MIRAI MR02-K01 Expendable Conductivity-Temperature-Depth Profiler (XCTD)

Last Modified: 2019-08-29

ReadMe | Observation Data | Data Format

Cruise ID: MR02-K01
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-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:
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
200201090509	01055398	XCTD-1	-	MK-100
200201090847	01055401	XCTD-1	-	MK-100
200201091208	01055387	XCTD-1	-	MK-100
200201091531	01055388	XCTD-1	-	MK-100
200201091845	01055402	XCTD-1	-	MK-100
200201092155	01055389	XCTD-1	-	MK-100
200201100110	01055396	XCTD-1	-	MK-100
200201100434	01055400	XCTD-1	-	MK-100
200201100759	01055386	XCTD-1	-	MK-100
200201101134	01075811	XCTD-1	-	MK-100
200201101500	01075810	XCTD-1	-	MK-100
200201101820	01055397	XCTD-1	-	MK-100
200201101830	01055404	XCTD-1	-	MK-100
200201102211	01055399	XCTD-1	-	MK-100
200201110143	01075816	XCTD-1	-	MK-100
200201110504	01075814	XCTD-1	-	MK-100
200201110832	01075819	XCTD-1	-	MK-100
200201111207	01075818	XCTD-1	-	MK-100
200201111526	01075809	XCTD-1	-	MK-100
200201120244	01075812	XCTD-1	-	MK-100
200201120610	01075815	XCTD-1	-	MK-100
200201120931	01075813	XCTD-1	-	MK-100
200201121249	01075892	XCTD-1	-	MK-100
200201121611	01075817	XCTD-1	-	MK-100
200201121934	01075820	XCTD-1	-	MK-100
200201122258	01075888	XCTD-1	-	MK-100
200201130233	01075887	XCTD-1	-	MK-100
200201130604	01075890	XCTD-1	-	MK-100
200201130944	01075891	XCTD-1	-	MK-100
200201241014	01075889	XCTD-1	-	MK-100
200201241354	01075882	XCTD-1	-	MK-100
200201241732	01075886	XCTD-1	-	MK-100
200201242109	01075883	XCTD-1	-	MK-100
200201250252	01075885	XCTD-1	-	MK-100
200201250624	01075822	XCTD-1	-	MK-100
200201250958	01075884	XCTD-1	-	MK-100
200201251335	01075823	XCTD-1	-	MK-100
200201251712	01075881	XCTD-1	-	MK-100
200201252052	01075821	XCTD-1	-	MK-100
200201270512	01075825	XCTD-1	-	MK-100
200201270827	01075829	XCTD-1	-	MK-100
200201271201	01075824	XCTD-1	-	MK-100
200201271534	01075830	XCTD-1	-	MK-100
200201271908	01075831	XCTD-1	-	MK-100
200201280134	01075832	XCTD-1	-	MK-100
200201280509	01075827	XCTD-1	-	MK-100
200201280846	01075828	XCTD-1	-	MK-100
200201281225	01075864	XCTD-1	-	MK-100
200201281603	01075861	XCTD-1	-	MK-100
200201281942	01075826	XCTD-1	-	MK-100
200201290139	00103175	XCTD-1	-	MK-100
200201290514	00103174	XCTD-1	-	MK-100
200201290849	00103179	XCTD-1	-	MK-100
200201291223	00103176	XCTD-1	-	MK-100
200201291607	00103178	XCTD-1	-	MK-100
200201301617	00103192	XCTD-1	-	MK-100
200201301948	00103193	XCTD-1	-	MK-100
200201302329	00103196	XCTD-1	-	MK-100
200201310315	00103197	XCTD-1	-	MK-100
200201310719	00103198	XCTD-1	-	MK-100
200201311138	00103187	XCTD-1	-	MK-100
200201311556	00103191	XCTD-1	-	MK-100
200201312020	00103188	XCTD-1	-	MK-100
200202010343	00103189	XCTD-1	-	MK-100
200202010811	01116920	XCTD-1	-	MK-100
200202011234	00103195	XCTD-1	-	MK-100
200202011704	00103190	XCTD-1	-	MK-100

