

MIRAI MR01-K02 Expendable Bathythermograph (XBT)

Last Modified: 2019-09-28

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

Cruise ID: [MR01-K02](#)

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/MR01-K02_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			
Measurement 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

Documents listed above are supplied by *Supramat, Inc.*, in *CDR*.

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

Cast name	Probe Serial No.	Probe Type	Launcher	Converter
200105140905	-	T-7	Auto	MK-30N
200105140949	-	T-7	Auto	MK-30N
200105141033	-	T-7	Auto	MK-30N
200105141120	-	T-7	Auto	MK-30N
200105141204	-	T-7	Auto	MK-30N
200105141251	-	T-7	Auto	MK-30N
200105141339	-	T-7	Auto	MK-30N
200105141425	-	T-7	Auto	MK-30N
200105141515	-	T-7	Auto	MK-30N
200105141601	-	T-7	Auto	MK-30N
200105141647	-	T-7	Auto	MK-30N
200105141731	-	T-7	Auto	MK-30N
200105141814	-	T-7	Auto	MK-30N
200105141855	-	T-7	Auto	MK-30N
200105141950	-	T-7	Auto	MK-30N
200105142038	-	T-7	Auto	MK-30N
200105142127	-	T-7	Auto	MK-30N
200105142217	-	T-7	Auto	MK-30N
200105142306	-	T-7	-	MK-30N
200105142355	-	T-7	-	MK-30N
200105150044	-	T-7	-	MK-30N
200105150132	-	T-7	-	MK-30N
200105150218	-	T-7	-	MK-30N
200105150305	-	T-7	-	MK-30N
200105150351	-	T-7	-	MK-30N
200105150438	-	T-7	-	MK-30N
200105150527	-	T-7	-	MK-30N
200105150618	-	T-7	-	MK-30N
200105150710	-	T-7	-	MK-30N
200105150803	-	T-7	-	MK-30N
200105150857	-	T-7	Auto	MK-30N
200105150953	-	T-7	Auto	MK-30N
200105151046	-	T-7	Auto	MK-30N
200105151138	-	T-7	Auto	MK-30N
200105151232	-	T-7	Auto	MK-30N
200105151328	-	T-7	Auto	MK-30N
200105151423	-	T-7	Auto	MK-30N
200105151518	-	T-7	Auto	MK-30N
200105151610	-	T-7	Auto	MK-30N
200105151703	-	T-7	Auto	MK-30N
200105151755	-	T-7	Auto	MK-30N
200105160329	-	T-7	-	MK-30N
200105160438	-	T-7	-	MK-30N
200105160533	-	T-7	-	MK-30N
200105160630	-	T-7	-	MK-30N
200105160724	-	T-7	Auto	MK-30N
200105160824	-	T-7	Auto	MK-30N
200105160920	-	T-7	-	MK-30N
200105161012	-	T-7	-	MK-30N
200105161107	-	T-7	Auto	MK-30N
200105161201	-	T-7	Auto	MK-30N
200105161256	-	T-7	Auto	MK-30N
200105161351	-	T-7	Auto	MK-30N
200105161448	-	T-7	Auto	MK-30N
200105161544	-	T-7	Auto	MK-30N
200105161642	-	T-7	Auto	MK-30N
200105161740	-	T-7	Auto	MK-30N
200105161839	-	T-7	Auto	MK-30N
200105161938	-	T-7	Auto	MK-30N
200105162039	-	T-7	Auto	MK-30N
200105162138	-	T-7	Auto	MK-30N
200105162235	-	T-7	Auto	MK-30N
200105162333	-	T-7	Auto	MK-30N
200105170031	-	T-7	Auto	MK-30N
200105170131	-	T-7	Auto	MK-30N
200105170226	-	T-7	Auto	MK-30N

Data processing

(1) For sensor's stability, 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

- 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

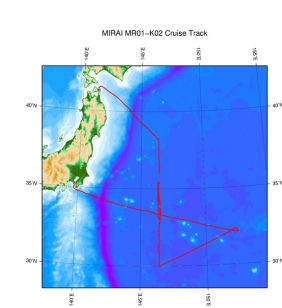
In addition, an abnormal value is identified by a visual check, and the data after visual QC is released.

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](#)

MR01-K02

Ship Name: MIRAI

Period: 2001-05-13 - 2001-05-28

Chief Scientist: Yasushi Yoshikawa (JAMSTEC)

Update History

2019-09-28	An observation data was registered.
2017-06-29	An observation data was registered.
2014-07-16	An observation data was registered.
2014-02-20	An observation data was registered.
2012-12-25	An observation data was registered.

