Línea de acción 5

Análisis de escenarios de derrames

Procesamiento de datos de CTD, termosalinómetro y ADCPs

Reporte de datos

Experimento de Dispersión en Aguas Profundas

(DWDE-2)

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1 INTRODUCTION

This study is part of the megaproject “Ocean observation platforms, base line, numerical modeling and scenarios of natural response capability of the Gulf of Mexico, under potential large scale oil spills”, conducted by the Consorcio de Investigación del Golfo de México (CIGoM), and funded by Fondo Sectorial SENER-CONACyT-Hidrocarburos. The overall goals of the megaproject include: improve the predictability of pollutant transport; obtain a baseline of biological, ecological and biogeochemical parameters; and establish possible consequences of large scale oil spill scenarios in the deep waters of the Gulf of Mexico.

The large megaproject is subdivided in several subprojects, and the activities of the cruise reported here are part of the Deep Water Dispersion Experiment (DWDE), which is the observational program of the subproject “Deep and shallow particle dispersion and biological connectivity over the continental slope in the western Gulf of Mexico”, the goals of which are:

- Provide new information on the most important transport mechanisms of pollutants released in the deep waters of the Perdido region.
- Provide a dataset to assess the accuracy of numerical model predictions and improve the parameterizations of submesoscale features in ocean models for deep water regions of the Gulf of Mexico.
- Develop a solid understanding of background levels of hydrocarbon fluorescence as well as carbon sources in the deep water regions of the Gulf of Mexico.
- Integrate biological connectivity estimations with model predictions to increase our understanding of the influence of mesoscale features on pelagic populations.

This report summarizes the data processing of the ship data obtained during DWDE-2.

2 Stations

DWDE2 campaign consisted of 28 stations where biological, chemical and physical samples were collected, and where a glider was released in the region of Perdido (western Gulf of Mexico).

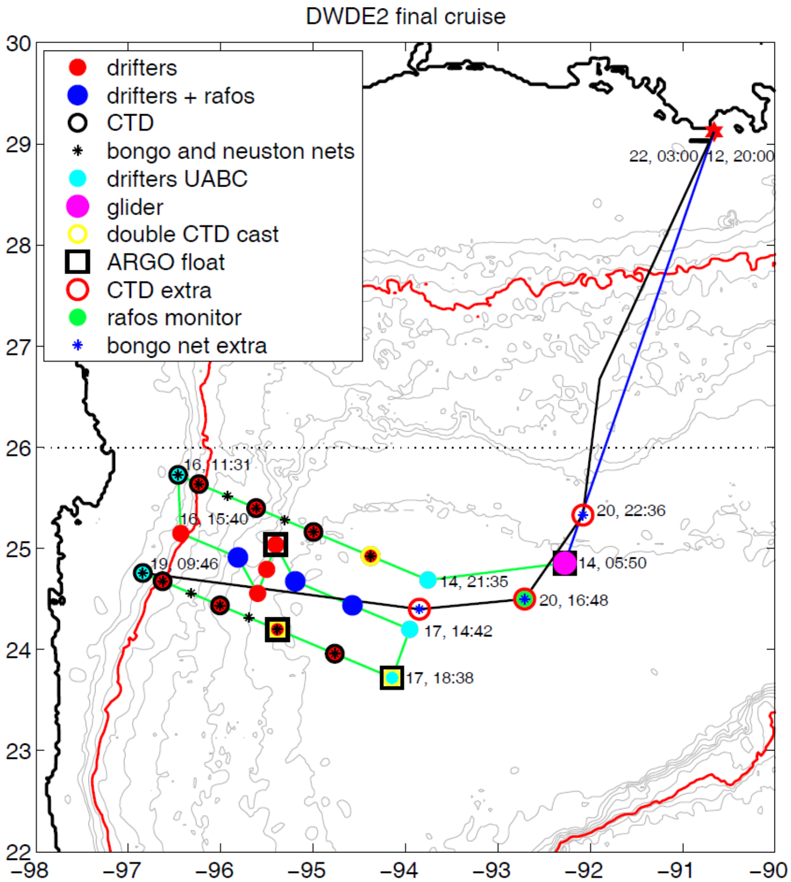

Figure 1: Stations DWDE-2

The surface circulation patterns (20th October) and ship trajectory are shown in Figure 2. Particularly of interest are the large anticyclone centered at (-92.5,24.5) and the smaller cyclone located in the north. This eddies were measured by the three ship mounted ADCPs and with the CTD casts.

The Figure 3 shows the vorticity (vort) and Kintetic Energy (KE) field derived from AVISO. Some interesting features are the high KE signal associated to the anticyclone, and the high positive vorticity patches around the same eddy.

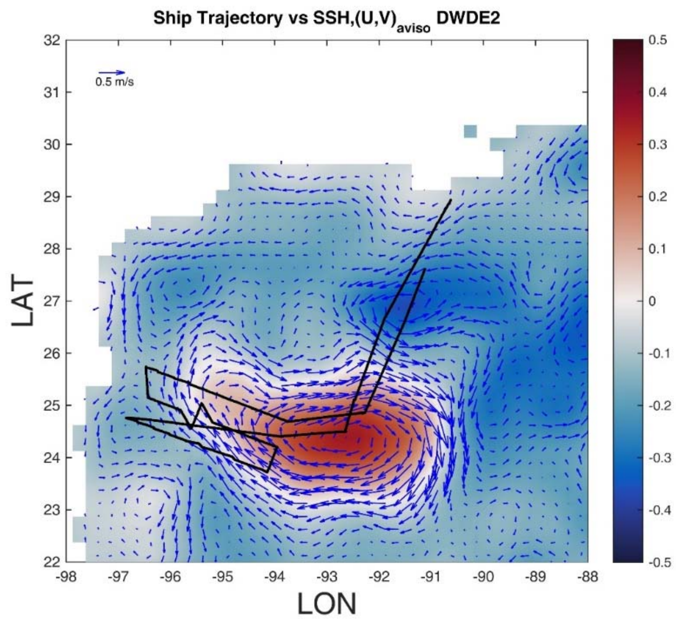

Figure 2. Sea surface circulation pattern for the 20th of October and ship path. The map shows a large anticyclone in the Perdido region, and several other mesoscale structures in the Gulf of Mexico.

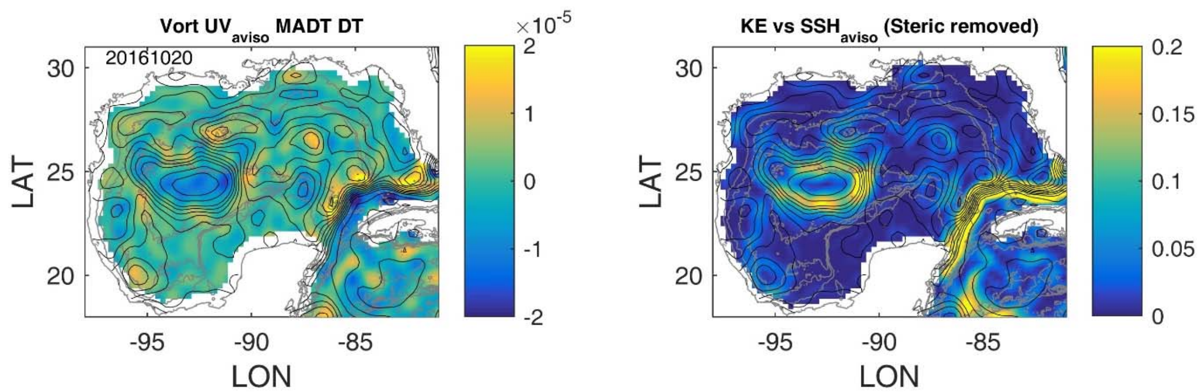

Figure 3: Vorticity and Kinetic Energy GoM.

3 DESCRIPTION OF DATA

3.1 General

This report describes the data acquired during the DWDE2 cruise in the region of Perdido in the Gulf of Mexico from 12th to 22th of October, 2016, on board the R/V Pelican. A total of 18 CTD casts were collected in two cross-shelf transects: north (E13-E17) and south (E1-E5 stations), and Eddy see Figure 1.

3.1.1 CTD instrument

The CTD instrument used during this cruise was an SBE-911 plus, made by Sea-bird Electronics Inc.

The CTD was equipped with the standard sensors: temperature, conductivity (salinity) and pressure (depth). In addition, four backscatter fluorometers were installed to determine the distribution of hydrocarbons, chlorophyll and natural chromophoric dissolved organic matter (CDOM). The CDOM sensor, from WetLabs, with an excitation/emission setting of 370nm/460nm, two hydrocarbon Aquatracka UV sensors from Chelsea Technologies with an excitation/emission setting of 239nm/360nm and finally, an Aquatracka III Chlorophyll-a sensor also from Chelsea Technologies. The CTD was also equipped with two oxygen sensors. All the sensors were deployed at all hydrographic stations. Specifications for the CTD sensors are given in Table 1.

PARAMETERS AND SENSORS	RANGE	ACCURACY	RESOLUTION (at 24 Hz)	CALIB. DATE
Conductivity: SBE04 (x2)	0-70 Sm-1	0.003 Sm-1	0.0004Sm-1	4/12/2016
Pressure: Paroscientifi Digiquartz	0-10350 dbar	0.015% of full scale	0.001% of full scale	1/25/2016

Temperature: SBE03 (x2)	-5.0 - +35 °C	± 0.001 °C	0.0003 °C	4/12/2016
Oxygen: SBE43 (x2)	120% of surface saturation	± 2% of saturation	N/A	2/9/2016
Colored Dissolved Organic Matter: Fluorometer Wet Labs CDOM	Chl-a: 0.03-75 µg/L, Uranine: 0.03-75 µg/L	N/A	Chl-a: 0.03 µg/L, Uranine: 1 µg/l	5/22/2007
Hydrocarbons: Fluorometer Chelsea Aquatracka III	Hydrocarbon (refined): 0.001-10 µg/L, Hydrocarbon (crude): 0.001-10 µg/L, CDOM: 0.001-10 µg/L	± 0.02 µg/l or 3% whichever the greater	Hydrocarbon (refined): 0.001 µg/L, Hydrocarbon (crude): 0.001 µg/L, CDOM: 0.001 µg/L	12/1/2015
Hydrocarbons: Fluorometer Chelsea UV Aquatracka (x2)	Chl-a: 0.01-100 µg/L, Rhodamine: 0.01-100 µg/L, Fluorescein: 0.01-100 µg/L, Turbidity: 0.01-100 FTU	N/A	Chl-a: 0.01 µg/L, Rhodamine: 0.01 µg/L, Fluorescein: 0.01 µg/L, Turbidity: 0.01 FTU	12/1/2015
Beam Transmission: transmissiometer Wetlabs C-Star	0-100%	N/A	N/A	8/3/2016

Table 1: CTD sensor specifications and calibration dates.

During the DWDE2 cruise it was discovered that the quality of Chelsea UV Aquatracka hydrocarbon sensor from Dr. Rainer Amon was insufficient. In order to compare the performance the same sensor was compared with other UV sensor of the same type. During this cruise it was discovered that calibration of both sensors was not good, and important differences in the profiles were detected.

3.1.2 Thermosalinograph

In addition, surface data was continuously collected along track by the ship's Sea-bird Electronics SBE 21 thermosalinograph, a Wetstar Fluorometer and a WETLabs CStar 25.0-centimeter path length transmissometer.

The data collected were: temperature, salinity, chlorophyll-a, and beam transmission. Specifications of the sensors are given in Table 2.

Table 2: Thermosalinograph sensor specifications and calibration dates DWDE-2.

PARAMETERS AND SENSORS	RANGE	ACCURACY	RESOLUTION (at 24 Hz)	CALIB. DATE
Conductivity	0 - 7 Sm-1	± 0.001 S/m	0.0001 S/m	N/A
Temperature	-5 to +35 °C	± 0.01 °C	0.001 °C	N/A
Temperature, SBE 38 remote	-5 to +35 °C	± 0.001 °C	0.0003 °C	N/A

Chlorophyll-a	0.03-75 µg/L		0.03 µg/L	N/A
Beam Transmission: transmissometer Wetlabs C-Star	0-100%	N/A	N/A	2/12/2015 field calibration: 06-14-2016

3.1.3 ADCPs

R/V Pelican have three Acoustic Doppler Current Profilers (1200 kHz, 300 kHz and 75 kHz RDI).

To resolve the surface with high detail it uses an ADCP Workhorse 1200 Khz. The instrument is configured with a vertical resolution (bin size) of 0.5m and time resolution of two minutes. Depending on the operation conditions the maximum range achieved is about 12m. The first measured bin is at 5m depth giving us information down to 17 meters.

A Workhorse 300KHz ADCP was configured with a vertical resolution of 2 meters and a time resolution of 2 minutes. The maximum range achieved during the measurement campaign was 70 m. The blanking distance for this instrument was approximately 9 m, thus the instrument measured correctly up to 80m.

Finally, to measure large depths an Ocean Surveyor 75 Khz was used. This instrument was configured with a bin size of 16m and time resolution of 5 minutes. The maximum achieved range was approximately 770 m, considering a blanking distance of 27 m, in good conditions, the instrument measured up to 790 m.

As stated before, the range that the instruments measure depends on multiple factors: the instrument characteristics, the navigation and the weather conditions. Measurements under low-wind (small-waves) conditions are the best.

At the end of the cruise around the 20th of October, strong Northern winds created high waves. The result was the loss of data due to the erratic ship movement, see

Figure 4. The gap is also visible in the WH1200KHz and WH300KHz (not shown here).

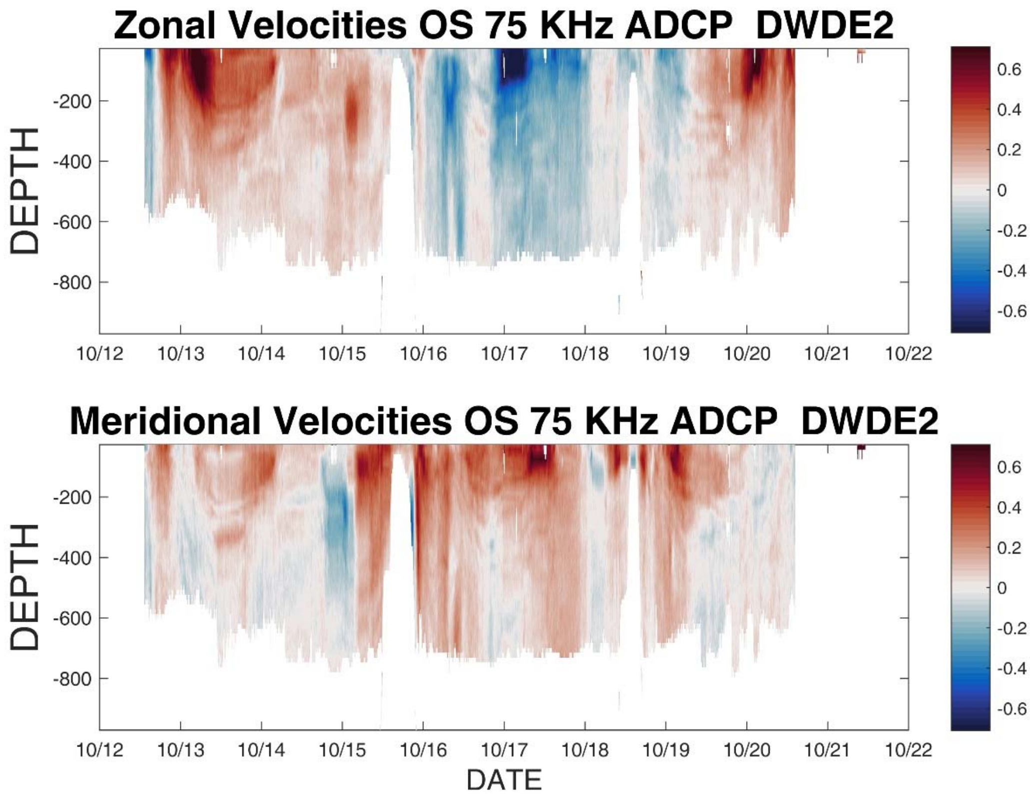

Figure 4: Zonal and Longitudinal velocities measured by the 75 kHz ADCP during the DWDE-2 cruise. The gap at the end was caused by bad weather during the cruise.

4 DATA PROCESSING

4.1 CTD

The CTD data processing consisted of two stages: Seabird: Seasave and Data Processing modules and Python CTD library.

4.1.1 Seabird processing

The first part of the processing of CTD data was done using Seabird software Version 7.26.6.26.

1. First step in this stage was to convert data from its original hexadecimal values (frequency and voltage) to ascii values (from HEX to CNV files), during this stage a hysteresis correction was applied to the Oxygen values. The conversion process was performed using the Seasave program from Seabird.

The extracted variables and their units are presented in Table 3:

Table 3: CTD variables DWDE2 campaign.

VAR. NAME	VARIABLE MEASURED	UNITS
prDM	Pressure, Digiquartz	Db
Pumps	Pump Status	on(1)/off(0)
t090C	Temperature (ITS-90)	ºC
t190C	Temperature, 2 (ITS-90)	ºC
timeS	Time, Elapsed	Seconds
Spar	SPAR/Surface Irradiance	microEinsteins/m2/s
sal00	Salinity, Practical	PSU
sal11	Salinity, Practical, 2	PSU
sbeox0ML/L	Oxygen, SBE 43	ml/l
sbeox1ML/L	Oxygen, SBE 43, 2	ml/l
wetCDOM	Fluorescence, WET Labs CDOM	mg/m^3
flCUVA	Fluorescence, Chelsea UV Aquatracka	ug/l
flCUVA1	Fluorescence, Chelsea UV Aquatracka	ug/l
flC	Fluorescence, Chelsea Aquatracka	ug/l

CStarTr0	Beam Transmission, WET Labs C-Star	%
depSM	Depth (salt water)	M
dz/dtM	Descent Rate	m/s
Latitude	Latitude	Deg
Longitude	Longitude	Deg
Scan	Scan Count	Count
altM	Altimeter	M
timeJ	Julian Days	Days
c0S/m	Conductivity	S/m
c1S/m	Conductivity, 2	S/m
sbeox0Mm/Kg	Oxygen, SBE 43	µmol/kg

2. Following the extraction of the variable, the **Wildedit** module was used. This module eliminates bad data: large values and values flagged as "bad" are eliminated from the data series. To discard bad data, the module calculates the mean 100 data points (corresponding to about 5 seconds of sampling) and eliminates those values where data deviates by more than 2 standard deviations. And the process is repeated with the new ensemble, and data deviating more than 20 standard deviations are flagged as bad.

3. The module **Filter** is used to low-pass filter the salinity and pressure with constants A=0.03 and B=0.15 seconds, respectively.

4. Next step in the processing is aligning the oxygen and conductivity data, two seconds and 0.73 seconds are applied respectively to oxygen and conductivity and salinity. This alignment is applied using the **align CTD** module.

5. The last stage of the Seabird processing is to apply **Celltm** module. This step apply cell thermal mass correction for the lag in the response of temperature sensor.

6. Finally, data is then saved as ascii CNV files.

4.1.2 Python CTD processing

The second part of the processing of the CTD data was performed using the Python CTD library (https://github.com/ocefpaf/python-ctd). A tool to load hydrographic data into Pandas DataFrame. This library includes some methods for data pre-processing and analysis.

In this stage a seven-steps processing was performed:

1. First a moving average with a time window of 2 seconds is applied to descent velocity and oxygen values. This filter is applied to remove the noise of the high frequency signals. The descent velocity will be used to remove pressure reversals later on.

2. Remaining bad values are eliminated from the wetCDOM, flCUVA, flC, and CStarTr0 variables. In some occasions the lack of synchronization between sensors and the data acquisition system results in wrong recorded values. This values can be detected as jumps in the data that have a fixed value (e.g. 0). This values were not removed by the Wild Edit module. This step is important to avoid the generation of artificial peaks in the processed data.

3. Pressure reversals are the eliminated from the dataset using a threshold velocity of 0.25 m/s. The pressure reversals arise from the ship heave. This method is equivalent to **Loop Edit** module of Sea-bird.

4. A despiking process is applied to all series. The despike process is equivalent to Wildedit from Seabird.

5. Splitting on downcast and upcast is performed. This step consist of separating the data from down and up components of the casts. Usually the downcast is the data that is used to analyze due to the fact that instruments are measuring undisturbed parcels of water.

6. Bin average of the data is performed in order to obtain data every 1 dBar.

7. The data were inspected visually for each cast, comparing upcast and downcasts, as well as the primary and secondary sensors, after which final editing of the data were made.

8. Data is saved as CSV files ready to be used.

The final data result from the processed data collected by the primary sensors during the downcast. The positions for each cast were obtained by averaging the ships' GPS data over the duration of the CTD downcast

4.2 ADCPs

The ADCP data were collected and pre-processed by the python UHDAS-CODAS system implemented by the University of Hawaii, which automatically and continuously graphed the data in near-real time.

UHDAS (University of Hawaii Data Acquisition System) is an open source acquisition software, this is responsible for acquiring the three ADCPs and other instrument's data required for the processing. UHDAS is capable to acquire information from several ADCPs using only one computer, this is an advantage compared with the VmDAS system (Teledyne RD Instruments) which needs one computer per ADCP.

The **CODAS processing** (Common Ocean Data Access System) processing system is a Python and C suite of programs specially designed to process and store ADCP data. CODAS processing system uses data from ADCPs, GPS and navigation system to extract velocities of the flow relative to the ship.

In general, four steps are needed to process ADCP data:

1. A reference layer is used to remove the ship's speed from the velocities measured by the ADCPs. By assuming the oceans reference layer is smooth, positions can be nudged to smooth the ship's velocity, which directly results in a smooth reference layer.

2. GPS heading correction of the gyro heading, using a quality-controlled difference in headings. A GPS-derived heading source may provide a more accurate (but less reliable) heading source than the gyro.

3. Estimation of the heading misalignment from either "bottom track " or "water track". Watertrack calibration use sudden accelerations (such as stopping and starting of the ship when doing station-work) to derive an estimate if the heading misalignment.

4. Edition of the database to remove bad data.

CODAS processing is managed by the Python program quick_adcp.py. The actual steps for processing the ADCP data with the CODAS processing software are the following:

1. Setting up a processing directory (**adcptree.py**)

2. Scanning the data files in order to determine whether there are issues with timestamps that need to be addressed. Two operations are performed in during this stage:
    - List time ranges and other information about the data files

- Create a file with the time range of the data

3. Load data into CODAS database. This is achieved by calling quick_adcp.py with a control file with parameters for processing. When working with UHDAS the program handles single-ping data and performs the following actions:
    1. Read the ADCP and ancillary serial data
    2. Find the UTC time, position and attitude
    3. Edit out bad single-ping velocities
    4. Average the single ping data
    5. Write to disk

4. Heading correction: obtain a heading correction for the gyro heading, using the GPS-based attitude device and check the health of the accurate heading device.

5. Navigation: find and smooth the reference layer.

6. Calibration: determine preliminary angle and amplitude calibrations from watertrack and/or bottom track data (using corrected headings)

7. Editing: bottom interference, wire interference, bubbles, ringing, identifying problems with heading and underway bias. This includes the use of gautoedit manual processing.

8. Calibration: final calibration using edited data.

9. Documentation: record the different steps during the processing of the data.

10. Extraction: netcdf or matlab files.

4.3 Thermosalinograph

Data from thermosalinograph was extracted from MIDAS dataset. Due to the different time resolutions for the navigation and thermosalinograph a process to merge the data was needed.

The MIDAS system collects atmospheric and sea surface data, but only Temperature, Salinity and Fluorescence were extracted.

Figure 5 shows Temperature, Salinity and Fluorescence along the ship track measured by the thermosalinograph. A region of low temperatures (T<29°C) is located at the north of the large mesoscale eddy. A region of low salinity (S<35.4PSU) is located also at the north of the eddy, but also in a small cyclonic eddy located east of the anticyclone, signaling the presence of fresh water due to Mississippi river. That waters have a high (F>2.2 mg/l) Chlorophyl-a content, it can be observed that maximum Chl is observed in cold waters north of the large eddy.

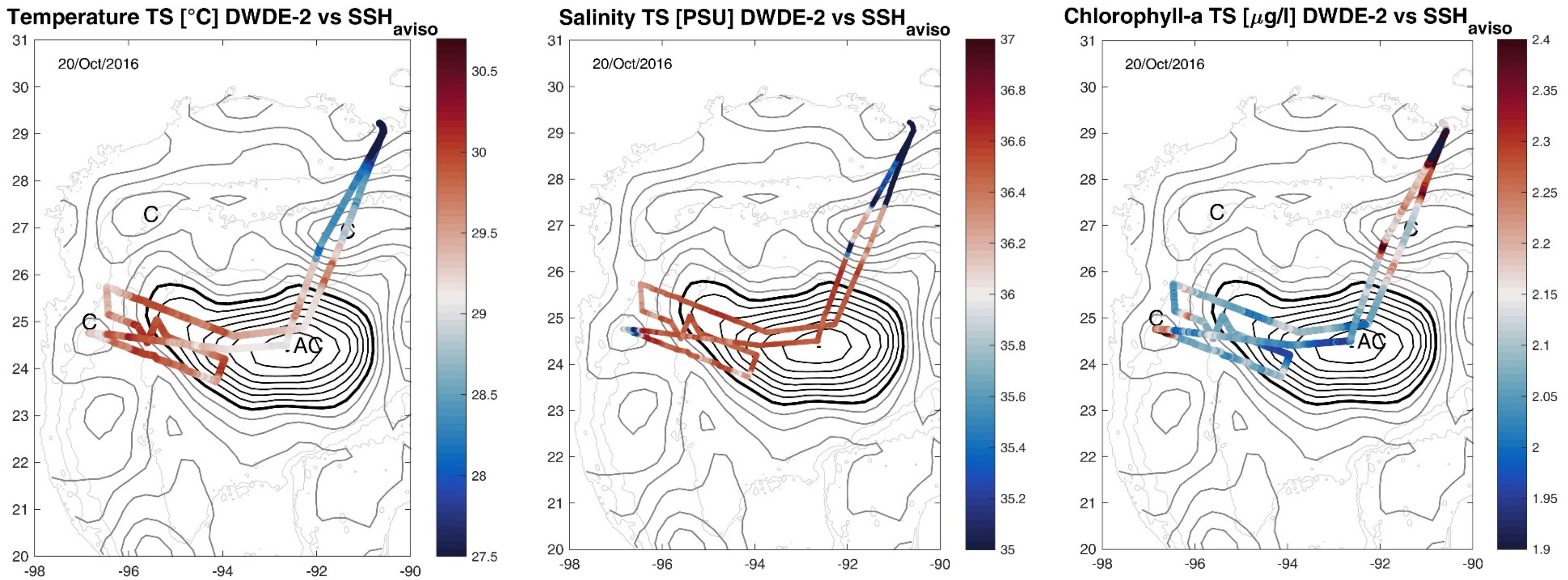

Figure 5: Temperature, Salinity and Chlorophyll-a measured along ship path during DWDE-2 cruise.

5 CTD casts transects

The transect casts were collected along 2 cross-shelf sections: south and north. Each consisting of five casts.

The information about the CTD casts is given in Table 4. The depths corresponds to maximum depth reached in the cast, not to the planned depth. The latitudes and longitudes where calculated as the mean value of the cast positions recorded by the GPS.

Table 4: CTD cast's information for DWDE2 cruise.

DAY	SECTION	STATION	CAST #	DEPTH (m)	Lat	Long
10/14/2016	Eddy	Eddy	1	3632	24° 51.420 N	93° 43.380 W
10/15/2016	North	E13	2	3689	24° 55.572 N	95° 37.380 W
10/15/2016	North	E13	3	3684	24° 56.280 N	95° 34.770 W
10/16/2016	North	E14	4	3532	25° 09.330 N	95° 01.380 W
10/16/2016	North	E15	5	1410	25° 24.156 N	96° 22.920 W
10/16/2016	North	E16	6	580	25° 38.400 N	97° 45.708 W
10/16/2016	North	E17	7	102	25° 43.680 N	97° 32.430 W
10/16/2016	South	E1.b	8	3740	23° 43.248 N	95° 51.228 W
10/16/2016	South	E1.b	9	3740	23° 45.180 N	95° 47.340 W
10/16/2016	South	E1	10	3690	23° 57.768 N	95° 13.950 W

10/16/2016	South	E2	11	3455	24° 11.910 N	96° 36.978 W
10/16/2016	South	E2.b	12	3425	24° 14.508 N	96° 34.410 W
10/16/2016	South	E3	13	2506	24° 26.310 N	97° 59.418 W
10/16/2016	South	E4	14	660	24° 40.77 N	97° 22.248 W
10/19/2016	South	E5	15	154	24° 45.438 N	97° 9.300 W
10/20/2016	Eddy	Eddy2	16	3733	24° 24.072 N	94° 09.072 W
10/20/2016	Eddy	Eddy3	17	3725	24° 30.072 N	93° 21.942 W
10/21/2016	Eddy	Eddy4	18	3508	25° 6.7380 N	93° 31.248 W

As presented in DWDE1 report, results will be presented using the new **International Thermodynamic Equation Of Seawater – 2010 (TEOS-10) [1]**. A thermodynamic description of sea water based on Gibbs function, in this formulation of thermodynamic properties are calculated directly and are fully consistent.

First, as an alternative to the T-S diagram, the diagram of Absolute Salinity vs Conservative Temperature is shown in Figure 6. The figure also shows iso-contours of potential density anomaly and spiciness. Dissolved oxygen (in color shows deep waters (d>1000 m) having large concentrations. Data obtained inside of the large anticyclonic eddy is clearly differentiated from the rest of the data with values of SA>36.6 and 15<CT<26.

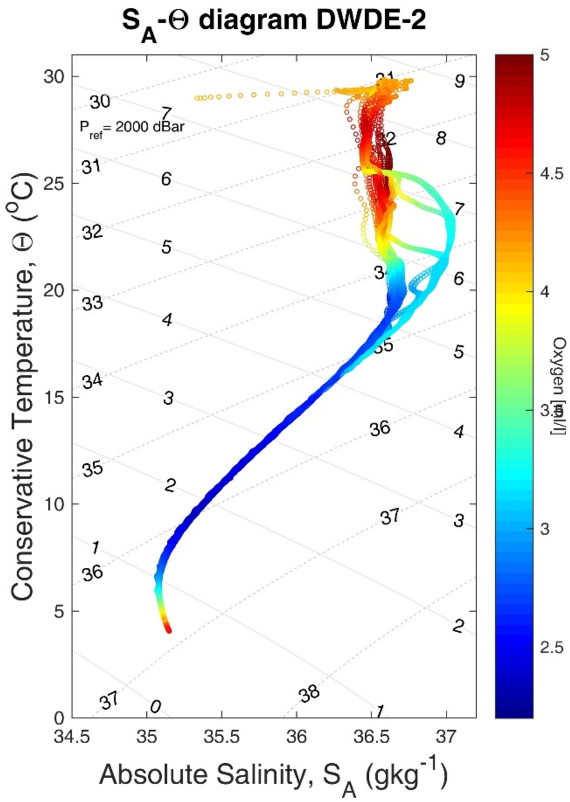

Figure 6: Absolute Salinity vs Conservative temperature diagram for downcast data DWDE-2 σ_t and π (spiciness) contours are shown every 1.0 g/kg.

