A report on the operation and data analysis of glider experiments in the SES

Deliverable Nr. 3.6

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CONTENTS

EXECUTIVE SUMMARY / ABSTRACT

Gliders are proving to be an extremely effective platform for a variety of ocean observations. They are also a powerful tool when used in combination with more traditional platforms (e.g. ships, moorings, etc.) and consistently add significant additional value in terms of the scientific and societal questions that can be addressed. For these reasons gliders were chosen as a new platform to be specifically supported for repeated transect monitoring within the WP3 enhancement of observing systems capability in the SES.

This report considers the repeated transect glider missions undertaken in the SES during the PERSEUS period (2012 – 2015) and by PERSEUS Partners, the contribution to the aims outlined in the DOW for subtask 3.3.1 and in more general terms, the contribution of gliders to the multi-platform ocean observing capability in the SES, with some perspectives on future glider endurance line monitoring.

SCOPE

The role of WP3 in PERSEUS is to respond to scientific and societal needs through new multi-platform observing systems, with emphasis on the characterisation of ocean state and ocean variability, and with provision for the implementation of monitoring systems fit to meet the needs of MSFD. This is achieved through the upgrade and expansion of the present observing capacity in the Southern European seas (SES), following a careful review of pre-PERSEUS capacity, and completed by the development and publication of a long term integrated multi-platform ocean observing strategy for the Mediterranean and Black Seas region.

Within this, the aim of Task 3.3 New Observing Components, is to establish new observing capacity across the SES, for sustained monitoring, through gliders, a Continuous Plankton Recorder (CPR) system and a Fishing Fleet Vessel Monitoring System (VMS), and, through an intensive multi-platform experiment (ALBOREX Experiment, see PERSEUS Deliverable D3.8), to demonstrate the value of coordinated, intense, process orientated, multi-platform studies within a long-term observational strategy.

The aim of Subtask 3.3.1 was to contribute to the development of a glider network in the Southern European Seas (SES), to assess a wide range of scales of variability in the upper 1000m of the ocean, and allow accurate estimates (without aliasing effects due to mesoscale processes) of water transport and characterisation of the physical and biogeochemical properties of the surface and intermediate water masses.

1. Role of gliders as a component of new ocean observing systems

In recent years, gliders have emerged as an important new tool for oceanographic monitoring, due to their capacity to operate autonomously, in all weather conditions, for months at a time, and with higher sampling resolution than generally obtained with research vessels (Testor et al. 2010, Ruiz et al. 2012). These characteristics have meant that gliders are becoming a key component of the observational platforms available to ocean science; for example through providing critical information for climate change research and improving forecasts through data assimilation (Shulman et al., 2009; Dobricic et al. 2010, Gangopadhyay et al. 2013). The high-resolution data gained from gliders has already provided insight into the variability of major coastal currents (Castelao et al. 2008, Todd et al. 2011), the evolution of mesoscale eddy structures (Ruiz et al. 2009, Martin et al. 2009), constituted an important part of the emergency response to the Deepwater Horizon oil spill (Kohut et al. 2011), are enabling an improved characterisation of the coupling between physical and biochemical processes in the upper ocean (Olita et al. 2014, PERESEUS Deliverable D3.11) and providing in-situ oceanic variables from hurricane pathways in order to improve prediction capability (Baltes et al. 2014).

Part of the success of gliders is that they respond directly to the current challenges in ocean observations. In the last 20 years of ocean research have allowed a description of the state of the global ocean circulation (Bryden et al., 2012). Two successful international initiatives in particular, the T/P satellite altimetry missions and the Argo Program (Le Traon, 2013) have helped in establishing the ocean circulation at large scales. However as we have tried to downscale towards regional and/or local needs, it has become increasingly clear that the ocean varies across a wide range of spatial and temporal scales - there is no such thing as 'ocean state'. Technological advances such as gliders now enable us to monitor temporal and spatial variability at both global and regional level, and to monitor variability in coastal to open ocean exchanges. The challenge for the future is to well utilize this technology to gain a better understanding of how the deep and coastal ocean varies over a broad range of scales at key locations, such as boundary currents, biodiversity hotspots, circulation 'choke' points and bio-domain boundaries. With this clear capacity to advance our understanding, it might be suggested that a specific glider component in GOOS would enhance the global connection between glider monitoring activities, to bring a global awareness to the current regional activity.

Using gliders to regularly monitor key repeat transects or 'endurance' lines is increasing. They complement existing infrastructure, such as ship surveys and deep moorings, which are required for full depth and high accuracy ocean profiling, synoptic process studies and the measurements of specific ocean tracers, and significantly expand observing capability. Initially limited by battery life, platform robustness and sensor accuracy, many of these issues are currently being actively resolved by the glider community and glider manufacturers.

A recent GROOM EU Project Report (Deliverable D4.1: Assess how existing hydrographic endurance line monitoring can be supported by the glider infrastructure[1]) considered that the main motives for using gliders was to monitor transects more frequently and at higher resolution than previously, and also to gain data in real-time. Gliders delivered on these advantages and also offered near surface sampling for deep moorings that have no surface expression, to reduce the risk of damage from fishing vessels and 'knockdown' from ocean currents, and better shelf sampling capabilities than ships campaigns. The data quality was found to be as good as that obtainable from moored CTDs. The report also identified several situations where the limits of effective use of gliders for monitoring were reached, namely areas with strong currents and more remote areas.

Overall gliders have a significant contribution to make to ocean observing, cost effectively expanding our capability to determine and characterise ocean variability at a variety of scales, an important topic now and for future years. This is particularly true in the Mediterranean where mesoscale activity is constant, vigorous, and overlies the large scale thermohaline circulation cells, and where vigorous winter storms lead to deep and intermediate water formation, which again impacts the circulation but can be difficult to observe with traditional means. The Mediterranean is also accessible from land and so hits another sweet spot for flexible glider deployment and recovery and is segmented by a series of important straits and channels that can be monitored by gliders.

The aim of subtask 3.3.1 was to support the existing new glider monitoring transects and to expanding the network of glider operations in the SES. This was done through supporting 3 established long term glider monitoring lines; MOOSE transects in the Gulf of Lions, SOCIB 'canales' transects in the Balearic Basin and 'butterfly' endurance line transects south of Cyprus in the Eastern Mediterranean. In addition one new endurance line was initiated in the Adriatic and 3 new trial glider lines undertaken, one from Menorca to Sardinia and 2 in the southern Mediterranean, from Sardinia to Tunisia and from Mallorca to Tunisia. Importantly all 3 new glider lines were part of a transnational open access (TNA) program offered by JERICO, an EU funded project, and a good example of an effective method to build capacity and enhance scope with targeted and well coordinated EU funding.

Therefore this report builds on the previous work undertaken through the FP7 GROOM and JERICO projects, through analysing the operation of an expanding regional (SES) glider network and what it can deliver in terms of results of the data analysis. The report is structured as follows; section 2 contains details on all the glider endurance lines and specific missions, including scientific objective, operational summary, results and conclusions. Section 3 details the glider data availability, and Section 4 contains a synthesis and conclusions from across the SES in the PERSEUS period 2012 – 2015. In the annexes short mission reports can be found for all the missions undertaken within PERSEUS, which can be used as a guide in accessing the glider mission data in the PERSEUS database.

[1] Available from http://www.groom-fp7.eu/lib/exe/fetch.php?media=public:deliverables:groom_d4.1_nerc_rev.pdf

2. Glider Endurance Lines and Specific Projects undertaken in the SES during PERSEUS

This chapter contains the project summaries from each PERSEUS glider partner, giving details on the endurance line monitoring, why gliders were used, the sampling strategy, and what has been achieved in terms of missions, data analysis and results. Finally the value that monitoring with gliders has brought to the project is summarised.

2.1 MOOSE glider monitoring program

2.1.1 Project Overview

Name of Endurance Line/Specific Project: MOOSE
Institution: CNRS
PI: Pierre Testor
Project partners (if relevant): None
Number of glider missions reported: 26 (2012-2015 only)
Type of mission: Sustained observations – glider 'endurance' lines
Contact person: Pierre Testor (testor@locean-ipsl.upmc.fr)
Objective:

The global Mediterranean basin including its seas and the bordering continental surfaces has always proven to be a politically critical area due to the social issues arising in this cradle of civilization. Subject to increasing anthropogenic constraints, it is now environmentally threatened both in terms of its ecological balance and its exploitable resources and water systems. A Mediterranean Ocean Observing System for the Environment (MOOSE) has been set up as an interactive, distributed and integrated observatory system of the NW Mediterranean Sea to detect and identify long-term environmental anomalies. Another target is to define efficient indicators of the health of the NW Mediterranean basin.

The challenges for MOOSE are to properly track and monitor the 1) Northern Current, flowing along the continental slope and recirculating north of the Balearic Islands, 2) the coastal/offshore exchanges, including cascading and 3) the formation of deep/intermediate waters offshore ventilating the deep layers. This is required to monitor the thermohaline circulation, heat, salt budgets as well as stock estimates for the biogeochemistry. The adopted approach must be multi-scale and address the circulations of the three (surface, intermediate and deep) water masses of this basin.

MOOSE, built as a multi-scale observation network, is now based on a multi-site system of continental-shelf and deep-sea fixed stations (moorings) as well as Lagrangian (profiling floats) and mobile (gliders, ships) platforms to observe the spatio-temporal variability of interaction processes between the coastal-open ocean and the ocean-atmosphere components (see figure 2.1.1). It includes high frequency monitoring in order to precisely document the broad spectrum of temporal and spatial scales involved and to link it to the main circulation features already identified (basin scale gyres, eddies, biogeochemical provinces).

In this context, the MOOSE glider operation and maintenance were carried out in the framework of the PERSEUS project from 2012 to 2015. The glider measurements complement the existing observing components and numerical modeling of the basin.

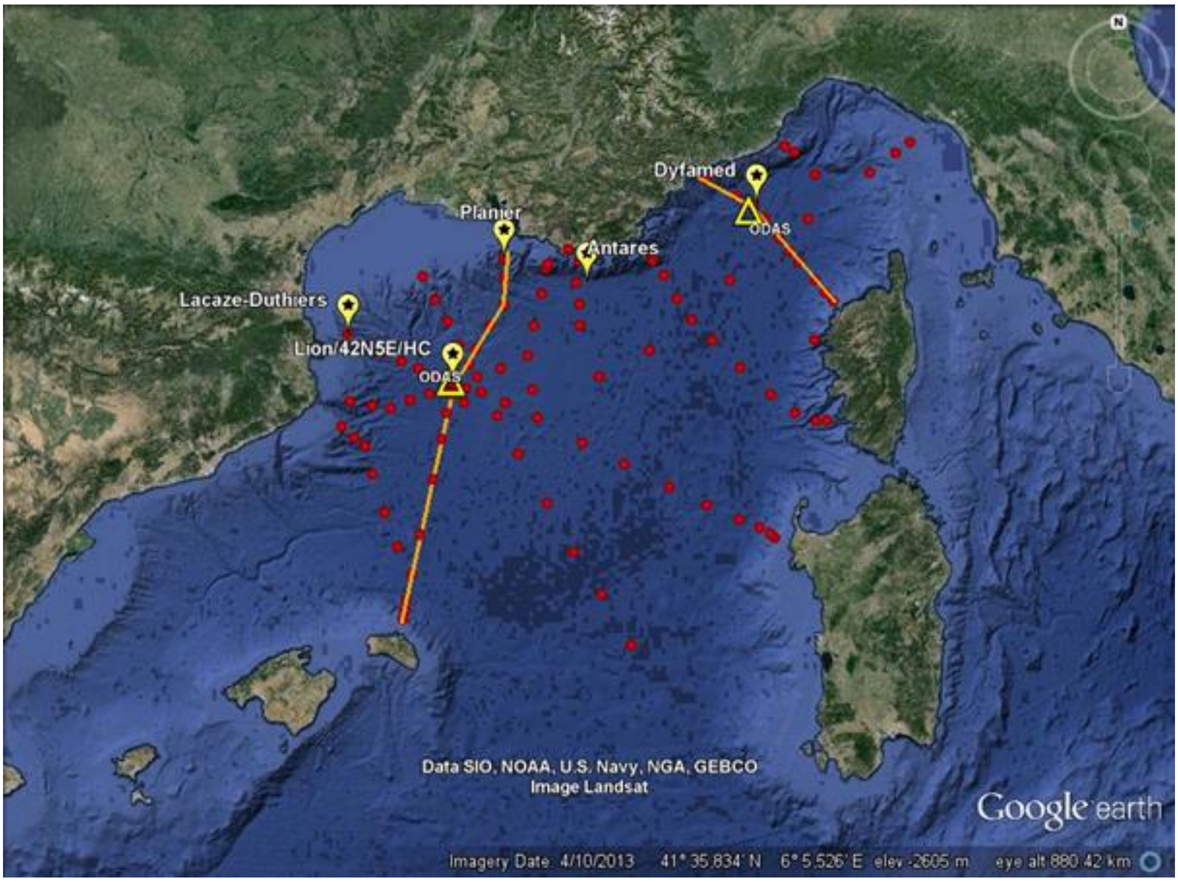


Figure 2.1.1: Maps of MOOSE glider operations (orange lines), annual cruises (red dots) and moorings (yellow marks). Monthly cruises are carried out at Lacaze-Duthiers, Antares and Dyfamed.

2.1.2 Endurance Line Project description: including the scientific question addressed

If glider operations in the Western Mediterranean Sea started in 2005, gliders have started to be deployed regularly in 2010 in the framework of the MOOSE observatory (MOOSE), thanks to the setup of national glider facilities at DT-INSU/Ifremer (http://www.dt.insu.cnrs.fr/gliders/gliders.php) and with the support of the European project FP7-PERSEUS, along two endurance lines, so-called:

- MooseT00: Nice-Calvi (Ligurian Sea)
- MooseT02: Marseille-Menorca (Gulf of Lion)

Both endurance lines ensure a multi-scale monitoring of the northwestern basin from East to West and from the french coast to Balearic Islands and Corsica, considering winter mixing processes (even deep convection in the Gulf of Lion) and bloom events. One objective is to study the winter convection and its impact on the thermohaline circulation and primary production. Another objective is to monitor the variability of the Northern Current at the mesoscale level and its impact on coastal and open sea circulation.

Data are made publicly available in near real-time in particular to better constrain operational models (analyses and forecasts).

2.1.3 Technical Summary of the glider operations undertaken during PERSEUS

During 2012-2015, over 20 glider missions were carried out, each between 1 and 3 months of duration. Glider missions were carried out along MooseT00 and MooseT02 lines.

Sampling strategy is as follows. Temperature and salinity are always measured to 1000 m. Gliders are also equipped with dissolved oxygen, turbidity and Chl-a fluorescence sensors. Data are acquired at a rate of 4-8s and transmitted in real time at a rate of 24s to save communication costs. Occasional full depth calibration profiles at the beginning and end of the mission were carried out for dissolved oxygen and optical parameters.

Most of the missions ended successfully with a coastal recovery but we had to deplore the loss of two gliders along MooseT00 at about the same place: sg509 on 28 July 2013 (deployment PerseusT02_03, last position at 16:43 GMT) and nearchos on 27 May 2015 (deployment MoosePerseusT02_09, last position at 14:14 GMT). The gliders disappeared in the vicinity of the continental slope. Since their last transmissions were not interrupted (by a possible collision with a ship), it is likely the losses results from bad altimeter functioning and/or the steep and muddy bottom that could have trapped the instruments.

Since the beginning of PERSEUS 26 deployments were carried out 13 along MooseT00 and 13 along MooseT02.

1. bonpland MooseT00_16
2. tintin MooseT00_17
3. hannon MooseT02_08
4. sg509 MooseT02_07
5. tintin MooseT00_18
6. sg508 MooseT02_09
7. tintin MooseT00_19
8. bonpland MooseT00_20
9. eudoxus PerseusT02_00
10. bonpland MooseT00_22
11. tintin MooseT00_23
12. eudoxus PerseusT02_01
13. sg508 PerseusT02_02
14. bonpland MooseT00_24
15. tintin MooseT00_25
16. sg509 PerseusT02_03
17. hannon MooseT00_26
18. milou MooseT00_27
19. eudoxus PerseusT02_04
20. eudoxus PerseusT02_05
21. milou PerseusT02_06
22. himilcon MooseT00_28
23. milou PerseusT02_07
24. milou MoosePerseusT02_08
25. himilcon MoosePerseusT00_29
26. nearchos MoosePerseusT02_09

2.1.4 Summary of scientific results

a. Characterization of the variability of deep water formation processes

The results show the implication of sub-basin circulation patterns in the ocean heat storage, and emphasized the key role played by the convection region in the northwestern Mediterranean (Houpert et al., 2014) and the high density of observations in time and space allowed us to characterize the seasonal variability of the Northern Current. The high frequency monitoring of temperature, salinity and current measurements allowed to assess the different time scales of the physical processes interfering in the phases of deep convection, the effects of interannual variability of atmospheric forcing and water column stratification on the intensity of the winter mixing, the evolution of the heat and salt contents of the water column, and the characteristics of the deep water masses (Houpert et al., 2015).

Data have been used to assess the high resolution modeling of deep water formation in the northwestern Mediterranean. The results show that, with the MOOSE sustained observations, we should be able to reliably simulate winter convection at interannual scale. The accuracy of the present simulations could be a high-resolution reference for relatively low-resolution regional climate models (Estournel et al., 2015).

b. Characterization of (sub)mesoscale processes

Gliders data along the two MOOSE sections in the Ligurian Sea and the Gulf of Lion collected since 2010 allowed to provide a fine description of the structure and high number of small (radius 5km) and coherent (> 6months) eddies of deep and intermediate water masses. The analysis of these data and very high resolution model highlight the essential role of these eddies in the thermohaline circulation. Figure 2.1.2 presents examples of the eddies that were frequently observed by gliders. It must be noted that these Submesoscale Coherent Vortices (SCVs) are small (10km in diameter) and subsurface features that could only be properly described by high resolution in situ measurements provided by the gliders. Bosse et al., (2015a, 2015b), Damien et al., (2015) present an assessment of these eddies for the general circulation of the basin based on in situ data analysis and high resolution modelling.

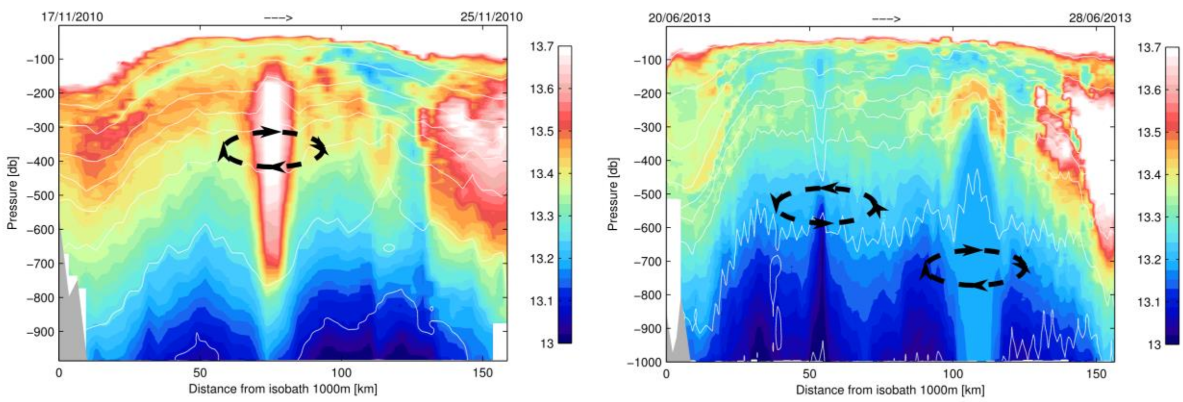


Figure 2.1.2: Two vertical glider sections showing examples of submesoscale eddies in LIW (left, anticyclonic) and WMDW (right, cyclonic and anticyclonic) as seen T.

In addition, the gliders provide first quasi-systematic observations of vertical exchanges at fine scale in the frontal zone separating the Northern Current with waters further offshore. These features (Figure 2.1.3) are observed each time the gliders cross the front associated with the Northern Current. They are mostly due to symmetric instability forced by a down-front wind and have an impact on biogeochemistry as demonstrated by the optical sensors on board the gliders.

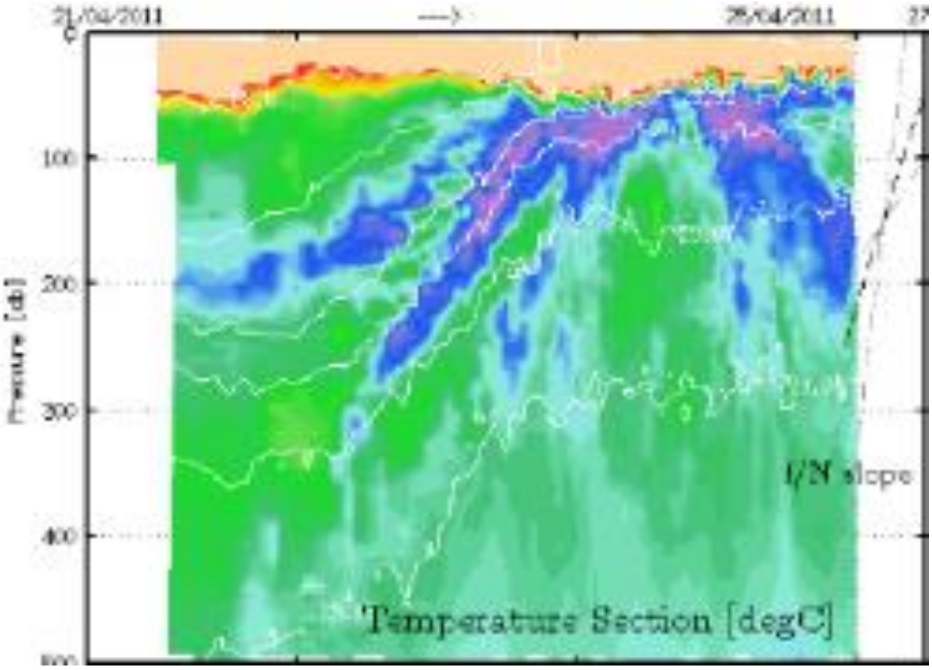


Figure 2.1.3: a vertical glider section across the Northern Current showing interleaving and vertical exchange at the front.

c. Quantification of the shelf-slope exchanges mass balance

Data obtained in 2012 from an array of mooring lines, and hydrographic cruises allowed to get new insight about the interaction of dense shelf water cascading with open-sea convection, their connection with peculiar atmospheric circulation patterns, and their impact on the alteration of deep-water characteristics at basin scale (Durrieu de Madron et al., 2013). The variability of the Northern current could be observed as well by combining glider data and satellite altimetry (Bouffard et al. 2015).

The high number of profile observations (in particular gliders but also ships and profiling floats) allows for the first time to monitor the contrast between the coastal and open ocean for the surface (Figure 2.1.4) and intermediate layers and estimates of integral cross-shelf fluxes are being made.

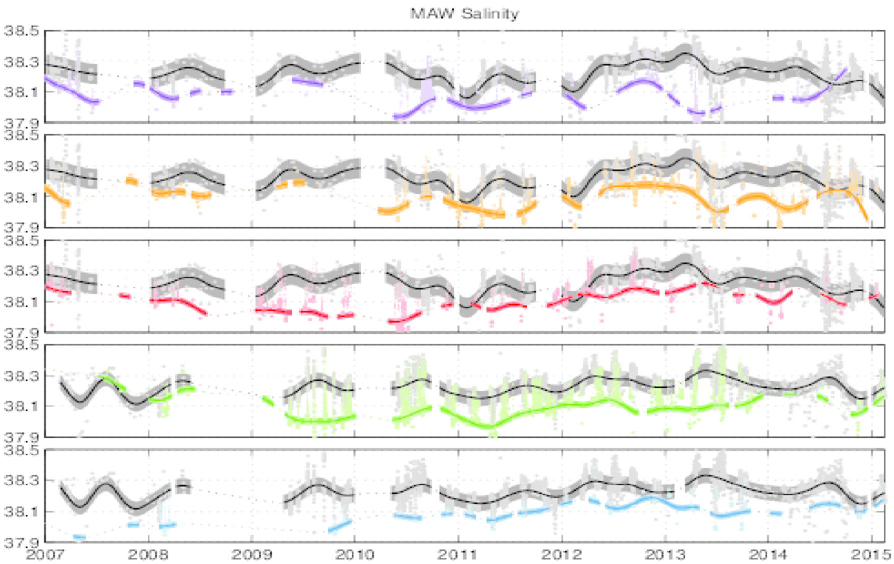


Figure 2.1.4. Contrasts in salinity along the coast of France between the open (grey) and the coastal oceans (color ; blue-Calvi, green-Villefranche/m, red-Toulon, orange-Marseille, violet-Banyuls/m) from all in-situ data for the surface Atlantic Water layer.

2.1.5 The benefits of using gliders to address this scientific question

Gliders can provide invaluable complementary information to the existing in-situ ocean observing systems in time, space, parameter and data access domains. They are important survey tools for local sampling of the (sub)mesoscale, and operational monitoring. The glider applications address investigations and monitoring of processes across multiple disciplines (mostly physical and biogeochemical), making use of the wide range of available sensors.

In spatial domain the strength of gliders is in smaller scales. Gliders are the only autonomous platform that can resolve (sub)-mesoscale in two spatial dimensions (along track and vertical). They can carry out fine-resolution repeated sections where needed. Gliders can bridge spatial, temporal, and parameter sampling gaps in present observing systems. Gliders are weather-insensitive so that they can be used in weather conditions where research ships cannot operate. Thus gliders can collect data from situations like deep convection events that are often the most dynamic in oceans.

2.2 SOCIB/CSIC Ibiza Channel endurance line monitoring

2.2.1 Project Overview

Name of Endurance Line: Ibiza Channel endurance line monitoring - 'canales' missions

Institution: SOCIB/IMEDEA (CSIC/UIB)

PI: Emma Heslop/Joaquín Tintoré

Project partners (if relevant): None

Number of glider missions reported: 23

Type of mission: quasi-continuous glider endurance line monitoring

Contact person: Emma Heslop (eheslop@socib.es)

Objective: Quasi-continuous SOCIB 'Canales' missions are focused on establishing the variability of the N/S exchange of water masses that occur through the Ibiza Channel (IC), an important 'choke' point in the Mediterranean circulation. They form a part of SOCIB's long-term, regional glider endurance line monitoring program, in the context of the multi-platform ocean observations. During each mission a standard transect across the IC is sampled several times (4 – 6), the Mallorca Channel (MC) is also sampled, when operationally practical. 'Canales' missions are repeated with no greater than a 1 month gap between mission completion and re-initiation.

2.2.2 Endurance Line description including scientific question addressed

The Ibiza Channel (IC) is an important 'choke' point in the basin scale circulation of the Western Mediterranean Sea, in a biodiversity hotspot. At the basin scale the Western Mediterranean has a cyclonic circulation involving Atlantic Water (AW) in the surface layer and Levantine Intermediate Water (LIW) in the intermediate layer. On the western side of the IC the Northern Current (NC), part of the cyclonic circulation, flows south out of the Balearic Sea sub-basin, see Figure 2.2.1. Whilst on the eastern side, AW of more recent Atlantic origin (warmer and fresher) flows in from the Algerian sub-basin to the south to form the Balearic Current (BC). The IC can become 'blocked' by eddies, frequently anticyclonic and linked to a cold and fresh, regional winter mode water, called Western Mediterranean Intermediate Water (WIW). When the IC is 'blocked' by an eddy the NC has been observed to re-circulate to the north of the channel and join the BC, such eddies also limit or block inflows, which affects the spawning location of Atlantic Bluefin tuna (Alemany et al. 2010). Thus IC governs an important and complex inter-basin exchange of water masses, which are known to affect local ecosystems, and also represents the last constricted 'choke' point in the upper and intermediate layer basin scale cyclonic circulation, before the cyclonic return flow exits into the Atlantic Ocean through the Strait of Gibraltar.

Although 'large cruise-to-cruise variability in transport through the channels' had previously and frequently been noted (García-Ladona et al. 1996, Lopéz-Jurado and Díaz del Río 1994, Pinot and Ganachaud 1999, Pinot et al. 2002), characterisation of this variability had not been possible with the limited number of historical ships cruises, mainly undertaken during the summer. In most detailed study of transports through the IC, Pinot et al. (2002) undertook seasonal cruises over 2.5 years and defined a seasonal (winter/summer) maximum and minimum of transport of water mass, both northwards and southwards , through the IC.

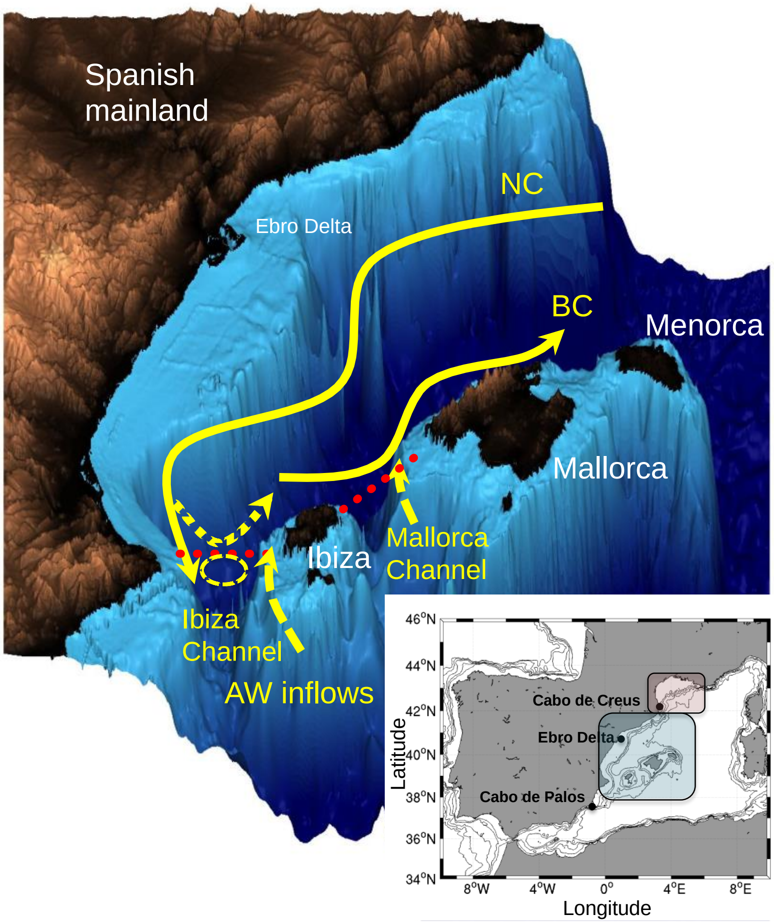


Figure 2.2.1. Balearic Sea circulation, with main currents and channels: The Northern Current (NC), Balearic Current (BC) and AW inflows are marked, as is the intermittent re-circulation of the NC (dashed line) above an IC ' blocking' eddy (dashed circle)., the approximate location of the glider transects (red dots) is marked. The inset shows the location of the Balearic Basin (blue) in Western Mediterranean Sea.

In the face of the high spatial and temporal complexity in the IC, gliders were seen as the means to extend our knowledge of the high frequency dynamics of the channel, through repeated transect monitoring across all seasons, and thus improve our understanding of the scales of variability from high frequency, to seasonal and then interannual.

2.2.3 Technical Summary of the glider operations undertaken during PERSEUS

The SOCIB/IMEDEA 'canales' glider IC endurance line missions were initiated in January 2011, and since then 28 missions have been undertaken (23 to date during the PERSEUS Project period, January 2012 – June 2015), see Annex 1 for a summary of each mission.

A typical 'canales' mission takes approximately 24 days to complete; the glider is deployed close to Mallorca, navigates across the MC and round the island of Ibiza, samples the IC 4– 6 times (battery capacity dependant) before returning to Mallorca via the same route. Each Ibiza Channel transect is 80 km and takes an average of 3.5 days to complete, the water column profile spacing is dependent on bathymetry, thus the distance between profiles is approximately 2.7 km in the deep channel and 300 m on the shelf. The maximum depth along the IC transect is ~950 m and the MC ~900 m, thus the gliders sample to the full channel depths. The Ibiza Channel standard transect is at approximately 39°N, between surface waypoints at 38.99°N, 0.13°E and 38.98°N, 1.10°E, which is generally perpendicular to the major current flows (see figure 2.2.1). The Mallorca Channel transect line is between surface waypoints at 39.22°N, 1.65°E and 39.50°N, 2.18°E, again approximately perpendicular to the major flows. The glider flight path is generally close to that of the transect line (the line between the transect way points), occasionally however stronger currents can sweep the glider off track, necessitating a real-time adjustment of the navigation instructions.

Three different glider platforms have been used during the 4.5 years of monitoring: Teledyne Webb Research Slocum G1 and G2 gliders and iRobot Seagliders. The sampling strategy and data processing however are consistent across all platforms. The gliders carry a standard set of sensors Seabird Electronics Glider Payload CTD (GPCTD-SBE, measuring temperature in °C and conductivity S/m and pressure db), a Wetlabs Puck (FLNTU-SLK, measuring Fluorometer at 470/695nm (Chlorophyll-a 0-50 µg/I) and Turbidity at 700nm (0 – 25 NTU) and an Aandera Oxygen Optode (OPTODE_5013 or 4330, measuring absolute oxygen content µm relative air saturation % and temperature in °C). The GPCTD is set to sample at 0.5 Hz and to the full depth of the water column, the Wetlabs Puck and the Oxygen Optode at 8 s and to 200 m. Sampling is on downcast only. The SOCIB glider fleet has both pumped (Slocum G2 gliders) and un-pumped (Slocum G1 and Seagliders) CTDs installed, for un-pumped CTDs a thermal lag correction is applied in the post processing (after Garau et al. 2010), this correction requires both downcast and upcast sampling for at least 1 transect, generally the first.

Overall the glider monitoring of the Ibiza Channel endurance line has been highly successful, since 2011 the IC has been sampled approximately 124 times and the MC approximately 45 times, with of order 18,000 profiles of the water column obtained (15,990 profiles from 2011 – 2014), which represents an order of magnitude more profiles than all the previous ship based hydrography.

The complexity of glider mission operation is not to be underestimated and requires careful pre and post mission procedures and in-mission real-time management by the glider operators. In the 4.5 years of IC endurance line glider operations the SOCIB Glider Facility has encountered a number of challenges and from this developed a strategy for repeatable, successful glider operations, which reflects a balance between scientific objectives, the constraints of platform and study area, and operational practicalities. Below are noted the key elements of the IC 'endurance' line operation strategy, which have enabled an effective, efficient, economic and regularly occupied glider endurance line to be established in the IC:

1. Team work
2. Flexible mission objectives

3. Documented procedures
3. Easy, fast deployment
4. Investment
5. Automated data management

Note: these are orientated towards regular-to-continuous glider transects in an accessible location. Other types of glider operations, such as multi glider process studies or remote operations/extreme conditions (e.g. Arctic studies), may have different and additional considerations.

2.2.4 Summary of scientific results

The IC endurance line quasi-continuous glider sampling has enabled important sub-seasonal to seasonal variability to be captured and the development of a model to characterise complex patterns of transport. The main results and the influence this has on our understanding of both the regional and basin scale circulation can be found in Heslop (2015) and Heslop et al. (2012), key highlights of which are summarised below.

Gliders captured high frequency variability in the exchange through the IC, with changes in transport of the same order of magnitude as the previously defined seasonal signal (Pinot et al. 2002), but occurring over timescales of days to a week (See Figure 2.2.2). For example, in southward flows changes of order 0.8 to 0.9 Sv occur over timescales of days to weeks, caused by the arrival of WIW to the channel and by the arrival, departure and shifting of spring and autumn eddies. Although previous seasonal ship surveys had noted a high cruise-to-cruise variability in transport, they were insufficient to show that the water volumes exchanged through the Ibiza Channel 'choke' point fluctuate on 'weather' timescales. This is an important finding and clearly demonstrates the need to resolve circulation processes at sub-seasonal timescales, in order to understand ecosystem response and the impact of future climatic change.

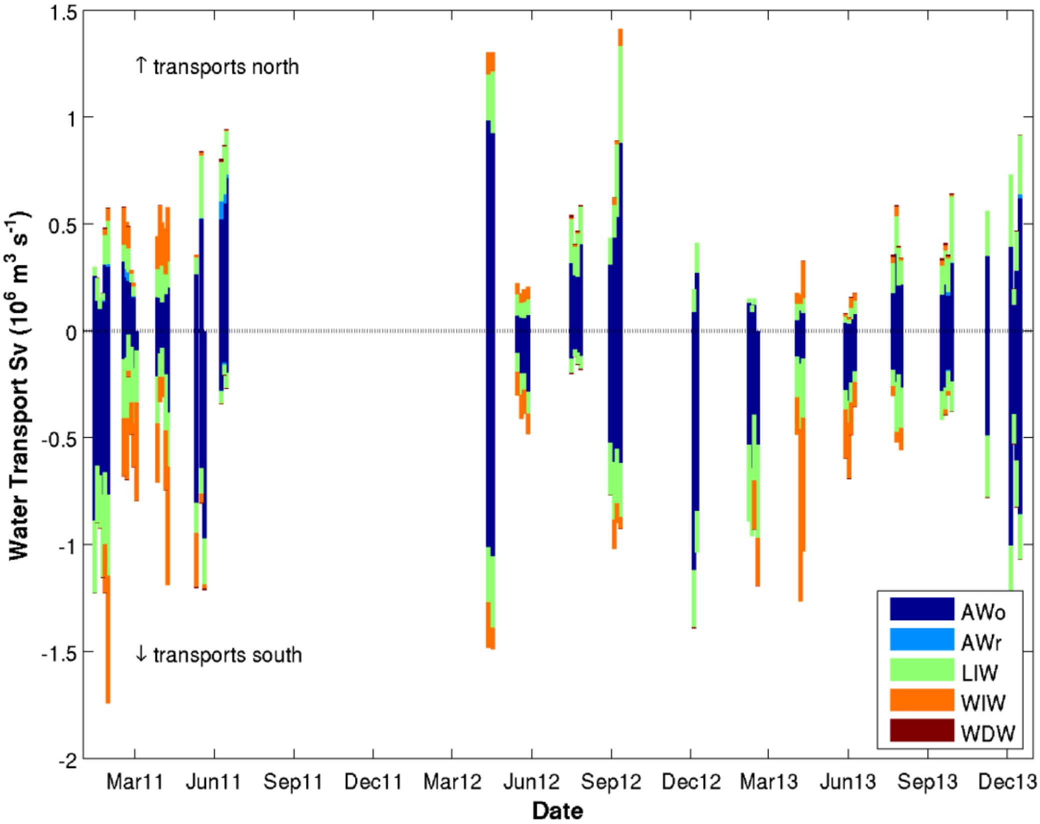


Fig 2.2.2. Geostrophic transport in the IC from glider transects. Each bar represents the water mass transport for a single (2-day) transect of the deep (central) part of the IC, total bar height is the total volume of water transported, water masses denoted by colour.

At seasonal timescales the traditional view of the north/south exchange through the IC and MC has been overturned. Southward flows of the Northern Current through the IC are characterised as having a seasonal cycle, in line with earlier studies, however now a full annual cycle is defined. The northward component of the exchange is characterised as variable with an interannual mean flow of order 0.4 Sv, which is contrary to the generally held assumption that inflows from the south were seasonal and spread northward through the Balearic Channels in summer as the Northern Current declined. In fact, through the summer, the net flow through the Ibiza Channel is shown to be broadly neutral, see Figure 2.2.3.

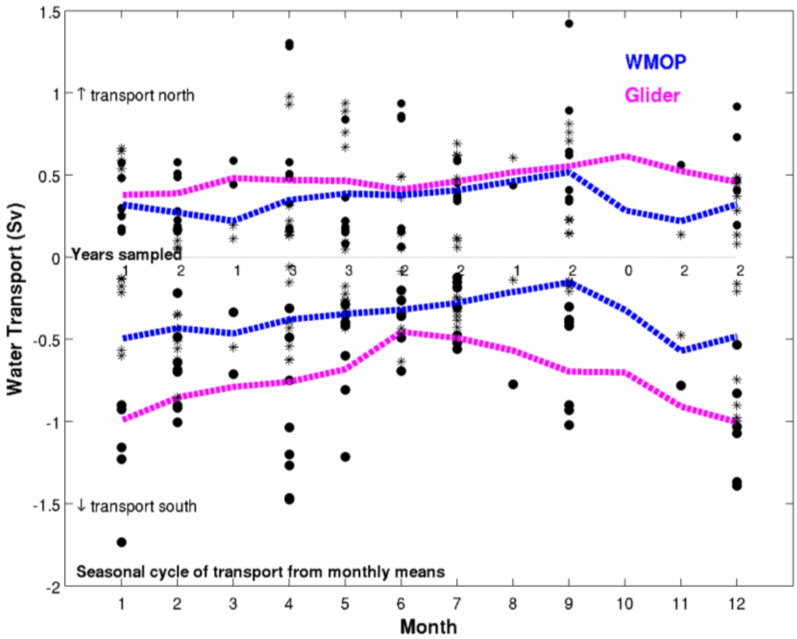


Figure 2.2.3 Seasonal cycles are represented by dashed lines, glider (magenta) and WMOP (blue), plotted with mean of transect transport values by month, gliders (dots) and model (stars), to give a view of the high variability (also see 4.1). Seasonal cycles derived from mean glider/WMOP transects per month, with a 3-month moving average applied.

The fresher inflows of AW of 'more recent Atlantic origin' are identified as sporadic events of several months duration, which occur simultaneously through both the IC and M. It is hypothesised that the driver for these inflow events lies to the south, related to intermittent gyre patterns in the Alboran Sea. This study therefore finds that the patterns of northward and southward transport through the IC are not inter-dependant, which changes the previously held view of the regional circulation.

The repeated sections of temperature, salinity, density and geostrophic velocity obtained with gliders (Figure 2.2.4) indicate a pattern of an underlying basin scale circulation that re-emerges or re-instates as the mesoscale interference wanes and shifts, and specific spatial patterns in the mesoscale events. These observations provide the basis for the seasonal 'modes' proposed by Heslop (2015) and provide a model against which other regional studies can be compared. .

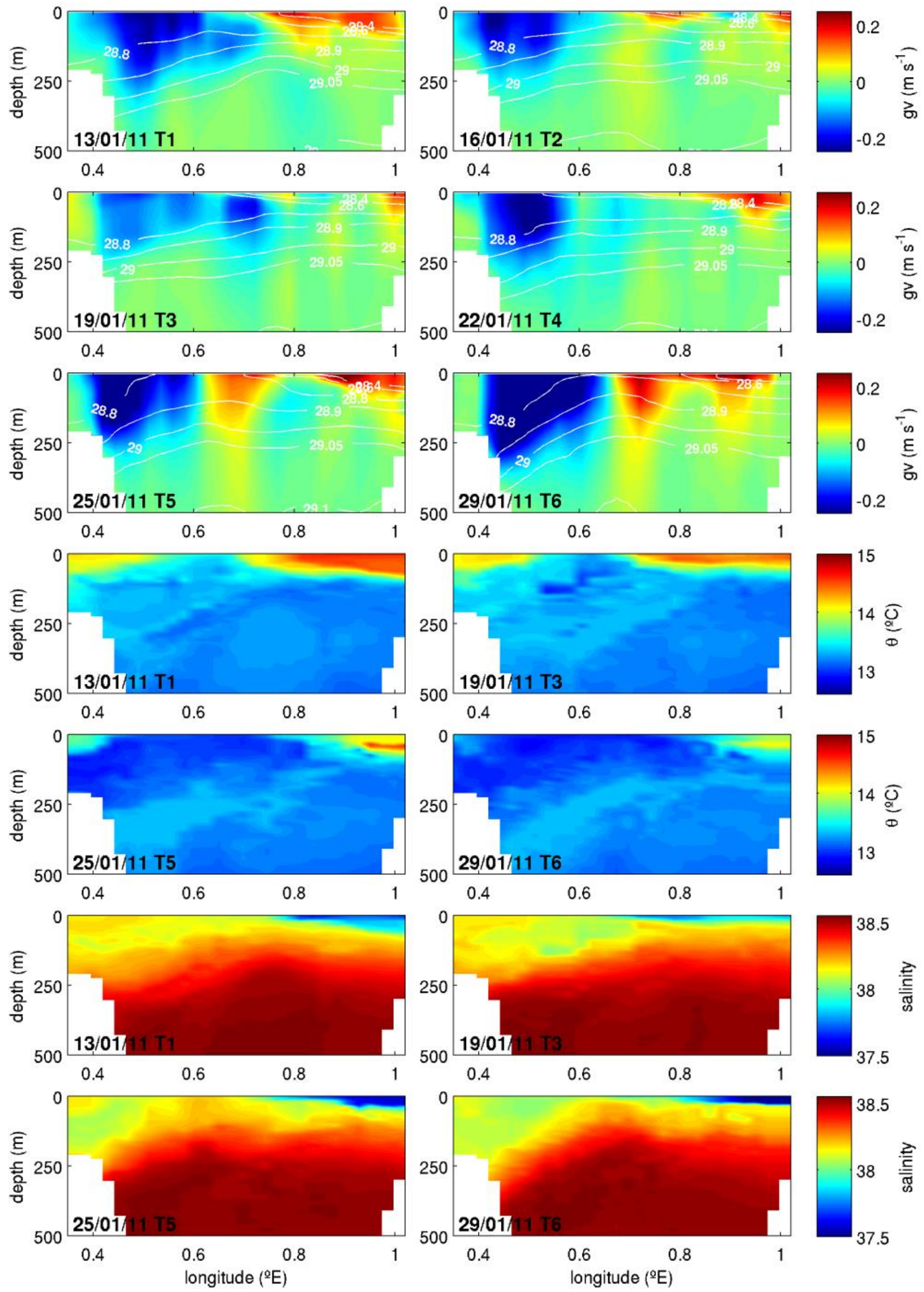


Figure 2.2.4. Geostrophic velocity (gv), potential temperature (θ) and salinity sections for canalesJan2011, the mean date of the transect is marked in the bottom left of each panel, geostrophic velocities northward are positive and southward are negative, and selected isopycnals are marked in white.

The modeling of such a complex area as the Balearic Basin is challenging, as the processes implicated in the circulation are numerous, complex, and exhibit a wide range of spatial and temporal variability. A detailed comparison between glider observations and model simulations (SOCIB WMOP) is now providing insight into issues within the model representation, with the aim of improving this at a regional and ultimately basin scale.

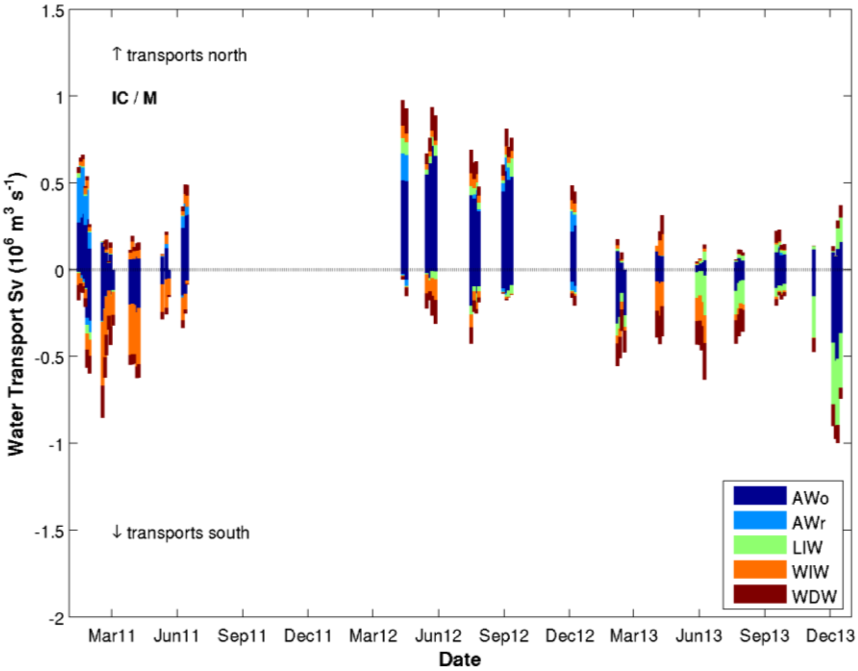


Figure 2.2.5. Geostrophic transport by water mass in the IC from WMOP, each bar represents the water mass transport for a single (2-day) transect of the deep (central) part of the IC, total bar height is the total volume of water transported, water masses denoted by colour.

WMOP appears to represent the, seasonal cycle in southward flow (strongest in winter), WIW is present in winter, and fresher AW inflows are represented (see Figure 2.2.4 and Figure 2.2.5). However important and specific differences are also visible, LIW is not always present and overall the southward transport is too low. The underlying causes of these are the topic of current research, however the high resolution, multi-scale observations provided by the glider monitoring are enabling a new style of comparison, moving away from climatology and into the mesoscale, and are delivering insight which is relevant to modeling at the basin scale.

2.2.5 Benefits of using gliders to address this scientific question

Endurance line glider monitoring of the IC has enabled a step change in in our knowledge of circulation variability at an important and complex 'choke' point in the Mediterranean circulation. The quasi-continuous (monthly and 'burst' sampling) of the glider sampling strategy allows us to observe the evolution of the dynamics from transect-to-transect and the detail from glider 'burst' sampling of the IC provides a new view of high frequency variability, which was not previously possible with either single seasonal ship transects or sparse moorings.

Ship missions concurrent with glider missions however do provide important opportunities to calibrate the glider data CTD data against the in-situ water sample calibrated glider data, leading to an estimated precision in salinity of 0.01, which is less than that of a well calibrated ships CTD. A comparison of on-board vessel mounted ADCP to the glider calculated geostrophic velocity also provides an important check for assumptions used in a study of geostrophic water transport, see Figure 2.2.6.

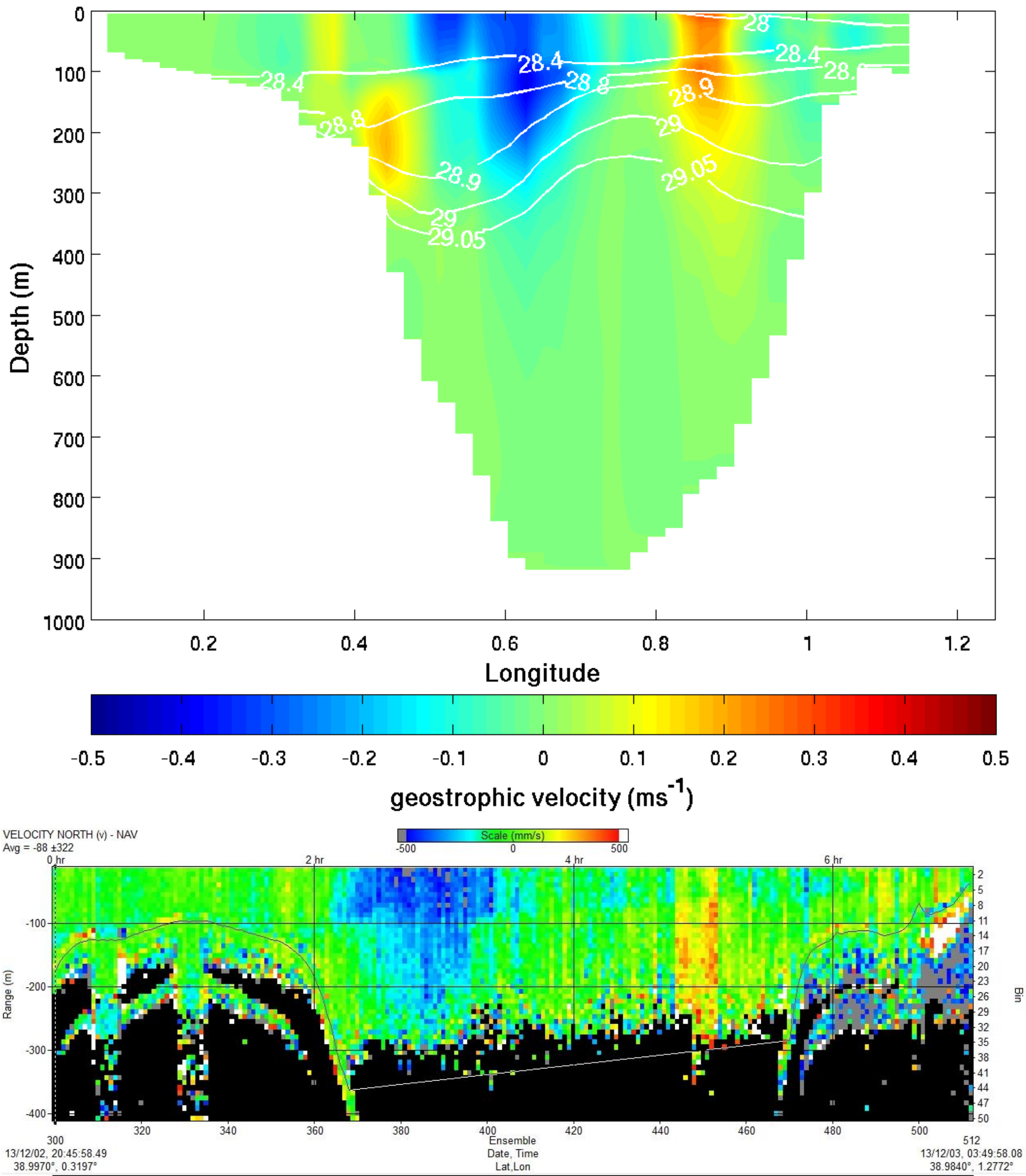


Figure 2.2.6. Geostrophic velocity section for glider and contemporaneous VM-ADCP, the glider section is from canalesDec2013 T2 (03/12/2013 21:26 to 06/12/2013 09:57) and the ADCP velocity section from the overnight transect of ship mission SOCIB_Dic13 (02/12/2013 19:00 to 03/12/2013 03:00). Southward velocities are negative and northward velocities are positive, and both sections have the same velocity scale.

With the fast repeat glider sampling a fresh, almost real-time, view of the IC is provided. Within missions and seasons, in response to hydrographic and mesoscale changes, the NC is observed to broaden and deepen, to move further offshore or on-shelf, and to develop multiple streams of flow. Eddies are observed to evolve in almost real-time and their signature is captured across missions and months. The episodic nature of the fresh AW inflows is also captured. This level of insight is unique to the glider dataset and has been instrumental in determining patterns in the exchange dynamics that underlie the high levels of variability. Transects from the earlier ship campaigns, with a seasonal sampling focus, appear as 'snapshots' in time and did not manage to capture a coherent picture of the circulation.

2.3 Cyprus National Glider Monitoring Program

2.3.1 Project Overview

Name of Endurance Line/Specific Project: Cyprus National Glider Monitoring Program
Institution: OC-UCY
PI: Daniel Hayes
Project partners (if relevant): None
Number of glider missions reported: 3 (2012-2015)
Type of mission: Sustained observations – glider 'endurance' lines
Contact person: Dan Hayes (dhayes@ucy.ac.cy)
Objective:

This research project aims at observing the eastern Levantine Basin of the Mediterranean Sea at a level of detail and accuracy never before achieved. To reach this target, it is necessary to utilize the most modern oceanographic platform available, the underwater vehicle known as a glider. With these relatively small and very efficient instruments, it is possible to collect many months of high resolution data from the upper 1000 m of the sea and cover thousands of kilometers on a single set of batteries. Measurements include temperature, salinity, currents, dissolved oxygen, chlorophyll, and turbidity. The Oceanography Center won a grant from the Cyprus Research Promotion Foundation to purchase and operate two autonomous underwater gliders over a period of 4 years (2008-2011). The vehicles were built at the Seaglider Fabrication Center of the University of Washington (late-2007). From 2012 to 2015, operation and maintenance were carried out in the frame of the FP7 GROOM and PERSEUS projects. The glider measurements complement the existing observing programs and numerical modeling of the Levantine Basin carried out by the Oceanography Center. Targets include the (1) accurate description and improved understanding of the general circulation and thermohaline structure of the Levantine Basin by continuously repeated, long-term transects, (2) the detailed understanding of the mesoscale variability in the Levantine Basin and its relation with the biogeochemical variability of the region using detailed analysis and supplemental, coordinated glider transects, (3) the strengthening of the skill in forecasting the ocean state by assimilation of glider data into existing European and regional ocean forecasting systems (including that of the Cyprus Oceanography Centre) and (4) the near real time availability of glider data via the Cyprus Oceanography Centre's web site using the Iridium satellite telemetry system.

The above targets aid in two regards as follows. Firstly, the eastern Mediterranean Sea, and in particular the Levantine basin, is an oligotrophic (i.e. with very low presence of phytoplankton) ocean and could be considered representative of oceanic regions having similar behaviours (like the south Pacific Gyre). South of Cyprus a permanent cyclonic structure has been recurrently observed during a few cruises during the last 2 decades and more continuously (but only at surface) with satellite. An accurate 3-dimensional survey of this structure was needed. This structure is supposed to create a physical barrier, which disconnects the "inside gyre" ecosystem dynamic to the "outside gyre" one, in a few kilometers two contrasting ecosystems may be present. Secondly, the skill of forecasting systems to predict ocean conditions is raised as is the availability and coverage of measurements, and as a result, end-users of such systems benefit: oil spill models, tracer dispersion models, search and rescue operations, fishing enterprises, ecosystem managers.

In summary, the in-situ data obtained from gliders during the Cyprus National Glider Monitoring Program have provided information related to a number of scientific issues of the Eastern Mediterranean, Levantine Basin such as:

- the pathways of Atlantic Water (AW) and the associated Mid Mediterranean Jet (MMJ).
- the fluctuation of the Cyprus warm core eddy, its position, size, and intensity
- the Levantine Intermediate Water (LIW) formation and spread.
- the Cyprus eddy generation, maintenance, destruction.

2.3.2 Endurance Line description: including the scientific question addressed

See 2.1

2.3.3 Technical Summary of the glider operations undertaken during PERSEUS

During 2012-2015, three long glider missions were carried out, each between 5 and 6 months of duration. Glider missions were carried out according to the “butterfly” or “bow tie” patterns established in YPOKINOUMODA (Cyprus Research Promotion Foundation Infrastructure Upgrade grant). These patterns cover the Cyprus EEZ, and in particular overlap the many years of ship hydrography (from 1995). See Fig. 2.3.1. Because of the scales of variability (about 20 km) and the time to complete a butterfly (about 1 month), the pattern allows little chance for features to go unobserved. Because of historical observations, the western butterfly is preferred as the most likely location for the Cyprus Eddy. However, in some missions, the eastern butterfly was performed to provide more coverage and in fact “find” the Cyprus Eddy (which has been observed on every mission, but with varying size, strength, and position). This explains the somewhat irregular glider tracks (besides the fact that the glider is deflected by the eddy currents, and sometimes had to be re-routed to make headway).

Sampling strategy is as follows. Temperature and salinity are always measured to 1000 m (10 s). Dissolved oxygen is measured at 60 s from surface to 600 m. Optical parameters (backscatter at 470 nm and 700 nm, and chlorophyll-a fluorescence) are measured only in the upper 300 m at 60 s intervals. Occasional full depth calibration profiles at the beginning and end of the mission were carried out for dissolved oxygen and optical parameters.

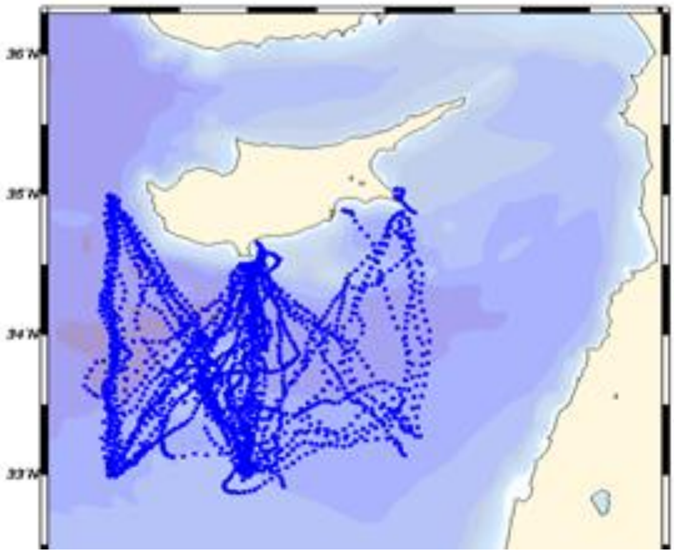


Figure 2.3.1: Location surfacing from 2009 to 2015 of Cyprus national glider fleet (SG149, SG150).

No particular problems were faced, and each mission ended successfully with a coastal recovery. One lesson learned was that for open sea deployments from large vessels, the glider should be launched well clear of the ship, and the ship and inflatable should all be drifting together, not on dynamic positioning. Strong surface currents caused one deployment to drift in the direction of the ship before diving.

2.3.4 Summary of scientific results

During 2012-2015, it was found that the Cyprus warm core eddy continues to undergo significant seasonal and inter-annual fluctuations in terms of its shape, size, intensity and location (Figs. 2.3.2 to 2.3.4, Hayes et al., 2014). It was also found that the values of salinity and temperature measured by gliders agree with those observed by ships, floats. Near 250 m in recent years, high S and T are observed in the Cyprus eddy, south of Cyprus, and abrupt, broad scale changes were in 2009, followed by a slow recovery to previous values (Fig. 2.3.5, Hayes et al., 2014).

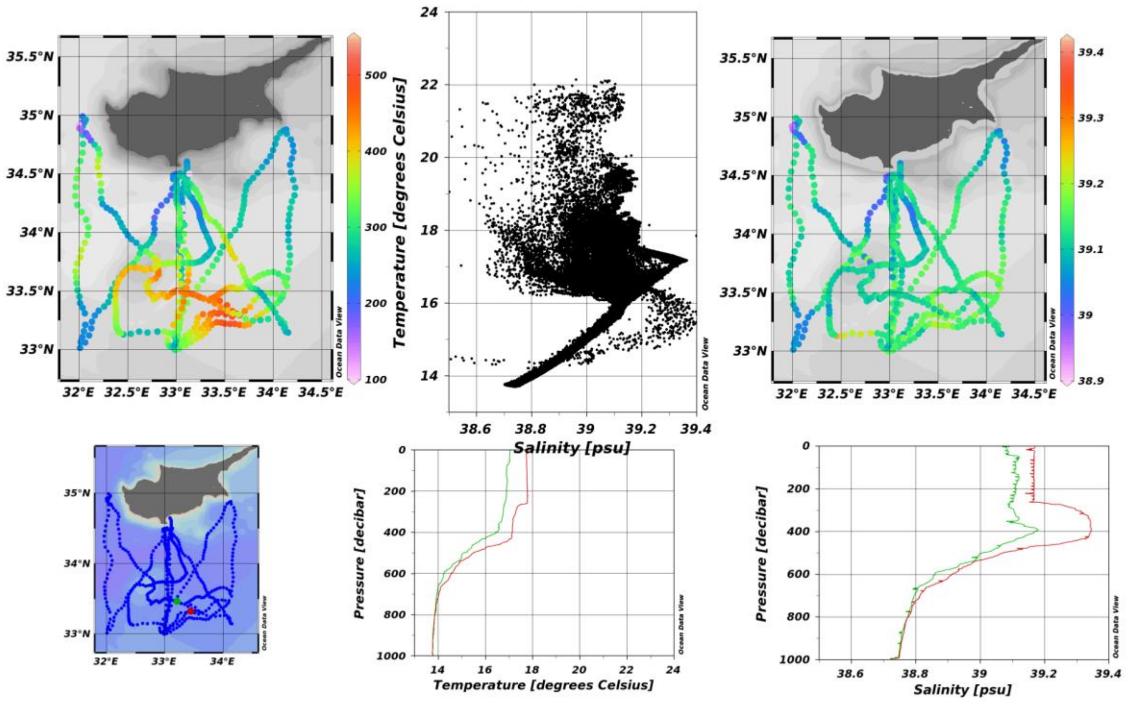


Figure 2.3.2. Depth of 29.0 sigma, TS, Salinity at 250m, Mission track, and profiles in Cyprus Eddy. December 2011 to June 2012. Eddy is in SE part of region.

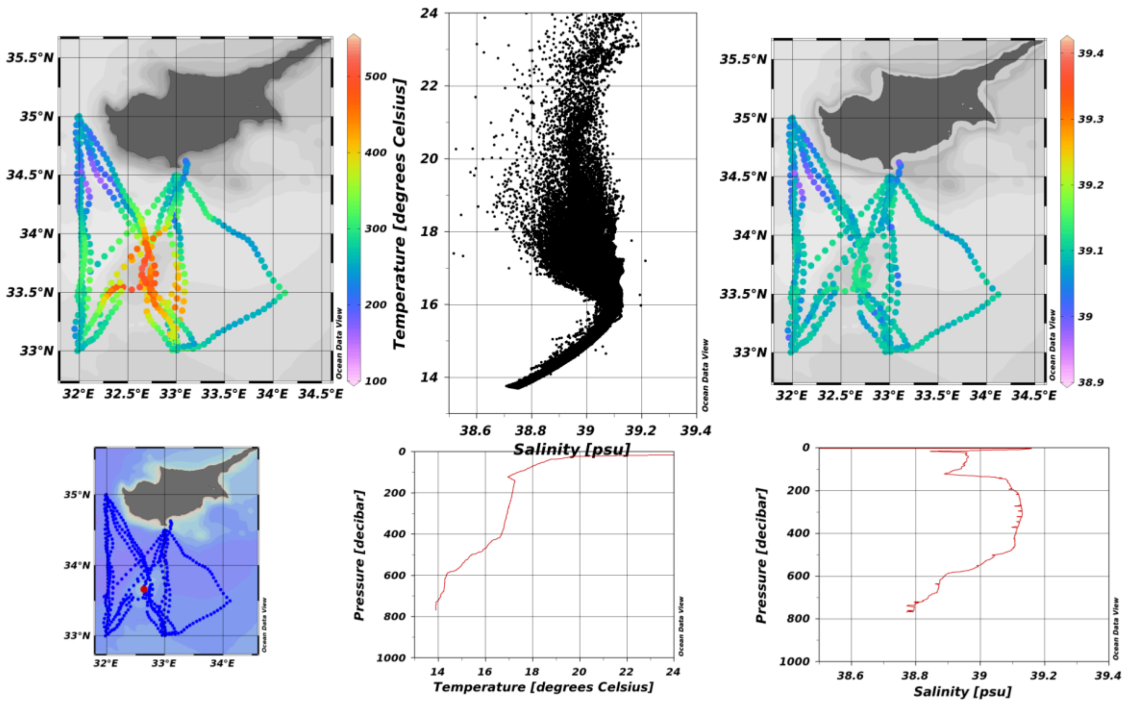


Figure 2.3.3. As in Fig. 2.3.2 but for February-August 2013. Eddy is over Eratosthenes seamount.

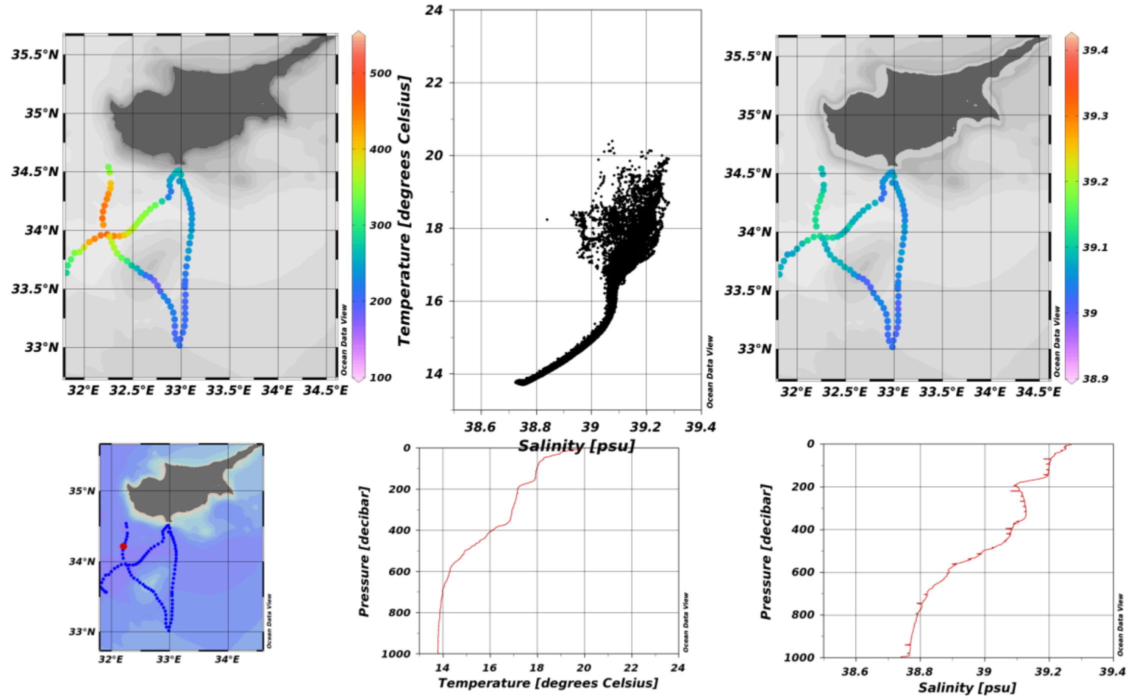
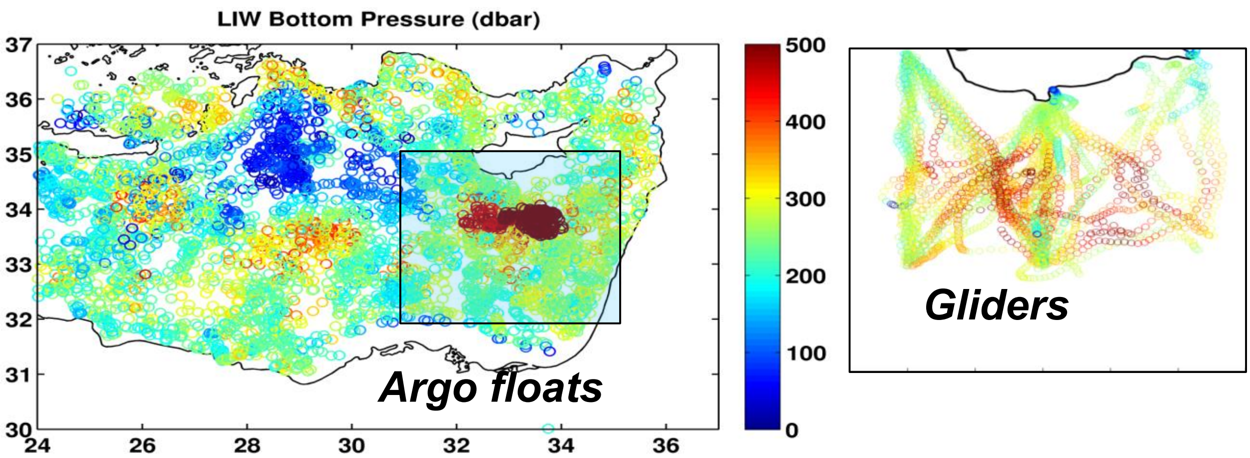


Figure 2.3.4. As in Fig. 2.3.2 but for April-May 2014. Eddy is west of Eratosthenes seamount.

2.3.5 The benefits of using gliders to address this scientific question

Because of the strong sub-surface and temporal variability present in the Eastern Mediterranean, gliders are required to capture the current sea conditions. Satellite observations do not adequately observe the subsurface, especially since altimetry is not of sufficient horizontal resolution for observed features. Profiling floats can sample eddies for short periods (a few months at most) before drifting off. Ship cruises over the previous decades have only provided a glimpse into the characteristics of features like the Cyprus Eddy.



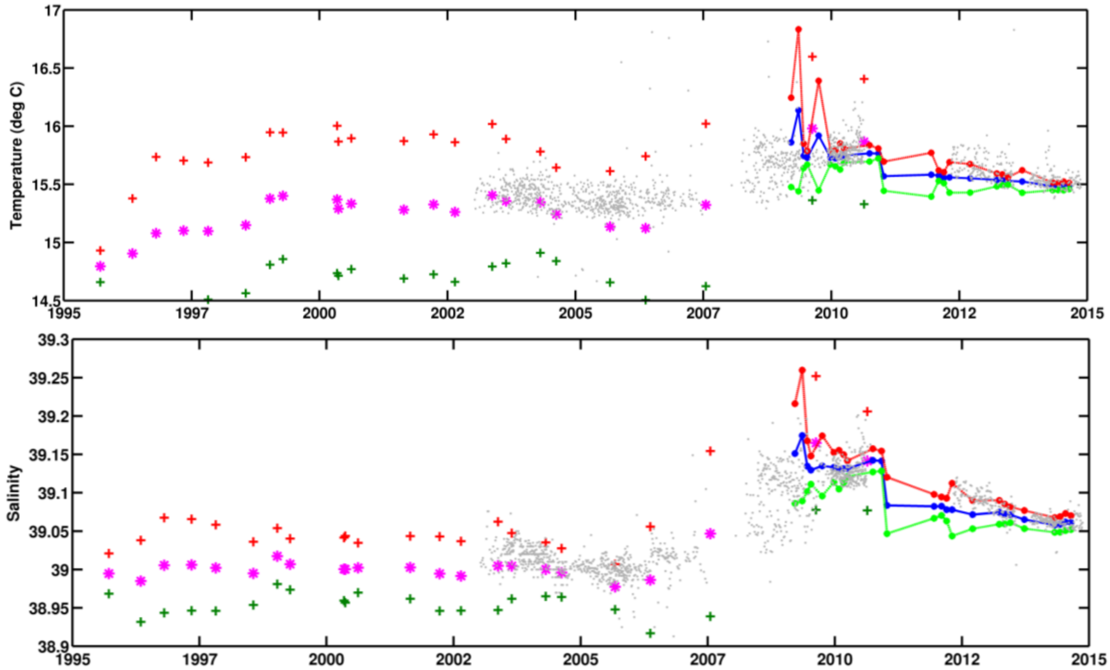


Figure 2.3.5. Float and glider positions in the Eastern Levantine used for analysing Levantine Intermediate Water properties (a). Ships (CYBO) are ot shown, but overlap the glider region. Time series of (b) salinity and (c) temperature at depth of 29.0 sigma-θ. Pink: CYBO averages red/green equal one standard deviation. Connected blue stars: glider monthly averages with one standard deviation. Gray dots are float values (not averaged).

2.4 South Adriatic pit

2.4.1 Endurance Line Overview

Name of Endurance Line/Specific Project: South Adriatic pit monitoring program
Institution: OGS
PI: Elena Mauri
Project partners (if relevant): None
Number of glider missions reported: 3
Type of mission: Sustained observations – glider 'endurance' lines
Contact person: Elena Mauri (emauri@ogs.trieste.it)
Objective:

The purpose of the experiment was to study the winter deep water convection in the South Adriatic pit area. The glider at first covered the transect Bari – Dubrovnik and then it was piloted to perform an Adriatic longitudinal transect, down to almost 1000m deep in the area of the south-Adriatic pit. At the end of the mission a butterfly path was performed close to the E2-M3A mooring.

2.4.2 Endurance Line description

The area of the South Adriatic is known as an area of winter open sea deep water formation through convection mechanism. Both coastal and open sea convections occur during winters in the Adriatic Sea and provide dense waters for the general circulation of the Eastern Mediterranean Sea. The coastal convection is trigged by the local climate, the cold and dry Bora north-easterly wind plays a key role, in the cooling of the sea surface temperature through conduction and in the evaporation. Fresh water of riverine origin can also play a role in the North Adriatic dense water (NAdDW) formation process: a weak river discharge in fall and early winter can favor the formation of particularly salty and dense NAdDW, while a large discharge mitigates the density. In addition to the well known areas of dense water formation of the Gulf of Trieste, there are other similar areas, variable from year to year, along the Croatian coast. The newly formed dense water sinks along the shelf break carrying their properties to greater depths. The other mechanism that contributes to the dense water formation in the Adriatic is the open sea convection, which can vary significantly from one year to the other in the South Adriatic Pit (SAP). This variability was reported in previous studies. Some winters, like in 1996-1997 and 2006-2007, experienced only a shallow convection or even no convection, while during other winters (in 1991-1992 or 2008, 2009, 2010) a much deeper convection occurred down to a maximum depth of 1000 m. The vertical mixing locally induced by the open sea convection does not affect the mass properties of the water mass below 1000 m which can be ventilated by cascading of the dense water formed in the northern regions. The NAdDW originally formed on the shelf flows preferably along the Italian shelf and cascades in the SAP. Even though the NAdDW gradually changes its properties during the motion, it is still detectable in the SAP.

In the last decades the South Adriatic Sea has been sampled in the fall/winter period using different observational methods. More recently, autonomous instruments like floats and moorings have replaced/supported vessel mounted Conductivity-Temperature-Depth (CTD) casts, in order to improve the temporal coverage of the observations. Since 2013, gliders have also been operated in the area. Gliders equipped with CTD and biogeochemical sensors give the opportunity to study and resolve smaller spatial and temporal scales never observed in the past, thus improving the understanding of the biogeochemical processes and the interconnections with the local physics at scales spanning from the sub-mesoscale to the basin scale.

2.4.3 Technical Summary of the glider operations undertaken during PERSEUS

The endurance line performed during PERSEUS covers the Bari and Dubrovnik transect. A second transect along the longitudinal axis of the Adriatic Sea was performed as well as a butterfly path in the vicinity of the E2-M3A buoy site (see figure 2.4.1 below). As a whole, the Seaglider Amerigo was operated for 3 weeks, from February 15 to March 6, 2014. The scientific payload is presented in the mission template.

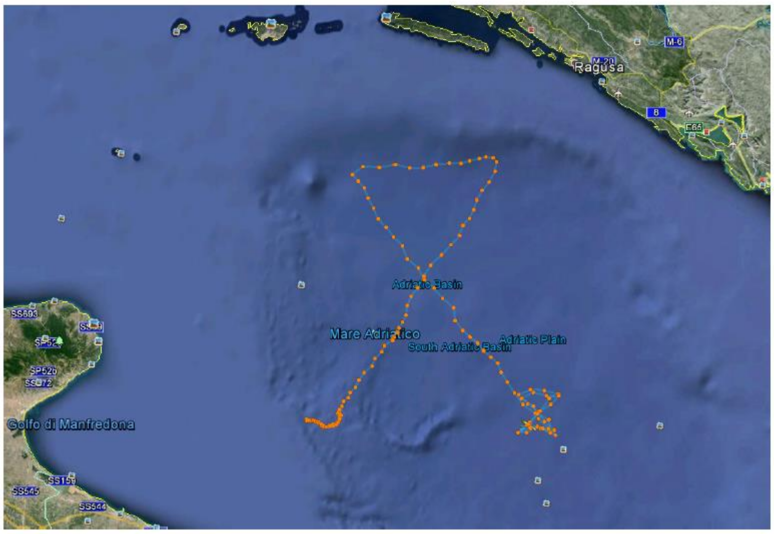


Figure 2.4.1. Flight path of glider Amerigo from February, 15th to March, 6th 2014

2.4.4 Summary of scientific results

During the CONVEX14 mission measurements of deep waters with density around 29.2 Kg/m3, correspond to waters with temperature around 13.3°C and salinity in 38.65 – 38.7 and probably represent the Adriatic Bottom Water (ABW), a dense water mass formed in the southern Adriatic that flows south and exits into the Ionian Sea via the Otranto Strait and spreads over the Eastern Mediterranean bottom layer.

Some postulate that NadDW flowing into the canyon in the Shelf of Bari and mixes with the Modified Levantine Intermediate Water (MLIW) in order to form the ABW. Others presume that the contribution of NADW is minor factor, and that the ABW is formed mainly by the mixing of the surface water in the center of the South Adriatic Pit with the underlying MLIW, during periods of deep convection. Either way, most research confirms that ABW represents the most important component of the bottom water of the entire eastern Mediterranean Sea and in any case we believe that the usage of gliders in order to monitor the important deep water formation in Adriatic Sea is more than necessary.

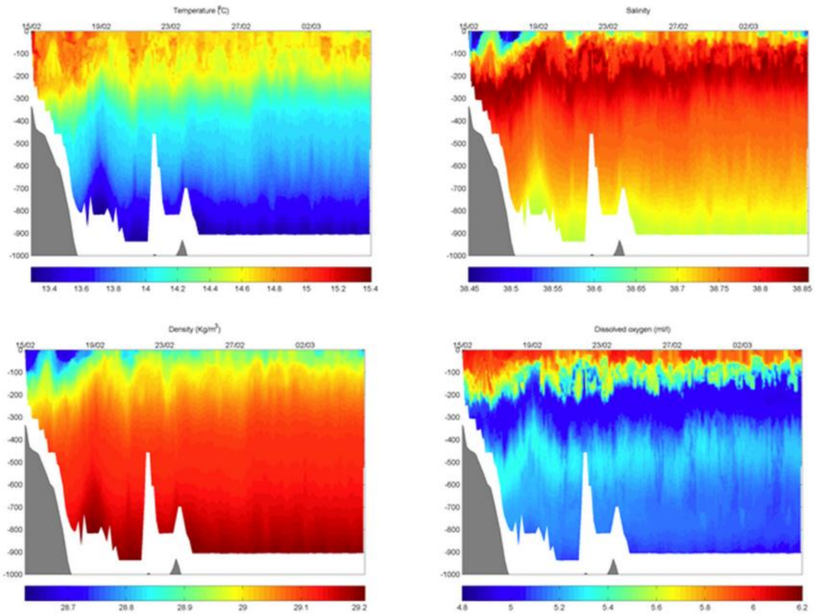


Figure 2.4.2. Temperature, salinity, density and dissolved oxygen measured during CONVEX 14 experiment in the South Adriatic Sea in winter 2014.

2.4.5 The benefits of using gliders to address this scientific question

For the CONVEX 14 experiment, the benefit of using gliders, in addition to have high resolution measurement, is to have better chance to sample the convection events than other platform, such as ship or even the E3A mooring which might not be always adequately located as the convection area can move for year to year or convection event to event.

2.5 JERICO TNA – Menorca-Sardinia - GABS CSIC/SOCIB

2.5.1 Specific Project Overview

Name of Endurance Line/Specific Project: GABS Glider
Institution: CNR-IAMC
PI: Alberto Ribotti/Antonio Olita
Project partners (if relevant): IMEDEA-CSIC, SOCIB
Number of glider missions reported: 2
Type of mission: process study under JERICO TNA call
Contact persons: Alberto Ribotti, Antonio Olita (alberto.ribotti@cnr.it, antonio.olita@cnr.it)
Objective: The proposed research aimed to identify the physical and biological properties of the surface and intermediate water masses between the Balearic Islands and Sardinia. Specific objectives were:

i) Study the seasonal variability of the physical properties of surface and intermediate water masses between the Algerian and the Provencal sub-basins;
ii) Assess the transport of water, salt and heat through the section and
iii) Validate (and assimilate in) operational hydrodynamic numerical model of the western Mediterranean implemented at IAMC CNR UOS Oristano (http://www.seaforecast.cnr.it/en/fl/wmed.php).
iv) Investigate mechanisms of spring bloom triggering over a frontal area.

Endurance Line/Specific Project description

The southern part of the Algero-Provencal sub-basin, namely the Algerian sub-Basin (AB), is characterized at the surface by the Atlantic Water (AW) flowing into the Mediterranean Sea through the Gibraltar Strait (Millot 1999). Along the Algerian coast, the AW is transported mainly by the Algerian current (AC Millot, J. Geoph. Res., 1985) from which anticyclonic Algerian eddies (AEs, Puillat et al. 2002; Taupier-Letage et al. 2003), often involving surface and intermediate waters, are generated by baroclinic instabilities of the AC itself. The AEs generally remain more or less included in the main AC flow. Reaching the Sardinia Channel (SaC) they can collapse or, strongly modified, can remain almost blocked in the SaC area for several months before collapsing (Puillat et al. 2002). In some cases (a few per year), the AEs can detach from the AC moving eastward and northward. In these cases eddies can follow the Sardinian slope northward becoming open-sea eddies. These big “old” and highly energetic AEs can accomplish one or more cyclonic cycle in the AB not exceeding 40°N (Puillat et al. 2002). Studies focusing on the biological response of AEs (e.g. Taupier-Letage et al. 2003), depicted complicated relationships depending on the life history, path and size of such eddies, indicating that further investigations are needed.

The northern part of the sub-basin (Provençal sub-Basin) is also a highly dynamic region with strong mesoscale activity, especially studied because site of deep-water formation and for the seasonal bloom occurring in the so-called MEDOC area (MEDOC group, Nature, 1969; the area of Deep Water Formation in northwestern Mediterranean just offshore the Gulf of Lion) in spring are strictly related as in Jacques et al. (1973). The deep water formation process involves three phases (MEDOC group, Nature, 1969; Levy et al. 1998): preconditioning, violent mixing and sinking of the chimneys with the rapid re-stratification of the surface waters. Northern and southern parts of the basin are divided by a strict area constituted by a north-south gradient between saltier and colder waters in the north (LaViolette et al., 1990; López Garciá et al., 1994), and fresher Atlantic Water (AW) in the south. A third and central part (around 39.5-41°N) can be seen as a buffer area between the northern and southern ones, mainly characterized by the presence and action of the Balearic Front. Nevertheless, this part is also characterized by the strongest coupling between chlorophyll a (Chl-a; a good and prompt proxy for phytoplanktonic biomass) and the displacement of isopycnals. In other words, effects on the phytoplanktonic abundance of nutrient injection in euphotic layer, generated by isopycnal displacements, is much more evident here than in northern and southern areas (Olita et al., 2011). So, this area is for sure of great interest for the understanding of the coupling between mesoscale circulation and biological response, a field needing further investigation.

In fact, phytoplankton blooms in the northwestern Mediterranean Sea are seasonal events that mainly occur in a specific area comprising the Gulf of Lion and the Provencal basin, where they are promoted by a general cyclonic circulation, strong wind-driven mixing and subsequent re-stratification of the water column. At the southern boundary of this area, a persistent density front known as the North Balearic Front can be found. The front is presumed to cause an early phytoplankton bloom in its vicinity because a) it enhances the transport of nutrients into the euphotic layer and b) it promotes the speedy re-stratification of the water column (through frontal instabilities).

Thus, in order to study the physical and biological characteristics of surface and intermediate water masses in the area between 39.5° and 41°N of latitude in the western Mediterranean, a deep water sea glider (to 1000m depth) was used in two missions between Balearic islands and Sardinia (figure 2.5.1) conducted in March and October 2013, in order to consider also the seasonality of the system.

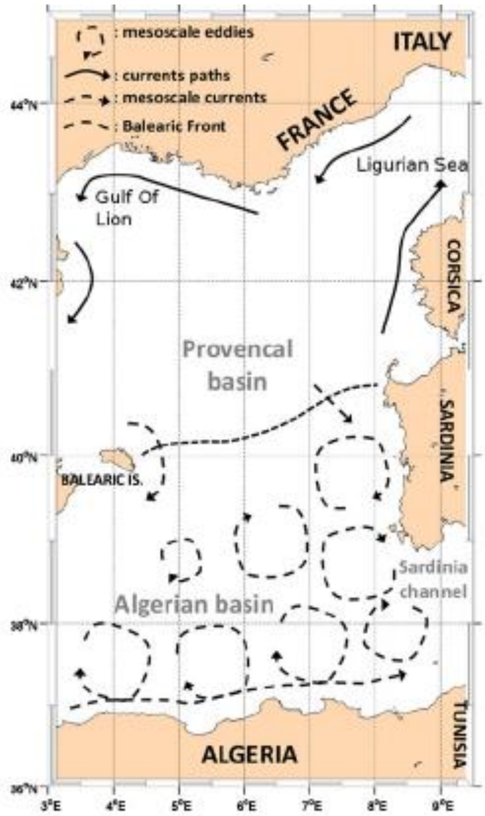


Figure 2.5.1: reference area with main hydrographic features

Technical Summary of the glider operations undertaken during PERSEUS

The glider used in the experiments was a Seaglider manufactured by iRobot. Basically, this glider moves through the water by means of a buoyancy engine which is used to alter the vehicle overall density, causing it to sink or rise vertically. The wings on the glider translate the vertical displacement into forward motion. The result is the characteristic saw-tooth navigation pattern common to this kind of vehicle. The main battery pack, weighing approximately 10 kg (20% of the total weight of the glider), can be shifted inside the housing to modify pitch, roll and heading. The glider navigates by dead- reckoning to programmed waypoints, inflecting at set depths and altitudes based on the coordinates and parameters supplied to it in a specific mission text file. As set by the mission, it periodically surfaces to communicate data and instructions, and to obtain a GPS fix for location. Any difference in dead reckoning and position is attributed to current, and that knowledge is used on the subsequent segment. Navigational aids include a GPS receiver, a compass, a pressure sensor, and a transponder for bottom detection.

