

MIRAI MR99-K05 Leg1 Bottle Sampling Water Chemical Analysis

Last Modified: 2017-07-28

[ReadMe](#) [Observation Data](#) [Data Format](#) [Quality Information](#)

Cruise ID: [MR99-K05 Leg1](#)

Bottle Sampling Water Chemical Analysis: Processed (PI)

Data Policy: [JAMSTEC](#)

Observation Items: Temperature, Salinity, Dissolved oxygen, Chlorophyll, Silicate, Nitrate, Nitrite, Phosphate, CFC11, CFC12, CFC113, Total inorganic carbon, Alkalinity, pH, Carbon14, Carbon13, Barium, Total organic carbon, SF6, Ca, Cu, Ni, 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 CHEMISTRY	> CHLOROPHYLL
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 CHEMISTRY	> TRACE ELEMENTS
OCEANS > OCEAN TEMPERATURE	> POTENTIAL TEMPERATURE

For Using Data

Principal Investigator

CTDTMP : Masao Fukasawa (JAMSTEC)
 CTDSAL : Masao Fukasawa (JAMSTEC)
 SALNTY : Hiroyuki Yoritaka (Hydrographic Department, Japan Maritime Safety Agency)
 CTDOXY : Masao Fukasawa (JAMSTEC)
 OXYGEN : Masao Fukasawa (JAMSTEC)
 CHLORA : Yoshimi Suzuki (Shizuoka University)
 SILCAT : Chizuru Saitoh (JAMSTEC)
 NITRAT : Chizuru Saitoh (JAMSTEC)
 NITRIT : Chizuru Saitoh (JAMSTEC)
 PHSPHT : Chizuru Saitoh (JAMSTEC)
 CFC-11 : Yutaka Watanabe (NIRE)
 CFC-12 : Yutaka Watanabe (NIRE)
 CFC113 : Yutaka Watanabe (NIRE)
 SF6 : Yutaka Watanabe (NIRE)
 TCARBON : Tsuneo Ono (NRIFS)
 ALKALI : Tsuneo Ono (NRIFS)
 PH : Tsuneo Ono (NRIFS)
 DELC14 : Robert Key (Princeton University) / Masao Fukasawa (JAMSTEC)
 DELC13 : Yutaka Watanabe (NIRE)
 TOC : Yoshimi Suzuki (Shizuoka University)
 BARIUM : Yoshihisa Kato (Tokai University)
 CALCIUM : Yoshihisa Kato (Tokai University)
 CU : Chizuru Saitoh (JAMSTEC)
 NI : Chizuru Saitoh (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)



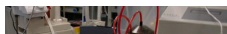
Instrument:

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



Instrument:

Titration for 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.

Information on Chemical and Biological data

1. Dissolved Oxygen
 - (1) Instruments : Titrator: Model 716 DMS Titrino (Metrohm)
Detector: Pt electrode
 - (2) Methods : Winkler method/potentiometric method
 - (3) Precision : 0.008mL/L
 - (4) Reference Material/Calibration : 0.0100N KIO₃ solution
2. Salinity
 - (1) Instruments : Autosol salinometer model 8400B (Guildline Instruments Ltd.)
 - (2) Methods : -
 - (3) Precision : 0.0013 PSU
 - (4) Reference Material/Calibration: IAPSO Standard Sea Water batch P135 (Ocean Scientific International Ltd.)
3. Silicate
 - (1) Instruments : TRAACS800 (Bran+Luebbe)
 - (2) Methods : Molybdenum blue method
 - (3) Precision : 0.8%
 - (4) Reference Material/Calibration: -
4. Nitrate
 - (1) Instruments : TRAACS800 (Bran+Luebbe)
 - (2) Methods : Diazotization method (reduced to nitrite by Cd - Cu tube)
 - (3) Precision : 0.4%
 - (4) Reference Material/Calibration: -
5. Nitrite
 - (1) Instruments : TRAACS800 (Bran+Luebbe)
 - (2) Methods : Diazotization method
 - (3) Precision : -
 - (4) Reference Material/Calibration: -
6. Phosphate
 - (1) Instruments : TRAACS800 (Bran+Luebbe)
 - (2) Methods : Molybdenum blue method
 - (3) Precision : 0.7%
 - (4) Reference Material/Calibration: -
7. Total inorganic carbon
 - (1) Instruments : UIC CM5012 coulometer / KIMOTO EN-501 auto-coulometer
 - (2) Methods : Extraction/Coulometry (Ono et al., 1998)
 - (3) Precision : 2.7 $\mu\text{mol kg}^{-1}$
 - (4) Reference Material/Calibration: Primary standard grade Na₂CO₃ solution
8. Total Alkalinity
 - (1) Instruments : Manual measurement
 - (2) Methods : Modified one-point method (Culberson et al., 1970)
 - (3) Precision : 3.5 $\mu\text{mol kg}^{-1}$
 - (4) Reference Material/Calibration: Primary standard grade Na₂CO₃ solution
9. pH
 - (1) Instruments : Spectro multi channel photo detector MCPD-2000 (Otsuka ELECTRONICS CO., LTD)
 - (2) Methods : Continuous-flow Spectrophotometric pH measurements (Clayton et al., 1993) (The pH indicator is m-cresol purple)
 - (3) Precision : 0.002
 - (4) Reference Material/Calibration: 2-amino-2-hydroxymethyl-1,3-propanediol (tris) buffer in synthetic seawater, 2-aminopyridine buffer in synthetic seawater (Dickson, Scott, DOE, 1994)

