

## MIRAI MR03-K04 Leg6 Expendable Bathythermograph (XBT)

Last Modified: 2019-09-28

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

Cruise ID: [MR03-K04 Leg6](#)

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

Data Policy: [JAMSTEC](#)

Observation Items: Depth, Temperature

Science Keywords:

OCEANS > OCEAN TEMPERATURE > WATER TEMPERATURE

### 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.

$$Z = at + 10E^{-3} \cdot bt^2$$

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.

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

Cast name	Probe Serial No.	Probe Type	Launcher	Converter
200402140238	-	T-7	Auto	MK-30N
200402140245	-	T-7	Auto	MK-30N
200402140251	-	T-7	Auto	MK-30N
200402140256	-	T-7	Auto	MK-30N
200402140309	-	T-7	Auto	MK-30N
200402140313	-	T-7	Auto	MK-30N
200402140318	-	T-7	Auto	MK-30N
200402140324	-	T-7	Auto	MK-30N
200402140335	-	T-7	Auto	MK-30N
200402140339	-	T-7	Auto	MK-30N
200402140345	-	T-7	Auto	MK-30N
200402140350	-	T-7	Auto	MK-30N
200402140402	-	T-7	Auto	MK-30N
200402140405	-	T-7	Auto	MK-30N
200402140410	-	T-7	Auto	MK-30N
200402140415	-	T-7	Auto	MK-30N
200402140426	-	T-7	Auto	MK-30N
200402140431	-	T-7	Auto	MK-30N
200402140436	-	T-7	Auto	MK-30N
200402140441	-	T-7	Auto	MK-30N
200402140454	-	T-7	Auto	MK-30N
200402140458	-	T-7	Auto	MK-30N
200402140504	-	T-7	Auto	MK-30N
200402140508	-	T-7	Auto	MK-30N
200402140519	-	T-7	Auto	MK-30N
200402140522	-	T-7	Auto	MK-30N
200402140527	-	T-7	Auto	MK-30N
200402140532	-	T-7	Auto	MK-30N
200402140545	-	T-7	Auto	MK-30N
200402140549	-	T-7	Auto	MK-30N
200402140554	-	T-7	Auto	MK-30N
200402140558	-	T-7	Auto	MK-30N
200402140611	-	T-7	Auto	MK-30N
200402140615	-	T-7	Auto	MK-30N
200402140621	-	T-7	Auto	MK-30N
200402140625	-	T-7	Auto	MK-30N
200402140637	-	T-7	Auto	MK-30N
200402140641	-	T-7	Auto	MK-30N
200402140646	-	T-7	Auto	MK-30N
200402140652	-	T-7	Auto	MK-30N
200402140703	-	T-7	Auto	MK-30N
200402140708	-	T-7	Auto	MK-30N
200402141122	-	T-7	Auto	MK-30N
200402141126	-	T-7	Auto	MK-30N
200402141129	-	T-7	Auto	MK-30N
200402141133	-	T-7	Auto	MK-30N
200402141144	-	T-7	Auto	MK-30N
200402141148	-	T-7	Auto	MK-30N
200402141154	-	T-7	Auto	MK-30N
200402141157	-	T-7	Auto	MK-30N
200402141208	-	T-7	Auto	MK-30N
200402141212	-	T-7	Auto	MK-30N
200402141218	-	T-7	Auto	MK-30N
200402141224	-	T-7	Auto	MK-30N
200402141236	-	T-7	Auto	MK-30N
200402141242	-	T-7	Auto	MK-30N
200402141248	-	T-7	Auto	MK-30N
200402141255	-	T-7	Auto	MK-30N
200402141307	-	T-7	Auto	MK-30N
200402141314	-	T-7	Auto	MK-30N
200402141321	-	T-7	Auto	MK-30N
200402141327	-	T-7	Auto	MK-30N
200402141348	-	T-7	Auto	MK-30N
200402141355	-	T-7	Auto	MK-30N
200402141402	-	T-7	Auto	MK-30N
200402141416	-	T-7	Auto	MK-30N
200402141423	-	T-7	Auto	MK-30N
200402141436	-	T-7	Auto	MK-30N
200402141450	-	T-7	Auto	MK-30N
200402141455	-	T-7	Auto	MK-30N
200402141501	-	T-7	Auto	MK-30N
200402141508	-	T-7	Auto	MK-30N