5.1 Section South

Cross-shelf section plots of In Conservative Temperature, Absolute Salinity, Oxygen, Beam Transmissivity, Brunt-Vaisala frequency, CDOM, CUVA and Chlorophyl are shown from Figure 7 to Figure 13. Appendix E shows the corresponding plots for Section North.

Figure 7 shows the Conservative temperature section. It can be observed a very well mixed region extending up to ~50 m. A cold signal close to the shelf is consistent with the presence of a cyclonic eddy in this region.

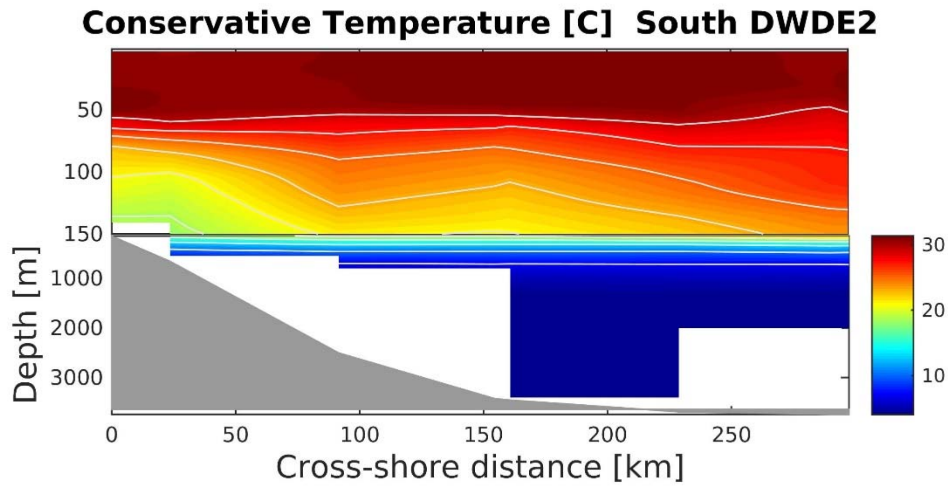

Figure 7: Conservative Temperature section South DWDE2.

In TEOS-10, Absolute Salinity (SA) is preferred over Practical Salinity due to the fact that SA is the appropriate salinity variable for the accurate calculation of horizontal density gradients in the ocean, and it is also the appropriate salinity variable for the calculation of freshwater fluxes and for calculations involving the exchange of freshwater with the atmosphere.

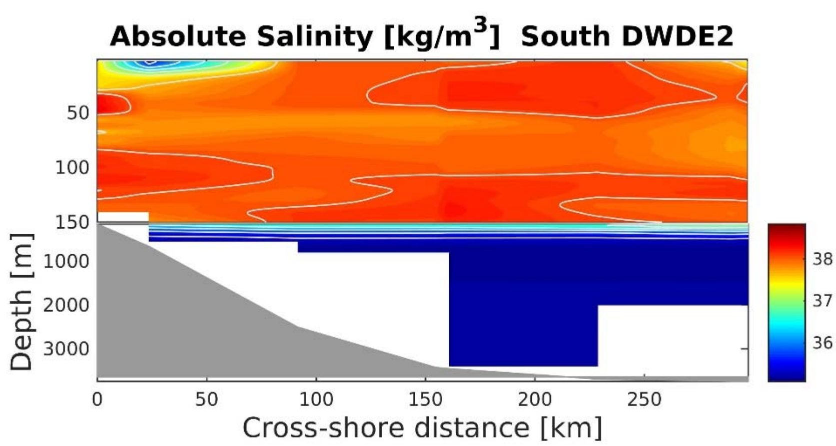

Figure 8: Absolute Salinity section South DWDE2 cruise.

Figure 8 shows a surface low salinity signal. It is probably related with the presence of river waters advected into the sampled eddy. That fresh water signal is detected also in the thermosalinograph data.

Figure 9 shows a subsurface maximum in oxygen (O >0.4 ml/l) between 50 and 100 m for all the section, and a minimum (O<.3 ml/l) between 100 and 150 meters close to the shelf and between 500 and 150 m in the deeper part of the section, and larger values (O>0.4 ml/l) below 1000 m. The low values of oxygen below 100m, close to the shelf, are also consistent with the upwelling due to the cyclonic eddy.

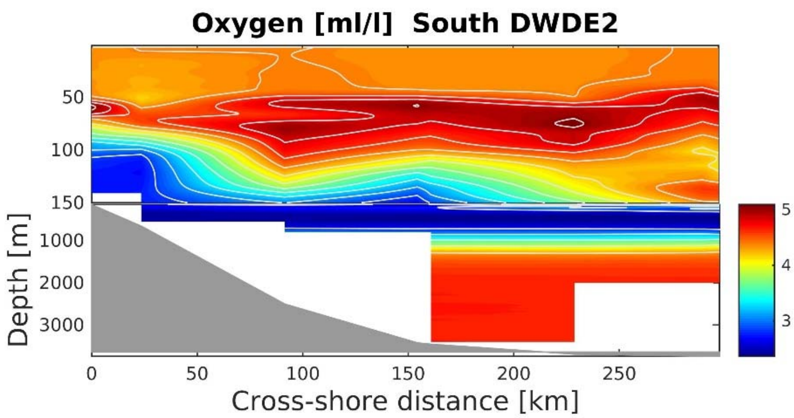

Figure 9: Oxygen section South DWDE2 cruise.

Figure 10 shows a subsurface region with low transmissivity region between 50 and 100m deep close to the shelf, and it is related with a cyclonic eddy sampled during the cruise.

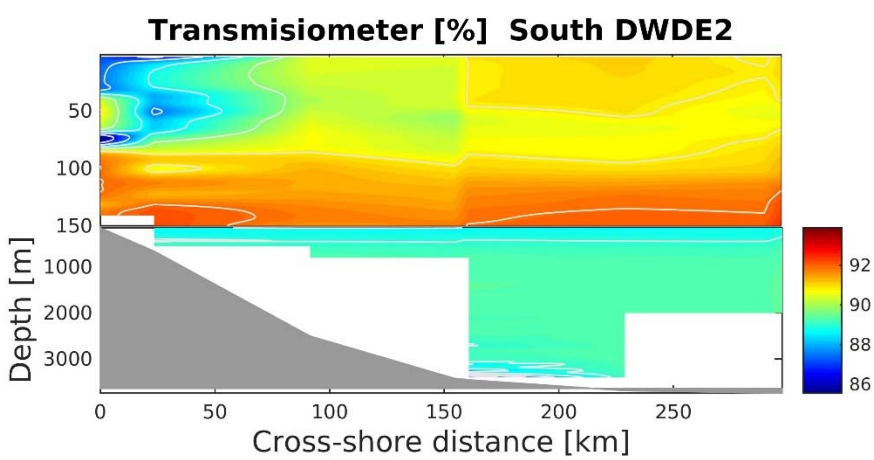

Figure 10: Beam transmission section South DWDE2.

Close to the shelf, two peaks of large Brunt-Vaisala frequency is located between 50m and 80m deep (Figure 11), just above the region of low transmissivity. This might be related with the position of the picnocline. A peak (~5s-2) is also located close to the surface ~15m, and it is related with surface low salinity waters.

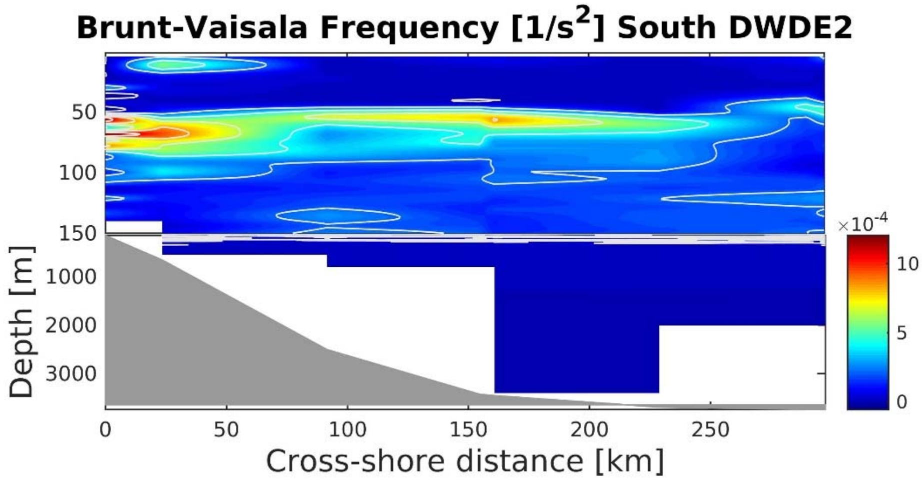

Figure 11: Brunt-Vaisala Frequency section South DWDE2.

The CDOM section in Figure 12 shows large values (>.8 mg/m^3) below 1000 m and peak (~.6mg/m3) in the surface where the low salinity water was detected.

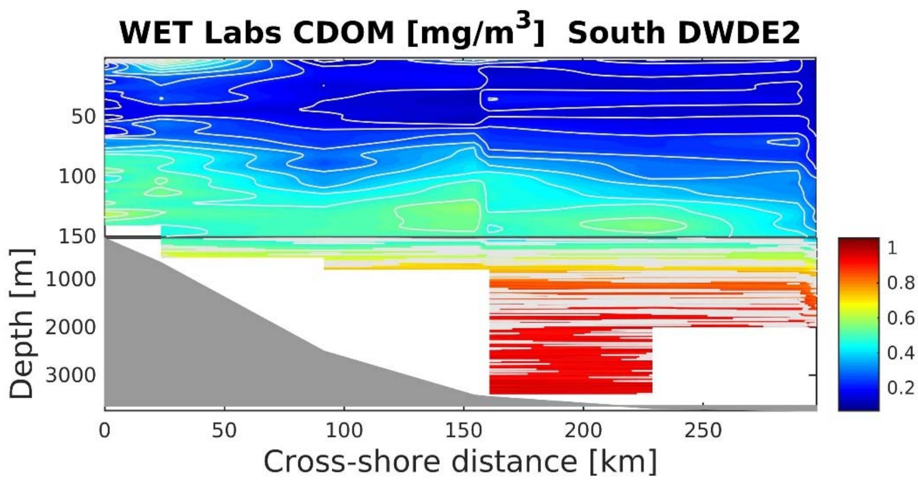

Figure 12: Colored Dissolved Organic Matter section South DWDE2.

Close to the shelf, the Chlorophyll-a Chelsea UV in Figure 13 shows a region of high fluorescence values (~0.3 μg/l) near the surface but more interesting is the region below 50 the region of high Brunt-Vaisala frequency, where Chelsea UV fluorometer gives large values (0.25 μg/l) in the measured Chlorophyll-a . The position coincides with the region of low beam transmission, signaling the presence of large amounts of organic matter.

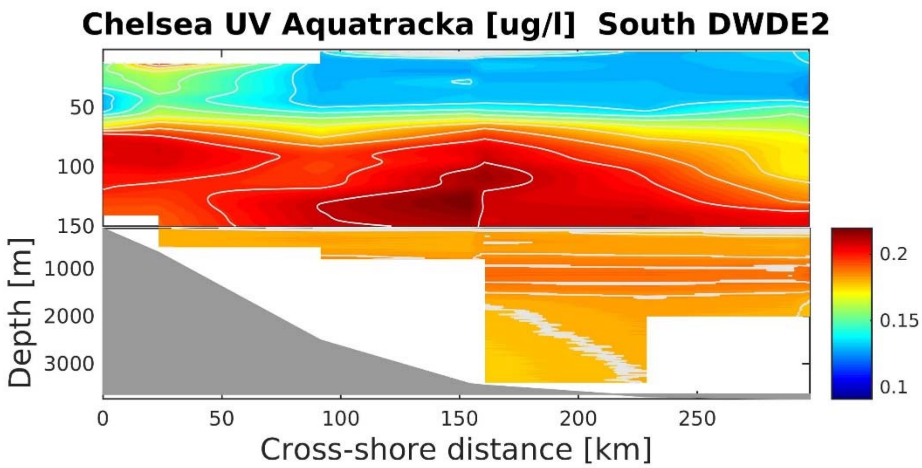

Figure 13: Chelsea UV Aquatracka hydrocarbon section South DWDE2.

The hydrocarbon Aquatracka UV sensor cannot differentiate between hydrocarbons and proteins coming from terrestrial waters (personal communication with Rainer Amon). In Figure 13 a region of high concentration (>.17 ug/l) is located in the surface. This is consistent with the presence of a region of low salinity water due to river discharge.

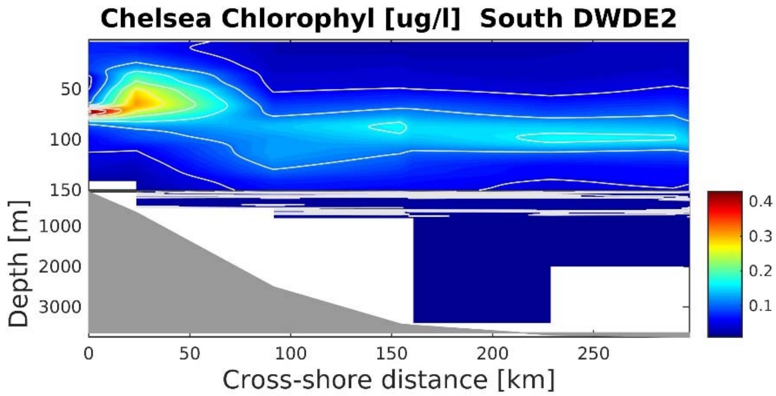

Figure 14: Chelsea Chlorophyl-a Aqua sensor DWDE2.

Chlorophyl-a sensor detects a region of high concentration close to the shelf. That signal is related with a cyclonic eddy that was sampled during the cruise, the thermosalinograph data also shows this high concentration of chlorophyl in the surface (Figure 5) but that signal could also be due to the presence of coastal waters.

6 REFERENCIAS Y AGRADECIMIENTOS

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[3] **Python CTD ver. 0.2.1**: *Tools to load hydrographic data as DataFrames,* https://github.com/ocefpaf/python-ctd, *accessed 15-Nov-2016*

[4] **Seasoft V2: SBE Data Processing CTD Data Processing & Plotting Software for Windows** manual. Ver. 7.25.0

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7 Appendix

7.1 APPENDIX A. Scientific Crew

Scientific crew DWDE2

Name	Institution
Dra. Paula Pérez Brunius*	CICESE
Sharon Herzka	CICESE
Rainer M. W. Amon	TAMUG
Ayal Anis	TAMUG
Paula García Carrillo	CICESE
Argelia Ronquillo Méndez	CICESE
Alejandro Domínguez Guadarrama	CICESE
Mónica Cecilia Mozqueda Torres	CICESE
Renata Goulart	CICESE
Jesús Cano	CICESE
Javier Rodríguez	CICESE
Marc Piedeleu	CICESE
Sergei Molodtsov	TAMU
*** Chief Scientist**	

7.2 APPENDIX B. CTD calibration sheets

PSA file: D:\CTD Data\2016\PE16_25_Bower_CTD\PE17_19_Perez2.psa

Instrument configuration file:
F:\ADominguez\DATA\DWDE3\DATA\PE17_19_Perez_CTD\RAW\Seabird\PE17_19_Perez2.xmlcon

Configuration report for SBE 911plus/917plus CTD

Frequency channels suppressed : 0

Voltage words suppressed : 0
Computer interface : RS-232C
Deck unit : SBE11plus Firmware Version >= 5.0
Scans to average : 1
NMEA position data added : Yes
NMEA depth data added : No
NMEA time added : No
NMEA device connected to : deck unit
Surface PAR voltage added : Yes
Scan time added : No

1) Frequency 0, Temperature

Serial number : 4515
Calibrated on : 25-Jan-2017
G : 4.42214277e-003
H : 6.47522810e-004
I : 2.23428851e-005
J : 1.80568064e-006
F0 : 1000.000
Slope : 1.00000000
Offset : 0.0000

2) Frequency 1, Conductivity

Serial number : 0264w
Calibrated on : 15-Mar-17
G : -4.02240641e+000
H : 4.65717665e-001
I : -2.83822656e-003
J : 2.19486173e-004
CTcor : 3.2500e-006
CPcor : -9.57000000e-008

Slope : 1.00000000

Offset : 0.00000

Cell Const : 2000.0000

Series R : 300.0000

3) Frequency 2, Pressure, Digiquartz with TC

Serial number : 0797

Calibrated on : 19-Jan-17

C1 : -4.289259e+004

C2 : -2.342210e-002

C3 : 1.233970e-002

D1 : 3.704000e-002

D2 : 0.000000e+000

T1 : 3.043431e+001

T2 : -3.431844e-004

T3 : 4.427170e-006

T4 : 2.063150e-009

T5 : 0.000000e+000

Slope : 0.99998630

Offset : -0.11922

AD590M : 1.287000e-002

AD590B : -8.640080e+000

4) Frequency 3, Temperature, 2

Serial number : 0657

Calibrated on : 10-Nov-2016

G : 4.82531882e-003

H : 6.75177888e-004

I : 2.73168061e-005

J : 2.27946833e-006

F0 : 1000.000

Slope : 1.00000000

Offset : 0.0000

5) Frequency 4, Conductivity, 2

Serial number : 0842w

Calibrated on : 15-Mar-17

G : -3.98368391e+000

H : 4.32841046e-001

I : 2.42720746e-003

J : -1.38891642e-004

CTcor : 3.2500e-006

CPcor : -9.57000000e-008

Slope : 1.00000000

Offset : 0.00000

Cell Const : 2000.0000

Series R : 300.0000

6) A/D voltage 0, Oxygen, SBE 43

Serial number : 1224

Calibrated on : 2016-12-10

Equation : Sea-Bird

Soc : 4.54300e-001

Offset : -5.04700e-001

A : -3.77310e-003

B : 1.92210e-004

C : -2.48620e-006

E : 3.60000e-002

Tau20 : 1.06000e+000

D1 : 1.92634e-004

D2 : -4.64803e-002

H1 : -3.30000e-002

H2 : 5.00000e+003
H3 : 1.45000e+003

7) A/D voltage 1, Oxygen, SBE 43, 2

Serial number : 0769
Calibrated on : 10-Nov-2016
Equation : Sea-Bird
Soc : 4.84400e-001
Offset : -5.10400e-001
A : -3.27240e-003
B : 1.38310e-004
C : -2.00910e-006
E : 3.60000e-002
Tau20 : 1.30000e+000
D1 : 1.92634e-004
D2 : -4.64803e-002
H1 : -3.30000e-002
H2 : 5.00000e+003
H3 : 1.45000e+003

8) A/D voltage 2, Transmissometer, WET Labs C-Star

Serial number : 489DR
Calibrated on : 11-23-16
M : 19.8100
B : 0.1189
Path length : 0.250

9) A/D voltage 3, Altimeter

Serial number : 45111
Calibrated on :

Scale factor : 15.000
Offset   : 0.000

10) A/D voltage 4, Fluorometer, WET Labs ECO CDOM

Serial number : FLCDRTD-742
Calibrated on : 5/22/2007
Dark output   : 0.066
Scale factor : 50.000

11) A/D voltage 5, Fluorometer, Chelsea Aqua 3

Serial number : 088-009
Calibrated on : 12-21-16
VB   : 0.148100
V1   : 1.809600
Vacetone   : 0.246100
Scale factor : 1.000000
Slope   : 1.000000
Offset   : 0.000000

12) A/D voltage 6, Fluorometer, Chelsea UV Aquatracka

Serial number : 11-8186-001
Calibrated on : 12/01/2015
A   : 0.001101
B   : -0.018348

13) A/D voltage 7, Fluorometer, Chelsea UV Aquatracka, 2

Serial number : 15-7733-001
Calibrated on : 02/23/2016
A   : 0.000972

B : -0.056291

14) SPAR voltage, Unavailable

15) SPAR voltage, SPAR/Surface Irradiance

Serial number : 6409
Calibrated on : 11/07/16
Conversion factor : 1625.46729000
Ratio multiplier : 1.00000000

Scan length : 40

Pump Control

This setting is only applicable to a custom build of the SBE 9plus.
Enable pump on / pump off commands: NO

Data Acquisition:

Archive data: YES
Delay archiving: NO
Data archive: D:\CTD Data\2017\PE17_19_Perez_CTD\LAN_004.hex
Timeout (seconds) at startup: 60
Timeout (seconds) between scans: 20

Instrument port configuration:

Port = COM8
Baud rate = 19200
Parity = N
Data bits = 8
Stop bits = 1

Water Sampler Data:

Water Sampler Type: SBE Carousel

Number of bottles: 24
Port: COM7
Enable remote firing: NO
Firing sequence: Sequential
Tone for bottle fire confirmation uses PC sound card.

Header information:
Header Choice = Include Default Header Information in File
prompt 0 = Event Number (yyyymmddhhhh)
prompt 1 = Local Time (hhhh)
prompt 2 = Activity
prompt 3 = Latitude (dd mm.mmm N)
prompt 4 = Longitude (dd mm.mmm W)
prompt 5 = Bottom Depth (m)
prompt 6 = Station #

TCP/IP - port numbers:
Data acquisition:
Data port: 49163
Status port: 49165
Command port: 49164
Remote bottle firing:
Command port: 49167
Status port: 49168
Remote data publishing:
Converted data port: 49161
Raw data port: 49160

Miscellaneous data for calculations
Depth, Average Sound Velocity, and TEOS-10
Latitude when NMEA is not available: 0.00000000
Longitude when NMEA is not available: 0.00000000
Average Sound Velocity

Minimum pressure [db]: 20.00000000

Minimum salinity [psu]: 20.00000000

Pressure window size [db]: 20.00000000

Time window size [s]: 60.00000000

Descent and Acceleration

Window size [s]: 2.00000000

Plume Anomaly

Theta-B: 0.00000000

Salinity-B 0.00000000

Theta-Z / Salinity-Z 0.00000000

Reference pressure [db] 0.00000000

Oxygen

Window size [s]: 2.00000000

Apply hysteresis correction: 1

Apply Tau correction: 1

Potential Temperature Anomaly

A0: 0.00000000

A1: 0.00000000

A1 Multiplier: Salinity

Serial Data Output:

Output data to serial port: NO

Mark Variables:

Variables:

Digits	Variable Name [units]
0	Scan Count
4	Depth [salt water, m]
7	Conductivity [S/m]
5	Salinity, Practical [PSU]
6	Oxygen, SBE 43 [mg/l]
5	Temperature [ITS-90, deg C]

Shared File Output:

Output data to shared file: NO

TCP/IP Output:

Raw data:

Output raw data to socket: NO

XML wrapper and settings: NO

Seconds between raw data updates: 0.00000000

Converted data:

Output converted data to socket: NO

XML format: NO

SBE 11plus Deck Unit Alarms

Enable minimum pressure alarm: NO

Enable maximum pressure alarm: NO

Enable altimeter alarm: NO

SBE 14 Remote Display

Enable SBE 14 Remote Display: NO

PC Alarms

Enable minimum pressure alarm: NO

Enable maximum pressure alarm: NO

Enable altimeter alarm: NO

Enable bottom contact alarm: NO

Alarm uses PC sound card.

Options:

Prompt to save program setup changes: YES

Automatically save program setup changes on exit: NO

Confirm instrument configuration change: YES

Confirm display setup changes: YES

Confirm output file overwrite: YES

Check scan length: YES

Compare serial numbers: YES

Maximized plot may cover Seasave: NOfiguration report for SBE 911plus/917plus CTD

APPENDIX C: ADCP processing logbooks

7.2.1 ADCP WH1200 kHz

2016-10-22 11:37:15,032 INFO quick_adcp importing numpy version 1.8.2

2016-10-22 11:37:15,048 INFO quick_adcp importing matplotlib version 1.4.3

2016-10-22 11:37:15,195 INFO quick_adcp

===

2016-10-22 11:37:15,195 INFO quick_adcp

===

2016-10-22 11:37:15,195 INFO quick_adcp command line was:

/usr/local/currents/bin/run_quick.py -d wh1200

2016-10-22 11:37:15,195 INFO quick_adcp cwd is

/home/data/PE17_07_Bower_ADCP/proc/wh1200

about to run these steps:

- write_clearflags
- scandata
- avg_and_load
- codaseditsetup
- setflags
- getnav
- lst_hdg
- plot_headcorr
- navsteps
- find_pflags
- apply_edit
- navsteps

- lst_temp
- plot_temp
- lst_npings
- calib
- matfiles
- adcpsect
- refabs
- smoothnav
- putnav
- refplots
- find_pflags
- codaseditsetup

2016-10-22 11:37:15,215 INFO quick_adcp --
2016-10-22 11:37:15,216 INFO quick_adcp step 1: set up files in "edit" directory

2016-10-22 11:37:15,216 INFO quick_adcp --
2016-10-22 11:37:15,216 INFO quick_adcp step 2: scan files for time range

2016-10-22 11:37:15,295 INFO quick_adcp looking for database with adcpdb/a_pe*.blk
2016-10-22 11:37:15,295 INFO quick_adcp database found: listing blocks
2016-10-22 11:37:15,307 INFO quick_adcp --
2016-10-22 11:37:15,308 INFO quick_adcp step 3: generate averaged data...
2016-10-22 11:37:15,343 INFO quick_adcp --
2016-10-22 11:37:15,343 INFO quick_adcp step 4: load averaged data (to database)
2016-10-22 11:37:15,413 INFO quick_adcp database time range:
2016-10-22 11:37:15,413 INFO quick_adcp 2016/10/13 01:19:47 to 2016/10/22 11:36:16
2016-10-22 11:37:15,413 INFO quick_adcp (286.055405 to 295.483519)
2016-10-22 11:37:15,448 INFO quick_adcp --
2016-10-22 11:37:15,448 INFO quick_adcp step 5: set up files for codas editing (gautoedit.py)

2016-10-22 11:37:15,449 INFO quick_adcp --
2016-10-22 11:37:15,449 INFO quick_adcp step 6: run setflags?

2016-10-22 11:37:15,511 INFO quick_adcp --
2016-10-22 11:37:15,511 INFO quick_adcp step 7: get navigation

2016-10-22 11:37:15,892 INFO quick_adcp --
2016-10-22 11:37:15,892 INFO quick_adcp step 8: list heading

2016-10-22 11:37:15,932 INFO quick_adcp --
2016-10-22 11:37:15,933 INFO quick_adcp step 9: plot heading correction

2016-10-22 11:37:16,504 INFO quick_adcp

2016-10-22 11:37:16,504 INFO quick_adcp ---- running navsteps ---
2016-10-22 11:37:16,505 INFO quick_adcp ------------------------
2016-10-22 11:37:16,505 INFO quick_adcp step 10: nav steps: run adcpsect
2016-10-22 11:37:16,505 INFO quick_adcp navstep 1
2016-10-22 11:37:16,585 INFO quick_adcp ------------------------
2016-10-22 11:37:16,585 INFO quick_adcp step 11: nav steps: run refabs
2016-10-22 11:37:16,585 INFO quick_adcp navstep 2
2016-10-22 11:37:16,636 INFO quick_adcp ------------------------
2016-10-22 11:37:16,636 INFO quick_adcp step 12: nav steps: run smoothr for plots
2016-10-22 11:37:16,636 INFO quick_adcp navstep 3
2016-10-22 11:37:16,865 INFO quick_adcp ------------------------
2016-10-22 11:37:16,865 INFO quick_adcp step 13: nav steps: smooth navigation for velocities
2016-10-22 11:37:16,866 INFO quick_adcp navstep 4
2016-10-22 11:37:17,151 INFO quick_adcp ------------------------
2016-10-22 11:37:17,151 INFO quick_adcp step 14: nav steps: put positions and uvship from refsm into codasdb
2016-10-22 11:37:17,152 INFO quick_adcp navstep 5
2016-10-22 11:37:17,543 INFO quick_adcp ------------------------

2016-10-22 11:37:17,544 INFO quick_adcp step 15: nav steps: make reflayer plots
2016-10-22 11:37:17,544 INFO quick_adcp navstep 6
2016-10-22 11:37:18,200 INFO quick_adcp --
2016-10-22 11:37:18,200 INFO quick_adcp step 10: find profile flags

2016-10-22 11:37:18,406 INFO quick_adcp --
2016-10-22 11:37:18,406 INFO quick_adcp step 11: apply editing

2016-10-22 11:37:18,499 INFO quick_adcp --
2016-10-22 11:37:18,499 INFO quick_adcp step 12: run calibration steps

2016-10-22 11:37:19,473 INFO quick_adcp --
2016-10-22 11:37:19,473 INFO quick_adcp step 13: extract and plot temperature

2016-10-22 11:37:19,732 INFO quick_adcp --
2016-10-22 11:37:19,732 INFO quick_adcp step 14: extract and plot number of pings per ensemble

2016-10-22 11:37:19,921 INFO quick_adcp --
2016-10-22 11:37:19,921 INFO quick_adcp step 15: extract matlab "allbins"

2016-10-22 11:37:20,348 INFO quick_adcp --
2016-10-22 11:37:20,348 INFO quick_adcp writing "cruise_info.txt"

7.2.2 ADCP WH300 kHz

2016-10-22 11:37:28,424 INFO quick_adcp importing numpy version 1.8.2

2016-10-22 11:37:28,439 INFO quick_adcp importing matplotlib version 1.4.3

2016-10-22 11:37:28,578 INFO quick_adcp
===

2016-10-22 11:37:28,578 INFO quick_adcp ==

2016-10-22 11:37:28,578 INFO quick_adcp command line was: /usr/local/currents/bin/run_quick.py -d wh300

2016-10-22 11:37:28,578 INFO quick_adcp cwd is /home/data/PE17_07_Bower_ADCP/proc/wh300

about to run these steps:

- write_clearflags

- scandata

- avg_and_load

- codaseditsetup

- setflags

- getnav

- lst_hdg

- plot_headcorr

- navsteps

- find_pflags

- apply_edit

- navsteps

- lst_temp

- plot_temp

- lst_npings

- calib

- matfiles

- adcpsect

- refabs
- smoothnav
- putnav
- refplots
- find_pflags
- codaseditsetup

2016-10-22 11:37:28,600 INFO quick_adcp --

2016-10-22 11:37:28,600 INFO quick_adcp step 1: set up files in "edit" directory

2016-10-22 11:37:28,600 INFO quick_adcp --

2016-10-22 11:37:28,600 INFO quick_adcp step 2: scan files for time range

2016-10-22 11:37:28,681 INFO quick_adcp looking for database with adcpdb/a_pe*.blk

2016-10-22 11:37:28,681 INFO quick_adcp database found: listing blocks

2016-10-22 11:37:28,700 INFO quick_adcp --

2016-10-22 11:37:28,700 INFO quick_adcp step 3: generate averaged data...

2016-10-22 11:37:28,734 INFO quick_adcp --

2016-10-22 11:37:28,734 INFO quick_adcp step 4: load averaged data (to database)

2016-10-22 11:37:28,806 INFO quick_adcp database time range:

2016-10-22 11:37:28,806 INFO quick_adcp 2016/10/13 01:19:47 to 2016/10/22 11:36:17

2016-10-22 11:37:28,806 INFO quick_adcp (286.055405 to 295.483530)

2016-10-22 11:37:28,838 INFO quick_adcp --

2016-10-22 11:37:28,839 INFO quick_adcp step 5: set up files for codas editing (gautoedit.py)

2016-10-22 11:37:28,839 INFO quick_adcp --

2016-10-22 11:37:28,839 INFO quick_adcp step 6: run setflags?

