MIRAI MR99-K04 Expendable Bathythermograph (XBT)

Last Modified: 2019-09-28

ReadMe | Observation Data | Data Format

Cruise ID: MR99-K04
Expendable Bathythermograph (XBT): Processed (DMO)-QCed
Data Policy: JAMSTEC
Observation Items: Depth, Temperature
Science Keywords:
OCEANS > OCEAN TEMPERATURE > WATER TEMPERATURE

Cruise Report
http://www.godac.jamstec.go.jp/catalog/data/doc_catalog/media/MR99-K04_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 bathythermograph (XBT) (
- MR11-E02)

Overview

Using XBT (eXpendable Bathy Thermograph) system, the vertical distribution of water temperature is observed during free fall of its probe part in the seawater. On board, the analogue signal is converted to the temperature by data processor and the data is stored in PC. Depth data is calculated from the elapsed time.

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 : 50 msec

(3) XBT probe specifications

Probe Type	TSK T-5	TSK T-6	TSK T-7	TSK T-10
Temperature range [deg-C]	-2 to 35			
Temperature accuracy [deg-C]	+/- 0.2			
Temperature resolution [deg-C]	0.01			
Measurment depth [m]	1830	460	760	300
Depth accuracy [m]	5 or +/- 2% of depth; whichever is larger			
Maximum elapsed time [sec]	291	73	123	48
Rated ship speed [knot]	6	15	15	10

Since XBT 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 T-5	TSK T-6	TSK T-7	TSK T-10
Coefficient-a	6.828	6.691	6.691	6.301
Coefficient-b	-1.82	-2.25	-2.25	-2.16

* Coefficients listed above are supplied by Sippican, Inc., in USA

Coefficients listed above are supplied by Sippican, Inc., in USA.

The list of an XBT type used in each cast is as follows.

Cast name	Probe Serial No.	Probe Type	Launcher	Converter
199907302301	-	T-7	-	MK-30N
199907310013	-	T-7	-	MK-30N
199907310125	-	T-7	-	MK-30N
199907310236	-	T-7	-	MK-30N
199907310345	-	T-7	-	MK-30N
199907310454	-	T-7	-	MK-30N
199907310602	-	T-7	-	MK-30N
199907310708	-	T-7	-	MK-30N
199907310812	-	T-7	-	MK-30N
199907310914	-	T-7	-	MK-30N
199907311015	-	T-7	-	MK-30N
199907311117	-	T-7	-	MK-30N
199907311220	-	T-7	-	MK-30N
199907311325	-	T-7	-	MK-30N
199907311431	-	T-7	-	MK-30N
199907311537	-	T-7	-	MK-30N
199907311641	-	T-7	-	MK-30N
199907311746	-	T-7	-	MK-30N
199907311852	-	T-7	-	MK-30N
199907312011	-	T-7	-	MK-30N
199907312137	-	T-7	-	MK-30N
199907312312	-	T-7	-	MK-30N
199908010200	-	T-7	-	MK-30N
199908010304	-	T-7	-	MK-30N
199908010407	-	T-7	-	MK-30N
199908010507	-	T-7	-	MK-30N
199908010605	-	T-7	-	MK-30N
199908010702	-	T-7	-	MK-30N
199908010801	-	T-7	-	MK-30N
199908010901	-	T-7	-	MK-30N
199908021051	-	T-7	-	MK-30N
199908021201	-	T-7	-	MK-30N
199908021309	-	T-7	-	MK-30N
199908021421	-	T-7	-	MK-30N
199908021530	-	T-7	-	MK-30N
199908021643	-	T-7	-	MK-30N
199908021756	-	T-7	-	MK-30N
199908050934	-	T-7	-	MK-30N
199908051031	-	T-7	-	MK-30N
199908051130	-	T-7	-	MK-30N
199908051223	-	T-7	-	MK-30N
199908051315	-	T-7	-	MK-30N
199908051411	-	T-7	-	MK-30N
199908051510	-	T-7	-	MK-30N
199908051612	-	T-7	-	MK-30N
199908051718	-	T-7	-	MK-30N
199908051829	-	T-7	-	MK-30N
199908051945	-	T-7	-	MK-30N
199908052103	-	T-7	-	MK-30N
199908052221	-	T-7	-	MK-30N
199908052334	-	T-7	-	MK-30N
199908060041	-	T-7	-	MK-30N
199908060407	-	T-7	-	MK-30N
199908060506	-	T-7	-	MK-30N
199908060602	-	T-7	-	MK-30N
199908060656	-	T-7	-	MK-30N
199908060750	-	T-7	-	MK-30N
199908060846	-	T-7	-	MK-30N
199908060944	-	T-7	-	MK-30N
199908061047	-	T-7	-	MK-30N
199908061154	-	T-7	-	MK-30N
199908061304	-	T-7	-	MK-30N
199908061418	-	T-7	-	MK-30N
199908061527	-	T-7	-	MK-30N
199908061633	-	T-7	-	MK-30N
199908061737	-	T-7	-	MK-30N
199908061840	-	T-7	-	MK-30N
199908061939	-	T-7	-	MK-30N
199908062037	-	T-7	-	MK-30N
199908062137	-	T-7	-	MK-30N
199908062142	-	T-7	-	MK-30N
199908062238	-	T-7	-	MK-30N
199908070148	-	T-7	-	MK-30N

