

MIRAI MR12-02 Leg1 Bottle Sampling Water Chemical Analysis

Last Modified: 2018-01-25

ReadMe Observation Data Data Format Quality Information

Cruise ID: [MR12-02 Leg1](#)

Bottle Sampling Water Chemical Analysis: Processed (PI)

Data Policy: [JAMSTEC](#)

Observation Items: Temperature, Salinity, Dissolved oxygen, Chlorophyll, Silicate, Nitrate, Nitrite, Phosphate, Ammonia, Total inorganic carbon, Alkalinity, pH, DOC, 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 > SALINITY
OCEANS > OCEAN CHEMISTRY > CHLOROPHYLL
OCEANS > OCEAN TEMPERATURE > WATER TEMPERATURE
OCEANS > SALINITY/DENSITY > SALINITY
OCEANS > OCEAN TEMPERATURE > SEA SURFACE TEMPERATURE
OCEANS > OCEAN CHEMISTRY > ALKALINITY
OCEANS > OCEAN CHEMISTRY > CARBON
OCEANS > OCEAN TEMPERATURE > POTENTIAL TEMPERATURE

Cruise Report

http://www.godac.jamstec.go.jp/catalog/data/doc_catalog/media/MR12-02_leg1-2_all.pdf

For Using Data

Principal Investigator

CTDTMP : Masahide Wakita/Hiroshi Uchida (JAMSTEC)
CTDSAL : Masahide Wakita/Hiroshi Uchida (JAMSTEC)
SALNTY : Masahide Wakita (JAMSTEC)
OXYGEN : Masahide Wakita (JAMSTEC)
CHLORA : Kazuhiko Matsumoto (JAMSTEC)
CHLWELSH : Kazuhiko Matsumoto (JAMSTEC)
SILCAT : Michio Aoyama (Meteorological Research Institute)/Masahide Wakita (JAMSTEC)
NITRAT : Michio Aoyama (Meteorological Research Institute)/Masahide Wakita (JAMSTEC)
NITRIT : Michio Aoyama (Meteorological Research Institute)/Masahide Wakita (JAMSTEC)
PHSPHT : Michio Aoyama (Meteorological Research Institute)/Masahide Wakita (JAMSTEC)
NH4 : Michio Aoyama (Meteorological Research Institute)/Masahide Wakita (JAMSTEC)
TCARBN : Masahide Wakita (JAMSTEC)
ALKALI : Masahide Wakita (JAMSTEC)
PH : Masahide Wakita (JAMSTEC)
DOC : 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(5ch) (MR09-02 -)



Instrument:

Total dissolved inorganic carbon measurement system (MR11-05 Leg1 -)



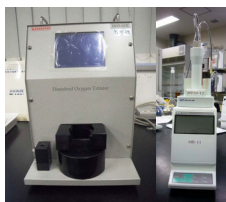
Instrument:

pH meter (MR02-K03 -)



Instrument:

Titration for DO Dissolved oxygen titration equipment (MR11-06 -)



Instrument:

Fluorometer (TURNER DESIGNS)



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.

Information on CTD data

(1) Temperature sensor

Model: SBE03, Sea-Bird Electronics, Inc.
Measurement range: -5.0 to +35degC
Accuracy: 0.001degC
Resolution: 0.0002degC

(2) Salinity sensor

Model: SBE04, 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.

Information on Chemical and Biological data

1. Dissolved Oxygen

(1) Instruments :

Burette: APB-510 and APB-620 (Kyoto Electronic Co. Ltd.) / 10 cm³ of titration vessel
Detector : Automatic photometric titrator DOT-01X (Kimoto Electronic Co. Ltd)
Software : DOT_Terminal Ver.1.2.0

(2)Methods: Winkler method

(3)Precision: Standard deviation 0.14 μmol kg⁻¹

(4)Reference Material/Calibration: CSK standard of potassium iodate Lot EPJ3885

2. Salinity

(1)Instruments: Autosal salinometer model 8400B (Guildline Instruments Ltd.)

(2)Methods: -

(3)Precision: The average of the double conductivity ratio was 1.99976

The standard deviation was 0.00004 (0.0007 in salinity)

(4)Reference Material/Calibration: IAPSO Standard Sea Water batch P154 (Ocean Scientific International Ltd.)

3. Silicate

(1)Instruments: BL TEC K.K QuAAtro 2-HR

(2)Methods: Molybdenum blue method

(3)Precision: C.V. 0.14%

(4)Reference Material/Calibration: RMNS, Silicon standard solution SiO₂ in NaOH 0.5 mol/L CertiPUR® (Merck KGaA)

4. Nitrate

(1)Instruments: BL TEC K.K QuAAtro 2-HR

(2)Methods: Diazotization method (reduced to nitrite by Cd - Cu tube)

(3)Precision: C.V. 0.14%

(4)Reference Material/Calibration: RMNS, potassium nitrate 99.995 suprapur® (Merck KGaA)

5. Nitrite

(1)Instruments: BL TEC K.K QuAAtro 2-HR

(2)Methods: Diazotization method

(3)Precision: C.V. 0.29%

(4)Reference Material/Calibration: RMNS, sodium nitrite (Wako Pure Chemical Industries, Ltd.)