(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
- 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](#)

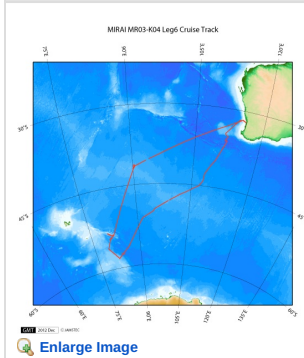
In addition, an abnormal value is identified by a visual check, and the data after visual QC is released.

**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**



**MR03-K04 Leg6**

Ship Name: MIRAI

Period: 2004-01-27 - 2004-02-19

Chief Scientist: Shuichi Watanabe (JAMSTEC)

Project Name: [Blue Earth Global Expedition 2003]

**Update History**

2019-09-28	An observation data was registered.
2017-06-29	An observation data was registered.
2014-07-24	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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[POWER GRAB SAMPLER \(SHELL\)](#)  
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**Go to a Cruise Information**

Cruise ID:

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Dive ID:

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## MIRAI MR03-K04 Leg6 Expendable Bathythermograph (XBT)

Last Modified: 2019-09-28

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

 Cruise ID: [MR03-K04 Leg6](#)

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

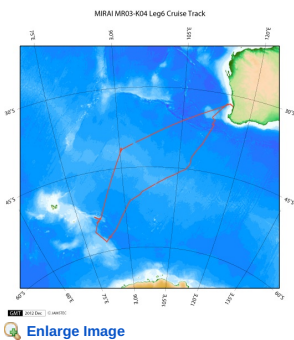
QCed data were added flag according to the NODC (National Oceanographic Data Center) quality control procedure, additionally visually checked. Please see the site of NODC of the following link for quality control procedure.

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

#### Sample Program

[ex\\_read2.f](#)

#### Related Information



#### MR03-K04 Leg6

Ship Name: MIRAI

Period: 2004-01-27 - 2004-02-19

Chief Scientist: Shuichi Watanabe (JAMSTEC)

Project Name: [Blue Earth Global Expedition 2003]

#### Update History

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## MIRAI MR03-K04 Leg6 Expendable Bathythermograph (XBT)

Last Modified: 2019-09-28

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

Cruise ID: **MR03-K04 Leg6**

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

Data Policy: **JAMSTEC**

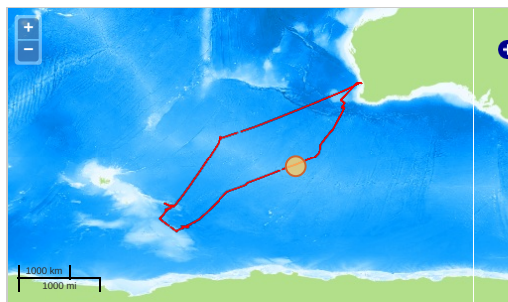
Observation Items: Depth, Temperature

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.

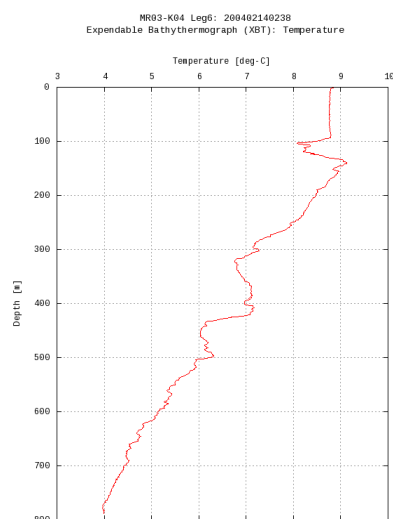


— ... Observation Line — ... Navigation ● ... Observation, Dive Point, Hole

Imagery reproduced from ...

