

## For Using Data

|                        |                                                  |
|------------------------|--------------------------------------------------|
| Data Policy            | JAMSTEC                                          |
| Principal Investigator | Data Management Office                           |
| Use Constraints        | See Terms and Conditions about constrain of use. |
| Data Citation          | See Terms and Conditions about data citation.    |

## Quality level

DMO-Processed

## Instrument

Continuous sea surface water monitoring system



## Overview

Thermosalinograph measures the following surface parameters continuously.

- temperature
- salinity
- dissolved oxygen

Sea surface water is continuously pumped up at 2.9 meters depth to the No.2 Laboratory and then flowed into each analyzer.

The flow rate of this system is controlled.

## Measurement System

## 1) Temperature

|                     |                                                       |
|---------------------|-------------------------------------------------------|
| Manufacturer :      | ANEOS Corporation (former Nippon Electric Instrument) |
| Type :              | Pt100 N66M                                            |
| Serial No.          | TS14831                                               |
| Measurement range : | M (0-220 deg-C)                                       |
| Accuracy:           | +/- 0.15 deg-C (JIS Grade A)                          |
| Location :          | ship bottom                                           |

## 2) Salinity (Temperature/Conductivity) , Dissolved oxygen, Fluorescence and Turbidity

|                     |                                                          |
|---------------------|----------------------------------------------------------|
| Manufacturer :      | JFE Advantech Co., Ltd.                                  |
| Type :              | RINKO-AAQ170                                             |
| Serial No.          | 130                                                      |
| Measurement range : | [Temperature] -3 ~ 45 deg-C                              |
|                     | [Conductivity] 0.5 ~ 70 mS/cm                            |
|                     | [Salinity] 2 ~ 42 PSU                                    |
|                     | [Dissolved oxygen] 0 ~ 200% (0~20 mg/L)                  |
|                     | [Chlorophyll in vivo] 0 ~ 400 ppb(Uranin reference)      |
|                     | [Turbidity] 0 ~ 1000 FTU                                 |
| Accuracy :          | [Temperature] +/- 0.01 deg-C                             |
|                     | [Conductivity] +/- 0.01 mS/cm                            |
|                     | [Salinity] -                                             |
|                     | [Dissolved oxygen] +/- 2% FS (+/-0.4 mg/L)               |
|                     | [Chlorophyll in vivo] Non-linearity +/- 1% FS (0~200ppb) |
|                     | [Turbidity] +/- 0.3 FTU or +/- 2%                        |
| Resolution :        | [Temperature] 0.001 deg-C                                |
|                     | [Conductivity] 0.001 mS/cm                               |
|                     | [Salinity] 0.001 PSU                                     |
|                     | [Dissolved oxygen] 0.01% (0.001 mg/L)                    |
|                     | [Chlorophyll in vivo] 0.01 ppb                           |
|                     | [Turbidity] 0.03 FTU                                     |
| Location :          | No.2 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.

Zero padding was applied to the temperature data published on this site.

| Item             | Raw data    | On this data  |
|------------------|-------------|---------------|
| Temperature      | 0.1[deg-C]  | 0.1 [deg-C]   |
| Salinity         | 0.001 [PSU] | 0.001 [PSU]   |
| Dissolved oxygen | 0.001 [%]   | 0.1 [μmol/kg] |

### Data processing

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

#### 1) Data processing

The raw data was recorded every 30 seconds intervals

The data published on this site was created as 1 minute data by extracting the raw data whose time within  $\pm 15$  seconds is closer to 00 second.

#### 2) Dissolved oxygen data unit was convert from saturation to concentration (μmol/kg).

#### 3) 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>

#### 4) 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.

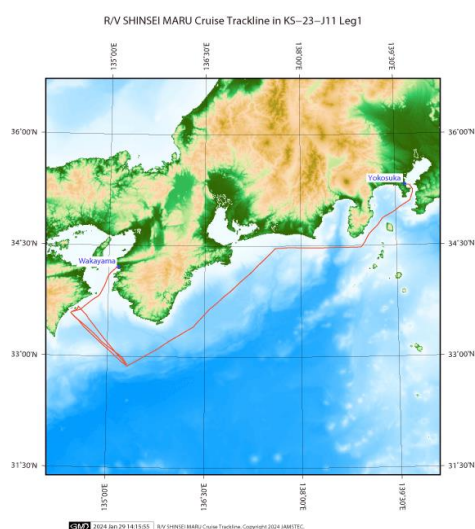
### About this data

This cruise obtained data of fluorescence and turbidity in addition to data of temperature, salinity and dissolved oxygen.

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

## Related Information

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### KS-23-J11 Leg1

|                  |                                                     |
|------------------|-----------------------------------------------------|
| Ship Name:       | SHINSEIMARU                                         |
| Period:          | 2023/12/28 - 2024/01/05                             |
| Chief Scientist: | Shuhei Nishida (JAMSTEC)                            |
| Proposal:        | Real time ocean bottom crustal movement observation |
|                  | Maintenance of the DONET                            |

## 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           |              | [CR][LF]                       |
| 9   | 79 - 80 | Terminator       | a2            |              |                                |

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

### Definition of Quality Control Flags

#### 1. Observed Level Flags

- 0 - accepted value
- 1 - range outlier ( outside of broad range check )
- A - doubtful value
- N - missing value

#### 2. Date and time flag (Thermosalinograph only)

- 0 - accepted data and time
- 1 - failed duplicate/missing/incorrect date and time

#### 3. Position flag (Thermosalinograph only)

- 0 - accepted position
- 1 - failed estimated ship speed check including missing/incorrect position