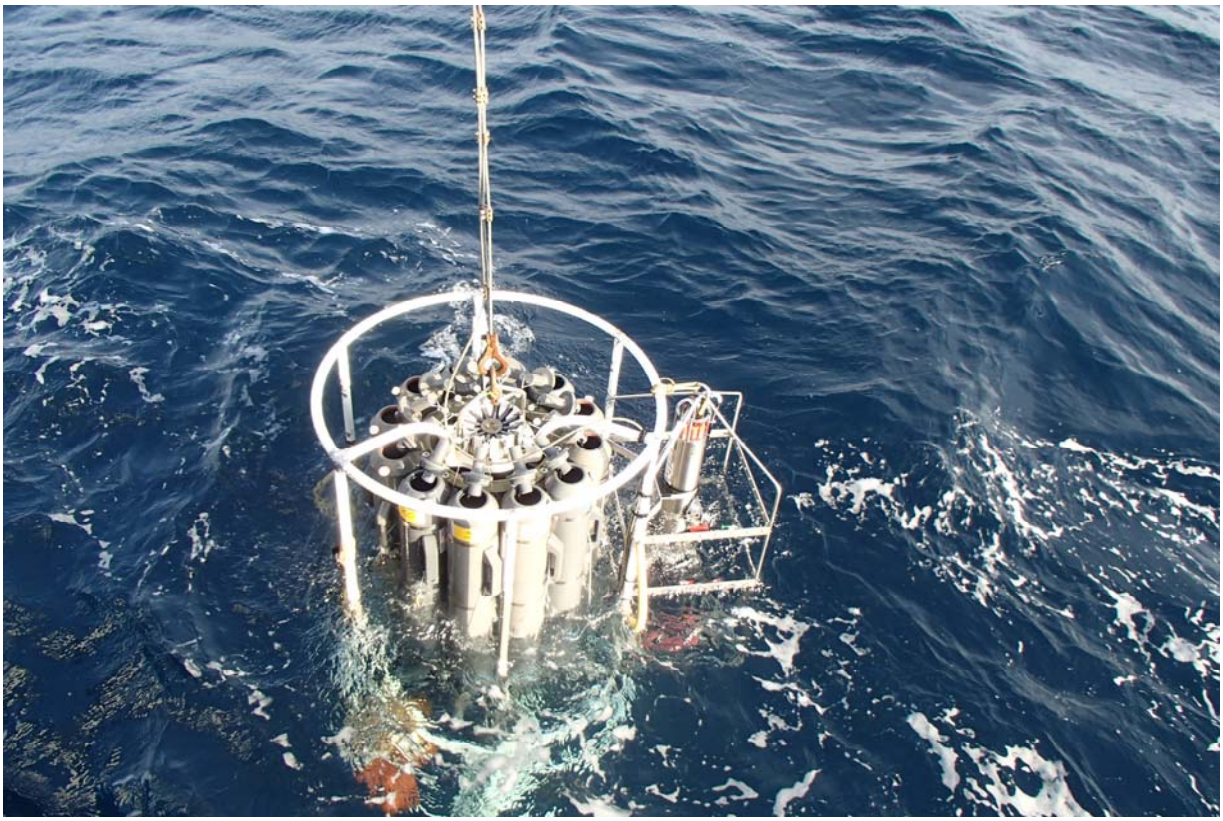
BOUSSOLE Monthly Cruise Report

Cruise 141
November 14 – 16&18, 2013

Duty Chief: Melek Golbol (golbol@obs-vlfr.fr)
Vessel: R/V Téthys II
(Captain: Renaud Le Bourhis)

Science Personnel: Emilie Diamond and Melek Golbol.

Laboratoire d'Océanographique de Villefranche (LOV), 06238 Villefranche sur mer cedex, France



Deployment of the CTD Rosette with the Underwater Video Profiler (at right of the CTD Rosette) at the DYFAMED site.

BOUSSOLE project

ESA/ESRIN contract N° 13226/10/I-NB

December 03, 2013

Foreword

This report is part of the technical report series that is being established by the BOUSSOLE project.

BOUSSOLE is funded and supported by the following Agencies and Institutions

European Space Agency

Centre National d'Etudes Spatiales, France

National Aeronautics and Space Administration, USA

Centre National de la Recherche Scientifique, France

Université Pierre & Marie Curie, France

Observatoire Océanologique de Villefranche/mer, France

Contents

Cruise Objectives

Routine operations

Multiple Biospherical's C-OPS (Compact Optical Profiling System) radiometric profiles are performed at the BOUSSOLE site around solar noon, under optimal conditions: clear blue skies and flat, calm sea surface. If the sky is clear and sea conditions are reasonably calm (no whitecaps or large swell), hand held CIMEL sun photometer measurements are to be performed consecutively where possible with C-OPS profiles. If sea conditions are poor but sky is good, hand held CIMEL sun photometer measurements can be made at intervals throughout the day to measure atmospheric optical thickness. CTD deployments are required at the start and the end of the C-OPS profiling day and around noon in the longer summer days or when there is a high possibility of a satellite matchup. The CTD package also includes a Chl fluorometer. Additional instrumentation for measurement of inherent optical properties has been added from December 2011. The package includes a hyperspectral absorption meter (Hobilabs a-sphere), a multispectral backscattering meter (Hobilabs Hydroscat-6) and a multispectral beam transmissometer (Hobilabs Gamma-4). Seawater samples are to be collected, filtered and stored into liquid nitrogen for subsequent HPLC pigment and particle absorption spectrophotometric filter analysis in the lab. Three replicates samples are to be collected at surface for total suspended matter weighting in the lab.

