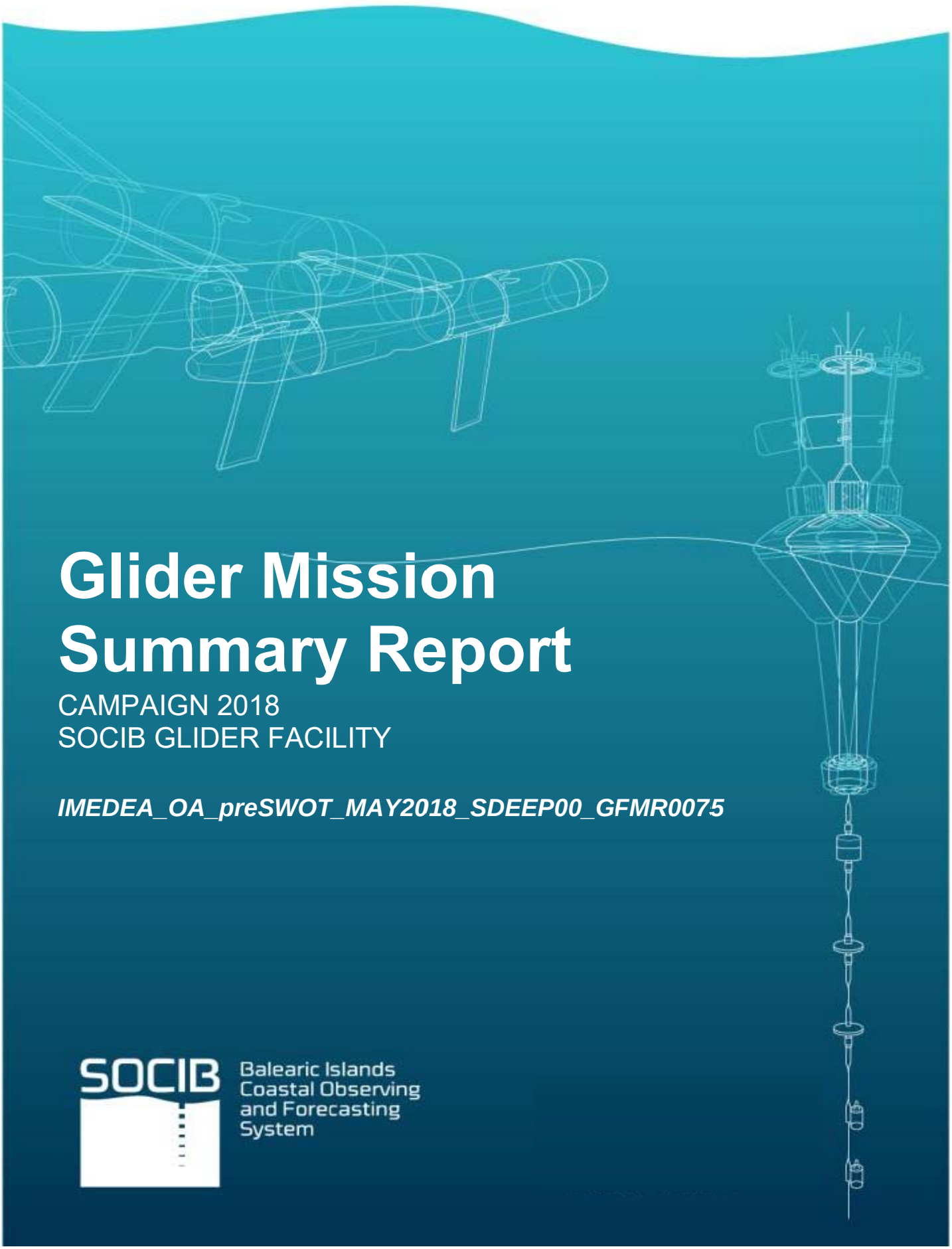
SOCIB Balearic Islands Coastal Observing and Forecasting System

