

The BOUSSOLE project technical reports; report # 10-232, issue 1.

BOUSSOLE Monthly Cruise Report

Cruise 249

December 12-14, 2022

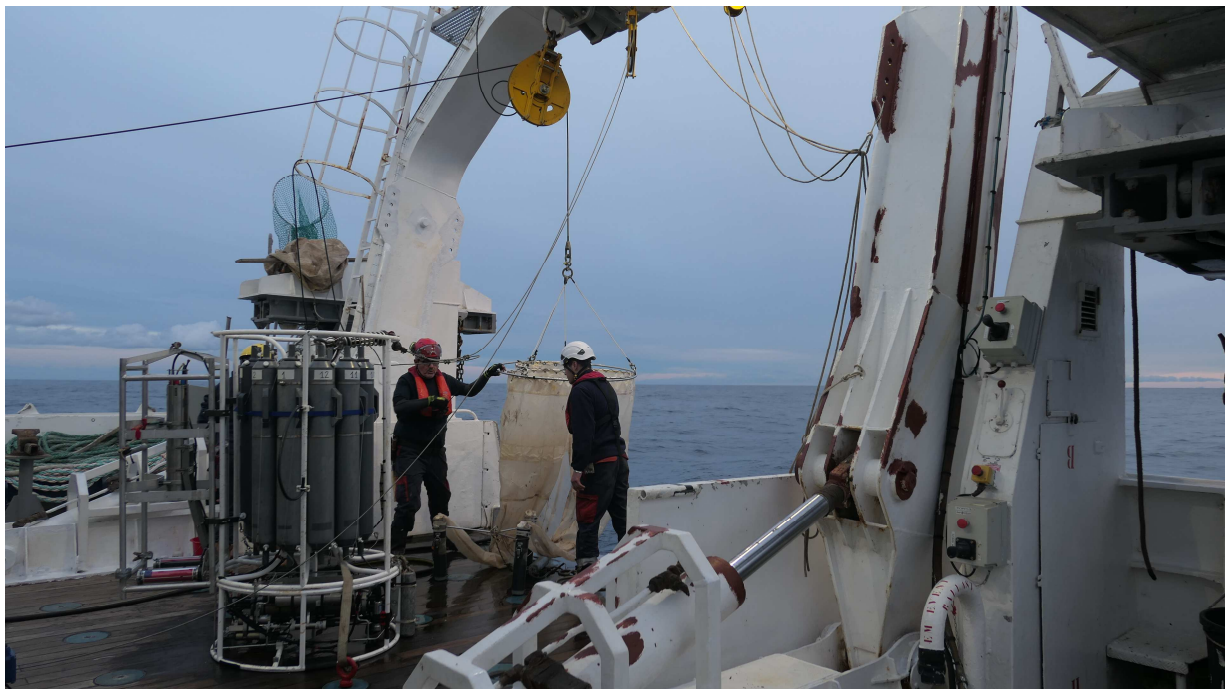
Duty Chief: Melek Golbol (melek.golbol@imev-mer.fr)

Vessel: R/V L'EUROPE

(Captain: Dany Deneuve)

Science Personnel: Eva Delcamp, Emilie Diamond-Riquier, Melek Golbol, Elsa Simon and Paco Stil

Institut de la Mer de Villefranche (IMEV), 06230 Villefranche-sur-Mer, France

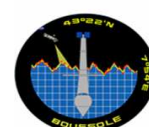


Deployment of a triple vertical zooplankton net from the deck of the R/V L'Europe at the DYFAMED site for MOOSE program.

BOUSSOLE project

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

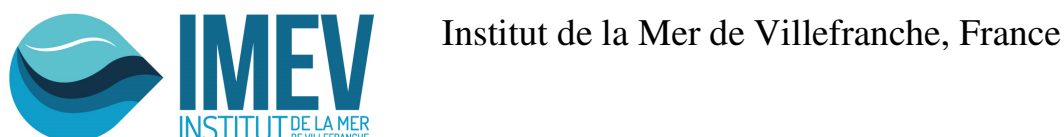
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Foreword

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. 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). A CTD cast including a 0.2 μm filter installed on the inlet tube of the a-Sphere is to be performed once per cruise at the BOUSSOLE site for the dissolved matter absorption measurements. This cast will be stopped at ten depths during 2 or 7 min depending on the depths in order to ensure that the integrating cavity of the a-Sphere be completely filled at each of these depths during the ascent of the CTD.

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 replicate 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).

Projects-specific operations

In addition, water samples are to be collected at 5 m depth for dissolved oxygen (DO), total alkalinity (TA) and total inorganic carbon (TC) analysis (from March 2014) and pH analysis (from October 2021). The TA/TC samples will be processed by the National service for such analyses (SNAPOCO – LOCEAN in Paris). The DO and pH samples will be analysed in the *Institut de la Mer de Villefranche* by the MOOSE team. The results will allow checking the data collected by the pCO₂ CARIOCA sensors, the optode and the pH sensor installed on the buoy at 3 m.

