

MIRAI MR05-05 Leg1 Bottle Sampling Water Chemical Analysis

Last Modified: 2017-07-28

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Cruise ID: [MR05-05 Leg1](#)

Bottle Sampling Water Chemical Analysis: Processed (PI)

Data Policy: [JAMSTEC](#)

Observation Items: Temperature, Salinity, Dissolved oxygen, Silicate, Nitrate, Nitrite, Phosphate, CFC11, CFC12, CFC113, Total inorganic carbon, Alkalinity, pH, Carbon14, Carbon13, Potential temperature, Density

Science Keywords:

OCEANS > OCEAN CHEMISTRY	> DISSOLVED GASES
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	> RADIOCARBON
OCEANS > OCEAN CHEMISTRY	> SILICATE
OCEANS > OCEAN CHEMISTRY	> SALINITY
OCEANS > OCEAN TEMPERATURE	> WATER TEMPERATURE
OCEANS > SALINITY/DENSITY	> SALINITY
OCEANS > OCEAN CHEMISTRY	> ALKALINITY
OCEANS > OCEAN CHEMISTRY	> CARBON
OCEANS > OCEAN CHEMISTRY	> OCEAN TRACERS
OCEANS > OCEAN CHEMISTRY	> STABLE ISOTOPES
OCEANS > OCEAN TEMPERATURE	> POTENTIAL TEMPERATURE

Cruise Report

http://www.godac.jamstec.go.jp/catalog/data/doc_catalog/media/MR05-05_leg1-3_all.pdf

For Using Data

Principal Investigator

CTDTMP : Hiroshi Uchida (JAMSTEC)
 SBE35 : Hiroshi Uchida (JAMSTEC)
 CTDSAL : Hiroshi Uchida (JAMSTEC)
 SALNTY : Takeshi Kawano (JAMSTEC)
 CTDOXY : Hiroshi Uchida (JAMSTEC)
 OPTOXY : Hiroshi Uchida (JAMSTEC)
 OXYGEN : Yuichiro Kumamoto (JAMSTEC)
 DWNPRS : Hiroshi Uchida (JAMSTEC)
 DWNNOXY : Hiroshi Uchida (JAMSTEC)
 SILCAT : Michio Aoyama (Meteorological Research Institute)
 NITRAT : Michio Aoyama (Meteorological Research Institute)
 NITRIT : Michio Aoyama (Meteorological Research Institute)
 PHSPHT : Michio Aoyama (Meteorological Research Institute)
 CFC-11 : Kenichi Sasaki (JAMSTEC)
 CFC-12 : Kenichi Sasaki (JAMSTEC)
 CFC113 : Kenichi Sasaki (JAMSTEC)
 TCARBN : Akihiko Murata (JAMSTEC)
 ALKALI : Akihiko Murata (JAMSTEC)
 PH : Akihiko Murata (JAMSTEC)
 DELC14 : Yuichiro Kumamoto (JAMSTEC)
 DELC13 : Yuichiro Kumamoto (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:
pH meter (MR02-K03 -)



Instrument:
Titrator for total alkalinity (- MR14-02)





Overview

Please see the [Data book](#) for details of data.

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/(120% of surface saturation)
Accuracy : 0.1ml/(2% of saturation)
Resolution : 0.01ml/l
- (5) Deep Ocean Standards Thermometer
Model : SBE 35, Sea-Bird Electronics, Inc.
- (6) Oxygen Optode
Model : Aanderaa Oxygen Optode 3830, Aanderaa Instruments AS, NORWAY

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 : 0.083 umol kg⁻¹
 - (4) Reference Material/Calibration:0.001667M KIO₃ solution/compared standard to CSK standard solution (Wako pure chemical industries, Ltd.)
2. Salinity
 - (1) Instruments:Autosal salinometer model 8400B(Guildline Instruments Ltd.)
 - (2) Methods :-
 - (3) Precision : 0.00017 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. 0.090% (median)
 - (4) Reference Material/Calibration:RMNS [Aoyama et al., 2007] and commercial available silicon standard solution for atomic absorption spectrometry
4. Nitrate
 - (1) Instruments:TRAACS800 (Bran+Luebbe)
 - (2) Methods :Diazotization method
 - (3) Precision : C.V. 0.070% (median),
 - (4) Reference Material/Calibration:KNO₃ solution and RMNS [Aoyama et al., 2007]
5. Nitrite
 - (1) Instruments:TRAACS800 (Bran+Luebbe)
 - (2) Methods :Diazotization method (reduced to nitrite by Cd - Cu tube)
 - (3) Precision :-
 - (4) Reference Material/Calibration:NaNO₂ solution and RMNS [Aoyama et al., 2007]
6. Phosphate
 - (1) Instruments:TRAACS800 (Bran+Luebbe)
 - (2) Methods :Molybdenum blue method
 - (3) Precision :C.V. 0.070% (median),
 - (4) Reference Material/Calibration:KH₂PO₄ solution and RMNS [Aoyama et al., 2007]
7. Total inorganic carbon
 - (1) Instruments:the automated TCO₂ analyzer (Nippon ANS , Inc.) equipped with carbon coulometer 5012 (UIC , Inc.)
 - (2) Methods :coulometry
 - (3) Precision :1.1 umol kg⁻¹
 - (4) Reference Material/Calibration:Na₂CO₃ solution and the CRM provided by Dr. Dickson in Scripps Institute of Oceanography
8. 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 :1.9 umol kg⁻¹

(4) Reference Material/Calibration:Na₂CO₃ solution and the CRM provided by Dr. Dickson in Scripps Institute of Oceanography

9. pH

(1) Instruments:Measurement of pH was made by a pH measuring system (Nippon ANS, Inc.), which adopts a method of the spectrophotometric determination.

