



TNA PROJECT REPORT
1st Call of Proposals
12 January – 3 April, 2012

A) General Information

Proposal reference number⁽¹⁾	CALL_1_7
Project Acronym (ID)⁽²⁾	GESEBB
Title of the project⁽³⁾	Glider campaign to estimate the 3D structure of an Eddy in the Southeastern Bay of Biscay.
Host Research Infrastructure⁽⁴⁾	Glider
Starting date - End date⁽⁵⁾	23 July 2013 – 24 September 2013
Name of Principal Investigator⁽⁶⁾	Ainhua B. Caballero Reyes
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Additional users⁽⁷⁾	Anna Rubio Compañy, Julien Mader, Carlos Hernández and Luis Ferrer Rodríguez.

B) Project objectives (max. 250 words)⁽⁸⁾

The experiment will permit to know in detail the vertical structure of an stationary anticyclonic eddy recurrent in the southeaster Bay of Biscay and its evolution during the two months of the campaign. If the stationary eddy is not sampled, both because it has not been developed or because we are not able to see it in remote sensing maps, the campaign will permit to sample in detail the vertical structures of the water column (stratification, thermocline...) over the shelf-slope area in a period which is especially interesting regarding the biological cycle of some of the key species for the fishery activity.

C) Main achievements and difficulties encountered (max. 250 words)⁽⁹⁾

The main **achievement** of this mission is that the glider measured with all the sensors and to the desired depth all the required mission duration. A good communication with the pilots allow us to adjust the sampling design every Waypoint; this permitted to make decisions once gather all the last information from the glider itself and from the satellite measurements (IR, visible and altimetry). Campe glider crossed not only an anticyclonic structure but also at less other two cyclones. We are not sure yet that the measured anticyclone is the stationary eddy (the target structure of this mission) but if not this will surely not due to the sampling design, but to an absence of this type of structure during this year.

The main **difficulty** of this mission is that the first attempt was aborted (4 to 5 July 2013). This inconvenient together with the delay of the start date, due to an unavailability of a free glider-pilot in the desired time period, do not allow us to sample the structure when its surface signal is more evident (April to July). Other difficulty is that the months before the beginning of the mission were very cloudy in the Bay of Biscay and we encountered difficulties to find not cloud-contaminated satellite images. Therefore, we were not sure about the central position of the target structure and we used the first days of the mission (2 transects) to localize the anticyclonic eddy.

D) Dissemination of the results ⁽¹⁰⁾

The results of the Glider campaign have been disseminated in different media (journals, radio and television interviews) and also via internet (itsasnet, sinc, magazineoceano...). A preliminary analyses of the results have been presented in the Epigram Workshop (16-18 Sept., Île de Ré, France) and will be summarized in a poster that will be showed in the next EUR-OCEANS hot topics conference (6-8 Nov. 2013, Gran Canaria, Spain). Finally, it is planned to disseminate the results in other international scientific conferences (Oceans 14, EGU or others...) and Glider Workshops; and, if suitable, to a peer-reviewed scientific journal.

E) Use of the Infrastructure/Installation ⁽¹¹⁾

	In situ	By remote
Nr. of Users involved		4
Access units (days/months/etc)		2 months
In situ stay day / Remote Access duration		

F) User project scientific field

Main field ⁽¹²⁾	Earth Sciences & Environment
Scientific description ⁽¹³⁾	Marine Science/Oceanography

H) Technical and Scientific preliminary Outcomes (max. 2 pages) ⁽¹⁴⁾

Sampling design

In order to optimize the monitoring of the mesoscale anticyclonic eddy, the sampling design proposed before the beginning of the campaign, was composed of 4 rotating butterflies (Fig. 1, left). Nevertheless, the weeks before starting the mission were cloudy and the available SST and Chl-a images were contaminated by clouds. This lack of information disallows us to locate the centre of the target oceanic structure. In order to locate it, 2 first exploratory transects were done. And after that the sampling design was constantly adjusted, based on the last satellite data and images, on the information provided by the drifter and on the last measurements of the glider (Fig. 1, right).

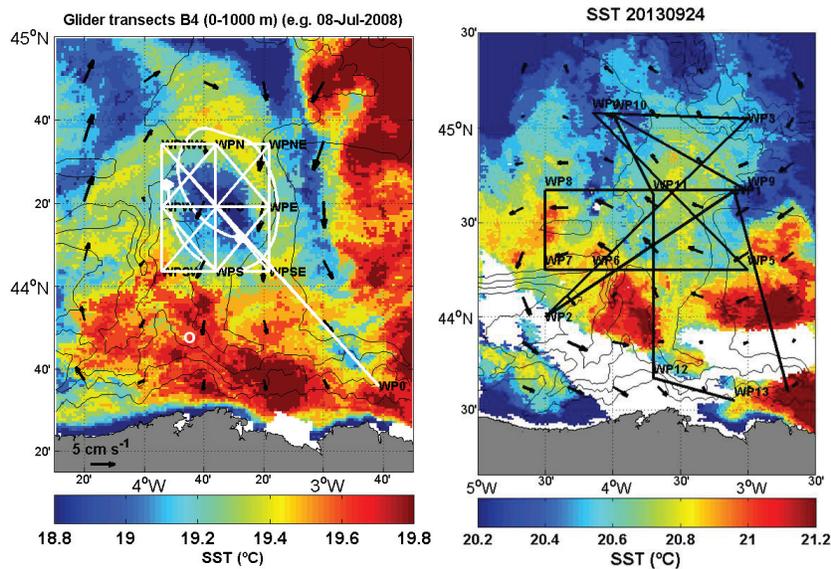


Figure 1: (Left) Preliminary sampling design and (Right) final sampling design.

