

## MIRAI MR00-K03 Bottle Sampling Water Chemical Analysis

Last Modified: 2015-05-29

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Cruise ID: **MR00-K03**

Bottle Sampling Water Chemical Analysis: Processed (DMO)-QCed

Data Policy: **JAMSTEC**

**Observation Items:** Temperature, Salinity, Dissolved oxygen, Fluorescence, Chlorophyll, 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	> POTENTIAL TEMPERATURE
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

**Cruise Report**

[http://www.godac.jamstec.go.jp/catalog/data/doc\\_catalog/media/MR00-K03\\_all.pdf](http://www.godac.jamstec.go.jp/catalog/data/doc_catalog/media/MR00-K03_all.pdf)

### For Using Data

#### Principal Investigator

CTDTMP : Yuichiro Kumamoto (JAMSTEC)  
 CTDSAL : Yuichiro Kumamoto (JAMSTEC)  
 SALNTY : Chizuru Saitoh (JAMSTEC)  
 OXYGEN : Chizuru Saitoh (JAMSTEC)  
 FLUOR : Yuichiro Kumamoto (JAMSTEC)  
 CHLORA : Kosei Sasaoka (Hokkaido University)  
 SILCAT : Chizuru Saitoh (JAMSTEC)  
 NITRAT : Chizuru Saitoh (JAMSTEC)  
 NITRIT : Chizuru Saitoh (JAMSTEC)  
 PHSPHT : Chizuru Saitoh (JAMSTEC)  
 NH4 : Chizuru Saitoh (JAMSTEC)  
 TCARBON : Yuichiro Kumamoto (JAMSTEC)  
 ALKALI : Akihiko Murata (JAMSTEC)  
 PH : Andrey Andreev (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 ( - MR03-K04 Leg6)



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



Instrument:  
Fluorometer (TURNER DESIGNS)



The values of TA and nutrients (silicate, phosphate, and nitrate) 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 KNOT data only.)

#### Information on CTD data

(1) Temperature sensor

Model: SBE3, Sea-Bird Electronics, Inc.  
Measurement range: -5.0 to +35 deg C  
Accuracy: 0.001 deg C  
Resolution: 0.0002 deg C

(2) Salinity sensor

Model: SBE4, Sea-Bird Electronics, Inc.  
Measurement range: 0.0 to 7 S/m  
Accuracy: 0.0003 S/m  
Resolution: 0.00004 S/m

(3) Pressure sensor

Model: SBE9plus, Sea-Bird Electronics, Inc.  
Measurement range: up to 10500 m  
Accuracy: 0.015% F.S.  
Resolution: 0.001% F.S.

(4) Fluorometer

Model : SEA TECH, Inc.

#### 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: -

(4) Reference Material/Calibration: 0.0100N KIO<sub>3</sub> solution / Comparison with CSK standard solution (Wako pure chemical industries, Ltd.)

2. Salinity

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

(2) Methods: -

(3) Precision: 0.0017 PSU

(4) Reference Material/Calibration: IAPSO Standard Sea Water batch P134 (Ocean Scientific International Ltd.)

3. Silicate

(1) Instruments: TRAACS800 (Bran+Luebbe)

(2) Methods: Molybdenum blue method

(3) Precision: From 0.07 to 1.69% except nitrite and ammonia (CV%)

(4) Reference Material/Calibration: -

4. Nitrate

(1) Instruments: TRAACS800 (Bran+Luebbe)

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

(3) Precision: From 0.07 to 1.69% except nitrite and ammonia (CV%)

(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: From 0.07 to 1.69% except nitrite and ammonia (CV%)

(4) Reference Material/Calibration: -

7. Ammonia

(1) Instruments: TRAACS800 (Bran+Luebbe)

(2) Methods: Indophenol method

(3) Precision: -

(4) Reference Material/Calibration: -

8. Total inorganic carbon

(1) Instruments: automated TCO<sub>2</sub> sampling system (Nippon ANS Inc.) equipped with carbon coulometer 5012 (UIC Inc.)

(2) Methods: coulometry

(3) Precision: less than 0.1%

(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: auto-burette (Radiometer, ABU901), a pH glass electrode (Radiometer, pHG201-7), a reference electrode (Radiometer, REF201)

(2) Methods: Modified Gran titration/Open-cell/potentiometry

(3) Precision: 1.1 umol/kg

(4) Reference Material/Calibration: 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 PHM95)

(2) Methods: potentiometric methods at 25deg-C

(3) Precision: -

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

#### 11. Chlorophyll-a

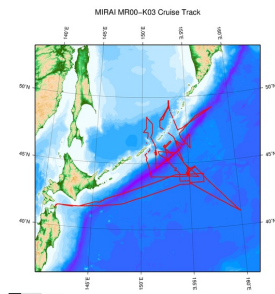
(1) Instruments: Fluorophotometer model 10-AU (Turner design)

(2) Methods: extract in N,N-dimethylformamide/fluorometric determination (Parsons et al., 1984)

(3) Precision: -

(4) Reference Material/Calibration: -

#### Related Information



[Enlarge Image](#)

#### MR00-K03

Ship Name: MIRAI

Period: 2000-05-09 - 2000-06-09

Chief Scientist: Masashi Kusabe (JAMSTEC)

Project Name: [Station KNOT]

#### Update History

2015-05-29	An observation data was registerd.
2013-08-21	An observation data was registerd.
2013-08-09	An observation data was registerd.
2012-12-25	An observation data was registerd.

