

## MIRAI MR98-K01 Conductivity-Temperature-Depth Profiler (CTD)

Last Modified: 2017-06-22

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Cruise ID: [MR98-K01](#)

Conductivity-Temperature-Depth Profiler (CTD): Processed (DMO)-QCed

Data Policy: [JAMSTEC](#)

Observation Items: Pressure, Temperature, Salinity, Dissolved oxygen

Science Keywords:

OCEANS > OCEAN CHEMISTRY > OXYGEN  
OCEANS > OCEAN TEMPERATURE > WATER TEMPERATURE  
OCEANS > SALINITY/DENSITY > SALINITY

Cruise Report

[http://www.godac.jamstec.go.jp/catalog/data/doc\\_catalog/media/MR98-K01\\_all.pdf](http://www.godac.jamstec.go.jp/catalog/data/doc_catalog/media/MR98-K01_all.pdf)

### [For Using Data](#)

#### Principal Investigator

Data Management Office

#### Use Constraints

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

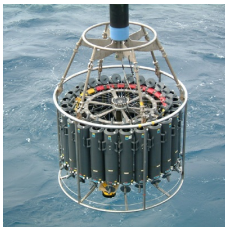
#### Data Citation

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

### Instrument

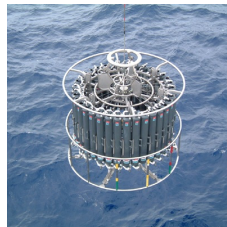
Instrument:

Water sampling system with CTD (30  
litters \* 24 bottles)



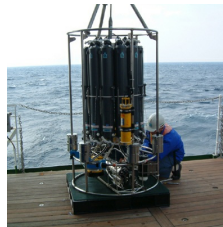
Instrument:

Water sampling system with CTD (12  
litters \* 36 bottles)



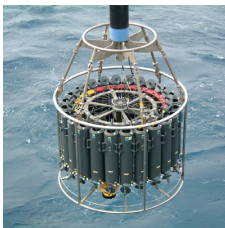
Instrument:

Water sampling system with CTD (12  
litters \* 12 bottles)



Instrument:

Conductivity temperature depth  
measurements (CTD)



### Overview

CTD(Conductivity-Temperature-Depth profiler) is used to observe the vertical profiles of temperature and conductivity.

Usually, this system is operated with multicylinder water sampler.

Observed signal is transmitted from sensor to the operation room on board using wire cable, and electric power is supplied from vessel to sensor.

Details of sensors attached to CTD system for MR98-K01 cruise are presented in "System".

The following software, developed and supplied by the Sea-Bird Electronics, Inc., was used in MR98-K01.

SEASAVE(ver 5.27b) for data acquisition

SEASOFT(ver 5.27b) for data processing

Data presented on this website is averaged over 1db.

### System

#### • Pressure sensor

Model : SBE9plus, Sea-Bird Electronics,Inc.

Serial number : 42410

Measurement range : up to 10500m

Accuracy : 0.015% F.S.

Resolution : 0.001% F.S.

#### • Pressure sensor

Model : SBE9plus, Sea-Bird Electronics,Inc.

Serial number : 42423

Measurement range : up to 10500m

Accuracy : 0.015% F.S.

Resolution : 0.001% F.S.

#### • Temperature sensor

Model : SBE3, Sea-Bird Electronics,Inc.

Serial number : 031359

Measurement range : -5.0 to +35degC

Accuracy : 0.001degC

- Resolution : 0.0002degC
- Temperature sensor
    - Model : SBE3, Sea-Bird Electronics, Inc.
    - Serial number : 031525
    - Measurement range : -5.0 to +35degC
    - Accuracy : 0.001degC
    - Resolution : 0.0002degC
  - Salinity sensor
    - Model : SBE4, Sea-Bird Electronics, Inc.
    - Serial number : 041202
    - Measurement range : 0.0 to 7 S/m
    - Accuracy : 0.0003 S/m
    - Resolution : 0.00004 S/m
  - Salinity sensor
    - Model : SBE4, Sea-Bird Electronics, Inc.
    - Serial number : 041205
    - Measurement range : 0.0 to 7 S/m
    - Accuracy : 0.0003 S/m
    - Resolution : 0.00004 S/m
  - DO sensor
    - Model : SBE13, Sea-Bird Electronics, Inc.
    - Serial number : 130338
    - Measurement range : 0 to 15ml/l
    - Accuracy : 0.1ml/l
    - Resolution : 0.01ml/l

