MIRAI MR00-K03 Expendable Bathythermograph (XBT)

Last Modified: 2019-09-28

ReadMe | Observation Data | Data Format

Cruise ID: MR00-K03
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/MR00-K03_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
200005110119	-	T-5	Auto	MK-30N
200005150037	-	T-5	Auto	MK-30N
200005150632	-	T-5	Auto	MK-30N
200005150639	-	T-7	Auto	MK-30N
200005151522	-	T-5	Auto	MK-30N
200005151657	-	T-5	Auto	MK-30N
200005160326	-	T-5	Auto	MK-30N
200005160451	-	T-7	Auto	MK-30N
200005161313	-	T-7	Auto	MK-30N
200005170636	-	T-7	Auto	MK-30N
200005171955	-	T-7	Auto	MK-30N
200005180847	-	T-7	Auto	MK-30N
200005181109	-	T-7	Auto	MK-30N
200005181231	-	T-7	Auto	MK-30N
200005181336	-	T-7	Auto	MK-30N
200005181449	-	T-7	Auto	MK-30N
200005181714	-	T-7	Auto	MK-30N
200005181830	-	T-7	Auto	MK-30N
200005182010	-	T-7	Auto	MK-30N
200005182201	-	T-7	Auto	MK-30N
200005200814	-	T-7	Auto	MK-30N
200005200907	-	T-7	Auto	MK-30N
200005311639	-	T-5	Auto	MK-30N
200006021828	-	T-7	Auto	MK-30N
200006022147	-	T-7	Auto	MK-30N
200006022230	-	T-7	Auto	MK-30N
200006030612	-	T-7	Auto	MK-30N
200006031320	-	T-5	Auto	MK-30N
200006031757	-	T-5	Auto	MK-30N
200006031853	-	T-7	Auto	MK-30N
200006040654	-	T-7	Auto	MK-30N
200006040701	-	T-7	Auto	MK-30N
200006042031	-	T-7	Auto	MK-30N
200006050535	-	T-7	Auto	MK-30N
200006050639	-	T-7	Auto	MK-30N
200006050726	-	T-7	Auto	MK-30N
200006050830	-	T-7	Auto	MK-30N
200006050902	-	T-7	Auto	MK-30N
200006050948	-	T-7	Auto	MK-30N
200006051047	-	T-5	Auto	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

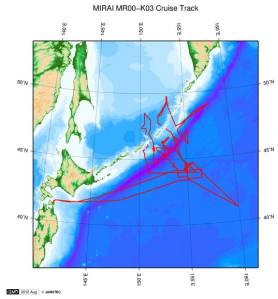
In addition, an abnormal value is identified by a visual check, and the data after visual QC is released.

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

MR00-K03
Ship Name: MIRAI
Period: 2000-05-09 - 2000-06-09
Chief Scientist: Masashi Kusakabe (JAMSTEC)
Project Name: [Station KNOT]

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.
2012-12-25	An observation data was registerd.

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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

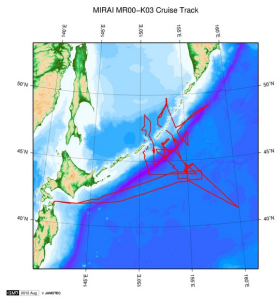
2. Observed Level Flags
- N - missing value
- 0 - accepted value
- 1 - range outlier (outside of broad range check)
- 2 - failed inversion check
- 3 - failed gradient check
- 4 - zero anomaly
- 5 - failed combined gradient and inversion checks
- 6 - failed range and inversion checks
- 7 - failed range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

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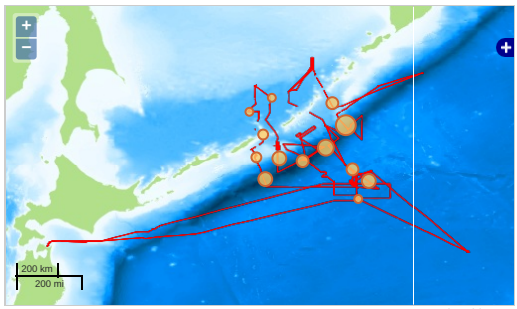
Observation Map