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

The "MOOSE DYFAMED" cruise scheduled two days before the beginning of this cruise was cancelled because of bad weather, so their operations were performed during the BOUSSOLE cruise.

Cruise Summary

The first day was used for BOUSSOLE operations including CTD casts with water sampling, C-OPS profiles and a Secchi disk at the BOUSSOLE site. It was also used for MOOSE operations including zooplankton vertical nets and a Manta horizontal net at the DYFAMED site but it was not possible to deploy the deep CTD cast because of the bad weather. The two last days were cancelled because of bad weather.

Monday 12 December 2022

The sea state was slight with a gentle to moderate breeze. The sky was cloudy/overcast and the visibility was excellent. Firstly, a CTD cast with water sampling was performed at the BOUSSOLE site. A cap was put on the backscattering meter for dark measurements and a 0.2 μm filter put on the a-Sphere absorption meter for the

dissolved matter absorption measurements. This cast was stopped at 10 depths during the ascent of the CTD. The Niskin bottle could not be closed at 5 m depth due to a software configuration problem. So, another CTD cast was deployed successively in order to sample at this depth for TSM, TA/TC, DO and pH analyses. Then, 3 C-OPS, a CTD cast and a Secchi disk were performed at the BOUSSOLE site. Then, two vertical zooplankton nets were deployed at the DYFAMED site for MOOSE program. Unfortunately, it was not possible to deploy the deep CTD cast because of the rough sea conditions. Nevertheless, it was possible to deploy the Manta horizontal net during the way back to the Nice harbour.

Tuesday 13 December 2022

Bad weather prevented departure from the Nice harbour.

Wednesday 14 December 2022

Bad weather prevented departure from the Nice harbour.

Pictures taken during this cruise can be found at:

<https://photos.app.goo.gl/f5ewiSjLciUJQVRz9>

Data from the BOUSSOLE cruises and buoy are available at:

http://www.obs-vlfr.fr/Boussole/html/boussole_data/login_form.php

Cruise Report

Monday 12 December 2022 (UTC)

People on board: Eva Delcamp, Emilie Diamond-Riquier, Melek Golbol, Elsa Simon and Paco Stil.

0640 Departure from the Nice harbour.
1010 Arrival at the BOUSSOLE site.
1025 CTD 01, 400 m (with a 0.2 μ m filter on a-Sphere and with 2 minutes stop at 400, 150 m and 7 minutes stop at 80, 60, 50, 40 m) (with cap on the HS6).
1200 CTD 02, 10 m with water sampling at 5 m for TSM, TA/TC, DO and pH.
1230 C-OPS 01, 02, 03.
1400 CTD 03, 400 m with water sampling at 400, 200, 150, 80, 70, 60, 50, 40, 30, 20, 10 and 5 m for HPLC and a_p .
1415 Secchi 01, 20 m.
1455 Departure to DYFAMED site.
1520 Arrival at the DYFAMED site.
1525 Zooplankton nets x 2, 100 and 200 m (MOOSE program).
1555 Deep CTD cast cancelled (bad weather).
1610 Manta horizontal net (MOOSE Program).
Departure to the Nice harbour.
2000 Arrival at the Nice harbour.

Tuesday 13 December 2022

Bad weather prevented departure from the Nice harbour.

