MIRAI MR17-05C Expendable Conductivity-Temperature-Depth Profiler (XCTD)

Last Modified: 2019-11-29

ReadMe | Observation Data | Data Format

Cruise ID: MR17-05C
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/MR17-05C_all.pdf

For Using Data

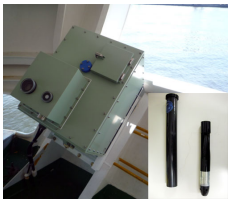
Principal Investigator
Data Management Office

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) (MR11-04 -)



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
201709020127	16027328	XCTD-1	Auto	MK-150N
201709020221	16027342	XCTD-1	Auto	MK-150N
201709020306	16027343	XCTD-1	Auto	MK-150N
201709021224	16027326	XCTD-1	Auto	MK-150N
201709021250	16027320	XCTD-1	Auto	MK-150N
201709021314	16027327	XCTD-1	Auto	MK-150N
201709021339	16027323	XCTD-1	Auto	MK-150N
201709021404	16027324	XCTD-1	Auto	MK-150N
201709021430	16027322	XCTD-1	Auto	MK-150N
201709021455	16027321	XCTD-1	Auto	MK-150N
201709021519	16027341	XCTD-1	Auto	MK-150N
201709030539	16027352	XCTD-1	Auto	MK-150N
201709030624	16027351	XCTD-1	Auto	MK-150N
201709030718	16027349	XCTD-1	Auto	MK-150N
201709030820	16027350	XCTD-1	Auto	MK-150N
201709031339	16027345	XCTD-1	Auto	MK-150N
201709031436	16027325	XCTD-1	Auto	MK-150N
201709031531	16027403	XCTD-1	Auto	MK-150N
201709041518	16027404	XCTD-1	Auto	MK-150N
201709041702	16027346	XCTD-1	Auto	MK-150N
201709042037	16027344	XCTD-1	Auto	MK-150N
201709050157	16027347	XCTD-1	Auto	MK-150N
201709050558	16027348	XCTD-1	Auto	MK-150N
201709070104	16027353	XCTD-1	Auto	MK-150N
201709070249	16027402	XCTD-1	Auto	MK-150N
201709070431	16027406	XCTD-1	Auto	MK-150N
201709070631	16027405	XCTD-1	Auto	MK-150N
201709070817	16027410	XCTD-1	Auto	MK-150N
201709071005	16027409	XCTD-1	Auto	MK-150N
201709071208	16027408	XCTD-1	Auto	MK-150N
201709071353	16027412	XCTD-1	Auto	MK-150N
201709071537	16027411	XCTD-1	Auto	MK-150N
201709071718	16027413	XCTD-1	Auto	MK-150N
201709071909	16027407	XCTD-1	Auto	MK-150N
201709072051	16027356	XCTD-1	Auto	MK-150N
201709072235	16027355	XCTD-1	Auto	MK-150N
201709080038	16027354	XCTD-1	Auto	MK-150N
201709100837	16027359	XCTD-1	Auto	MK-150N
201709101119	16027357	XCTD-1	Auto	MK-150N
201709101512	16027360	XCTD-1	Auto	MK-150N
201709101803	16027358	XCTD-1	Auto	MK-150N
201709110800	16027361	XCTD-1	Auto	MK-150N
201709120051	16027365	XCTD-1	Auto	MK-150N
201709120127	16027366	XCTD-1	Auto	MK-150N
201709120205	16027367	XCTD-1	Auto	MK-150N
201709120243	16027370	XCTD-1	Auto	MK-150N
201709120324	16027363	XCTD-1	Auto	MK-150N
201709120406	16027362	XCTD-1	Auto	MK-150N
201709121302	16027371	XCTD-1	Auto	MK-150N
201709121351	16027375	XCTD-1	Auto	MK-150N
201709121426	16027376	XCTD-1	Auto	MK-150N
201709121501	16027369	XCTD-1	Auto	MK-150N
201709121536	16027368	XCTD-1	Auto	MK-150N
201709121612	16027372	XCTD-1	Auto	MK-150N
201709122347	16027364	XCTD-1	Auto	MK-150N
201709132250	17025025	XCTD-1	Auto	MK-150N
201709132339	17025019	XCTD-1	Auto	MK-150N
201709140029	17025020	XCTD-1	Auto	MK-150N
201709140120	17025021	XCTD-1	Auto	MK-150N
201709140210	17025027	XCTD-1	Auto	MK-150N
201709140302	16027373	XCTD-1	Auto	MK-150N
201709141347	17025028	XCTD-1	Auto	MK-150N
201709141754	17025024	XCTD-1	Auto	MK-150N
201709141909	17025026	XCTD-1	Auto	MK-150N
201709141915	17025029	XCTD-1	Auto	MK-150N
201709150136	17025032	XCTD-1	Auto	MK-150N
201709150251	16027374	XCTD-1	Auto	MK-150N

