# DARWIN
**Data** and Sample Research System
for **W**hole **C**ruise **I**nformation in JAMSTEC

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## MIRAI MR10-06 Conductivity-Temperature-Depth Profiler (CTD)

Last Modified: 2017-06-22

**ReadMe**  Observation Data  Data Format

**Cruise ID**: **MR10-06**
**Conductivity-Temperature-Depth Profiler (CTD)**: Processed (DMO)-QCed
**Data Policy**: **JAMSTEC**
**Observation Items**: Pressure, Temperature, Salinity, Dissolved oxygen
**Science Keywords**:

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

**Cruise Report**
**http://www.godac.jamstec.go.jp/catalog/data/doc_catalog/media/MR10-06_all.pdf**

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ℹ️ **For Using Data**

**Principal Investigator**
Data Management Office

**Use Constraints**
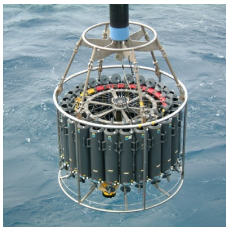See **Terms and Conditions** about constrain of use.

**Data Citation**
See **Terms and Conditions** about data citation.
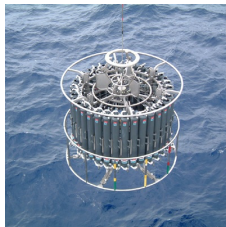
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**Instrument**

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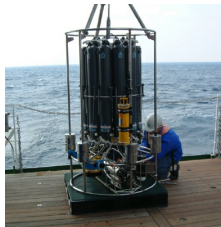Water sampling system with CTD (30 litters * 24 bottles)



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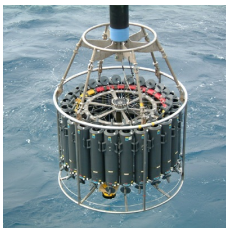Water sampling system with CTD (12 litters * 36 bottles)



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



Instrument:
Conductivity temperature depth measurements (CTD)



**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 MR10-06 cruise are presented in "System".

The following software, developed and supplied by the Sea-Bird Electronics, Inc., was used in MR10-06.

SEASAVE(ver 7.20g) for data acquisition
SEASOFT(ver 7.18d) for data processing

Data presented on this website is averaged over 1db.

**System**

• Pressure sensor
Model : SBE9plus, Sea-Bird Electronics,Inc.
Serial number : 79511
Measurement range : up to 10500m
Accuracy : 0.015% F.S.
Resolution : 0.001% F.S.
• Temperature sensor
Model : SBE3, Sea-Bird Electronics,Inc.
Serial number : 031525
Measurement range : -5.0 to +35degC
Accuracy : 0.001degC
Resolution : 0.0002degC
• Salinity sensor
Model : SBE4, Sea-Bird Electronics,Inc.
Serial number : 043036
Measurement range : 0.0 to 7 S/m
Accuracy : 0.0003 S/m

Resolution : 0.00004 S/m
• DO sensor
    Model : SBE43, Sea-Bird Electronics,Inc.
    Serial number : 430330
    Measurement range : 120% of surface saturation
    Accuracy : 2% of saturation

Sensors used in each cast is as follows.

