

## KAIREI KR10-13 Expendable Conductivity-Temperature-Depth Profiler (XCTD)

Last Modified: 2019-09-06

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

Cruise ID: [KR10-13](#)

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/KR10-13\\_all.pdf](http://www.godac.jamstec.go.jp/catalog/data/doc_catalog/media/KR10-13_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 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.

$$Z = at + 10E^{-3} * bt^2$$

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-000620101212	-	XCTD-2	Hand	MK-130
XCTD-000720101212	-	XCTD-2	Hand	MK-130
XCTD-000820101217	-	XCTD-2	Hand	MK-130
XCTD-000920101219	-	XCTD-2	Hand	MK-130
XCTD-001020101219	-	XCTD-2	Hand	MK-130
XCTD-001120101219	-	XCTD-2	Hand	MK-130
XCTD-001220101219	-	XCTD-2	Hand	MK-130
XCTD-001320101220	-	XCTD-2	Hand	MK-130
XCTD-001420101220	-	XCTD-2	Hand	MK-130
XCTD-001520101220	-	XCTD-2	Hand	MK-130
XCTD-001620101220	-	XCTD-2	Hand	MK-130
XCTD-001720101221	-	XCTD-2	Hand	MK-130
XCTD-001820101221	-	XCTD-2	Hand	MK-130
XCTD-001920101221	-	XCTD-2	Hand	MK-130
XCTD-002020101221	-	XCTD-2	Hand	MK-130
XCTD-002120101222	-	XCTD-2	Hand	MK-130
XCTD-002220101223	-	XCTD-2	Hand	MK-130
XCTD-002320101224	-	XCTD-2	Hand	MK-130
XCTD-002420101224	-	XCTD-2	Hand	MK-130
XCTD-002520101224	-	XCTD-2	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.

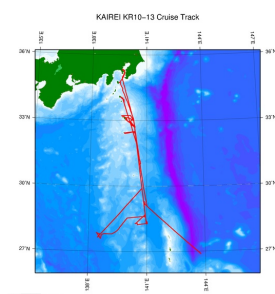
- 1) The gradient check of adjacent depth data
- 2) The density inversion check
- 3) The broad range check set up at given ocean space and depth

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](#)

#### KR10-13

Ship Name: KAI REI  
Period: 2010-12-07 - 2010-12-28  
Chief Scientist: Mikiya Yamashita (JAMSTEC)  
Project Name: [Seismic study]  
Proposal Crustal growth of the Izu-Ogasawara island arc  
Title:

#### Update History

2019-09-06	An observation data was registered.
2017-06-14	An observation data was registered.
2014-09-23	An observation data was registered.
2014-02-18	An observation data was registered.
2012-12-13	An observation data was registered.

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6K Camera DEEP TOW  
6K Sonar DEEP TOW  
KM-ROV  
POWER GRAB SAMPLER (SHELL)  
POWER GRAB SAMPLER (CLOW)  
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## KAIREI KR10-13 Expendable Conductivity-Temperature-Depth Profiler (XCTD)

Last Modified: 2019-09-06

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

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 : <a href="#">Definition of Quality Control Flags</a>
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

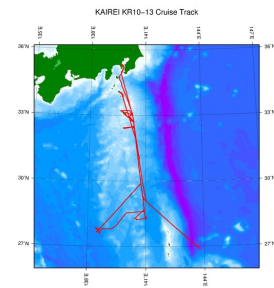
QCed data were added flag according to the NODC (National Oceanographic Data Center) quality control procedure, additionally visually checked. Please see the site of NODC of the following link for quality control procedure.

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

#### Sample Program

[ex\\_read2.f](#)

#### Related Information



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#### KR10-13

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Chief Scientist: Mikiya Yamashita (JAMSTEC)

Project Name: [Seismic study]

Proposal Crustal growth of the Izu-Ogasawara island arc

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国立研究開発法人  
海洋研究開発機構  
JAPAN AGENCY FOR MARINE-EARTH SCIENCE AND TECHNOLOGY

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Data Policy: **JAMSTEC**

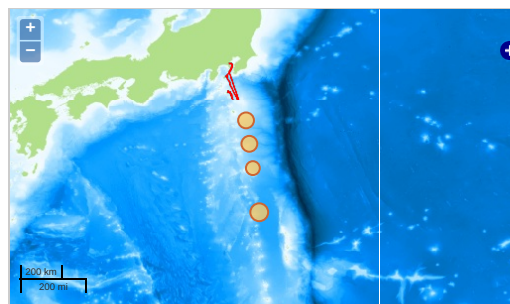
Observation Items: Depth, Temperature, Salinity

