MIRAI MR02-K06 Leg4 Expendable Conductivity-Temperature-Depth Profiler (XCTD)

Last Modified: 2019-08-29

ReadMe | Observation Data | Data Format

Cruise ID: MR02-K06 Leg4
Expendable Conductivity-Temperature-Depth Profiler (XCTD): Processed (DMO)-QCed
Data Policy: JAMSTEC
Observation Items: Depth, Temperature, Salinity
Science Keywords:

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

Cruise Report
http://www.godac.jamstec.go.jp/catalog/data/doc_catalog/media/MR02-K06_leg3-4_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:
Expendable conductivity temperature depth measurements (XCTD) (- MR11-E02)

Overview

Using XCTD (eXpendable Conductivity Temperature Depth profiler) system, the vertical distribution of water temperature and salinity are observed during free fall of its probe part in the seawater. Observed temperature and conductivity are transmitted to the data processor on board by the digital signal. The digital signal is converted to the temperature, conductivity and depth by data processor as binary data. Binary data is transmitted from data processor to PC. The PC calculates salinity from temperature, conductivity and depth, and those properties are recorded in PC as the ASCII files.

System

(1) Launcher

Hand launcher

Manufacturer : Sippican,Inc.
Operation area : Rear upper deck

Automatic launcher

Manufacturer : Tsurumi Seiki Co., LTD.
Location : Port side of rear upper deck (4m from the sea level). The control panel is installed in the investigation room.

(2) Converter

Manufacturer : Tsurumi Seiki Co., LTD.
Location : Investigation room
Sampling rate : 40 msec

(3) XCTD probe specifications

Probe Type	TSK XCTD-1	TSK XCTD-2	TSK XCTD-3	TSK XCTD-4
Temperature range [deg-C]	-2 to 35			
Temperature accuracy [deg-C]	+/- 0.02			
Temperature resolution [deg-C]	0.01			
Conductivity range [mS/cm]	0 to 60			
Conductivity accuracy [mS/cm]	+/- 0.03			
Conductivity resolution [mS/cm]	0.015			
Measurment depth [m]	1000	1850	1000	1850
Depth accuracy [m]	5 or +/- 2% of depth; whichever is larger			
Maximum elapsed time [sec]	300	600	200	502
Rated ship speed [knot]	12	3.5	20	6

Since XCTD carries no pressure sensor, we need to estimate depth from the elapsed time. The fall-rate equation is as follows.

$$Z = at + 10E^{-3} * bt^{2}$$

Where Z(m) is the depth and t(sec) is the elapsed time.

In addition, coefficients of the fall-rate equation are different by probe types.

Probe Type	TSK XCTD-1	TSK XCTD-2	TSK XCTD-3	TSK XCTD-4
Coefficient-a	3.42543	3.43898	5.07598	3.68081
Coefficient-b	-0.47	-0.31	-0.72	-0.47

* Coefficients listed above are supplied by Sippican, Inc., in USA.

The list of an XCTD type used in each cast is as follows.