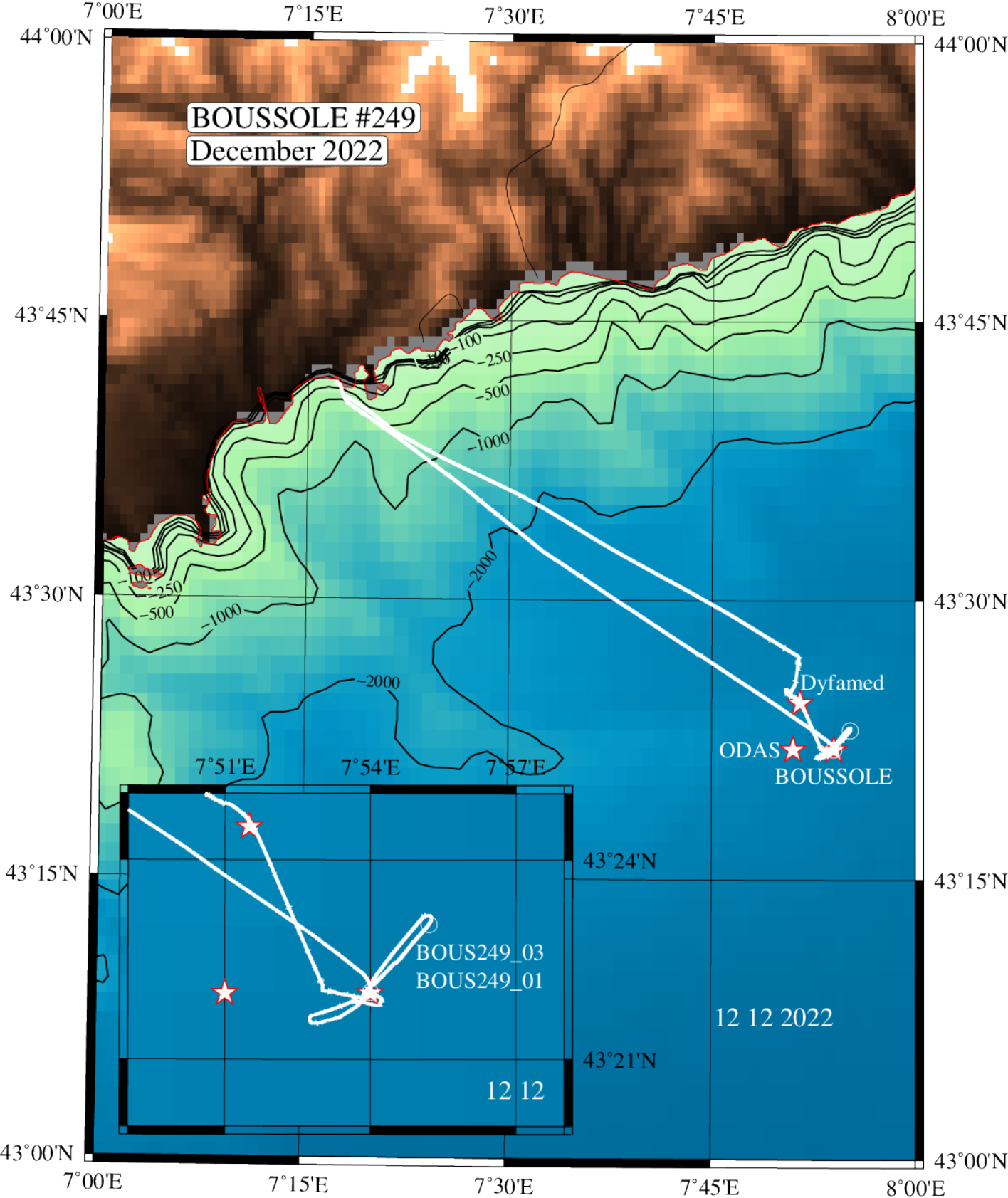
Wednesday 14 December 2022

Bad weather prevented departure from the Nice harbour.

Problems identified during the cruise

- Diving operations were not performed during this cruise because of bad weather forecasts. They were anticipated and took place on December 7th with the M/Y Papeete II.
- CTD 01: It was planned to sample at 5 m depth for TSM, TA/TC, DO and pH analyses. Unfortunately, the Niskin bottle could not be closed due to a software configuration. However, another CTD cast was deployed successively in order to sample for these parameters.