Sensors used in each cast is as follows.

| Cast name | Serial number of sensor |             |          |                  |
|-----------|-------------------------|-------------|----------|------------------|
|           | Pressure                | Temperature | Salinity | Dissolved Oxygen |
| 98K101L1  | 42410                   | 031359      | 041202   | 130338           |
| 98K101S1  | 42423                   | 031525      | 041205   | -                |
| 98K101S2  | 42423                   | 031525      | 041205   | -                |
| 98K101S3  | 42423                   | 031525      | 041205   | -                |
| 98K101S4  | 42423                   | 031525      | 041205   | -                |
| 98K101S5  | 42423                   | 031525      | 041205   | -                |
| 98K107L1  | 42410                   | 031359      | 041202   | 130338           |
| 98K1K1S1  | 42423                   | 031525      | 041205   | -                |
| 98K1K1L1  | 42410                   | 031359      | 041202   | 130338           |
| 98K1K1L2  | 42410                   | 031359      | 041202   | 130338           |
| 98K1K1S2  | 42423                   | 031525      | 041205   | -                |
| 98K1K1L3  | 42410                   | 031359      | 041202   | 130338           |
| 98K1K1L4  | 42410                   | 031359      | 041202   | 130338           |
| 98K1K1L5  | 42410                   | 031359      | 041202   | 130338           |
| 98K1K1S3  | 42423                   | 031525      | 041205   | -                |
| 98K1K1S4  | 42423                   | 031525      | 041205   | -                |
| 98K1K1S5  | 42423                   | 031525      | 041205   | -                |
| 98K1K1S6  | 42423                   | 031525      | 041205   | -                |
| 98K1K1S7  | 42423                   | 031525      | 041205   | -                |
| 98K1K1S8  | 42423                   | 031525      | 041205   | -                |
| 98K102L1  | 42410                   | 031359      | 041202   | 130338           |
| 98K102S1  | 42423                   | 031525      | 041205   | -                |
| 98K102L2  | 42410                   | 031359      | 041202   | 130338           |
| 98K119S1  | 42423                   | 031525      | 041205   | -                |
| 98K119L1  | 42410                   | 031359      | 041202   | 130338           |
| 98K119S2  | 42423                   | 031525      | 041205   | -                |
| 98K119L2  | 42410                   | 031359      | 041202   | 130338           |
| 98K108L1  | 42410                   | 031359      | 041202   | 130338           |
| 98K108S1  | 42423                   | 031525      | 041205   | -                |
| 98K108L2  | 42410                   | 031359      | 041202   | 130338           |
| 98K108S2  | 42423                   | 031525      | 041205   | -                |
| 98K108L3  | 42410                   | 031359      | 041202   | 130338           |
| 98K109L1  | 42410                   | 031359      | 041202   | 130338           |
| 98K109S1  | 42423                   | 031525      | 041205   | -                |
| 98K110S1  | 42423                   | 031525      | 041205   | -                |
| 98K110L1  | 42410                   | 031359      | 041202   | 130338           |
| 98K110S2  | 42423                   | 031525      | 041205   | -                |
| 98K110L2  | 42410                   | 031359      | 041202   | 130338           |
| 98K111L1  | 42410                   | 031359      | 041202   | 130338           |
| 98K111S1  | 42423                   | 031525      | 041205   | -                |
| 98K111L2  | 42410                   | 031359      | 041202   | 130338           |
| 98K111S2  | 42423                   | 031525      | 041205   | -                |
| 98K112S1  | 42423                   | 031525      | 041205   | -                |
| 98K112L1  | 42410                   | 031359      | 041202   | 130338           |
| 98K112L2  | 42410                   | 031359      | 041202   | 130338           |
| 98K112S2  | 42423                   | 031525      | 041205   | -                |
| 98K113S1  | 42423                   | 031525      | 041205   | -                |
| 98K113S2  | 42423                   | 031525      | 041205   | -                |
| 98K113L1  | 42410                   | 031359      | 041202   | 130338           |
| 98K114L1  | 42410                   | 031359      | 041202   | 130338           |
| 98K114S1  | 42423                   | 031525      | 041205   | -                |
| 98K114L2  | 42410                   | 031359      | 041202   | 130338           |