For the missions in the NBF area, the Seaglider was configured to dive and climb at a velocity of about 10 cm/s, equivalent to a horizontal headway of roughly 17 cm/s, without taking currents into account. The pitch angle was about 20 degrees and the maximum operating depth range, bathymetry permitting, was 0-1000 m. A free-flushed SeaBird CT-Sail (S/N 0173), last calibrated in March 2011, provided conductivity (C) and temperature (T) measurements, and a Paine Electronics pressure sensor (S/N 264065) calibrated in February 2011 was used to obtain depth (D) readings. The glider acquired

CTD data once every 4.6 s (approximately once every 0.46 m along its trajectory), down to a depth of 1000 m. The data were post-processed using the University of Washington's Python routines for computing conductivity, temperature, salinity, and potential density from raw readings. The usual instrumental lags influencing glider CTD data were handled employing the Glider Matlab Toolbox (Garau et al., 2011) and available at http://socib.es/users/glider/glider_toolbox/. In particular, as an un-pumped CTD was used, the data were affected by a thermal-lag, which had to be corrected. Salinity and temperature profiles were divided into two groups, one for the outbound leg and another for the return one to simplify analysis and interpretation. Both ascending and descending profiles were used. Densities were interpolated on a regular grid having a horizontal and vertical resolution of about 2 km and 1 m, respectively, in order to better assess the ML depth. The ML depth was estimated along both the west-to-east and the east-to-west transects using a threshold method: the lower limit of the ML at any location was identified as a density increase greater than 0.2 kg/m^3 with respect to the (sub-)surface value. The method assumes that the mean density at the computed ML depth will not exceed some arbitrary threshold (28.8 kg/m^3 -1000). Should this happen, what could be indicated is the presence of waters upwelled to the surface, and the real ML depth would be close to zero. In this kind of situation, the algorithm fails to supply a viable solution.

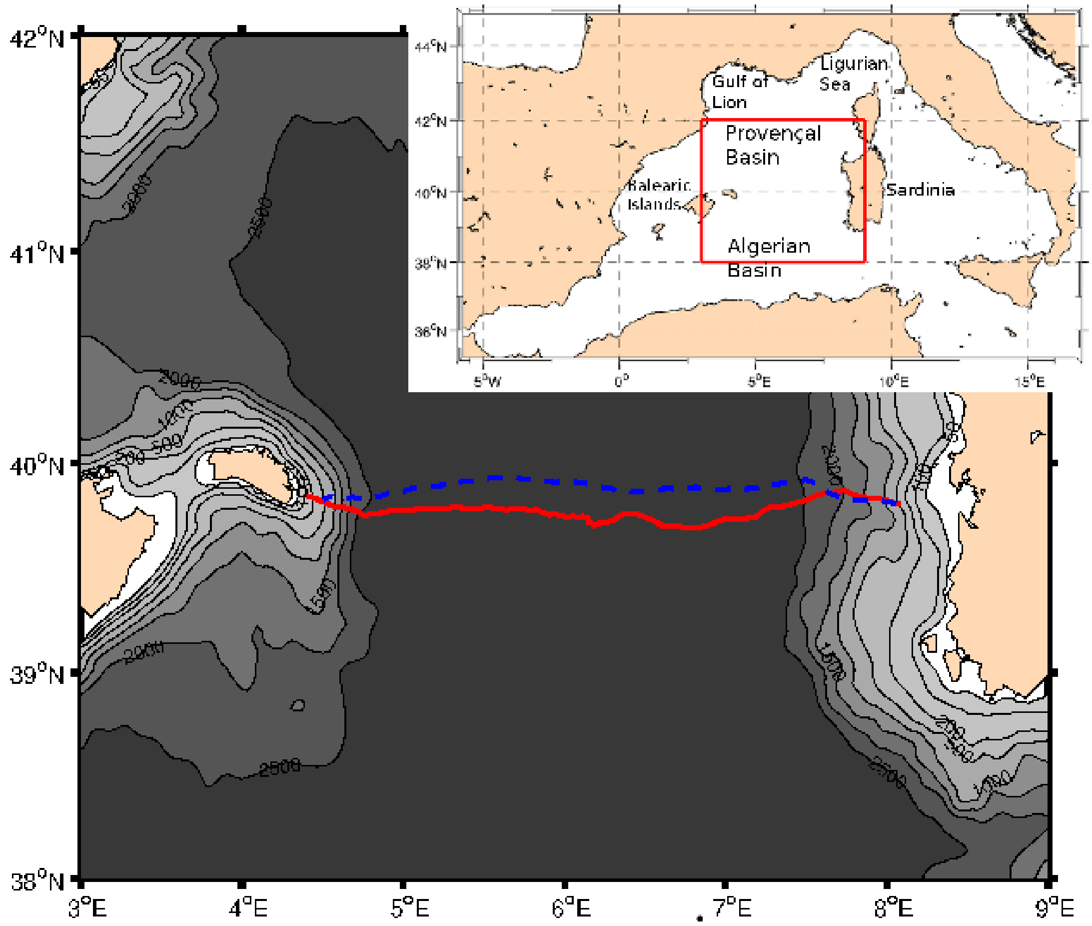


Figure 5.5.2: The route of the first glider mission (march 2013), superimposed on the bathymetry in the studied area. Both outbound (west-to-east, red line) and return (east-to-west, blue line) tracks are shown. The bathymetry has been extracted from the US Navy Digital Bathymetric Data Base

Apart from the mentioned CTD sensors, the glider was also equipped with a WET Labs ECO Triplet fluorometer (S/N BBFL2VMT-777) capable of measuring fluorescence and furnishing derived Chlorophyll-a values. The instrument, with a declared resolution of 0.012 mg/m^3 for Chlorophyll-a, was calibrated in November 2010 by the manufacturer. During the first week of the survey, the flurometer was active in the first 300 m of the water column. From the second week onwards, its maximum sampling depth was reduced to 180 m to minimize energy consumption. Once the west-to-east section was completed, it was decided to use the fluorometer on every fourth dive only because the energy consumption continued to remain too high. The sampling rate of the instrument was roughly 9.2 s during the entire mission, which corresponds to one reading at 0.92 m intervals along the glider's path. Values for Chlorophyll-a (hereafter referred to as Chl-a) were obtained from measured fluorescence using the relevant calibration information provided by the manufacturer.

Fluorescence observations gathered during the day can sometimes be subject to errors caused by a reduction in yield related to insolation, the well-known quenching effect. However, the glider data set for the parameter did not show any substantial day-to-night differences, probably because of the period when the survey was conducted. There are reports in the literature that the quenching effect is quite small in winter.

Technical specifications here above described are valid for both the glider missions in March and October 2013.

Summary of scientific results

Major scientific findings about bio-physical coupling were related to the March mission. The data provided by the glider clearly showed the onset of a bloom soon after a decrease in wind-driven turbulent convection and mixing. The in-situ observations were supported and confirmed by satellite imagery. It was shown that frontal dynamics play a key role in the promotion and acceleration of re-stratification, which is a necessary pre-conditioning factor for the onset of blooms much like other relevant processes such as an enhanced biological pump. Swift re-stratification stimulates new production by inhibiting mixing. Finally, viewing the blooming phenomenon from a regional perspective, it seems that Sverdrup's Critical Depth model applies in the northern well-mixed area whereas, in the south, front-related re-stratification seems to be the principal cause.

For figures and main findings of the missions please refer to the following scientific peer-reviewed publication in Ocean Science journal (IF 2.2):

Olita, A., Sparnocchia, S., Cusí, S., Fazioli, L., Sorgente, R., Tintoré, J., and Ribotti, A.: Observations of a phytoplankton spring bloom onset triggered by a density front in NW Mediterranean, Ocean Sci., 10, 657-666, doi:10.5194/os-10-657-2014, 2014.

Which is available at:
http://www.ocean-sci.net/10/657/2014/os-10-657-2014.html

The October 2013 mission results are still under investigation, but they already revealed interesting features at intermediate (LIW) depths with a large variability in LIW mass presence in respect to the March 2013 sampling. They will be further analysed in order to shed more light on the seasonal variability of the LIW occurrence along the western Sardinia coast. Further, October 2013 data provided, together with the March dataset, a good and cost-effective source of data to be assimilated in the Operational model of the Western Mediterranean sea (POM based) implemented by the group of Oceanography of CNR-IAMC. The configuration of the assimilation of glider data is presently a work in progress activity @CNR-IAMC section of Oristano.

The benefits of using gliders to address this scientific question

Gliders have well-known advantages of being cost effective. Further they may sample under hard meteo-marine conditions and finally are able to explore a variety of scales in virtue of the fine spatial resolution in the horizontal domain.

Further, thanks to glider data it was possible to continuously sample a given transect for more than 40 days, allowing to pass from the pre-bloom period to the initiation of the bloom triggered by dynamic stratification without solution of continuity. All this aspects make the gliders a unique platform in combining high-resolution, low cost sampling and operability that cannot be provided by any other ship-based or autonomous platform.

2.6 JERICO TNA – Sardinia–Tunisia – CNRS/SAROST

2.6.1 Project Overview

Name of Specific Project: Multi-Sensor Investigations in the Channel of Sardinia (MUSICS)
Institution: SAROST S.A.
PI: Slim GANA
Project partners (if relevant): SZN-Napoli (Italy), IAMC-CNR (Oristano, Napoli - Italy), LOCEAN (France)
Number of glider missions reported: 1 (16/09/2014 to 19/09/2014 only)
Type of mission: Collaborative TNA projects – Pilot study for a potential endurance line to fill the gaps in a key area
Contact person: Slim GANA (slim.gana@sarost-group.com)
Objective: In subtask 3.3.1 of PERSEUS DOW, it is stated in particular that: With the perspective of a glider network covering the entire SES, PERSEUS will 1) assess this sustained network strategy at this sub-basin scale and 2) ensure that additional deployments will be carried out where gliders have not been yet deployed, in the eastern Mediterranean and in the Black Sea, in order to build the capacity in these regions for sustained glider operations. In this respect, PERSEUS efforts will also coordinate a "Mediterranean and Black Seas" proposal for transnational access to French and Spanish gliders in the framework of JERICO.

In order to reach the objectives mentioned above and with the support of JERICO TNA (EU-FP7), a deep water glider (up to 1000m) was deployed from the R/V Tethys in the Sardinia Channel (during the SOMBA campaign - see photo at the end of this section) and has carried out 3 return trips during the period from the 16th of August 2014 to the 19th of September 2014 (Figure 2.6.1). The gilder (EUDOXUS) was programmed by the technicians of the French Facility (CETSM, Toulon) to follow a path close to SARAL satellite track #887. This specific project was named MUSICS for "Multi-Sensors Investigations in the Channel of Sardinia".

We remind that the Sardinia Channel is a zonally oriented passage connecting the Algerian and the Tyrrhenian basins, with a sill depth of about 1900 m. In spite of the considerable amount of work achieved and accurate results obtained about the circulation in the Western Mediterranean Sea, during the last 20 years, the Sardinia Channel is still one of the regions where the dynamical processes and water exchanges are not clearly identified. Previous studies (Garzoli and maillard 1979, Ozturgut 1975) pointed out the complexity of the processes in the region and the role of the bottom topography in sustaining them, and provided a first estimation of the involved fluxes. The main knowledge about the water masses crossing this region mostly concerns the AW (Atlantic Water) and the LIW (Levantine Intermediate Water). Along the Algerian coast, the AW is transported mainly by the Algerian current (Millot 1985) from which the anticyclonic Algerian eddies (AEs, Puillat et al. 2002, Taupier-Letage et al. 2003), often involving surface and intermediate waters, are generated by baroclinic instabilities of the AC itself. The AEs generally remain more or less included in the main AC flow. The AEs along slope-downstream propagation usually ends in the Sardinia Channel, where

AEs interact with the bathymetry and can remain almost blocked in the Channel area for several months before collapsing (Puillat et al. 2002).

In order to clarify some of these processes, including the behavior of the Algerian current and associated eddies, our methodology is based on a combined approach using glider observations and sea surface features observed by satellite. By autonomously collecting high-quality observations in three dimensions, gliders allow high-resolution oceanographic monitoring and provide useful contributions for the understanding of mesoscale dynamics and multidisciplinary interactions (e.g. Hodges and Fratantoni 2009).

In summary, the main objectives of the project are:

- identification of the physical properties of the surface and intermediate water masses between Northern Tunisian Coast and Sardinia and evaluation of the transport of water, salt and heat through the area;
- study of the variability of the physical properties of surface and intermediate water masses by combination of glider and satellite data;
- understanding exchanges through sub-basins and the complex interactions through eddies by combination of glider and satellite data; and
- validation of the operational hydrodynamic numerical model of the western Mediterranean (http://www.seaforecast.cnr.it/en/fl/wmed.php) through the use of in-situ and satellite data.

2.6.2 Specific Project description: including the scientific question addressed

See 2.6.1

2.6.3 Technical Summary of the glider operations undertaken during PERSEUS

During this experiment, a significant dataset has been collected through the Sardinia Channel (Fig. 2.6.1). The innovation stands in the high spatial resolution, in the temporal repetition (6 days) and in the number of parameters sampled simultaneously by the Glider, equipped with CTD, O2 sensors, Fluorometers (ChlA), back scattering from 470 to 880 nm.

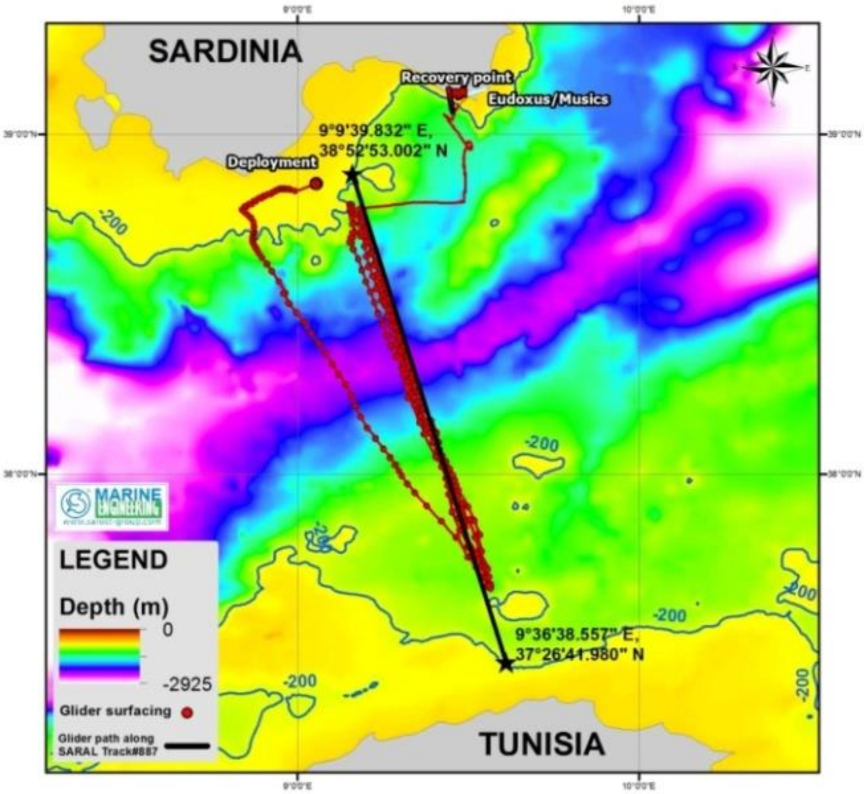


Figure 2.6.1-a: Glider tracks across the Sardinia Channel (Red dot are Glider surfacing locations). The Glider was planned to follow SARAL satellite track #887 (black solid line) in order allow a multi-disciplinary assessment of the dynamic.

The time schedule of the field experiment was as follow:

Date	Event
15 Aug. 2014	The glider left the facility and was shipped to the mooring point by R/V Thetys (SOMBA)
16 Aug. 2014 - 27 Aug. 2014	1st trip: from Sardinia to Northern Tunisian coasts and return (139km+129km)
27 Aug. 2014 - 7 Sept. 2014	2nd trip: from Sardinia to Northern Tunisian coasts and return (129km + 128km)
7 Sept. 2014 -19 Sept. 2014	3rd trip: from Sardinia to Northern Tunisian coasts and return (128km+ 128km)
23 Sept. 2014	Recovery of the Glider from Villasimius in Sardinia by CETSM, SAROST and IAMC-CNR team
25 Sept. 2014	The Glider is back to CETSM facility

A total of 750 vertical profiles were collected in the area. However, as we can observe in Fig.1, the first leg was relatively far from the expected route because, just after its deployment, the glider has drifted to the west. Starting from the second leg, the glider has closely followed the track #887 of the Satellite SARAL. As we can observe also on Fig. 2.6.1-a, the legs were shorter than initially planned. The return point, off the Tunisia coasts, was shifted Northward in order to reduce the risk of collision with ships, taking in account the very important maritime traffic along the African coast (Fig. 2.6.1-b).

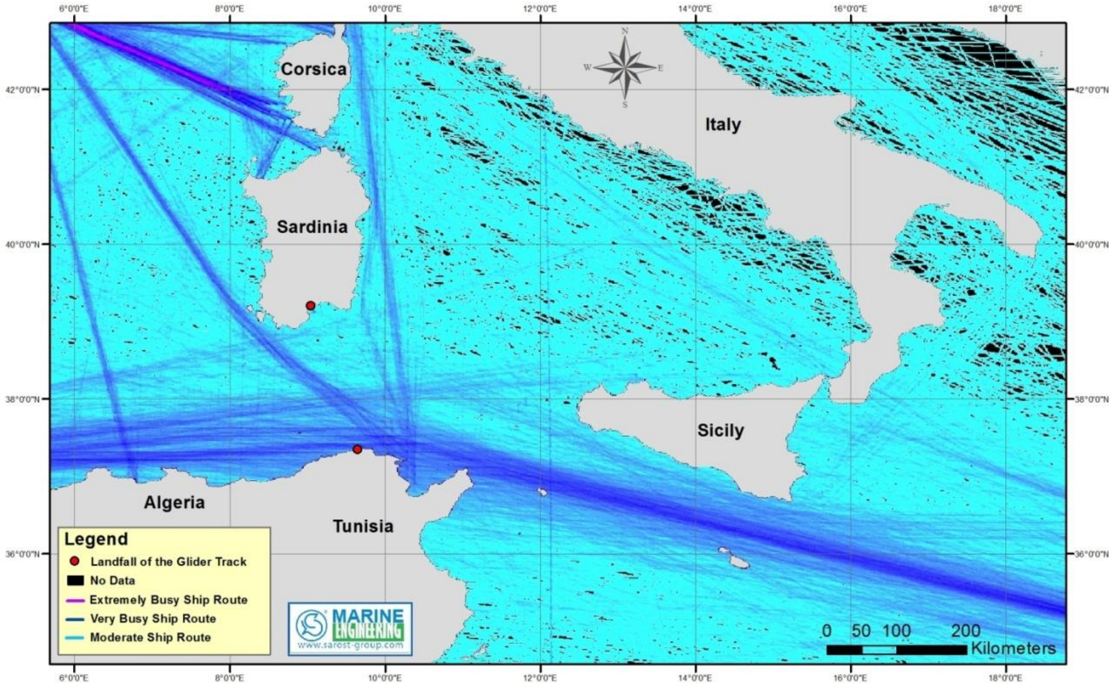


Figure 2.6.1-b: The main risk for the glider is collision with boats or interference with fishing activities (nets). The map shows the cumulated ships traffic in the area. In the southern part of the Sardinia Channel, there is a very busy ship route. So, it is recommended that the Glider remains under 50m depth in this area.

2.6.4 Summary of scientific results

a. Water Masses Properties and Dynamic

Six glider's legs were carried out during the period spanning from the 16th of August 2014 to the 19th of September 2014. As mentioned above, one of the aims of this work is to analyze the hydrological properties of the surface and intermediate water masses and their variability, focusing first on T/S properties (Fig. 2.6.2-a, Fig. 2.6.2-b, Fig. 2.6.3-a, Fig. 2.6.3-b).

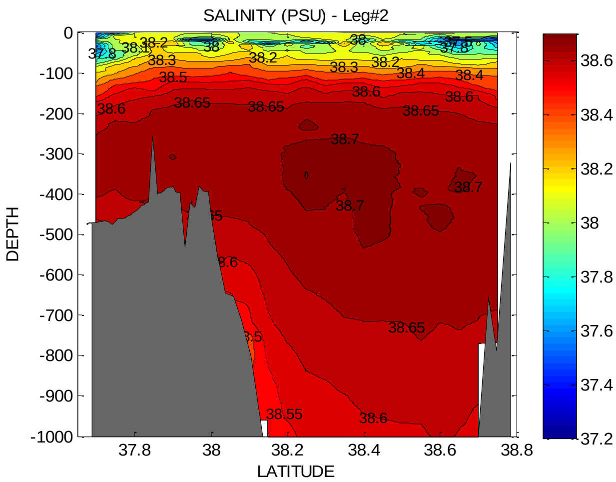


Figure 2.6.2-a: Vertical section of salinity for Leg#2 (23-28 Aug. 2014)

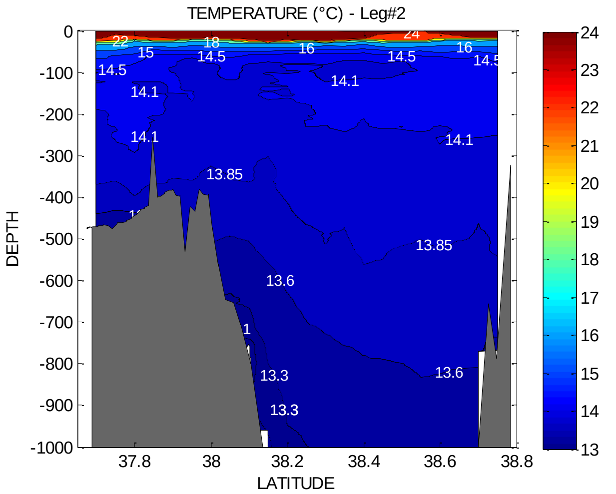


Figure 2.6.2.b: Vertical section of Temperature for Leg#2 (23 to 28 August 2014)

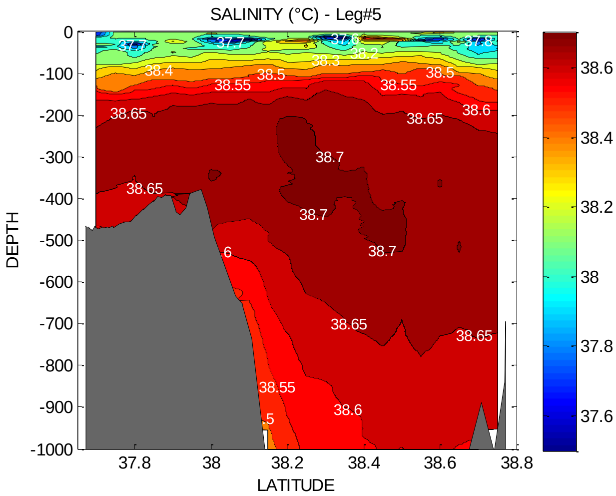


Figure 2.6.3.a: Vertical section of salinity for Leg#5 (08 to 13 September 2014)

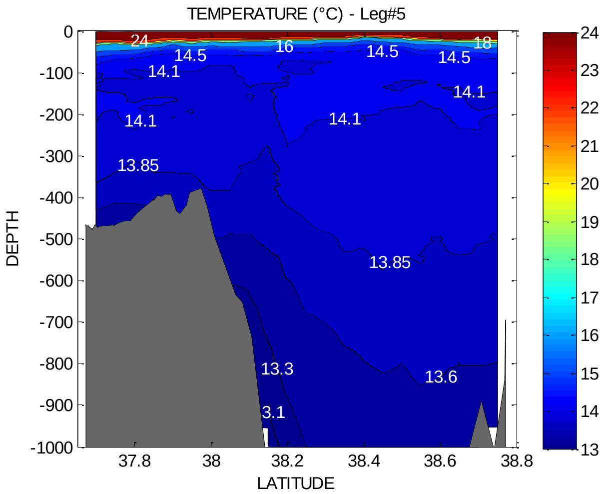


Figure 2.6.3.b: Vertical section of Temperature for Leg#5 (08 to 13 September 2014)

Fig. 2.6.2-a and 2.6.3-a (resp. 2.6.2-b and 2.6.3-b) show the vertical section of salinity (resp. Temperature) for Leg#2 (23 to 28 August 2014) and Leg#5 (08 to 13 September 2014), along the same glider track shown on Fig.1. Leg#5 is obtained 15 days after Leg#2. The comparison of the T/S hydrological sections gives an indication on the intensity of the temporal variability and on the mixing occurring within and between water masses. The core of LIW is clearly observed with S>38.7 at depths between 250m and 450m and the spreading of this water mass appears clearly in Fig. 2.6.2-a and 2.6.3-a.

b. Dynamic of the surface layer

Near the surface, lenses of fresher water are observed at about 50m depth, all along the section, and they correspond to meandering of AW, which is advected from West to East by the Algerian current. One particularly interesting event occurred during the glider monitoring and was observed around the first week of September 2015. An eddy, characterized by a colder (23°C) but saltier water (38.3°/°°), is observed in the central part of the channel and is highlighted in Fig. 2.6.4-a, 2.6.4-b and 2.6.4-c. The horizontal distribution of SST (Fig. 2.6.4-a) is obtained from infrared measurements collected by satellite radiometers and statistical interpolation (MyOcean sea surface temperature nominal operational product for the Med Sea). The corresponding sea surface salinity maps (Fig. 2.6.4-b) are obtained from MyOcean numerical model. These data are interpreted in relation with the Glider data acquired during the same period in the same area (38.1°N, 9.4°E).

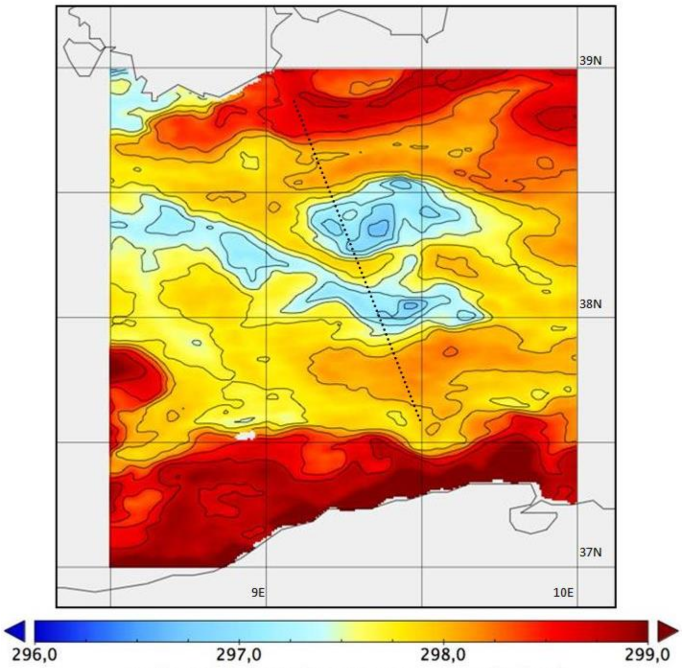


Figure 2.6.4-a: SST (Kelvin) obtained by analysis of satellite radiometers data (MyOcean data,7 Sept.2014)

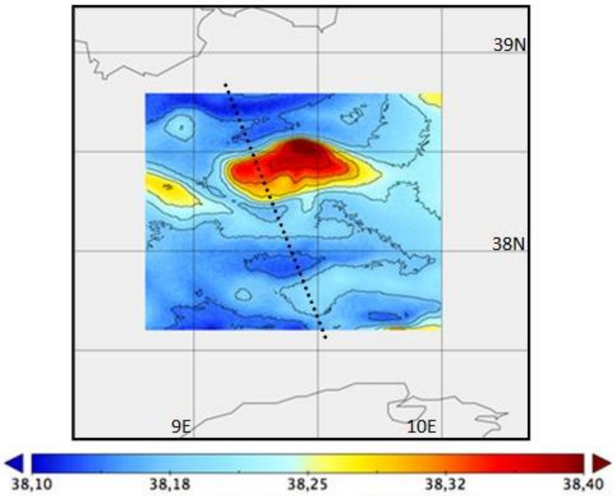


Figure 2.6.4-b: Analyzed Sea Surface Salinity (daily averaged) obtained by 3-D hydrodynamic model (NEMO) on a horizontal grid of 1/16° (MyOcean product, 7 Sept. 2014).

The SST map (Fig. 2.6.4-a) clearly shows the signature of an eddy that was generated and advected by the meandering of the AC. Progressively; two main cells of relatively colder water (23.4°C) are created and observed at the sea surface. The northernmost one, centered on 38.1°N-9.5°E, seems more active. The shape of the SST anomaly (and the SST distribution on the preceding days, not shown here) gives indication that the structure on which we are focusing is a cyclonic eddy, that differs totally from the big anticyclonic eddies studied in [8] and [9]. It is particularly unexpected to observe that a maximum of salinity, reaching 38.4, is associated to this eddy, which is colder than the surrounding waters. If we admit, that relatively colder waters in the area of interest are necessarily of an Atlantic origin, one would expect fresh water in the center of the eddy, but it is not the case, here. As we will see later, in-situ glider data will be very useful to understand this hydrological situation.

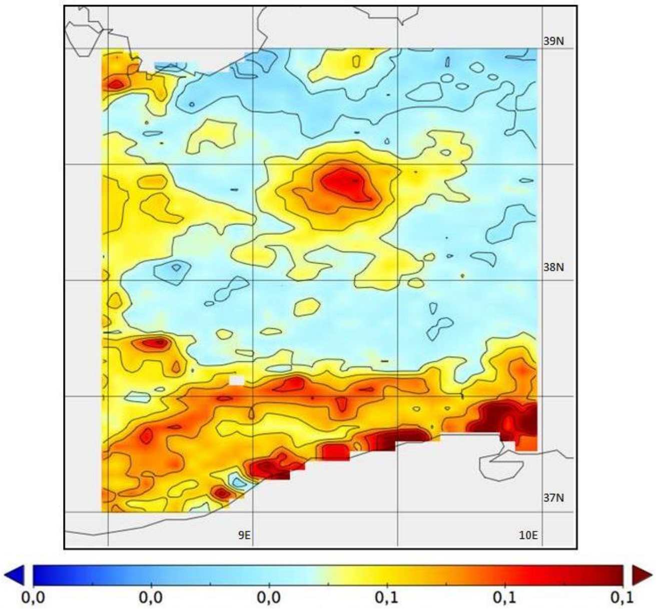


Figure 2.6.4-c: Interpolated Chlorophyll Concentration in milligram m^-3 produced by GOS-ISAC (Rome) from MODIS-Aqua and NPP-VIIRS Sensors using MedOC3 algorithm - Date: 7 Sept.2014.

Furthermore, the map of Surface Chlorophyll Concentration (Fig. 2.6.4-c), deduced from satellite remote sensing ocean color, shows a maximum in the center of the eddy, exactly where the temperature is 23.35°C. Therefore, there are reasons to believe that our cyclonic eddy is related to an upwelling that bring nourishment in suspended matter from the sub-surface layer to the surface. This can be confirmed thanks to the hydrologic in-situ data acquired during the same time by the glider. Let's consider the vertical section of the temperature (Fig. 2.6.5-a) and the vertical section of the salinity (Fig. 2.6.5b).

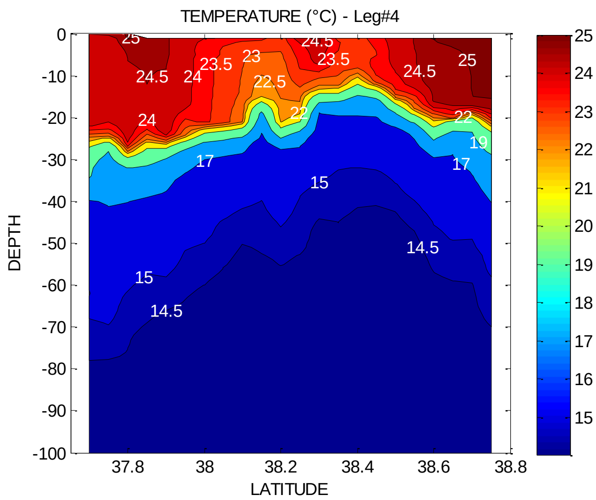


Figure 2.6.5-a: Vertical section of in-situ Temperature in the 100m surface layer obtained by Glider during the fourth leg (03-09-2014 to 07-09-2014).

At about 38.15°N (highlighted in the figure by the vertical white arrow), we observe an outcropping of the isotherms, which starts at about 50m depth. The in-situ temperature at the surface corresponds to the temperature observed in the center of the eddy (23.5°C) using IR data.

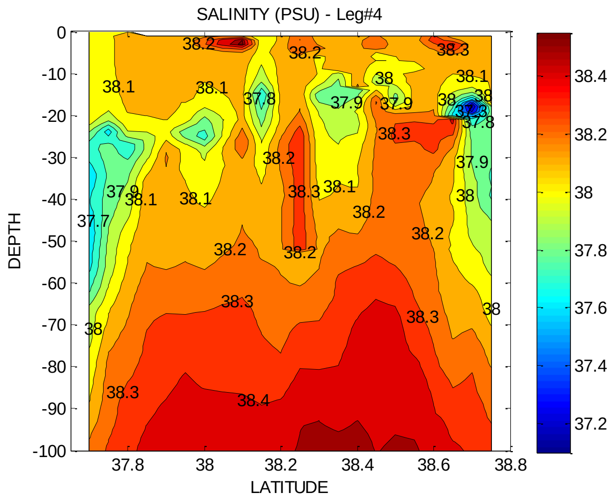


Figure 2.6.5-b: Vertical section of in-situ Salinity in the 100m surface layer obtained by Glider during the fourth leg (03-09-2014 to 07-09-2014).

The suspected existence of the upwelling is confirmed by the shape to the isohalines in Fig. 2.6.5-b, in the subsurface layer ranging between -20m and -50m and at the vicinity of 38.2°N (highlighted by the black ellipse). Consequently, it is demonstrated, from the joint analyses of in-situ and satellite data, that the cyclonic eddy (that seems to be a meander of the AC) generates an upwelling, which, in turn, brings salty water to the surface (38.3 - 38.4), associated with relatively high concentration of chlorophyll.

Also, as previously done in [10], it would be interesting to look at the Sea Level anomaly induced by the cyclonic eddy. On one hand, the map of the Sea Level Anomaly obtained for the same day using the Multi-Mission Altimetric data (Fig.6-a) shows that the central area of the Sardinia Channel is rather characterized by a slightly negative Sea level anomaly.

On the other hand, the temporal evolution of SLA calculated from Altika along-track altimetric data (Fig. 2.6.6-b) shows an increasing of the anomaly in the area at the vicinity of 38.3°N, from -5cm in July 2014 to +7cm in September 2014, and going through 2.5 cm in August.

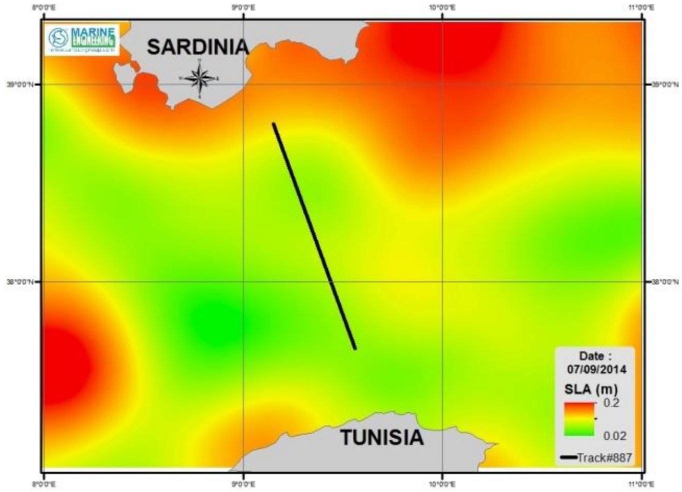


Figure 2.6.6-a: Sea Level Anomaly (07 Sept. 2014) obtained by Multi-Mission Altimetric data interpolated on a grid of 1/8°x1/8° (AVISO products)

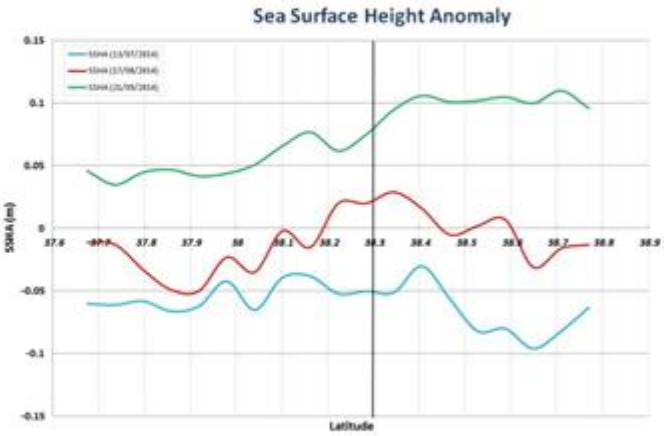


Figure 2.6.6-b: Temporal evolution of SLA calculated from SARAL/Altika along-track altimetric data in summer 2014 (AVISO data).

The 2 sets of altimetric data give results that are not consistent. Therefore, it would be interesting to focus more carefully on this issue and to undertake a more detailed and accurate analysis of this mesoscale structure using SAR mode Cryosat-2 data.

2.6.5 The benefits of using gliders to address this scientific question

Ship cruises over the previous decades have only provided a limited overview of the water properties and dynamic in the key area of the Canal of Sardinia. In order to address and understand the dynamical processes occurring in the ocean, including mesoscale and sub-mesoscale processes, and especially in key regions, as straits, we need to develop a strategy based on synergy between the different platforms of data acquisition: ships, moored buoys, drifters, satellites and gliders. The current analysis shows the relevancy of the multiplatform approach for addressing comprehensively the hydro-biological processes occurring in the ocean.

For instance, it was demonstrated, from the joint analyses of glider in-situ, satellite data and 3-D model outputs, how a cyclonic eddy can generates an upwelling, which, in its turn, brings salty water to the surface (38.3 - 38.4 psu), associated with relatively high concentration of chlorophyll. Without the data glider, it would be not possible to monitor with a such spatial and temporal resolution what is occurring in the sub-surface and intermediate layers of the sea in the area of interested.

In the near future, the SENTINEL-3 mission (ESA) will provide to oceanographers the capacity to observe simultaneously Sea Surface Temperature Radiometer (SLSTR), Sea Color (OLCI) and sea surface height anomalies by SAR mode Altimeters (SRAL), with an enhanced accuracy in the coastal zone. Therefore, it would be very fruitful (in terms of degree of new knowledge acquisition) to have a Glider endurance line in the Canal of Sardinia. Nevertheless, data acquired from research vessels are still needed for validation.

2.7 JERICO TNA – Mallorca-Algeria - CSIC/SOCIB

2.7.1 Specific Project Overview

Name of Endurance Line/Specific Project: ABACUS – Algerian BAsin Circulation Unmanned Survey

Institution: Università degli studi di Napoli Parthenope

PI: Prof. Giorgio Budillon

Project partners (if relevant): ENSMAAL (Algeria)

Number of glider missions reported: 2

Type of mission: endurance line

Contact person: Dr. Giuseppe Aulicino (giuseppeaulicino@uniparthenope.it), Dr. Yuri Cotroneo (cotroneo@uniparthenope.it)

Objective: The proposed research aims to combine traditional (ship collected) in situ data, glider observations and a large set of satellite observed variables to get insights into the Algerian Basin circulation, dominated by the presence of very energetic mesoscale structures, characterized by meandering of the Algerian Current and isolated cyclonic and anti-cyclonic mesoscale eddies. In particular merging the glider high resolution sampling capabilities with satellite information will advance knowledge on mesoscale features overpassing the well-known in situ measurement limits both in space and time.

2.7.2 Endurance Line/Specific Project description

After the Alboran Sea, the Algerian Basin is the first wide basin crossed by Atlantic water entering the Mediterranean Sea. It is dominated by the presence of very energetic mesoscale structures that usually develop from meander of the Algerian Current to isolated cyclonic and anti-cyclonic mesoscale eddies. Our project aims at contributing to these studies realizing an integrated monitoring of this area using both deepwater glider technology to collect high-quality observations in three dimensions and near real time satellite Chl-a and SST maps to identify mesoscale features. The research project was realized between September and December 2014 through access to JERICO TNA infrastructures at SOCIB/IMEDEA (Mallorca-Spain). In situ data have also been collected by the ENSSMAL partners (Algeria) onboard the SOMBA cruise developed in the study area between August and September.

During the second half of August 2014, the Slocum G2 glider SDEEP01 has been prepared by specialized technicians from SOCIB-IMEDEA (balasting, calibration, informatics, data management and other required laboratory operations). On Sept 1st the SDEEP01 Slocum glider has been deployed off the Mallorca coast in presence of two scientists from University of Naples "Parthenope" (Italy). Unfortunately, on Sept 3rd it was necessary to recover SDEEP01 due to the pump wrong functioning. On Sept 15th a second deployment has been performed by SOCIB-IMEDEA technicians after 12 days spent in the labs to repair and verify the hydraulic circuits. From this date SDEEP01 has started its first route along the SARAL satellite track for a successful 36 days cruise down to the Algerian Current edge and back to Mallorca. As expected, during this period the glider has monitored ocean physical and biological features from surface to 975m depth performing one deep CTD, O2 sensor and fluorimeter cast every 4Km. Supervised by the excellent SOCIB-IMEDEA data processing team, ABACUS group has progressively acquired sub-sampled near real-time data along the entire mission.

Additionally, during the return leg, a butterfly route has been inserted trying to sample an eddy, at East-side of initially programmed route, evidenced by the AVISO altimetry and ratified by two SOCIB SVP drifters. The eddy was monitored along its main axes (Figure 2.7.1), while two surface drifters trapped into the eddy provided surface data. Water masses trapped into the eddy, mean radius, rotational speed, and track from origin to dissipation are going to be studied using AVISO maps and SDEEP01 data (Figure 2.7.2). Finally, on Oct 20th SDEEP01 has been recovered by SOCIB-IMEDEA team for the download of the mission full resolution datasets and the maintenance operations necessary to adapt the vehicle to the new target water's hydrographic conditions (re-ballasting, re-calibration, complete check-up). Snapshots of data collected along the 36 days mission for the monitored parameters is reported in Figure 2.7.3.

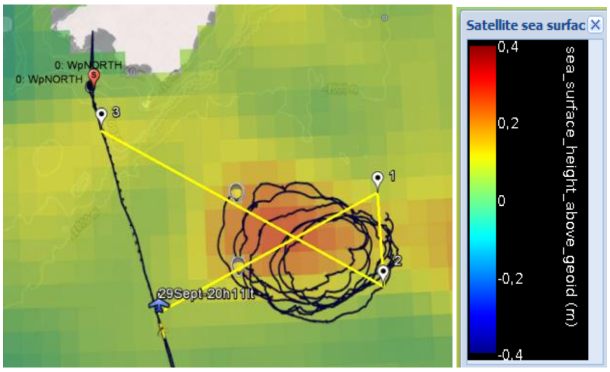


Figure 2.7.1: Glider (yellow line) and drifters tracks (round black line) and superimposed Sea Surface Height from AVISO. Numbers indicate the glider waypoints added to implement a butterfly like trace meant to perform two diametrically-opposed sections of the mesoscale structure.

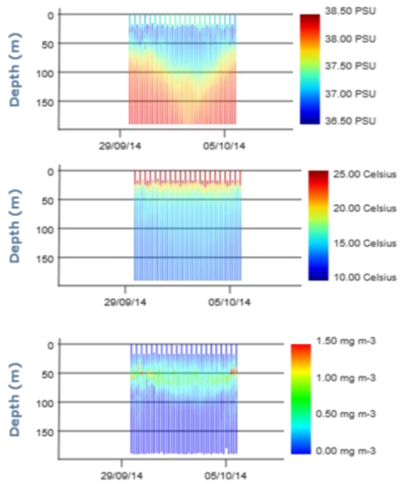


Figure 2.7.2: Main properties of surface sea water along the eddy butterfly-like transect. From top to bottom: salinity, temperature and chl-A concentration.

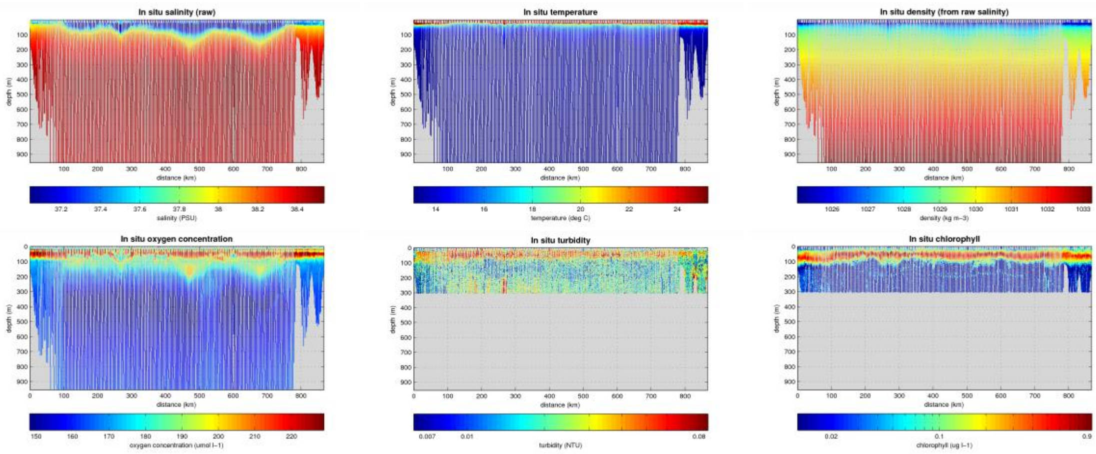


Figure 2.7.3: Main oceanographic data collected by SDEEP01 during its first mission (36 days). From top left to bottom right: salinity, temperature, density, oxygen concentration, turbidity and Chl-a concentration.

On Nov 3rd the second SDEEP01 ABACUS mission started. This time the glider track was scheduled to have an overflown by SARAL-ALTIKA satellite twice along two neighbour ground tracks (#229 and #773 respectively). Unfortunately, this deployment has been aborted due to spontaneous resets occurred during the first days of water works that would make the glider to reinitialize and to enter the autonomous hold-position mission while still underwater. SDEEP01 has been recovered 16nm of the Porto Colom harbour in a perfectly executed operation and has been revised with the support of the manufacturer. On Nov 18th, once the problem has been solved, the second mission has been re-started aiming at having the glider overflown by SARAL-ALTIKA satellite twice, on Nov 26th and Dec 12th, in two neighbor ground tracks (#773 and #229 respectively). These objectives have been perfectly accomplished thanks to the planned "W" shaped track that resulted very useful to maximize the synoptic sampling between glider and altimetric satellite (Figure 2.7.4). The vehicle has been precisely recovered by SOCIB's field-team on Dec 19th after 32 days at sea along the two transects from Mallorca to the Algerian Basin and back. Snapshots of near real time data collected along this second mission are shown in Figure 5.

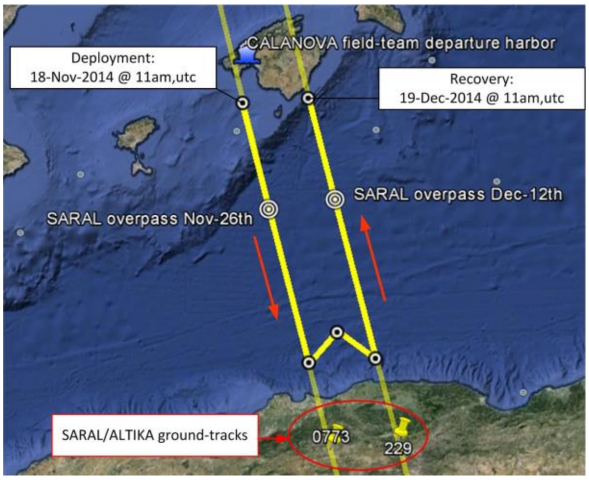


Figure 2.7.4: The 32 days "W" shaped track (yellow line) followed by SDEEP01 between Mallorca and the Algerian Basin during the second mission. Glider has been overflown by SARAL-ALTIKA satellite twice, on Nov 26th and Dec 12th, in two neighbor ground tracks (#773 and #329 respectively). Deployment (Nov 18th) and recovery (Dec 19th) dates are also shown.

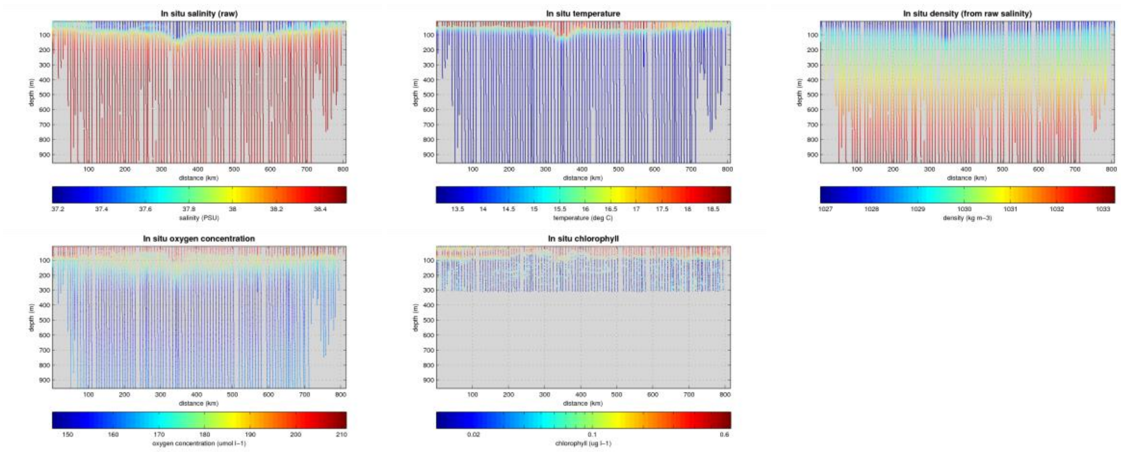


Figure 2.7.5: Main oceanographic near real time data collected by SDEEP01 during its second mission (32 days). From top left to bottom right: salinity, temperature, density, oxygen concentration and Chl-a concentration.

According to the planned research activities, in the last three months we focused on two main topics dealing with (i) a satellite/glider data comparison to assess the ocean description capabilities of multiplatform missions and (ii) an analysis of the Algerian basin circulation involving the complex interactions due to the eddies presence and persistence in the study area. Ship-based and mooring information collected during SOMBA project as well as MODIS sea surface temperature and Chl-a maps observed during ABACUS project have been analysed too. Moreover, we worked to establish a close collaboration with the other scientific team, which have developed research activities in the same study area in the framework of TNA-JERICO projects.

2.7.3 Technical Summary of the glider operations undertaken during PERSEUS

ABACUS project completed two Slocum deep glider missions along the monitoring line between Mallorca and the Algerian Basin. Along a total of four transects, ocean physical and biological features have been monitored from surface to 975m depth performing one deep CTD, O2 sensor and fluorimeter cast every 4Km. In particular, ABACUS project field activities were performed using SLOCUM G2 glider for deep water (1000m maximum depth) with a linear speed of 0.18±0.02 m/s. Real time data transmission from the glider occurred every 8 Km (6 hours) and permitted to retrieve a first decimated overview of data collected as well as to eventually transmit new sampling and navigation directives to the glider.

In this paper we used glider data from a mission conducted from 15th September to 20th October 2014 over the area interested by presence of a mesoscale eddy (Figure 1).

The pre-mission activities have been carried out at SOCIB glider facilities in Mallorca and included all ballasting and adjusting operations needed to assure the glider capability to break out to the surface. At this scope climatological maximum values of temperature and minimum values of salinity for the studied area and period have been analysed. These data were used as extreme hydrographic characteristics of the water to be navigated and allowed to derive the minimum density (1024,0683 Kg/m3) needed to precisely tune the glider for the target waters.

Resolution of sampling was defined according to the scientific aims of the mission (high resolution in both horizontal and vertical directions) and considering the energetic constraints of the platform.

The data acquisition strategy was set in order to complete a saw-chain navigation pattern (Figure 6) allowing the glider to dive with an angle of 26° between -20 and -975m depth. Glider was programmed to sample only on downcast (coloured lines in Figure 6) with a final resolution of almost 4 Km along track once the profile is normalized to the vertical. No data were collected during upcast (black lines in Figure 6). Glider platform hosted a series of physical and biogeochemical sensors sampling the seawater at different rates according to depth as shown in Figure 2.7.6.

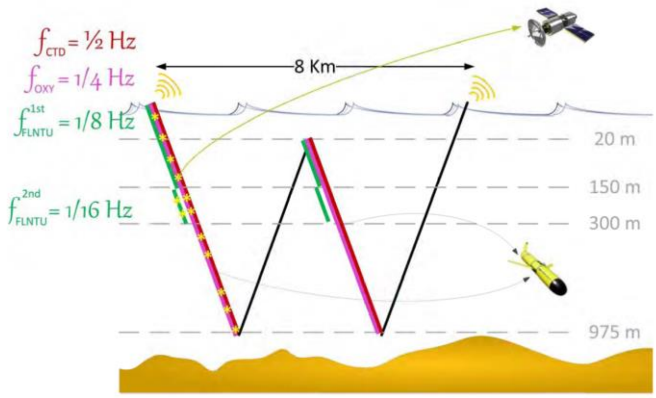


Figure 2.7.6: Glider platform hosted a series of physical and biogeochemical sensors sampling the seawater at different rates according to depth

Technical problems encountered by the glider at sea (pumping, unexpected resets) caused two mission aborts; the excellent SOCIB-IMEDEA technicians readily solved these issues and assured the perfect accomplishment of the project.

2.7.4 Summary of scientific results

ABACUS project completed two Slocum deep glider missions along the monitoring line between Mallorca and the Algerian Basin. Along a total of four transects, ocean physical and biological features have been monitored from surface to 975m depth performing one deep CTD, O2 sensor and fluorimeter cast every 4Km. During the return leg of the first mission, a butterfly route has been inserted to sample an eddy evidenced by the AVISO altimetry and ratified by two SOCIB drifters. Water masses trapped into the eddy, mean radius, rotational speed, and track from origin to dissipation have been monitored using AVISO maps and glider data. Also, the glider track was overflown by SARAL-ALTIKA satellite once during the first mission and twice, along two neighbour ground tracks, during the second mission.

θ/S diagram of the entire glider mission (Figure 2.7.7) shows the presence of typical Mediterranean water masses. The surface layer(0-50m) of most of the profiles is characterized by Atlantic Water (AW) signal while deeper layers are occupied by Levantine Intermediate Water (LIW). Fresher and colder AW is found in the southern part of the basin, while more mixed and modified AW is found in the northern sectors of the cruise. Just under the AW layer, starting from 300m depth, it is possible to identify the presence of LIW. Temperature and salinity values registered at surface level inside the identified eddy (red dots in Figure 7) are more similar to water mass characteristics of the southern part of the basin (blue dots). This correspondence of thermohaline properties represents a clear indication of the possible origin of the eddy from a perturbation of the AC main stream. Moreover this hypothesis seems to perfectly agree with results deriving from satellite data analysis. Biogeochemical results about oxygen and chlorophyll products are under analysis as well as all the data concerning the second (W shaped) ABACUS glider mission (Nov-Dec 2014).

We expect to disseminate technical and scientific results achieved by the ABACUS group joint efforts through both scientific papers on peer reviewed publications and communication to scientific conferences and workshops. In particular, the results achieved in the framework of the first ABACUS mission (focusing on Glider and satellite monitoring of a Mediterranean mesoscale eddy) are going to be presented by Dr. Aulicino at the upcoming IUGG-IAPSO conference in Prague (June 2015). Furthermore, the paper “Glider and satellite high resolution monitoring of a mesoscale eddy in the Algerian Basin: effects on the mixed layer depth and biogeochemistry” by Cotroneo, Aulicino, Budillon, Fusco, Pascual, Ruiz, Tintoré is going to be submitted to JMS special issue focusing on JERICO activities. Joint papers involving results achieved by other projects carried out under TNA-JERICO are in plan, too. Seminaries and other outreach activities for students and academics are also under developing at Università degli studi di Napoli Parthenope.

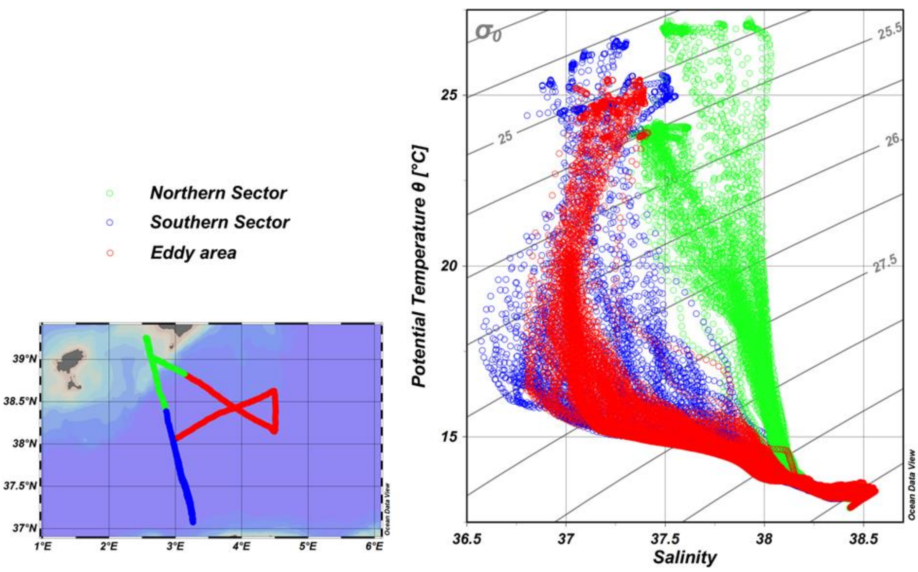


Figure 2.7.7: θ/S diagram of the first glider mission (Set-Oct 2014)

2.7.5 The benefits of using gliders to address this scientific question

Glider high-resolution sampling gave us the opportunity to merge 3D deep observations with surface (MODIS) and integrated (AVISO) satellite information in order to monitor an interesting and typical anticyclonic eddy, thus advancing our knowledge of the study area.

3. Data availability

The data from 19 gliders from the PERSEUS partners are currently circulating in European Data Portals; a sample from the CORIOLIS Data Centre is shown below.

Sample of glider data labelled PERSEUS in the CORIOLIS Data Centre (June 2015)

* note that a glider may be labelled as PERSEUS during a spcific mission period and then not labelled as PERSEUS

WMO No.	Glider name	Glider owner	Mission operator	Project affiliation	Date start	Date end
68452	Ideep00 deep Slocum glider	IMEDEA, Mediterranean Institute for Advanced Studies	SOCIB	PERSEUS project	10/02/2011	05/03/2011
68452	Ideep00 deep Slocum glider	IMEDEA, Mediterranean Institute for Advanced Studies	SOCIB	PERSEUS project	02/06/2011	20/06/2011
68457	sdeep00 deep Slocum glider	IMEDEA, Mediterranean Institute for Advanced Studies	SOCIB	PERSEUS project	07/04/2014	10/05/2014
68457	sdeep00 deep Slocum glider	IMEDEA, Mediterranean Institute for Advanced Studies	SOCIB	PERSEUS project	15/07/2013	03/08/2013
68452	Ideep00 deep Slocum glider	IMEDEA, Mediterranean Institute for Advanced Studies	SOCIB	PERSEUS project	12/01/2011	05/02/2011
68452	Ideep00 deep Slocum glider	IMEDEA, Mediterranean Institute for Advanced Studies	SOCIB	PERSEUS project	25/05/2014	31/05/2014
68452	Ideep00 deep Slocum glider	IMEDEA, Mediterranean Institute for Advanced Studies	SOCIB	PERSEUS project	18/03/2011	12/04/2011
68457	sdeep00 deep Slocum glider	IMEDEA, Mediterranean Institute for Advanced Studies	SOCIB	PERSEUS project	21/05/2013	15/06/2013
68452	Ideep00 deep Slocum glider	IMEDEA, Mediterranean Institute for Advanced Studies	SOCIB	PERSEUS project	09/07/2012	02/08/2012
68457	sdeep00 deep Slocum glider	IMEDEA, Mediterranean Institute for Advanced Studies	SOCIB	PERSEUS project	09/09/2013	05/10/2013
68950	Eudoxus slocum glider	ENSTA, Ecole Nationale Supérieure des Techniques Avancées	CNRS	PERSEUS project	24/01/2013	12/02/2013
68950	Eudoxus slocum glider	ENSTA, Ecole Nationale Supérieure des Techniques Avancées	CNRS	PERSEUS project	05/09/2012	19/12/2012
68452	Ideep00 deep Slocum glider	IMEDEA, Mediterranean Institute for Advanced Studies	SOCIB	PERSEUS project	03/05/2011	22/05/2011
68452	Ideep00 deep Slocum glider	IMEDEA, Mediterranean Institute for Advanced Studies	SOCIB	PERSEUS project	22/08/2012	17/09/2012
68457	sdeep00 deep Slocum glider	IMEDEA, Mediterranean Institute for Advanced Studies	SOCIB	PERSEUS project	27/11/2012	14/12/2012
68457	sdeep00 deep Slocum glider	IMEDEA, Mediterranean Institute for Advanced Studies	SOCIB	PERSEUS project	30/01/2013	22/02/2013
68457	sdeep00 deep Slocum glider	IMEDEA, Mediterranean Institute for Advanced Studies	SOCIB	PERSEUS project	02/11/2013	12/11/2013
68457	sdeep00 deep Slocum glider	IMEDEA, Mediterranean Institute for Advanced Studies	SOCIB	PERSEUS project	03/12/2013	18/12/2013
68457	sdeep00 deep Slocum glider	IMEDEA, Mediterranean Institute for Advanced Studies	SOCIB	PERSEUS project	06/02/2014	28/02/2014
68457	sdeep00 deep Slocum glider	IMEDEA, Mediterranean Institute for Advanced Studies	SOCIB	PERSEUS project	10/06/2014	18/06/2014
68965	sdeep02 Sea Glider	SOCIB (Sistema de Observación y predicción Costero de las Islas Baleares)	SOCIB	PERSEUS project		
68966	ideep02 Slocum deep glider	IMEDEA (CSIC-UIB)	SOCIB	PERSEUS project		
68967	sdeep01 Slocum deep glider	SOCIB (Sistema de Observación y predicción Costero de las Islas Baleares)	SOCIB	PERSEUS project		
68968	icoast00 Slocum costal glider	IMEDEA (CSIC-UIB)	SOCIB	PERSEUS project		
68969	sdeep03 Sea Glider	SOCIB (Sistema de Observación y predicción Costero de las Islas Baleares)	SOCIB	PERSEUS project		
68996	ideep01 Slocum deep Glider	IMEDEA (CSIC-UIB)	SOCIB	PERSEUS project		

4. Summary of PERSEUS glider contribution to monitoring and conclusions

4.1 Glider endurance line sampling in the Mediterranean 2012 - 2015

The aim of Subtask 3.3.1 according to the DoW was to contribute to the development of a glider network in the Southern European Seas (SES), to assess a wide range of scales of variability in the upper 1000m of the ocean, and allow accurate estimates of water transport and characterisation of the physical and biogeochemical properties of the surface and intermediate water masses.

This has certainly been achieved, with more than 60 PERSEUS Partner glider missions completed to date. This PERSEUS Deliverable shows that gliders have been effective in delivering new knowledge on these key scientific topics. Also important is that new endurance line transects (supported by PERSEUS glider partners under the JERICO TNA) are enabling this work to be extended southward towards the north coast of Africa, an identified gap in Mediterranean ocean observations, and are also contributing to capacity building for glider data analysis. It was not possible to initiate an endurance line in the Black Sea during the PERSEUS Project, an attempt under the JERICO TNA program failed as there was not sufficient human resource in the Black Sea PERSEUS partner institutes to initiate additional sampling programs in the 2013-2014 timeframe. This is a sampling and capacity gap that should be addressed within future programs.

Over the last 10 years glider monitoring in the Mediterranean has helped change the way we can characterize the oceanic variability. The platform autonomy enabling a constant presence at sea, across all seasons and sea states, and thus a wider range of scales of variability to be resolved and increased observations of important processes such as shelf-open ocean cascading, deep and intermediate water formation, and evolving eddy and frontal structures. Within PERSEUS the endurance line monitoring and subsequent data analysis have delivered new knowledge of hydrography and circulation variability, more reliable seasonal cycles and important novel observations of evolving mesoscale structures from a physical and biogeochemical perspective. Work is still on going in the glider community in general regarding the quality control and analysis of the biogeochemical parameters (O2, Chl-a, turbidity). However for the PERSEUS glider endurance line transects this is already well under way with some important results (Olita et al. 2014).

4.2 Glider endurance line sampling key advantages

Gliders enable cost effective, year-round, ocean observations, under all weather conditions and at higher resolutions than has been previously affordable with traditional platforms. The project summaries (Section 2) strongly and consistently show the advantage that the higher resolution glider sampling (temporal and spatial) confers on scientific outcomes, particularly in the mesoscale to submesoscale space. New structures are observed, new variability is characterised and new understanding of the annual and sub seasonal dynamics in the Mediterranean are developed. This is particularly important in the Mediterranean where the basin scale processes can be obscured by vigorous and persistent mesoscale activity, and this activity has to be well characterised before seasonal values can be interpreted. The ability to link physical and biogeochemical measurements/phenomena at fine scale is also a key advantage. The year round and all weather capability of gliders adds an important component to this resolution and also makes it possible to routinely sample important processes that take place under extreme weather conditions, such as water mass formation. This has not been previously possible, without some risk and has certainly not been undertaken routinely.

For glider endurance lines, even if not explicitly mentioned in many reports, one of the undoubted advantages of glider monitoring is cost. Although glider missions are not without costs, the relatively low cost of acquiring good quality ocean data at high temporal and spatial resolution, and the insight gained at important oceanic scales, is compelling.

Glider endurance lines also appear to be playing an important role in calibrating satellite altimetry. Additionally the gliders ability to transmit real-time data is also valuable; enabling real-time response in sampling strategy, ability to check data quality, and provides observations in case of loss. An emerging use of gliders is their contribution to improving model representation of physical and biogeochemical processes, the high resolution (spatial and temporal) sampling enables detailed comparisons to be made, which is providing fresh and specific insight into how to improve model performance, and links between physical and biogeochemical variability.

The focus of Task 3.3.1 has been to support and expand repeated glider transects and although gliders also an important part of a multi-platform approach to process studies, this is not assessed here, but can be found in detail in the PERSEUS Deliverable D3.8 subtask 3.3.4 and the Multi-Platform Experiment (ALBOREX).

4.3 Glider endurance line sampling key limitations

Although conferring many advantages gliders like all platforms have their limitations, the current limitations of gliders as a sampling platform, many of which are actively being addressed by the glider community and/or glider manufacturers, can be summarised as follows:

- Depth of profiling: 1000 m is the current deep glider limitation, which means that deeper water masses and ocean density structure are not yet sampled by gliders. However the main glider manufacturers have deeper capability gliders under active development and some prototypes have already been trialled. It seems likely that 2000 – 2500 m rated gliders could be in trial within 18 months (personal communication, glider manufacturer), and work is also on going to develop gliders capable of sampling to 6000 m, that could be available within a few years. Gliders capable of sampling to 2000 – 2500 m would greatly enhance the monitoring capability in the SES, where 3000 m is the maximum depth. It should be recognised however that with deeper gliders the sensor accuracy and assumptions made about the synchronicity of the sampling and/or location of a water column 'profile' will increase in significance.

- Data processing: Gliders produce significantly more data than traditional ships surveys, and also have some specific sampling and sensor related issues (e.g. thermal lag, Garau et al. 2011) that require special attention. In addition, glider manufacturers do not provide a comprehensive set of processing software as for other platforms. Thus even established glider groups can become overwhelmed with data processing and quality control, if regular missions are being operated. As glider fleets become more centralised around national facilities, from which scientists request mission time, without mission processing capability, this issue is again coming to the fore. Across the European glider community initiatives have been underway to improve and harmonise glider data processing, namely through the work of EGO (Everyone's Gliding Observatories, www.ego-network.org), GROOM and JERICO. To date the main outcomes have been an enhanced collaboration between the various glider operators across Europe through sharing of knowledge and best practice, as well as some code for data processing (https://forge.ifremer.fr/svn/oo-ego-gliders/trunk). In addition, SOCIB has a glider data processing toolbox (Troupin et al. 2015), which evolved naturally from the need to operate and manage the SOCIB glider data streams in real-time and delayed mode and to address issues related to thermal-lag (Garau et al. 2011), which can affect glider salinity data, and is freely available for download and use by other glider operators or data users (https://github.com/socib/glider_toolbox).

- Strong currents: The gliders relatively slow speed means that the glider flight path and mission objectives can be adversely affected by strong currents, (e.g. > 40 cm s^{-1}). Some of this can be overcome with adaptive piloting, however not all. Recently however, Teledyne Webb Research released a hybrid glider, with small propeller, which is capable of augmenting the glider speed, such that these gliders can now 'punch through' currents of greater velocity, maintaining course and sampling strategy.

- Synchronicity: The gliders relatively slow speed means that the synchronicity of the data needs to be taken into consideration, as appropriate to the features under study and the dynamics of the environment (Heslop 2015). Although scientists using glider datasets need to be aware of this issue, it is also a consideration for the users of oceanographic data in general. Within this report many of the features under study are mesoscale to sub-mesoscale, and for this days to weeks scale of events, synchronicity has not been considered a major issue.

- Sensors: the range of sensors available for gliders is currently more limited than for example available for ships or moorings, due relative newness of the platform, the low power requirements and the space available for sensor mounting. However, increasing research interest in expanded glider capabilities is leading to the development of new sensors adapted specifically for gliders, both by research institutes and by the main sensor manufacturers. Already available are micro-turbulence profilers, nitrate sensors and acoustic (ADCP and PAR) sensors, with pH and alkalinity, amongst others, under development. The level of activity suggests that gliders will become a very well equipped platform. Perhaps the more pertinent question will be the best practice for QC and in-situ calibration of these new datasets.

- QC/in-situ calibration: To ensure data accuracy/precision is as good as it can be and quantified. Data quality is an important issue and some of the specifics of the glider platform, for example slower sampling rates of the sensors (due to power constraints), pumped and un-pumped CTDs, etc. mean that this has and will continue to be an important topic and area for cross institute collaboration within the European glider community, to share experience and best practice. Both GROOM and JERICO EU projects have had tasks associated with this (e.g. For physical variables, namely T, S and D (CTD data) this has been to a great extent solved, with peer reviewed articles and reports (e.g. GROOM deliverable D3.2, (Garau et al. 2010) providing information on data quality control and processing for glider CTD. For the standard biogeochemical sensors this is an area of discussion and is being actively resolved by glider groups in this report as well as at recent glider community meetings (Glider Community Workshop, Norwich, UK May 2015). For newer sensors, there are already experts within the community with experience and as glider users expand their monitoring capability, hopefully the level of cooperation on glider data QC and calibration will continue. Glider data quality control is an important consideration for mission planning, for example the possibility to take situ water sample etc. however once calibrated the data quality is certainly sufficient for most applications.

- Piloting: generally during operations glider pilots have responsibility (24/7) for the gliders, which can become burdensome when missions are regular. There is an opportunity for further work in this area, some piloting systems are being developed, with alerts etc., another solution would to have regional piloting support services or automated piloting for out-of-hours operations.

- Battery power: there is a trade off between type and number of sensors, sampling rates, and mission length, which is optimised for the mission objective. The use of lithium batteries and the availability of an extra battery bay for some models mean that gliders can be deployed for missions of the order of 200 days.

4.4 Perspectives for glider monitoring across the Mediterranean and Black Sea

The following 4 issues, from the experience within PERSEUS of supporting and expanding repeat glider transects, are important considerations for future glider monitoring in the Mediterranean and Black Sea.

- Expand the range of sensors routinely used: there is some scope to expand range of sensors routinely deployed on repeat glider transects, additional biogeochemical and PAR sensors could add information relevant to MFSD monitoring, in some instances acoustic tag detection sensors (fish or mammal tag) could also be very useful in detecting population migration etc. The point is that there is much scope to increase the sampling undertaken on routine missions, however there is an impact in cost (both in terms of acquiring additional instrumentation, but also in terms of human resource for the quality control and calibration additional variables). Notwithstanding routine transects are a valuable opportunity to collect more data and this should be encouraged and supported. Perhaps a 1 – 2 mission trial with glider teams of 'standard suite' new glider sensors could be undertaken to save duplication of work and costs and to develop QC protocols. This has the potential to significantly contribute to filling some of the parameter gaps identified in PERSEUS deliverable D3.1 and the use of glider monitoring for MFSD implementation.

- Glider community: The European glider community has been active in fostering cooperation and exchange (EGO) between glider groups, this activity has additionally been supported by the GROOM Project and eCOST action. This activity has many benefits in terms of the sharing and harmonisation of best practice in operations, data sampling, data processing, quality control, and calibration, and has led to joint glider activities. Hopefully this cooperation and exchange will continue into the future as it has been an important component in developing the capabilities of this platform in Europe, and will be important to future expansion of glider use across the Mediterranean and Black Sea.

  Continue TNA activity: Gliders are complex platforms to operate and require a team of experts for regular efficient deployments; glider technicians and pilots, scientists and field technicians. Some countries have addressed this by creating national facilities (UK, France), however open access programs, such as the JERICO TNA program documented in this report are also important in providing outside scientists access to this unique platform. The TNA program operated by JERICO, in combination with the good coordination through PERSEUS, has been successful. It has enabled new scientists access to the glider platform for their research and resulted in a number of key outcomes; new observations and new knowledge, capacity building, and the extension of sampling into regions that are chronically under sampled, namely the southern Mediterranean. The TNA program for gliders is a worthwhile investment and should continue to be funded at a European and/or national level.

- Expand network of glider transects physical and biogeochemical focus: Although subtask 3.3.1 has successful supported regular transects and the initiation of new transects it can be seen from figure 4.4.1 (below) that not all areas of the Mediterranean and Black Sea are well covered.

Figure 4.4.1 Map showing PERSEUS Partner glider endurance lines 2012 – 2015 (red)

One of the important objectives for an integrated and multiplatform observing system in the Mediterranean and Black Seas to increase our knowledge of the variability in transport of water masses and biogeochemical fluxes across key transects and hotspots (as noted, for example, at the recent Kostas Nittis Scientific and Strategic Workshop, Athens, May 2015). Gliders would be an effective way to do this. Within PERSEUS WP1 work on bio-domains also indicates, perhaps not surprisingly, that many important physical boundaries in the Mediterranean and Black Sea are also coincident with bio-domain boundaries (see PERSEUS Deliverable D1.6 for the work on bio-domains). To maximise glider monitoring for both physical and biogeochemical parameters, a possible scenario would be to select transects that provide high resolution data across important physical and biogeochemical/eco-system boundaries. In Figure 4.4.2, eight such new glider endurance lines are proposed, transects at key physical boundaries, or crossing areas where increased knowledge of physical variability is important, that also represent eco-region boundaries. This may not be the most optimal scheme, however such an increase in glider endurance lines would quickly generate a wealth of detailed information on variability (physical and biogeochemical) triggering a range of downstream benefits, to modelling (operational and climate and ecosystem), in linking physical variability to biological response and in knowledge of fundamental components of the Mediterranean and Black Sea system function.

Figure 4.4.2 Map showing PERSEUS Partner glider endurance lines 2012 – 2015 (red) and proposed expansion of glider endurance lines (blue) to extend glider monitoring to cover key physical/bio-domain across the Mediterranean and Black Sea

The extension of glider monitoring to cover such key physical/eco-region boundaries across the Mediterranean and Black Sea would, at an estimate, require the setting up of an additional 6 glider ports and/or 'satellite' ports (smaller glider facilities that just prepare and launch gliders under the supervision and piloting of a larger regional glider port facility).

The cost of operating glider endurance lines is obviously important, but we have shown, within the work of the glider partners and facilities and the EU projects PERSEUS, GROOM and JERICO, that it is realistic to monitor, at the scales required, using gliders, which was not the case previously with ship based monitoring. In the last 2 years, the European glider community has carried out detailed cost analysis on glider operations and these studies could form an excellent background with respect to establishing the cost of increasing capacity in the Mediterranean and Black Sea to achieve a glider endurance line physical/eco-region monitoring network, along the lines of the transects proposed above.

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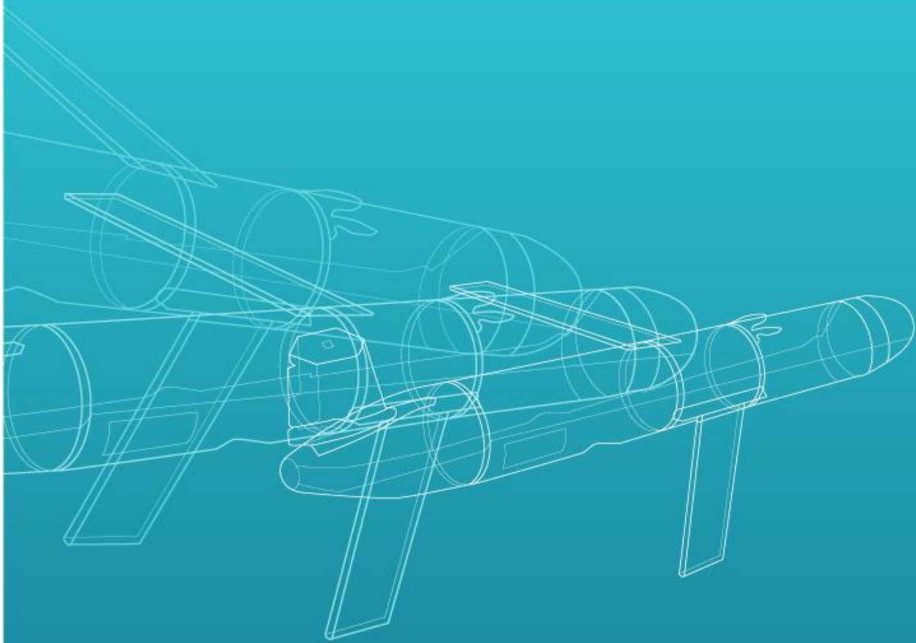
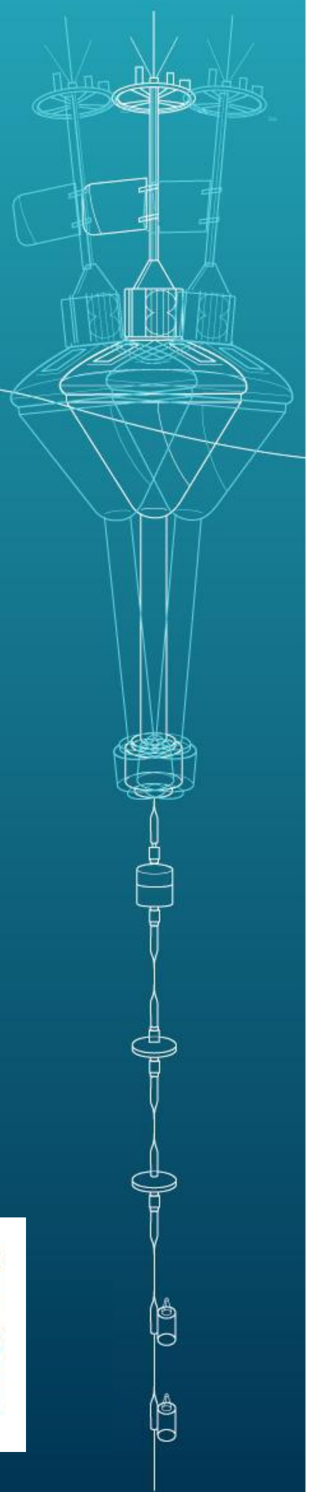
Appendices

A1. Glider mission summaries for MOOSE glider monitoring program

Below are 27 glider mission summary reports for missions during PERSEUS period (2012 – 2015)





MOOSE
Glider Mission Summary Reports

2012 - 2015

CNRS

Glider deployment report

Mission	MooseT00_16
Platform	Slocum open ocean glider
Platform ID	Bonpland (serial 142)
Start date	2012-01-11 10:10:46
End date	2012-01-25 08:02:58
Area	North West Mediterranean Observatory
Objective	The proposed research is based on the monitoring of the long term evolution of the North Western Mediterranean Sea with glider repeat-sections carried out in the framework of the ALLENVI/INSU/ SOERE MOOSE (http://moose-network.fr), INSU/MISTRALS (http://www.mistrals-home.org), and EU FP7 PERSEUS (http://www.perseus-net.eu). The objective is to monitor the oceanographic variability (physical and biogeochemical) of the north western Mediterranean Sea, over a continuum of spatial and temporal scales. Two cross-basin repeat-sections with a repeat rate of about 10-20 days allow to monitor the main circulation features (Northern Current, North Balearic Front, Western Corsica Current) on a regular basis, as well as major processes such as winter intermediate and deep water formations and vernal blooms. The gliders regularly visit MOOSE moorings for cross-calibration purposes and to explore the variability around these moorings. i) T00 is a repeat-section between Nice and Calvi passing by the MOOSE mooring DYFAMED located in the central Ligurian Sea ii) T02 is a repeat-section between Marseille and Menorca passing by the MOOSE mooring LION located in the center of the deep convection area
Total days : 14	Total Navigation (km) : 370
Related platforms/missions	Every other T00 missions

Sensors	Wetlabs bb2flslk V4 Calibration date : 2010-08-02T11:54:51 Measured parameters : FLUORESCENCE_CHLA, BBP470, BBP412, Wetlabs bb2flslk V5 Calibration date : 2010-06-18T16:47:29 Measured parameters : BBP532, CDOM, BBP660, Teledyne Webb research CTD 41cp Calibration date : 2001-10-30T18:45:27 Measured parameters : TEMP, CNDC, PRES, Satlantic Inc. SUNA Calibration date : Measured parameters : MOLAR_NITRATE, Aanderaa Oxy 5013 Calibration date : 2010-03-15T12:36:40 Measured parameters : MOLAR_DOXY, TEMP_DOXY, BPHASE_DOXY, DPHASE_DOXY,
Number of profiles	88
Events	
Mission Summary	https://gfcp.ego-network.org/gliders/Bonpland/MooseT00_16/logbook
PI	Pierre Testor / Laurent Coppola
Institute (owner of the glider)	DT INSU
Project affiliation	MOOSE
Glider software version	Navigation software version : Science software version :
Number of Iridium connections	
RT Data transmitted by Iridium	201 navigation files (4.2M) 208 science files (3.8M)
DM Data downloaded from glider	
Data available from	http://www.ifremer.fr/co/ego/ego/Bonpland
Calibrations	https://gfcp.ego-network.org/gliders/Bonpland/MooseT00_16/info/bonpland_mooset00_16.json

Battery type	Lithium Battery packs : 1 x WILPA1727 + 1 x WILPA1726 + 1 x WILPA1727
Batteries	Initial batteries voltage : V Final batteries voltage : V Batteries consumption : Ah
Full post mission report	https://glider83a.dt.insu.cnrs.fr/deployment_report.php?glider=Bonpland&deployment=MooseT00_16
Technical contact	ups855.liste.glidertech@cnrs.fr

Figure 1 : Mission flight path

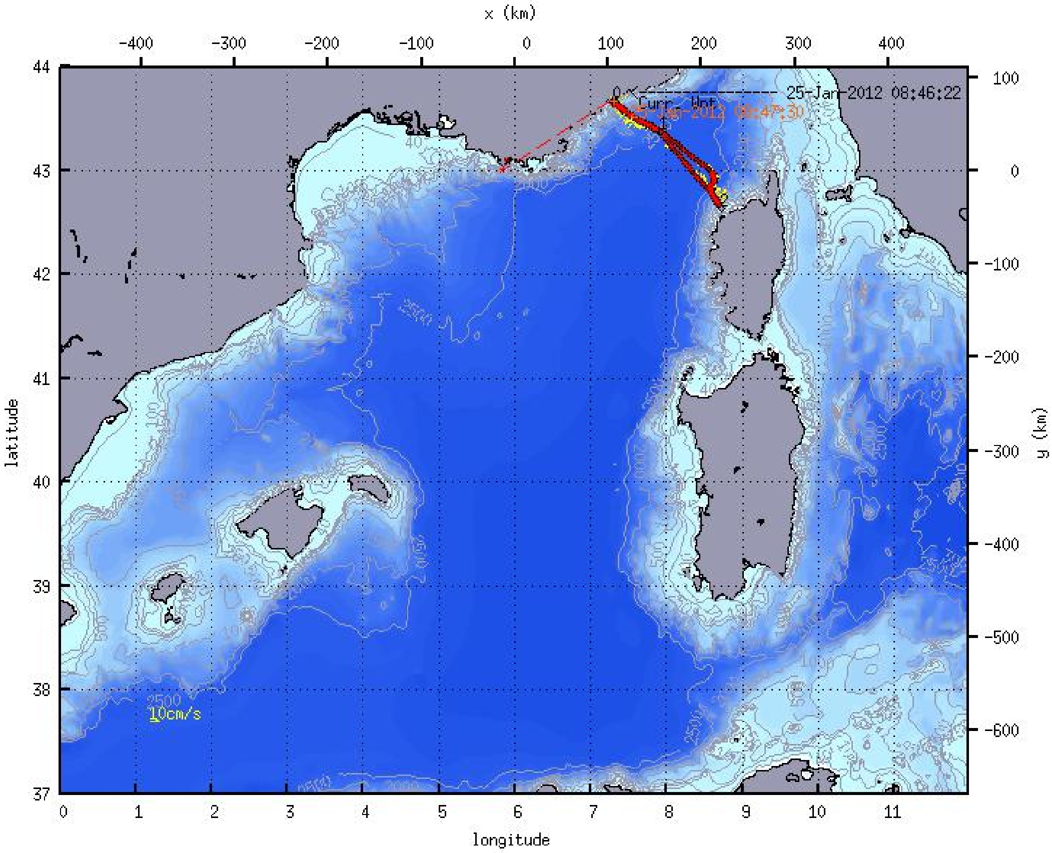
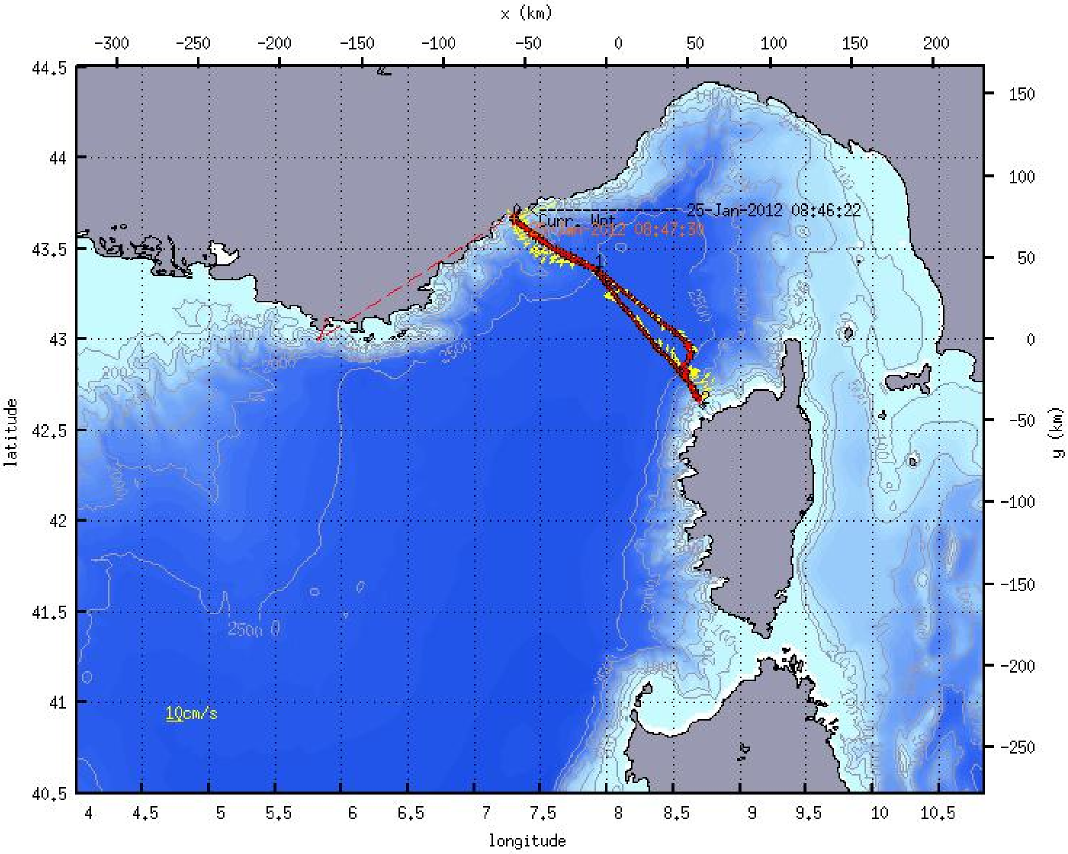


Figure 2 : Mission flight path



Glider deployment report

Mission	MooseT02_07
Platform	Seaglider
Platform ID	Sg509 (serial 509)
Start date	2012-01-12 10:42:52
End date	2012-03-13 09:18:45
Area	North West Mediterranean Observatory
Objective	The proposed research is based on the monitoring of the long term evolution of the North Western Mediterranean Sea with glider repeat-sections carried out in the framework of the ALLENVI/INSU/ SOERE MOOSE (http://moose-network.fr), INSU/MISTRALS (http://www.mistrals-home.org), and EU FP7 PERSEUS (http://www.perseus-net.eu). The objective is to monitor the oceanographic variability (physical and biogeochemical) of the north western Mediterranean Sea, over a continuum of spatial and temporal scales. Two cross-basin repeat-sections with a repeat rate of about 10-20 days allow to monitor the main circulation features (Northern Current, North Balearic Front, Western Corsica Current) on a regular basis, as well as major processes such as winter intermediate and deep water formations and vernal blooms. The gliders regularly visit MOOSE moorings for cross-calibration purposes and to explore the variability around these moorings. i) T00 is a repeat-section between Nice and Calvi passing by the MOOSE mooring DYFAMED located in the central Ligurian Sea ii) T02 is a repeat-section between Marseille and Menorca passing by the MOOSE mooring LION located in the center of the deep convection area
Total days : 61	Total Navigation (km) : 1108
Related platforms/missions	every other T02 missions
Sensors	
Number of profiles	1022
Events	
Mission Summary	https://gfcp.ego-network.org/gliders/Sg509/MooseT02_07/logbook
PI	Pierre Testor
Institute (owner of the glider)	IFREMER
Project affiliation	MOOSE
Glider software version	Navigation software version : Science software version :
Number of Iridium connections	
RT Data transmitted by Iridium	navigation files () science files ()

