

## HYPER-DOLPHIN HPD 01490 Submersible Conductivity-Temperature-Depth Profiler (CTD)

Last Modified: 2017-01-25

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

Dive No.: **HPD 01490**

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

Data Policy: [JAMSTEC](#)

Observation Items: Depth/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/NT13-05\\_all.pdf](http://www.godac.jamstec.go.jp/catalog/data/doc_catalog/media/NT13-05_all.pdf)

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**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:

CTD/DO measurement system  
equipped on the remotely operated  
vehicle "HYPER-DOLPHIN"



### Overview

The CTD/DO system mounted on the 3000m-class remotely operated vehicle (ROV) "HYPER-DOLPHIN" is mainly composed of two instruments: a primary detection element and a PC for control and collection.

The primary detection element is consisted of SBE-19 SEACAT PROFILER CTD and SBE43 DO of Sea-Bird Electronics, Inc, installed horizontally under the main float of the front horizontal thruster of the vehicle. Its withstand depth is 4200m and its maximum depth of use is 4000m. Each parameter of conductivity, water temperature, pressure, and dissolved oxygen (DO) can be measured in 1Hz and is transmitted to the PC for control and collection onboard. , Record of each measurement data and ASCII conversions, data corrections, data management in the primary detecting element, time control, and other environmental settings can be conducted in the PC.

### Specifications

SBE-19 SEACAT PROFILER CTD and SBE43 DO, Sea-Bird Electronics, Inc.

| Sensor           | Measurement range | Accuracy                  | Model  | S/N                          |
|------------------|-------------------|---------------------------|--------|------------------------------|
| Temperature      | -5 to +35 deg-C   | 0.01 deg-C                | SBE 19 | 1924638-3068<br>1924638-3069 |
| Conductivity     | 0 to 7 S/m        | 0.001 S/m                 |        |                              |
| Pressure         | 0 to 6000 psi     | 0.02% of full scale range |        |                              |
| Dissolved oxygen | 0 to 15 ml/l      | 0.1 ml/l                  | SBE 43 | 0818, 0819                   |

### Data collection and situations

The data collection in each dive starts from just before the HYPER-DOLPHIN (hereafter, the vehicle) submerges and ends immediately after it comes up to the sea surface.

Because of the installed position of the primary detecting element, actual observation depth of the CTDO will be approximately 1.3m higher than the depth of the sea bottom even when the vehicle is on the seabed. Water intake duct is extended by a vinyl tube ahead of the vehicle on the left to minimize the effect of disturbances by the vehicle.

### Data processing

1-sec time interval data was treated with the contents equal to the SEASOFT software which is a following data processing module.

| Module          | Function  |
|-----------------|---|
| DATA CONVERSION | Converts raw data to pressure, temperature, conductivity, and oxygen.                                   |
| FILTER          | Performs a low pass filter on conductivity to make the high frequency data smooth.                      |
| ALIGNCTD        | Advances temperature for 0.5 seconds compared with pressure to correct the measurement time difference. |
| DERIVE          | Computes salinity.  |

### Data available here

The data available on this web site is 1-sec mean CTD/DO data integrated with the vehicle positioning data in latitude and longitude. The SSBL (Super Short Base Line) method is used to measure the vehicle's position, which requires transponder installed on the vehicle and an array of transducers equipped on the bottom of the mother ship. The position is measured by both phase lag measured from angles of received sound waves and distance calculated from travelling period of them. As for the measurement accuracy of SSBL, standard deviation of the horizontal measurement error is within 2.5% of slant range. Vertical profile of sound velocity is needed to calculate accurate distance from the travelling period. Therefore, the temperature measurement using XBT etc. of each sea area is executed.