Operations that have to be performed in each cruise include:
- Collection and filtration of seawater samples for colored dissolved organic matter (from June 2005) and particulate organic carbon (from October 2011) analyses in the lab. Small quantities of seawater are to be fixed with glutaraldehyde for cytometric analysis (from December 2011).

- One CTD transect is performed between the BOUSSOLE site and the Port of Nice. This transect consists of six fixed stations on-route from BOUSSOLE (see map in appendix). Whenever feasible, this transect should be performed at a similar time for each cruise, in order to minimise the influence of possible diurnal variability.

- Divers check the underwater state of the buoy structure and instrumentation, take pictures for archiving, clean the sensor optical surfaces, and then take again some pictures after cleaning. Divers also put a neoprene cap on the backscattering meter and on the transmissometers for acquiring dark measurements (started in April 2009).

Further details about these operations and the data collection and processing protocols are to be found in:
Antoine, D. M. Chami, H. Claustre, F. D'Ortenzio, A. Morel, G. Bécu, B. Gentili, F. Louis, J. Ras, E. Roussier, A.J. Scott, D. Tailliez, S. B. Hooker, P. Guevel, J.-F. Desté, C. Dempsey and D. Adams. 2006, BOUSSOLE: a joint CNRS-INSU, ESA, CNES and NASA Ocean Color Calibration And Validation Activity. NASA Technical memorandum N° 2006 - 214147, 61 pp.
(http://www.obs-vlfr.fr/Boussole/html/publications/pubs/BOUSSOLE_TM_214147.pdf)

Additional operations

A deep CTD cast with water sampling for oxygen, alkalinity, nutrients analysis and an Underwater Video Profiler (UVP) cast were performed at the DYFAMED site for the DYFAMED program. The CTD cast was used for the first station of the transect because the Station 01 is located next to the DYFAMED site.

Cruise Summary

The first day was used for retrieving data from the buoy, 1 CTD cast with water sampling at the BOUSSOLE site, optical profiles, 1 Secchi disk, 1 CTD cast at the DYFAMED site with water sampling and the CTD transect. The last three days were cancelled because bad weather prevented departure from the Nice harbour.

Thursday 14 November 2013

The first day, the sea state was slight with a gentle breeze. The sky was overcast and the visibility was good. When arrived at the BOUSSOLE site, solar panels, sensors, ARGOS and CISCO connectors on the top of the buoy were cleaned. One of the solar panel was broken at half, another panel was slightly damaged on its metal frame.

A direct connection with the buoy was established for data retrieval and data from the pCO2 sensors at 3m and 10m were downloaded. In the meantime, 1 CTD cast with water sampling was performed at the BOUSSOLE site. Surface water was collected with a bucket for TSM analysis. After, 1 Secchi disk and three C-OPS profiles were performed at the BOUSSOLE site. Then, the CTD Transect including 1 CTD cast at the DYFAMED site (next to the first station of the transect) was performed.

Friday 15 November 2013

Bad weather prevented departure from the Nice harbour.

Saturday 16 November 2013

Bad weather prevented departure from the Nice harbour.

Monday 18 November 2013

Bad weather prevented departure from the Nice harbour.

Cruise Report

Thursday 14 November 2013 (UTC)

People on board: Emilie Diamond and Melek Golbol.

0620 Departure from the Nice harbour.
0920 Arrival at the BOUSSOLE site.
0930 Cleaning of the solar panels, ARGOS and CISCO connectors on the top of the buoy.
Downloading of the pCO2 sensors data.
0930 CTD 01, 400 m with water sampling at 400, 200, 150, 80, 70, 60, 50, 40, 30, 20, 10 and 5 m for HPLC, a_p, CDOM, POC and Cytometry.
1020 Bucket at surface for TSM.
1025 Secchi 01, 17m.
1030 Filtrations.
1100 Direct connection with the buoy and data retrieval.
1210 C-OPS 01, 02, 03.
1340 CTD 02, 2300m at the DYFAMED site (43°25'N 07°54'E).
1615 Arrival at station 02 (43°28'N 07°42'E): bad weather: no CTD
1655 CTD 03, 400 m, station 03 (43°31'N 07°37'E).
1800 CTD 04, 400 m, station 04 (43°34'N 07°31'E).
1900 CTD 05, 400 m, station 05 (43°37'N 07°25'E).
1955 CTD 06, 400 m, station 06 (43°39'N 07°21'E).
2030 Departure to the Nice harbour.
2100 Arrival at the Nice harbour.

Friday 15 November 2013

Bad weather prevented departure from the Nice harbour.

Saturday 16 November 2013

Bad weather prevented departure from the Nice harbour.

Monday 18 November 2013

Bad weather prevented departure from the Nice harbour.

