CTD Data RV Heincke HE563
Data Processing Report

Contents

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1 Introduction

This report describes the processing of CTD raw data acquired by Seabird SBE 911plus CTD on board RV Heincke during expedition HE563.

2 Workflow

The different steps of processing and validation are visualized in Figure 1. The CTD raw data are delivered from AWI by Gerd Rohardt or Sandra Tippenhauer. The station book of the RV Heincke cruise is extracted from the DAVIS SHIP data base (https://dship.awi.de). The first CTD station and cast is processed manually in SBE Data Processing to configure the *.psa Seabird routines *Data Conversion*, *Wild Edit*, *Bottle Summary*, *Split*, *Translate*, *Cell Thermal Mass*, *Loop Edit* and *Bin Average*. The Seabird routines are then run in a batch job *CTDjob* in ManageCTD to process the complete CTD data set. The downcast of each CTD station/cast is used for further processing. In *CTDjob* the start record and the lowest altimeter point of the downcast is selected. With the *Utilities → Dship Ebook* function of ManageCTD the DAVIS SHIP station book extraction is used for getting the header information of all CTD stations/casts of the cruise. ManageCTD *Utilities → Find Profile* function compares station times of the header with the entries in the station book to find out the correct naming of the stations and casts. In *CTDheader* in ManageCTD the header information of each CTD station/cast is displayed, controlled and corrected if necessary. *CTDdespike* in ManageCTD is used for a visual check of the data and to erase/interpolate spikes in the data if necessary. Additionally, a sensor pair (Temp1/Sal1 or Temp2/Sal2) is chosen for each station/cast of the RV Heincke cruise in *CTDdespike*.

ManageCTD *Utilities → CheckDoubleSensors* controls the quality of temperature and conductivity sensors. For this purpose outliers of too high sensor pair differences could be removed. The data is then converted to spreadsheet format with *dsp2odv* for visualization of the data in Ocean Data View (ODV). The processed CTD data are written to text files and imported to PANGAEA (http://www.PANGAEA.de) for publication.
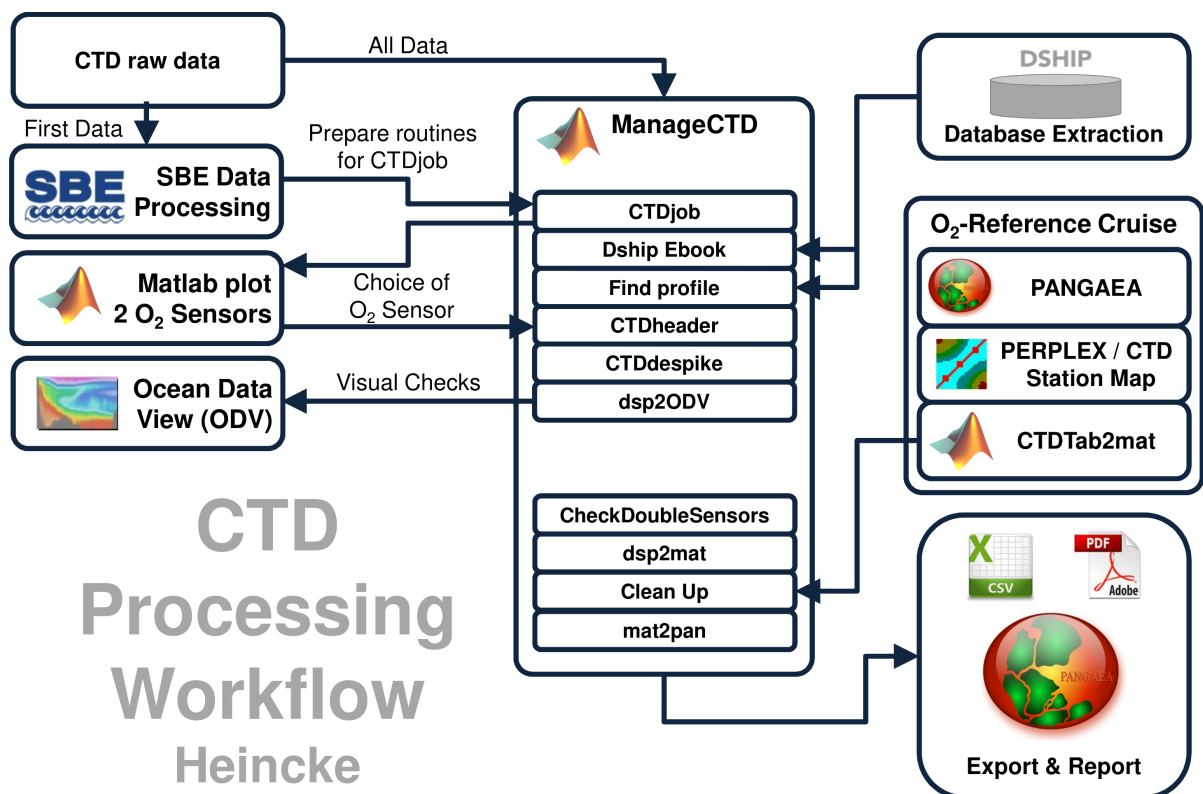
Figure 1: CTD data Processing Workflow

3 Cruise details

Vessel name	RV Heincke
Cruise name	HE563
Cruise start	06.10.2020 Bremerhaven
Cruise end	20.10.2020 Bremerhaven
Cruise duration	15 days
No. of CTD casts	163

4 Sensor Layout

This chapter describes the CTD sensors mounted during this cruise. No oxygen sensors were deployed during HE549.

