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TNA PROJECT REPORT
2nd Call of Proposals
14 January – 27 March, 2013

A) General Information

Proposal reference number(1)	CALL_2_1
Project Acronym (ID) (2)	METRO
Title of the project(3)	MEditerranean sediment TRap Observatory
Host Research Infrastructure(4)	CNR MPL - MPLS
Starting date - End date(5)	18 October 2013 – 8 November 2014
Name of Principal Investigator(6) **Home Laboratory** **E-mail address** **Telephone**	Dr. Anna Sanchez Vidal Universitat de Barcelona, GRC Geociènces Marines, Facultat de Geologia c/Martí Franquès s/n, Barcelona Spain anna.sanchez@ub.edu +34934021361
Additional users (7)	Antoni Calafat-Frau, Miquel Canals-Artigas, Aitor Rumin Caparrós, Anna Aymà Padrós. Universitat de Barcelona, GRC Geociènces Marines, Facultat de Geologia c/Martí Franquès s/n, Barcelona Spain

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

The main objective of the METRO (MEditerranean sediment TRap Observatory) project is to characterize the physical factors that drive the particulate carbon pump (which includes photosynthesis, particle settling and advection, and organic matter remineralization) at three key locations in the Western Mediterranean which are the Gulf of Lion, the Algero - Balearic basin and the Sicily Channel. The carbon pump cause sequestration of carbon dioxide in the deep sea due to the sinking of particles, thus an accurate quantification of the export flux of particulate organic carbon, and knowledge on physical processes affecting it during its descent to the seafloor (i.e. advection by strong currents), is fundamental for the understanding its magnitude and efficiency. The University of Barcelona (UB) team has been monitoring carbon fluxes since 2009 in the Cap de Creus submarine canyon at 1000 m of water depth, and since 2012 in the Algero - Balearic basin at 2000 m of water depth. Data obtained by these two fixed platforms (near - bottom current speeds, temperature and salinity, particle fluxes) has allowed to investigate the biological (primary production) and physical processes (dense shelf water cascading, convection, storms) that drive the flux of carbon to the deep sea floor. The third platform has been achieved through the integration of a sediment trap to the Sicily Channel mooring C01 maintained by CNR and offered by JERICO through the second Transnational Access call.

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

The University of Barcelona, together with the valuable help and expertise of the CNR-ISMAR, has recently successfully recovered the sediment trap integrated in the Sicily Channel mooring line. The recovery percentage of sediment trap samples has been satisfactory, with 23 samples recovered of a maximum of 24 (i.e. 96% recovery rate). Treatment of samples (splitting of sediment trap samples in different fractions to perform analyses) is ongoing (see scientific objectives for the next 6 months).

D) Dissemination of the results [10]

Results will be published in specialised, high impact, scientific journals, and presented in scientific conferences and symposia.

E) Use of the Infrastructure/Installation [11]

	In situ	By remote
Nr. of Users involved	2 (Aitor Rumin Caparrós, Anna Aymà Padrós)	N
Access units (days/months/etc)	days	6 months
In situ stay day / Remote Access duration	Total of 17 days onboard RV Urania (deployment, recovery and recovery operations)	from 18 October 2013 to 8 November 2014

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]

1. Scientific progress over the past 13 months (October 2013 – November 2014)

The Sicily Channel mooring C01 maintained by CNR is installed at 400 m of water depth between Sicily and Tunisia, and is equipped with currentmeters, ADCP and CTD probes for continuous measurement of hydrological variables. The UB team has incorporated a sediment trap at approximately 30 m above the seafloor in the mooring so near bottom particle fluxes at the three locations in the Western Mediterranean are recorded concomitantly. This will allow to provide concomitant (autumn 2013 to autumn 2014) measurements to seek which physical forcings impact carbon export to the deep sea floor, and if such physical forcings are atmospheric driven and somehow inter-related at a sub-basin (Western Mediterranean) scale.