GOBIERNO DE ESPAÑA MINISTERIO DE CIENCIA, INNOVACIÓN Y UNIVERSIDADES

GOVERN ILLES BALEARS



Glider Mission Summary Report

CAMPAIGN 2018
SOCIB GLIDER FACILITY

IMEDEA_OA_preSWOT_MAY2018_SDEEP00_GFMR0075

SOCIB Balearic Islands Coastal Observing and Forecasting System

1. Mission Name	*preSWOT2018 (codename)* *IMEDEA_OA_preSWOT_MAY2018_SDEEP00_GFMR0075 (full-name)*		
2. Platform Model	*Electric Glider. SLOCUM G2 1000m*		
3. Platform ID / Name / WMO Code	*U243 / SDEEP00 / 68457*		
4. Related Platforms / Missions	• *SEA003: Sea-explorer glider, owned by MIO, surveying in the frame of synoptic BIOSWOT2018 experiment. (contact person: Andrea M. Doglioli <andrea.doglioli@mio.osupytheas.fr>)* • *ABACUS4-2018: Jerico-Next TNA mission concatenated with preSWOT2018 (contact person: Yuri Cotroneo <yuri.cotroneo@uniparthenope.it>)*		
5. Start Date	*03/may/2018 (this is the glider launch-day. Glider preparation began on 24/Apr/18)*		
6. End Date	*15/may/2018 (Glider was not recovered but left, and configured, to concatenate with next survey: ABACUS4-2018)*		
7. Total Days	*13 (days-in-water)*	**8. Total distance (Km / Nm)**	*163 Nm*
9. Survey Area (NODC or SDN region)	*Western Mediterranean* *Algerian Basin*		
10. Objective(s)	*The general objective of this project is to quantify and improve our large scale integrated understanding of vertical exchanges associated with oceanic mesoscale and sub-mesoscale features (e.g., fronts, meanders, eddies and filaments) through the combined use of in-situ and satellite data in synergy with numerical models.(for more details contact the PI of the preSWOT experiment: Ananda Pascual <ananda.pascual@imedea.uib-csic.es>)*		

11. Scientific Sensors

Sensor Type	*Manufacturer*	*Serial Number*	*Last-Calibration Date*
CTD (pumped)	*SBE*	*0064*	*05/Dec/2016*
FLNTU	*WebLABS*	*3711*	*16/Dec/2016*
OXYGEN	*AADI*	*1409*	*14/Feb/2017*

12. Number of Profiles

Sensor Type	*Number of Vertical Profiles*	*Total Vertical Maneuvers (ascends+descends)*	*Sampled Vertical-Distance (meters)*
CTD (pumped)	*404*	*407*	*165057*
FLNTU	*403*		*89156*
OXYGEN	*403*		*165425*

13. Significant Events

- *First ever a SOCIB glider was deployed along a SEA-EXPLORER glider model*
- *SENTINEL-3 overflight (swath #244) during the first leg (North to South) of the scientific survey of the SOCIB glider*
- *Mission concatenated with ABACUS-4. The proximity of the PRESWOT end-wpt, with ABACUS-4's, made feasible to move from one survey area to the other just in time for ABACUS-4 to begin.*
- *The SOCIB glider found favorable currents during the first leg although it was not that problematic during the return trip*

Parc Bit. Ctra. Valldemossa, Km 7,4 · Edifici Naorte, Bloc A, Planta 2ª, Porta 3 · 07121 Palma (Illes Balears, Espanya) · Tel. +34 971 43 99 98 · Fax +34 971 43 99 79

14. Mission Summary

14.1 Introduction

This mission, the 3rd one by SDEEP00 in 2018, and the 8th in the all-year list, with internal code GF-MR-0075, has been executed in the frame of SOCIB's Open Access (OA) program. More precisely, it has been the result of an approved proposal, of Dra. Ananda Pascual Ascaso, backed up by funds provided by Spain's program "Plan Nacional". Also, this mission has occurred after a field-sensor-validation mission (GARICAT) on April-17th and before another OA mission called ABACUS-IV funded by the Jerico-Next-TNA European program. preSWOT2018 and ABACUS-IV surveys have been concatenated and occurred within the same sea deployment of SDEEP00. Finally, it is important to mention that a French glider (SEA003, owned/operated by MIO and being a Sea-Explorer by ALSEAMAR company) was launched simultaneously, during the same field operation, and surveyed side-by-side to SDEEP00 during the whole period of preSWOT2018.

14.2 Pre-mission Report

Created prior to the start of this mission preparation, compiling the key preliminary aspects of this GF-MR-75 derived from the planning sessions (meetings, email conversations, talks,...)

