

MIRAI MR15-04 Bottle Sampling Water Chemical Analysis

Last Modified: 2018-05-08

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

Cruise ID: [MR15-04](#)

Bottle Sampling Water Chemical Analysis: Processed (PI)

Data Policy: [JAMSTEC](#)

Observation Items: Temperature, Salinity, Dissolved oxygen, Potential temperature, Density, Fluorescence, PAR, Silicate, Nitrate, Nitrite, Phosphate, Ammonia, Chlorophyll

Science Keywords:

OCEANS	> OCEAN CHEMISTRY	> AMMONIA
OCEANS	> OCEAN CHEMISTRY	> NITRITE
OCEANS	> OCEAN CHEMISTRY	> NITRATE
OCEANS	> OCEAN CHEMISTRY	> NUTRIENTS
OCEANS	> OCEAN CHEMISTRY	> OXYGEN
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
BIOSPHERE	> AQUATIC ECOSYSTEMS	> PLANKTON
OCEANS	> OCEAN OPTICS	> PHOTOSYNTHETICALLY ACTIVE RADIATION
BIOSPHERE	> ECOLOGICAL DYNAMICS	> ECOSYSTEM FUNCTIONS
OCEANS	> OCEAN OPTICS	> FLUORESCENCE
OCEANS	> OCEAN TEMPERATURE	> POTENTIAL TEMPERATURE

Cruise Report

http://www.godac.jamstec.go.jp/catalog/data/doc_catalog/media/MR15-04_all.pdf

For Using Data

Principal Investigator

Masaki Katsumata (JAMSTEC)

JAMSTEC / BPPT joint cruise in the Indonesian waters.

Use Constraints

See [Terms and Conditions](#) about constrain of use.

Data Citation

See [Terms and Conditions](#) about data citation.

Instrument

Instrument:

Salinity measurement system



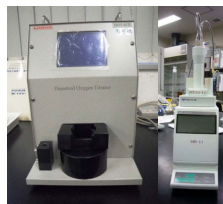
Instrument:

Nutrient analyzer(5ch) (MR09-02 -)



Instrument:

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



Instrument:

Fluorometer (TURNER DESIGNS)



Information on CTD data

Pressure sensor

Model : SBE9plus, Sea-Bird Electronics, Inc.

Measurement range : 0 to 10500 m

Accuracy : $\pm 0.015\%$ of full scale range

Resolution : 0.001% of full scale

Temperature sensor

Model : SBE3, Sea-Bird Electronics, Inc.

Measurement range : -5 to +35 °C

Accuracy : ± 0.001 °C

Resolution : 0.0002 °C

Salinity sensor

Model : SBE4, Sea-Bird Electronics, Inc.

Measurement range : 0 to 7 S/m

Accuracy : ± 0.0003 S/m

Resolution : 0.00004 S/m

DO sensor

Model : SBE43, Sea-Bird Electronics, Inc.

Measurement range : 120% of surface saturation

Accuracy : \pm 2% of saturation

Fluorometer

Model : Seapoint Sensors, Inc.

Measurement range : 0 - 5 $\mu\text{g/l}$

Resolution : 0.02 $\mu\text{g/l}$

PAR sensor

Model : Satlantic, Inc.

Measurement range : 0 - 5000 $\mu\text{mol photons m}^{-2}\text{s}^{-1}$

Accuracy : -

Information on Chemical and Biological data

Salinity

Instruments : Autosal salinometer model 8400B S/N 62556 (Guildline Instruments Ltd.)

Methods : -

Precision : average of the double conductivity ratio 1.99963, standard deviation of the double conductivity ratio 0.00005 (34 bottles)

Reference Material/Calibration : IAPSO Standard Sea Water P157 (Ocean Scientific International Ltd.)

Dissolved Oxygen

Instruments : Burette: APB-510/APB-620 manufactured by Kyoto Electronic Co. Ltd. /10 cm³ of titration vessel
Detector and Software: Automatic photometric titrator DOT-01X manufactured by Kimoto Electronic Co. Ltd

Methods : Winkler method/photometric methods

Precision : 0.104 $\mu\text{mol kg}^{-1}$

Reference Material/Calibration : NMIJ/AIST Potassium Iodate CRM, Lot No. : 3006-1 No.028

Silicate

Instruments : BL TEC K.K QuAAtro 2-HR

Methods : Molybdenum blue method

Precision : C.V. 0.11 %

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

Nitrate

Instruments : BL TEC K.K QuAAtro 2-HR

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

Precision : C.V. 0.08 %

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

Nitrite

Instruments : BL TEC K.K QuAAtro 2-HR

Methods : Diazotization method

Precision : C.V. 0.17 %

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

Phosphate

Instruments : BL TEC K.K QuAAtro 2-HR

Methods : Molybdenum blue method

Precision : C.V. 0.14 %

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

Chlorophyll a

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

Methods : Extract in N, N-dimethylformamide /fluorometric determination (Welschmeyer non-acidification method), Holm-Hansen method

Precision : -

Reference Material/Calibration : Pure chlorophyll a (Sigma-chemical Co.)

Chlorophyll HPLC

Instruments : Agilent 1200 modular system, G1311A Quaternary pump, G1329A auto-sampler, G1315D photodiode array detector

Methods : Zapata method using HPLC

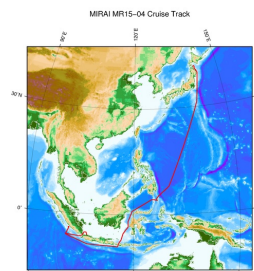
Precision : -

Reference Material/Calibration : Chlorophyll a Lot# BCBP4384V (DHI Co.)

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



MR15-04

Ship Name: MIRAI

Period: 2015-11-05 - 2015-12-20

Chief Scientist: Masaki Katsumata (JAMSTEC)

Proposal ▶ Observational study of the heavy rain zone in the tropical eastern Indian ocean

Title:

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Update History

2018-05-08	An observation data was registerd.
2018-01-13	An observation data was registerd.
2017-12-31	An observation data was registerd.

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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

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Dive ID:

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国立研究開発法人
海洋研究開発機構

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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	ExpoCode
2	SECT_ID		A6	Section ID
3	STNNBR		A6	Station Number
4	CASTNO		I3	Cast Number
5	SAMPNO		A7	Sample Number
6	BTLNBR		A7	Bottle Number (S/N fixed to the sampling device)
7	BTLNBR_FLAG_W		I1	Bottle quality flags
8	BOTTLE		A7	bottle
9	DATE		I8	Cast date
10	TIME	UTC	A4	Cast time
11	LATITUDE	DEG	F8.4	Latitude
12	LONGITUDE	DEG	F9.4	Longitude
13	DEPTH	METERS	I5	Bottom depth
14	CTDDPT	METERS	F9.1	Depth
15	CTDDPT_FLAG_W		I1	Quality flags for CTD data
16	CTDPRS	DBAR	F9.1	Pressure
17	CTDPRS_FLAG_W		I1	Quality flags for CTD data
18	CTDTMP	ITS-90	F9.4	Temperature
19	CTDTMP_FLAG_W		I1	Quality flags for CTD data
20	CTDTMP_1	ITS-90	F9.4	Temperature (secondary sensor)
21	CTDTMP_1_FLAG_W		I1	Quality flags for CTD data
22	CTDSAL	PSS-78	F9.4	Salinity
23	CTDSAL_FLAG_W		I1	Quality flags for CTD data
24	CTDSAL_1	PSS-78	F9.4	Salinity (secondary sensor)
25	CTDSAL_1_FLAG_W		I1	Quality flags for CTD data
26	CTDCND	S/M	F11.6	Conductivity (primary sensor)
27	CTDCND_FLAG_W		I1	Quality flags for CTD data
28	CTDCND_1	S/M	F11.6	Conductivity (secondary sensor)
29	CTDCND_1_FLAG_W		I1	Quality flags for CTD data
30	CTDOXY	UMOL/KG	F9.2	CTD-oxygen (primary sensor)
31	CTDOXY_FLAG_W		I1	Quality flags for CTD data
32	CTDOXY_1	UMOL/KG	F9.2	CTD-oxygen (secondary sensor)
33	CTDOXY_1_FLAG_W		I1	Quality flags for CTD data
34	CTDOXV	V	F9.4	CTD-oxygen voltage (primary sensor)
35	CTDOXV_FLAG_W		I1	Quality flags for CTD data
36	CTDOXV_1	V	F9.4	CTD-oxygen voltage (secondary sensor)
37	CTDOXV_1_FLAG_W		I1	Quality flags for CTD data
38	THETA	DEG C	F9.4	Potential temperature
39	THETA_FLAG_W		I1	Quality flags for CTD data
40	THETA_1	DEG C	F9.4	Potential temperature (secondary sensor)
41	THETA_1_FLAG_W		I1	Quality flags for CTD data
42	SIG0	KG/CUM	F9.4	Density
43	SIG0_FLAG_W		I1	Quality flags for CTD data
44	SIG0_1	KG/CUM	F9.4	Density (secondary sensor)
45	SIG0_1_FLAG_W		I1	Quality flags for CTD data
46	FLUOR	MG/CUM	F9.3	Fluorescence
47	FLUOR_FLAG_W		I1	Quality flags for CTD data
48	PAR	UE/SQM/S	F9.3	PAR
49	PAR_FLAG_W		I1	Quality flags for CTD data
50	SALNTY	PSS-78	F9.4	Bottle Salinity
51	SALNTY_FLAG_W		I1	Quality flags for water samples
52	SALNTY_1	PSS-78	F9.4	Bottle Salinity (duplicate)
53	SALNTY_1_FLAG_W		I1	Quality flags for water samples
54	OXYGEN	UMOL/KG	F9.2	Bottle Oxygen
55	OXYGEN_FLAG_W		I1	Quality flags for water samples
56	OXYGEN_1	UMOL/KG	F9.2	Bottle Oxygen (duplicate)
57	OXYGEN_1_FLAG_W		I1	Quality flags for water samples
58	SILCAT	UMOL/KG	F9.2	Silicate
59	SILCAT_FLAG_W		I1	Quality flags for water samples
60	SILUNC	UMOL/KG	F9.2	Uncertainty of Silicate data
61	SILCAT1	UMOL/KG	F9.2	Silicate
62	SILCAT1_FLAG_W		I1	Quality flags for water samples
63	SILCAT2	UMOL/KG	F9.2	Silicate (duplicate)

Column No.	Column Heading Mnemonic	Units Mnemonic	Reporting Precision FORTRAN Format	Quality flags for water samples Comments
66	NITRAT_FLAG_W		I1	Quality flags for water samples
67	NRAUNC	UMOL/KG	F9.2	Uncertainty of Nitrate data
68	NITRAT1	UMOL/KG	F9.2	Nitrate
69	NITRAT1_FLAG_W		I1	Quality flags for water samples
70	NITRAT2	UMOL/KG	F9.2	Nitrate (duplicate)
71	NITRAT2_FLAG_W		I1	Quality flags for water samples
72	NITRIT	UMOL/KG	F9.2	Nitrite
73	NITRIT_FLAG_W		I1	Quality flags for water samples
74	NRIUNC	UMOL/KG	F9.2	Uncertainty of Nitrite data
75	NITRIT1	UMOL/KG	F9.2	Nitrite
76	NITRIT1_FLAG_W		I1	Quality flags for water samples
77	NITRIT2	UMOL/KG	F9.2	Nitrite (duplicate)
78	NITRIT2_FLAG_W		I1	Quality flags for water samples
79	PHSPHT	UMOL/KG	F9.3	Phosphate
80	PHSPHT_FLAG_W		I1	Quality flags for water samples
81	PHPUNC	UMOL/KG	F9.3	Uncertainty of Phosphate data
82	PHSPHT1	UMOL/KG	F9.3	Phosphate
83	PHSPHT1_FLAG_W		I1	Quality flags for water samples
84	PHSPHT2	UMOL/KG	F9.3	Phosphate (duplicate)
85	PHSPHT2_FLAG_W		I1	Quality flags for water samples
86	NH4UNC	UMOL/KG	F9.2	Uncertainty of Ammonium data
87	AMMONIA	UMOL/KG	F9.2	Ammonium
88	AMMONIA_FLAG_W		I1	Quality flags for water samples
89	AMMONIA1	UMOL/KG	F9.2	Ammonium
90	AMMONIA1_FLAG_W		I1	Quality flags for water samples
91	AMMONIA2	UMOL/KG	F9.2	Ammonium (duplicate)
92	AMMONIA2_FLAG_W		I1	Quality flags for water samples
93	CHLWEL	UG/L	F9.2	Chlorophyll a
94	CHLWEL_FLAG_W		I1	Quality flags for water samples
95	CHLWEL_1	UG/L	F9.2	Chlorophyll a (duplicate)
96	CHLWEL_1_FLAG_W		I1	Quality flags for water samples
97	CHLHOL	UG/L	F9.2	Chlorophyll a (Holm-Hansen method)
98	CHLHOL_FLAG_W		I1	Quality flags for water samples
99	CHLHOL_1	UG/L	F9.2	Chlorophyll a (Holm-Hansen method duplicate)
100	CHLHOL_1_FLAG_W		I1	Quality flags for water samples
101	CHLHPLC	UG/L	F9.3	Chlorophyll a (HPLC)
102	CHLHPLC_FLAG_W		I1	Quality flags for water samples
103	DCHLA	UG/L	F9.3	Divinyl Chlorophyll a (HPLC)
104	DCHLA_FLAG_W		I1	Quality flags for water samples
105	SIZECHL>10um	UG/L	F9.2	Chlorophyll a > 10um
106	SIZECHL>10um_FLAG_W		I1	Quality flags for water samples
107	SIZECHL3-10um	UG/L	F9.2	Chlorophyll a 3-10um
108	SIZECHL3-10um_FLAG_W		I1	Quality flags for water samples
109	SIZECHL1-3um	UG/L	F9.2	Chlorophyll a 1-3um
110	SIZECHL1-3um_FLAG_W		I1	Quality flags for water samples
111	SIZECHL<1um	UG/L	F9.2	Chlorophyll a < 1um
112	SIZECHL<1um_FLAG_W		I1	Quality flags for water samples

ODV Format

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

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

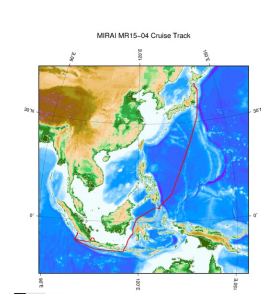
Format Information

Column No.	Column Heading	Comments
1	EXPOCODE	Cruise Label
2	Cruise	Cruise
3	STNNBR	Station number_Cast number
4	Station	Station
5	Type	Station type
6	Bottle	bottle
7	mon/day/yr	Cast date
8	hh:mm	Cast time
9	Latitude[degrees_north]	Latitude
10	Longitude[degrees_east]	Longitude
11	Bot. Depth[METERS]	Bottom depth
12	CTDDPT[METERS]	Depth
13	QF	Quality flags for CTD data
14	CTDPRS[DBAR]	Pressure
15	QF	Quality flags for CTD data
16	CTDTMP[ITS-90]	Temperature
17	QF	Quality flags for CTD data
18	CTDTMP_1[ITS-90]	Temperature (secondary sensor)
19	QF	Quality flags for CTD data
20	CTDSAL[PSS-78]	Salinity
21	QF	Quality flags for CTD data
22	CTDSAL_1[PSS-78]	Salinity (secondary sensor)
23	QF	Quality flags for CTD data
24	CTDCND[S/M]	Conductivity (primary sensor)
25	QF	Quality flags for CTD data
26	CTDCND_1[S/M]	Conductivity (secondary sensor)
27	QF	Quality flags for CTD data

Column No.	Column Heading	Comments
28	CTDOXY[UMOL/KG]	CTDOXY (primary sensor)
29	QF	Quality flags for CTD data
30	CTDOXY_1[UMOL/KG]	CTD-oxygen (secondary sensor)
31	QF	Quality flags for CTD data
32	CTDOXV[V]	CTD-oxygen voltage (primary sensor)
33	QF	Quality flags for CTD data
34	CTDOXV_1[V]	CTD-oxygen voltage (secondary sensor)
35	QF	Quality flags for CTD data
36	THETA[DEG C]	Potential temperature
37	QF	Quality flags for CTD data
38	THETA_1[DEG C]	Potential temperature (secondary sensor)
39	QF	Quality flags for CTD data
40	SIG0[KG/CUM]	Density
41	QF	Quality flags for CTD data
42	SIG0_1[KG/CUM]	Density (secondary sensor)
43	QF	Quality flags for CTD data
44	FLUOR[MG/CUM]	Fluorescence
45	QF	Quality flags for CTD data
46	PAR[UE/SQM/S]	PAR
47	QF	Quality flags for CTD data
48	SALNTY[PSS-78]	Bottle Salinity
49	QF	Quality flags for water samples
50	SALNTY_1[PSS-78]	Bottle Salinity (duplicate)
51	QF	Quality flags for water samples
52	OXYGEN[UMOL/KG]	Bottle Oxygen
53	QF	Quality flags for water samples
54	OXYGEN_1[UMOL/KG]	Bottle Oxygen (duplicate)
55	QF	Quality flags for water samples
56	SILCAT[UMOL/KG]	Silicate
57	QF	Quality flags for water samples
58	SILUNC	Uncertainty of Silicate data
59	QF	Quality flags for water samples
60	SILCAT1[UMOL/KG]	Silicate
61	QF	Quality flags for water samples
62	SILCAT2[UMOL/KG]	Silicate (duplicate)
63	QF	Quality flags for water samples
64	NITRAT[UMOL/KG]	Nitrate
65	QF	Quality flags for water samples
66	NRAUNC	Uncertainty of Nitrate data
67	QF	Quality flags for water samples
68	NITRAT1[UMOL/KG]	Nitrate
69	QF	Quality flags for water samples
70	NITRAT2[UMOL/KG]	Nitrate (duplicate)
71	QF	Quality flags for water samples
72	NITRIT[UMOL/KG]	Nitrite
73	QF	Quality flags for water samples
74	NRIUNC	Uncertainty of Nitrite data
75	QF	Quality flags for water samples
76	NITRIT1[UMOL/KG]	Nitrite
77	QF	Quality flags for water samples
78	NITRIT2[UMOL/KG]	Nitrite (duplicate)
79	QF	Quality flags for water samples
80	PHSPHT[UMOL/KG]	Phosphate
81	QF	Quality flags for water samples
82	PHPUNC	Uncertainty of Phosphate data
83	QF	Quality flags for water samples
84	PHSPHT1[UMOL/KG]	Phosphate
85	QF	Quality flags for water samples
86	PHSPHT2[UMOL/KG]	Phosphate (duplicate)
87	QF	Quality flags for water samples
88	NH4UNC	Uncertainty of Ammonium data
89	QF	Quality flags for water samples
90	AMMONIA[UMOL/KG]	Ammonium
91	QF	Quality flags for water samples
92	AMMONIA1[UMOL/KG]	Ammonium
93	QF	Quality flags for water samples
94	AMMONIA2[UMOL/KG]	Ammonium (duplicate)
95	QF	Quality flags for water samples
96	CHLWEL[UG/L]	Chlorophyll a
97	QF	Quality flags for water samples
98	CHLWEL_1[UG/L]	Chlorophyll a (duplicate)
99	QF	Quality flags for water samples
100	CHLHOL[UG/L]	Chlorophyll a (Holm-Hansen method)
101	QF	Quality flags for water samples
102	CHLHOL_1[UG/L]	Chlorophyll a (Holm-Hansen method duplicate)
103	QF	Quality flags for water samples
104	CHLHPLC[UG/L]	Chlorophyll a (HPLC)
105	QF	Quality flags for water samples
106	DCHLA[UG/L]	Divinyl Chlorophyll a (HPLC)
107	QF	Quality flags for water samples
108	SIZECHL>10um[UG/L]	Chlorophyll a > 10um
109	QF	Quality flags for water samples

Column No.	Column Heading [UG/L]	Comments
111	QF	Quality flags for water samples
112	SIZECHL1-3um[UG/L]	Chlorophyll a 1-3um
113	QF	Quality flags for water samples
114	SIZECHL<1um[UG/L]	Chlorophyll a < 1um
115	QF	Quality flags for water samples
116	SAMPNO	Sample Number
117	QF	Bottle quality flags

Related Information



[Enlarge Image](#)

MR15-04

Ship Name: MIRAI

Period: 2015-11-05 - 2015-12-20

Chief Scientist: Masaki Katsumata (JAMSTEC)

Proposal ▶ Observational study of the heavy rain zone in the tropical eastern Indian ocean

Title:

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Information of the Ships

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[POWER GRAB SAMPLER \(CLOW\)](#)
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Go to a Cruise Information

Cruise ID:

Go to a Dive Information

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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 (PI)

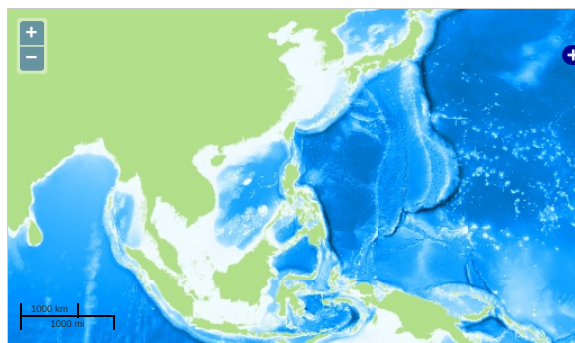
Data Policy: [JAMSTEC](#)

Observation Items: Temperature, Salinity, Dissolved oxygen, Potential temperature, Density, Fluorescence, PAR, Silicate, Nitrate, Nitrite, Phosphate, Ammonia, Chlorophyll

Science Keywords:

OCEANS	> OCEAN CHEMISTRY	> AMMONIA
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OCEANS	> OCEAN CHEMISTRY	> NITRATE
OCEANS	> OCEAN CHEMISTRY	> NUTRIENTS
OCEANS	> OCEAN CHEMISTRY	> OXYGEN
OCEANS	> OCEAN CHEMISTRY	> PHOSPHATE
OCEANS	> OCEAN CHEMISTRY	> SILICATE
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BIOSPHERE	> ECOLOGICAL DYNAMICS	> ECOSYSTEM FUNCTIONS
OCEANS	> OCEAN OPTICS	> FLUORESCENCE
OCEANS	> OCEAN TEMPERATURE	> POTENTIAL TEMPERATURE

Observation Map



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

Imagery reproduced from ...

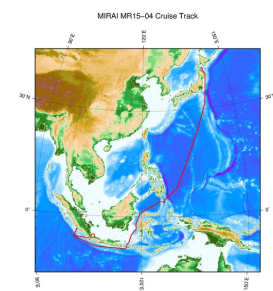
Data List

☐ File names

☐ MR150400_ex_bot.csv

☐ MR150400_odv_bot.txt

Related Information



[Enlarge Image](#)

MR15-04

Ship Name: MIRAI

Period: 2015-11-05 - 2015-12-20

Chief Scientist: Masaki Katsumata (JAMSTEC)

Proposal ▶ Observational study of the heavy rain zone in the tropical eastern Indian ocean

Title:

Update History

2018-05-08	An observation data was registered.
2018-01-13	An observation data was registered.
2017-12-31	An observation data was registered.

Application for Data and
Samples
Data Policy

What's New
Update History
Feeds

Data
Map Search
Data Tree
Detailed Search

YOKOSUKA
MIRAI
KAIREI
CHIKYU
KAIMEI
SHINSEI MARU
HAKUHO MARU

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 Dive Information

Dive ID:

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JAPAN AGENCY FOR MARINE-EARTH SCIENCE AND TECHNOLOGY