2016-10-22 11:37:28,908 INFO quick_adcp --

2016-10-22 11:37:28,908 INFO quick_adcp step 7: get navigation

2016-10-22 11:37:29,278 INFO quick_adcp --

2016-10-22 11:37:29,279 INFO quick_adcp step 8: list heading

2016-10-22 11:37:29,317 INFO quick_adcp --

2016-10-22 11:37:29,317 INFO quick_adcp step 9: plot heading correction

2016-10-22 11:37:29,883 INFO quick_adcp

2016-10-22 11:37:29,883 INFO quick_adcp ---- running navsteps ---

2016-10-22 11:37:29,883 INFO quick_adcp ------------------------

2016-10-22 11:37:29,883 INFO quick_adcp step 10: nav steps: run adcpsect

2016-10-22 11:37:29,883 INFO quick_adcp navstep 1

2016-10-22 11:37:29,965 INFO quick_adcp ------------------------

2016-10-22 11:37:29,966 INFO quick_adcp step 11: nav steps: run refabs

2016-10-22 11:37:29,966 INFO quick_adcp navstep 2

2016-10-22 11:37:30,017 INFO quick_adcp ------------------------

2016-10-22 11:37:30,017 INFO quick_adcp step 12: nav steps: run smoothr for plots

2016-10-22 11:37:30,017 INFO quick_adcp navstep 3

2016-10-22 11:37:30,265 INFO quick_adcp ------------------------

2016-10-22 11:37:30,265 INFO quick_adcp step 13: nav steps: smooth navigation for velocities

2016-10-22 11:37:30,265 INFO quick_adcp navstep 4

2016-10-22 11:37:30,596 INFO quick_adcp ------------------------

2016-10-22 11:37:30,596 INFO quick_adcp step 14: nav steps: put positions and uvship from refsm into codasdb

2016-10-22 11:37:30,597 INFO quick_adcp navstep 5

2016-10-22 11:37:30,984 INFO quick_adcp ------------------------

2016-10-22 11:37:30,984 INFO quick_adcp step 15: nav steps: make reflayer plots

2016-10-22 11:37:30,984 INFO quick_adcp navstep 6

2016-10-22 11:37:31,613 INFO quick_adcp ---

2016-10-22 11:37:31,613 INFO quick_adcp step 10: find profile flags

2016-10-22 11:37:31,853 INFO quick_adcp ---

2016-10-22 11:37:31,853 INFO quick_adcp step 11: apply editing

2016-10-22 11:37:31,952 INFO quick_adcp ---

2016-10-22 11:37:31,952 INFO quick_adcp step 12: run calibration steps

2016-10-22 11:37:33,003 INFO quick_adcp ---

2016-10-22 11:37:33,003 INFO quick_adcp step 13: extract and plot temperature

2016-10-22 11:37:33,272 INFO quick_adcp ---

2016-10-22 11:37:33,272 INFO quick_adcp step 14: extract and plot number of pings per ensemble

2016-10-22 11:37:33,510 INFO quick_adcp --

2016-10-22 11:37:33,510 INFO quick_adcp step 15: extract matlab "allbins"

2016-10-22 11:37:34,090 INFO quick_adcp --

2016-10-22 11:37:34,090 INFO quick_adcp writing "cruise_info.txt"

7.2.3 ADCP OS75kHz

2016-10-22 11:37:42,510 INFO quick_adcp importing numpy version 1.8.2

2016-10-22 11:37:42,522 INFO quick_adcp importing matplotlib version 1.4.3

2016-10-22 11:37:42,695 INFO quick_adcp ==

2016-10-22 11:37:42,695 INFO quick_adcp ==

2016-10-22 11:37:42,695 INFO quick_adcp command line was: /usr/local/currents/bin/run_quick.py -d os75nb

2016-10-22 11:37:42,695 INFO quick_adcp cwd is /home/data/PE17_07_Bower_ADCP/proc/os75nb

about to run these steps:

- write_clearflags

- scandata

- avg_and_load

- codaseditsetup

- setflags

- getnav

- lst_hdg

- plot_headcorr
- navsteps
- find_pflags
- apply_edit
- navsteps
- lst_temp
- plot_temp
- lst_npings
- calib
- matfiles
- adcpsect
- refabs
- smoothnav
- putnav
- refplots
- find_pflags
- codaseditsetup

2016-10-22 11:37:42,705 INFO quick_adcp --

2016-10-22 11:37:42,705 INFO quick_adcp step 1: set up files in "edit" directory

2016-10-22 11:37:42,706 INFO quick_adcp --

2016-10-22 11:37:42,706 INFO quick_adcp step 2: scan files for time range

2016-10-22 11:37:42,812 INFO quick_adcp looking for database with adcpdb/a_pe*.blk

2016-10-22 11:37:42,812 INFO quick_adcp database found: listing blocks

2016-10-22 11:37:42,820 INFO quick_adcp ---

2016-10-22 11:37:42,821 INFO quick_adcp step 3: generate averaged data...

2016-10-22 11:37:42,862 INFO quick_adcp ---

2016-10-22 11:37:42,862 INFO quick_adcp step 4: load averaged data (to database)

2016-10-22 11:37:42,912 INFO quick_adcp database time range:

2016-10-22 11:37:42,912 INFO quick_adcp 2016/10/13 13:08:49 to 2016/10/22 11:37:17

2016-10-22 11:37:42,912 INFO quick_adcp (286.547789 to 295.484225)

2016-10-22 11:37:42,935 INFO quick_adcp ---

2016-10-22 11:37:42,935 INFO quick_adcp step 5: set up files for codas editing (gautoedit.py)

2016-10-22 11:37:42,936 INFO quick_adcp ---

2016-10-22 11:37:42,936 INFO quick_adcp step 6: run setflags?

2016-10-22 11:37:42,975 INFO quick_adcp ---

2016-10-22 11:37:42,976 INFO quick_adcp step 7: get navigation

2016-10-22 11:37:43,311 INFO quick_adcp ---

2016-10-22 11:37:43,311 INFO quick_adcp step 8: list heading

2016-10-22 11:37:43,335 INFO quick_adcp ---

2016-10-22 11:37:43,335 INFO quick_adcp step 9: plot heading correction

2016-10-22 11:37:43,872 INFO quick_adcp

2016-10-22 11:37:43,872 INFO quick_adcp ---- running navsteps ---

2016-10-22 11:37:43,873 INFO quick_adcp ------------------------

2016-10-22 11:37:43,873 INFO quick_adcp step 10: nav steps: run adcpsect

2016-10-22 11:37:43,873 INFO quick_adcp navstep 1

2016-10-22 11:37:43,913 INFO quick_adcp ------------------------

2016-10-22 11:37:43,914 INFO quick_adcp step 11: nav steps: run refabs

2016-10-22 11:37:43,914 INFO quick_adcp navstep 2

2016-10-22 11:37:43,944 INFO quick_adcp ------------------------

2016-10-22 11:37:43,944 INFO quick_adcp step 12: nav steps: run smoothr for plots

2016-10-22 11:37:43,944 INFO quick_adcp navstep 3

2016-10-22 11:37:44,043 INFO quick_adcp ------------------------

2016-10-22 11:37:44,044 INFO quick_adcp step 13: nav steps: smooth navigation for velocities

2016-10-22 11:37:44,044 INFO quick_adcp navstep 4

2016-10-22 11:37:44,200 INFO quick_adcp ------------------------

2016-10-22 11:37:44,200 INFO quick_adcp step 14: nav steps: put positions and uvship from refsm into codasdb

2016-10-22 11:37:44,200 INFO quick_adcp navstep 5

2016-10-22 11:37:44,513 INFO quick_adcp ------------------------

2016-10-22 11:37:44,513 INFO quick_adcp step 15: nav steps: make reflayer plots

2016-10-22 11:37:44,513 INFO quick_adcp navstep 6

2016-10-22 11:37:45,064 INFO quick_adcp --

2016-10-22 11:37:45,064 INFO quick_adcp step 10: find profile flags

2016-10-22 11:37:45,169 INFO quick_adcp --

2016-10-22 11:37:45,169 INFO quick_adcp step 11: apply editing

2016-10-22 11:37:45,225 INFO quick_adcp --

2016-10-22 11:37:45,226 INFO quick_adcp step 12: run calibration steps

2016-10-22 11:37:46,069 INFO quick_adcp --

2016-10-22 11:37:46,069 INFO quick_adcp step 13: extract and plot temperature

2016-10-22 11:37:46,310 INFO quick_adcp --

2016-10-22 11:37:46,310 INFO quick_adcp step 14: extract and plot number of pings per ensemble

2016-10-22 11:37:46,474 INFO quick_adcp --

2016-10-22 11:37:46,474 INFO quick_adcp step 15: extract matlab "allbins"

2016-10-22 11:37:46,749 INFO quick_adcp --

2016-10-22 11:37:46,750 INFO quick_adcp writing "cruise_info.txt"

2016-12-09 16:38:13,580 INFO quick_setup found dbinfo.txt: use values if otherwise unspecified

2016-12-09 16:38:13,593 INFO quick_setup found dbname a_pe

2016-12-09 16:38:13,593 INFO quick_setup fix file is a_pe.gps

2016-12-09 16:38:13,593 INFO quick_setup reflayer: ref_method = refsm

2016-12-09 16:38:13,593 INFO   quick_setup reflayer: refuv_source = nav

2016-12-09 16:38:13,593 INFO   quick_setup reflayer: refuv_smoothwin = 3

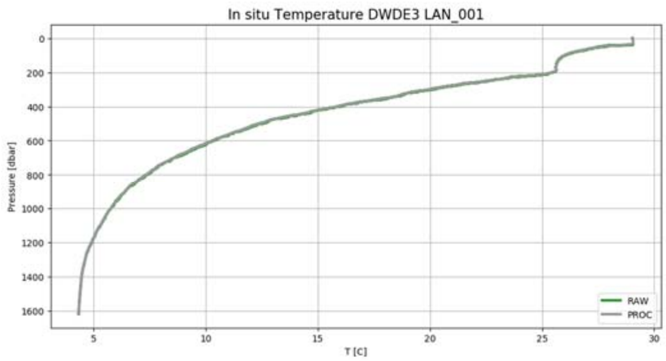
2016-12-09 16:38:13,595 INFO   root   importing numpy version 1.9.3

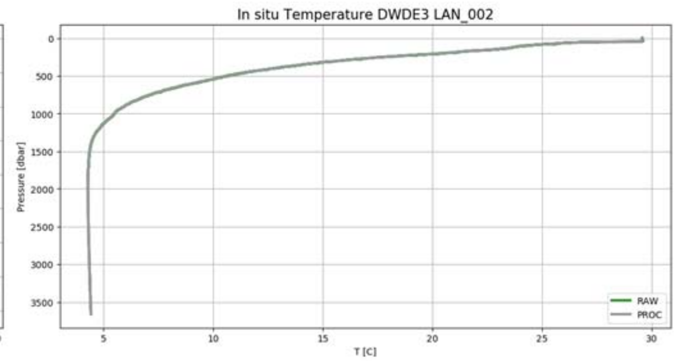
2016-12-10 00:38:13,615 INFO   root   importing matplotlib version 1.4.3

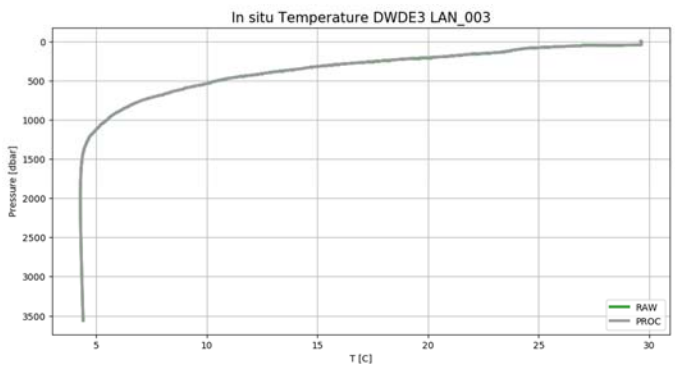
2016-12-10 00:38:13,878 INFO   root   found steps2rerun: --apply_edit:navsteps:calib

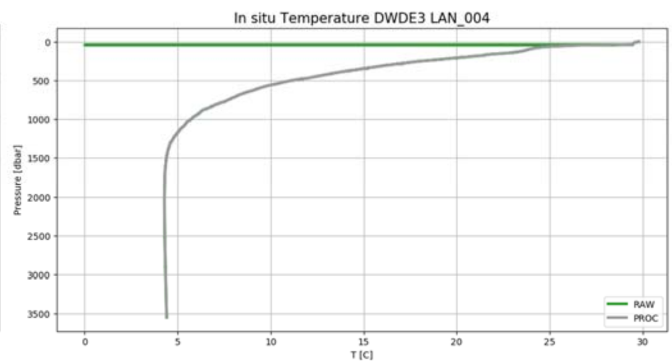
7.3 APPENDIX D CTD PROFILES

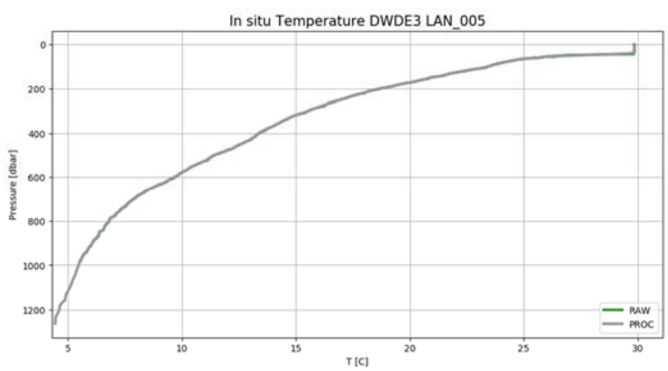
7.3.1 In situ Temperature

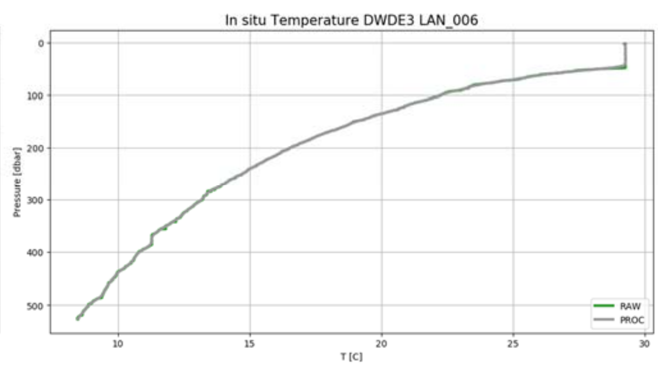


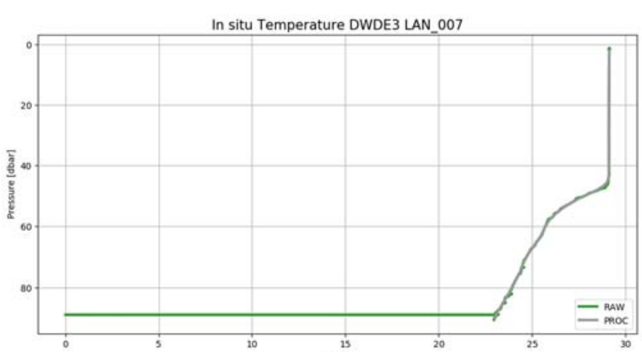


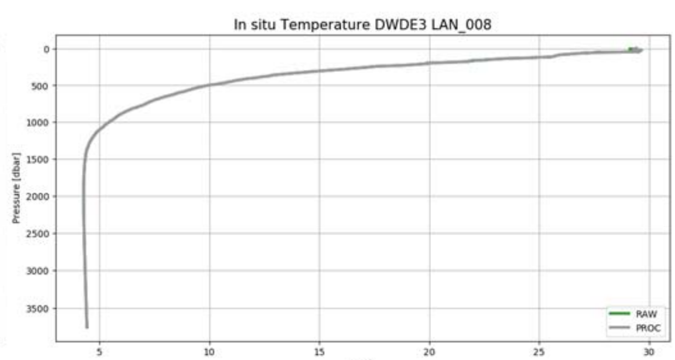


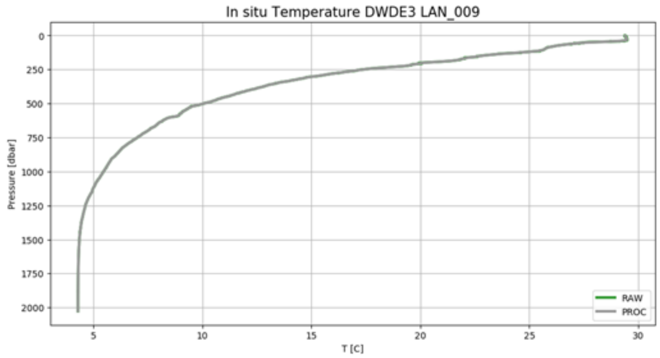


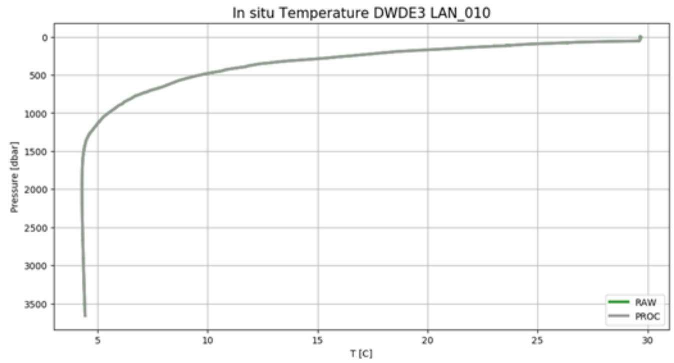


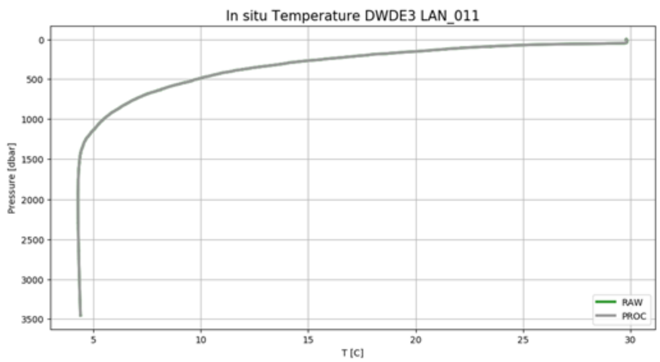


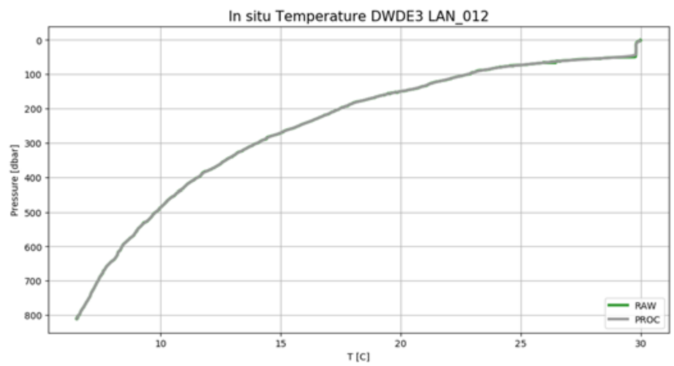


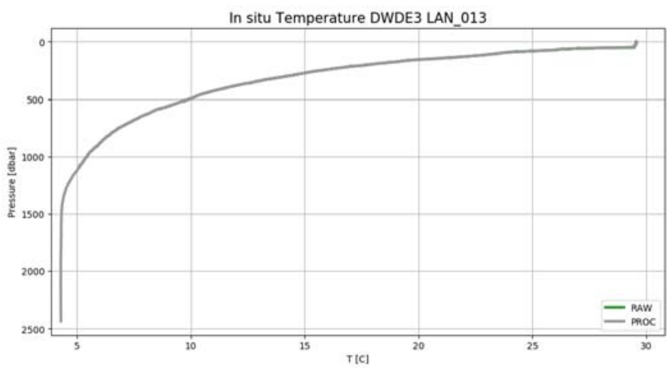


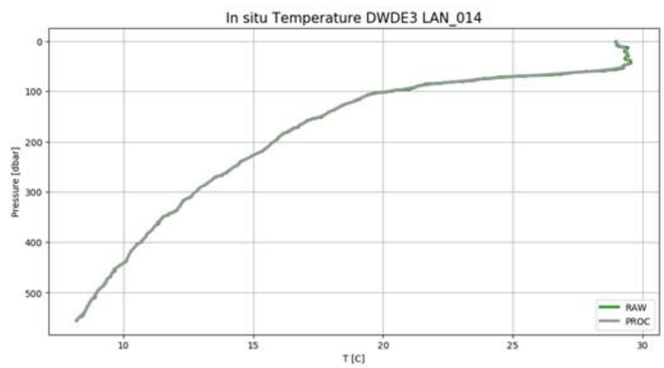

In situ Temperature DWDE3 LAN_009
Pressure [dbar]
0
250
500
750
1000
1250
1500
1750
2000
5
10
15
20
25
30
T [C]
RAW
PROC

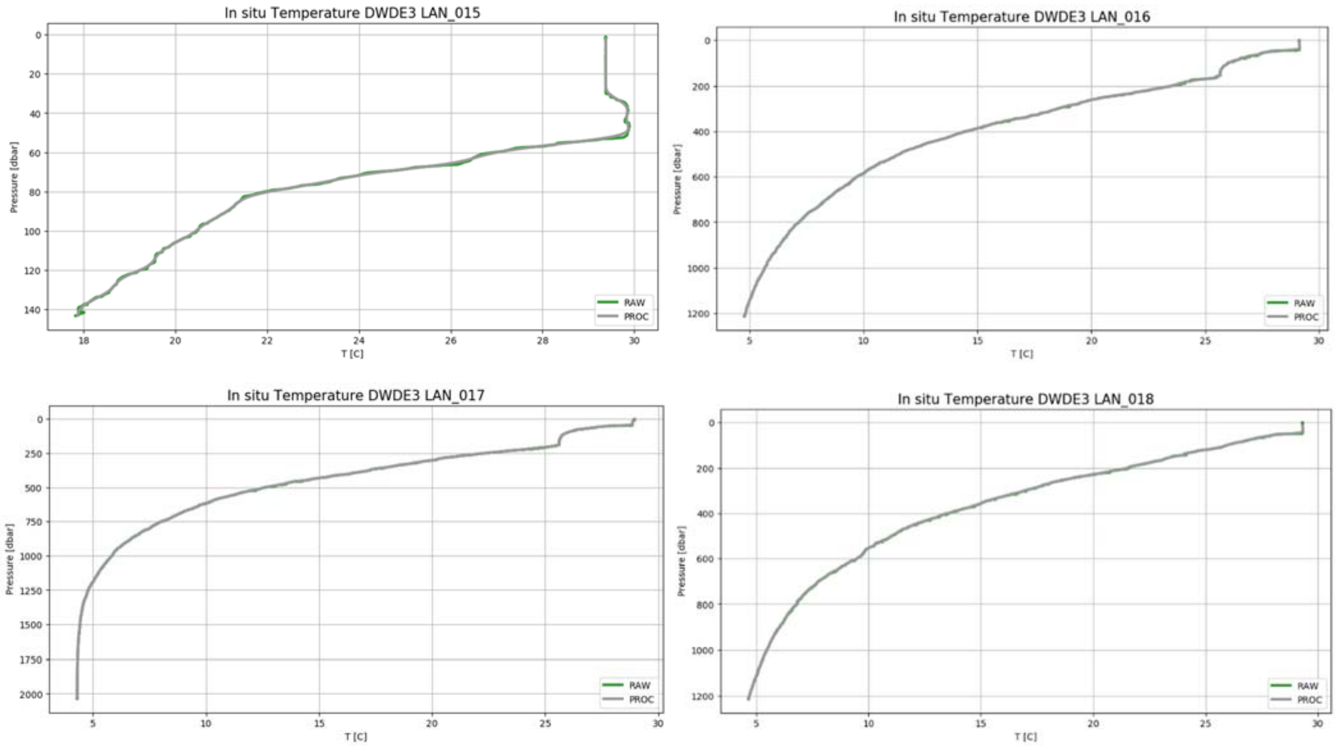

In situ Temperature DWDE3 LAN_010
Pressure [dbar]
0
500
1000
1500
2000
2500
3000
3500
5
10
15
20
25
30
T [C]
RAW
PROC


In situ Temperature DWDE3 LAN_011
Pressure [dbar]
0
500
1000
1500
2000
2500
3000
3500
5
10
15
20
25
30
T [C]
RAW
PROC

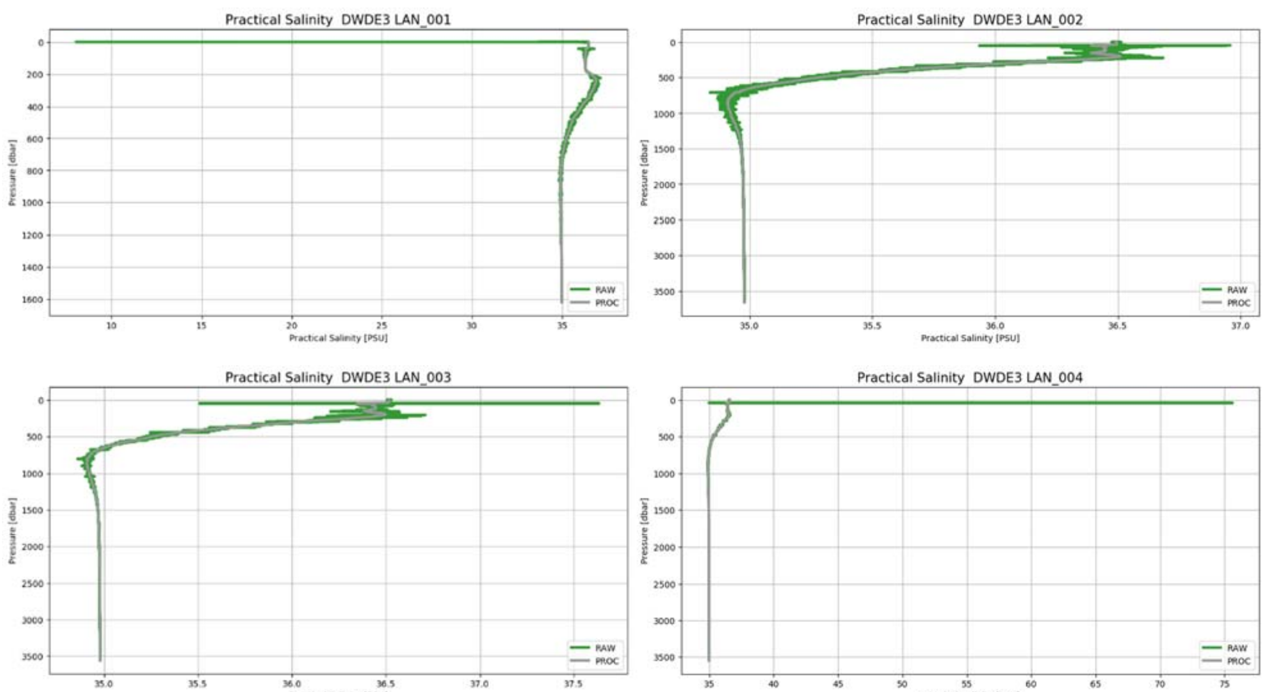

In situ Temperature DWDE3 LAN_012
Pressure [dbar]
0
100
200
300
400
500
600
700
800
10
15
20
25
30
T [C]
RAW
PROC

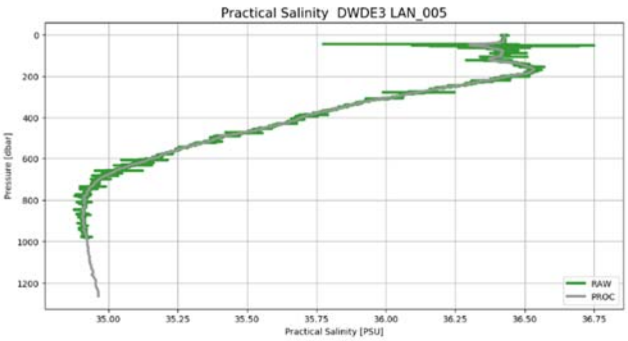

In situ Temperature DWDE3 LAN_013
Pressure [dbar]
0
500
1000
1500
2000
2500
5
10
15
20
25
30
T [C]
RAW
PROC

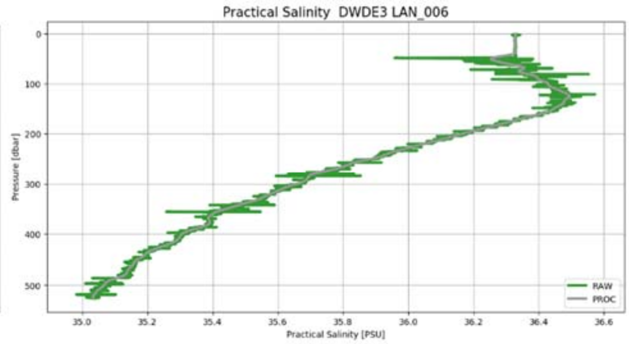

In situ Temperature DWDE3 LAN_014
Pressure [dbar]
0
100
200
300
400
500
10
15
20
25
30
T [C]
RAW
PROC

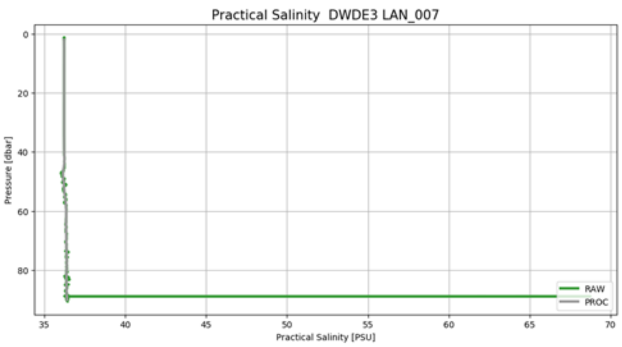


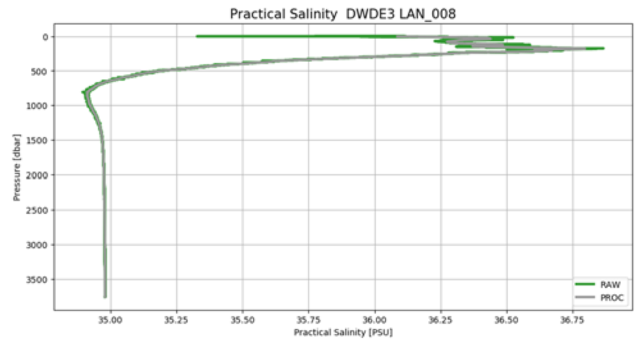
7.3.2 Practical Salinity

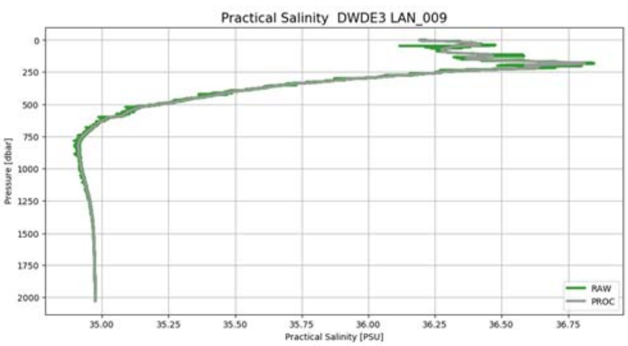


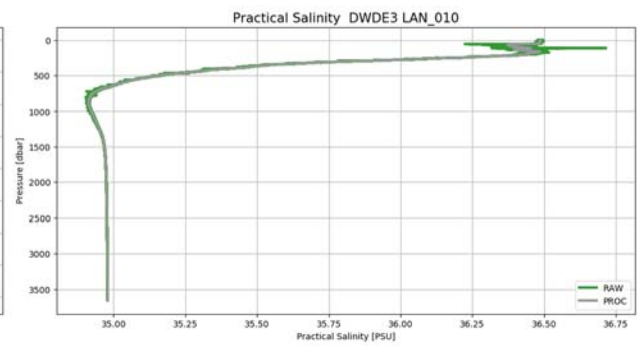

Practical Salinity DWDE3 LAN_005
Pressure [dbar]
Practical Salinity [PSU]
RAW
PROC

