

# BOUSSOLE Monthly Cruise Report

## Cruise 189

November 07-09, 2017

Duty Chief: Melek Golbol ([golbol@obs-vlfr.fr](mailto:golbol@obs-vlfr.fr))

Vessel: R/V Téthys II  
(Captain: Dany Deneuve)

Science Personnel: Marco Bellacicco, Emilie Diamond, Beat Gasser, Melek Golbol, and Eduardo Soto Garcia.

*Laboratoire d'Océanographie de Villefranche (LOV), 06230 Villefranche-sur-Mer, France*



Several sunfishes have been seen in the vicinity of the BOUSSOLE buoy.

**BOUSSOLE project**

**ESA/ESRIN contract N° 4000119096/17/I-BG**

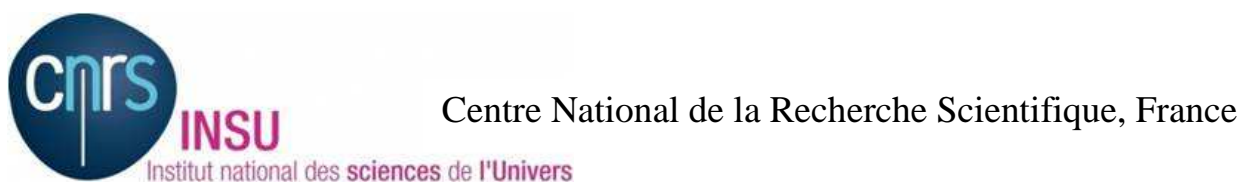
*November 13, 2017*



## 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



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## 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). Two CTD casts are to be performed at each data acquisition at the BOUSSOLE site: one cast with, and one cast without, a 0.2 $\mu$ m filter added on the a-sphere for the dissolved matter absorption measurements.

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.

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).

In addition, water samples are to be collected at two depths (5 m and 10 m) for dissolved oxygen (DO), total alkalinity (TA) and total inorganic carbon (TC) analysis (from March 2014). This operation is part of the BIOCAREX ANR project, in collaboration with the LOCEAN in Paris (J. Boutin and collaborators). The TA/TC samples will be processed by the National service for such analyses (SNAPOCO – LOCEAN in Paris). The results will allow checking the data collected by the two pCO<sub>2</sub> CARIOCA sensors installed on the buoy at 3m and 10m.

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](http://www.obs-vlfr.fr/Boussole/html/publications/pubs/BOUSSOLE_TM_214147.pdf)

### Additional operations

Water samples for cytometry analysis were collected at 10 m depth in the frame of a collaboration with Collin Roesler (Bowdoin College, Maine, USA), about the installation of an ECO 3X1M multi-channel fluorimeter on the BOUSSOLE buoy at 9 m depth.

The MOOSE DYFAMED cruise planned on November 6 was cancelled because of bad weather. So, the DYFAMED operations were performed during this BOUSSOLE cruise.

## Cruise Summary

The first and the last day of the cruise, bad weather prevented the departure from the Nice harbour. So, only one day was used to perform the operations at the BOUSSOLE and DYFAMED sites.

That day was used for checking the functioning of the buoy and for cleaning ARGOS connector, buoy surface sensors and solar panels. It was also used for CTD casts with water sampling, for optical profiles and for a Secchi disk at the BOUSSOLE site, and for a deep CTD cast with water sampling and zooplankton nets at the DYFAMED site.

## Tuesday 07 November 2017

Bad weather prevented departure from the Nice harbour.

## Wednesday 08 November 2017

The sea state was slight with a gentle breeze. The sky was overcast and the visibility was medium. When arrived at BOUSSOLE, a CTD cast with water sampling was performed. A cap was put on the Hydroscat-6 for dark measurements and a 0.2  $\mu\text{m}$  filter on the a-Sphere absorption meter for the dissolved mater absorption measurements. Then, the buoy was checked because the ARGOS sensor of the buoy did not transmit data. It appeared that the buoy was well functioning. Surface sensors, ARGOS connector and solar panels were cleaned. Then, 1 CTD cast with water sampling, 3 C-OPS profiles and a Secchi disk were performed at the BOUSSOLE site. Finally, we went to the DYFAMED site to complete the MOOSE DYFAMED program. A deep CTD cast and 2 zooplankton nets were performed at the DYFAMED site before returning to the nice harbour.