14.3 Preparation

Phases were executed between 23/April/2018 and 02/May/2018. All checks and configurations were undertaken according to the pre-mission-report and applicable protocols, except the CEM (Compass-Error-Measurement) test which was postponed to the Conclusion phase of the last mission executed on the set of batteries on-board SDEEP00 identified in the field 23 of this report.

14.4 Launching

This field operation (03/May/2018) was conducted by 1 SOCIB-ETD and 1 SOCIB-GF members on board SOCIB-I (9m Hurricane Zodiac). Exceptionally, Dr. Frederic Cyr (Fisheries and Oceans Canada, Frederic.Cyr@dfo-mpo.gc.ca) participated in this operation as field-pilot of the MIO's SEA003. Remote piloting of SDEEP00 was undertaken at IMEDEA's glider-control-room by 1 SOCIB-GF additional member. Gliders were released in N39°19.110' E02° 32.718' (SDEEP00) and N39°18.498' E02° 33.318' between 09:05am,utc and 11:10am,utc. In spite of the expected technical inconveniency, derived from the goal of launching gliders of two different models, one of them, the Sea-Explorer, first ever seen by SOCIB-GF, the operation was an operative and tactical success (environmental conditions were quite good). Both gliders executed buoy-tethered test-dives prior to the initial dive of each mission. The major difficulty was to overcome the low 3G/GSM cellular signal in the area.

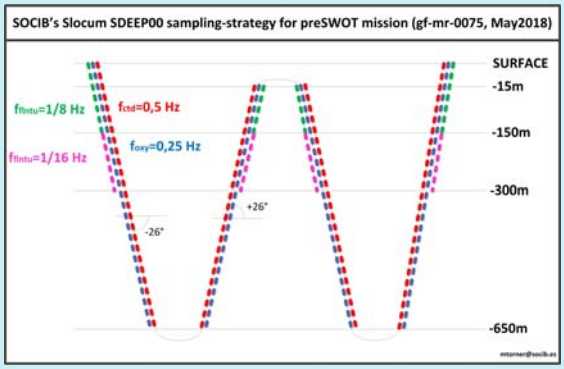
14.5 Survey

In general terms, it was very successful. The main preliminary objectives were all accomplished without major setbacks. The absence of critical situations resulted in no emergency actions.

- ***Navigation:*** *was very satisfactory. Fluid and continuous advancement without relevant deviations from commanded route (1.23Km in average). More than one waypoint-list was used in order to configure the 3 chapters of the navigation: (1) the initial transit from the launching-wpt to the start-wpt of the preSWOT2018 survey-track, (2) two legs, a round-trip, over this survey-track (being a fragment of SENTINEL-3's swath number 0244) and (3) a final transit to the next-mission's (ABACUS-4) start-wpt. Additionally, the first leg over swath-0244 was extended by updating an end-waypoint which was 16Nm further away. However, SDEEP00 was commanded to return before hitting that terminal location due to timing restrictions conditioned by the fear to encounter frontal currents that were initially favorable during the first leg over swatch-0244. Besides this terminal waypoint, all other waypoints were accomplished successfully (max. dead-reckoning error of 2131 meters). There were no interruptions due to currents nor mission aborts. No periods of 'holding position' waiting for a particular event. Summarizing, the traced path was adjusted to what was commanded and very much in parallel to the synoptic survey by SEA003.*

- ***Sampling strategy:*** *was initially configured accordingly to scientific requirements, see attached image:*

,



- ***Underwater Maneuvering:*** *was initially configured accordingly to scientific objectives, environmental conditions (mainly the bathymetry found in navigated waters) and 'flying' efficiency.. During the mission this strategy changed several times in order to adapt to variations related to this aspects (mainly scientific objectives since the others were not exigent). Basically, there were three stages which required specific configurations:*

    - *1st 04/may/2018 to 5/may/2018: initial transit to the initial waypoint of the scientific track [UTC-surfacing, altimeter on];*
    - *2nd 5/may/2018 to 15/may/2018: scientific-survey over S-3 swath-0244 [surfacing every 2 complete dives, fixed bottom-depth of -700m*

14.6 Recovery

Physical recovery did not take place. This mission was concatenated to ABACUS4 GFMR0078.