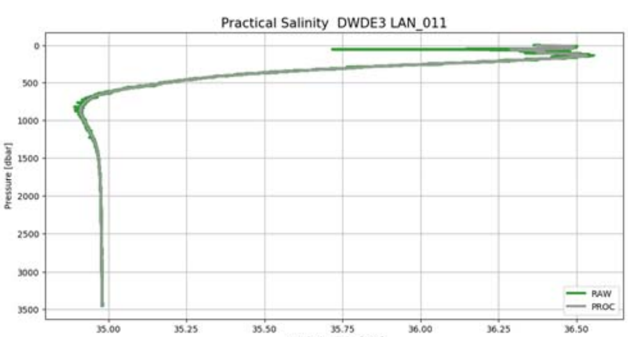

Practical Salinity DWDE3 LAN_006
Pressure [dbar]
Practical Salinity [PSU]
RAW
PROC

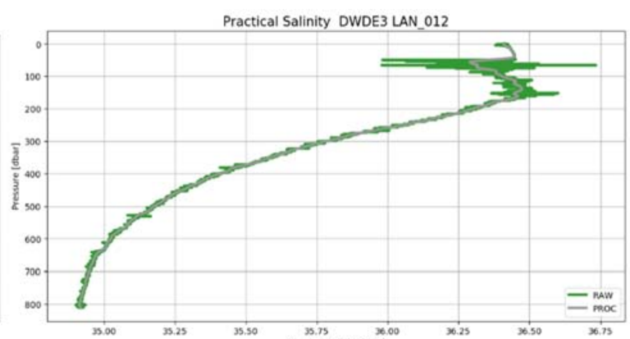

Practical Salinity DWDE3 LAN_007
Pressure [dbar]
Practical Salinity [PSU]
RAW
PROC

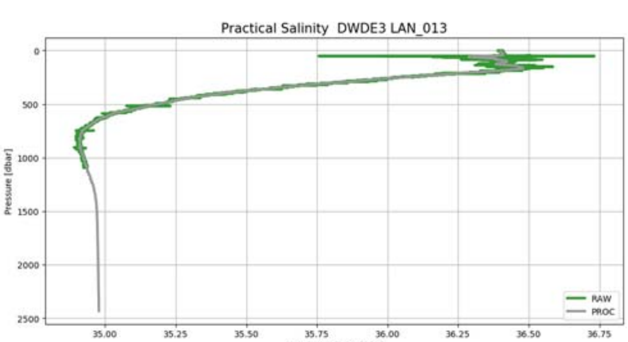

Practical Salinity DWDE3 LAN_008
Pressure [dbar]
Practical Salinity [PSU]
RAW
PROC

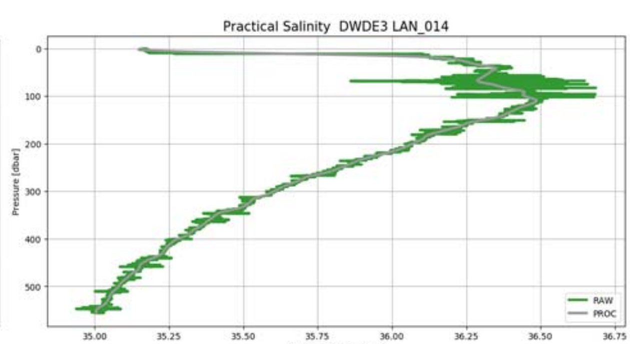

Practical Salinity DWDE3 LAN_009
Pressure [dbar]
Practical Salinity [PSU]
RAW
PROC

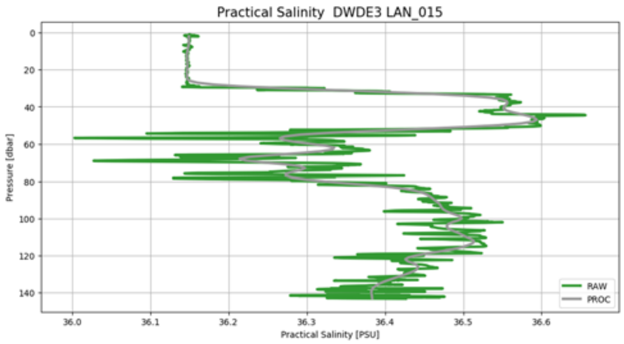

Practical Salinity DWDE3 LAN_010
Pressure [dbar]
Practical Salinity [PSU]
RAW
PROC

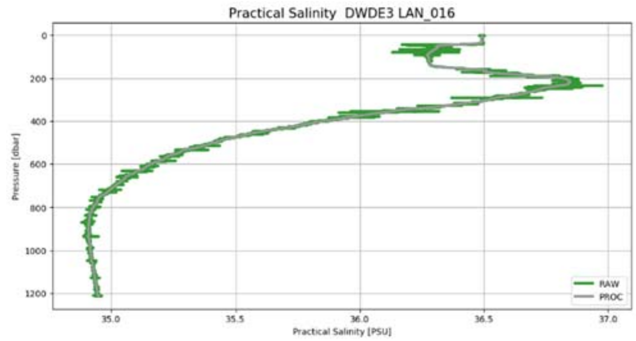

Practical Salinity DWDE3 LAN_011
Pressure [dbar]
Practical Salinity [PSU]
RAW
PROC

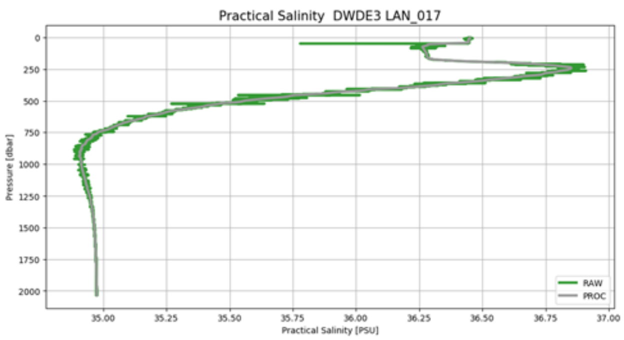

Practical Salinity DWDE3 LAN_012
Pressure [dbar]
Practical Salinity [PSU]
RAW
PROC

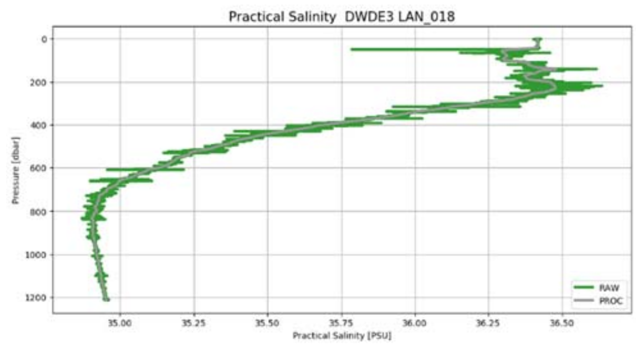

Practical Salinity DWDE3 LAN_013
Pressure [dbar]
Practical Salinity [PSU]
RAW
PROC


Practical Salinity DWDE3 LAN_014
Pressure [dbar]
Practical Salinity [PSU]
RAW
PROC

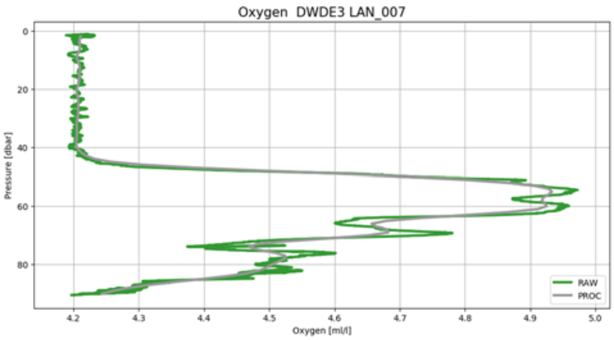

Practical Salinity DWDE3 LAN_015
Pressure [dbar]
Practical Salinity [PSU]
RAW
PROC

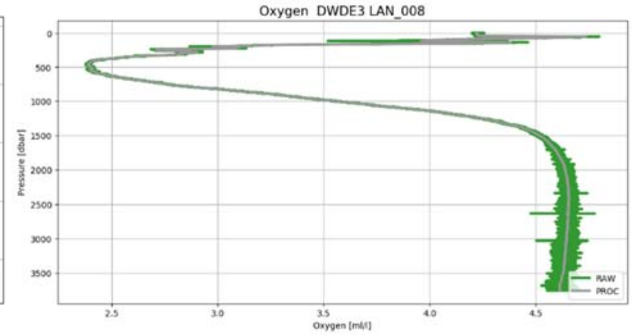

Practical Salinity DWDE3 LAN_016
Pressure [dbar]
Practical Salinity [PSU]
RAW
PROC

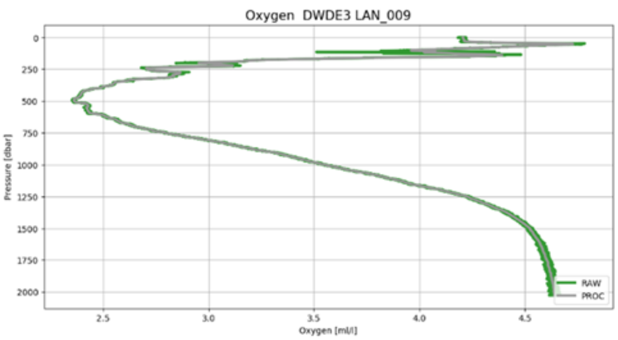

Practical Salinity DWDE3 LAN_017
Pressure [dbar]
Practical Salinity [PSU]
RAW
PROC

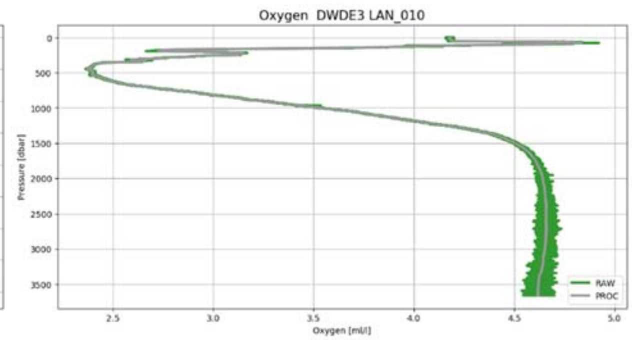

Practical Salinity DWDE3 LAN_018
Pressure [dbar]
Practical Salinity [PSU]
RAW
PROC

