

MIRAI MR17-05C Conductivity-Temperature-Depth Profiler (CTD)

Last Modified: 2019-08-31

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

Cruise ID: [MR17-05C](#)

Conductivity-Temperature-Depth Profiler (CTD) Processed (DMO/PI)

Data Policy: [JAMSTEC](#)

Observation Items: Pressure, Temperature, Salinity, Dissolved oxygen, PAR, Fluorescence

Science Keywords:

OCEANS > OCEAN CHEMISTRY > OXYGEN
OCEANS > OCEAN TEMPERATURE > WATER TEMPERATURE
OCEANS > SALINITY/DENSITY > SALINITY
OCEANS > OCEAN OPTICS > PHOTOSYNTHETICALLY ACTIVE RADIATION
OCEANS > OCEAN OPTICS > FLUORESCENCE

Cruise Report

http://www.godac.jamstec.go.jp/catalog/data/doc_catalog/media/MR17-05C_all.pdf

For Using Data

Principal Investigator

Shigeto Nishino (JAMSTEC)
Data Management Office

Use Constraints

See [Terms and Conditions](#) about constrain of use.

Data Citation

See [Terms and Conditions](#) about data citation.

Instrument

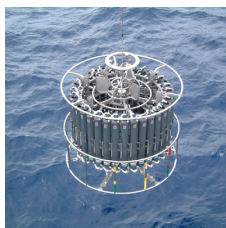
Instrument:

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



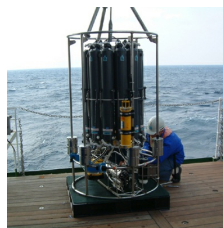
Instrument:

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



Instrument:

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



Instrument:

Conductivity temperature depth
measurements (CTD)



Data Citation

Please mention that this cruise was conducted under the Arctic Challenge for Sustainability (ArCS) Project, which was funded by the Ministry of Education, Culture, Sports, Science and Technology of Japan (MEXT).

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 MR17-05C cruise are presented in "System".

The following software, developed and supplied by the Sea-Bird Electronics, Inc., was used in MR17-05C.

SEASAVE(ver 7.23.2) for data acquisition

SEASOFT(ver 7.23.2) for data processing

Data presented on this website is averaged over 1db.

System

(1) Pressure sensor

Model : SBE9plus, Sea-Bird Electronics,Inc.
Serial No. : 09P54451-1027 (117457)
Measurement range : up to 10500 m
Accuracy : 0.015 %F.S.
Resolution: 0.001 %F.S.
Last Calibration Date : 25-May-2017

(2) Temperature sensor

Model : SBE03-04/F, Sea-Bird Electronics,Inc.
Serial No. : 031525
Measurement range : -5.0 to +35 degC

Measurement range : 0.0 to 100 degC

Accuracy : 0.001 degC

Resolution: 0.0002 degC

Last Calibration Date : 05-May-2017

(3) Salinity sensor

Model : SBE04C, Sea-Bird Electronics, Inc.

Serial No. : 042435

Measurement range : 0.0 to 7 S/m

Accuracy : 0.0003 S/m

Resolution: 0.00004 S/m

Last Calibration Date : 05-May-2017

(4) Dissolved oxygen sensor

Model : RINKO III, JFE Advantech Co., Ltd.

Serial No. : 0287

Measurement range : 0 to 200 %

Accuracy : Non-Linear ± 2 %FS

Resolution: 0.01 to 0.04 %

Last Calibration Date : 24-May-2017

(5) Transmissometer

Model : C-Star, WET Labs, Inc.

Serial No. : 1726DR

Last Calibration Date : 22-Feb-2017

(6) Fluorometer

- Primary

Model : Seapoint Chlorophyll Fluorometer, Seapoint Sensors, Inc.

Serial No. : 3700

Measurement range : 0 - 5 ug/l (Gain: 30X)

Resolution: 0.02 ug/l

- Secondary

Model : Seapoint Chlorophyll Fluorometer, Seapoint Sensors, Inc.

Serial No. : 3618

Measurement range : 0 - 50 ug/l (Gain: 3X)

Resolution: 0.02 ug/l

* For casts whose primary fluorometer (SN 3700) is outside the measurement range, secondary fluorometer (SN 3618) is used.

(7) Turbidity Meter

Model : Seapoint Turbidity Meter, Seapoint Sensors, Inc.

Serial No. : 14953

Measurement range : 0 - 25 FTU (Gain: 100X)

Resolution: 0.006 FTU

(9) PAR sensor

Model : PAR-Log ICSW, Satlantic Inc.

