

## MIRAI MR05-01 Bottle Sampling Water Chemical Analysis

Last Modified: 2017-07-28

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Cruise ID: [MR05-01](#)

Bottle Sampling Water Chemical Analysis: Processed (PI)

Data Policy: [JAMSTEC](#)

**Observation Items:** Temperature, Salinity, Dissolved oxygen, Fluorescence, Chlorophyll, Transmittance, Silicate, Nitrate, Nitrite, Phosphate, Total inorganic carbon, Alkalinity, pH, Potential temperature, Density

**Science Keywords:**

OCEANS > OCEAN CHEMISTRY > INORGANIC CARBON  
OCEANS > OCEAN CHEMISTRY > NITRITE  
OCEANS > OCEAN CHEMISTRY > NITRATE  
OCEANS > OCEAN CHEMISTRY > NUTRIENTS  
OCEANS > OCEAN CHEMISTRY > OXYGEN  
OCEANS > OCEAN CHEMISTRY > pH  
OCEANS > OCEAN CHEMISTRY > PHOSPHATE  
OCEANS > OCEAN CHEMISTRY > SILICATE  
OCEANS > OCEAN CHEMISTRY > SALINITY  
OCEANS > OCEAN CHEMISTRY > CHLOROPHYLL  
OCEANS > OCEAN TEMPERATURE > WATER TEMPERATURE  
OCEANS > SALINITY/DENSITY > SALINITY  
OCEANS > OCEAN CHEMISTRY > ALKALINITY  
OCEANS > OCEAN CHEMISTRY > CARBON  
OCEANS > OCEAN OPTICS > FLUORESCENCE  
OCEANS > OCEAN TEMPERATURE > POTENTIAL TEMPERATURE

**Cruise Report**

[http://www.godac.jamstec.go.jp/catalog/data/doc\\_catalog/media/MR05-01\\_all.pdf](http://www.godac.jamstec.go.jp/catalog/data/doc_catalog/media/MR05-01_all.pdf)

### For Using Data

#### Principal Investigator

CTDTMP : Makio Honda (JAMSTEC)  
CTDSAL : Makio Honda (JAMSTEC)  
SALNTY : Makio Honda (JAMSTEC)  
CTDOXY : Makio Honda (JAMSTEC)  
OXYGEN : Makio Honda (JAMSTEC)  
FLUOR : Makio Honda (JAMSTEC)  
CHLORA : Makio Honda (JAMSTEC)  
XMISS : Makio Honda (JAMSTEC)  
SILCAT : Makio Honda (JAMSTEC)  
NITRAT : Makio Honda (JAMSTEC)  
NITRIT : Makio Honda (JAMSTEC)  
PHSPHT : Makio Honda (JAMSTEC)  
TCARBN : Makio Honda (JAMSTEC)  
ALKALI : Makio Honda (JAMSTEC)  
PH : Makio Honda (JAMSTEC)

#### Use Constraints

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

#### Data Citation

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

### Instrument

Instrument:

Salinity measurement system



Instrument:

Nutrient analyzer(4ch) ( - MR09-01)



Instrument:

Total dissolved inorganic carbon measurement system ( - MR11-E02)



Instrument:

Titration for DO ( - MR11-05 Leg2)



Instrument:

Titration for total alkalinity ( - MR14-02)



Instrument:

Fluorometer (TURNER DESIGNS)



· The values of TA and silicate have systematic errors among cruises, because the analytical methods used for these determinations, and the precision and standards for analysis varied slightly from cruise to cruise. The dataset posted here is "corrected" in a cruise. If you need the corrected data for systematic errors among cruises, please see ["Hydrographic Data at Station K2 and KNOT"](#) . (Available data are station K2 and KNOT data only.)

· Data flags of FLUOR and XMISS are Unknown (flag1) because of lack of the calibration.

#### Information on CTD data

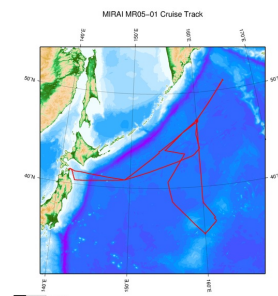
- (1) Temperature sensor  
Model: SBE3, Sea-Bird Electronics, Inc.  
Measurement range: -5.0 to +35degC  
Accuracy: 0.001degC  
Resolution: 0.0002degC
- (2) Salinity sensor  
Model: SBE4, Sea-Bird Electronics, Inc.  
Measurement range: 0.0 to 7S/m  
Accuracy: 0.0003S/m  
Resolution: 0.00004S/m
- (3) Pressure sensor  
Model: SBE9plus, Sea-Bird Electronics, Inc.  
Measurement range: up to 10500m  
Accuracy: 0.015%F.S.  
Resolution: 0.001%F.S.
- (4) DO sensor  
Model: SBE43, Sea-Bird Electronics, Inc.  
Measurement range: 0-15ml/l  
Accuracy: 0.1ml/l  
Resolution: 0.01ml/l
- (5) Fluorometer  
Model: Seapoint Sensors, Inc.
- (6) Transmissometer  
Model: WET Labs, Inc.