6. Phosphate

(1)Instruments: BL TEC K.K QuAAtro 2-HR

(2)Methods: Molybdenum blue method

(3)Precision: C.V. 0.20%

(4)Reference Material/Calibration: RMNS, potassium dihydrogen phosphate anhydrous 99.995 suprapur® (Merck KGaA)

7. Ammonia

(1)Instruments : BL TEC K.K QuAAtro 2-HR

(2)Methods : Indophenol method

(3)Precision : C.V. 0.40%

(4)Reference Material/Calibration : ammonium sulfate (Wako Pure Chemical Industries, Ltd.)

8. Total inorganic carbon

(1)Instruments: TCO₂ measuring system (Nippon ANS, Inc.) equipped with coulometer Model 3000(Nippon ANS, Inc.)

(2)Methods: coulometry

(3)Precision: average of the differences 0.48μmol kg⁻¹, standard deviation 0.42μmol kg⁻¹

(4)Reference Material/Calibration: -

9. Total alkalinity

(1)Instruments: Spectrophotometric system(Nippon ANS, Inc.).

The system comprises of a spectrophotometer (Carry 50 Scan, Varian)

(2)Methods: Single step acid additional procedure/spectrophotometry

(3)Precision: average of the differences 0.8μmol kg⁻¹, standard deviation of the differences 0.7μmol kg⁻¹

(4)Reference Material/Calibration: -

10. pH

(1)Instruments: pH/Ion meter Radiometer PHM240 (Radiometer Analytical SAS)

(2)Methods: potentiometric methods

(2)Methods: potentiometric method

(3)Precision: The average of differences 0.001 pH unit, the standard deviation of differences 0.001 pH units

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

11. Chlorophyll a

(1)Instruments : Fluorophotometer model 10-AU-005 (Turner design)

(2)Methods : Extract in N,N-dimethylformamide / fluorometric determination (Non-acidification method and Acidification method)

(3)Precision : -

(4)Reference Material/Calibration : pure chlorophyll a (Sigma-Aldrich Co.)

12. DOC

(1)Instruments : Shimadzu TOC-V (Shimadzu Co.)

(2)Methods : High temperature catalytic oxidation

(3)Precision : -

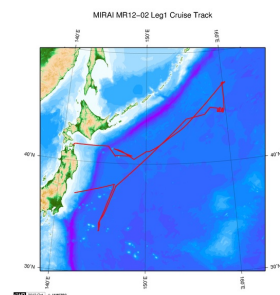
(4)Reference Material/Calibration : -

About this data

There are some description error for nutrient data of this cruise.

Please refer to the errata of the cruise report.

Related Information



[Enlarge Image](#)

MR12-02 Leg1

Ship Name: MIRAI

Period: 2012-06-04 - 2012-06-24

Chief Scientist: Makio Honda (JAMSTEC)

Project Name: [Station K2, Station KNOT]

Proposal ▶ Change in material cycles and ecosystem by the climate change and its feedback

Title:

Update History

2018-01-25	An observation data was registered.
2017-07-28	An observation data was registered.
2015-05-29	An observation data was registered.
2015-03-06	An observation data was registered.
2014-08-30	An observation data was registered.
2013-09-12	An observation data was registered.

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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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**JAMSTEC**
JAPAN AGENCY FOR MARINE-EARTH SCIENCE AND TECHNOLOGY

國立研究開發法人
海洋研究開発機構

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MIRAI MR12-02 Leg1 Bottle Sampling Water Chemical Analysis

Last Modified: 2018-01-25

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Cruise ID: [MR12-02 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	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	OXYGEN	UMOL/KG	F9.2	Oxygen
24	OXYGEN_FLAG_W		I1	Quality flags for water samples
25	CHLORA	MG/CUM	F9.2	Chlorophyll a
26	CHLORA_FLAG_W		I1	Quality flags for water samples
27	CHLWELSH	MG/CUM	F9.2	Chlorophyll a (Welschmeyer method)
28	CHLWELSH_W		I1	Quality flags for water samples
29	SILCAT	UMOL/KG	F9.2	Silicate
30	SILCAT_FLAG_W		I1	Quality flags for water samples
31	SILUNC	UMOL/KG	F9.2	Uncertainty of Silicate data
32	NITRAT	UMOL/KG	F9.2	Nitrate
33	NITRAT_FLAG_W		I1	Quality flags for water samples
34	NRAUNC	UMOL/KG	F9.2	Uncertainty of Nitrate data
35	NITRIT	UMOL/KG	F9.2	Nitrite
36	NITRIT_FLAG_W		I1	Quality flags for water samples
37	NRIUNC	UMOL/KG	F9.2	Uncertainty of Nitrite data
38	PHSPHT	UMOL/KG	F9.3	Phosphate
39	PHSPHT_FLAG_W		I1	Quality flags for water samples
40	PHPUNC	UMOL/KG	F9.3	Uncertainty of Phosphate data
41	NH4	UMOL/KG	F9.2	Ammonium
42	NH4_FLAG_W		I1	Quality flags for water samples
43	NH4UNC	UMOL/KG	F9.2	Uncertainty of Ammonium data
44	TCARBN	UMOL/KG	F9.1	Total carbon
45	TCARBN_FLAG_W		I1	Quality flags for water samples
46	ALKALI	UMOL/KG	F9.1	Total alkalinity
47	ALKALI_FLAG_W		I1	Quality flags for water samples
48	PH	-	F9.3	pH
49	PH_FLAG_W		I1	Quality flags for water samples
50	DOC	UMOL/KG	F9.1	Uncertainty of Phosphate data
51	DOC_FLAG_W		I1	Quality flags for water samples
52	THETA	DEG C	F9.4	Potential temperature
53	SIG0	KG/CUM	F9.4	Density

