

## MIRAI MR06-03 Leg2 Bottle Sampling Water Chemical Analysis

Last Modified: 2017-07-28

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Cruise ID: [MR06-03 Leg2](#)

Bottle Sampling Water Chemical Analysis: Processed (PI)

Data Policy: [JAMSTEC](#)

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

Science Keywords:

OCEANS > OCEAN CHEMISTRY > AMMONIA  
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 > SEA SURFACE TEMPERATURE  
OCEANS > OCEAN CHEMISTRY > SALINITY  
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/MR06-03\\_leg1-2\\_all.pdf](http://www.godac.jamstec.go.jp/catalog/data/doc_catalog/media/MR06-03_leg1-2_all.pdf)

### For Using Data

#### Principal Investigator

CTDTMP : Masahide Wakita (JAMSTEC)  
SBE35 : Makio Honda (JAMSTEC)  
CTDSAL : Masahide Wakita (JAMSTEC)  
SALNTY : Masahide Wakita (JAMSTEC)  
CTDOXY : Makio Honda (JAMSTEC)  
OPTOXY : Makio Honda (JAMSTEC)  
OXYGEN : Masahide Wakita (JAMSTEC)  
DWNPRS : Makio Honda (JAMSTEC)  
DWNNOX : Makio Honda (JAMSTEC)  
FLUOR : Makio Honda (JAMSTEC)  
XMISS : Makio Honda (JAMSTEC)  
SILCAT : Masahide Wakita (JAMSTEC)  
NITRAT : Masahide Wakita (JAMSTEC)  
NITRIT : Masahide Wakita (JAMSTEC)  
PHSPHT : Masahide Wakita (JAMSTEC)  
NH4 : Masahide Wakita (JAMSTEC)  
TCARBN : Masahide Wakita (JAMSTEC)  
ALKALI : Masahide Wakita (JAMSTEC)  
PH : Masahide Wakita (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:

pH meter (MR02-K03 - )





#### Notice

- Temperature data measured by a mercury thermometer is listed in CTDTMP column at SAMPNO 0 which means sampled by bucket. Please notice that this data is different from other data in format (f9.1) and instrument.
- 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.
- (7) Deep Ocean Standards Thermometer  
Model : SBE 35, Sea-Bird Electronics, Inc.
- (8) Oxygen Optode  
Model : Arec Electronics Inc.

#### Information on Chemical and Biological data

1. Dissolved Oxygen
  - (1) Instruments : Burette:APB-510 manufactured by Kyoto Electronic Co. Ltd. / 10 cm<sup>3</sup> 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 : Autosal salinometer model 8400B (Guildline Instruments Ltd.)
  - (2) Methods : -
  - (3) Precision : 0.0002 PSU
  - (4) Reference Material/Calibration : IAPSO Standard Sea Water batch P146 (Ocean Scientific International Ltd.)
3. Silicate
  - (1) Instruments : TRAACS800 (Bran+Luebbe)
  - (2) Methods : Molybdenum blue method
  - (3) Precision : C.V. 0.07% (171uM)
  - (4) Reference Material/Calibration : RMNS [Aoyama et al., 2007] and Silicate standard solution, the silicate primary standard, was obtained from Merck,Ltd.  
This standard solution, traceable to SRM from NIST was 1000 mg per litter.
4. Nitrate
  - (1) Instruments : TRAACS800 (Bran+Luebbe)
  - (2) Methods : Diazotization method (reduced to nitrite by Cd - Cu tube)
  - (3) Precision : C.V. 0.07% (55uM)
  - (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. 0.07% (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. 0.09% (3.6uM)
  - (4) Reference Material/Calibration : KH<sub>2</sub>PO<sub>4</sub> solution and RMNS [Aoyama et al., 2007]
7. Ammonia
  - (1) Instruments : TRAACS800 (Bran+Luebbe)
  - (2) Methods : Indophenol method/gas diffusion method(GDM)
  - (3) Precision : C.V. 0.25% (4.0uM)
  - (4) Reference Material/Calibration : (NH<sub>4</sub>)<sub>2</sub>SO<sub>4</sub> solution
8. 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 : 1.2umol 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

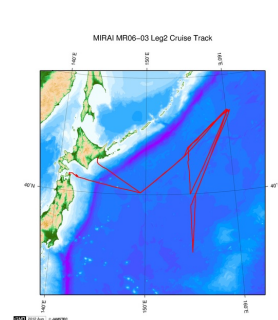
#### 9. Total Alkalinity

- (1) Instruments : TALK measuring systems (TA-1000), which were made by Nippon ANS, Inc.  
(2) Methods : Modified Gran titration/Closed-cell/potentiometry  
(3) Precision : 1.1 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