|            |                                    |
|------------|------------------------------------|
| 2014-07-12 | An observation data was registerd. |
| 2014-02-06 | An observation data was registerd. |
| 2013-03-27 | An observation data was registerd. |
| 2013-01-25 | An observation data was registerd. |

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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 to a Dive Information

Dive ID:

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## MIRAI MR98-K01 Conductivity-Temperature-Depth Profiler (CTD)

Last Modified: 2017-06-22

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

 Cruise ID: [MR98-K01](#)

Conductivity-Temperature-Depth Profiler (CTD): Processed (DMO)-QCed

 Data Policy: [JAMSTEC](#)

### CTD DMO

#### Format Description for the Corrected Data

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](#)

Data in following cruise is not expressed with Exchange Format. Please see the site of each cruise for format.

MR02-K05 Leg1

MR04-05

#### Format Description for the QCed Data

Each data file contains one line header (meta data) followed by data lines for each cast.

The number of data lines are recorded in the header.

Header part

| No. | Column  | Content              | Format        | Remarks           |
|-----|---------|----------------------|---------------|-------------------|
| 1   | 1       | Header ID            | a1            | fixed as '#'      |
| 2   | 3 - 6   | Data ID              | a4            | CTD               |
| 3   | 8 - 22  | Cruise ID            | a15           | MYYY-(K)XX(_legx) |
| 4   | 24 - 31 | Cast name            | a8            |                   |
| 5   | 33 - 40 | Date                 | i8            | YYYYMMDD (UTC)    |
| 6   | 42 - 45 | Time                 | i4            | hhmm (UTC)        |
| 7   | 47 - 55 | Latitude             | i2,a1,f5.2,a1 | dd-mm.mmN(S)      |
| 8   | 57 - 66 | Longitude            | i3,a1,f5.2,a1 | ddd-mm.mmE(W)     |
| 9   | 68 - 71 | Number of data lines | i4            |                   |
| 10  | 72 - 73 | Terminator           | -             | CR+LF             |

Data part

| No. | Column  | Content          | Unit    | Format | Remarks   |
|-----|---------|------------------|---------|--------|---|
| 1   | 1 - 11  | Pressure         | dbar    | f11.3  |   |
| 2   | 12 - 22 | Temperature      | deg-C   | f11.4  | ITS-90  |
| 3   | 23 - 33 | Salinity         | PSU     | f11.4  | PSS-78  |
| 4   | 34 - 44 | Dissolved oxygen | umol/kg | f11.3  |   |
| 5   | 45 - 55 | Flag             | -       | i11    | 1 - 7 : space<br>8 : flag of pressure<br>9 : flag of temperature<br>10 : flag of salinity<br>11 : flag of dissolved oxygen<br>* reference : <a href="#">Definition of Quality Control Flags</a> |
| 6   | 56 - 57 | Terminator       | -       | -      | CR+LF   |

Each contents of the data part is stored in 11 bytes.

Missing value is presented by '-5', and error value is presented by '-9'.