#### Information on Chemical and Biological data

1. Dissolved Oxygen
  - (1) Instruments: Burette: APB-510 manufactured by Kyoto Electronic Co. Ltd. / 10 cm3 of titration vessel  
Detector and Software: Automatic photometric titrator manufactured by Kimoto Electronic Co. Ltd
  - (2) Methods: Winkler method/photometric methods
  - (3) Precision: 0.087 umol kg<sup>-1</sup>
  - (4) Reference Material/Calibration: 0.001667M KIO<sub>3</sub> solution
2. Salinity
  - (1) Instruments: Autosol salinometer model 8400B (Guildline Instruments Ltd.)
  - (2) Methods: -
  - (3) Precision: 0.0004 PSU
  - (4) Reference Material/Calibration: IAPSO Standard Sea Water batch P145 (Ocean Scientific International Ltd.)
3. Silicate
  - (1) Instruments: TRAACS800 (Bran+Luebbe)
  - (2) Methods: Molybdenum blue method
  - (3) Precision: C.V. 0.10% (172uM)
  - (4) Reference Material/Calibration: RMNS [Aoyama et al., 2007] and Silicate standard solution, the silicate primary standard, is obtained from Kanto Chemical CO., Inc.  
  
This standard solution is 1000 mg per liter with 0.5 M KOH and prepared for ICP analysis.
4. Nitrate
  - (1) Instruments: TRAACS800 (Bran+Luebbe)
  - (2) Methods: Diazotization method (reduced to nitrite by Cd - Cu tube)
  - (3) Precision: C.V. 0.13% (54uM)
  - (4) Reference Material/Calibration: KNO<sub>3</sub> solution and RMNS [Aoyama et al., 2007]
5. Nitrite
  - (1) Instruments: TRAACS800 (Bran+Luebbe)
  - (2) Methods: Diazotization method
  - (3) Precision: C.V. 0.18% (1.2uM)
  - (4) Reference Material/Calibration: NaNO<sub>2</sub> solution and RMNS [Aoyama et al., 2007]
6. Phosphate
  - (1) Instruments: TRAACS800 (Bran+Luebbe)
  - (2) Methods: Molybdenum blue method
  - (3) Precision: C.V. 0.15% (3.7uM)
  - (4) Reference Material/Calibration: KH<sub>2</sub>PO<sub>4</sub> solution and RMNS [Aoyama et al., 2007]
7. Total inorganic carbon
  - (1) Instruments: the automated TCO<sub>2</sub> analyzer (Nippon ANS, Inc.) equipped with carbon coulometer 5012 (UIC Inc.)
  - (2) Methods: coulometry
  - (3) Precision: 1.32umol kg<sup>-1</sup>
  - (4) Reference Material/Calibration: Na<sub>2</sub>CO<sub>3</sub> solution and the CRM provided by Dr. Dickson in Scripps Institute of Oceanography
8. Total Alkalinity
  - (1) Instruments: auto-burette (Radiometer, ABU901), a pH glass electrode (Radiometer, pHG201-7), a reference electrode (Radiometer, REF201)
  - (2) Methods: Modified Gran titration/Closed-cell/potentiometry
  - (3) Precision: 1.05 umol kg<sup>-1</sup>
  - (4) Reference Material/Calibration: Na<sub>2</sub>CO<sub>3</sub> solution and the CRM provided by Dr. Dickson in Scripps Institute of Oceanography
9. pH

- (1) Instruments: a glass/reference electrode with a pH/Ion meter (Radiometer PHM95)  
(2) Methods: potentiometric methods at 25deg-C  
(3) Precision: 0.0012 pH unit  
(4) Reference Material/Calibration: total hydrogen ion scale
10. Chlorophyll-a  
(1) Instruments: Fluorophotometer model 10-AU-005 (Turner designs)  
(2) Methods: extract in N,N-dimethylformamide/fluorometric determination (acidification method)  
(3) Precision: -  
(4) Reference Material/Calibration: -

#### Related Information



[Enlarge Image](#)

#### MR05-01

Ship Name: MIRAI  
Period: 2005-02-28 - 2005-03-24  
Chief Scientist: Makio Honda (JAMSTEC)  
Project Name: [Station K2, Station KNOT]

#### Update History

2017-07-28	An observation data was registerd.
2015-05-29	An observation data was registerd.
2013-08-24	An observation data was registerd.
2012-11-25	An observation data was registerd.