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Dive ID:

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MIRAI MR01-K02 Expendable Bathythermograph (XBT)

Last Modified: 2019-09-28

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 Cruise ID: [MR01-K02](#)

Expendable Bathythermograph (XBT): Processed (DMO)-QCed

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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.

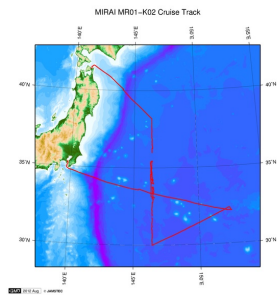
QCed data were added flag according to the NODC (National Oceanographic Data Center) quality control procedure, additionally visually checked. Please see the site of NODC of the following link for quality control procedure.

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

Sample Program

[ex_read2.f](#)

Related Information



 [Enlarge Image](#)

MR01-K02

Ship Name: MIRAI

Period: 2001-05-13 - 2001-05-28

Chief Scientist: Yasushi Yoshikawa (JAMSTEC)

Update History

2019-09-28	An observation data was registerd.
2017-06-29	An observation data was registerd.
2014-07-16	An observation data was registerd.
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6K Sonar DEEP TOW
KM-ROV
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MIRAI MR01-K02 Expendable Baththermograph (XBT)

Last Modified: 2019-09-28

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

Cruise ID: **MR01-K02**

Expendable Baththermograph (XBT): Processed (DMO)-QCed

Data Policy: **JAMSTEC**

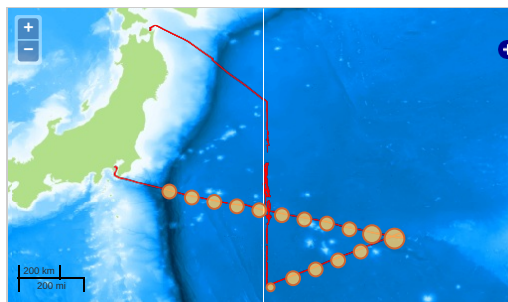
Observation Items: Depth, Temperature

Science Keywords:

OCEANS > OCEAN TEMPERATURE > WATER TEMPERATURE

Observation Map

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

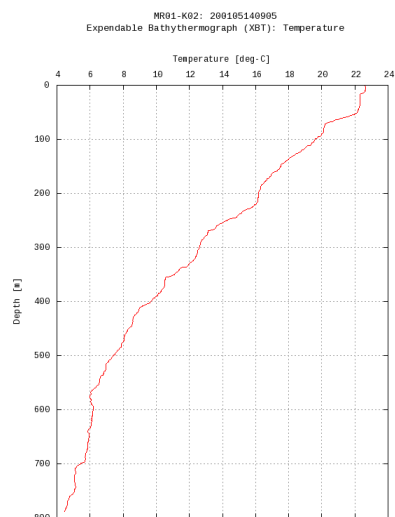


— ... Observation Line — ... Navigation ● ... Observation, Dive Point, Hole

Imagery reproduced from ...

Figures

200105140905


















































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

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File names

☐ 200105140905.dat
☐ 200105140949.dat
☐ 200105141033.dat
☐ 200105141120.dat
☐ 200105141204.dat
☐ 200105141251.dat
☐ 200105141339.dat
☐ 200105141425.dat
☐ 200105141515.dat
☐ 200105141601.dat
☐ 200105141647.dat
☐ 200105141731.dat
☐ 200105141814.dat
☐ 200105141855.dat
☐ 200105141950.dat
☐ 200105142038.dat
☐ 200105142127.dat
☐ 200105142217.dat
☐ 200105142306.dat

	200105142355.dat
	200105150044.dat
	200105150132.dat
	200105150218.dat
	200105150305.dat
	200105150351.dat
	200105150438.dat
	200105150527.dat
	200105150618.dat
	200105150710.dat
	200105150803.dat
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	200105160630.dat
	200105160724.dat
	200105160824.dat
	200105160920.dat
	200105161012.dat
	200105161107.dat
	200105161201.dat
	200105161256.dat
	200105161351.dat
	200105161448.dat
	200105161544.dat
	200105161642.dat
	200105161740.dat
	200105161839.dat
	200105161938.dat
	200105162039.dat
	200105162138.dat
	200105162235.dat
	200105162333.dat
	200105170031.dat
	200105170131.dat
	200105170226.dat
	ex_read2.f (Sample Program)