SBE 911plus CTD (SN: 1015), SBE Instrument Configuration Version 7.23.0.1.

ID	Sensor Name	Serial No.	Calibration Date
55	TemperatureSensor	5354	13-Dec-19
3	ConductivitySensor	2470	17-Dec-19
45	PressureSensor	1015	26-Jan-17
55	TemperatureSensor	5375	13-Dec-19
3	ConductivitySensor	3573	17-Dec-19
0	AltimeterSensor	46466	23-Mar-09
71	WET_LabsCStar	1348DR	28-Jan-2016
20	FluoroWetlabECO_AFL_FL_Sensor	1365	15-Jan-2016

5 Processing

Details of processing procedures and processing parameters are described in *CTD Processing Logbook of RV Heincke* (hdl: 10013/epic.47427).

Density Inversions and Manual Validation

Obvious outliers were removed manually. For the visual check density inversions > 0.005 kg/m^3 and > 0.01 kg/m^3 were flagged differently for display but not removed automatically. Decisions whether the flagged values were manually removed or not are based on the description in *CTD Processing Logbook of RV Heincke* (hdl: 10013/epic.47427).

Sensor Differences
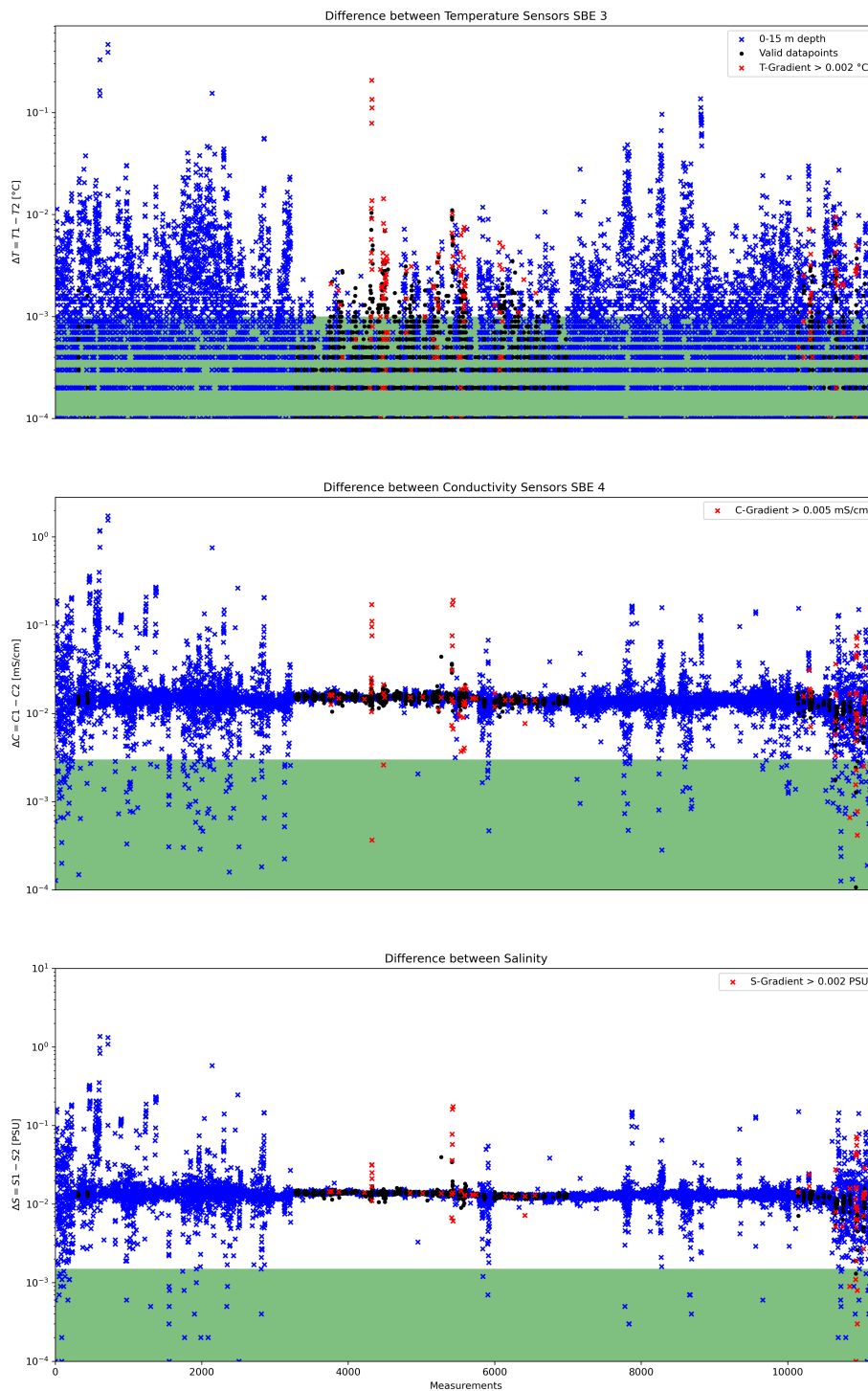
Figure 2: Data accuracy of sensor pairs HE563

6 Results

A complete processing overview for each sensor at each station is summarized in the table in the Appendix (Figure 3).

