

KAIYO KY14-09 Expendable Conductivity-Temperature-Depth Profiler (XCTD)

Last Modified: 2019-09-07

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

Cruise ID: [KY14-09](#)

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/KY14-09_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-025920140621	12057526	XCTD-1	Hand	MK-130
XCTD-026020140627	12057523	XCTD-1	Hand	MK-130
XCTD-026120140627	12057525	XCTD-1	Hand	MK-130
XCTD-026220140627	12057524	XCTD-1	Hand	MK-130
XCTD-026320140628	12057527	XCTD-1	Hand	MK-130
XCTD-026420140628	12057528	XCTD-1	Hand	MK-130
XCTD-026520140628	12057529	XCTD-1	Hand	MK-130

Cast name	Probe Serial No.	XCTD-1 Probe Type	Hand Launcher	MK-130 Converter
XCTD-026620140628	12057530			
XCTD-026720140628	12057531	XCTD-1	Hand	MK-130
XCTD-026820140628	12057532	XCTD-1	Hand	MK-130
XCTD-026920140628	12057536	XCTD-1	Hand	MK-130
XCTD-027020140628	12057533	XCTD-1	Hand	MK-130
XCTD-027120140628	12057534	XCTD-1	Hand	MK-130
XCTD-027220140628	12057535	XCTD-1	Hand	MK-130

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.

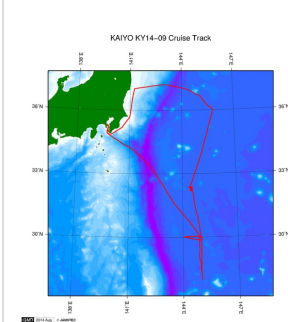
- 1) The gradient check of adjacent depth data
- 2) The density inversion check
- 3) The broad range check set up at given ocean space and depth

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



[Enlarge Image](#)

KY14-09

Ship Name: KAIYO

Period: 2014-06-19 - 2014-06-30

Chief Scientist: Yoshimi Kawai (JAMSTEC)

Project Name: [Station S1, Station KEO]

Proposal Title: Transport and change processes of subtropical mode water and its effects on biogeochemical cycle

Update History

2019-09-07	An observation data was registered.
2017-06-14	An observation data was registered.
2016-06-30	An observation data was registered.

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6K Sonar DEEP TOW

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POWER GRAB SAMPLER (SHELL)

POWER GRAB SAMPLER (CLOW)

BMS

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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

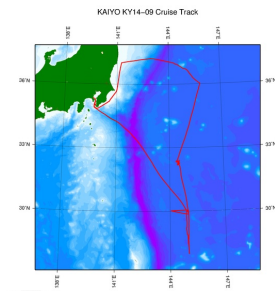
QCed data were added flag according to the NODC (National Oceanographic Data Center) quality control procedure, additionally visually checked. Please see the site of NODC of the following link for quality control procedure.

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

Sample Program

[ex_read2.f](#)

Related Information



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 Chief Scientist: Yoshimi Kawai (JAMSTEC)
 Project Name: [Station S1, Station KEO]
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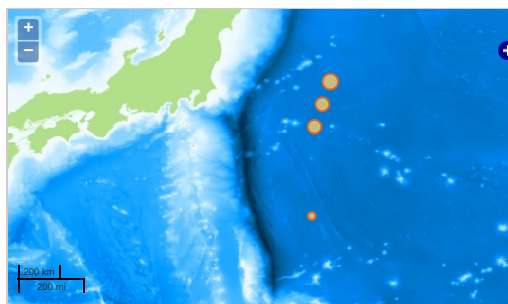
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Science Keywords:

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.



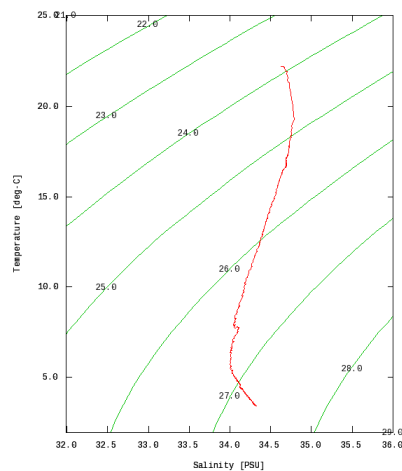
Imagery reproduced from ...

Figures

XCTD-025920140621



KY14-09: XCTD-025920140621
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](#)

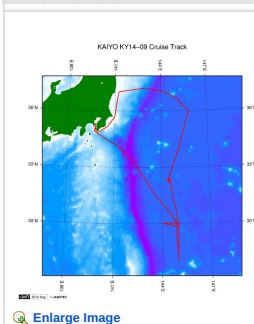
File names

- ☐ XCTD-025920140621.dat
- ☐ XCTD-026020140627.dat
- ☐ XCTD-026120140627.dat
- ☐ XCTD-026220140627.dat
- ☐ XCTD-026320140628.dat
- ☐ XCTD-026420140628.dat
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- ☐ XCTD-027020140628.dat
- ☐ XCTD-027120140628.dat
- ☐ XCTD-027220140628.dat

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

Observation	Time and Date	Lat. [°]	Lon. [°]
XCTD-025920140621	2014-06-21 23:52	30.0451	144.9776
XCTD-026020140627	2014-06-27 20:07	34.0066	145.1026
XCTD-026120140627	2014-06-27 22:15	34.2550	145.1850
XCTD-026220140627	2014-06-27 23:59	34.4996	145.2665
XCTD-026320140628	2014-06-28 01:38	34.7545	145.3683
XCTD-026420140628	2014-06-28 03:05	35.0028	145.4508
XCTD-026520140628	2014-06-28 04:34	35.2596	145.5366
XCTD-026620140628	2014-06-28 05:59	35.5098	145.6205
XCTD-026720140628	2014-06-28 07:25	35.7581	145.7204
XCTD-026820140628	2014-06-28 08:53	36.0081	145.8030
XCTD-026920140628	2014-06-28 10:37	36.1773	145.5635
XCTD-027020140628	2014-06-28 12:04	36.3326	145.3750
XCTD-027120140628	2014-06-28 13:35	36.5085	145.2050
XCTD-027220140628	2014-06-28 13:43	36.5196	145.2006

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