KAIREI KR11-05 Leg1 Expendable Bathythermograph (XBT)

Last Modified: 2019-09-11

ReadMe | Observation Data | Data Format

Cruise ID: KR11-05 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/KR11-05_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:
XBT/XCTD

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
PT 0101201110306		T-5	Hand	MK-130

Cast name	Probe Serial No.	Probe Type	Launcher	Converter
BT-010120110306	-	T-5	Hand	MK-130
BT-010220110307	-	T-5	Hand	MK-130
BT-010320110307	-	T-5	Hand	MK-130
BT-010420110307	-	T-5	Hand	MK-130
BT-010520110308	-	T-5	Hand	MK-130
BT-010620110308	-	T-5	Hand	MK-130
BT-010720110308	-	T-5	Hand	MK-130
BT-010820110309	-	T-5	Hand	MK-130
BT-010920110309	-	T-5	Hand	MK-130
BT-011020110310	-	T-5	Hand	MK-130
BT-011120110310	-	T-5	Hand	MK-130
BT-011220110311	-	T-5	Hand	MK-130
BT-011320110311	-	T-5	Hand	MK-130

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

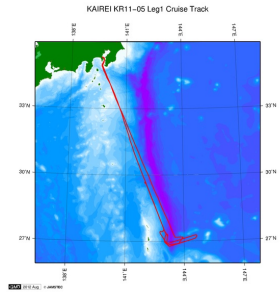
In addition, an abnormal value is identified by a visual check, and the data after visual QC is released.

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

KR11-05 Leg1
Ship Name: KAIREI
Period: 2011-03-03 - 2011-03-14
Chief Scientist: Yuka Kaiho (JAMSTEC)
Project Name: [Seismic study]
Proposal Title: High-resolution structure study in the Izu-Ogasawara region

Update History

2019-09-11	An observation data was registerd.
2017-06-29	An observation data was registerd.
2014-09-23	An observation data was registerd.
2014-03-25	An observation data was registerd.
2013-03-20	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

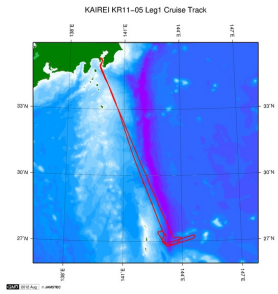
2. Observed Level Flags
- N - missing value
- 0 - accepted value
- 1 - range outlier (outside of broad range check)
- 2 - failed inversion check
- 3 - failed gradient check
- 4 - zero anomaly
- 5 - failed combined gradient and inversion checks
- 6 - failed range and inversion checks
- 7 - failed range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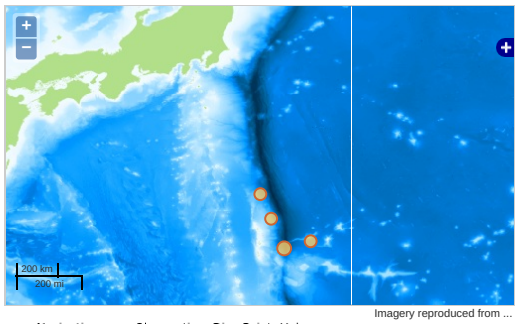
Observation Map

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

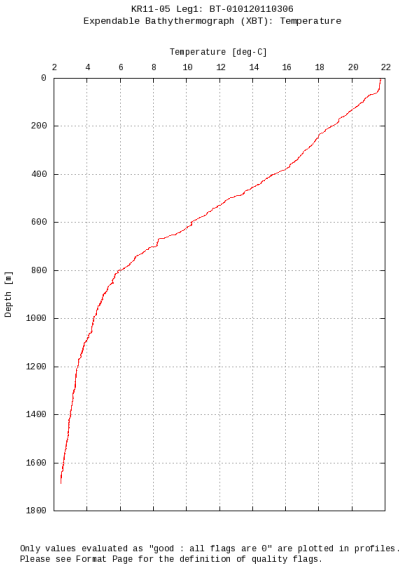


Imagery reproduced from ...

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

Figures

BT-010120110306



Data List

Add to Basket

File names
BT-010120110306.dat
BT-010220110307.dat
BT-010320110307.dat
BT-010420110307.dat
BT-010520110308.dat
BT-010620110308.dat
BT-010720110308.dat
BT-010820110309.dat
BT-010920110309.dat
BT-011020110310.dat
BT-011120110310.dat
BT-011220110311.dat
BT-011320110311.dat
ex_read2.f (Sample Program)

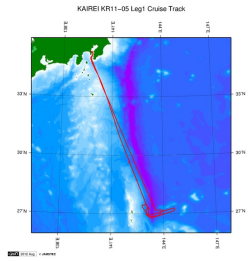
- Observation List

The list of observation is shown as follows.

Observation	Time and Date	Lat. [°]	Lon. [°]
BT-010120110306	2011-03-06 15:18	26.9245	143.2598
BT-010220110307	2011-03-07 08:34	27.2396	144.4355

Observation	Time and Date	Lat. [°]	Lon. [°]
BT-010320110307	2011-03-07 08:38	27.2408	144.4404
BT-010420110307	2011-03-07 15:02	27.0888	144.4448
BT-010520110308	2011-03-08 04:56	26.7821	143.3008
BT-010620110308	2011-03-08 04:59	26.7810	143.2966
BT-010720110308	2011-03-08 21:30	27.6526	142.9356
BT-010820110309	2011-03-09 05:37	28.2403	142.6816
BT-010920110309	2011-03-09 21:23	29.3313	142.2016
BT-011020110310	2011-03-10 08:31	29.3311	142.2016
BT-011120110310	2011-03-10 08:34	29.3278	142.2033
BT-011220110311	2011-03-11 00:49	28.2406	142.6815
BT-011320110311	2011-03-11 09:41	27.6521	142.9358

Related Information



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