Double Sensor Check

In Figure 2, the absolute residuals between the sensorpairs are shown for the measured parameters *Temperature* and *Conductivity*, the derived parameter *Salinity*. Measurements in shallow water depths < 15 m (blue crosses) and gradients between two datapoints exceeding a defined threshold (red crosses) were omitted for accuracy calculation.

Parameter	Accuracy given by manufacturer	Measurements removed Surface 0-15m + gradient filter	Remaining measurements within accuracy specifications
Temperature	$\pm 0.001\,^{\circ}C$	81.06%	89.60%
Conductivity	$\pm 0.003\,mS/cm$	80.80%	0.23%
Salinity	$\pm 0.0015\,PSU$	80.55%	0.05%

Comments

- 163 CTD "max depth/on ground" entries in DShip station book

- 165 CTD raw data sets delivered

- 2 CTD raw data sets were tests

- 4 CTD casts were done on the same station HE563_1-1 (p001a01, p001a03, p001a04, p001a05)

- 163 CTD casts processed and uploaded

- of these 163 processed CTD casts:
    - 157 data points interpolated
    - 200 data points erased

Result files

Text File (HE563_phys_oce.tab):

The format is a plain text (tab-delimited values) file.

Column separator	Tabulator "\t"
Column 1	Event label
Column 2	Date/Time of event
Column 3	Latitude of event
Column 4	Longitude of event
Column 5	Elevation of event
Column 6	DEPTH, water
Column 7	Pressure, water
Column 8	Temperature, water
Column 9	Conductivity
Column 10	Salinity
Column 11	Temperature, water, potential
Column 12	Density, sigma-theta (0)
Column 13	Oxygen
Column 14	Oxygen, saturation
Column 15	Attenuation, optical beam transmission
Column 16	Fluorometer
Column 17	Number of observations

Processing Report (CTD-HE563-report.pdf):

This PDF document.