ODV Format

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

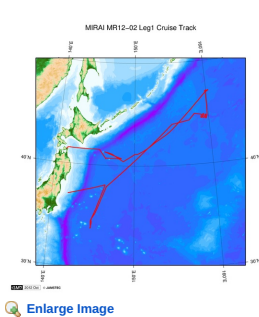
[Ocean Data View \(ODV\)](#)

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

Column No.	Column Heading <small>Longitude (degrees_east)</small>	Comments
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	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	OXYGEN[UMOL/KG]	Oxygen
20	QF	Quality flags for water samples
21	CHLORA[MG/CUM]	Chlorophyll a
22	QF	Quality flags for water samples
23	CHLWELSH[MG/CUM]	Chlorophyll a (Welschmeyer method)
24	QF	Quality flags for water samples
25	SILCAT[UMOL/KG]	Silicate
26	QF	Quality flags for water samples
27	SILUNC	Uncertainty of Silicate data
28	QF	Quality flags for water samples
29	NITRAT[UMOL/KG]	Nitrate
30	QF	Quality flags for water samples
31	NRAUNC	Uncertainty of Nitrate data
32	QF	Quality flags for water samples
33	NITRIT[UMOL/KG]	Nitrite
34	QF	Quality flags for water samples
35	NRIUNC	Uncertainty of Nitrite data
36	QF	Quality flags for water samples
37	PHSPHT[UMOL/KG]	Phosphate
38	QF	Quality flags for water samples
39	PHPUNC	Uncertainty of Phosphate data
40	QF	Quality flags for water samples
41	NH4[UMOL/KG]	Ammonium
42	QF	Quality flags for water samples
43	NH4UNC	Uncertainty of Ammonium data
44	QF	Quality flags for water samples
45	TCARBN[UMOL/KG]	Total carbon
46	QF	Quality flags for water samples
47	ALKAL[UMOL/KG]	Total alkalinity
48	QF	Quality flags for water samples
49	PH	pH
50	QF	Quality flags for water samples
51	DOC[UMOL/KG]	Uncertainty of Phosphate data
52	QF	Quality flags for water samples
53	THETA[DEG C]	Potential temperature
54	QF	Quality flag for CTD data
55	SIG0[KG/CUM]	Density
56	QF	Quality flag for CTD data
57	SAMPNO	Sample number
58	QF	Bottle quality flag

Related Information



MR12-02 Leg1
Ship Name: MIRAI
Period: 2012-06-04 - 2012-06-24
Chief Scientist: Makio Honda (JAMSTEC)
Project Name: [Station K2,Station KNOT]
Proposal ▶ Change in material cycles and ecosystem by the climate change and its feedback
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MIRAI MR12-02 Leg1 Bottle Sampling Water Chemical Analysis

Last Modified: 2018-01-25

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Cruise ID: [MR12-02 Leg1](#)

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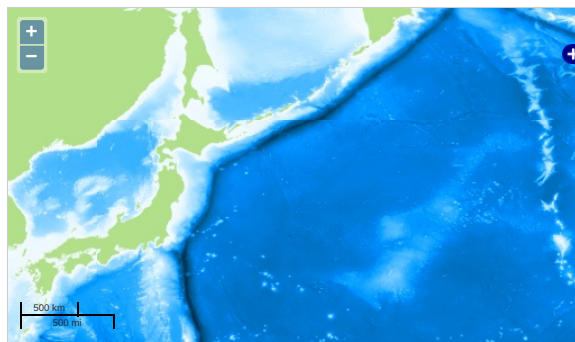
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Observation Map



Imagery reproduced from ...

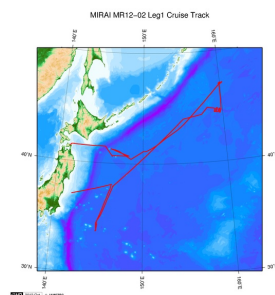
Data List

☐ File names

☐ MR120201_ex_bot.csv

☐ MR120201_odv_bot.txt

Related Information



[Enlarge Image](#)

MR12-02 Leg1

Ship Name: MIRAI

Period: 2012-06-04 - 2012-06-24

Chief Scientist: Makio Honda (JAMSTEC)

Project Name: [Station K2, Station KNOT]

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