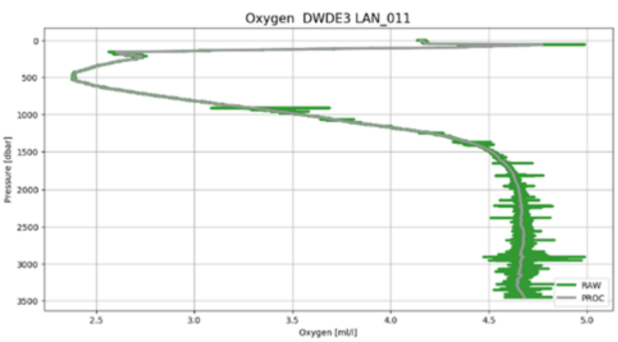
7.3.3 Oxygen

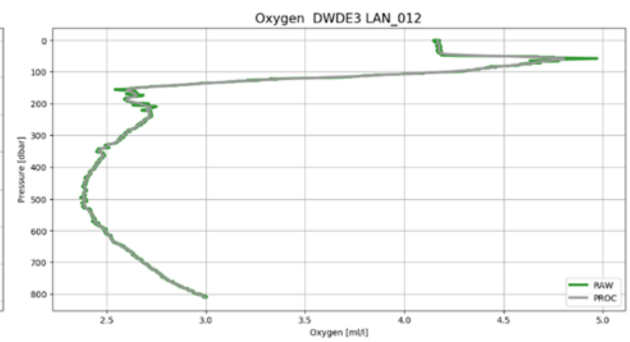

Oxygen DWDE3 LAN_007
Pressure [dbar]
Oxygen [ml/l]
RAW
PROC

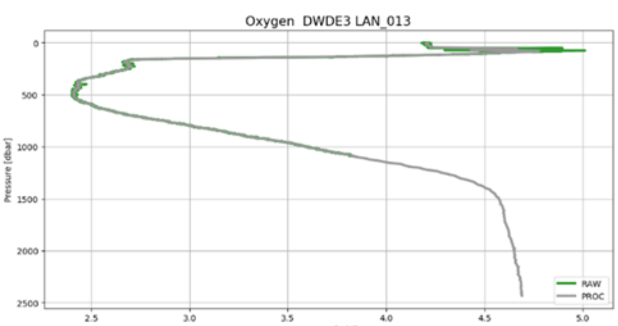

Oxygen DWDE3 LAN_008
Pressure [dbar]
Oxygen [ml/l]
RAW
PROC

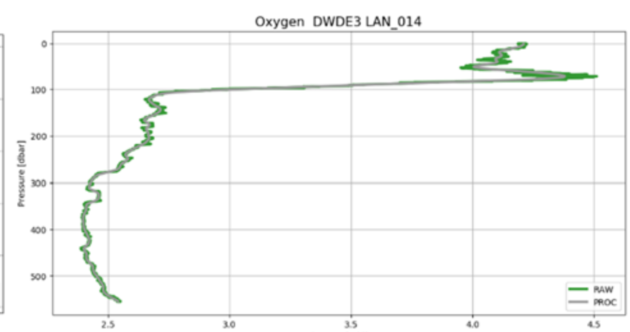

Oxygen DWDE3 LAN_009
Pressure [dbar]
Oxygen [ml/l]
RAW
PROC

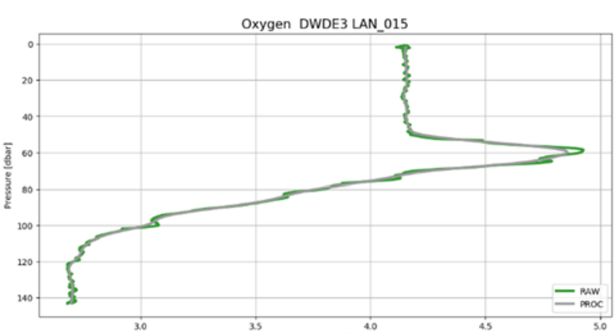

Oxygen DWDE3 LAN_010
Pressure [dbar]
Oxygen [ml/l]
RAW
PROC

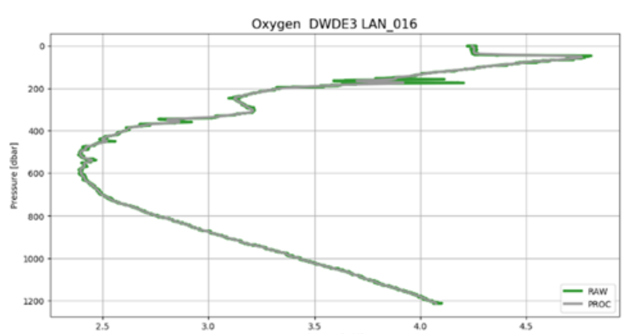

Oxygen DWDE3 LAN_011
Pressure [dbar]
Oxygen [ml/l]
RAW
PROC

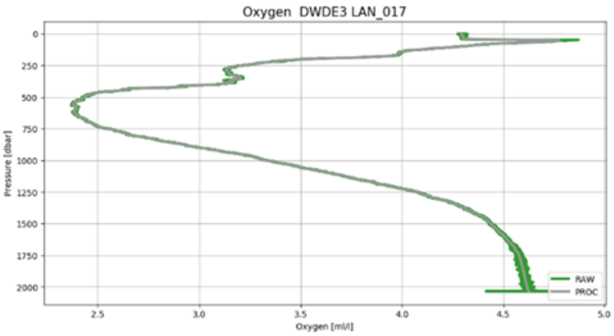

Oxygen DWDE3 LAN_012
Pressure [dbar]
Oxygen [ml/l]
RAW
PROC

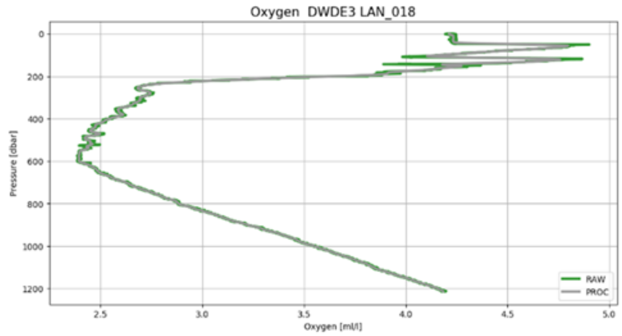

Oxygen DWDE3 LAN_013
Pressure [dbar]
Oxygen [ml/l]
RAW
PROC

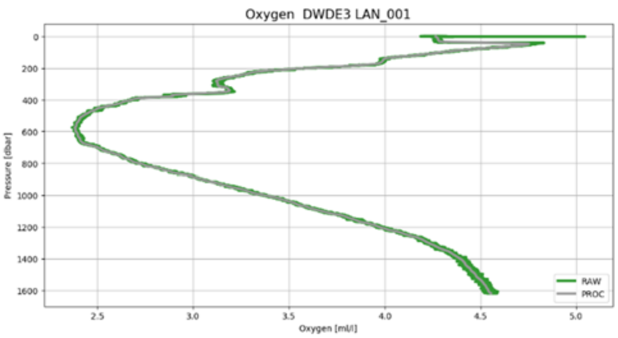

Oxygen DWDE3 LAN_014
Pressure [dbar]
Oxygen [ml/l]
RAW
PROC

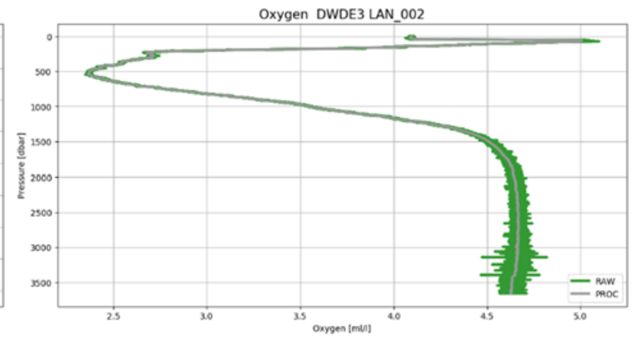

Oxygen DWDE3 LAN_015
Pressure [dbar]
Oxygen [ml/l]
RAW
PROC

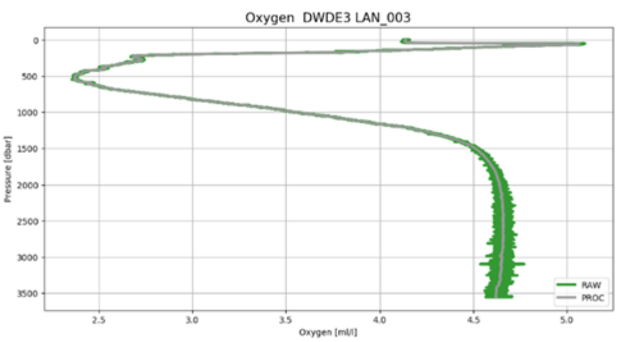

Oxygen DWDE3 LAN_016
Pressure [dbar]
Oxygen [ml/l]
RAW
PROC

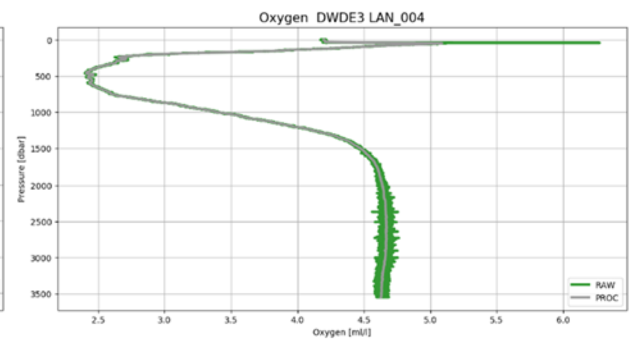

Oxygen DWDE3 LAN_017
Pressure [dbar]
Oxygen [ml/l]
RAW
PROC

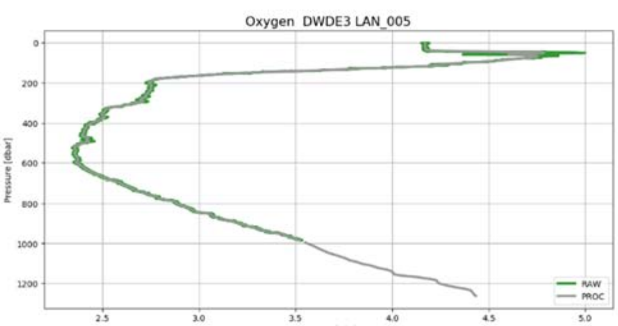

Oxygen DWDE3 LAN_018
Pressure [dbar]
Oxygen [ml/l]
RAW
PROC

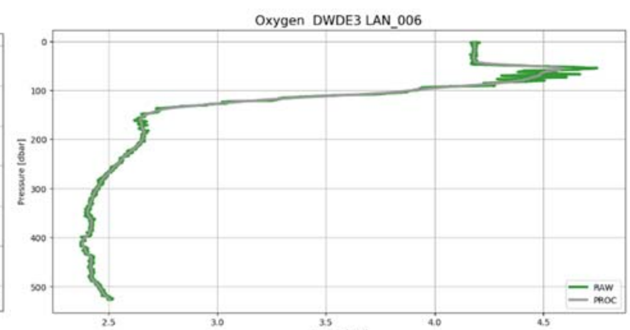

Oxygen DWDE3 LAN_001
Pressure [dbar]
Oxygen [ml/l]
RAW
PROC


Oxygen DWDE3 LAN_002
Pressure [dbar]
Oxygen [ml/l]
RAW
PROC

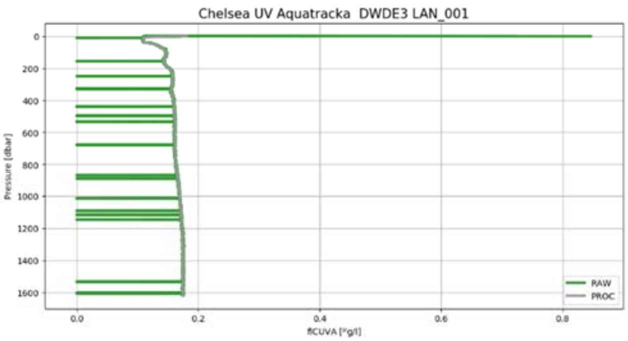

Oxygen DWDE3 LAN_003
Pressure [dbar]
Oxygen [ml/l]
RAW
PROC

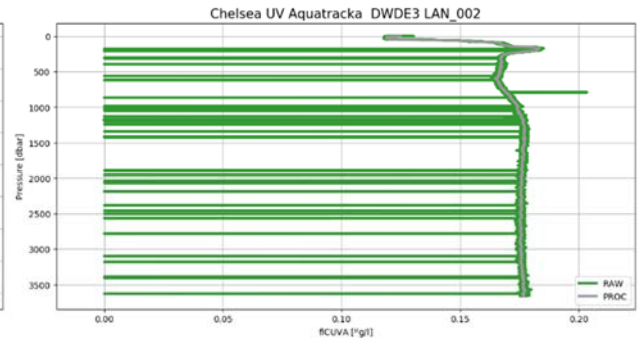

Oxygen DWDE3 LAN_004
Pressure [dbar]
Oxygen [ml/l]
RAW
PROC

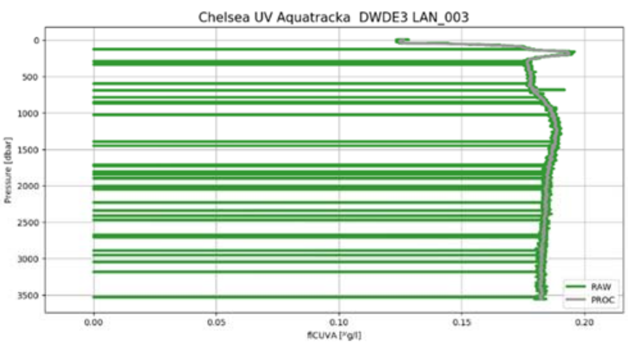

Oxygen DWDE3 LAN_005
Pressure [dbar]
Oxygen [ml/l]
RAW
PROC

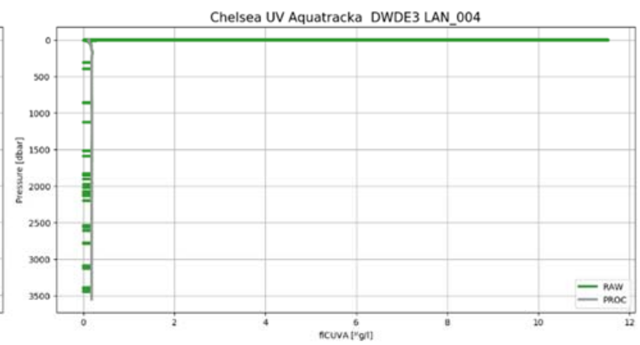

Oxygen DWDE3 LAN_006
Pressure [dbar]
Oxygen [ml/l]
RAW
PROC

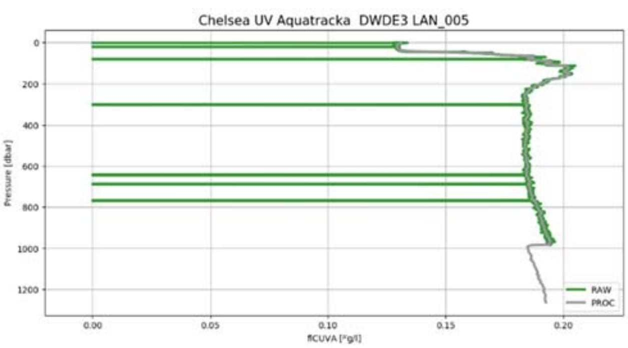
7.3.4 flCUVA Aquatracka

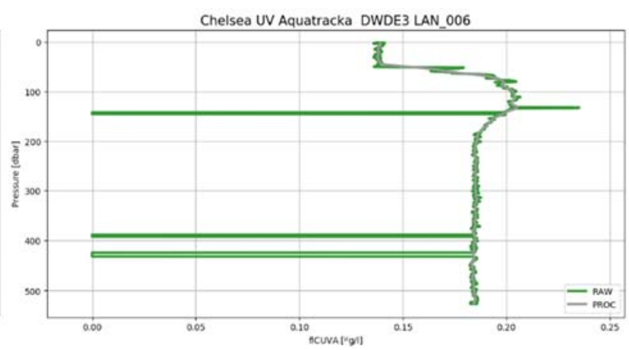


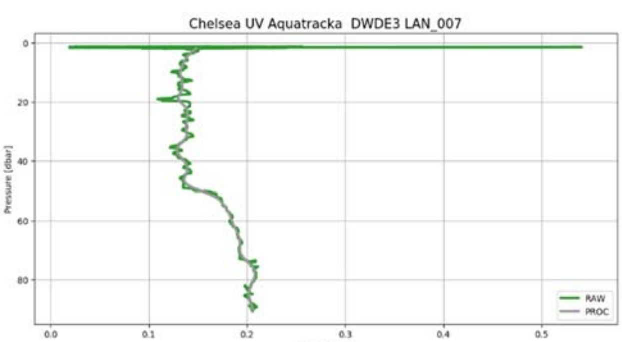


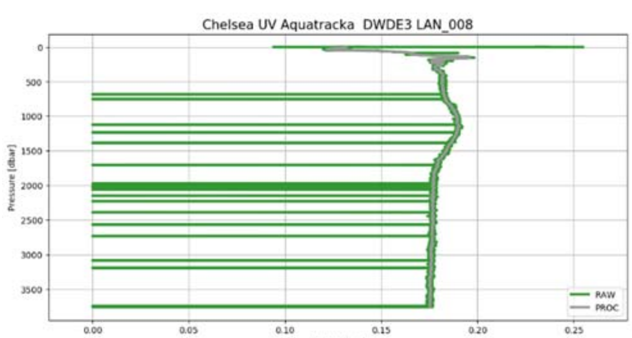


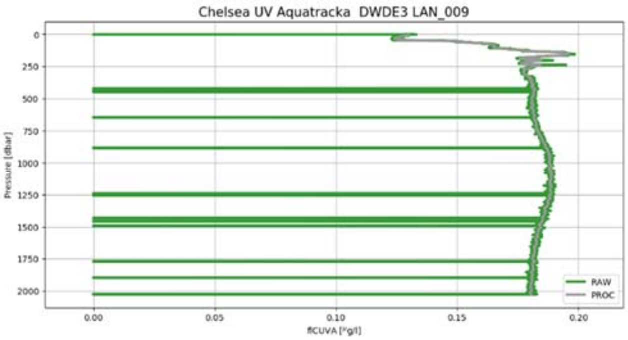


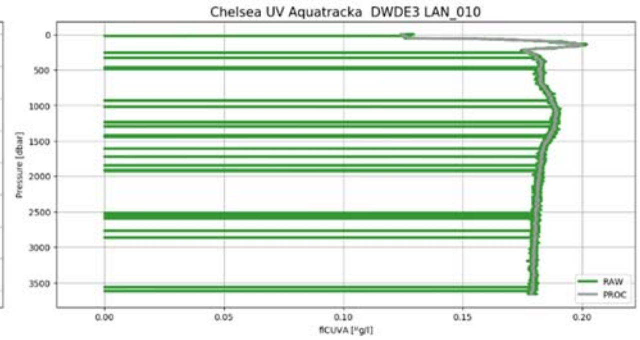


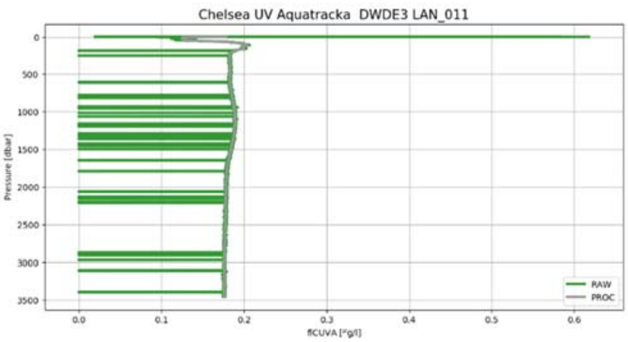


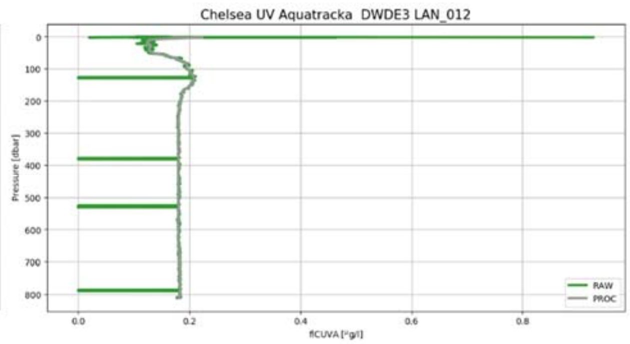


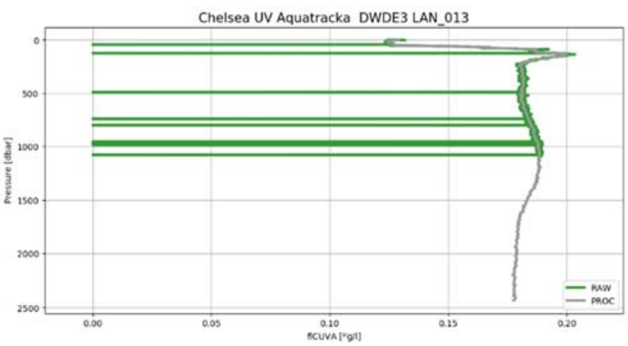


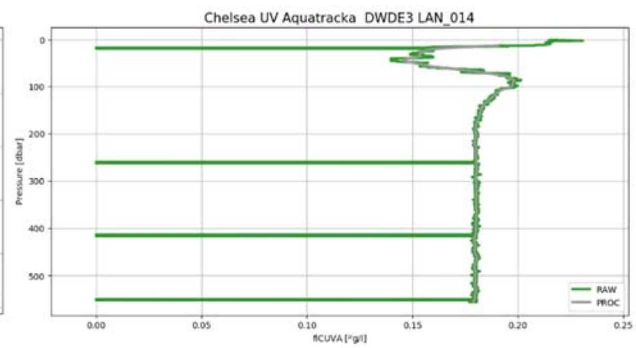

Chelsea UV Aquatracka DWDE3 LAN_009
Pressure [dbar]
RAW
PROC

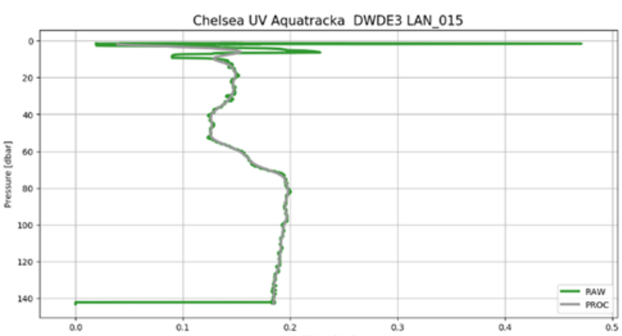

Chelsea UV Aquatracka DWDE3 LAN_010
Pressure [dbar]
RAW
PROC

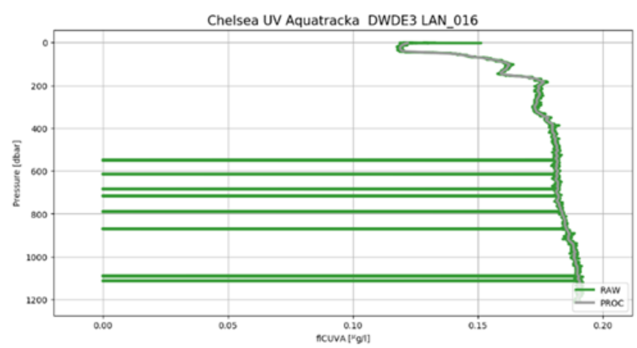

Chelsea UV Aquatracka DWDE3 LAN_011
Pressure [dbar]
RAW
PROC

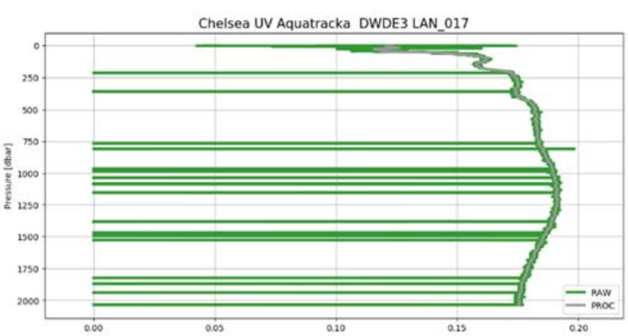

Chelsea UV Aquatracka DWDE3 LAN_012
Pressure [dbar]
RAW
PROC

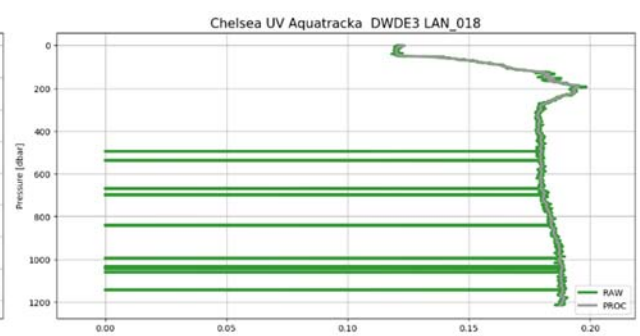

Chelsea UV Aquatracka DWDE3 LAN_013
Pressure [dbar]
RAW
PROC


Chelsea UV Aquatracka DWDE3 LAN_014
Pressure [dbar]
RAW
PROC

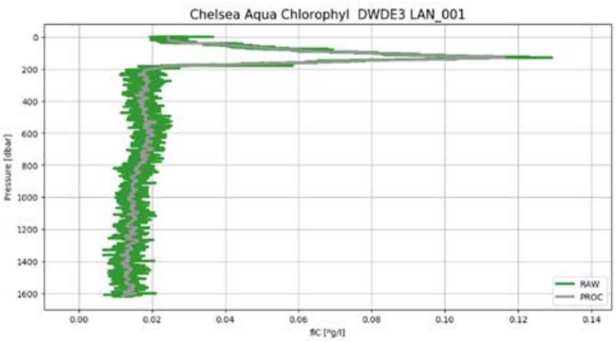

Chelsea UV Aquatracka DWDE3 LAN_015
Pressure [dbar]
RAW
PROC

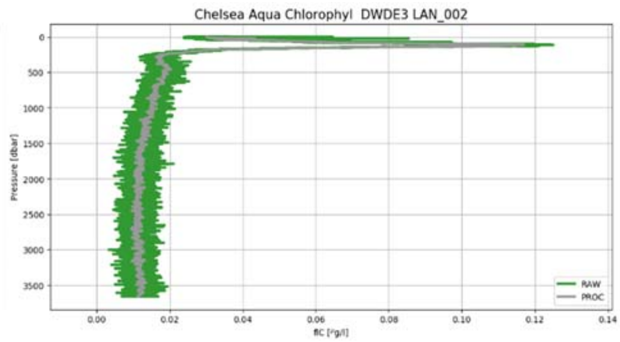

Chelsea UV Aquatracka DWDE3 LAN_016
Pressure [dbar]
RAW
PROC

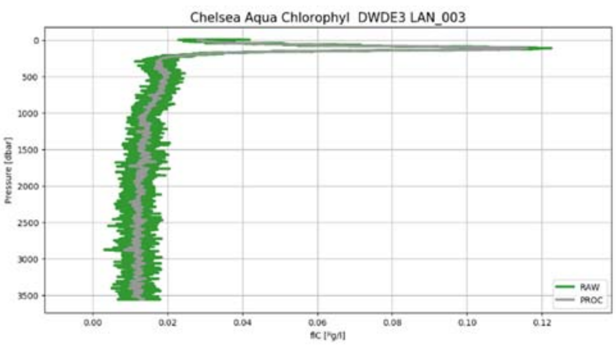

Chelsea UV Aquatracka DWDE3 LAN_017
Pressure [dbar]
RAW
PROC

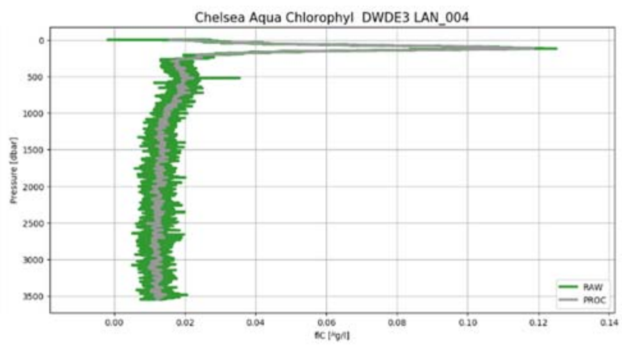

Chelsea UV Aquatracka DWDE3 LAN_018
Pressure [dbar]
RAW
PROC

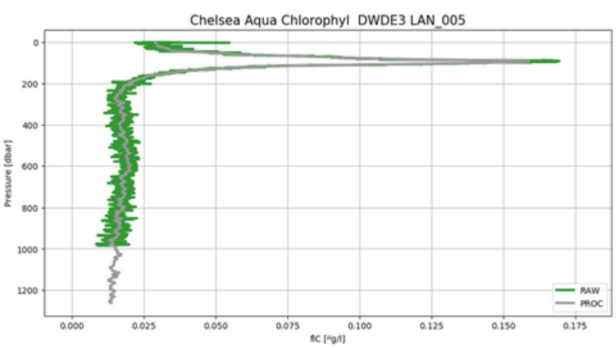
7.3.5 Chlorophyl-a aquatracka

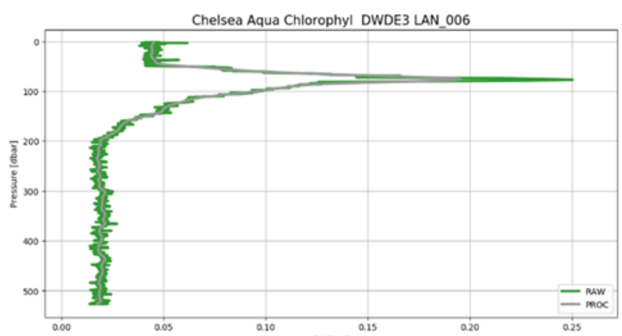


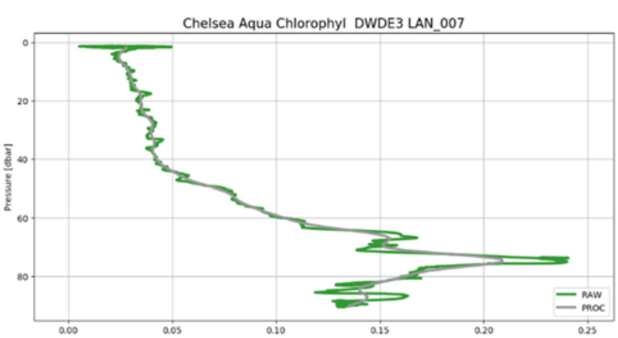


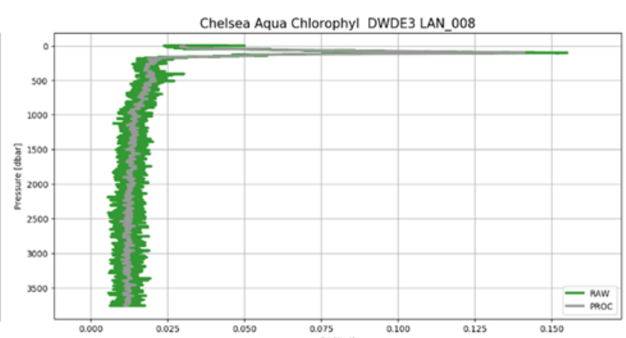


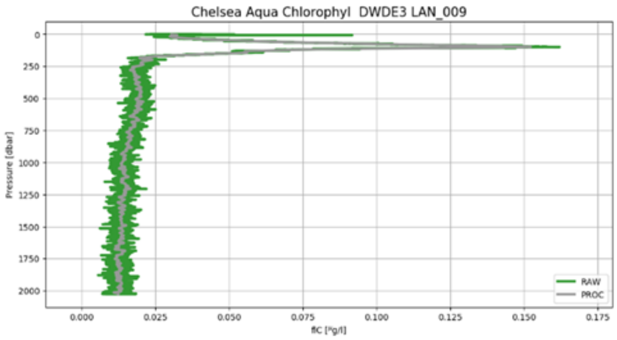


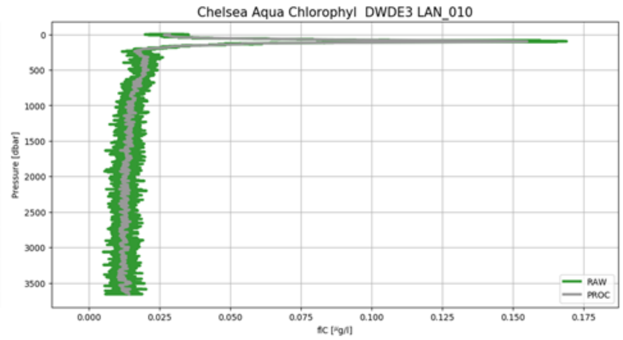


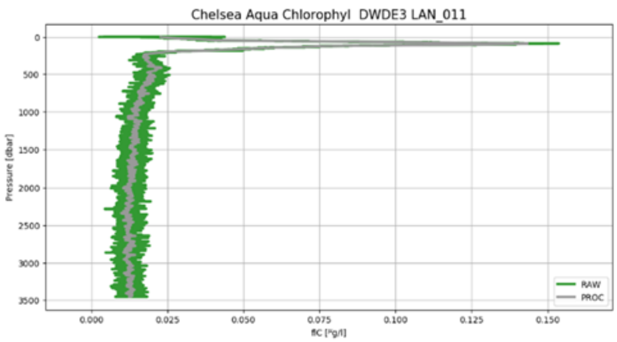


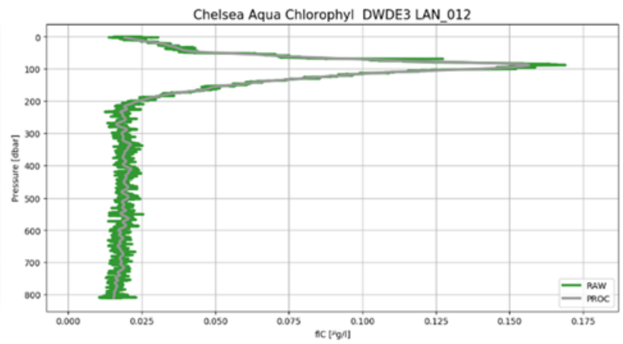


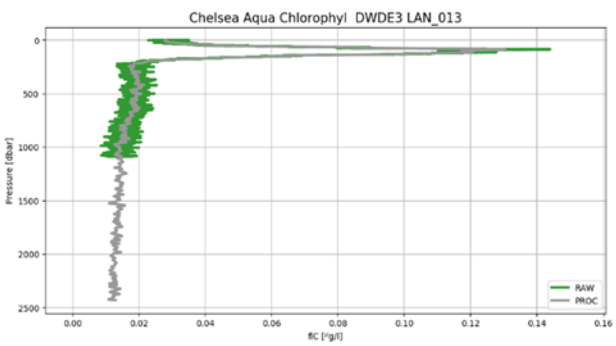


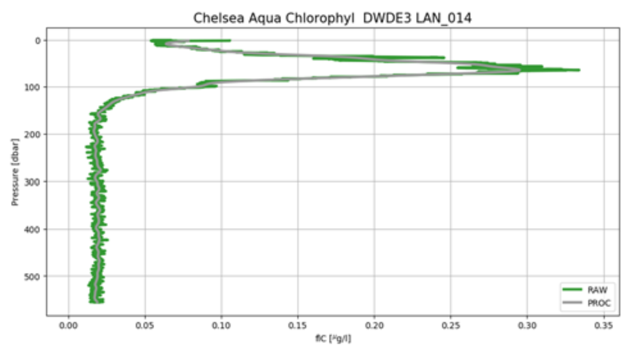

Chelsea Aqua Chlorophyl DWDE3 LAN_009
Pressure [dbar]
RAW
PROC

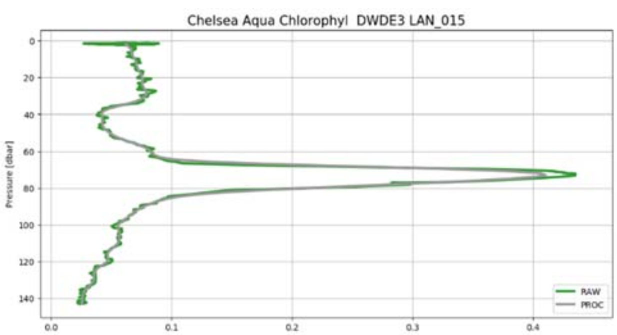

Chelsea Aqua Chlorophyl DWDE3 LAN_010
Pressure [dbar]
RAW
PROC

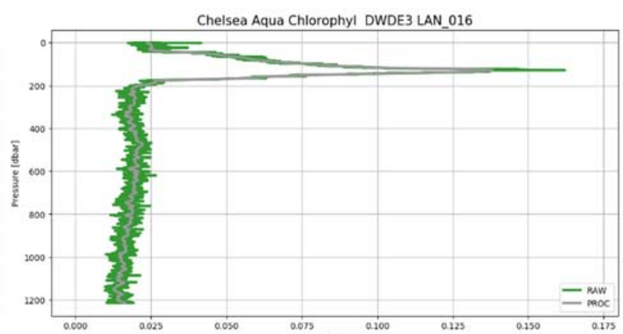

Chelsea Aqua Chlorophyl DWDE3 LAN_011
Pressure [dbar]
RAW
PROC

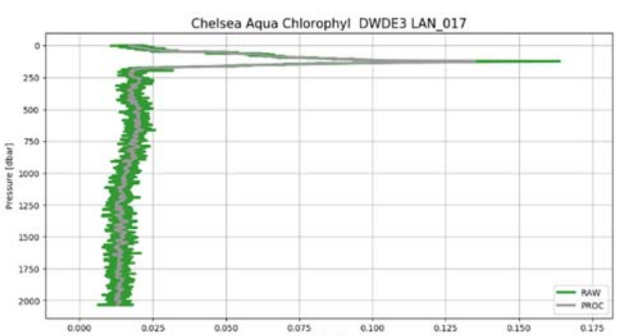

Chelsea Aqua Chlorophyl DWDE3 LAN_012
Pressure [dbar]
RAW
PROC

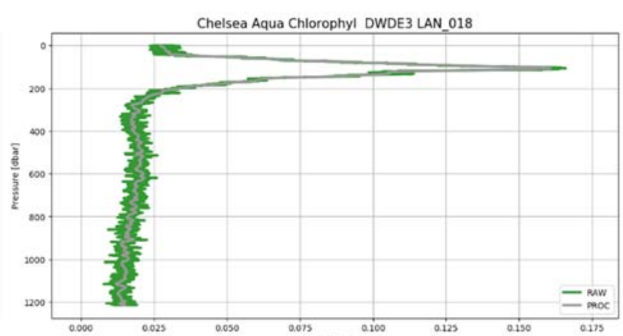

Chelsea Aqua Chlorophyl DWDE3 LAN_013
Pressure [dbar]
RAW
PROC


Chelsea Aqua Chlorophyl DWDE3 LAN_014
Pressure [dbar]
RAW
PROC

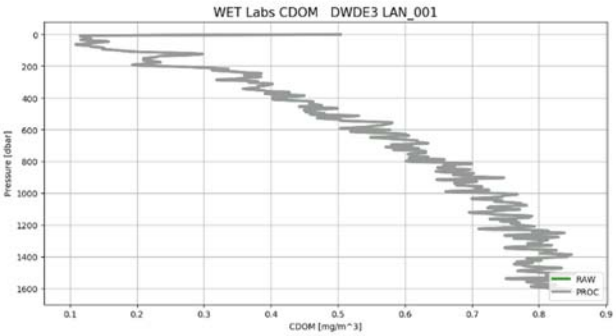