Cast name	Probe Serial No.	Probe Type	Launcher	Converter
201709150607	17025034	XCTD-1	Auto	MK-150N
201709150721	17025031	XCTD-1	Auto	MK-150N
201709150835	17025038	XCTD-1	Auto	MK-150N
201709150948	17025022	XCTD-1	Auto	MK-150N
201709151100	17025023	XCTD-1	Auto	MK-150N
201709151213	17025039	XCTD-1	Auto	MK-150N
201709151327	17025036	XCTD-1	Auto	MK-150N
201709151440	17025033	XCTD-1	Auto	MK-150N
201709151554	17025030	XCTD-1	Auto	MK-150N
201709151707	17025035	XCTD-1	Auto	MK-150N

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

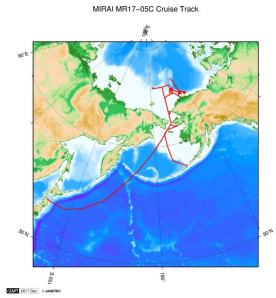
3) The broad range check set up at given ocean space and depth

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

MR17-05C
Ship Name: MIRAI
Period: 2017-08-24 - 2017-10-01
Chief Scientist: Shigeto Nishino (JAMSTEC)
Project Name: [Arctic Ocean Climate System Reaserch]
Proposal ▸ Arctic Challenge for Sustainability (ArCS)
Title:

Update History

2019-11-29	An observation data was registerd.

MIRAI MR17-05C Expendable Conductivity-Temperature-Depth Profiler (XCTD)

Last Modified: 2019-11-29

Cruise ID: MR17-05C

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

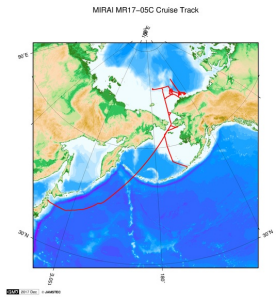
QCed data were added flag according to the NODC (National Oceanographic Data Center) quality control procedure, additionally visually checked. Please see the site of NODC of the following link for quality control procedure.

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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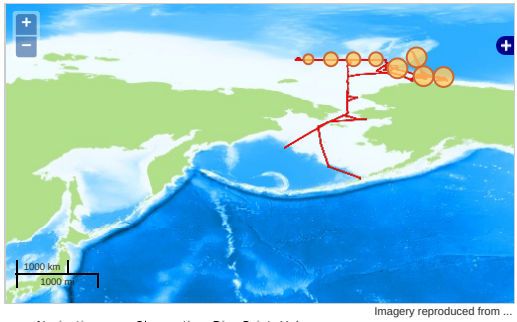
Data Policy: JAMSTEC
Observation Items: Depth, Temperature, Salinity
Science Keywords:

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.

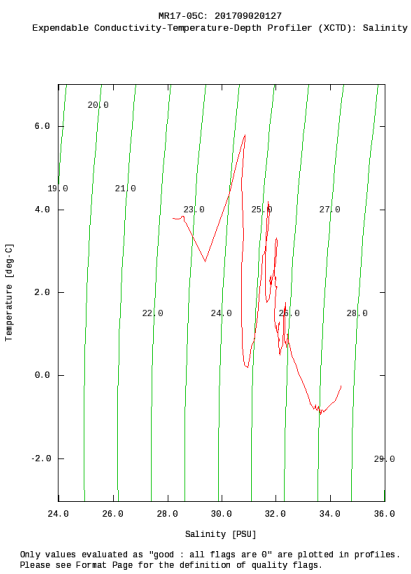


Imagery reproduced from ...

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

Figures

201709020127



Data List

Add to Basket

File names
201709020127.dat
201709020221.dat
201709020306.dat
201709021224.dat
201709021250.dat
201709021314.dat
201709021339.dat
201709021404.dat
201709021430.dat
201709021455.dat
201709021519.dat
201709030539.dat
201709030624.dat
201709030718.dat

File names

201709031339.dat
201709031436.dat
201709031531.dat
201709041518.dat
201709041702.dat
201709042037.dat
201709050157.dat
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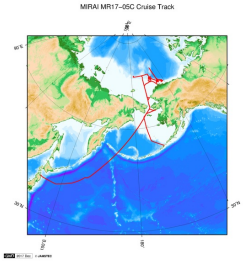
201709151100.dat
201709151213.dat
201709151327.dat
201709151440.dat
201709151554.dat
201709151707.dat
ex_read2.f (Sample Program)

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

Observation	Time and Date	Lat. [°]	Lon. [°]
201709020127	2017-09-02 01:29	71.9943	-155.5486
201709020221	2017-09-02 02:23	72.1733	-155.4998
201709020306	2017-09-02 03:08	72.3229	-155.4543
201709021224	2017-09-02 12:27	72.0830	-154.9990
201709021250	2017-09-02 12:51	72.1666	-155.0006
201709021314	2017-09-02 13:16	72.2496	-155.0036
201709021339	2017-09-02 13:41	72.3333	-154.9976
201709021404	2017-09-02 14:06	72.4165	-155.0000
201709021430	2017-09-02 14:31	72.5000	-154.9986
201709021455	2017-09-02 14:56	72.5831	-154.9985
201709021519	2017-09-02 15:21	72.6666	-155.0001
201709030539	2017-09-03 05:40	72.4703	-155.4141
201709030624	2017-09-03 06:26	72.4063	-154.9995
201709030718	2017-09-03 07:23	72.3123	-154.4988
201709030820	2017-09-03 08:21	72.2186	-153.9990