Cast No.	Probe Serial No.	Probe Type	Launcher	Converter
199908070251	-	T-7	-	MK-30N
199908070353	-	T-7	-	MK-30N
199908070457	-	T-7	-	MK-30N
199908070557	-	T-7	-	MK-30N
199908070655	-	T-7	-	MK-30N
199908070751	-	T-7	-	MK-30N
199908070847	-	T-7	-	MK-30N
199908070946	-	T-7	-	MK-30N
199908071052	-	T-7	-	MK-30N
199908071157	-	T-7	-	MK-30N
199908071304	-	T-7	-	MK-30N
199908071404	-	T-7	-	MK-30N
199908071507	-	T-7	-	MK-30N
199908071608	-	T-7	-	MK-30N
199908071710	-	T-7	-	MK-30N
199908071917	-	T-7	-	MK-30N
199908072019	-	T-7	-	MK-30N
199908170342	-	T-7	-	MK-30N
199908170440	-	T-7	-	MK-30N
199908170539	-	T-7	-	MK-30N
199908170623	-	T-7	-	MK-30N
199908170637	-	T-7	-	MK-30N
199908170735	-	T-7	-	MK-30N
199908170938	-	T-7	-	MK-30N
199908171037	-	T-7	-	MK-30N
199908171136	-	T-7	-	MK-30N
199908171233	-	T-7	-	MK-30N
199908171332	-	T-7	-	MK-30N
199908171610	-	T-7	-	MK-30N
199908171712	-	T-7	-	MK-30N
199908171816	-	T-7	-	MK-30N
199908171918	-	T-7	-	MK-30N
199908172020	-	T-7	-	MK-30N
199908172225	-	T-7	-	MK-30N
199908172325	-	T-7	-	MK-30N
199908180026	-	T-7	-	MK-30N
199908180124	-	T-7	-	MK-30N
199908180225	-	T-7	-	MK-30N
199908180451	-	T-7	-	MK-30N
199908180600	-	T-7	-	MK-30N
199908180836	-	T-7	-	MK-30N
199908180956	-	T-7	-	MK-30N

Data processing

(1) For sensor's stablility, values of less than 1 m for temperature 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 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

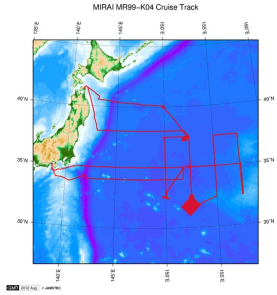
In addition, an abnormal value is identified by a visual check, and the data after visual QC is released.

Note

(1) It is reported that T-5 probes produced by Tsurumi Seiki Co. Ltd. (TSK T-5 probes) have a fall-rate bias. Please see the following about publication policy of XBT fall-rate bias correction data.

Publication policy of XBT fall-rate bias correction data

Related Information



Enlarge Image

MR99-K04
Ship Name: MIRAI
Period: 1999-07-23 - 1999-08-19
Chief Scientist: Hirofumi Yamamoto (JAMSTEC)

Update History

2019-09-28	An observation data was registerd.
2017-06-29	An observation data was registerd.
2014-07-12	An observation data was registerd.
2014-02-20	An observation data was registerd.
2013-01-25	An observation data was registerd.