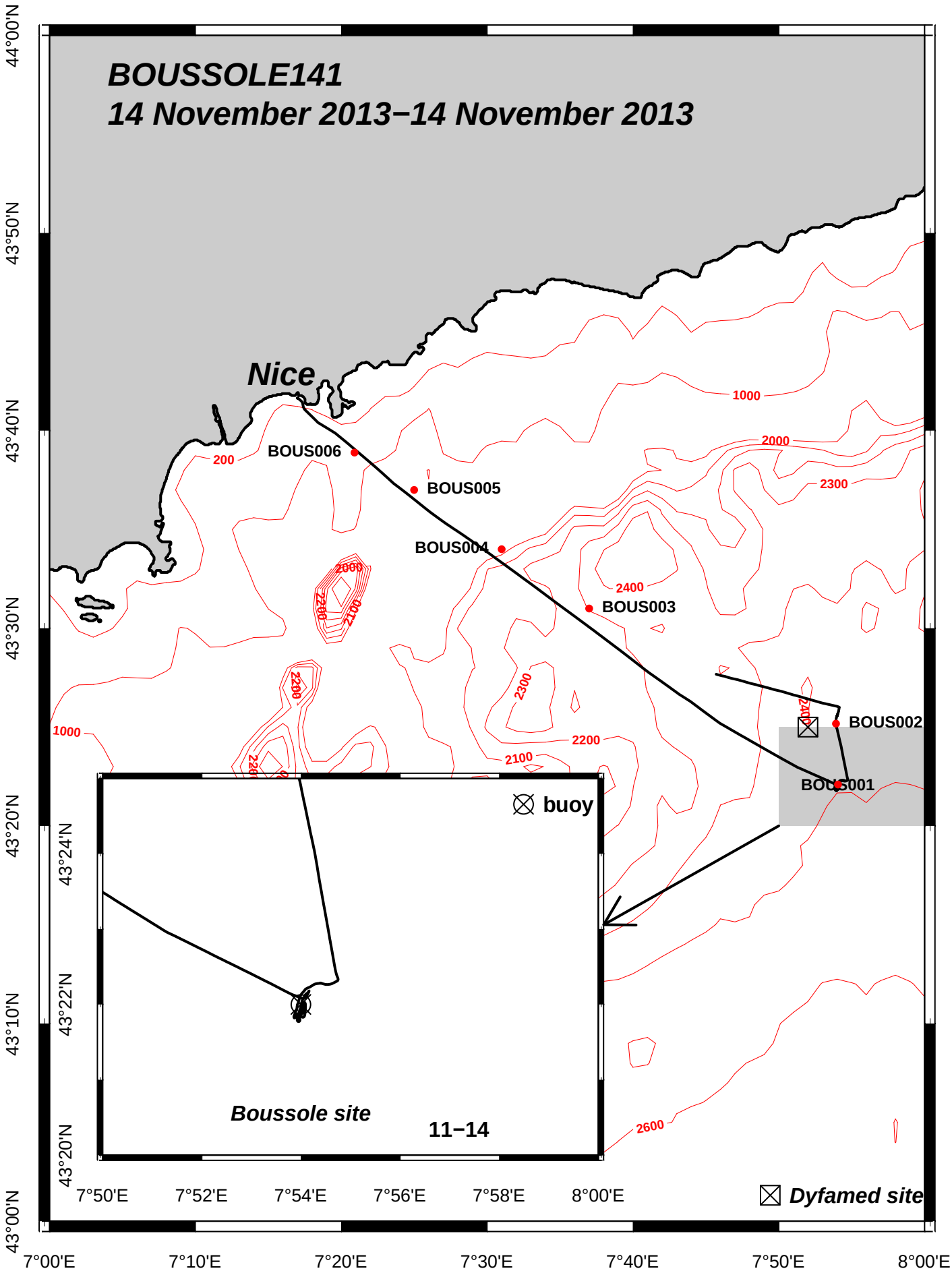
Problems identified during the cruise

- One of the solar panel of the buoy was broken at half, another panel was slightly damaged on its metal frame.