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[POWER GRAB SAMPLER \(CLOW\)](#)  
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Cruise ID:

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Dive ID:

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## MIRAI MR05-01 Bottle Sampling Water Chemical Analysis

Last Modified: 2017-07-28

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Cruise ID: [MR05-01](#)

Bottle Sampling Water Chemical Analysis: Processed (PI)

Data Policy: [JAMSTEC](#)

### Exchange Format

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](#)

Format Information

Column No.	Column Heading Mnemonic	Units Mnemonic	Reporting Precision FORTRAN Format	Comments
1	EXPCODE		A14	Expedition code
2	SECT		A6	For WOCE data the WHP section identifier
3	STNNBR		A6	Station number
4	CASTNO		I3	Cast number
5	SAMPNO		A7	Sample number
6	BTLNBR		A7	Bottle identification number
7	BTLNBR_FLAG_W		I1	Bottle quality flag
8	DATE		I8	Cast date(UTC)
9	TIME	UTC	I4	Cast time (UTC)
10	LATITUDE	DEG	F8.3	LATITUDE
11	LONGITUDE	DEG	F9.3	LONGITUDE
12	DEPTH	M	I5	Reported depth to bottom.
13	CTDDPT	M	F9.1	Depth
14	CTDDPT_FLAG_W		I1	Quality flag for CTD data
15	CTDPRS	DBAR	F9.1	Pressure
16	CTDPRS_FLAG_W		I1	Quality flag for CTD data
17	CTDTMP	ITS-90	F9.4	Temperature
18	CTDTMP_FLAG_W		I1	Quality flag for CTD data
19	CTDSAL	PSS-78	F9.4	CTD Salinity sensor
20	CTDSAL_FLAG_W		I1	Quality flag for CTD data
21	SALNTY	PSS-78	F9.4	Salinity
22	SALNTY_FLAG_W		I1	Quality flags for water samples
23	CTDOXY	UMOL/KG	F9.2	CTD Oxygen sensor
24	CTDOXY_FLAG_W		I1	Quality flag for CTD data
25	OXYGEN	UMOL/KG	F9.2	Oxygen
26	OXYGEN_FLAG_W		I1	Quality flags for water samples
27	FLUOR	UG/L	F9.2	Fluorometer
28	FLUOR_FLAG_W		I1	Quality flag for CTD data
29	CHLORA	MG/CUM	F9.2	Chlorophyll a
30	CHLORA_FLAG_W		I1	Quality flags for water samples
31	XMISS	%TRANS	F9.1	Transmissometer
32	XMISS_FLAG_W		I1	Quality flag for CTD data
33	SILCAT	UMOL/KG	F9.2	Silicate
34	SILCAT_FLAG_W		I1	Quality flags for water samples
35	NITRAT	UMOL/KG	F9.2	Nitrate
36	NITRAT_FLAG_W		I1	Quality flags for water samples
37	NITRIT	UMOL/KG	F9.2	Nitrite
38	NITRIT_FLAG_W		I1	Quality flags for water samples
39	PHSPHT	UMOL/KG	F9.2	Phosphate
40	PHSPHT_FLAG_W		I1	Quality flags for water samples
41	TCARBN	UMOL/KG	F9.1	Total carbon
42	TCARBN_FLAG_W		I1	Quality flags for water samples
43	ALKALI	UMOL/KG	F9.1	Total alkalinity
44	ALKALI_FLAG_W		I1	Quality flags for water samples
45	PH	-	F9.3	pH
46	PH_FLAG_W		I1	Quality flags for water samples
47	THETA	DEG C	F9.4	Potential temperature
48	SIG0	KG/CUM	F9.4	Density

### ODV Format

Please see the following link for details of ODV Format and ODV Software.

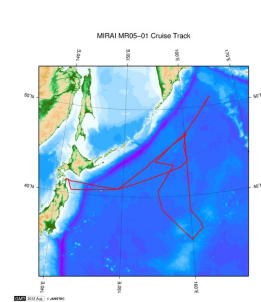
[Ocean Data View \(ODV\)](#)

Format Information

Column No.	Column Heading	Comments
1	Cruise	Cruise Label
2	Station	Station number_Cast number
3	Type	Station type
4	mon/day/yr	Cast date(UTC)
5	hh:mm	Cast time (UTC)
6	Latitude [degrees_north]	LATITUDE
7	Longitude [degrees_east]	LONGITUDE
8	Bot. Depth [m]	Reported depth to bottom.
9	CTDDPT[M]	Depth
10	QF	Quality flag for CTD data
11	CTDPRS[DBAR]	Pressure

