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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_2
Project Acronym (ID) (2)	ECCECs
Title of the project(3)	Emerging Chemical Contaminants in European Coasts
Host Research Infrastructure(4)	CNR MPL – MPLS, HZG COSYNA_1 (Lysbris ferrybox)
Starting date - End date(5)	February 2014 – December 2014 Access to infrastructures: CNR MPL MPLS: from 2 April to 28 June 2014 HZG COSYNA_1: from 30 September to 27 October 2014
Name of Principal Investigator(6) **Home Laboratory** **E-mail address** **Telephone**	Dr. Jana Klanova Research Centre for toxic compounds in the environment – Environmental chemistry division, Kamenice 753/5, 62500 Brno, Czech Republic klanova@recetox.muni.cz
Additional users (7)	Luca Nizzetto and Miroslav Brumovsky, Research Centre for toxic compounds in the environment – Environmental chemistry division, Kamenice 753/5, 62500 Brno, Czech Republic

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

O1) To provide a first continental scale, consistent assessment of emerging chemical contaminants occurrence and distribution in European coastal waters.

O2) To assess the budget of selected chemical contaminants in the marine water column and investigate the mechanisms controlling their vertical distribution.

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

The in-situ access to the infrastructures took place in three campaigns as follows:

CNR MPL MPLS:

spring cruise: 24.3.-9.4. 2014 (campaign MEDOCC14) on board the CNR RV Urania

autumn cruise: 4.11.-1.12. 2014 (campaigns EMSO-MEDIT_02 + ICHNUSSA 2014) on board the CNR RV Urania

LysBris (Ferry box) campaign: 28.09.- 18.10.2014

OBJECTIVE 1.

Achievements: We successfully performed a 1 month-long campaign by repeatedly collecting

water samples from the Lysbris (Ferry box) in the North sea surface water. We collected in total 48 sample that were aggregated 4x4 based on geographic area(to achieve volumes sufficient for detecting trace chemicals in water). Figure 1 reports the location of the sampling.

Figure 1. Sampling location. Activity 1

Chemical analysis for this activity are currently on going in RECETOX laboratory. Please consider that chemical analysis for this type of samples requires generally several weeks of laboratory work. We foreseen to generate preliminary data by January 2014.

We managed to expand the scopes of the project. The original project foresaw only monitoring in the North sea for occurrence of emerging contaminants. We took advantage of our presence on board of the CNR research vessel Urania (while exploiting the access for the deployment of the passive samplers on the MPLS mooring in the Sicily channel) to conduct two additional campaigns across the Tyrrhenian sea in which the occurrence of emerging contaminants in marine surface water was targeted. In total we collected about 20 samples. Some of these samples were already analysed and preliminary data are available see figure 1 (but not yet published).