Chelsea Aqua Chlorophyl DWDE3 LAN_015
Pressure [dbar]
RAW
PROC

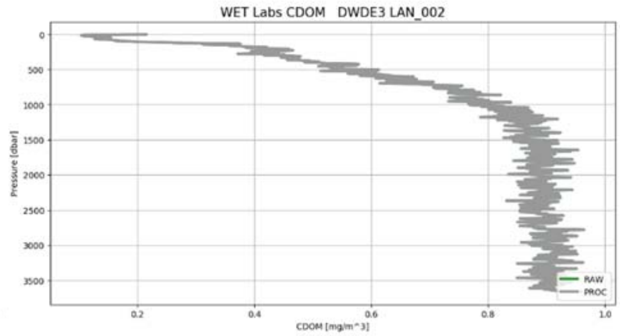

Chelsea Aqua Chlorophyl DWDE3 LAN_016
Pressure [dbar]
RAW
PROC

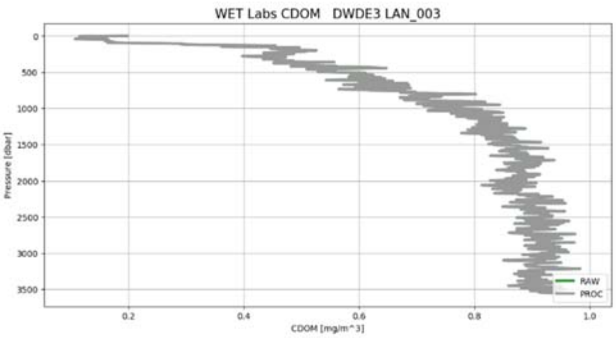

Chelsea Aqua Chlorophyl DWDE3 LAN_017
Pressure [dbar]
RAW
PROC

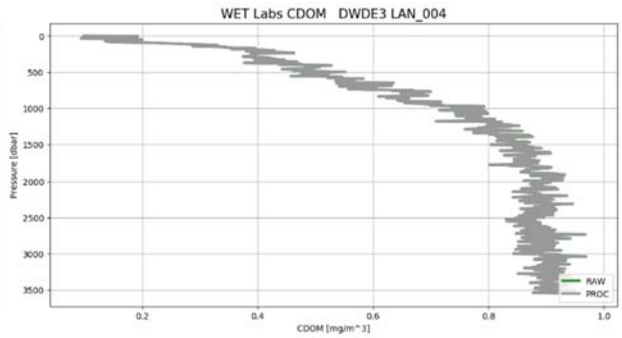

Chelsea Aqua Chlorophyl DWDE3 LAN_018
Pressure [dbar]
RAW
PROC

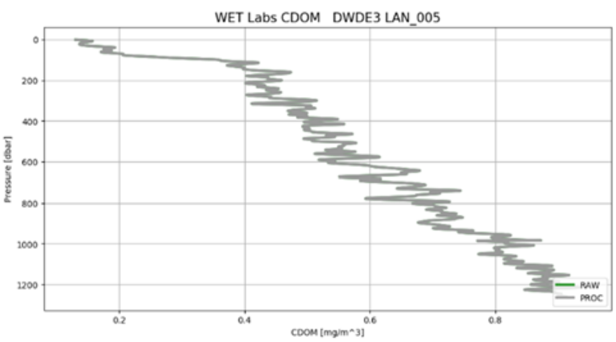
7.3.6 Wetstar CDOM

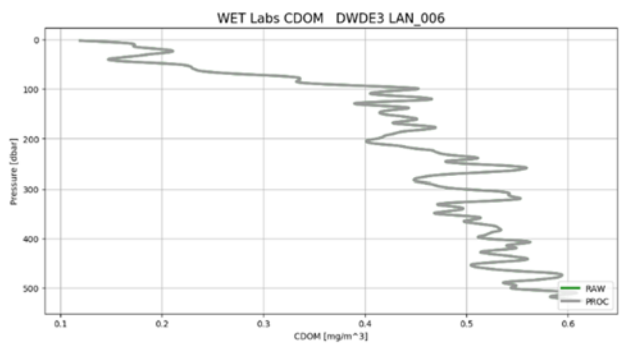


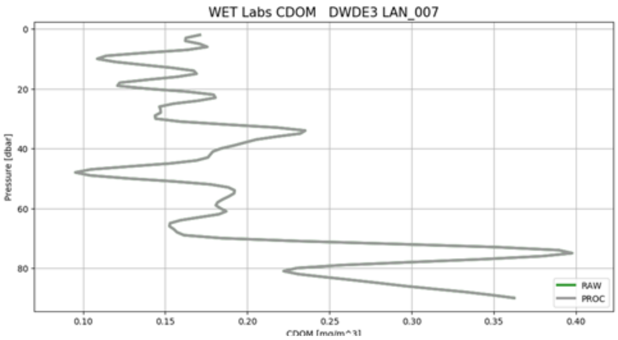


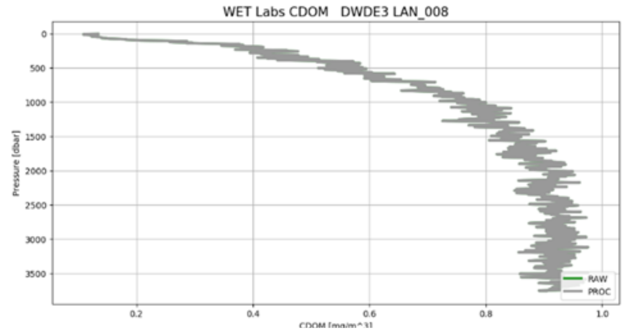


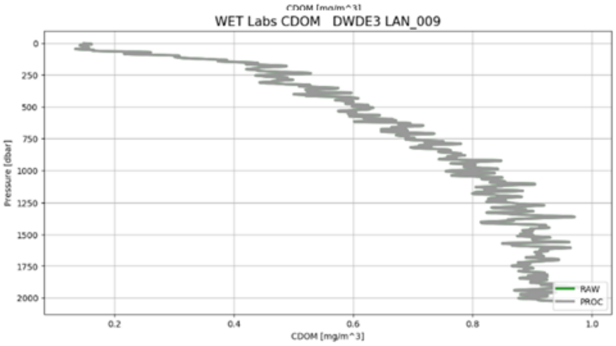


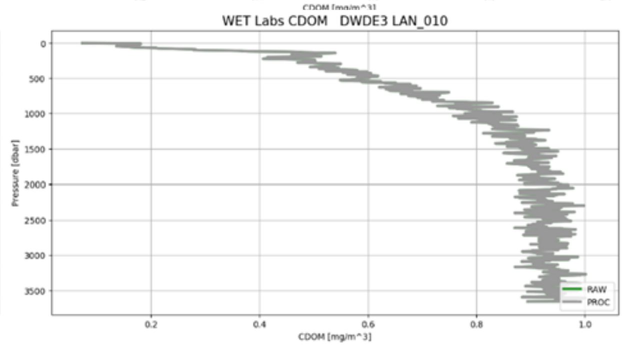


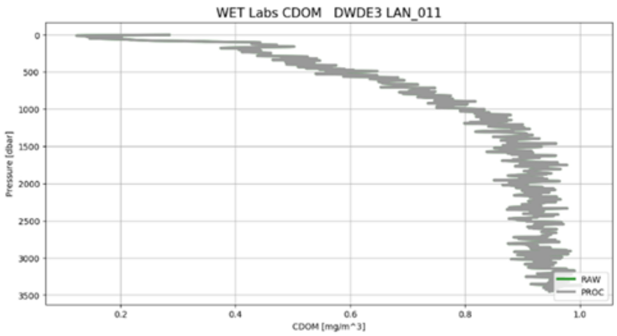


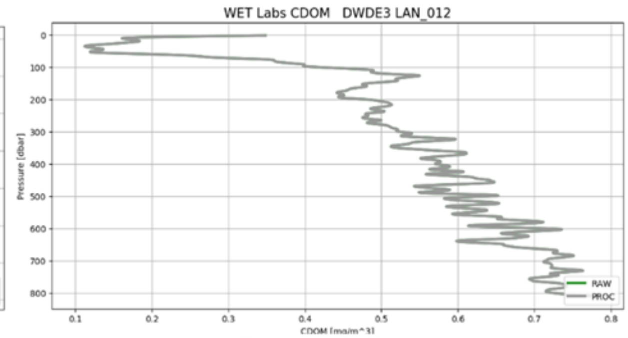

WET Labs CDOM DWDE3 LAN_007
Pressure [dbar]
RAW
PROC

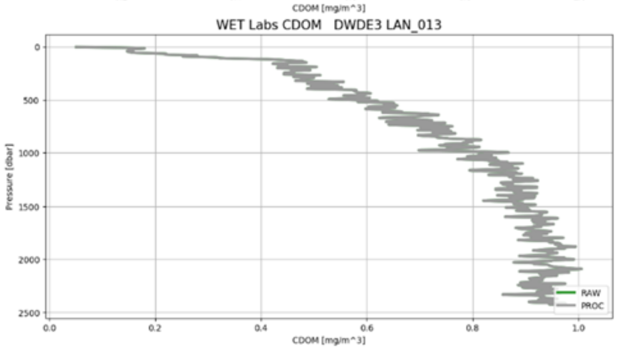

WET Labs CDOM DWDE3 LAN_008
Pressure [dbar]
RAW
PROC

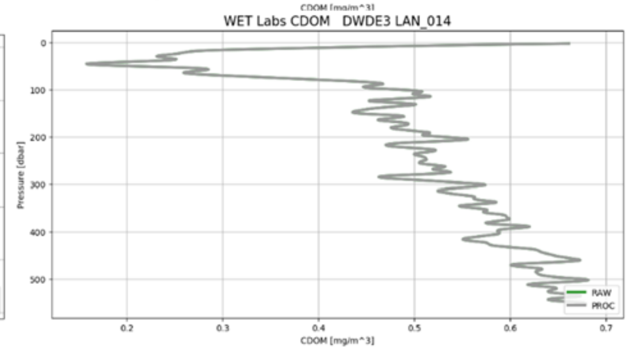

WET Labs CDOM DWDE3 LAN_009
Pressure [dbar]
CDOM [mg/m^3]
RAW
PROC

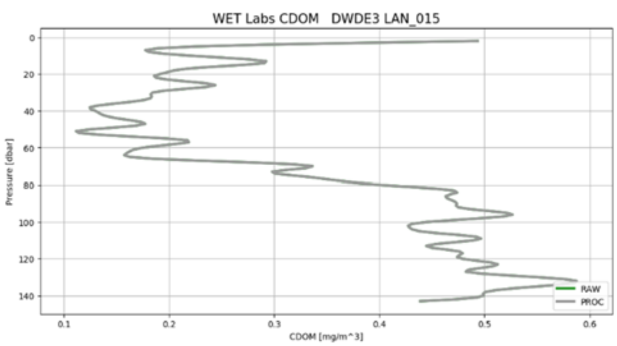

WET Labs CDOM DWDE3 LAN_010
Pressure [dbar]
CDOM [mg/m^3]
RAW
PROC

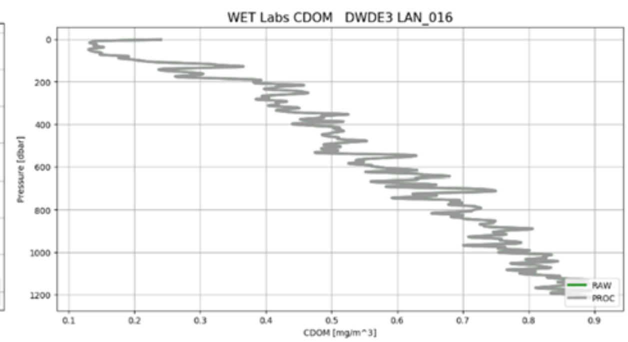

WET Labs CDOM DWDE3 LAN_011
Pressure [dbar]
CDOM [mg/m^3]
RAW
PROC

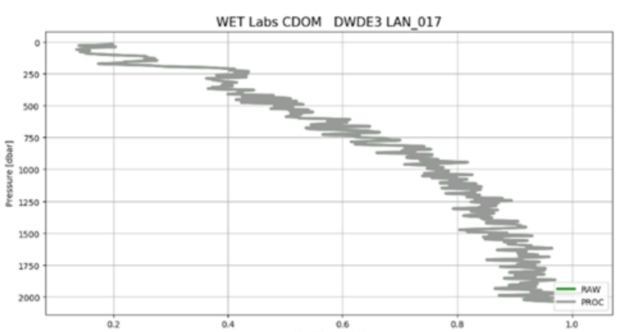

WET Labs CDOM DWDE3 LAN_012
Pressure [dbar]
RAW
PROC

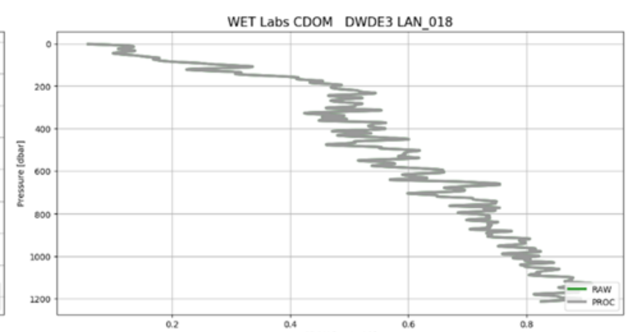

WET Labs CDOM DWDE3 LAN_013
Pressure [dbar]
CDOM [mg/m^3]
RAW
PROC


WET Labs CDOM DWDE3 LAN_014
Pressure [dbar]
CDOM [mg/m^3]
RAW
PROC

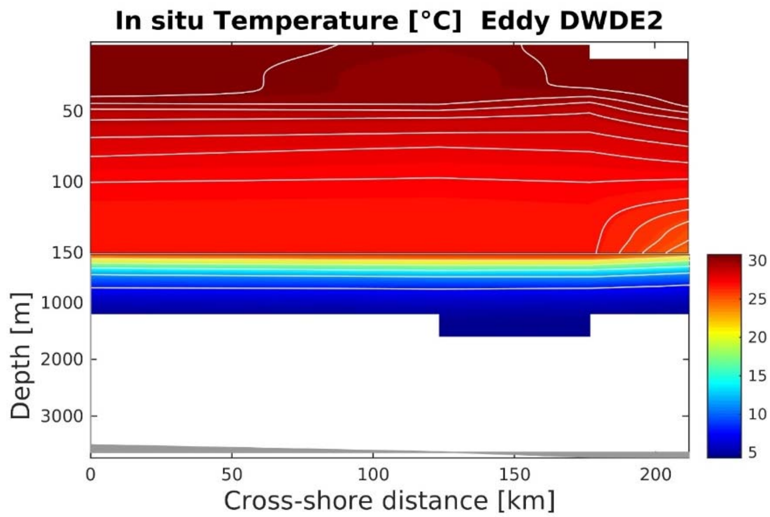

WET Labs CDOM DWDE3 LAN_015
Pressure [dbar]
CDOM [mg/m^3]
RAW
PROC

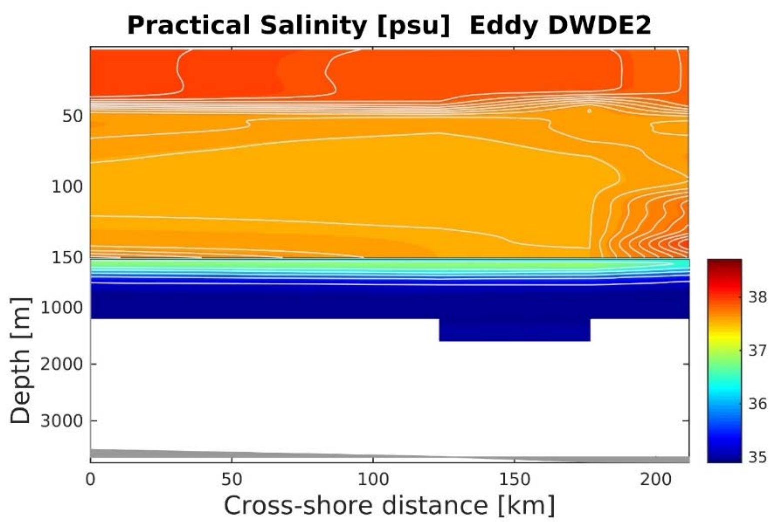

WET Labs CDOM DWDE3 LAN_016
Pressure [dbar]
CDOM [mg/m^3]
RAW
PROC

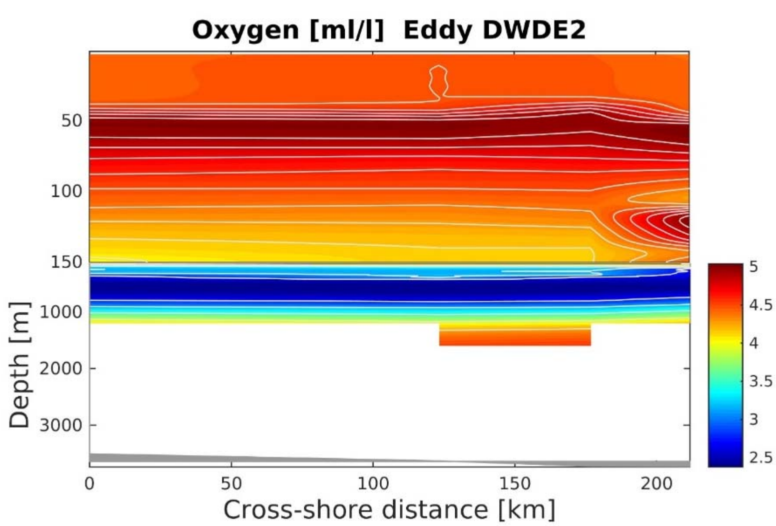

WET Labs CDOM DWDE3 LAN_017
Pressure [dbar]
CDOM [mg/m^3]
RAW
PROC

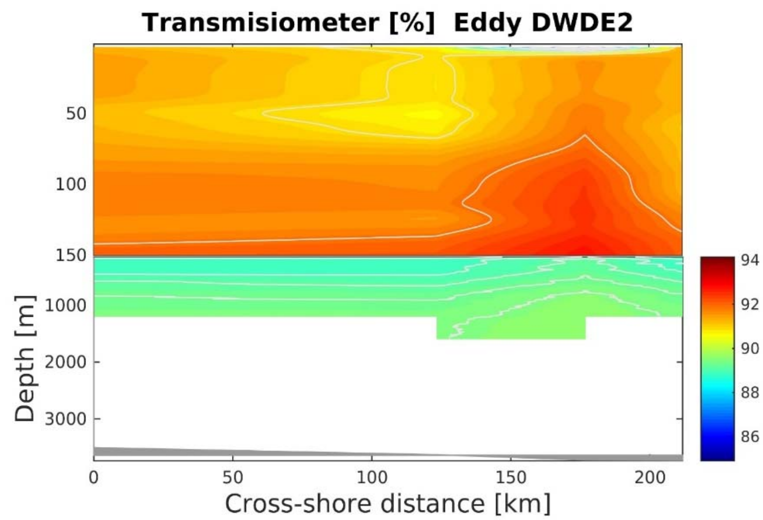

WET Labs CDOM DWDE3 LAN_018
Pressure [dbar]
CDOM [mg/m^3]
RAW
PROC

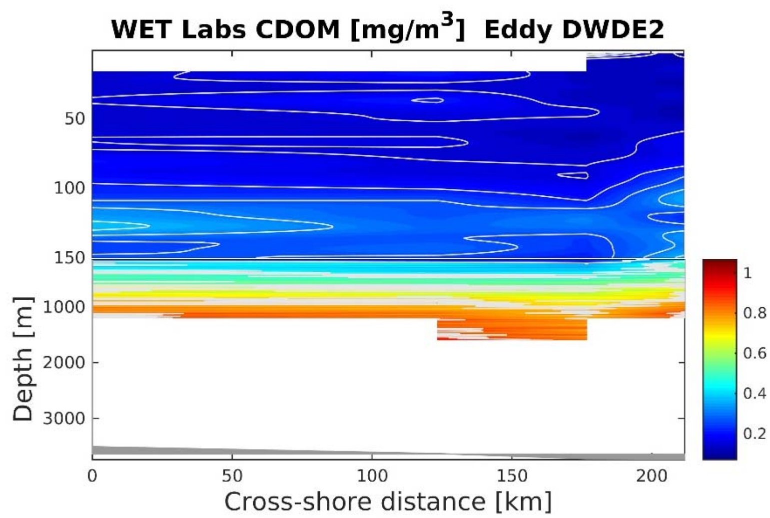
APPENDIX E: CTD CROSS SECTIONS

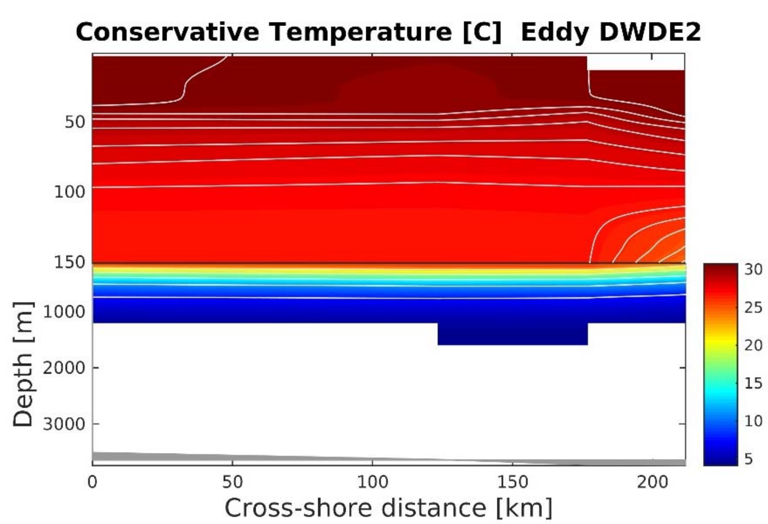


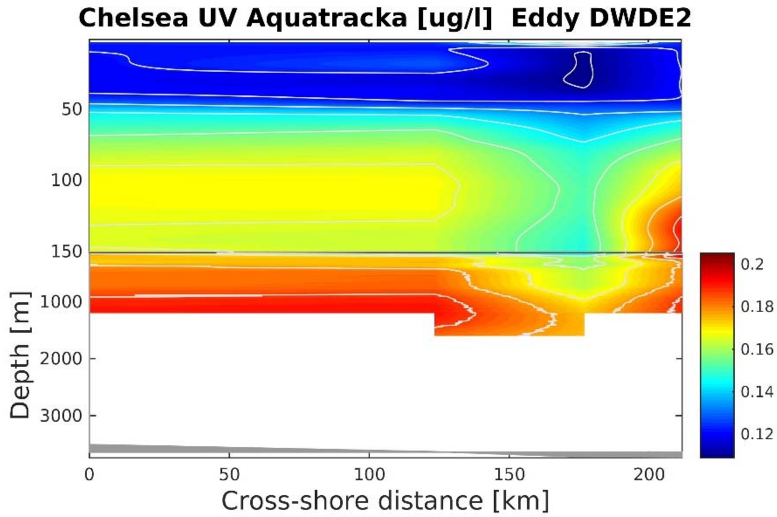


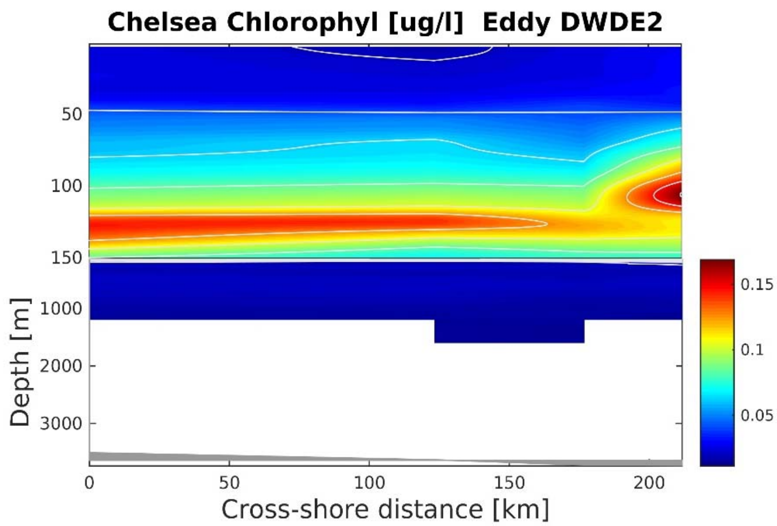


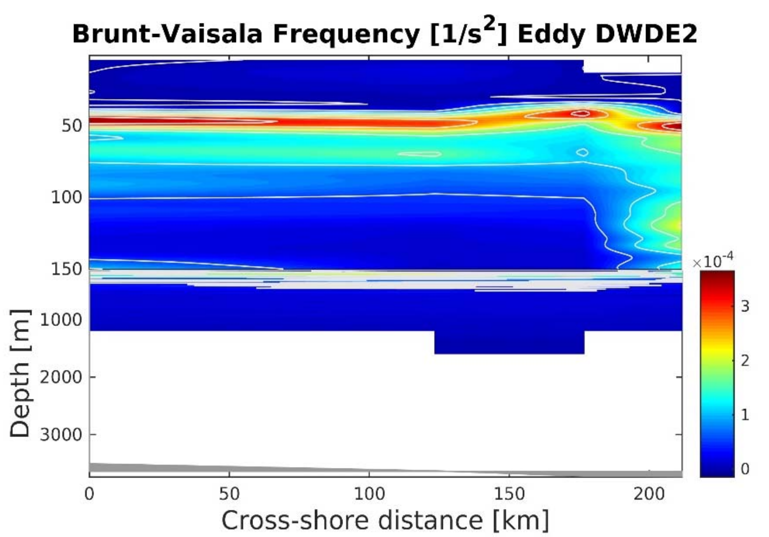

Transmisiometer [%] Eddy DWDE2
50
100
150
1000
2000
3000
Depth [m]
0
50
100
150
200
Cross-shore distance [km]
94
92
90
88
86

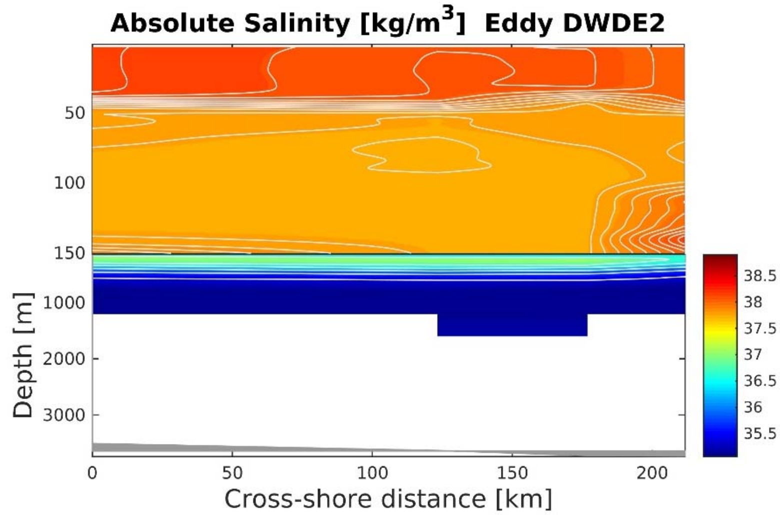

WET Labs CDOM [mg/m3] Eddy DWDE2
50
100
150
1000
2000
3000
Depth [m]
0
50
100
150
200
Cross-shore distance [km]
1
0.8
0.6
0.4
0.2

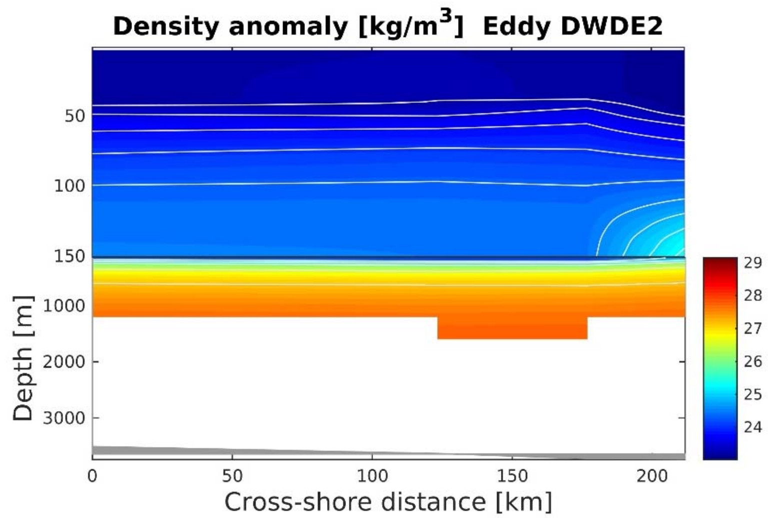

Conservative Temperature [C] Eddy DWDE2
50
100
150
1000
2000
3000
Depth [m]
0
50
100
150
200
Cross-shore distance [km]
30
25
20
15
10
5

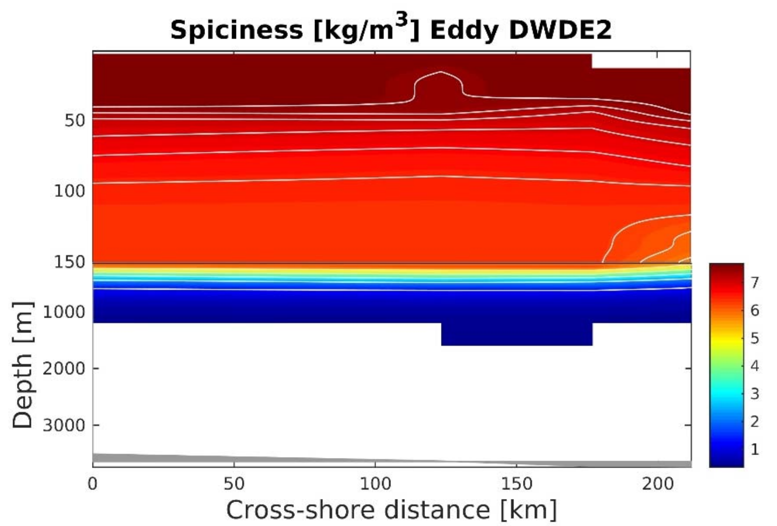

Chelsea UV Aquatracka [ug/l] Eddy DWDE2
Depth [m]
Cross-shore distance [km]
50
100
150
1000
2000
3000
0
50
100
150
200
0.2
0.18
0.16
0.14
0.12

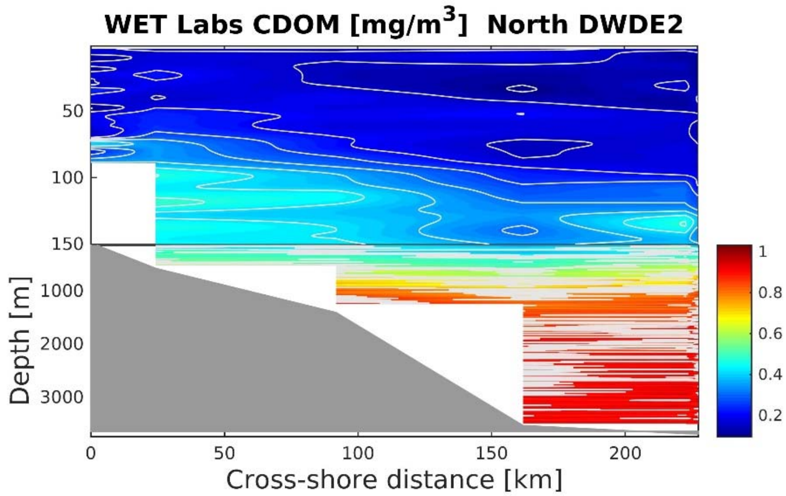

Chelsea Chlorophyl [ug/l] Eddy DWDE2
Depth [m]
Cross-shore distance [km]
50
100
150
1000
2000
3000
0
50
100
150
200
0.15
0.1
0.05

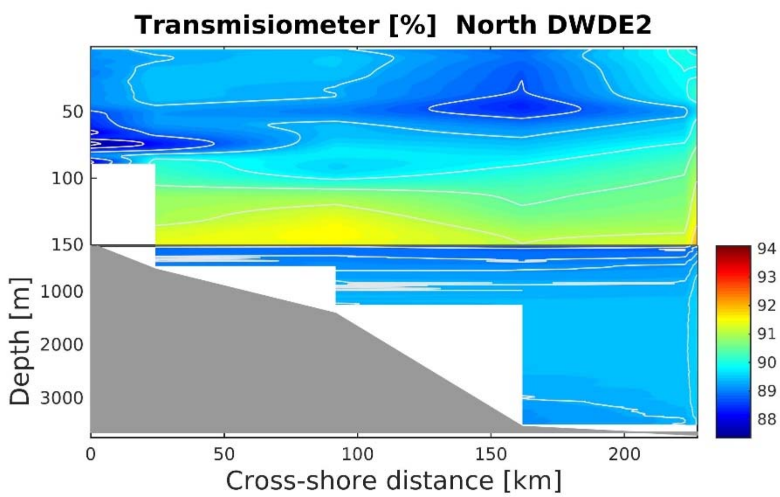

Brunt-Vaisala Frequency [1/s^2] Eddy DWDE2
Depth [m]
Cross-shore distance [km]
50
100
150
1000
2000
3000
0
50
100
150
200
$\times10^{-4}$
3
2
1
0

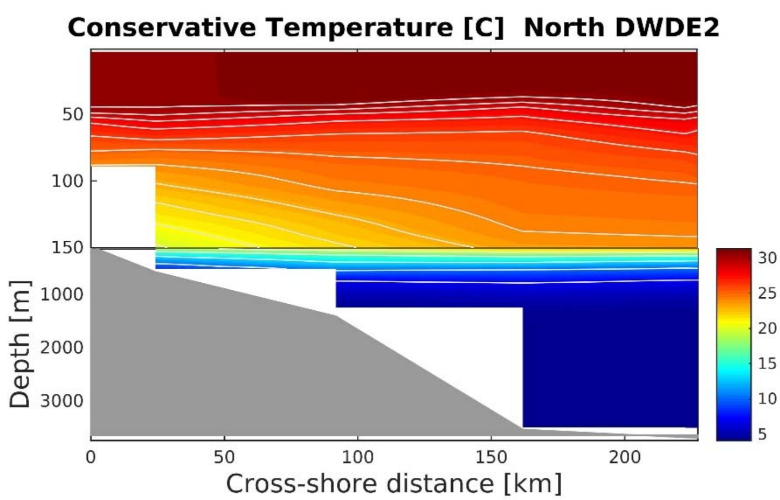

Absolute Salinity [kg/m3] Eddy DWDE2
Depth [m]
50
100
150
1000
2000
3000
0
50
100
150
200
Cross-shore distance [km]
38.5
38
37.5
37
36.5
36
35.5

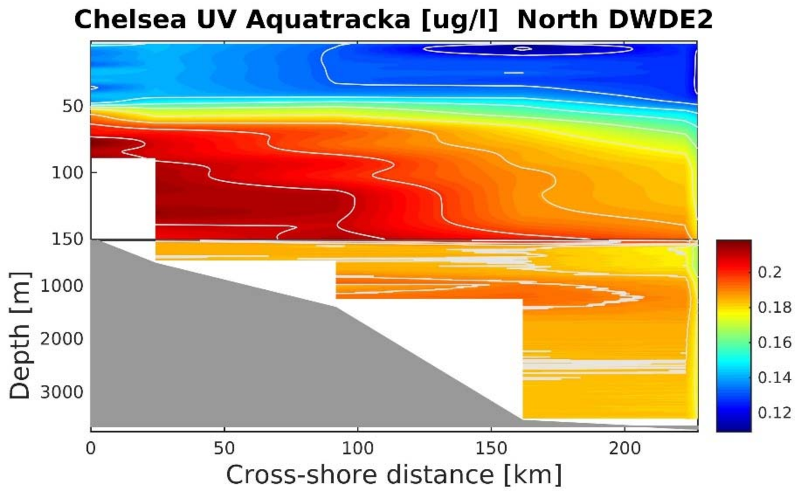

Density anomaly [kg/m3] Eddy DWDE2
Depth [m]
50
100
150
1000
2000
3000
0
50
100
150
200
Cross-shore distance [km]
29
28
27
26
25
24

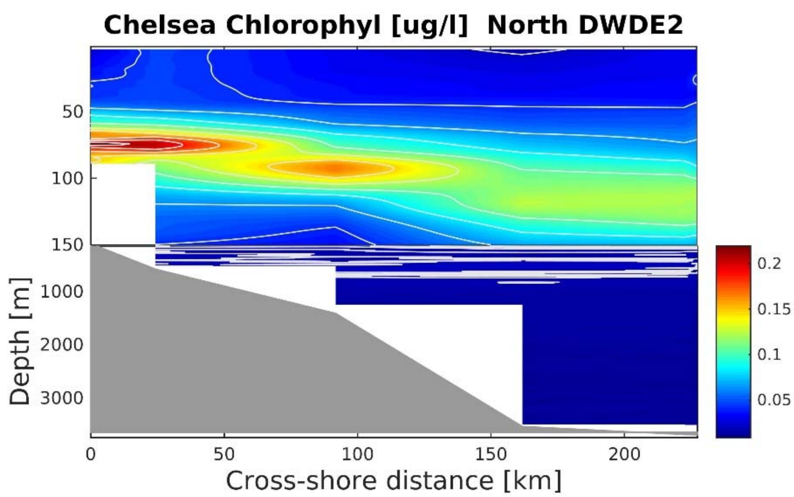

Spiciness [kg/m3] Eddy DWDE2
Depth [m]
50
100
150
1000
2000
3000
0
50
100
150
200
Cross-shore distance [km]
7
6
5
4
3
2
1

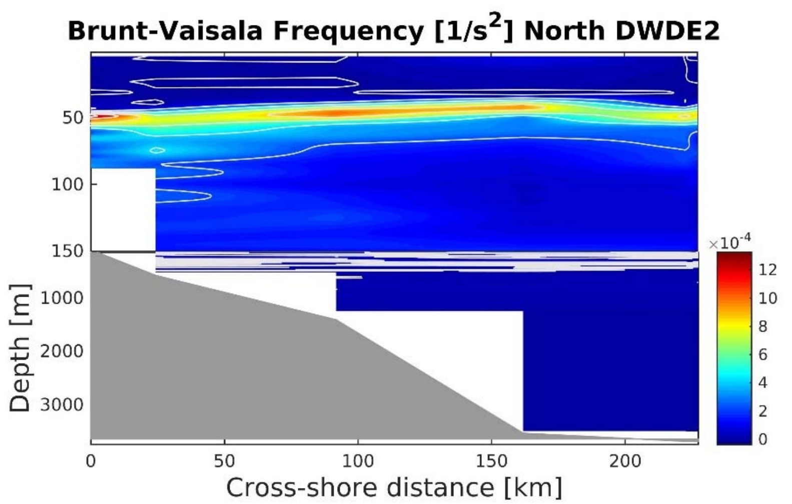

WET Labs CDOM [mg/m3] North DWDE2
Depth [m]
Cross-shore distance [km]

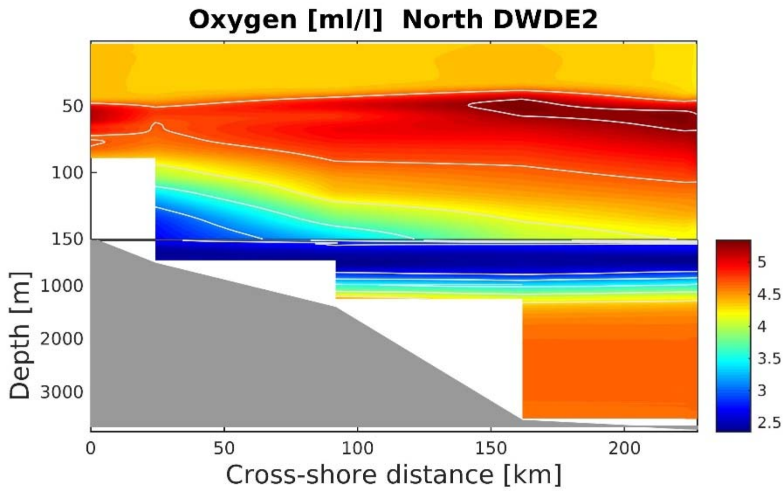

Transmisiometer [%] North DWDE2
Depth [m]
Cross-shore distance [km]


Conservative Temperature [C] North DWDE2
Depth [m]
Cross-shore distance [km]

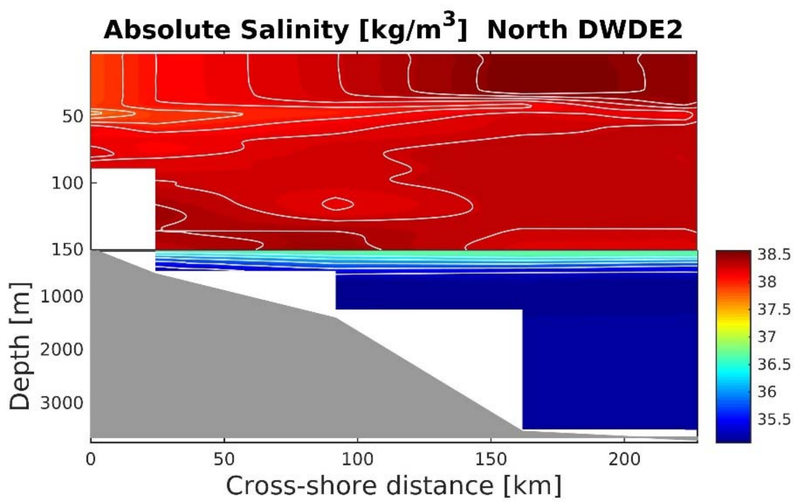

Chelsea UV Aquatracka [ug/l] North DWDE2
Depth [m]
Cross-shore distance [km]


Chelsea Chlorophyl [ug/l] North DWDE2
Depth [m]
Cross-shore distance [km]

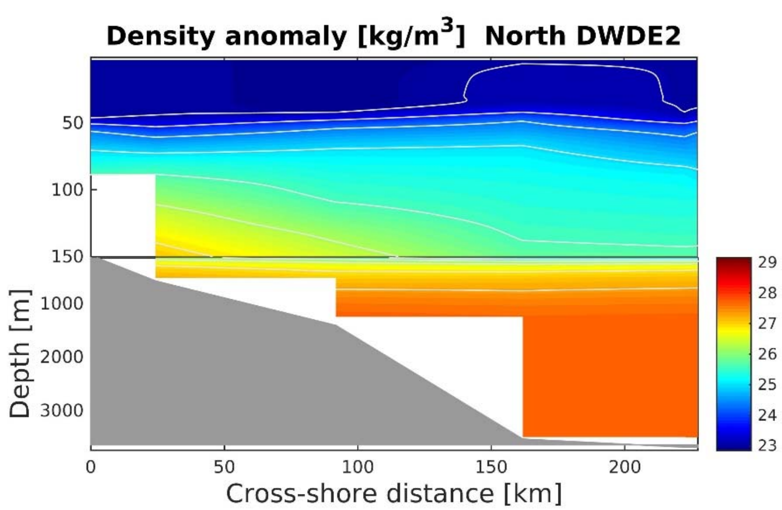

Brunt-Vaisala Frequency [1/s2] North DWDE2
Depth [m]
Cross-shore distance [km]