Station HE563_	Gear Abbr.	Date	Time	Position Latitude	Position Longitude	Depth [m]	File Name HE563_	Sensor pair	Temp interp	Temp erased	Sal interp	Sal erased	Trans interp	Trans erased	Fluor interp	Fluor erased	Oxy interp	Oxy erased	complete interp	complete erased	2 Oxy Sensor	2 Oxy Offset	Oxy ref cruise/sss-cc	dist. (km)	Offset	Comments
1-1-1	CTD	09.10.2020	12:21	53° 31.357' N	008° 33.615' E	10.1	p001a01	1																		no btl
1-1-2	CTD	09.10.2020	13:07	53° 31.239' N	008° 33.369' E	8.8	p001a03	1	1	4	1	4	1	4	1	4			4	28						no btl
1-1-3	CTD	09.10.2020	13:16	53° 31.255' N	008° 33.436' E	9.2	p001a04	1		5		5		5		5				20						no btl
1-1-4	CTD	09.10.2020	13:26	53° 31.292' N	008° 33.514' E	10.0	p001a05	1		4		4		4		4				16						no btl
2-1	CTD	10.10.2020	3:46	53° 37.068' N	006° 20.117' E	13.1	p002a01	1																		
3-1	CTD	10.10.2020	5:19	53° 37.170' N	006° 31.496' E	9.4	p003a01	1																		
4-1	CTD	10.10.2020	6:37	53° 33.178' N	006° 41.912' E	12.1	p004a01	1		2		2		2		2				8						
5-1	CTD	10.10.2020	7:50	53° 29.128' N	006° 50.155' E	9.5	p005a01	1	1		1		1		1				4							
6-1	CTD	10.10.2020	9:02	53° 24.777' N	006° 56.796' E	6.6	p006a01	1																		
7-1	CTD	10.10.2020	10:01	53° 19.880' N	007° 00.115' E	7.6	p007a01	1	1		1		1		1				4							
8-1	CTD	10.10.2020	11:04	53° 19.973' N	007° 09.894' E	7.3	p008a01	1																		
9-1	CTD	10.10.2020	13:58	53° 29.465' N	006° 47.069' E	10.8	p009a01	1																		
9-3	CTD	10.10.2020	14:58	53° 29.485' N	006° 47.070' E	10.8	p009a03	1																		
9-5	CTD	10.10.2020	15:07	53° 29.473' N	006° 47.074' E	10.8	p009a05	1																		no btl, Jo-Jo style measurement
9-7	CTD	10.10.2020	15:35	53° 29.488' N	006° 47.070' E	10.7	p009a07	1																		Jo-Jo style measurement
9-9	CTD	10.10.2020	16:04	53° 29.468' N	006° 47.068' E	10.6	p009a09	1																		Jo-Jo style measurement
9-11	CTD	10.10.2020	16:40	53° 29.476' N	006° 46.984' E	10.7	p009a11	1	1		1		1		1				4							no btl, Jo-Jo style measurement
9-13	CTD	10.10.2020	17:04	53° 29.482' N	006° 46.981' E	10.4	p009a13	1																		no btl, Jo-Jo style measurement
9-14	CTD	10.10.2020	17:34	53° 29.487' N	006° 46.965' E	10.2	p009a14	1																		no btl, Jo-Jo style measurement
9-15	CTD	10.10.2020	18:05	53° 29.484' N	006° 46.956' E	9.8	p009a15	1																		Jo-Jo style measurement
9-16	CTD	10.10.2020	18:42	53° 29.488' N	006° 46.956' E	9.6	p009a16	1																		no btl
9-17	CTD	10.10.2020	19:08	53° 29.488' N	006° 46.956' E	9.4	p009a17	1																		no btl, Jo-Jo style measurement
9-18	CTD	10.10.2020	19:34	53° 29.489' N	006° 46.957' E	9.3	p009a18	1																		no btl, Jo-Jo style measurement
9-19	CTD	10.10.2020	20:04	53° 29.492' N	006° 46.960' E	9.3	p009a19	1	1	16	1	16	1	12	1	12			4	56						Jo-Jo style measurement
9-20	CTD	10.10.2020	20:34	53° 29.495' N	006° 46.964' E	9.1	p009a20	1																		no btl, Jo-Jo style measurement
9-21	CTD	10.10.2020	21:05	53° 29.500' N	006° 47.022' E	9.0	p009a21	1																		no btl, Jo-Jo style measurement
9-22	CTD	10.10.2020	21:36	53° 29.496' N	006° 47.052' E	9.0	p009a22	1																		no btl, Jo-Jo style measurement
9-23	CTD	10.10.2020	22:03	53° 29.496' N	006° 47.066' E	9.0	p009a23	1																		no btl, Jo-Jo style measurement
9-24	CTD	10.10.2020	22:33	53° 29.481' N	006° 47.073' E	9.5	p009a24	1																		Jo-Jo style measurement
9-25	CTD	10.10.2020	23:02	53° 29.464' N	006° 47.063' E	9.8	p009a25	1	1		1		1		1				4							no btl, Jo-Jo style measurement
9-26	CTD	10.10.2020	23:32	53° 29.464' N	006° 47.065' E	10.2	p009a26	1																		no btl, Jo-Jo style measurement
9-27	CTD	11.10.2020	0:01	53° 29.459' N	006° 47.061' E	10.3	p009a27	1																		no btl, Jo-Jo style measurement
9-28	CTD	11.10.2020	0:33	53° 29.453' N	006° 47.055' E	10.4	p009a28	1																		no btl, Jo-Jo style measurement
9-29	CTD	11.10.2020	1:03	53° 29.458' N	006° 47.067' E	10.7	p009a29	1																		no btl, Jo-Jo style measurement
9-30	CTD	11.10.2020	1:31	53° 29.470' N	006° 47.075' E	10.7	p009a30	1	1		1		1		1				4							no btl, Jo-Jo style measurement
9-31	CTD	11.10.2020	2:02	53° 29.458' N	006° 47.068' E	10.8	p009a31	2																		Jo-Jo style measurement
9-32	CTD	11.10.2020	2:35	53° 29.489' N	006° 47.075' E	10.9	p009a32	1																		no btl, Jo-Jo style measurement
9-33	CTD	11.10.2020	3:02	53° 29.495' N	006° 47.070' E	10.7	p009a33	2																		no btl, Jo-Jo style measurement
9-34	CTD	11.10.2020	3:32	53° 29.465' N	006° 47.077' E	10.9	p009a34	1																		no btl, Jo-Jo style measurement
9-35	CTD	11.10.2020	4:01	53° 29.493' N	006° 47.076' E	10.9	p009a35	1																		no btl, Jo-Jo style measurement
9-36	CTD	11.10.2020	4:31	53° 29.508' N	006° 47.053' E	10.8	p009a36	1																		no btl, Jo-Jo style measurement
9-37	CTD	11.10.2020	5:01	53° 29.498' N	006° 47.070' E	10.4	p009a37	1																		no btl, Jo-Jo style measurement
9-38	CTD	11.10.2020	5:31	53° 29.506' N	006° 47.010' E	10.4	p009a38	1																		no btl, Jo-Jo style measurement
9-39	CTD	11.10.2020	6:02	53° 29.503' N	006° 46.984' E	10.0	p009a39	1																		Jo-Jo style measurement