Glider deployment report

DM Data downloaded from glider	
Data available from	http://www.ifremer.fr/co/ego/ego/Sg509
Calibrations	https://gfcp.ego-network.org/gliders/Sg509/MooseT02_07/info/sg509_mooset02_07.json
Battery type	Battery packs :
Batteries	Initial batteries voltage : V Final batteries voltage : V Batteries consumption : Ah
Full post mission report	https://glider83a.dt.insu.cnrs.fr/deployment_report.php?glider=Sg509&deployment=MooseT02_07
Technical contact	ups855.liste.glidertech@cnrs.fr

Figure 1 : Mission flight path

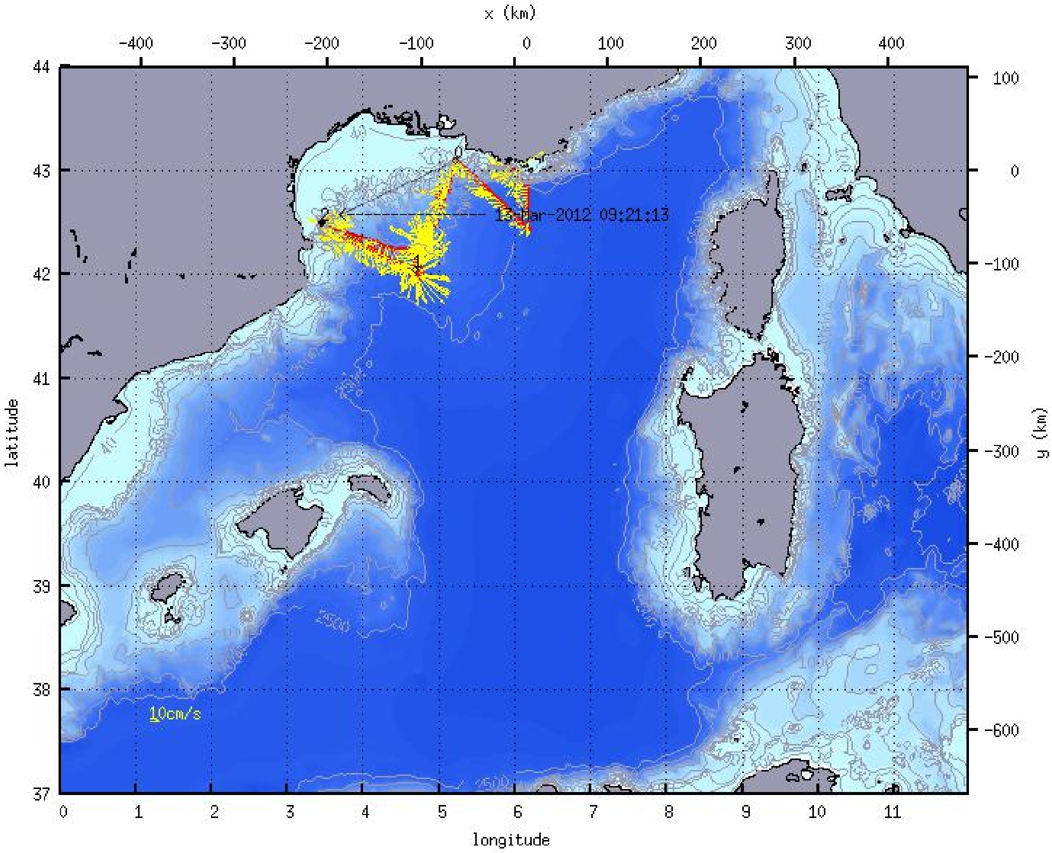
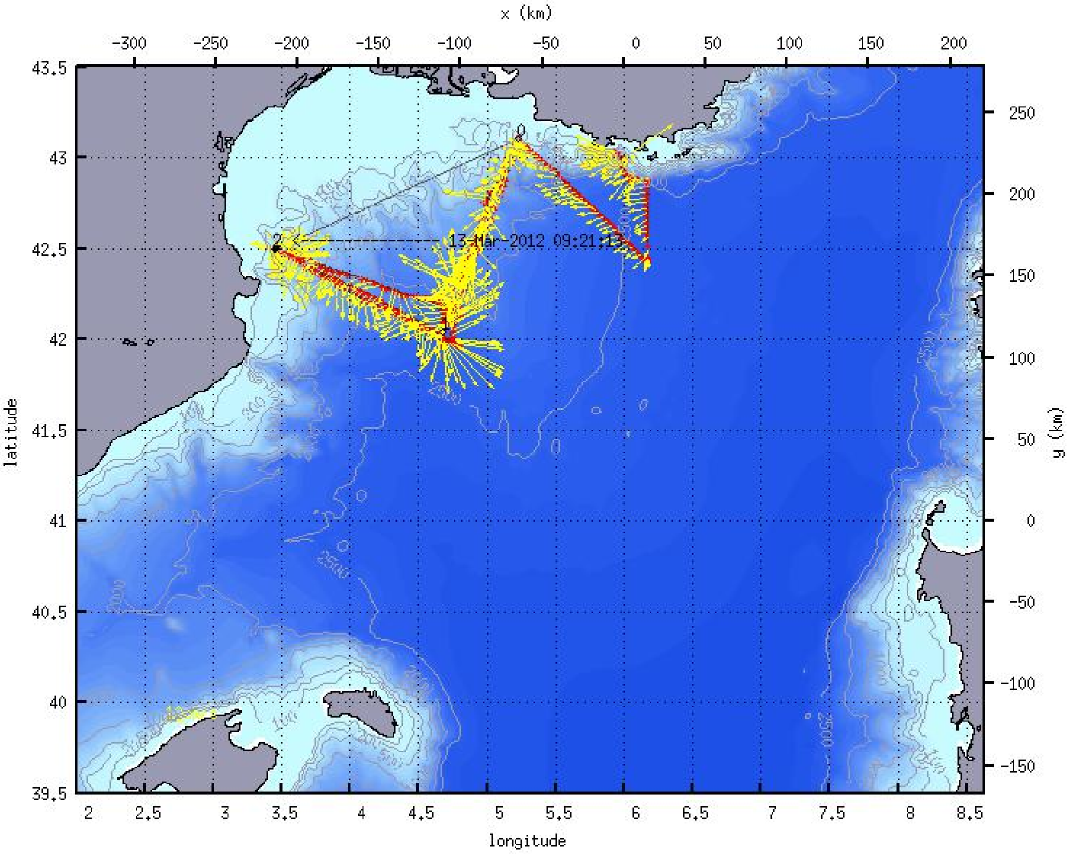


Figure 2 : Mission flight path



Glider deployment report

Mission	MooseT00_17
Platform	Slocum open ocean glider
Platform ID	Tintin (serial 124)
Start date	2012-01-25 10:14:09
End date	2012-02-09 18:51:00
Area	North West Mediterranean Observatory
Objective	The proposed research is based on the monitoring of the long term evolution of the North Western Mediterranean Sea with glider repeat-sections carried out in the framework of the ALLENVI/INSU/ SOERE MOOSE (http://moose-network.fr), INSU/MISTRALS (http://www.mistrals-home.org), and EU FP7 PERSEUS (http://www.perseus-net.eu). The objective is to monitor the oceanographic variability (physical and biogeochemical) of the north western Mediterranean Sea, over a continuum of spatial and temporal scales. Two cross-basin repeat-sections with a repeat rate of about 10-20 days allow to monitor the main circulation features (Northern Current, North Balearic Front, Western Corsica Current) on a regular basis, as well as major processes such as winter intermediate and deep water formations and vernal blooms. The gliders regularly visit MOOSE moorings for cross-calibration purposes and to explore the variability around these moorings. i) T00 is a repeat-section between Nice and Calvi passing by the MOOSE mooring DYFAMED located in the central Ligurian Sea ii) T02 is a repeat-section between Marseille and Menorca passing by the MOOSE mooring LION located in the center of the deep convection area
Total days : 15	Total Navigation (km) : 419
Related platforms/missions	Every other T00 missions

Sensors	Wetlabs bb2flslk V3 Calibration date : 2009-06-30T11:29:38 Measured parameters : BBP880, BBP715, FLUORESCENCE_PE, Unknown bb2flslk V5 Calibration date : 2008-10-02T11:01:16 Measured parameters : BBP532, CDOM, BBP660, Wetlabs bb2flslk V4 Calibration date : 2008-05-01T16:52:12 Measured parameters : FLUORESCENCE_CHLA, BBP470, BBP412, Teledyne Webb research Oxy 5013 Calibration date : 2009-03-04T11:02:19 Measured parameters : MOLAR_DOXY, TEMP_DOXY, BPHASE_DOXY, DPHASE_DOXY,
Number of profiles	848
Events	
Mission Summary	https://gfcp.ego-network.org/gliders/Tintin/MooseT00_17/logbook
PI	Pierre Testor / Laurent Coppola
Institute (owner of the glider)	LOV
Project affiliation	MOOSE
Glider software version	Navigation software version : Science software version :
Number of Iridium connections	
RT Data transmitted by Iridium	264 navigation files (4.5M) 277 science files (5.1M)
DM Data downloaded from glider	
Data available from	http://www.ifremer.fr/co/ego/ego/Tintin
Calibrations	https://gfcp.ego-network.org/gliders/Tintin/MooseT00_17/info/tintin_mooset00_17.json
Battery type	Lithium Battery packs : 1 x WILPA1727 + 1 x WILPA1726
Batteries	Initial batteries voltage : V Final batteries voltage : V Batteries consumption : Ah

Glider deployment report

Full post mission report	https://glider83a.dt.insu.cnrs.fr/deployment_report.php?glider=Tintin&deployment=MooseT00_17
Technical contact	ups855.liste.glidertech@cnrs.fr

Figure 1 : Mission flight path

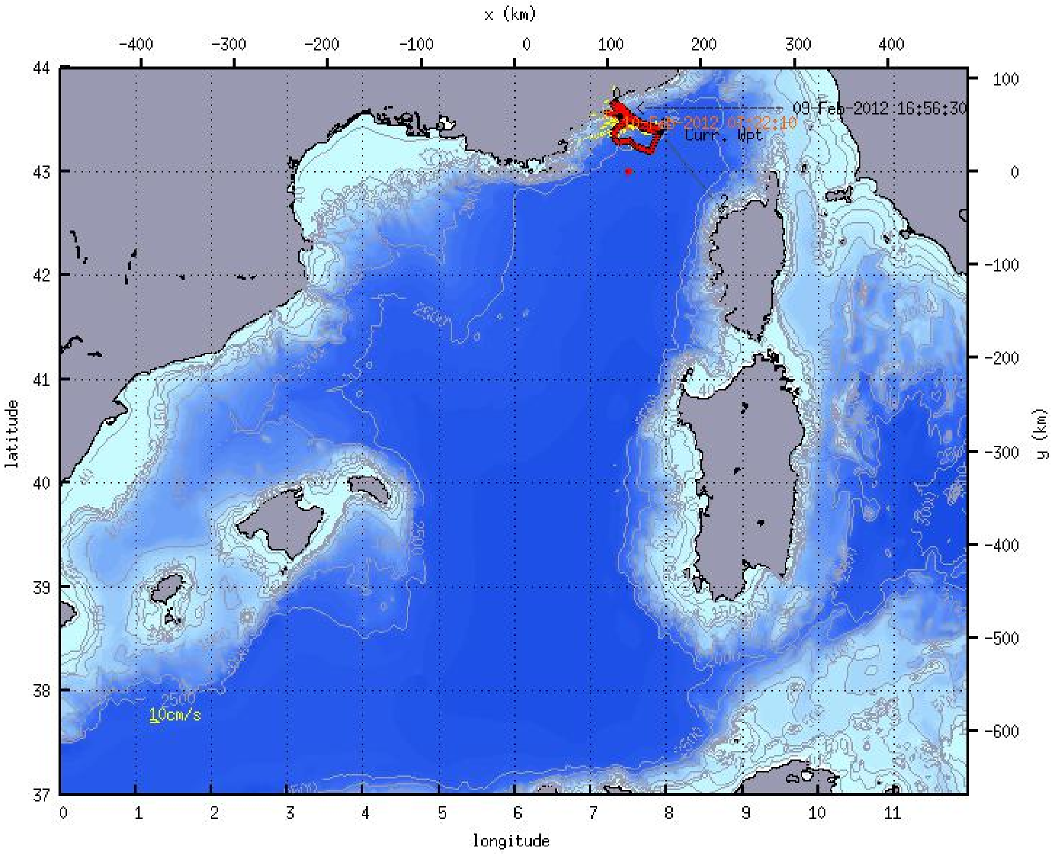
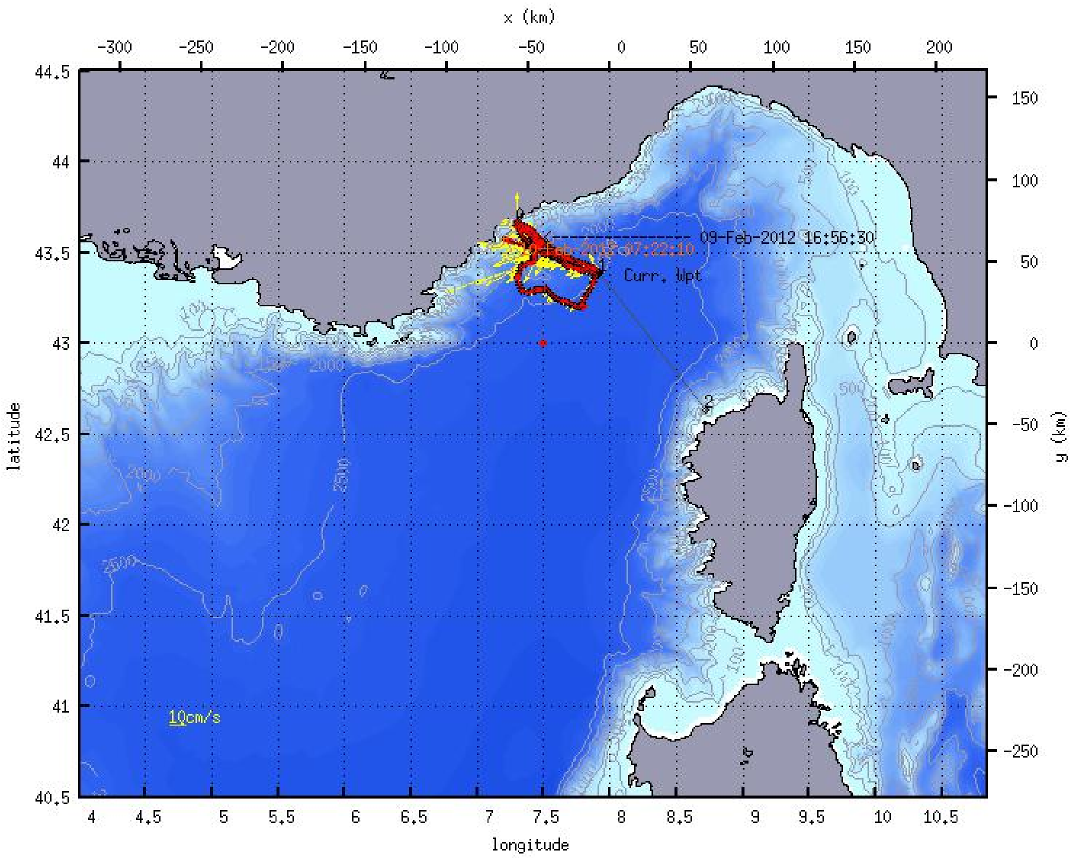


Figure 2 : Mission flight path



Glider deployment report

Mission	MooseT02_08
Platform	Slocum open ocean glider
Platform ID	Hannon (serial 97)
Start date	2012-03-20 10:13:37
End date	2012-03-22 11:03:48
Area	North West Mediterranean Observatory
Objective	The proposed research is based on the monitoring of the long term evolution of the North Western Mediterranean Sea with glider repeat-sections carried out in the framework of the ALLENVI/INSU/ SOERE MOOSE (http://moose-network.fr), INSU/MISTRALS (http://www.mistrals-home.org), and EU FP7 PERSEUS (http://www.perseus-net.eu). The objective is to monitor the oceanographic variability (physical and biogeochemical) of the north western Mediterranean Sea, over a continuum of spatial and temporal scales. Two cross-basin repeat-sections with a repeat rate of about 10-20 days allow to monitor the main circulation features (Northern Current, North Balearic Front, Western Corsica Current) on a regular basis, as well as major processes such as winter intermediate and deep water formations and vernal blooms. The gliders regularly visit MOOSE moorings for cross-calibration purposes and to explore the variability around these moorings. i) T00 is a repeat-section between Nice and Calvi passing by the MOOSE mooring DYFAMED located in the central Ligurian Sea ii) T02 is a repeat-section between Marseille and Menorca passing by the MOOSE mooring LION located in the center of the deep convection area
Total days : 2	Total Navigation (km) : 67
Related platforms/missions	every other T02 missions

Glider deployment report

Sensors	Teledyne Webb research bb2flslk V2 Calibration date : 2007-10-31T15:55:07 Measured parameters : FLUORESCENCE_CHLA, BBP532, BBP470, Teledyne Webb research bb2flslk V1 Calibration date : 2007-10-31T10:42:12 Measured parameters : CDOM, BBP660, BBP880, Teledyne Webb research CTD 41cp Calibration date : 2006-05-08T16:45:32 Measured parameters : TEMP, CNDC, PRES, Teledyne Webb research Oxy 5013 Calibration date : 2009-08-20T12:09:52 Measured parameters : MOLAR_DOXY, TEMP_DOXY, BPHASE_DOXY, DPHASE_DOXY,
Number of profiles	58
Events	
Mission Summary	https://gfcp.ego-network.org/gliders/Hannon/MooseT02_08/logbook
PI	Pierre Testor
Institute (owner of the glider)	LOCEAN
Project affiliation	MOOSE
Glider software version	Navigation software version : Science software version :
Number of Iridium connections	
RT Data transmitted by Iridium	39 navigation files (1.2M) 38 science files (624K)
DM Data downloaded from glider	
Data available from	http://www.ifremer.fr/co/ego/ego/Hannon
Calibrations	https://gfcp.ego-network.org/gliders/Hannon/MooseT02_08/info/hannon_mooset02_08.json
Battery type	Lithium Battery packs : 1 x WILPA1726 + 1 x WILPA1727
Batteries	Initial batteries voltage : V Final batteries voltage : V Batteries consumption : Ah

Glider deployment report

Full post mission report	https://glider83a.dt.insu.cnrs.fr/deployment_report.php?glider=Hannon&deployment=MooseT02_08
Technical contact	ups855.liste.glidertech@cnrs.fr

Figure 1 : Mission flight path

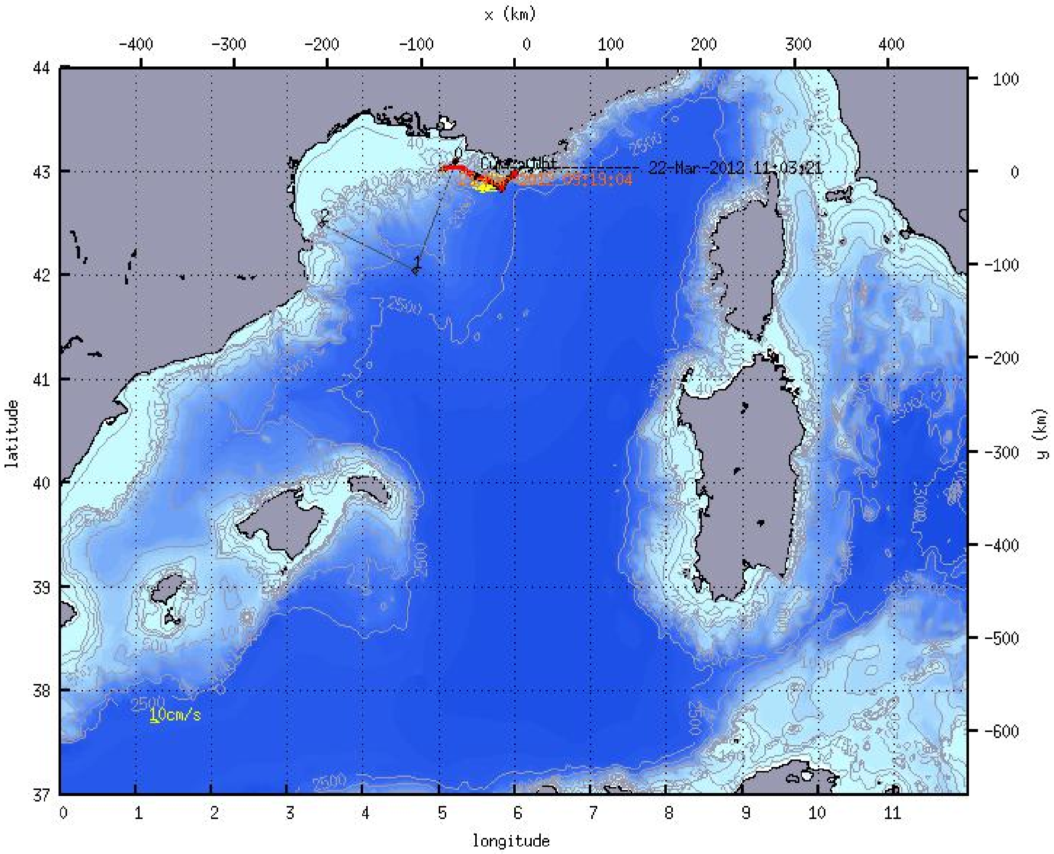
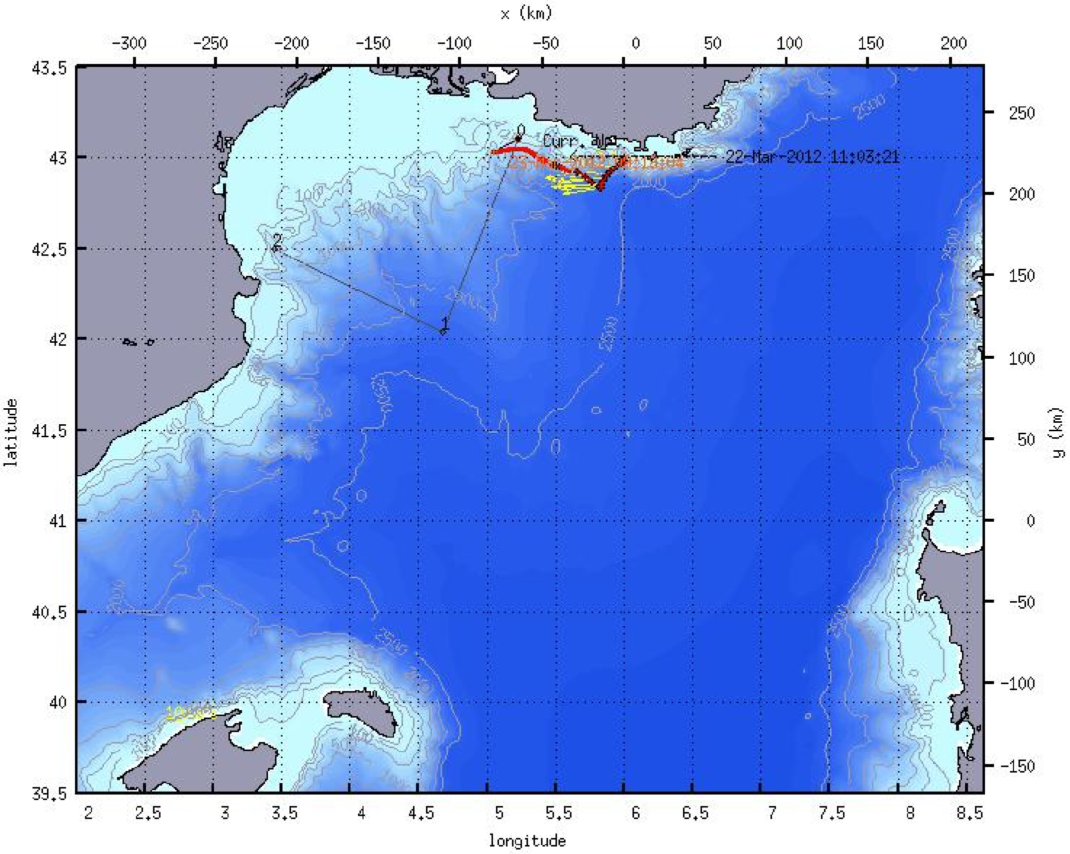


Figure 2 : Mission flight path



Glider deployment report

Mission	MooseT00_18
Platform	Slocum open ocean glider
Platform ID	Tintin (serial 124)
Start date	2012-04-18 09:32:10
End date	2012-05-22 12:26:24
Area	North West Mediterranean Observatory
Objective	The proposed research is based on the monitoring of the long term evolution of the North Western Mediterranean Sea with glider repeat-sections carried out in the framework of the ALLENVI/INSU/ SOERE MOOSE (http://moose-network.fr), INSU/MISTRALS (http://www.mistrals-home.org), and EU FP7 PERSEUS (http://www.perseus-net.eu). The objective is to monitor the oceanographic variability (physical and biogeochemical) of the north western Mediterranean Sea, over a continuum of spatial and temporal scales. Two cross-basin repeat-sections with a repeat rate of about 10-20 days allow to monitor the main circulation features (Northern Current, North Balearic Front, Western Corsica Current) on a regular basis, as well as major processes such as winter intermediate and deep water formations and vernal blooms. The gliders regularly visit MOOSE moorings for cross-calibration purposes and to explore the variability around these moorings. i) T00 is a repeat-section between Nice and Calvi passing by the MOOSE mooring DYFAMED located in the central Ligurian Sea ii) T02 is a repeat-section between Marseille and Menorca passing by the MOOSE mooring LION located in the center of the deep convection area
Total days : 34	Total Navigation (km) : 911
Related platforms/missions	Every other T00 missions

Sensors	Wetlabs bb2flslk V3 Calibration date : 2009-06-30T11:29:38 Measured parameters : BBP880, BBP715, FLUORESCENCE_PE, Unknown bb2flslk V5 Calibration date : 2008-10-02T11:01:16 Measured parameters : BBP532, CDOM, BBP660, Wetlabs bb2flslk V4 Calibration date : 2008-05-01T16:52:12 Measured parameters : FLUORESCENCE_CHLA, BBP470, BBP412, Teledyne Webb research Oxy 5013 Calibration date : 2009-03-04T11:02:19 Measured parameters : MOLAR_DOXY, TEMP_DOXY, BPHASE_DOXY, DPHASE_DOXY,
Number of profiles	810
Events	
Mission Summary	https://gfcp.ego-network.org/gliders/Tintin/MooseT00_18/logbook
PI	Pierre Testor / Laurent Coppola
Institute (owner of the glider)	LOV
Project affiliation	MOOSE
Glider software version	Navigation software version : Science software version :
Number of Iridium connections	138
RT Data transmitted by Iridium	536 navigation files (7.6M) 540 science files (9.9M)
DM Data downloaded from glider	
Data available from	http://www.ifremer.fr/co/ego/ego/Tintin
Calibrations	https://gfcp.ego-network.org/gliders/Tintin/MooseT00_18/info/tintin_mooset00_18.json
Battery type	Lithium Battery packs : 1 x WILPA1727 + 1 x WILPA1726
Batteries	Initial batteries voltage : V Final batteries voltage : V Batteries consumption : Ah

Glider deployment report

Full post mission report	https://glider83a.dt.insu.cnrs.fr/deployment_report.php?glider=Tintin&deployment=MooseT00_18
Technical contact	ups855.liste.glidertech@cnrs.fr

Figure 1 : Mission flight path

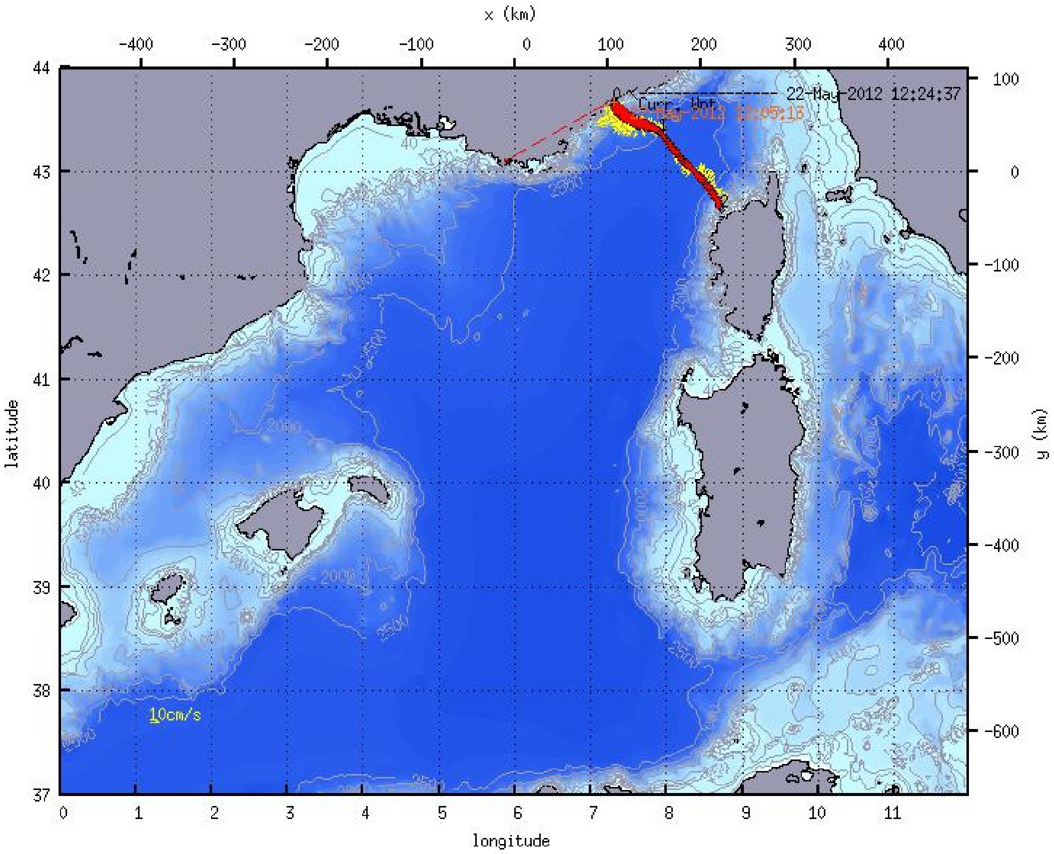
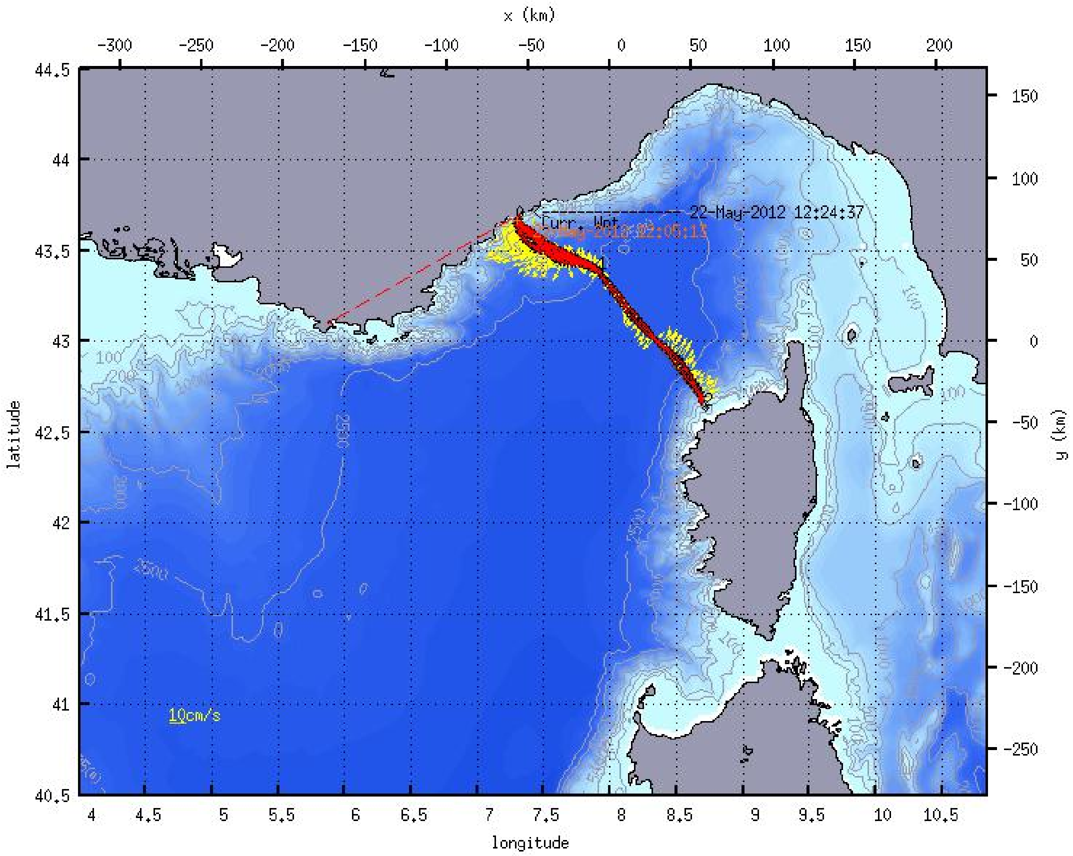


Figure 2 : Mission flight path



Glider deployment report

Mission	MooseT02_09
Platform	Seaglider
Platform ID	Sg508 (serial 508)
Start date	2012-05-21 09:34:28
End date	2012-07-23 12:00:56
Area	North West Mediterranean Observatory
Objective	The proposed research is based on the monitoring of the long term evolution of the North Western Mediterranean Sea with glider repeat-sections carried out in the framework of the ALLENVI/INSU/ SOERE MOOSE (http://moose-network.fr), INSU/MISTRALS (http://www.mistrals-home.org), and EU FP7 PERSEUS (http://www.perseus-net.eu). The objective is to monitor the oceanographic variability (physical and biogeochemical) of the north western Mediterranean Sea, over a continuum of spatial and temporal scales. Two cross-basin repeat-sections with a repeat rate of about 10-20 days allow to monitor the main circulation features (Northern Current, North Balearic Front, Western Corsica Current) on a regular basis, as well as major processes such as winter intermediate and deep water formations and vernal blooms. The gliders regularly visit MOOSE moorings for cross-calibration purposes and to explore the variability around these moorings. i) T00 is a repeat-section between Nice and Calvi passing by the MOOSE mooring DYFAMED located in the central Ligurian Sea ii) T02 is a repeat-section between Marseille and Menorca passing by the MOOSE mooring LION located in the center of the deep convection area
Total days : 63	Total Navigation (km) : 815
Related platforms/missions	every other T02 missions
Sensors	
Number of profiles	532
Events	
Mission Summary	https://gfcp.ego-network.org/gliders/Sg508/MooseT02_09/logbook
PI	Pierre Testor
Institute (owner of the glider)	
Project affiliation	MOOSE
Glider software version	Navigation software version : Science software version :
Number of Iridium connections	288
RT Data transmitted by Iridium	navigation files () science files ()

DM Data downloaded from glider	
Data available from	http://www.ifremer.fr/co/ego/ego/Sg508
Calibrations	https://gfcp.ego-network.org/gliders/Sg508/MooseT02_09/info/sg508_mooset02_09.json
Battery type	Battery packs :
Batteries	Initial batteries voltage : V Final batteries voltage : V Batteries consumption : Ah
Full post mission report	https://glider83a.dt.insu.cnrs.fr/deployment_report.php?glider=Sg508&deployment=MooseT02_09
Technical contact	ups855.liste.glidertech@cnrs.fr

Figure 1 : Mission flight path

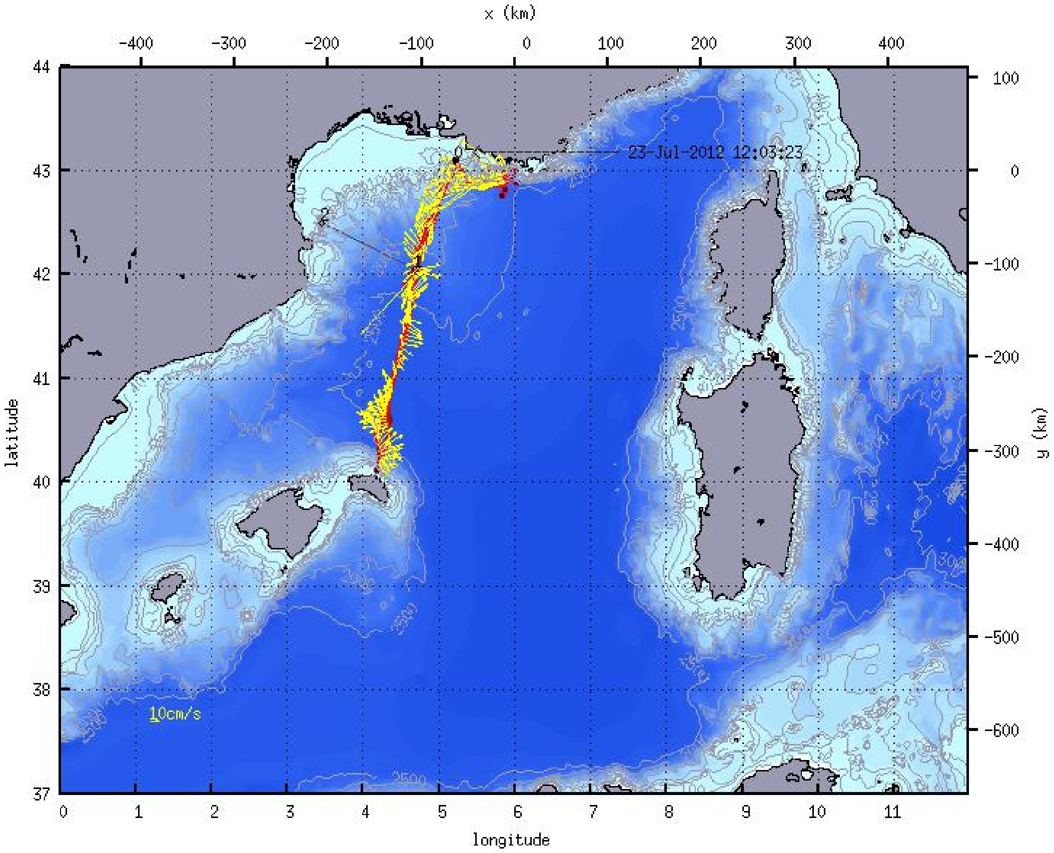
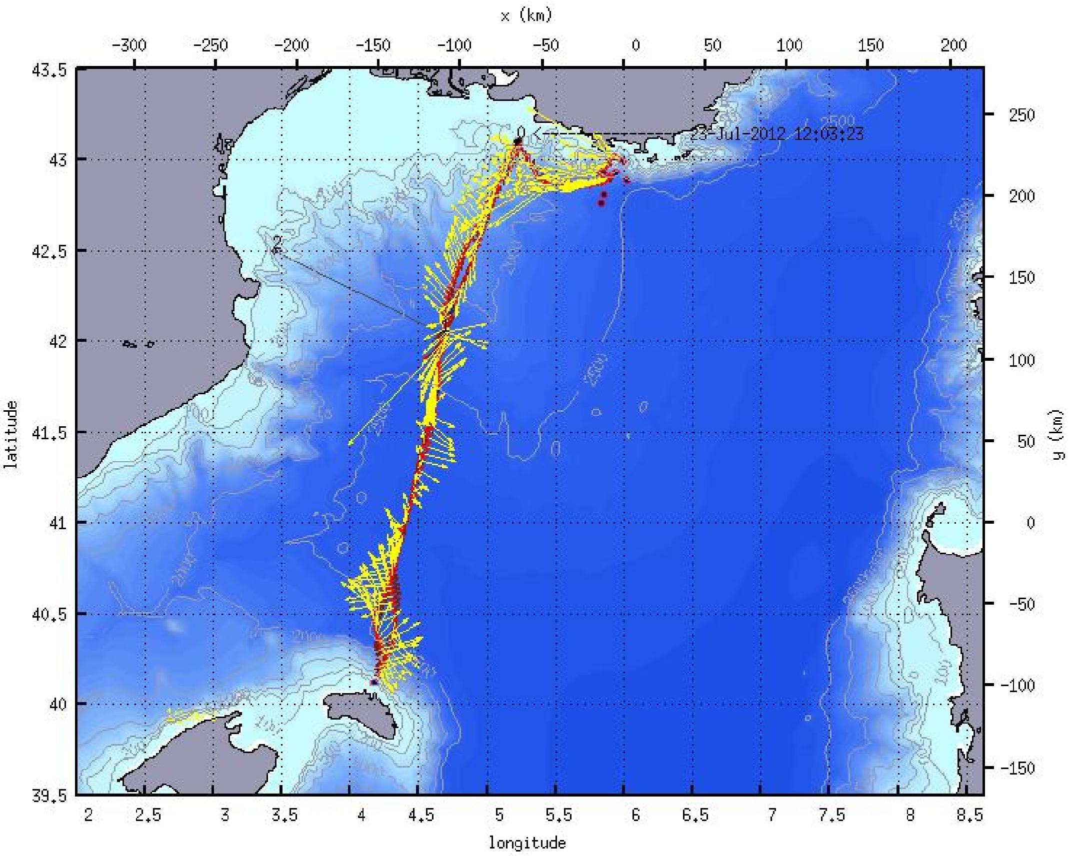


Figure 2 : Mission flight path



Glider deployment report

Mission	MooseT00_19
Platform	Slocum open ocean glider
Platform ID	Tintin (serial 124)
Start date	2012-06-13 08:23:57
End date	2012-09-11 05:59:12
Area	North West Mediterranean Observatory
Objective	The proposed research is based on the monitoring of the long term evolution of the North Western Mediterranean Sea with glider repeat-sections carried out in the framework of the ALLENVI/INSU/ SOERE MOOSE (http://moose-network.fr), INSU/MISTRALS (http://www.mistrals-home.org), and EU FP7 PERSEUS (http://www.perseus-net.eu). The objective is to monitor the oceanographic variability (physical and biogeochemical) of the north western Mediterranean Sea, over a continuum of spatial and temporal scales. Two cross-basin repeat-sections with a repeat rate of about 10-20 days allow to monitor the main circulation features (Northern Current, North Balearic Front, Western Corsica Current) on a regular basis, as well as major processes such as winter intermediate and deep water formations and vernal blooms. The gliders regularly visit MOOSE moorings for cross-calibration purposes and to explore the variability around these moorings. i) T00 is a repeat-section between Nice and Calvi passing by the MOOSE mooring DYFAMED located in the central Ligurian Sea ii) T02 is a repeat-section between Marseille and Menorca passing by the MOOSE mooring LION located in the center of the deep convection area
Total days : 90	Total Navigation (km) : 1029
Related platforms/missions	Every other T00 missions

Glider deployment report

Sensors	Wetlabs bb2flslk V3 Calibration date : 2009-06-30T11:29:38 Measured parameters : BBP880, BBP715, FLUORESCENCE_PE, Unknown bb2flslk V5 Calibration date : 2008-10-02T11:01:16 Measured parameters : BBP532, CDOM, BBP660, Wetlabs bb2flslk V4 Calibration date : 2008-05-01T16:52:12 Measured parameters : FLUORESCENCE_CHLA, BBP470, BBP412, Teledyne Webb research Oxy 5013 Calibration date : 2009-03-04T11:02:19 Measured parameters : MOLAR_DOXY, TEMP_DOXY, BPHASE_DOXY, DPHASE_DOXY,
Number of profiles	860
Events	
Mission Summary	https://gfcp.ego-network.org/gliders/Tintin/MooseT00_19/logbook
PI	Pierre Testor / Laurent Coppola
Institute (owner of the glider)	LOV
Project affiliation	MOOSE
Glider software version	Navigation software version : 7.9 Science software version :
Number of Iridium connections	237
RT Data transmitted by Iridium	577 navigation files (9.2M) 577 science files (11M)
DM Data downloaded from glider	
Data available from	http://www.ifremer.fr/co/ego/ego/Tintin
Calibrations	https://gfcp.ego-network.org/gliders/Tintin/MooseT00_19/info/tintin_mooset00_19.json
Battery type	Lithium Battery packs : 1 x WILPA1727 + 1 x WILPA1726
Batteries	Initial batteries voltage : V Final batteries voltage : V Batteries consumption : Ah

Glider deployment report

Full post mission report	https://glider83a.dt.insu.cnrs.fr/deployment_report.php?glider=Tintin&deployment=MooseT00_19
Technical contact	ups855.liste.glidertech@cnrs.fr

Figure 1 : Mission flight path

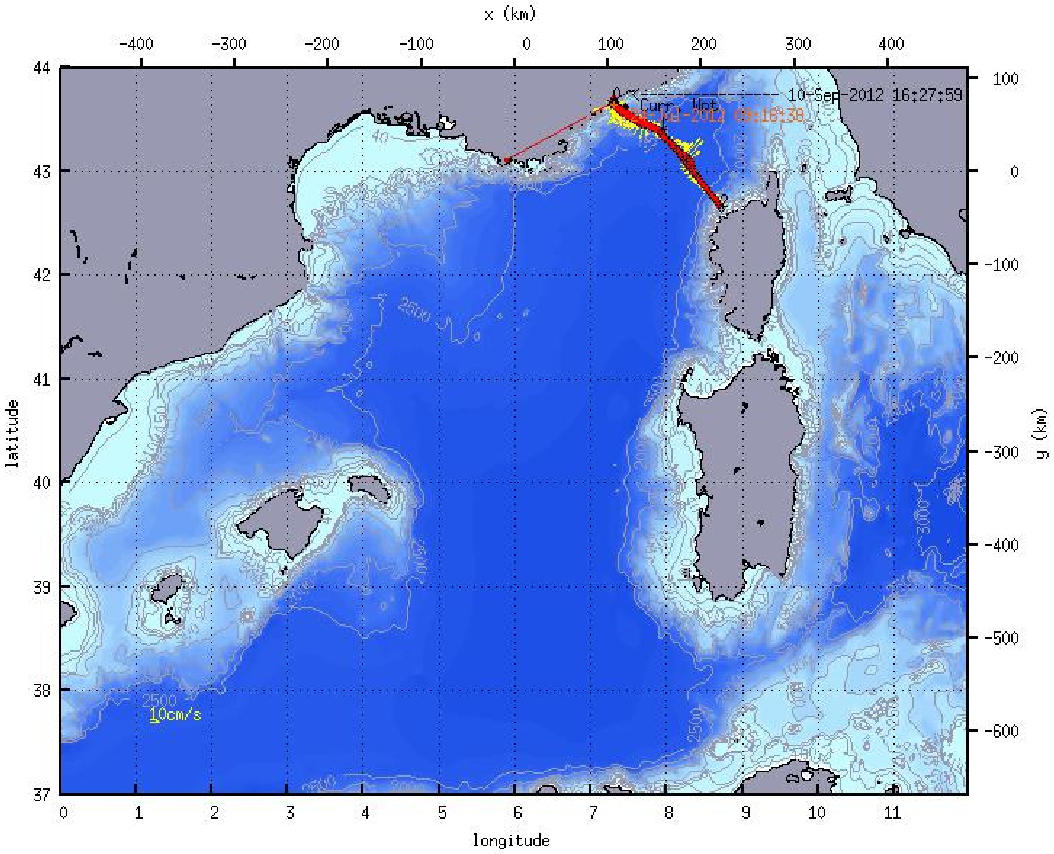
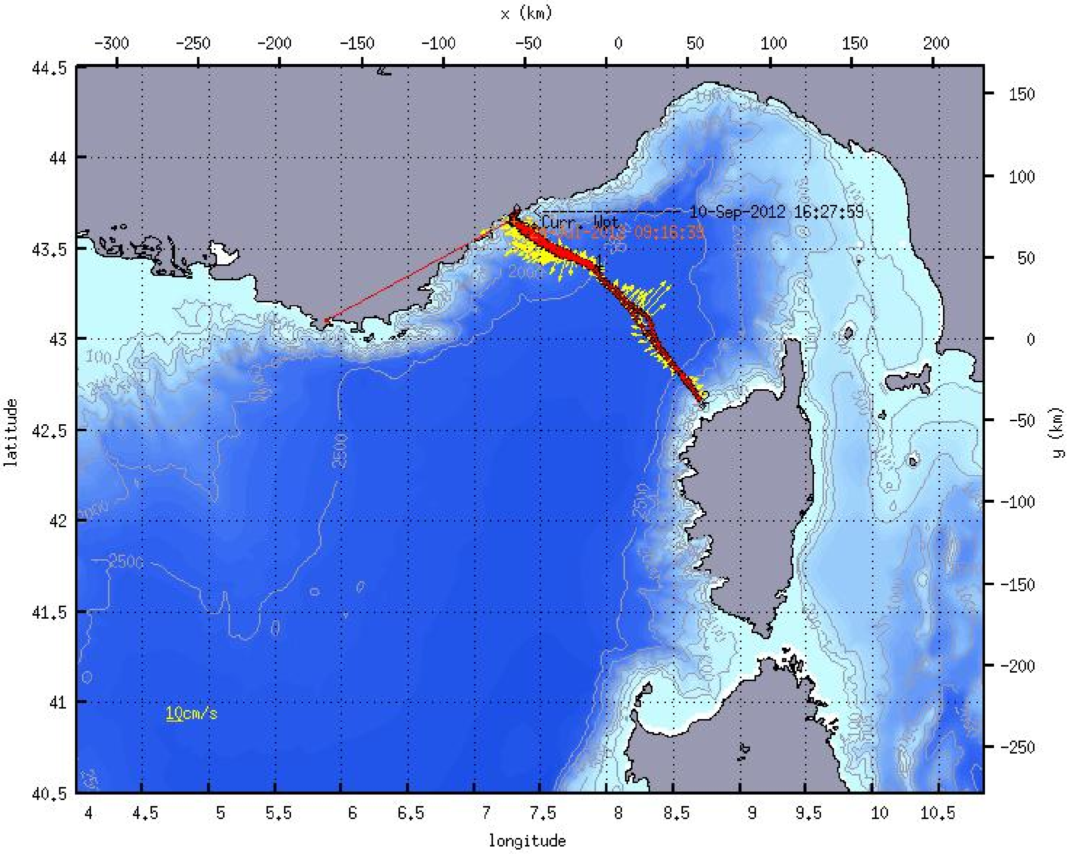


Figure 2 : Mission flight path



Glider deployment report

Mission	MooseT00_20
Platform	Slocum open ocean glider
Platform ID	Bonpland (serial 142)
Start date	2012-08-28 14:27:52
End date	2012-09-03 04:31:50
Area	North West Mediterranean Observatory
Objective	The proposed research is based on the monitoring of the long term evolution of the North Western Mediterranean Sea with glider repeat-sections carried out in the framework of the ALLENVI/INSU/ SOERE MOOSE (http://moose-network.fr), INSU/MISTRALS (http://www.mistrals-home.org), and EU FP7 PERSEUS (http://www.perseus-net.eu). The objective is to monitor the oceanographic variability (physical and biogeochemical) of the north western Mediterranean Sea, over a continuum of spatial and temporal scales. Two cross-basin repeat-sections with a repeat rate of about 10-20 days allow to monitor the main circulation features (Northern Current, North Balearic Front, Western Corsica Current) on a regular basis, as well as major processes such as winter intermediate and deep water formations and vernal blooms. The gliders regularly visit MOOSE moorings for cross-calibration purposes and to explore the variability around these moorings. i) T00 is a repeat-section between Nice and Calvi passing by the MOOSE mooring DYFAMED located in the central Ligurian Sea ii) T02 is a repeat-section between Marseille and Menorca passing by the MOOSE mooring LION located in the center of the deep convection area
Total days : 6	Total Navigation (km) : 141
Related platforms/missions	Every other T00 missions

Glider deployment report

Sensors	Wetlabs bb2flslk V4 Calibration date : 2010-08-02T11:54:51 Measured parameters : FLUORESCENCE_CHLA, BBP470, BBP412, Wetlabs bb2flslk V5 Calibration date : 2010-06-18T16:47:29 Measured parameters : BBP532, CDOM, BBP660, Teledyne Webb research CTD 41cp Calibration date : 2001-10-30T18:45:27 Measured parameters : TEMP, CNDC, PRES, Satlantic Inc. SUNA Calibration date : Measured parameters : MOLAR_NITRATE, Aanderaa Oxy 5013 Calibration date : 2012-05-23T12:41:40 Measured parameters : MOLAR_DOXY, TEMP_DOXY, BPHASE_DOXY, DPHASE_DOXY,
Number of profiles	58
Events	
Mission Summary	https://gfcp.ego-network.org/gliders/Bonpland/MooseT00_20/logbook
PI	Pierre Testor / Laurent Coppola
Institute (owner of the glider)	DT INSU
Project affiliation	MOOSE
Glider software version	Navigation software version : 7.9 Science software version :
Number of Iridium connections	123
RT Data transmitted by Iridium	63 navigation files (2.3M) 47 science files (1.5M)
DM Data downloaded from glider	
Data available from	http://www.ifremer.fr/co/ego/ego/Bonpland
Calibrations	https://gfcp.ego-network.org/gliders/Bonpland/MooseT00_20/info/bonpland_mooset00_20.json

Battery type	Lithium Battery packs : 1 x WILPA1727 + 1 x WILPA1726 + 1 x WILPA1727
Batteries	Initial batteries voltage : V Final batteries voltage : V Batteries consumption : Ah
Full post mission report	https://glider83a.dt.insu.cnrs.fr/deployment_report.php?glider=Bonpland&deployment=MooseT00_20
Technical contact	ups855.liste.glidertech@cnrs.fr

Figure 1 : Mission flight path

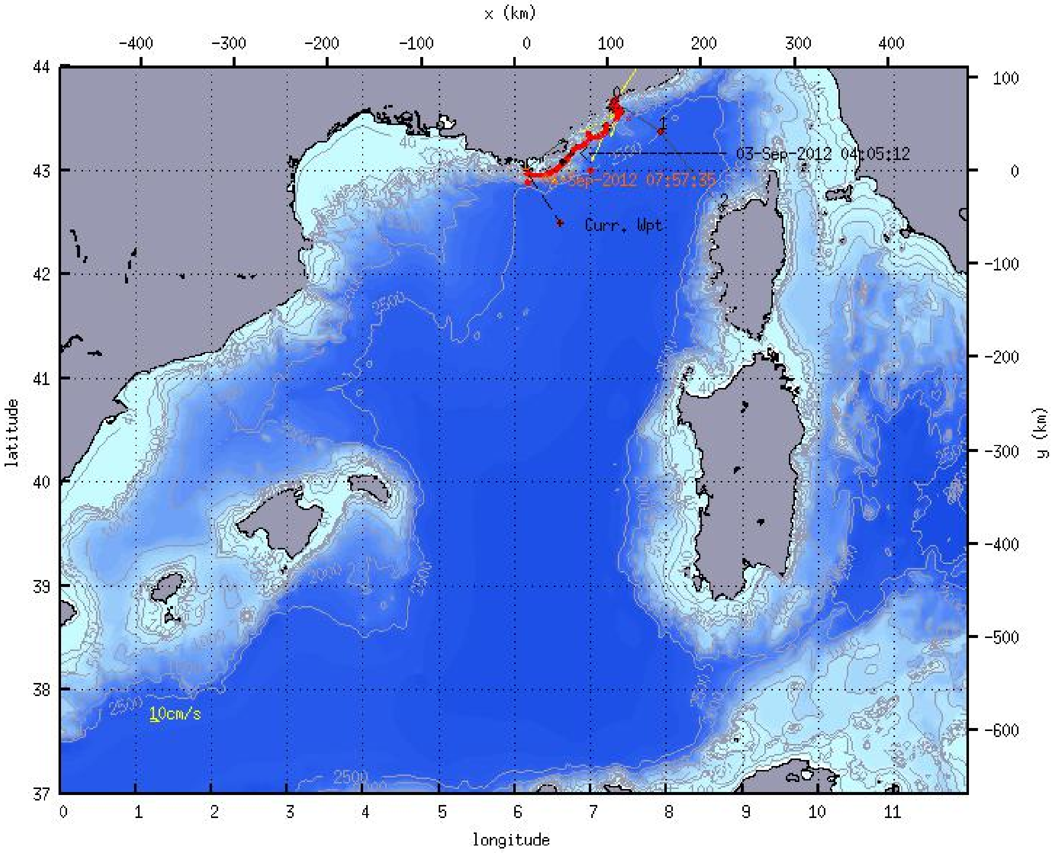
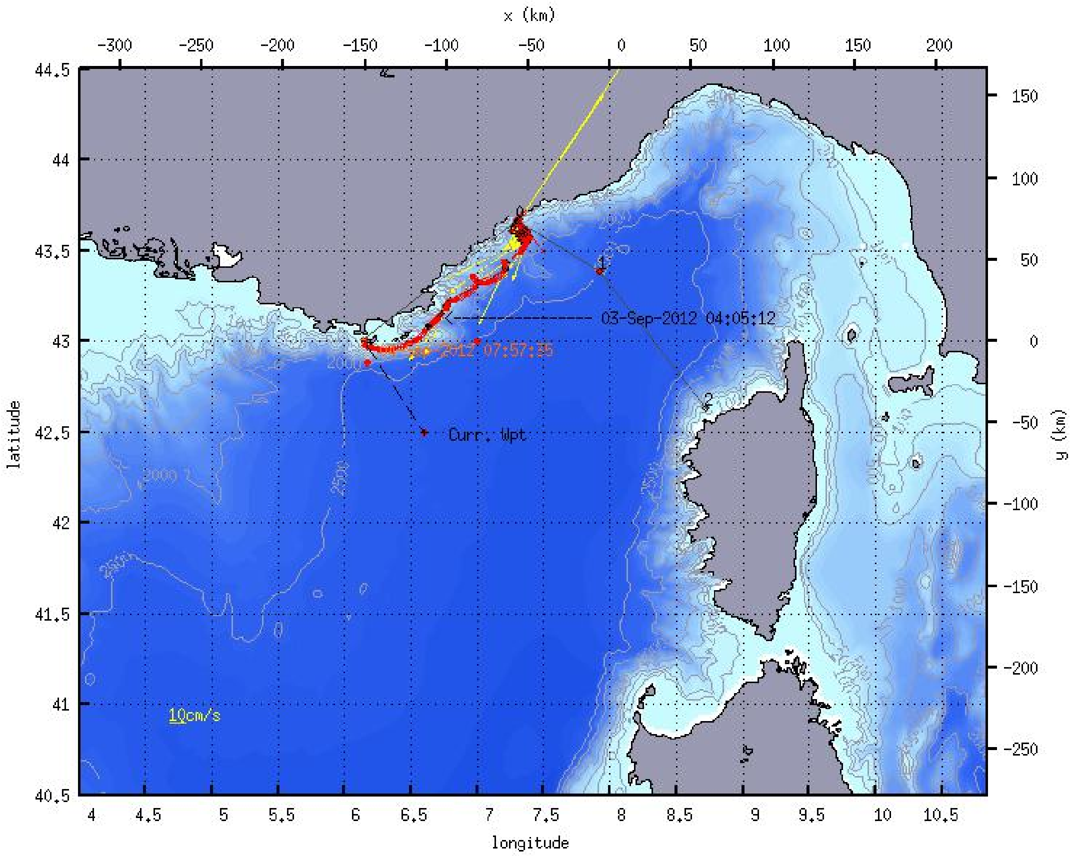


Figure 2 : Mission flight path



Glider deployment report

Mission	PerseusT02_00
Platform	Slocum open ocean glider
Platform ID	Eudoxus (serial 136)
Start date	2012-09-05 09:26:57
End date	2012-12-19 02:29:40
Area	North West Mediterranean Observatory
Objective	The proposed research is based on the monitoring of the long term evolution of the North Western Mediterranean Sea with glider repeat-sections carried out in the framework of the ALLENVI/INSU/ SOERE MOOSE (http://moose-network.fr), INSU/MISTRALS (http://www.mistrals-home.org), and EU FP7 PERSEUS (http://www.perseus-net.eu). The objective is to monitor the oceanographic variability (physical and biogeochemical) of the north western Mediterranean Sea, over a continuum of spatial and temporal scales. Two cross-basin repeat-sections with a repeat rate of about 10-20 days allow to monitor the main circulation features (Northern Current, North Balearic Front, Western Corsica Current) on a regular basis, as well as major processes such as winter intermediate and deep water formations and vernal blooms. The gliders regularly visit MOOSE moorings for cross-calibration purposes and to explore the variability around these moorings. i) T00 is a repeat-section between Nice and Calvi passing by the MOOSE mooring DYFAMED located in the central Ligurian Sea ii) T02 is a repeat-section between Marseille and Menorca passing by the MOOSE mooring LION located in the center of the deep convection area
Total days : 105	Total Navigation (km) : 2147
Related platforms/missions	every other T02 missions
Sensors	Aanderaa Oxy 5013 Calibration date : 2012-02-25T17:48:22 Measured parameters : MOLAR_DOXY, TEMP_DOXY, BPHASE_DOXY, DPHASE_DOXY,
Number of profiles	598
Events	
Mission Summary	https://gfcp.ego-network.org/gliders/Eudoxus/PerseusT02_00/logbook
PI	Pierre Testor
Institute (owner of the glider)	ENSTA
Project affiliation	PERSEUS
Glider software version	Navigation software version : V 7.10 Science software version :

Glider deployment report

Number of Iridium connections	598
RT Data transmitted by Iridium	1854 navigation files (27M) 1678 science files (25M)
DM Data downloaded from glider	
Data available from	http://www.ifremer.fr/co/ego/ego/Eudoxus
Calibrations	https://gfcp.ego-network.org/gliders/Eudoxus/PerseusT02_00/info/eudoxus_perseust02_00.json
Battery type	Lithium Battery packs : 0 x None + 1 x WILPA1726 + 1 x WILPA1727
Batteries	Initial batteries voltage : V Final batteries voltage : V Batteries consumption : Ah
Full post mission report	https://glider83a.dt.insu.cnrs.fr/deployment_report.php?glider=Eudoxus&deployment=PerseusT02_00
Technical contact	ups855.liste.glidertech@cnrs.fr

Figure 1 : Mission flight path

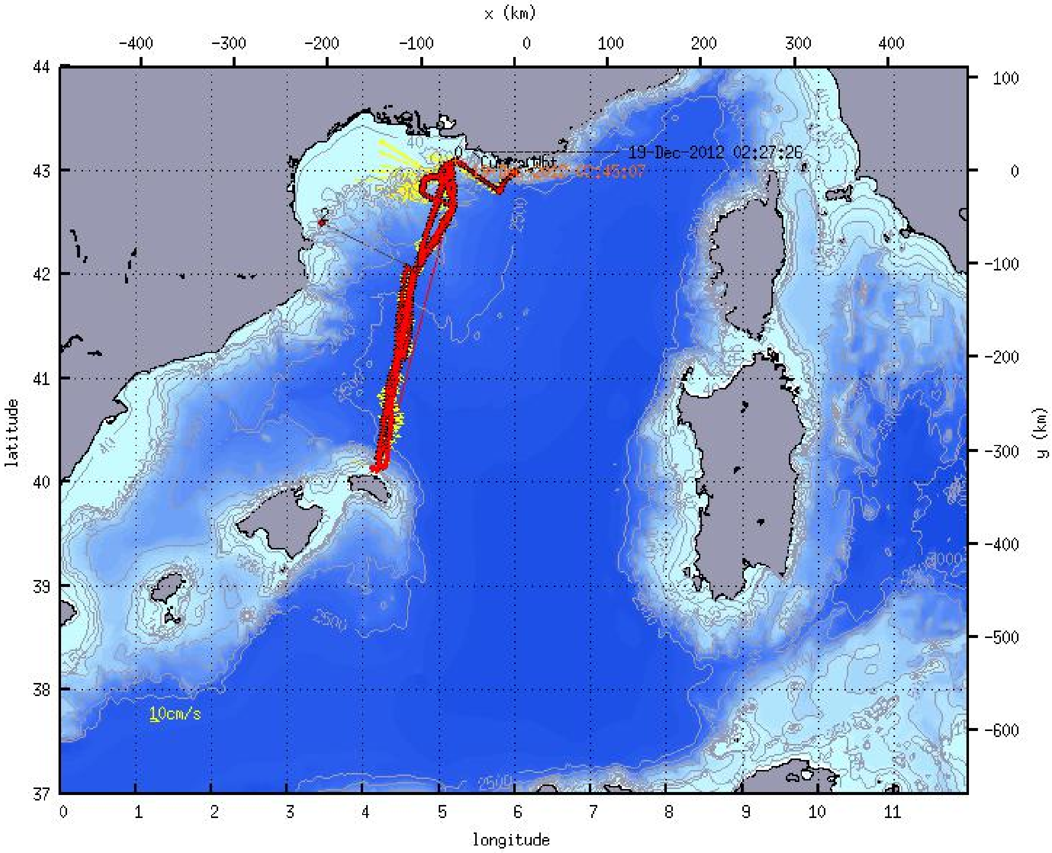
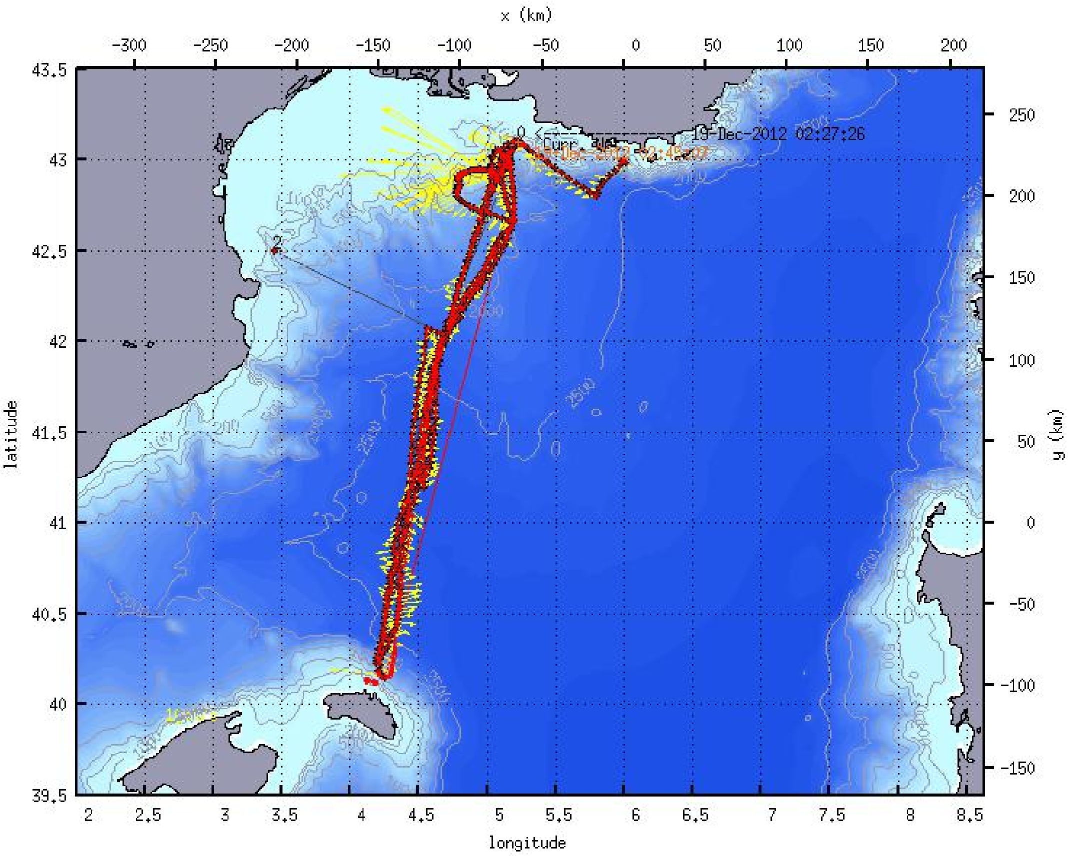


Figure 2 : Mission flight path



Glider deployment report

Mission	MooseT00_22
Platform	Slocum open ocean glider
Platform ID	Bonpland (serial 142)
Start date	2012-11-14 10:28:47
End date	2012-12-19 00:28:28
Area	North West Mediterranean Observatory
Objective	The proposed research is based on the monitoring of the long term evolution of the North Western Mediterranean Sea with glider repeat-sections carried out in the framework of the ALLENVI/INSU/ SOERE MOOSE (http://moose-network.fr), INSU/MISTRALS (http://www.mistrals-home.org), and EU FP7 PERSEUS (http://www.perseus-net.eu). The objective is to monitor the oceanographic variability (physical and biogeochemical) of the north western Mediterranean Sea, over a continuum of spatial and temporal scales. Two cross-basin repeat-sections with a repeat rate of about 10-20 days allow to monitor the main circulation features (Northern Current, North Balearic Front, Western Corsica Current) on a regular basis, as well as major processes such as winter intermediate and deep water formations and vernal blooms. The gliders regularly visit MOOSE moorings for cross-calibration purposes and to explore the variability around these moorings. i) T00 is a repeat-section between Nice and Calvi passing by the MOOSE mooring DYFAMED located in the central Ligurian Sea ii) T02 is a repeat-section between Marseille and Menorca passing by the MOOSE mooring LION located in the center of the deep convection area
Total days : 35	Total Navigation (km) : 911
Related platforms/missions	Every other T00 missions

Sensors	Wetlabs bb2flslk V4 Calibration date : 2010-08-02T11:54:51 Measured parameters : FLUORESCENCE_CHLA, BBP470, BBP412, Wetlabs bb2flslk V5 Calibration date : 2010-06-18T16:47:29 Measured parameters : BBP532, CDOM, BBP660, Teledyne Webb research CTD 41cp Calibration date : 2001-10-30T18:45:27 Measured parameters : TEMP, CNDC, PRES, Satlantic Inc. SUNA Calibration date : Measured parameters : MOLAR_NITRATE, Aanderaa Oxy 5013 Calibration date : 2012-05-23T12:41:40 Measured parameters : MOLAR_DOXY, TEMP_DOXY, BPHASE_DOXY, DPHASE_DOXY,
Number of profiles	665
Events	
Mission Summary	https://gfcp.ego-network.org/gliders/Bonpland/MooseT00_22/logbook
PI	Pierre Testor / Laurent Coppola
Institute (owner of the glider)	DT INSU
Project affiliation	MOOSE
Glider software version	Navigation software version : 7.9 Science software version :
Number of Iridium connections	275
RT Data transmitted by Iridium	729 navigation files (11M) 714 science files (15M)
DM Data downloaded from glider	
Data available from	http://www.ifremer.fr/co/ego/ego/Bonpland
Calibrations	https://gfcp.ego-network.org/gliders/Bonpland/MooseT00_22/info/bonpland_mooset00_22.json

Battery type	Lithium Battery packs : 1 x WILPA1727 + 1 x WILPA1726 + 1 x WILPA1727
Batteries	Initial batteries voltage : V Final batteries voltage : V Batteries consumption : Ah
Full post mission report	https://glider83a.dt.insu.cnrs.fr/deployment_report.php?glider=Bonpland&deployment=MooseT00_22
Technical contact	ups855.liste.glidertech@cnrs.fr

Figure 1 : Mission flight path

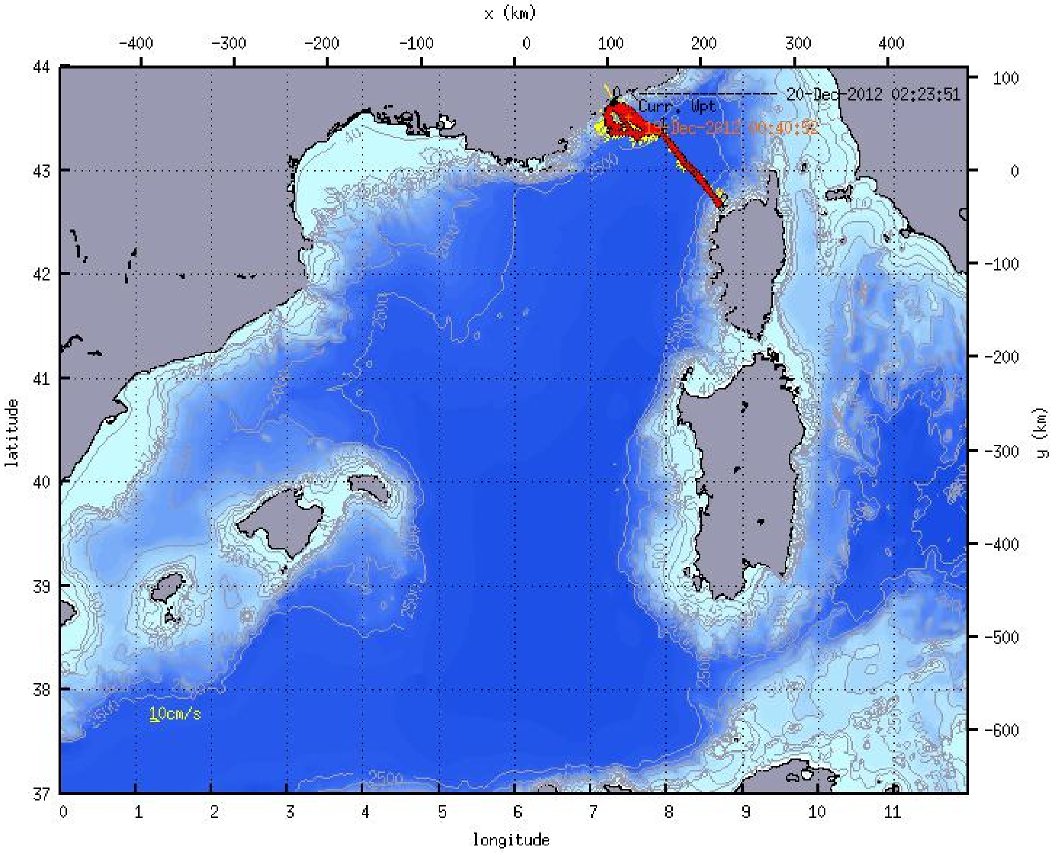
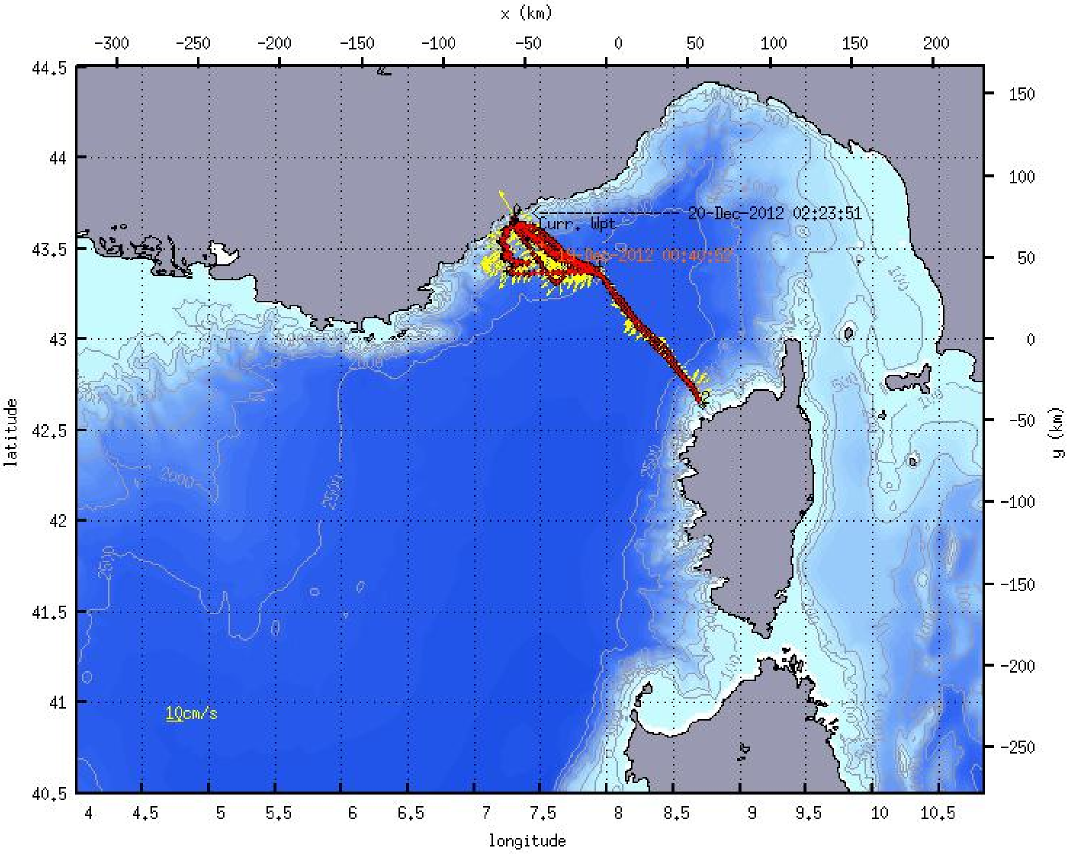


Figure 2 : Mission flight path



Glider deployment report

Mission	MooseT00_23
Platform	Slocum open ocean glider
Platform ID	Tintin (serial 124)
Start date	2013-01-08 13:36:37
End date	2013-02-28 13:59:56
Area	North West Mediterranean Observatory
Objective	The proposed research is based on the monitoring of the long term evolution of the North Western Mediterranean Sea with glider repeat-sections carried out in the framework of the ALLENVI/INSU/ SOERE MOOSE (http://moose-network.fr), INSU/MISTRALS (http://www.mistrals-home.org), and EU FP7 PERSEUS (http://www.perseus-net.eu). The objective is to monitor the oceanographic variability (physical and biogeochemical) of the north western Mediterranean Sea, over a continuum of spatial and temporal scales. Two cross-basin repeat-sections with a repeat rate of about 10-20 days allow to monitor the main circulation features (Northern Current, North Balearic Front, Western Corsica Current) on a regular basis, as well as major processes such as winter intermediate and deep water formations and vernal blooms. The gliders regularly visit MOOSE moorings for cross-calibration purposes and to explore the variability around these moorings. i) T00 is a repeat-section between Nice and Calvi passing by the MOOSE mooring DYFAMED located in the central Ligurian Sea ii) T02 is a repeat-section between Marseille and Menorca passing by the MOOSE mooring LION located in the center of the deep convection area
Total days : 51	Total Navigation (km) : 1358
Related platforms/missions	Every other T00 missions

Glider deployment report

Sensors	Wetlabs bb2flslk V3 Calibration date : 2009-06-30T11:29:38 Measured parameters : BBP880, BBP715, FLUORESCENCE_PE, Unknown bb2flslk V5 Calibration date : 2008-10-02T11:01:16 Measured parameters : BBP532, CDOM, BBP660, Wetlabs bb2flslk V4 Calibration date : 2008-05-01T16:52:12 Measured parameters : FLUORESCENCE_CHLA, BBP470, BBP412, Teledyne Webb research Oxy 5013 Calibration date : 2009-03-04T11:02:19 Measured parameters : MOLAR_DOXY, TEMP_DOXY, BPHASE_DOXY, DPHASE_DOXY,
Number of profiles	709
Events	
Mission Summary	https://gfcp.ego-network.org/gliders/Tintin/MooseT00_23/logbook
PI	Pierre Testor / Laurent Coppola
Institute (owner of the glider)	LOV
Project affiliation	MOOSE
Glider software version	Navigation software version : 7.9 Science software version :
Number of Iridium connections	359
RT Data transmitted by Iridium	1195 navigation files (19M) 1216 science files (24M)
DM Data downloaded from glider	
Data available from	http://www.ifremer.fr/co/ego/ego/Tintin
Calibrations	https://gfcp.ego-network.org/gliders/Tintin/MooseT00_23/info/tintin_mooset00_23.json
Battery type	Lithium Battery packs : 1 x WILPA1727 + 1 x WILPA1726
Batteries	Initial batteries voltage : V Final batteries voltage : V Batteries consumption : Ah

Glider deployment report

Full post mission report	https://glider83a.dt.insu.cnrs.fr/deployment_report.php?glider=Tintin&deployment=MooseT00_23
Technical contact	ups855.liste.glidertech@cnrs.fr

Figure 1 : Mission flight path

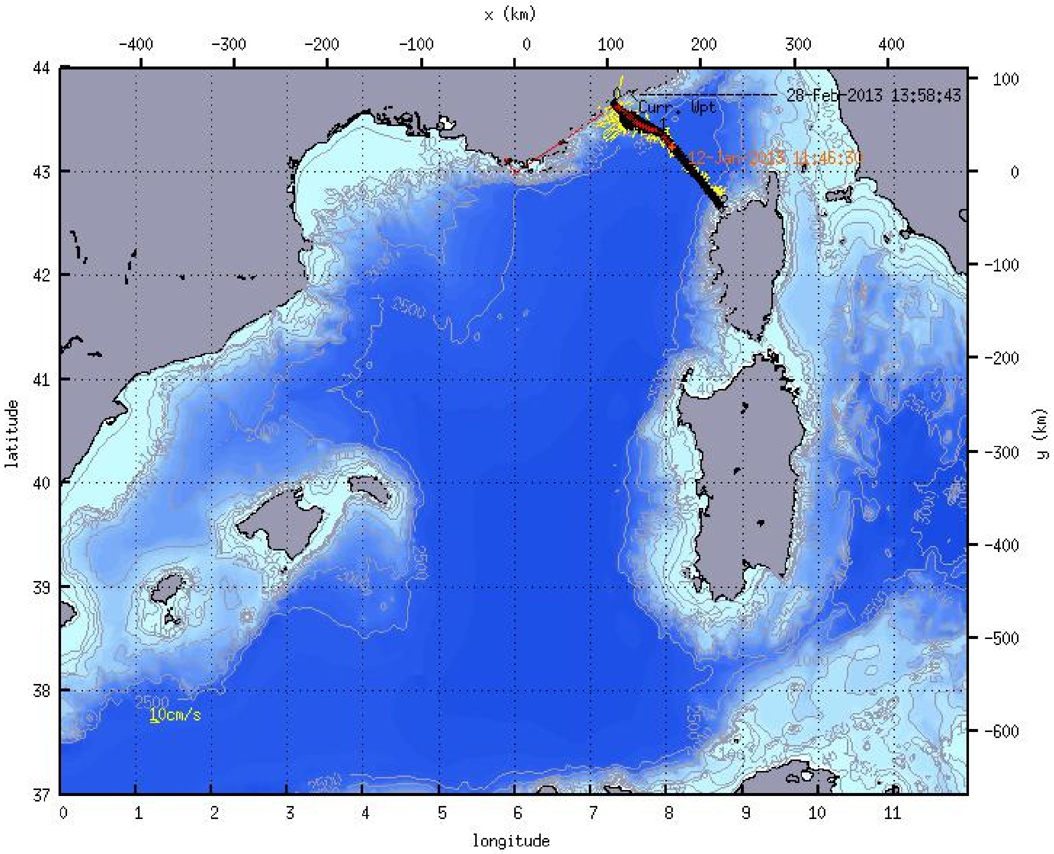
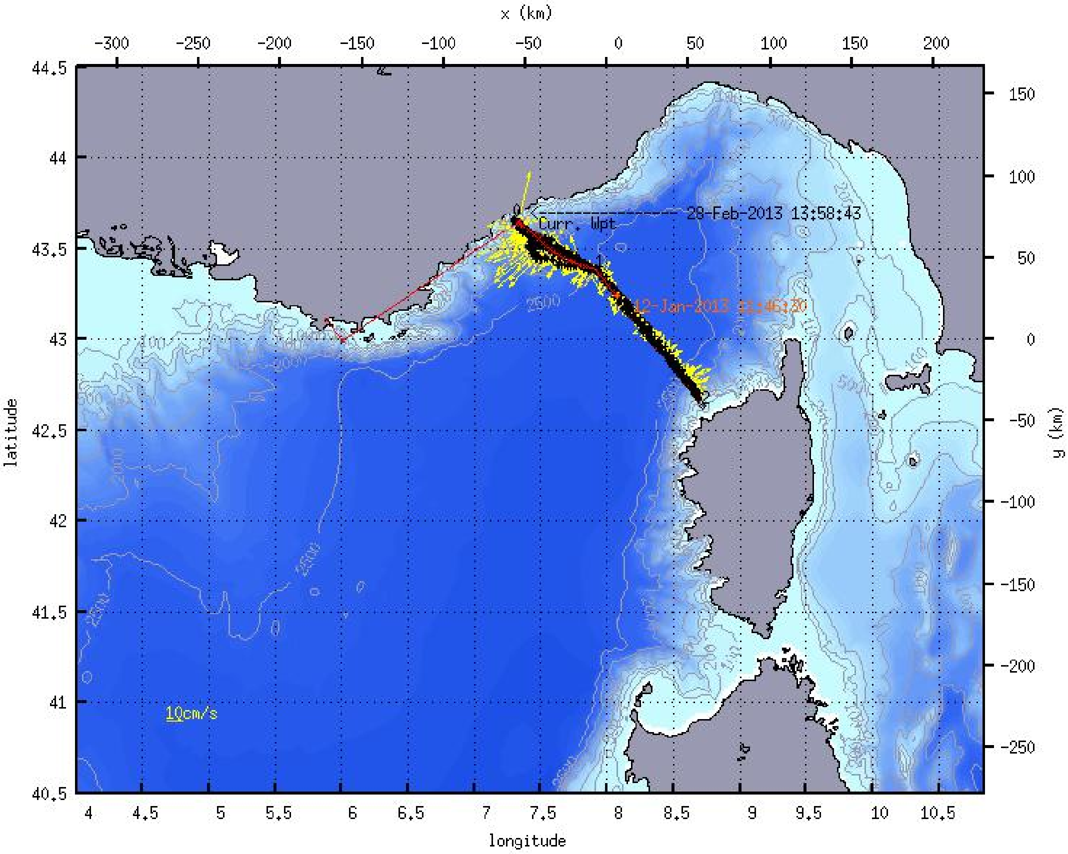


Figure 2 : Mission flight path



Glider deployment report

Mission	PerseusT02_01
Platform	Slocum open ocean glider
Platform ID	Eudoxus (serial 136)
Start date	2013-01-24 13:49:21
End date	2013-02-08 11:01:18
Area	North West Mediterranean Observatory
Objective	The proposed research is based on the monitoring of the long term evolution of the North Western Mediterranean Sea with glider repeat-sections carried out in the framework of the ALLENVI/INSU/ SOERE MOOSE (http://moose-network.fr), INSU/MISTRALS (http://www.mistrals-home.org), and EU FP7 PERSEUS (http://www.perseus-net.eu). The objective is to monitor the oceanographic variability (physical and biogeochemical) of the north western Mediterranean Sea, over a continuum of spatial and temporal scales. Two cross-basin repeat-sections with a repeat rate of about 10-20 days allow to monitor the main circulation features (Northern Current, North Balearic Front, Western Corsica Current) on a regular basis, as well as major processes such as winter intermediate and deep water formations and vernal blooms. The gliders regularly visit MOOSE moorings for cross-calibration purposes and to explore the variability around these moorings. i) T00 is a repeat-section between Nice and Calvi passing by the MOOSE mooring DYFAMED located in the central Ligurian Sea ii) T02 is a repeat-section between Marseille and Menorca passing by the MOOSE mooring LION located in the center of the deep convection area
Total days : 15	Total Navigation (km) : 359
Related platforms/missions	every other T02 missions
Sensors	Wetlabs bbfl2slk V1 Calibration date : 2012-11-28T11:57:29 Measured parameters : FLUORESCENCE_CHLA, BBP532, CDOM, Teledyne Webb research CTD 41cp Calibration date : 2008-10-03T10:15:24 Measured parameters : TEMP, CNDC, PRES, Aanderaa Oxy 5013 Calibration date : 2012-05-23T12:24:56 Measured parameters : MOLAR_DOXY, TEMP_DOXY, BPHASE_DOXY, DPHASE_DOXY,
Number of profiles	469
Events	

Glider deployment report

Mission Summary	https://gfcp.ego-network.org/gliders/Eudoxus/PerseusT02_01/logbook
PI	Pierre Testor
Institute (owner of the glider)	ENSTA
Project affiliation	PERSEUS
Glider software version	Navigation software version : V 7.10 Science software version :
Number of Iridium connections	154
RT Data transmitted by Iridium	360 navigation files (4.5M) 351 science files (5.0M)
DM Data downloaded from glider	
Data available from	http://www.ifremer.fr/co/ego/ego/Eudoxus
Calibrations	https://gfcp.ego-network.org/gliders/Eudoxus/PerseusT02_01/info/eudoxus_perseust02_01.json
Battery type	Lithium Battery packs : 0 x None + 1 x WILPA1726 + 1 x WILPA1727 + 1 x WILPA1727
Batteries	Initial batteries voltage : V Final batteries voltage : V Batteries consumption : Ah
Full post mission report	https://glider83a.dt.insu.cnrs.fr/deployment_report.php?glider=Eudoxus&deployment=PerseusT02_01
Technical contact	ups855.liste.glidertech@cnrs.fr

