

APPENDIX 3
TA PROJECT REPORT (TEMPLATE)

(see following pages)

TA PROJECT REPORT PACKAGE



- The completed and signed forms included in this package should be sent by email to jerico.ta@marine.ie and jerico-s3@ifremer.fr within **one month after the completion of the TA experiment** by the User Group Leader.
- Refunding of the TA reimbursement to the user group will be processed as soon as these forms will be submitted.**
- The TA Project Report will be published in the JERICO-S3 website. The report, as well as other information collected with the attached forms, will be used to report to the European Commission.
- Please note that any publication resulting from work carried out under the JERICO-S3 TA activity must acknowledge the support of the European Commission – H2020 Framework Programme, JERICO-S3 under grant agreement No.871153.**

1. Project Information

| | |
|--|---|
| Proposal reference number¹ | Agreement N° 22/1002928 |
| Experiment Acronym (ID)² | FRIPP-CEE |
| Title of the project³ | Frontal dynamics Influencing Primary Production – Carbon Export Experiment |
| Host Research Infrastructure⁴ | Consorcio para el Diseno, Construccion, Equipamiento y Explotacion del Sistema De Observacion Costero de las Iles Balears (SOCIB) |
| Starting date - End date⁵ | 31-05-2023 - 20-06-2023 |
| Name of Principal Investigator⁶ Home Laboratory Address E-mail address Telephone | Antonio Olita CNR-ISAC, Cagliari, Italy Antonio.olita@cnr.it +393285321116 |

2. Project objectives⁷ (250 words max.)

The project was aiming to study the impact of frontal dynamics on the Phytoplankton production and distribution as inferred from fluorometric measurements during the Deep Chlorophyll maximum (DCM) stage. Observed variations in the DCM can indicate the role of the Mesoscale and submesoscale features on Carbon export. This is the main aim of the present project.

The specific objectives were:

1) Observe the dynamics of the front in terms of: horizontal and vertical velocities; instabilities; mixing and enhanced dynamical stratification

2) Study the impact of such frontal dynamics on production in a DCM condition as in Olita et al 2017.

¹ Reference number assigned to the proposal by the TA-Office.

² User-project identifier used in the proposal.

³ Title of the approved proposal. The length cannot exceed 255 characters

⁴ Name of the installation/infrastructure accessed with this project. If more than one installations/infrastructures are used by the same project, please list them in the box.

⁵ Specify starting and end date of the project (including eventual preparatory phase before the access).

⁶ Fill in with the full contact of the Principal Investigator (user group leader).

⁷ Write the short-term, medium and long-term objectives of the project. Use no more than 250 words.

3) Estimate Carbon export from DCM to deeper layers (>200 m) promoted by vertical submesoscale and mesoscale dynamics.

3. Main achievements and difficulties encountered (250 words max.)⁸

The sampling was successfully performed as planned. No major difficulties have been encountered during the glider mission. The glider dived down to 300 m, a depth that was considered a good compromise to have both high temporal and spatial resolution observations below the euphotic layer and maintain the actual glider path (low horizontal currents) to resolve fine structures.

4. Dissemination of the results⁹

We are preparing a contribution for Ocean Science Meeting 2024 will be held in New Orleans, US. Then we will consider the opportunity of submitting submit a full paper once the results will be analysed in depth.

⁸ Describe briefly the main achievements obtained and possible impacts, as well as possible difficulties encountered during the execution of the project. Use no more than 250 words.

⁹ Describe any plan you have to disseminate and publish the results resulting from work carried out under the Transnational Access activity in JERICO -S3: scientific articles, books - or part of them -, patents, as well as reports and communication to scientific conferences, meetings and workshops. Highlight peer-reviewed publications. **Note that any publications resulting from work carried out under the JERICO -S3 TA activity must acknowledge the support of the European Commission – H2020 Framework Programme, JERICO -S3 under grant agreement No. 871153.**

5. Technical and Scientific preliminary Outcomes (2 pages max.)¹⁰

Glider sampled the area indicated in Fig. 1 from 31 May to 20 June 2023.