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

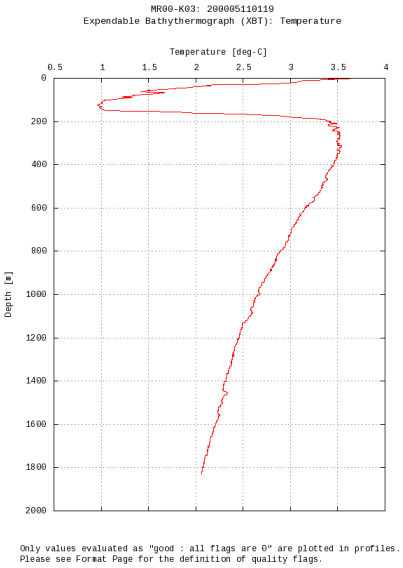


Imagery reproduced from ...

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

Figures

200005110119



Data List

Add to Basket

File names
200005110119.dat
200005150037.dat
200005150632.dat
200005150639.dat
200005151522.dat
200005151657.dat
200005160326.dat
200005160451.dat
200005161313.dat
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200005181714.dat
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File names
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200005200814.dat
200005200907.dat
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200006021828.dat
200006022147.dat
200006022230.dat
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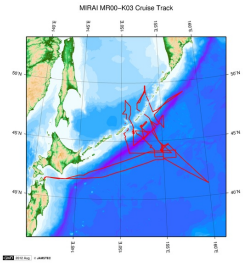
200006050535.dat
200006050639.dat
200006050726.dat
200006050830.dat
200006050902.dat
200006050948.dat
200006051047.dat
ex_read2.f (Sample Program)

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

Observation	Time and Date	Lat. [°]	Lon. [°]
200005110119	2000-05-11 01:12	43.5008	155.0031
200005150037	2000-05-15 00:31	44.3840	150.8756
200005150632	2000-05-15 06:23	44.7390	150.7510
200005150639	2000-05-15 06:35	44.7406	150.7478
200005151522	2000-05-15 15:14	45.0508	150.6170
200005151657	2000-05-15 16:45	45.3498	150.4793
200005160326	2000-05-16 03:18	46.0131	150.8615
200005160451	2000-05-16 04:48	46.3620	150.7811
200005161313	2000-05-16 13:09	47.3708	150.1721
200005170636	2000-05-17 06:32	47.9923	151.1660
200005171955	2000-05-17 19:52	46.1925	151.5276
200005180847	2000-05-18 08:42	45.3025	151.4990
200005181109	2000-05-18 11:06	44.6681	151.4998
200005181231	2000-05-18 12:28	44.8376	151.8706
200005181336	2000-05-18 13:33	44.9995	152.1828
200005181449	2000-05-18 14:46	45.1820	152.5329
200005181714	2000-05-18 17:09	45.5663	153.1908
200005181830	2000-05-18 18:27	45.7783	153.5638
200005182010	2000-05-18 20:06	45.8338	152.9986
200005182201	2000-05-18 21:58	45.8851	152.3333
200005200814	2000-05-20 08:09	45.4421	153.0753
200005200907	2000-05-20 09:02	45.5961	153.3023
200005311639	2000-05-31 16:31	47.7546	153.8518
200006021828	2000-06-02 18:25	47.2490	154.1435
200006022147	2000-06-02 21:10	47.0140	154.2391
200006022230	2000-06-02 22:26	46.7751	154.4515
200006030612	2000-06-03 06:06	46.9383	154.9635
200006031320	2000-06-03 13:13	46.6466	155.2460
200006031757	2000-06-03 17:48	46.5051	154.7731
200006031853	2000-06-03 18:48	46.3761	154.4475
200006040654	2000-06-04 06:51	46.1865	154.2123
200006040701	2000-06-04 06:58	46.1629	154.2165
200006042031	2000-06-04 20:26	45.8748	153.7656
200006050535	2000-06-05 05:32	44.8155	154.7475
200006050639	2000-06-05 06:36	44.6290	155.0246
200006050726	2000-06-05 07:24	44.4926	155.2204
200006050830	2000-06-05 08:27	44.3003	155.4704
200006050902	2000-06-05 08:59	44.2040	155.5986
200006050948	2000-06-05 09:45	44.0696	155.7786
200006051047	2000-06-05 10:40	43.9221	155.9900

Related Information



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