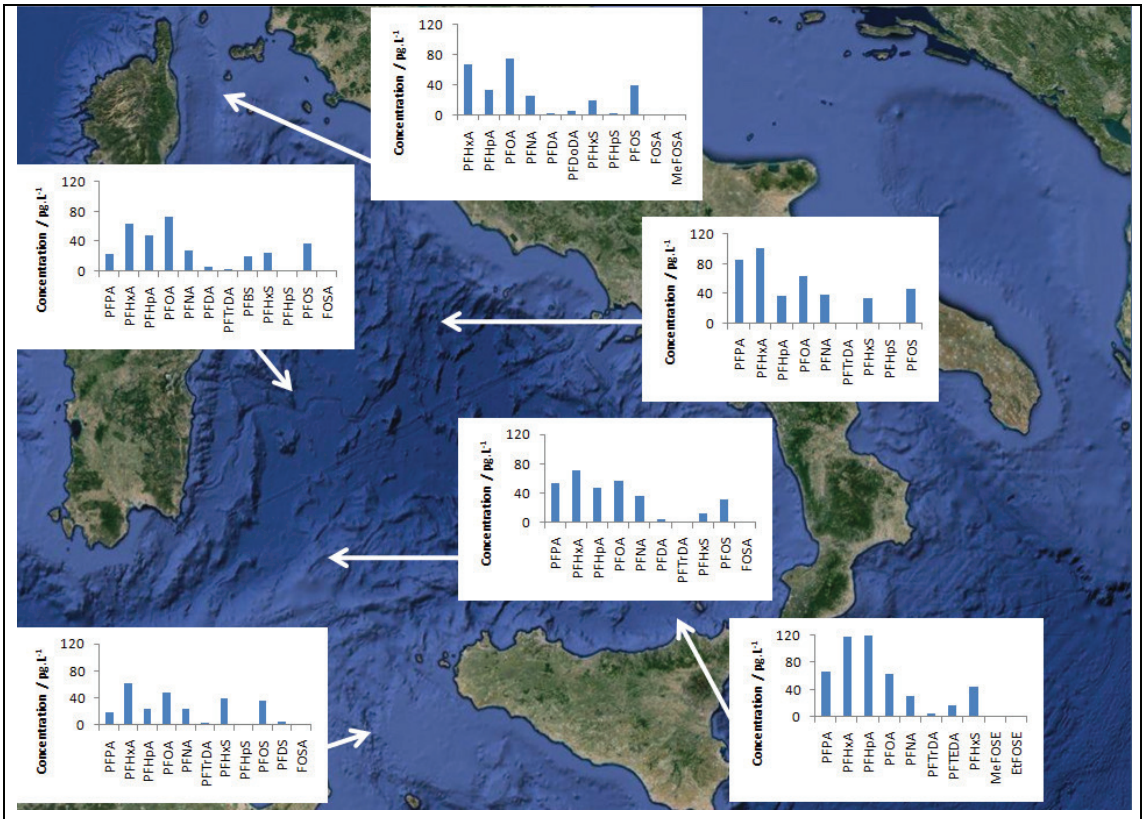

Figure 2 Preliminary data for perfluorinated compounds in surface water

Difficulties: In some situation, the automatic sampler used on board of the Lysbris failed to collect samples due to a mismatch between the set geographical coordinates for autonomous sampling and the actual route of the mobile infrastructure. It was difficult to predict the ship position with high accuracy. The captain often modified the route to take advantage of wind and stream conditions. This situation resulted in loosing 16 sampling events. Thanks to the support of the access provider we compensated by re-running the campaign 3 times and collect a sufficient number of samples.

We originally foresaw two short accesses to the Lysbris (spring and autumn). We opted to run only a single autumn campaign. We however repeated the sampling during three consecutive weeks. This change allowed us to focus better on our main objective: to provide a continental scale assessment of emerging contaminants in surface marine water. We could in fact repeat sampling from any given location and obtain larger amount of ewater to be analysed. This enables to expand the spectrum of analysed substances in our samples.

OBJECTIVE 2.

Achievements: A first deployment took place on April 2nd, 2014 in the Sicily channel. Five passive sampler cages containing each 3 silicon passive sampler sheets were deployed on mooring C1 at depths of 220, 260, 310, 360 and 400 metres. The exposure time predicted was 6 months.

Passive samplers are used to preconcentrating in-situ hydrophobic organic pollutants extracted from the water onto a simple flat stripe of silicon-based polymer. Individual silicone stripes are

held in a support called spider inside of a stainless steel cage.

Difficulties: During an extraordinary control of the mooring after 3 months form the deployment, the CNR staff reported that our stainless steel cages suffered severe corrosion and one cage was lost. We immediately opted for recovery in advance all our samples. The actual exposure time was of about 3 months, nearly half of the one originally set, which we believe to be a sufficient time to accumulate a detectable mass of the pollutants The samples were correctly handled by the CNR staff and shipped to RECETOX were they are being analysed. We do not have result yet form the chemical analysis . We foresee concentration data to be generated by the beginning of 2015.

This first attempt of using passive sampler cages in Mediterranean sea deep-water highlighted some technical problem with regard to the currently available materials for marine deployment. Based on what we learn from this experience we designed a totally new cage completely built in Titanium and **deployed during a second campaign in autumn**. A new set of two titanium cages with 3silicon rubber sheet each, is currently attached on the MPLS mooring and will be collected in April 2015.

Figure 3 Deployment of passive sampler cages on the MPLS.

D) Dissemination of the results (10)

We are still at the stage of gathering preliminary data from the chemical analysis.

These data will be the base for the PhD thesis of Miroslav Brumovsky (who physically accessed the infrastructure and run the sampling). We will expect to write 2 scientific papers and have them published during 2015.

E) Use of the Infrastructure/Installation [11]

	In situ	By remote	
		CNR MPL MPLS	**HZG COSYNA_1 (Lysbris ferrybox)**
Nr. of Users involved	1	3	3
Access units (days/months/etc)	day	day	day
In situ stay day / Remote Access duration	43	88	28

F) User project scientific field

Main field [12]	Earth Sciences & Environment, Chemistry
Scientific description [13]	Other – Environment, Chemistry

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

The data we have generated so far (namely, a dataset of perfluorinated compounds (PFCs) from the Mediterranean surface water, is the first survey of these emerging persistent organic pollutants from the Mediterranean sea. This is an important achievement since data of organic chemical contamination in this sea are generally rare.

It has to be recalled that these substances were found at ultra-trace levels in marine water (e.g. pg/L or sub pg/L). Several potential sources of contamination of blanks and samples during sample traveling and handling often result in invalidating entire sampling campaigns. Instead, we obtained clearly detectable levels of several priority substances after applying a very restrictive set of quality assurance criteria. The levels we detected were about 3 to 5 times higher than detection limits. This give total confidence on the quality of the measurements.We demonstrated here that JERICO infrastructures can be used to carry out such a difficult monitoring and we hope to further exploit this infrastructure for future needs.

Levels of PFCs in the Mediterranean sea surface water are in the range of data from open ocean monitoring, suggesting the peculiar characteristic of this sea (being a “close” sea) did not result in higher levels. The dominant compound groups were the perfluoro carboxilates (including the Perfluoropentaonic acid (PFPA), the Perfluorohexanoic acid, Perfluoroheptanoic acid (PFHpA), and the Perfluorooctanoic acid (PFOA)) , a perfluoroalkoxy alkane (N-methyl perfluorooctane sulfonamido ethanol (MeFOSE)) and its degradation product Perfluorooctanesulfonic acid (PFOS).

These substances are used in teflon polymers, films (e.g. scotch) and coatings.After evidences of their persistence and adverse inpacts on the environment some of them were recently included in the list of banned substances by the UNEP Stockholm convention.

Although we did not have results from the deployment of the passive samplers on the MPLS mooring, the difficulties encountered during the campaign drove to the devel,opment of new materials (titanium cages) which we will employ in future applications.

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