Cast name	Probe Serial No.	Probe Type	Launcher	Converter
200202011704	00103199	XCTD-1	-	MK-100
200202012135	00103200	XCTD-1	-	MK-100
200202020442	01116916	XCTD-1	-	MK-100
200202020856	01116917	XCTD-1	-	MK-100
200202031121	01116922	XCTD-1	-	MK-100
200202031510	01116915	XCTD-1	-	MK-100
200202031901	01116918	XCTD-1	-	MK-100
200202032245	01116924	XCTD-1	-	MK-100
200202040548	01116929	XCTD-1	-	MK-100
200202040930	01075863	XCTD-1	-	MK-100
200202041310	01116931	XCTD-1	-	MK-100
200202041649	01116926	XCTD-1	-	MK-100
200202042027	01075866	XCTD-1	-	MK-100
200202050003	01116921	XCTD-1	-	MK-100
200202050622	01116928	XCTD-1	-	MK-100
200202051004	01075862	XCTD-1	-	MK-100
200202051346	01075865	XCTD-1	-	MK-100
200202052030	01075859	XCTD-1	-	MK-100
200202060009	01075858	XCTD-1	-	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

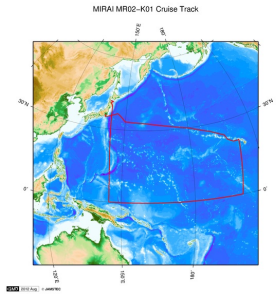
3) The broad range check set up at given ocean space and depth

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-K01
Ship Name: MIRAI
Period: 2002-01-07 - 2002-02-15
Chief Scientist: Takeshi Kawano (JAMSTEC)

Update History

2019-08-29	An observation data was registerd.
2017-06-14	An observation data was registerd.
2014-07-18	An observation data was registerd.
2014-02-18	An observation data was registerd.
2012-12-25	An observation data was registerd.

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Cruise ID: MR02-K01

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

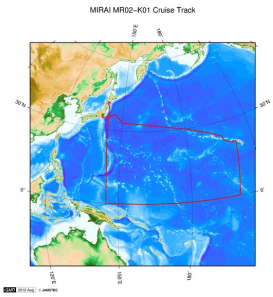
QCed data were added flag according to the NODC (National Oceanographic Data Center) quality control procedure, additionally visually checked. Please see the site of NODC of the following link for quality control procedure.

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

Sample Program

ex_read2.f

Related Information



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Data Policy: JAMSTEC

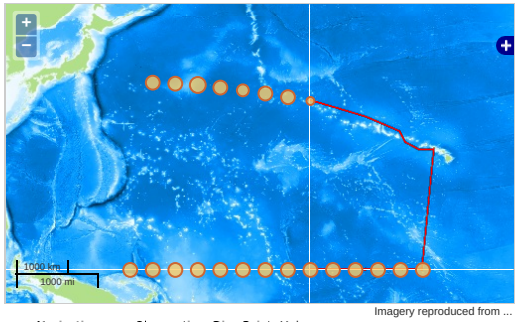
Observation Items: Depth, Temperature, Salinity

Science Keywords:

OCEANS	> OCEAN TEMPERATURE	> WATER 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.

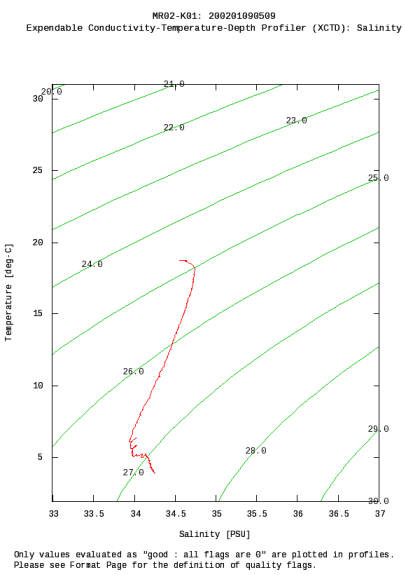


Imagery reproduced from ...