### Figures

200402140238





































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"/>	200402140238.dat
<input type="checkbox"/>	200402140245.dat
<input type="checkbox"/>	200402140251.dat
<input type="checkbox"/>	200402140256.dat
<input type="checkbox"/>	200402140309.dat
<input type="checkbox"/>	200402140313.dat
<input type="checkbox"/>	200402140318.dat
<input type="checkbox"/>	200402140324.dat
<input type="checkbox"/>	200402140335.dat
<input type="checkbox"/>	200402140339.dat
<input type="checkbox"/>	200402140345.dat
<input type="checkbox"/>	200402140350.dat
<input type="checkbox"/>	200402140402.dat
<input type="checkbox"/>	200402140405.dat
<input type="checkbox"/>	200402140410.dat
<input type="checkbox"/>	200402140415.dat
<input type="checkbox"/>	200402140426.dat
<input type="checkbox"/>	200402140431.dat
<input type="checkbox"/>	200402140436.dat

	200402140441.dat
	200402140454.dat
	200402140458.dat
	200402140504.dat
	200402140508.dat
	200402140519.dat
	200402140522.dat
	200402140527.dat
	200402140532.dat
	200402140545.dat
	200402140549.dat
	200402140554.dat
	200402140558.dat
	200402140611.dat
	200402140615.dat
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	200402140625.dat
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	200402140652.dat
	200402140703.dat
	200402140708.dat
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	200402141148.dat
	200402141154.dat
	200402141157.dat
	200402141208.dat
	200402141212.dat
	200402141218.dat
	200402141224.dat
	200402141236.dat
	200402141242.dat
	200402141248.dat
	200402141255.dat
	200402141307.dat
	200402141314.dat
	200402141321.dat
	200402141327.dat
	200402141348.dat
	200402141355.dat
	200402141402.dat
	200402141416.dat
	200402141423.dat
	200402141436.dat
	200402141450.dat
	200402141455.dat
	200402141501.dat
	200402141508.dat
	ex_read2.f (Sample Program)

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

Observation	Time and Date	Lat. [°]	Lon. [°]
200402140238	2004-02-14 02:36	-46.4920	103.4888
200402140245	2004-02-14 02:43	-46.4831	103.5170
200402140251	2004-02-14 02:49	-46.4750	103.5413
200402140256	2004-02-14 02:55	-46.4666	103.5636
200402140309	2004-02-14 03:07	-46.4480	103.6130
200402140313	2004-02-14 03:12	-46.4411	103.6306
200402140318	2004-02-14 03:16	-46.4333	103.6503
200402140324	2004-02-14 03:22	-46.4251	103.6720
200402140335	2004-02-14 03:34	-46.4066	103.7200
200402140339	2004-02-14 03:38	-46.4000	103.7363
200402140345	2004-02-14 03:43	-46.3918	103.7576
200402140350	2004-02-14 03:49	-46.3836	103.7803
200402140402	2004-02-14 04:01	-46.3626	103.8255
200402140405	2004-02-14 04:04	-46.3573	103.8373
200402140410	2004-02-14 04:08	-46.3491	103.8553
200402140415	2004-02-14 04:13	-46.3423	103.8730
200402140426	2004-02-14 04:25	-46.3240	103.9200
200402140431	2004-02-14 04:29	-46.3166	103.9376
200402140436	2004-02-14 04:34	-46.3080	103.9596
200402140441	2004-02-14 04:39	-46.3001	103.9796
200402140454	2004-02-14 04:52	-46.2793	104.0298
200402140458	2004-02-14 04:56	-46.2731	104.0453
200402140504	2004-02-14 05:02	-46.2630	104.0703
200402140508	2004-02-14 05:06	-46.2571	104.0845
200402140519	2004-02-14 05:17	-46.2386	104.1290