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Last Modified: 2019-09-28

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Cruise ID: MR99-K04
Expendable Bathythermograph (XBT): Processed (DMO)-QCed
Data Policy: JAMSTEC

XBT DMO

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	XBT
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	45 - 55	Flag	-	i11	1 - 7 : space 8 : flag of depth 9 : flag of temperature 10 - 11 : space * reference : 'Definition of Quality Control Flags'
4	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

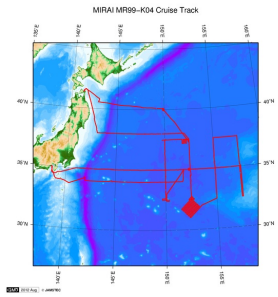
2. Observed Level Flags
- N - missing value
- 0 - accepted value
- 1 - range outlier (outside of broad range check)
- 2 - failed inversion check
- 3 - failed gradient check
- 4 - zero anomaly
- 5 - failed combined gradient and inversion checks
- 6 - failed range and inversion checks
- 7 - failed range and gradient checks
- 8 - failed range and zero anomaly checks
- 9 - failed range and combined gradient and inversion checks
- A - failed visual check

* Range and gradient check is performed to XBT data.

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

MR99-K04
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Period: 1999-07-23 - 1999-08-19
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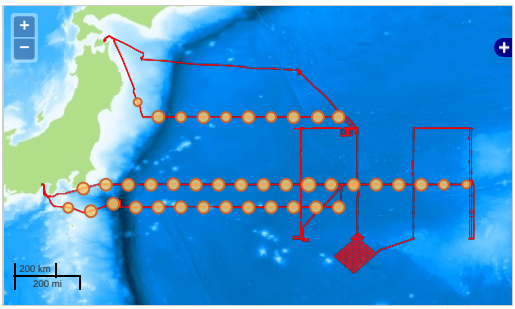
Expendable Bathythermograph (XBT): Processed (DMO)-QCed
Data Policy: JAMSTEC
Observation Items: Depth, Temperature
Science Keywords:

OCEANS	> OCEAN	> WATER
	TEMPERATURE	TEMPERATURE

Observation Map

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

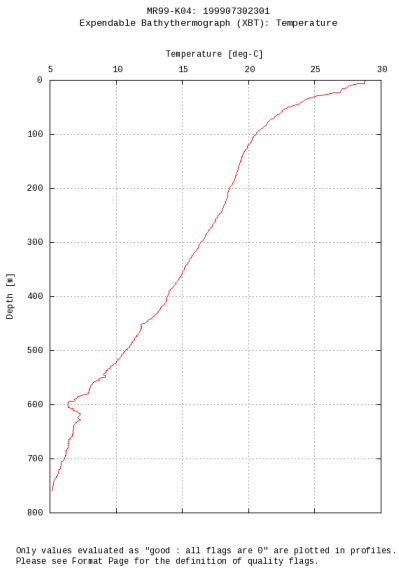


Imagery reproduced from ...

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

Figures

199907302301



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
199907302301.dat
199907310013.dat
199907310125.dat
199907310236.dat
199907310345.dat
199907310454.dat
199907310602.dat
199907310708.dat
199907310812.dat
199907310914.dat
199907311015.dat
199907311117.dat
199907311220.dat
199907311325.dat
199907311431.dat
199907311537.dat
199907311641.dat
199907311746.dat
199907311852.dat

199907312011.dat

File names

199907312137.dat
199907312312.dat
199908010200.dat
199908010304.dat
199908010407.dat
199908010507.dat
199908010605.dat
199908010702.dat
199908010801.dat
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199908021530.dat
199908021643.dat
199908021756.dat
199908050934.dat
199908051031.dat
199908051130.dat
199908051223.dat
199908051315.dat
199908051411.dat
199908051510.dat
199908051612.dat
199908051718.dat
199908051829.dat
199908051945.dat
199908052103.dat
199908052221.dat
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199908060750.dat
199908060846.dat
199908060944.dat
199908061047.dat
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199908061527.dat
199908061633.dat
199908061737.dat
199908061840.dat
199908061939.dat
199908062037.dat
199908062137.dat
199908062142.dat
199908062238.dat
199908070148.dat
199908070251.dat
199908070353.dat
199908070457.dat
199908070557.dat
199908070655.dat
199908070751.dat
199908070847.dat
199908070946.dat
199908071052.dat
199908071157.dat
199908071304.dat
199908071404.dat
199908071507.dat
199908071608.dat
199908071710.dat
199908071917.dat
199908072019.dat
199908170342.dat
199908170440.dat
199908170539.dat
199908170623.dat
199908170637.dat
199908170735.dat
199908170938.dat
199908171037.dat
199908171136.dat
199908171233.dat
199908171332.dat