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

Figures

200201090509



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
200201090509.dat
200201090847.dat
200201091208.dat
200201091531.dat
200201091845.dat
200201092155.dat
200201100110.dat
200201100434.dat
200201100759.dat
200201101134.dat
200201101500.dat
200201101820.dat
200201101830.dat
200201102211.dat

File names

200201110143.dat
200201110504.dat
200201110832.dat
200201111207.dat
200201111526.dat
200201120244.dat
200201120610.dat
200201120931.dat
200201121249.dat
200201121611.dat
200201121934.dat
200201122258.dat
200201130233.dat
200201130604.dat
200201130944.dat
200201241014.dat
200201241354.dat
200201241732.dat
200201242109.dat
200201250252.dat
200201250624.dat
200201250958.dat
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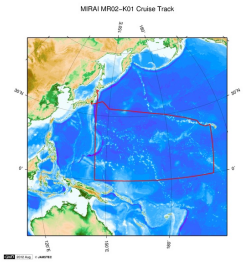
200201251712.dat
200201252052.dat
200201270512.dat
200201270827.dat
200201271201.dat
200201271534.dat
200201271908.dat
200201280134.dat
200201280509.dat
200201280846.dat
200201281225.dat
200201281603.dat
200201281942.dat
200201290139.dat
200201290514.dat
200201290849.dat
200201291223.dat
200201291607.dat
200201301617.dat
200201301948.dat
200201302329.dat
200201310315.dat
200201310719.dat
200201311138.dat
200201311556.dat
200201312020.dat
200202010343.dat
200202010811.dat
200202011234.dat
200202011704.dat
200202012135.dat
200202020442.dat
200202020856.dat
200202031121.dat
200202031510.dat
200202031901.dat
200202032245.dat
200202040548.dat
200202040930.dat
200202041310.dat
200202041649.dat
200202042027.dat
200202050003.dat
200202050622.dat
200202051004.dat
200202051346.dat
200202052030.dat
200202060009.dat
ex_read2.f (Sample Program)

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

Observation	Time and Date	Lat. [°]	Lon. [°]
200201090509	2002-01-09 05:09	33.2500	152.0006
200201090847	2002-01-09 08:42	33.1895	153.0023
200201091208	2002-01-09 12:03	33.1390	154.0020
200201091531	2002-01-09 15:26	33.1166	155.0003
200201091845	2002-01-09 18:40	33.0735	156.0011
200201092155	2002-01-09 21:50	33.0280	157.0011
200201100110	2002-01-10 01:04	32.9831	158.0004