Cast name	Probe Serial No.	Probe Type	Launcher	Converter
200302031539	01116888	XCTD-1	Auto	MK-100
200302032012	01116891	XCTD-1	Auto	MK-100
200302040013	01116890	XCTD-1	Auto	MK-100
200302040414	01116893	XCTD-1	Auto	MK-100
200302040828	02069291	XCTD-1	Auto	MK-100
200302041245	02069292	XCTD-1	Auto	MK-100
200302041723	01116889	XCTD-1	Auto	MK-100
200302042100	01116892	XCTD-1	Auto	MK-100
200302050108	02069299	XCTD-1	Auto	MK-100
200302050634	02069293	XCTD-1	Auto	MK-100
200302051354	02069294	XCTD-1	Auto	MK-100
200302052046	02069298	XCTD-1	Auto	MK-100
200302060234	02069303	XCTD-1	Auto	MK-100
200302060759	02069302	XCTD-1	Auto	MK-100
200302061239	02069297	XCTD-1	Auto	MK-100
200302061658	02069295	XCTD-1	Auto	MK-100
200302062059	02069300	XCTD-1	Auto	MK-100
200302070036	02070084	XCTD-1	Auto	MK-100
200302070408	02070089	XCTD-1	Auto	MK-100
200302070751	02070085	XCTD-1	Auto	MK-100
200302071000	02070088	XCTD-1	Auto	MK-100
200302071216	02070077	XCTD-1	Auto	MK-100
200302071432	02070082	XCTD-1	Auto	MK-100
200302071708	02070081	XCTD-1	Auto	MK-100
200302071950	02070080	XCTD-1	Auto	MK-100
200302072219	02070083	XCTD-1	Auto	MK-100
200302080043	02059271	XCTD-1	Auto	MK-100
200302080257	02059266	XCTD-1	Auto	MK-100
200302080517	02070087	XCTD-1	Auto	MK-100
200302080741	02059274	XCTD-1	Auto	MK-100
200302081318	02059270	XCTD-1	Auto	MK-100
200302081606	02070078	XCTD-1	Auto	MK-100
200302081847	02059276	XCTD-1	Auto	MK-100
200302082149	02059273	XCTD-1	Auto	MK-100
200302090052	02069281	XCTD-1	Auto	MK-100
200302090404	02059277	XCTD-1	Auto	MK-100
200302090659	02059279	XCTD-1	Auto	MK-100
200302090953	02059280	XCTD-1	Auto	MK-100
200302091231	02069284	XCTD-1	Auto	MK-100
200302091706	02069283	XCTD-1	Auto	MK-100
200302092107	02059278	XCTD-1	Auto	MK-100
200302100054	02059269	XCTD-1	Auto	MK-100
200302100437	02059272	XCTD-1	Auto	MK-100
200302100826	02069288	XCTD-1	Auto	MK-100
200302101151	02059275	XCTD-1	Auto	MK-100
200302101518	02069290	XCTD-1	Auto	MK-100
200302101840	02069289	XCTD-1	Auto	MK-100
200302102145	02069287	XCTD-1	Auto	MK-100
200302110054	02069282	XCTD-1	Auto	MK-100
200302110408	02059265	XCTD-1	Auto	MK-100
200302110722	02069286	XCTD-1	Auto	MK-100
200302111034	02059263	XCTD-1	Auto	MK-100
200302111348	02059264	XCTD-1	Auto	MK-100

Data processing

(1) For sensor's stablility, values of less than 1 m for temperature and less than 3 m for salinity are replaced by missing values, respectively, based on manufacturer's recommendation.

(2) Quality control

QCed data were added flag according to the NODC (National Oceanographic Data Center) quality control procedure.

1) The gradient check of adjacent depth data

2) The density inversion check

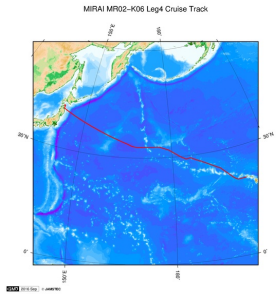
3) The broad range check set up at given ocean space and depth

Please see the site of NODC of the following link for quality control procedure in detail.

QUALITY CONTROL AND PROCESSING OF HISTORICAL OCEANOGRAPHIC TEMPERATURE, SALINITY, AND OXYGEN DATA

In addition, an abnormal value is identified by a visual check, and the data after visual QC is released.

Related Information



Enlarge Image

MR02-K06 Leg4
Ship Name: MIRAI
Period: 2003-02-02 - 2003-02-14
Chief Scientist: Kazuhiko Matsumoto (JAMSTEC)

Update History

2019-08-29	An observation data was registerd.
2017-06-14	An observation data was registerd.
2016-10-11	An observation data was registerd.