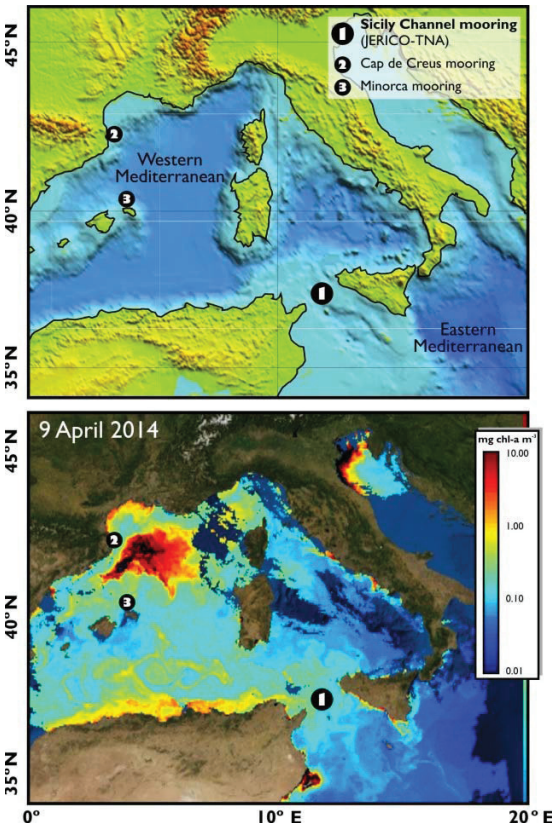

Figure 1. Top: Map of the Western Mediterranean Sea with the location of the 2 moorings maintained by University of Barcelona (Cap de Creus and Minorca moorings) and the Sicily Channel mooring purpose of this JERICO TNA project. Above: satellite-derived chlorophyll-a concentration (mg m-3) in surface waters of the Western Mediterranean in early April 2014 that show the typical spring phytoplankton bloom in the convection zone when surface layer stabilizes. Visualization has been produced using MyOcean products.

The simultaneous measurements started with the ICHNUSSA13 cruise carried out from 15th to 29th October 2013 onboard the Italian RV Urania. In this cruise a sequential sampling Technicap PPS3 sediment trap (with a cylindro-conical shape, a collecting area of 0.125 m2, and equipped with 12 sampling cups) (Heussner et al., 1990) was deployed framed in the Sicily Channel mooring. The sediment trap motor was programmed to obtain particle fluxes with a sampling interval of 15 days. The sampling cups were filled before deployment with a buffered 5% (v/v) formaldehyde solution in 0.45 μm filtered seawater that limits degradation of trapped particles and prevents the mechanical disruption of swimming organisms that occasionally enter the traps during sampling. The mooring line was recovered in late March 2014 during the MEDOCC14 cruise. During the cruise the batteries of the sediment trap motor were replaced, the motor was re-programmed, and 12 new sediment sample cups were installed. The mooring was then successfully redeployed the 7th April 2014 and recovered again in November 2014 during the ICHNUSSA14 cruise onboard RV Urania, which finished in early December 2014. The recovery percentage of sediment trap samples has been satisfactory, with 95% of success (23 out of 24). (see first set of samples, 11 of 12 recovered, in Figure 2).

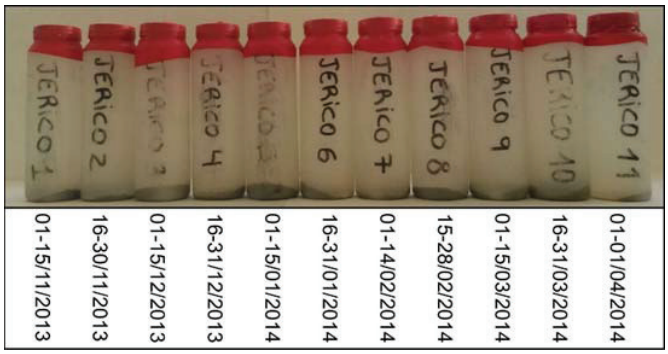

Figure 2. Photograph of the sediment trap cups obtained in the Sicily Channel during the first 6 months of the experiment. As the sediment trap was programmed until mid-April 2014, sample 12 was lost, and sample 11 collected particles just for 1 day (note however the significant amount of sample recovered in 1 day, that may show the importance of the spring bloom in settling particles).

2. Scientific objectives for the next 6 months (December 2014 – May 2015)

After the arrival of the sediment trap samples in the laboratory of the University of Barcelona (expected by mid-December 2014) samples will be processed (swimmers removed under the microsope and sample splitting in different fractions for different analysis) and geochemical measurements (organic carbon, calcium carbonate, opal and lithogenics) and grain size measurements will be performed. Geochemical results obtained by the METRO project in the Sicily Channel will be integrated with physical variables (current speed, temperature, salinity) to determinate which are the physical forcings affecting carbon export to the deep. This will allow to strengthen cooperation links with the CNR group in Italy. In addition, results obtained will be integrated with those obtained in Ierapetra and Cap de Creus to seek for similar physical forcings of carbon and pollutants export. Results will be published in specialised, high impact, scientific journals, and presented in scientific conferences and symposia.

3. References

Heussner, S., Ratti, C., and Carbonne, J., 1990. The PPS 3 time-series sediment trap and the trap sample processing techniques used during the ECOMARGE experiment. Cont. Shelf Res., 10, 943-958, doi:10.1016/0278-4343(90)90069-X.

Rumín-Caparrós, A., Sanchez-Vidal, A., Calafat, A., Canals, M., Martín, J., Puig, P., and Pedrosa-Pàmies, R., 2013. External forcings, oceanographic processes and particle flux dynamics in Cap de Creus submarine canyon, NW Mediterranean Sea, Biogeosciences, 10, 3493-3505, doi:10.5194/bg-10-3493-2013.

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) 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