Appendices

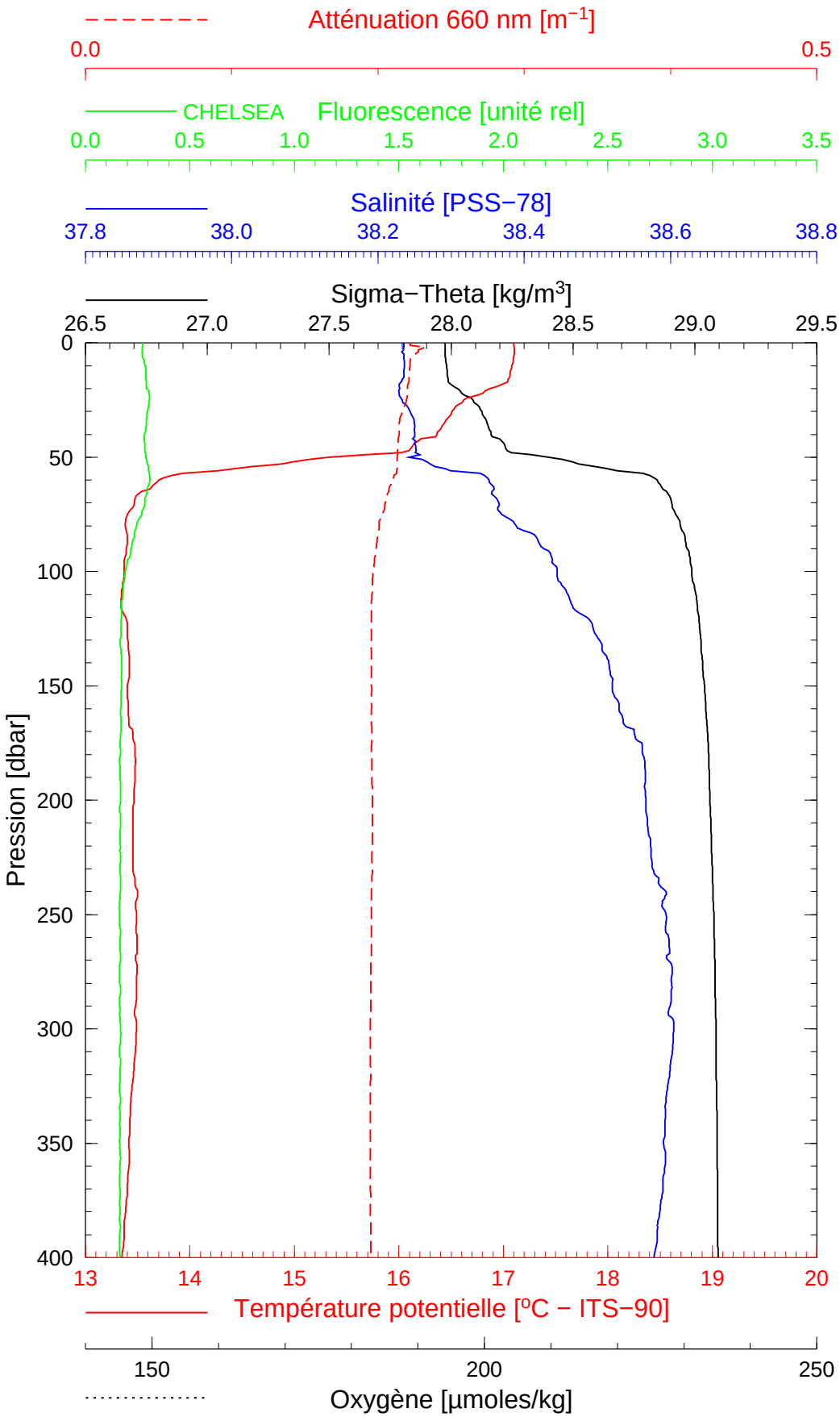
Cruise Summary Table for Boussole 141

Date	Black names	Profile names	CTD notées	Other sensors	Start Time	Duration	Depth max	Latitude (N)		longitude					Weather							Sea		
	(file ext: ".raw")	(file extension: ".raw")			GMT (hour.min)	(min.sec)	(meter)	(Degree)	(Minute)	(Degree)	(Minute)	Sky	Clouds	Quantity (#/8)	Wind sp. (kn)	Wind dir.	Atm. Pressure (hPa)	Humidity (%)	Visibility	T air	T water	Sea	Swell H (m)	Swell dir.	Whitecaps
			CTDBOUS001	HPLC, Ap, CDOM, POC & cyto	9:34	42:00	400	43	22.093	7	54.061	overcast		8	10	250	1016.8	75		16.2	17.1	calm			
			Bucket TSM		10:20	2:00	surface	43	22	7	54	overcast										calm			
			Secchi01		10:25	4:00	17	43	22	7	54	overcast							good			calm			
	bou_c-ops_131114_1207_001_data.csv				12:11	1:13																			
		bou_c-ops_131114_1207_002_data.csv			12:20	3:42	90.5	43	21.916	7	53.902	overcast	Cs&Ac	7	10	200	1014.4	75	good	16.4		calm	1.0		no
		bou_c-ops_131114_1207_004_data.csv			12:37	2:35	61.6	43	22.153	7	54.032	overcast	Cs&Ac	7	10	200	1014.4	75	good	16.4		calm	1.0		no
14/11/13		bou_c-ops_131114_1207_006_data.csv			12:54	3:16	80.3	43	22.278	7	54.347	overcast	Cs&Ac	7	10	200	1014.4	75	good	16.4		calm	1.0		no
	bou_c-ops_131114_1207_007_data.csv				13:41	1:43																			
			CTDBOUS002		13:40	96:00	2400	43	25.174	7	53.924	blue		3	12	202	1013.2	71		16.4	16.4	calm			
			CTDBOUS003		16:55	31:00	400	43	31.000	7	37.000	night		7	15	207	1010.4	72		15.7	17.1	calm			
			CTDBOUS004		18:03	26:00	400	43	34.000	7	31.000	night		8	15	227	1009.2	59		15.2	18.5	calm			
			CTDBOUS005		19:02	25:00	400	43	37.000	7	25.000	night		5	16	NA	1007.6	49		15.2	17.7	calm			
			CTDBOUS006		19:54	27:00	400	43	38.888	7	20.912	night		5	13	NA	1006.6	57		14.9	18.5	calm			
15/11/13	Bad weather																								
16/11/13	Bad weather																								
18/11/13	Bad weather																								