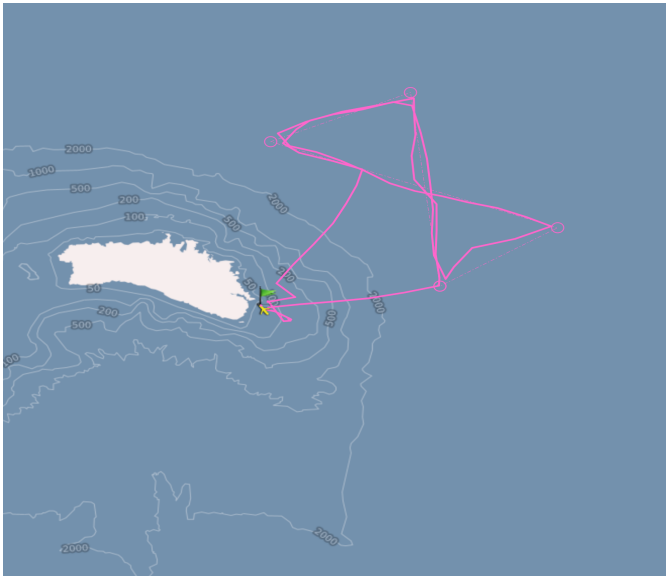


Fig.1 Glider Track of the experiment FRIPP-CEE

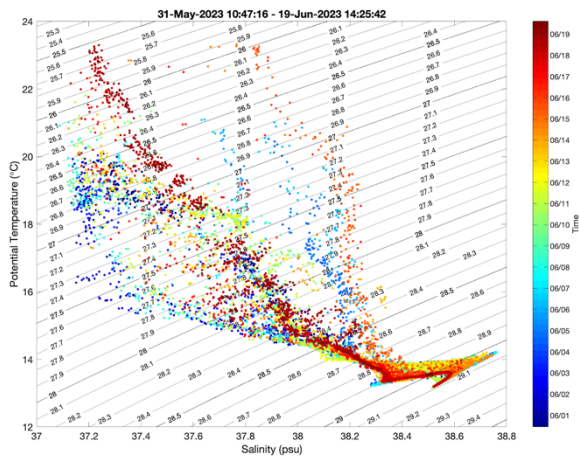


Fig.2 T-S Diagram for the whole dataset collected by the glider flight.

¹⁰ Describe in detail results and main findings of your experiment at the present stage.

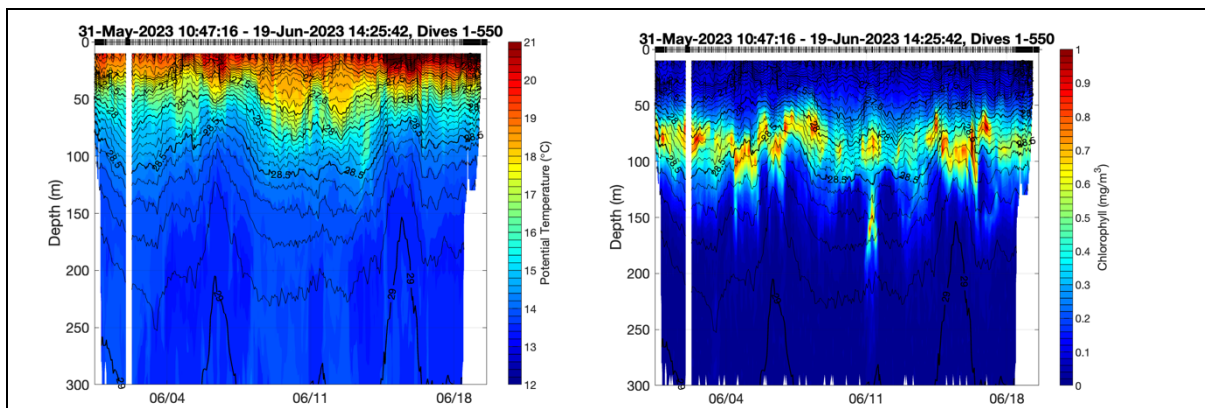


Fig.3 Potential Temperature (left) and chlorophyll (right) sections.

Temperature section (as well as density, not shown) shows that during the cruise the thermal stratification was already formed, although signature of intensification of the stratification as the sampling proceeds is also evident. DCM, deep chlorophyll maximum, was already present at the bottom of the stratified layer, ranging 60 to about 100 m depth. An interesting feature, in terms of Chlorophyll appears around June 11, with a chlorophyll patch centered at about 160 m suggesting a subduction of water which footprint can be recognised (in Chl and other bio-optical variables) till 200 m.

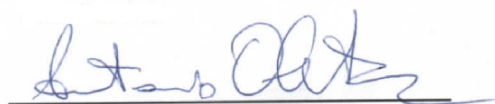
High oxygen concentrations were observed in the DCM where the productivity enhanced and associated with areas where enhancement of CHL observed. In addition, relative high oxygen below 100 m observed in patches linked with the observed patchiness of the WIW water in the region.

Oxygen maxima are just above the DCM area. This could suggest a diffusion of Oxygen from production areas, an effect that should deserve further investigation, by analyzing the production of the different patches, a synoptic view that would also encompass the PAR analysis. Within DCM large number of cells would determine production of O₂ but also its consumption during night (respiration).

We will analyze the export of organic carbon from production areas mediated by the subduction filament we observed to act in the middle of the “transect”.

[Cagliari], 10/10/2023

Location and date



Signature of principal investigator