(DICKSON, Guyot, DOE, 1994)

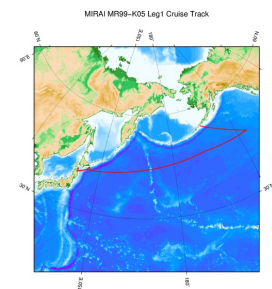
10. CFCs

- (1) Instruments : ECD-GC (Hitachi 263-30E)
(2) Methods : Purged and trapped ECD-GC method (Bullister and Weiss, 1988)
(3) Precision : 0.01 pmole kg⁻¹
(4) Reference Material/Calibration: Inter-calibrated gaseous bomb

11. SF6

- (1) Instruments : ECD-GC (Hitachi 5000A)
(2) Methods : Purged and trapped ECD-GC method (Law et al., 1994)
(3) Precision : 0.03 fmole kg⁻¹
(4) Reference Material/Calibration: Inter-calibrated gaseous bomb

Related Information



[Enlarge Image](#)

MR99-K05 Leg1

Ship Name: MIRAI
Period: 1999-08-23 - 1999-09-10
Chief Scientist: Masao Fukasawa (JAMSTEC)
Project Name: [POST-WOCE Hydrography]

Update History

2017-07-28	An observation data was registered.
2017-04-11	An observation data was registered.
2016-10-17	An observation data was registered.

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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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ReadMe Observation Data **Data Format** Quality Information

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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](#)

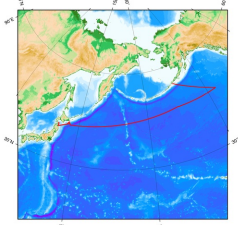
Format Information


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		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	CTDSAL	PSS-78	F9.4	CTD Salinity sensor
18	CTDSAL_FLAG_W		I1	Quality flag for CTD data
19	SALNTY	PSS-78	F9.4	Salinity
20	SALNTY_FLAG_W		I1	Quality flags for water samples
21	CTDOXY	UMOL/KG	F9.2	CTD Oxygen sensor
22	CTDOXY_FLAG_W		I1	Quality flag for CTD data
23	OXYGEN	UMOL/KG	F9.2	Oxygen
24	OXYGEN_FLAG_W		I1	Quality flags for water samples
25	CHLORA	UG/KG	F9.2	Chlorophyll a
26	CHLORA_FLAG_W		I1	Quality flags for water samples
27	SILCAT	UMOL/KG	F9.2	Silicate
28	SILCAT_FLAG_W		I1	Quality flags for water samples
29	NITRAT	UMOL/KG	F9.2	Nitrate
30	NITRAT_FLAG_W		I1	Quality flags for water samples
31	NITRIT	UMOL/KG	F9.2	Nitrite
32	NITRIT_FLAG_W		I1	Quality flags for water samples
33	PHSPHT	UMOL/KG	F9.2	Phosphate
34	PHSPHT_FLAG_W		I1	Quality flags for water samples
35	CFC-11	PMOL/KG	F9.3	Freon-11
36	CFC-11_FLAG_W		I1	Quality flags for water samples
37	CFC-12	PMOL/KG	F9.3	Freon-12
38	CFC-12_FLAG_W		I1	Quality flags for water samples
39	CFC113	PMOL/KG	F9.3	Freon-113
40	CFC113_FLAG_W		I1	Quality flags for water samples
41	SF6	FMOL/KG	F9.4	SF6
42	SF6_FLAG_W		I1	Quality flags for water samples
43	TCARBN	UMOL/KG	F9.1	Total carbon
44	TCARBN_FLAG_W		I1	Quality flags for water samples
45	ALKALI	UMOL/KG	F9.1	Total alkalinity
46	ALKALI_FLAG_W		I1	Quality flags for water samples
47	PH	-	F9.3	pH
48	PH_FLAG_W		I1	Quality flags for water samples
49	DELC14	/MILLE	F9.1	14Carbon
50	DELC14_FLAG_W		I1	Quality flags for water samples
51	C14ERR	/MILLE	F9.1	Expected error
52	DELC13	/MILLE	F9.3	13Carbon
53	DELC13_FLAG_W		I1	Quality flags for water samples
54	TOC	UMOL/KG	F9.1	Total organic carbon
55	TOC_FLAG_W		I1	Quality flags for water samples
56	BARIU	NMOL/KG	F9.1	Barium
57	BARIU_FLAG_W		I1	Quality flags for water samples
58	CALCIUM	MMOL/KG	F9.1	Calcium
59	CALCIUM_FLAG_W		I1	Quality flags for water samples
60	CU	UMOL/L	F9.1	Cu
61	CU_FLAG_W		I1	Quality flags for water samples
62	NI	UMOL/L	F9.1	Ni
63	NI_FLAG_W		I1	Quality flags for water samples
64	THETA	DEG C	F9.4	Potential temperature
65	SIGD	KG/CM ³ M	F9.4	Density