## Thursday 09 November 2017

Bad weather prevented departure from the Nice harbour.

Pictures taken during this cruise can be found at:

<https://photos.app.goo.gl/xV36iwGhpULUWJLM2>

Data from the BOUSSOLE cruises and buoy are available at:

[http://www.obs-vlfr.fr/Boussole/html/boussole\\_data/login\\_form.php](http://www.obs-vlfr.fr/Boussole/html/boussole_data/login_form.php)

## Cruise Report

### Tuesday 07 November 2017

Bad weather prevented departure from the Nice harbour.

### Wednesday 08 November 2017 (UTC)

People on board: Marco Bellacicco, Emilie Diamond, Beat Gasser (IAEA-Monaco), Melek Golbol, and Eduardo Soto Garcia.

0610 Departure from the Nice harbour.  
0935 Arrival at the BOUSSOLE site.  
0945 CTD 05, 400 m with water sampling at 10 and 5 m for O<sub>2</sub>, TA/TC and TSM (with 0.2  $\mu\text{m}$  filter on a-Sphere and cap on HS-6).  
1030 Check of the buoy, cleaning of surface sensors, ARGOS connector and solar panels.  
1105 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<sub>p</sub> and cytometry.  
1135 Filtrations.  
1230 C-OPS 01, 02, 03.  
1310 Secchi 01, 19 m.  
1315 Departure to the DYFAMED site.  
1330 Arrival at the DYFAMED site.  
1340 Deep CTD cast, MOOSE 113, 2350 m with water sampling for MOOSE DYFAMED program.  
1540 Zooplankton nets x 2 for MOOSE DYFAMED program.  
1550 Departure to the Nice harbour.  
1845 Arrival at the BOUSSOLE site.

### Thursday 09 November 2017

Bad weather prevented departure from the Nice harbour.

## **Problems identified during the cruise**

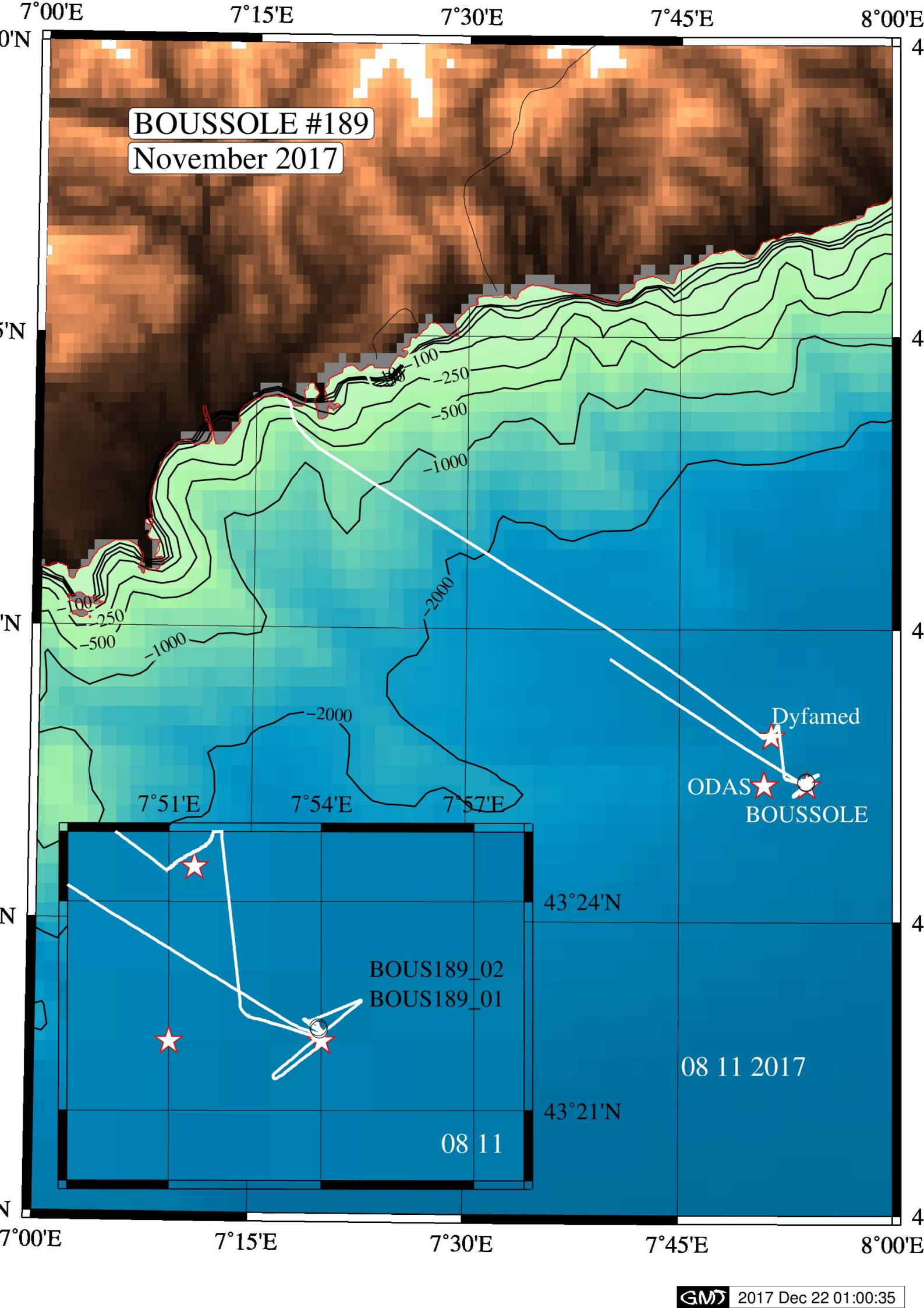
- The diving operations could not be carried out because the weather forecasts announced high waves for the entire cruise duration.
- The bottles containing the O<sub>2</sub> samples were accidentally broken in the lab. So, there will be no O<sub>2</sub> data obtained by Winkler analyses for this cruise.