#### Definition of Quality Control Flags

##### 1. Depth Flags

- 0 - accepted value
- 1 - error in recorded depth ( same or less than previous depth )
- 2 - density inversion

##### 2. Observed Level Flags

- N - missing value
- 0 - accepted value
- 1 - range outlier ( outside of broad range check )
- 2 - failed inversion check
- 3 - failed gradient check
- 4 - zero anomaly
- 5 - failed combined gradient and inversion checks
- 6 - failed range and inversion checks
- 7 - failed range and gradient checks
- 8 - failed range and zero anomaly checks
- 9 - failed range and combined gradient and inversion checks
- A - failed visual check

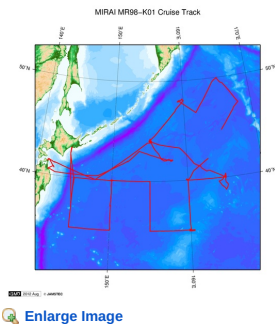
QCed data were added flag according to the NODC (National Oceanographic Data Center) quality control procedure, additionally visually checked. Please see the site of NODC of the following link for quality control procedure.

[QUALITY CONTROL AND PROCESSING OF HISTORICAL OCEANOGRAPHIC TEMPERATURE, SALINITY, AND OXYGEN DATA](#)

#### Sample Program

[ex\\_read2.f](#)

#### Related Information



**MR98-K01**  
 Ship Name: MIRAI  
 Period: 1998-10-30 - 1998-12-15  
 Chief Scientist: Masashi Kusakabe (JAMSTEC)  
 Project Name: [Station KNOT]

#### Update History

|            |                                    |
|------------|------------------------------------|
| 2017-06-22 | An observation data was registerd. |
| 2014-08-19 | An observation data was registerd. |
| 2014-07-12 | An observation data was registerd. |
| 2014-02-06 | An observation data was registerd. |
| 2013-03-27 | An observation data was registerd. |
| 2013-01-25 | An observation data was registerd. |

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#### Information of the Ships

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 KAIYO  
 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 to a Dive Information

Dive ID:

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 海洋研究開発機構  
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## MIRAI MR98-K01 Conductivity-Temperature-Depth Profiler (CTD)

Last Modified: 2017-06-22

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

Cruise ID: **MR98-K01**

Conductivity-Temperature-Depth Profiler (CTD): Processed (DMO)-QCed

Data Policy: **JAMSTEC**

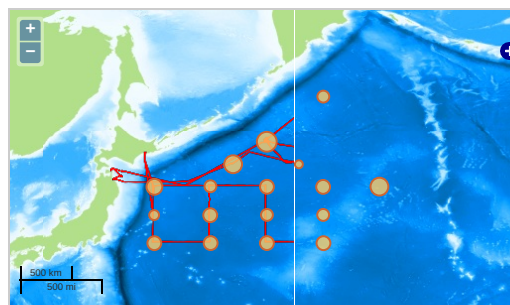
Observation Items: Pressure, Temperature, Salinity, Dissolved oxygen

Science Keywords:

OCEANS > OCEAN CHEMISTRY > OXYGEN  
OCEANS > OCEAN > WATER  
TEMPERATURE TEMPERATURE  
OCEANS > SALINITY/DENSITY > SALINITY

### Observation Map

1. Clicking the icon displays a balloon with observation information.
2. Then click the observation name, figures will be displayed.



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

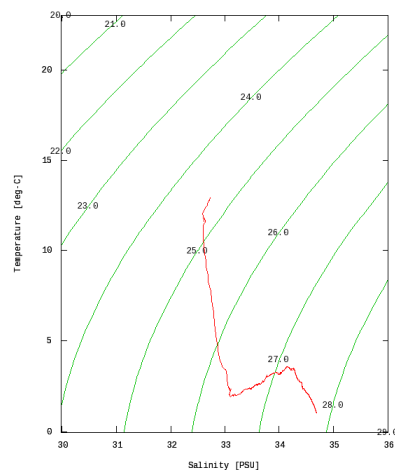
Imagery reproduced from ...

### Figures

98K101L1



MR98-K01: 98K101L1  
Conductivity-Temperature-Depth Profiler (CTD): Salinity





























Only values evaluated as "good : all flags are 0" are plotted in profiles.  
Please see Format Page for the definition of quality flags.