File names
199908171610.dat
199908171712.dat
199908171816.dat
199908171918.dat
199908172020.dat
199908172225.dat
199908172325.dat
199908180026.dat
199908180124.dat
199908180225.dat
199908180451.dat
199908180600.dat
199908180836.dat
199908180956.dat
ex_read2.f (Sample Program)

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

Observation	Time and Date	Lat. [°]	Lon. [°]
199907302301	1999-07-30 22:59	33.9985	151.6660
199907310013	1999-07-31 00:11	33.9976	151.3330
199907310125	1999-07-31 01:23	33.9998	151.0001
199907310236	1999-07-31 02:34	33.9993	150.6668
199907310345	1999-07-31 03:43	33.9981	150.3333
199907310454	1999-07-31 04:52	34.0013	150.0001
199907310602	1999-07-31 06:00	34.0005	149.6660
199907310708	1999-07-31 07:06	34.0045	149.3321
199907310812	1999-07-31 08:10	34.0046	148.9998
199907310914	1999-07-31 09:12	34.0050	148.6663
199907311015	1999-07-31 10:13	33.9928	148.3340
199907311117	1999-07-31 11:15	33.9941	148.0000
199907311220	1999-07-31 12:18	33.9913	147.6666
199907311325	1999-07-31 13:23	33.9878	147.3336
199907311431	1999-07-31 14:29	33.9983	147.0000
199907311537	1999-07-31 15:35	34.0025	146.6655
199907311641	1999-07-31 16:39	33.9986	146.3334
199907311746	1999-07-31 17:44	34.0083	146.0006
199907311852	1999-07-31 18:51	33.9968	145.6666
199907312011	1999-07-31 20:09	34.0106	145.3328
199907312137	1999-07-31 21:35	34.0128	145.0013
199907312312	1999-07-31 23:10	33.9985	144.6586
199908010200	1999-08-01 01:59	34.0088	144.3331
199908010304	1999-08-01 03:02	34.0058	143.9998
199908010407	1999-08-01 04:05	33.9996	143.6668
199908010507	1999-08-01 05:05	33.9933	143.3333
199908010605	1999-08-01 06:03	33.9955	143.0001
199908010702	1999-08-01 07:00	33.9915	142.6661
199908010801	1999-08-01 07:59	33.9985	142.3334
199908010901	1999-08-01 08:59	34.0005	141.9998
199908021051	1999-08-02 10:49	34.1530	141.6666
199908021201	1999-08-02 11:59	34.0416	141.3333
199908021309	1999-08-02 13:07	33.9316	141.0001
199908021421	1999-08-02 14:19	33.8270	140.6668
199908021530	1999-08-02 15:28	33.7501	140.3338
199908021643	1999-08-02 16:41	33.8821	140.0001
199908021756	1999-08-02 17:54	33.9758	139.6666
199908050934	1999-08-05 09:32	34.7284	140.0016
199908051031	1999-08-05 10:29	34.8306	140.3313
199908051130	1999-08-05 11:27	34.9165	140.6651
199908051223	1999-08-05 12:21	35.0003	140.9963
199908051315	1999-08-05 13:13	35.0020	141.3361
199908051411	1999-08-05 14:09	35.0030	141.6690
199908051510	1999-08-05 15:07	35.0038	142.0003
199908051612	1999-08-05 16:10	34.9981	142.3334
199908051718	1999-08-05 17:16	35.0013	142.6666
199908051829	1999-08-05 18:27	34.9950	143.0013
199908051945	1999-08-05 19:43	35.0008	143.3348
199908052103	1999-08-05 21:01	35.0095	143.6671
199908052221	1999-08-05 22:18	35.0195	144.0008
199908052334	1999-08-05 23:32	35.0203	144.3331
199908060041	1999-08-06 00:39	35.0135	144.6663
199908060407	1999-08-06 04:05	34.9963	145.0001
199908060506	1999-08-06 05:04	34.9993	145.3336
199908060602	1999-08-06 06:00	35.0015	145.6678
199908060656	1999-08-06 06:54	35.0025	146.0010
199908060750	1999-08-06 07:48	35.0038	146.3341
199908060846	1999-08-06 08:44	35.0020	146.6668
199908060944	1999-08-06 09:43	35.0053	147.0011
199908061047	1999-08-06 10:45	34.9920	147.3353
199908061154	1999-08-06 11:52	34.9886	147.6655
199908061304	1999-08-06 13:02	34.9951	147.9998
199908061418	1999-08-06 14:16	35.0010	148.3338
199908061527	1999-08-06 15:25	35.0030	148.6668

