

## HYPER-DOLPHIN HPD 01107 Submersible Conductivity-Temperature-Depth Profiler (CTD)

Last Modified: 2017-01-25

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

Dive No.: **HPD 01107**

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/NT10-06\\_leg2\\_all.pdf](http://www.godac.jamstec.go.jp/catalog/data/doc_catalog/media/NT10-06_leg2_all.pdf)

### **i** 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:

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 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.

### Note

The periodic spike noise in 120 or 60 seconds occurred about temperature and salinity was removed.

### 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.

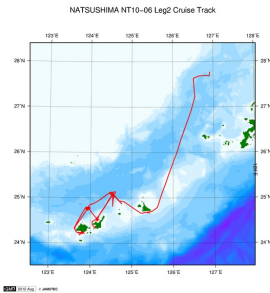
The CTDO system was not installed as the observation equipment, but installed as one of the navigation equipment to monitor the ambient environmental conditions of the vehicle. So, note that the calibration interval of the equipment is not especially provided and the calibration of the equipment is irregularly 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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#### NT10-06 Leg2

Ship Name: NATSUSHIMA

Period: 2010-04-04 - 2010-04-12

Chief Scientist: Toshiro Yamanaka (Okayama University)

Proposal Geoscientific and biological investigation using submersible for unexplored hydrothermal fields in the Central - Southern Okinawa Trough

#### Update History

2017-01-25 An observation data was registerd.

#### JAMSTEC

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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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海洋研究開発機構  
JAPAN AGENCY FOR MARINE-EARTH SCIENCE AND TECHNOLOGY

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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

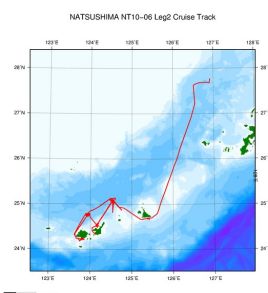
No.	Column	Item	Unit	Format	Remarks
1	1 - 8	Date	-	i8	YYYYMMDD (LST)
2	10 - 15	Time	-	i6	hhmmss (LST)
3	17 - 26	Latitude	degree	f10.5	No sign for the northern hemisphere. Negative for the southern hemisphere.
4	28 - 37	Longitude	degree	f10.5	No sign for the eastern hemisphere. Negative for the western 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 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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#### NT10-06 Leg2

Ship Name: NATSUSHIMA

Period: 2010-04-04 - 2010-04-12

Chief Scientist: Toshiro Yamanaka (Okayama University)

Proposal: Geoscientific and biological investigation using submersible for unexplored hydrothermal fields in the Central - Southern Okinawa Trough

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6K Camera DEEP TOW  
6K Sonar DEEP TOW  
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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TEMPERATURE TEMPERATURE  
OCEANS > SALINITY/DENSITY > SALINITY

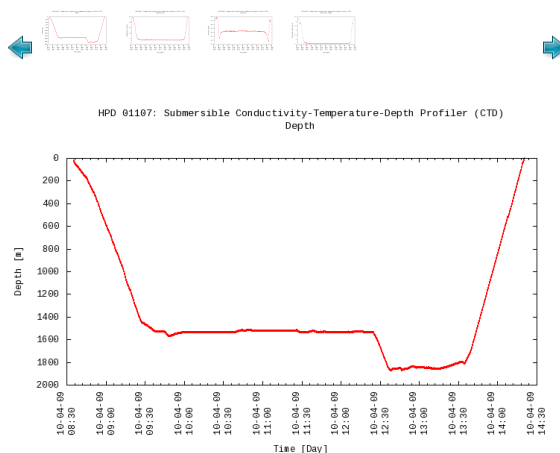
### Observation Map



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

Imagery reproduced from ...

### Figures



### Data List

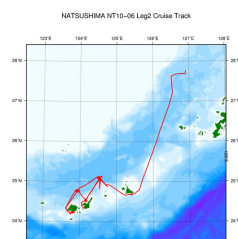
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File names

☐ HPD\_01107.txt

### Related Information

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



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#### NT10-06 Leg2

Ship Name: NATSUSHIMA

Period: 2010-04-04 - 2010-04-12

Chief Scientist: Toshiro Yamanaka (Okayama University)

Proposal Geoscientific and biological investigation using submersible for unexplored hydrothermal

Title: fields in the Central - Southern Okinawa Trough

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