Figure 1 : Mission flight path

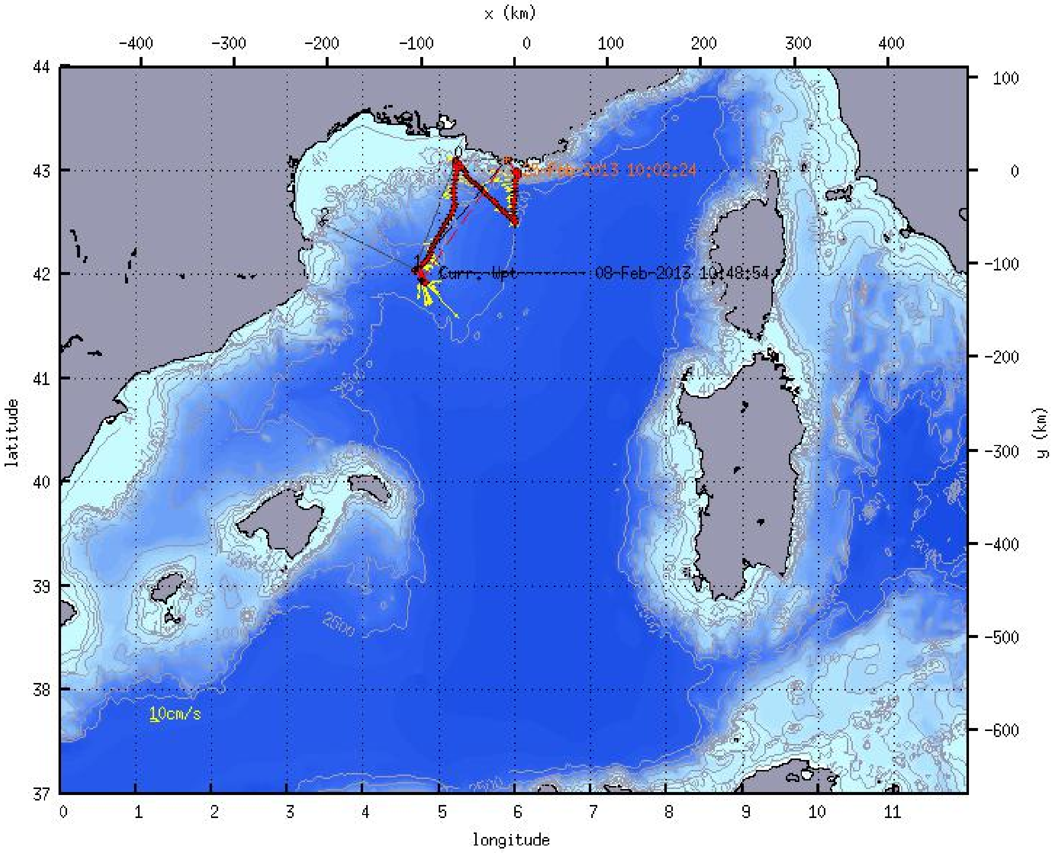
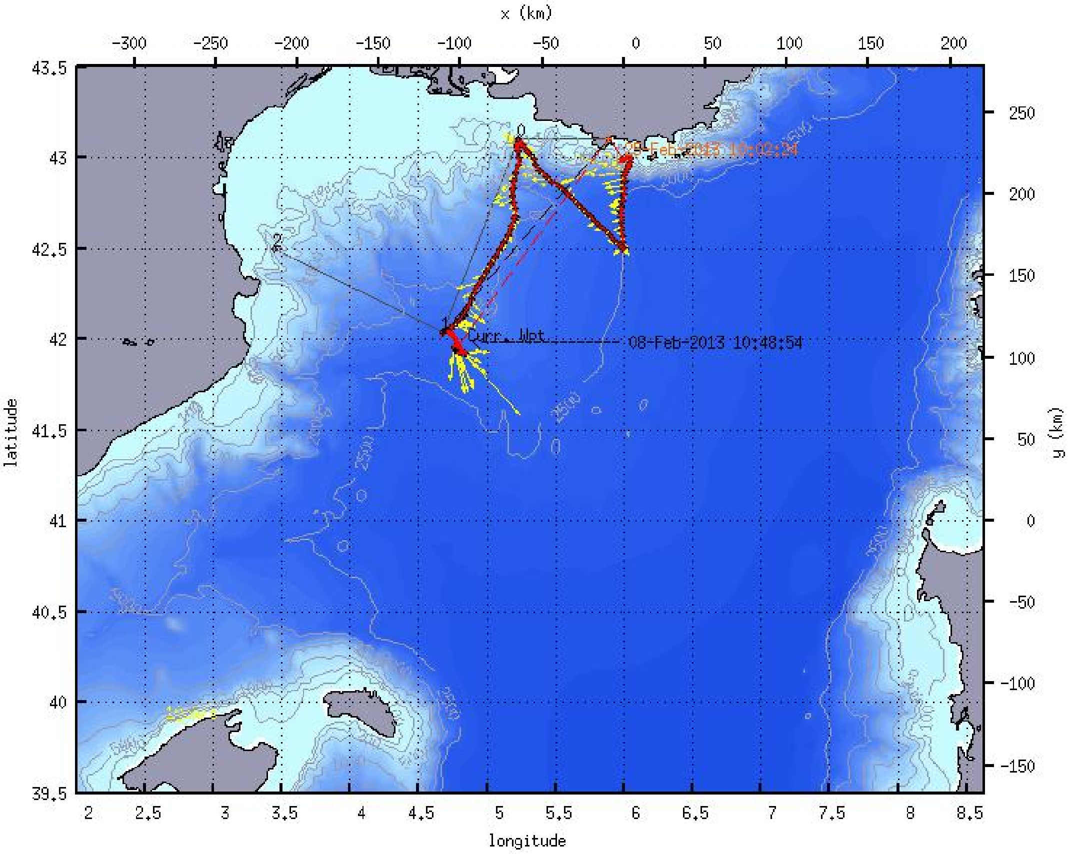


Figure 2 : Mission flight path



Glider deployment report

Mission	PerseusT02_02
Platform	Seaglider
Platform ID	Sg508 (serial 508)
Start date	2013-02-19 13:57:40
End date	2013-04-06 15:32:40
Area	North West Mediterranean Observatory
Objective	The proposed research is based on the monitoring of the long term evolution of the North Western Mediterranean Sea with glider repeat-sections carried out in the framework of the ALLENVI/INSU/ SOERE MOOSE (http://moose-network.fr), INSU/MISTRALS (http://www.mistrals-home.org), and EU FP7 PERSEUS (http://www.perseus-net.eu). The objective is to monitor the oceanographic variability (physical and biogeochemical) of the north western Mediterranean Sea, over a continuum of spatial and temporal scales. Two cross-basin repeat-sections with a repeat rate of about 10-20 days allow to monitor the main circulation features (Northern Current, North Balearic Front, Western Corsica Current) on a regular basis, as well as major processes such as winter intermediate and deep water formations and vernal blooms. The gliders regularly visit MOOSE moorings for cross-calibration purposes and to explore the variability around these moorings. i) T00 is a repeat-section between Nice and Calvi passing by the MOOSE mooring DYFAMED located in the central Ligurian Sea ii) T02 is a repeat-section between Marseille and Menorca passing by the MOOSE mooring LION located in the center of the deep convection area
Total days : 46	Total Navigation (km) : 829
Related platforms/missions	every other T02 missions
Sensors	
Number of profiles	509
Events	
Mission Summary	https://gfcp.ego-network.org/gliders/Sg508/PerseusT02_02/logbook
PI	Pierre Testor
Institute (owner of the glider)	
Project affiliation	PERSEUS
Glider software version	Navigation software version : Science software version :
Number of Iridium connections	446
RT Data transmitted by Iridium	navigation files () science files ()

Glider deployment report

DM Data downloaded from glider	
Data available from	http://www.ifremer.fr/co/ego/ego/Sg508
Calibrations	https://gfcp.ego-network.org/gliders/Sg508/PerseusT02_02/info/sg508_perseust02_02.json
Battery type	Battery packs :
Batteries	Initial batteries voltage : V Final batteries voltage : V Batteries consumption : Ah
Full post mission report	https://glider83a.dt.insu.cnrs.fr/deployment_report.php?glider=Sg508&deployment=PerseusT02_02
Technical contact	ups855.liste.glidertech@cnrs.fr

Figure 1 : Mission flight path

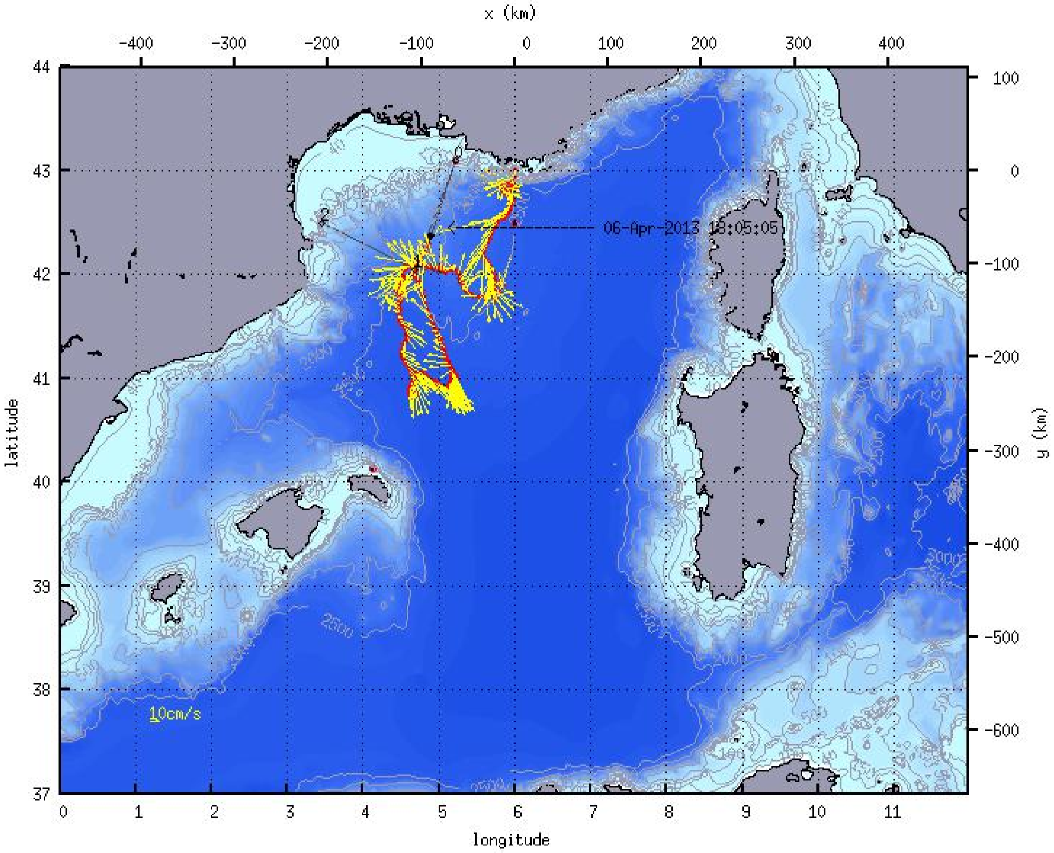
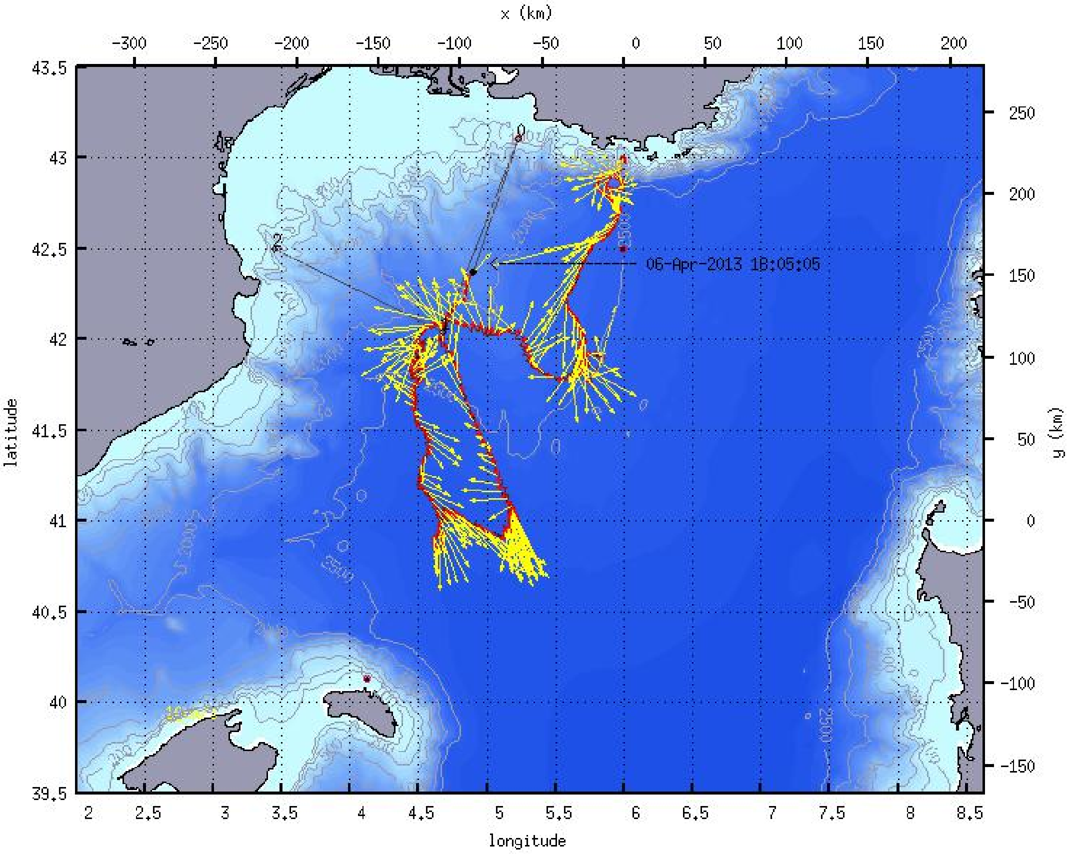


Figure 2 : Mission flight path



Glider deployment report

Mission	MooseT00_24
Platform	Slocum open ocean glider
Platform ID	Bonpland (serial 142)
Start date	2013-02-25 10:26:17
End date	2013-03-06 16:45:59
Area	North West Mediterranean Observatory
Objective	The proposed research is based on the monitoring of the long term evolution of the North Western Mediterranean Sea with glider repeat-sections carried out in the framework of the ALLENVI/INSU/ SOERE MOOSE (http://moose-network.fr), INSU/MISTRALS (http://www.mistrals-home.org), and EU FP7 PERSEUS (http://www.perseus-net.eu). The objective is to monitor the oceanographic variability (physical and biogeochemical) of the north western Mediterranean Sea, over a continuum of spatial and temporal scales. Two cross-basin repeat-sections with a repeat rate of about 10-20 days allow to monitor the main circulation features (Northern Current, North Balearic Front, Western Corsica Current) on a regular basis, as well as major processes such as winter intermediate and deep water formations and vernal blooms. The gliders regularly visit MOOSE moorings for cross-calibration purposes and to explore the variability around these moorings. i) T00 is a repeat-section between Nice and Calvi passing by the MOOSE mooring DYFAMED located in the central Ligurian Sea ii) T02 is a repeat-section between Marseille and Menorca passing by the MOOSE mooring LION located in the center of the deep convection area
Total days : 9	Total Navigation (km) : 194
Related platforms/missions	Every other T00 missions

Sensors	Wetlabs bb2flslk V4 Calibration date : 2010-08-02T11:54:51 Measured parameters : FLUORESCENCE_CHLA, BBP470, BBP412, Teledyne Webb research bb2flslk V6 Calibration date : 2009-10-05T11:32:13 Measured parameters : BBP532, CDOM, BBP880, Teledyne Webb research CTD 41cp Calibration date : 2001-10-30T18:45:27 Measured parameters : TEMP, CNDC, PRES, Satlantic Inc. SUNA Calibration date : Measured parameters : MOLAR_NITRATE, Aanderaa Oxy 5013 Calibration date : 2012-05-23T12:41:40 Measured parameters : MOLAR_DOXY, TEMP_DOXY, BPHASE_DOXY, DPHASE_DOXY,
Number of profiles	104
Events	
Mission Summary	https://gfcp.ego-network.org/gliders/Bonpland/MooseT00_24/logbook
PI	Pierre Testor / Laurent Coppola
Institute (owner of the glider)	DT INSU
Project affiliation	MOOSE
Glider software version	Navigation software version : 7.9 Science software version :
Number of Iridium connections	193
RT Data transmitted by Iridium	162 navigation files (3.0M) 136 science files (1.7M)
DM Data downloaded from glider	
Data available from	http://www.ifremer.fr/co/ego/ego/Bonpland
Calibrations	https://gfcp.ego-network.org/gliders/Bonpland/MooseT00_24/info/bonpland_mooset00_24.json

Battery type	Lithium Battery packs : 1 x WILPA1727 + 1 x WILPA1726 + 1 x WILPA1727
Batteries	Initial batteries voltage : V Final batteries voltage : V Batteries consumption : Ah
Full post mission report	https://glider83a.dt.insu.cnrs.fr/deployment_report.php?glider=Bonpland&deployment=MooseT00_24
Technical contact	ups855.liste.glidertech@cnrs.fr

Figure 1 : Mission flight path

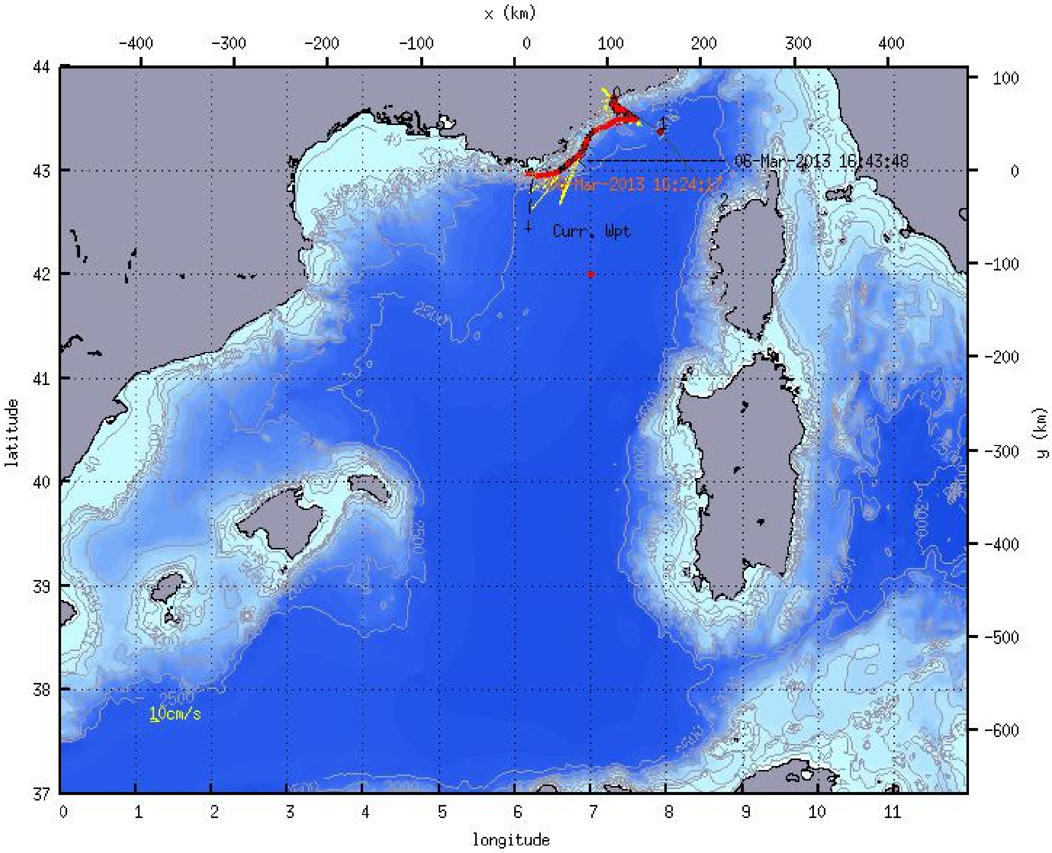
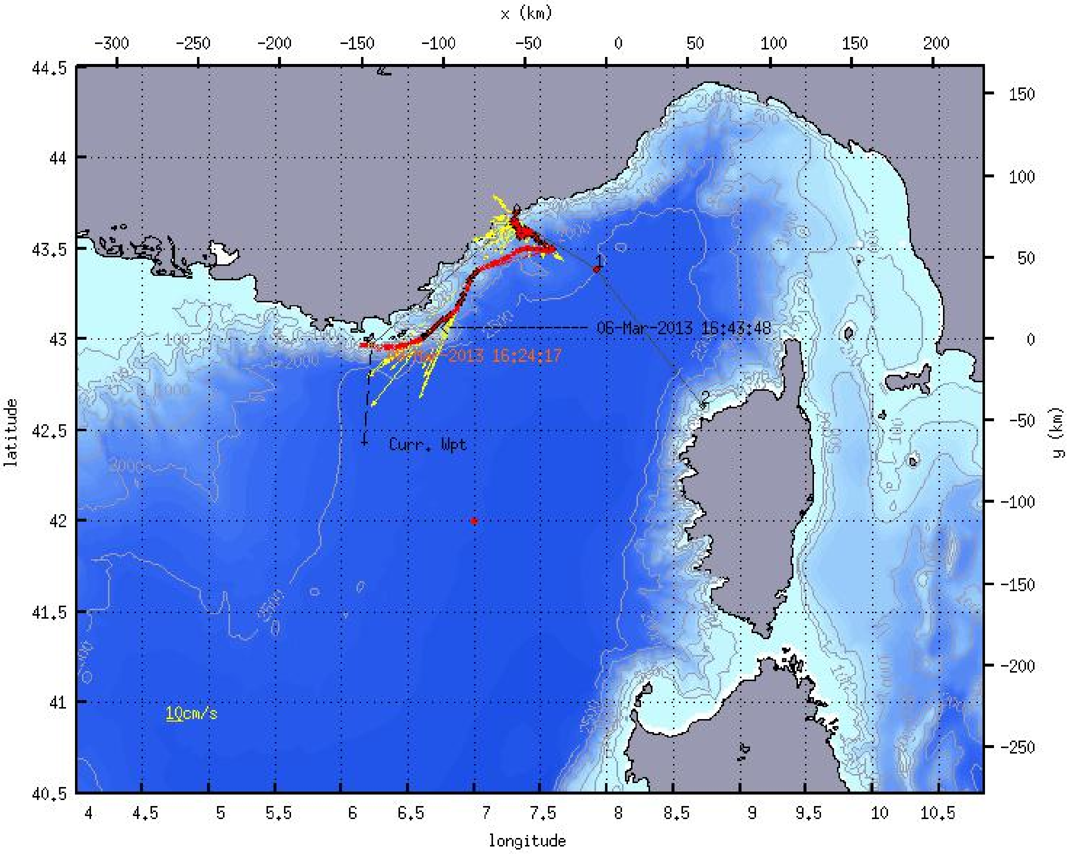


Figure 2 : Mission flight path



Glider deployment report

Mission	MooseT00_25
Platform	Slocum open ocean glider
Platform ID	Tintin (serial 124)
Start date	2013-03-12 10:49:55
End date	2013-04-30 12:29:42
Area	North West Mediterranean Observatory
Objective	The proposed research is based on the monitoring of the long term evolution of the North Western Mediterranean Sea with glider repeat-sections carried out in the framework of the ALLENVI/INSU/ SOERE MOOSE (http://moose-network.fr), INSU/MISTRALS (http://www.mistrals-home.org), and EU FP7 PERSEUS (http://www.perseus-net.eu). The objective is to monitor the oceanographic variability (physical and biogeochemical) of the north western Mediterranean Sea, over a continuum of spatial and temporal scales. Two cross-basin repeat-sections with a repeat rate of about 10-20 days allow to monitor the main circulation features (Northern Current, North Balearic Front, Western Corsica Current) on a regular basis, as well as major processes such as winter intermediate and deep water formations and vernal blooms. The gliders regularly visit MOOSE moorings for cross-calibration purposes and to explore the variability around these moorings. i) T00 is a repeat-section between Nice and Calvi passing by the MOOSE mooring DYFAMED located in the central Ligurian Sea ii) T02 is a repeat-section between Marseille and Menorca passing by the MOOSE mooring LION located in the center of the deep convection area
Total days : 49	Total Navigation (km) : 1040
Related platforms/missions	Every other T00 missions

Glider deployment report

Sensors	Wetlabs bb2flslk V3 Calibration date : 2009-06-30T11:29:38 Measured parameters : BBP880, BBP715, FLUORESCENCE_PE, Unknown bb2flslk V5 Calibration date : 2008-10-02T11:01:16 Measured parameters : BBP532, CDOM, BBP660, Wetlabs bb2flslk V4 Calibration date : 2008-05-01T16:52:12 Measured parameters : FLUORESCENCE_CHLA, BBP470, BBP412, Teledyne Webb research Oxy 5013 Calibration date : 2009-03-04T11:02:19 Measured parameters : MOLAR_DOXY, TEMP_DOXY, BPHASE_DOXY, DPHASE_DOXY,
Number of profiles	648
Events	
Mission Summary	https://gfcp.ego-network.org/gliders/Tintin/MooseT00_25/logbook
PI	Pierre Testor / Laurent Coppola
Institute (owner of the glider)	LOV
Project affiliation	MOOSE
Glider software version	Navigation software version : 7.9 Science software version :
Number of Iridium connections	260
RT Data transmitted by Iridium	496 navigation files (7.6M) 498 science files (8.9M)
DM Data downloaded from glider	
Data available from	http://www.ifremer.fr/co/ego/ego/Tintin
Calibrations	https://gfcp.ego-network.org/gliders/Tintin/MooseT00_25/info/tintin_mooset00_25.json
Battery type	Lithium Battery packs : 1 x WILPA1727 + 1 x WILPA1726 + 1 x WILPA1727
Batteries	Initial batteries voltage : V Final batteries voltage : V Batteries consumption : Ah

Glider deployment report

Full post mission report	https://glider83a.dt.insu.cnrs.fr/deployment_report.php?glider=Tintin&deployment=MooseT00_25
Technical contact	ups855.liste.glidertech@cnrs.fr

Figure 1 : Mission flight path

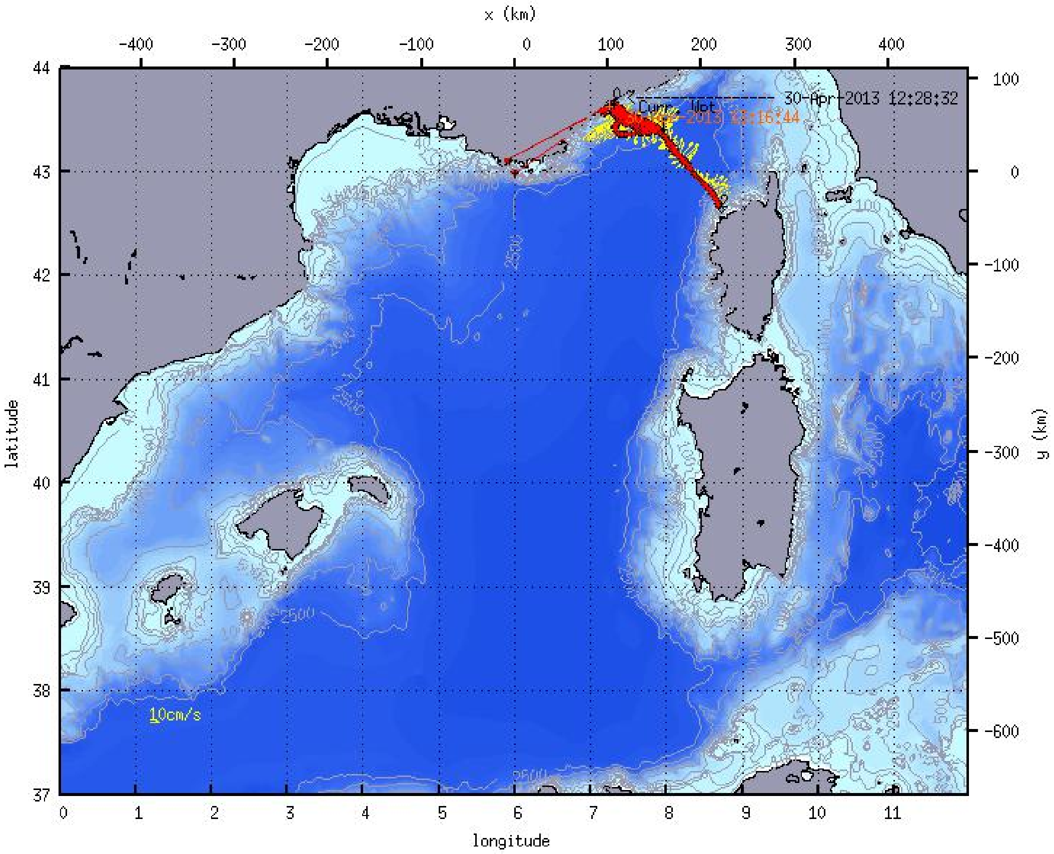
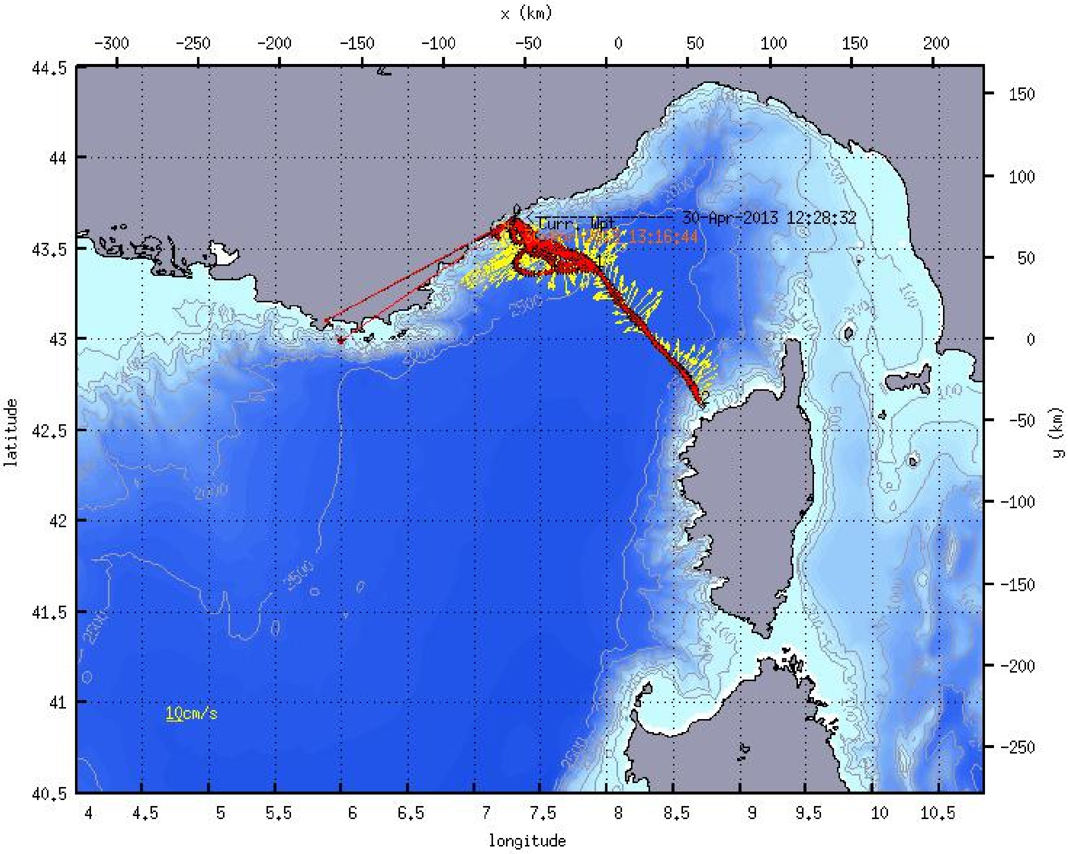


Figure 2 : Mission flight path



Glider deployment report

Mission	PerseusT02_03
Platform	Seaglider
Platform ID	Sg509 (serial 509)
Start date	2013-04-24 07:43:53
End date	2013-07-28 16:41:16
Area	North West Mediterranean Observatory
Objective	The proposed research is based on the monitoring of the long term evolution of the North Western Mediterranean Sea with glider repeat-sections carried out in the framework of the ALLENVI/INSU/ SOERE MOOSE (http://moose-network.fr), INSU/MISTRALS (http://www.mistrals-home.org), and EU FP7 PERSEUS (http://www.perseus-net.eu). The objective is to monitor the oceanographic variability (physical and biogeochemical) of the north western Mediterranean Sea, over a continuum of spatial and temporal scales. Two cross-basin repeat-sections with a repeat rate of about 10-20 days allow to monitor the main circulation features (Northern Current, North Balearic Front, Western Corsica Current) on a regular basis, as well as major processes such as winter intermediate and deep water formations and vernal blooms. The gliders regularly visit MOOSE moorings for cross-calibration purposes and to explore the variability around these moorings. i) T00 is a repeat-section between Nice and Calvi passing by the MOOSE mooring DYFAMED located in the central Ligurian Sea ii) T02 is a repeat-section between Marseille and Menorca passing by the MOOSE mooring LION located in the center of the deep convection area
Total days : 95	Total Navigation (km) : 1548
Related platforms/missions	every other T02 missions
Sensors	
Number of profiles	1000
Events	
Mission Summary	https://gfcp.ego-network.org/gliders/Sg509/PerseusT02_03/logbook
PI	Pierre Testor
Institute (owner of the glider)	IFREMER
Project affiliation	PERSEUS
Glider software version	Navigation software version : Science software version :
Number of Iridium connections	384
RT Data transmitted by Iridium	navigation files () science files ()

Glider deployment report

DM Data downloaded from glider	
Data available from	http://www.ifremer.fr/co/ego/ego/Sg509
Calibrations	https://gfcp.ego-network.org/gliders/Sg509/PerseusT02_03/info/sg509_perseust02_03.json
Battery type	Battery packs :
Batteries	Initial batteries voltage : V Final batteries voltage : V Batteries consumption : Ah
Full post mission report	https://glider83a.dt.insu.cnrs.fr/deployment_report.php?glider=Sg509&deployment=PerseusT02_03
Technical contact	ups855.liste.glidertech@cnrs.fr

Figure 1 : Mission flight path

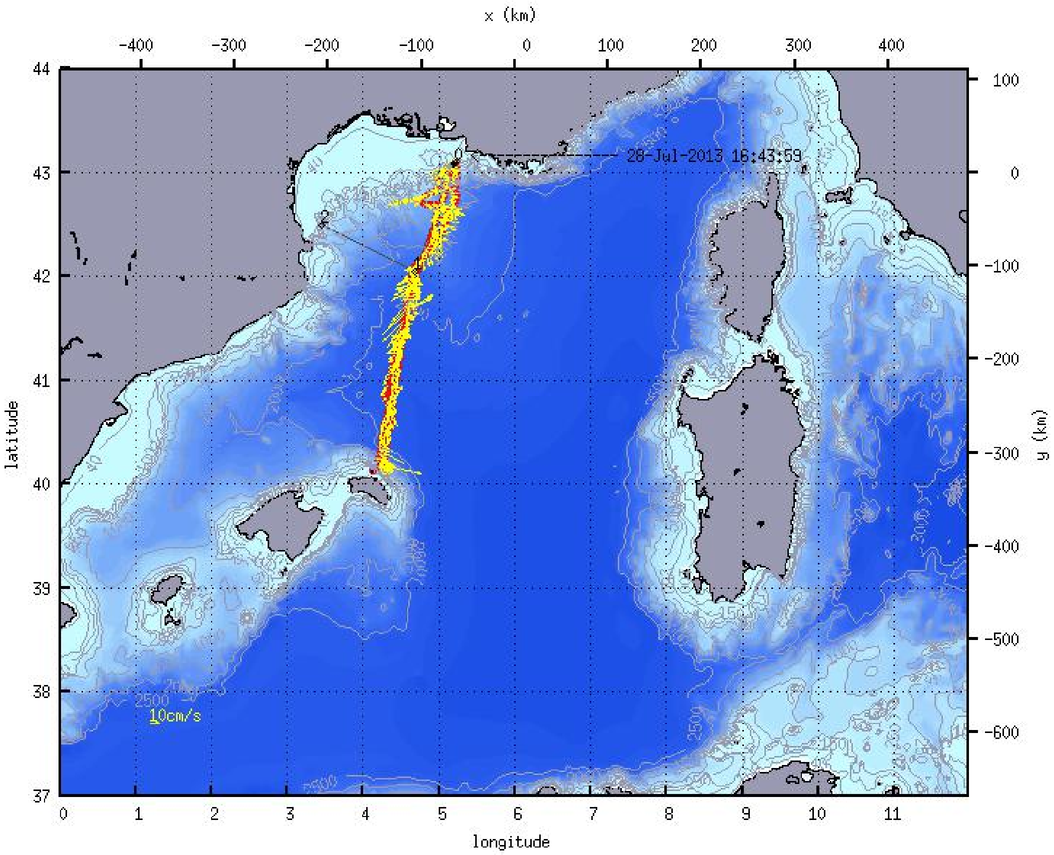
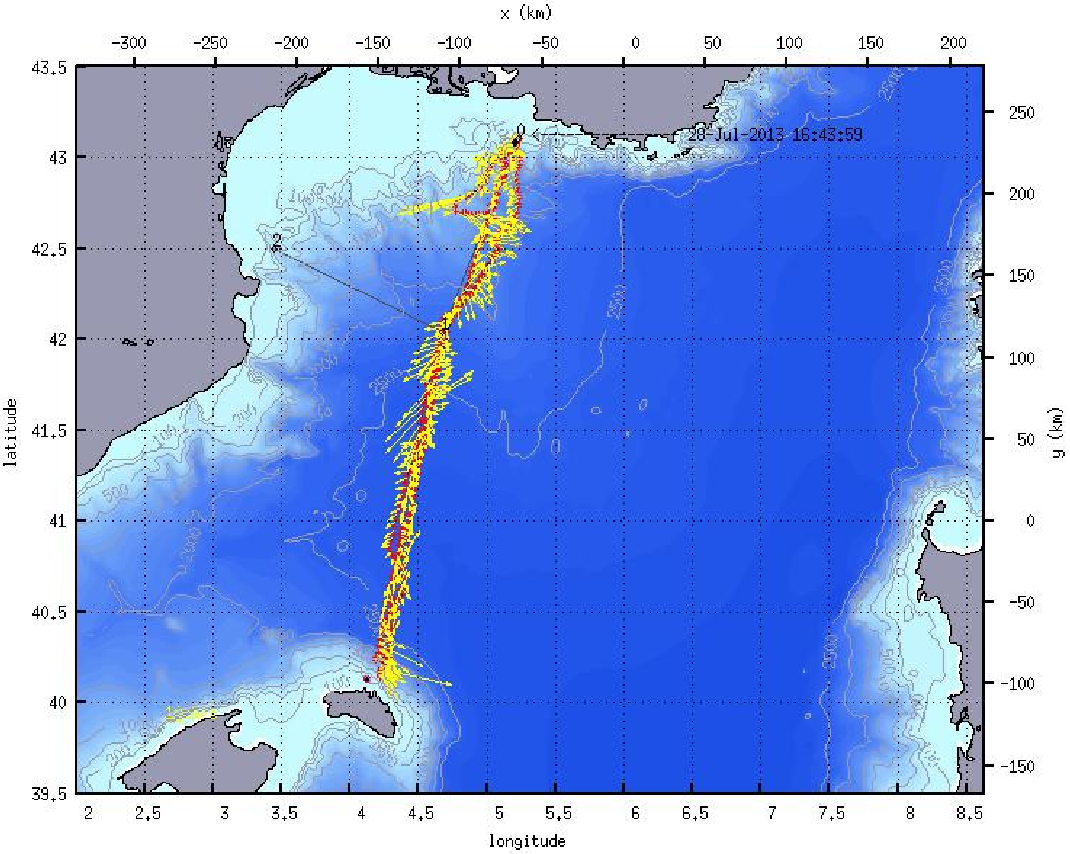


Figure 2 : Mission flight path



Glider deployment report

Mission	MooseT00_26
Platform	Slocum open ocean glider
Platform ID	Hannon (serial 97)
Start date	2013-06-20 12:29:13
End date	2013-07-31 08:18:12
Area	North West Mediterranean Observatory
Objective	The proposed research is based on the monitoring of the long term evolution of the North Western Mediterranean Sea with glider repeat-sections carried out in the framework of the ALLENVI/INSU/ SOERE MOOSE (http://moose-network.fr), INSU/MISTRALS (http://www.mistrals-home.org), and EU FP7 PERSEUS (http://www.perseus-net.eu). The objective is to monitor the oceanographic variability (physical and biogeochemical) of the north western Mediterranean Sea, over a continuum of spatial and temporal scales. Two cross-basin repeat-sections with a repeat rate of about 10-20 days allow to monitor the main circulation features (Northern Current, North Balearic Front, Western Corsica Current) on a regular basis, as well as major processes such as winter intermediate and deep water formations and vernal blooms. The gliders regularly visit MOOSE moorings for cross-calibration purposes and to explore the variability around these moorings. i) T00 is a repeat-section between Nice and Calvi passing by the MOOSE mooring DYFAMED located in the central Ligurian Sea ii) T02 is a repeat-section between Marseille and Menorca passing by the MOOSE mooring LION located in the center of the deep convection area
Total days : 41	Total Navigation (km) : 1002
Related platforms/missions	Every other T00 missions

Sensors	Teledyne Webb research bb2flslk V2 Calibration date : 2007-10-31T15:55:07 Measured parameters : FLUORESCENCE_CHLA, BBP532, BBP470, Teledyne Webb research bb2flslk V1 Calibration date : 2007-10-31T10:42:12 Measured parameters : CDOM, BBP660, BBP880, Teledyne Webb research CTD 41cp Calibration date : 2006-05-08T16:45:32 Measured parameters : TEMP, CNDC, PRES, Teledyne Webb research Oxy 5013 Calibration date : 2009-08-20T12:09:52 Measured parameters : MOLAR_DOXY, TEMP_DOXY, BPHASE_DOXY, DPHASE_DOXY,
Number of profiles	701
Events	
Mission Summary	https://gfcp.ego-network.org/gliders/Hannon/MooseT00_26/logbook
PI	Pierre Testor / Laurent Coppola
Institute (owner of the glider)	LOCEAN
Project affiliation	MOOSE
Glider software version	Navigation software version : V 7.10 Science software version :
Number of Iridium connections	255
RT Data transmitted by Iridium	794 navigation files (12M) 754 science files (11M)
DM Data downloaded from glider	
Data available from	http://www.ifremer.fr/co/ego/ego/Hannon
Calibrations	https://gfcp.ego-network.org/gliders/Hannon/MooseT00_26/info/hannon_mooset00_26.json
Battery type	Lithium Battery packs : 1 x WILPA1726 + 1 x WILPA1727 + 1 x WILPA1727
Batteries	Initial batteries voltage : V Final batteries voltage : V Batteries consumption : Ah

Glider deployment report

Full post mission report	https://glider83a.dt.insu.cnrs.fr/deployment_report.php?glider=Hannon&deployment=MooseT00_26
Technical contact	ups855.liste.glidertech@cnrs.fr

Figure 1 : Mission flight path

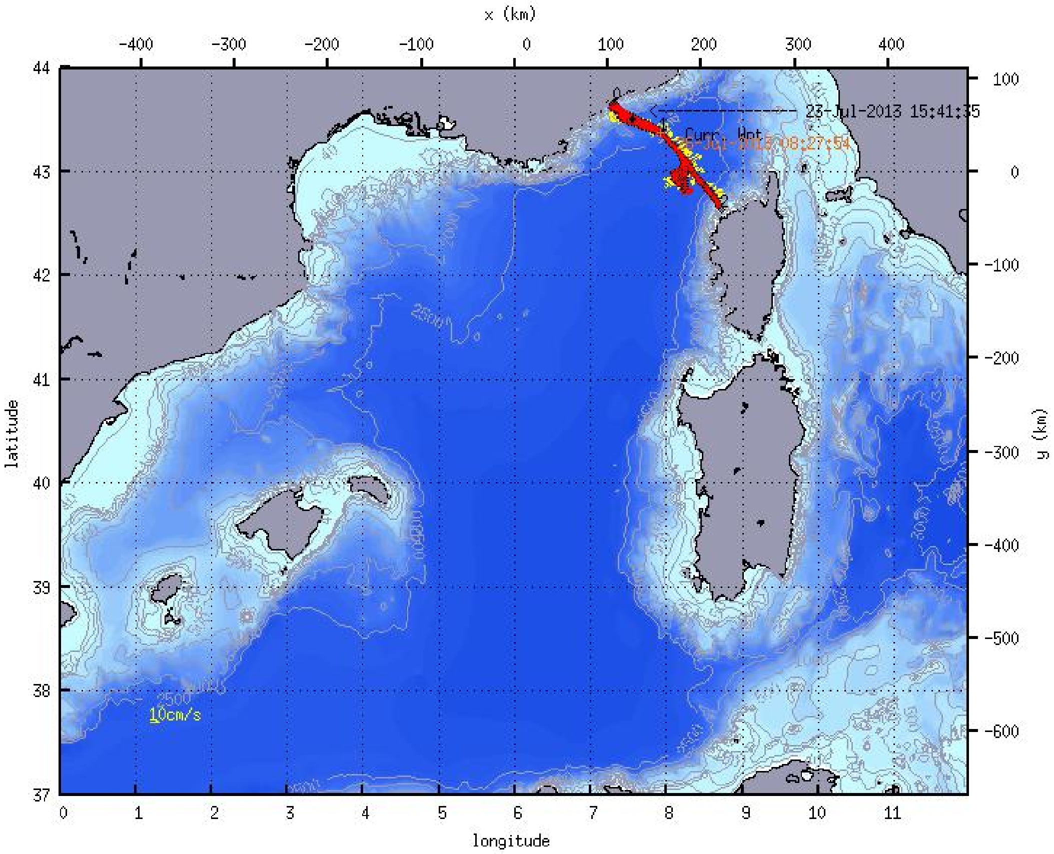
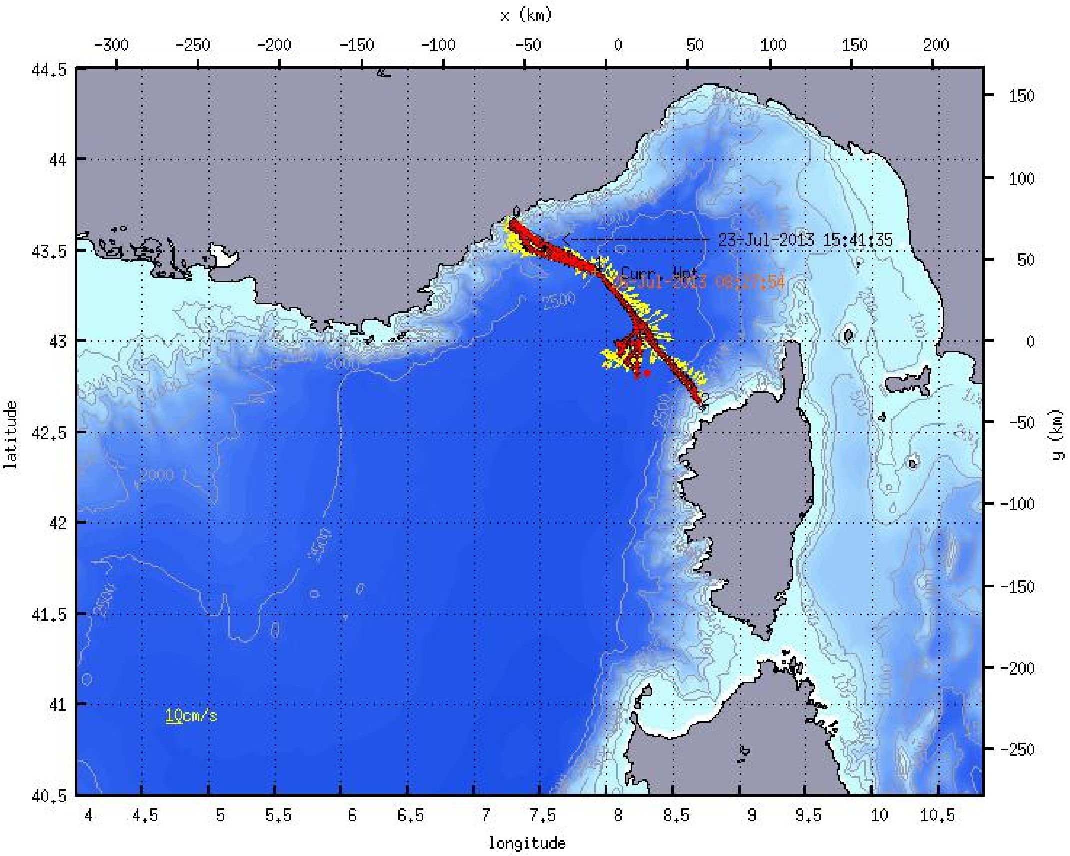


Figure 2 : Mission flight path



Glider deployment report

Mission	MooseT00_27
Platform	Slocum open ocean glider
Platform ID	Milou (serial 133)
Start date	2013-09-20 13:46:34
End date	2013-11-02 08:05:09
Area	North West Mediterranean Observatory
Objective	The proposed research is based on the monitoring of the long term evolution of the North Western Mediterranean Sea with glider repeat-sections carried out in the framework of the ALLENVI/INSU/ SOERE MOOSE (http://moose-network.fr), INSU/MISTRALS (http://www.mistrals-home.org), and EU FP7 PERSEUS (http://www.perseus-net.eu). The objective is to monitor the oceanographic variability (physical and biogeochemical) of the north western Mediterranean Sea, over a continuum of spatial and temporal scales. Two cross-basin repeat-sections with a repeat rate of about 10-20 days allow to monitor the main circulation features (Northern Current, North Balearic Front, Western Corsica Current) on a regular basis, as well as major processes such as winter intermediate and deep water formations and vernal blooms. The gliders regularly visit MOOSE moorings for cross-calibration purposes and to explore the variability around these moorings. i) T00 is a repeat-section between Nice and Calvi passing by the MOOSE mooring DYFAMED located in the central Ligurian Sea ii) T02 is a repeat-section between Marseille and Menorca passing by the MOOSE mooring LION located in the center of the deep convection area
Total days : 43	Total Navigation (km) : 1115
Related platforms/missions	Every other T00 missions

Sensors	Teledyne Webb research bb2flslk V6 Calibration date : 2009-10-05T11:32:13 Measured parameters : BBP532, CDOM, BBP880, Wetlabs bb2flslk V2 Calibration date : 2007-10-31T15:25:44 Measured parameters : FLUORESCENCE_CHLA, BBP532, BBP470, Teledyne Webb research CTD 41cp Calibration date : 2008-01-31T19:01:50 Measured parameters : TEMP, CNDC, PRES, Aanderaa Oxy 5013 Calibration date : 2009-11-25T16:07:16 Measured parameters : MOLAR_DOXY, TEMP_DOXY, BPHASE_DOXY, DPHASE_DOXY,
Number of profiles	1798
Events	
Mission Summary	https://gfcp.ego-network.org/gliders/Milou/MooseT00_27/logbook
PI	Pierre Testor / Laurent Coppola
Institute (owner of the glider)	LOV
Project affiliation	MOOSE
Glider software version	Navigation software version : Science software version :
Number of Iridium connections	415
RT Data transmitted by Iridium	820 navigation files (13M) 852 science files (13M)
DM Data downloaded from glider	
Data available from	http://www.ifremer.fr/co/ego/ego/Milou
Calibrations	https://gfcp.ego-network.org/gliders/Milou/MooseT00_27/info/milou_mooset00_27.json
Battery type	Lithium Battery packs : 1 x WILPA1726 + 1 x WILPA1727 + 1 x WILPA1727
Batteries	Initial batteries voltage : V Final batteries voltage : V Batteries consumption : Ah

Full post mission report	https://glider83a.dt.insu.cnrs.fr/deployment_report.php?glider=Milou&deployment=MooseT00_27
Technical contact	ups855.liste.glidertech@cnrs.fr

Figure 1 : Mission flight path

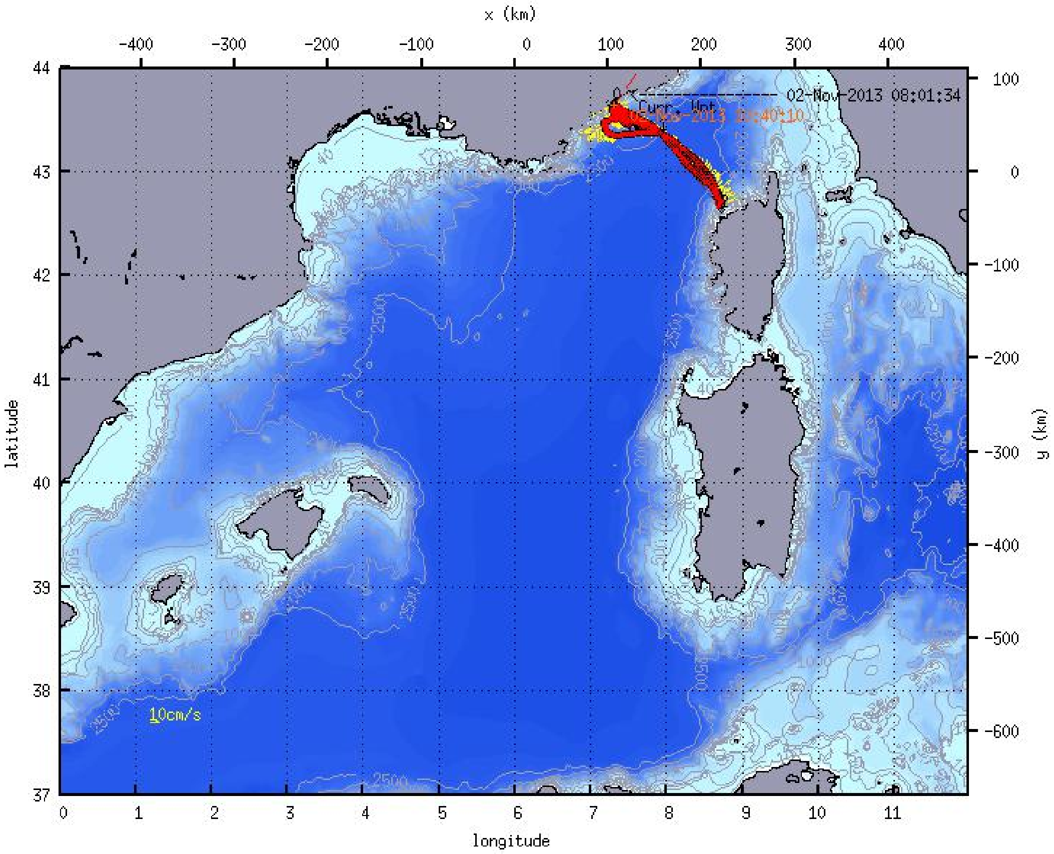
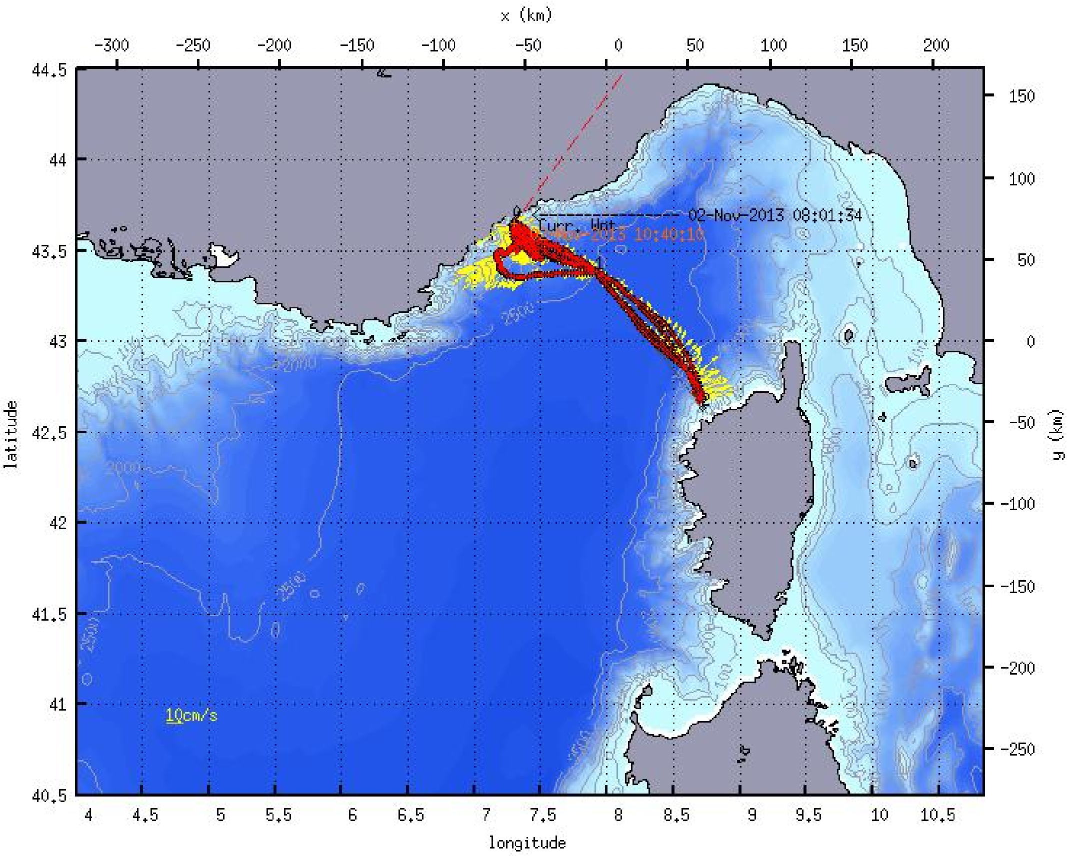


Figure 2 : Mission flight path



Glider deployment report

Mission	PerseusT02_04
Platform	Slocum open ocean glider
Platform ID	Eudoxus (serial 136)
Start date	2014-01-08 14:01:14
End date	2014-01-15 11:21:45
Area	North West Mediterranean Observatory
Objective	The proposed research is based on the monitoring of the long term evolution of the North Western Mediterranean Sea with glider repeat-sections carried out in the framework of the ALLENVI/INSU/ SOERE MOOSE (http://moose-network.fr), INSU/MISTRALS (http://www.mistrals-home.org), and EU FP7 PERSEUS (http://www.perseus-net.eu). The objective is to monitor the oceanographic variability (physical and biogeochemical) of the north western Mediterranean Sea, over a continuum of spatial and temporal scales. Two cross-basin repeat-sections with a repeat rate of about 10-20 days allow to monitor the main circulation features (Northern Current, North Balearic Front, Western Corsica Current) on a regular basis, as well as major processes such as winter intermediate and deep water formations and vernal blooms. The gliders regularly visit MOOSE moorings for cross-calibration purposes and to explore the variability around these moorings. i) T00 is a repeat-section between Nice and Calvi passing by the MOOSE mooring DYFAMED located in the central Ligurian Sea ii) T02 is a repeat-section between Marseille and Menorca passing by the MOOSE mooring LION located in the center of the deep convection area
Total days : 7	Total Navigation (km) : 175
Related platforms/missions	every other T02 missions
Sensors	Wetlabs bbfl2slk V1 Calibration date : 2012-11-28T11:57:29 Measured parameters : FLUORESCENCE_CHLA, BBP532, CDOM, Teledyne Webb research CTD 41cp Calibration date : 2008-10-03T10:15:24 Measured parameters : TEMP, CNDC, PRES, Aanderaa Oxy 5013 Calibration date : 2012-05-23T12:24:56 Measured parameters : MOLAR_DOXY, TEMP_DOXY, BPHASE_DOXY, DPHASE_DOXY,
Number of profiles	103
Events	

Glider deployment report

Mission Summary	https://gfcp.ego-network.org/gliders/Eudoxus/PerseusT02_04/logbook
PI	Pierre Testor
Institute (owner of the glider)	ENSTA
Project affiliation	PERSEUS
Glider software version	Navigation software version : V 7.10 Science software version :
Number of Iridium connections	67
RT Data transmitted by Iridium	2457 navigation files (29M) 2393 science files (43M)
DM Data downloaded from glider	
Data available from	http://www.ifremer.fr/co/ego/ego/Eudoxus
Calibrations	https://gfcp.ego-network.org/gliders/Eudoxus/PerseusT02_04/info/eudoxus_perseust02_04.json
Battery type	Lithium Battery packs : 0 x None + 1 x WILPA1726 + 1 x WILPA1727 + 1 x WILPA1727
Batteries	Initial batteries voltage : V Final batteries voltage : V Batteries consumption : Ah
Full post mission report	https://glider83a.dt.insu.cnrs.fr/deployment_report.php?glider=Eudoxus&deployment=PerseusT02_04
Technical contact	ups855.liste.glidertech@cnrs.fr

Glider deployment report

Figure 1 : Mission flight path

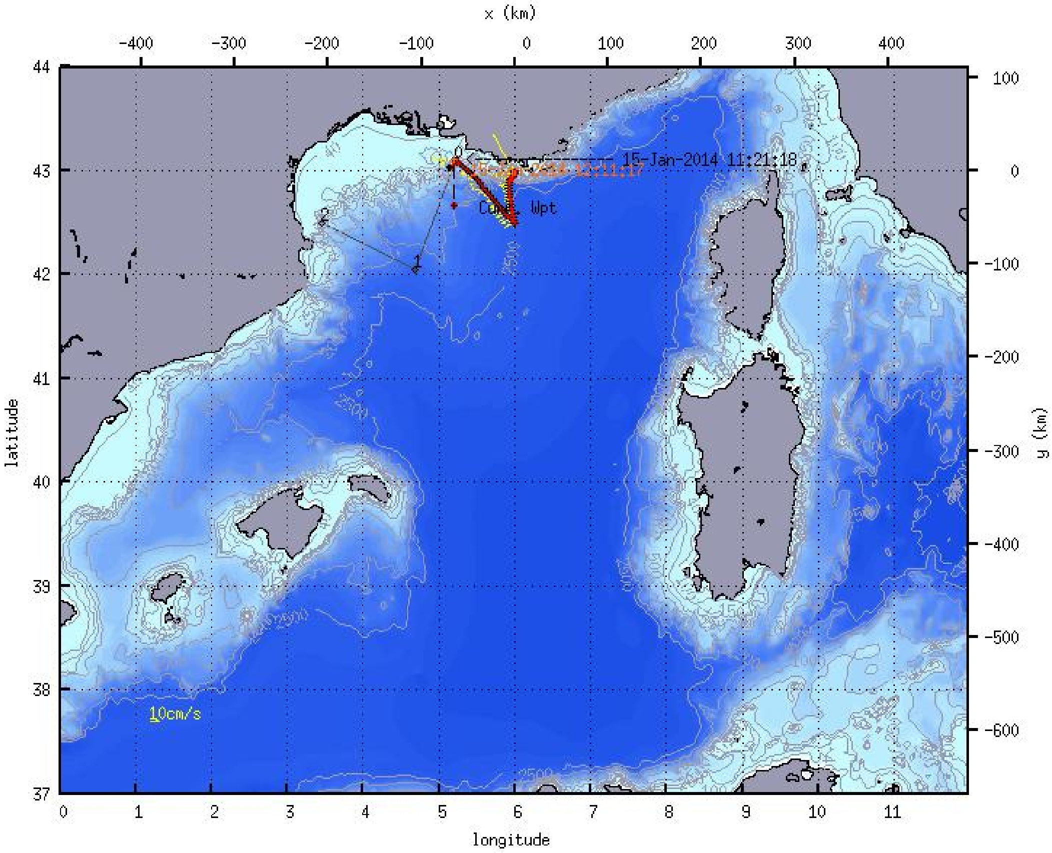
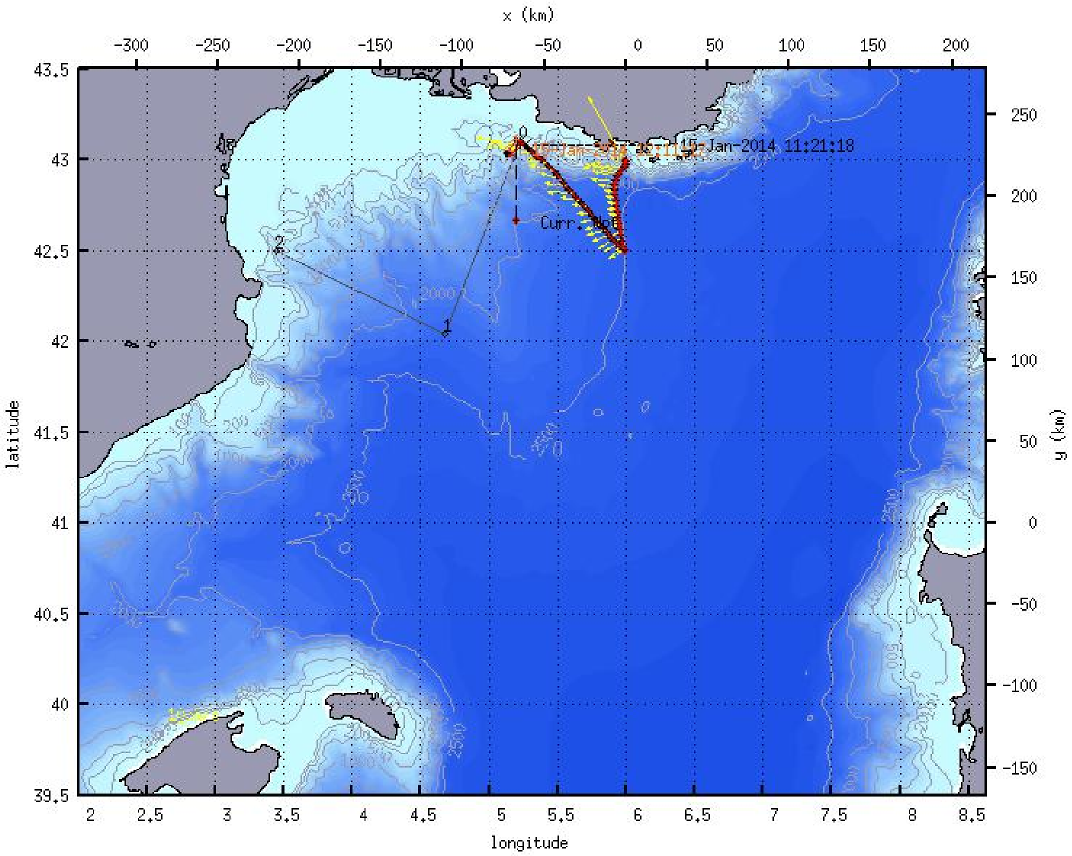


Figure 2 : Mission flight path



Glider deployment report

Mission	PerseusT02_05
Platform	Slocum open ocean glider
Platform ID	Eudoxus (serial 136)
Start date	2014-02-14 12:18:22
End date	2014-03-21 01:49:36
Area	North West Mediterranean Observatory
Objective	The proposed research is based on the monitoring of the long term evolution of the North Western Mediterranean Sea with glider repeat-sections carried out in the framework of the ALLENVI/INSU/ SOERE MOOSE (http://moose-network.fr), INSU/MISTRALS (http://www.mistrals-home.org), and EU FP7 PERSEUS (http://www.perseus-net.eu). The objective is to monitor the oceanographic variability (physical and biogeochemical) of the north western Mediterranean Sea, over a continuum of spatial and temporal scales. Two cross-basin repeat-sections with a repeat rate of about 10-20 days allow to monitor the main circulation features (Northern Current, North Balearic Front, Western Corsica Current) on a regular basis, as well as major processes such as winter intermediate and deep water formations and vernal blooms. The gliders regularly visit MOOSE moorings for cross-calibration purposes and to explore the variability around these moorings. i) T00 is a repeat-section between Nice and Calvi passing by the MOOSE mooring DYFAMED located in the central Ligurian Sea ii) T02 is a repeat-section between Marseille and Menorca passing by the MOOSE mooring LION located in the center of the deep convection area
Total days : 35	Total Navigation (km) : 790
Related platforms/missions	every other T02 missions
Sensors	Wetlabs bbfl2slk V1 Calibration date : 2012-11-28T11:57:29 Measured parameters : FLUORESCENCE_CHLA, BBP532, CDOM, Teledyne Webb research CTD 41cp Calibration date : 2008-10-03T10:15:24 Measured parameters : TEMP, CNDC, PRES, Aanderaa Oxy 5013 Calibration date : 2012-05-23T12:24:56 Measured parameters : MOLAR_DOXY, TEMP_DOXY, BPHASE_DOXY, DPHASE_DOXY,
Number of profiles	536
Events	

Glider deployment report

Mission Summary	https://gfcp.ego-network.org/gliders/Eudoxus/PerseusT02_05/logbook
PI	Pierre Testor
Institute (owner of the glider)	ENSTA
Project affiliation	PERSEUS
Glider software version	Navigation software version : V 7.10 Science software version :
Number of Iridium connections	565
RT Data transmitted by Iridium	3337 navigation files (38M) 3688 science files (69M)
DM Data downloaded from glider	
Data available from	http://www.ifremer.fr/co/ego/ego/Eudoxus
Calibrations	https://gfcp.ego-network.org/gliders/Eudoxus/PerseusT02_05/info/eudoxus_perseust02_05.json
Battery type	Lithium Battery packs : 0 x None + 1 x WILPA1726 + 1 x WILPA1727 + 1 x WILPA1727
Batteries	Initial batteries voltage : 14.0552093720761 V Final batteries voltage : 13.944584387568 V Batteries consumption : Ah
Full post mission report	https://glider83a.dt.insu.cnrs.fr/deployment_report.php?glider=Eudoxus&deployment=PerseusT02_05
Technical contact	ups855.liste.glidertech@cnrs.fr

Glider deployment report

Figure 1 : Mission flight path

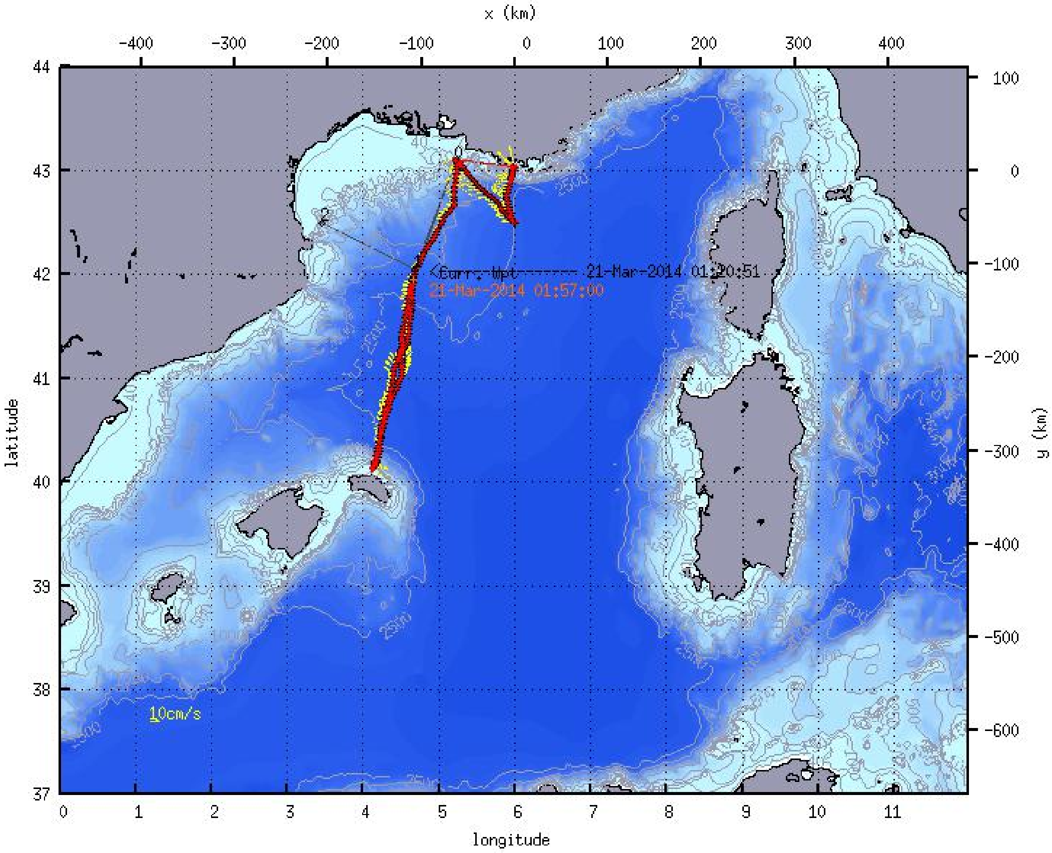
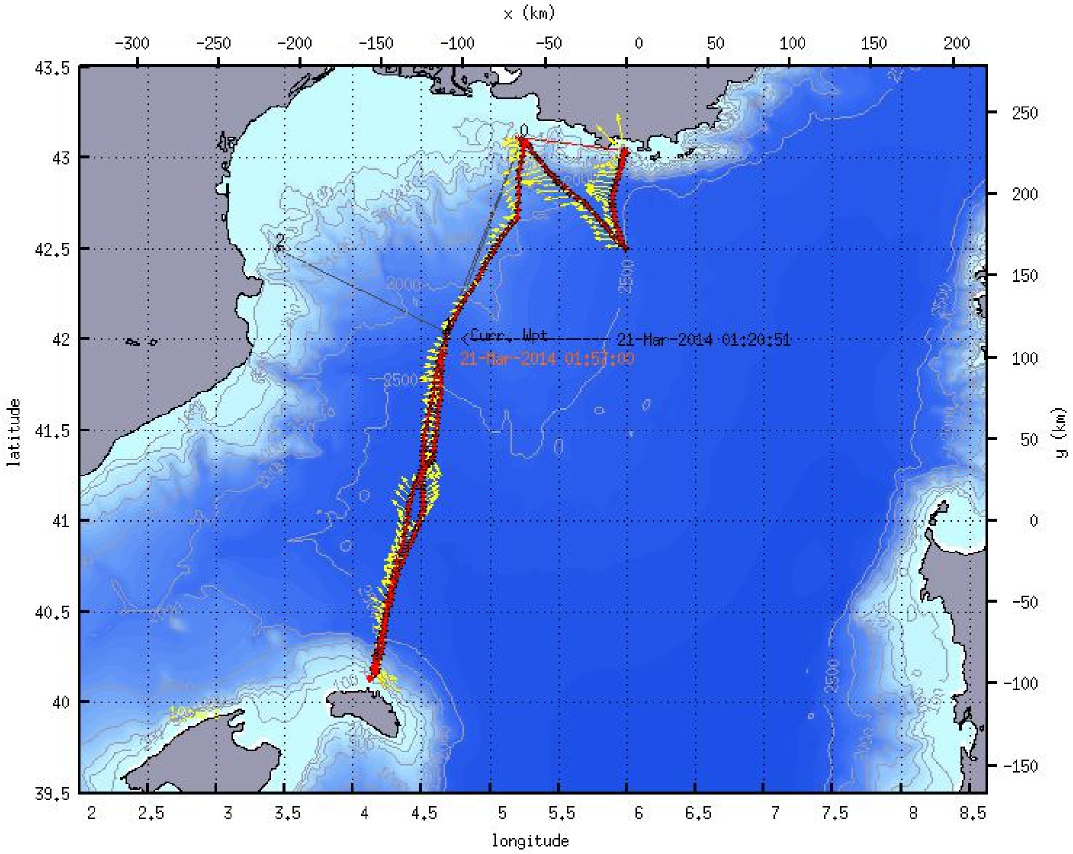


Figure 2 : Mission flight path



Glider deployment report

Mission	PerseusT02_06
Platform	Slocum open ocean glider
Platform ID	Milou (serial 133)
Start date	2014-07-23 08:47:09
End date	2014-09-15 08:48:58
Area	North West Mediterranean Observatory
Objective	The proposed research is based on the monitoring of the long term evolution of the North Western Mediterranean Sea with glider repeat-sections carried out in the framework of the ALLENVI/INSU/ SOERE MOOSE (http://moose-network.fr), INSU/MISTRALS (http://www.mistrals-home.org), and EU FP7 PERSEUS (http://www.perseus-net.eu). The objective is to monitor the oceanographic variability (physical and biogeochemical) of the north western Mediterranean Sea, over a continuum of spatial and temporal scales. Two cross-basin repeat-sections with a repeat rate of about 10-20 days allow to monitor the main circulation features (Northern Current, North Balearic Front, Western Corsica Current) on a regular basis, as well as major processes such as winter intermediate and deep water formations and vernal blooms. The gliders regularly visit MOOSE moorings for cross-calibration purposes and to explore the variability around these moorings. i) T00 is a repeat-section between Nice and Calvi passing by the MOOSE mooring DYFAMED located in the central Ligurian Sea ii) T02 is a repeat-section between Marseille and Menorca passing by the MOOSE mooring LION located in the center of the deep convection area
Total days : 54	Total Navigation (km) : 1206
Related platforms/missions	every other T02 missions
Sensors	Wetlabs bb2flslk V2 Calibration date : 2007-10-31T15:25:44 Measured parameters : FLUORESCENCE_CHLA, BBP532, BBP470, Teledyne Webb research CTD 41cp Calibration date : 2008-01-31T19:01:50 Measured parameters : TEMP, CNDC, PRES, Aanderaa Oxy 5013 Calibration date : 2014-02-14T09:56:28 Measured parameters : MOLAR_DOXY, TEMP_DOXY, BPHASE_DOXY, DPHASE_DOXY,
Number of profiles	456
Events	

Glider deployment report

Mission Summary	https://gfcp.ego-network.org/gliders/Milou/PerseusT02_06/logbook
PI	Pierre Testor
Institute (owner of the glider)	LOV
Project affiliation	PERSEUS
Glider software version	Navigation software version : 7.14 Science software version :
Number of Iridium connections	323
RT Data transmitted by Iridium	1073 navigation files (17M) 876 science files (14M)
DM Data downloaded from glider	
Data available from	http://www.ifremer.fr/co/ego/ego/Milou
Calibrations	https://gfcp.ego-network.org/gliders/Milou/PerseusT02_06/info/milou_perseust02_06.json
Battery type	Lithium Battery packs : 1 x WILPA1726 + 1 x WILPA1727 + 1 x WILPA1727
Batteries	Initial batteries voltage : 13.561273438288 V Final batteries voltage : 13.9662942378964 V Batteries consumption : 325.799 Ah
Full post mission report	https://glider83a.dt.insu.cnrs.fr/deployment_report.php?glider=Milou&deployment=PerseusT02_06
Technical contact	ups855.liste.glidertech@cnrs.fr

Figure 1 : Mission flight path

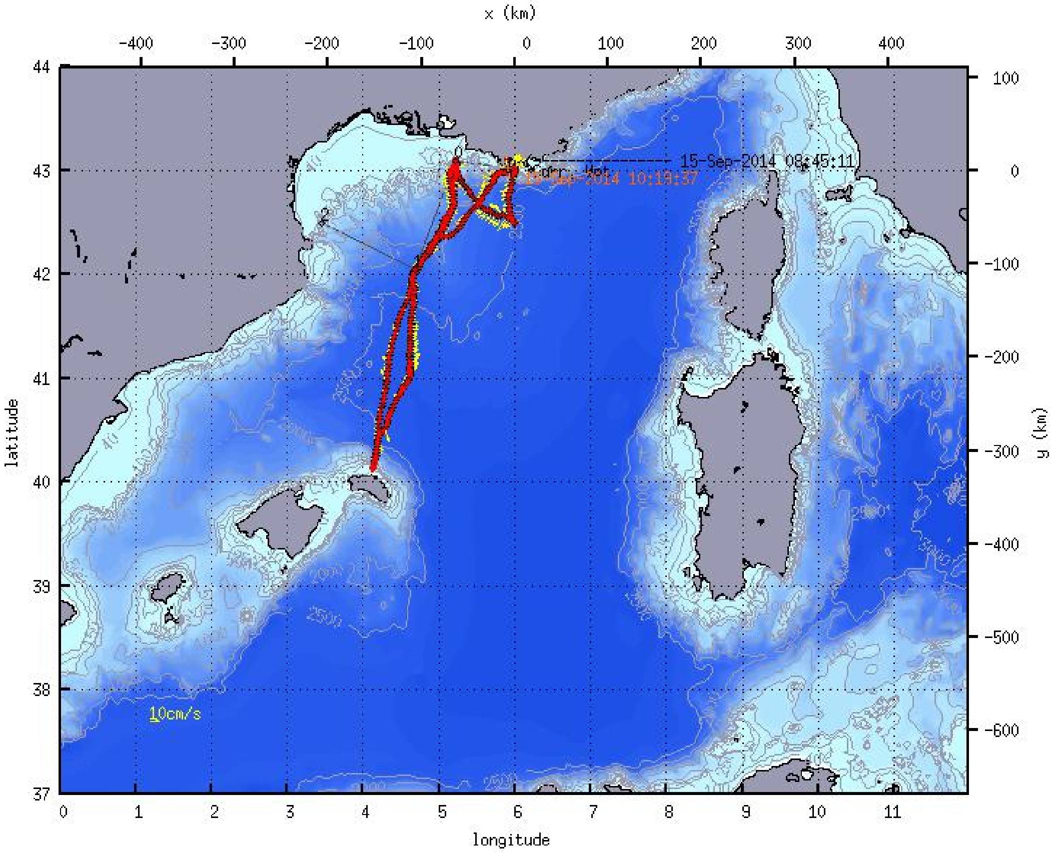
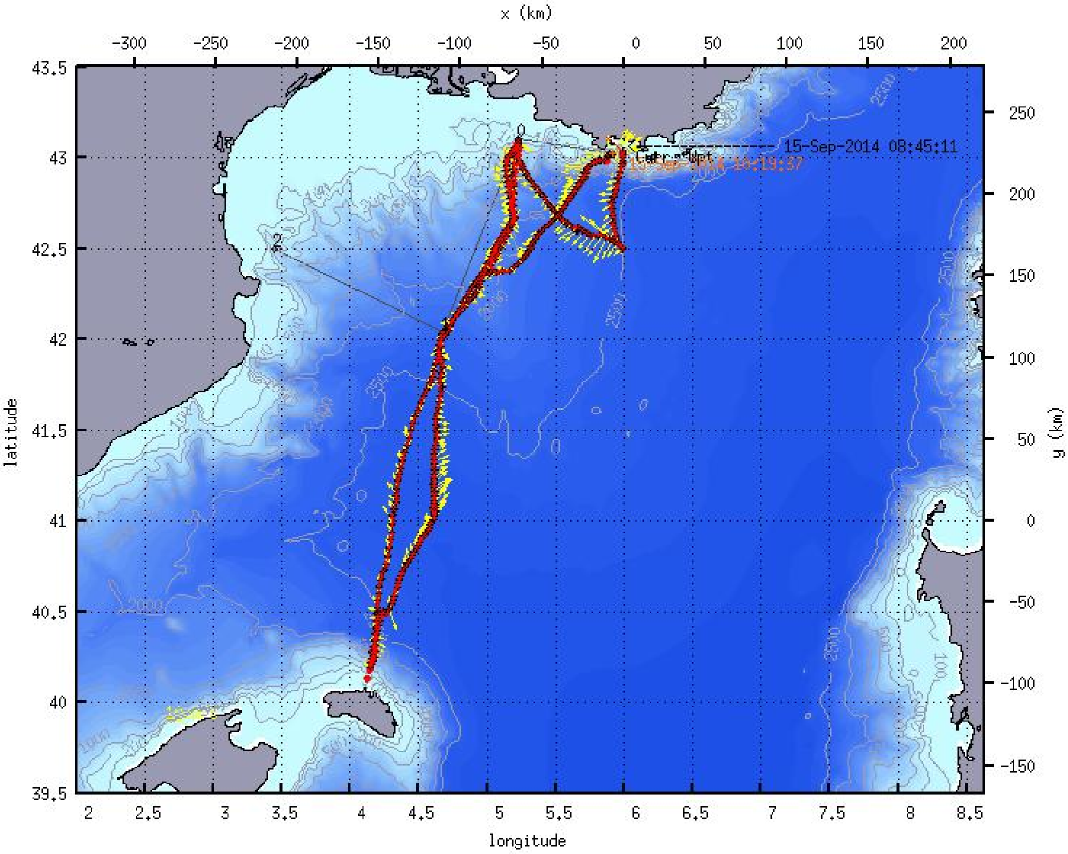


Figure 2 : Mission flight path



Glider deployment report

Mission	MooseT00_28
Platform	Slocum open ocean glider
Platform ID	Himilcon (serial 098)
Start date	2014-11-12 11:54:59
End date	2014-11-26 02:17:30
Area	Mediterranean Observatories
Objective	The proposed research is based on the monitoring of the long term evolution of the North Western Mediterranean Sea with glider repeat-sections carried out in the framework of the ALLENVI/INSU/ SOERE MOOSE (http://moose-network.fr), INSU/MISTRALS (http://www.mistrals-home.org), and EU FP7 PERSEUS (http://www.perseus-net.eu). The objective is to monitor the oceanographic variability (physical and biogeochemical) of the north western Mediterranean Sea, over a continuum of spatial and temporal scales. Two cross-basin repeat-sections with a repeat rate of about 10-20 days allow to monitor the main circulation features (Northern Current, North Balearic Front, Western Corsica Current) on a regular basis, as well as major processes such as winter intermediate and deep water formations and vernal blooms. The gliders regularly visit MOOSE moorings for cross-calibration purposes and to explore the variability around these moorings. i) T00 is a repeat-section between Nice and Calvi passing by the MOOSE mooring DYFAMED located in the central Ligurian Sea ii) T02 is a repeat-section between Marseille and Menorca passing by the MOOSE mooring LION located in the center of the deep convection area
Total days : 14	Total Navigation (km) : 378
Related platforms/missions	Every other T00 missions
Sensors	SeaBird Electronics CTD 41cp Calibration date : 2009-06-07T18:18:46 Measured parameters : TEMP, CNDC, PRES, Teledyne Webb research flntu Calibration date : 2011-08-19T17:00:08 Measured parameters : FLUORESCENCE_CHLA, TURBIDITY, Aanderaa Oxy 5013 Calibration date : 2009-11-25T16:07:16 Measured parameters : MOLAR_DOXY, TEMP_DOXY, BPHASE_DOXY, DPHASE_DOXY,
Number of profiles	196
Events	

Glider deployment report

Mission Summary	https://gfcp.ego-network.org/gliders/Himilcon/MooseT00_28/logbook
PI	Pierre Testor / Laurent Coppola
Institute (owner of the glider)	LOCEAN
Project affiliation	MOOSE
Glider software version	Navigation software version : Science software version :
Number of Iridium connections	241
RT Data transmitted by Iridium	879 navigation files (8.9M) 918 science files (13M)
DM Data downloaded from glider	
Data available from	http://www.ifremer.fr/co/ego/ego/Himilcon
Calibrations	https://gfcp.ego-network.org/gliders/Himilcon/MooseT00_28/info/himilcon_mooset00_28.json
Battery type	Lithium Battery packs : 1 x WILPA1726 + 1 x WILPA1727 + 1 x WILPA1727
Batteries	Initial batteries voltage : 13.5300053682711 V Final batteries voltage : 13.8820586900706 V Batteries consumption : Ah
Full post mission report	https://glider83a.dt.insu.cnrs.fr/deployment_report.php?glider=Himilcon&deployment=MooseT00_28
Technical contact	ups855.liste.glidertech@cnrs.fr