#### 10. pH

- (1) Instruments : a glass / reference electrode with a pH / Ion meter (Radiometer PHM240)  
(2) Methods : potentiometric methods at 25deg-C  
(3) Precision : 0.001 pH unit  
(4) Reference Material/Calibration : total hydrogen ion scale

#### Related Information



##### MR06-03 Leg2

Ship Name: MIRAI  
Period: 2006-06-19 - 2006-07-25  
Chief Scientist: Makio Honda (JAMSTEC)  
Project Name: [Station K2, Station KNOT]

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#### Update History

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

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[6K Sonar DEEP TOW](#)  
[KM-ROV](#)  
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[POWER GRAB SAMPLER \(CLOW\)](#)  
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## MIRAI MR06-03 Leg2 Bottle Sampling Water Chemical Analysis

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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		A18	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	CTDPRS	DBAR	F9.1	Pressure
14	CTDPRS_FLAG_W		I1	Quality flag for CTD data
15	CTDTMP	ITS-90	F9.4	Temperature
16	CTDTMP_FLAG_W		I1	Quality flag for CTD data
17	SBE35	ITS-90	F10.5	Temperature from Deep Ocean Standards Thermometer
18	SBE35_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	F9.1	CTD Oxygen sensor
24	CTDOXY_FLAG_W		I1	Quality flag for CTD data
25	OPTOXY	UMOL/KG	F9.1	Optode oxygen
26	OPTOXY_FLAG_W		I1	Quality flag for CTD data
27	OXYGEN	UMOL/KG	F9.1	Oxygen
28	OXYGEN_FLAG_W		I1	Quality flags for water samples
29	DWNPRS	DBAR	F9.1	Down-cast pressure at the same density of the up-cast CTD data
30	DWNPRS_FLAG_W		I1	Quality flag for CTD data
31	DWNOXY	UMOL/KG	F9.1	Down-cast CTD oxygen at pressure of DWNPRS
32	DWNOXY_FLAG_W		I1	Quality flag for CTD data
33	FLUOR	UG/L	F9.2	Fluorometer
34	FLUOR_FLAG_W		I1	Quality flag for CTD data
35	XMISS	%TRANS	F9.1	Transmissometer
36	XMISS_FLAG_W		I1	Quality flag for CTD data
37	SILCAT	UMOL/KG	F9.1	Silicate
38	SILCAT_FLAG_W		I1	Quality flags for water samples
39	NITRAT	UMOL/KG	F9.1	Nitrate
40	NITRAT_FLAG_W		I1	Quality flags for water samples
41	NITRIT	UMOL/KG	F9.2	Nitrite
42	NITRIT_FLAG_W		I1	Quality flags for water samples
43	PHSPHT	UMOL/KG	F9.2	Phosphate
44	PHSPHT_FLAG_W		I1	Quality flags for water samples
45	NH4	UMOL/KG	F9.2	Ammonium
46	NH4_FLAG_W		I1	Quality flags for water samples
47	TCARBN	UMOL/KG	F9.1	Total carbon
48	TCARBN_FLAG_W		I1	Quality flags for water samples
49	ALKALI	UMOL/KG	F9.1	Total alkalinity
50	ALKALI_FLAG_W		I1	Quality flags for water samples
51	PH	-	F9.3	pH
52	PH_FLAG_W		I1	Quality flags for water samples
53	THETA	DEG C	F9.4	Potential temperature
54	SIG0	KG/CUM	F9.4	Density

### ODV Format

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

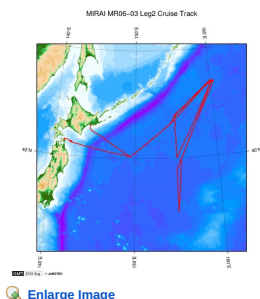
[Ocean Data View \(ODV\)](#)

Format Information

Column No.	Column Heading	Comments
1	Cruise	Cruise Label
2	Station	Station number_Cast number
3	Type	Station type
4	Cast date	Cast date(UTC)

