

NATSUSHIMA NT14-11 Leg2 Expendable Bathythermograph (XBT)

Last Modified: 2019-09-18

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

Cruise ID: [NT14-11 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/NT14-11_leg2_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:

XBT



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

(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.

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

Cast name	Probe Serial No.	Probe Type	Launcher	Converter
BT 017620140712		T-6	Hand	MX 2001

Cast name	Probe Serial No.	Probe Type	Hand Launcher	Converter
BT-017720140713	-	T-7	Hand	MK-30N
BT-017820140713	-	T-7	Hand	MK-30N
BT-017920140713	-	T-5	Hand	MK-30N
BT-018020140714	-	T-7	Hand	MK-30N
BT-018120140714	-	T-5	Hand	MK-30N
BT-018220140715	-	T-7	Hand	MK-30N
BT-018320140717	-	T-7	Hand	MK-30N
BT-018420140717	-	T-5	Hand	MK-30N
BT-018520140719	-	T-5	Hand	MK-30N
BT-018620140719	-	T-7	Hand	MK-30N
BT-018720140719	-	T-7	Hand	MK-30N
BT-018820140719	-	T-7	Hand	MK-30N
BT-018920140720	-	T-7	Hand	MK-30N
BT-019020140720	-	T-7	Hand	MK-30N
BT-019120140720	-	T-5	Hand	MK-30N
BT-019220140721	-	T-7	Hand	MK-30N
BT-019320140721	-	T-7	Hand	MK-30N
BT-019420140721	-	T-7	Hand	MK-30N
BT-019520140722	-	T-7	Hand	MK-30N
BT-019620140722	-	T-7	Hand	MK-30N
BT-019720140723	-	T-7	Hand	MK-30N
BT-019820140723	-	T-7	Hand	MK-30N
BT-019920140723	-	T-7	Hand	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

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.

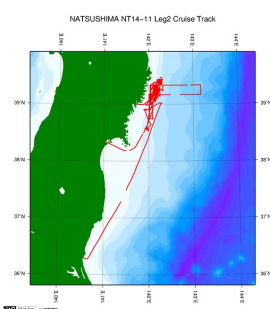
Note

(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



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NT14-11 Leg2

Ship Name: NATSUSHIMA

Period: 2014-07-12 - 2014-07-25

Chief Scientist: Yasuo Furushima (JAMSTEC)

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

Proposal Elucidation of the marine ecosystem fluctuation mechanism in the Sanriku offshore area

Title:

Update History

2019-09-18	An observation data was registered.
2017-06-23	An observation data was registered.
2016-07-29	An observation data was registered.

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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.

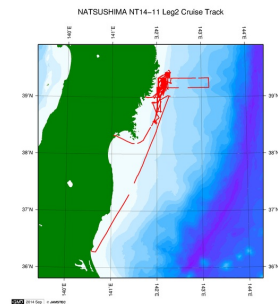
[QUALITY CONTROL AND PROCESSING OF HISTORICAL OCEANOGRAPHIC TEMPERATURE, SALINITY, AND OXYGEN DATA](#)

Sample Program

[ex_read2.f](#)

Related Information

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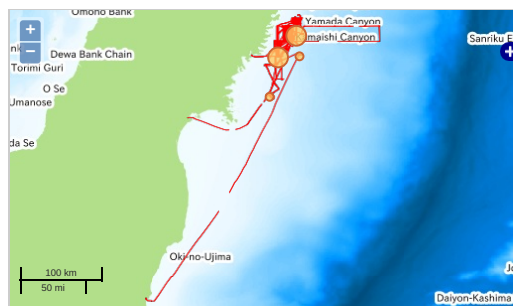
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Observation Map