Figure 1 : Mission flight path

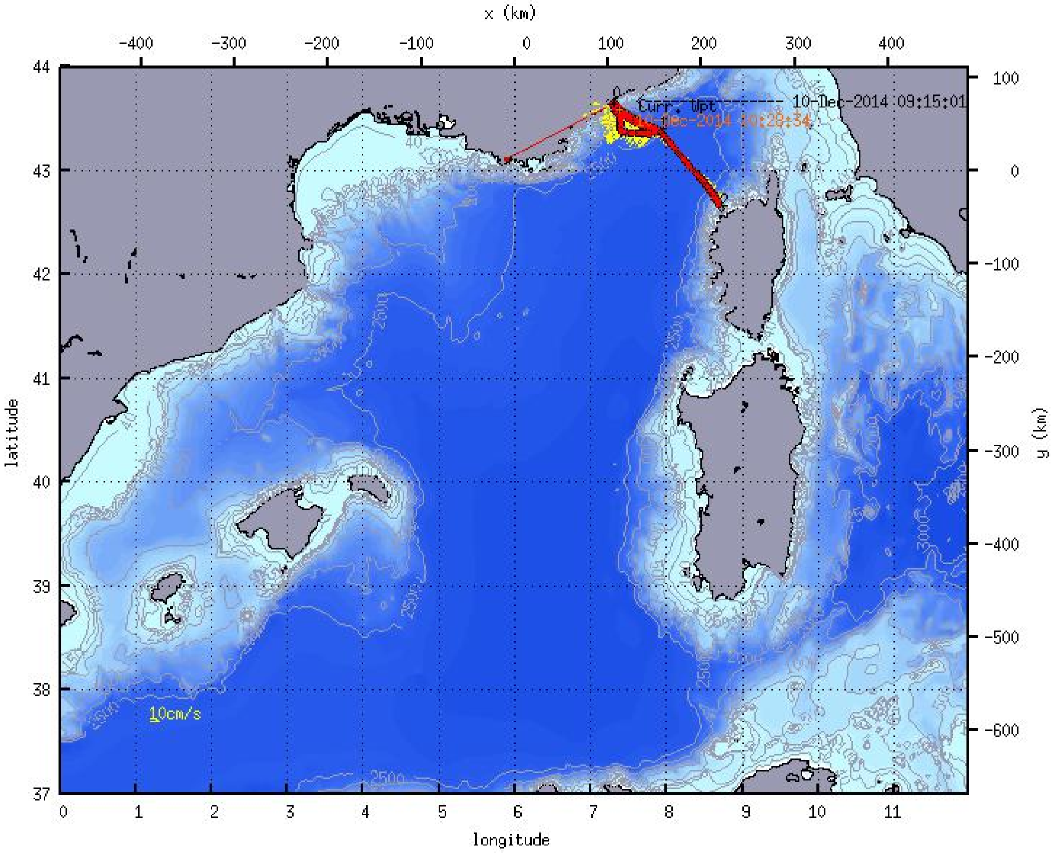
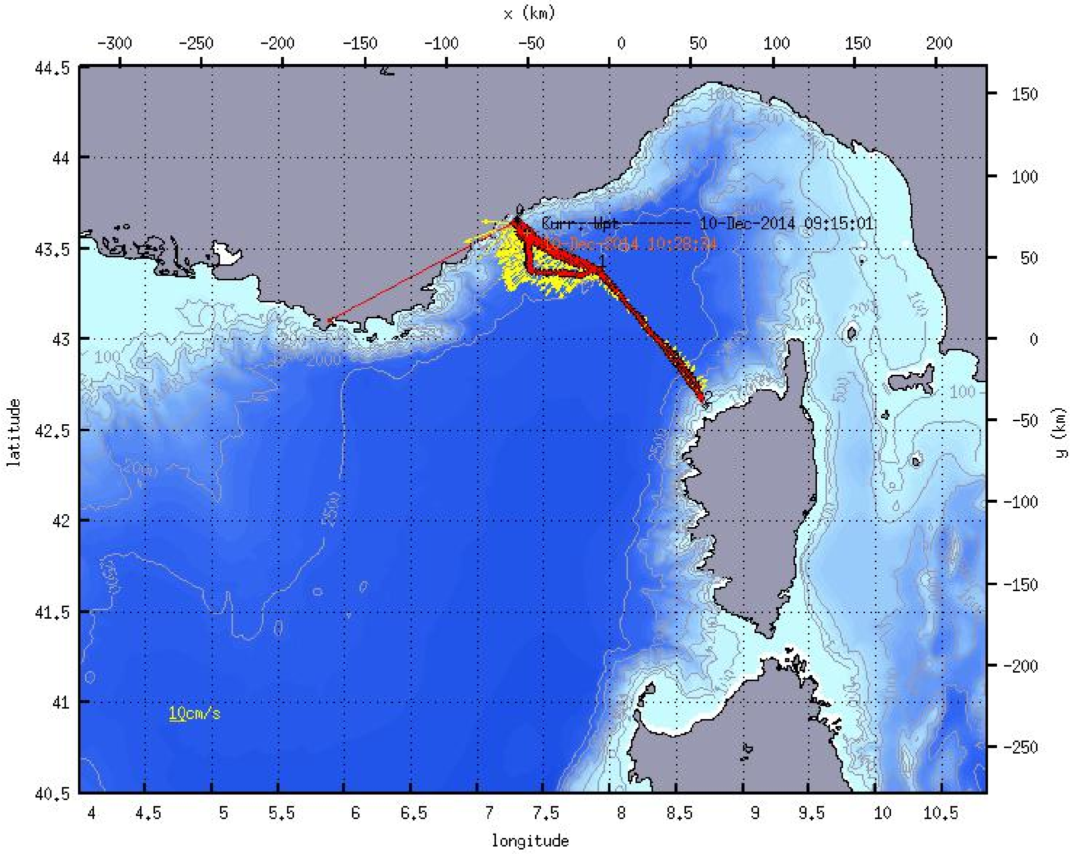


Figure 2 : Mission flight path



Glider deployment report

Mission	PerseusT02_07
Platform	Slocum open ocean glider
Platform ID	Milou (serial 133)
Start date	2014-11-15 14:42:39
End date	2014-11-26 03:04:34
Area	North West Mediterranean Observatory
Objective	The proposed research is based on the monitoring of the long term evolution of the North Western Mediterranean Sea with glider repeat-sections carried out in the framework of the ALLENVI/INSU/ SOERE MOOSE (http://moose-network.fr), INSU/MISTRALS (http://www.mistrals-home.org), and EU FP7 PERSEUS (http://www.perseus-net.eu). The objective is to monitor the oceanographic variability (physical and biogeochemical) of the north western Mediterranean Sea, over a continuum of spatial and temporal scales. Two cross-basin repeat-sections with a repeat rate of about 10-20 days allow to monitor the main circulation features (Northern Current, North Balearic Front, Western Corsica Current) on a regular basis, as well as major processes such as winter intermediate and deep water formations and vernal blooms. The gliders regularly visit MOOSE moorings for cross-calibration purposes and to explore the variability around these moorings. i) T00 is a repeat-section between Nice and Calvi passing by the MOOSE mooring DYFAMED located in the central Ligurian Sea ii) T02 is a repeat-section between Marseille and Menorca passing by the MOOSE mooring LION located in the center of the deep convection area
Total days : 11	Total Navigation (km) : 245
Related platforms/missions	every other T02 missions
Sensors	Wetlabs bb2flslk V2 Calibration date : 2007-10-31T15:25:44 Measured parameters : FLUORESCENCE_CHLA, BBP532, BBP470, Teledyne Webb research CTD 41cp Calibration date : 2008-01-31T19:01:50 Measured parameters : TEMP, CNDC, PRES, Aanderaa Oxy 5013 Calibration date : 2014-02-14T09:56:28 Measured parameters : MOLAR_DOXY, TEMP_DOXY, BPHASE_DOXY, DPHASE_DOXY,
Number of profiles	118
Events	

Glider deployment report

Mission Summary	https://gfcp.ego-network.org/gliders/Milou/PerseusT02_07/logbook
PI	Pierre Testor
Institute (owner of the glider)	LOV
Project affiliation	PERSEUS
Glider software version	Navigation software version : 7.14 Science software version :
Number of Iridium connections	192
RT Data transmitted by Iridium	761 navigation files (9.1M) 636 science files (8.6M)
DM Data downloaded from glider	
Data available from	http://www.ifremer.fr/co/ego/ego/Milou
Calibrations	https://gfcp.ego-network.org/gliders/Milou/PerseusT02_07/info/milou_perseust02_07.json
Battery type	Lithium Battery packs : 1 x WILPA1726 + 1 x WILPA1727 + 1 x WILPA1727
Batteries	Initial batteries voltage : 13.9713235243676 V Final batteries voltage : 13.9876080894101 V Batteries consumption : 401.3862 Ah
Full post mission report	https://glider83a.dt.insu.cnrs.fr/deployment_report.php?glider=Milou&deployment=PerseusT02_07
Technical contact	ups855.liste.glidertech@cnrs.fr

Glider deployment report

Figure 1 : Mission flight path

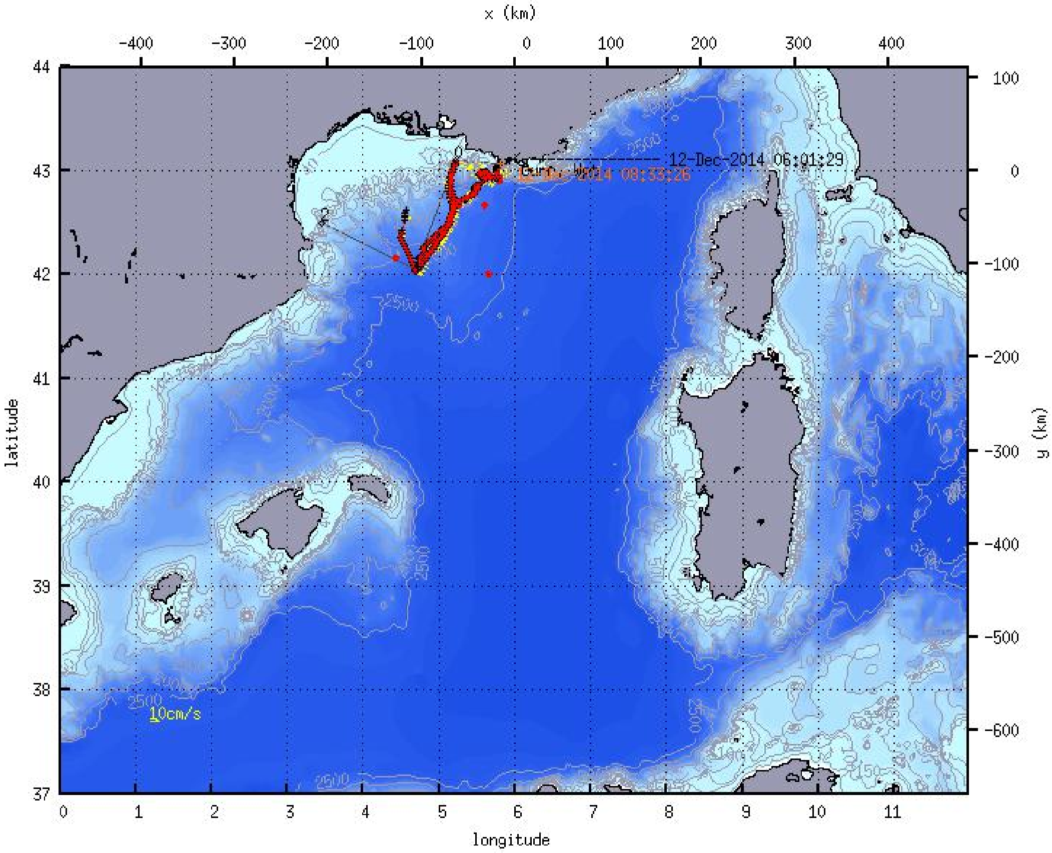
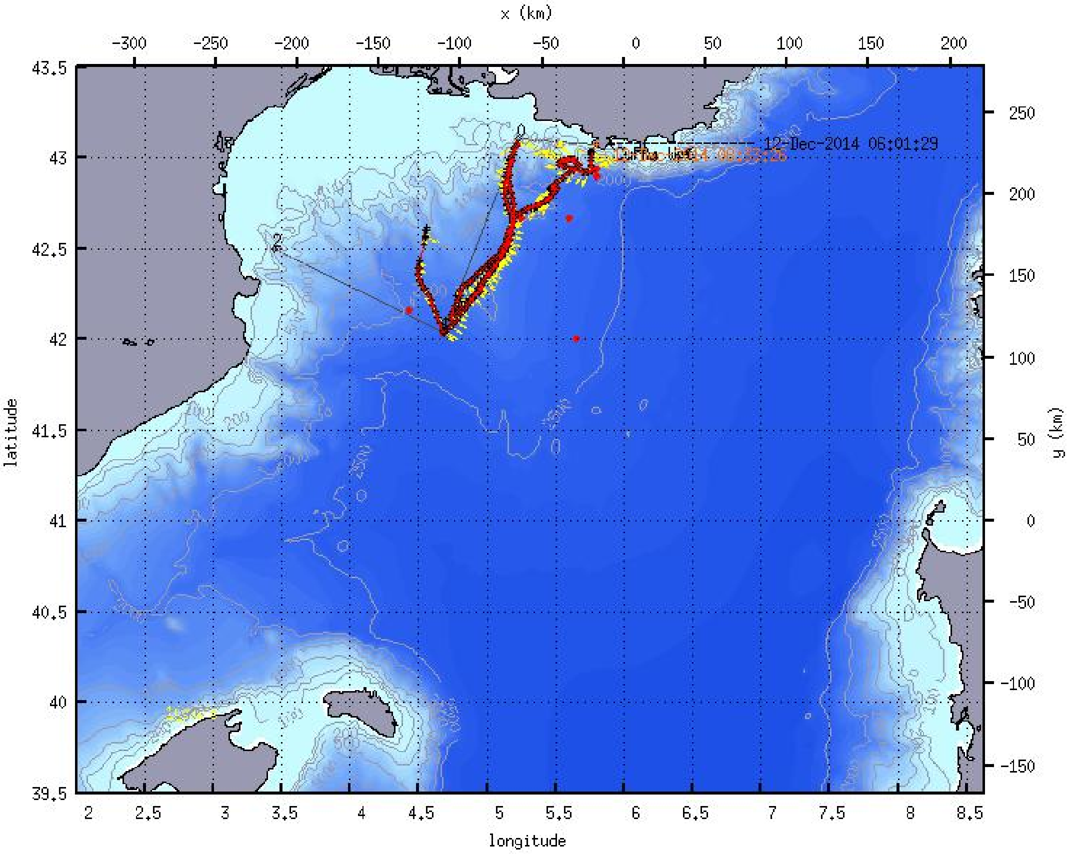


Figure 2 : Mission flight path



Glider deployment report

Mission	MoosePerseusT02_08
Platform	Slocum open ocean glider
Platform ID	Milou (serial 133)
Start date	2015-01-14 08:00:08
End date	2015-03-02 10:00:33
Area	North West Mediterranean Observatory
Objective	The proposed research is based on the monitoring of the long term evolution of the North Western Mediterranean Sea with glider repeat-sections carried out in the framework of the ALLENVI/INSU/ SOERE MOOSE (http://moose-network.fr), INSU/MISTRALS (http://www.mistrals-home.org), and EU FP7 PERSEUS (http://www.perseus-net.eu). The objective is to monitor the oceanographic variability (physical and biogeochemical) of the north western Mediterranean Sea, over a continuum of spatial and temporal scales. Two cross-basin repeat-sections with a repeat rate of about 10-20 days allow to monitor the main circulation features (Northern Current, North Balearic Front, Western Corsica Current) on a regular basis, as well as major processes such as winter intermediate and deep water formations and vernal blooms. The gliders regularly visit MOOSE moorings for cross-calibration purposes and to explore the variability around these moorings. i) T00 is a repeat-section between Nice and Calvi passing by the MOOSE mooring DYFAMED located in the central Ligurian Sea ii) T02 is a repeat-section between Marseille and Menorca passing by the MOOSE mooring LION located in the center of the deep convection area
Total days : 47	Total Navigation (km) : 1743
Related platforms/missions	Every other T00 missions
Sensors	Wetlabs bb2flslk V2 Calibration date : 2007-10-31T15:25:44 Measured parameters : FLUORESCENCE_CHLA, BBP532, BBP470, Teledyne Webb research CTD 41cp Calibration date : 2008-01-31T19:01:50 Measured parameters : TEMP, CNDC, PRES, Aanderaa Oxy 5013 Calibration date : 2014-02-14T09:56:28 Measured parameters : MOLAR_DOXY, TEMP_DOXY, BPHASE_DOXY, DPHASE_DOXY,
Number of profiles	640
Events	

Glider deployment report

Mission Summary	https://gfcp.ego-network.org/gliders/Milou/MoosePerseusT02_08/logbook
PI	Pierre Testor
Institute (owner of the glider)	LOV
Project affiliation	MOOSE
Glider software version	Navigation software version : 7.14 Science software version :
Number of Iridium connections	333
RT Data transmitted by Iridium	887 navigation files (14M) 871 science files (11M)
DM Data downloaded from glider	
Data available from	http://www.ifremer.fr/co/ego/ego/Milou
Calibrations	https://gfcp.ego-network.org/gliders/Milou/MoosePerseusT02_08/info/milou_mooseperseust02_08.json
Battery type	Lithium Battery packs : 1 x WILPA1726 + 1 x WILPA1727 + 1 x WILPA1727
Batteries	Initial batteries voltage : 13.3973056497883 V Final batteries voltage : 13.8637314662545 V Batteries consumption : 398.3687 Ah
Full post mission report	https://glider83a.dt.insu.cnrs.fr/deployment_report.php?glider=Milou&deployment=MoosePerseusT02_08
Technical contact	ups855.liste.glidertech@cnrs.fr

Figure 1 : Mission flight path

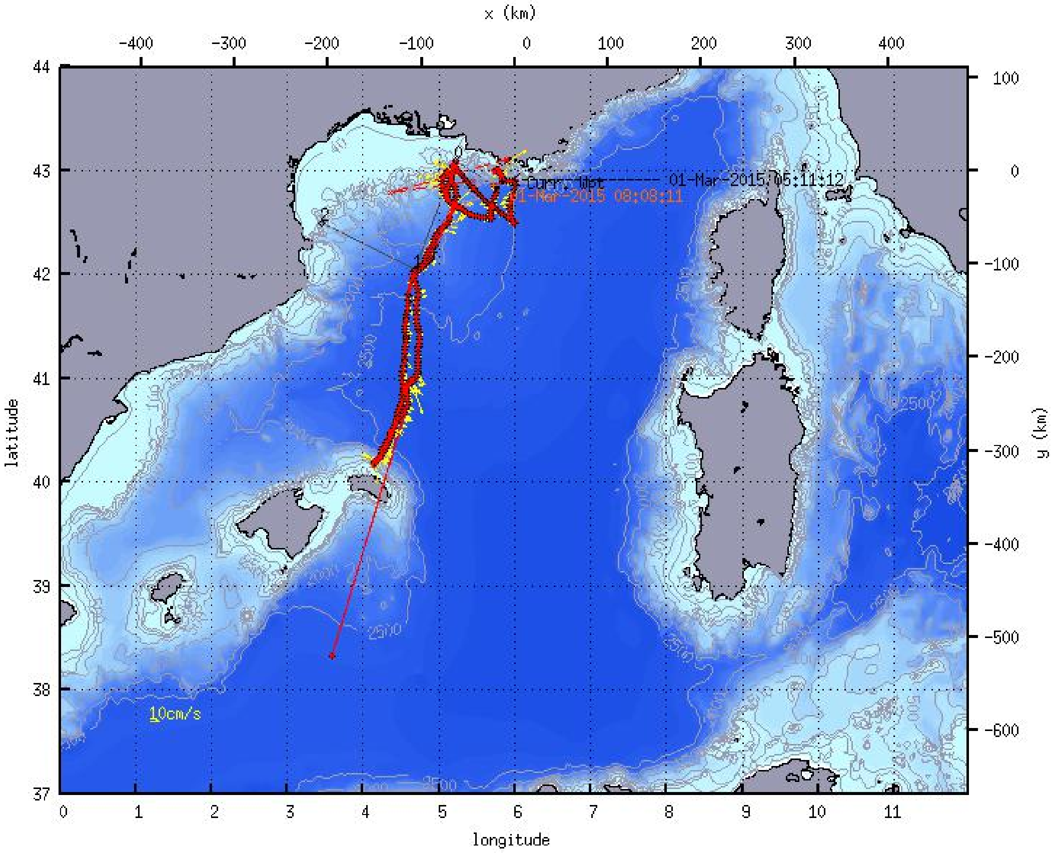
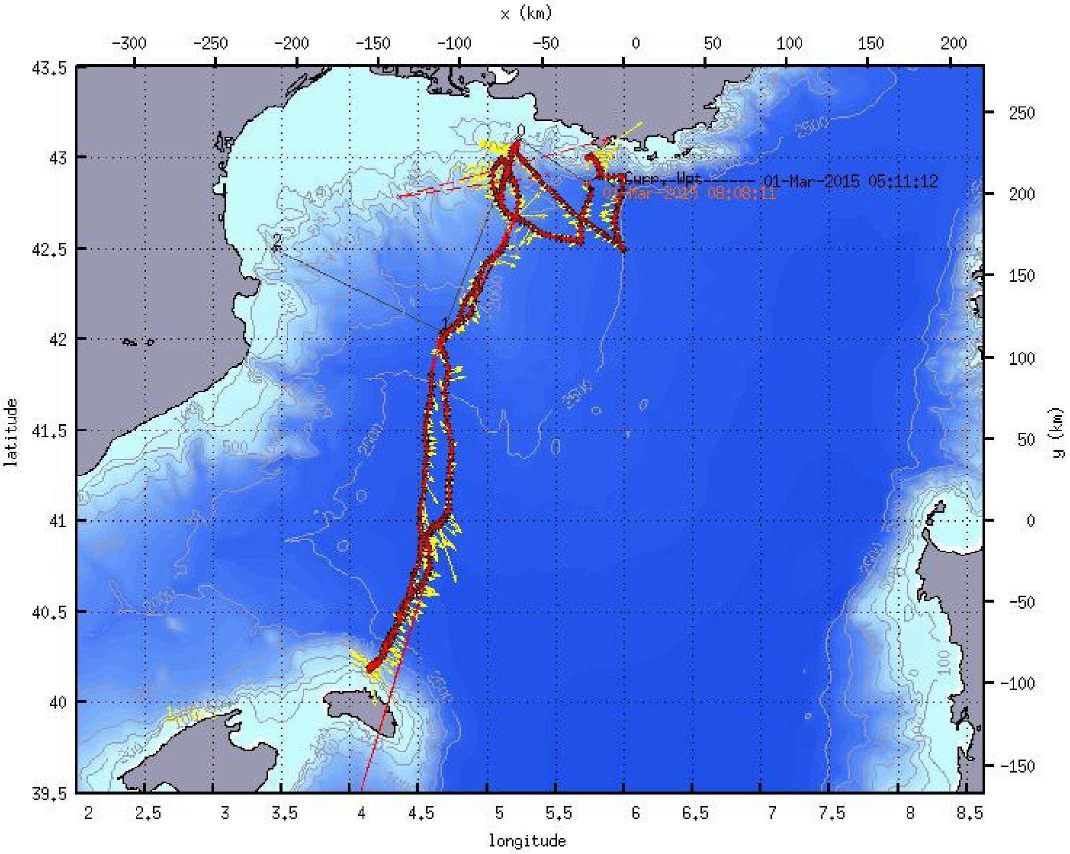


Figure 2 : Mission flight path



Glider deployment report

Mission	MoosePerseusT00_29
Platform	Slocum open ocean glider
Platform ID	Himilcon (serial 098)
Start date	2015-01-22 09:54:07
End date	2015-03-27 08:34:35
Area	North West Mediterranean Observatory
Objective	The proposed research is based on the monitoring of the long term evolution of the North Western Mediterranean Sea with glider repeat-sections carried out in the framework of the ALLENVI/INSU/ SOERE MOOSE (http://moose-network.fr), INSU/MISTRALS (http://www.mistrals-home.org), and EU FP7 PERSEUS (http://www.perseus-net.eu). The objective is to monitor the oceanographic variability (physical and biogeochemical) of the north western Mediterranean Sea, over a continuum of spatial and temporal scales. Two cross-basin repeat-sections with a repeat rate of about 10-20 days allow to monitor the main circulation features (Northern Current, North Balearic Front, Western Corsica Current) on a regular basis, as well as major processes such as winter intermediate and deep water formations and vernal blooms. The gliders regularly visit MOOSE moorings for cross-calibration purposes and to explore the variability around these moorings. i) T00 is a repeat-section between Nice and Calvi passing by the MOOSE mooring DYFAMED located in the central Ligurian Sea ii) T02 is a repeat-section between Marseille and Menorca passing by the MOOSE mooring LION located in the center of the deep convection area
Total days : 64	Total Navigation (km) : 1461
Related platforms/missions	Every other T00 missions
Sensors	SeaBird Electronics CTD 41cp Calibration date : 2009-06-07T18:18:46 Measured parameters : TEMP, CNDC, PRES, Teledyne Webb research flntu Calibration date : 2011-08-19T17:00:08 Measured parameters : FLUORESCENCE_CHLA, TURBIDITY, Aanderaa Oxy 5013 Calibration date : 2009-11-25T16:07:16 Measured parameters : MOLAR_DOXY, TEMP_DOXY, BPHASE_DOXY, DPHASE_DOXY,
Number of profiles	1200
Events	

Glider deployment report

Mission Summary	https://gfcp.ego-network.org/gliders/Himilcon/MoosePerseusT00_29/logbook
PI	Pierre Testor / Laurent Coppola
Institute (owner of the glider)	LOCEAN
Project affiliation	MOOSE
Glider software version	Navigation software version : Science software version :
Number of Iridium connections	426
RT Data transmitted by Iridium	1310 navigation files (16M) 1363 science files (19M)
DM Data downloaded from glider	
Data available from	http://www.ifremer.fr/co/ego/ego/Himilcon
Calibrations	https://gfcp.ego-network.org/gliders/Himilcon/MoosePerseusT00_29/info/himilcon_mooseperseust00_29.json
Battery type	Lithium Battery packs : 1 x WILPA1726 + 1 x WILPA1727 + 1 x WILPA1727
Batteries	Initial batteries voltage : 13.8988519572147 V Final batteries voltage : 14.0285187139628 V Batteries consumption : Ah
Full post mission report	https://glider83a.dt.insu.cnrs.fr/deployment_report.php?glider=Himilcon&deployment=MoosePerseusT00_29
Technical contact	ups855.liste.glidertech@cnrs.fr

Glider deployment report

Figure 1 : Mission flight path

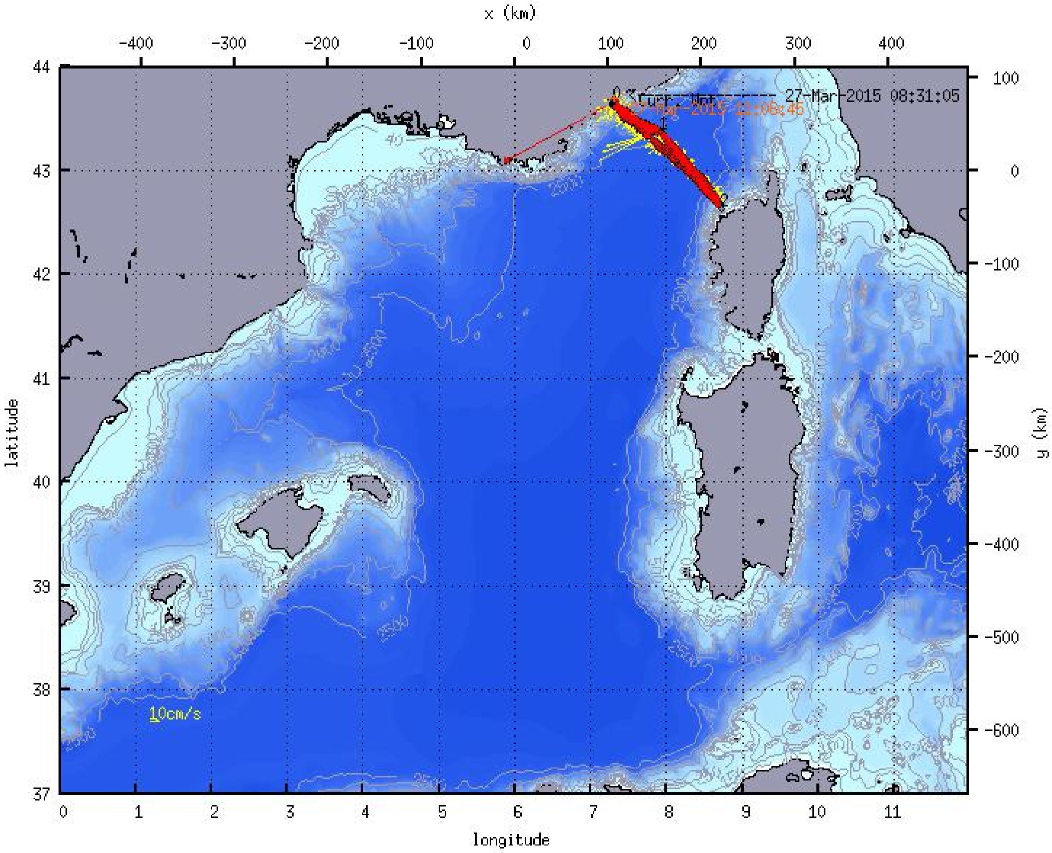
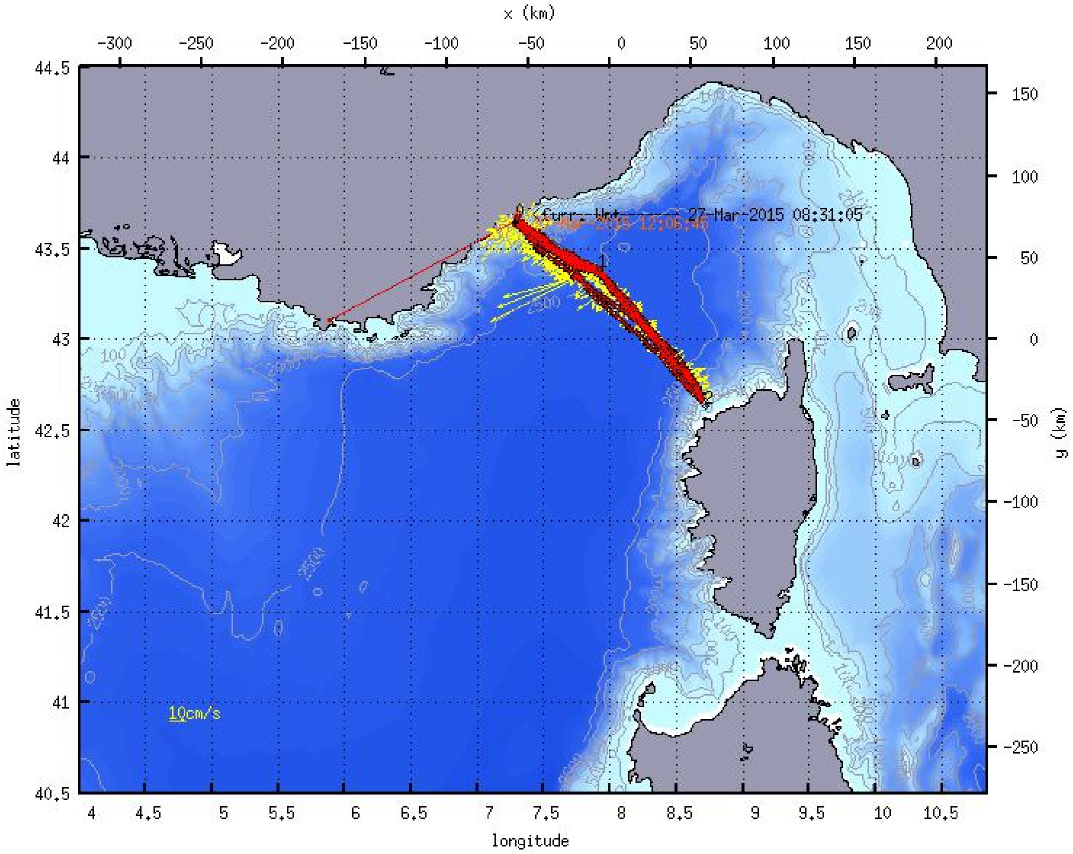


Figure 2 : Mission flight path



Glider deployment report

Mission	MoosePerseusT02_09
Platform	Slocum open ocean glider
Platform ID	Nearchos (serial 127)
Start date	2015-03-19 14:16:12
End date	2015-05-27 14:02:16
Area	North West Mediterranean Observatory
Objective	The proposed research is based on the monitoring of the long term evolution of the North Western Mediterranean Sea with glider repeat-sections carried out in the framework of the ALLENVI/INSU/ SOERE MOOSE (http://moose-network.fr), INSU/MISTRALS (http://www.mistrals-home.org), and EU FP7 PERSEUS (http://www.perseus-net.eu). The objective is to monitor the oceanographic variability (physical and biogeochemical) of the north western Mediterranean Sea, over a continuum of spatial and temporal scales. Two cross-basin repeat-sections with a repeat rate of about 10-20 days allow to monitor the main circulation features (Northern Current, North Balearic Front, Western Corsica Current) on a regular basis, as well as major processes such as winter intermediate and deep water formations and vernal blooms. The gliders regularly visit MOOSE moorings for cross-calibration purposes and to explore the variability around these moorings. i) T00 is a repeat-section between Nice and Calvi passing by the MOOSE mooring DYFAMED located in the central Ligurian Sea ii) T02 is a repeat-section between Marseille and Menorca passing by the MOOSE mooring LION located in the center of the deep convection area
Total days : 69	Total Navigation (km) : 1644
Related platforms/missions	every other T02 missions
Sensors	Wetlabs bb2flslk V2 Calibration date : 2007-10-31T15:25:44 Measured parameters : FLUORESCENCE_CHLA, BBP532, BBP470, Teledyne Webb research CTD 41cp Calibration date : 2008-01-31T19:01:50 Measured parameters : TEMP, CNDC, PRES, Aanderaa Oxy 5013 Calibration date : 2014-02-14T09:56:28 Measured parameters : MOLAR_DOXY, TEMP_DOXY, BPHASE_DOXY, DPHASE_DOXY,
Number of profiles	1099
Events	

Glider deployment report

Mission Summary	https://gfcp.ego-network.org/gliders/Nearchos/MoosePerseusT02_09/logbook
PI	Pierre Testor
Institute (owner of the glider)	ENSTA
Project affiliation	
Glider software version	Navigation software version : 7.5 Science software version :
Number of Iridium connections	472
RT Data transmitted by Iridium	1428 navigation files (17M) 1423 science files (22M)
DM Data downloaded from glider	
Data available from	http://www.ifremer.fr/co/ego/ego/Nearchos
Calibrations	https://gfcp.ego-network.org/gliders/Nearchos/MoosePerseusT02_09/info/nearchos_mooseperseust02_09.json
Battery type	Lithium Battery packs : 1 x WILPA1726
Batteries	Initial batteries voltage : 13.8601083189344 V Final batteries voltage : 14.0918230173731 V Batteries consumption : 344.049 Ah
Full post mission report	https://glider83a.dt.insu.cnrs.fr/deployment_report.php?glider=Nearchos&deployment=MoosePerseusT02_09
Technical contact	ups855.liste.glidertech@cnrs.fr

Figure 1 : Mission flight path

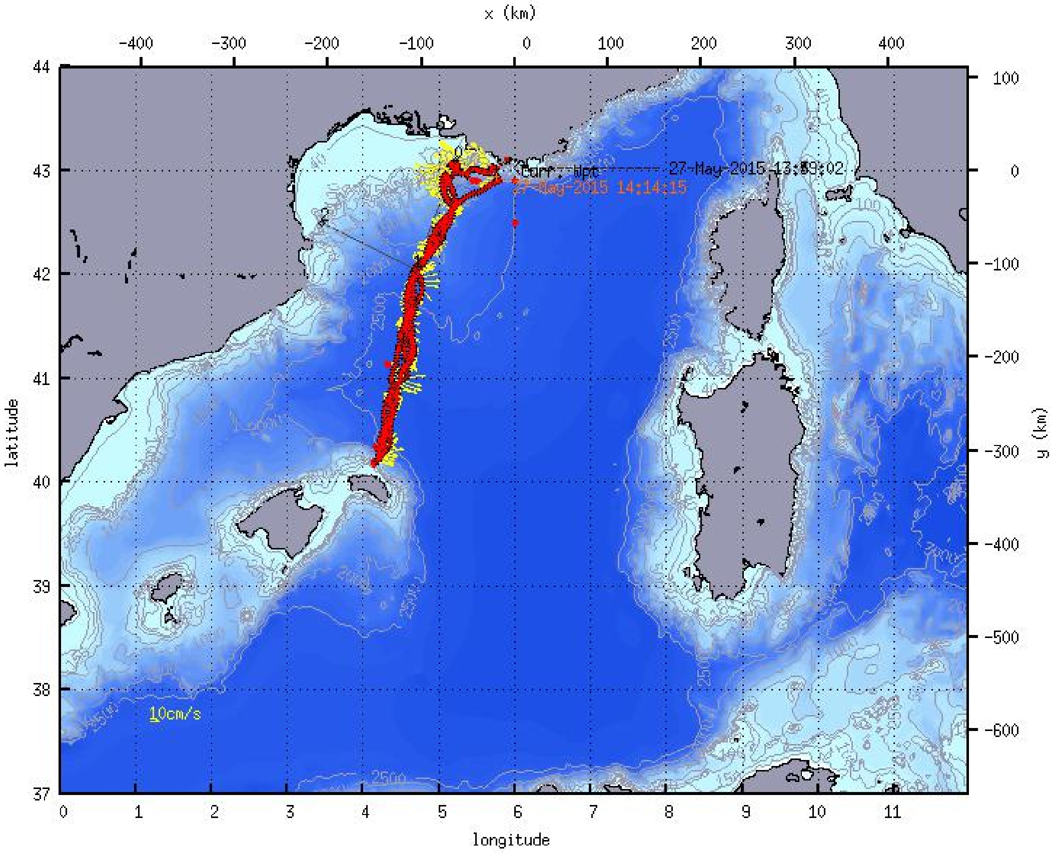
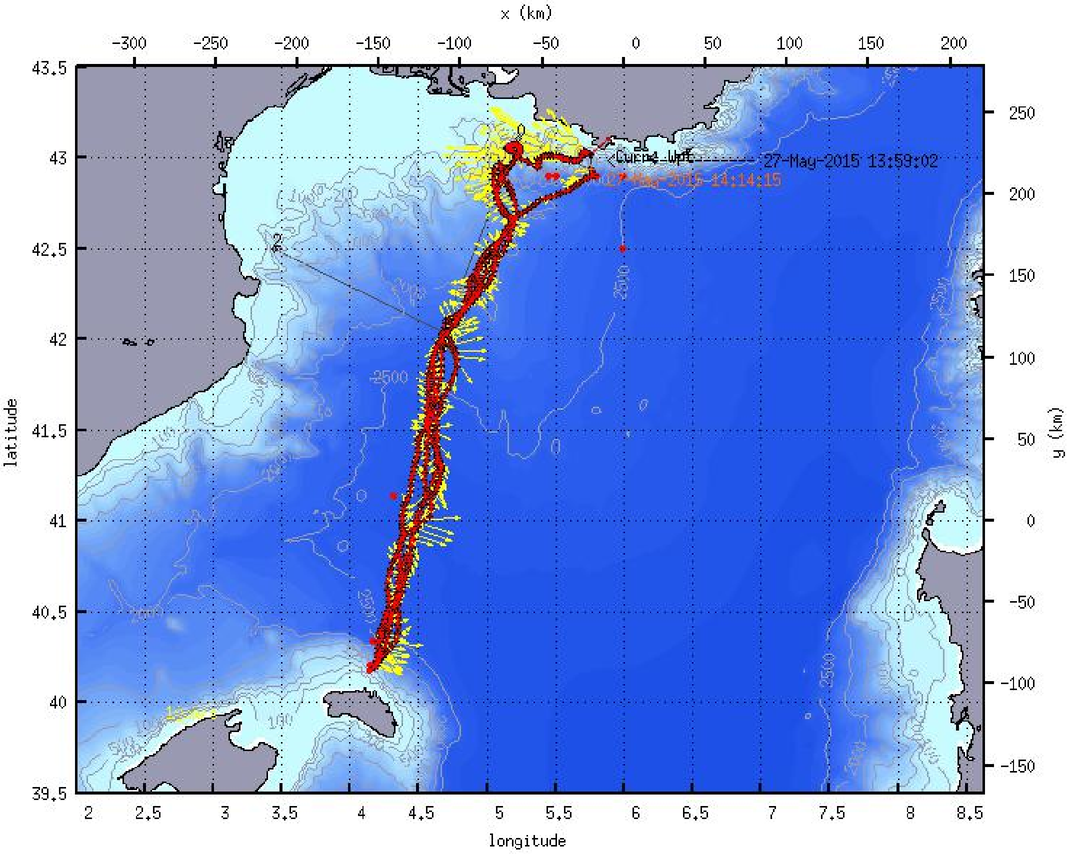
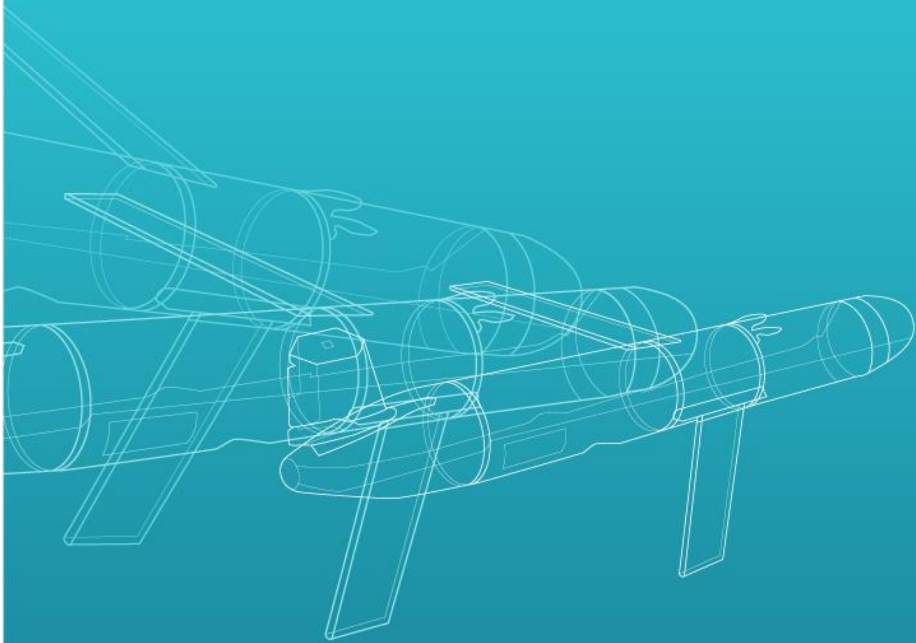


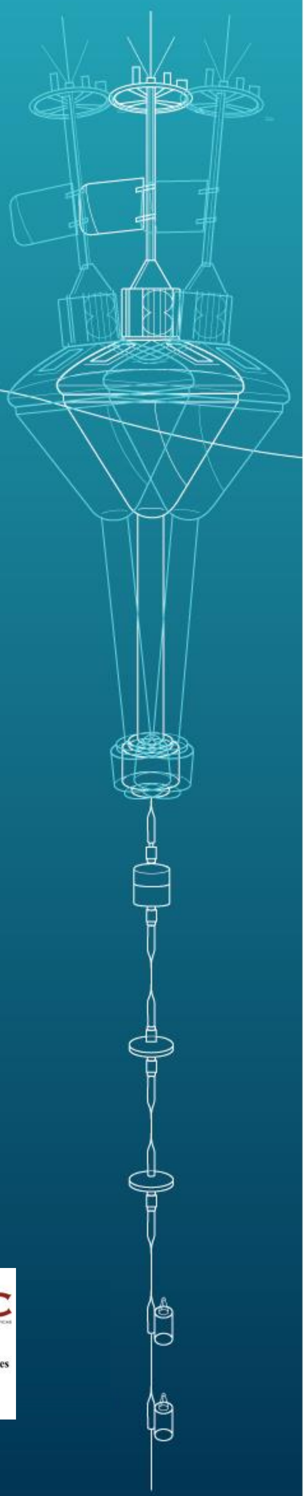
Figure 2 : Mission flight path



A2. Glider mission summaries for SOCIB/CSIC Ibiza Channel endurance line monitoring program

Below are 23 glider mission summary reports for missions during PERSEUS period (2012 – 2015)





Glider Mission Summary Report

2012 - 2015

SOCIB (CSIC)

SOCIB_CANALES_MAY2012 (GR-MR-0008)

SOCIB Balearic Islands Coastal Observing and Forecasting System

GOBIERNO DE ESPAÑA MINISTERIO DE ECONOMÍA Y COMPETITIVIDAD

Govern de les Illes Balears

IMEDEA CSIC Universitat de les Illes Balears

Mission Name	*SOCIB_CANALES_MAY2012 (GR-MR-0008)*		
Platform Model	*Slocum 1000 G1*		
Platform ID / Name / WMO Code	*U132 / IDEEP02 / (n/a)*		
Related Platforms / Missions			
Start Date	*2012-05-09*		
End Date	*2012-06-01*		
Total Days *24*	**Total distance (Km / Nm)**	*564,9 / 305,4*	
Survey Area (NODC or SDN region)	*Mallorca and Eïvissa Channels (Western Mediterranean sea)*		
Objective(s)	*Establishing the variability of the N/S exchange of water masses that occur through the Ibiza Channel.* *Sampling a standard transect across the Ibiza Channel several times using physical and biogeochemical sensors.* *No greater than 1 month gap in between consecutive iterations.* *The Mallorca Channel is also sampled when operationally practical.*		
Scientific Sensors (name & model / serial_number / calibration date)	*CTD-SBE / sn 0129 / 29-Sep-2008* *FLNTUSLK -WetLabs- / sn0988 / 13-Jun-2008* *OPTODE_5013 -Aandera- / sn 0994 / 23-Oct-2009*		
Number of Profiles	*819 (CTD), 346 (FLNTU), 346 (OXY)*		
Significant Events	*2 on-mission aborts: wpt-too-far & undervolts* *Mission was re-run 5 times during the water survey* *Multiple oddities from devices: IRIDIUM, OCEAN_PRESSURE & DIGIFIN* *Surface drifting prior to recovery* *Emergency recovery due to low battery level*		
Mission Summary	*This mission stands for the 2nd iteration of the Canales Campaign 2012 carried out by IMEDEA's glider IDEEP02 (Unit 132).* *Launching was performed by a 2-member field-team on board SOCIB-I professional RIB at location N39.5172° E02.1785°* *During the time the glider remained deployed 2 Mallorca-Eïvissa and 4 Eïvissa-Valencia channels were surveyed.* *Overall performance of mechanical and sampling devices was reasonably good. Only some devices exhibited a quite high number of oddities, which did not implied adverse situations. Only the battery level was a problem, at the end of the mission, while the glider was 1 day away from the end of the programmed track, when dropping too low and thus forcing an emergency recovery after leaving the glider in low-power drifting mode.* *Recovery was performed by the same team and vessel in the middle of the Mallorca-Eïvissa channel (N39.3883° E01.9395°)* *Upon completion, IDEEP02 was received at IMEDEA's glider-lab, put on the bench, revised and properly stored. The gathered dataset was fully backed-up and uploaded to SOCIB's FTP for subsequent processing and diffusion via SOCIB's public repository.*		

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Principal Investigator (e-mail or contact phone/address)	*Prof. Joaquim Tintoré* *jtintore@socib.es (+34 971439821)*
Institute	*SOCIB in collaboration with IMEDEA*
Project Affiliation (web-site)	*http://www.socib.eu*
Partnership / Participation	*SOCIB (internal long-term project of sustained monitoring line)* *IMEDEA (in-kind contribution of material and infrastructures)*
Glider Software Version	*v7.3 Ice House*
Data Retrieval (real-time [RT] / delayed-mode [DM])	*Real-time sub-set via satellite link every 6 hours every day* *Delayed-mode direct download of full gathered data sets*
Compass Calibration (specify procedure)	*(n/a)*
Battery Type	*Manufacturer's original Alkaline batt.pack (143Ah-nominal cap.)*
Battery Consumption (Ah)	*136.3Ah*
Data Available From	*http://thredds.socib.es/thredds/dodsC/auv/glider/ideep02-ime_sldeep002/L2/2012/dep0003_ideep02_ime-sldeep002_L2_2012-05-09_data_dt.nc*
Full Mission Report From	*glidertech@socib.es*
Technical Contact	*glidertech@socib.es*

Figure 1

(Map providing general overview of Survey Area)

Mission Summary

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

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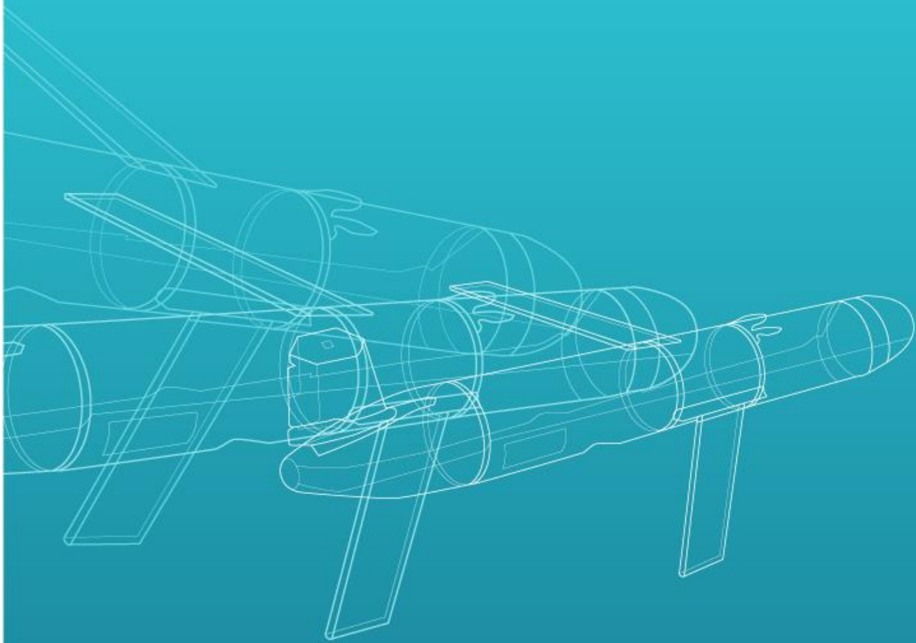

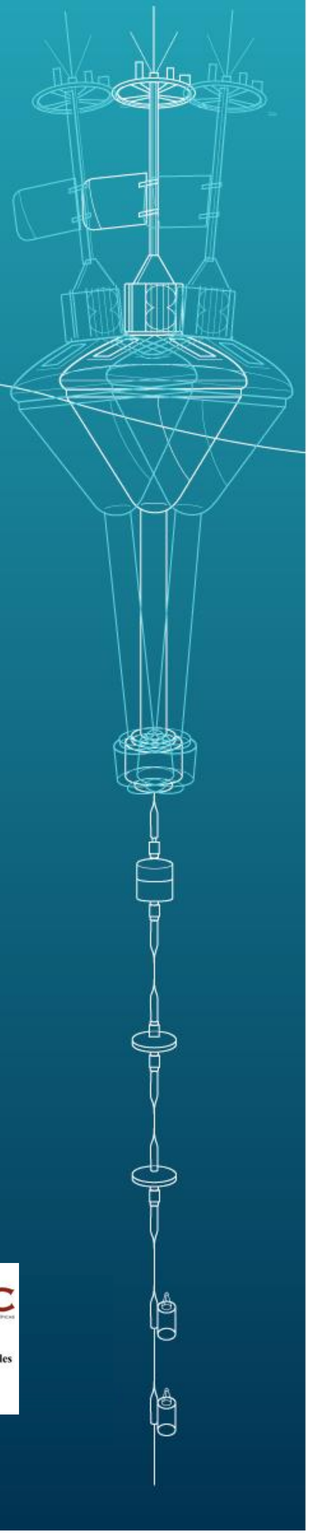

Glider Mission Summary Report

2012 - 2015

SOCIB (CSIC)

SOCIB_CANALES_JUL2012 (GR-MR-0011)

SOCIB Balearic Islands Coastal Observing and Forecasting System

GOBIERNO DE ESPAÑA MINISTERIO DE ECONOMÍA Y COMPETITIVIDAD

Govern de les Illes Balears

IMEDEA CSIC Universitat de les Illes Balears

Mission Name	*SOCIB_CANALES_JUL2012 (GR-MR-0011)*		
Platform Model	*Slocum 1000 G1*		
Platform ID / Name / WMO Code	*U184 / IDEEP00 / 68452*		
Related Platforms / Missions			
Start Date	*2012-07-09*		
End Date	*2012-08-01*		
Total Days *24*		**Total distance (Km / Nm)**	*585,9 / 316,7*
Survey Area (NODC or SDN region)	*Mallorca and Eïvissa Channels (Western Mediterranean sea)*		
Objective(s)	*Establishing the variability of the N/S exchange of water masses that occur through the Ibiza Channel.* *Sampling a standard transect across the Ibiza Channel several times using physical and biogeochemical sensors.* *No greater than 1 month gap in between consecutive iterations.* *The Mallorca Channel is also sampled when operationally practical.*		
Scientific Sensors (name & model / serial_number / calibration date)	*CTD-SBE / sn 0195 / (n/a)* *FLNTUSLK -WetLabs- / sn2128 / 01-Feb-2011* *OPTODE -Aandera- / sn 0841 / 14-Sep-2010*		
Number of Profiles	*777 (CTD), 326 (FLNTU), 327 (OXY)*		
Significant Events	*2 on-mission aborts: same_depth_for & overtime* *Mission was re-run 3 times during the water survey* *Multiple oddities from devices: IRIDIUM, OCEAN_PRESSURE, PITCH_MOTOR & DIGIFIN*		
Mission Summary	*This mission stands for the 3rd iteration of the Canales Campaign 2012 carried out by IMEDEA's glider IDEEP00 (Unit 184).* *Launching was performed by a 2-member field-team on board SOCIB-I professional RIB at location N39.5221° E02.1676°* *During the time the glider remained deployed 2 Mallorca-Eïvissa and 4 Eïvissa-Valencia channels were surveyed.* *Overall performance of mechanical and sampling devices was reasonably good. Only some devices exhibited a quite high number of oddities, which did not implied adverse situations. Communications were fluid during the whole mission and the glider did not have much trouble transmitting near-real-time files to dockserver.* *Recovery was performed by the same team and vessel in the middle of the Mallorca-Eïvissa channel (N39.5094° E02.1847°)* *Upon completion, IDEEP00 was received at IMEDEA's glider-lab, put on the bench, revised and properly stored. The gathered dataset was fully backed-up and uploaded to SOCIB's FTP for subsequent processing and diffusion via SOCIB's public repository.*		

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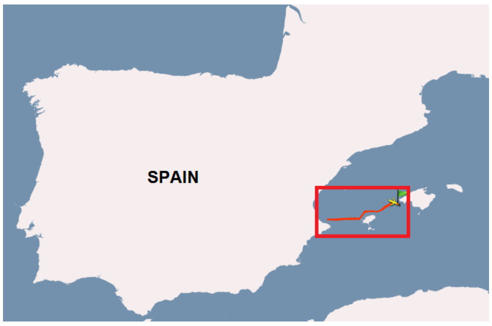
Principal Investigator (e-mail or contact phone/address)	*Prof. Joaquim Tintoré* *jtintore@socib.es (+34 971439821)*
Institute	*SOCIB in collaboration with IMEDEA*
Project Affiliation (web-site)	*http://www.socib.eu*
Partnership / Participation	*SOCIB (internal long-term project of sustained monitoring line)* *IMEDEA (in-kind contribution of material and infrastructures)*
Glider Software Version	*v7.3 Ice House*
Data Retrieval (real-time [RT] / delayed-mode [DM])	*Real-time sub-set via satellite link every 6 hours every day* *Delayed-mode direct download of full gathered data sets*
Compass Calibration (specify procedure)	*(n/a)*
Battery Type	*Manufacturer's original Alkaline batt.pack (143Ah-nominal cap.)*
Battery Consumption (Ah)	*120Ah (reading from 0Ah to 120,335Ah)*
Data Available From	*http://thredds.socib.es/thredds/dodsC/auv/glider/ideep00-ime_sldeep000/L1/2012/dep0008_ideep00_ime-sldeep000_L1_2012-07-09_data_dt.nc*
Full Mission Report From	*glidertech@socib.es*
Technical Contact	*glidertech@socib.es*

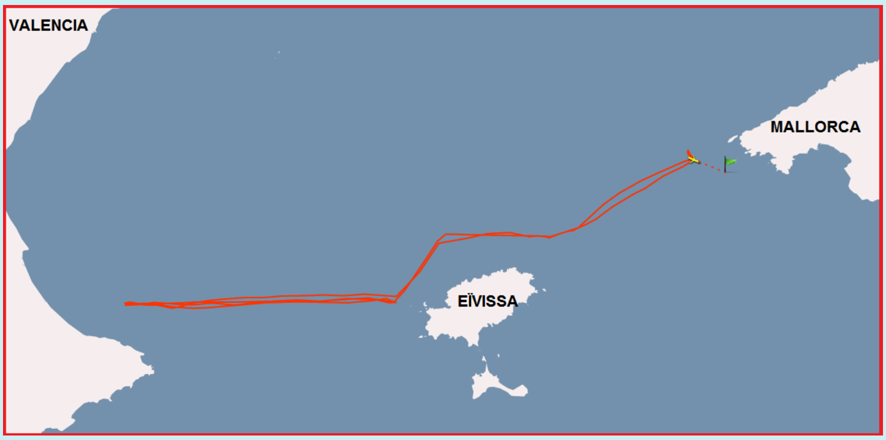
Figure 1

(Map providing general overview of Survey Area)



Mission Summary

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



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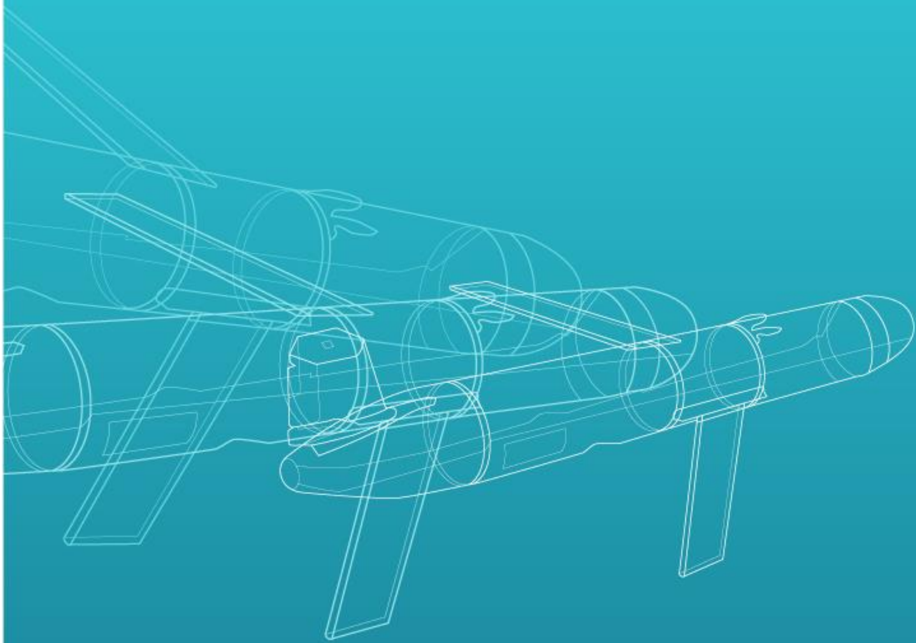

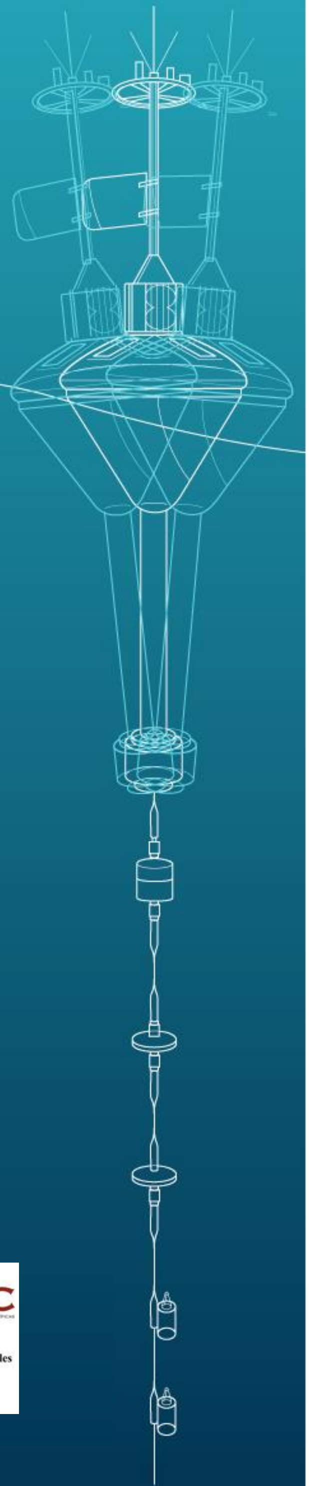

Glider Mission Summary Report

2012 - 2015

SOCIB (CSIC)

SOCIB_CANALES_AUG2012 (GR-MR-0011b)

SOCIB Balearic Islands Coastal Observing and Forecasting System

GOBIERNO DE ESPAÑA MINISTERIO DE ECONOMÍA Y COMPETITIVIDAD

Govern de les Illes Balears

IMEDEA CSIC Universitat de les Illes Balears

Mission Name	*SOCIB_CANALES_AUG2012 (GR-MR-0011b)*		
Platform Model	*Slocum 1000 G1*		
Platform ID / Name / WMO Code	*U184 / IDEEP00 / 68452*		
Related Platforms / Missions			
Start Date	*2012-08-22*		
End Date	*2012-09-16*		
Total Days *27*		**Total distance (Km / Nm)**	*589,5 / 318,7*
Survey Area (NODC or SDN region)	*Mallorca and Eïvissa Channels (Western Mediterranean sea)*		
Objective(s)	*Establishing the variability of the N/S exchange of water masses that occur through the Ibiza Channel.* *Sampling a standard transect across the Ibiza Channel several times using physical and biogeochemical sensors.* *No greater than 1 month gap in between consecutive iterations.* *The Mallorca Channel is also sampled when operationally practical.*		
Scientific Sensors (name & model / serial_number / calibration date)	*CTD-SBE / sn 0195 / (n/a)* *FLNTUSLK -WetLabs- / sn2128 / 01-Feb-2011* *OPTODE -Aandera- / sn 0841 / 14-Sep-2010*		
Number of Profiles	*881 (CTD), 352 (FLNTU), 352 (OXY)*		
Significant Events	*Launching: overtime mission executed twice* *3 on-mission aborts: same_depth_for(x2) & ms_undervolts* *Premature recovery due to low battery level at the end of mission* *Currents pushing North in middle Eïvissa-Valencia channel* *Multiple oddities from devices: IRIDIUM, OCEAN_PRESSURE, PITCH_MOTOR & DIGIFIN*		
Mission Summary	*This mission stands for the 4th iteration of the Canales Campaign 2012, carried out by IMEDEA's glider IDEEP00 (Unit 184).* *Launching was performed by a 2-member field-team on board SOCIB-I professional RIB at location N39.5043° E02.1894°* *During the time the glider remained deployed 2 Mallorca-Eïvissa and 4 Eïvissa-Valencia channels were surveyed.* *Overall performance of mechanical and sampling devices was reasonably good. Only some devices exhibited a quite high number of oddities, which did not implied adverse situations.* *However, 15Km. before the end of the mission (second Eïvissa-Mallorca channel) battery voltage dropped below the minimum causing the glider to abort the mission. After that, IDEEP00 was put back into mission reducing target diving depth to 350m to save energy and avoid aborts while waiting for the precipitate recovery.* *Recovery was performed by the same team and vessel in the middle of the Mallorca-Eïvissa channel (N39.4757° E02.109°)* *Upon completion, IDEEP00 was received at IMEDEA's glider-lab, put on the bench, revised and properly stored. The gathered dataset was fully backed-up and uploaded to SOCIB's FTP for subsequent processing and diffusion via SOCIB's public repository.*		

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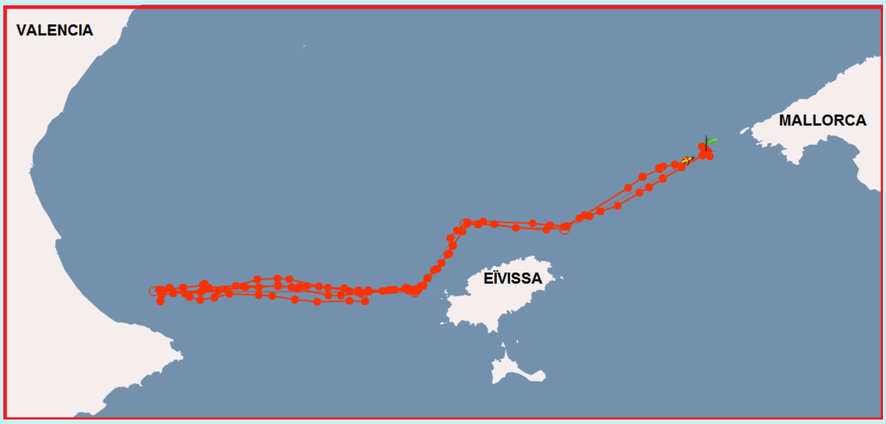
Principal Investigator (e-mail or contact phone/address)	*Prof. Joaquim Tintoré* *jtintore@socib.es (+34 971439821)*
Institute	*SOCIB in collaboration with IMEDEA*
Project Affiliation (web-site)	*http://www.socib.eu*
Partnership / Participation	*SOCIB (internal long-term project of sustained monitoring line)* *IMEDEA (in-kind contribution of material and infrastructures)*
Glider Software Version	*v7.7 GAMMA_RAD5*
Data Retrieval (real-time [RT] / delayed-mode [DM])	*Real-time sub-set via satellite link every 6 hours every day* *Delayed-mode direct download of full gathered data sets*
Compass Calibration (specify procedure)	*(n/a)*
Battery Type	*Manufacturer's original Alkaline batt.pack (143Ah-nominal cap.)*
Battery Consumption (Ah)	*128,298Ah (reading from 0,033Ah to 128,331Ah)*
Data Available From	*http://thredds.socib.es/thredds/dodsC/auv/glider/ideep00-ime_sldeep000/L1/2012/dep0009_ideep00_ime-sldeep000_L1_2012-08-22_data_dt.nc*
Full Mission Report From	*glidertech@socib.es*
Technical Contact	*glidertech@socib.es*

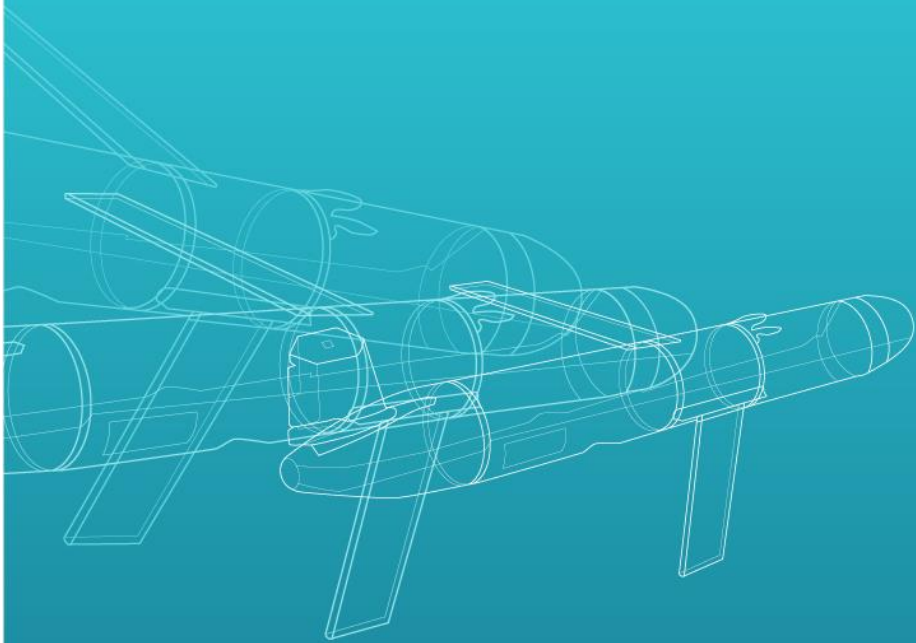
Figure 1

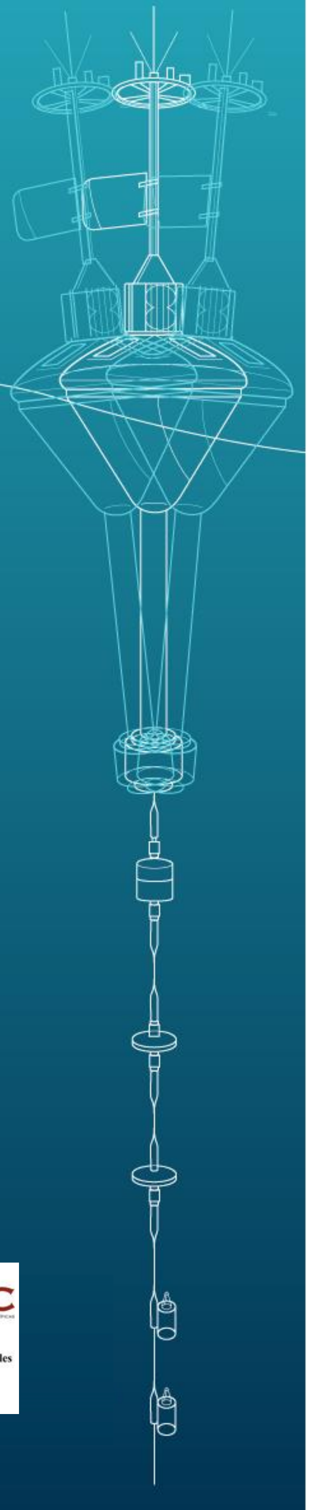
(Map providing general overview of Survey Area)

Mission Summary

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







Glider Mission Summary Report

2012 - 2015

SOCIB (CSIC)

SOCIB_CANALES_OCT2012 (GR-MR-0012)

SOCIB Balearic Islands Coastal Observing and Forecasting System

GOBIERNO DE ESPAÑA MINISTERIO DE ECONOMÍA Y COMPETITIVIDAD

Govern de les Illes Balears

IMEDEA CSIC Universitat de les Illes Balears

Mission Name	*SOCIB_CANALES_OCT2012 (GR-MR-0012)*
Platform Model	*Slocum 1000 G1*
Platform ID / Name / WMO Code	*U132 / IDEEP02 / 68966*
Related Platforms / Missions	
Start Date	*2012-10-24*
End Date	*2012-11-03*
Total Days *11*	**Total distance (Km / Nm)** *177,5 / 95,9*
Survey Area (NODC or SDN region)	*Mallorca and Eïvissa Channels (Western Mediterranean sea)*
Objective(s)	*Establishing the variability of the N/S exchange of water masses that occur through the Ibiza Channel.* *Sampling a standard transect across the Ibiza Channel several times using physical and biogeochemical sensors.* *No greater than 1 month gap in between consecutive iterations.* *The Mallorca Channel is also sampled when operationally practical.*
Scientific Sensors (name & model / serial_number / calibration date)	*CTD- SBE / sn 0129 / 29-Sep-2008* *FLNTUSLK -WetLabs- / sn0988 / 13-Jun-2008* *OPTODE_5013 -Aandera- / sn 0994 / 23-Oct-2009*
Number of Profiles	*397 (CTD), 304 (FLNTU), 304 (OXY)*
Significant Events	*ABORTED MISSION* *Missed calls during initial 72 hours of mission* *Strong currents pushing South while navigating around Eïvissa and during the first half of the first Eïvissa to Valencia transect* *Critical WATER LEAK in the middle of the Eïvissa-Valencia channel* *Glider left drifting at the surface while waiting for emergency recovery* *Harsh recovery due to very severe sea-state and weather*
Mission Summary	*This mission stands for the 5th iteration of the Canales Campaign 2012, carried out by IMEDEA's glider IDEEP02 (Unit 132). Unit 184 went out of service in need for repair.* *Launching was performed by a 2-member field-team on board SOCIB-I professional RIB at location N39.5044° E02.1878°* *During the time the glider remained deployed 1 Mallorca-Eïvissa and 1/2 Eïvissa-Valencia channels were surveyed.* *Overall performance of mechanical and sampling devices was reasonably good. Comms were stable but during the first days of mission (time gaps in between calls of 12hrs).* *IDEEP02 called in on Friday, Nov-2nd at 01:02am,utc, reporting having aborted the mission due to WATER LEAK detected. It was left drifting at the surface and an emergency recovery was immediately prepared. 2 field-techs flew to Eïvissa and hired a charter boat to perform the extraction operation. Weather conditions were very adverse during that weekend.* *Having drifter for 30 hrs (and covered a non-linear 10km track), IDEEP02 was recovered on Saturday Nov-3rd near N38.8905° E00.5521° waypoint. This operation was very difficult due to local waves and wind.* *Once received at IMEDEA, IDEEP02 was analyzed and the leak entrance detected. A defective o-ring was considered the cause and the glider prepared for a new attempt. Gathered data was backed up and uploaded to SOCIB's FTP.*

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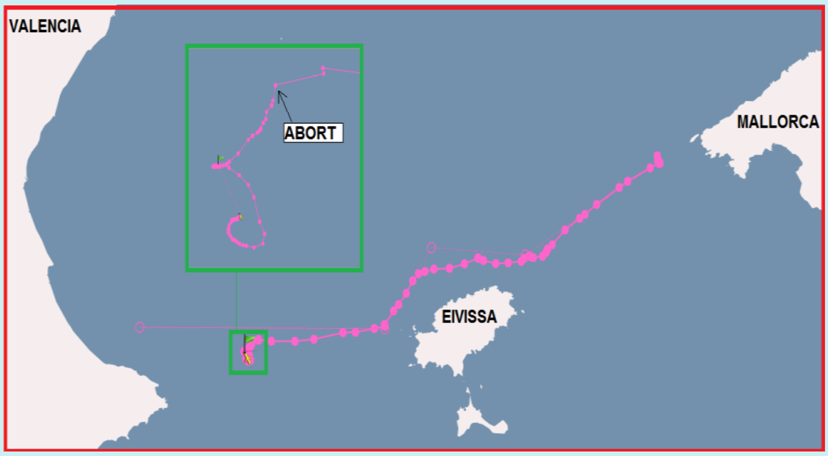
Principal Investigator (e-mail or contact phone/address)	*Prof. Joaquim Tintoré* *jtintore@socib.es (+34 971439821)*
Institute	*SOCIB in collaboration with IMEDEA*
Project Affiliation (web-site)	*http://www.socib.eu*
Partnership / Participation	*SOCIB (internal long-term project of sustained monitoring line)* *IMEDEA (in-kind contribution of material and infrastructures)*
Glider Software Version	*v7.7 GAMMA_RAD5*
Data Retrieval (real-time [RT] / delayed-mode [DM])	*Real-time sub-set via satellite link every 6 hours every day* *Delayed-mode direct download of full gathered data sets*
Compass Calibration (specify procedure)	*(n/a)*
Battery Type	*Manufacturer's original Alkaline batt.pack (143Ah-nominal cap.)*
Battery Consumption (Ah)	*61,074Ah (reading from 2,566Ah to 63,640Ah)*
Data Available From	*http://thredds.socib.es/thredds/dodsC/auv/glider/ideep02-ime_sldeep002/L1/2012/dep0004_ideep02_ime-sldeep002_L1_2012-10-24_data_dt.nc*
Full Mission Report From	*glidertech@socib.es*
Technical Contact	*glidertech@socib.es*

Figure 1

(Map providing general overview of Survey Area)

Mission Summary

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



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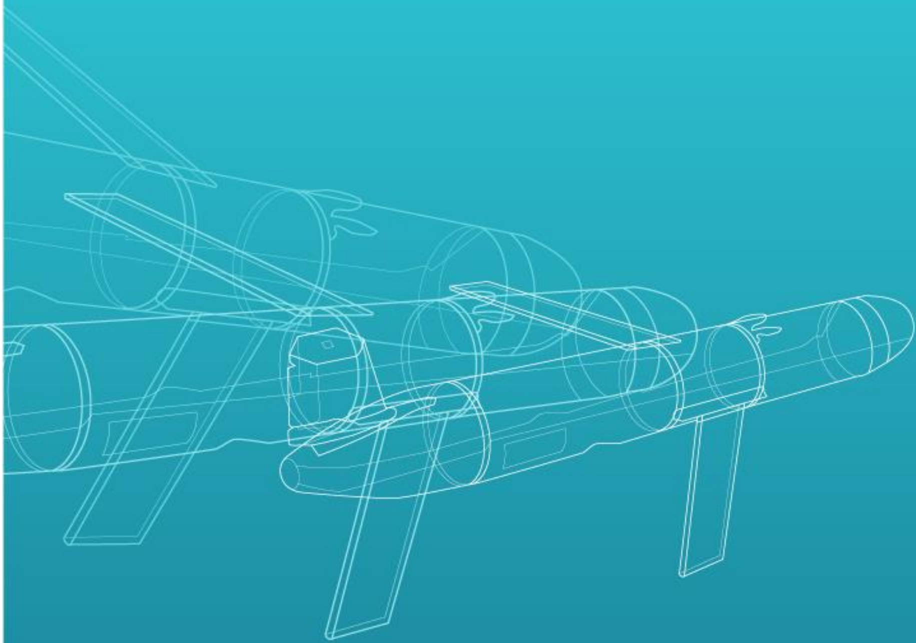

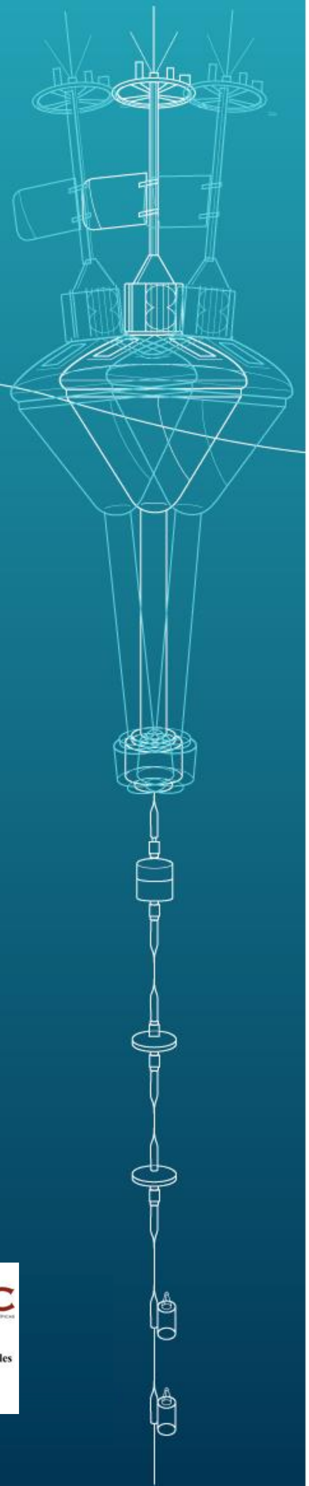

Glider Mission Summary Report

2012 - 2015

SOCIB (CSIC)

SOCIB_CANALES_NOV2012 (GR-MR-0014)

SOCIB Balearic Islands Coastal Observing and Forecasting System

Gobierno de España · Ministerio de Economía y Competitividad · Govern de les Illes Balears

IMEDEA · CSIC · Universitat de les Illes Balears

Mission Name	*SOCIB_CANALES_NOV2012 (GR-MR-0014)*		
Platform Model	*Slocum 1000 G2*		
Platform ID / Name / WMO Code	*U243 / SDEEP00 / 68457*		
Related Platforms / Missions			
Start Date	*2012-11-27*		
End Date	*2012-12-13*		
Total Days *18*		**Total distance (Km / Nm)**	*442,5 / 239,2*
Survey Area (NODC or SDN region)	*Mallorca and Eïvissa Channels (Western Mediterranean sea)*		
Objective(s)	*Establishing the variability of the N/S exchange of water masses that occur through the Ibiza Channel.* *Sampling a standard transect across the Ibiza Channel several times using physical and biogeochemical sensors.* *No greater than 1 month gap in between consecutive iterations.* *The Mallorca Channel is also sampled when operationally practical.*		
Scientific Sensors (name & model / serial_number / calibration date)	*GPCTD -SBE- / sn 0107 / 04-Jan-2012* *FLNTU -WetLabs- / sn2279 / 15-Jul-2011* *OPTODE -Aandera- / sn 1409 / 15-Feb-2011*		
Number of Profiles	*874 (CTD), 437 (FLNTU), 435 (OXY)*		
Significant Events	*First operational mission performed by SDEEP00 (Slocum G2)* *Deployment/Recovery closer to home-port to allow the glider to navigate for 24hrs., for testing, before the beginning of the standard Canales transect* *Shorter commanded track with respect to standard Canales due to the proximity of the Christmas festivity and the GPCTD being replaced due to aggressive corrosion of the unit initially delivered*		
Mission Summary	*This mission stands for the 6th iteration of the Canales Campaign 2012, carried out by SOCIB's glider SDEEP00 (Unit 243). Unit 132 failed due to water-leak for second time (gf-mr-0012) forcing the usage of SDEEP00. This mission was the first Canales, and the first operational mission, executed by SDEEP00.* *Launching was performed by a 2-member field-team on board SOCIB-I professional RIB at location N39.3983° E02.3227°. Having not been deployed nearby the standard initial Canales waypoint, SDEEP00 navigated North to meet that point while executing a test transect.* *During the time the glider remained deployed 2 Mallorca-Eïvissa and 2 Eïvissa-Valencia channels were surveyed.* *Overall performance of mechanical and sampling devices was excellent. Comms were stable and the navigation of the glider was adjusted to the commanded path.* *Once the return Eïvissa-Mallorca transect was concluded, thus ending the mission, SDEEP00 was commanded to navigate to the launching waypoint while waiting for recovery on the next day.* *Recovery took place near N39.4518° E02.2874° waypoint.* *Upon completion, SDEEP00 was received at IMEDEA's glider-lab, put on the bench, revised and properly stored. The gathered dataset was fully backed-up and uploaded to SOCIB's FTP for subsequent processing and diffusion via SOCIB's public repository.*		

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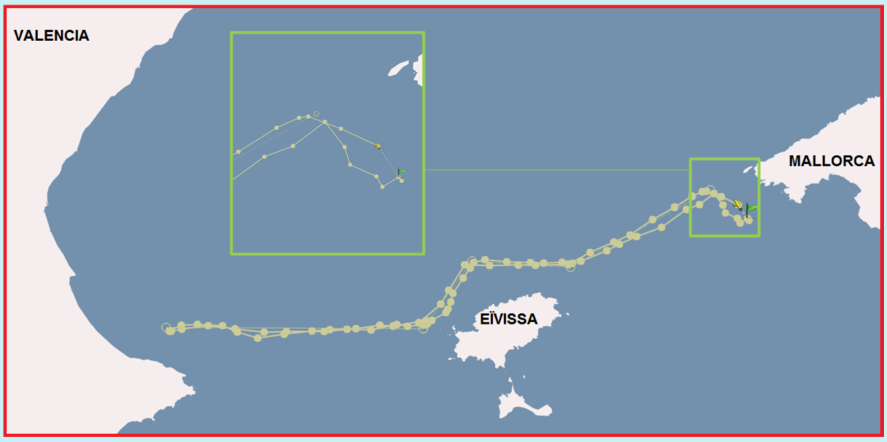
Principal Investigator (e-mail or contact phone/address)	*Prof. Joaquim Tintoré* *jtintore@socib.es (+34 971439821)*
Institute	*SOCIB in collaboration with IMEDEA*
Project Affiliation (web-site)	*http://www.socib.eu*
Partnership / Participation	*SOCIB (internal long-term project of sustained monitoring line)* *IMEDEA (in-kind contribution of material and infrastructures)*
Glider Software Version	*v7.7 GAMMA_RAD5*
Data Retrieval (real-time [RT] / delayed-mode [DM])	*Real-time sub-set via satellite link every 6 hours every day* *Delayed-mode direct download of full gathered data sets*
Compass Calibration (specify procedure)	*(n/a)*
Battery Type	*Manufacturer's original Alkaline batt.pack (143Ah-nominal cap.)*
Battery Consumption (Ah)	*102,613Ah (reading from 1,081Ah to 103,694Ah)*
Data Available From	*http://thredds.socib.es/thredds/dodsC/auv/glider/sdeep00-scb_sldeep000/L1/2012/dep0002_sdeep00_scb-sldeep000_L1_2012-11-27_data_dt.nc*
Full Mission Report From	*glidertech@socib.es*
Technical Contact	*glidertech@socib.es*

Figure 1

(Map providing general overview of Survey Area)

Mission Summary

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



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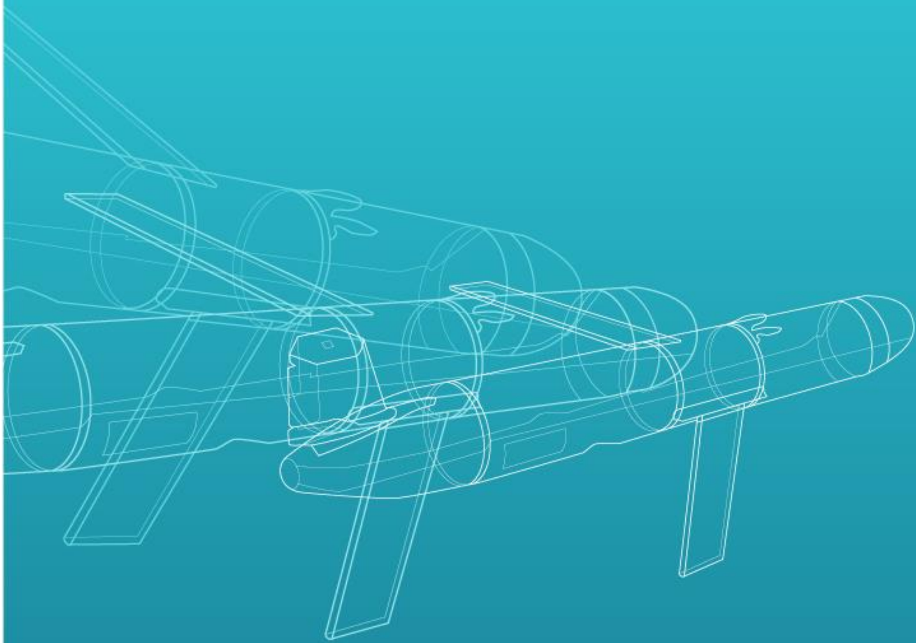

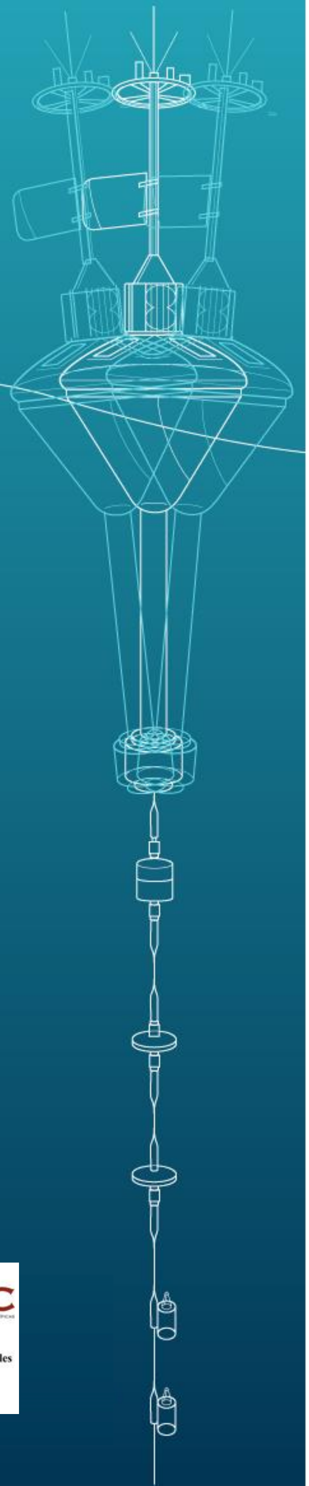

Glider Mission Summary Report

2012 - 2015

SOCIB (CSIC)

SOCIB_CANALES_JAN2013 (GR-MR-0015)

SOCIB Balearic Islands Coastal Observing and Forecasting System

GOBIERNO DE ESPAÑA MINISTERIO DE ECONOMÍA Y COMPETITIVIDAD

Govern de les Illes Balears

IMEDEA CSIC Universitat de les Illes Balears

Mission Name	*SOCIB_CANALES_JAN2013 (GR-MR-0015)*		
Platform Model	*Slocum 1000 G2*		
Platform ID / Name / WMO Code	*U243 / SDEEP00 / 68457*		
Related Platforms / Missions			
Start Date	*2013-01-30*		
End Date	*2013-02-21*		
Total Days 27		**Total distance (Km / Nm)**	*556,5 / 300,8*
Survey Area (NODC or SDN region)	*Mallorca and Eïvissa Channels (Western Mediterranean sea)*		
Objective(s)	*Establishing the variability of the N/S exchange of water masses that occur through the Ibiza Channel.* *Sampling a standard transect across the Ibiza Channel several times using physical and biogeochemical sensors.* *No greater than 1 month gap in between consecutive iterations.* *The Mallorca Channel is also sampled when operationally practical.*		
Scientific Sensors (name & model / serial_number / calibration date)	*GPCTD -SBE- / sn 0107 / 04-Jan-2012* *FLNTU -WetLabs- / sn2279 / 15-Jul-2011* *OPTODE -Aandera- / sn 1409 / 15-Feb-2011*		
Number of Profiles	*744 (CTD), 354 (FLNTU), 353 (OXY)*		
Significant Events	*Second operational mission performed by SDEEP00 (Slocum G2)* *Glider navigated not as adjusted to the commanded route as desired, although it was good enough to meet the mission's objectives.* *Recovery was premature (in the middle of the Eïvissa-Mallorca channel) due to low battery (UNDERVOLTS ABORT)*		
Mission Summary	*This mission stands for the 1st iteration of the Canales Campaign 2013, carried out by SOCIB's glider SDEEP00 (Unit 243).* *Launching was performed by a 2-member field-team on board SOCIB-I professional RIB at location N39.5089 ° E02.1863°.* *3 Iridium calls were missing during the first 72hrs. of mission.* *During the time the glider remained deployed 1 Mallorca-Eïvissa and 4 Eïvissa-Valencia channels were surveyed. The second Mallorca-Eïvissa was not completed successfully.* *Overall performance of mechanical and sampling devices was excellent. Only quite a few oddities coming from DIGIFIN and IRIDIUM devices. During one of the segments, the Oxygen sensor raised an error that prevented completing the current profile.* *While returning back to port, in the middle of the Eïvissa-Mallorca transect, SDEEP00 called in reporting low battery.* *After that, the glider was configured to perform shallow dives until next morning when an emergency recovery took place near N39.3214° E01.9043° waypoint.* *Upon completion, SDEEP00 was received at IMEDEA's glider-lab, put on the bench, revised and properly stored. The gathered dataset was fully backed-up and uploaded to SOCIB's FTP for subsequent processing and diffusion via SOCIB's public repository.*		

