

For Using Data

Data Policy	JAMSTEC
Principal Investigator	Data Management Office
Use Constraints	See Terms and Conditions about constrain of use.
Data Citation	See Terms and Conditions about data citation.

Quality level

Processed (DMO)-QCed

Instrument

CTD (Conductivity-Temperature-Depth profiler)



Overview

CTD(Conductivity-Temperature-Depth profiler) is used to observe the vertical profiles of temperature and conductivity. Usually, this system is operated with multicylinder water sampler.

Observed signal is transmitted from sensor to the operation room on board using wire cable, and electric power is supplied from vessel to sensor.

Details of sensors attached to CTD system for this cruise are presented in "Measurement System".

The following software, developed and supplied by the Sea-Bird Scientific, was used in this cruise.

SEASAVE(ver 7.26.7.121) for data acquisition

SBEDataProcessing(ver 7.26.7.114) for data processing

Data presented on this website is averaged over 1db.

Measurement System

1) Pressure sensor

Manufacturer :	Sea-Bird Scientific
Type :	SBE9plus
Serial No. :	134402
Measurement range :	up ~ 10500 m
Accuracy :	+/- 0.015% of full scale range
Resolution :	0.001% of full scale range

2) Temperature sensor

Manufacturer :	Sea-Bird Scientific
Type :	SBE3
Serial No. :	032730
Measurement range :	-5 to +35 deg-C
Accuracy :	+/- 0.001 deg-C
Resolution :	0.0002 deg-C

3) Conductivity sensor (Salinity sensor)

Manufacturer :	Sea-Bird Scientific
Type :	SBE4
Serial No. :	044450
Measurement range :	0 to 7 S/m
Accuracy :	+/- 0.0003 S/m
Resolution :	0.00004 S/m

4) Dissolved Oxygen sensor

Manufacturer :	Sea-Bird Scientific
Type :	SBE43
Serial No. :	430205
Accuracy :	120% of surface saturation
Resolution :	+/- 2% of saturation

Calibration Information

1) Pressure sensor

Serial No.	Calibration date	Institution	slope	offset (dbar)
134402	4-Mar-2020	JAMSTEC	0.9999137	0.31942

The observed value is computed as

Observed value [dbar] = slope * computed pressure[dbar] + offset[dbar]

2) Temperature sensor

Serial No.	Calibration date	Institution
032730	28-Dec-2019	Sea-Bird Scientific

3) Conductivity sensor (Salinity sensor)

Serial No.	Calibration date	Institution
044450	10-Jan-2020	Sea-Bird Scientific

4) Dissolved Oxygen sensor

Serial No.	Calibration date	Institution
430205	13-Dec-2019	Sea-Bird Scientific

Use sensors

Sensors used in each cast is as follows.

Cast name	Pressure	Temperature	Salinity	Dissolved Oxygen
001M001	134402	032730	044450	430205
002M001	134402	032730	044450	430205
002M002	134402	032730	044450	430205
002M003	134402	032730	044450	430205
003M001	134402	032730	044450	430205
003M002	134402	032730	044450	430205

Data processing

1) Data processing sequence for SBDataProcceing is as follows;

("*" is not SBDataProcceing original procedure.)

Modules	Function
Data Conversion	Convert raw data to engineering units, and store converted data in file.
tcorp*	Corrected the pressure sensitivity of the temperature(SBE3) sensor.
rincor*	Corrected the hysteresis of dissolved oxygen(RINKO III) sensor.
rincorcorros*	Corrected the hysteresis of the dissolved oxygen voltage data (RINKO III) at the time of water sampling.
Bottle Summary	Summarize data from water sampler bottle .ros file, storing results in .btl file.
Align CTD	Align data relative to pressure(typically used for conductivity, temperature, and oxygen)
Wild Edit	Mark a data value with badflag to eliminate wild points.
Cell Thermal Mass	Perform conductivity thermal mass correction.
Filter	Low-pass filter columns of data.
wfilter	Median filter removes spikes of fluorometer, turbidimeter, transmissometer, Deep SUNA and PAR data.
sectionu*	Extract rows of data from file.
Loop Edit	Mark a scan with badflag if scan fails pressure reversal or minimum velocity tests.
despike*	Remove spikes of the data.
Derive	Calculate salinity, density, oxygen, etc.
Bin Average	Average data. Bins can be based on pressure, depth, scan number, or time ranges.
bottomcut*	Bottom cut deletes discontinuous scan bottom data if it's created by Bin Average.
Split	Split data in file into upcast and downcast files.

2) Quality control

QCed data were added flag according to the NODC (National Oceanographic Data Center) quality control procedure.

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

Please see the paper for quality control procedure in detail.

Quality control and processing of historical oceanographic temperature, salinity, and oxygen data.

P. Boyer and Levitus, 1994. NOAA technical report NESDIS ; 81

* <https://repository.library.noaa.gov/view/noaa/13443>

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

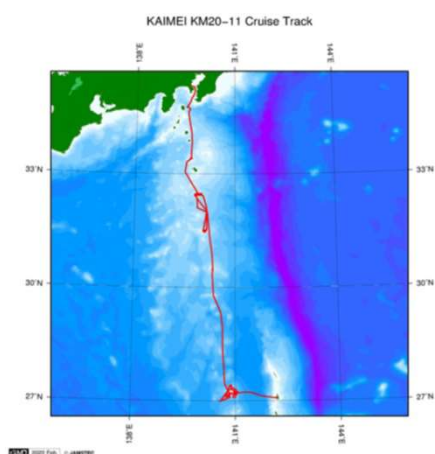
Note

In this cruise, there is extra data (dissolved oxygen (RINKO III), fluorescence intensity, turbidity, light transmission, PAR, distance to bottom) in addition to temperature, salinity, dissolved oxygen that has been opened to the public.

Detailed results of sensor calibration are also stored.

If you would like the raw data set, please contact DMO at "dmo@jamstec.go.jp".

Related Information



KM20-11

Ship Name:	KAIMEI
Period:	2020-12-12 - 2020-12-24
Chief Scientist:	Yasuo Furushima (JAMSTEC)
Proposal:	Understanding the actual condition of marine pollutants and their impact on marine ecosystems

Format Description for CTD DMO

Format Description for the Corrected Data

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

* <https://cchdo.ucsd.edu/formats>

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	CTD
3	8 - 22	Cruise ID	a15	
4	24 - 31	Cast name	a8	
5	33 - 40	Date	i8	YYYYMMDD (UTC)
6	42 - 45	Time	i4	hhmm (UTC)
7	47 - 55	Latitude	i2,a1,f5.2,a1	dd-mm.mmN(S)
8	57 - 66	Longitude	i3,a1,f5.2,a1	ddd-mm.mmE(W)
9	68 - 71	Number of data lines	i4	
10	72 - 73	Terminator	a2	[CR][LF]

Data part

No.	Column	Content	Format	Unit	Remarks
1	1 - 11	Pressure	f11.3	dbar	
2	12 - 22	Temperature	f11.4	deg-C	ITS-90
3	23 - 33	Salinity	f11.4	PSU	PSS-78
4	34 - 44	Dissolved oxygen	f11.3	μ mol/kg	
5	45 - 55	Quality control flag	i11		45 - 51 : space
					52 : flag of pressure
					53 : flag of temperature
					54: flag of salinity
					55 : flag of dissolved oxygen
6	56 - 57	Terminator	a2		[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