

MIRAI MR12-E02 Leg1 Expendable Bathythermograph (XBT)

Last Modified: 2019-09-28

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

Cruise ID: [MR12-E02 Leg1](#)

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/MR12-E02_leg1_all.pdf

For Using Data

Principal Investigator

Data Management Office

Use Constraints

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

Data Citation

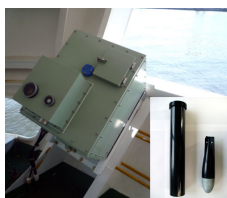
See [Terms and Conditions](#) about data citation.

Instrument

Instrument:

Expendable bathythermograph (XBT)

(MR11-04 -)



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
201203062324	-	T-7	Hand	MK-150N
201203070312	-	T-7	Hand	MK-150N
201203081019	-	T-7	Hand	MK-150N
201203091225	-	T-7	Hand	MK-150N
201203091502	-	T-7	Hand	MK-150N
201203100907	-	T-7	Hand	MK-150N
201203101658	-	T-7	Hand	MK-150N
201203111418	-	T-7	Hand	MK-150N
201203120931	-	T-7	Hand	MK-150N
201203121215	-	T-7	Hand	MK-150N
201203121800	-	T-7	Hand	MK-150N
201203130153	-	T-7	Hand	MK-150N
201203130422	-	T-7	Hand	MK-150N
201203140544	-	T-7	Hand	MK-150N

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

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.

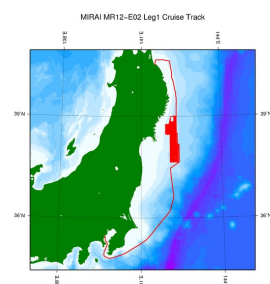
Note

(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

☒ Cruise Data ☐ Dive Data



[Enlarge Image](#)

MR12-E02 Leg1

Ship Name: MIRAI

Period: 2012-03-05 - 2012-03-15

Chief Scientist: Takafumi Kasaya (JAMSTEC)

Project Name: [Tohoku Ecosystem-Associated Marine Sciences (TEAMS)]

Proposal Title: Marine Ecosystems Investigation, Impact by the mega-earthquake (the 2011 Earthquake of the Pacific coast of Tohoku) and Tsunami:For Recover and Rebuild of Sanriku Fisheries Activities

Update History

2019-09-28	An observation data was registerd.
2017-06-29	An observation data was registerd.
2014-08-12	An observation data was registerd.
2014-03-31	An observation data was registerd.
2014-02-20	An observation data was registerd.
2013-07-18	An observation data was registerd.

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



MIRAI MR12-E02 Leg1 Expendable Bathythermograph (XBT)

Last Modified: 2019-09-28

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

Cruise ID: [MR12-E02 Leg1](#)

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.

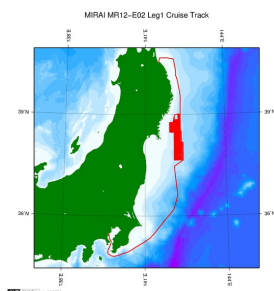
[QUALITY CONTROL AND PROCESSING OF HISTORICAL OCEANOGRAPHIC TEMPERATURE, SALINITY, AND OXYGEN DATA](#)

Sample Program

[ex_read2.f](#)

Related Information

☒ Cruise Data ☐ Dive Data



[Enlarge Image](#)

MR12-E02 Leg1

Ship Name: MIRAI

Period: 2012-03-05 - 2012-03-15

Chief Scientist: Takafumi Kasaya (JAMSTEC)

Project Name: [Tohoku Ecosystem-Associated Marine Sciences (TEAMS)]

Proposal Marine Ecosystems Investigation, Impact by the mega-earthquake (the 2011 Earthquake of the Pacific coast of Tohoku) and Tsunami: For Recover and Rebuild of Sanriku Fisheries Activities

Update History

2019-09-28	An observation data was registerd.
2017-06-29	An observation data was registerd.
2014-08-12	An observation data was registerd.
2014-03-31	An observation data was registerd.
2014-02-20	An observation data was registerd.
2013-07-18	An observation data was registerd.