Observation	Time and Date	Lat. [°]	Lon. [°]
201709031339	2017-09-03 13:41	72.0833	-152.9991
201709031436	2017-09-03 14:37	71.9378	-152.5003
201709031531	2017-09-03 15:33	71.8433	-152.0003
201709041518	2017-09-04 15:19	71.5021	-151.5153
201709041702	2017-09-04 17:05	71.6803	-152.5000
201709042037	2017-09-04 20:40	71.8770	-153.5000
201709050157	2017-09-05 01:59	72.0133	-154.5025
201709050558	2017-09-05 06:00	72.1726	-155.4995
201709070104	2017-09-07 01:13	72.0000	-155.0004
201709070249	2017-09-07 02:51	72.3335	-155.1675
201709070431	2017-09-07 04:33	72.6671	-155.3320
201709070631	2017-09-07 06:33	73.0005	-155.6083
201709070817	2017-09-07 08:19	73.3343	-155.7558
201709071005	2017-09-07 10:06	73.6668	-155.9155
201709071208	2017-09-07 12:10	74.0001	-156.1653
201709071353	2017-09-07 13:55	74.3333	-156.3145
201709071537	2017-09-07 15:38	74.6665	-156.4633
201709071718	2017-09-07 17:20	75.0001	-156.5911
201709071909	2017-09-07 19:10	75.3333	-156.7818
201709072051	2017-09-07 20:53	75.6668	-156.9081
201709072235	2017-09-07 22:37	76.0000	-157.0368
201709080038	2017-09-08 00:40	76.3336	-157.1713
201709100837	2017-09-10 08:39	72.3768	-156.4923
201709101119	2017-09-10 11:21	72.6294	-157.5016
201709101512	2017-09-10 15:14	72.9191	-158.4998
201709101803	2017-09-10 18:05	73.1378	-159.5029
201709110800	2017-09-11 08:02	73.3890	-160.1836
201709120051	2017-09-12 00:52	73.5006	-159.9966
201709120127	2017-09-12 01:29	73.6250	-160.0011
201709120205	2017-09-12 02:07	73.7500	-159.9998
201709120243	2017-09-12 02:45	73.8748	-159.9968
201709120324	2017-09-12 03:27	73.9990	-160.0135
201709120406	2017-09-12 04:08	74.0001	-160.5000
201709121302	2017-09-12 13:04	73.5818	-161.6131
201709121351	2017-09-12 13:53	73.5010	-162.0149
201709121426	2017-09-12 14:28	73.6241	-161.9891
201709121501	2017-09-12 15:03	73.7505	-162.0011
201709121536	2017-09-12 15:38	73.8751	-161.9980
201709121612	2017-09-12 16:14	74.0001	-161.9998
201709122347	2017-09-12 23:50	73.6165	-162.7463
201709132250	2017-09-13 22:51	73.4166	-160.8511
201709132339	2017-09-13 23:41	73.5833	-160.9708
201709140029	2017-09-14 00:32	73.7501	-161.0951
201709140120	2017-09-14 01:22	73.9165	-161.2175
201709140210	2017-09-14 02:12	74.0836	-161.3348
201709140302	2017-09-14 03:03	74.2503	-161.4608
201709141347	2017-09-14 13:49	74.7613	-161.9621
201709141754	2017-09-14 17:56	75.0000	-162.9998
201709141909	2017-09-14 19:11	75.0003	-164.0016
201709141915	2017-09-14 19:19	74.9926	-164.0713
201709150136	2017-09-15 01:38	75.0003	-166.0031
201709150251	2017-09-15 02:53	75.0000	-167.0006
201709150607	2017-09-15 06:09	75.0000	-168.0001
201709150721	2017-09-15 07:23	75.0001	-169.0011
201709150835	2017-09-15 08:37	74.9998	-169.9991
201709150948	2017-09-15 09:50	75.0000	-170.9993
201709151100	2017-09-15 11:02	75.0003	-171.9988
201709151213	2017-09-15 12:15	75.0001	-172.9993
201709151327	2017-09-15 13:29	74.9996	-173.9998
201709151440	2017-09-15 14:42	75.0000	-175.0013
201709151554	2017-09-15 15:56	75.0003	-176.0000
201709151707	2017-09-15 17:09	75.0000	-177.0000

Related Information



Enlarge Image

MR17-05C
Ship Name: MIRAI
Period: 2017-08-24 - 2017-10-01
Chief Scientist: Shigeto Nishino (JAMSTEC)
Project Name: [Arctic Ocean Climate System Reaserch]
Proposal ▸ Arctic Challenge for Sustainability (ArCS)
Title:

Update History

2019-11-29	An observation data was registerd.