#### JAMSTEC

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YOKOSUKA

MIRAI

KAIREI

CHIKYU

KAIMEI

SHINSEI MARU

HAKUHO MARU

#### Information of the Submersibles

KAIKO

SHINKAI 2000

SHINKAI 6500

DEEP TOW

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

#### Go to a Cruise Information

Cruise ID:

Go

#### Go to a Dive Information

Dive ID:

Go

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**JAMSTEC**

国立研究開発法人  
海洋研究開発機構  
JAPAN AGENCY FOR MARINE-EARTH SCIENCE AND TECHNOLOGY

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Bottle Sampling Water Chemical Analysis: Processed (DMO)-QCed

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		A3	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	F9.3	Temperature
16	CTDTMP_FLAG_W		I1	Quality flag for CTD data
17	CTDSAL	PSS-78	F9.3	CTD Salinity sensor
18	CTDSAL_FLAG_W		I1	Quality flag for CTD data
19	SALNTY	PSS-78	F9.3	Salinity
20	SALNTY_FLAG_W		I1	Quality flags for water samples
21	OXYGEN	UMOL/KG	F9.1	Oxygen
22	OXYGEN_FLAG_W		I1	Quality flags for water samples
23	FLUOR	UG/L	F9.1	Fluorometer
24	FLUOR_FLAG_W		I1	Quality flag for CTD data
25	CHLORA	MG/CUM	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	NH4	UMOL/KG	F9.1	Ammonium
36	NH4_FLAG_W		I1	Quality flags for water samples
37	TCARBN	UMOL/KG	F9.1	Total carbon
38	TCARBN_FLAG_W		I1	Quality flags for water samples
39	ALKALI	UMOL/KG	F9.1	Total alkalinity
40	ALKALI_FLAG_W		I1	Quality flags for water samples
41	PH	-	F9.3	pH
42	PH_FLAG_W		I1	Quality flags for water samples
43	THETA	DEG C	F9.3	Potential temperature
44	SIG0	KG/CUM	F9.3	Density

### ODV Format

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

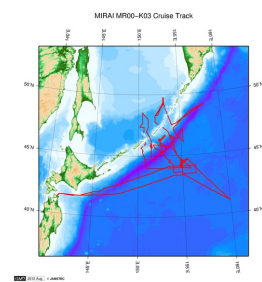
[Ocean Data View \(ODV\)](#)

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(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

Column No.	Column Heading	Comments
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	FLUOR[UG/L]	Fluorometer
22	QF	Quality flag for CTD data
23	CHLORA[MG/CUM]	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	NH4[UMOL/KG]	Ammonium
34	QF	Quality flags for water samples
35	TCARB[UMOL/KG]	Total carbon
36	QF	Quality flags for water samples
37	ALKALI[UMOL/KG]	Total alkalinity
38	QF	Quality flags for water samples
39	PH	pH
40	QF	Quality flags for water samples
41	THETA[DEG C]	Potential temperature
42	QF	Quality flag for CTD data
43	SIG0[KG/CUM]	Density
44	QF	Quality flag for CTD data
45	SAMPNO	Sample number
46	QF	Bottle quality flag

#### Related Information



[Enlarge Image](#)

#### MR00-K03

Ship Name: MIRAI  
Period: 2000-05-09 - 2000-06-09  
Chief Scientist: Masashi Kusakabe (JAMSTEC)  
Project Name: [Station KNOT]

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6K Sonar DEEP TOW  
KM-ROV  
POWER GRAB  
SAMPLER (SHELL)  
POWER GRAB  
SAMPLER (CLOW)  
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#### Go to a Dive Information

Dive ID:



## MIRAI MR00-K03 Bottle Sampling Water Chemical Analysis

Last Modified: 2015-05-29

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OCEANS > OCEAN CHEMISTRY	> ALKALINITY
OCEANS > OCEAN CHEMISTRY	> CARBON
OCEANS > OCEAN OPTICS	> FLUORESCENCE

### Observation Map



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

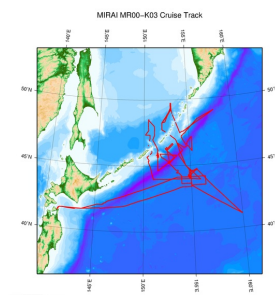
### Data List

☐ File names

☐ MR00K0300\_ex\_bot.csv

☐ MR00K0300\_odv\_bot.txt

### Related Information



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#### MR00-K03

Ship Name: MIRAI

Period: 2000-05-09 - 2000-06-09

Chief Scientist: Masashi Kusakabe (JAMSTEC)

Project Name: [Station KNOT]

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KM-ROV  
POWER GRAB SAMPLER (SHELL)  
POWER GRAB SAMPLER (CLOW)  
BMS

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Cruise ID:

# Go to a Dive Information

Dive ID:

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**JAMSTEC**

国立研究開発法人  
海洋研究開発機構  
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