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

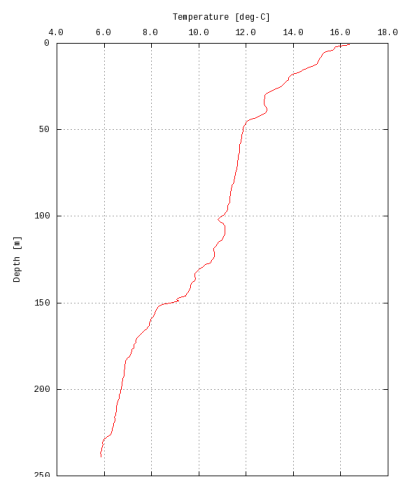


— ... Observation Line — ... Navigation ● ... Observation, Dive Point, Hole

Figures

BT-017620140713

NT14-11 Leg2: BT-017620140713
Expendable Bathythermograph (XBT): Temperature









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

<input type="checkbox"/>	BT-017620140713.dat
<input type="checkbox"/>	BT-017720140713.dat
<input type="checkbox"/>	BT-017820140713.dat
<input type="checkbox"/>	BT-017920140713.dat
<input type="checkbox"/>	BT-018020140714.dat
<input type="checkbox"/>	BT-018120140714.dat
<input type="checkbox"/>	BT-018220140715.dat
<input type="checkbox"/>	BT-018320140717.dat
<input type="checkbox"/>	BT-018420140717.dat
<input type="checkbox"/>	BT-018520140719.dat
<input type="checkbox"/>	BT-018620140719.dat
<input type="checkbox"/>	BT-018720140719.dat
<input type="checkbox"/>	BT-018820140719.dat
<input type="checkbox"/>	BT-018920140720.dat
<input type="checkbox"/>	BT-019020140720.dat
<input type="checkbox"/>	BT-019120140720.dat
<input type="checkbox"/>	BT-019220140721.dat
<input type="checkbox"/>	BT-019320140721.dat
<input type="checkbox"/>	BT-019420140721.dat

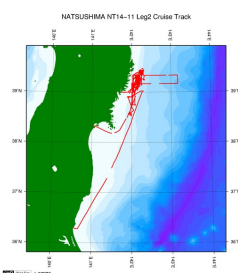
 BT-019520140722.dat
 BT-019620140722.dat
 BT-019720140723.dat
 BT-019820140723.dat
 BT-019920140723.dat
 ex_read2.f (Sample Program)

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

Observation	Time and Date	Lat. [°]	Lon. [°]
BT-017620140713	2014-07-13 10:03	39.0085	142.0376
BT-017720140713	2014-07-13 11:58	39.0588	142.0466
BT-017820140713	2014-07-13 14:17	39.0826	142.0560
BT-017920140713	2014-07-13 21:50	39.2486	142.2395
BT-018020140714	2014-07-14 19:36	39.0898	142.0353
BT-018120140714	2014-07-14 22:19	39.4253	142.2386
BT-018220140715	2014-07-15 19:06	39.2015	142.0286
BT-018320140717	2014-07-17 19:31	39.1261	142.0461
BT-018420140717	2014-07-17 22:22	39.2446	142.3295
BT-018520140719	2014-07-19 01:17	39.1898	142.2083
BT-018620140719	2014-07-19 10:38	39.2050	142.1023
BT-018720140719	2014-07-19 15:00	39.2245	142.1906
BT-018820140719	2014-07-19 23:40	39.1418	142.0386
BT-018920140720	2014-07-20 01:05	39.1751	142.1068
BT-019020140720	2014-07-20 04:27	39.2423	142.1161
BT-019120140720	2014-07-20 21:25	38.5715	141.9440
BT-019220140721	2014-07-21 10:06	38.9015	142.0108
BT-019320140721	2014-07-21 11:29	38.9378	142.0175
BT-019420140721	2014-07-21 15:04	39.2585	142.1663
BT-019520140722	2014-07-22 09:00	39.3071	142.1254
BT-019620140722	2014-07-22 12:16	39.2375	142.1348
BT-019720140723	2014-07-23 11:35	39.3771	142.2616
BT-019820140723	2014-07-23 13:20	39.4080	142.2965
BT-019920140723	2014-07-23 23:56	39.0206	142.2755

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