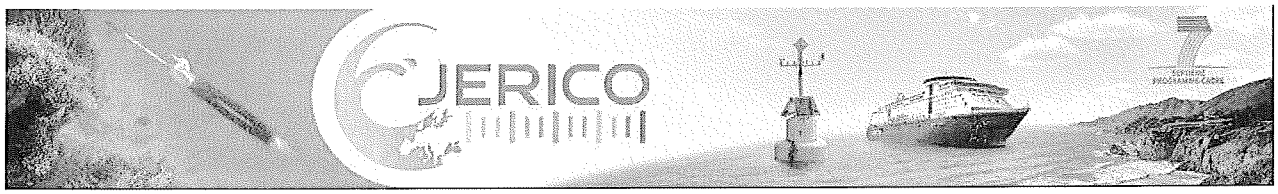
JERICO

Application for Transnational Access

to Coastal Observatories

National Research Council of Italy
Ifremer
Helmholtz-Zentrum Geesthacht
CSIC
National Oceanography Centre



Description of the project (to be provided in pdf format)
Please contact the manager of the infrastructure/installation you wish to use before writing the proposal

PART 1: User group details

Indicate if the proposal is submitted by

- O an individual
- ● a user group

Information about the applicants (PI and project partners)

Principal Investigator (user group leader)

Title **_Dr_** Name and Surname **___Ian Allan**_____

Gender ● Male O Female

Institution **____NIVA**_____

Department / Research Group _____

Address **_Gaustalleen 21, 0349 Oslo** _____

_____

Country **__Norway**_____

email ian.allan@niva.no _____

Telephone **____+47 98294122**_____

Fax **___+47 22185200**_____

Project partners
(repeat for each partner of the group)

Partner # 1

Title **__Mr_** Name and Surname _____**Philipp Knight**_____

Gender ● Male O Female

Institution **___ National Oceanography Centre**_____

Department / Research Group _____

Address **___ Joseph Proudman Building, 6, Brownlow Street, University of**

Liverpool Campus, Liverpool, L3 5DA

Country **United Kingdom**

email pjk@noc.ac.uk

Partner # 2

Title **Dr** Name and Surname **Branislav Vrana**

Gender ● Male O Female

Institution **RECETOX**

Department / Research Group

Address **Kamenice 126/3, 625 00 Brno**

Country **Czech Republic**

email vrana@recetox.muni.cz

PART 2: Additional information about the applicant(s) expertise

Expertise of the group in the domain of the application

This group includes Ian Allan and Branislav Vrana who together have close to 20 years of experience in the development and use of passive sampling devices for the monitoring of trace organic pollutants in in the environment.

Short CV of the PI

Ian Allan has been a research scientist at NIVA since 2008. After completing his PhD at the University of Reading in 2003, he was a postdoctoral fellow at the University of East Anglia (1 year) and the University of Portsmouth (3.5 years) where his work focussed on understanding and measuring the bioavailability of contaminants in environmental matrices such soils, sediments and water. A NIVA his work combines consultancy work and applied research with a strong passive sampling theme. He has authored over 20 NIVA reports for a range of industrial customers and national and regional regulatory authorities. He has also (co)-authored over 30 refereed scientific publications and 9 book chapters.

A list of 5 recent, relevant publications of the participant(s) in the field of the project

IJ Allan, HC Nilsson, I Tjersvoll, C Bradshaw & K Næs (2011) Mobile Passive Sampler: Concept for a novel exposure procedure, *Environmental Pollution*, Vol. 159 pp 2393-2397

IJ Allan & C Harman (2011) Global Aquatic Passive Sampling: Maximizing Available Resources using a novel exposure procedure, Viewpoint, *Environmental Science and Technology*, Vol. 45 (15) pp 6233-6234

B Vrana, GA Mills, **IJ Allan**, E Dominiak, K Svensson, J Knutsson, G Morrison, & R Greenwood (2005) Passive sampling techniques for monitoring of pollutants in water, *TrAC-Trends in Analytical Chemistry*, Vol. 24 (10) pp 845-868

IJ Allan, K Booij, A Paschke, **B Vrana**, GA Mills & R Greenwood (2009) Field performance of seven passive sampling devices for monitoring of hydrophobic substances. *Environmental Science and Technology*. Vol. 43 (14) pp 5383-5390

Passive sampling techniques in environmental monitoring. Comprehensive Analytical Chemistry, Vol. 48, eds. R. Greenwood, GA Mills and **B Vrana**, Wilson and Wilson's. 2007

PART 3: Detailed scientific description of the project

Main objectives of the proposed research

- *Evaluate the feasibility of combining glider technology and passive sampling technique to measure chemical contaminant concentrations at sites that are generally difficult to sample*
- *Estimate persistent organic pollutant concentrations in waters of the Celtic Sea based sampler-glider exposures*
- *Assess the representativeness of the data obtained through glider exposure of the passive samplers*

Background and rationale for the project

The measurement in the environment of trace levels of persistent organic pollutants such as those listed on the Stockholm Convention relies increasingly on the use of passive samplers. These are simple polymeric membranes that are capable of absorbing contaminants dissolved in water during exposure. With adequate calibration, it is possible to estimate dissolved contaminant concentrations for the period of exposure from the mass of contaminants absorbed in the sampler. Reasonable limits of detection are generally achieved by deploying samplers for periods of weeks to months on static rigs or moorings.

We have recently showed that mobile passive samplers towed through water (e.g. behind a boat or a trawl net) enabled significant increases in sampling rates (equivalent volume of water extracted by the sampler per unit of time) thereby allowing us to reduce exposure times drastically. Towing samplers through water also allows us to obtain spatially-resolved data rather than time-integrated concentrations.