Observance ID	Time and Date	Lat	Long
200402140527	2004-02-14 05:26	-46.2248	104.1626
200402140532	2004-02-14 05:31	-46.2168	104.1820
200402140545	2004-02-14 05:43	-46.1973	104.2293
200402140549	2004-02-14 05:47	-46.1908	104.2458
200402140554	2004-02-14 05:52	-46.1833	104.2650
200402140558	2004-02-14 05:57	-46.1755	104.2830
200402140611	2004-02-14 06:09	-46.1563	104.3306
200402140615	2004-02-14 06:13	-46.1496	104.3465
200402140621	2004-02-14 06:19	-46.1410	104.3680
200402140625	2004-02-14 06:24	-46.1340	104.3858
200402140637	2004-02-14 06:36	-46.1146	104.4320
200402140641	2004-02-14 06:39	-46.1086	104.4460
200402140646	2004-02-14 06:44	-46.1001	104.4656
200402140652	2004-02-14 06:50	-46.0910	104.4875
200402140703	2004-02-14 07:02	-46.0725	104.5320
200402140708	2004-02-14 07:06	-46.0658	104.5471
200402141122	2004-02-14 11:20	-45.6516	105.4983
200402141126	2004-02-14 11:24	-45.6450	105.5116
200402141129	2004-02-14 11:28	-45.6381	105.5256
200402141133	2004-02-14 11:31	-45.6323	105.5373
200402141144	2004-02-14 11:42	-45.6126	105.5765
200402141148	2004-02-14 11:46	-45.6061	105.5895
200402141154	2004-02-14 11:52	-45.5958	105.6105
200402141157	2004-02-14 11:56	-45.5895	105.6235
200402141208	2004-02-14 12:06	-45.5735	105.6605
200402141212	2004-02-14 12:10	-45.5673	105.6755
200402141218	2004-02-14 12:17	-45.5580	105.6986
200402141224	2004-02-14 12:22	-45.5501	105.7190
200402141236	2004-02-14 12:35	-45.5326	105.7640
200402141242	2004-02-14 12:41	-45.5245	105.7848
200402141248	2004-02-14 12:46	-45.5170	105.8043
200402141255	2004-02-14 12:53	-45.5085	105.8275
200402141307	2004-02-14 13:05	-45.4921	105.8721
200402141314	2004-02-14 13:13	-45.4833	105.8975
200402141321	2004-02-14 13:19	-45.4751	105.9203
200402141327	2004-02-14 13:26	-45.4668	105.9440
200402141348	2004-02-14 13:46	-45.4421	106.0178
200402141355	2004-02-14 13:54	-45.4338	106.0435
200402141402	2004-02-14 14:01	-45.4256	106.0680
200402141416	2004-02-14 14:14	-45.4086	106.1176
200402141423	2004-02-14 14:21	-45.4003	106.1408
200402141436	2004-02-14 14:35	-45.3835	106.1876
200402141450	2004-02-14 14:48	-45.3658	106.2341
200402141455	2004-02-14 14:53	-45.3586	106.2520
200402141501	2004-02-14 15:00	-45.3500	106.2738
200402141508	2004-02-14 15:06	-45.3411	106.2956

Related Information

MR03-K04 Leg6

Ship Name: MIRAI  
Period: 2004-01-27 - 2004-02-19  
Chief Scientist: Shuichi Watanabe (JAMSTEC)  
Project Name: [Blue Earth Global Expedition 2003]

Update History

2019-09-28

An observation data was registered.

2017-06-29

An observation data was registered.

2014-07-24

An observation data was registered.

2014-02-20

An observation data was registered.

2012-12-25

An observation data was registered.

JAMSTEC

Site Policy

Privacy Policy

Application for Data and Samples

Data Policy

What's New

Update History

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

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

Go to a Dive Information

Dive ID:

Go