Parc Bit. Ctra. Valldemossa, Km 7,4 · Edifici Naorte, Bloc A, Planta 2ª, Porta 3 · 07121 Palma (Illes Balears, Espanya) · Tel. +34 971 43 99 98 · Fax +34 971 43 99 79

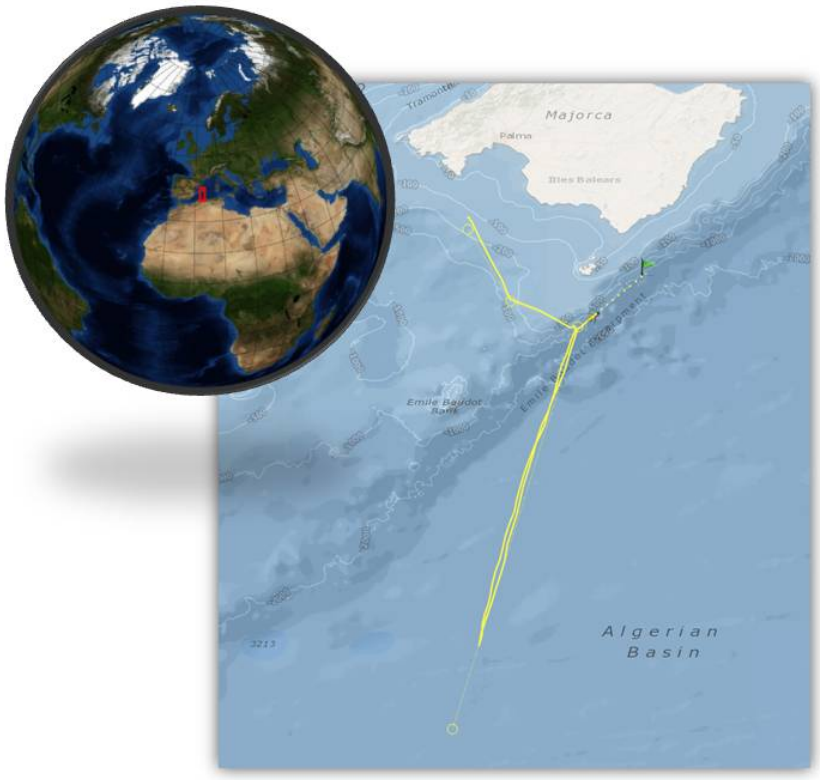
15. Principal Investigator	

(Title) Name	Email	Telf.
(PhD) Ananda Pascual Ascaso	ananda.pascual@imedea.uib-csic.es	+34 971 611 732
(PhD) John Allen	jallen@socib.es	+34 971 439 765

16. Institute	*IMEDEA (http://imedea.uib-csic.es/)* *SOCIB (www.socib.eu)*
17. Project Affiliation (web-site)	*n/a*
18. Partnership / Participation	*IMEDEA, SOCIB, MIO (https://www.mio.univ-amu.fr/?lang=en)*
19. Glider Software Version	*Nav: v7.21 LISST, Payload: v7.21*
20. Data Retrieval (real-time [RT] / delayed-mode [DM])	• *RT: both engineering (SBD) and scientific (TBD) near-real-time pair of files transmitted, during the whole mission, during each surface in between each two consecutive dives* • *DM: wireless download, along with the mission which followed (ABACUS-IV), via radio link to not disassemble the glider*
21. Compass Calibration (specify procedure)	*Neither compass calibration nor error-measurement was done during the pre-mission period (due to timing and logistics restrictions). Since SDEEP00 will not suffer modifications before it is redeployed for CANALES-JUNE-2018, compass error-measurement was performed in June 2018. See 20180612_U243_CEM_PRE_canalesJun2018 report for more information*
22. Battery Type	*Official/Factory Lithium Pack (based on ELECTROCHEM cells) with a nominal battery capacity of 700Ah approx.*
23. Battery Consumption (Ah)	*78.6459Ah (mission_start: 45.4231Ah ; mission_end: 124.069Ah)*
24. Data Available From	*http://thredds.socib.es/thredds/fileServer/auv/glider/sdeep00-scb_sldeep000/L2/2018/dep0023_sdeep00_scb-sldeep000_L2_2018-05-03_data_dt.nc*
25. Further Details	*glidertech@socib.es (technical aspects) & glider.data@socib.es (scientific data)*

26. General Map

(Map providing general overview of Survey Area)



On-line Track

http://apps.socib.es/dapp/?deployments=801-13-0-FFFF00&layers=isobaths,ocean_basemap&units=scientific

Parc Bit. Ctra. Valldemossa, Km 7,4 · Edifici Naorte, Bloc A, Planta 2ª, Porta 3 · 07121 Palma (Illes Balears, Espanya) · Tel. +34 971 43 99 98 · Fax +34 971 43 99 79

27. Detailed Map

(Map providing detailed overview of Survey Area and traced Flight Path with surface points if possible)

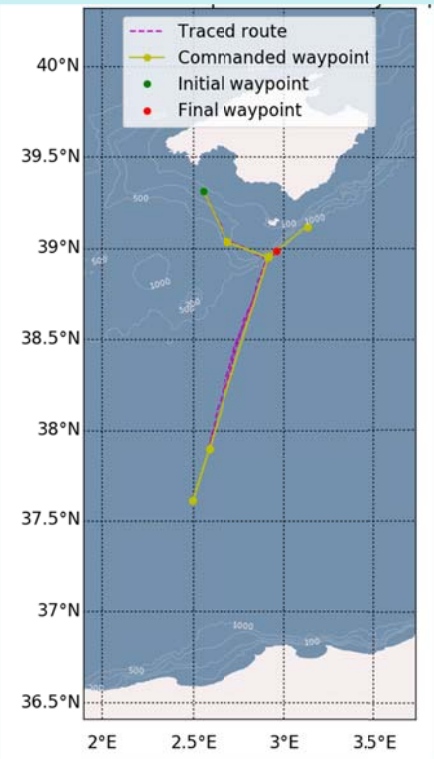


Fig 2.1 Map showing both the commanded route and the resulting track

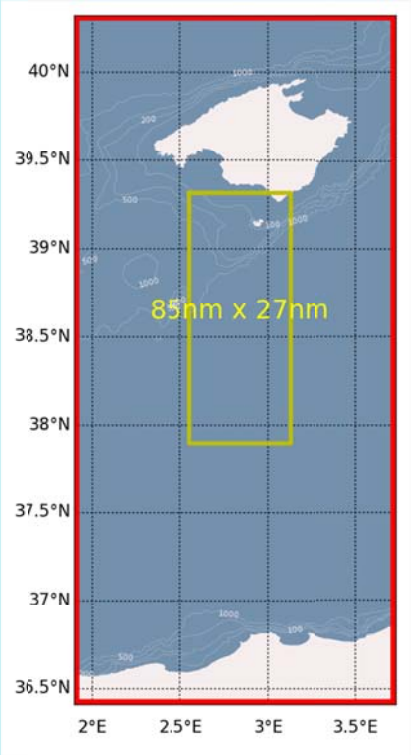
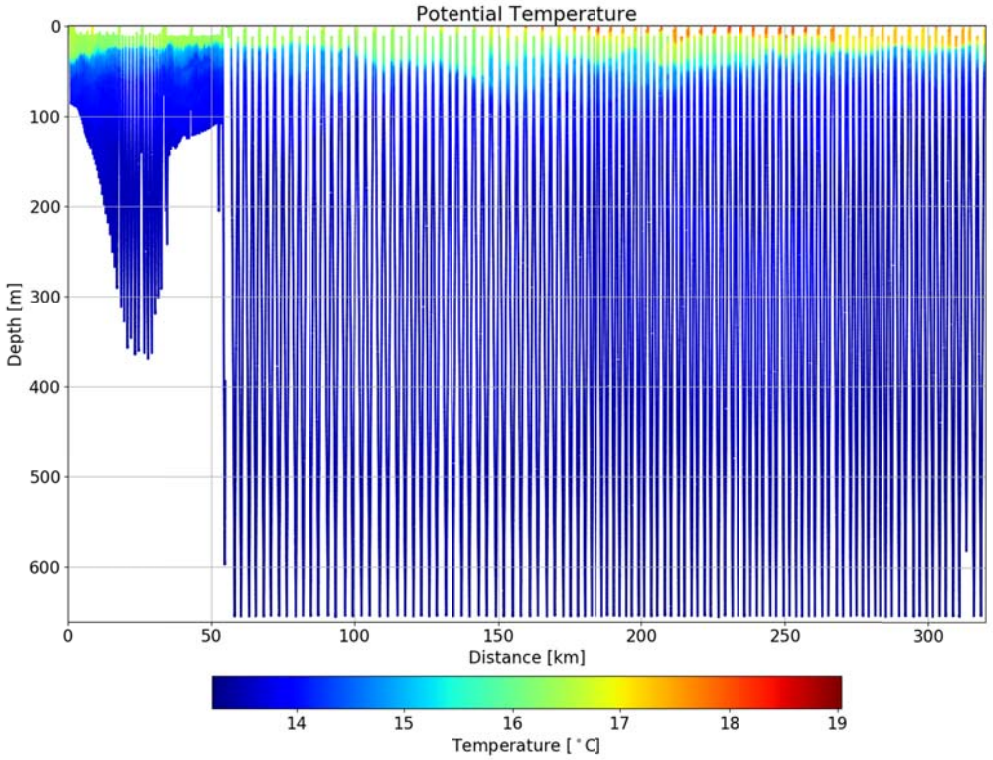