Appendices



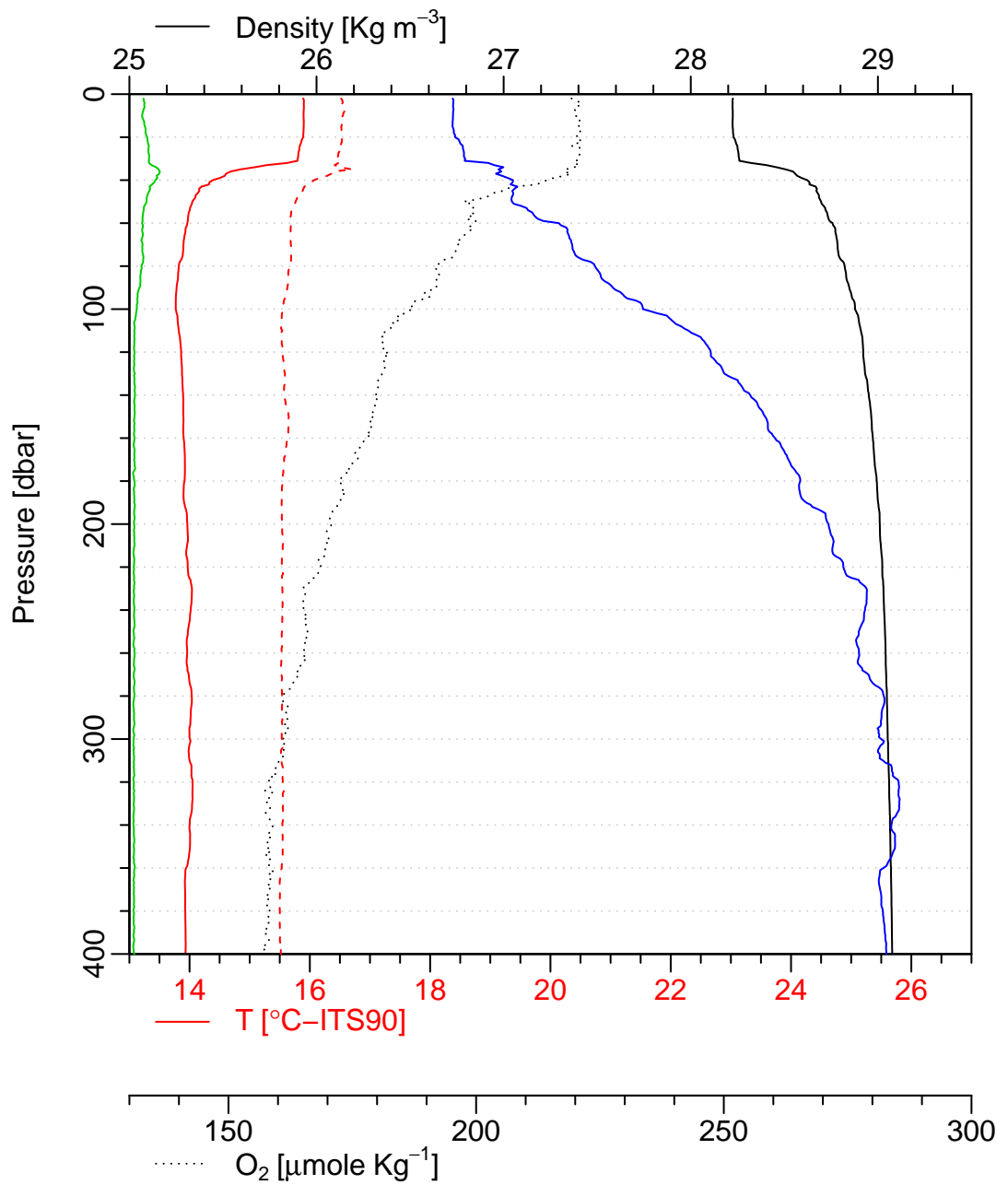
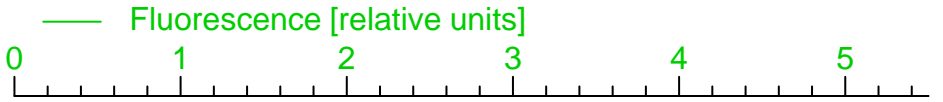
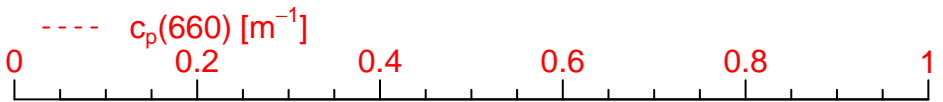
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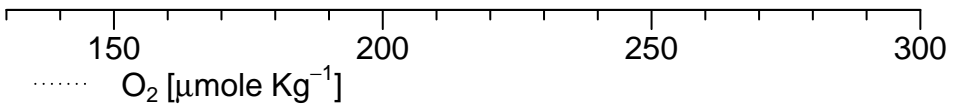
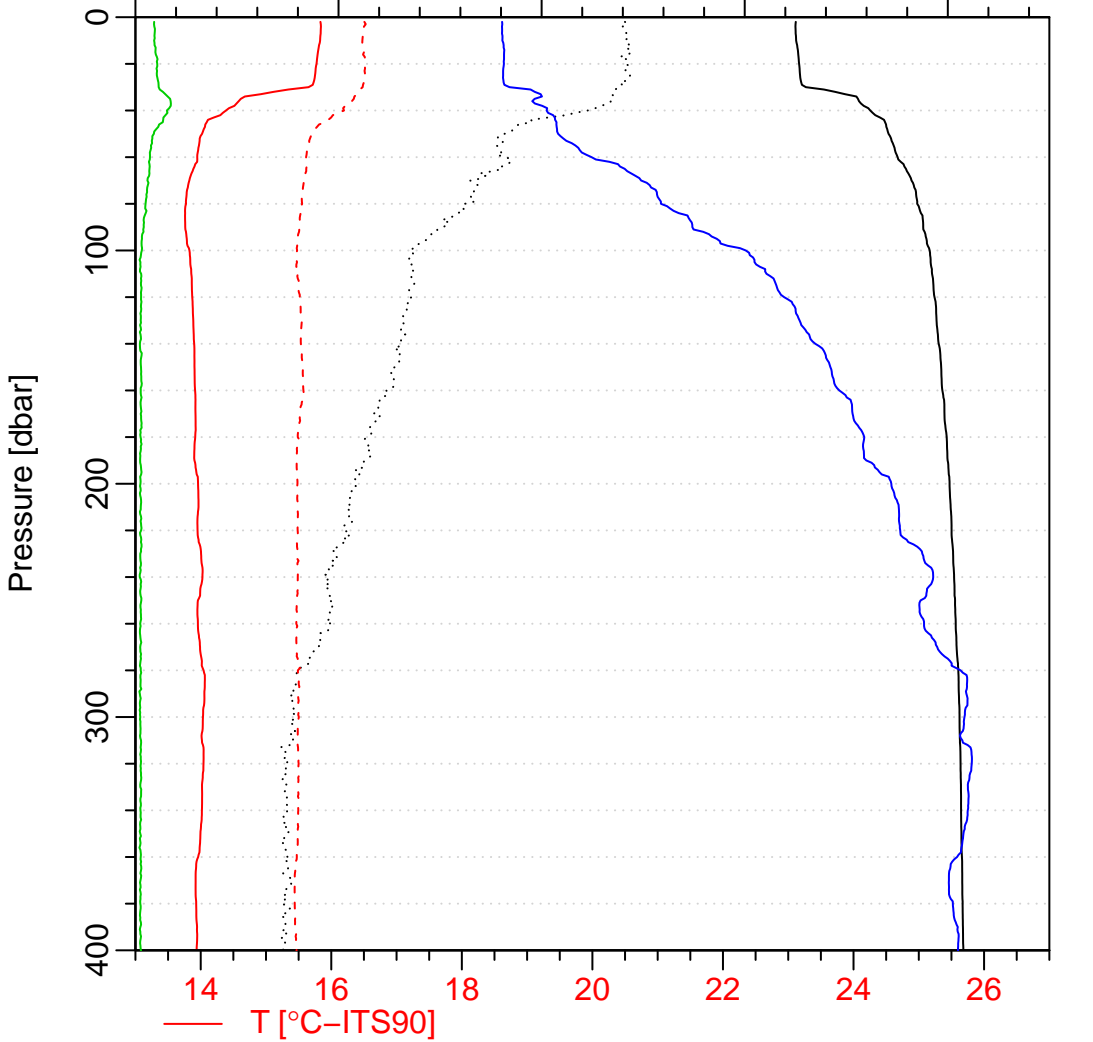