BOUSSOLE141
14 November 2013−14 November 2013
Nice
BOUS006
BOUS005
BOUS004
BOUS003
BOUS002
BOUS001
200
1000
2000
2300
2400
2600
2200
2100
buoy
Boussole site
11−14
Dyfamed site
44°00'N
43°50'N
43°40'N
43°30'N
43°20'N
43°10'N
43°00'N
7°00'E
7°10'E
7°20'E
7°30'E
7°40'E
7°50'E
8°00'E
43°24'N
43°22'N
43°20'N
7°50'E
7°52'E
7°54'E
7°56'E
7°58'E
8°00'E

BOUSSOLE 141 **14/11/2013** **BOUS131114_01**

BOUS001

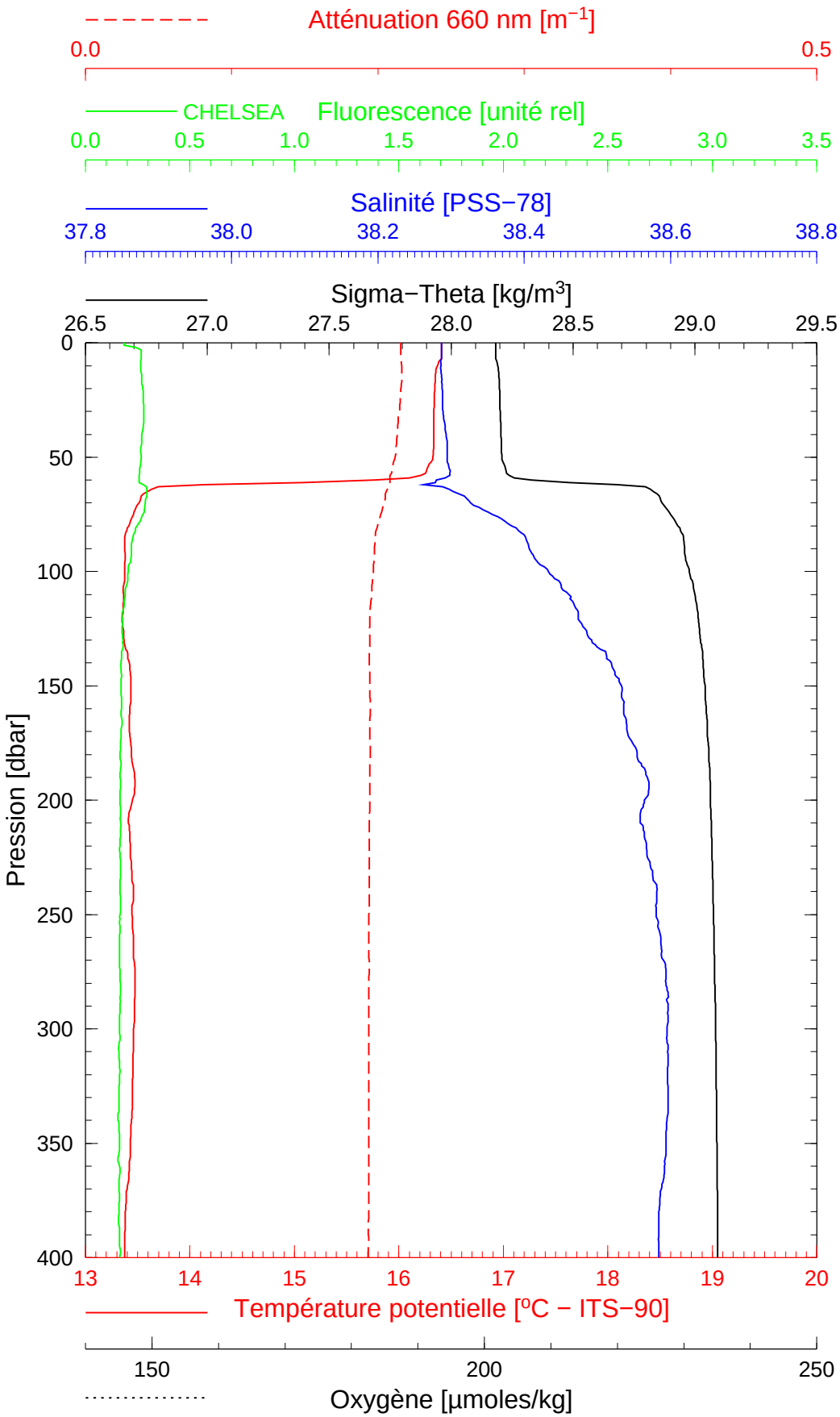


Date *14/11/2013* *Latitude* *43°22.093 N*

Heure déb *09h 34min [TU]* *Longitude* *07°54.061 E*

BOUSSOLE 141 **14/11/2013** **BOUS131114_02**

BOUS002

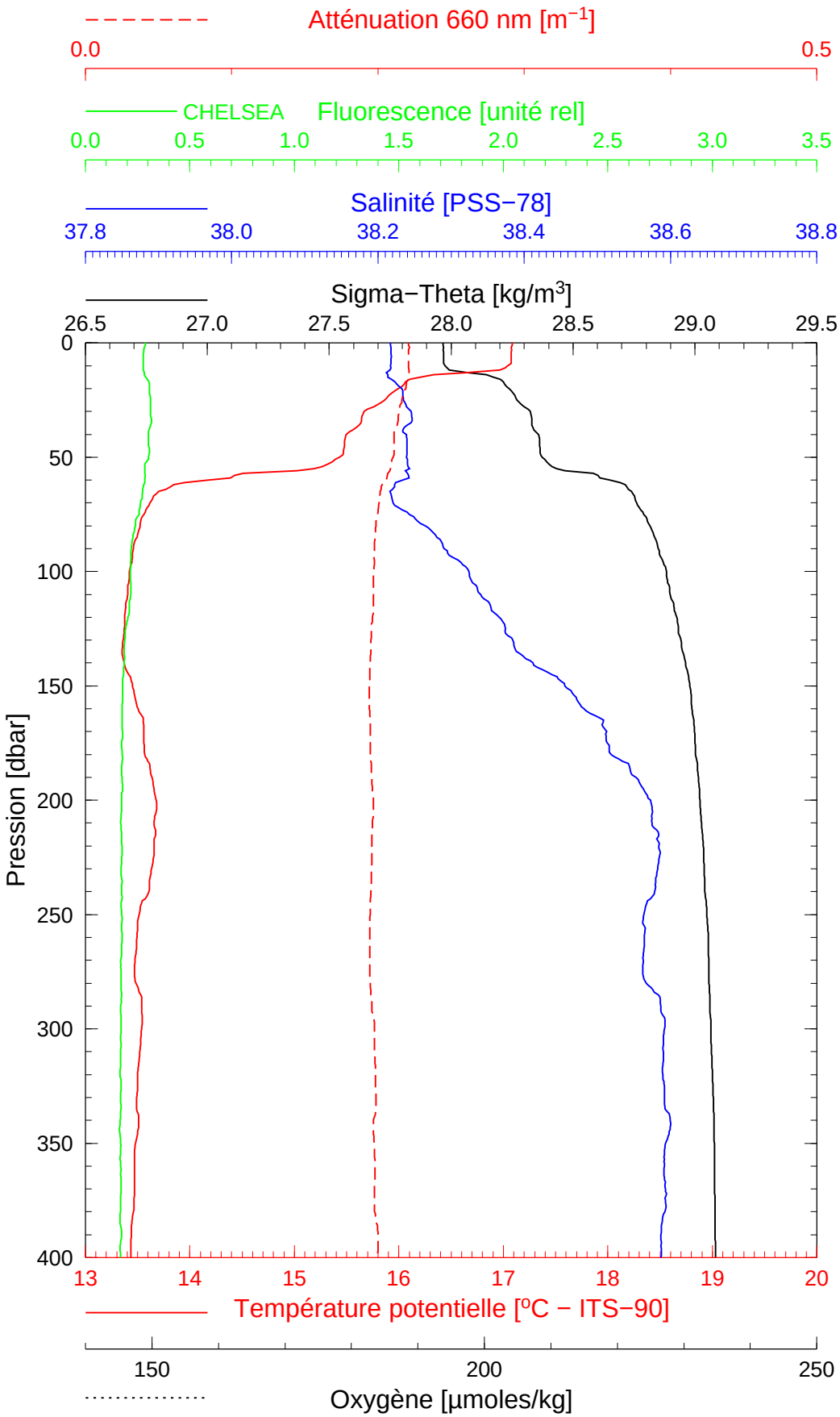


Date *14/11/2013* *Latitude* *43°25.174 N*

Heure déb *13h 40min [TU]* *Longitude* *07°53.924 E*