Column No.	Column Heading Mnemonic	Units Mnemonic	Reporting Precision	FORTTRAN Format	Density	Comments
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(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	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	CHLORA[UG/KG]					Chlorophyll a
24	QF					Quality flags for water samples
25	SILCAT[UMOL/KG]					Silicate
26	QF					Quality flags for water samples
27	NITRAT[UMOL/KG]					Nitrate
28	QF					Quality flags for water samples
29	NITRIT[UMOL/KG]					Nitrite
30	QF					Quality flags for water samples
31	PHSPHT[UMOL/KG]					Phosphate
32	QF					Quality flags for water samples
33	CFC-11[PMOL/KG]					Freon-11
34	QF					Quality flags for water samples
35	CFC-12[PMOL/KG]					Freon-12
36	QF					Quality flags for water samples
37	CFC113[PMOL/KG]					Freon-113
38	QF					Quality flags for water samples
39	SF6[FMOL/KG]					SF6
40	QF					Quality flags for water samples
41	TCARBN[UMOL/KG]					Total carbon
42	QF					Quality flags for water samples
43	ALKALI[UMOL/KG]					Total alkalinity
44	QF					Quality flags for water samples
45	PH					pH
46	QF					Quality flags for water samples
47	DELC14[MILLE]					14Carbon
48	QF					Quality flags for water samples
49	C14ERR					Expected error
50	QF					Quality flags for water samples
51	DELC13[MILLE]					13Carbon
52	QF					Quality flags for water samples
53	TOC[UMOL/KG]					Total organic carbon
54	QF					Quality flags for water samples
55	BARIUM[NMOL/KG]					Barium
56	QF					Quality flags for water samples
57	CALCIUM[MMOL/KG]					Calcium
58	QF					Quality flags for water samples
59	CU[UMOL/L]					Cu
60	QF					Quality flags for water samples
61	NI[UMOL/L]					Ni
62	QF					Quality flags for water samples
63	THETA[DEG C]					Potential temperature
64	QF					Quality flag for CTD data
65	SIG0[KG/CUM]					Density
66	QF					Quality flag for CTD data
67	SAMPNO					Sample number
68	QF					Bottle quality flag

Related Information

MIRAI MR99-K05 Leg1 Cruise Track



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MR99-K05 Leg1
Ship Name: MIRAI
Period: 1999-08-23 - 1999-09-10
Chief Scientist: Masao Fukasawa (JAMSTEC)
Project Name: [POST-WOCE Hydrography]

Update History	
2017-07-28	An observation data was registerd.
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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 MR99-K05 Leg1 Bottle Sampling Water Chemical Analysis

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Bottle Sampling Water Chemical Analysis: Processed (PI)

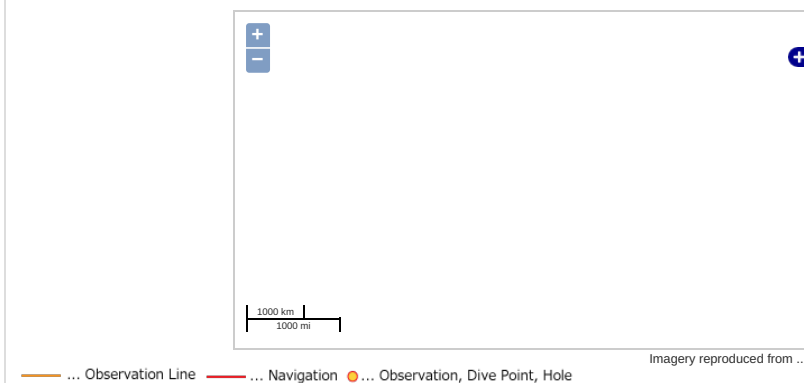
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OCEANS > OCEAN CHEMISTRY > STABLE ISOTOPES
OCEANS > OCEAN CHEMISTRY > TRACE ELEMENTS
OCEANS > OCEAN TEMPERATURE > POTENTIAL TEMPERATURE

Observation Map



Data List

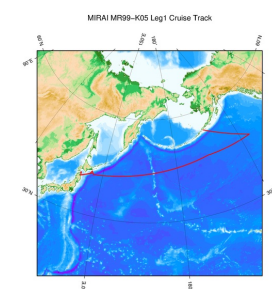
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☐ **File names**

☐ MR99K0501_ex_bot.csv

☐ MR99K0501_odv_bot.txt

Related Information



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MR99-K05 Leg1

Ship Name: MIRAI

Period: 1999-08-23 - 1999-09-10

Chief Scientist: Masao Fukasawa (JAMSTEC)

Project Name: [POST-WOCE Hydrography]

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