Column No.	Column Heading	Comments
12	QF	Quality flag for CTD data
13	CTDTMP[ITS-90]	Temperature
14	QF	Quality flag for CTD data
15	CTDSAL[PSS-78]	CTD Salinity sensor
16	QF	Quality flag for CTD data
17	SALNTY[PSS-78]	Salinity
18	QF	Quality flags for water samples
19	CTDOXY[UMOL/KG]	CTD Oxygen sensor
20	QF	Quality flag for CTD data
21	OXYGEN[UMOL/KG]	Oxygen
22	QF	Quality flags for water samples
23	FLUOR[UG/L]	Fluorometer
24	QF	Quality flag for CTD data
25	CHLORA[MG/CUM]	Chlorophyll a
26	QF	Quality flags for water samples
27	XMISS[%TRANS]	Transmissometer
28	QF	Quality flag for CTD data
29	SILCAT[UMOL/KG]	Silicate
30	QF	Quality flags for water samples
31	NITRAT[UMOL/KG]	Nitrate
32	QF	Quality flags for water samples
33	NITRIT[UMOL/KG]	Nitrite
34	QF	Quality flags for water samples
35	PHSPHT[UMOL/KG]	Phosphate
36	QF	Quality flags for water samples
37	TCARBN[UMOL/KG]	Total carbon
38	QF	Quality flags for water samples
39	ALKAL[UMOL/KG]	Total alkalinity
40	QF	Quality flags for water samples
41	PH	pH
42	QF	Quality flags for water samples
43	THETA[DEG C]	Potential temperature
44	QF	Quality flag for CTD data
45	SIG0[KG/CUM]	Density
46	QF	Quality flag for CTD data
47	SAMPNO	Sample number
48	QF	Bottle quality flag

#### Related Information



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**MR05-01**  
Ship Name: MIRAI  
Period: 2005-02-28 - 2005-03-24  
Chief Scientist: Makio Honda (JAMSTEC)  
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2017-07-28	An observation data was registerd.
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POWER GRAB  
SAMPLER (SHELL)  
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## MIRAI MR05-01 Bottle Sampling Water Chemical Analysis

Last Modified: 2017-07-28

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Cruise ID: [MR05-01](#)

Bottle Sampling Water Chemical Analysis: Processed (PI)

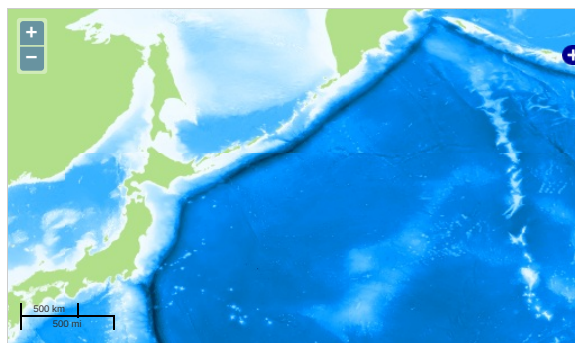
Data Policy: [JAMSTEC](#)

**Observation Items:** Temperature, Salinity, Dissolved oxygen, Fluorescence, Chlorophyll, Transmittance, Silicate, Nitrate, Nitrite, Phosphate, Total inorganic carbon, Alkalinity, pH, Potential temperature, Density

**Science Keywords:**

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OCEANS > OCEAN CHEMISTRY > OXYGEN  
OCEANS > OCEAN CHEMISTRY > pH  
OCEANS > OCEAN CHEMISTRY > PHOSPHATE  
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OCEANS > OCEAN CHEMISTRY > SALINITY  
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OCEANS > SALINITY/DENSITY > SALINITY  
OCEANS > OCEAN CHEMISTRY > ALKALINITY  
OCEANS > OCEAN CHEMISTRY > CARBON  
OCEANS > OCEAN OPTICS > FLUORESCENCE  
OCEANS > OCEAN TEMPERATURE > POTENTIAL TEMPERATURE

### Observation Map



... Observation Line    ... Navigation    ... Observation, Dive Point, Hole    Imagery reproduced from ...

### Data List

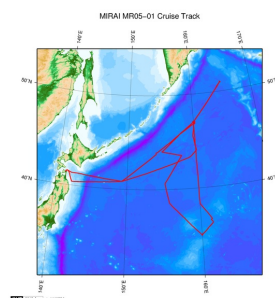
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☐ File names

☐ MR050100\_ex\_bot.csv

☐ MR050100\_odv\_bot.txt

### Related Information



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