Serial No. : 1025

Measurement range : 0 - 5000 $\mu\text{mol photons/m}^2/\text{s}$

Last Calibration Date : 06-Jul-2015

(6) UV Nitrate Sensor (018M001-068M001, 070M001-104M001)

Model : Deep SUNA, Satlantic Inc.

Serial No. : 895

Measurement range : -5 - 30 $\mu\text{mol/l}$

Last Calibration Date : 02-Feb-2017

Correction method

- Temperature

Coefficients of primary temperature correction: correct_tmp_pri_MR1705C_p390.txt

Coefficients of dependencies for pressure (Pcor) and Offset were calculated from the data > 390dbar.

Timecor is assumed to be elapsed days from the sensor calibration date.

When there are two or more water samples in the same layer, the first data is used.

$\text{corCTDTMP1} = \text{CTDTMP1} - (\text{Pcor} * \text{CTDPRS} + \text{Timecor} * \text{Sumdate} + \text{Offset})$

- Salinity

Coefficients of primary conductivity correction: correct_cnd_pri_MR1704_P2.txt

Coefficients of conductivity (Ccor), pressure (Pcor), conductivity * pressure (PCcor), pressure squared (P^2_{cor}), and Offset were calculated from the data.

It is not included Timecor calculated to be elapsed days from the time of the first observation.

$\text{corCTDCND1} = \text{CTDCND1} - (\text{Ccor} * \text{CTDCND1} + \text{Pcor} * \text{CTDPRS} + \text{PCcor} * \text{CTDPRS} * \text{CTDCND1} + P^2_{\text{cor}} * (\text{CTDPRS}^2) + \text{Offset})$

- Dissolved oxygen (RINKO III)

Coefficients of primary RINKO III correction: rinkooutconf_pri_rnkt_8_t_01.txt

The time variable uses the sumday of MR1705C_scanmax.txt calculated from the operating time.

Coefficients were calculated from data in which the standard deviation of the dissolved oxygen voltage of each bottle data is less than 0.01.

Stern-Volmer equation

$$\text{ksv} = c_0 + (c_1 * \text{CTDTMP1}) + (c_2 * \text{CTDTMP1}^2)$$

$$\text{tau0} = 1 + (c_3 * \text{CTDTMP1})$$

$$\text{tau} = c_4 + (c_5 * \text{CTDOXV1}) + (c_6 * \text{sumday}) + (c_7 * \text{sumday} * \text{CTDOXV1})$$

$$\text{rinoxy} = ((\text{tau0} / \text{tau})^{\text{conf}} - 1) / \text{ksv}$$

pressure compensate

$$\text{ox} = (1 + \text{cp} * \text{CTDPRS} / 1000) * \text{rinoxy}$$

$$\text{ts} = \log((298.15 - \text{CTDTMP1}) / (273.15 + \text{CTDTMP1}))$$

Calculation of the oxygen solubility was used coefficients calculated by Uchida (2016) from the data of Benson and Krause (1992) by Garcia and Gordon (1984).

$$B_0 = -6.24523e-3$$

$$B_1 = -7.37614e-3$$

$$B_2 = -1.03410e-2$$

$$B_3 = -8.17083e-3$$

$$C_0 = -4.88682e-7$$

$$\text{factt} = \exp(s * (B_0 + B_1 * \text{ts} + B_2 * \text{ts}^2 + B_3 * \text{ts}^3) + C_0 * \text{CTDSAL1}^2);$$

Garcia and Gordon (1992)

$$\text{ox} = \text{ox} * \text{factt};$$

- Light transmission

Coefficients of light transmission correction: xmissoutconf_MR1705C.txt

The time variable uses the sumday of MR1705C_scanmax.txt calculated from the operating time.

The coefficient is calculated from Vref of high-pressure cast from 390db and further from data less than 3 times the standard deviation of Vref.

$V_{ref} = c_0 + c_1 * \text{sumday}$

- Fluorescence

Coefficients of primary fluorescence correction: FI_pri_MR1705C_w1.txt

Coefficients of secondary fluorescence correction: FI_sec_MR1705C_w1.txt

Coefficients were calculated from the cast time from 20:00 to 04:00 (LST).