The measuring system comprises of a water dispensing unit with an auto-sampler and a spectrophotometer (Carry 50 Scan, Varian).

(2) Methods :spectrophotometric method

(3) Precision : 0.0012 pH unit

(4) Reference Material/Calibration:total hydrogen ion scale

10. CFCs

(1) Instruments:A custom made purging and trapping system was attached to gas chromatograph (GC-14B: Shimadzu Ltd) having an electron capture detector (ECD-14: Shimadzu Ltd).

(2) Methods :see "DATA BOOK"

(3) Precision :CFC-11 0.006pmol kg⁻¹; CFC-12 0.004pmol kg⁻¹; CFC-113 0.004pmol kg⁻¹

(4) Reference Material/Calibration:see "DATA BOOK"

11.δ13C and Δ14 C of Dissolved Inorganic Carbon

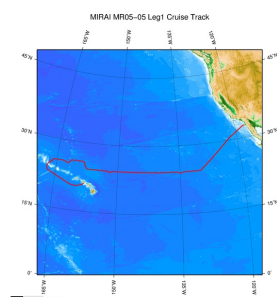
(1) Instruments: see "DATA BOOK"

(2) Methods : see "DATA BOOK"

(3) Precision : see "DATA BOOK"

(4) Reference Material/Calibration: see "DATA BOOK"

Related Information



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MR05-05 Leg1

Ship Name: MIRAI

Period: 2005-10-31 - 2005-11-24

Chief Scientist: Takeshi Kawano (JAMSTEC)

Project Name: [POST-WOCE Hydrography]

Update History

2017-07-28	An observation data was registerd.
2017-04-11	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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URASHIMA
YOKOSUKA DEEP TOW
6K Camera DEEP TOW
6K Sonar DEEP TOW
KM-ROV
POWER GRAB SAMPLER (SHELL)
POWER GRAB SAMPLER (CLOW)
BMS

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海洋研究開発機構

MIRAI MR05-05 Leg1 Bottle Sampling Water Chemical Analysis

Last Modified: 2017-07-28

ReadMe Observation Data **Data Format** Quality Information

Cruise ID: [MR05-05 Leg1](#)

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	F8.4	LATITUDE
11	LONGITUDE	DEG	F9.4	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	F9.2	CTD Oxygen sensor
24	CTDOXY_FLAG_W		I1	Quality flag for CTD data
25	OPTOXY	UMOL/KG	F9.2	Optode oxygen
26	OPTOXY_FLAG_W		I1	Quality flag for CTD data
27	OXYGEN	UMOL/KG	F9.2	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	F9.2	Down-cast CTD oxygen at pressure of DWNPRS
32	DWNOXY_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	SILUNC	UMOL/KG	F9.2	Uncertainty of Silicate data
36	NITRAT	UMOL/KG	F9.2	Nitrate
37	NITRAT_FLAG_W		I1	Quality flags for water samples
38	NRAUNC	UMOL/KG	F9.2	Uncertainty of Nitrate data
39	NITRIT	UMOL/KG	F9.2	Nitrite
40	NITRIT_FLAG_W		I1	Quality flags for water samples
41	NRIUNC	UMOL/KG	F9.2	Uncertainty of Nitrite data
42	PHSPHT	UMOL/KG	F9.3	Phosphate
43	PHSPHT_FLAG_W		I1	Quality flags for water samples
44	PHPUNC	UMOL/KG	F9.3	Uncertainty of Phosphate data
45	CFC-11	PMOL/KG	F9.3	Freon-11
46	CFC-11_FLAG_W		I1	Quality flags for water samples
47	CFC-12	PMOL/KG	F9.3	Freon-12
48	CFC-12_FLAG_W		I1	Quality flags for water samples
49	CFC113	PMOL/KG	F9.3	Freon-113
50	CFC113_FLAG_W		I1	Quality flags for water samples
51	TCARBN	UMOL/KG	F9.1	Total carbon
52	TCARBN_FLAG_W		I1	Quality flags for water samples
53	ALKALI	UMOL/KG	F9.1	Total alkalinity
54	ALKALI_FLAG_W		I1	Quality flags for water samples
55	PH	-	F9.4	pH
56	PH_FLAG_W		I1	Quality flags for water samples
57	DELC14	/MILLE	F9.1	14Carbon
58	DELC14_FLAG_W		I1	Quality flags for water samples
59	C14ERR	/MILLE	F9.1	Expected error
60	DELC13	/MILLE	F9.3	13Carbon
61	DELC13_FLAG_W		I1	Quality flags for water samples
62	C13ERR	/MILLE	F9.3	Expected error
63	THETA	DEG C	F9.4	Potential temperature

Column No.	Column Heading Mnemonic	Units Mnemonic	Reporting Precision Format	Density Comments
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ODV Format

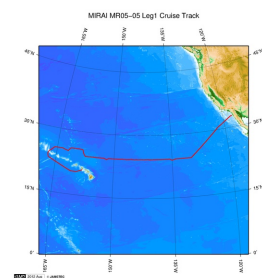
Please see the following link for details of ODV Format and ODV Software.

