131115	2010-11-13 11:16	36.0003	143.4426
201011131206	2010-11-13 12:07	36.1670	143.3546
201011131257	2010-11-13 12:58	36.3336	143.2731
201011131346	2010-11-13 13:47	36.5003	143.2218
201011131433	2010-11-13 14:35	36.6665	143.1766
201011131521	2010-11-13 15:23	36.8333	143.1350
201011131610	2010-11-13 16:11	36.9998	143.1031
201011131700	2010-11-13 17:01	37.1666	143.0493
201011131749	2010-11-13 17:51	37.3333	142.9866
201011131838	2010-11-13 18:39	37.5000	142.9316
201011131926	2010-11-13 19:29	37.6683	142.8851

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MR10-06

Ship Name: MIRAI

Period: 2010-10-18 - 2010-11-16

Chief Scientist: Makio Honda (JAMSTEC)

Project Name: [Station K2, Station S1, Station KEO, Station KNOT]

Proposal: ▶ Change in material cycles and ecosystem by the climate change and its feedback

Title:

Update History

2019-08-31	An observation data was registered.
2017-06-14	An observation data was registered.
2014-08-08	An observation data was registered.
2014-02-18	An observation data was registered.
2012-11-27	An observation data was registered.

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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:

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