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 to a Dive Information

Dive ID:

Copyright 2011 Japan Agency for Marine-Earth Science and Technology



JAMSTEC

国立研究開発法人
海洋研究開発機構
JAPAN AGENCY FOR MARINE-EARTH SCIENCE AND TECHNOLOGY

MIRAI MR12-E02 Leg1 Expendable Bathythermograph (XBT)

Last Modified: 2019-09-28

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

Cruise ID: [MR12-E02 Leg1](#)

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

Data Policy: [JAMSTEC](#)

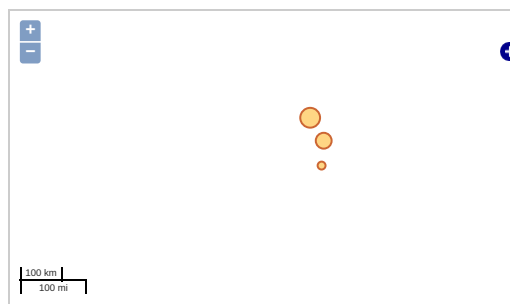
Observation Items: Depth, Temperature

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.

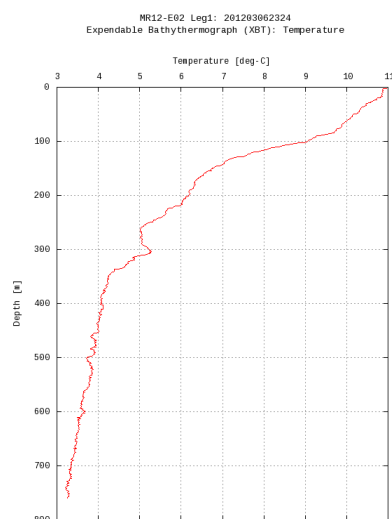


— ... Observation Line — ... Navigation ● ... Observation, Dive Point, Hole

Imagery reproduced from ...

Figures

201203062324



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"/>	201203062324.dat
<input type="checkbox"/>	201203070312.dat
<input type="checkbox"/>	201203081019.dat
<input type="checkbox"/>	201203091225.dat
<input type="checkbox"/>	201203091502.dat
<input type="checkbox"/>	201203100907.dat
<input type="checkbox"/>	201203101658.dat
<input type="checkbox"/>	201203111418.dat
<input type="checkbox"/>	201203120931.dat
<input type="checkbox"/>	201203121215.dat
<input type="checkbox"/>	201203121800.dat
<input type="checkbox"/>	201203130153.dat
<input type="checkbox"/>	201203130422.dat
<input type="checkbox"/>	201203140544.dat
<input type="checkbox"/>	ex_read2.f (Sample Program)

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

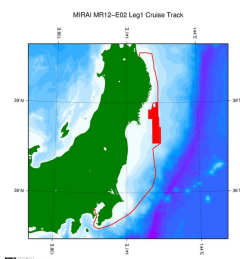
Observation	Time and Date	Lat. [°]	Lon. [°]
201203062324	2012-03-06 23:25	37.6085	142.3366

Observation	Time and Date	Lat. (°)	Lon. (°)
201203070312	2012-03-07 03:14	38.1603	142.3835
201203081019	2012-03-08 10:20	38.1251	142.2051
201203091225	2012-03-09 12:27	38.4761	142.2051
201203091502	2012-03-09 15:03	38.2455	142.2326
201203100907	2012-03-10 09:08	37.8828	142.1048
201203101658	2012-03-10 17:00	38.6701	142.0831
201203111418	2012-03-11 14:19	38.5231	141.9520
201203120931	2012-03-12 09:33	38.6599	142.0230
201203121215	2012-03-12 12:17	38.5295	142.0680
201203121800	2012-03-12 18:02	38.8163	142.1300
201203130153	2012-03-13 01:55	38.5153	142.2193
201203130422	2012-03-13 04:23	38.8168	142.2410
201203140544	2012-03-14 05:45	39.0071	142.1953

Related Information

[Cruise Data](#)

[Dive Data](#)



[Enlarge Image](#)

MR12-E02 Leg1

Ship Name: MIRAI

Period: 2012-03-05 - 2012-03-15

Chief Scientist: Takafumi Kasaya (JAMSTEC)

Project Name: [Tohoku Ecosystem-Associated Marine Sciences (TEAMS)]

Proposal Marine Ecosystems Investigation, Impact by the mega-earthquake (the 2011 Earthquake of the Pacific coast of Tohoku) and Tsunami:For Recover and Rebuild of Sanriku Fisheries Activities

Update History

2019-09-28	An observation data was registered.
2017-06-29	An observation data was registered.
2014-08-12	An observation data was registered.
2014-03-31	An observation data was registered.
2014-02-20	An observation data was registered.
2013-07-18	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 to a Dive Information

Dive ID:

