

## For Using Data

Data Policy	JAMSTEC
Principal Investigator	Data Management Office 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.

## Quality

DMO-Processed

## Instrument

Continuous sea surface water monitoring system (MR14-03 - )



## Overview

Thermosalinograph measures the following surface parameters continuously.

- temperature
- salinity
- dissolved oxygen

Sea surface water is continuously pumped up at 4.5 meters depth to the sea surface monitoring laboratory and then flowed into each analyzer.

The flow rate of this system is controlled.

## Measurement System

## 1) Temperature

Manufacturer :	Sea-Bird Scientific
Type :	SBE38
Serial No.	3852788-0457
Calibration date	2017/04/28
Measurement range :	-5 ~ 35 deg-C (ITS-90)
Accuracy :	+/-0.001 deg-C
Resolution :	0.00025 deg-C
Location :	Bow thruster room

## 2) Salinity (temperature/conductivity)

Manufacturer :	Sea-Bird Scientific
Type :	SBE45
Serial No.	4552788-0264
Calibration date	2017/05/04
Measurement range :	[temperature] -5 ~ 35 deg-C (ITS-90)
	[conductivity] 0 ~ 7 S/m
Accuracy :	[temperature] +/- 0.002 deg-C
	[conductivity] +/- 0.0003 S/m
Resolution :	[temperature] 0.0001deg-C
	[conductivity] 0.00001 S/m
Location :	Sea surface monitoring laboratory

### 3) Dissolved oxygen

Manufacturer : JFE Advantech Co., Ltd.  
 Type : RINKO II ARO-CAR  
 Serial No. 0013  
 Measurement range : 0 ~ 200%  
 Accuracy : +/- 2% F.S. (non-linear)  
 Resolution : 0.001mgL<sup>-1</sup> to 0.004mg L<sup>-1</sup>  
 Location : Sea surface monitoring laboratory

### 4) Fluorescence and Turbidity

Manufacturer : Turner Designs  
 Type : C3  
 Serial No. 2300384  
 Measurement range : [chlorophyll in vivo] 0 ~ 500  $\mu\text{g L}^{-1}$   
 [turbidity] 0 ~ 1500 NTU  
 Minimum detection limit : [chlorophyll in vivo] 0.03  $\mu\text{g L}^{-1}$   
 [turbidity] 0.05NTU  
 Location : Sea surface monitoring laboratory

### 5) Total dissolved gas pressure

Manufacturer : Pro-Oceanus Systems Inc.  
 Type : HGTD-Pro, model 0-30 PSI  
 Serial No. 37-394-10  
 Accuracy : 0.01%  
 Resolution : 0.0001%  
 Location : Sea surface monitoring laboratory

## Number of significant figures of data

After considering the accuracy of the sensors, the significant digit of data was changed as in the following list.

Item	Raw data	On this data
Temperature	0.0001[deg-C]	0.001 [deg-C]
Salinity	0.0001 [PSU]	0.001 [PSU]
Dissolved oxygen	0.01 [ $\mu\text{mol/kg}$ ]	0.1 [ $\mu\text{mol/kg}$ ]

\* The unit of the dissolved oxygen was changed from ml/l into  $\mu\text{mol/kg}$  since MR10-04.

## Data missing period

2018/01/11 07:31 - 2018/01/12 00:29

## Calibration Information

### 1) Salinity

There was no water sampling for salinity correction on this cruise.

### 2) Dissolved Oxygen

Comparison between DO data measured with TSG and that measured by Winkler method is presented in the following table and figure.

Refer to 'Fig. MR17-08 Leg2\_tsg\_btl\_do' and 'MR17-08 Leg2\_tsg\_btl\_do.txt'.

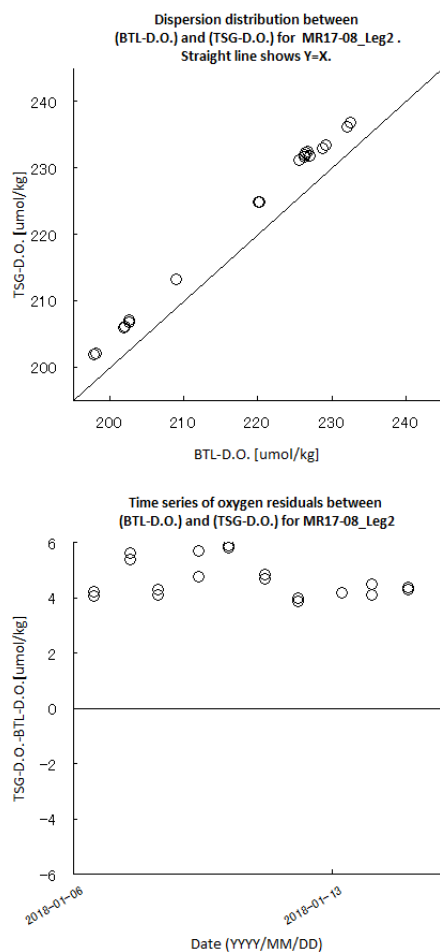


Fig. MR17-08 Leg2\_tsg\_btl\_do

## Data processing

DMO-Processed data are flagged after the data check process shown below:

### 1) Range check

For details about range set of temperature, salinity and oxygen data, please see the following reference of NODC (National Oceanographic Data Center) .

Quality control and processing of historical oceanographic temperature, salinity, and oxygen data. P. Boyer and Levitus, 1994. NOAA technical report NESDIS ; 81

\* <https://repository.library.noaa.gov/view/noaa/13443>

### 2) Visual check

If an value were extremely out from time-series plot of each variable or were affected by ambient air due to unstable flow of sampled water, it may be put flag "A" which means doubtful value.

## About this data

1) This cruise obtained data of fluorescence, turbidity, and total dissolved gas pressure in addition to data of temperature, salinity and dissolved oxygen.

Detailed results of sensor calibration are also stored.

If you would like these data set, please contact DMO at "dmo@jamstec.go.jp".

2) During the following period, dissolved oxygen data are flagged A due to the air contamination in some of the seawater lines. Also, dissolved oxygen correction samples taken during this period were bad. Please use with caution.

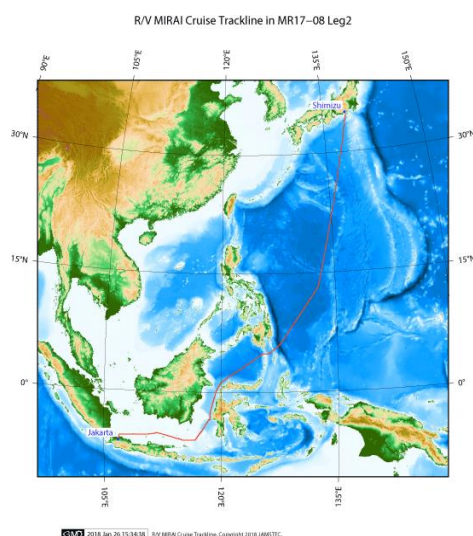
2018/1/6 8:55 – 2018/1/11 7:30

3) During the following periods, dissolved oxygen data was flagged A for leakage. No problems with water temperature and salinity data

2018/1/17 3:04 – 2018/1/17 3:43

## Related Information

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### MR17-08 Leg2

Ship Name: MIRAI  
Period: 2018/01/06 - 2018/01/27  
Chief Scientist: Satoru Yokoi (JAMSTEC)  
Proposal: Study on air-sea interaction over upwelling region in the eastern Indian Ocean

The monitoring of ocean climate change from surface to deep layer in the Indian Ocean by using Argo-type floats

Aerosol optical characteristics measured by ship-borne sky radiometer

Observational study on clouds and mixed layer depths over the tropical ocean

On variations of precipitation and vapor isotope ratio associated with Madden Julian Oscillation

Researches on the organized precipitating systems and their accompanying cold pools in the maritime continents region

A study on the mechanisms for convective clustering from thermally induced local circulations over the Maritime Continent

## Format Description for TSG DMO

Each data file contains one line header and daily observation data.

### Header part

No.	Column	Content	Format	Remarks
1	1	Header ID	a1	fixed as '#'
2	3 - 6	Data ID	a4	TSG
3	8 - 22	Cruise ID	a15	e.g. MRYX-XX_legx
4	68 - 71	Number of data lines	i4	
5	72 - 73	Terminator	a2	[CR][LF]

### Data part

No.	Column	Content	Format	Unit	Remarks
1	1 - 8	Date	i4,i2,i2		YYYYMMDD (UTC)
2	10 - 13	Time	i2,i2		hhmm (UTC)
3	15 - 23	Latitude	i2,a1,f5.2,a1		dd-mm.mmN(S)
4	25 - 34	Longitude	i3,a1,f5.2,a1		ddd-mm.mmE(W)
5	35 - 45	Temperature	f11.3	deg-C	ITS-90
6	46 - 56	Salinity	f11.3	PSU	PSS-78
7	57 - 67	Dissolved oxygen	f11.1	$\mu$ mol/kg	
					1 - 6 : space
					7 : flag of date/time
					8 : flag of latitude/longitude
					9 : flag of temperature
					10 : flag of salinity
					11 : flag of dissolved oxygen
8	68 - 78	Flag	i11		
9	79 - 80	Terminator	a2		[CR][LF]

\* This format has been applied since MR10-04 cruise of R/V Mirai.

\* Temperature, Salinity, Dissolved oxygen: Missing value is presented by '-5', and error value is presented by '-9'.

### Definition of Quality Control Flags

- Observed Level Flags
  - 0 - accepted value
  - 1 - range outlier ( outside of broad range check )
  - A - doubtful value
  - N - missing value
- Date and time flag (Thermosalinograph only)
  - 0 - accepted data and time
  - 1 - failed duplicate/missing/incorrect date and time
- Position flag (Thermosalinograph only)
  - 0 - accepted position
  - 1 - failed estimated ship speed check including missing/incorrect position