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Expendable Conductivity-Temperature-Depth Profiler (XCTD): Processed (DMO)-QCed
Data Policy: JAMSTEC

XCTD 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	XCTD
3	8 - 22	Cruise ID	a15	
4	33 - 40	Date	i8	YYYYMMDD (UTC)
5	42 - 45	Time	i4	hhmm (UTC)
6	47 - 55	Latitude	i2,a1,f5.2,a1	dd-mm.mmN(S)
7	57 - 66	Longitude	i3,a1,f5.2,a1	ddd-mm.mmE(W)
8	68 - 71	Number of data lines	i4	
9	72 - 73	Terminator	-	CR+LF

Data part

No.	Column	Content	Unit	Format	Remarks
1	1 - 11	Depth	m	f11.1	
2	12 - 22	Temperature	deg-C	f11.2	ITS-90
3	23 - 33	Salinity	PSU	f11.3	PSS-78
4	45 - 55	Flag	-	i11	1 - 7 : space 8 : flag of depth 9 : flag of temperature 10 : flag of salinity 11 : space * reference : 'Definition of Quality Control Flags'
5	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'.

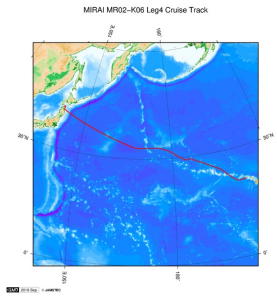
Definition of Quality Control Flags
1. Depth Flags
- 0 - accepted value
- 1 - error in recorded depth (same or less than previous depth)
- 2 - density inversion

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



Enlarge Image

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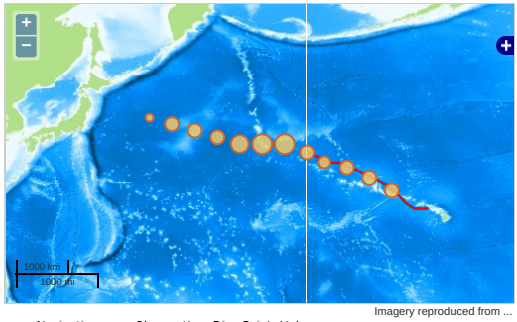
OCEANS	> SALINITY/DENSITY	> SALINITY

Observation Map

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

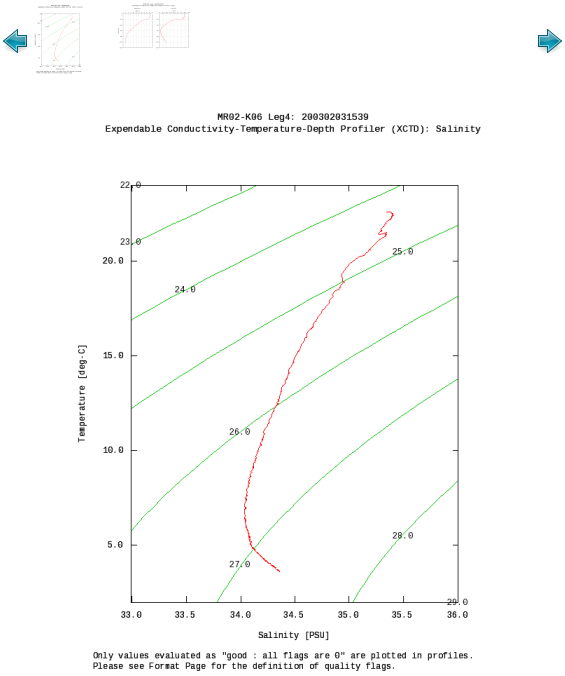


Imagery reproduced from ...

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

Figures

200302031539



Data List

Add to Basket

File names
200302031539.dat
200302032012.dat
200302040013.dat
200302040414.dat
200302040828.dat
200302041245.dat
200302041723.dat
200302042100.dat
200302050108.dat
200302050634.dat
200302051354.dat
200302052046.dat
200302060234.dat
200302060759.dat

File names

200302061239.dat
200302061658.dat
200302062059.dat
200302070036.dat
200302070408.dat
200302070751.dat
200302071000.dat
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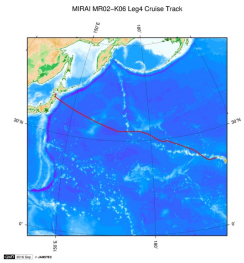
200302100437.dat
200302100826.dat
200302101151.dat
200302101518.dat
200302101840.dat
200302102145.dat
200302110054.dat
200302110408.dat
200302110722.dat
200302111034.dat
200302111348.dat
ex_read2.f (Sample Program)