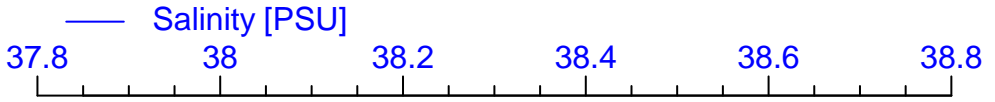
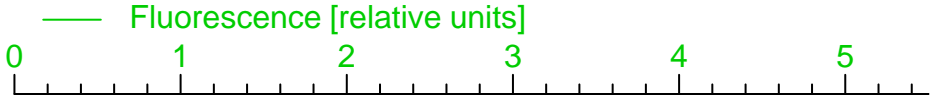
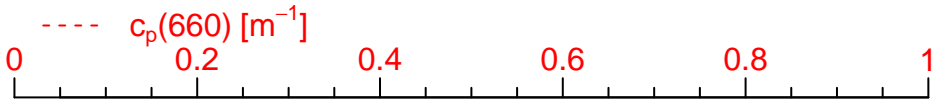
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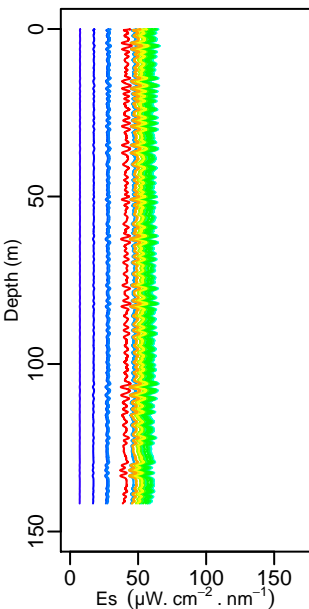
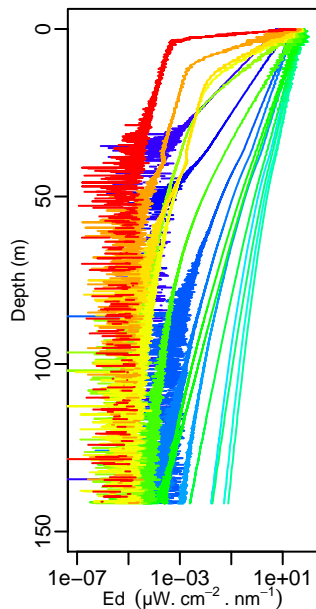
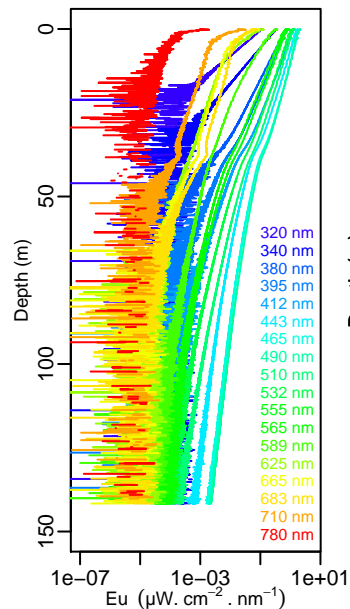