Fig 2.2 Location and dimensions of this mission's boundary box

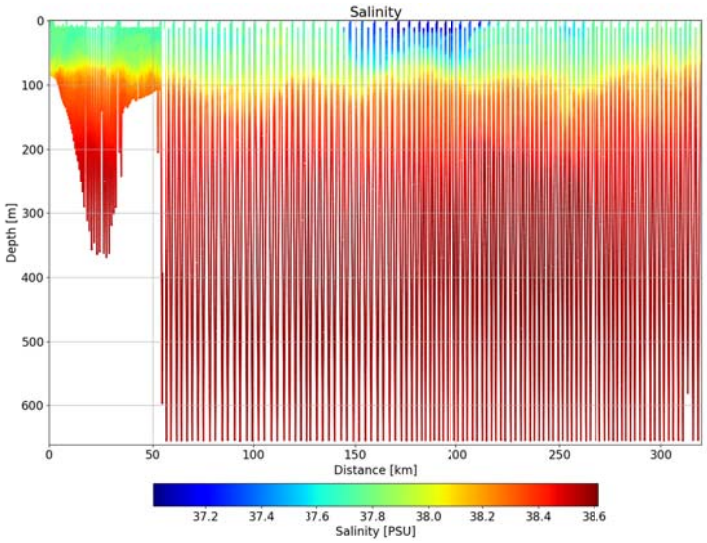
28. Scientific Preliminary Review

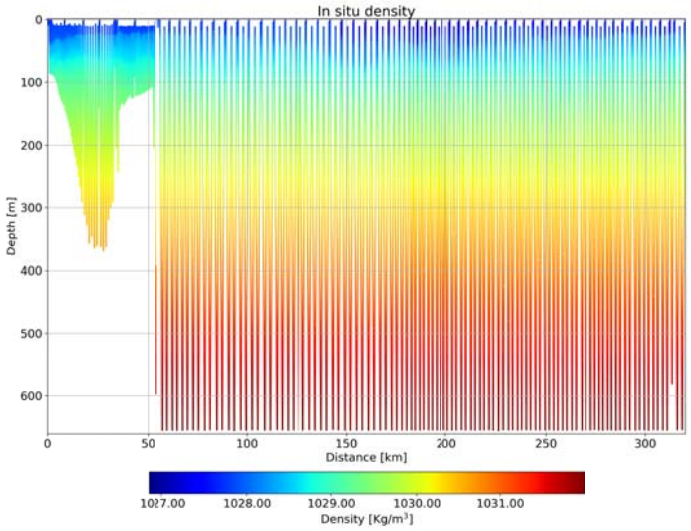
CTD

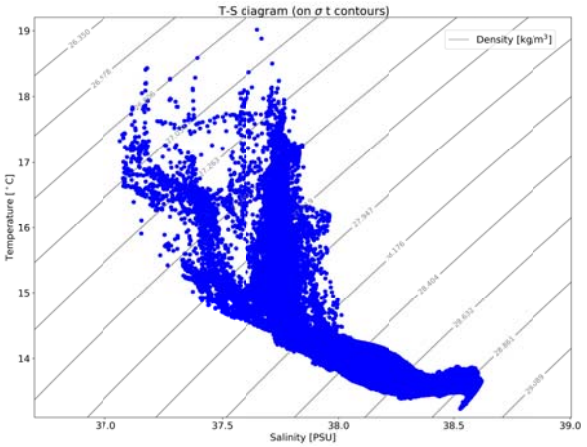


Parc Bit. Ctra. Valldemossa, Km 7,4 · Edifici Naorte, Bloc A, Planta 2ª, Porta 3 · 07121 Palma (Illes Balears, Espanya) · Tel. +34 971 43 99 98 · Fax +34 971 43 99 79