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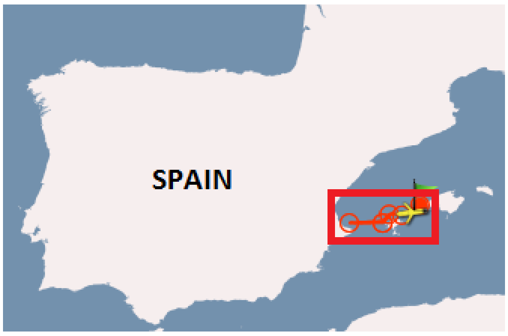
Principal Investigator (e-mail or contact phone/address)	*Prof. Joaquim Tintoré* *jtintore@socib.es (+34 971439821)*
Institute	*SOCIB in collaboration with IMEDEA*
Project Affiliation (web-site)	*http://www.socib.eu*
Partnership / Participation	*SOCIB (internal long-term project of sustained monitoring line)* *IMEDEA (in-kind contribution of material and infrastructures)*
Glider Software Version	*v7.7 GAMMA_RAD5*
Data Retrieval (real-time [RT] / delayed-mode [DM])	*Real-time sub-set via satellite link every 6 hours every day* *Delayed-mode direct download of full gathered data sets*
Compass Calibration (specify procedure)	*(n/a)*
Battery Type	*Manufacturer's original Alkaline batt.pack (143Ah-nominal cap.)*
Battery Consumption (Ah)	*112,825Ah (reading from 0,735Ah to 113,56Ah)*
Data Available From	*http://thredds.socib.es/thredds/dodsC/auv/glider/sdeep00-scb_sldeep000/L1/2013/dep0003_sdeep00_scb-sldeep000_L1_2013-01-30_data_dt.nc*
Full Mission Report From	*glidertech@socib.es*
Technical Contact	*glidertech@socib.es*

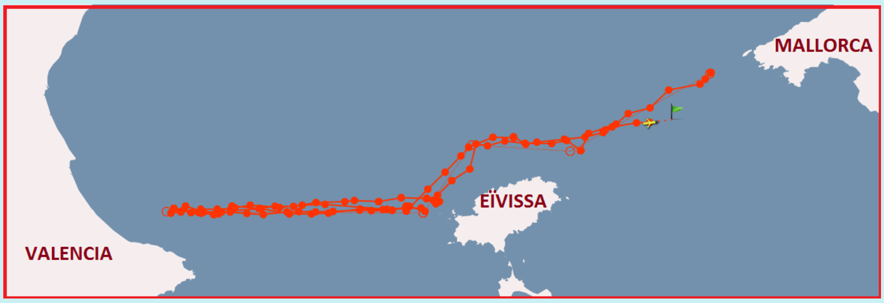
Figure 1

(Map providing general overview of Survey Area)



Mission Summary

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



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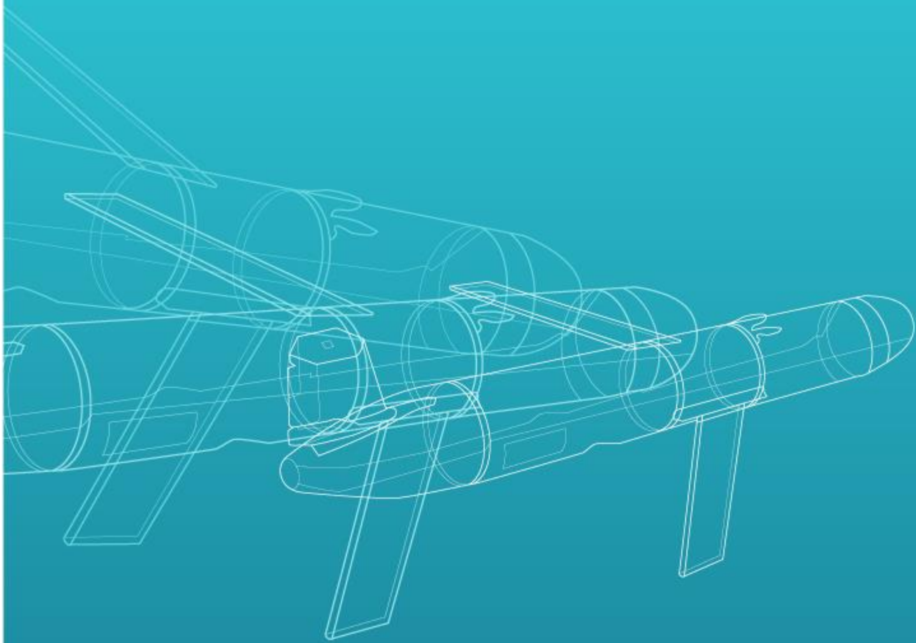

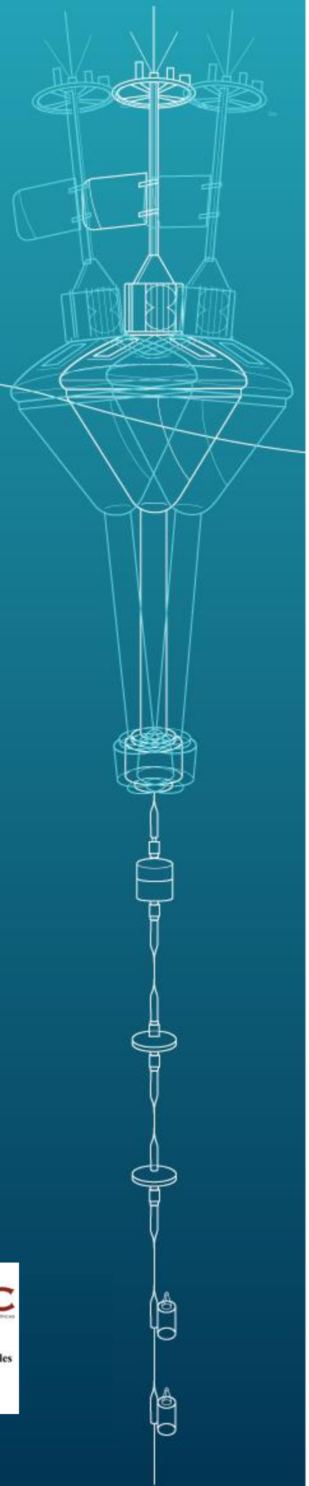

Glider Mission Summary Report

2012 - 2015

SOCIB (CSIC)

SOCIB_CANALES_MAR2013 (GR-MR-0016)

SOCIB Balearic Islands Coastal Observing and Forecasting System

GOBIERNO DE ESPAÑA MINISTERIO DE ECONOMÍA Y COMPETITIVIDAD

Govern de les Illes Balears

IMEDEA CSIC Universitat de les Illes Balears

Mission Name	*SOCIB_CANALES_MAR2013 (GR-MR-0016)*		
Platform Model	*Slocum 1000 G2*		
Platform ID / Name / WMO Code	*U244 / SDEEP01 / 68967*		
Related Platforms / Missions			
Start Date	*2013-03-22*		
End Date	*2013-04-15*		
Total Days *24*	**Total distance (Km / Nm)**	*544 / 294*	
Survey Area (NODC or SDN region)	*Mallorca and Eïvissa Channels (Western Mediterranean sea)*		
Objective(s)	*Enginering trials in the first days of deployment for comprehensive test during 1st ever deployment of U244.* *Establishing the variability of the N/S exchange of water masses that occur through the Ibiza Channel.* *Sampling a standard transect across the Ibiza Channel several times using physical and biogeochemical sensors.* *No greater than 1 month gap in between consecutive iterations.*		
Scientific Sensors (name & model / serial_number / calibration date)	*GPCTD -SBE- / sn 0064 / 19-May-2011* *FLNTU -WetLabs- / sn2280 / 15-Jul-2011* *OPTODE -Aandera- / sn 1410 / 11-Feb-2011*		
Number of Profiles	*846 (CTD), 383 (FLNTU), 384 (OXY)*		
Significant Events	*First deployment & mission performed by SDEEP01 (Slocum G2)* *Engineering trials during the first 5 days of deployment (butterfly track in 1000m-deep area at NW of Dragonera Island.* *Unusual recovery in location at North of St.Antoni's port (Eïvissa island) on board SOCIB-I RIB taking advantage of the presence of this field team due to independent maintenance works in the area*		
Mission Summary	*This mission stands for the 2nd iteration of the Canales Campaign 2013, carried out by SOCIB's glider SDEEP01 (Unit 244).* *Launching was performed by a 2-member field-team on board SOCIB-I professional RIB at location N39.5439° E2.3012°.* *In order to test the overall performance, this Glider was commanded to follow a butterfly pattern diving at max. depth (975m) in a region of easy access in case of emergency. The results of this test were excellent and therefore the vehicle was put in execution mode of a Canales scientific mission.* *During the time the glider remained deployed 1 Mallorca-Eïvissa and 4 Eïvissa-Valencia channels were surveyed.* *Overall performance of mechanical and sampling devices was excellent. Only quite a few oddities coming from DIGIFIN and IRIDIUM devices. Navigation and traced route were successful and, in general terms, the Glider behaved as commanded and expected.* *The initial plan of recovery was altered availing the coincidence of the Glider and SOCIB-I in the same area at North of St.Antoni's town (Eïvissa). SOCIB-I, in coordination with Glider pilots, waited for SDEEP01 to surface and executed the extraction operation.* *Upon completion, SDEEP01 was received at IMEDEA's glider-lab, put on the bench, revised and properly stored. Gathered dataset was fully backed-up and uploaded to SOCIB's FTP for subsequent processing and diffusion via SOCIB's public repository.*		

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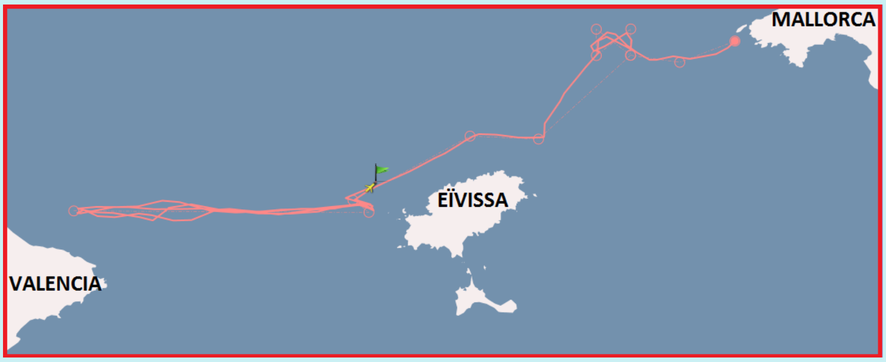
Principal Investigator (e-mail or contact phone/address)	*Prof. Joaquim Tintoré jtintore@socib.es (+34 971439821)*
Institute	*SOCIB in collaboration with IMEDEA*
Project Affiliation (web-site)	*http://www.socib.eu*
Partnership / Participation	*SOCIB (internal long-term project of sustained monitoring line) IMEDEA (in-kind contribution of material and infrastructures)*
Glider Software Version	*v7.7 GAMMA_RAD5*
Data Retrieval (real-time [RT] / delayed-mode [DM])	*Real-time sub-set via satellite link every 6 hours every day Delayed-mode direct download of full gathered data sets*
Compass Calibration (specify procedure)	*Not considered necessary as it was the first ever mission of this Glider*
Battery Type	*Manufacturer's original Alkaline batt.pack (143Ah-nominal cap.)*
Battery Consumption (Ah)	*106,658Ah (reading from 3,226Ah to 109,884Ah)*
Data Available From	*http://thredds.socib.es/thredds/dodsC/auv/glider/sdeep01-scb_sldeep001/L1/2013/dep0001_sdeep01_scb-sldeep001_L1_2013-03-22_data_dt.nc*
Full Mission Report From	*glidertech@socib.es*
Technical Contact	*glidertech@socib.es*

Figure 1

(Map providing general overview of Survey Area)

Mission Summary

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



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Glider Mission Summary Report

2012 - 2015

SOCIB (CSIC)

SOCIB_CANALES_MAY2013 (GR-MR-0017)

Mission Name	*SOCIB_CANALES_MAY2013 (GR-MR-0017)*
Platform Model	*Slocum 1000 G2*
Platform ID / Name / WMO Code	*U243 / SDEEP00 / 68457*
Related Platforms / Missions	
Start Date	*2013-05-20*
End Date	*2013-06-14*
Total Days *26*	**Total distance (Km / Nm)** *587 / 317*
Survey Area (NODC or SDN region)	*Mallorca and Eïvissa Channels (Western Mediterranean sea)*
Objective(s)	*Testing the first Lithium-Primary pack (factory part) used by SOCIB gliders.* *Establishing the variability of the N/S exchange of water masses that occur through the Ibiza Channel.* *Sampling a standard transect across the Ibiza Channel several times using physical and biogeochemical sensors.* *No greater than 1 month gap in between consecutive iterations.*
Scientific Sensors (name & model / serial_number / calibration date)	*GPCTD -SBE- / sn 0107 / 04-Jan-2012* *FLNTU -WetLabs- / sn2279 / 15-Jul-2011* *OPTODE -Aandera- / sn 1409 / 15-Feb-2011*
Number of Profiles	*777 (CTD), 252 (FLNTU), 249 (OXY)*
Significant Events	*First Lithium powered Glider deployed by SOCIB* *During the first transect in the Mallorca-Eïvisa channel, the Glider was commanded to repeat a 8Km transect in the middle of the channel in order to complete a second deep dive to max. depth* *This execution of the Canales mission was, in tactical terms, perfect. The programmed route, the official for Canales-2013, was 100% completed.*
Mission Summary	*This mission stands for the 3rd iteration of the Canales Campaign 2013, carried out by SOCIB's glider SDEEP00 (Unit 243).* *Launching was performed by a 2-member field-team on board 7m RIB at location N39.5303° E2.2698°.* *The segment in between N39.3614° E1.924° and N39.338° E1.8837° was repeated in the deepest area of the 1st Mallorca-Eïvissa channel to perform a second deep-dive to max. depth (975m).* *During the time the glider remained deployed 2 Mallorca-Eïvissa and 4 Eïvissa-Valencia channels were surveyed. All of them fully completed.* *Overall performance of mechanical and sampling devices was excellent. Only quite a few oddities coming from DIGIFIN and IRIDIUM devices. Navigation and traced route were optimal and adjusted to what was commanded and expected.* *Upon completion, SDEEP00 was received at IMEDEA's glider-lab, put on the bench, revised and properly stored. The gathered dataset was fully backed-up and uploaded to SOCIB's FTP for subsequent processing and diffusion via SOCIB's public repository.*

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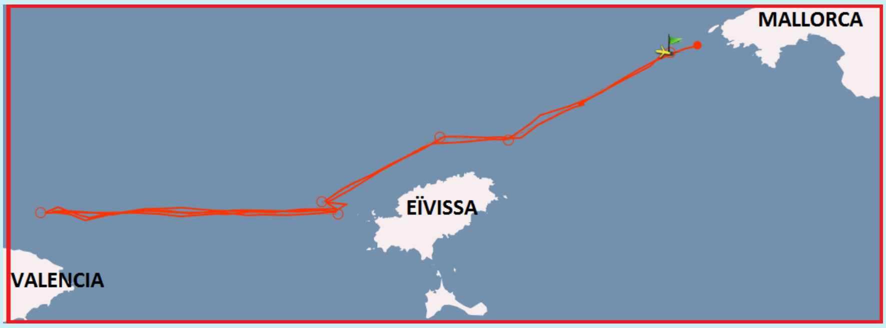
Principal Investigator (e-mail or contact phone/address)	*Prof. Joaquim Tintoré* *jtintore@socib.es (+34 971439821)*
Institute	*SOCIB in collaboration with IMEDEA*
Project Affiliation (web-site)	*http://www.socib.eu*
Partnership / Participation	*SOCIB (internal long-term project of sustained monitoring line)* *IMEDEA (in-kind contribution of material and infrastructures)*
Glider Software Version	*v7.7 GAMMA_RAD5*
Data Retrieval (real-time [RT] / delayed-mode [DM])	*Real-time sub-set via satellite link every 6 hours every day* *Delayed-mode direct download of full gathered data sets*
Compass Calibration (specify procedure)	*Error measurement revealed no necessity to perform a compass calibration*
Battery Type	*Manufacturer's original Lithium batt.pack (700Ah-nominal cap.)*
Battery Consumption (Ah)	*113,858Ah (reading from 0,123Ah to 113,981Ah)*
Data Available From	*http://thredds.socib.es/thredds/dodsC/auv/glider/sdeep00-scb_sldeep000/L1/2013/dep0004_sdeep00_scb-sldeep000_L1_2013-05-20_data_dt.nc*
Full Mission Report From	*glidertech@socib.es*
Technical Contact	*glidertech@socib.es*

Figure 1

(Map providing general overview of Survey Area)

Mission Summary

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



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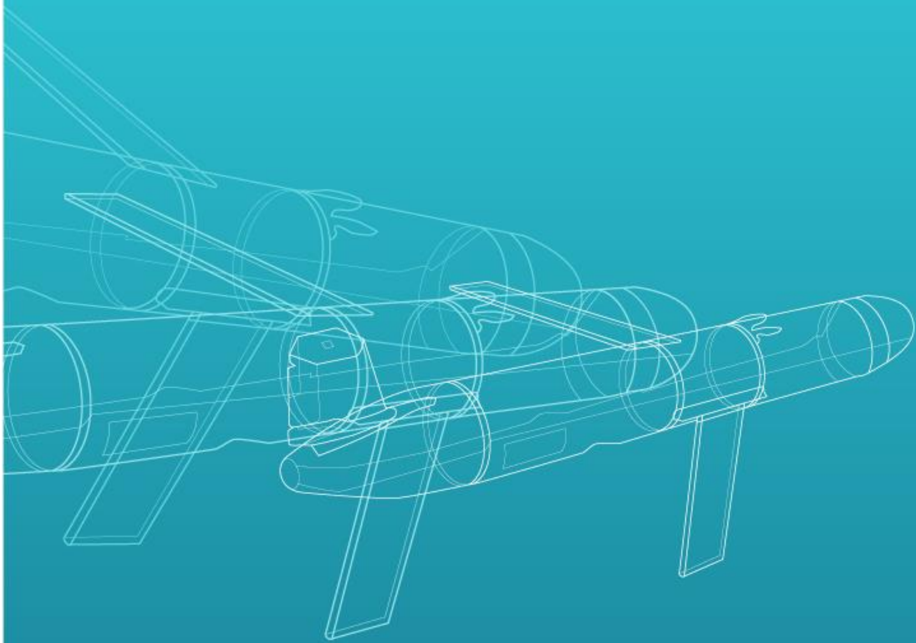
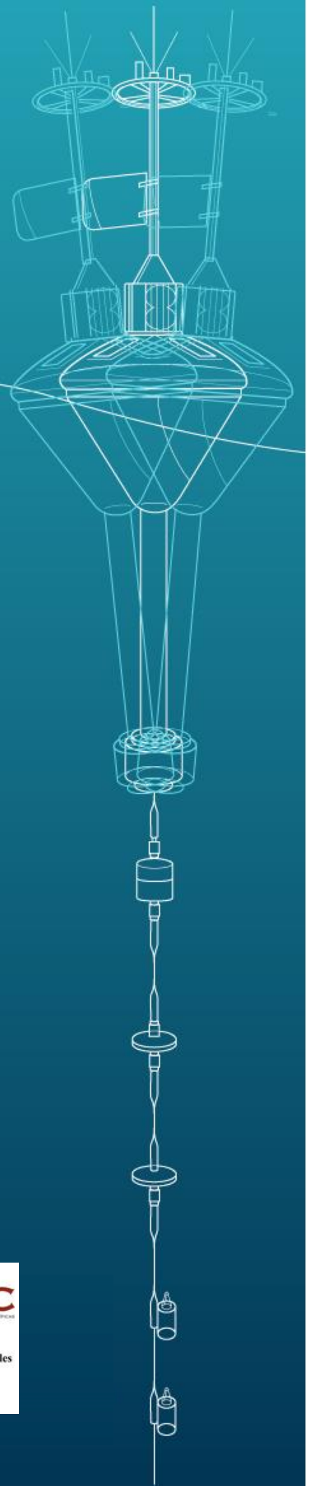


Glider Mission Summary Report

2012 - 2015

SOCIB (CSIC)

SOCIB_CANALES_JUL2013 (GR-MR-0018)



SOCIB Balearic Islands Coastal Observing and Forecasting System

GOBIERNO DE ESPAÑA MINISTERIO DE ECONOMÍA Y COMPETITIVIDAD

Govern de les Illes Balears

IMEDEA CSIC Universitat de les Illes Balears

Mission Name	*SOCIB_CANALES_JUL2013 (GR-MR-0018)*		
Platform Model	*Slocum 1000 G2*		
Platform ID / Name / WMO Code	*U243 / SDEEP00 / 68457*		
Related Platforms / Missions			
Start Date	*2013-07-15*		
End Date	*2013-08-02*		
Total Days *19*		**Total distance (Km / Nm)**	*448 / 242*
Survey Area (NODC or SDN region)	*Mallorca and Eïvissa Channels (Western Mediterranean sea)*		
Objective(s)	*Establishing the variability of the N/S exchange of water masses that occur through the Ibiza Channel.* *Sampling a standard transect across the Ibiza Channel several times using physical and biogeochemical sensors.* *No greater than 1 month gap in between consecutive iterations.* *The Mallorca Channel is also sampled when operationally practical.*		
Scientific Sensors (name & model / serial_number / calibration date)	*GPCTD -SBE- / sn 0107 / 04-Jan-2012* *FLNTU -WetLabs- / sn2279 / 15-Jul-2011* *OPTODE -Aandera- / sn 1409 / 15-Feb-2011*		
Number of Profiles	*564 (CTD), 261 (FLNTU), 261 (OXY)*		
Significant Events	*Fourth operational mission performed by SDEEP00 (Slocum G2)* *Second ever mission by a SOCIB Lithium-powered glider* *Moderate discordance between commanded and traced route probably due to minimal excess of roll to starboard* *1 DE_PUMP error forced Glider to interrupt the execution* *Glider recovered near Eïvissa to concatenate this mission with G-ALTIKA mission (PI: ananda.pascual@imedea.uib-csic.es)*		
Mission Summary	*This mission stands for the 4th iteration of the Canales Campaign 2013, carried out by SOCIB's glider SDEEP00 (Unit 243).* *Launching was performed by a 2-member field-team on board SOCIB-I professional RIB at location N39.4795° E2.2468°.* *During the time the glider remained deployed 1 Mallorca-Eïvissa and 4 Eïvissa-Valencia channels were surveyed. All of them fully completed.* *Overall performance of mechanical and sampling devices was very good (1 DE_PUMP error during navigation). Only quite a few oddities coming from DIGIFIN and IRIDIUM devices and warnings from GPS. Navigation and traced route were acceptable but improvable probably due to un-precise ballasting procedure. Communications were stable and fluent allowing the transmission of both near-real-time data and telemetry, including ARGOS messages.* *Glider was recovered at position N38.9934° E1.0594° by SOCIB's field team onboard SOCIB-I so this glider could be deployed the same day in fulfillment of the G-ALTIKA mission.* *Upon completion, SDEEP00 was received at IMEDEA's glider-lab, put on the bench, revised and properly stored. The gathered dataset was fully backed-up and uploaded to SOCIB's FTP for subsequent processing and diffusion via SOCIB's public repository.*		

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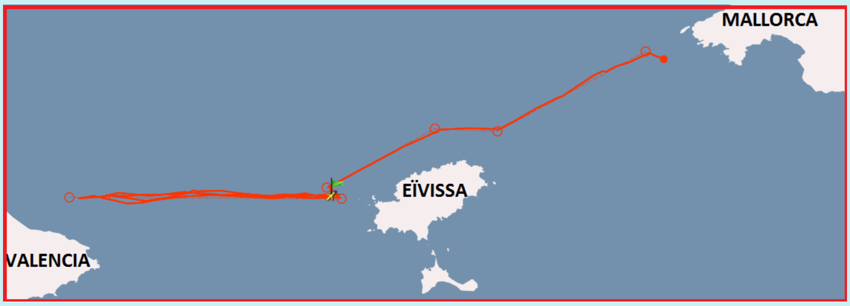
Principal Investigator (e-mail or contact phone/address)	*Prof. Joaquim Tintoré* *jtintore@socib.es (+34 971439821)*
Institute	*SOCIB in collaboration with IMEDEA*
Project Affiliation (web-site)	*http://www.socib.eu*
Partnership / Participation	*SOCIB (internal long-term project of sustained monitoring line)* *IMEDEA (in-kind contribution of material and infrastructures)*
Glider Software Version	*v7.7 GAMMA_RAD5*
Data Retrieval (real-time [RT] / delayed-mode [DM])	*Real-time sub-set via satellite link every 6 hours every day* *Delayed-mode direct download of full gathered data sets*
Compass Calibration (specify procedure)	*Error measurement revealed no necessity to perform a compass calibration*
Battery Type	*Manufacturer's original Lithium batt.pack (700Ah-nominal cap.)*
Battery Consumption (Ah)	*97,949Ah (reading from 117,656Ah to 215,605Ah)*
Data Available From	*http://thredds.socib.es/thredds/dodsC/auv/glider/sdeep00-scb_sldeep000/L1/2013/dep0005_sdeep00_scb-sldeep000_L1_2013-07-15_data_dt.nc*
Full Mission Report From	*glidertech@socib.es*
Technical Contact	*glidertech@socib.es*

Figure 1 (Map providing general overview of Survey Area)	
Mission Summary (Map providing detailed overview of Survey Area and traced Flight Path with surface points if possible)	

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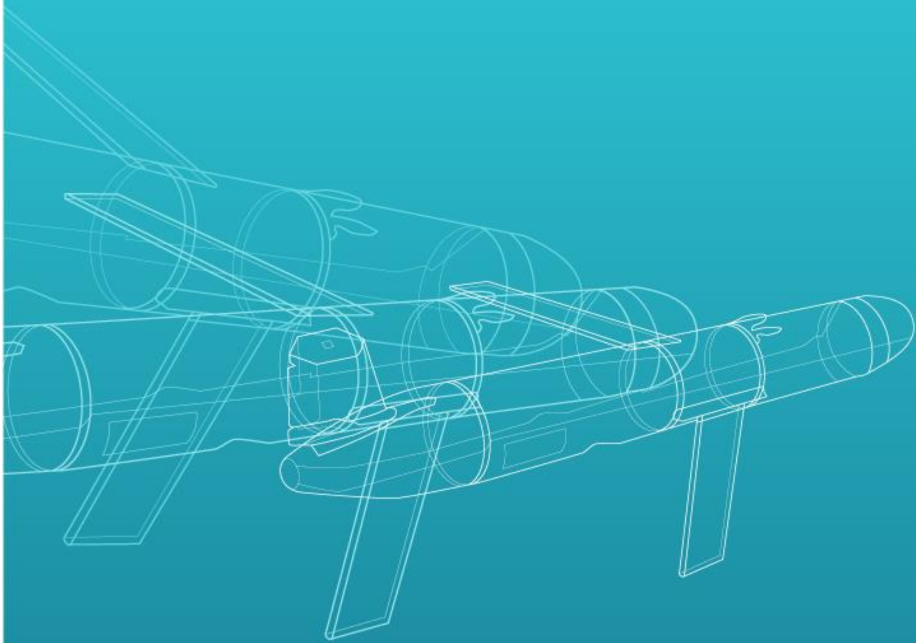

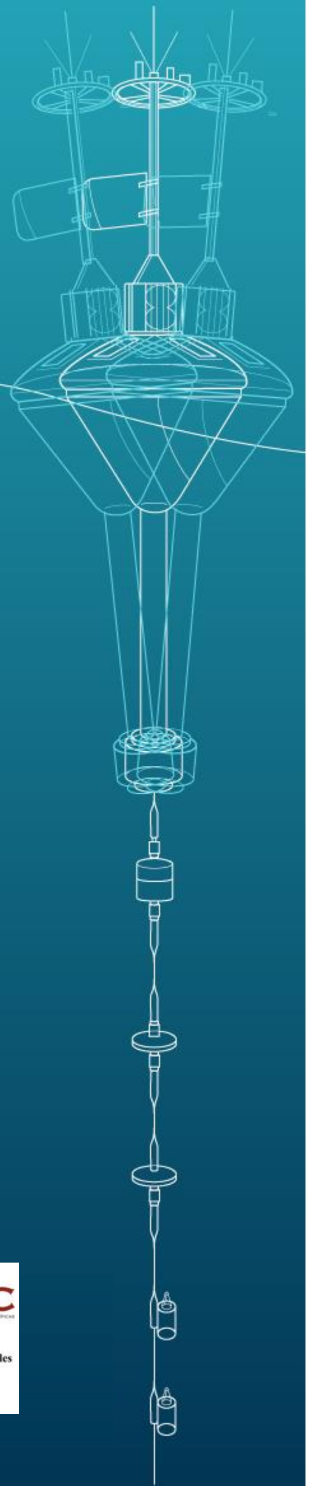

Glider Mission Summary Report

2012 - 2015

SOCIB (CSIC)

SOCIB_CANALES_SEP2013 (GR-MR-0021)

SOCIB Balearic Islands Coastal Observing and Forecasting System

GOBIERNO DE ESPAÑA MINISTERIO DE ECONOMÍA Y COMPETITIVIDAD

Govern de les Illes Balears

IMEDEA CSIC Universitat de les Illes Balears

Mission Name	*SOCIB_CANALES_SEP2013 (GR-MR-0021)*		
Platform Model	*Slocum 1000 G2*		
Platform ID / Name / WMO Code	*U243 / SDEEP00 / 68457*		
Related Platforms / Missions			
Start Date	*2013-09-09*		
End Date	*2013-10-04*		
Total Days *26*		**Total distance (Km / Nm)**	*576 / 320*
Survey Area (NODC or SDN region)	*Mallorca and Eïvissa Channels (Western Mediterranean sea)*		
Objective(s)	*Establishing the variability of the N/S exchange of water masses that occur through the Ibiza Channel.* *Sampling a standard transect across the Ibiza Channel several times using physical and biogeochemical sensors.* *No greater than 1 month gap in between consecutive iterations.* *The Mallorca Channel is also sampled when operationally practical.*		
Scientific Sensors (name & model / serial_number / calibration date)	*GPCTD -SBE- / sn 0107 / 04-Jan-2012* *FLNTU -WetLabs- / sn2279 / 15-Jul-2011* *OPTODE -Aandera- / sn 1409 / 15-Feb-2011*		
Number of Profiles	*720 (CTD), 242 (FLNTU), 242 (OXY)*		
Significant Events	*6th operational mission performed by SDEEP00 (Slocum G2)* *Glider still powered by first-ever-used Lithium factory pack* *Glider aborted the operation only once due a non-critical event such as OVERTIME* *During this mission the standard Canales 2013 track was 100% completed (2 mallorca chan. plus 4 eïvissa chan.)*		
Mission Summary	*This mission stands for the 5th iteration of the Canales Campaign 2013, carried out by SOCIB's glider SDEEP00 (Unit 243).* *Launching was performed by a 2-member field-team on board SOCIB-I professional RIB at location N39.5029° E2.2188°.* *During the time the glider remained deployed 2 Mallorca-Eïvissa and 4 Eïvissa-Valencia channels were surveyed. All of them fully completed.* *Overall performance of mechanical and sampling devices was excellent. Only quite a few oddities coming from DIGIFIN and IRIDIUM and only some from DE_PUMP, PITCH_MOTOR devices. Couple of warnings from GPS. Navigation and traced route were also a success. Communications were stable and fluent allowing the transmission of both near-real-time data and telemetry, including ARGOS messages.* *Glider was recovered at position N39.4839° E2.1371° by SOCIB's field team onboard SOCIB-I.* *Upon completion, SDEEP00 was received at IMEDEA's glider-lab, put on the bench, revised and properly stored. The gathered dataset was fully backed-up and uploaded to SOCIB's FTP for subsequent processing and diffusion via SOCIB's public repository.*		

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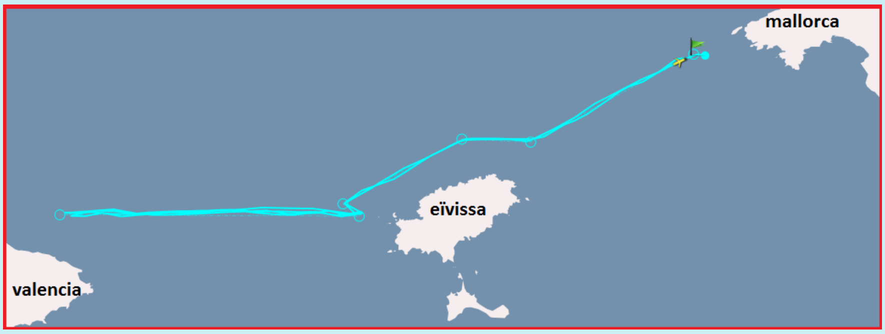
Principal Investigator (e-mail or contact phone/address)	*Prof. Joaquim Tintoré* *jtintore@socib.es (+34 971439821)*
Institute	*SOCIB in collaboration with IMEDEA*
Project Affiliation (web-site)	*http://www.socib.eu*
Partnership / Participation	*SOCIB (internal long-term project of sustained monitoring line)* *IMEDEA (in-kind contribution of material and infrastructures)*
Glider Software Version	*v7.7 GAMMA_RAD5*
Data Retrieval (real-time [RT] / delayed-mode [DM])	*Real-time sub-set via satellite link every 6 hours every day* *Delayed-mode direct download of full gathered data sets*
Compass Calibration (specify procedure)	*Error measurement revealed no necessity to perform a compass calibration*
Battery Type	*Manufacturer's original Lithium batt.pack (700Ah-nominal cap.)*
Battery Consumption (Ah)	*141,214Ah (reading from 239.741Ah to 380.955Ah)*
Data Available From	*http://thredds.socib.es/thredds/dodsC/auv/glider/sdeep00-scb_sldeep000/L1/2013/dep0007_sdeep00_scb-sldeep000_L1_2013-09-09_data_dt.nc*
Full Mission Report From	*glidertech@socib.es*
Technical Contact	*glidertech@socib.es*

Figure 1

(Map providing general overview of Survey Area)

Mission Summary

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



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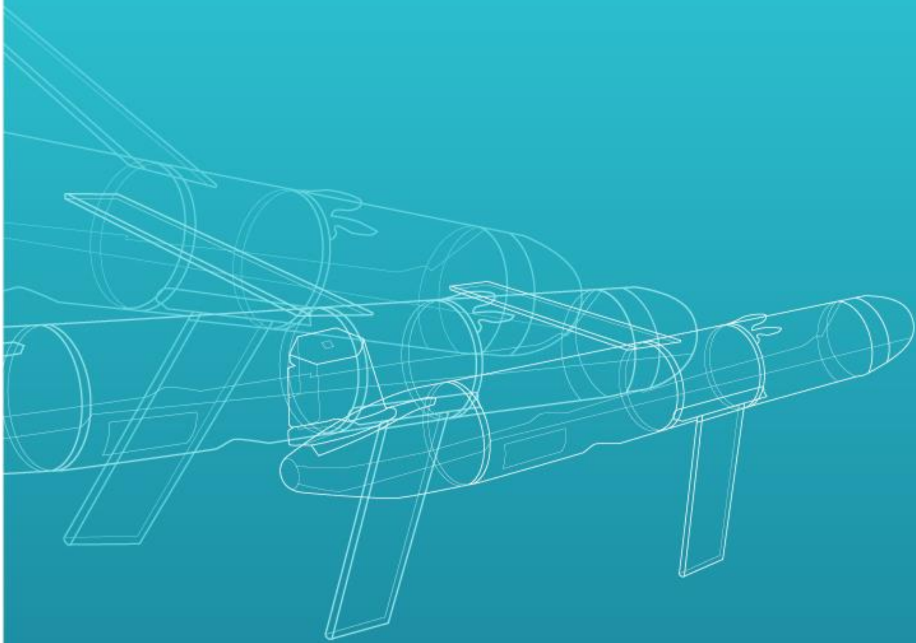

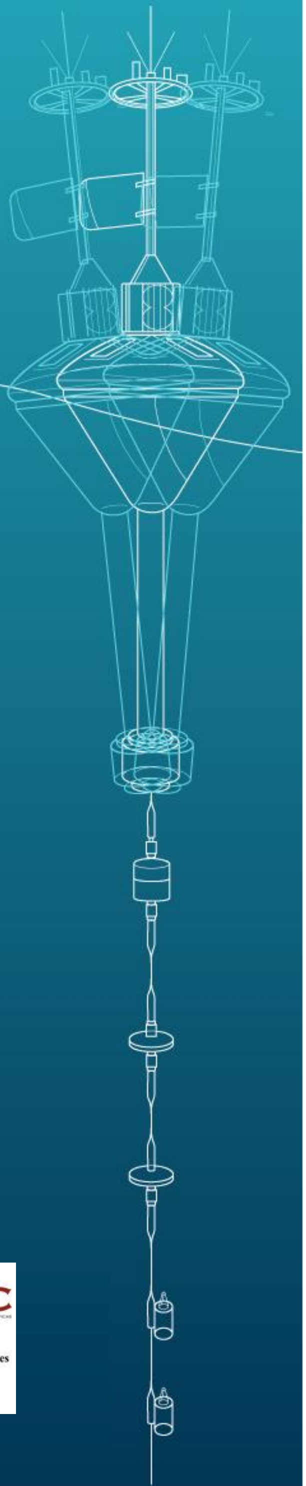

Glider Mission Summary Report

2012 - 2015

SOCIB (CSIC)

SOCIB_CANALES_NOV2013 (GR-MR-0022)

SOCIB Balearic Islands Coastal Observing and Forecasting System

Mission Name	SOCIB_CANALES_NOV2013 (GR-MR-0022)
Platform Model	Slocum 1000 G2
Platform ID / Name / WMO Code	U243 / SDEEP00 / 68457
Related Platforms / Missions	
Start Date	2013-11-01
End Date	2013-11-12
Total Days 11	**Total distance (Km / Nm)** 224 / 121
Survey Area (NODC or SDN region)	Mallorca and Eïvissa Channels (Western Mediterranean sea)
Objective(s)	Establishing the variability of the N/S exchange of water masses that occur through the Ibiza Channel. Sampling a standard transect across the Ibiza Channel several times using physical and biogeochemical sensors. No greater than 1 month gap in between consecutive iterations. The Mallorca Channel is also sampled when operationally practical.
Scientific Sensors (name & model / serial_number / calibration date)	GPCTD -SBE- / sn 0107 / 04-Jan-2012 FLNTU -WetLabs- / sn2279 / 15-Jul-2011 OPTODE -Aandera- / sn 1409 / 15-Feb-2011
Number of Profiles	423 (CTD), 311 (FLNTU), 300 (OXY)
Significant Events	7th operational mission performed by SDEEP00 (Slocum G2). Glider still powered by first-ever-used Lithium factory pack. Glider aborted the operation due to low battery level. Emergency recovery by SASEMAR rescue vessel. Glider picked-up in Xàtiva (Valencia) by SOCIB technical staff. Pitch battery disconnected (origin of the abort).
Mission Summary	This mission stands for the 6th iteration of the Canales Campaign 2013, carried out by SOCIB's glider SDEEP00 (Unit 243). Launching was performed by a 2-member field-team on board SOCIB-I professional RIB at location N39.4245° E2.2865° (closer than usual due to rough weather conditions). During the time the glider remained deployed 1 Mallorca-Eïvissa and 1 Eïvissa-Valencia channels were surveyed. Overall performance of mechanical and sampling devices was excellent. Only quite a few oddities coming from DIGIFIN and IRIDIUM devices. Couple of warnings from GPS. Navigation and traced route were also a success. Communications were stable and fluent allowing the transmission of both near-real-time data and telemetry, including ARGOS messages. Only 1 call (expected at 10am,utc) was missed. On Nov-11th, SDEEP00 interrupted the mission reporting low battery. This situation could not be solved remotely so the Glider was recovered (N38.9921° E0.2141°) by SASEMAR emergency vessel. A member of SOCIB tech-staff drove to Xàtiva(Valencia) to pick-up the glider from SASEMAR's head-quarters. Upon completion, SDEEP00 was received at IMEDEA's glider-lab, put on the bench, revised and properly stored. At the end, the origin of the low-battery event was the total disconnection of the Pitch-Battery from the Glider's electrical supply circuitry. Gathered dataset was fully backed-up and uploaded to SOCIB's FTP for subsequent processing and diffusion via SOCIB's public repository.

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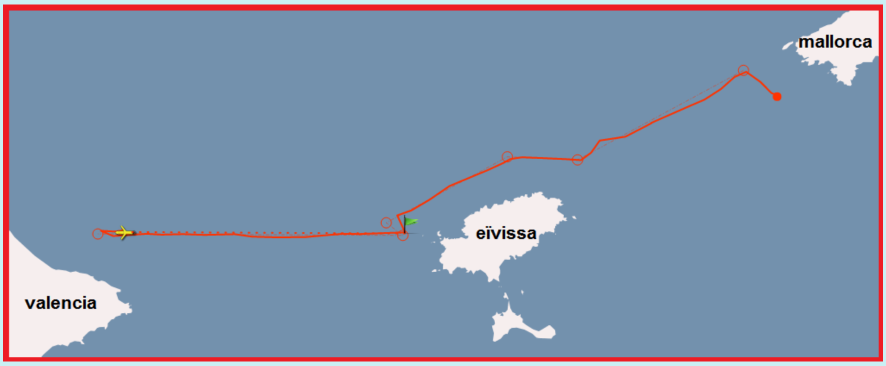
Principal Investigator (e-mail or contact phone/address)	*Prof. Joaquim Tintoré* *jtintore@socib.es (+34 971439821)*
Institute	*SOCIB in collaboration with IMEDEA*
Project Affiliation (web-site)	*http://www.socib.eu*
Partnership / Participation	*SOCIB (internal long-term project of sustained monitoring line)* *IMEDEA (in-kind contribution of material and infrastructures)*
Glider Software Version	*v7.7 GAMMA_RAD5*
Data Retrieval (real-time [RT] / delayed-mode [DM])	*Real-time sub-set via satellite link every 6 hours every day* *Delayed-mode direct download of full gathered data sets*
Compass Calibration (specify procedure)	*Error measurement revealed no necessity to perform a compass calibration*
Battery Type	*Manufacturer's original Lithium batt.pack (700Ah-nominal cap.)*
Battery Consumption (Ah)	*58,813Ah (reading from 381,841Ah to 440,654Ah)*
Data Available From	*http://thredds.socib.es/thredds/dodsC/auv/glider/sdeep00-scb_sldeep000/L1/2013/dep0008_sdeep00_scb-sldeep000_L1_2013-11-01_data_dt.nc*
Full Mission Report From	*glidertech@socib.es*
Technical Contact	*glidertech@socib.es*

Figure 1

(Map providing general overview of Survey Area)

Mission Summary

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



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Glider Mission Summary Report

2012 - 2015

SOCIB (CSIC)

SOCIB_CANALES_DEC2013 (GR-MR-0023)

SOCIB Balearic Islands Coastal Observing and Forecasting System

GOBIERNO DE ESPAÑA MINISTERIO DE ECONOMÍA Y COMPETITIVIDAD

Govern de les Illes Balears

IMEDEA CSIC Universitat de les Illes Balears

Mission Name	SOCIB_CANALES_DEC2013 (GR-MR-0023)		
Platform Model	Slocum 1000 G2		
Platform ID / Name / WMO Code	U243 / SDEEP00 / 68457		
Related Platforms / Missions			
Start Date	2013-12-02		
End Date	2013-12-17		
Total Days 16		**Total distance (Km / Nm)**	352 / 195
Survey Area (NODC or SDN region)	Mallorca and Eïvissa Channels (Western Mediterranean sea)		
Objective(s)	Establishing the variability of the N/S exchange of water masses that occur through the Ibiza Channel. Sampling a standard transect across the Ibiza Channel several times using physical and biogeochemical sensors. No greater than 1 month gap in between consecutive iterations. The Mallorca Channel is also sampled when operationally practical.		
Scientific Sensors (name & model / serial_number / calibration date)	GPCTD -SBE- / sn 0064 / 19-May-2011 (*) FLNTU -WetLabs- / sn2280 / 15-Jul-2011 (*) OPTODE -Aandera- / sn 1409 / 15-Feb-2011		
Number of Profiles	490 (CTD), 0 (FLNTU), 0 (OXY) (**)		
Significant Events	Glider still powered by first-ever-used Lithium factory pack. Survey area reduced to Eïvissa-Valencia channel only. (*) SDEEP00 mounting other glider's CTD and FLNTU (**) Optical sensors off during mission to save energy First ever Glider deployment from SOCIB-R/V Initial deployment failed due to Pitch battery not screwed to pitch-motor Recovery with in-kind contribution of Parc Natural Illots de Ponent		
Mission Summary	This mission stands for the 7th, and final, iteration of the Canales Campaign 2013, carried out by SOCIB's glider SDEEP00 (Unit 243). This mission also closed year 2013 in the Glider Facility. For this mission, U243 was mounting U244's GPCTD and FLNTU sensors for technical reasons. Launching was performed, for the first time, by crew on-board SOCIB-R/V at location N38.9803° E1.0971°. This first launch revealed SDEEP00 could not properly adjust its pitch angle (Pitch Battery was not properly screwed to the pitch motor). This could not be solved remotely so it was decided that SDEEP00 would spend the night drifting on the surface, SOCIB-R/V would recover it on Dec-3rd,08:25am,utc in N39.0461° E1.1326° and a technician flying to Eïvissa in order to fix the problem on-board SOCIB-R/V at St.Antoni's harbor mooring. The second launch took place on Dec-3rd, 13:50pm,utc in N38.9826° E1.0967° also from SOCIB-R/V. Mission resumed without an issue. During the time the glider remained deployed 4 Eïvissa-Valencia channels were surveyed. Overall performance of mechanical and sampling devices was acceptable (SCIENCE_SUPER failed to log sensor data during two segments and 1 mission interrupt due to DE_PUMP failure). Only quite a few oddities coming from DIGIFIN and IRIDIUM devices. Couple of warnings from GPS. Navigation and traced route were also a success. Communications were stable and fluent allowing the transmission of both near-real-time data and telemetry, including ARGOS messages. Due to logistical limitations, recovery was executed with in-kind contribution (4m. RIB and 2 crew) from Eïvissa's local governmental institution 'Parc Natural d'Illots de Ponent'. SDEEP00 was extracted in N38.9931° E1.0578° on Dec-17th, 12:50pm,utc Upon completion, SDEEP00 was received at IMEDEA's glider-lab, put on the bench, revised and properly stored. Gathered dataset was fully backed-up and uploaded to SOCIB's FTP for subsequent processing and diffusion via SOCIB's public repository.		

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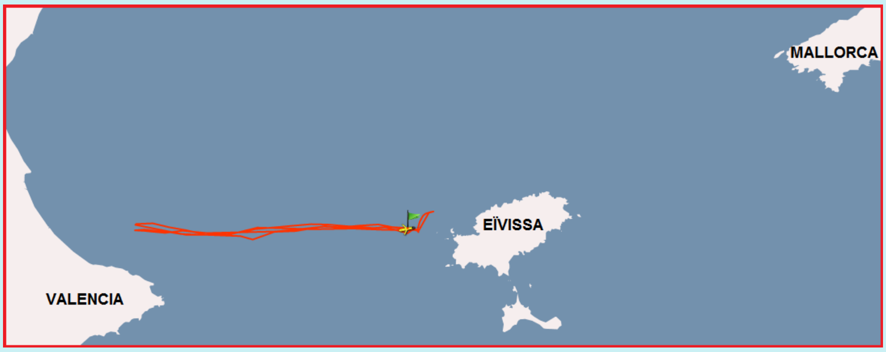
Principal Investigator (e-mail or contact phone/address)	*Prof. Joaquim Tintoré* *jtintore@socib.es (+34 971439821)*
Institute	*SOCIB in collaboration with IMEDEA*
Project Affiliation (web-site)	*http://www.socib.eu*
Partnership / Participation	*SOCIB (internal long-term project of sustained monitoring line)* *IMEDEA (in-kind contribution of material and infrastructures)*
Glider Software Version	*v7.13 Acomms*
Data Retrieval (real-time [RT] / delayed-mode [DM])	*Real-time sub-set via satellite link every 6 hours every day* *Delayed-mode direct download of full gathered data sets*
Compass Calibration (specify procedure)	*Error measurement revealed no necessity to perform a compass calibration*
Battery Type	*Manufacturer's original Lithium batt.pack (700Ah-nominal cap.)*
Battery Consumption (Ah)	*75,875Ah (reading from 442,175Ah to 518,05Ah)*
Data Available From	*http://thredds.socib.es/thredds/dodsC/auv/glider/sdeep00-scb_sldeep000/L1/2013/dep0009_sdeep00_scb-sldeep000_L1_2013-12-02_data_dt.nc*
Full Mission Report From	*glidertech@socib.es*
Technical Contact	*glidertech@socib.es*

Figure 1

(Map providing general overview of Survey Area)

Mission Summary

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



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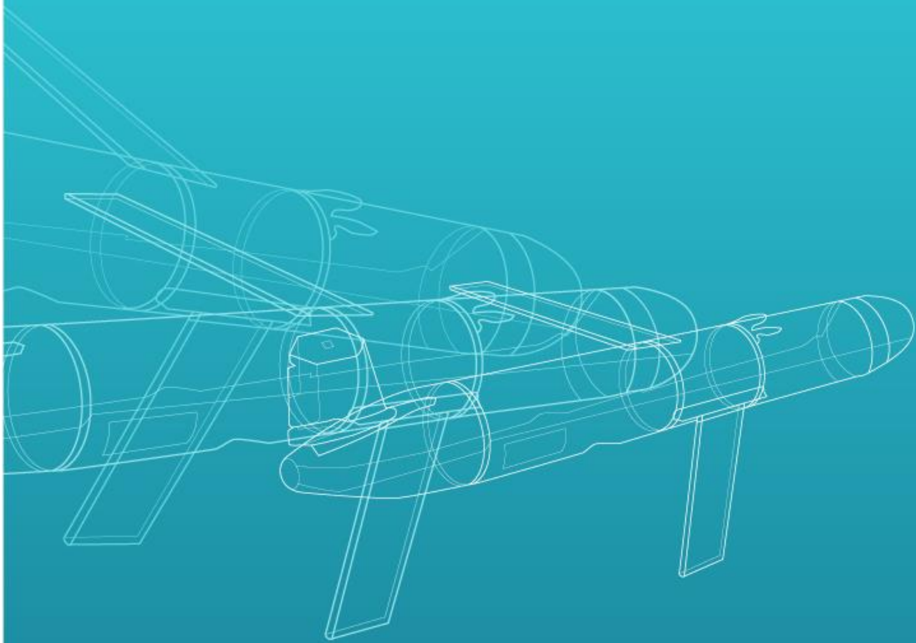

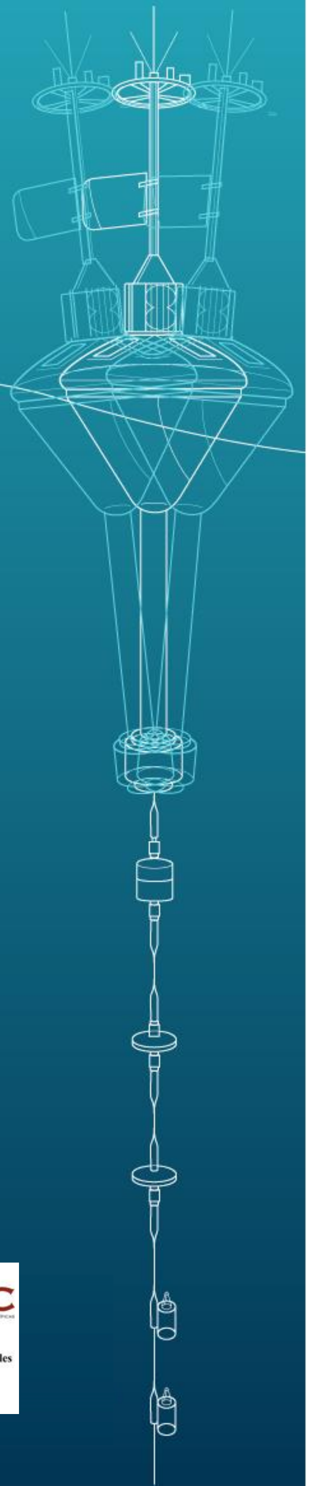

Glider Mission Summary Report

2012 - 2015

SOCIB (CSIC)

SOCIB_CANALES_JAN2014 (GR-MR-0024)

SOCIB
Balearic Islands Coastal Observing and Forecasting System

GOBIERNO DE ESPAÑA
MINISTERIO DE ECONOMÍA Y COMPETITIVIDAD
Govern de les Illes Balears

IMEDEA
CSIC
Universitat de les Illes Balears

Mission Name	*SOCIB_CANALES_JAN2014 (GR-MR-0024)*
Platform Model	*Slocum 1000 G2*
Platform ID / Name / WMO Code	*U243 / SDEEP00 / 68457*
Related Platforms / Missions	
Start Date	*2014-02-02*
End Date	*2014-02-27*
Total Days *22*	**Total distance (Km / Nm)** *480 / 259*
Survey Area (NODC or SDN region)	*Mallorca and Eïvissa Channels (Western Mediterranean sea)*
Objective(s)	*Establishing the variability of the N/S exchange of water masses that occur through the Ibiza Channel.* *Sampling a standard transect across the Ibiza Channel several times using physical and biogeochemical sensors.* *No greater than 1 month gap in between consecutive iterations.* *The Mallorca Channel is also sampled when operationally practical.*
Scientific Sensors (name & model / serial_number / calibration date)	*GPCTD -SBE- / sn 0064 / 19-May-2011 (*)* *FLNTU -WetLabs- / sn2280 / 15-Jul-2011 (*)* *OPTODE -Aandera- / sn 1409 / 15-Feb-2011* *(*): original sensors from U244*
Number of Profiles	*824 (CTD), 199 (FLNTU), 197 (OXY)*
Significant Events	*Glider still powered by first-ever-used Lithium factory pack.* *Last mission on used Lithium factory pack.* *Glider deployed in front of St.Antoni's (Eïvissa) bay from hired vessel.* *Glider interrupted mission execution twice due to NO_COP_TICKLE.* *Trying to avoid a low-battery situation, SDEEP00 was commanded to return to Mallorca following the shortest way possible, without following the standard route to sample the Eïvissa-Mallorca channel.*
Mission Summary	*This mission stands for the 1st iteration of the Canales Campaign 2014, carried out by SOCIB's glider SDEEP00 (Unit 243). This mission also marked the beginning of year 2014 for the Glider Facility.* *For this mission, U243 was mounting U244's GPCTD and FLNTU sensors for technical reasons.* *Launching was performed in front of St.Antoni's (Eïvissa) bay on-board a rental vessel (crew: captain and SOCIB-tech) at location N39.0384° E1.2504°. This was done in order to optimize battery usage and also conditioned by rough weather in area.SDEEP00 needed 2 days to get to the beginning of the Eïvissa-Valencia transect. Then, scientific survey started.* *Overall performance of mechanical and sampling devices was acceptable (SCIENCE_SUPER raised 4 warnings during one segment). Only quite a few oddities coming from DIGIFIN and IRIDIUM devices. Couple of warnings from GPS. Navigation and traced route were also adequate (average mismatch of 2Km with commanded route and North drift near Valencia). Communications were stable and fluent allowing the transmission of both near-real-time data and telemetry, including ARGOS messages.* *During the time the glider remained deployed 4 Eïvissa-Valencia channels were surveyed. No Eïvissa-Mallorca channels since SDEEP00 was directly sent, not following the scientific route, towards the recovery waypoint to avoid low-battery problems during return home. The Glider was finally recovered by a 2-member team on-board SOCIB-I Professional RIB in N39.4023° E2.2337°.* *Upon completion, SDEEP00 was received at IMEDEA's glider-lab, put on the bench, revised and properly stored. Gathered dataset was fully backed-up and uploaded to SOCIB's FTP for subsequent processing and diffusion via SOCIB's public repository.*

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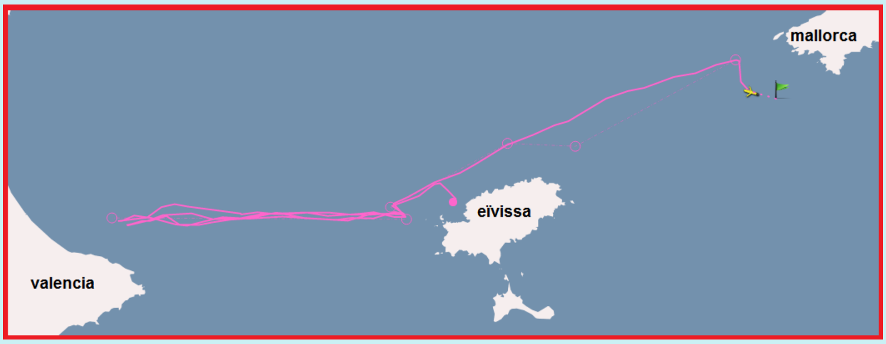
Principal Investigator (e-mail or contact phone/address)	*Prof. Joaquim Tintoré* *jtintore@socib.es (+34 971439821)*
Institute	*SOCIB in collaboration with IMEDEA*
Project Affiliation (web-site)	*http://www.socib.eu*
Partnership / Participation	*SOCIB (internal long-term project of sustained monitoring line)* *IMEDEA (in-kind contribution of material and infrastructures)*
Glider Software Version	*v7.13 Acomms*
Data Retrieval (real-time [RT] / delayed-mode [DM])	*Real-time sub-set via satellite link every 6 hours every day* *Delayed-mode direct download of full gathered data sets*
Compass Calibration (specify procedure)	*Error measurement revealed no necessity to perform a compass calibration*
Battery Type	*Manufacturer's original Lithium batt.pack (700Ah-nominal cap.)*
Battery Consumption (Ah)	*110,087Ah (reading from 518,987Ah to 629,074Ah)*
Data Available From	*http://thredds.socib.es/thredds/dodsC/auv/glider/sdeep00-scb_sldeep000/L1/2014/dep0010_sdeep00_scb-sldeep000_L1_2014-02-06_data_dt.nc*
Full Mission Report From	*glidertech@socib.es*
Technical Contact	*glidertech@socib.es*

Figure 1

(Map providing general overview of Survey Area)

Mission Summary

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



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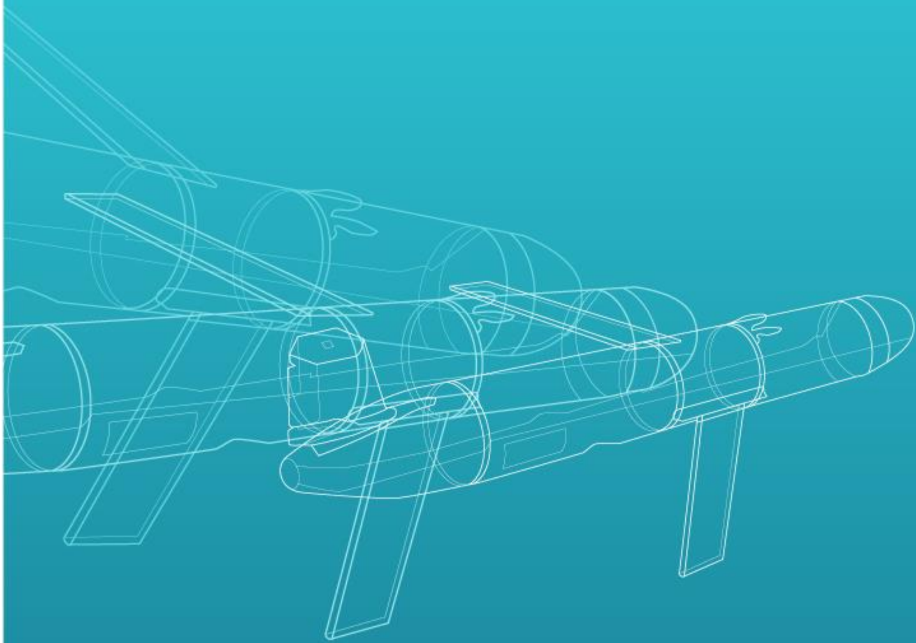

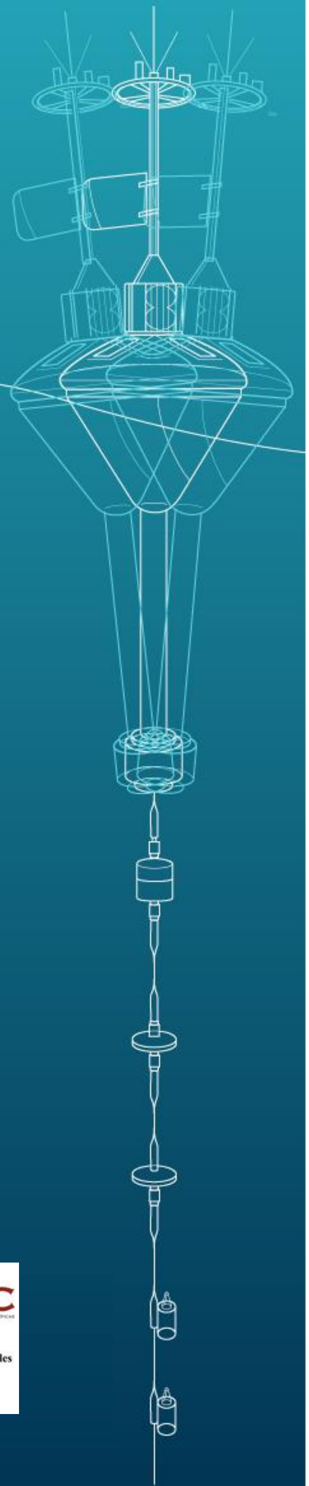

Glider Mission Summary Report

2012 - 2015

SOCIB (CSIC)

SOCIB_CANALES_APR2014 (GR-MR-0025)

SOCIB Balearic Islands Coastal Observing and Forecasting System

GOBIERNO DE ESPAÑA MINISTERIO DE ECONOMÍA Y COMPETITIVIDAD Govern de les Illes Balears

IMEDEA CSIC Universitat de les Illes Balears

Mission Name	*SOCIB_CANALES_APR2014 (GR-MR-0025)*
Platform Model	*Slocum 1000 G2*
Platform ID / Name / WMO Code	*U243 / SDEEP00 / 68457*
Related Platforms / Missions	
Start Date	*2014-04-07*
End Date	*2014-05-09*
Total Days *33*	**Total distance (Km / Nm)** *579 / 313*
Survey Area (NODC or SDN region)	*Mallorca and Eïvissa Channels (Western Mediterranean sea)*
Objective(s)	*Establishing the variability of the N/S exchange of water masses that occur through the Ibiza Channel.* *Sampling a standard transect across the Ibiza Channel several times using physical and biogeochemical sensors.* *No greater than 1 month gap in between consecutive iterations.* *The Mallorca Channel is also sampled when operationally practical.*
Scientific Sensors (name & model / serial_number / calibration date)	*GPCTD -SBE- / sn 0064 / 19-May-2011* *FLNTU -WetLabs- / sn2280 / 15-Jul-2011* *OPTODE -Aandera- / sn 1410 / 11-Feb-2011 (*)* *(*): sensor borrowed from U244 due to U243's foil breach*
Number of Profiles	*1103 (CTD), 318 (FLNTU), 318 (OXY)*
Significant Events	*Glider with new Lithium factory pack on-board (2nd ever used)* *First deployment attempt aborted due to glider being excessively light (bad ballasting)* *Traced path altered by intense currents near Valencia's waypoint (Eïvissa-Valencia transect).* *Very important deviation from program route during return home trip (N-E of Eïvissa) prior to start of Eïvissa-Mallorca transect.* *Return home transect (Eïvissa-Mallorca) not completed. Glider recovered by SOCIB-R/V while executing RADMED cruise and coinciding with SDEEP00 at a given location of this transect.*
Mission Summary	*This mission stands for the 2nd iteration of the Canales Campaign 2014, carried out by SOCIB's glider SDEEP00 (Unit 243).* *For this mission, U243 was mounting U244's GPCTD and FLNTU sensors for technical reasons.* *Deployment operation needed two attempts. First one failed due to an incorrect ballasting (glider too light, could not sink). Second attempt was executed perfectly. Both of them from SOCIB-I Professional RIB vessel with 2-member crew. SDEEP00 was successfully launched at location N39.5173° E2.1922°.* *Overall performance of mechanical and sampling devices was excellent. Only quite a few oddities coming from DIGIFIN, DE_PUMP and IRIDIUM devices. Couple of warnings from GPS. Navigation and traced route were also adequate although it was affected by strong currents near Valencia's shore. Additionally, when almost leaving Eïvissa waters, during the return trip, SDEEP00 suffered a super deviation from route (17Km to South) that conditioned the execution of the Eïvissa-Mallorca transect. Communications were stable and fluent allowing the transmission of both near-real-time data and telemetry, including ARGOS messages. However, 4 missing calls were registered.* *During the time the glider remained deployed 4 Eïvissa-Valencia and 1 Mallorca-Eïvissa channels were surveyed. No Eïvissa-Mallorca channels since SDEEP00 was directly recovered by SOCIB-R/V. This vessel was in the vicinity of the Glider on May-9th@10am,utc while performing RADMED cruise. Consequently, SOCIB disposes of precise CTD casts near-by Glider's sampling for inter-comparison and calibration. Recovery took place at location N39.3996° E2.0434°.* *Upon completion, SDEEP00 was received at IMEDEA's glider-lab, put on the bench, revised and properly stored. Gathered dataset was fully backed-up and uploaded to SOCIB's FTP for subsequent processing and diffusion via SOCIB's public repository.*

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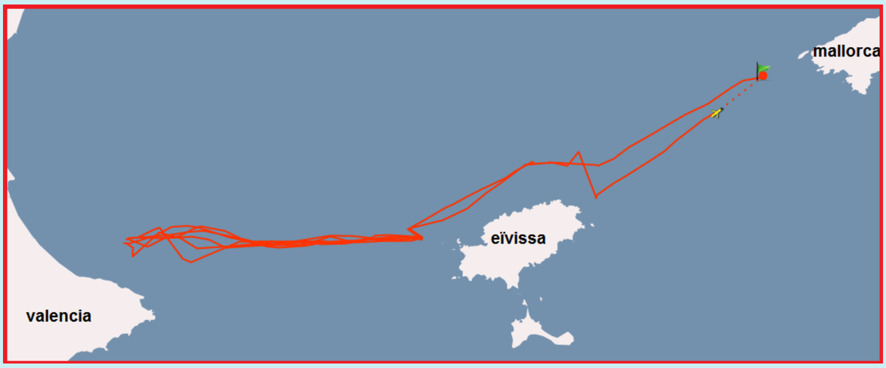
Principal Investigator (e-mail or contact phone/address)	*Prof. Joaquim Tintoré* *jtintore@socib.es (+34 971439821)*
Institute	*SOCIB in collaboration with IMEDEA*
Project Affiliation (web-site)	*http://www.socib.eu*
Partnership / Participation	*SOCIB (internal long-term project of sustained monitoring line)* *IMEDEA (in-kind contribution of material and infrastructures)*
Glider Software Version	*v7.13 Acomms*
Data Retrieval (real-time [RT] / delayed-mode [DM])	*Real-time sub-set via satellite link every 6 hours every day* *Delayed-mode direct download of full gathered data sets*
Compass Calibration (specify procedure)	*Compass calibration after installing new battery pack*
Battery Type	*Manufacturer's original Lithium batt.pack (700Ah-nominal cap.)*
Battery Consumption (Ah)	*163.752Ah (reading from 3.406Ah to 167.158Ah)*
Data Available From	*http://thredds.socib.es/thredds/dodsC/auv/glider/sdeep00-scb_sldeep000/L1/2014/dep0011_sdeep00_scb-sldeep000_L1_2014-04-07_data_dt.nc*
Full Mission Report From	*glidertech@socib.es*
Technical Contact	*glidertech@socib.es*

Figure 1

(Map providing general overview of Survey Area)

Mission Summary

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



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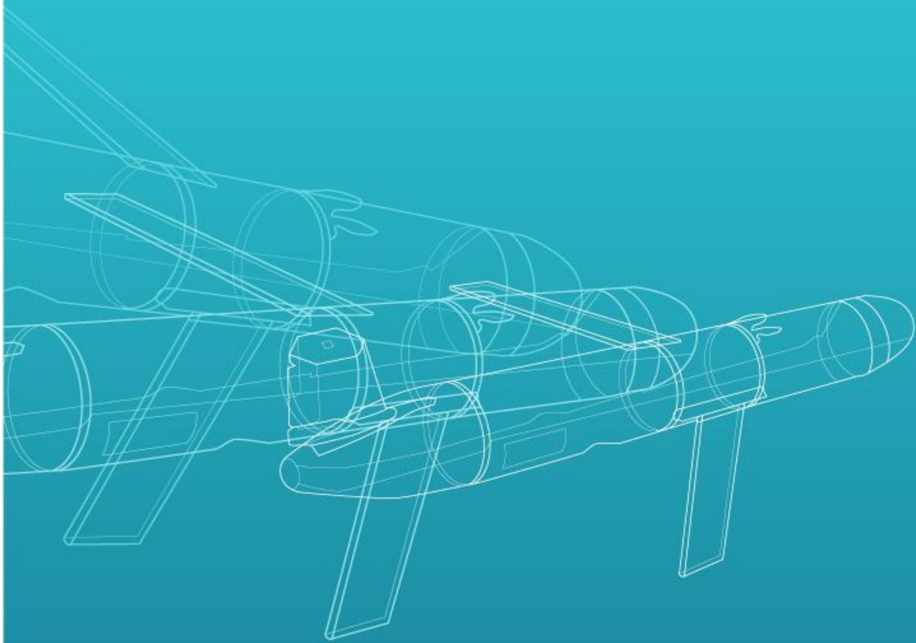

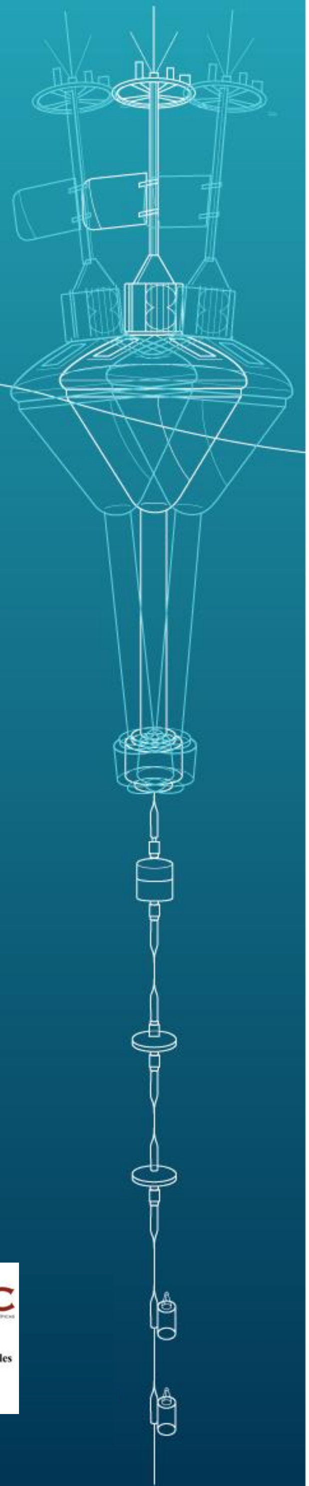

Glider Mission Summary Report

2012 - 2015

SOCIB (CSIC)

SOCIB_CANALES_JUN2014 (GR-MR-0028)

SOCIB Balearic Islands Coastal Observing and Forecasting System

GOBIERNO DE ESPAÑA MINISTERIO DE ECONOMÍA Y COMPETITIVIDAD

Govern de les Illes Balears

IMEDEA CSIC Universitat de les Illes Balears

Mission Name	*SOCIB_CANALES_JUN2014 (GR-MR-0028)*		
Platform Model	*Slocum 1000 G2*		
Platform ID / Name / WMO Code	*U243 / SDEEP00 / 68457*		
Related Platforms / Missions			
Start Date	*2014-06-10*		
End Date	*2014-06-17*		
Total Days *8*	**Total distance (Km / Nm)**	*41 / 22*	
Survey Area (NODC or SDN region)	*Mallorca and Eïvissa Channels (Western Mediterranean sea)*		
Objective(s)	*Establishing the variability of the N/S exchange of water masses that occur through the Ibiza Channel.* *Sampling a standard transect across the Ibiza Channel several times using physical and biogeochemical sensors.* *No greater than 1 month gap in between consecutive iterations.* *The Mallorca Channel is also sampled when operationally practical.*		
Scientific Sensors (name & model / serial_number / calibration date)	*GPCTD -SBE- / sn 0064 / 19-May-2011* *FLNTU -WetLabs- / sn2280 / 15-Jul-2011* *OPTODE -Aandera- / sn 1410 / 11-Feb-2011 (*)* *(*): sensor borrowed from U244 due to U243's foil breach*		
Number of Profiles	*202 (CTD), 102 (FLNTU), 102 (OXY)*		
Significant Events	*Glider with Lithium factory pack on-board* *Aborted mission due to a series of water leaks occurred during the* *3 consecutive attempts of deployment* *After this attempts, SDEEP00 was considered in need for factory repair, refurbishment and re-calibration*		
Mission Summary	*This mission does not stand for a valid iteration of the Canales Campaign 2014 considering that SDEEP00 (Unit 243) did not accomplish the objectives associated to this Endurance Line.* *For this mission, U243 was mounting U244's GPCTD and FLNTU sensors for technical reasons.* *Deployment operation took place in three different non-consecutive days due to water-leak aborts forcing the recovery of the vehicle, an attempt of repair and a consequent new attempt. All of them were executed by a 2-member field-team on board SOCIB-I Professional RIB. The used launching waypoint was N39.5095° E2.1818°.* *Overall performance of mechanical and sampling devices, obviously when the glider could perform before being affected by the leaks, was excellent. However, it leaked in three different occasions at the various depths of 850m, 500m, and, lastly, 80m.* *Neither Mallorca-Eïvissa nor Eïvissa-Valencia transects were successfully sampled during this mission and, therefore, it is not formally considered a valid iteration of Canales Campaign 2014.* *Emergency recoveries were executed by the same team on board SOCIB-I and, in the first two, leaving the glider drifting at the surface while waiting for extraction was needed. In order of occurrence, recovery locations were N39.4386° E2.0268°, N39.4095° E1.9731° and N39.5073° E2.1881°* *Upon completion, SDEEP00 was received at IMEDEA's glider-lab, put on the bench, revised and its status set to 'out-of-service'. Since that moment, arrangements to ship the Glider back to factory for repair/refurbishment/recalibration were made. Gathered dataset was fully backed-up and uploaded to SOCIB's FTP for subsequent processing and diffusion via SOCIB's public repository. Although its scientific value is considered to be null.*		

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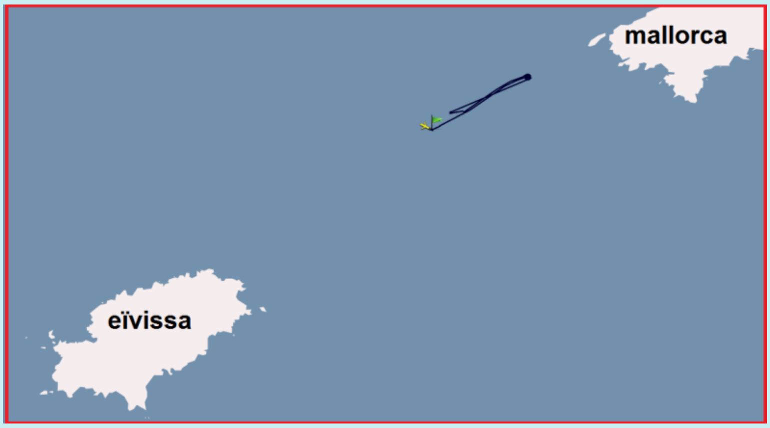
Principal Investigator (e-mail or contact phone/address)	*Prof. Joaquim Tintoré* *jtintore@socib.es (+34 971439821)*
Institute	*SOCIB in collaboration with IMEDEA*
Project Affiliation (web-site)	*http://www.socib.eu*
Partnership / Participation	*SOCIB (internal long-term project of sustained monitoring line)* *IMEDEA (in-kind contribution of material and infrastructures)*
Glider Software Version	*v7.13 Acomms*
Data Retrieval (real-time [RT] / delayed-mode [DM])	*Real-time sub-set via satellite link every 6 hours every day* *Delayed-mode direct download of full gathered data sets*
Compass Calibration (specify procedure)	*Error measurement revealed no necessity to perform a compass calibration*
Battery Type	*Manufacturer's original Lithium batt.pack (700Ah-nominal cap.)*
Battery Consumption (Ah)	*17.691Ah (reading from 168.288Ah to 185.979Ah)*
Data Available From	*http://thredds.socib.es/thredds/dodsC/auv/glider/sdeep00-scb_sldeep000/L1/2014/dep0010_sdeep00_scb-sldeep000_L1_2014-02-06_data_dt.nc*
Full Mission Report From	*glidertech@socib.es*
Technical Contact	*glidertech@socib.es*

Figure 1

(Map providing general overview of Survey Area)

Mission Summary

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



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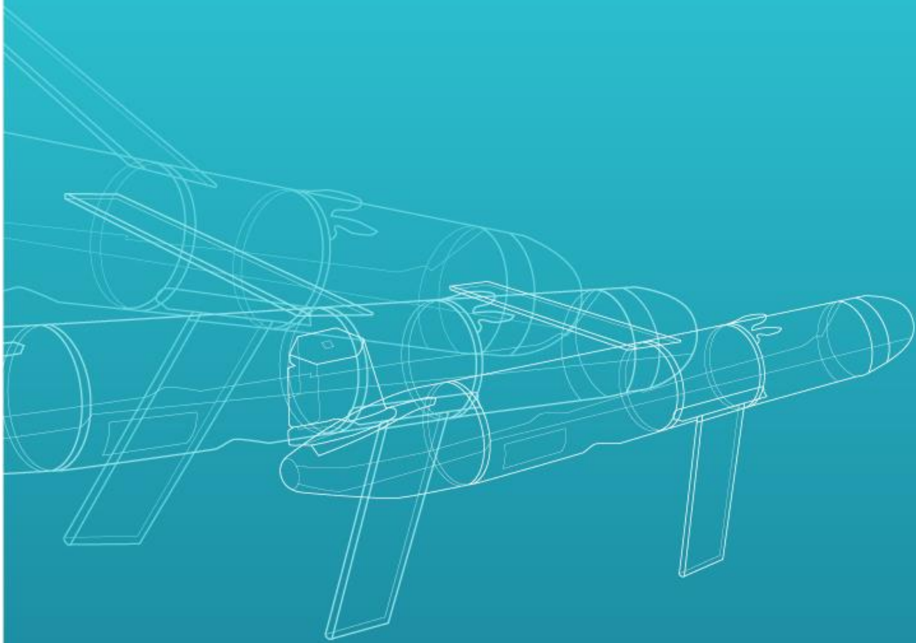

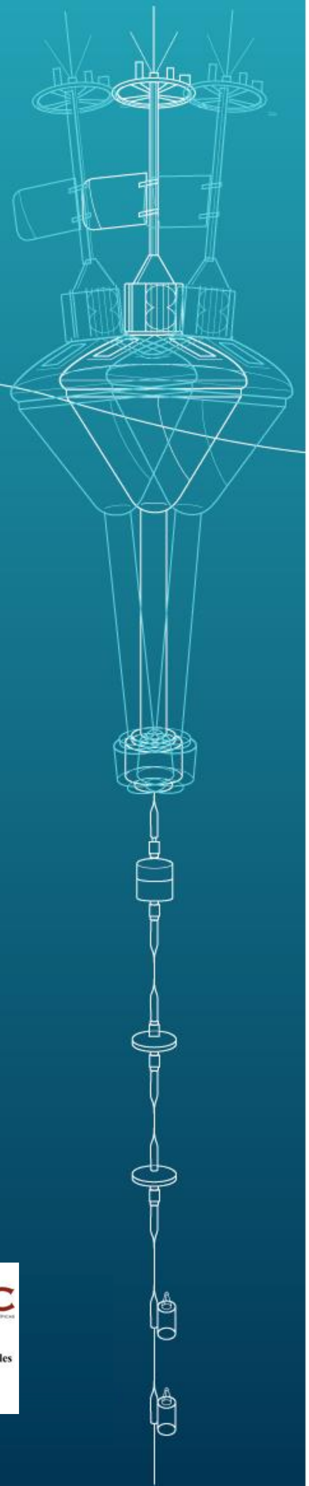

Glider Mission Summary Report

2012 - 2015

SOCIB (CSIC)

SOCIB_CANALES_JUL2014_1stDeployment

(GR-MR-0029)

SOCIB Balearic Islands Coastal Observing and Forecasting System

GOBIERNO DE ESPAÑA MINISTERIO DE ECONOMÍA Y COMPETITIVIDAD

Govern de les Illes Balears

IMEDEA CSIC Universitat de les Illes Balears

Mission Name	*SOCIB_CANALES_JUL2014_1stDeployment (GR-MR-0029)*		
Platform Model	*Slocum 1000 G2*		
Platform ID / Name / WMO Code	*U244 / SDEEP01 / 68967*		
Related Platforms / Missions			
Start Date	*2014-07-03*		
End Date	*2014-07-13*		
Total Days *10*	**Total distance (Km / Nm)**	*178 / 96*	
Survey Area (NODC or SDN region)	*Mallorca and Eïvissa Channels (Western Mediterranean sea)*		
Objective(s)	*Establishing the variability of the N/S exchange of water masses that occur through the Ibiza Channel.* *Sampling a standard transect across the Ibiza Channel several times using physical and biogeochemical sensors.* *No greater than 1 month gap in between consecutive iterations.* *The Mallorca Channel is also sampled when operationally practical.*		
Scientific Sensors (name & model / serial_number / calibration date)	*GPCTD -SBE- / sn 0107 / 01-Apr-2012* *FLNTU -WetLabs- / sn2279 / 15-Jul-2011* *OPTODE -Aandera- / sn 1410 / 11-Feb-2011*		
Number of Profiles	*421 (CTD), 261 (FLNTU), 261 (OXY)*		
Significant Events	*Glider with Lithium factory pack on-board* *Altimeter exhibiting considerably high number of false bottom hits* *Spontaneous abduction of the U244 glider by Valencian fisherman* *Glider was rescued by Valencia's Guardia Civil (Spanish military force)* *SOCIB glider technician picked-up SDEEP00 from Guardia Civil Station in Oliva (Valencia)*		
Mission Summary	*This mission stands for the 3rd iteration of the Canales Campaign 2014, carried out by SOCIB's glider SDEEP01 (Unit 244). However, this iteration was interrupted by an external actor thus splitting the execution in 2 different and consecutive deployments.* *For this mission, U244 was mounting U243's GPCTD and FLNTU sensors for technical reasons.* *The launching operation was executed by a 2-member field-team on board SOCIB-I Professional RIB. Due to rough weather conditions, U244 was released closer (N39.4294° E2.3033°) to departure port than the standard/official Canales starting waypoint (N39.4933° E2.181°).* *During the execution of this mission 1 Mallorca-Eïvissa transect was completed successfully.* *Overall performance of mechanical and sampling devices, until the unexpected extraction, was acceptable but the ALTIMETER (providing false bottom hits that caused the Glider to inflect to soon to the surface and not reaching to the channels bottoms). There also was 1 mission interruption due to DE_PUMP failure and some oddities coming from DIGIFIN, IRIDIUM and GPS. After some innovative altimeter's configuration, bottom detection worked properly. Additionally, Communications were stable and fluent allowing proper near-real-time data sending and ARGOS messaging. Navigation was also successful provoking traced route to match fairly well with commanded path.* *Suddenly, on July-12th@09:57am,utc (N38.9924° E0.595°), SDEEP01 called in reporting not being able to sink and therefore having aborted the execution of the mission (obvious, it was on a fisherman's ship). That same night, SDEEP01 reported being on-land which turned out to be the fisherman's private property. SOCIB contacted local military forces that quickly rescued the vehicle. The next day, SOCIB glidertech picked-up the Glider from this force's station in Oliva (Valencia). SDEEP01 exhibited neither damages nor visible defects.* *Upon return home, SDEEP01 was put on the bench, revised and considered ready to go for a second deployment within this GF-MR-0029 mission. Gathered dataset was fully backed-up and uploaded to SOCIB's FTP for subsequent processing and diffusion via SOCIB's public repository. Although its scientific value is considered to be null.*		

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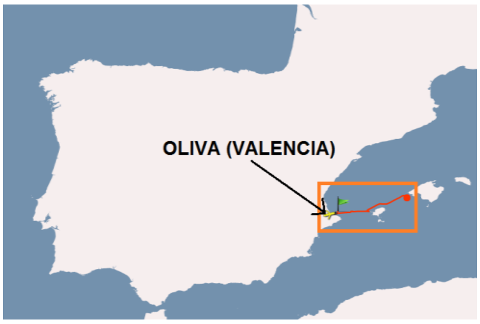
Principal Investigator (e-mail or contact phone/address)	*Prof. Joaquim Tintoré* *jtintore@socib.es (+34 971439821)*
Institute	*SOCIB in collaboration with IMEDEA*
Project Affiliation (web-site)	*http://www.socib.eu*
Partnership / Participation	*SOCIB (internal long-term project of sustained monitoring line)* *IMEDEA (in-kind contribution of material and infrastructures)*
Glider Software Version	*v7.13 Acomms*
Data Retrieval (real-time [RT] / delayed-mode [DM])	*Real-time sub-set via satellite link every 6 hours every day* *Delayed-mode direct download of full gathered data sets*
Compass Calibration (specify procedure)	*Error measurement revealed no necessity to perform a compass calibration*
Battery Type	*Manufacturer's original Lithium batt.pack (700Ah-nominal cap.)*
Battery Consumption (Ah)	*53.077Ah (reading from 187.116Ah to 240.193Ah)*
Data Available From	*http://thredds.socib.es/thredds/dodsC/auv/glider/sdeep01-scb_sldeep001/L1/2014/dep0014_sdeep01_scb-sldeep001_L1_2014-07-03_data_dt.nc*
Full Mission Report From	*glidertech@socib.es*
Technical Contact	*glidertech@socib.es*

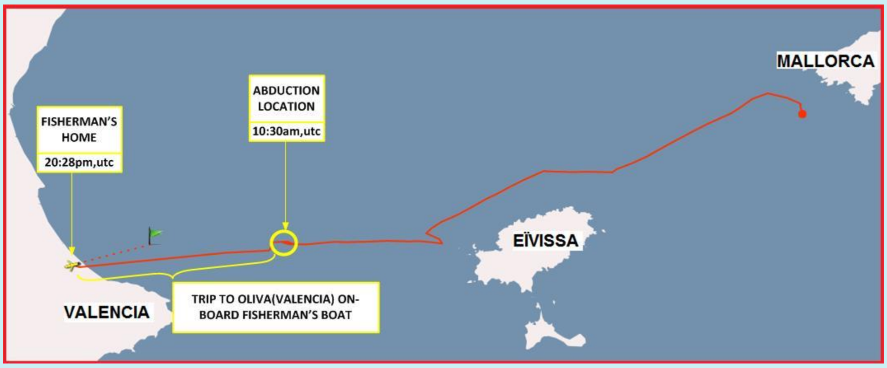
Figure 1

(Map providing general overview of Survey Area)



Mission Summary

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



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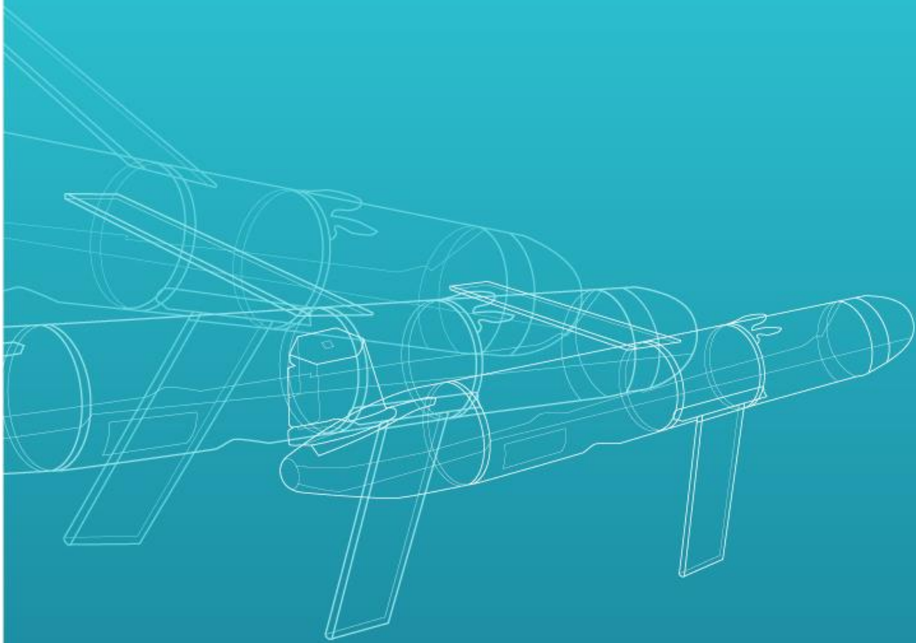