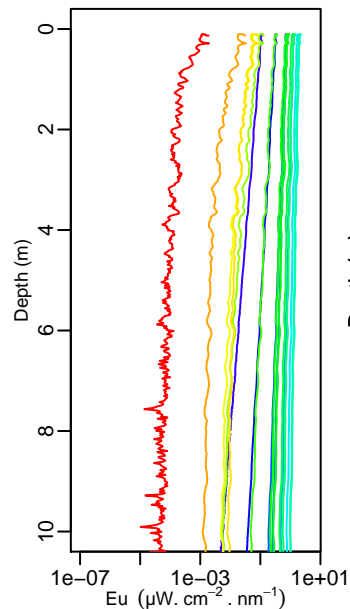
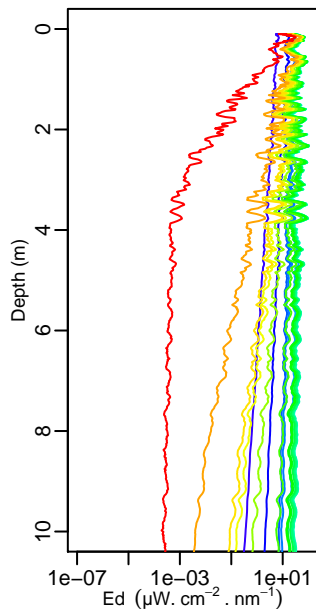
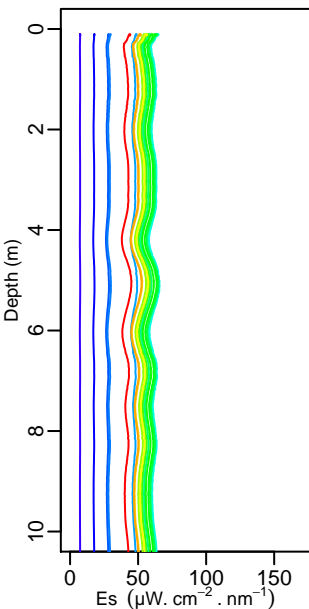
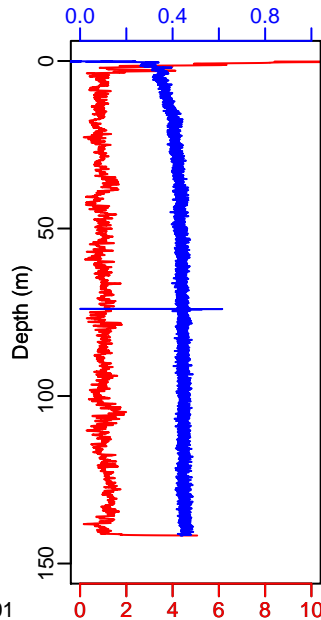
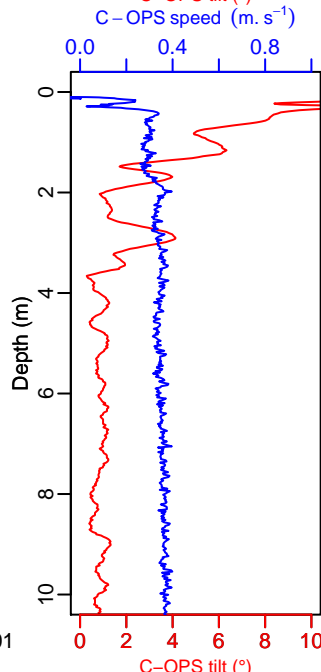
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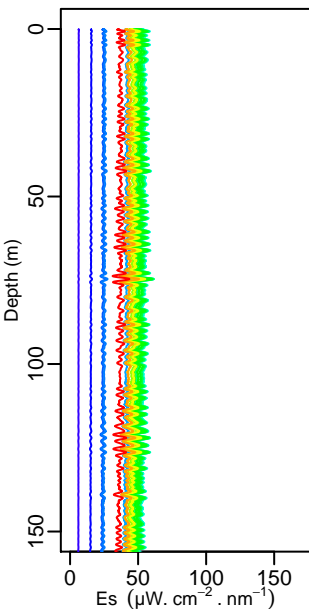