28. Scientific Preliminary Review

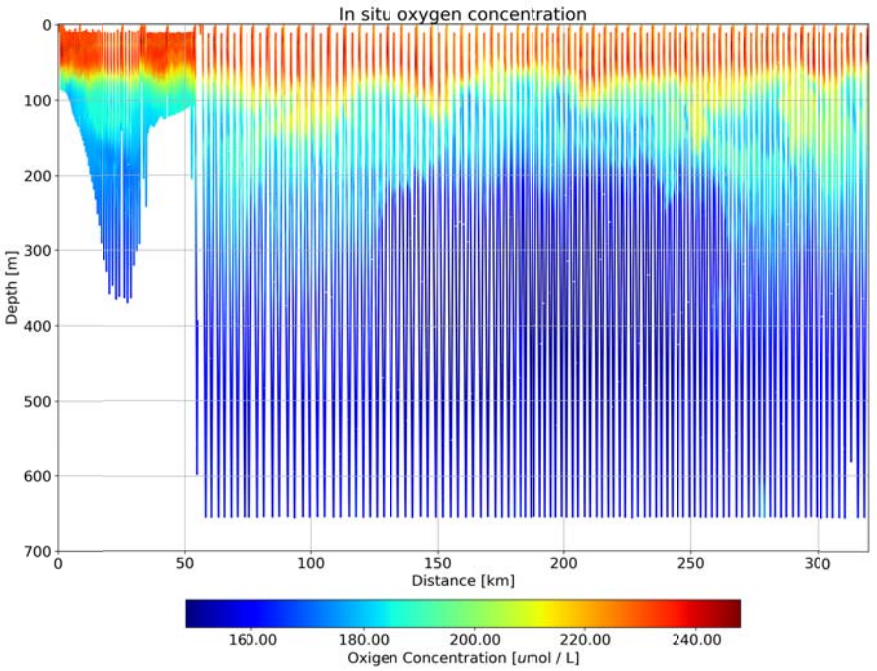


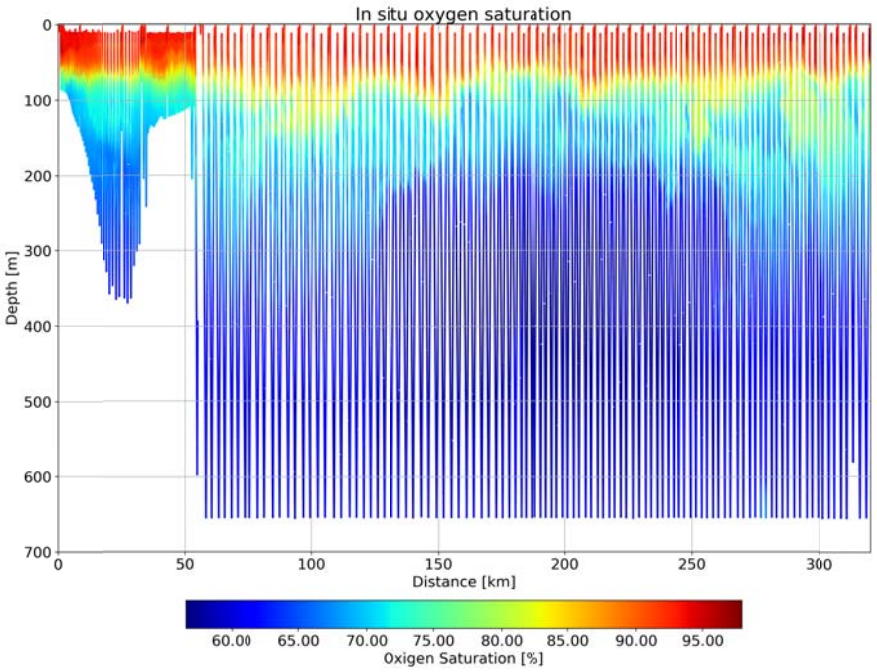




Parc Bit. Ctra. Valldemossa, Km 7,4 · Edifici Naorte, Bloc A, Planta 2ª, Porta 3 · 07121 Palma (Illes Balears, Espanya) · Tel. +34 971 43 99 98 · Fax +34 971 43 99 79