| Cast name | Serial number of sensor | | | |
|---|---|---|---|---|
| | Pressure | Temperature | Salinity | Dissolved Oxygen |
| 001M01 | 79511 | 031525 | 043036 | 430330 |
| 002M01 | 79511 | 031525 | 043036 | 430330 |
| 004M01 | 79511 | 031525 | 043036 | 430330 |
| 005M01 | 79511 | 031525 | 043036 | 430330 |
| 008M01 | 79511 | 031525 | 043036 | 430330 |
| 009M01 | 79511 | 031525 | 043036 | 430330 |
| 010M01 | 79511 | 031525 | 043036 | 430330 |
| K02M01 | 79511 | 031525 | 043036 | 430330 |
| K02M02 | 79511 | 031525 | 043036 | 430330 |
| K02M03 | 79511 | 031525 | 043036 | 430330 |
| K02M04 | 79511 | 031525 | 043036 | 430330 |
| K02M05 | 79511 | 031525 | 043036 | 430330 |
| K02M06 | 79511 | 031525 | 043036 | 430330 |
| K02M07 | 79511 | 031525 | 043036 | 430330 |
| K02M08 | 79511 | 031525 | 043036 | 430330 |
| K02M09 | 79511 | 031525 | 043036 | 430330 |
| KNTM01 | 79511 | 031525 | 043036 | 430330 |
| S01M01 | 79511 | 031525 | 043036 | 430330 |
| S01M02 | 79511 | 031525 | 043036 | 430330 |
| S01M03 | 79511 | 031525 | 043036 | 430330 |
| S01M04 | 79511 | 031525 | 043036 | 430330 |
| S01M05 | 79511 | 031525 | 043036 | 430330 |
| S01M06 | 79511 | 031525 | 043036 | 430330 |
| S01M07 | 79511 | 031525 | 043036 | 430330 |
| S01M08 | 79511 | 031525 | 043036 | 430330 |
| S01M09 | 79511 | 031525 | 043036 | 430330 |
| S01M10 | 79511 | 031525 | 043036 | 430330 |
| S01M11 | 79511 | 031525 | 043036 | 430330 |
| S01M12 | 79511 | 031525 | 043036 | 430330 |

**Calibration Information**
Calibration Information is as follows.
**Calibration Information**

**Data processing**
(1) Data processing sequence for SEASOFT is as follows;
("∗" is not SEASOFT original procedure.)

| command | function |
|---|---|
| datcnv | Convert raw data to engineering units, and store converted data in file. |
| alignctd | Align data relative to pressure(typically used for conductivity, temperature, and oxygen). |
| wildedit | Mark a data value with badflag to eliminate wild points. |
| celltm | Perform conductivity thermal mass correction. |
| filter | Low-pass filter columns of data. |
| wfilter | Median filter removes spikes of fluorometer data. |
| section | Extract rows of data from file. |
| loopedit | Mark a scan with badflag if scan fails pressure reversal or minimum velocity tests. |
| despike∗ | Remove spikes of the data. |
| derive | Calculate oxygen. (with oxygen sensor) |
| binavg | Average data, basing bins on pressure, depth, scan number, or time range. |
| derive | Calculate salinity, density, etc.. |
| 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.
    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
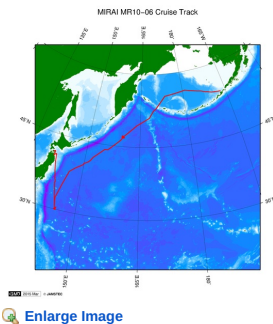Please see the site of NODC of the following link for quality control procedure in detail.
**QUALITY CONTROL AND PROCESSING OF HISTORICAL OCEANOGRAPHIC TEMPERATURE, SALINITY, AND OXYGEN DATA**
In addition, an abnormal value is identified by a visual check, and the data after visual QC is released.

**Note**
(1) In this cruise, there is extra data (fluorescence intensity, distance to bottom) in additional to temperature, salinity, dissolved oxygen that has been opened to the public. Please contact us from "Contact Us" above if necessary.

**Related Information**

**Enlarge Image**

**MR10-06**

Ship Name: MIRAI
Period: 2010-10-18 - 2010-11-16
Chief Scientist: Makio Honda (JAMSTEC)
Project Name: [Station K2,Station S1,Station KEO,Station KNOT]
Proposal ▶ Change in material cycles and ecosystem by the climate change and its feedback
Title:

**Update History**

| | |
|---|---|
| 2017-06-22 | An observation data was registerd. |
| 2014-08-08 | An observation data was registerd. |
| 2014-02-15 | An observation data was registerd. |
| 2014-02-13 | An observation data was registerd. |
| 2013-03-27 | An observation data was registerd. |
| 2013-03-26 | An observation data was registerd. |
| 2012-11-27 | An observation data was registerd. |

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6K Sonar DEEP TOW
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## MIRAI MR10-06 Conductivity-Temperature-Depth Profiler (CTD)

Last Modified: 2017-06-22

**ReadMe**  **Observation Data**  **Data Format**

**Cruise ID**: **MR10-06**
**Conductivity-Temperature-Depth Profiler (CTD)**: Processed (DMO)-QCed
**Data Policy**: **JAMSTEC**