Figure 3: CTD data Processing Summary HE563

Station HE563_	Gear Abbr.	Date	Time	Position Latitude	Position Longitude	Depth [m]	File Name HE563_	Sensor pair	Temp interp	Temp erased	Sal interp	Sal erased	Trans interp	Trans erased	Fluor interp	Fluor erased	Oxy interp	Oxy erased	complete interp	complete erased	2 Oxy Sensors Sensor	2 Oxy Sensors Offset	O2 ref cruise/sss-cc	O2 ref dist. (km)	O2 ref Offset	Comments
9-40	CTD	11.10.2020	6:39	53° 29.501' N	006° 46.973' E	9.9	p009a40	2																		no btl, Jo-Jo style measurement
9-41	CTD	11.10.2020	7:06	53° 29.498' N	006° 46.969' E	9.8	p009a41	2																		no btl, Jo-Jo style measurement
9-43	CTD	11.10.2020	7:36	53° 29.501' N	006° 46.972' E	9.7	p009a43	1	1		1		1		1				4							no btl, Jo-Jo style measurement
9-45	CTD	11.10.2020	8:07	53° 29.501' N	006° 46.972' E	9.4	p009a45	1																		Jo-Jo style measurement
9-47	CTD	11.10.2020	8:46	53° 29.504' N	006° 46.977' E	9.3	p009a47	1																		no btl
9-48	CTD	11.10.2020	9:05	53° 29.499' N	006° 46.974' E	9.1	p009a48	1	1		1		1		1				4							no btl, Jo-Jo style measurement
9-50	CTD	11.10.2020	9:34	53° 29.496' N	006° 46.973' E	9.2	p009a50	1																		no btl, Jo-Jo style measurement
10-1	CTD	11.10.2020	10:01	53° 29.490' N	006° 46.981' E	9.2	p010a01	1																		Jo-Jo style measurement
10-3	CTD	11.10.2020	10:35	53° 29.472' N	006° 47.050' E	9.0	p010a03	1																		no btl, Jo-Jo style measurement
10-5	CTD	11.10.2020	11:07	53° 29.461' N	006° 47.068' E	9.3	p010a05	2																		no btl, Jo-Jo style measurement
10-7	CTD	11.10.2020	11:35	53° 29.460' N	006° 47.070' E	9.5	p010a07	1																		no btl, Jo-Jo style measurement
10-10	CTD	11.10.2020	12:03	53° 29.466' N	006° 47.077' E	9.7	p010a10	1																		no btl, Jo-Jo style measurement
10-12	CTD	11.10.2020	12:34	53° 29.454' N	006° 47.063' E	9.7	p010a12	1																		no btl, Jo-Jo style measurement
10-14	CTD	11.10.2020	13:03	53° 29.466' N	006° 47.080' E	10.0	p010a14	1																		no btl, Jo-Jo style measurement
10-16	CTD	11.10.2020	13:32	53° 29.465' N	006° 47.078' E	10.2	p010a16	1	1		1		1		1				4							no btl, Jo-Jo style measurement
10-18	CTD	11.10.2020	14:02	53° 29.459' N	006° 47.071' E	10.2	p010a18	1	1		1		1		1				4							Jo-Jo style measurement
11-1	CTD	12.10.2020	10:04	53° 51.953' N	006° 21.026' E	23.3	p011a01	1	1		1		1		1				4							no btl
12-1	CTD	12.10.2020	10:33	53° 51.842' N	006° 17.875' E	24.5	p012a01	1																		
13-1	CTD	12.10.2020	11:36	53° 54.741' N	006° 16.711' E	24.7	p013a01	1																		
14-1	CTD	12.10.2020	12:46	53° 53.662' N	006° 24.169' E	22.1	p014a01	1																		no btl
15-1	CTD	12.10.2020	14:05	54° 03.583' N	006° 22.247' E	27.5	p015a01	1	3		3		3		3				12							
16-1	CTD	13.10.2020	6:09	55° 25.250' N	004° 22.831' E	36.2	p016a01	1	1		1		1		1				4							
18-1	CTD	13.10.2020	7:46	55° 27.029' N	004° 28.804' E	28.1	p018a01	1	1		1		1		1				4							
19-1	CTD	13.10.2020	9:37	55° 22.860' N	004° 39.710' E	43.2	p019a01	1	1		1		1		1				4							
20-1	CTD	13.10.2020	11:44	55° 14.913' N	004° 56.085' E	43.1	p020a01	1																		
21-1	CTD	13.10.2020	13:14	55° 07.264' N	005° 13.749' E	36.5	p021a01	1	1		1		1		1				4							
22-1	CTD	13.10.2020	14:58	54° 58.230' N	005° 33.617' E	35.9	p022a01	1	1		1		1		1				4							
23-1	CTD	13.10.2020	16:39	54° 49.794' N	005° 53.426' E	37.4	p023a01	1				1														
24-1	CTD	13.10.2020	18:55	54° 40.281' N	006° 14.924' E	37.0	p024a01	1	2		2		2		2				8	1						
25-1	CTD	13.10.2020	20:37	54° 30.974' N	006° 35.977' E	34.8	p025a01	1	1		1		1		1				4							
26-1	CTD	13.10.2020	22:32	54° 20.798' N	006° 58.965' E	34.6	p026a01	1	3		3		3		3				12							
27-1	CTD	13.10.2020	23:54	54° 14.304' N	007° 14.532' E	33.3	p027a01	1	1		1		1		1				4							
28-1	CTD	15.10.2020	12:47	54° 23.438' N	007° 27.711' E	16.3	p028a01	1	1		1		1		1				4							
29-1	CTD	15.10.2020	14:07	54° 29.042' N	007° 29.979' E	12.7	p029a01	1	1		1		1		1				4							
30-1	CTD	15.10.2020	15:13	54° 29.108' N	007° 59.958' E	16.2	p030a01	1	1		1		1		1				4							
31-1	CTD	15.10.2020	18:11	54° 14.155' N	007° 50.424' E	33.6	p031a01	1	1		1		1		1				4							
32-1	CTD	15.10.2020	19:17	54° 06.877' N	007° 14.759' E	33.6	p032a01	1	1		1		1		1				4							
33-1	CTD	15.10.2020	20:15	54° 00.279' N	007° 18.689' E	27.6	p033a01	1																		
34-1	CTD	15.10.2020	20:58	53° 56.178' N	007° 22.342' E	23.2	p034a01	1	1		1		1		1				4							
35-1	CTD	15.10.2020	21:44	53° 51.886' N	007° 24.971' E	19.3	p035a01	1	1		1		3						3							
36-1	CTD	16.10.2020	22:31	53° 47.257' N	007° 29.979' E	9.0	p036a01	1																		
38-1	CTD	16.10.2020	7:15	53° 48.663' N	007° 35.418' E	12.4	p038a01	2																		
39-1	CTD	16.10.2020	8:02	53° 50.444' N	007° 35.462' E	17.4	p039a01	1																		
40-1	CTD	16.10.2020	9:27	53° 52.551' N	007° 38.436' E	20.3	p040a01	1			1		2						2							
41-1	CTD	16.10.2020	10:16	53° 50.549' N	007° 42.596' E	12.4	p041a01	1																		
42-1	CTD	16.10.2020	11:22	53° 48.717' N	007° 42.387' E	9.2	p042a01	1																		
43-1	CTD	16.10.2020	12:33	53° 48.714' N	007° 38.413' E	10.5	p043a01	1																		
44-1	CTD	16.10.2020	13:29	53° 48.584' N	007° 35.418' E	10.4	p044a01	1		1		1		1		1				4						no btl
46-1	CTD	16.10.2020	19:21	53° 48.733' N	007° 42.498' E	8.4	p046a01	1		1																
46-2	CTD	16.10.2020	19:37	53° 48.735' N	007° 42.496' E	8.9	p046a02	1						1		1				4						no btl
46-3	CTD	16.10.2020	20:06	53° 48.737' N	007° 42.493' E	9.1	p046a03	1		1																no btl
46-4	CTD	16.10.2020	20:35	53° 48.733' N	007° 42.495' E	9.5	p046a04	1		1				1		1				4						
46-5	CTD	16.10.2020	21:05	53° 48.733' N	007° 42.494' E	9.5	p046a05	1																		no btl

