

MIRAI MR12-05 Leg2 Expendable Bathythermograph (XBT)

Last Modified: 2017-06-29

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Cruise ID: [MR12-05 Leg2](#)

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/MR12-05_leg1-3_all.pdf

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Data Management Office

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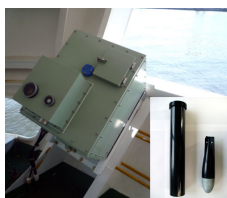
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Instrument

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.

Type : LM-3A

Operation area : Rear upper deck

Automatic launcher

Manufacturer : Tsurumi Seiki Co., LTD.

Type : AL-8

Location : Port side of rear (4m from the sea level). The control panel is installed in the investigation room.

(2) Converter

Manufacturer : Tsurumi Seiki Co., LTD.

Type : MK-30N

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]	-2.22 to 35.55			
Temperature accuracy [deg-C]	+/- 0.2			
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
Coefficient-a	6.828	6.691	6.691	6.301
Coefficient-b	-1.82	-2.25	-2.25	-2.16

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 XBT types.

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* 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	XBT type
201212260936	T-7

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](#)

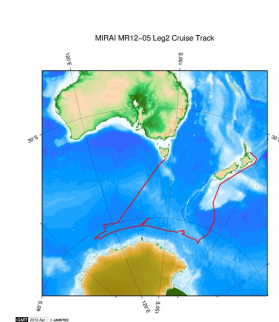
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Note

(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 fall-rate bias corrected data.

[Publication policy of XBT fall-rate bias correction data](#)

Related Information



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MR12-05 Leg2

Ship Name: MIRAI

Period: 2012-11-27 - 2013-01-03

Chief Scientist: Katsuro Katsumata (JAMSTEC)

Proposal ▶ WOCE-revisit in the western Pacific and Southern oceans

Title:

Update History

2017-06-29	An observation data was registered.
2015-05-21	An observation data was registered.
2015-01-15	An observation data was registered.

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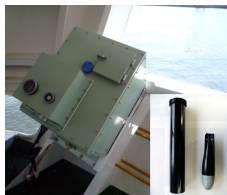
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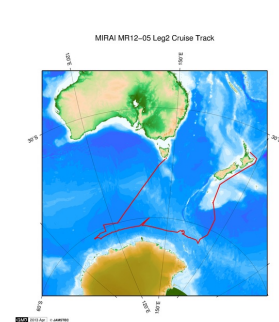
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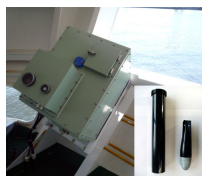
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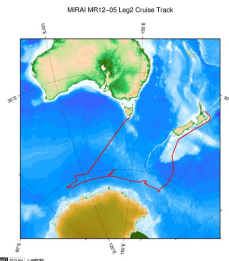
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