### 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 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 | CTD |
| 3 | 8 - 22 | Cruise ID | a15 | MRYY-(K)XX(_legx) |
| 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 | - | CR+LF |

Data part

| No. | Column | Content | Unit | Format | Remarks |
|-----|--------|---------|------|--------|---------|
| 1 | 1 - 11 | Pressure | dbar | f11.3 | |
| 2 | 12 - 22 | Temperature | deg-C | f11.4 | ITS-90 |
| 3 | 23 - 33 | Salinity | PSU | f11.4 | PSS-78 |
| 4 | 34 - 44 | Dissolved oxygen | umol/kg | f11.3 | |
| 5 | 45 - 55 | Flag | - | i11 | 1 - 7 : space<br>8 : flag of pressure<br>9 : flag of temperature<br>10 : flag of salinity<br>11 : flag of dissolved oxygen<br>* reference : '**Definition of Quality Control Flags**' |
| 6 | 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
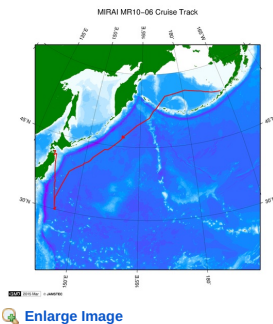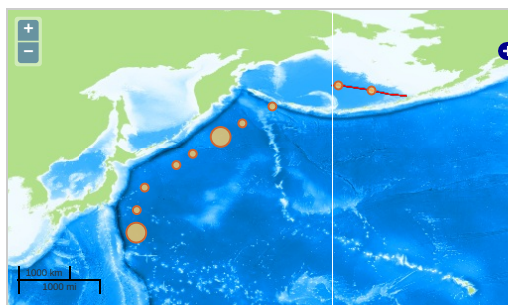    A - failed visual check

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**

## MR10-06

Ship Name: MIRAI
Period: 2010-10-18 - 2010-11-16
Chief Scientist: Makio Honda (JAMSTEC)
Project Name: [Station K2,Station S1,Station KEO,Station KNOT]
Proposal ▶ Change in material cycles and ecosystem by the climate change and its feedback
Title:

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### Update History

| 2017-06-22 | An observation data was registerd. |
|------------|-------------------------------------|
| 2014-08-08 | An observation data was registerd. |
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## MIRAI MR10-06 Conductivity-Temperature-Depth Profiler (CTD)

Last Modified: 2017-06-22

| ReadMe | Observation Data | Data Format |

**Cruise ID**: **MR10-06**
**Conductivity-Temperature-Depth Profiler (CTD)**: Processed (DMO)-QCed
**Data Policy**: **JAMSTEC**
**Observation Items**: Pressure, Temperature, Salinity, Dissolved oxygen
**Science Keywords**:

| OCEANS | > OCEAN CHEMISTRY | > OXYGEN |
| OCEANS | > OCEAN TEMPERATURE | > 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 ...

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

### Figures

001M01



MR10-06: 001M01
Conductivity-Temperature-Depth Profiler (CTD): Salinity
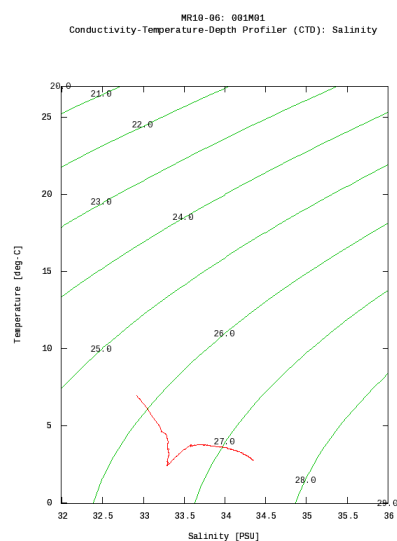


Only values evaluated as "good : all flags are 0" are plotted in profiles.
Please see Format Page for the definition of quality flags.