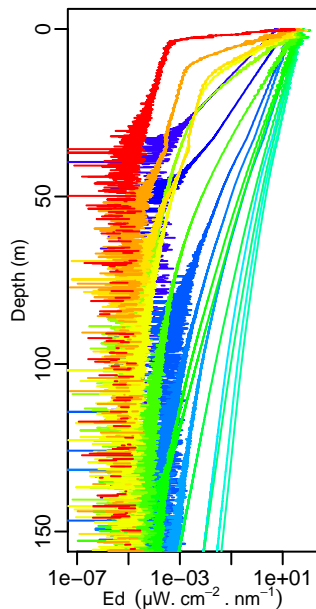
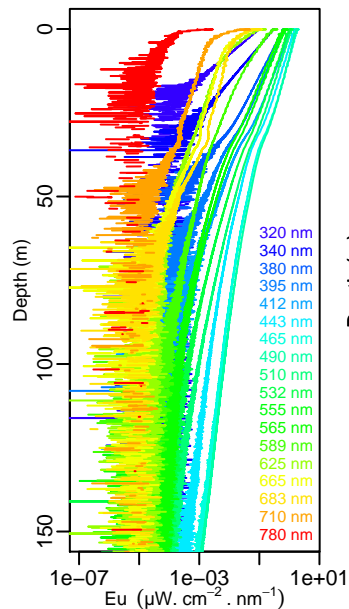
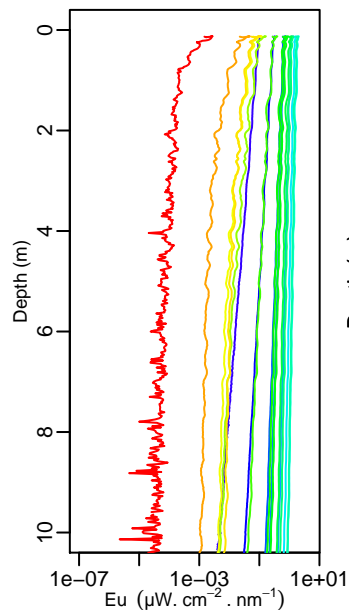
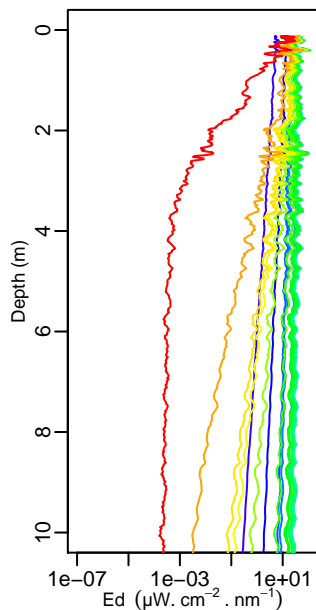
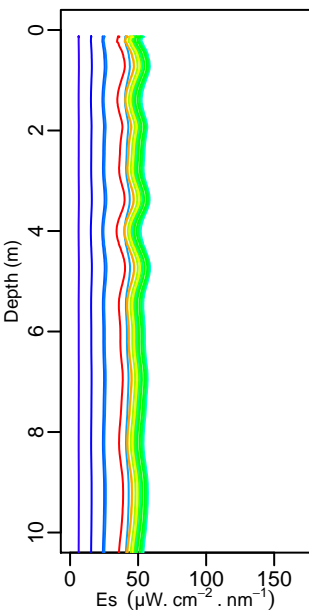
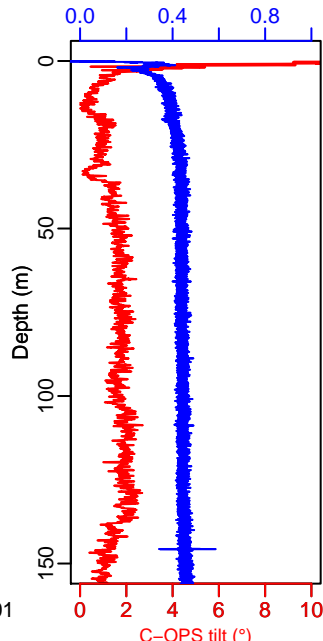
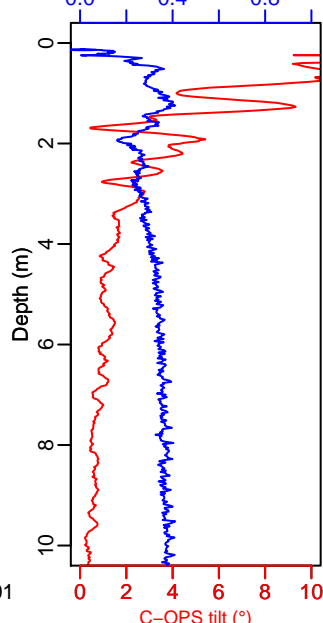


