

NATSUSHIMA NT12-14 Expendable Conductivity-Temperature-Depth Profiler (XCTD)

Last Modified: 2019-09-05

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Cruise ID: [NT12-14](#)

Expendable Conductivity-Temperature-Depth Profiler (XCTD): Processed (DMO)-QCed

Data Policy: [JAMSTEC](#)

Observation Items: Depth, Temperature, Salinity

Science Keywords:

OCEANS > OCEAN TEMPERATURE > WATER TEMPERATURE

OCEANS > SALINITY/DENSITY > SALINITY

Cruise Report

http://www.godac.jamstec.go.jp/catalog/data/doc_catalog/media/NT12-14_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.

Overview

Using XCTD (eXpendable Conductivity Temperature Depth profiler) system, the vertical distribution of water temperature and salinity are observed during free fall of its probe part in the seawater. Observed temperature and conductivity are transmitted to the data processor on board by the digital signal. The digital signal is converted to the temperature, conductivity and depth by data processor as binary data. Binary data is transmitted from data processor to PC. The PC calculates salinity from temperature, conductivity and depth, and those properties are recorded in PC as the ASCII files.

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 : 40 msec

(3) XCTD probe specifications

Probe Type	TSK XCTD-1	TSK XCTD-2	TSK XCTD-3	TSK XCTD-4
Temperature range [deg-C]	-2 to 35			
Temperature accuracy [deg-C]	+/- 0.02			
Temperature resolution [deg-C]	0.01			
Conductivity range [mS/cm]	0 to 60			
Conductivity accuracy [mS/cm]	+/- 0.03			
Conductivity resolution [mS/cm]	0.015			
Measurement depth [m]	1000	1850	1000	1850
Depth accuracy [m]	5 or +/- 2% of depth; whichever is larger			
Maximum elapsed time [sec]	300	600	200	502
Rated ship speed [knot]	12	3.5	20	6

Since XCTD 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 XCTD-1	TSK XCTD-2	TSK XCTD-3	TSK XCTD-4
Coefficient-a	3.42543	3.43898	5.07598	3.68081
Coefficient-b	-0.47	-0.31	-0.72	-0.47

* Coefficients listed above are supplied by Sippican, Inc., in USA.

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

Cast name	Probe Serial No.	Probe Type	Launcher	Converter
XCTD-000020120612	10121094	XCTD-1	Hand	-
XCTD-000120120614	10121095	XCTD-1	Hand	-
XCTD-000220120614	10121096	XCTD-1	Hand	-
XCTD-000320120614	10121097	XCTD-1	Hand	-
XCTD-000420120614	10121098	XCTD-1	Hand	-
XCTD-000520120614	11063960	XCTD-1	Hand	-
XCTD-000620120614	11063961	XCTD-1	Hand	-

Cast name	Probe Serial No.	Probe Type	Hand Launcher	Converter
XCTD-000720120614	11063962	XCTD-1		
XCTD-000820120614	11063963	XCTD-1	Hand	-
XCTD-000920120614	11063964	XCTD-1	Hand	-
XCTD-001020120614	11063965	XCTD-1	Hand	-
XCTD-001120120614	11063966	XCTD-1	Hand	-
XCTD-001220120614	11063967	XCTD-1	Hand	-
XCTD-001320120615	11063968	XCTD-1	Hand	-
XCTD-001420120615	11063969	XCTD-1	Hand	-

Data processing

(1) For sensor's stability, values of less than 1 m for temperature and less than 3 m for salinity 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.

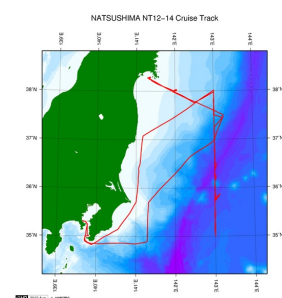
- 1) The gradient check of adjacent depth data
- 2) The density inversion check
- 3) The broad range check set up at given ocean space and depth

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.

Related Information



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NT12-14

Ship Name: NATSUSHIMA

Period: 2012-06-11 - 2012-06-18

Chief Scientist: Yoshimi Kawai (JAMSTEC)

Proposal Investigation of the atmospheric response to the Kuroshio Extension

Title:

Update History

2019-09-05	An observation data was registerd.
2017-06-14	An observation data was registerd.
2014-09-05	An observation data was registerd.
2014-07-01	An observation data was registerd.

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 Data Policy: [JAMSTEC](#)

XCTD DMO

Format Description for the Corrected Data

Provided in the Exchange Format of CCHDO (CLIVAR and Carbon Hydrographic Data Office). Please see the following link for details of Exchange Format.

[CCHDO | CLIVAR & Carbon Hydrographic Data Office](#)

Data in following cruise is not expressed with Exchange Format. Please see the site of each cruise for format.