As stated before, parallel to the glider mission two Ocean drifter Iridium (Albatros) drifters, with a holey sock drogue centred at 50 m depth, were deployed once located the approximate position of the eddy. The drifters were deployed on 44°42'N 3°30'W and 44°36'N 3°27'W the 5th of August and they described the trajectory showed in Figure 2 until 27 August and 2 September, respectively.

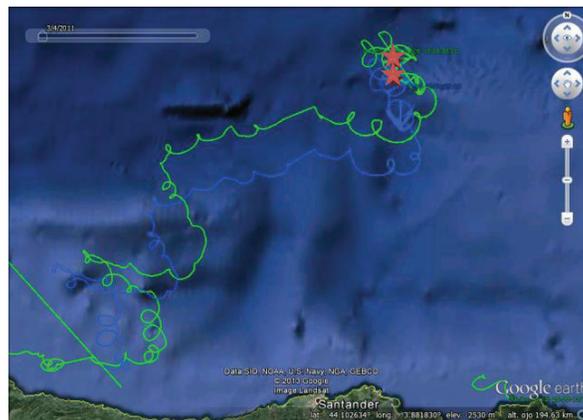


Figure 2: Trajectories followed by the two drifters deployed in the centre of the eddy; the red crosses indicate the deployment position.

Preliminary results

The **general characteristics** of the water column observed during the mission are listing in the following table and figures*:

	July	August	September
Potential temperature (°C)	9.64-24.47	9.61-23.8	9.79-22.91
Salinity (psu)	34.09-36.01	33.86-36.11	34.45-36.21
Dissolved Oxygen (μmol/kg)	119.91-217.94	121.02-227.54	122.04-208.98

Table 1. Ranges of potential temperature, salinity and dissolved oxygen during all the months of the mission, from surface to 1000 m in the case of the first two variables and from surface to 750 m in the case of the last variable.

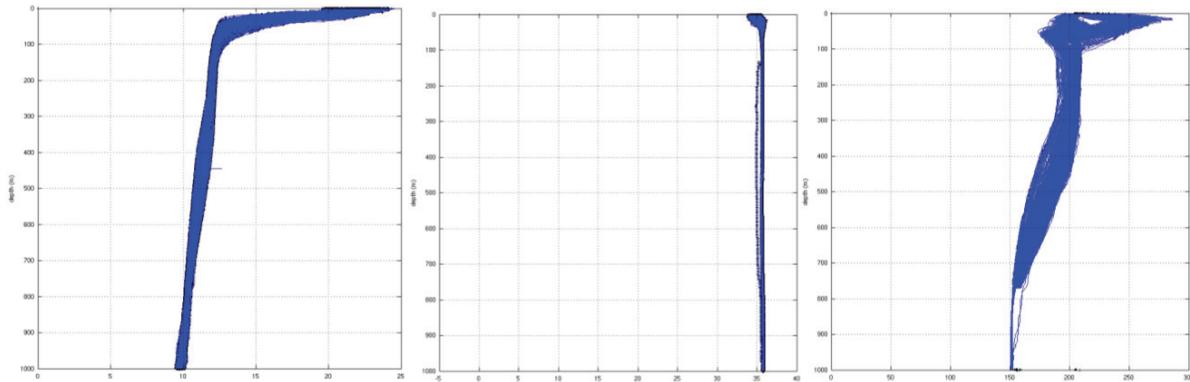


Figure 3. Vertical profiles of the potential temperature, salinity and dissolved oxygen during the entire mission.

With regard of the mesoscale structure, besides the satellite information (i.e. Fig. 4, left) the vertical integrated velocities (i.e. Fig. 4, right) allow us to locate the cyclonic and anticyclonic eddies. The vertical structures of these structures were typical of SWODDIES: a doming/sinking of the seasonal thermocline and the sinking/doming of the general thermocline in the case of the anticyclones/cyclones.