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

Observation	Time and Date	Lat. [°]	Lon. [°]
200105140905	2001-05-14 09:00	34.2798	142.0058
200105140949	2001-05-14 09:44	34.2123	142.2495
200105141033	2001-05-14 10:30	34.1381	142.5018
200105141120	2001-05-14 11:16	34.0705	142.7511
200105141204	2001-05-14 12:02	34.0136	143.0013
200105141251	2001-05-14 12:48	33.9680	143.2510
200105141339	2001-05-14 13:35	33.9196	143.5013
200105141425	2001-05-14 14:23	33.8651	143.7513
200105141515	2001-05-14 15:11	33.8173	144.0015
200105141601	2001-05-14 15:58	33.7628	144.2515
200105141647	2001-05-14 16:44	33.7118	144.5031
200105141731	2001-05-14 17:28	33.6643	144.7516
200105141814	2001-05-14 18:11	33.6235	145.0016
200105141855	2001-05-14 18:52	33.5973	145.2520
200105141950	2001-05-14 19:47	33.5983	145.5018
200105142038	2001-05-14 20:36	33.5211	145.7533
200105142127	2001-05-14 21:24	33.4493	145.9993
200105142217	2001-05-14 22:14	33.3773	146.2518
200105142306	2001-05-14 23:03	33.3306	146.5004
200105142355	2001-05-14 23:52	33.2816	146.7506
200105150044	2001-05-15 00:41	33.2301	147.0008
200105150132	2001-05-15 01:29	33.1791	147.2504
200105150218	2001-05-15 02:16	33.1275	147.4998
200105150305	2001-05-15 03:02	33.0820	147.7526
200105150351	2001-05-15 03:48	33.0426	148.0000
200105150438	2001-05-15 04:35	32.9996	148.2501
200105150527	2001-05-15 05:24	32.9523	148.5000
200105150618	2001-05-15 06:15	32.9041	148.7501
200105150710	2001-05-15 07:08	32.8558	149.0008
200105150803	2001-05-15 08:01	32.7953	149.2503
200105150857	2001-05-15 08:54	32.7236	149.5003

Observation ID	Time and Date	Lat (°N)	Lon (°E)
200105151046	2001-05-15 10:43	32.6051	150.0006
200105151138	2001-05-15 11:36	32.5515	150.2508
200105151232	2001-05-15 12:30	32.5021	150.5006
200105151328	2001-05-15 13:25	32.4473	150.7501
200105151423	2001-05-15 14:20	32.3880	151.0003
200105151518	2001-05-15 15:15	32.3351	151.2506
200105151610	2001-05-15 16:07	32.2928	151.5006
200105151703	2001-05-15 16:59	32.2471	151.7506
200105151755	2001-05-15 17:52	32.1910	152.0004
200105160329	2001-05-16 03:25	32.1503	152.4523
200105160438	2001-05-16 04:35	32.3138	152.2488
200105160533	2001-05-16 05:31	32.2101	152.0001
200105160630	2001-05-16 06:27	32.1061	151.7486
200105160724	2001-05-16 07:22	32.0188	151.5006
200105160824	2001-05-16 08:19	31.9143	151.2506
200105160920	2001-05-16 09:15	31.8156	150.9998
200105161012	2001-05-16 10:09	31.7161	150.7510
200105161107	2001-05-16 11:04	31.6130	150.5003
200105161201	2001-05-16 11:59	31.5145	150.2498
200105161256	2001-05-16 12:54	31.4136	150.0000
200105161351	2001-05-16 13:49	31.3216	149.7501
200105161448	2001-05-16 14:46	31.2205	149.4998
200105161544	2001-05-16 15:42	31.1313	149.2501
200105161642	2001-05-16 16:40	31.0226	149.0003
200105161740	2001-05-16 17:38	30.9188	148.7501
200105161839	2001-05-16 18:36	30.8216	148.5001
200105161938	2001-05-16 19:35	30.7166	148.2501
200105162039	2001-05-16 20:36	30.6193	148.0000
200105162138	2001-05-16 21:35	30.5245	147.7498
200105162235	2001-05-16 22:33	30.4311	147.4995
200105162333	2001-05-16 23:31	30.3338	147.2498
200105170031	2001-05-17 00:28	30.2366	146.9998
200105170131	2001-05-17 01:26	30.1323	146.7504
200105170226	2001-05-17 02:23	30.0286	146.5003

Related Information



MR01-MR02 Cruise Track

MR01-K02
Ship Name: MIRAI
Period: 2001-05-13 - 2001-05-28
Chief Scientist: Yasushi Yoshikawa (JAMSTEC)

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Update History

2019-09-28	An observation data was registered.
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What's New

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Publication List

Amount of Public Info.

Data

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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


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Dive ID:

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