### Data List

[Add to Basket](#)

#### File names

|                          |              |
|--------------------------|--------------|
| <input type="checkbox"/> | 98K101L1.dat |
| <input type="checkbox"/> | 98K101S1.dat |
| <input type="checkbox"/> | 98K101S2.dat |
| <input type="checkbox"/> | 98K101S3.dat |
| <input type="checkbox"/> | 98K101S4.dat |
| <input type="checkbox"/> | 98K101S5.dat |
| <input type="checkbox"/> | 98K102L1.dat |
| <input type="checkbox"/> | 98K102L2.dat |
| <input type="checkbox"/> | 98K102S1.dat |
| <input type="checkbox"/> | 98K107L1.dat |
| <input type="checkbox"/> | 98K108L1.dat |
| <input type="checkbox"/> | 98K108L2.dat |
| <input type="checkbox"/> | 98K108L3.dat |

|   |                             |
|---|-----------------------------|
|     | 98K108S1.dat                |
|    | 98K108S2.dat                |
|    | 98K109L1.dat                |
|    | 98K109S1.dat                |
|    | 98K110L1.dat                |
|    | 98K110L2.dat                |
|    | 98K110S1.dat                |
|    | 98K110S2.dat                |
|    | 98K111L1.dat                |
|    | 98K111L2.dat                |
|    | 98K111S1.dat                |
|    | 98K111S2.dat                |
|    | 98K112L1.dat                |
|    | 98K112L2.dat                |
|    | 98K112S1.dat                |
|    | 98K112S2.dat                |
|    | 98K113L1.dat                |
|    | 98K113S1.dat                |
|    | 98K113S2.dat                |
|    | 98K114L1.dat                |
|    | 98K114L2.dat                |
|    | 98K114S1.dat                |
|    | 98K114S2.dat                |
|    | 98K115L1.dat                |
|    | 98K115S1.dat                |
|    | 98K115S2.dat                |
|    | 98K116L1.dat                |
|   | 98K116L2.dat                |
|  | 98K116S1.dat                |
|  | 98K116S2.dat                |
|  | 98K117L1.dat                |
|  | 98K117L2.dat                |
|  | 98K117S1.dat                |
|  | 98K117S3.dat                |
|  | 98K118L1.dat                |
|  | 98K118S1.dat                |
|  | 98K118S2.dat                |
|  | 98K119L1.dat                |
|  | 98K119L2.dat                |
|  | 98K119S1.dat                |
|  | 98K119S2.dat                |
|  | 98K120L1.dat                |
|  | 98K120L2.dat                |
|  | 98K120L3.dat                |
|  | 98K120L4.dat                |
|  | 98K120S1.dat                |
|  | 98K120S2.dat                |
|  | 98K1K1L1.dat                |
|  | 98K1K1L2.dat                |
|  | 98K1K1L3.dat                |
|  | 98K1K1L4.dat                |
|  | 98K1K1L5.dat                |
|  | 98K1K1S1.dat                |
|  | 98K1K1S2.dat                |
|  | 98K1K1S3.dat                |
|  | 98K1K1S4.dat                |
|  | 98K1K1S5.dat                |
|  | 98K1K1S6.dat                |
|  | 98K1K1S7.dat                |
|  | 98K1K1S8.dat                |
|  | 98K1K2L1.dat                |
|  | 98K1K2L2.dat                |
|  | 98K1K2L3.dat                |
|  | 98K1K2L4.dat                |
|  | 98K1K2L5.dat                |
|  | 98K1K2S1.dat                |
|  | 98K1K2S2.dat                |
|  | 98K1K2S3.dat                |
|  | 98K1K2S4.dat                |
|  | ex_read2.f (Sample Program) |

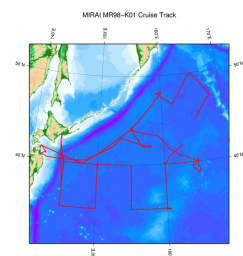
● Observation List  
The list of observation is shown as follows.

