

For Using Data

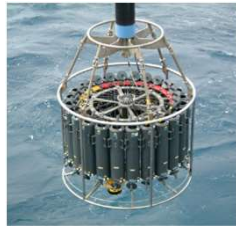
Data Policy	JAMSTEC
Principal Investigator	Data Management Office
Use Constraints	See Terms and Conditions about constrain of use.
Data Citation	See Terms and Conditions about data citation.

Quality

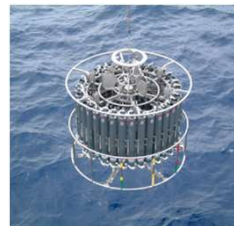
DMO-Processed

Instrument

CTD (Conductivity-Temperature-Depth profiler)



Water sampling system with CTD (12litters * 36 bottles)



Water sampling system with CTD (12litters * 12 bottles)



Water sampling system with CTD (30litters * 24 bottles)



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 7.23.2) for data acquisition

SBEDataProcessing(ver 7.23.2) 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. :	79492
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. :	041172

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)
79492	25-May-2017	JAMSTEC	0.99979869	3.09347

The observed value is computed as :

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

2) Temperature sensor

Serial No.	Calibration date	Institution
032730	26-Aug-2017	Sea-Bird Scientific

3) Conductivity sensor (Salinity sensor)

Serial No.	Calibration date	Institution
041172	8-Sep-2017	Sea-Bird Scientific

4) Dissolved Oxygen sensor

Serial No.	Calibration date	Institution
430205	26-Aug-2017	Sea-Bird Scientific

Use sensors

Sensors used in each cast is as follows.

Cast name	Pressure	Temperature	Salinity	Dissolved Oxygen
C01M001	79492	032730	041172	430205
C02M001	79492	032730	041172	430205
C02M002	79492	032730	041172	430205
C03M001	79492	032730	041172	430205
C03M002	79492	032730	041172	430205
L01M001	79492	032730	041172	430205
L03M001	79492	032730	041172	430205
L05M001	79492	032730	041172	430205
L07M001	79492	032730	041172	430205
L09M001	79492	032730	041172	430205
L11M001	79492	032730	041172	430205
L13M001	79492	032730	041172	430205
L15M001	79492	032730	041172	430205
L18M001	79492	032730	041172	430205
L20M001	79492	032730	041172	430205
L22M001	79492	032730	041172	430205
L24M001	79492	032730	041172	430205
L26M001	79492	032730	041172	430205
STNM001	79492	032730	041172	430205
STNM002	79492	032730	041172	430205
STNM003	79492	032730	041172	430205
STNM004	79492	032730	041172	430205
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[illegible]

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STNM217	79492	032730	041172	430205

Data processing

1) Data processing sequence for SBEDataProcessing is as follows;

("*" is not SBEDataProcessing 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 .bti 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 such as fluorometer, turbidimeter, transmissometer, nitrate 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.

- i. The gradient check of adjacent depth data
- ii. The density inversion check
- iii. 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.

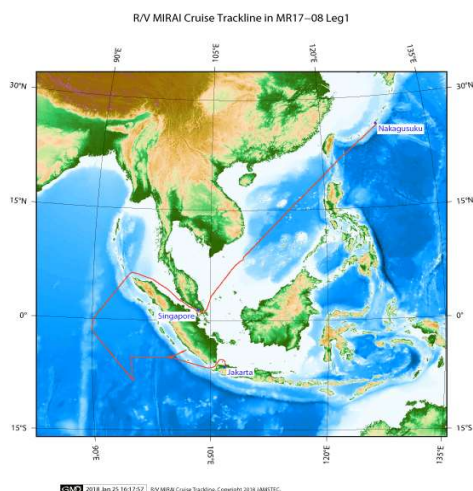
Note

In this cruise, there is extra data (fluorescence intensity, 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



MR17-08 Leg1

Ship Name: MIRAI
Period: 2017/11/11 - 2018/01/04
Chief Scientist: Satoru Yokoi (JAMSTEC)
Proposal: Study on air-sea interaction over upwelling region in the eastern Indian Ocean

The monitoring of ocean climate change from surface to deep layer in the Indian Ocean by using Argo-type floats

Aerosol optical characteristics measured by ship-borne sky radiometer

Observational study on clouds and mixed layer depths over the tropical ocean

On variations of precipitation and vapor isotope ratio associated with Madden Julian Oscillation

Researches on the organized precipitating systems and their accompanying cold pools in the maritime continents region

A study on the mechanisms for convective clustering from thermally induced local circulations over the Maritime Continent

Format Description for CTD DMO

Format Description for the DMO-Processed 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