The vehicle positioning data was calculated by adding the relative distance to the mother ship's position. The simplified equation with the area-dependent coefficients every 30 degrees in latitude and longitude was applied to the distance (XY) to Lon/Lat conversion, which provided by Japan Coast Guard. Here, the original time interval of position data is more than 10 seconds. The noises remaining in the position data are manually eliminated and linearly interpolated when the speed calculated from adjacent two position data is greater than 3.0 knot which is the maximum operation speed of the vehicle. Moreover, noises remained in the depth, temperature, salinity, and oxygen data are visually checked and replaced to missing values only when the data seemed to be obviously abnormal.

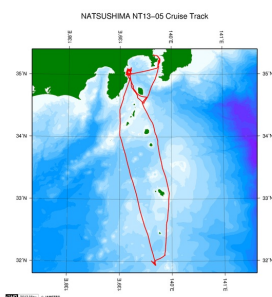
The CTDO system was not installed as the observation equipment, but installed as one of the navigation equipment to monitor the ambient environmental conditions of the vehicle. So, note that the calibration interval of the equipment is not especially provided and the calibration of the equipment is irregularly executed.

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

| Data             | Raw (ASCII data) | On this web site |
|------------------|------------------|------------------|
| Depth            | 0.001 [m]        | 0.1 [m]          |
| Temperature      | 0.0001 [deg-C]   | 0.01 [deg-C]     |
| Salinity         | 0.0001 [PSU]     | 0.01 [PSU]       |
| Dissolved oxygen | 0.00001 [ml/l]   | 0.1 [ml/l]       |

#### Related Information

☒ Cruise Data ☐ Dive Data



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#### NT13-05

Ship Name: NATSUSHIMA

Period: 2013-03-13 - 2013-03-20

Chief Scientist: Shinji Tsuchida (JAMSTEC)

Proposal ▶ Studies on biodiversity and early life history of vent associated animals in Izu, Bonin and Mariana Arcs

Title: Mariana Arcs

#### Update History

|            |                                    |
|------------|------------------------------------|
| 2017-01-25 | An observation data was registerd. |
|------------|------------------------------------|

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#### Information of the Ships

NATSUSHIMA

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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### Submersible CTD Qced (HPD)\_1sec

Header part

| No. | Column  | Item                | Format | Remarks        |
|-----|---------|---------------------|--------|----------------|
| 1   | 1       | Header ID           | a1     | fixed as '#'   |
| 2   | 3 - 37  | Submersible vehicle | a35    | HYPER-DOLPHIN  |
| 3   | 39 - 48 | Data ID             | a10    | CTD            |
| 4   | 50 - 70 | Cruise ID           | a21    | NNYY-XX(_legx) |
| 5   | 78 - 81 | Dive number         | a4     |                |

Data part

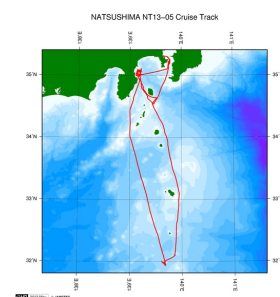
| No. | Column    | Item                      | Unit   | Format | Remarks   |
|-----|-----------|---------------------------|--------|--------|---|
| 1   | 1 - 8     | Date                      | -      | i8     | YYYYMMDD (LST)  |
| 2   | 10 - 15   | Time                      | -      | i6     | hhmmss (LST)  |
| 3   | 17 - 26   | Latitude                  | degree | f10.5  | No sign for the northern hemisphere.<br>Negative for the southern hemisphere. |
| 4   | 28 - 37   | Longitude                 | degree | f10.5  | No sign for the eastern hemisphere.<br>Negative for the western hemisphere.   |
| 5   | 39 - 48   | Depth                     | m      | f10.1  | Convert from pressure.*   |
| 6   | 50 - 59   | Temperature               | deg-C  | f10.2  | ITS-90  |
| 7   | 61 - 70   | Salinity                  | PSU    | f10.2  | PSS-78  |
| 8   | 72 - 81   | Dissolved oxygen          | ml/l   | f10.1  |   |
| 9   | 83 - 92   | Altitude                  | m      | f10.1  |   |
| 10  | 94 - 103  | Roll                      | degree | f10.1  |   |
| 11  | 105 - 114 | Pitch                     | degree | f10.1  |   |
| 12  | 116 - 125 | Vehicle heading           | degree | f10.1  |   |
| 13  | 127 - 136 | Timecode                  | -      | i10    |   |
| 14  | 138 - 147 | Port swing arm angle      | degree | f10.1  |   |
| 15  | 149 - 158 | Starboard swing arm angle | degree | f10.1  |   |
| 16  | 160 - 169 | Frame grab                | -      | i10    | 1: single grab<br>2: series of 8  |
| 17  | 171 - 180 | HDTV pan                  | degree | f10.1  |   |
| 18  | 182 - 191 | HDTV tilt                 | degree | f10.1  |   |
| 19  | 193 - 202 | CCD pan                   | degree | f10.1  |   |
| 20  | 204 - 213 | CCD tilt                  | degree | f10.1  |   |