### Data List

Add to Basket

| | File names |
| --- | --- |
| ☐ | 001M01.dat |
| ☐ | 002M01.dat |
| ☐ | 004M01.dat |
| ☐ | 005M01.dat |
| ☐ | 008M01.dat |
| ☐ | 009M01.dat |
| ☐ | 010M01.dat |
| ☐ | K02M01.dat |
| ☐ | K02M02.dat |
| ☐ | K02M03.dat |
| ☐ | K02M04.dat |
| ☐ | K02M05.dat |
| ☐ | K02M06.dat |
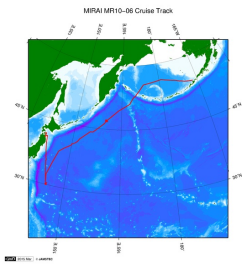
- File Names
  - ☐ K02M07.dat
  - ☐ K02M08.dat
  - ☐ K02M09.dat
  - ☐ KNTM01.dat
  - ☐ S01M01.dat
  - ☐ S01M02.dat
  - ☐ S01M03.dat
  - ☐ S01M04.dat
  - ☐ S01M05.dat
  - ☐ S01M06.dat
  - ☐ S01M07.dat
  - ☐ S01M08.dat
  - ☐ S01M09.dat
  - ☐ S01M10.dat
  - ☐ S01M11.dat
  - ☐ S01M12.dat
  - ☐ ex_read2.f (Sample Program)

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

| Observation | Time and Date | Lat. [°] | Lon. [°] |
|---|---|---|---|
| 001M01 | 2010-10-19 22:38 | 55.2351 | -173.2300 |
| 002M01 | 2010-10-20 19:51 | 56.1350 | -179.1186 |
| 004M01 | 2010-10-23 01:16 | 52.4003 | 169.1628 |
| 005M01 | 2010-10-24 02:19 | 49.3973 | 163.8388 |
| 008M01 | 2010-11-03 04:42 | 41.9998 | 152.1121 |
| 009M01 | 2010-11-04 11:53 | 37.9998 | 146.4880 |
| 010M01 | 2010-11-05 08:00 | 33.9995 | 145.0828 |
| K02M01 | 2010-10-24 20:54 | 46.9898 | 159.9750 |
| K02M02 | 2010-10-25 05:40 | 46.9918 | 160.0453 |
| K02M03 | 2010-10-25 16:56 | 46.8853 | 159.9975 |
| K02M04 | 2010-10-25 20:50 | 46.8810 | 160.0250 |
| K02M05 | 2010-10-26 03:42 | 46.8466 | 160.0443 |
| K02M06 | 2010-10-26 20:53 | 46.8630 | 159.9363 |
| K02M07 | 2010-10-26 23:25 | 46.8645 | 159.9440 |
| K02M08 | 2010-10-28 07:22 | 46.8743 | 159.9233 |
| K02M09 | 2010-10-28 16:55 | 46.8651 | 159.9896 |
| KNTM01 | 2010-11-02 07:29 | 44.0018 | 155.0268 |
| S01M01 | 2010-11-06 06:42 | 30.0006 | 145.0000 |
| S01M02 | 2010-11-06 20:25 | 29.9995 | 144.9995 |
| S01M03 | 2010-11-07 09:03 | 30.0000 | 144.9993 |
| S01M04 | 2010-11-07 17:43 | 30.0021 | 144.9981 |
| S01M05 | 2010-11-07 22:46 | 30.0106 | 145.0451 |
| S01M06 | 2010-11-08 05:46 | 30.0030 | 145.0015 |
| S01M07 | 2010-11-09 03:49 | 29.9985 | 144.9983 |
| S01M08 | 2010-11-09 08:24 | 30.0001 | 144.9996 |
| S01M09 | 2010-11-09 10:02 | 29.9993 | 145.0010 |
| S01M10 | 2010-11-09 17:53 | 30.0008 | 145.0001 |
| S01M11 | 2010-11-10 02:53 | 30.0011 | 144.9993 |
| S01M12 | 2010-11-10 21:56 | 30.0101 | 145.0681 |

**Related Information**



MIRAI MR10-06 Cruise Track

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**MR10-06**
Ship Name: MIRAI
Period: 2010-10-18 - 2010-11-16
Chief Scientist: Makio Honda (JAMSTEC)
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