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

Observation	Time and Date	Lat. [°]	Lon. [°]
200302031539	2003-02-03 15:34	24.7576	-164.9998
200302032012	2003-02-03 20:07	25.4751	-165.9950
200302040013	2003-02-04 00:08	25.9860	-167.0004
200302040414	2003-02-04 04:09	26.4916	-168.0001
200302040828	2003-02-04 08:23	26.9988	-168.9910
200302041245	2003-02-04 12:40	27.4998	-170.0001
200302041723	2003-02-04 17:18	28.0028	-171.1353
200302042100	2003-02-04 20:55	28.3643	-171.9906
200302050108	2003-02-05 01:04	28.7975	-173.0003
200302050634	2003-02-05 06:30	29.2601	-174.0893
200302051354	2003-02-05 13:49	29.2475	-175.0003
200302052046	2003-02-05 20:41	29.2951	-175.9898
200302060234	2003-02-06 02:29	29.7508	-177.0003
200302060759	2003-02-06 07:54	30.2996	-177.9918
200302061239	2003-02-06 12:34	30.8993	-179.0001
200302061658	2003-02-06 16:53	31.4916	179.9998
200302062059	2003-02-06 20:54	32.0433	179.0103
200302070036	2003-02-07 00:31	32.3650	177.9996
200302070408	2003-02-07 04:03	32.6805	176.9996
200302070751	2003-02-07 07:46	32.9808	176.0146
200302071000	2003-02-07 09:56	32.9956	175.4995
200302071216	2003-02-07 12:11	32.9841	175.0000
200302071432	2003-02-07 14:28	32.9888	174.5000
200302071708	2003-02-07 17:03	32.9825	173.9996
200302071950	2003-02-07 19:45	32.9751	173.5003
200302072219	2003-02-07 22:14	32.9836	173.0138
200302080043	2003-02-08 00:38	32.9906	172.4998
200302080257	2003-02-08 02:53	32.9946	172.0000
200302080517	2003-02-08 05:13	32.9893	171.4996
200302080741	2003-02-08 07:36	32.9885	170.9998
200302081318	2003-02-08 13:13	32.9793	170.0166
200302081606	2003-02-08 16:02	32.9663	169.4998
200302081847	2003-02-08 18:43	32.9593	168.9996
200302082149	2003-02-08 21:45	32.9743	168.5003
200302090052	2003-02-09 00:48	33.0148	168.0025
200302090404	2003-02-09 04:00	33.1203	167.5003
200302090659	2003-02-09 06:54	33.2131	167.0173
200302090953	2003-02-09 09:49	33.3921	166.5000
200302091231	2003-02-09 12:26	33.5800	166.0001

Observation	Time and Date	Lat. [°]	Lon. [°]
200302092106	2003-02-09 17:01	33.9866	165.0176
200302092107	2003-02-09 21:02	34.2103	163.9996
200302100054	2003-02-10 00:49	34.5101	163.0081
200302100437	2003-02-10 04:32	34.8273	162.0000
200302100826	2003-02-10 08:21	35.0961	161.0161
200302101151	2003-02-10 11:46	35.3928	159.9998
200302101518	2003-02-10 15:13	35.6783	158.9838
200302101840	2003-02-10 18:35	35.9798	157.9995
200302102145	2003-02-10 21:40	36.2840	156.9824
200302110054	2003-02-11 00:49	36.5518	155.9996
200302110408	2003-02-11 04:03	36.8495	155.0031
200302110722	2003-02-11 07:17	37.1441	153.9998
200302111034	2003-02-11 10:29	37.4081	153.0006
200302111348	2003-02-11 13:43	37.6968	152.0001

Related Information



Enlarge Image

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Chief Scientist: Kazuhiko Matsumoto (JAMSTEC)

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2016-10-11	An observation data was registerd.