BOUSSOLE 141 **14/11/2013** **BOUS131114_03**

BOUS003

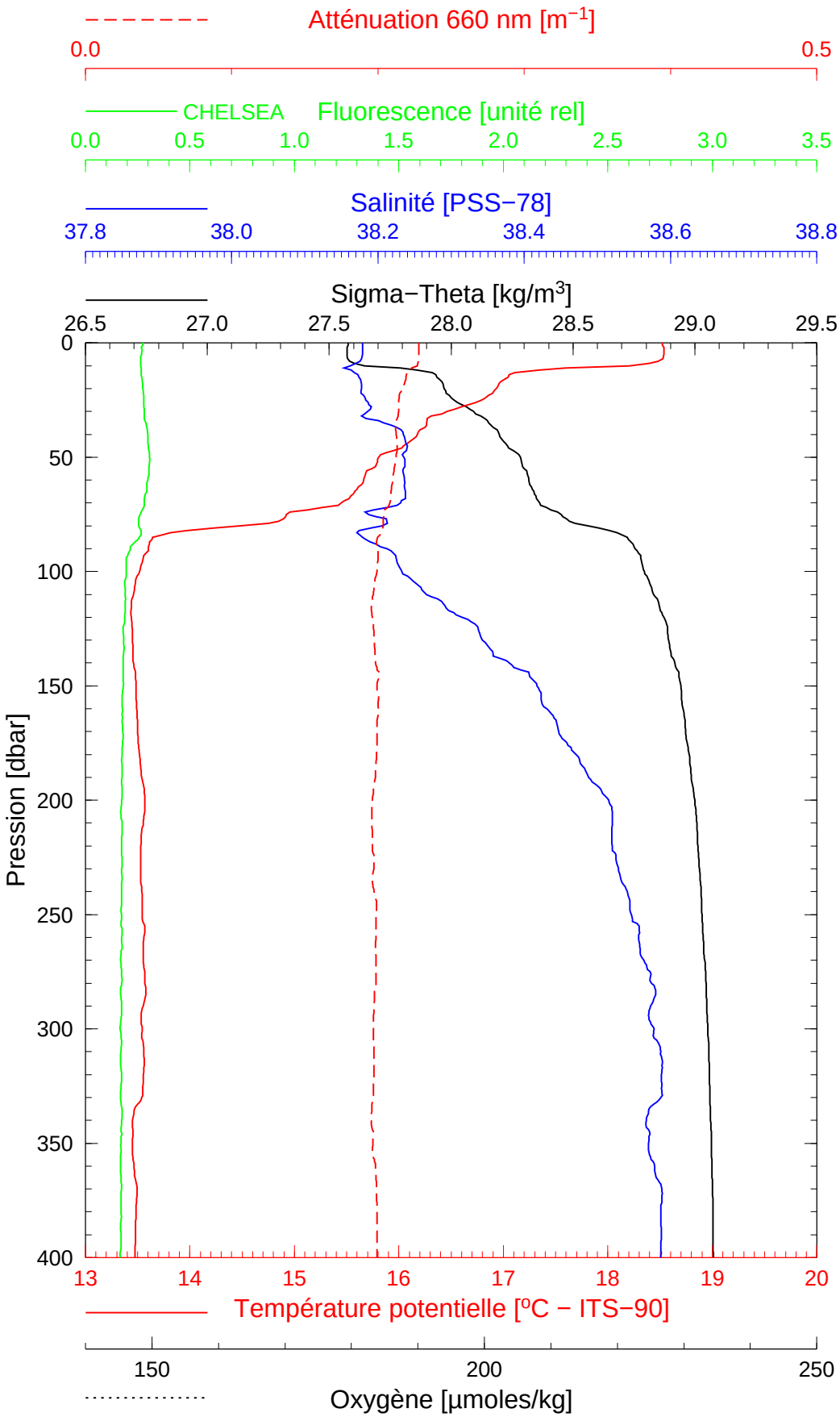


Date *14/11/2013* *Latitude* *43°31.000 N*

Heure déb *16h 55min [TU]* *Longitude* *07°37.000 E*

BOUSSOLE 141 **14/11/2013** **BOUS131114_04**

BOUS004

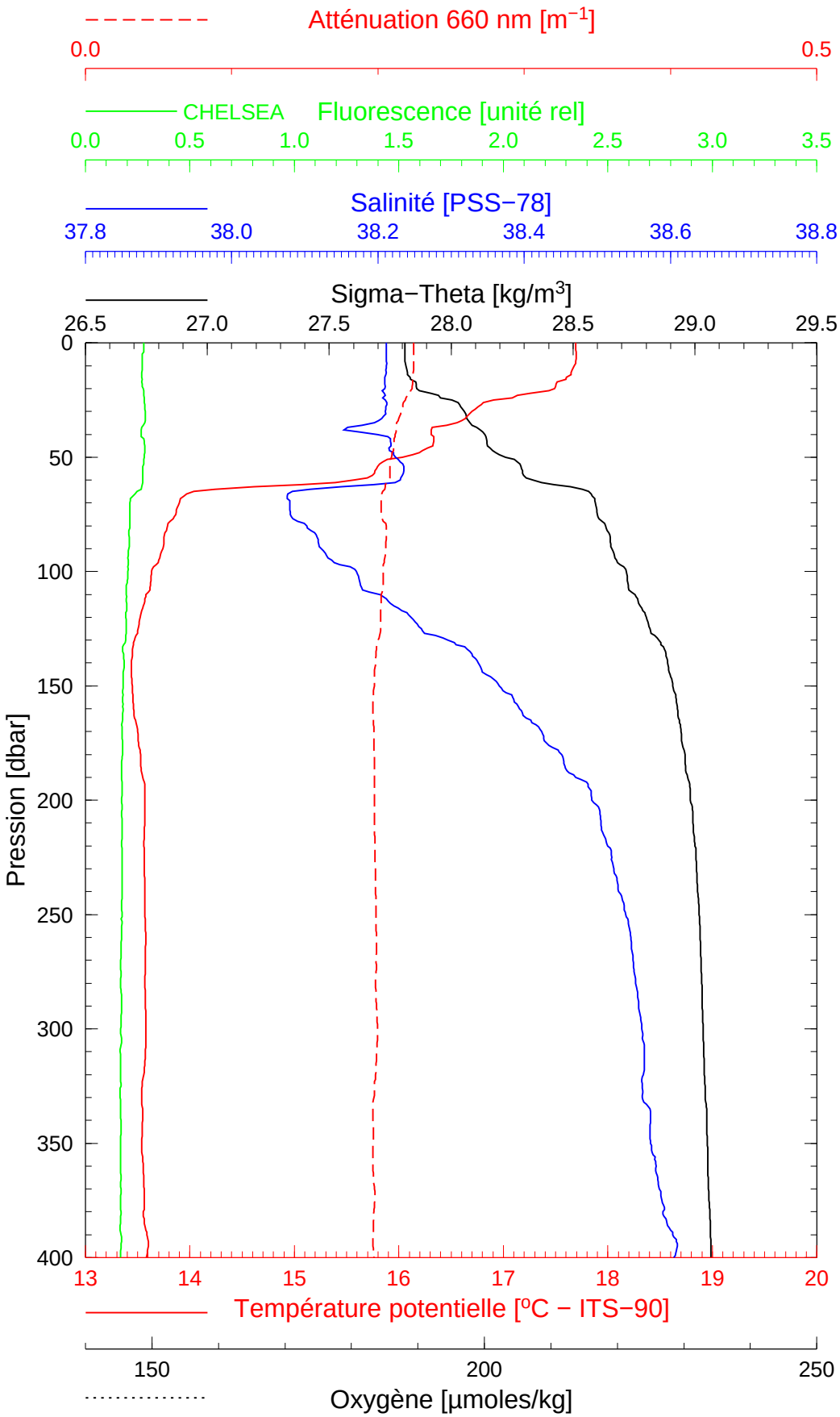


Date *14/11/2013* *Latitude* *43°34.000 N*

Heure déb *18h 03min [TU]* *Longitude* *07°31.000 E*