Missing value is presented by '-999'.

\* Approximately 0.2% error is included due to latitude information.

### Related Information

[Cruise Data](#) [Dive Data](#)



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#### NT13-05

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Period: 2013-03-13 - 2013-03-20

Chief Scientist: Shinji Tsuchida (JAMSTEC)

Proposal ▶ Studies on biodiversity and early life history of vent associated animals in Izu, Bonin and Mariana Arcs

Title:

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2017-01-25 An observation data was registerd.

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KM-ROV

Go to a Cruise Information

Cruise ID:

Go to a Dive Information

Dive ID:

POWER GRAB SAMPLER  
(SHELL)  
POWER GRAB SAMPLER  
(CLOW)  
BMS

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**JAMSTEC**  
JAPAN AGENCY FOR MARINE-EARTH SCIENCE AND TECHNOLOGY

国立研究開発法人  
海洋研究開発機構

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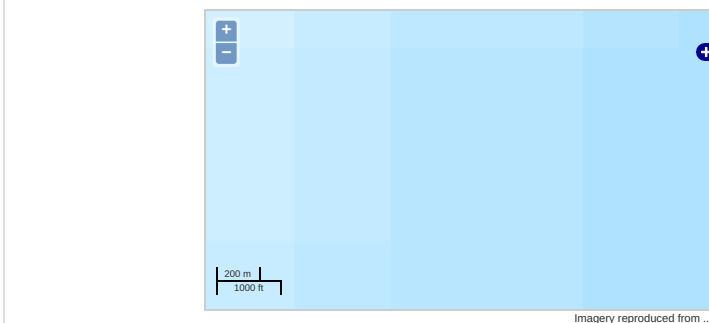
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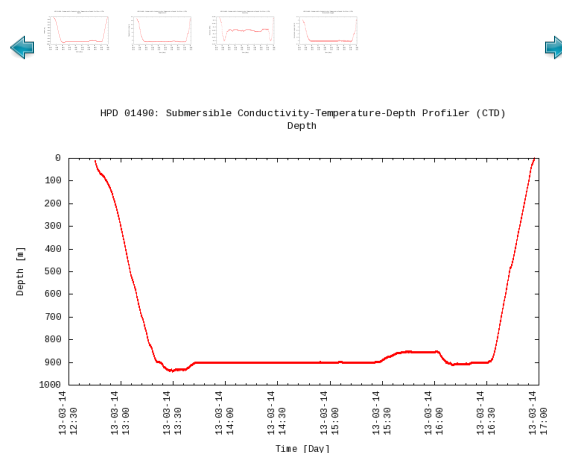
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TEMPERATURE TEMPERATURE  
OCEANS > SALINITY/DENSITY > SALINITY

### Observation Map



### Figures



### Data List

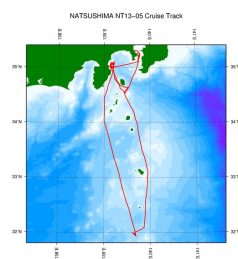
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File names

☐ HPD\_01490.txt

### Related Information

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