Science Keywords:

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

### Observation Map

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



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

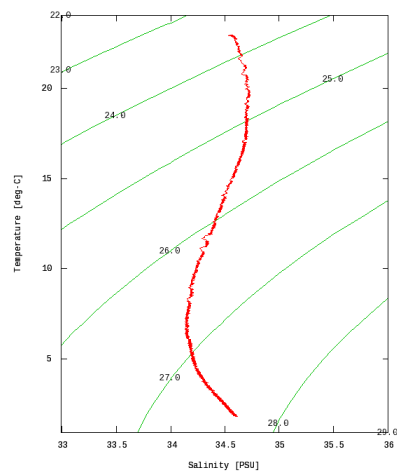
Imagery reproduced from ...

### Figures

XCTD-000620101212



KR10-13: XCTD-000620101212  
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

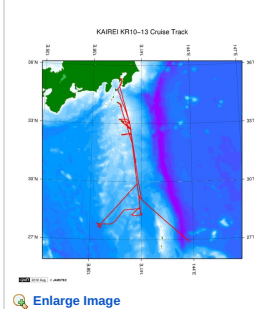
<input type="checkbox"/>	XCTD-000620101212.dat
<input type="checkbox"/>	XCTD-000720101212.dat
<input type="checkbox"/>	XCTD-000820101217.dat
<input type="checkbox"/>	XCTD-000920101219.dat
<input type="checkbox"/>	XCTD-001020101219.dat
<input type="checkbox"/>	XCTD-001120101219.dat
<input type="checkbox"/>	XCTD-001220101219.dat
<input type="checkbox"/>	XCTD-001320101220.dat
<input type="checkbox"/>	XCTD-001420101220.dat
<input type="checkbox"/>	XCTD-001520101220.dat
<input type="checkbox"/>	XCTD-001620101220.dat
<input type="checkbox"/>	XCTD-001720101221.dat
<input type="checkbox"/>	XCTD-001820101221.dat
<input type="checkbox"/>	XCTD-001920101221.dat

-  [File names](#) 20101221.dat
-  [XCTD-002120101222.dat](#)
-  [XCTD-002220101223.dat](#)
-  [XCTD-002320101224.dat](#)
-  [XCTD-002420101224.dat](#)
-  [XCTD-002520101224.dat](#)
-  [ex\\_read2.f \(Sample Program\)](#)

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

Observation	Time and Date	Lat. [°]	Lon. [°]
XCTD-000620101212	2010-12-12 08:59	28.7168	140.9178
XCTD-000720101212	2010-12-12 10:58	28.6190	140.9315
XCTD-000820101217	2010-12-17 16:36	32.7950	140.3321
XCTD-000920101219	2010-12-19 05:58	32.5005	140.3783
XCTD-001020101219	2010-12-19 09:19	32.3471	140.4021
XCTD-001120101219	2010-12-19 14:58	32.1561	140.4241
XCTD-001220101219	2010-12-19 19:52	31.9585	140.4523
XCTD-001320101220	2010-12-20 01:20	31.7555	140.4798
XCTD-001420101220	2010-12-20 05:42	31.5645	140.5041
XCTD-001520101220	2010-12-20 10:06	31.3696	140.5398
XCTD-001620101220	2010-12-20 16:02	31.2221	140.5616
XCTD-001720101221	2010-12-21 00:39	30.9235	140.6065
XCTD-001820101221	2010-12-21 06:44	30.6768	140.6351
XCTD-001920101221	2010-12-21 10:56	30.4821	140.6678
XCTD-002020101221	2010-12-21 16:01	30.2380	140.7040
XCTD-002120101222	2010-12-22 00:07	29.8971	140.7513
XCTD-002220101223	2010-12-23 22:57	28.6225	140.9276
XCTD-002320101224	2010-12-24 01:38	28.7238	140.9136
XCTD-002420101224	2010-12-24 04:07	28.8228	140.9026
XCTD-002520101224	2010-12-24 12:02	29.1180	140.8640

#### Related Information



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Chief Scientist: Mikiya Yamashita (JAMSTEC)  
Project Name: [Seismic study]  
Proposal: Crustal growth of the Izu-Ogasawara island arc  
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