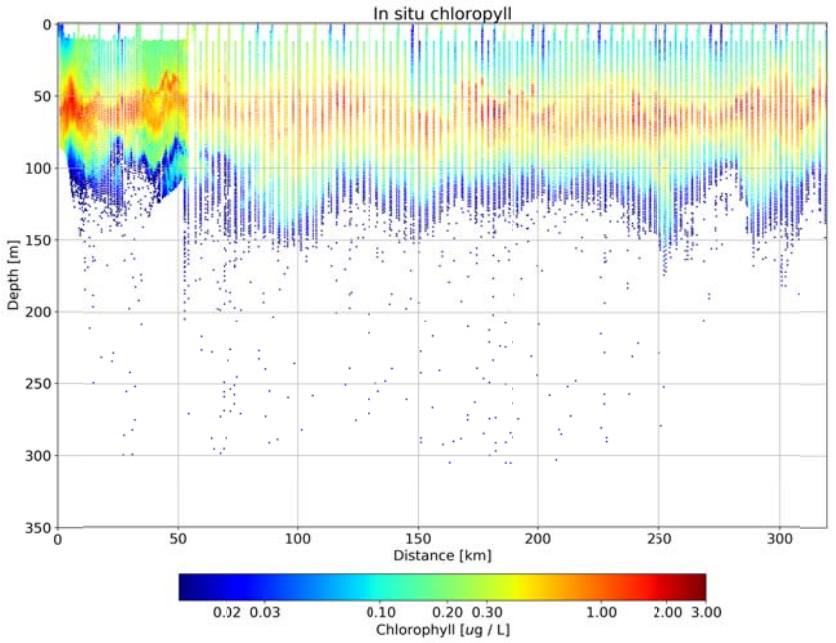
OXYGEN

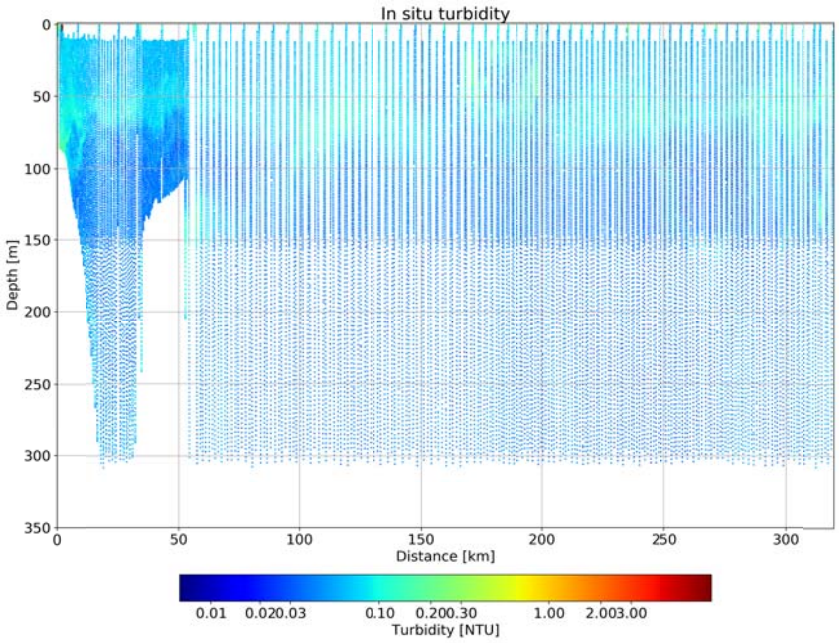




Parc Bit. Ctra. Valldemossa, Km 7,4 · Edifici Naorte, Bloc A, Planta 2ª, Porta 3 · 07121 Palma (Illes Balears, Espanya) · Tel. +34 971 43 99 98 · Fax +34 971 43 99 79

TURBIDITY & CHLOROPHYL





Parc Bit. Ctra. Valldemossa, Km 7,4 · Edifici Naorte, Bloc A, Planta 2ª, Porta 3 · 07121 Palma (Illes Balears, Espanya) · Tel. +34 971 43 99 98 · Fax +34 971 43 99 79