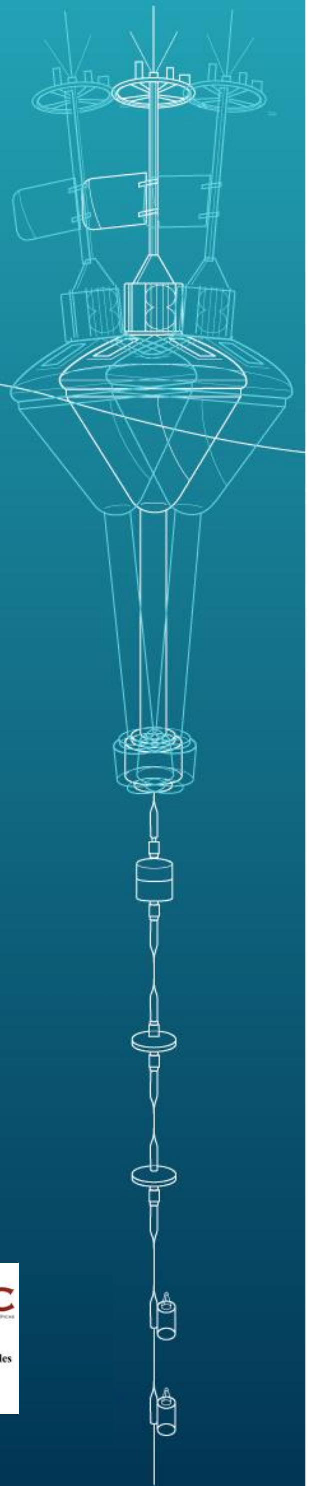

Glider Mission Summary Report

2012 - 2015

SOCIB (CSIC)

SOCIB_CANALES_JUL2014_2ndDeployment

(GR-MR-0029)

SOCIB Balearic Islands Coastal Observing and Forecasting System

GOBIERNO DE ESPAÑA MINISTERIO DE ECONOMÍA Y COMPETITIVIDAD

Govern de les Illes Balears

IMEDEA CSIC Consejo Superior de Investigaciones Científicas UIB Universitat de les Illes Balears

Mission Name	*SOCIB_CANALES_JUL2014_2ndDeployment (GR-MR-0029)*		
Platform Model	*Slocum 1000 G2*		
Platform ID / Name / WMO Code	*U244 / SDEEP01 / 68967*		
Related Platforms / Missions			
Start Date	*2014-07-21*		
End Date	*2014-08-05*		
Total Days	*16*	**Total distance (Km / Nm)**	*330 / 178*
Survey Area (NODC or SDN region)	*Mallorca and Eïvissa Channels (Western Mediterranean sea)*		
Objective(s)	*Establishing the variability of the N/S exchange of water masses that occur through the Ibiza Channel.* *Sampling a standard transect across the Ibiza Channel several times using physical and biogeochemical sensors.* *No greater than 1 month gap in between consecutive iterations.* *The Mallorca Channel is also sampled when operationally practical.*		
Scientific Sensors (name & model / serial_number / calibration date)	*GPCTD -SBE- / sn 0107 / 01-Apr-2012* *FLNTU -WetLabs- / sn2279 / 15-Jul-2011* *OPTODE -Aandera- / sn 1410 / 11-Feb-2011*		
Number of Profiles	*480 (CTD), 273 (FLNTU), 273 (OXY)*		
Significant Events	*Glider with Lithium factory pack on-board.* *GF-MR-0029 resume after fisherman's abduction.* *Survey area limited to Eïvissa-Valencia channel.* *Altimeter raising false bottom hits persisted, although it could be gotten around again.*		
Mission Summary	*This mission stands for the 3rd iteration of the Canales Campaign 2014, carried out by SOCIB's glider SDEEP01 (Unit 244). However, this iteration was interrupted by an external actor thus splitting the execution in 2 different and consecutive deployments.* *For this mission, U244 was mounting U243's GPCTD and FLNTU sensors for technical reasons.* *This second launching operation was executed by a 2-member field-team on board SOCIB-I Professional RIB. Due to tactical reasons (summer holidays ahead), U244 was released directly from Eïvissa's N-E coast (N38.9969° E1.0996°). Field-team stood-by in St.Antoni (Eïvissa) for two days until the glider proved to perform optimally.* *During the execution of this mission 4 Eïvissa-Valencia transects were completed successfully.* *Overall performance of mechanical and sampling devices was acceptable but the ALTIMETER (providing false bottom hits that caused the Glider to inflect too soon to the surface and not reaching to the channel bottom). There also were some oddities coming from DIGIFIN, IRIDIUM and GPS. After some altimeter's configuration, bottom detection worked properly. Additionally, Communications were stable and fluent allowing proper near-real-time data sending and ARGOS messaging. Navigation was also successful provoking traced route to match fairly well with commanded path.* *Recovery took place also in Eïvissa waters by the same field-team and vessel. It happened in N38.9946° E1.0975°.* *Upon completion, SDEEP00 was received at IMEDEA's glider-lab, put on the bench, revised and properly stored. Gathered dataset was fully backed-up and uploaded to SOCIB's FTP for subsequent processing and diffusion via SOCIB's public repository.*		

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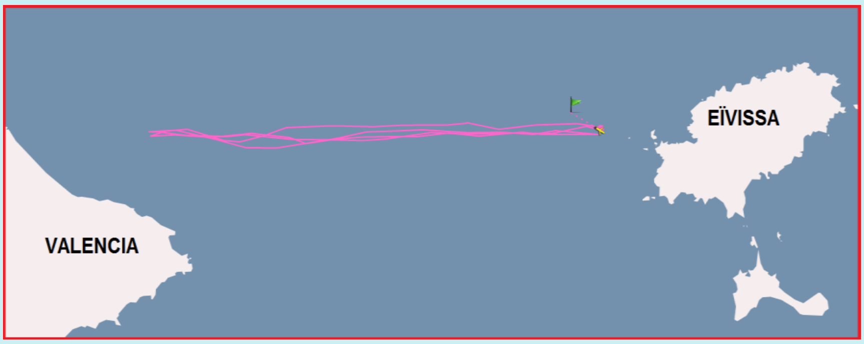
Principal Investigator (e-mail or contact phone/address)	*Prof. Joaquim Tintoré* *jtintore@socib.es (+34 971439821)*
Institute	*SOCIB in collaboration with IMEDEA*
Project Affiliation (web-site)	*http://www.socib.eu*
Partnership / Participation	*SOCIB (internal long-term project of sustained monitoring line)* *IMEDEA (in-kind contribution of material and infrastructures)*
Glider Software Version	*v7.13 Acomms*
Data Retrieval (real-time [RT] / delayed-mode [DM])	*Real-time sub-set via satellite link every 6 hours every day* *Delayed-mode direct download of full gathered data sets*
Compass Calibration (specify procedure)	*Error measurement revealed no necessity to perform a compass calibration*
Battery Type	*Manufacturer's original Lithium batt.pack (700Ah-nominal cap.)*
Battery Consumption (Ah)	*87.421Ah (reading from 243.674Ah to 331.095Ah)*
Data Available From	*http://thredds.socib.es/thredds/dodsC/auv/glider/sdeep01-scb_sldeep001/L1/2014/dep0015_sdeep01_scb-sldeep001_L1_2014-07-21_data_dt.nc*
Full Mission Report From	*glidertech@socib.es*
Technical Contact	*glidertech@socib.es*

Figure 1

(Map providing general overview of Survey Area)

Mission Summary

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



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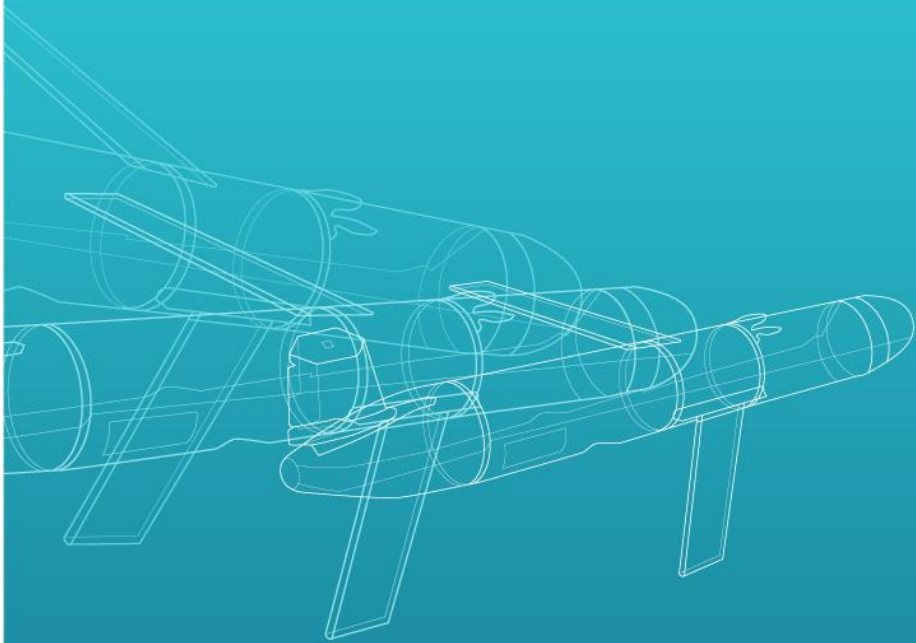

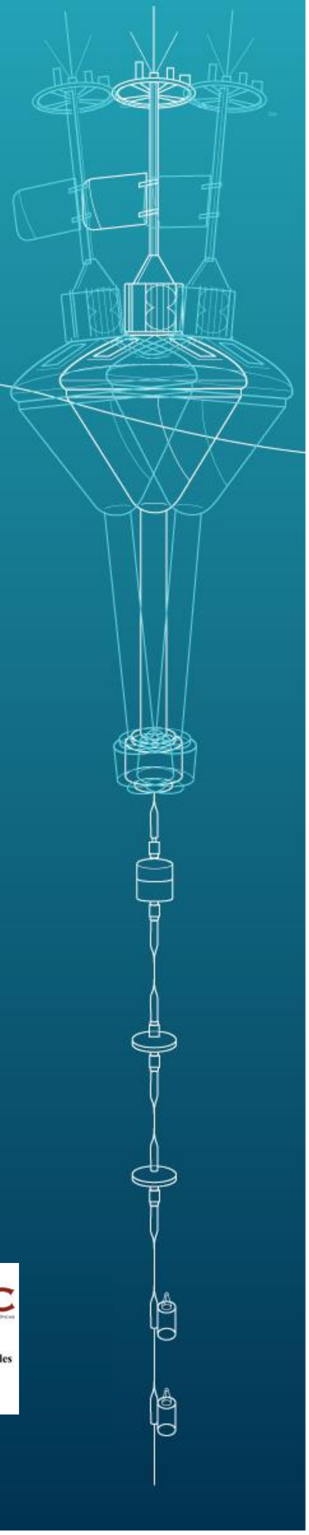

Glider Mission Summary Report

2012 - 2015

SOCIB (CSIC)

SOCIB_CANALES_OCT2014 (GR-MR-0031)

SOCIB Balearic Islands Coastal Observing and Forecasting System

GOBIERNO DE ESPAÑA MINISTERIO DE ECONOMÍA Y COMPETITIVIDAD

Govern de les Illes Balears

IMEDEA CSIC Universitat de les Illes Balears

Mission Name	*SOCIB_CANALES_OCT2014 (GR-MR-0031)*
Platform Model	*Slocum 1000 G2*
Platform ID / Name / WMO Code	*U184 / IDEEP00 / 68452*
Related Platforms / Missions	
Start Date	*2014-10-07*
End Date	*2014-10-24*
Total Days *18*	**Total distance (Km / Nm)** *370 / 200*
Survey Area (NODC or SDN region)	*Mallorca and Eïvissa Channels (Western Mediterranean sea)*
Objective(s)	*Establishing the variability of the N/S exchange of water masses that occur through the Ibiza Channel.* *Sampling a standard transect across the Ibiza Channel several times using physical and biogeochemical sensors.* *No greater than 1 month gap in between consecutive iterations.* *The Mallorca Channel is also sampled when operationally practical.*
Scientific Sensors (name & model / serial_number / calibration date)	*CTD -SBE- / sn 0195 / 23-Dec-2009* *FLNTU -WetLabs- / sn 2128 / 01-Feb-2011* *OPTODE -Aandera- / sn 0841 / 01-May-2013*
Number of Profiles	*615 (CTD), 143 (FLNTU), 143 (OXY)*
Significant Events	*Survey area limited to the Eïvissa-Valencia channel.* *Significant uncoupling between traced and commanded route (presumably due to strong currents).* *Glider failing to get a first GPS fix during in-mission surfaces.* *Backwards navigation upon completion of 4th transect.* *Mission interrupt due to low battery charge available.* *Recovery on-board Eïvissa's Local Governmental vessel.*
Mission Summary	*This mission stands for the 4th iteration of the Canales Campaign 2014, carried out by SOCIB's glider IDEEP00 (Unit 184). This G1 was selected since U244 was assigned to ABACUS mission.* *Deployment was executed by a 3-member field-team on board SOCIB-I Professional RIB. Chosen location was N38.9954° E1.0936° (Eïvissa's N-W) due to tactical and logistical issues involving also SOCIB's ETD division.* *During the execution of this mission 4 Eïvissa-Valencia transects were completed successfully.* *Overall performance of mechanical and sampling devices was acceptable. Nevertheless, OCEAN_PRESSURE sensor exhibited a relatively high drift very close to the surface causing the Glider to turn on GPS still underwater . There also were some oddities coming from DIGIFIN, SCIENCE_SUPER, IRIDIUM and GPS. Additionally, Communications were stable (but with some call-drops) allowing proper near-real-time data sending and ARGOS messaging. Navigation was characterized by a changing deviation (2.5Km in average) of traced route with respect to commanded path. This is attributed to the presence of strong currents.* *The previous night to the recovery, IDEEP00 interrupted the execution of the mission reporting a low remaining battery charge (20%). As this happened at late night, the Glider remained holding the position until a Pilot resumed the mission.* *Recovery took place also in Eïvissa waters by a Glider technician on board a vessel of Eïvissa's local government fishery control office. It happened in N38.8881° E1.0758°. This point was setup to reduce the navigation of the vessel as it departed from Eïvissa city (South to the island of Eïvissa).* *Upon completion, IDEEP00 was received at IMEDEA's glider-lab, put on the bench, revised and properly stored. Gathered dataset was fully backed-up and uploaded to SOCIB's FTP for subsequent processing and diffusion via SOCIB's public repository.*

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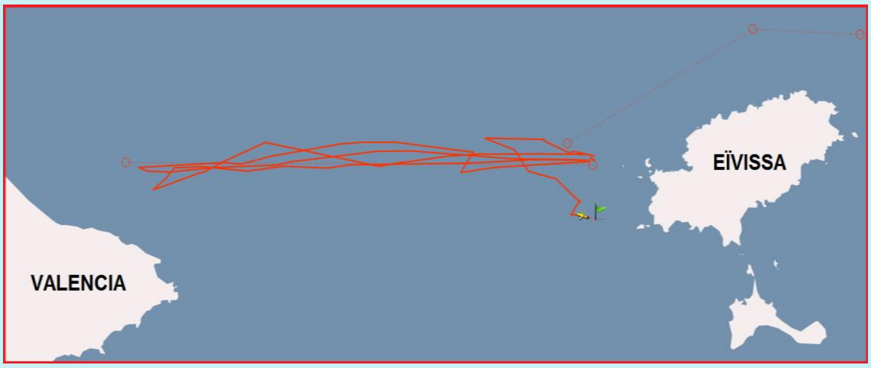
Principal Investigator (e-mail or contact phone/address)	*Prof. Joaquim Tintoré* *jtintore@socib.es (+34 971439821)*
Institute	*SOCIB in collaboration with IMEDEA*
Project Affiliation (web-site)	*http://www.socib.eu*
Partnership / Participation	*SOCIB (internal long-term project of sustained monitoring line)* *IMEDEA (in-kind contribution of material and infrastructures)*
Glider Software Version	*v7.13 Acomms*
Data Retrieval (real-time [RT] / delayed-mode [DM])	*Real-time sub-set via satellite link every 6 hours every day* *Delayed-mode direct download of full gathered data sets*
Compass Calibration (specify procedure)	*Error measurement revealed no necessity to perform a compass calibration*
Battery Type	*Manufacturer's original Alkaline batt.pack (143Ah-nominal cap.)*
Battery Consumption (Ah)	*74.732Ah (reading from 38.156Ah to 112.888Ah)*
Data Available From	*http://thredds.socib.es/thredds/dodsC/auv/glider/ideep00-ime_sldeep000/L1/2014/dep0013_ideep00_ime-sldeep000_L1_2014-10-07_data_dt.nc*
Full Mission Report From	*glidertech@socib.es*
Technical Contact	*glidertech@socib.es*

Figure 1

(Map providing general overview of Survey Area)

Mission Summary

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



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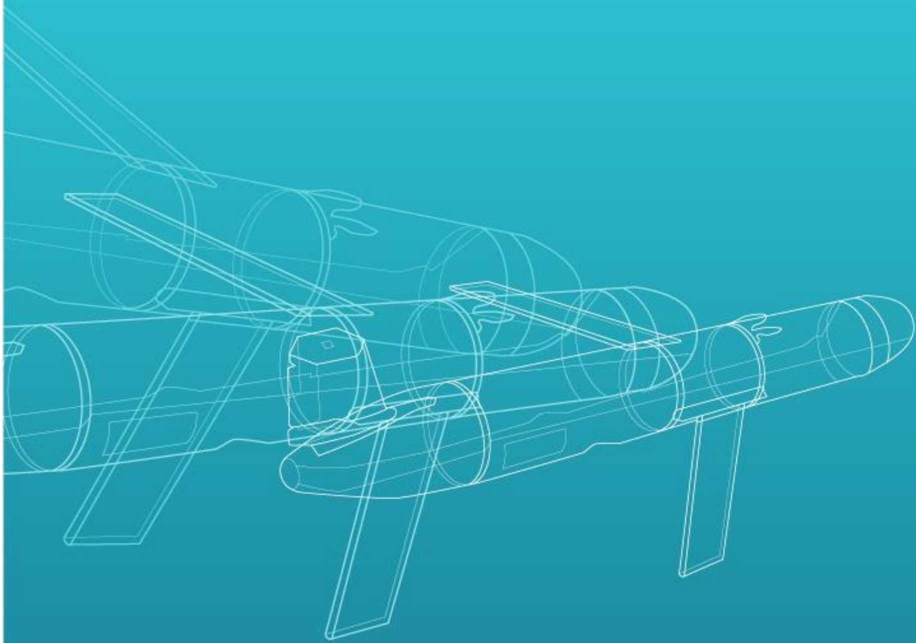

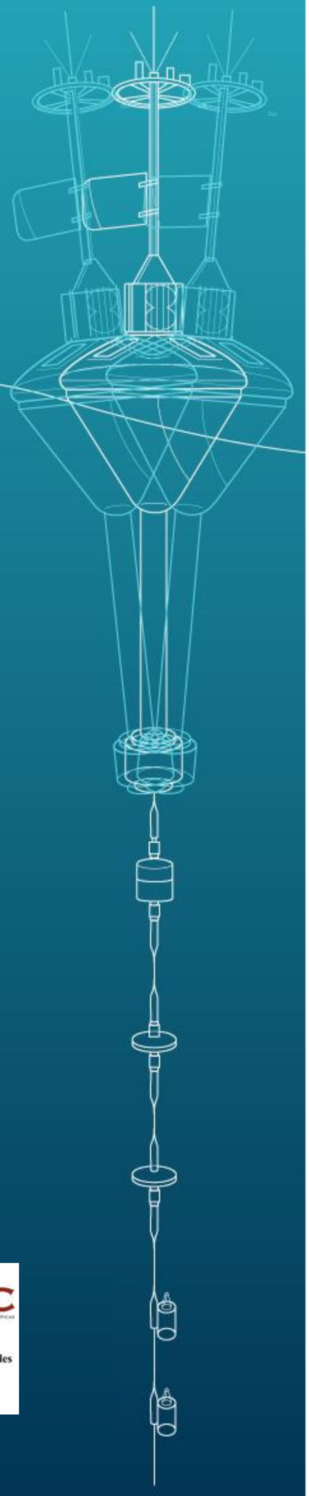

Glider Mission Summary Report

2012 - 2015

SOCIB (CSIC)

SOCIB_CANALES_NOV2014 (GR-MR-0032)

SOCIB Balearic Islands Coastal Observing and Forecasting System

Gobierno de España Ministerio de Economía y Competitividad

Govern de les Illes Balears

IMEDEA CSIC Universitat de les Illes Balears

Mission Name	*SOCIB_CANALES_NOV2014 (GR-MR-0032)*		
Platform Model	*Slocum 1000 G2*		
Platform ID / Name / WMO Code	*U184 / IDEEP00 / 68452*		
Related Platforms / Missions			
Start Date	*2014-11-25*		
End Date	*2014-12-19*		
Total Days *25*		**Total distance (Km / Nm)**	*518 / 280*
Survey Area (NODC or SDN region)	*Mallorca and Eïvissa Channels (Western Mediterranean sea)*		
Objective(s)	*Establishing the variability of the N/S exchange of water masses that occur through the Ibiza Channel.* *Sampling a standard transect across the Ibiza Channel several times using physical and biogeochemical sensors.* *No greater than 1 month gap in between consecutive iterations.* *The Mallorca Channel is also sampled when operationally practical.*		
Scientific Sensors (name & model / serial_number / calibration date)	*CTD -SBE- / sn 0195 / 23-Dec-2009* *FLNTU -WetLabs- / sn 2128 / 01-Feb-2011* *OPTODE -Aandera- / sn 0841 / 01-May-2013*		
Number of Profiles	*884 (CTD), 168 (FLNTU), 168 (OXY)*		
Significant Events	*Deployment directly into Eïvissa-Valencia channel (SOCIB-R/V).* *Important dynamics affecting Glider's deviation from commanded track.* *Super-currents (never observed since 2010), in front of Valencia's coast, prevented Eïvissa-Valencia transect completion not even once.* *Second attempted transect ended with a 43Km drift to South in only 6 hours.* *Dual recovery of this Gliders along with ABACUS's U244.*		
Mission Summary	*This mission stands for the 5th (and final) iteration of the Canales Campaign 2014, carried out by SOCIB's glider IDEEP00 (Unit 184), concurrently with ABACUS-JERICO-TNA mission.* *Deployment was executed on board SOCIB-R/V. Chosen location was N38.9841° E1.1039° (Eïvissa's N-W) to accommodate to SOCIB-R/V's cruise plan.* *During the execution of this mission 4 Eïvissa-Valencia transects were attempted although not 100% completed due to extraordinary N-to-W currents in front of Valencia's coast blocking que advancement of the glider for the last 16Km of the transect. 1 Eïvissa-Mallorca channel was sampled successfully during the return trip.* *Overall performance of mechanical and sampling devices was acceptable. There were some oddities coming from DIGIFIN, SCIENCE_SUPER, IRIDIUM and GPS. Additionally, Communications were stable (but with some call-drops) allowing proper near-real-time data sending and ARGOS messaging. Navigation was totally affected by the presence of very strong currents, for the rest, all navionic systems seemed to work fine.* *Special maneuvers were attempted to escape from the blockage of the currents. It worked only that successive attempts to resume path were unfruitful. On Dec-10th, IDEEP00 ended navigating backwards 45Km in ony 6 hours.* *Considering this, a third channel was not attempted and IDEEP00 commanded to return to Mallorca where it met ABACUS' glider (U243) that was also returning from its cruise. IDEEP00 was the first one to be recovered during a dual-recovery that took place in N39.3045° E2.3785°.* *Upon completion, IDEEP00 was received at IMEDEA's glider-lab, put on the bench, revised and properly stored. Gathered dataset was fully backed-up and uploaded to SOCIB's FTP for subsequent processing and diffusion via SOCIB's public repository.*		

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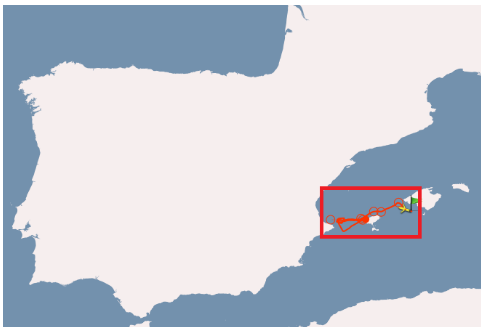
Institute	*SOCIB in collaboration with IMEDEA*
Project Affiliation (web-site)	*http://www.socib.eu*
Partnership / Participation	*SOCIB (internal long-term project of sustained monitoring line)* *IMEDEA (in-kind contribution of material and infrastructures)*
Glider Software Version	*v7.13 Acomms*
Data Retrieval (real-time [RT] / delayed-mode [DM])	*Real-time sub-set via satellite link every 6 hours every day* *Delayed-mode direct download of full gathered data sets*
Compass Calibration (specify procedure)	*Error measurement revealed no necessity to perform a compass calibration*
Battery Type	*Manufacturer's original Alkaline batt.pack (143Ah-nominal cap.)*
Battery Consumption (Ah)	*107.47Ah (reading from 0.702Ah to 108.172Ah)*
Data Available From	*http://thredds.socib.es/thredds/dodsC/auv/glider/ideep00-ime_sldeep000/L1/2014/dep0014_ideep00_ime-sldeep000_L1_2014-11-25_data_dt.nc*
Full Mission Report From	*glidertech@socib.es*
Technical Contact	*glidertech@socib.es*

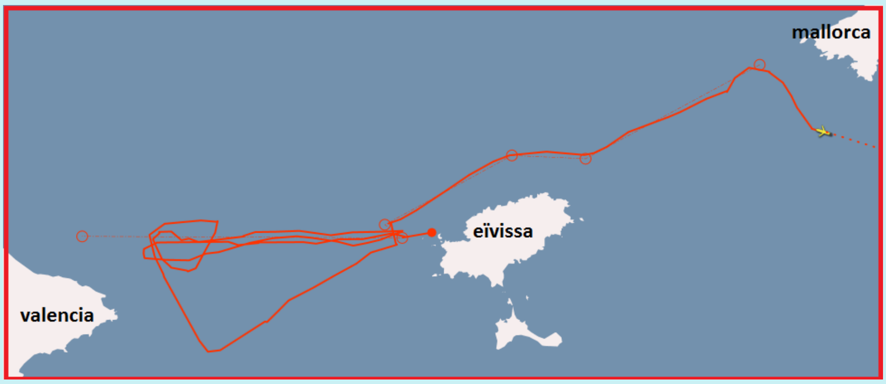
Figure 1

(Map providing general overview of Survey Area)



Mission Summary

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



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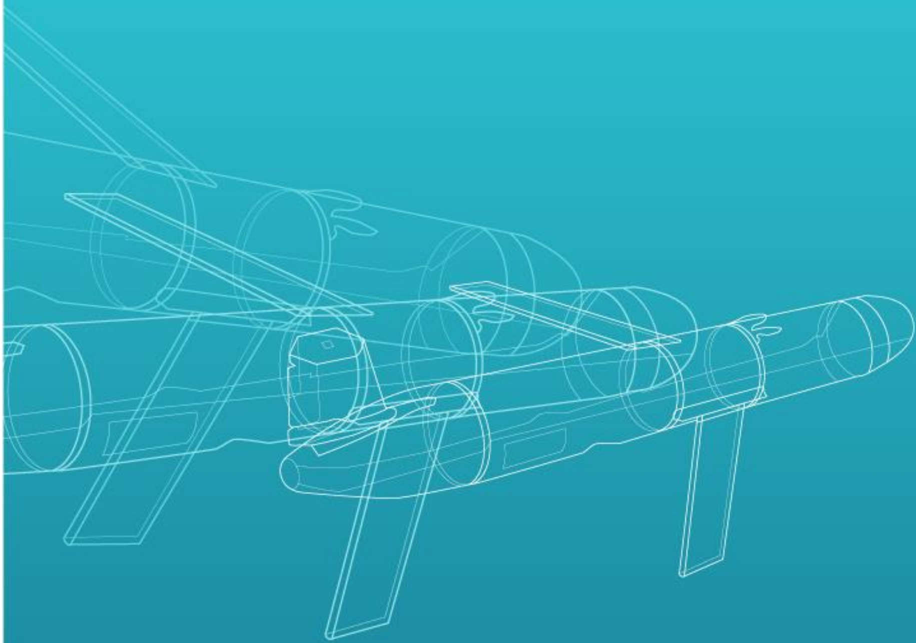

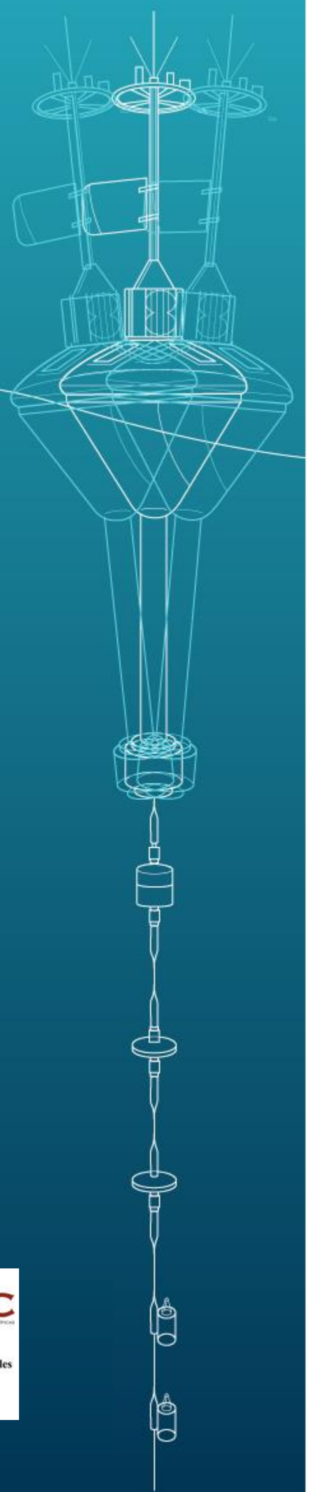

Glider Mission Summary Report

2012 - 2015

SOCIB (CSIC)

SOCIB_CANALES_JAN2015_(GR-MR-0033)

SOCIB Balearic Islands Coastal Observing and Forecasting System

GOBIERNO DE ESPAÑA MINISTERIO DE ECONOMÍA Y COMPETITIVIDAD

Govern de les Illes Balears

IMEDEA CSIC Universitat de les Illes Balears

Mission Name	*SOCIB_CANALES_JAN2015(GR-MR-0033)*		
Platform Model	*Slocum 1000 G2*		
Platform ID / Name / WMO Code	*U244 / SDEEP01 / 68967*		
Related Platforms / Missions			
Start Date	*2015-01-28*		
End Date	*2014-03-16*		
Total Days	*48*	**Total distance (Km / Nm)**	*962 / 520*
Survey Area (NODC or SDN region)	*Mallorca and Eïvissa Channels (Western Mediterranean sea)*		
Objective(s)	*Establishing the variability of the N/S exchange of water masses that occur through the Ibiza Channel.* *Sampling a standard transect across the Ibiza Channel several times using physical and biogeochemical sensors.* *No greater than 1 month gap in between consecutive iterations.* *The Mallorca Channel is also sampled when operationally practical.*		
Scientific Sensors (name & model / serial_number / calibration date)	*GPCTD -SBE- / sn 0107 / 01-Apr-2012* *FLNTU -WetLabs- / sn2279 / 15-Jul-2011* *OPTODE -Aandera- / sn 1410 / 11-Feb-2011*		
Number of Profiles	*2083 (CTD), 467 (FLNTU), 467 (OXY)*		
Significant Events	*Glider with Lithium factory pack on-board.* *Intense currents disturbing the completion of the first 2 Eïvissa-Valencia channels (compensation maneuvers executed).* *Altimeter raising false bottom hits prevented the Glider to complete some deep dives.* *Last mission of SDEEP01 before going for refurbishment.*		
Mission Summary	*This mission stands for the 1st iteration of the Canales Campaign 2015, carried out by SOCIB's glider SDEEP01 (Unit 244).* *For this mission, U244 was mounting U243's GPCTD and FLNTU sensors for technical reasons.* *Launching operation was executed by a 2-member field-team on board SOCIB-I Professional RIB. Due to rough weather conditions, U244 was released closer to home-port than usual (N39.2979° E2.4856°).* *During the execution of this mission 6 Eïvissa-Valencia and 2 Mallorca-Eïvissa transects were completed satisfactorily. However, the presence of very strong currents prevented the Glider to stick to the commanded path. To penetrate the area of the currents, SDEEP01 hat to be commanded to gain Latitude, before heading West, in an attempt to counteract the push-to-South effect of this currents. This maneuver was specially aggressive during the first 2 Valencia hits. The third Eïvissa-Valencia was more quite.* *Overall performance of mechanical and sampling devices was acceptable but the ALTIMETER (providing false bottom hits that caused the Glider to inflect too soon to the surface and not reaching to the channel bottom). There also were some oddities coming from DIGIFIN, IRIDIUM and GPS. After some altimeter's configuration, bottom detection worked properly. Additionally, Communications were stable and fluent allowing proper near-real-time data sending and ARGOS messaging. Navigation was, as expected, not very much adjusted to the commanded path in the Eïvissa channel although SDEEP01 behaved fine in the rest of the track.* *Recovery took place in the same location of the deployment by the same field-team and vessel. It happened in N39.3222° E2.3242°.* *Upon completion, SDEEP01 was received at IMEDEA's glider-lab, put on the bench, revised and properly stored. Gathered dataset was fully backed-up and uploaded to SOCIB's FTP for subsequent processing and diffusion via SOCIB's public repository.*		

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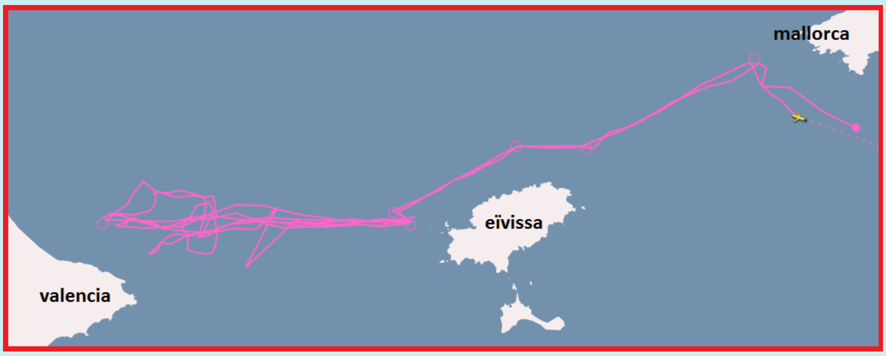
Principal Investigator (e-mail or contact phone/address)	*Prof. Joaquim Tintoré* *jtintore@socib.es (+34 971439821)*
Institute	*SOCIB in collaboration with IMEDEA*
Project Affiliation (web-site)	*http://www.socib.eu*
Partnership / Participation	*SOCIB (internal long-term project of sustained monitoring line)* *IMEDEA (in-kind contribution of material and infrastructures)*
Glider Software Version	*v7.13 Acomms*
Data Retrieval (real-time [RT] / delayed-mode [DM])	*Real-time sub-set via satellite link every 6 hours every day* *Delayed-mode direct download of full gathered data sets*
Compass Calibration (specify procedure)	*Error measurement revealed no necessity to perform a compass calibration*
Battery Type	*Manufacturer's original Lithium batt.pack (700Ah-nominal cap.)*
Battery Consumption (Ah)	*254.254Ah (reading from 324.826Ah to 579.08Ah)*
Data Available From	*http://thredds.socib.es/thredds/dodsC/auv/glider/sdeep01-scb_sldeep001/L1/2015/dep0020_sdeep01_scb-sldeep001_L1_2015-01-28_data_dt.nc*
Full Mission Report From	*glidertech@socib.es*
Technical Contact	*glidertech@socib.es*

Figure 1

(Map providing general overview of Survey Area)

Mission Summary

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



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Glider Mission Summary Report

2012 - 2015

SOCIB (CSIC)

SOCIB_CANALES_MAR2015_(GR-MR-0034)

SOCIB Balearic Islands Coastal Observing and Forecasting System

Mission Name	*SOCIB_CANALES_MAR2015(GR-MR-0034)*		
Platform Model	*Slocum 1000 G1*		
Platform ID / Name / WMO Code	*U132 / IDEEP02 / 68966*		
Related Platforms / Missions			
Start Date	*2015-03-16*		
End Date	*2014-04-08*		
Total Days *23*	**Total distance (Km / Nm)**	*532 / 288*	
Survey Area (NODC or SDN region)	*Mallorca and Eïvissa Channels (Western Mediterranean sea)*		
Objective(s)	*Establishing the variability of the N/S exchange of water masses that occur through the Ibiza Channel.* *Sampling a standard transect across the Ibiza Channel several times using physical and biogeochemical sensors.* *No greater than 1 month gap in between consecutive iterations.* *The Mallorca Channel is also sampled when operationally practical.* *Testing SAFT Lithium Primary battery pack with in-house ballasting chassis (as well as general trial of IDEEP02 after refurbishment).*		
Scientific Sensors (name & model / serial_number / calibration date)	*GPCTD -SBE- / sn 0129 / 25-Jul-2014* *FLNTUSLC -WetLabs- / sn3710 / 06-Oct-2014* *OPTODE -Aandera- / sn 0994 / 21-Nov-2014*		
Number of Profiles	*1484 (CTD), 433 (FLNTU), 433 (OXY)*		
Significant Events	*First mission of IDEEP02 after extensive refurbishment and calibration.* *First ever G1 glider powered by Lithium batteries.* *Engineering trials (Butterfly path) performed near Mallorca prior to the beginning of the scientific sampling.* *All CTD profiles within this mission do not contain valid sci_water_pressure due to CTD's pressure sensor malfunction coming from factory re-calibration. Conductivity and Temperature measurements are alright.*		
Mission Summary	*This mission stands for the 2nd iteration of the Canales Campaign 2015, carried out by SOCIB's glider IDEEP02 (Unit 132). It is also the first one attempted since this unit returned from factory refurbishment and calibration.* *Launching operation was executed by a 2-member field-team on board SOCIB-I Professional RIB in N39.3114° E2.3169°. In trial mode, IDEEP02 was commanded to a deep-water area in where a butterfly-pattern mission was commanded around N39.5478° E1.9337°. After 2 days executing this trials, Canales scientific survey began.* *During the execution of this mission 2 Eïvissa-Valencia and 2 Mallorca-Eïvissa transects were technically completed (but not scientifically). Some defect in the CTD's pressure sensor prevented the science-logger to record precise pressure readings along with conductivity and temperature. This defect was found to have been occurring before the Glider was shipped back from factory to IMEDEA.* *Overall performance of mechanical devices was acceptable. Obviously, scientific performance was not successful although Optical sensors and SCIENCE_SUPER worked very well. There were some oddities coming from DIGIFIN, IRIDIUM and GPS. Additionally, Communications were stable and fluent allowing proper near-real-time data sending and ARGOS messaging. Navigation was correct although IDEEP02 suffered the influence of light currents in the Eïvissa-Valencia channel.* *The performance of the new SAFT Lithium batt. pack was outstanding.* *Recovery took place in N39.4673° E2.2263°, upon completion of the return trip, by the same field-team and vessel used for deployment.* *Upon completion, IDEEP02 was received at IMEDEA's glider-lab, put on the bench, revised and properly stored. Gathered dataset was fully backed-up and uploaded to SOCIB's FTP for subsequent processing and diffusion via SOCIB's public repository.* *There is work in progress to study the viability of using navigation's pressure sensor data in substitution of the missing CTD pressure sensor data.*		

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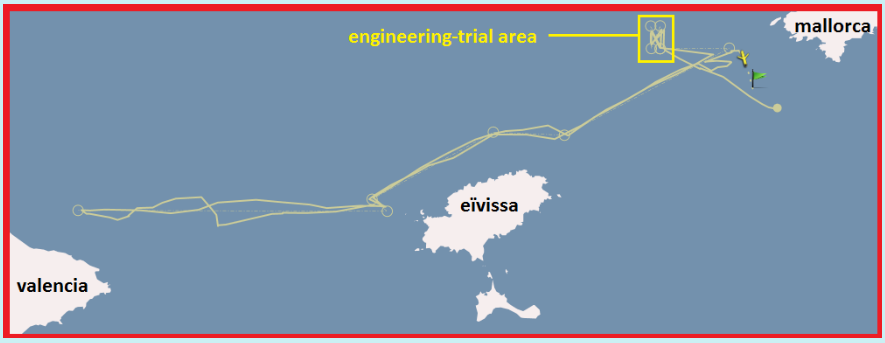
Principal Investigator (e-mail or contact phone/address)	*Prof. Joaquim Tintoré* *jtintore@socib.es (+34 971439821)*
Institute	*SOCIB in collaboration with IMEDEA*
Project Affiliation (web-site)	*http://www.socib.eu*
Partnership / Participation	*SOCIB (internal long-term project of sustained monitoring line)* *IMEDEA (in-kind contribution of material and infrastructures)*
Glider Software Version	*v7.14 Echo*
Data Retrieval (real-time [RT] / delayed-mode [DM])	*Real-time sub-set via satellite link every 6 hours every day* *Delayed-mode direct download of full gathered data sets*
Compass Calibration (specify procedure)	*Error measurement revealed no necessity to perform a compass calibration*
Battery Type	*SAFT Lithium batt. pack with custom ballast (453Ah-nominal cap.)*
Battery Consumption (Ah)	*128.815Ah (reading from 2.559Ah to 131.374Ah)*
Data Available From	*http://thredds.socib.es/thredds/dodsC/auv/glider/ideep02-ime_sldeep002/L1/2015/dep0006_ideep02_ime-sldeep002_L1_2015-03-16_data_dt.nc*
Full Mission Report From	*glidertech@socib.es*
Technical Contact	*glidertech@socib.es*

Figure 1

(Map providing general overview of Survey Area)

Mission Summary

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



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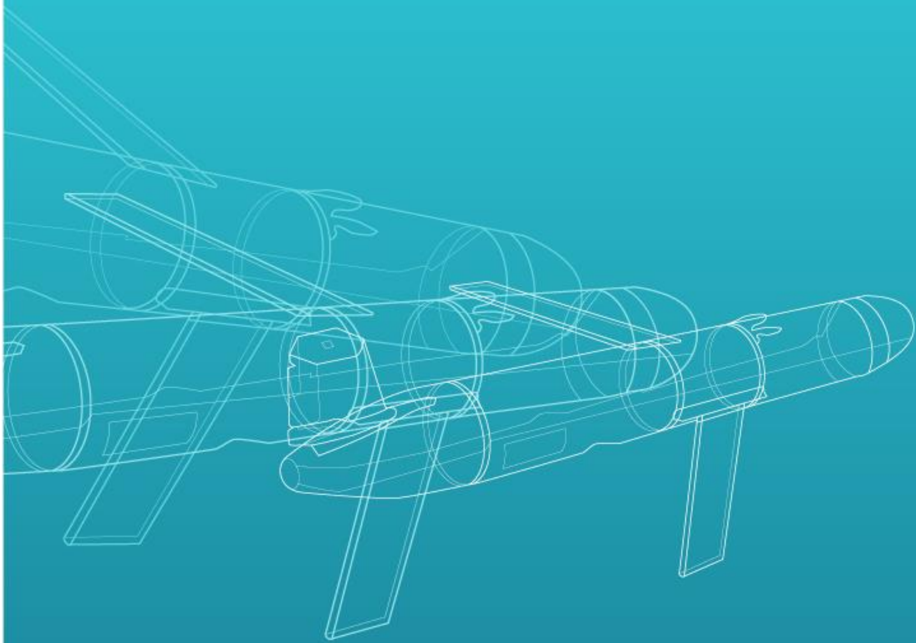

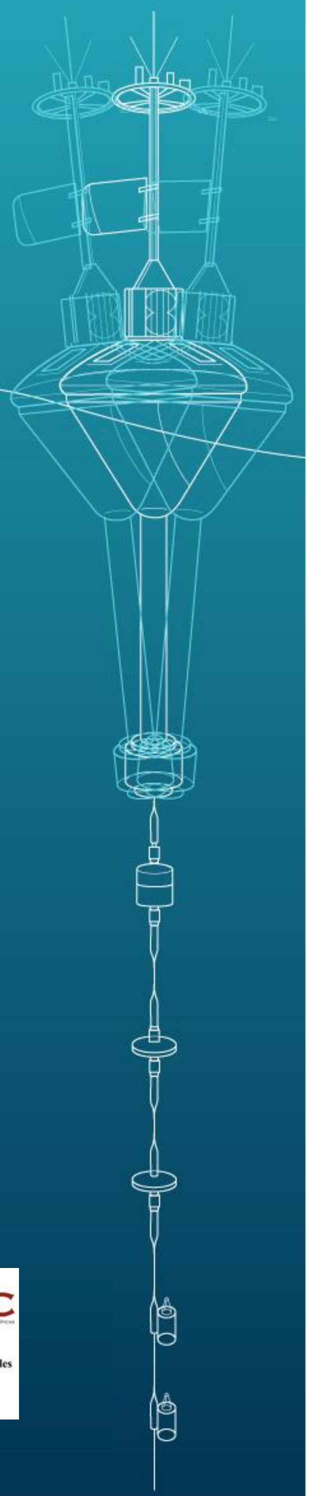

Glider Mission Summary Report

2012 - 2015

SOCIB (CSIC)

SOCIB_CANALES_APR2015_(GR-MR-0035)

SOCIB Balearic Islands Coastal Observing and Forecasting System

GOBIERNO DE ESPAÑA MINISTERIO DE ECONOMÍA Y COMPETITIVIDAD

Govern de les Illes Balears

IMEDEA CSIC Universitat de les Illes Balears

Mission Name	*SOCIB_CANALES_APR2015(GR-MR-0035)*		
Platform Model	*Slocum 1000 G1*		
Platform ID / Name / WMO Code	*U132 / IDEEP02 / 68966*		
Related Platforms / Missions			
Start Date	*2015-04-22*		
End Date	*2014-05-28*		
Total Days *37*		**Total distance (Km / Nm)**	*766 / 414*
Survey Area (NODC or SDN region)	*Mallorca and Eïvissa Channels (Western Mediterranean sea)*		
Objective(s)	*Establishing the variability of the N/S exchange of water masses that occur through the Ibiza Channel.* *Sampling a standard transect across the Ibiza Channel several times using physical and biogeochemical sensors.* *No greater than 1 month gap in between consecutive iterations.* *The Mallorca Channel is also sampled when operationally practical.* *Testing SAFT Lithium Primary battery pack with in-house ballasting chassis*		
Scientific Sensors (name & model / serial_number / calibration date)	*GPCTD -SBE- / sn 0195 / 10-Apr-2013 (*)* *FLNTUSLC -WetLabs- / sn3710 / 06-Oct-2014* *OPTODE -Aandera- / sn 0994 / 21-Nov-2014* *(*) Spare CTD in substitution of failing sn0129(CanalesMAR2014 gf-mr-0034)*		
Number of Profiles	*1455 (CTD), 445 (FLNTU), 445 (OXY)*		
Significant Events	*Second mission of IDEEP02 after extensive refurbishment and calibration. (First mission ended prematurely due to a CTD-sn0129 pressure sensor defect).* *G1 glider powered by Lithium batteries.* *Deployment using 7-m RIB launched from Port d'Andratx (SOCIB vessels not available).* *Mission aborted due to the Glider interrupting its execution due to various and non-coherent device errors (at the end, it was all probably a low battery level).*		
Mission Summary	*This mission stands for the 3rd iteration of the Canales Campaign 2015, carried out by SOCIB's glider IDEEP02 (Unit 132).* *After the CTD error experienced during the last mission, IDEEP02 was mounting a spare CTD for this one. The optical sensors were the same as the ones used in GF-MR-0034.* *Launching operation (in N39.5339° E2.2562°) was executed by a 2-member field-team on board IMEDEA's 7m RIB launched from Port d'Andratx (SOCIB vessels not available).* *During the execution of this mission 4 Eïvissa-Valencia and 1 Mallorca-Eïvissa transects were completed successfully.* *Overall performance of mechanical and sampling devices was satisfactory. There were some oddities coming from DIGIFIN, IRIDIUM and GPS. Additionally, Communications were stable and fluent allowing proper near-real-time data sending and ARGOS messaging. Navigation was correct although IDEEP02 suffered the influence of light currents in the Eïvissa-Valencia channel.* *During the 5th Eïvissa-Valencia transect IDEEP02 reported having interrupted the sampling due to a series of device errors that were not very coherent (m_depth and m_vacuum not updating, low battery remaining,…).* *Recovery took place in N38.9865° E0.7477°, as part of an emergency operation, by a 2-member field-team on board SOCIB-I 9m Professional RIB without which such a fast response could never have been possible.* *Upon completion, IDEEP02 was received at IMEDEA's glider-lab, put on the bench, revised and properly stored. Gathered dataset was fully backed-up and uploaded to SOCIB's FTP for subsequent processing and diffusion via SOCIB's public repository.* *The intensive analysis of the telemetry revealed that only the low-battery error made any sense. The others were probably a consequence of some electronics devices not functioning properly due to an excessively low voltage.*		

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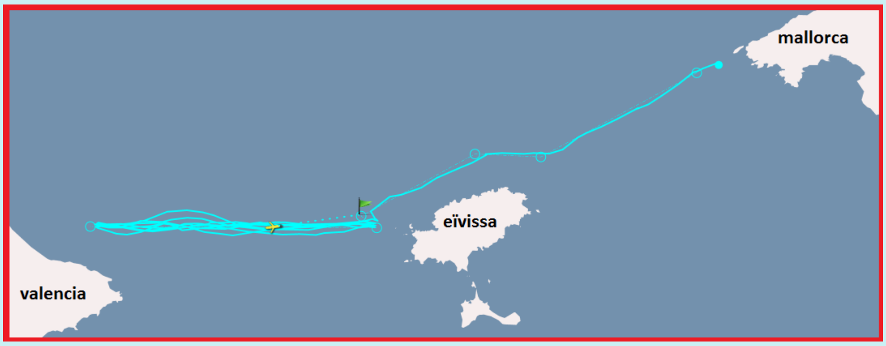
Principal Investigator (e-mail or contact phone/address)	*Prof. Joaquim Tintoré* *jtintore@socib.es (+34 971439821)*
Institute	*SOCIB in collaboration with IMEDEA*
Project Affiliation (web-site)	*http://www.socib.eu*
Partnership / Participation	*SOCIB (internal long-term project of sustained monitoring line)* *IMEDEA (in-kind contribution of material and infrastructures)*
Glider Software Version	*v7.14 Echo*
Data Retrieval (real-time [RT] / delayed-mode [DM])	*Real-time sub-set via satellite link every 6 hours every day* *Delayed-mode direct download of full gathered data sets*
Compass Calibration (specify procedure)	*Error measurement revealed no necessity to perform a compass calibration*
Battery Type	*SAFT Lithium batt. pack with custom ballast (453Ah-nominal cap.)*
Battery Consumption (Ah)	*182.085Ah (reading from 132.854Ah to 314.939Ah)*
Data Available From	*http://thredds.socib.es/thredds/dodsC/auv/glider/ideep02-ime_sldeep002/L1/2015/dep0007_ideep02_ime-sldeep002_L1_2015-04-22_data_dt.nc*
Full Mission Report From	*glidertech@socib.es*
Technical Contact	*glidertech@socib.es*

Figure 1

(Map providing general overview of Survey Area)

Mission Summary

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



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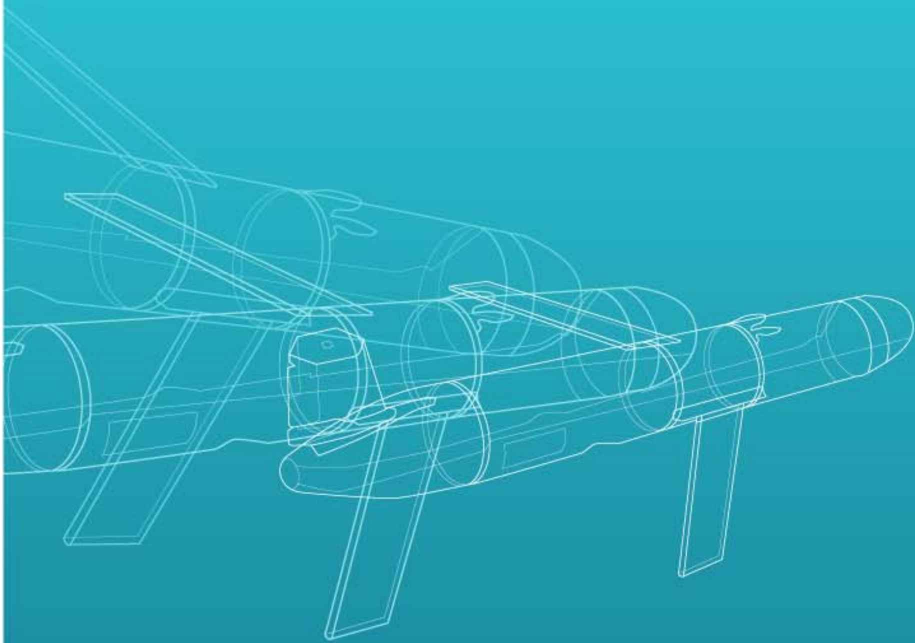

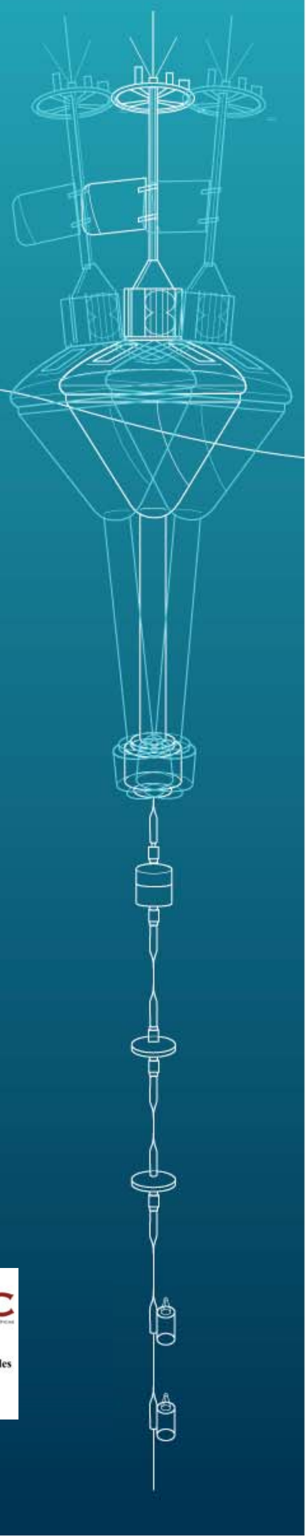

Glider Mission Summary Report

2012 - 2015

SOCIB (CSIC)

SOCIB_CANALES_JUN2015_(GR-MR-0036)

SOCIB Balearic Islands Coastal Observing and Forecasting System

GOBIERNO DE ESPAÑA MINISTERIO DE ECONOMÍA Y COMPETITIVIDAD

Govern de les Illes Balears

IMEDEA CSIC Universitat de les Illes Balears

Mission Name	SOCIB_CANALES_JUN2015(GR-MR-0036)		
Platform Model	Slocum 1000 G2		
Platform ID / Name / WMO Code	U243 / SDEEP00 / 68457		
Related Platforms / Missions	SOCIB-R/V (Canales July 2015 Mission)		
Start Date	2015-06-18		
End Date	2014-07-15		
Total Days 28	**Total distance (Km / Nm)**	615 / 332	
Survey Area (NODC or SDN region)	Mallorca and Eïvissa Channels (Western Mediterranean sea)		
Objective(s)	Establishing the variability of the N/S exchange of water masses that occur through the Ibiza Channel. Sampling a standard transect across the Ibiza Channel several times using physical and biogeochemical sensors. No greater than 1 month gap in between consecutive iterations. The Mallorca Channel is also sampled when operationally practical. Testing overall performance of U243 during the first 48hr. of mission being first deployment since factory refurbishment		
Scientific Sensors (name & model / serial_number / calibration date)	GPCTD -SBE- / sn 0064 / 24-Nov-2014 FLNTUSLC -WetLabs- / sn3711 / 22-Oct-2014 OPTODE -Aandera- / sn 1409 / 18-Jun-2014		
Number of Profiles	1131 (CTD), 433 (FLNTU), 432 (OXY)		
Significant Events	First mission executed by SDEEP00 (U243) since it returned from undergoing a factory refurbishment and re-calibration. Last mission was in June-2014. G2 glider powered by TWR Lithium battery pack. The same pack it left unfinished when shipped for factory refurbishment. 2 Mission interruptions due to hydraulic pump errors. >200 oddities from hydraulic pump during a specific mission segment. OPTODE 3835 oddities in 4 segments due to PROGLET-ERROR 558		
Mission Summary	This mission stands for the 4th iteration of the Canales Campaign 2015 and, in this case, carried out by SOCIB's glider SDEEP00 (Unit 243). This mission is also the first one after the factory refurbishment that took place in 2014. Specially motivated by the water-leak problems suffered during this unit's attempt to execute Canales-JUN2014 (gf-mr-0028). Launching operation (in N39.2968° E2.5039°) was executed by a 2-member field-team on board SOCIB-I 9m Professional RIB departing from CALANOVA harbor. This location is in front of Palma's Bay and that distance to the start of Mallorca chan. was to be used as initial 48hrs. of performance test prior to scientific mission. During the execution of this mission 4 Eïvissa-Valencia and 2 Mallorca-Eïvissa transects were completed successfully. Overall performance of mechanical and sampling devices was satisfactory. Only DE_PUMP behaved oddly (2 aborts and 240 oddities in segment #03210054). DIGIFIN and IRIDIUM devices exhibited acceptable oddities. Additionally, Communications were stable and fluent allowing proper near-real-time data sending and ARGOS messaging. Navigation was very adjusted to commanded route and there were no evidences of currents (nor other origin) deviation. Finally, <u>OPTODE sensor caused multiple oddities due to Proglet Error #558 (segments #03180008, #03180040, #03180041 and #03190011)</u>. Recovery took place in N39.4553° E2.2134°, by a 2-member field-team on board SOCIB-I 9m Professional RIB departing from CALANOVA harbor. Glider was intercepted after having completed the mission at 6am,lt and cruising to Palma's bay. Upon completion, SDEEP00 was received at IMEDEA's glider-lab, put on the bench, revised and properly stored. Gathered dataset was fully backed-up and uploaded to SOCIB's FTP for subsequent processing and diffusion via SOCIB's public repository. This glider, with the same battery pack, will attempt to perform the 5th iteration of the Canales Campaign 2015 and therein will sit on the shelf until the moment of entering that preparation.		

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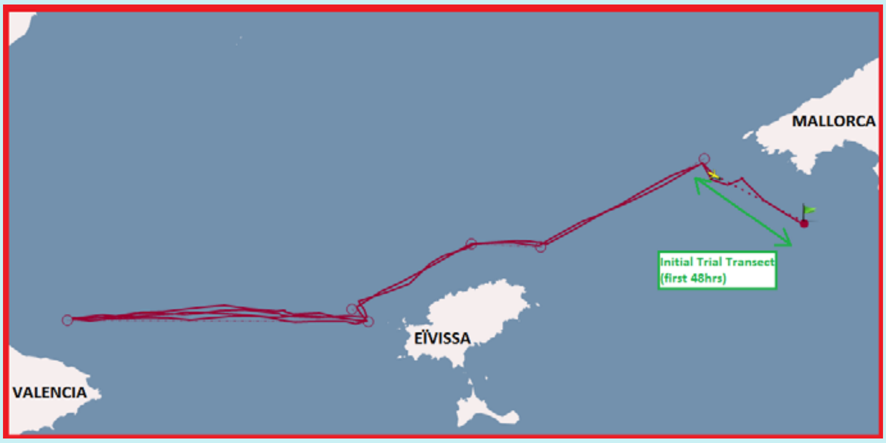
Principal Investigator (e-mail or contact phone/address)	*Prof. Joaquim Tintoré* *jtintore@socib.es (+34 971439821)*
Institute	*SOCIB in collaboration with IMEDEA*
Project Affiliation (web-site)	*http://www.socib.eu*
Partnership / Participation	*SOCIB (internal long-term project of sustained monitoring line)* *IMEDEA (in-kind contribution of material and infrastructures)*
Glider Software Version	*v7.13 Acomms*
Data Retrieval (real-time [RT] / delayed-mode [DM])	*Real-time sub-set via satellite link every 24 hours every day during 12am,lt control-call. Delayed-mode direct download of full gathered data sets*
Compass Calibration (specify procedure)	*Error measurement during mission preparation revealed no necessity to perform a compass calibration*
Battery Type	*ELECTROCHEM factory Lithium Pack (700Ah-nominal cap.)*
Battery Consumption (Ah)	*147.361Ah (reading from 333.671Ah to 481.032Ah)*
Data Available From	*http://thredds.socib.es/thredds/dodsC/auv/glider/sdeep00-scb_sldeep000/L1/2015/dep0014_sdeep00_scb-sldeep000_L1_2015-06-18_data_dt.nc*
Full Mission Report From	*glidertech@socib.es*
Technical Contact	*glidertech@socib.es*

Figure 1

(Map providing general overview of Survey Area)

Mission Summary

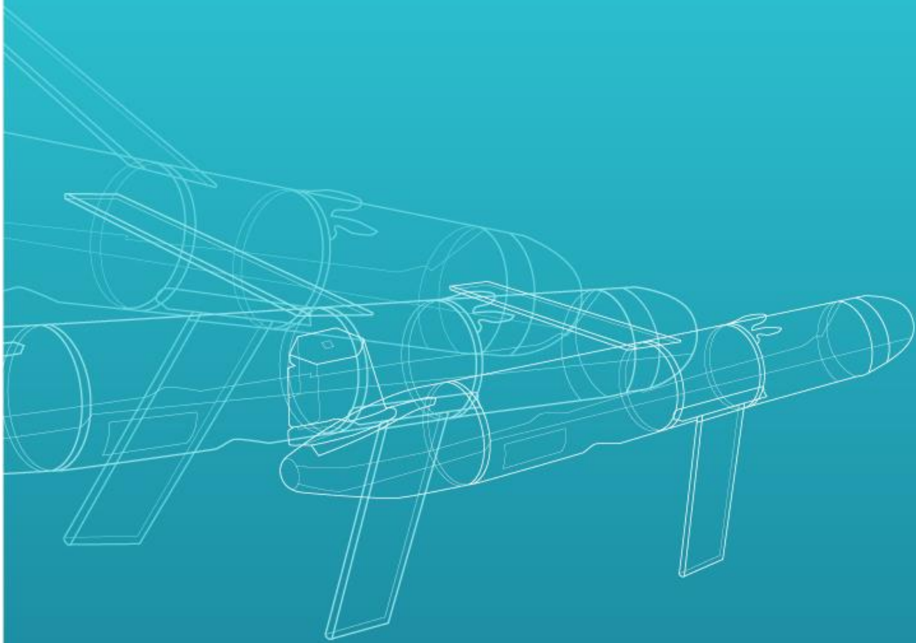
(Map providing detailed overview of Survey Area and traced Flight Path with surface points if possible)

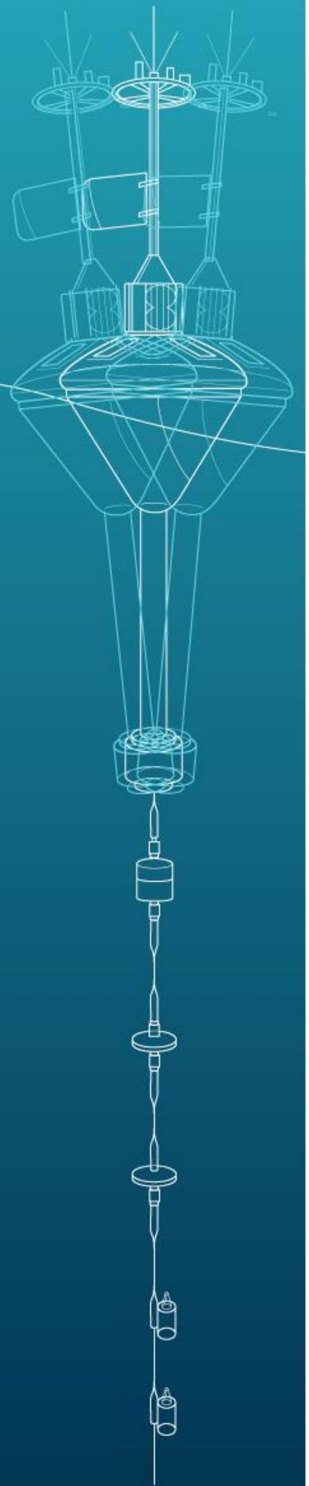


Parc Bit. Ctra. Valldemossa, Km 7,4 · Edifici Naorte, Bloc A, Planta 2ª, Porta 3 · 07121 Palma (Illes Balears, Espanya) · Tel. +34 971 43 99 98 · Fax +34 971 43 99 79

A3. Glider mission summaries for Cyprus National Glider Monitoring Program

Below are 3 glider mission summary reports for missions during PERSEUS period (2012 – 2015)





Glider Mission Summary Report

2012 - 2015

OC-UCY

EasternLevantine07 (SG149 Mission 10)

University of Cyprus
Oceanography Centre

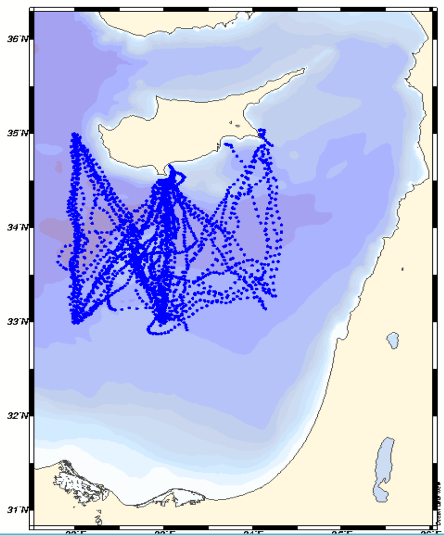
Mission Name	*EasternLevantine07*		
Platform Model	*Seaglider*		
Platform ID / Name / WMO Code	*SG149/Pheidippides/CYPD (ICES) / 68450 (WMO)*		
Related Platforms / Missions	*SG150/Atalanta/CYAL (ICES) / 68963 (WMO)*		
Start Date	*2011-12-16*		
End Date	*2012-06-01*		
Total Days *169*		**Total distance (Km / Nm)**	*2651 km*
Survey Area (NODC or SDN region)	*Mediterranean Sea Eastern Basin*		
Objective(s)	*Long term hydrographic monitoring.* *Continued tracking of the Cyprus eddy.*		

Scientific Sensors (name & model / serial_number / calibration date)	*SBE 41unpumped CTD ('gun-style') s/n 0070 / cal 2011-02-22* *SBE43 dissolved oxygen: s/n 132 / cal 2011-03-04*
Number of Profiles	*1106 (553 dive cycles). More than 90% to 1000 m depth.*
Significant Events	*Longest mission to date in days in Mediterranean.*
Mission Summary	*This mission was began and finished in Limassol. It was a routine monitoring mission "endurance butterfly." During the mission it was observed that the Cyprus eddy was much further to the southeast than previous missions, and several crossings were made, which interrupted the endurance pattern shortly.*

Principal Investigator (e-mail or contact phone/address)	*Daniel Hayes (dhayes@ucy.ac.cy)*
Institute	*Oceanography Center, University of Cyprus*
Project Affiliation (web-site)	*GROOM http://www.groom-fp7.eu/*
Partnership / Participation	*-*
Glider Software Version	*66.07*
Data Retrieval (real-time [RT] / delayed-mode [DM])	*RT*
Compass Calibration (specify procedure)	*UW factory cal*
Battery Type	*Lithium Primary*
Battery Consumption (Ah)	*87.72 of 97 AH (10V) + 84.85 of 87.63 AH (24V)*
Data Available From	*Coriolis Data Center: http://www.ifremer.fr/co/ego/ego/pheidippides/*
Full Mission Report From	*Daniel Hayes (dhayes@ucy.ac.cy)*
Technical Contact	*Daniel Hayes (dhayes@ucy.ac.cy)*

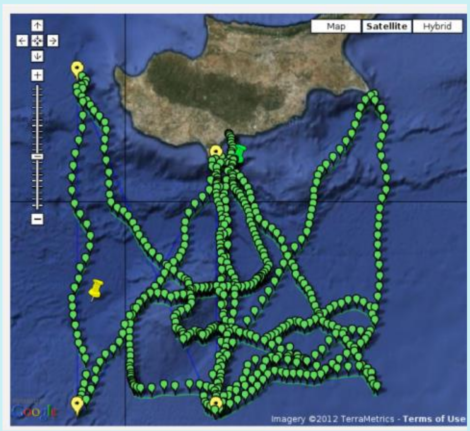
Figure 1

(Map providing general overview of Survey Area)

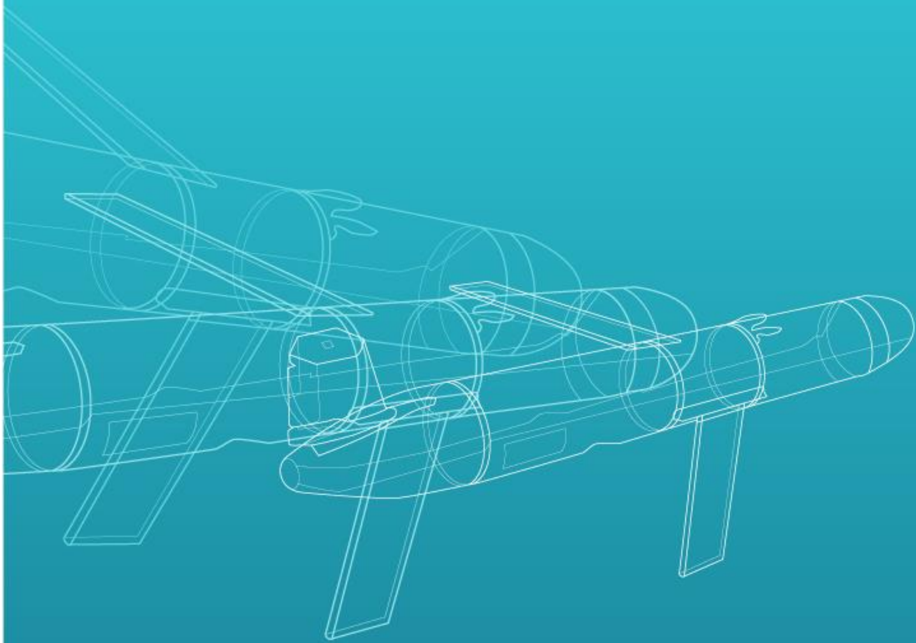


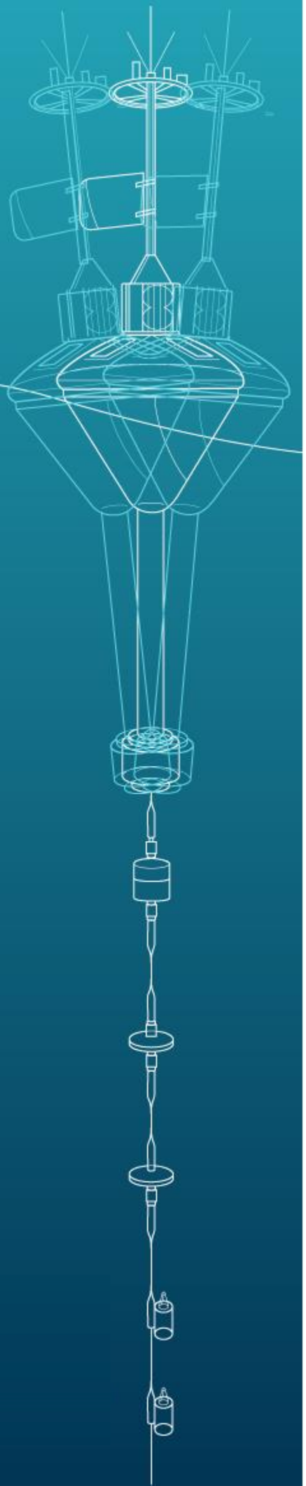
Mission Summary

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



Oceanography Center, University of Cyprus, 1 University Ave, 2109 Nicosia, Cyprus, http://www.ucy.ac.cy/oceanography/ · Tel. +357 22 893987 · Fax +357 22 892601





Glider Mission Summary Report

2012 - 2015

OC-UCY

EasternLevantine08 (SG149 Mission 11)

University of Cyprus
Oceanography Centre

Mission Name		*EasternLevantine08*	
Platform Model		*Seaglider*	
Platform ID / Name / WMO Code		*SG149/Pheidippides/CYPD (ICES) / 68450 (WMO)*	
Related Platforms / Missions		*SG150/Atalanta/CYAL (ICES) / 68963 (WMO)*	
Start Date		*2013-02-21*	
End Date		*2013-08-02*	
Total Days	*163*	**Total distance (Km / Nm)**	*3018 km*
Survey Area (NODC or SDN region)		*Mediterranean Sea Eastern Basin*	
Objective(s)		*Long term hydrographic monitoring.* *Continued tracking of the Cyprus eddy.*	
Scientific Sensors (name & model / serial_number / calibration date)		*SBE unpumped CTD ('gun-style') / s/n 0070 / cal 2012-10-30* *SBE43 dissolved oxygen: s/n 132 / cal 2012-10-13* *WetLabs BB2FL-VMT (470,700, CHL):s/n 855 / cal 2011-09-19*	
Number of Profiles		*1040 (520 dive cycles). More than 90% to 1000 m depth.*	
Significant Events		*First open sea deployment (at CSnet buoy). Eddy found directly over Eratosthenes Seamount.*	
Mission Summary		*After deployment, the glider headed straight for LImassol, then continued the western butterfly. In order to confirm that the eddy observed in the previous mission was no longer in the southeast corner, a portion of the eastern butterfly was also made. Glider recovered successfully near the coast outside Limassol.*	

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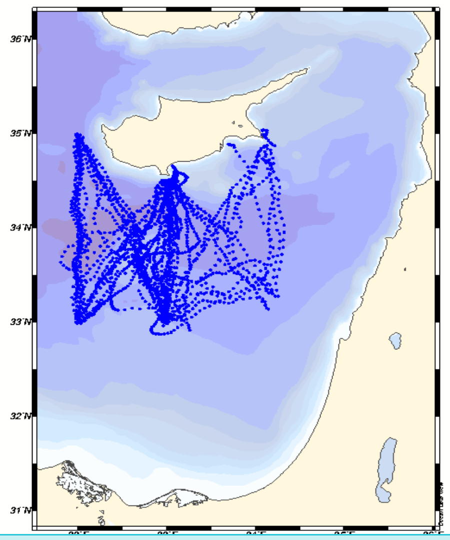
Principal Investigator (e-mail or contact phone/address)	*Daniel Hayes (dhayes@ucy.ac.cy)*
Institute	*Oceanography Center, University of Cyprus*
Project Affiliation (web-site)	*GROOM http://www.groom-fp7.eu/*
Partnership / Participation	*-*
Glider Software Version	*66.1*
Data Retrieval (real-time [RT] / delayed-mode [DM])	*RT*
Compass Calibration (specify procedure)	*UW factory cal*
Battery Type	*Lithium Primary*
Battery Consumption (Ah)	*86.9 of 97 AH (10V) + 86.0 of 91 AH (24V)*
Data Available From	*Coriolis Data Center: http://www.ifremer.fr/co/ego/ego/pheidippides/*
Full Mission Report From	*Daniel Hayes (dhayes@ucy.ac.cy)*
Technical Contact	*Daniel Hayes (dhayes@ucy.ac.cy)*

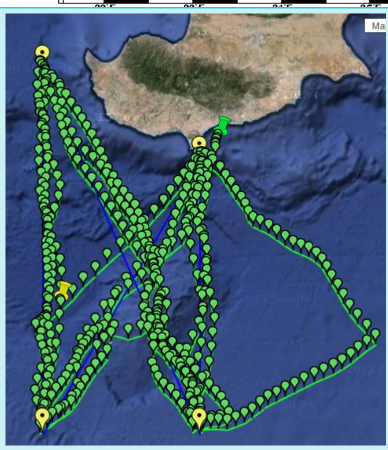
Figure 1

(Map providing general overview of Survey Area)

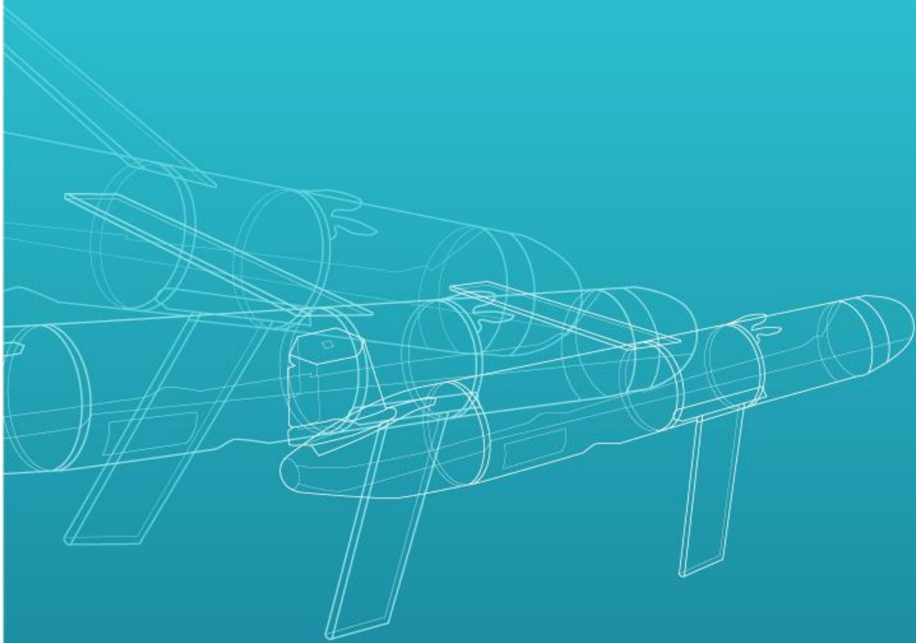


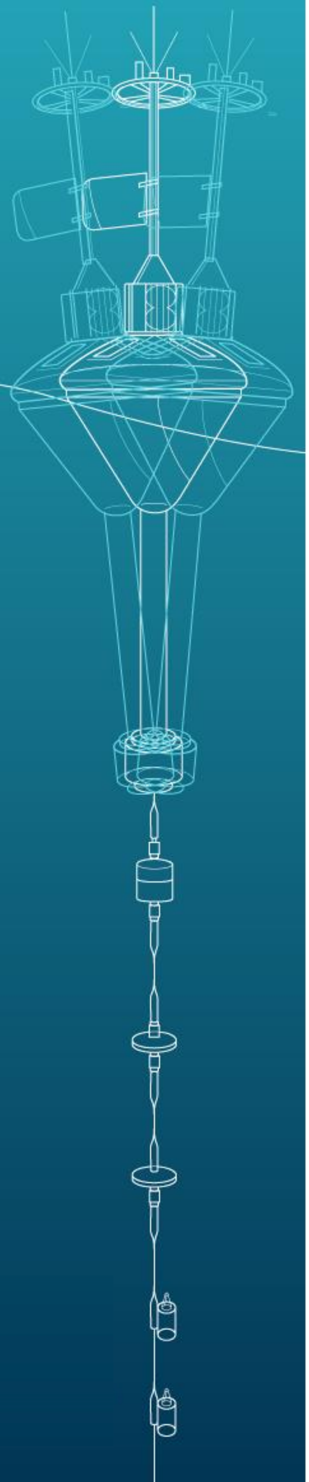
Mission Summary

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



Oceanography Center, University of Cyprus, 1 Uninversity Ave, 2109 Nicosia Cyprus, http://www.ucy.ac.cy/oceanography/ Tel. +357 22 893987 · Fax +357 22 892601





Glider Mission Summary Report

2012 - 2015

OC-UCY

EasternLevantine09 (SG150 Mission 8)

University of Cyprus
Oceanography Centre

Mission Name	*EasternLevantine08*		
Platform Model	*Seaglider*		
Platform ID / Name / WMO Code	*SG150/Atalanta/CYAL (ICES) / 68963 (WMO)*		
Related Platforms / Missions	*SG149/Pheidippides/CYPD (ICES) / 68450 (WMO)*		
Start Date	*2014-04-02*		
End Date	*2014-10-09*		
Total Days	*191*	**Total distance (Km / Nm)**	*3510 km*
Survey Area (NODC or SDN region)	*Mediterranean Sea Eastern Basin*		
Objective(s)	*Long term hydrographic monitoring.* *Continued tracking of the Cyprus eddy.*		
Scientific Sensors (name & model / serial_number / calibration date)	*SBE unpumped CTD ('gun-style') / s/n 0071 / cal 2011-05-10* *SBE43 dissolved oxygen: s/n 129 / cal 2011-05-04* *WetLabs BB2FL-VMG (470,700, CHL):s/n 450 / cal 2011-06-07*		
Number of Profiles	*1220 (610 dive cycles). More than 90% to 1000 m depth.*		
Significant Events	*Longest mission in time or distance to date in Mediterranean and Europe. Eddy found NW of Eratosthenes Seamount. Open sea deployment at CSnet buoy.*		
Mission Summary	*This mission was another routine monitoring "endurance butterfly" mission. Changes in LIW properties and Cyprus Eddy characteristics were observed. Glider recovered normally near the coast of Ayia Napa (SE Cyprus).*		

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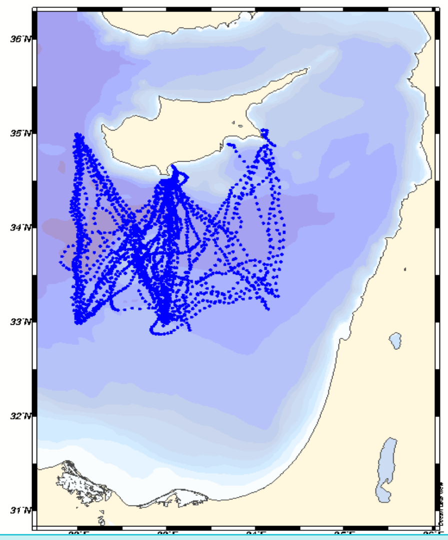
Principal Investigator (e-mail or contact phone/address)	*Daniel Hayes (dhayes@ucy.ac.cy)*
Institute	*Oceanography Center, University of Cyprus*
Project Affiliation (web-site)	*GROOM http://www.groom-fp7.eu/*
Partnership / Participation	*-*
Glider Software Version	*66.11*
Data Retrieval (real-time [RT] / delayed-mode [DM])	*RT*
Compass Calibration (specify procedure)	*UW factory cal*
Battery Type	*Lithium Primary*
Battery Consumption (Ah)	*94.6 of 97 AH (10V) + 87.1 of 91 AH (24V)*
Data Available From	*Coriolis Data Center: http://www.ifremer.fr/co/ego/ego/atalanta/*
Full Mission Report From	*Daniel Hayes (dhayes@ucy.ac.cy)*
Technical Contact	*Daniel Hayes (dhayes@ucy.ac.cy)*

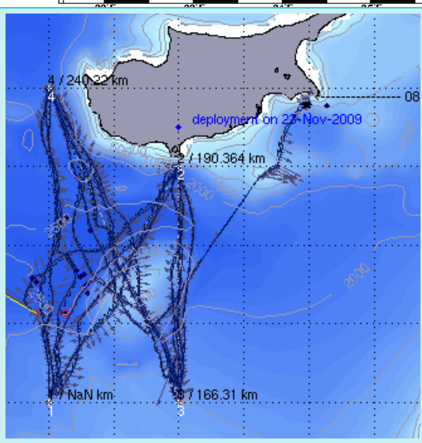
Figure 1

(Map providing general overview of Survey Area)



Mission Summary

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



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A4. Glider mission summaries for South Adriatic pit glider monitoring program

Below are 3 glider mission summary reports for missions during PERSEUS period (2012 – 2015)

Glider Mission Summary Report

2012 - 2015

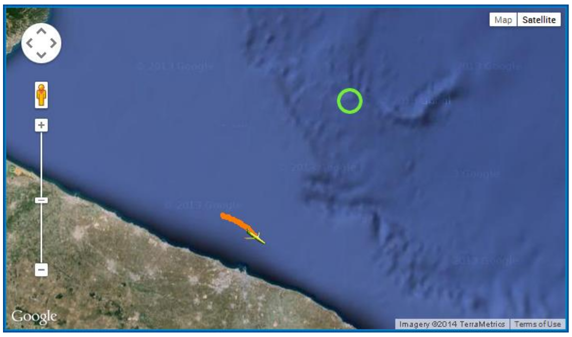
OGS

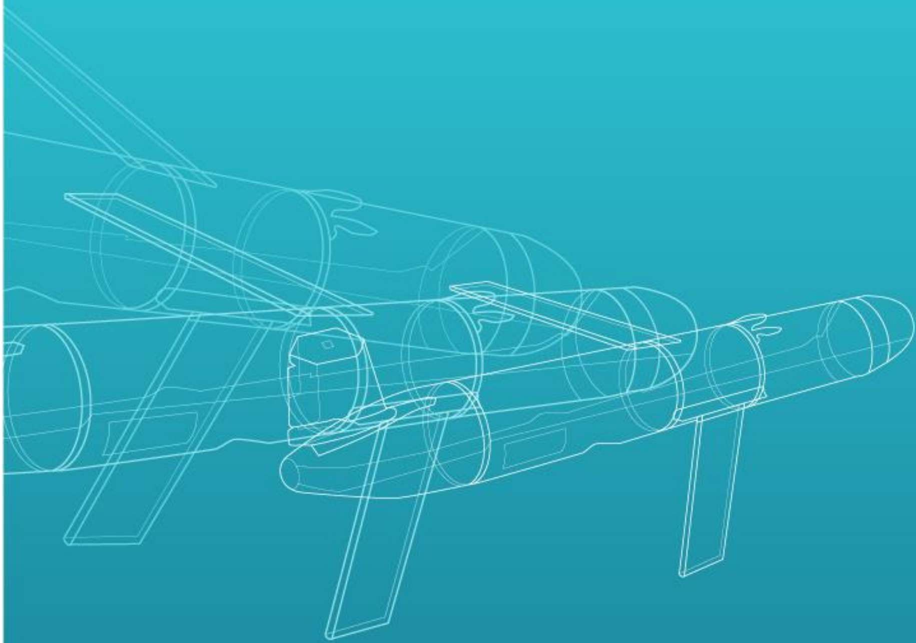
Convex13 (006)

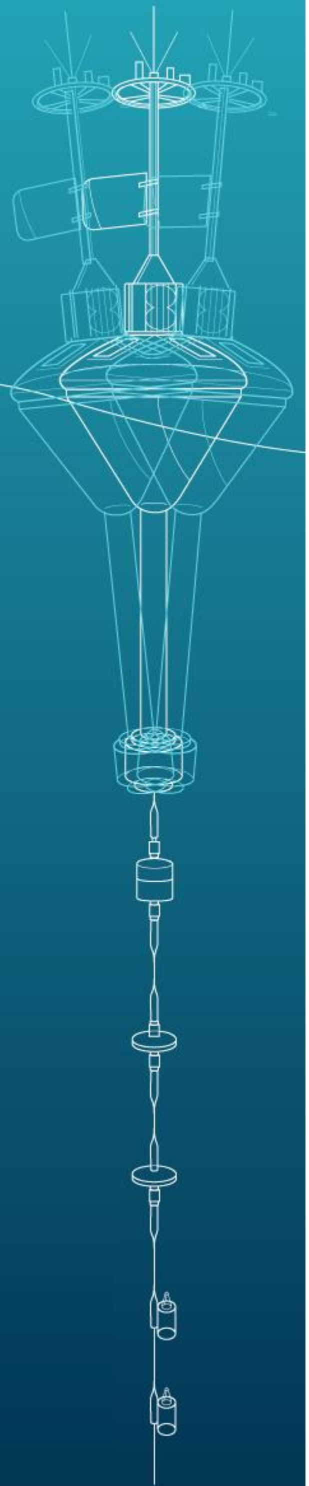
OGS

Mission Name	*Convex13*		
Platform Model	*Seaglider*		
Platform ID / Name / WMO Code	*SG553 / Amerigo / -*		
Related Platforms / Missions	*006*		
Start Date	*2013/03/12*		
End Date	*2013/03/13*		
Total Days	*1*	**Total distance (Km / Nm)**	*12 km*
Survey Area (NODC or SDN region)	*South Adriatic Sea*		
Objective(s)	*Long term monitoring and dense water formation through deep convection*		
Scientific Sensors (name & model / serial_number / calibration date)	*SBE GPCTD (Pumped) / s/n 0026 / cal. 2011/04/24* *AANDERAA Optode 4330 / s/n 731 / cal. 2011/08/02* *Wetlab BB2FL-VMT / s/n 878 / cal. 2011/10/28*		
Number of Profiles	*35 (35 dive cycles) 100% shallow (to max 40 m depth)*		
Significant Events	*Strong current along the Italian coast.* *Several problems to decode data with the iRobot scripts (on the Dockserver).* *Leakage in the WetLab connector*		
Mission Summary	*The Seaglider Amerigo was deployed in the Southern Adriatic Sea after the Teledyne tests. The mission last less then a day due to the WetLab fluorimeter connector leakage and some glider trim issues.*		