| Observation | Time and Date    | Lat. [°] | Lon. [°] |
|-------------|------------------|----------|----------|
| 98K101L1    | 1998-11-03 09:16 | 41.9995  | 151.9960 |
| 98K101S1    | 1998-11-03 14:14 | 41.9723  | 151.9946 |
| 98K101S2    | 1998-11-03 17:59 | 41.9643  | 151.9983 |
| 98K101S3    | 1998-11-03 19:28 | 41.9555  | 152.0108 |
| 98K101S4    | 1998-11-03 20:13 | 41.9486  | 152.0186 |
| 98K101S5    | 1998-11-03 20:44 | 41.9413  | 152.0226 |
| 98K102L1    | 1998-11-10 14:00 | 48.0061  | 160.0053 |
| 98K102L2    | 1998-11-11 20:49 | 47.9248  | 159.4811 |
| 98K102S1    | 1998-11-11 19:20 | 47.9301  | 159.4723 |



| Observation | Time and Date    | Lat     | Lon      |
|-------------|------------------|---------|----------|
| 98K108L1    | 1998-11-19 14:37 | 39.9963 | 145.0086 |
| 98K108L2    | 1998-11-19 23:33 | 39.9971 | 145.0415 |
| 98K108L3    | 1998-11-20 01:40 | 39.9885 | 145.0508 |
| 98K108S1    | 1998-11-19 19:08 | 40.0058 | 145.0278 |
| 98K108S2    | 1998-11-20 00:53 | 39.9930 | 145.0493 |
| 98K109L1    | 1998-11-20 15:52 | 37.4870 | 144.9813 |
| 98K109S1    | 1998-11-20 18:49 | 37.4651 | 144.9701 |
| 98K110L1    | 1998-11-25 09:50 | 34.9920 | 145.0008 |
| 98K110L2    | 1998-11-25 13:52 | 34.9980 | 144.9953 |
| 98K110S1    | 1998-11-25 07:18 | 34.9961 | 145.0026 |
| 98K110S2    | 1998-11-25 12:59 | 35.0018 | 144.9960 |
| 98K111L1    | 1998-11-26 07:06 | 35.0001 | 149.9998 |
| 98K111L2    | 1998-11-26 13:41 | 35.0561 | 150.0040 |
| 98K111S1    | 1998-11-26 12:27 | 35.0463 | 150.0004 |
| 98K111S2    | 1998-11-26 14:44 | 35.0730 | 150.0178 |
| 98K112L1    | 1998-11-27 09:48 | 37.4784 | 149.9610 |
| 98K112L2    | 1998-11-27 13:56 | 37.5058 | 149.9970 |
| 98K112S1    | 1998-11-27 07:21 | 37.4963 | 149.9955 |
| 98K112S2    | 1998-11-27 17:46 | 37.4878 | 149.9418 |
| 98K113L1    | 1998-11-29 05:05 | 40.0465 | 149.9836 |
| 98K113S1    | 1998-11-28 21:17 | 40.0493 | 150.0001 |
| 98K113S2    | 1998-11-29 01:36 | 40.0480 | 149.9856 |
| 98K114L1    | 1998-11-30 00:57 | 39.9985 | 155.0001 |
| 98K114L2    | 1998-11-30 04:54 | 39.9903 | 155.0186 |
| 98K114S1    | 1998-11-30 03:46 | 39.9980 | 155.0038 |
| 98K114S2    | 1998-11-30 05:45 | 39.9766 | 155.0091 |
| 98K115L1    | 1998-11-30 21:52 | 37.5021 | 154.9995 |
| 98K115S1    | 1998-11-30 19:22 | 37.4970 | 154.9996 |
| 98K115S2    | 1998-12-01 00:21 | 37.5056 | 155.0023 |
| 98K116L1    | 1998-12-01 11:59 | 35.0006 | 154.9970 |
| 98K116L2    | 1998-12-01 15:38 | 35.0030 | 154.9976 |
| 98K116S1    | 1998-12-01 14:49 | 34.9978 | 154.9933 |
| 98K116S2    | 1998-12-01 16:48 | 35.0010 | 155.0015 |
| 98K117L1    | 1998-12-03 03:42 | 34.9931 | 160.0175 |
| 98K117L2    | 1998-12-03 08:09 | 34.9878 | 160.0486 |
| 98K117S1    | 1998-12-03 00:10 | 34.9876 | 160.0306 |