Column No.	Column Heading	Comments
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(Calculate from CTDPRS and LATITUDE)
10	QF	Quality flag for CTD data
11	CTDPRS[DBAR]	Pressure
12	QF	Quality flag for CTD data
13	CTDTMP[ITS-90]	Temperature
14	QF	Quality flag for CTD data
15	SBE35[ITS-90]	Temperature from Deep Ocean Standards Thermometer
16	QF	Quality flag for CTD data
17	CTDSAL[PSS-78]	CTD Salinity sensor
18	QF	Quality flag for CTD data
19	SALNTY[PSS-78]	Salinity
20	QF	Quality flags for water samples
21	CTDOXY[UMOL/KG]	CTD Oxygen sensor
22	QF	Quality flag for CTD data
23	OPTOXY[UMOL/KG]	Optode oxygen
24	QF	Quality flag for CTD data
25	OXYGEN[UMOL/KG]	Oxygen
26	QF	Quality flags for water samples
27	DWNPRS[DBAR]	Down-cast pressure at the same density of the up-cast CTD data
28	QF	Quality flag for CTD data
29	DWNOXY[UMOL/KG]	Down-cast CTD oxygen at pressure of DWNPRS
30	QF	Quality flag for CTD data
31	FLUOR[UG/L]	Fluorometer
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33	XMISS[%TRANS]	Transmissometer
34	QF	Quality flag for CTD data
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36	QF	Quality flags for water samples
37	NITRAT[UMOL/KG]	Nitrate
38	QF	Quality flags for water samples
39	NITRIT[UMOL/KG]	Nitrite
40	QF	Quality flags for water samples
41	PHSPHT[UMOL/KG]	Phosphate
42	QF	Quality flags for water samples
43	NH4[UMOL/KG]	Ammonium
44	QF	Quality flags for water samples
45	TCARBN[UMOL/KG]	Total carbon
46	QF	Quality flags for water samples
47	ALKALI[UMOL/KG]	Total alkalinity
48	QF	Quality flags for water samples
49	PH	pH
50	QF	Quality flags for water samples
51	THETA[DEG C]	Potential temperature
52	QF	Quality flag for CTD data
53	SIG0[KG/CUM]	Density
54	QF	Quality flag for CTD data
55	SAMPNO	Sample number
56	QF	Bottle quality flag

#### Related Information



#### MR06-03 Leg2

Ship Name: MIRAI  
Period: 2006-06-19 - 2006-07-25  
Chief Scientist: Makio Honda (JAMSTEC)  
Project Name: [Station K2, Station KNOT]

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6K Camera DEEP TOW  
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## MIRAI MR06-03 Leg2 Bottle Sampling Water Chemical Analysis

Last Modified: 2017-07-28

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Bottle Sampling Water Chemical Analysis: Processed (PI)

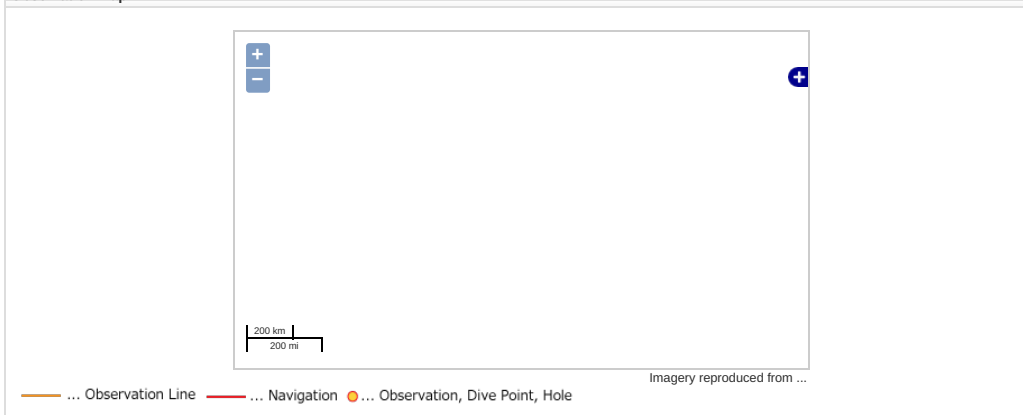
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OCEANS > OCEAN CHEMISTRY > CARBON  
OCEANS > OCEAN OPTICS > FLUORESCENCE  
OCEANS > OCEAN TEMPERATURE > POTENTIAL TEMPERATURE

### Observation Map



### Data List

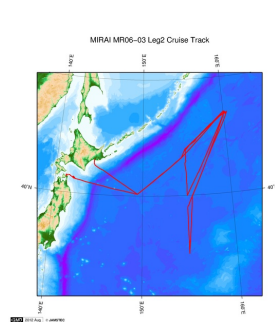
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☐ File names

☐ MR060302\_ex\_bot.csv

☐ MR060302\_odv\_bot.txt

### Related Information



#### MR06-03 Leg2

Ship Name: MIRAI  
Period: 2006-06-19 - 2006-07-25  
Chief Scientist: Makio Honda (JAMSTEC)  
Project Name: [Station K2, Station KNOT]

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