Figure 4: CTD data Processing Summary HE563

Station HE563_	Gear Abbr.	Date	Time	Position Latitude	Position Longitude	Depth [m]	File Name HE563_	Sensor pair	Temp interp	Temp erased	Sal interp	Sal erased	Trans interp	Trans erased	Fluor interp	Fluor erased	Oxy interp	Oxy erased	complete interp	complete erased	Comments
46-6	CTD	16.10.2020	21:34	53° 48.729' N	007° 42.496' E	9.7	p046a06	1													no btl
46-7	CTD	16.10.2020	22:02	53° 48.729' N	007° 42.495' E	10.0	p046a07	1													no btl
46-8	CTD	16.10.2020	22:32	53° 48.732' N	007° 42.494' E	9.8	p046a08	1													
46-9	CTD	16.10.2020	23:01	53° 48.737' N	007° 42.490' E	9.9	p046a09	1													no btl
46-10	CTD	16.10.2020	23:33	53° 48.741' N	007° 42.485' E	9.6	p046a10	1													
46-11	CTD	17.10.2020	0:03	53° 48.732' N	007° 42.461' E	9.1	p046a11	1													no btl
46-12	CTD	17.10.2020	0:33	53° 48.730' N	007° 42.453' E	8.5	p046a12	1		1		1		1		1				4	no btl
46-13	CTD	17.10.2020	1:02	53° 48.741' N	007° 42.451' E	8.5	p046a13	1													no btl
46-14	CTD	17.10.2020	1:31	53° 48.740' N	007° 42.444' E	8.3	p046a14	1													no btl
46-15	CTD	17.10.2020	2:03	53° 48.741' N	007° 42.447' E	7.9	p046a15	1													
46-16	CTD	17.10.2020	2:32	53° 48.728' N	007° 42.440' E	7.6	p046a16	2		1		1		1		1				4	no btl
46-17	CTD	17.10.2020	3:04	53° 48.725' N	007° 42.447' E	7.4	p046a17	1													no btl
46-18	CTD	17.10.2020	3:31	53° 48.725' N	007° 42.449' E	7.4	p046a18	1													no btl
46-19	CTD	17.10.2020	4:03	53° 48.733' N	007° 42.447' E	7.2	p046a19	1													no btl
46-20	CTD	17.10.2020	4:33	53° 48.732' N	007° 42.448' E	6.9	p046a20	1		1		1		1		1				4	no btl
46-21	CTD	17.10.2020	5:02	53° 48.718' N	007° 42.453' E	6.8	p046a21	1													no btl
46-22	CTD	17.10.2020	5:32	53° 48.722' N	007° 42.473' E	6.9	p046a22	1													
46-23	CTD	17.10.2020	6:06	53° 48.726' N	007° 42.483' E	7.3	p046a23	1													
46-24	CTD	17.10.2020	6:34	53° 48.728' N	007° 42.498' E	8.0	p046a24	1													
46-26	CTD	17.10.2020	7:04	53° 48.730' N	007° 42.499' E	8.4	p046a26	1													
46-28	CTD	17.10.2020	7:35	53° 48.712' N	007° 42.489' E	9.0	p046a28	1													
46-30	CTD	17.10.2020	8:04	53° 48.727' N	007° 42.500' E	8.7	p046a30	1													no btl
46-31	CTD	17.10.2020	8:35	53° 48.731' N	007° 42.498' E	9.7	p046a31	1													no btl
48-1	CTD	17.10.2020	17:05	53° 49.447' N	007° 52.482' E	9.1	p048a01	1													
48-2	CTD	17.10.2020	17:34	53° 49.450' N	007° 52.481' E	9.1	p048a02	1													no btl
48-3	CTD	17.10.2020	18:05	53° 49.443' N	007° 52.516' E	9.3	p048a03	1													no btl
48-4	CTD	17.10.2020	18:34	53° 49.433' N	007° 52.534' E	9.6	p048a04	1													
48-5	CTD	17.10.2020	19:05	53° 49.418' N	007° 52.552' E	9.8	p048a05	1													