$\text{corrCTDFL} = \text{slope} * \text{CTDFL} - \text{offset}$

- PAR

Coefficients of PAR: offset = -0.102

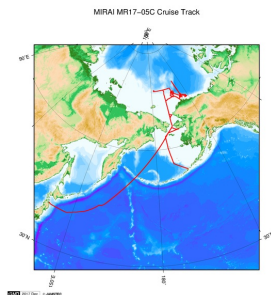
- Nitrate

Coefficients of Deep SUNA correction: correct_suna_MR1705C_ntr_all.txt

The time variable uses the Sumdate calculated from the operating time of SUNA.

$\text{corCTDNTR} = \text{CTDNTR} - (\text{NTRcor} * \text{CTDNTR} + \text{Timecor} * \text{Sumdate} + \text{Offset})$

Related Information



[Enlarge Image](#)

MR17-05C

Ship Name: MIRAI

Period: 2017-08-24 - 2017-10-01

Chief Scientist: Shigeto Nishino (JAMSTEC)

Project Name: [Arctic Ocean Climate System Research]

Proposal ▶ Arctic Challenge for Sustainability (ArCS)

Title:

Update History

Date	Description
2019-08-31	An observation data was registered.

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HAKUHO MARU

Information of the Submersibles

KAIKO
SHINKAI 2000
SHINKAI 6500
DEEP TOW
HYPER-DOLPHIN
URASHIMA
YOKOSUKA DEEP TOW
6K Camera DEEP TOW
6K Sonar DEEP TOW
KM-ROV
POWER GRAB SAMPLER (SHELL)
POWER GRAB SAMPLER (CLOW)
BMS

Go to a Cruise Information

Cruise ID:

Go to a Dive Information

Dive ID:

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国立研究開発法人
海洋研究開発機構

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Last Modified: 2019-08-31

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

Cruise ID: [MR17-05C](#)

Conductivity-Temperature-Depth Profiler (CTD): Processed (DMO/PI)

Data Policy: [JAMSTEC](#)

Format Description for the Processed (PI) 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](#)

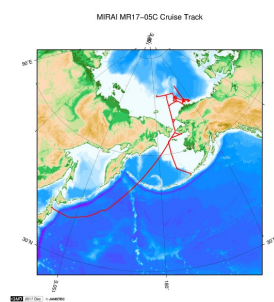
Output items are as follows.

- CTDPRS (Pressure)
- CTDTMP (Temperature)
- CTDSAL (Salinity)
- CTDOXY (Dissolved oxygen)
- XMISS (Light transmission)
- XMISSCP (Coefficient of beam attenuation)
- FLUOR (Fluorescence)
- TURB (Turbidity)
- PAR (PAR)
- CTDNRA (Nitrate)

The data flags are as follows.

- 1: Not calibrated
- 2: Acceptable measurement
- 3: questionable measurement
- 4: bad measurement
- 6: Interpolated over > 1 dbar interval

Related Information



[Enlarge Image](#)

MR17-05C

Ship Name: MIRAI

Period: 2017-08-24 - 2017-10-01

Chief Scientist: Shigeto Nishino (JAMSTEC)

Project Name: [Arctic Ocean Climate System Research]

Proposal ▶ Arctic Challenge for Sustainability (ArCS)

Title:

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Go to a Cruise Information

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Go to a Dive Information

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Last Modified: 2019-08-31

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Conductivity-Temperature-Depth Profiler (CTD): Processed (DMO/PI)

Data Policy: **JAMSTEC**

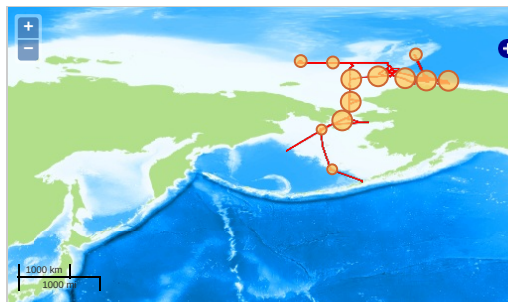
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Science Keywords:

OCEANS > OCEAN CHEMISTRY > OXYGEN
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OCEANS > SALINITY/DENSITY > SALINITY
OCEANS > OCEAN OPTICS > PHOTOSYNTHETICALLY ACTIVE RADIATION
OCEANS > OCEAN OPTICS > FLUORESCENCE

Observation Map

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



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

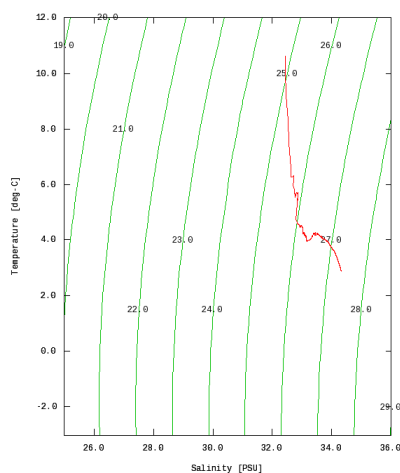
Imagery reproduced from ...