Observation	Time and Date	Lat. [°]	Lon. [°]
199908061633	1999-08-06 16:31	35.0035	149.0000
199908061737	1999-08-06 17:35	34.9953	149.3338
199908061840	1999-08-06 18:38	35.0033	149.6688
199908061939	1999-08-06 19:37	34.9961	150.0011
199908062037	1999-08-06 20:35	34.9991	150.3338
199908062137	1999-08-06 21:35	34.9995	150.6690
199908062142	1999-08-06 21:40	34.9993	150.6941
199908062238	1999-08-06 22:36	34.9963	150.9995
199908070148	1999-08-07 01:46	35.0003	151.3338
199908070251	1999-08-07 02:49	34.9993	151.6673
199908070353	1999-08-07 03:51	35.0005	152.0001
199908070457	1999-08-07 04:55	34.9955	152.3336
199908070557	1999-08-07 05:55	35.0005	152.6673
199908070655	1999-08-07 06:53	35.0010	153.0003
199908070751	1999-08-07 07:49	35.0036	153.3336
199908070847	1999-08-07 08:45	34.9998	153.6678
199908070946	1999-08-07 09:44	35.0011	153.9985
199908071052	1999-08-07 10:50	34.9996	154.3328
199908071157	1999-08-07 11:55	34.9988	154.6670
199908071304	1999-08-07 13:02	34.9951	155.0001
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199908071507	1999-08-07 15:05	35.0001	155.6665
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199908071710	1999-08-07 17:08	35.0001	156.3336
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199908072019	1999-08-07 20:17	35.0143	157.3334
199908170342	1999-08-17 03:40	38.0063	151.6660
199908170440	1999-08-17 04:38	38.0050	151.3338
199908170539	1999-08-17 05:37	38.0001	151.0000
199908170623	1999-08-17 06:21	38.0040	150.7483
199908170637	1999-08-17 06:36	38.0055	150.6653
199908170735	1999-08-17 07:33	38.0000	150.3320
199908170938	1999-08-17 09:36	37.9993	149.6665
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199908171136	1999-08-17 11:34	37.9983	148.9993
199908171233	1999-08-17 12:31	38.0068	148.6701
199908171332	1999-08-17 13:30	38.0026	148.3366
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199908171712	1999-08-17 17:10	37.9996	147.3333
199908171816	1999-08-17 18:13	38.0001	146.9991
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199908172020	1999-08-17 20:18	38.0053	146.3325
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199908180026	1999-08-18 00:23	38.0045	145.0010
199908180124	1999-08-18 01:22	38.0021	144.6701
199908180225	1999-08-18 02:23	37.9981	144.3391
199908180451	1999-08-18 04:49	38.0180	143.6668
199908180600	1999-08-18 05:58	38.0021	143.3323
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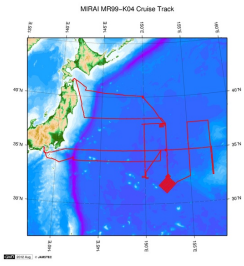
Related Information



Enlarge Image

MR99-K04
Ship Name: MIRAI
Period: 1999-07-23 - 1999-08-19
Chief Scientist: Hirofumi Yamamoto (JAMSTEC)

Update History

2019-09-28	An observation data was registerd.
2017-06-29	An observation data was registerd.
2014-07-12	An observation data was registerd.
2014-02-20	An observation data was registerd.
2013-01-25	An observation data was registerd.

6K Sonar DEEP TOW
KM-ROV
POWER GRAB SAMPLER (SHELL)
POWER GRAB SAMPLER (CLOW)
BMS

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