48-6	CTD	17.10.2020	19:36	53° 49.420' N	007° 52.564' E	10.4	p048a06	1													no btl
48-7	CTD	17.10.2020	20:05	53° 49.420' N	007° 52.563' E	10.7	p048a07	1													no btl
48-8	CTD	17.10.2020	20:35	53° 49.423' N	007° 52.563' E	11.1	p048a08	1													
48-9	CTD	17.10.2020	21:05	53° 49.428' N	007° 52.564' E	11.7	p048a09	1													
48-10	CTD	17.10.2020	21:34	53° 49.419' N	007° 52.562' E	12.1	p048a10	1													
48-11	CTD	17.10.2020	22:03	53° 49.422' N	007° 52.563' E	12.2	p048a11	1													no btl
48-12	CTD	17.10.2020	22:32	53° 49.427' N	007° 52.564' E	12.4	p048a12	1													no btl
48-14	CTD	17.10.2020	23:02	53° 49.437' N	007° 52.562' E	12.3	p048a14	1	1		1		1		1				4		
48-15	CTD	17.10.2020	23:32	53° 49.435' N	007° 52.565' E	12.4	p048a15	1													
48-16	CTD	18.10.2020	0:02	53° 49.443' N	007° 52.565' E	12.3	p048a16	1	1		1		1		1				4		
48-17	CTD	18.10.2020	0:32	53° 49.444' N	007° 52.565' E	12.0	p048a17	1													
48-18	CTD	18.10.2020	1:02	53° 49.442' N	007° 52.563' E	11.7	p048a18	1													
48-19	CTD	18.10.2020	1:34	53° 49.431' N	007° 52.472' E	11.3	p048a19	1	1		1		1		1				4		
48-20	CTD	18.10.2020	2:02	53° 49.421' N	007° 52.474' E	10.8	p048a20	1													
48-21	CTD	18.10.2020	2:33	53° 49.404' N	007° 52.491' E	10.5	p048a21	2													
48-22	CTD	18.10.2020	3:01	53° 49.422' N	007° 52.469' E	10.2	p048a22	1													
48-23	CTD	18.10.2020	3:32	53° 49.414' N	007° 52.475' E	10.4	p048a23	1	2		2		2		2				8		
48-24	CTD	18.10.2020	4:05	53° 49.416' N	007° 52.481' E	9.6	p048a24	1	1		1		1		1				4		
48-25	CTD	18.10.2020	4:33	53° 49.408' N	007° 52.499' E	9.5	p048a25	1													
48-26	CTD	18.10.2020	5:02	53° 49.396' N	007° 52.557' E	10.2	p048a26	1													
48-27	CTD	18.10.2020	5:33	53° 49.386' N	007° 52.554' E	8.8	p048a27	1													
48-28	CTD	18.10.2020	6:34	53° 49.428' N	007° 52.535' E	24.5	p048a28	1													
48-29	CTD	18.10.2020	7:06	53° 49.354' N	007° 52.546' E	8.4	p048a29	1													
48-30	CTD	18.10.2020	7:35	53° 49.378' N	007° 52.657' E	20.2	p048a30	1												31	
48-31	CTD	18.10.2020	8:06	53° 49.382' N	007° 52.723' E	11.7	p048a31	1		8		8		8		7					
49-1	CTD	18.10.2020	9:35	53° 47.723' N	008° 02.164' E	14.3	p049a01	1	1		1		1		1				4		
50-1	CTD	18.10.2020	10:08	53° 45.497' N	008° 04.223' E	13.9	p050a01	2													
51-1	CTD	18.10.2020	10:51	53° 41.449' N	008° 04.731' E	21.8	p051a01	1													
52-1	CTD	18.10.2020	11:40	53° 37.189' N	008° 09.703' E	14.1	p052a01	1													
53-1	CTD	18.10.2020	12:13	53° 34.933' N	008° 10.604' E	14.3	p053a01	1	1		1		1		1				4		
54-1	CTD	18.10.2020	12:53	53° 31.487' N	008° 10.870' E	15.3	p54a01	1	1		1		1		1						
56-1	CTD	19.10.2020	8:10	53° 59.325' N	008° 14.793' E	8.7	p56a01	1	1		1		1		1						
57-1	CTD	19.10.2020	9:32	53° 58.437' N	008° 27.406' E	16.0	p57a01	1	1		1		1		1						