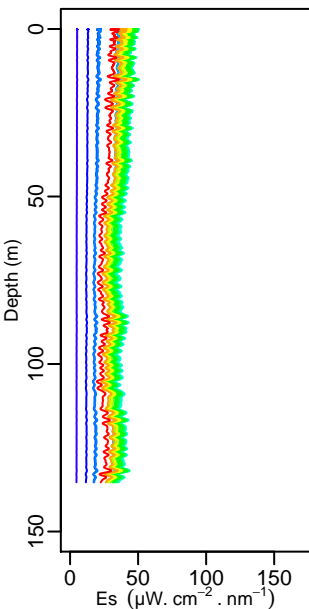
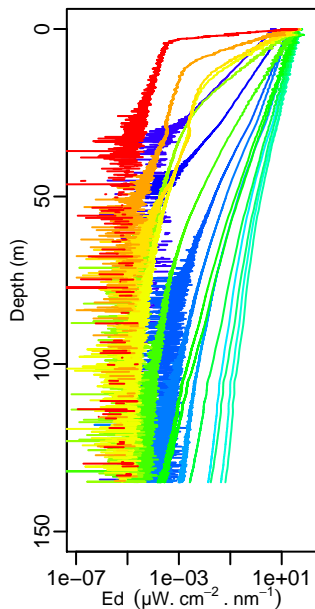
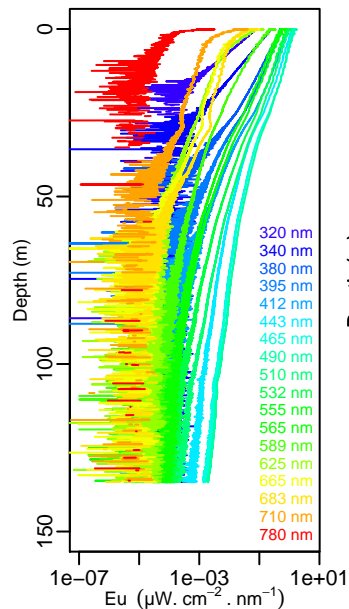
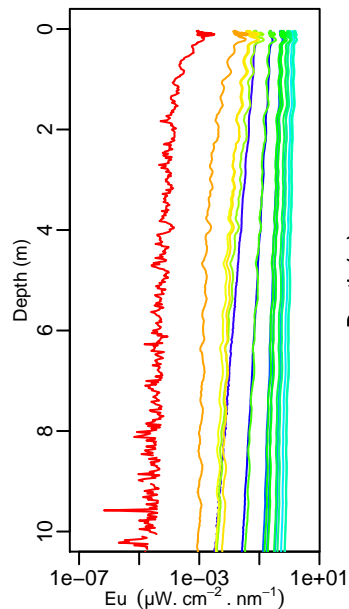
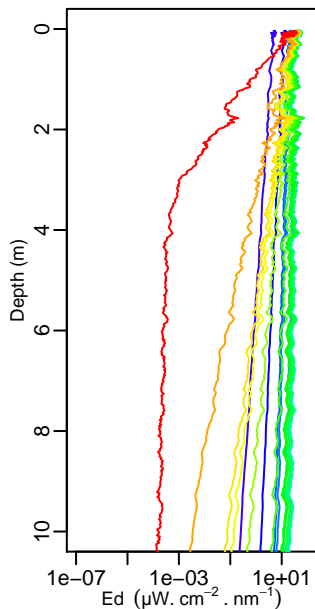
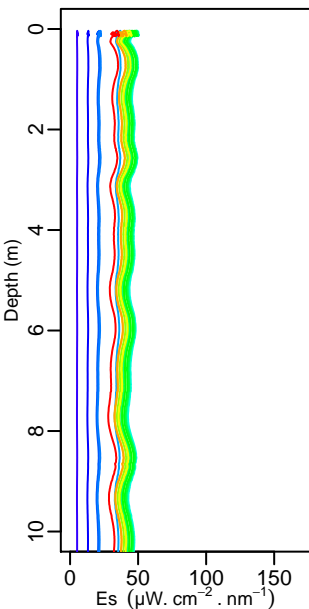
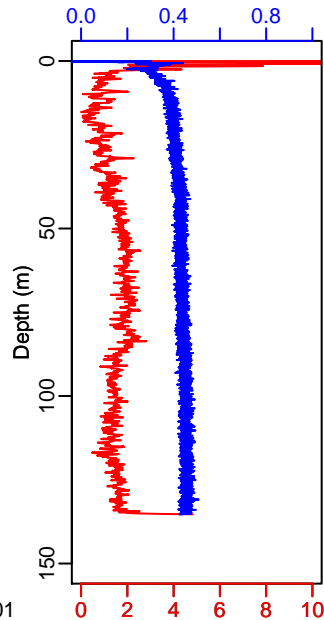
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