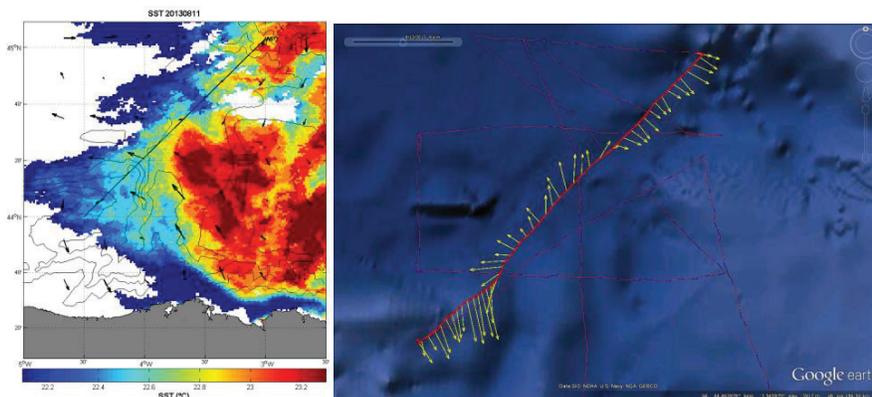


Figure 1: (Left) SST image with transect 3 of the mission overlapped (Right) and the integrated velocity vectors along transect 3.

The general conclusion of this experiment is that the main objectives have been achieved, though a more deep analysis must be done in order to estimate if the anticyclonic eddy was stationary. In addition, other structures have been also monitored, and much information of the water column from surface to 1000 m depth has been compiled. All this information will allow us, after compiling all the data and analyse them a better understanding of the ocean dynamics of the southeastern Bay of Biscay.

*Note: The information showed in this report is based on the available data (not all the measurements) in this moment.

Guidelines for the TNA Project Report

This report is due within one month after the completion of the JERICO TNA project by the User Group Leader (P.I.) and should be submitted to the **JERICO TNA Office** (jerico.tna@ismar.cnr.it) and the **Scientific Site Coordinator** at the hosting facility with a copy to the **JERICO Coordinator** (jerico@ifremer.fr).

An online "user group questionnaire" has also to be completed by each **Group Leader** of a user-project supported under JERICO as soon as an experiment has come to an end - you will find it here: http://cordis.europa.eu/fp7/capacities/questionnaire_en.html#fnote.

NOTES:

Refunding of the TA reimbursement will be processed as soon as the JERICO TNA Office, the Scientific Site Coordinator and the JERICO Coordinator will received this report.

Part of the information collected with this report will be used to fill in the European Commission MS Access database. Following article 4.4.2, the User Group PI will be asked by the JERICO Coordinator to update it at the reporting deadlines.

Notes for the compilation

1. It is the reference number assigned to the proposal by the TNA-Office.
2. It is the user-project identifier and must be unique under the grant agreement and for its lifetime. The length cannot exceed 20 characters.
3. Specify a title for the approved proposal. The length cannot exceed 255 characters.
4. Name of the installation/infrastructure accessed with this project. If more than one installations/infrastructures are used by the same project; please list them in the box.
5. Specify starting and end date of the project (including eventual preparatory phase before the access).
6. Fill with the full contact of the Principal Investigator (user group leader).
7. List the full users team (name and affiliation) that made direct use (physically or remotely - please specify) of the installation/infrastructure under the direction of the group leader.
8. Write the short-term, medium and long-term objectives of project. Use no more than 250 words.
9. Describe briefly the main achievements obtained and possible impacts, as well as possible difficulties encountered during the execution of the project. Use no more than 250 words.
10. Describe any plan you have to disseminate and publish the results resulting from work carried out under the Transnational Access activity in JERICO: scientific articles, books - or part of them -, patents, as well as reports and communication to scientific conferences, meetings and workshops. Highlight peer-reviewed publications. Users supported under the transnational access activity are encouraged, as far as possible, to make available on open repositories their publications. Acknowledgement to EC and JERICO is requested following article 4.5 of the "End-User" Agreement.
11. Indicate the number of users involved in the activity (the P.I. plus the users described at point 6), the amount of access to the installation/infrastructure and the length of in-person stay at the installation or the operator laboratory (e.g. for preparing the experiment).
12. See Annex, First column.
13. See Annex, Second column.
14. Describe in detail results and main findings of your experiment at the present stage.

Annex of the TNA Project Report - User-Project Scientific fields

Main field	Scientific description
Physics	Astronomy/Astrophysics/Astroparticles Atomic & molecular physics Condensed matter physics High energy and particle physics Nuclear physics Plasma physics Quantum electronics & optics Other - Physics
Chemistry	Chemistry
Life Sciences & Biotech	Food quality & safety Agriculture & Fisheries Medicine Veterinary sciences Molecular & cellular biology

	Other - Life Sciences & Biotech
Earth Sciences & Environment	Global Change & Climate Observation Ecosystems & Biodiversity Natural Disaster & Desertification Marine Science/Oceanography Water Science Hydrology Other – Earth Science Other – Environment
Engineering & Technology	Aeronautics Space New production processes Nanotechnology & Nanosciences Transport Other - Engineering & Technology
Mathematics	Mathematics
Information & Communication Technologies	IST for citizens, businesses & organizations Trust & Security Communication & Networks Computing & software technologies Components & Micro-systems Knowledge & interface technologies Other - ICT
Material Sciences	Knowledge based multifunctional materials Other - Material Sciences
Energy	Sustainable energy systems Fusion Other - Energy
Social Sciences	Economics Political Sciences Educational sciences Law Demography Other - Social Sciences
Humanities	Arts Hystory Languages Other - Humanities