| 98K117S3    | 1998-12-03 07:03 | 34.9843 | 160.0410 |
| 98K118L1    | 1998-12-03 22:34 | 37.5013 | 159.9895 |
| 98K118S1    | 1998-12-03 20:21 | 37.5005 | 160.0000 |
| 98K118S2    | 1998-12-04 01:03 | 37.5013 | 159.9845 |
| 98K119L1    | 1998-11-16 19:33 | 39.9896 | 159.9866 |
| 98K119L2    | 1998-11-17 01:47 | 40.0076 | 159.9873 |
| 98K119S1    | 1998-11-16 14:55 | 39.9958 | 160.0070 |
| 98K119S2    | 1998-11-17 00:32 | 40.0215 | 159.9685 |
| 98K120L1    | 1998-12-05 06:02 | 40.0126 | 164.9860 |
| 98K120L2    | 1998-12-05 13:37 | 40.0596 | 164.9593 |
| 98K120L3    | 1998-12-08 04:00 | 39.9986 | 165.0088 |
| 98K120L4    | 1998-12-08 09:10 | 40.0075 | 164.9621 |
| 98K120S1    | 1998-12-05 05:07 | 40.0133 | 164.9930 |
| 98K120S2    | 1998-12-05 10:14 | 40.0580 | 164.9656 |
| 98K1K1L1    | 1998-11-07 10:45 | 43.9936 | 154.9845 |
| 98K1K1L2    | 1998-11-07 20:42 | 43.9973 | 154.8941 |
| 98K1K1L3    | 1998-11-08 02:26 | 44.0508 | 154.9068 |
| 98K1K1L4    | 1998-11-08 03:42 | 44.0491 | 154.9270 |
| 98K1K1L5    | 1998-11-08 05:34 | 44.0456 | 154.9506 |
| 98K1K1S1    | 1998-11-07 04:55 | 43.9886 | 154.9411 |
| 98K1K1S2    | 1998-11-08 01:36 | 44.0443 | 154.8966 |
| 98K1K1S3    | 1998-11-09 00:22 | 44.0394 | 154.9745 |
| 98K1K1S4    | 1998-11-09 01:36 | 44.0379 | 154.9683 |
| 98K1K1S5    | 1998-11-09 02:16 | 44.0385 | 154.9643 |
| 98K1K1S6    | 1998-11-09 06:24 | 44.0371 | 154.9731 |
| 98K1K1S7    | 1998-11-09 10:56 | 44.0476 | 154.9861 |
| 98K1K1S8    | 1998-11-09 12:39 | 44.0516 | 154.9858 |
| 98K1K2L1    | 1998-12-10 22:14 | 44.0041 | 154.9923 |
| 98K1K2L2    | 1998-12-11 02:04 | 44.0088 | 155.0075 |
| 98K1K2L3    | 1998-12-11 09:01 | 43.9996 | 155.0303 |
| 98K1K2L4    | 1998-12-11 10:36 | 43.9833 | 155.0370 |
| 98K1K2L5    | 1998-12-11 12:32 | 43.9833 | 155.0415 |
| 98K1K2S1    | 1998-12-11 05:47 | 44.0113 | 155.0186 |
| 98K1K2S2    | 1998-12-11 09:56 | 43.9906 | 155.0306 |
| 98K1K2S3    | 1998-12-12 04:01 | 44.0005 | 154.9986 |
| 98K1K2S4    | 1998-12-12 07:48 | 44.0038 | 154.9923 |

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#### MR98-K01

Ship Name: MIRAI  
Period: 1998-10-30 - 1998-12-15  
Chief Scientist: Masashi Kusakabe (JAMSTEC)  
Project Name: [Station KNOT]

#### Update History

|            |                                    |
|------------|------------------------------------|
| 2017-06-22 | An observation data was registerd. |
| 2014-08-19 | An observation data was registerd. |
| 2014-07-12 | An observation data was registerd. |
| 2014-02-06 | An observation data was registerd. |
| 2013-03-27 | An observation data was registerd. |
| 2013-01-25 | An observation data was registerd. |

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