Figure 5: CTD data Processing Summary HE563

| Station HE563_	Gear Abbr.	Date	Time	Position Latitude	Position Longitude	Depth [m]	File Name HE563_	Sensor pair	Temp interp	Temp erased	Sal interp	Sal erased	Trans interp	Trans erased	Fluor interp	Fluor erased	Oxy interp	Oxy erased	complete interp	complete erased	2 Oxy Sensors Sensor	2 Oxy Sensors Offset	Oxygen reference cruise/sss-cc	dist. (km)	Offset	Comments
58-1	CTD	19.10.2020	10:27	53° 56.753' N	008° 37.923' E	14.8	p58a01	1																		
59-1	CTD	19.10.2020	11:15	53° 52.655' N	008° 42.706' E	19.6	p59a01	1																		
60-1	CTD	19.10.2020	11:49	53° 50.647' N	008° 46.487' E	19.7	p60a01	1																		
61-1	CTD	19.10.2020	12:28	53° 50.433' N	008° 53.576' E	15.9	p61a01	1																		
62-1	CTD	19.10.2020	13:19	53° 52.057' N	009° 03.739' E	14.8	p62a01	1																		
									40	52	40	53	45	48	40	47	0	0	157	200						

Figure 6: CTD data Processing Summary HE563
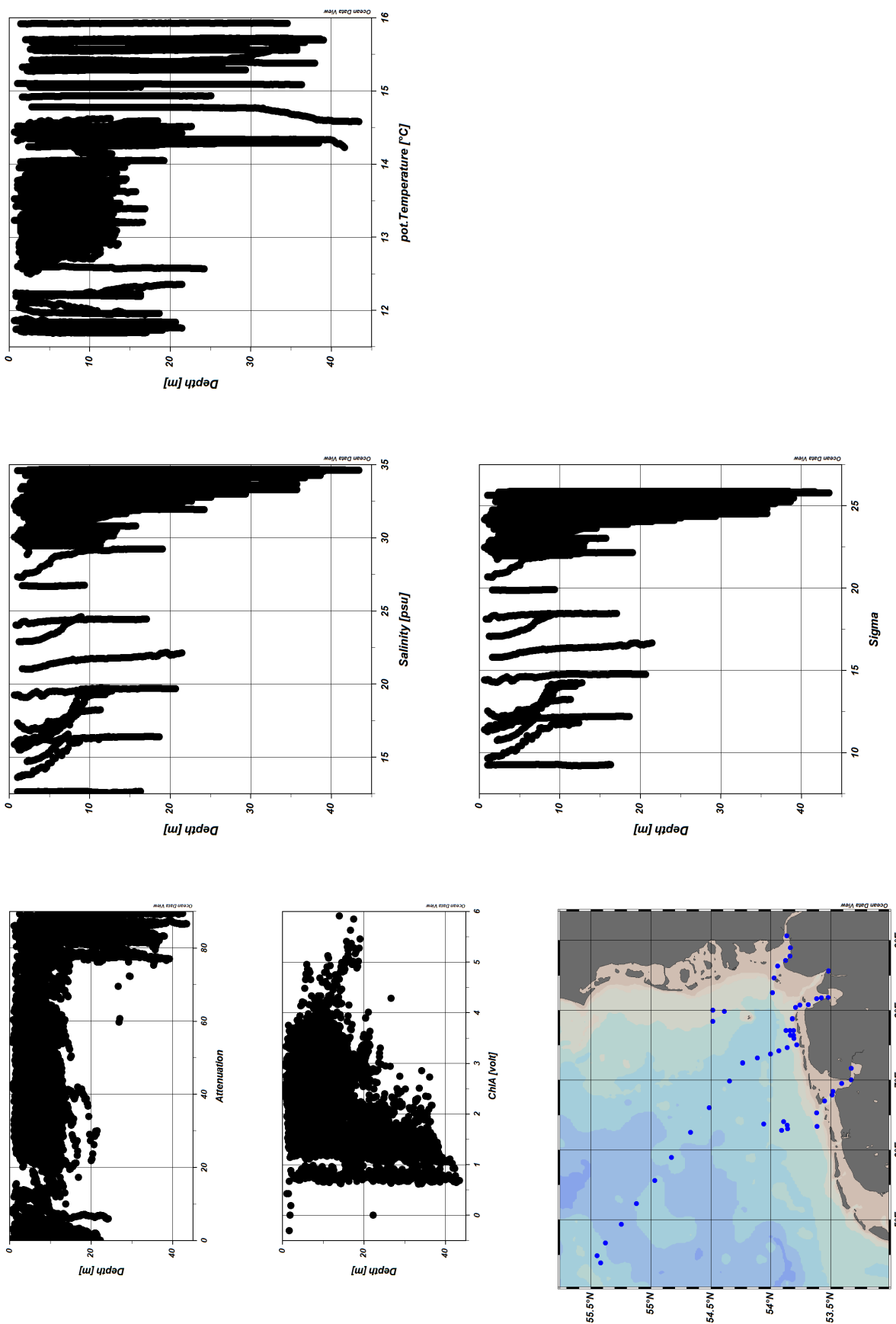
Figure 7: ODV Screenshot of HE563 CTD data