BOUSSOLE 141 **14/11/2013** **BOUS131114_05**

BOUS005

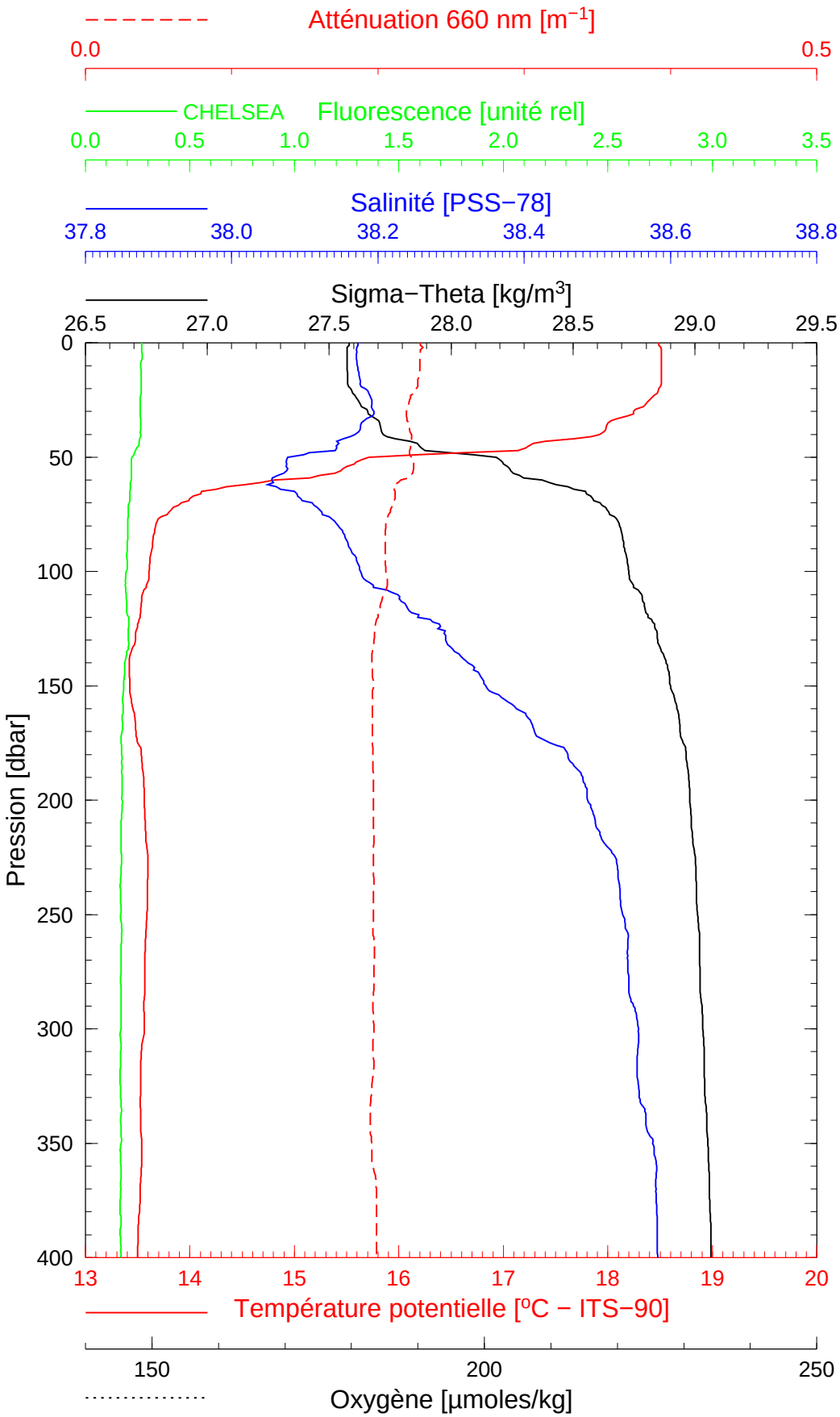


Date *14/11/2013* *Latitude* *43°37.000 N*

Heure déb *19h 02min [TU]* *Longitude* *07°25.000 E*

BOUSSOLE 141 **14/11/2013** **BOUS131114_06**

BOUS006



Date *14/11/2013* *Latitude* *43°38.888 N*

Heure déb *19h 54min [TU]* *Longitude* *07°20.912 E*