Principal Investigator (e-mail or contact phone/address)	*emauri@inogs.it*
Institute	*OGS*
Project Affiliation (web-site)	*-*
Partnership / Participation	*-*
Glider Software Version	*66.07.13*
Data Retrieval (real-time [RT] / delayed-mode [DM])	*RT*
Compass Calibration (specify procedure)	*UW factory cal*
Battery Type	*Lithium Primary*
Battery Consumption (Ah)	*1.5 of 94.5 AH (10V) + 3.9 of 143.7 AH (24V)*
Data Available From	*OGS (on request)* *The data (corrected) will be soon available fro Coriolis*
Full Mission Report From	*OGS*
Technical Contact	*rgerin@inogs.it*

Figure 1 (Map providing general overview of Survey Area)	
Mission Summary (Map providing detailed overview of Survey Area and traced Flight Path with surface points if possible)	http://nettuno.ogs.trieste.it/sire/glider/missions/Convex_13/sg554.kml





Glider Mission Summary Report

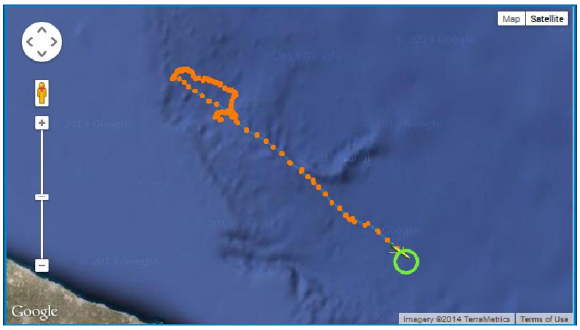
2012 - 2015

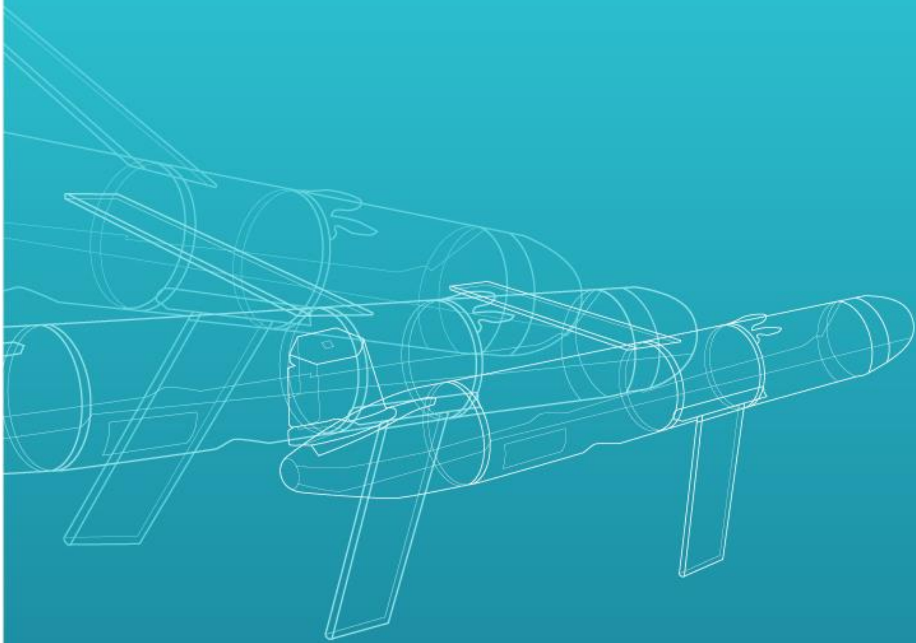
OGS

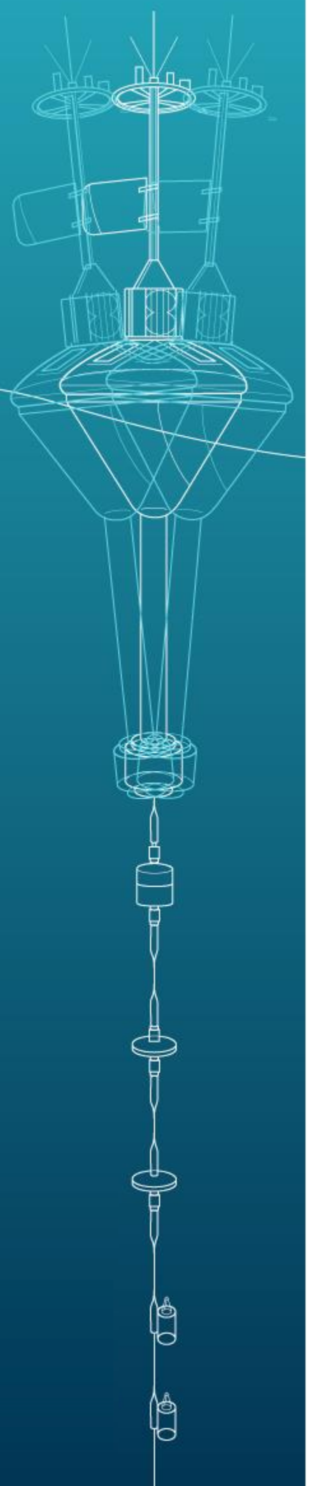
Coconet (007)

Mission Name	*Coconet*		
Platform Model	*Seaglider*		
Platform ID / Name / WMO Code	*SG553 / Amerigo / -*		
Related Platforms / Missions	*007*		
Start Date	*2013/05/15*		
End Date	*2013/05/22*		
Total Days	*7*	**Total distance (Km / Nm)**	*125 km*
Survey Area (NODC or SDN region)	*South Adriatic Sea*		
Objective(s)	*Long term monitoring and dense water formation through deep convection*		
Scientific Sensors (name & model / serial_number / calibration date)	*SBE GPCTD (Pumped) / s/n 0026 / cal. 2011/04/24* *AANDERAA Optode 4330 / s/n 731 / cal. 2011/08/02* *Wetlab BB2FL-VMT / s/n 878 / cal. 2011/10/28*		
Number of Profiles	*200 (100 dive cycles) about 50% down to 500 m depth*		
Significant Events	*Strong current along the Italian coast.* *Tongue of dense water formed in the North Adriatic Sea was detected (cascading?)* *OGS pilot team had the opportunity to trim the newly acquired glider fine-tuning the navigation parameters.*		
Mission Summary	*The area sampled during the mission covered the South Adriatic pit and the slope close to the Italian coast. During the first part of the experiment (about one day) the glider was headed toward North-East and was intensely trimmed thanks to the collaboration with Simò Cusì. Then, the glider began its planned mission (transect to Dubrovnik). After 2 days, the glider covered about 18 km only toward North-West due to a strong current, therefore, we changed the waypoints and made the glider going South-East for 3.5 days.*		

Principal Investigator (e-mail or contact phone/address)	*emauri@inogs.it*
Institute	*OGS*
Project Affiliation (web-site)	-
Partnership / Participation	-
Glider Software Version	*66.07.13*
Data Retrieval (real-time [RT] / delayed-mode [DM])	*RT*
Compass Calibration (specify procedure)	*UW factory cal*
Battery Type	*Lithium Primary*
Battery Consumption (Ah)	*12.5 of 90.7 AH (10V) + 9.8 of 137.3 AH (24V)*
Data Available From	*OGS (on request)* *The data (corrected) will be soon available fro Coriolis*
Full Mission Report From	*OGS*
Technical Contact	*rgerin@inogs.it*

Figure 1 (Map providing general overview of Survey Area)	
Mission Summary (Map providing detailed overview of Survey Area and traced Flight Path with surface points if possible)	http://nettuno.ogs.trieste.it/sire/glider/missions/Coconet/sg554.kml





Glider Mission Summary Report

2012 - 2015

OGS

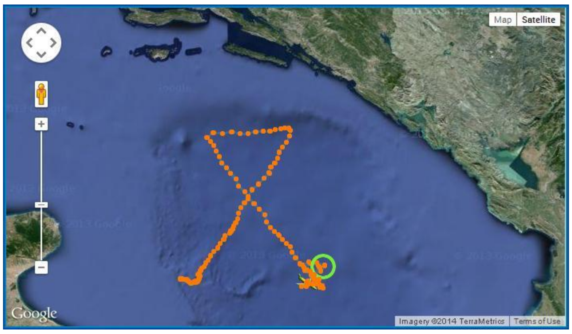
Convex14 (008)

Mission Name	*Convex14*		
Platform Model	*Seaglider*		
Platform ID / Name / WMO Code	*SG553 / Amerigo / -*		
Related Platforms / Missions	*008*		
Start Date	*2014/02/15*		
End Date	*2014/03/06*		
Total Days *20*		**Total distance (Km / Nm)**	*435 km*
Survey Area (NODC or SDN region)	*South Adriatic Sea*		
Objective(s)	*Long term monitoring and dense water formation in open sea through the deep convection*		
Scientific Sensors (name & model / serial_number / calibration date)	*SBE GPCTD (Pumped) / s/n 0026 / cal. 2011/04/24* *AANDERAA Optode 4330 / s/n 731 / cal. 2011/08/02* *Wetlab BB2FL-VMT / s/n 878 / cal. 2011/10/28*		
Number of Profiles	*256 (128 dive cycles) about 70% to 900 m depth*		
Significant Events	*The comparison between the CTD on the glider and CTD on a float in the same area at the same time shows a shift in the conductivity data. The sensor after the mission was sent to SeaBird. for new conductivity calibration coefficients. Data have been corrected accordingly.*		
Mission Summary	*The Seaglider Amerigo was successfully operated for 3 weeks (from February 15 to March 6 2014) in the Southern Adriatic Sea. The purpose of the experiment was to study the winter deep water convection in the area. The glider at first covered the transept Molfetta – Dubrovnik and then it was piloted to perform an Adriatic longitudinal transect, down to almost 1000m deep in the area of the south-Adriatic pit. At the end of the mission a butterfly sampling was performed close to the E2-M3A mooring.*		

Principal Investigator (e-mail or contact phone/address)	*emauri@inogs.it*
Institute	*OGS*
Project Affiliation (web-site)	*-*
Partnership / Participation	*-*
Glider Software Version	*66.07.13*
Data Retrieval (real-time [RT] / delayed-mode [DM])	*RT*
Compass Calibration (specify procedure)	*UW factory cal*
Battery Type	*Lithium Primary*
Battery Consumption (Ah)	*20.4 of 77.7 AH (10V) + 20.5 of 126.5 AH (24V)*
Data Available From	*OGS (on request)* *The corrected data will be soon available from DAC/GDAC*
Full Mission Report From	*OGS*
Technical Contact	*rgerin@inogs.it*

Figure 1

(Map providing general overview of Survey Area)



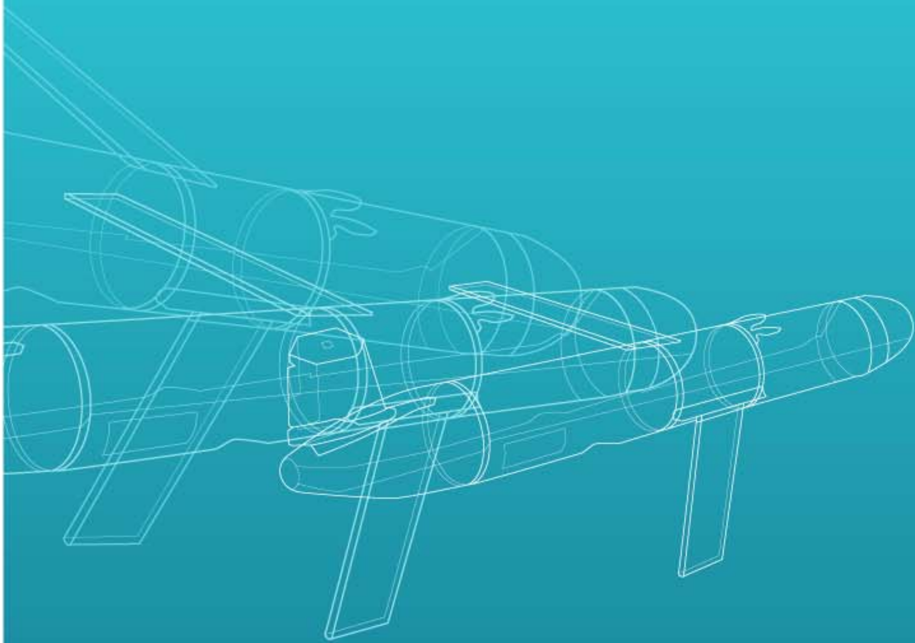
Mission Summary

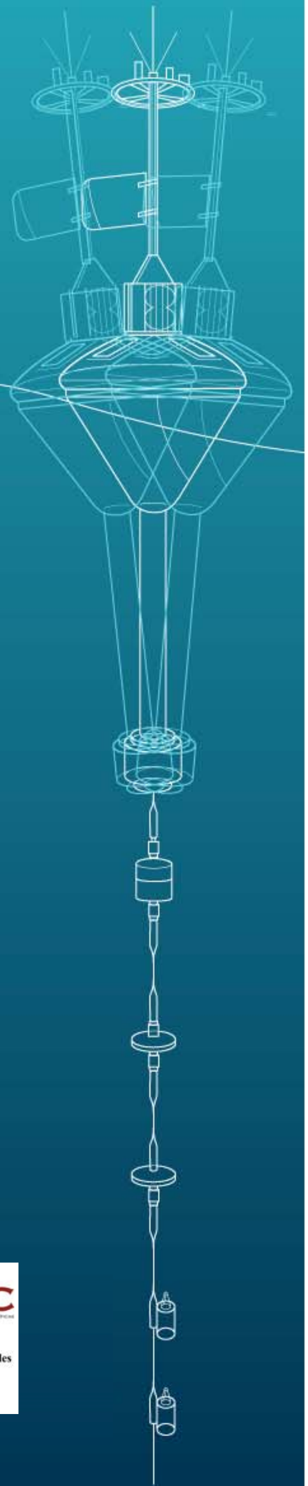
(Map providing detailed overview of Survey Area and traced Flight Path with surface points if possible)

http://nettuno.ogs.trieste.it/sire/glider/missions/Convex_14/sg554.kml

A5. Glider mission summaries for JERICO TNA –MENORCA SARDINIA- GABS CSIC/SOCIB glider monitoring program

Below are 2 glider mission summary reports for missions during PERSEUS period (2012 – 2015)





Glider Mission Summary Report

2012 - 2015

SOCIB (CSIC)

JERICO_TNA_Sardinia_FEB2013 (GF-MR-0013)

SOCIB Balearic Islands Coastal Observing and Forecasting System

Gobierno de España Ministerio de Economía y Competitividad

Govern de les Illes Balears

IMEDEA CSIC Universitat de les Illes Balears

Mission Name	*JERICO_TNA_Sardinia_FEB2013 (GF-MR-0013)*		
Platform Model	*Sea-Glider 1000m (iRobot version)*		
Platform ID / Name / WMO Code	*U541 / SDEEP03 / 68969*		
Related Platforms / Missions			
Start Date	*2013-01-31*		
End Date	*2013-03-16*		
Total Days *45*	**Total distance (Km / Nm)**	*780 / 421*	
Survey Area (NODC or SDN region)	*Menorca to Sardinia channel (Western Mediterranean sea)*		
Objec-tive(s)	*the proposed research wants to identify the physical properties of the surface and intermediate water masses between Baleares and Sardinia with the aim of:* *i) study the variability of the physical properties of surface and intermediate water masses between the Algerian and the Provencal sub-basins;* *ii) evaluate the transport of water, salt and heat through the area and verify if the interannual variability of the surface and intermediate water masses is due to climatic changes;* *iii) validate the operational hydrodynamic numerical model of the western Mediterranean (http://www.seaforecast.cnr.it/en/fl/wmed.php) through the use of in-situ and satellite data*		
Scientific Sensors (name & model / serial_number / calibration date)	*CT-Sail -SBE- / sn 0173 / 28-Mar-2011 (*)* *BBFL2VMT -WetLabs- / sn0777 / 13-Oct-2010* *OPTODE -Aandera- / sn 0470 / 15-Dec-2010* *(*) with Paine's pressure sensor sn264065 calibrated 01-Feb-2011*		
Number of Profiles	*452 (CTD), 452 (FLNTU), 452 (OXY)*		
Significant Events	*First scientific mission using SOCIB's Sea-Glider U541.* *First mission in the frame of JERICO-TNA program.* *Initial deployment failed due to 24V. battery issues.* *Deployment departing from Maó (Menorca).* *Recovery in front of Porto-Colom (Mallorca).*		
Mission Summary	*This mission stands for the 1st iteration of the Menorca-Sardinia JERICO-TNA mission, carried out by SOCIB's glider SDEEP03 (Unit 541).* *Launching operation (in N39.8439 E4.407°) was executed by a 2-member field-team displaced to Maó (Menorca). Used vessel was a 7-m RIB property of IMEDEA.* *During the execution of this mission 2 Menorca-Sardinia and 1 Menorca-Mallorca (travel for recovery) transects were completed successfully.* *Overall performance of mechanical and sampling devices was satisfactory. There were not relevant issues with any particular devices. Additionally, Communications were stable and fluent allowing proper near-real-time data sending. External ARGOS tag behaved as expected and messages were received by the CLS servers. Navigation was correct over the Men-Sar channel track although SDEEP03 suffered the influence of light currents especially in the middle of that channel. For logistical reasons, upon return to Menorca, SDEEP03 was sent to the coast of Mallorca over the 500m isobath.* *Recovery took place in N39.3409° E3.3843° by a 2-member field-team on board SOCIB-I 9m Professional RIB.* *Upon completion, SDEEP03 was received at IMEDEA's glider-lab, put on the bench, revised and properly stored. Gathered dataset was fully backed-up and uploaded to SOCIB's FTP for subsequent processing and diffusion via SOCIB's public repository.*		

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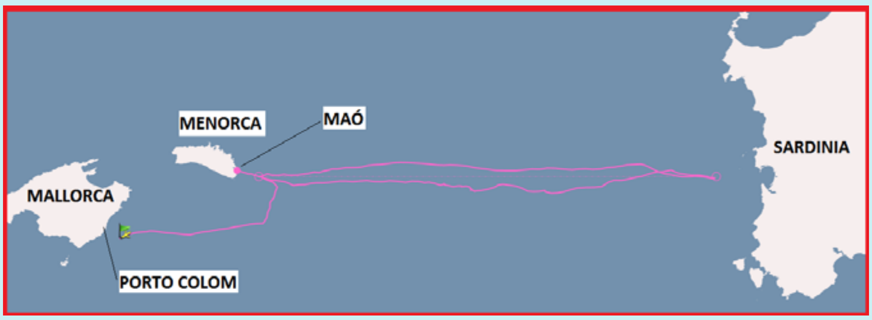
Principal Investigator (e-mail or contact phone/address)	*Dr. Alberto Ribotti – CNR, GOO, Oristano – Alberto.ribotti@cnr.it (+39.0783.229137)*
Institute	*CNR-GOO, Oristano (Italy)*
Project Affiliation (web-site)	*http://www.jerico-fp7.eu/tna*
Partnership / Participation	*CNR-GOO-Oristano (JERICO-TNA call solicitor&granted institution)* *CSIC-IMEDEA (accessed infrastructure and service provider)* *SOCIB (in-kind contribution of material and infrastructures)*
Glider Software Version	*V66.06*
Data Retrieval (real-time [RT] / delayed-mode [DM])	*Real-time sub-set via satellite link every 6 hours every day* *Delayed-mode direct download of full gathered data sets*
Compass Calibration (specify procedure)	*Error measurement revealed no necessity to perform a compass calibration*
Battery Type	*Electrochem's Lithium Prim. 24V (mechanics) & 10V (electronics)*
Battery Consumption (Ah)	*24,34Ahr (24V pack) & 41,72Ahr (10V pack)*
Data Available From	*http://thredds.socib.es/thredds/dodsC/auv/glider/sdeep03-scb_sgdeep003/L1/2013/dep0002_sdeep03_scb-sgdeep003_L1_2013-01-31_data_dt.nc*
Full Mission Report From	*glidertech@socib.es*
Technical Contact	*glidertech@socib.es*

Figure 1

(Map providing general overview of Survey Area)

Mission Summary

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



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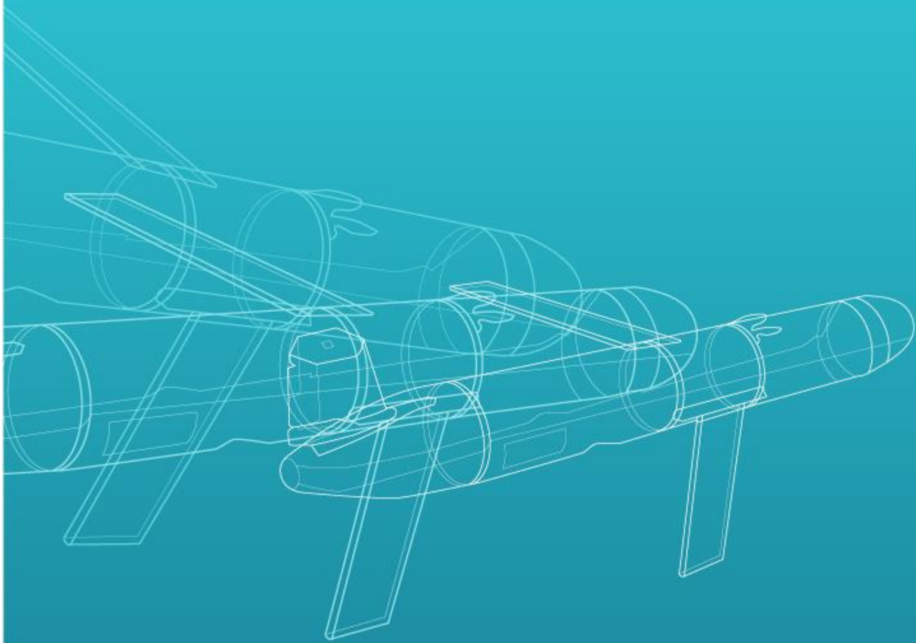

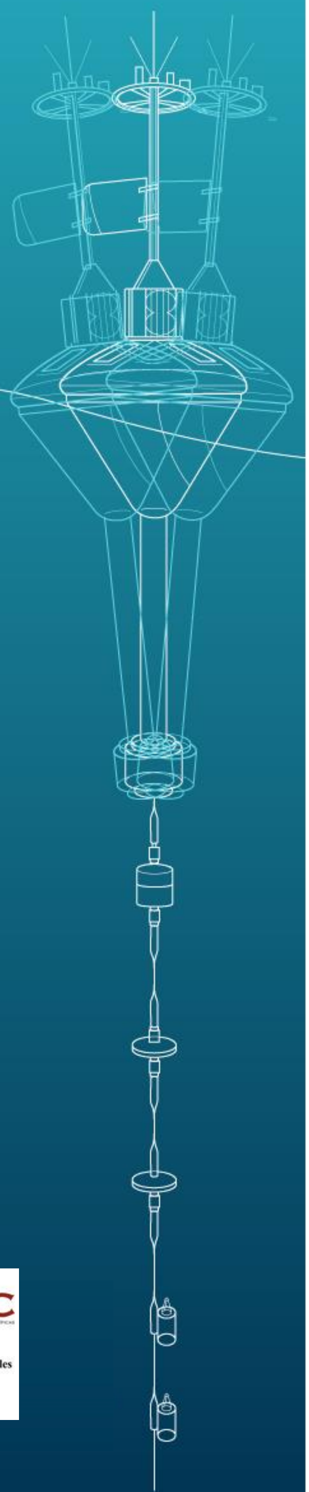

Glider Mission Summary Report

2012 - 2015

SOCIB (CSIC)

JERICO_TNA_Sardinia_OCT2013 (GF-MR-0020)

SOCIB Balearic Islands Coastal Observing and Forecasting System

GOBIERNO DE ESPAÑA MINISTERIO DE ECONOMÍA Y COMPETITIVIDAD

Govern de les Illes Balears

IMEDEA

CSIC

Universitat de les Illes Balears

Mission Name	*JERICO_TNA_Sardinia_OCT2013 (GF-MR-0020)*		
Platform Model	*Sea-Glider 1000m (iRobot version)*		
Platform ID / Name / WMO Code	*U538 / SDEEP02 / 68965*		
Related Platforms / Missions			
Start Date	*2013-10-15*		
End Date	*2013-11-29*		
Total Days	*46*	**Total distance (Km / Nm)**	*909 / 491*
Survey Area (NODC or SDN region)	*Menorca to Sardinia channel (Western Mediterranean sea)*		
Objec-tive(s)	*the proposed research wants to identify the physical properties of the surface and intermediate water masses between Baleares and Sardinia with the aim of:* *i) study the variability of the physical properties of surface and intermediate water masses between the Algerian and the Provencal sub-basins;* *ii) evaluate the transport of water, salt and heat through the area and verify if the interannual variability of the surface and intermediate water masses is due to climatic changes;* *iii) validate the operational hydrodynamic numerical model of the western Mediterranean (http://www.seaforecast.cnr.it/en/fl/wmed.php) through the use of in-situ and satellite data*		

Scientific Sensors (name & model / serial_number / calibration date)	*CT-Sail -SBE- / sn 0168 / 04-Jun-2013 (*)* *BBFL2VMT -WetLabs- / sn0778 / 26-Jul-2013* *OPTODE -Aandera- / sn 0464 / 03-Jun-2013* *(*) with Paine's pressure sensor sn264060 calibrated 04-Jun-2013*
Number of Profiles	*675 (CTD), 364 (FLNTU), 364 (OXY)*
Significant Events	*First mission after U538's factory refurbishment.* *Second iteration of the JERICO-TNA mission Menorca-Sardinia granted with reference CALL 1_8.* *Deployment and Recovery in front of Porto-Colom (Mallorca).* *First Sea-Glider mission after departure of Sea-Glider expert at IMEDEA.*
Mission Summary	*This mission stands for the 2nd iteration of the Menorca-Sardinia JERICO-TNA mission, carried out by SOCIB's glider SDEEP02 (Unit 538).* *Launching operation was performed in front of the coast of Porto-Colom (Mallorca, in N39.3316° E3.4228 °) by a 2-member field-team on board SOCIB-I Professional RIB.* *During the execution of this mission 2 Menorca-Sardinia and 2 Menorca-Mallorca (travel for recovery) transects were completed successfully.* *Overall performance of mechanical and sampling devices was satisfactory. There were not relevant issues with any particular devices. Additionally, Communications were stable and fluent allowing proper near-real-time data sending. External ARGOS tag behaved as expected and messages were received by the CLS servers. Navigation was correct over the Men-Sar channel and Mall-Men track although SDEEP02 suffered the influence of light currents especially in the Men-Sar channel. For logistical reasons, upon return to Menorca, SDEEP02 was sent to the coast of Mallorca over the 500m isobath.* *Recovery took place in N39.3422° E3.3861° by a 2-member field-team on board SOCIB-I 9m Professional RIB.* *Upon completion, SDEEP02 was received at IMEDEA's glider-lab, put on the bench, revised and properly stored. Gathered dataset was fully backed-up and uploaded to SOCIB's FTP for subsequent processing and diffusion via SOCIB's public repository.*

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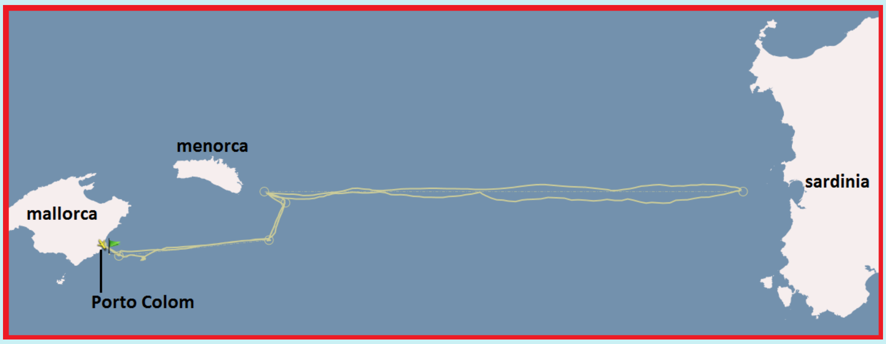
Principal Investigator (e-mail or contact phone/address)	*Dr. Alberto Ribotti – CNR, GOO, Oristano – Alberto.ribotti@cnr.it (+39.0783.229137)*
Institute	*CNR-GOO, Oristano (Italy)*
Project Affiliation (web-site)	*http://www.jerico-fp7.eu/tna*
Partnership / Participation	*CNR-GOO-Oristano (JERICO-TNA call solicitor&granted institution)* *CSIC-IMEDEA (accessed infrastructure and service provider)* *SOCIB (in-kind contribution of material and infrastructures)*
Glider Software Version	*V66.06*
Data Retrieval (real-time [RT] / delayed-mode [DM])	*Real-time sub-set via satellite link every 6 hours every day* *Delayed-mode direct download of full gathered data sets*
Compass Calibration (specify procedure)	*Error measurement revealed no necessity to perform a compass calibration*
Battery Type	*Electrochem's Lithium Prim. 24V (mechanics) & 10V (electronics)*
Battery Consumption (Ah)	*48.698Ahr (24V pack) & 39.892Ahr (10V pack)*
Data Available From	*http://thredds.socib.es/thredds/dodsC/auv/glider/sdeep02-scb_sgdeep002/L1/2013/dep0003_sdeep02_scb-sgdeep002_L1_2013-10-15_data_dt.nc*
Full Mission Report From	*glidertech@socib.es*
Technical Contact	*glidertech@socib.es*

Figure 1 (Map providing general overview of Survey Area)	
Mission Summary (Map providing detailed overview of Survey Area and traced Flight Path with surface points if possible)	

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A6. Glider mission summary for JERICO-TNA –Sardinia-Tunisia-CNRS/SAROST glider monitoring program

Below is one glider mission summary report for mission during PERSEUS period (2012 – 2015)

Glider deployment report

Mission	Somba
Platform	Slocum open ocean glider
Platform ID	Eudoxus (serial 136)
Start date	2014-08-16 16:12:22
End date	2014-09-23 07:19:06
Area	Mediterranean Observatories
Objective	The proposed research aims to combine traditional (ship collected) in situ data, glider observations and a large set of satellite observed variables to get insights into the exchanges through the Sardinia-Tunisia Channel at the levels of surface Atlantic Waters and Levantine Intermediate Waters. Thanks to EU FP7 PERSEUS WP3 coordination (http://www.perseus-net.eu) and EU FP7 JERICO TNA (http://www.jerico-fp7.eu/), this deployment was carried out in the framework of the SOMBA cruise (R/V Thetys II, INSU) carried out in September 2014 to study the physical and biogeochemical state of the Algerian basin
Total days : 38	Total Navigation (km) : 990
Related platforms/missions	Abacus-TNA-Nov2014
Sensors	Wetlabs bbfl2slk V1 Calibration date : 2012-11-28T11:57:29 Measured parameters : FLUORESCENCE_CHLA, BBP532, CDOM, Teledyne Webb research CTD 41cp Calibration date : 2008-10-03T10:15:24 Measured parameters : TEMP, CNDC, PRES, Aanderaa Oxy 5013 Calibration date : 2012-05-23T12:24:56 Measured parameters : MOLAR_DOXY, TEMP_DOXY, BPHASE_DOXY, DPHASE_DOXY,
Number of profiles	918
Events	
Mission Summary	https://gfcp.ego-network.org/gliders/Eudoxus/Somba/logbook
PI	Daniele Ludicone
Institute (owner of the glider)	ENSTA
Project affiliation	JERICO TNA
Glider software version	Navigation software version : V 7.10 Science software version :

Number of Iridium connections	289
RT Data transmitted by Iridium	813 navigation files (9.6M) 940 science files (20M)
DM Data downloaded from glider	
Data available from	http://www.ifremer.fr/co/ego/ego/Eudoxus
Calibrations	https://gfcp.ego-network.org/gliders/Eudoxus/Somba/info/eudoxus_somba.json
Battery type	Lithium Battery packs : 0 x None + 1 x WILPA1726 + 1 x WILPA1727 + 1 x WILPA1727
Batteries	Initial batteries voltage : V Final batteries voltage : V Batteries consumption : Ah
Full post mission report	https://glider83a.dt.insu.cnrs.fr/deployment_report.php?glider=Eudoxus&deployment=Somba
Technical contact	ups855.liste.glidertech@cnrs.fr

Figure 1 : Mission flight path

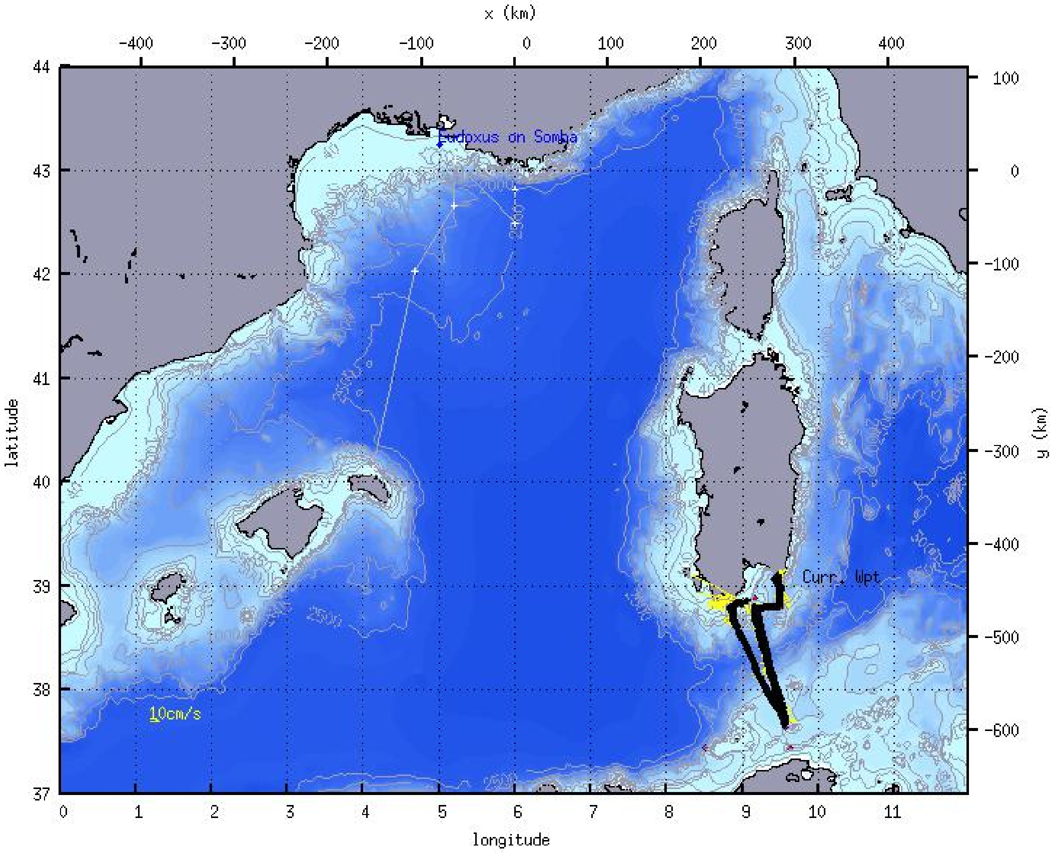
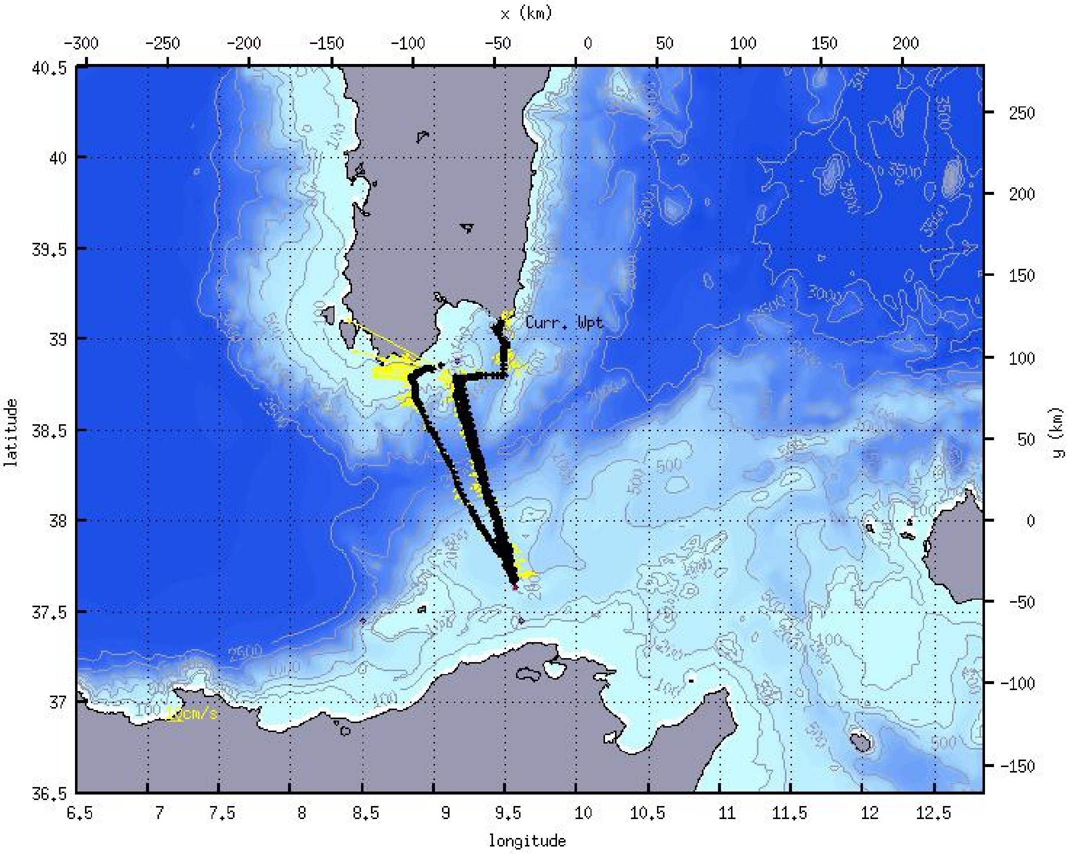
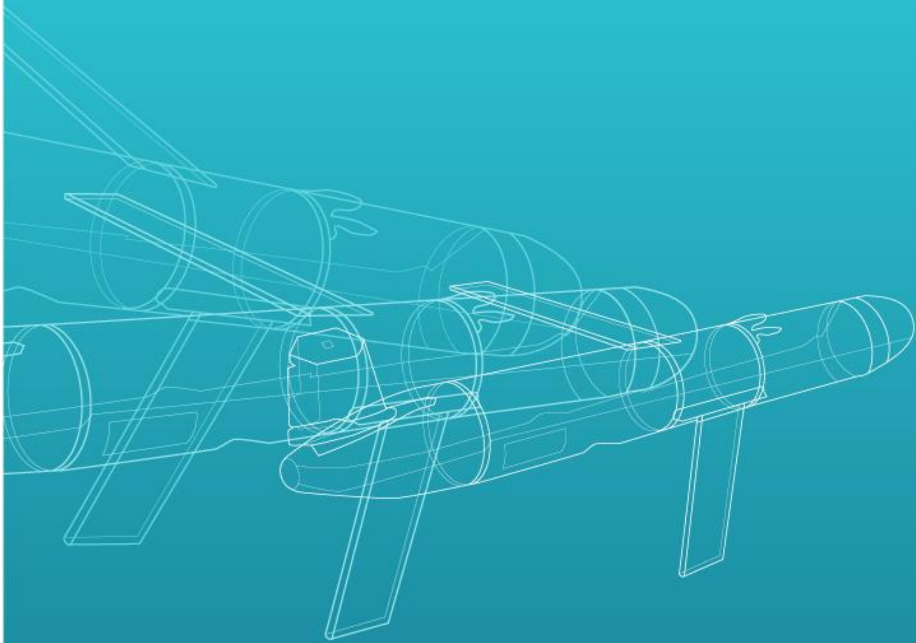


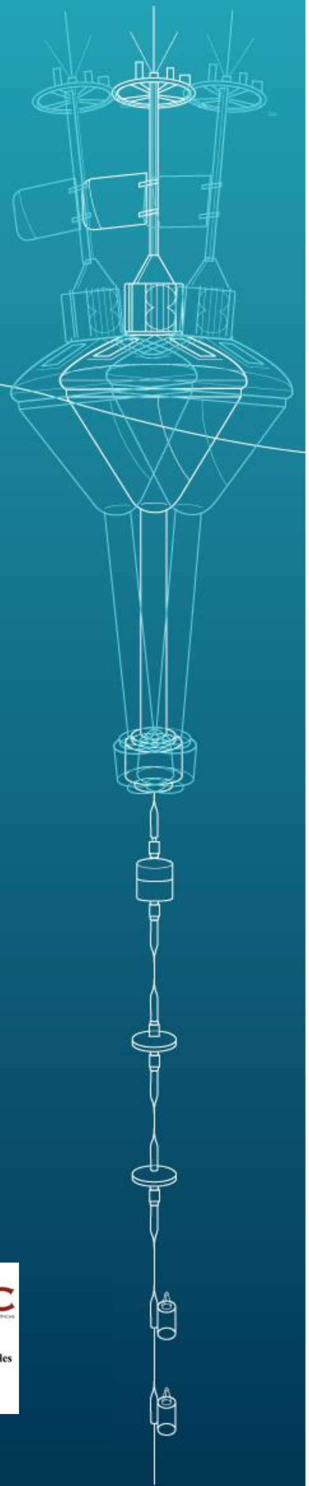
Figure 2 : Mission flight path



A7. Glider mission summaries for JERICO TNA –Mallorca-Algeria- CSIC/SOCIB glider monitoring program

Below are 4 glider mission summary reports for missions during PERSEUS period (2012 – 2015)





Glider Mission Summary Report

2012 - 2015

SOCIB (CSIC)

JERICO_TNA_Abacus_Sep2014_1stDeployment (GF-MR-0030)

SOCIB Balearic Islands Coastal Observing and Forecasting System

IMEDEA CSIC Universitat de les Illes Balears

Gobierno de España Ministerio de Economía y Competitividad Govern de les Illes Balears

Mission Name	*JERICO_TNA_Abacus_Sep2014_1stDeployment (GF-MR-0030)*		
Platform Model	*Slocum 1000m G2*		
Platform ID / Name / WMO Code	*U244 / SDEEP00 / (n/a)*		
Related Platforms / Missions	*R/V-Tethys-II & Eudoxus(dt-insu glider) / SOMBA & MUSICS*		
Start Date	*2014-09-01*		
End Date	*2014-09-03*		
Total Days	*3*	**Total distance (Km / Nm)**	*32,0 / 17,3*
Survey Area (NODC or SDN region)	*Algerian BASIN (Western Med.)*		
Objective(s)	*1.To identify the physical and biological properties of the surface and intermediate water masses between Balearic islands and Algerian coasts;* *2.To understand sub-basins dynamics and the complex interactions due to eddies;* *3.To assess the ocean description capabilities of several satellite products when approaching coastal areas, also comparing them to glider and ship collected in situ data.*		
Scientific Sensors (name & model / serial_number / calibration date)	*GPCTD -S.B.E.- / sn 0107 / 04-Jan-2012* *FLNTUSLK -WetLabs- / sn2279 / 15-Jul-2015* *OPTODE_5013 -Aandera- / sn 1410 / 10-Feb-2011*		
Number of Profiles	*103 (CTD), 103 (FLNTU), 103 (OXY)*		
Significant Events	*- altimeter exhibiting false bottom hits (glider ending dives prematurely)* *- aborts due to hydraulic-pump failure (oil_flux_oddities)* *- deployment cancelled and glider recovered*		
Mission Summary	*First deployment attempt within ABACUS mission (in the frame of the JERICO-TNA program).* *Deployment location: North-West of 'Cabrera' island (N 39° 15.324' E 2° 34.273').* *After only two days of navigation (with some issues related to the altimeter detector), SDEEP01 had to be recovered due to its impossibility to execute the mission with the minimum success warranties.* *Finally, the glider was recovered in the vicinity of the launching waypoint. Precisely, it was extracted from the water in location 39°11.723' N 2°35.300' E.* *Next step was to put the platform on the working bench and proceeded with a degassing of the oil circuit of the pump as the presence of dissolved air seemed to be the cause of the pump's malfunctioning*		

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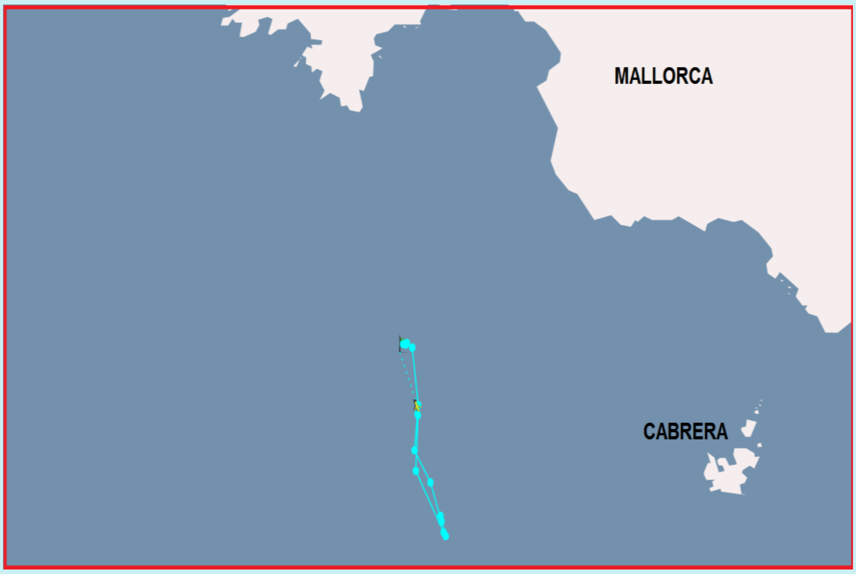
Principal Investigator (e-mail or contact phone/address)	*Prof. Giorgio Budillon* *giorgio.budillon@uniparthenope.it*
Institute	*PARTHENOPE (Univ. of Napoli, Italy)*
Project Affiliation (web-site)	*http://www.jerico-fp7.eu/tna*
Partnership / Participation	*PARTHENOPE (JERICO-TNA call solicitor&granted institution)* *CSIC-IMEDEA (accessed infrastructure and service provider)* *SOCIB (in-kind contribution of material and infrastructures)*
Glider Software Version	*v7.13 (Navigation), v3.17 (Science)*
Data Retrieval (real-time [RT] / delayed-mode [DM])	*Real-time sub-set via satellite link every 6 hours every day* *Delayed-mode direct download of full gathered data sets*
Compass Calibration (specify procedure)	*Heading error measurement. Coefficient re-calibration not needed*
Battery Type	*Manufacturer's original Lithium batt.pack (720Ah-nominal cap.)*
Battery Consumption (Ah)	*16,582Ah (1,785Ah up to 18,367Ah of battery consumption)*
Data Available From	*http://thredds.socib.es/thredds/catalog/auv/glider/sdeep01-scb_sldeep001/L2/2014/catalog.html*
Full Mission Report From	*glidertech@socib.es*
Technical Contact	*glidertech@socib.es*

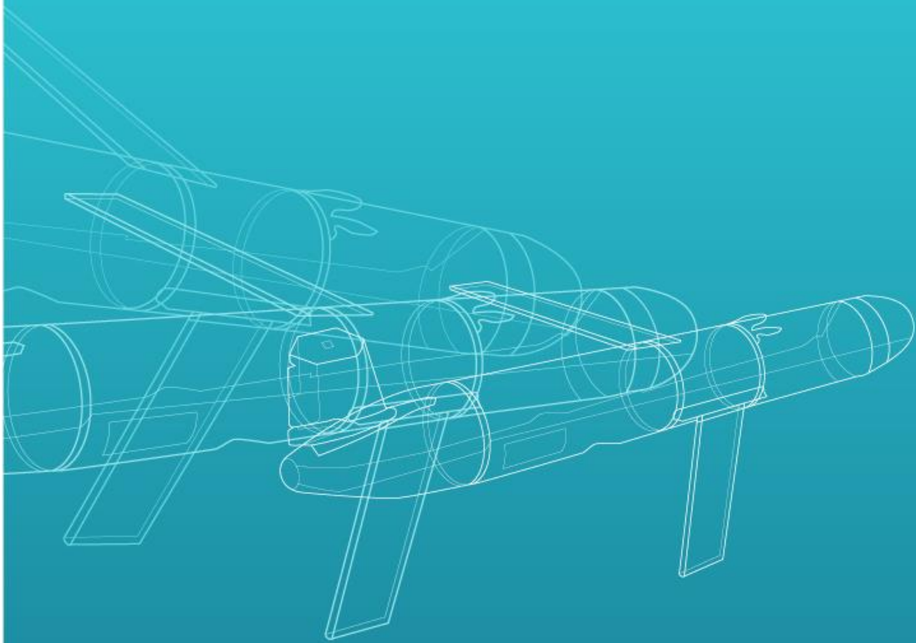
Figure 1

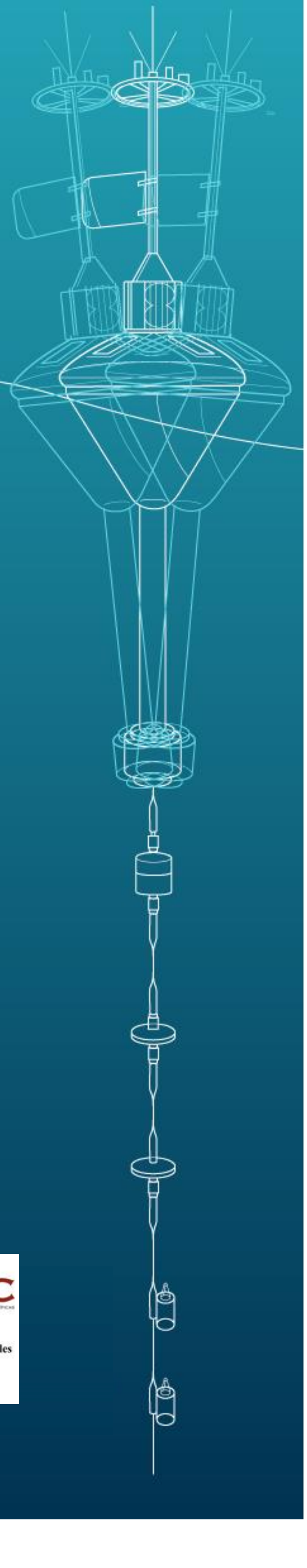
(Map providing general overview of Survey Area)

Mission Summary

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







Glider Mission Summary Report

2012 - 2015

SOCIB (CSIC)

JERICO_TNA_Abacus_Sep2014_2ndDeployment (GF-MR-0030)

SOCIB Balearic Islands Coastal Observing and Forecasting System

GOBIERNO DE ESPAÑA MINISTERIO DE ECONOMÍA Y COMPETITIVIDAD

Govern de les Illes Balears

IMEDEA CSIC Universitat de les Illes Balears

Mission Name	*JERICO_TNA_Abacus_Sep2014_2ndDeployment (GF-MR-0030)*		
Platform Model	*Slocum 1000m G2*		
Platform ID / Name / WMO Code	*U244 / SDEEP00 / (n/a)*		
Related Platforms / Missions	*R/V-Tethys-II & Eudoxus(dt-insu glider) / SOMBA & MUSICS*		
Start Date	*2014-09-15*		
End Date	*2014-10-20*		
Total Days	*36*	**Total distance (Km / Nm)**	*830 / 449*
Survey Area (NODC or SDN region)	*Algerian BASIN (Western Med.)*		
Objective(s)	*1.To identify the physical and biological properties of the surface and intermediate water masses between Balearic islands and Algerian coasts;* *2.To understand sub-basins dynamics and the complex interactions due to eddies;* *3.To assess the ocean description capabilities of several satellite products when approaching coastal areas, also comparing them to glider and ship collected in situ data.*		
Scientific Sensors (name & model / serial_number / calibration date)	*GPCTD -S.B.E.- / sn 0107 / 04-Jan-2012* *FLNTUSLK -WetLabs- / sn2279 / 15-Jul-2015* *OPTODE_5013 -Aandera- / sn 1410 / 10-Feb-2011*		
Number of Profiles	*338 (CTD), 338 (FLNTU), 338 (OXY)* *(mostly all are 20-975m profiles)*		
Significant Events	*- altimeter exhibiting false bottom hits (glider ending dives prematurely)* *- EDDY sampling (not programmed, on the fly)* *- No issues when entering the Algerian Current* *- Service-Intervention (glider recovered for check and data backup)*		
Mission Summary	*Second deployment attempt within ABACUS mission (in the frame of the JERICO-TNA program).* *Deployment location: North-West of 'Cabrera' island (39º15.232' N 02º33.590' E).* *The first leg and interception of the Algerian Current occurred without relevant issues and with fluid and stable communications and near-real-time data transferring.* *The return leg was interrupted after 2 days of its start by modifying the route in order to cross-sample an Eddy detected using satellite imagery and 2 IMEDEA/SOCIB drifters. This sampling concluded after 12 days without significant route deviation.* *Finally, the glider was recovered in the vicinity of the launching waypoint. Precisely, it was extracted from the water in location N39º15.131' E02º34.278'.* *This recovery marked the beginning of a Service-Intervention which included general checkout, full dataset backup and preparation for next deployment. This period of time also provided rest to the piloting team.*		

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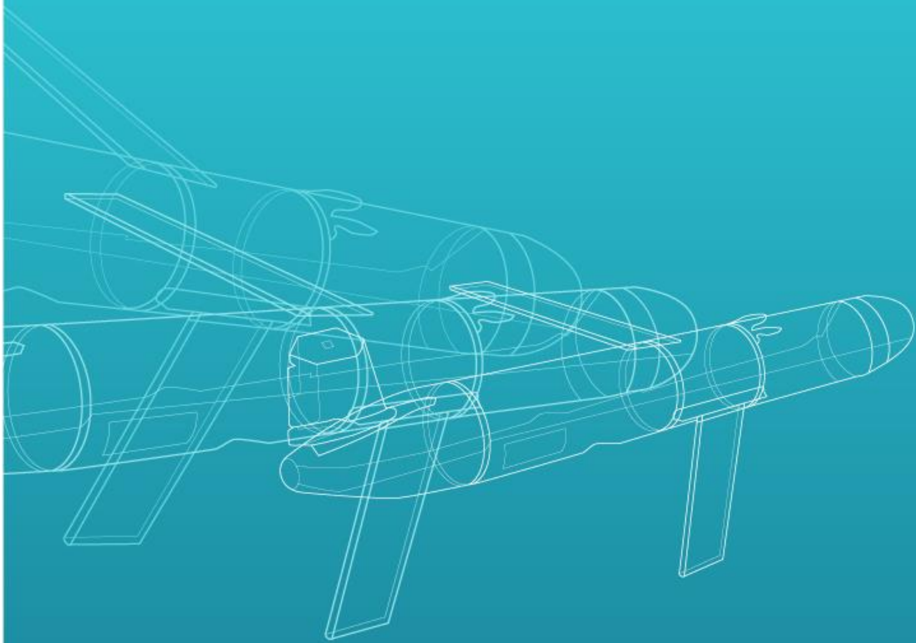
Principal Investigator (e-mail or contact phone/address)	*Prof. Giorgio Budillon* *giorgio.budillon@uniparthenope.it*
Institute	*PARTHENOPE (Univ. of Napoli, Italy)*
Project Affiliation (web-site)	*http://www.jerico-fp7.eu/tna*
Partnership / Participation	*PARTHENOPE (JERICO-TNA call solicitor&granted institution)* *CSIC-IMEDEA (accessed infrastructure and service provider)* *SOCIB (in-kind contribution of material and infrastructures)*
Glider Software Version	*v7.13 (Navigation), v3.17 (Science)*
Data Retrieval (real-time [RT] / delayed-mode [DM])	*Real-time sub-set via satellite link every 6 hours every day* *Delayed-mode direct download of full gathered data sets*
Compass Calibration (specify procedure)	*Heading error measurement. Coefficient re-calibration not needed*
Battery Type	*Manufacturer's original Lithium batt.pack (720Ah-nominal cap.)*
Battery Consumption (Ah)	*147,194Ah (19,063Ah up to 166,257Ah of battery consumption)*
Data Available From	*http://thredds.socib.es/thredds/catalog/auv/glider/sdeep01-scb_sldeep001/L2/2014/catalog.html*
Full Mission Report From	*glidertech@socib.es*
Technical Contact	*glidertech@socib.es*

Figure 1

(Map providing general overview of Survey Area)

Mission Summary

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

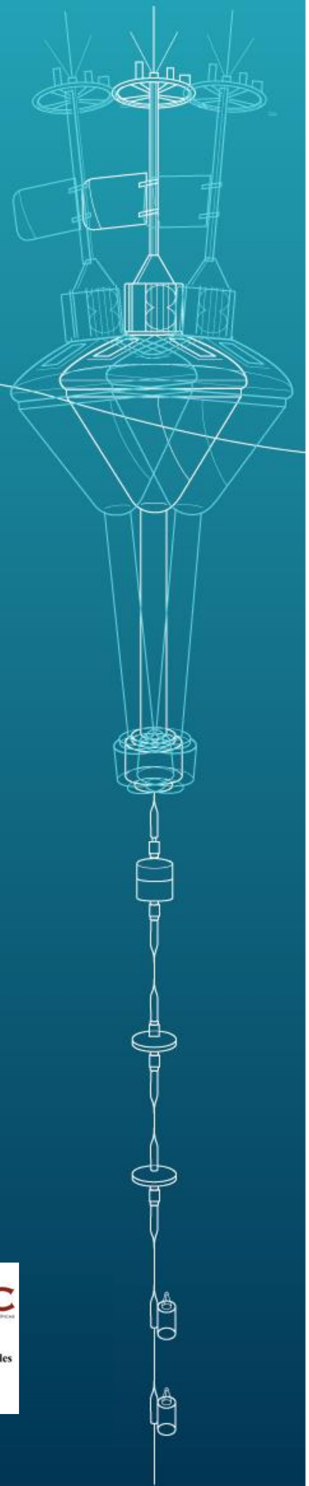


Glider Mission Summary Report

2012 - 2015

SOCIB (CSIC)

JERICO_TNA_Abacus_Sep2014_3rdDeployment (GF-MR-0030)



SOCIB Balearic Islands Coastal Observing and Forecasting System

GOBIERNO DE ESPAÑA MINISTERIO DE ECONOMÍA Y COMPETITIVIDAD

Govern de les Illes Balears

IMEDEA CSIC Universitat de les Illes Balears

Mission Name		*JERICO_TNA_Abacus_Sep2014_3rdDeployment (GF-MR-0030)*	
Platform Model		*Slocum 1000m G2*	
Platform ID / Name / WMO Code		*U244 / SDEEP00 / (n/a)*	
Related Platforms / Missions		*R/V-Tethys-II & Eudoxus(dt-insu glider) / SOMBA & MUSICS*	
Start Date		*2014-11-03*	
End Date		*2014-11-05*	
Total Days	*3*	**Total distance (Km / Nm)**	*(n/a)*
Survey Area (NODC or SDN region)		*Algerian BASIN (Western Med.)*	
Objective(s)		*1.To identify the physical and biological properties of the surface and intermediate water masses between Balearic islands and Algerian coasts;* *2.To understand sub-basins dynamics and the complex interactions due to eddies;* *3.To assess the ocean description capabilities of several satellite products when approaching coastal areas, also comparing them to glider and ship collected in situ data.*	
Scientific Sensors (name & model / serial_number / calibration date)		*GPCTD -S.B.E.- / sn 0107 / 04-Jan-2012* *FLNTUSLK -WetLabs- / sn2279 / 15-Jul-2015* *OPTODE_5013 -Aandera- / sn 1410 / 10-Feb-2011*	
Number of Profiles		*0 (CTD), 0 (FLNTU), 0 (OXY)* *(scientific survey was never effective during this 3rd attempt)*	
Significant Events		*- Launching performed from a different location (with respect to 1st and 2nd deployments) driven by a Saral/Altika passage expected by Nov-7th.* *- Plans for glider-sampling of Saral/Altika satellite swath* *- Aborts and Mission-Cancelation due to spurious power resets (glider restarting without being commanded so)*	
Mission Summary		*Third deployment attempt within ABACUS mission (in the frame of the JERICO-TNA program).* *Deployment location: South of Mallorca island (N39° 17.054' E3° 16.019'), departing from Porto-Colom port.* *Having 6 hours elapsed only, since the launching, SDEEP01 reported being executing the 'Last-gasp' mission. The cause of such behavior was that an spontaneous general-power reset had occurred with the platform being underwater. Although all systems seemed to be working properly, more resets occurred during the following 12 hrs. Under this circumstances, it was decided to leave the glider drifting at the surface while waiting for an emergency recovery.* *Finally, extraction took place in the vicinity of the launching waypoint. Precisely, in location N39º10.380' E03º26.178'.* *Following on-bench inspection revealed that the problem was due to two factors concerning the ON/OFF master plug: (1) metallic terminals of the connector's socket were dirty and (2) non-appropriate synthetic lube was applied to the terminals of the connector's plug (Green Plug) by on-field technicians minutes before the launching (according to the technical specifications of this synthetic grease, it is not a suitable product for such a purpose). Once the connector male/female components were properly cleaned and lubed, the incident was considered as 100% solved.*	

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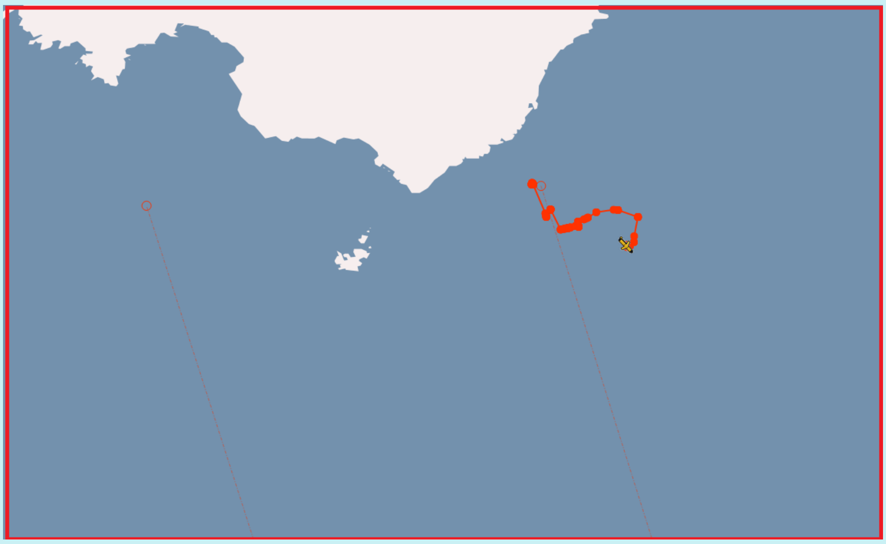
Principal Investigator (e-mail or contact phone/address)	*Prof. Giorgio Budillon* *giorgio.budillon@uniparthenope.it*
Institute	*PARTHENOPE (Univ. of Napoli, Italy)*
Project Affiliation (web-site)	*http://www.jerico-fp7.eu/tna*
Partnership / Participation	*PARTHENOPE (JERICO-TNA call solicitor&granted institution)* *CSIC-IMEDEA (accessed infrastructure and service provider)* *SOCIB (in-kind contribution of material and infrastructures)*
Glider Software Version	*v7.13 (Navigation), v3.17 (Science)*
Data Retrieval (real-time [RT] / delayed-mode [DM])	*(n/a)* *(scientific survey was never effective during this 3rd attempt)*
Compass Calibration (specify procedure)	*Heading error measurement. Coefficient re-calibration not needed*
Battery Type	*Manufacturer's original Lithium batt.pack (720Ah-nominal cap.)*
Battery Consumption (Ah)	*Undetermined (consumption record lost due to resets)*
Data Available From	*(n/a)* *(scientific survey was never effective during this 3rd attempt)*
Full Mission Report From	*glidertech@socib.es*
Technical Contact	*glidertech@socib.es*

Figure 1

(Map providing general overview of Survey Area)

Mission Summary

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



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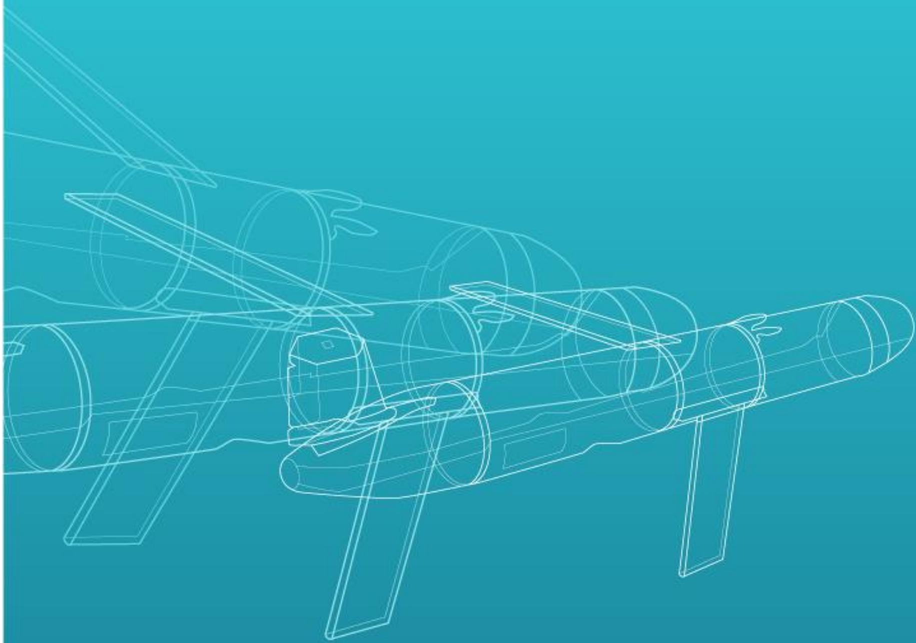

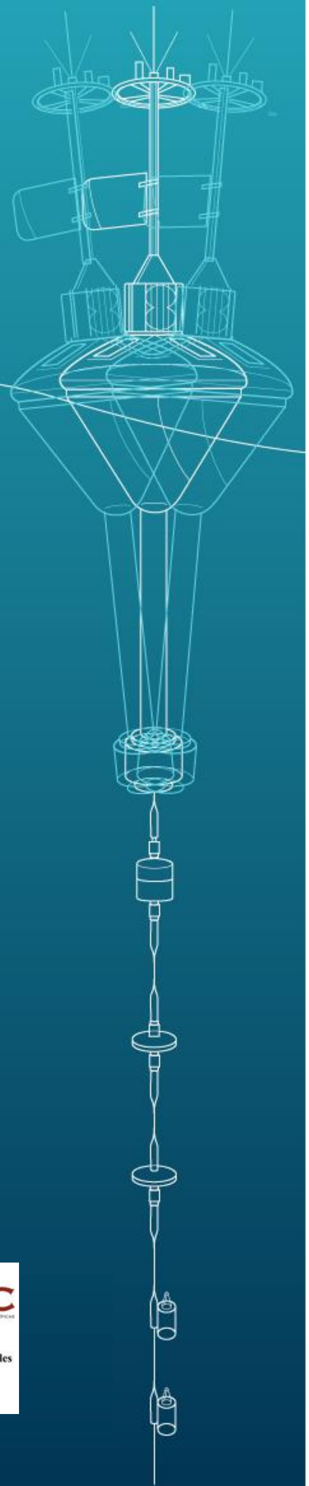

Glider Mission Summary Report

2012 - 2015

SOCIB (CSIC)

JERICO_TNA_Abacus_Sep2014_4thDeployment (GF-MR-0030)

SOCIB Balearic Islands Coastal Observing and Forecasting System

Gobierno de España — Ministerio de Economía y Competitividad

Govern de les Illes Balears

IMEDEA — CSIC — Universitat de les Illes Balears

Mission Name	JERICO_TNA_Abacus_Sep2014_4thDeployment (GF-MR-0030)		
Platform Model	Slocum 1000m G2		
Platform ID / Name / WMO Code	U244 / SDEEP00 / (n/a)		
Related Platforms / Missions	R/V-Tethys-II, EUDOXUS & IDEEP02 / SOMBA, MUSICS & CANALES		
Start Date	2014-11-18		
End Date	2014-12-19		
Total Days 32		**Total distance (Km / Nm)**	712.3 / 385.1
Survey Area (NODC or SDN region)	Algerian BASIN (Western Med.)		
Objective(s)	1.To identify the physical and biological properties of the surface and intermediate water masses between Balearic islands and Algerian coasts; 2.To understand sub-basins dynamics and the complex interactions due to eddies; 3.To assess the ocean description capabilities of several satellite products when approaching coastal areas, also comparing them to glider and ship collected in situ data.		
Scientific Sensors (name & model / serial_number / calibration date)	GPCTD -S.B.E.- / sn 0107 / 04-Jan-2012 FLNTUSLK -WetLabs- / sn2279 / 15-Jul-2015 OPTODE_5013 -Aandera- / sn 1410 / 10-Feb-2011		
Number of Profiles	425 (CTD), 425 (FLNTU), 425 (OXY) (majority of the profiles at full depth range - 20m to 975m-)		
Significant Events	- W-shaped track planed to accomplish Saral/Altika swath sampling - Launching location: same as 1st and 2nd deployments - Altimeter false hits occurring again - Successful glider-sampling of 2 Saral/Altika satellite swaths #773 and #329 - Abacus glider joined IMEDEA's IDEEP02 while waiting for a dual recovery that was finally executed without a problem		
Mission Summary	Fourth/Last deployment attempt within ABACUS mission (in the frame of the JERICO-TNA program). Deployment location: North-West of 'Cabrera' island (N39° 14.062' E2° 26.756'). The first leg was executed without adverse issues. The altimeter detected false bottom hits at the beginning but it was not a problem once the glider entered deep-diving mode. On Nov-26th the first Saral-Altika over-flight occurred near N39° 35.760' E3° 07.770'. At the end of this leg, no influence of Algerian Current was noticed and a 'W' intermediate transect executed to move from current Saral/Altika track #773 to the next one (#329). The second leg coincided with Saral/Altika trace #329 and a second over-flight of this satellite (over the glider) occurred near location N39° 54.462' E3° 23.328' on Dec-12th. Upon completion of the second leg, SDEEP01 was commanded to navigate to the launching waypoint and to navigate in-line with a 'Canales glider', IDEEP02, while waiting for a double recovery that took place on Dec-19th. That extraction marked the end of the water-works of ABACUS-2014 and, after the in-lab mission conclusion, all data was uploaded to SOCIB's FTP to be processed and publicly diffused for further scientific analysis.		

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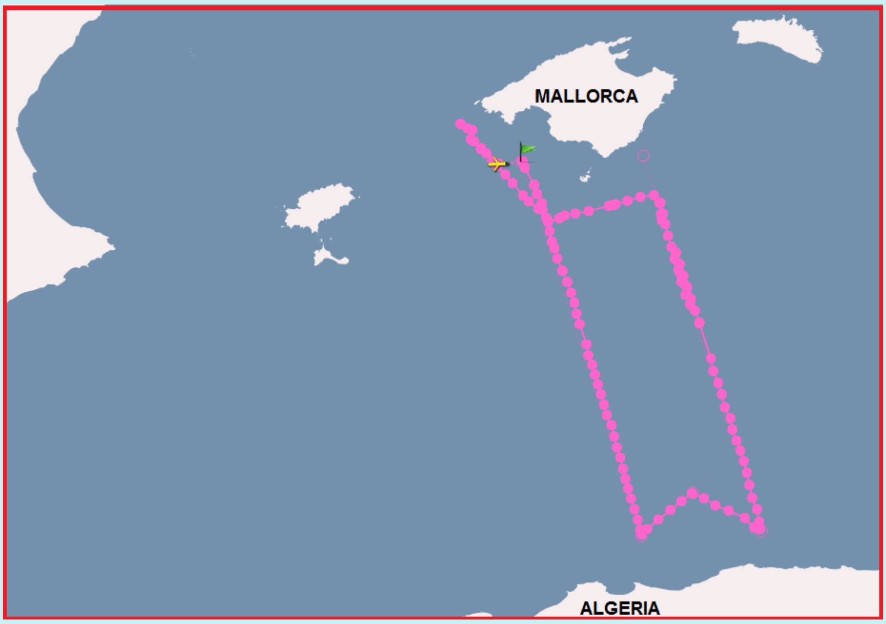
Principal Investigator (e-mail or contact phone/address)	*Prof. Giorgio Budillon* *giorgio.budillon@uniparthenope.it*
Institute	*PARTHENOPE (Univ. of Napoli, Italy)*
Project Affiliation (web-site)	*http://www.jerico-fp7.eu/tna*
Partnership / Participation	*PARTHENOPE (JERICO-TNA call solicitor&granted institution)* *CSIC-IMEDEA (accessed infrastructure and service provider)* *SOCIB (in-kind contribution of material and infrastructures)*
Glider Software Version	*v7.13 (Navigation), v3.17 (Science)*
Data Retrieval (real-time [RT] / delayed-mode [DM])	*Real-time sub-set via satellite link every 6 hours every day* *Delayed-mode direct download of full gathered data sets*
Compass Calibration (specify procedure)	*Heading error measurement. Coefficient re-calibration not needed*
Battery Type	*Manufacturer's original Lithium batt.pack (720Ah-nominal cap.)*
Battery Consumption (Ah)	*134.975Ah (187.643Ah up to 322.618Ah of battery consumption)*
Data Available From	*http://thredds.socib.es/thredds/catalog/auv/glider/sdeep01-scb_sldeep001/L2/2014/catalog.html*
Full Mission Report From	*glidertech@socib.es*
Technical Contact	*glidertech@socib.es*

Figure 1

(Map providing general overview of Survey Area)

Mission Summary

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



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B. PERSEUS Glider Communications

B1.Proceedings and newsletters

Bosse A, P. Testor, L. Mortier, L. Beguery, K. Bernardet, L. Prieur, V. Taillandier and F. D'Ortenzio, 2013: Observations of submesoscale coherent vortices of Levantine Intermediate Water: formation and role in the circulation of the western Mediterranean Sea. CIESM2013, extended abstract.

Somot S., L. Houpert, X. Durrieu De Madron, P. Testor, M. Herrmann and F. Sevault, 2013: model evaluation and understanding of the interannual variability (1980-2012) of the north-western Mediterranean open-sea deep convection, , CIESM2013, submitted extended abstract.

B2. Communications

Aracri S., K. Schroeder, J. Chiggiato, M. Borghini, G. M. Luna, C. Trees, A. Alvarez, B. Mourre, P. Testor, A.Bosse (2013) : Ligurian Sea water masses and circulation over one year of intense sampling programs (Nov 2012-Aug 2013), 7th HyMeX conference, Cassis, France, 7-10 Oct. 2013. (poster)

Arsouze T., P. Testor, B. L'Hévéder, A. Bosse, J. Beuvier (2014) : Using a numerical glider simulator (SIGLID) to study the deep water convection in the Gulf of Lion during HyMeX's SOP2, 8th HyMeX Workshop, Valletta, 15-18 September 2014, Malta

Bosse A., Testor P., Mortier L., and L. Houpert (2015): Multi-platform observation of submesoscale vortices formed by deep vertical mixing: characterization and role for the general circulation of the Mediterranean SeaObservations of anticyclonic and cyclonic Subthermocline Submesoscale Coherent Vortices: a case study in the Northwestern Mediterranean Sea EGU General Assembly 2015, Apr 2015, Vienna, Austria.

Bosse A., P. Testor, Mortier L., P. Damien, C. Estournel, P. Marsaleix, L. Prieur (2014) Submesoscale frontal processes at the margin of a deep convection area: a case study in the NW Mediterranean, Sea, 6th EGO meeting and final Symposium of the COST Action ES0904, Kiel, Germany, 16-17 June.

Bosse A., P. Testor, G. Legland, L. Mortier, L. Houpert, L. Prieur 2014): Vertical velocities associated with deep open-ocean convection in the Northwestern Mediterranean Sea as indirectly observed by gliders, EGU General Assembly 2014, 27 Apr.-02 May Vienna, Austria, Abstracts 16, 16009

Bosse A., P Testor, L Mortier, L Houpert: Observations of anticyclonic and cyclonic Subthermocline Submesoscale Coherent Vortices: a case study in the Northwestern Mediterranean Sea. EGU General Assembly 2014, 27 Apr.-02 May Vienna, Austria, Abstracts 16, 16049

Bosse A., P. Testor, L. Mortier, L. Houpert, H. Lavigne, F. d'Ortenzio, L. Prieur, V. Taillandier, L. Coppola, H. Claustre : High resolution sampling of Submesoscale Coherent Vortices transporting newly formed deep water across the NW Mediterranean Sea thanks to glider, 2014 Ocean Sciences Meeting, 23-28 February 2014, Honolulu, USA

Bosse A., P. Testor, L. Mortier, L. Beguery, K. Bernardet, L. Prieur, V. Taillandier and F. D'Ortenzio, 2013: Observations of submesoscale coherent vortices of Levantine

Intermediate Water: formation and role in the circulation of the western Mediterranean Sea. 40th CIESM Congress, 28 October - 1 November 2013, Marseille, France

Bosse A., P. Testor, L. Mortier, L. Beguery, K. Bernardet, V. Taillandier, F. d'Ortenzio, L. Prieur, L. Coppola, and F. Bourrin (2013) : New insights of the Northern Current in the Western Mediterranean Sea from Gliders data: Mean structure, Transport, and Seasonal Variability, EGU General Assembly, 7-12 April, Vienna, Austria.

Bosse A., P. Testor, L. Mortier, P. Damien, C. Estournel, P. Marsaleix, L. Beguery, K. Bernardet, V. Taillandier, F. d'Ortenzio, L. Prieur, L. Coppola, and F. Bourrin (2013) Characteristics of Geostrophic Eddies in the North Western Mediterranean as observed by Gliders and simulated by a high-resolution Model: formation, behaviour and dissipation, EGU General Assembly, 7-12 April, Vienna, Austria.

Bosse A, P. Testor, L. Mortier, L. Beguery, K. Bernardet, V. Taillandier, F. d'Ortenzio, L. Prieur, L. Coppola, and F. Bourrin (2013): Survey of submesoscale structures at the margin of the Northern Current in the North Western Mediterranean Sea using Gliders: observations and diagnostics, EGU General Assembly, 7-12 April, Vienna, Austria.

Bouffard J., J Marmain, A Bosse, A Petrenko, P Forget, A Doglioli, P Testor (2014): Variability of slope current positioning from space: Application to the Northern Current in the North Western Mediterranean Sea. 40th COSPAR Scientific Assembly. Held 2-10 August 2014, in Moscow, Russia

Cauchy P., P. Testor, C. Guinet, C. Gervaise, L. Di Oro, C. Ioana, L. Mortier, M.-N. Bouin, L. Beguery, and P. Klein (2013) Weather observations through oceanic acoustic noise recorded by gliders, EGU General Assembly, 7-12 April, Vienna, Austria.

Estournel C., P. Testor, P. Damien, L. Mortier, P. Marsaleix, J.-M. Lellouche, C. Ulses, F. Kessouri, P. Raimbault, and L Coppola, 2014: High resolution modelling of dense water formation in the Northwestern Mediterranean: benefits from an improved initial stratification in summer, EGU 2014, 27 Apr.-02 May Vienna, Austria

Durrieu de Madron X., L. Houpert, P. Puig, A. Sanchez-Vidal, P. Testor, A. Bosse, C. Estournel, S. Somot, F. Bourrin, M.-N. Bouin, A. Calafat, M. Canals, L. Coppola, F. D'Ortenzio, J. Font, S. Heussner, J. Martin, L. Mortier, A. Palanques, and P. Raimbault (2013) Interaction of dense dense shelf water cascading and open-sea convection in the Northwestern Mediterranean during winter 2012, EGU General Assembly, 7-12 April, Vienna, Austria.

Garnier V., P. Testor, J. Beuvier, L. Houpert, A. Bosse, L. Mortier, P. Garreau, B. Zakardjtan, Y. Ourmières, J. Marmain, P. Marsaleix, P. Damien, C. Estournel, S. Somot, K. Béranger (2014) : W4.2 - Impact of the resolution on the circulation, dense water formation and mesoscale processes in the North-Western Mediterranean Sea: comparisons of NEMO-MED12, embedded configurations and observations, 8th HyMeX Workshop, Valletta, 15-18 September 2014, Malta

Giordani H., P. Testor, L. Coppola, L. Prieur, I. Taupier-Letage, M.-N. Bouin, G. Caniaux, C. Lebeaupin-Brossier, M. Herrmann, F. D'Ortenzio (2014) : W4.4 - A multiplatform fine scale 3D analysis of the North-Western Mediterranean during the HyMeX/ASICS experiment. Application to dense water formation, 8th HyMeX Workshop, Valletta, 15-18 September 2014, Malta

Hayes D., A. Hannides, G. Goergiou, P. Testor, H. Gildor, G. Zodiatis (2014) Description of the Long-lived Subsurface Mesoscale Eddy South of Cyprus, 6th EGO meeting and final Symposium of the COST Action ES0904, Kiel, Germany, 16-17 June.

Heslop, E.E. M. Juza, B. Mourre, J. Allen, J-L López-Jurado, M. Torner, J. Tintoré (2015). Towards a better understanding of ocean variability, combining glider monitoring and numerical simulation, at a circulation "choke" point, 47th International Liege Colloquium on Ocean Dynamics, Liege, May 2015.

Heslop, E.E. M. Juza, B. Mourre, J. Allen, J-L López-Jurado, M. Torner, J. Tintoré (2015). Combining glider monitoring at a circulation "choke" point with numerical simulation, Glider Community Workshop 2015, Norwich, UK, May 2015.

Heslop, E.E. J. Tintoré, S. Ruiz, J. Allen, J-L López-Jurado, M. Torner (2014) The 'quiet revolution': continuous glider monitoring at ocean 'choke' points as key component of a new cross-platform observing system. AGU, (December 2014, San Francisco, US).

Heslop, E.E. J. Tintoré, P. Poulain, J-L López-Jurado, M. Torner (2014) The 'quiet revolution': continuous glider monitoring at ocean 'choke' points as key component of an EU cross-platform ocean observation strategy. PERSEUS 2nd SCIENTIFIC WORKSHOP (December 2014, Marrakesh, Morocco).

Heslop E.E., S. Ruiz, J. Allen, J-L López-Jurado and J. Tintoré (2014), Glider observed variability in oceanic circulation at different scales, from 'endurance' line monitoring at an important Mediterranean 'choke' point. 6th EGO meeting and final Symposium of the COST Action ES0904, Kiel, Germany, 16-17 June.

Heslop E.E., S. Ruiz, J. Allen, J-L López-Jurado and J. Tintoré (2014). Sub-seasonal and mesoscale variability of oceanic circulation at key 'choke' points: an example from the Western Mediterranean, EGU 2014, 27 Apr.-02 May Vienna, Austria.

Houpert L., P. Testor, X. Durrieu de Madron, S. Somot, F. D Ortenzio, C. Estournel: Wintertime mixing and dense water formation in the Mediterranean. Physical Oceanography and Climate seminar, 25th February 2015, NOC, Southampton, UK. (invited)

Houpert L. P.Testor, A. Bosse, X. Durrieu de Madron, L. Mortier (2014) Estimation of the Upper-Ocean Heat Budget Components from Gliders and Mooring data at the ocean station LION over the recent period (2007-2012), 6th EGO meeting and final Symposium of the COST Action ES0904, Kiel, Germany, 16-17 June.

Houpert L., X. Durrieu de Madron, P. Testor, A. Bosse, L. Mortier: Monitoring of Intense Events of Deep Water Formations in the Northwestern Mediterranean over the last five years, EGU General Assembly 2014 , 27 Apr. - 02 May 2014, Vienna, Austria

Houpert L., P. Testor, X. Durrieu de Madron, S. Somot, F. D'Ortenzio, C. Estournel, and H. Lavigne, 2014: Seasonal cycle of the mixed layer depth, of the seasonal thermocline and of the upper-ocean heat rate in the Mediterranean Sea: an observational approach (solicited), EGU 2014, 27 Apr.-02 May Vienna, Austria

Houpert L., P. Testor, X. Durrieu de Madron, C. Estournel, and F. D'Ortenzio (2013) Seasonal cycle of oceanic mixed layer and upper-ocean heat fluxes in the Mediterranean Sea from in-situ observations, EGU General Assembly, 7-12 April, Vienna, Austria.

Houpert L., P. Testor, X. Durrieu de Madron, A. Bosse, and L. Mortier (2014): High resolution monitoring of deep water formations in the north western Mediterranean over the recent period (2007-2012), 2014 Ocean Sciences Meeting, 23-28 February 2014, Honolulu, USA

Houpert L., Testor P., Durrieu de Madron X., (2012): Thermohaline variability in the northwestern mediterranean basin over the recent period from in-situ measurments, ASLO/AGU Ocean sciences meeting, Salt Lake City, Utah, USA, February 2012.

Kessouri F., C. Ulses, C. Estournel, P. Marsaleix, F. D'Ortenzio, M. Pujopay, L. Coppola, D. Lefevre, P. Testor, and P. Conan (2015): Study of the northwestern Mediterranean deep convection and phytoplankton spring bloom using 3D hydrodynamic biogeochemical model and the DeWEX experiments, EGU General Assembly 2015, 12-17 April 2015, Vienna, Austria

Olita, A., S. Sparnocchia, J. Tintore, S. Ruiz, M. Tomas, 2014: Multi-scale and Multi-Analysis of Deep Convection Processes in the Northwestern Mediterranean Sea, PERSEUS General Assembly, January 2014, Athens, Greece

Poulain P-M., G. Manzella, K. Schroeder, D. Kassis, P. Testor, L. Mortier, M. Ribera, V. Dadic, R. Santoleri, E. Heslop,J. Tintoré, 2014: Identification of gaps and recommendations on upgrades of the SES observing systems to serve PERSEUS needs, PERSEUS General Assembly, January 2014, Athens, Greece.

Somot S., L. Houpert, F. Sevault, P. Testor, A. Bosse, X. Durrieu de Madron, C. Dubois, M. Herrmann, R. Waldman, M.N. Bouin, C. Cassou: Interannual variability (1979-2013) of the North-Western Mediterranean deep water mass formation: past observation reanalysis and coupled ocean-atmosphere high-resolution modelling, EGU General Assembly 2015, 12-17 April 2015, Vienna, Austria

Somot S., L. Houpert, F. Sevault, X. Durrieu de Madron, A. Bosse, P. Testor, C. Dubois, M. Herrmann, R. Waldman, M.-N. Bouin, C. Cassou (2014) : Open-sea deep convection in the North-Western Mediterranean: replacing the HyMeX 2012-2013 winter in the past climate variability, 8th HyMeX Workshop, Valletta, 15-18 September 2014, Malta

Somot S., L. Houpert, X. Durrieu De Madron, P. Testor, M. Herrmann and F. Sevault, 2013: model evaluation and understanding of the interannual variability (1980-2012) of the north-western Mediterranean open-sea deep convection. 40th CIESM Congress, 28 October - 1 November 2013, Marseille, France

Somot S., L. Houpert, X. Durrieu de Madron, A. Bosse, P. Testor, F. Adloff, C. Dubois, M. Herrmann, R. Waldman, M.-N. Bouin, F. Sevaul (2013) : Observation-based indicators, model evaluation and understanding of the interannual variability (1980-2012) of the North-Western Mediterranean open-sea deep convection, 7th HyMeX conference, Cassis, France, 7-10 Oct. 2013.

Somot S., P. Testor, X. Durrieu de Madron, L. Houpert, M. Herrmann, C. Dubois, and F. Sevault (2013): Modelling the interannual variability (1979-2012) of the Mediterranean open-sea deep convection using a coupled regional climate system model, EGU General Assembly, 7-12 April, Vienna, Austria.

Taillandier, V, Claustre H., D¿Ortenzio F., Poteau A., Bession F., Testor, P., lepage Y., (2012) Glider deployed bio-optical instruments: lessons learned after 5-years sampling across the Ligurian Front, ASLO/AGU Ocean sciences meeting, Salt Lake City, Utah, USA, February 2012

Testor P., A. Bosse, L. Houpert, F. D'Ortenzio, H. Lavigne, V. Taillandier, P. Conan, L. Mortier, L. Prieur, C. Estournel, L. Coppola, A. Alvarez, R. Onken, J. Tintore, 2014. New knowledge of the variability od the Northwestern Mediterranean Sea from observations of the HYMEX/MERMEX EOP/SOPs. 8th HyMeX Workshop, Valletta, 15-18 September 2014, Malta

Testor P., and A. Beszczynska-Moeller, 2014 : new capabilities offered by gliders to study the physical-biological coupling in the ocean, COST Conference : The predictive

Power of Marine Science in a Changing Climate, 7-8 April 2014, Institute of Oceanology, Sopot, Poland.

Testor P., A. Bosse, L. Houpert, F. D'Ortenzio, H. Lavigne: Physical-biogeochemical coupling observed by gliders and profiling floats in the North-Western Mediterranean sea over a seasonal cycle, 2014 Ocean Sciences Meeting, 23-28 February 2014, Honolulu, USA

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