Observation	Time and Date	Lat. [°]	Lon. [°]
200201100434	2002-01-10 04:29	32.9126	159.0003
200201100759	2002-01-10 07:54	32.8398	160.0000
200201101134	2002-01-10 11:28	32.7665	161.0001
200201101500	2002-01-10 14:54	32.6386	162.0004
200201101820	2002-01-10 18:15	32.5143	163.0038
200201101830	2002-01-10 18:25	32.5101	163.0430
200201102211	2002-01-10 22:06	32.3786	164.0001
200201110143	2002-01-11 01:38	32.2621	165.0003
200201110504	2002-01-11 04:59	32.1365	166.0000
200201110832	2002-01-11 08:27	32.0161	166.9998
200201111207	2002-01-11 12:01	31.8890	168.0001
200201111526	2002-01-11 15:21	31.7615	169.0001
200201120244	2002-01-12 02:39	31.4748	171.0004
200201120610	2002-01-12 06:04	31.3236	172.0000
200201120931	2002-01-12 09:26	31.1588	173.0000
200201121249	2002-01-12 12:44	31.0000	174.0004
200201121611	2002-01-12 16:06	30.8386	175.0001
200201121934	2002-01-12 19:28	30.6755	176.0115
200201122258	2002-01-12 22:53	30.5160	176.9998
200201130233	2002-01-13 02:28	30.3443	178.0000
200201130604	2002-01-13 05:59	30.1723	179.0008
200201130944	2002-01-13 09:39	29.9993	179.9998
200201241014	2002-01-24 10:09	0.0011	-160.0378
200201241354	2002-01-24 13:49	-0.0006	-161.0173
200201241732	2002-01-24 17:27	0.0015	-162.0008
200201242109	2002-01-24 21:04	0.0010	-163.0003
200201250252	2002-01-25 02:47	0.0005	-164.0006
200201250624	2002-01-25 06:19	0.0013	-165.0001
200201250958	2002-01-25 09:53	0.0025	-166.0008
200201251335	2002-01-25 13:30	0.0028	-167.0000
200201251712	2002-01-25 17:07	0.0035	-168.0003
200201252052	2002-01-25 20:47	-0.0001	-169.0006
200201270512	2002-01-27 05:07	-0.0363	-170.1003
200201270827	2002-01-27 08:22	-0.0005	-171.0000
200201271201	2002-01-27 11:55	-0.0043	-172.0003
200201271534	2002-01-27 15:29	-0.0020	-173.0001
200201271908	2002-01-27 19:03	0.0000	-173.9998
200201280134	2002-01-28 01:29	-0.0020	-175.0000
200201280509	2002-01-28 05:03	0.0011	-176.0000
200201280846	2002-01-28 08:41	-0.0008	-177.0003
200201281225	2002-01-28 12:20	-0.0003	-178.0000
200201281603	2002-01-28 15:58	0.0015	-179.0006
200201281942	2002-01-28 19:37	0.0000	179.9998
200201290139	2002-01-29 01:34	0.0051	179.0000
200201290514	2002-01-29 05:09	-0.0008	178.0003
200201290849	2002-01-29 08:43	0.0016	176.9996
200201291223	2002-01-29 12:18	-0.0005	176.0001
200201291607	2002-01-29 16:02	-0.0020	174.9961
200201301617	2002-01-30 16:13	-0.1186	173.9991
200201301948	2002-01-30 19:42	-0.1043	173.0003
200201302329	2002-01-30 23:23	0.0001	172.0006
200201310315	2002-01-31 03:10	-0.0001	171.0004
200201310719	2002-01-31 07:14	0.0030	170.0000
200201311138	2002-01-31 11:32	0.0013	168.9998
200201311556	2002-01-31 15:51	0.0011	168.0001
200201312020	2002-01-31 20:14	0.0005	167.0003
200202010343	2002-02-01 03:37	-0.0053	166.0001
200202010811	2002-02-01 08:06	-0.0031	165.0001
200202011234	2002-02-01 12:29	0.0021	163.9958
200202011704	2002-02-01 16:59	-0.0013	163.0003
200202012135	2002-02-01 21:30	0.0005	162.0000
200202020442	2002-02-02 04:37	-0.0055	161.0004
200202020856	2002-02-02 08:51	-0.0006	160.0000
200202031121	2002-02-03 11:16	0.0023	159.0000
200202031510	2002-02-03 15:05	0.0133	158.0000
200202031901	2002-02-03 18:55	0.0161	157.0000
200202032245	2002-02-03 22:39	-0.0038	156.0115
200202040548	2002-02-04 05:43	0.0005	155.0001
200202040930	2002-02-04 09:25	0.0031	154.0000
200202041310	2002-02-04 13:05	0.0008	153.0003
200202041649	2002-02-04 16:44	0.0011	151.9996
200202042027	2002-02-04 20:22	0.0030	150.9940
200202050003	2002-02-04 23:58	-0.0008	150.0000
200202050622	2002-02-05 06:17	0.0001	149.0001
200202051004	2002-02-05 09:59	0.0005	147.9998
200202051346	2002-02-05 13:40	0.0041	147.0001
200202052030	2002-02-05 20:25	0.0015	146.0000
200202060009	2002-02-06 00:04	-0.0023	145.0001

Related Information



Enlarge Image

MR02-K01
Ship Name: MIRAI
Period: 2002-01-07 - 2002-02-15
Chief Scientist: Takeshi Kawano (JAMSTEC)

Update History

2019-08-29	An observation data was registerd.
2017-06-14	An observation data was registerd.
2014-07-18	An observation data was registerd.
2014-02-18	An observation data was registerd.
2012-12-25	An observation data was registerd.