[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
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	SILCAT[UMOL/KG]	Silicate
32	QF	Quality flags for water samples
33	SILUNC	Uncertainty of Silicate data
34	QF	Quality flags for water samples
35	NITRAT[UMOL/KG]	Nitrate
36	QF	Quality flags for water samples
37	NRAUNC	Uncertainty of Nitrate data
38	QF	Quality flags for water samples
39	NITRIT[UMOL/KG]	Nitrite
40	QF	Quality flags for water samples
41	NRIUNC	Uncertainty of Nitrite data
42	QF	Quality flags for water samples
43	PHSPHT[UMOL/KG]	Phosphate
44	QF	Quality flags for water samples
45	PHPUNC	Uncertainty of Phosphate data
46	QF	Quality flags for water samples
47	CFC-11[PMOL/KG]	Freon-11
48	QF	Quality flags for water samples
49	CFC-12[PMOL/KG]	Freon-12
50	QF	Quality flags for water samples
51	CFC113[PMOL/KG]	Freon-113
52	QF	Quality flags for water samples
53	TCARBN[UMOL/KG]	Total carbon
54	QF	Quality flags for water samples
55	ALKALI[UMOL/KG]	Total alkalinity
56	QF	Quality flags for water samples
57	PH	pH
58	QF	Quality flags for water samples
59	DELC14[MILLE]	14Carbon
60	QF	Quality flags for water samples
61	C14ERR	Expected error
62	QF	Quality flags for water samples
63	DELC13[MILLE]	13Carbon
64	QF	Quality flags for water samples
65	C13ERR	Expected error
66	QF	Quality flags for water samples
67	THETA[DEG C]	Potential temperature
68	QF	Quality flag for CTD data
69	SIG0[KG/CUM]	Density
70	QF	Quality flag for CTD data
71	SAMPNO	Sample number
72	QF	Bottle quality flag

Related Information



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MR05-05 Leg1

Ship Name: MIRAI
Period: 2005-10-31 - 2005-11-24
Chief Scientist: Takeshi Kawano (JAMSTEC)
Project Name: [POST-WOCE Hydrography]

Update History

2017-07-28	An observation data was registered.
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Information of the Submersibles

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SHINKAI 6500
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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

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MIRAI MR05-05 Leg1 Bottle Sampling Water Chemical Analysis

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Cruise ID: [MR05-05 Leg1](#)

Bottle Sampling Water Chemical Analysis: Processed (PI)

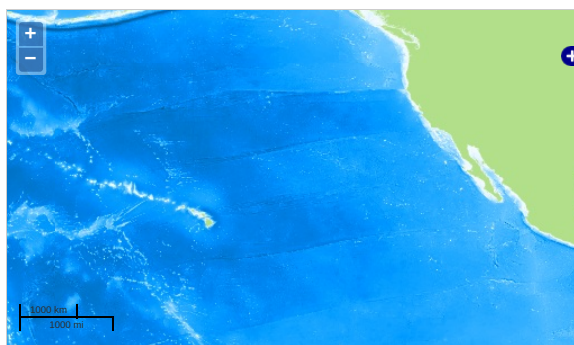
Data Policy: [JAMSTEC](#)

Observation Items: Temperature, Salinity, Dissolved oxygen, Silicate, Nitrate, Nitrite, Phosphate, CFC11, CFC12, CFC113, Total inorganic carbon, Alkalinity, pH, Carbon14, Carbon13, Potential temperature, Density

Science Keywords:

OCEANS > OCEAN CHEMISTRY > DISSOLVED GASES
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OCEANS > OCEAN CHEMISTRY > OCEAN TRACERS
OCEANS > OCEAN CHEMISTRY > STABLE ISOTOPES
OCEANS > OCEAN TEMPERATURE > POTENTIAL TEMPERATURE

Observation Map



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

Imagery reproduced from ...

Data List

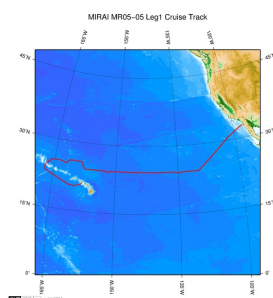
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☐ File names

☐ MR050501_ex_bot.csv

☐ MR050501_odv_bot.txt

Related Information



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MR05-05 Leg1

Ship Name: MIRAI

Period: 2005-10-31 - 2005-11-24

Chief Scientist: Takeshi Kawano (JAMSTEC)

Project Name: [POST-WOCE Hydrography]

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