# **Appendices**

Cruise Summary Table for Boussole 189

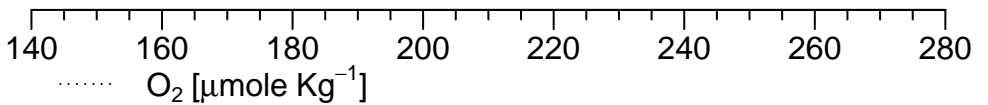
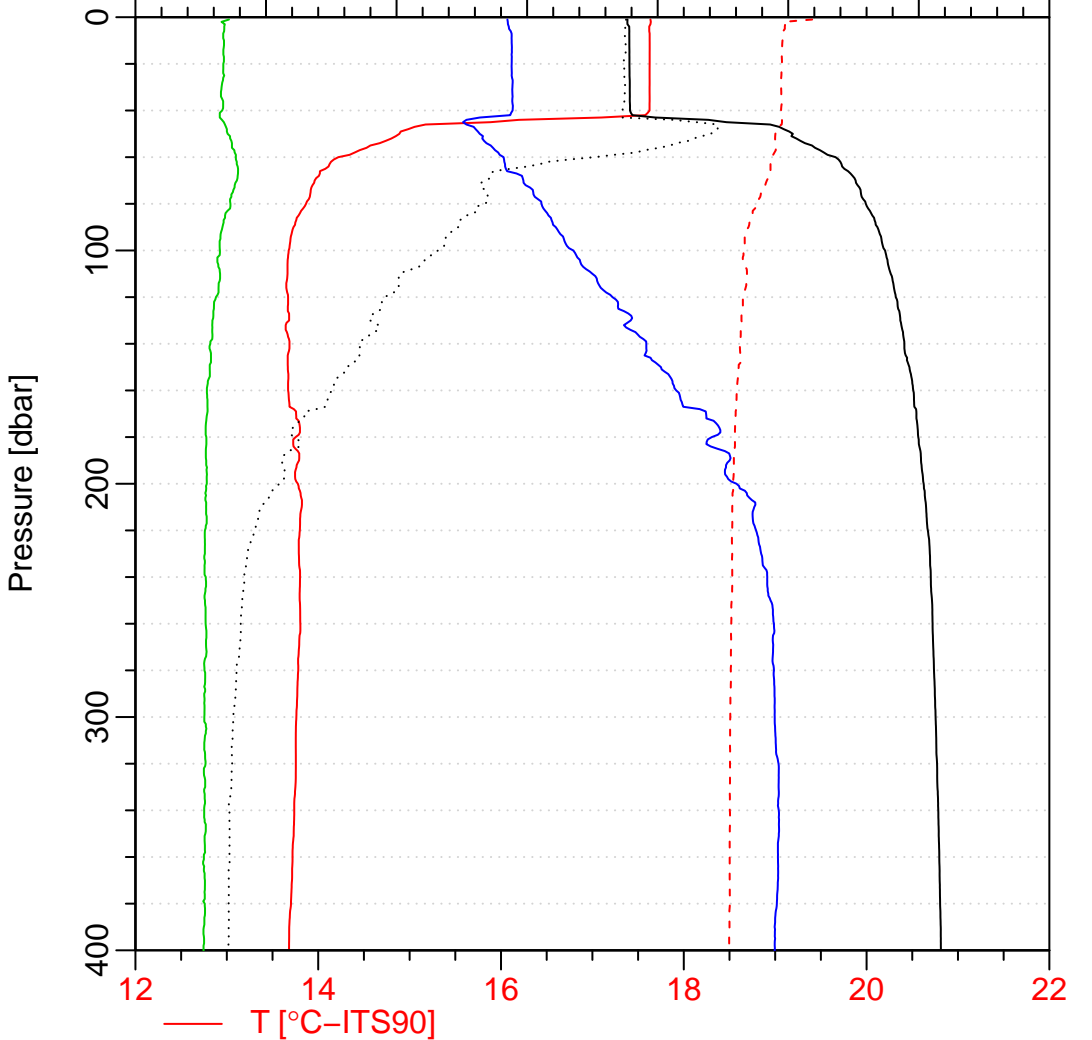
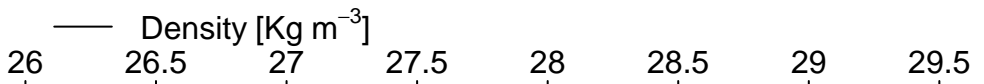
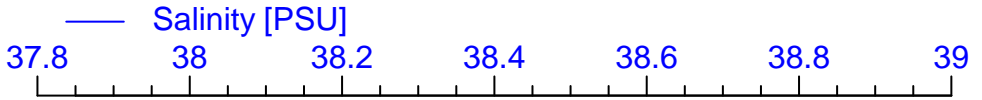
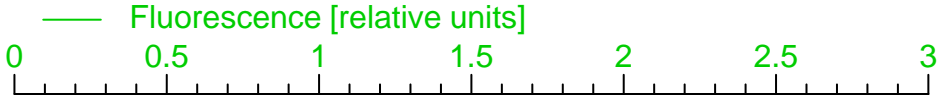
Date	Black names (file ext: ".raw")	Profile names (file extension: ".raw")	CTD notes	Other sensors	Start Time (GMT (hour.min))	Duration (min.sec)	Depth max (meter)	Latitude (N) (Degree)   (Minute)	Longitude (Degree)   (Minute)	Sky	Clouds	Quantity (#/8)	Weather Wind sp. (kn)	Wind dir.	Atm. Pressure (hPa)	Humidity (%)	Visibility	T air	T water	Sea	Sea Swell H (m)	Swell dir.	Whitecaps
07/11/17										Bad weather													
08/11/17		BOUS189_01		TA/TC & TSM	09:47	27:00	400	43   22	7   53	overcast		8	6	98	1014.8	80		13.5	17.62	calm			
		BOUS189_02		HPLC, Ap & Cyto	11:02	27:00	400	43   22.95	7   53.946	overcast		8	6	62	1014.4	76		13.4	17.62	calm			
		bou_c-ops_171108_1214_001_data.csv			12:28	3:43	89	43   22.082	7   53.793	overcast	St	8	8	25	1014.4	73	medium	14.0		calm	0.9		no
		bou_c-ops_171108_1214_002_data.csv			12:40	3:31	84	43   22.163	7   53.430	overcast	St	8	8	25	1014.4	73	medium	14.0		calm	0.9		no
		bou_c-ops_171108_1214_003_data.csv			12:51	3:50	92	43   22.246	7   53.046	overcast	St	8	8	25	1014.4	73	medium	14.0		calm	0.9		no
				Secchi01	13:10	4:00	19	43   22	7   54	overcast		8					medium			calm			
09/11/17										Bad weather													





bous189\_01

Date = 08/11/2017  
Heure debut [TU] = 09:47  
Longitude = 007 53.964 E  
Latitude = 43 22.162 N



bous189\_02

Date = 08/11/2017  
Heure debut [TU] = 11:02  
Longitude = 007 53.946 E  
Latitude = 43 22.195 N