Figures

999_00000_00001_ct1



MR17-05C: 999_00000_00001_ct1
Conductivity-Temperature-Depth Profiler (CTD): Salinity



































Data List

[Add to Basket](#)

☐ File names

☐ 999_00000_00001_ct1.csv
☐ 999_00000_00002_ct1.csv
☐ 999_00001_00001_ct1.csv
☐ 999_00002_00001_ct1.csv
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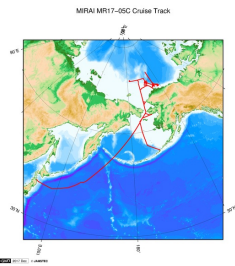
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 correct_suna_MR1705C_ntr_all.txt
 correct_tmp_pri_MR1705C_p390.txt
 rinkooutconf_pri_rnkt_8_t_01.txt
 xmissoutconf_MR1705C.txt

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

Observation	Time and Date	Lat. [°]	Lon. [°]
999_00000_00001_ct1	2017-08-24 22:25	56.0352	-172.1306
999_00000_00002_ct1	2017-08-25 00:02	56.0284	-172.1196
999_00001_00001_ct1	2017-08-26 18:34	63.0930	-174.0127
999_00002_00001_ct1	2017-08-27 07:28	63.8621	-172.2974
999_00003_00001_ct1	2017-08-27 14:37	64.7099	-170.3491
999_00004_00001_ct1	2017-08-27 19:03	65.0483	-169.5917
999_00005_00001_ct1	2017-08-27 22:54	65.2761	-169.0490
999_00006_00001_ct1	2017-08-28 01:55	65.6534	-168.6984
999_00007_00001_ct1	2017-08-28 06:33	66.2730	-168.8494
999_00008_00001_ct1	2017-08-28 12:17	67.2000	-168.9013
999_00009_00001_ct1	2017-08-28 15:43	67.5751	-168.8488
999_00010_00001_ct1	2017-08-28 20:16	68.0189	-168.8355
999_00011_00001_ct1	2017-08-29 01:02	68.5011	-168.7535
999_00012_00001_ct1	2017-08-29 04:20	69.0001	-168.7450
999_00013_00001_ct1	2017-08-29 08:28	69.4971	-168.7624
999_00014_00001_ct1	2017-08-29 12:35	69.9998	-168.7534
999_00015_00001_ct1	2017-08-29 16:02	70.5001	-168.7509
999_00016_00001_ct1	2017-08-29 19:39	70.9995	-168.7591
999_00017_00001_ct1	2017-08-30 00:32	71.5007	-168.7491
999_00018_00001_ct1	2017-08-30 04:54	72.0004	-168.7488
999_00018_00002_ct1	2017-08-30 06:30	71.9996	-168.7499
999_00019_00001_ct1	2017-08-30 10:55	72.4020	-166.6538
999_00020_00002_ct1	2017-08-30 16:23	72.5488	-163.9747
999_00021_00001_ct1	2017-08-30 21:54	72.7992	-161.3471
999_00021_00002_ct1	2017-08-31 00:16	72.8064	-161.3486
999_00021_00003_ct1	2017-08-31 01:20	72.8075	-161.3361
999_00022_00001_ct1	2017-08-31 06:06	72.2104	-159.1717
999_00023_00001_ct1	2017-08-31 09:53	71.8453	-158.3974
999_00024_00001_ct1	2017-08-31 11:55	71.7119	-158.1189
999_00025_00001_ct1	2017-08-31 13:57	71.5805	-157.8496
999_00026_00001_ct1	2017-08-31 15:39	71.4973	-157.6734
999_00027_00001_ct1	2017-08-31 17:33	71.4254	-157.5402
999_00028_00001_ct1	2017-08-31 19:24	71.3288	-157.3497
999_00029_00001_ct1	2017-08-31 21:28	71.2390	-157.2174
999_00030_00001_ct1	2017-08-31 23:48	71.2812	-157.2772
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Chief Scientist: Shigeto Nishino (JAMSTEC)
Project Name: [Arctic Ocean Climate System Research]
Proposal ▶ Arctic Challenge for Sustainability (ArCS)
Title:

Update History

2019-08-31	An observation data was registerd.
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