MR02-K05 Leg1

MR04-05

Format Description for the QCed Data

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	XCTD
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	23 - 33	Salinity	PSU	f11.3	PSS-78
4	45 - 55	Flag	-	i11	1 - 7 : space 8 : flag of depth 9 : flag of temperature 10 : flag of salinity 11 : space * reference : Definition of Quality Control Flags
5	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

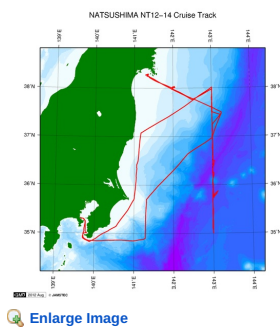
QCed data were added flag according to the NODC (National Oceanographic Data Center) quality control procedure, additionally visually checked. Please see the site of NODC of the following link for quality control procedure.

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Sample Program

[ex_read2.f](#)

Related Information



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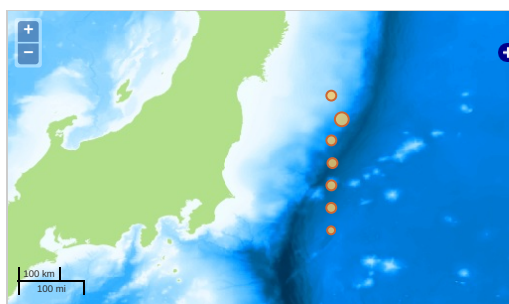
Observation Items: Depth, Temperature, Salinity

Science Keywords:

OCEANS > OCEAN > WATER
TEMPERATURE
OCEANS > SALINITY/DENSITY > SALINITY

Observation Map

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

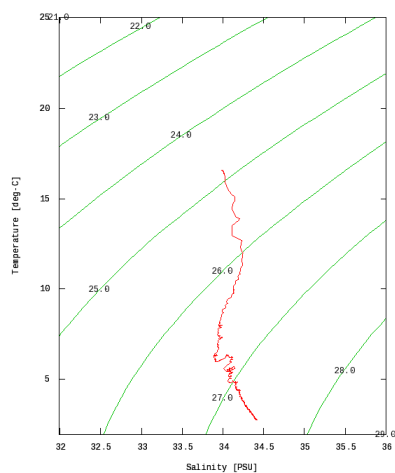


Figures

XCTD-000020120612



NT12-14: XCTD-000020120612
Expendable Conductivity-Temperature-Depth Profiler (XCTD): Salinity





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

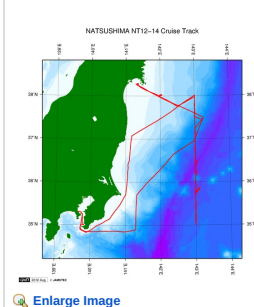
<input type="checkbox"/>	XCTD-000020120612.dat
<input type="checkbox"/>	XCTD-000120120614.dat
<input type="checkbox"/>	XCTD-000220120614.dat
<input type="checkbox"/>	XCTD-000320120614.dat
<input type="checkbox"/>	XCTD-000420120614.dat
<input type="checkbox"/>	XCTD-000520120614.dat
<input type="checkbox"/>	XCTD-000620120614.dat
<input type="checkbox"/>	XCTD-000720120614.dat
<input type="checkbox"/>	XCTD-000820120614.dat
<input type="checkbox"/>	XCTD-000920120614.dat
<input type="checkbox"/>	XCTD-001020120614.dat
<input type="checkbox"/>	XCTD-001120120614.dat
<input type="checkbox"/>	XCTD-001220120614.dat
<input type="checkbox"/>	XCTD-001320120615.dat

 **File names** 20120615.dat
 ex_read2.f (Sample Program)

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

Observation	Time and Date	Lat. [°]	Lon. [°]
XCTD-000020120612	2012-06-12 04:07	37.4720	143.2403
XCTD-000120120614	2012-06-14 03:11	37.9978	143.0070
XCTD-000220120614	2012-06-14 04:55	37.7545	143.0035
XCTD-000320120614	2012-06-14 06:36	37.5016	143.0050
XCTD-000420120614	2012-06-14 07:52	37.4523	143.2233
XCTD-000520120614	2012-06-14 10:12	37.2553	143.0085
XCTD-000620120614	2012-06-14 11:53	37.0040	143.0078
XCTD-000720120614	2012-06-14 13:37	36.7553	143.0126
XCTD-000820120614	2012-06-14 15:23	36.5006	143.0323
XCTD-000920120614	2012-06-14 17:18	36.2510	143.0170
XCTD-001020120614	2012-06-14 19:13	36.0060	143.0086
XCTD-001120120614	2012-06-14 21:01	35.7531	143.0016
XCTD-001220120614	2012-06-14 22:41	35.5065	143.0056
XCTD-001320120615	2012-06-15 00:31	35.2566	143.0051
XCTD-001420120615	2012-06-15 02:18	35.0081	143.0025

Related Information



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