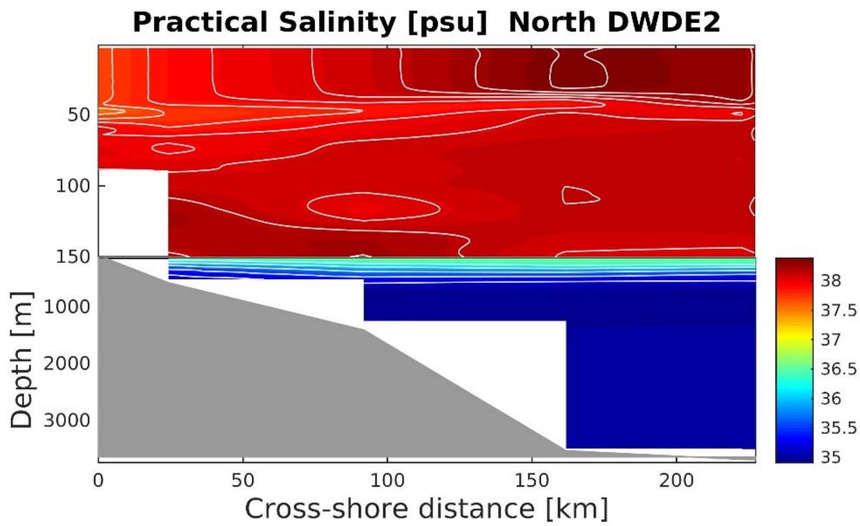
Oxygen [ml/l] North DWDE2
Depth [m]
Cross-shore distance [km]

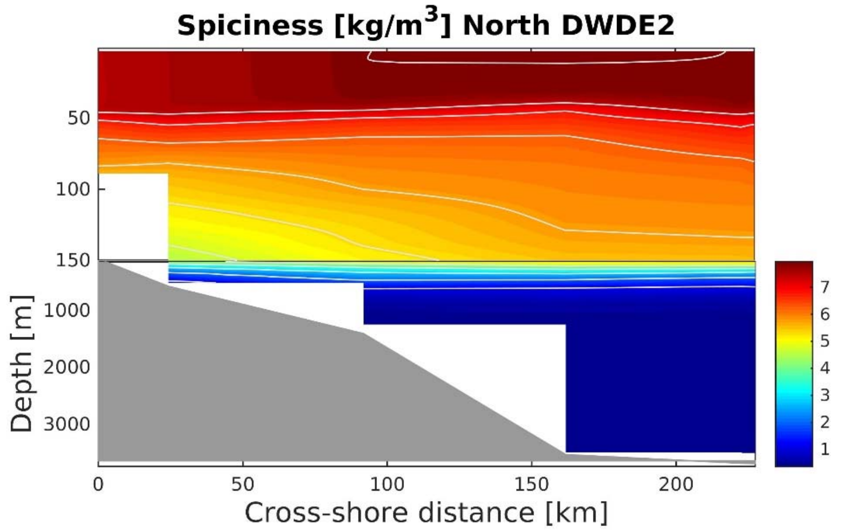


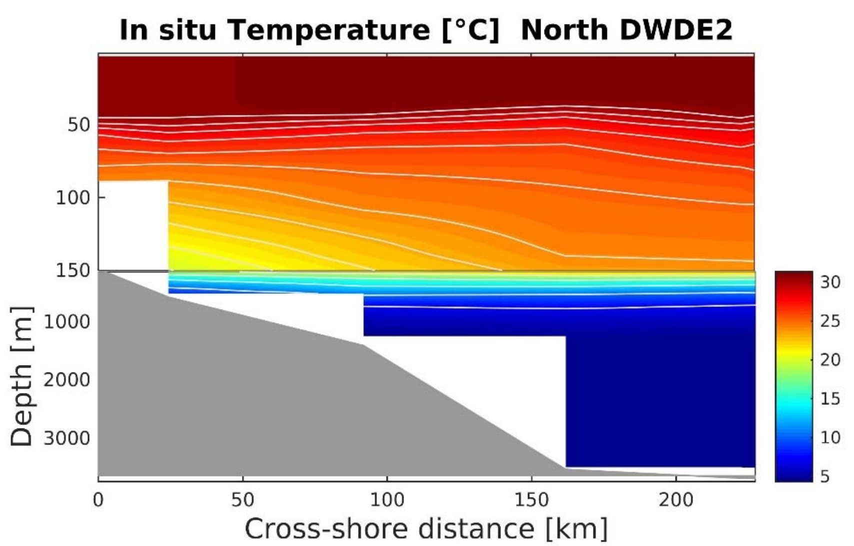
Absolute Salinity [kg/m3] North DWDE2
Depth [m]
Cross-shore distance [km]

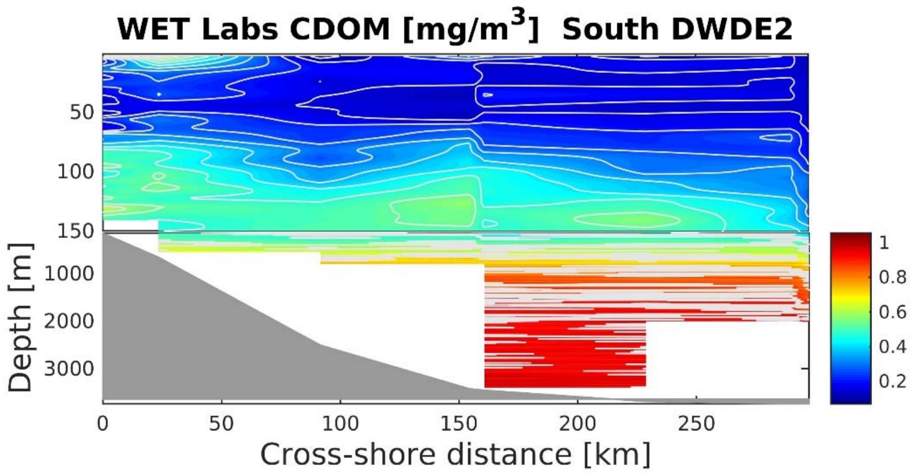


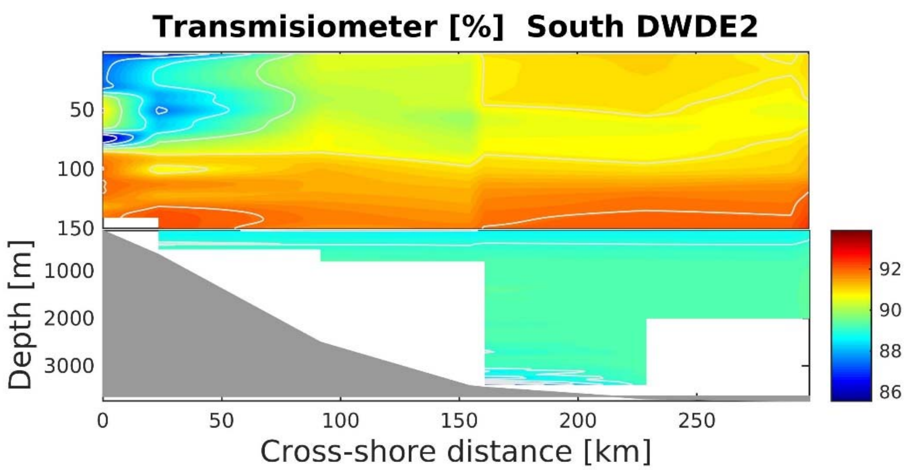
Density anomaly [kg/m3] North DWDE2
Depth [m]
Cross-shore distance [km]

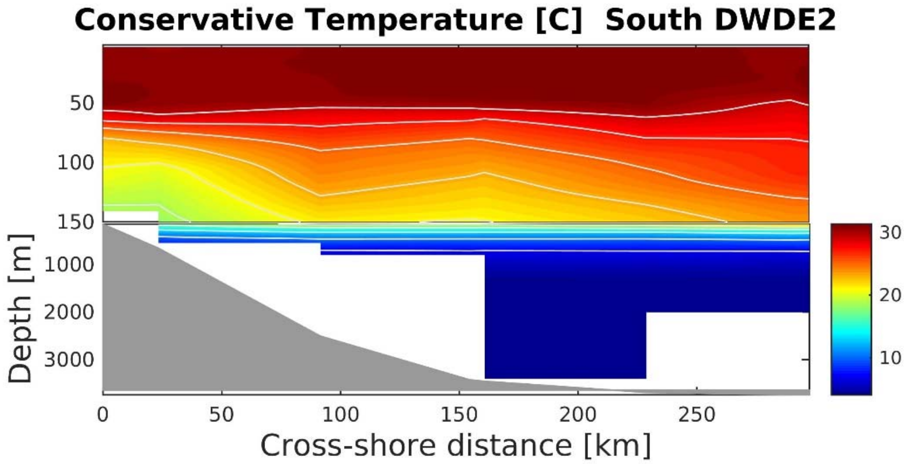

Practical Salinity [psu] North DWDE2
Depth [m]
50
100
150
1000
2000
3000
0
50
100
150
200
Cross-shore distance [km]
38
37.5
37
36.5
36
35.5
35


Spiciness [kg/m3] North DWDE2
Depth [m]
50
100
150
1000
2000
3000
0
50
100
150
200
Cross-shore distance [km]
7
6
5
4
3
2
1

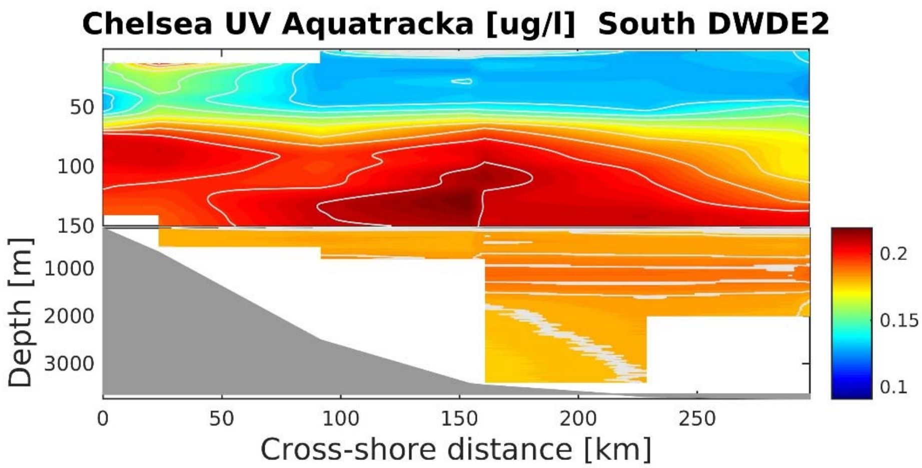

In situ Temperature [°C] North DWDE2
Depth [m]
50
100
150
1000
2000
3000
0
50
100
150
200
Cross-shore distance [km]
30
25
20
15
10
5


WET Labs CDOM [mg/m3] South DWDE2
Depth [m]
50
100
150
1000
2000
3000
0
50
100
150
200
250
Cross-shore distance [km]
1
0.8
0.6
0.4
0.2

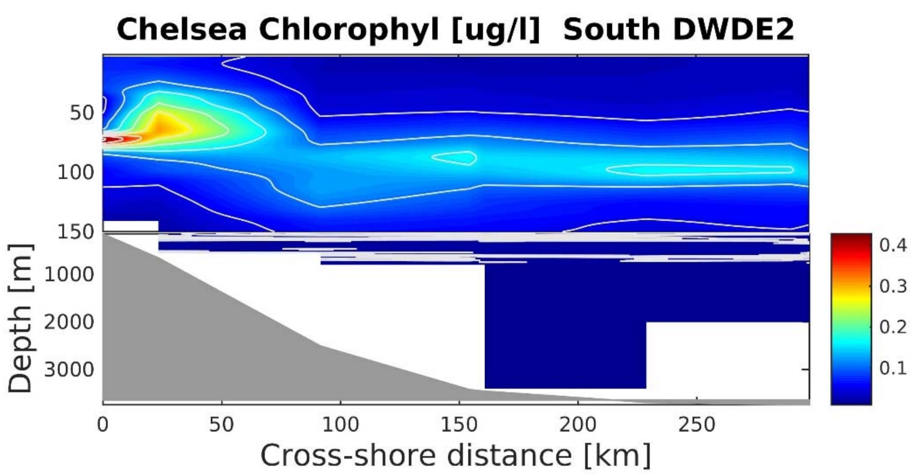

Transmisiometer [%] South DWDE2
Depth [m]
50
100
150
1000
2000
3000
0
50
100
150
200
250
Cross-shore distance [km]
92
90
88
86



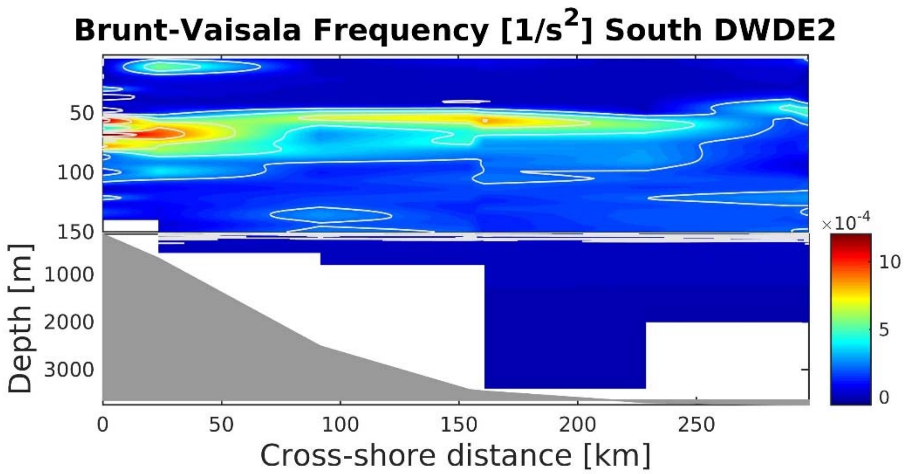
Conservative Temperature [C] South DWDE2
Depth [m]
Cross-shore distance [km]

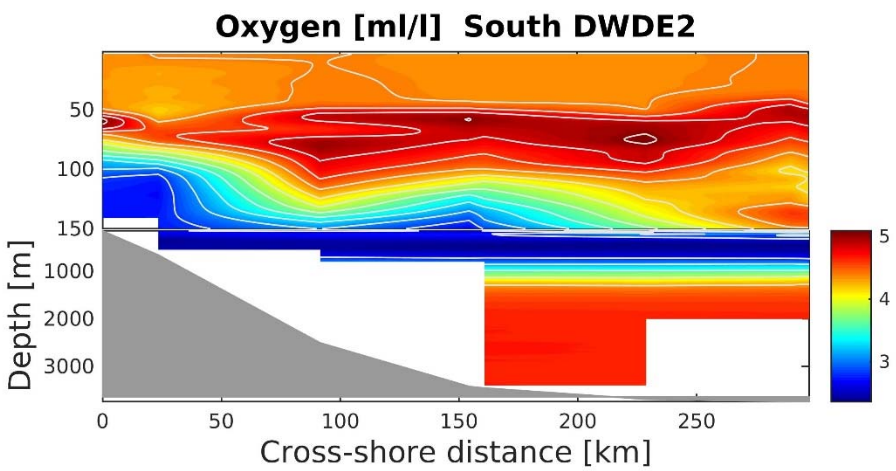


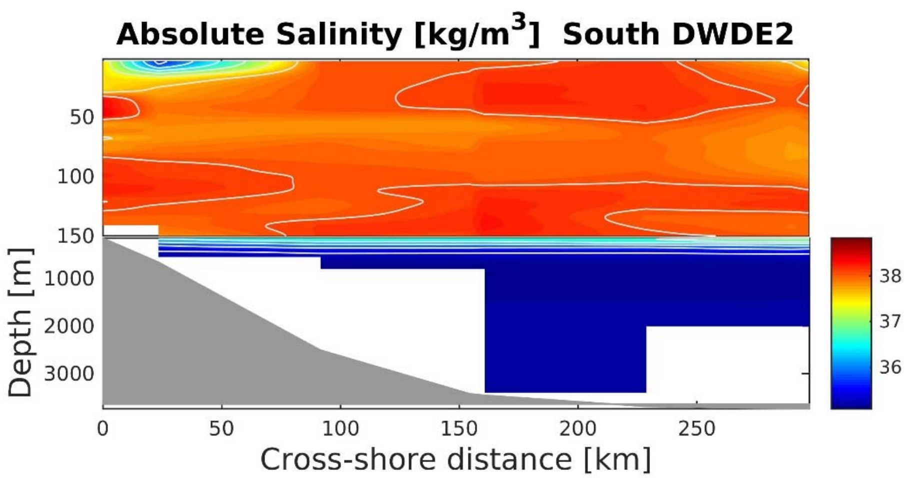
Chelsea UV Aquatracka [ug/l] South DWDE2
Depth [m]
Cross-shore distance [km]

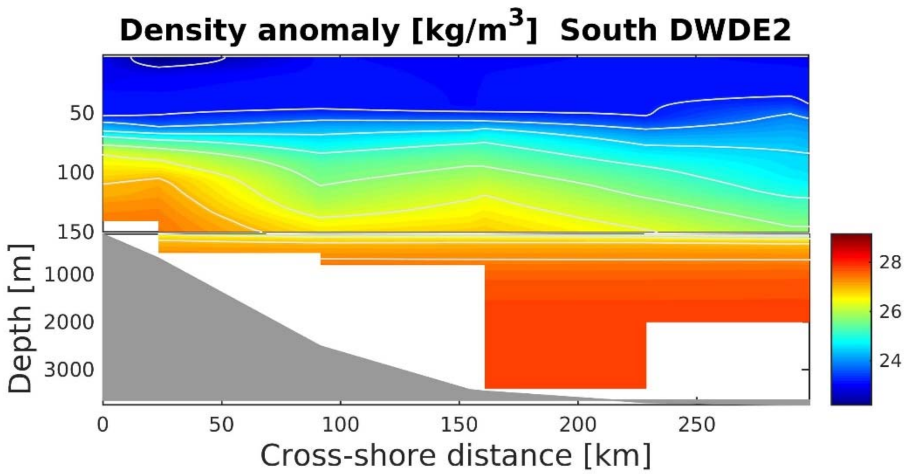


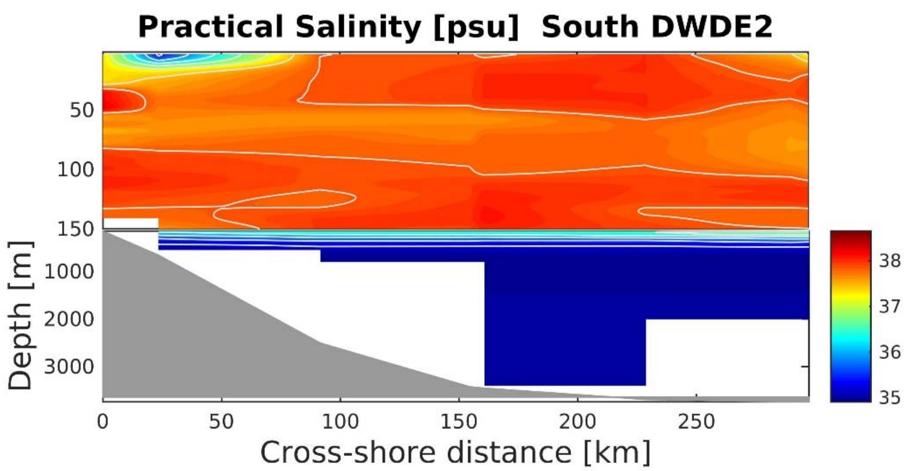
Chelsea Chlorophyl [ug/l] South DWDE2
Depth [m]
Cross-shore distance [km]

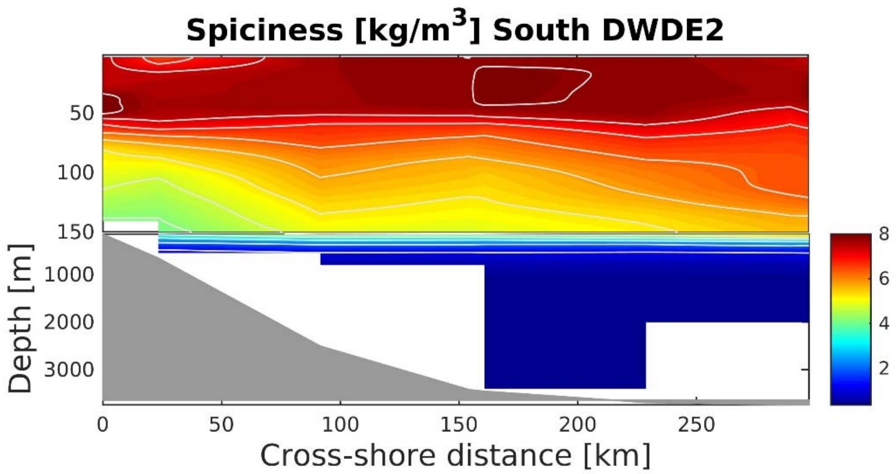

Brunt-Vaisala Frequency [1/s^2] South DWDE2
50
100
150
1000
2000
3000
Depth [m]
0
50
100
150
200
250
Cross-shore distance [km]
×10^-4
10
5
0

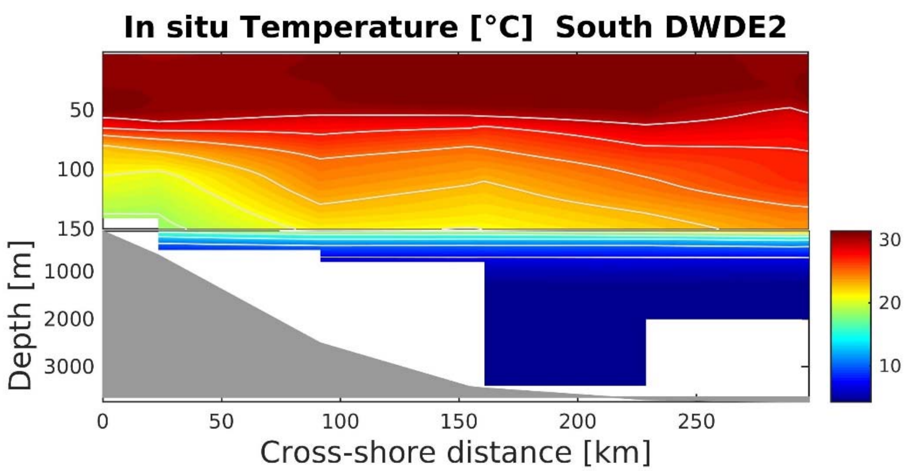

Oxygen [ml/l] South DWDE2
50
100
150
1000
2000
3000
Depth [m]
0
50
100
150
200
250
Cross-shore distance [km]
5
4
3


Absolute Salinity [kg/m^3] South DWDE2
50
100
150
1000
2000
3000
Depth [m]
0
50
100
150
200
250
Cross-shore distance [km]
38
37
36

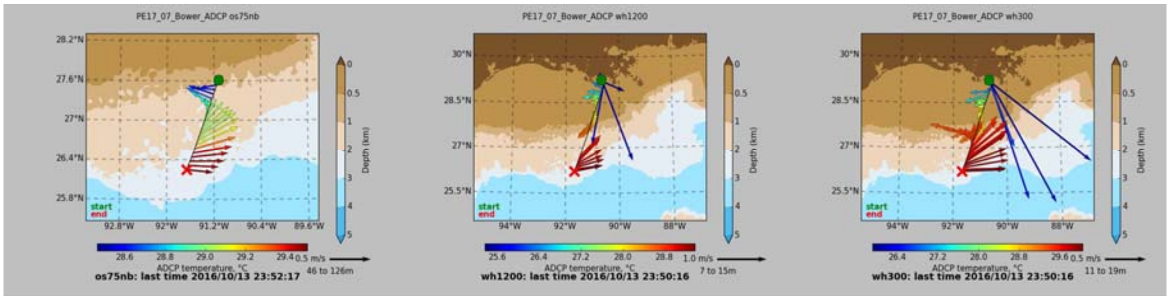

Density anomaly [kg/m3] South DWDE2
50
100
150
1000
2000
3000
Depth [m]
0
50
100
150
200
250
Cross-shore distance [km]
28
26
24

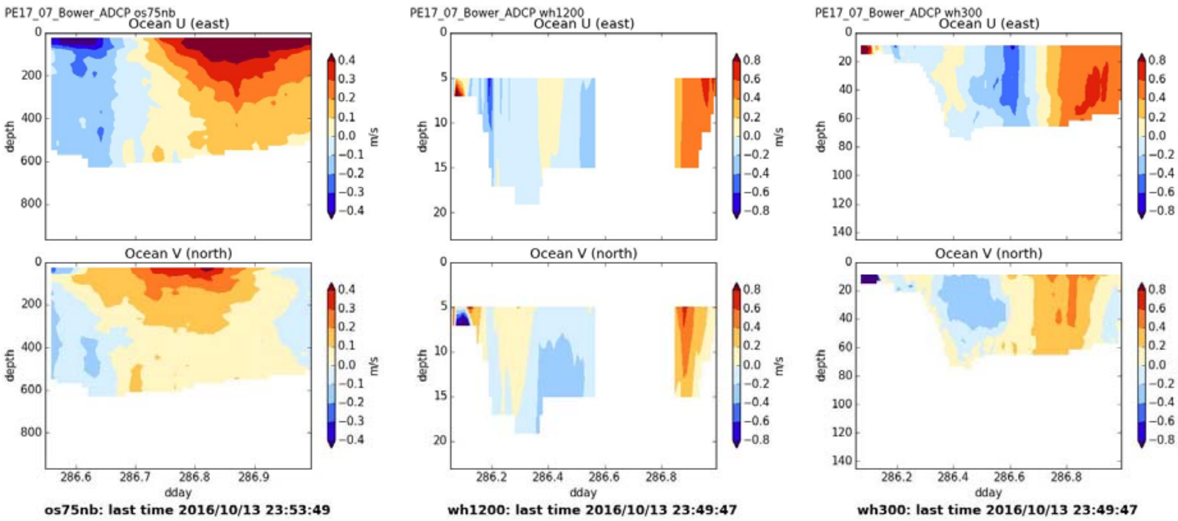

Practical Salinity [psu] South DWDE2
50
100
150
1000
2000
3000
Depth [m]
0
50
100
150
200
250
Cross-shore distance [km]
38
37
36
35

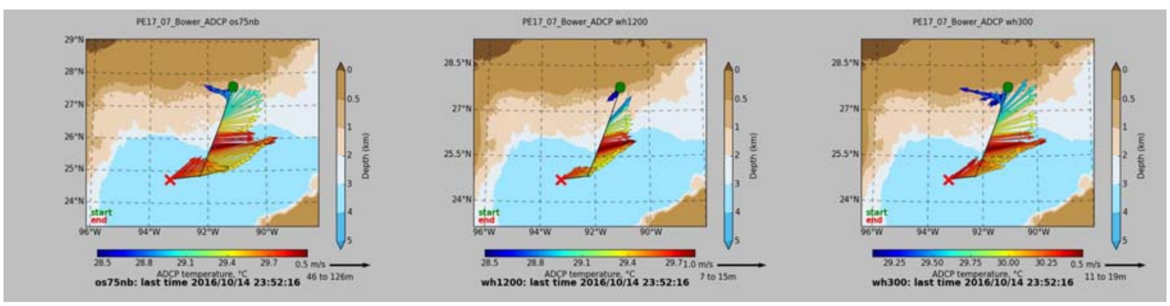


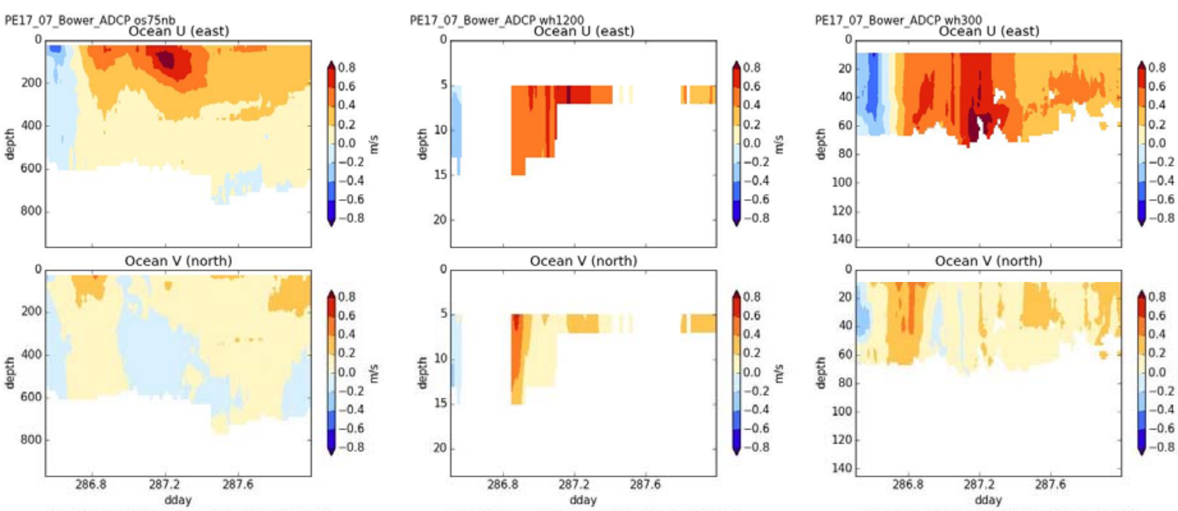


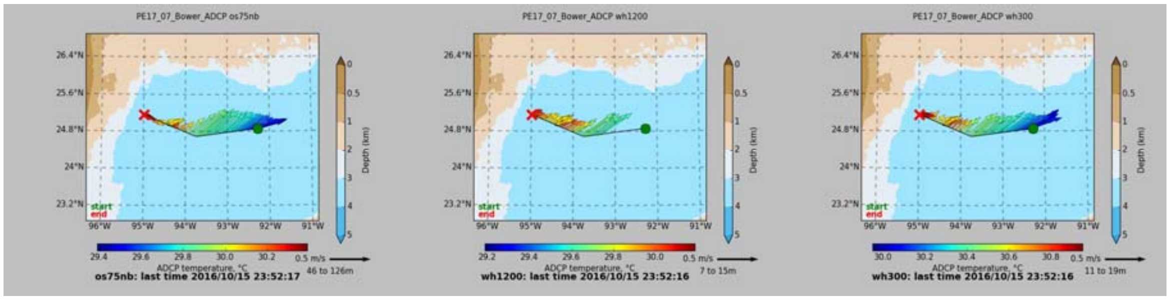
APPENDIX F. ADCP profiles.

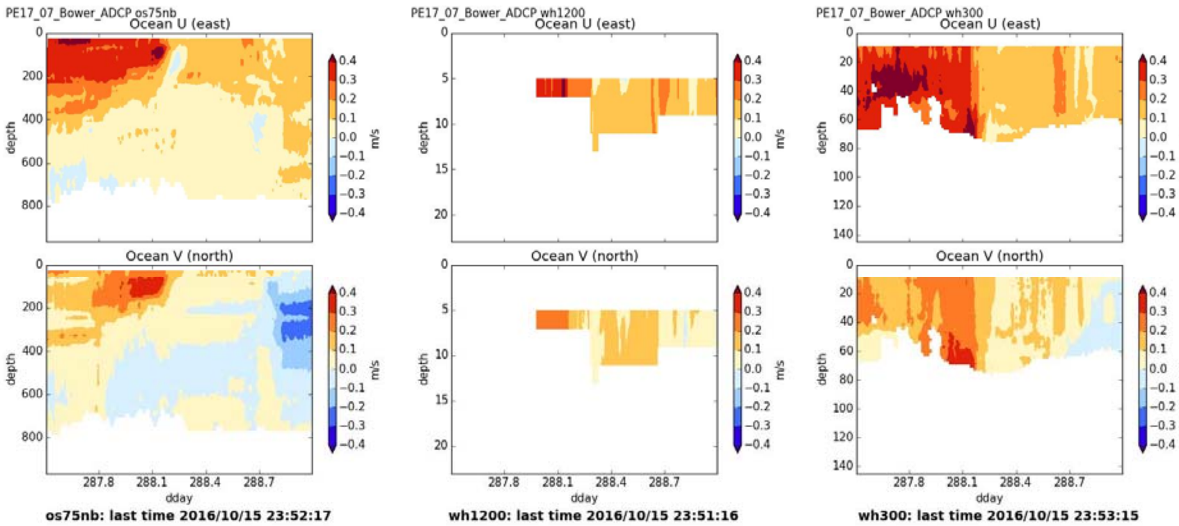

PE17_07_Bower_ADCP os75nb
os75nb: last time 2016/10/13 23:52:17
PE17_07_Bower_ADCP wh1200
wh1200: last time 2016/10/13 23:50:16
PE17_07_Bower_ADCP wh300
wh300: last time 2016/10/13 23:50:16

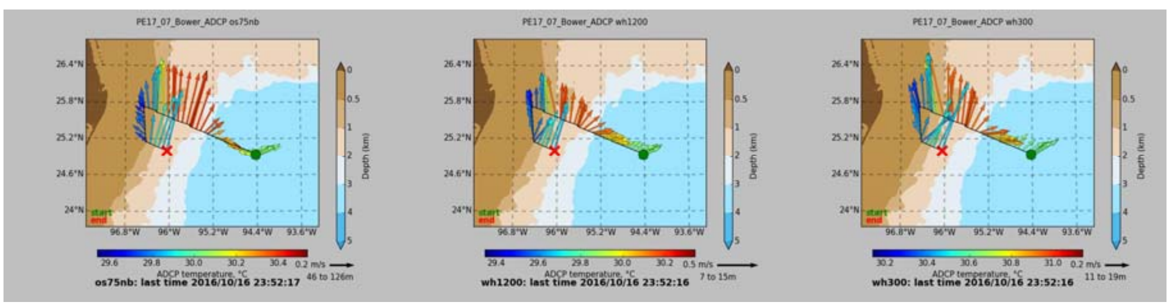

PE17_07_Bower_ADCP os75nb
Ocean U (east)
Ocean V (north)
depth
dday
m/s
os75nb: last time 2016/10/13 23:53:49
PE17_07_Bower_ADCP wh1200
wh1200: last time 2016/10/13 23:49:47
PE17_07_Bower_ADCP wh300
wh300: last time 2016/10/13 23:49:47

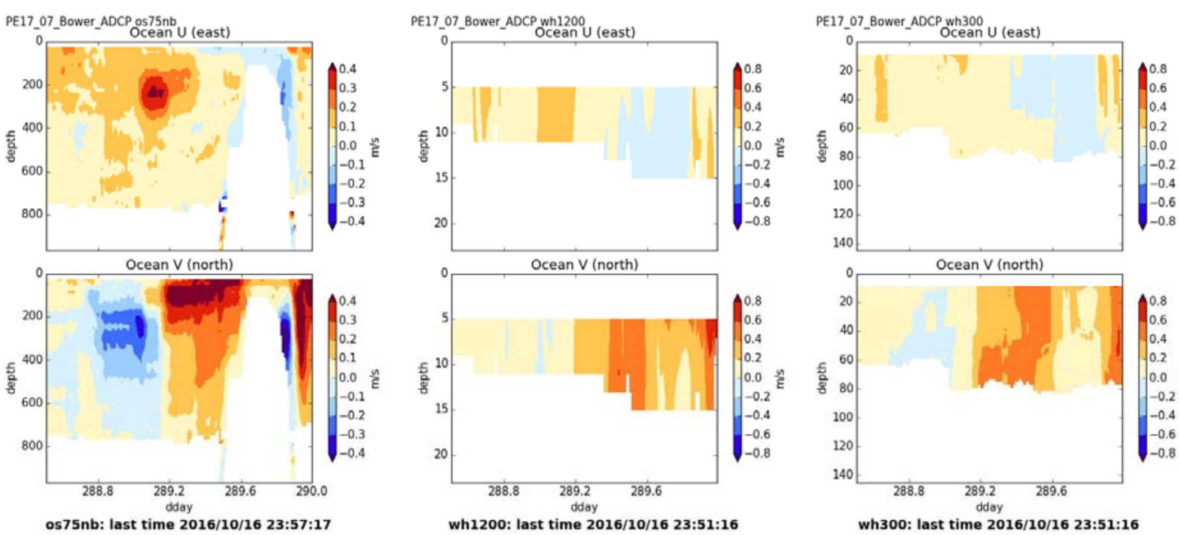

PE17_07_Bower_ADCP os75nb
os75nb: last time 2016/10/14 23:52:16
PE17_07_Bower_ADCP wh1200
wh1200: last time 2016/10/14 23:52:16
PE17_07_Bower_ADCP wh300
wh300: last time 2016/10/14 23:52:16

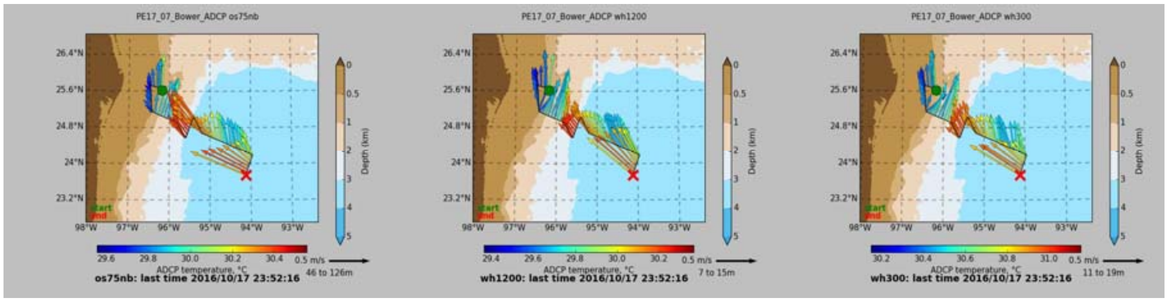

PE17_07_Bower_ADCP os75nb
Ocean U (east)
Ocean V (north)
depth
dday
m/s
os75nb: last time 2016/10/14 23:53:49
PE17_07_Bower_ADCP wh1200
wh1200: last time 2016/10/14 23:52:48
PE17_07_Bower_ADCP wh300
wh300: last time 2016/10/14 23:52:46

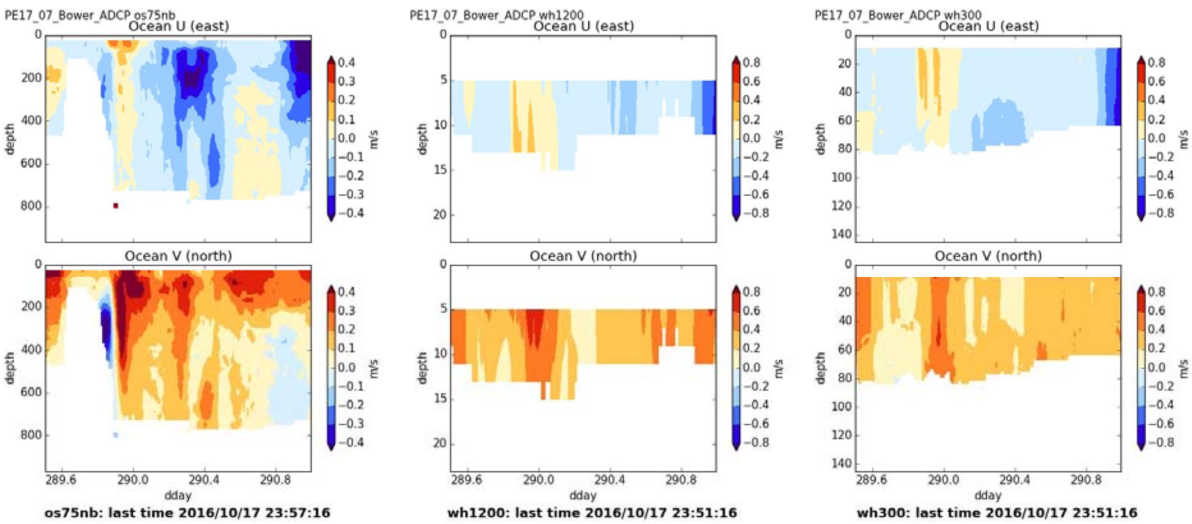

PE17_07_Bower_ADCP os75nb
PE17_07_Bower_ADCP wh1200
PE17_07_Bower_ADCP wh300
start
end
Depth (km)
ADCP temperature, °C
0.5 m/s
46 to 126m
7 to 15m
11 to 19m
os75nb: last time 2016/10/15 23:52:17
wh1200: last time 2016/10/15 23:52:16
wh300: last time 2016/10/15 23:52:16

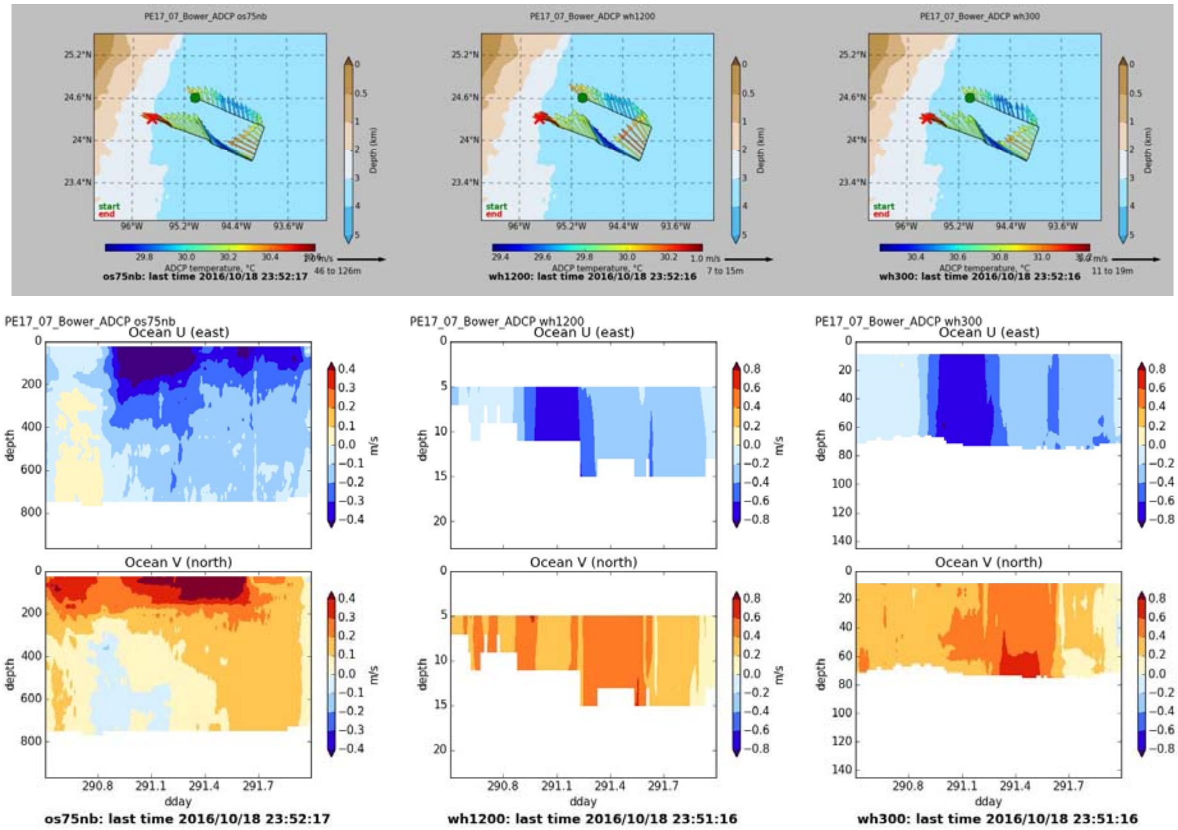

PE17_07_Bower_ADCP os75nb
PE17_07_Bower_ADCP wh1200
PE17_07_Bower_ADCP wh300
Ocean U (east)
Ocean V (north)
depth
m/s
dday
os75nb: last time 2016/10/15 23:52:17
wh1200: last time 2016/10/15 23:51:16
wh300: last time 2016/10/15 23:53:15

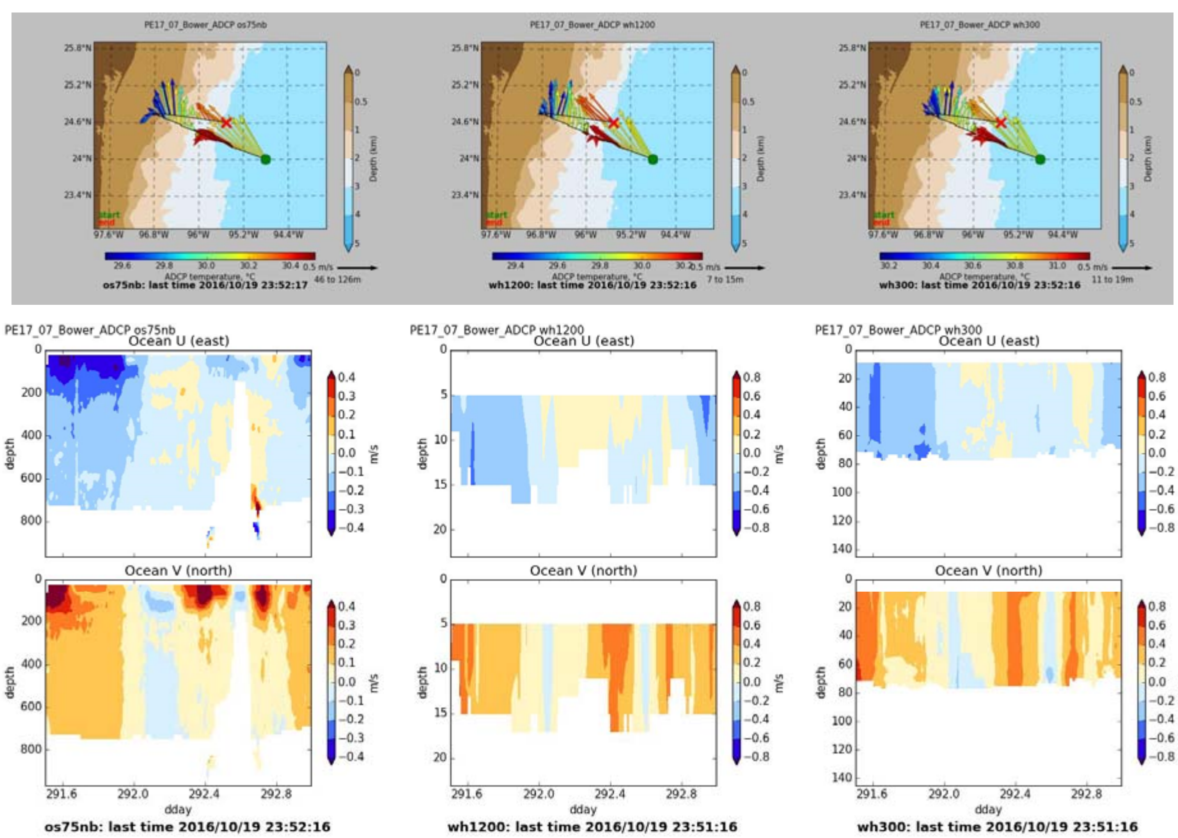

PE17_07_Bower_ADCP os75nb
PE17_07_Bower_ADCP wh1200
PE17_07_Bower_ADCP wh300
start
end
Depth (km)
ADCP temperature, °C
46 to 126m
7 to 15m
11 to 19m
os75nb: last time 2016/10/16 23:52:17
wh1200: last time 2016/10/16 23:52:16
wh300: last time 2016/10/16 23:52:16

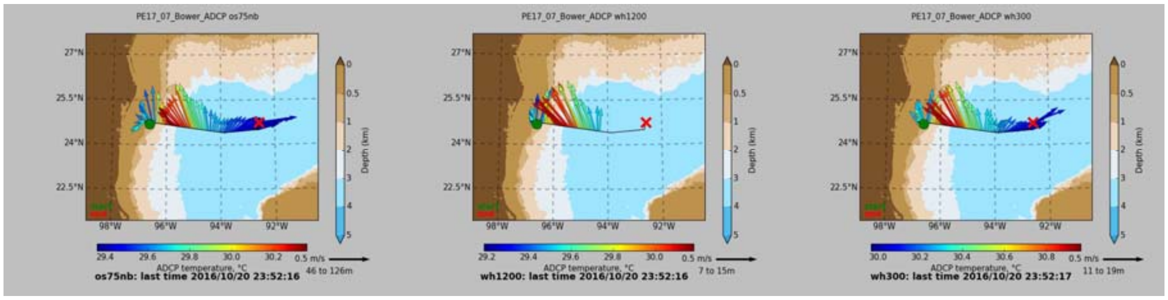

PE17_07_Bower_ADCP os75nb
PE17_07_Bower_ADCP wh1200
PE17_07_Bower_ADCP wh300
Ocean U (east)
Ocean V (north)
depth
m/s
dday
os75nb: last time 2016/10/16 23:57:17
wh1200: last time 2016/10/16 23:51:16
wh300: last time 2016/10/16 23:51:16

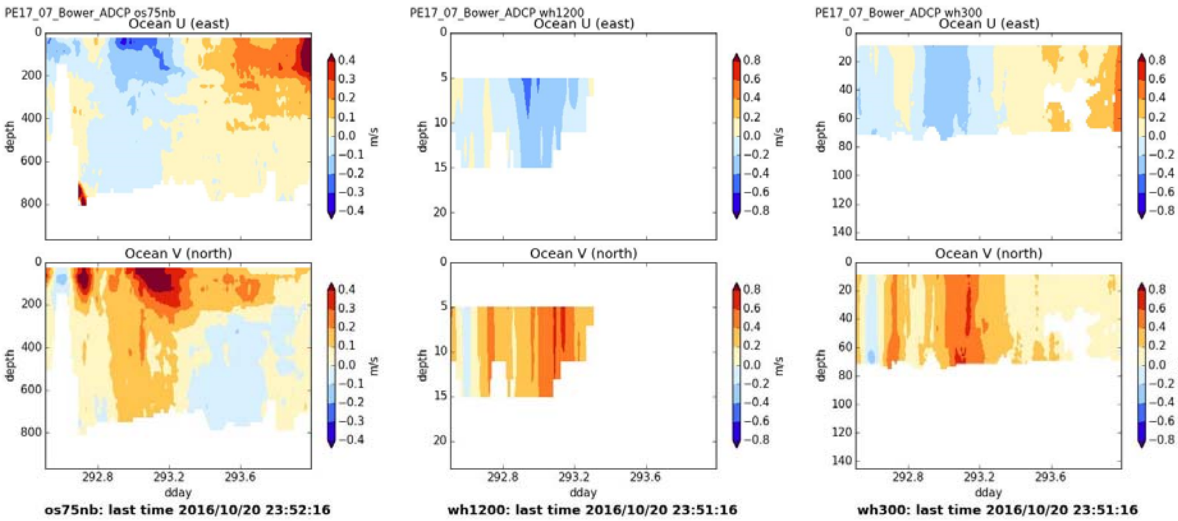

PE17_07_Bower_ADCP os75nb
PE17_07_Bower_ADCP wh1200
PE17_07_Bower_ADCP wh300
os75nb: last time 2016/10/17 23:52:16
wh1200: last time 2016/10/17 23:52:16
wh300: last time 2016/10/17 23:52:16

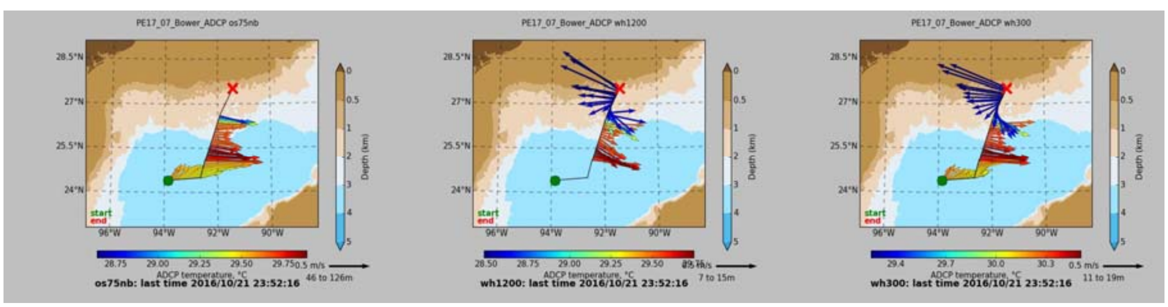

PE17_07_Bower_ADCP os75nb
PE17_07_Bower_ADCP wh1200
PE17_07_Bower_ADCP wh300
Ocean U (east)
Ocean V (north)
depth
dday
m/s
os75nb: last time 2016/10/17 23:57:16
wh1200: last time 2016/10/17 23:51:16
wh300: last time 2016/10/17 23:51:16

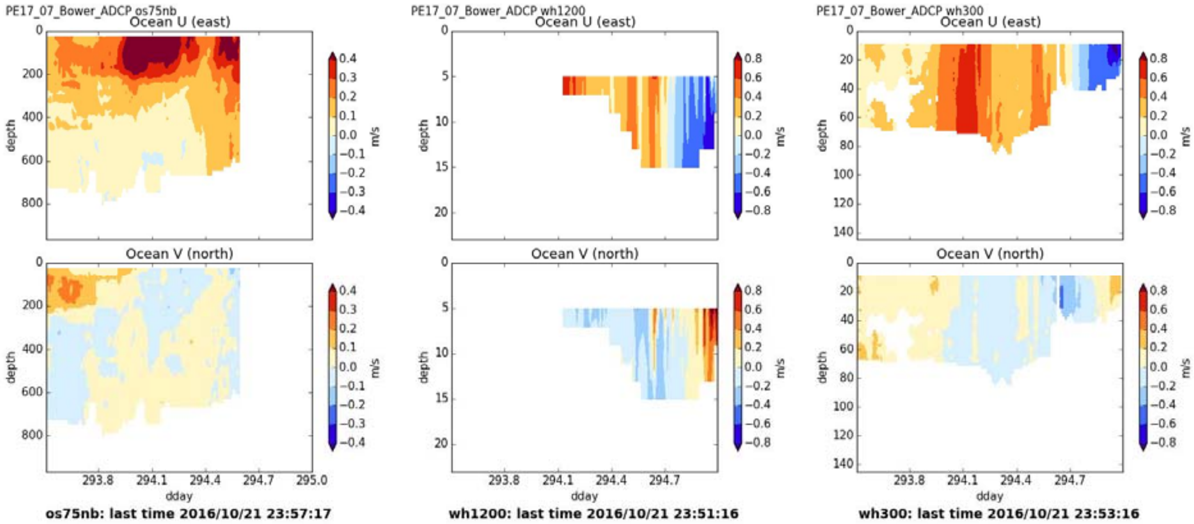

PE17_07_Bower_ADCP os75nb
PE17_07_Bower_ADCP wh1200
PE17_07_Bower_ADCP wh300
os75nb: last time 2016/10/18 23:52:17
wh1200: last time 2016/10/18 23:52:16
wh300: last time 2016/10/18 23:52:16
PE17_07_Bower_ADCP os75nb
Ocean U (east)
Ocean V (north)
PE17_07_Bower_ADCP wh1200
Ocean U (east)
Ocean V (north)
PE17_07_Bower_ADCP wh300
Ocean U (east)
Ocean V (north)
depth
dday
m/s
os75nb: last time 2016/10/18 23:52:17
wh1200: last time 2016/10/18 23:51:16
wh300: last time 2016/10/18 23:51:16

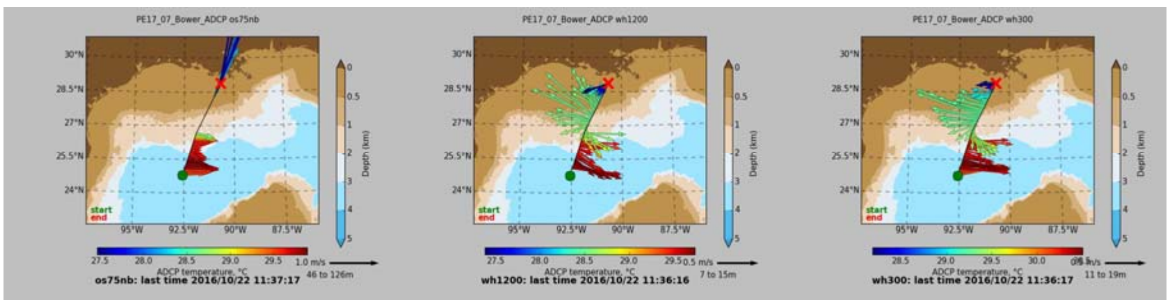

PE17_07_Bower_ADCP os75nb
PE17_07_Bower_ADCP wh1200
PE17_07_Bower_ADCP wh300
os75nb: last time 2016/10/19 23:52:17
wh1200: last time 2016/10/19 23:52:16
wh300: last time 2016/10/19 23:52:16
PE17_07_Bower_ADCP os75nb
Ocean U (east)
Ocean V (north)
PE17_07_Bower_ADCP wh1200
Ocean U (east)
Ocean V (north)
PE17_07_Bower_ADCP wh300
Ocean U (east)
Ocean V (north)
depth
dday
m/s
os75nb: last time 2016/10/19 23:52:16
wh1200: last time 2016/10/19 23:51:16
wh300: last time 2016/10/19 23:51:16

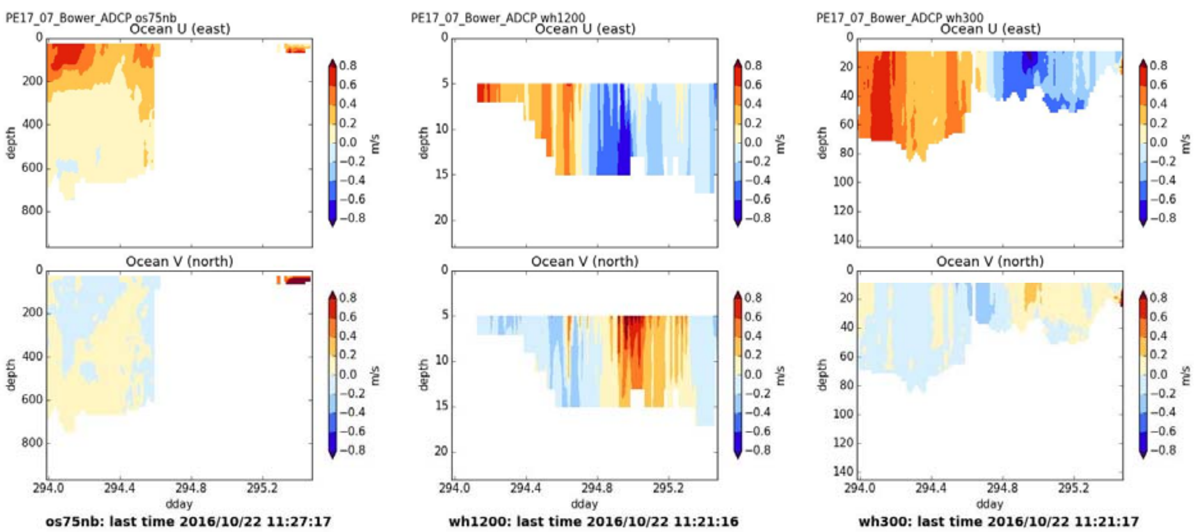

PE17_07_Bower_ADCP os75nb
os75nb: last time 2016/10/20 23:52:16
46 to 126m
PE17_07_Bower_ADCP wh1200
wh1200: last time 2016/10/20 23:52:16
7 to 15m
PE17_07_Bower_ADCP wh300
wh300: last time 2016/10/20 23:52:17
11 to 19m
ADCP temperature, °C
0.5 m/s
Depth (km)


PE17_07_Bower_ADCP os75nb
Ocean U (east)
Ocean V (north)
depth
dday
m/s
os75nb: last time 2016/10/20 23:52:16
PE17_07_Bower_ADCP wh1200
wh1200: last time 2016/10/20 23:51:16
PE17_07_Bower_ADCP wh300
wh300: last time 2016/10/20 23:51:16


PE17_07_Bower_ADCP os75nb
os75nb: last time 2016/10/21 23:52:16
46 to 126m
PE17_07_Bower_ADCP wh1200
wh1200: last time 2016/10/21 23:52:16
7 to 15m
PE17_07_Bower_ADCP wh300
wh300: last time 2016/10/21 23:52:16
11 to 19m
ADCP temperature, °C
0.5 m/s
start
end
Depth (km)


PE17_07_Bower_ADCP os75nb
Ocean U (east)
Ocean V (north)
depth
dday
m/s
os75nb: last time 2016/10/21 23:57:17
PE17_07_Bower_ADCP wh1200
Ocean U (east)
Ocean V (north)
wh1200: last time 2016/10/21 23:51:16
PE17_07_Bower_ADCP wh300
Ocean U (east)
Ocean V (north)
wh300: last time 2016/10/21 23:53:16


PE17_07_Bower_ADCP os75nb
PE17_07_Bower_ADCP wh1200
PE17_07_Bower_ADCP wh300
start
end
Depth (km)
ADCP temperature, °C
os75nb: last time 2016/10/22 11:37:17
wh1200: last time 2016/10/22 11:36:16
wh300: last time 2016/10/22 11:36:17


PE17_07_Bower_ADCP os75nb
Ocean U (east)
Ocean V (north)
depth
dday
m/s
os75nb: last time 2016/10/22 11:27:17
PE17_07_Bower_ADCP wh1200
Ocean U (east)
Ocean V (north)
wh1200: last time 2016/10/22 11:21:16
PE17_07_Bower_ADCP wh300
Ocean U (east)
Ocean V (north)
wh300: last time 2016/10/22 11:21:17

CIGoM

Consorcio de Investigación del Golfo de México

Este estudio es parte del proyecto 201441
"Implementación de redes de observación oceanográficas (físicas, geo-químicas, ecológicas) para la generación de escenarios ante posibles contingencias relacionadas a la exploración y producción de hidrocarburos en aguas profundas del Golfo de México"
financiado por el Fondo Sectorial
CONACYT-SENER-Hidrocarburos

Esta es una contribución del
Consorcio de Investigación del Golfo de México

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CONACYT