Combining gliders and passive samplers would allow in the future the possibility to measure contaminant contaminants in environments that have never been monitored before, i.e. in terms of sampling depth and inaccessible locations.

The representativeness of data obtained from passive sampler exposures when attached to gliders can be done by using samplers with differing conformations (thickness) but made of the same polymer and/or by calibrating these mobile samplers by comparing them with static ones deployed in situ.

Passive sampling measurements do not need any electrical or mechanical power to function. Since the samplers may be deployed outside of the hull of the glider, the passive samplers would not interfere with other measurements to be undertaken during the glider flight.

Experimental method and work plan

This pilot or proof-of -concept test aims to assess the suitability of using gliders as a mode of exposure of passive sampling devices for the measurement of trace levels of nonpolar organic substances such as polycyclic aromatic hydrocarbons (PAHs) and polychlorinated biphenyls (PCBs). Depending on average speed and duration of the glider cruise, For these compounds, the concentration in the samplers is expected to reach a high degree of thermodynamic equilibrium with the concentration in the water. We will use samplers spiked with a range of performance reference compounds (PRCs) that will provide us with a means to estimate the sampling rate during exposure with the glider.

Based on discussions with NOC, one or more possibilities for the assessment of the representativeness of the data obtained with the mobile passive samplers will be selected. This can be done by (i) using samplers with different thicknesses (but same surface area), (ii) calibrating mobile samplers with similar samplers deployed on a mooring in the area of the glider test, and finally (iii) by repeating the experiment in the same location and comparing data.

The location of the test is relatively unimportant at this stage. A glider operating depth of 0-200m below surface is totally adequate. During a glider cruise of several days passive samplers are able to accumulate sufficient amount of target substances for their quantification even at locations with extremely low concentrations in seawater (low pg/L).

Programme of activities:

Phase 1. Sampler preparation (May 2012). This will be done in collaboration between NIVA and RECETOX with communication with NOC over the design of the samplers and the mode of attachment to the glider

Phase 2. Sampler/glider deployment (June 2012). Deployment of the glider with passive samplers attached (NIVA/NOC) in the Celtic sea. Train NOC in the use and deployment/retrieval of passive sampling devices.

Phase 3. Rig/mooring deployment (June 2012). For calibration purposes a set of passive samplers could be deployed at an adequate and easy to reach location in the vicinity of the glider test site for calibration of data obtained with the mobile samplers.

Phase 4. Sampler retrieval (June 2012). Samplers will be retrieved by NOC at the same time as the glider is recovered. Samplers can be sent by post to NIVA/RECETOX for analyses.

Phase 5. Repeat test (September 2012). If the June 2012 test proves successful, a second exposure in the Celtic Sea could be undertaken.

Indicate the type of access applied for

O remote	*(the measuring system is implemented by the operator of the installation and the presence of the user group is not required)*
● partially remote	*(the presence of the user group is required at some stage e.g. installing and un-installing)*
O in person/hands on	*(the presence of the user group is required/recommended during the whole access period)*

Indicate the proposed time schedule including expected duration of access time

Passive sampling devices will be installed on the gliders during some of the NOC glider deployments planned for June-September in the Celtic sea. Two glider deployments are planned for June 2012 and one later in September.

Host infrastructure

Indicate the type(s) of JERICO host facility(s) you are interested in
(Tick more than one if it is useful for your project)

O ferrybox O fixed platform ● glider O calibration laboratory

Indicate the specific JERICO host facility(ies) you wish to choose

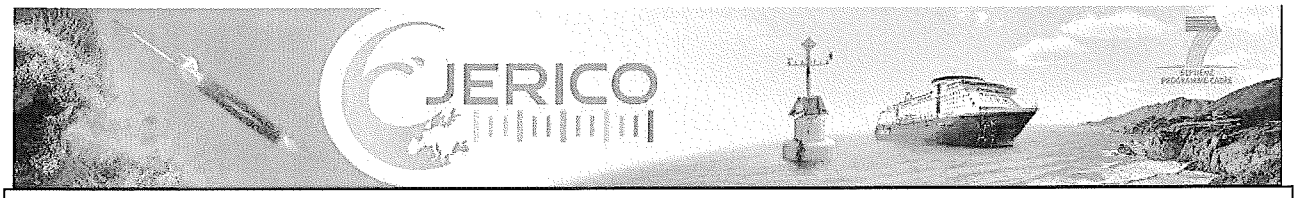
Glider facility at National Oceanography Centre (Liverpool, UK)

Explain briefly why you think your project will be best carried out at the specified host facility(ies)

The principal investigator (Ian) and the glider operator (Phil) at the NOC have been in touch discussing the possibility of combining glider and passive sampling technology.

If possible, list other JERICO facility(ies) where you think your experiment could alternatively be carried out

This pilot test could also be conducted using the other JERICO glider facilities



Additional information

Is there a facility similar to the one you wish to utilize in your country?

O Yes ● No

If yes, please indicate your reasons for requesting access to the JERICO facility you have chosen

Have you already submitted an Access Proposal to any of the participating facilities under this or previous EU Programs?

O Yes ● No

If yes, please indicate the name of the institution, submission date and reference number for each such proposal

Is this a resubmission of a previously rejected proposal? *(Select "yes" if this application is a revised version of a proposal submitted to JERICO before that was rejected by the Selection Panel)*

O Yes ● No

If yes, please give the exact reference number and submission date. Kindly describe briefly the changes made in comparison to the rejected version.

Is this a continuation of an earlier project funded under a previous call for Transnational Access in JERICO at the same facility?

O Yes ● No

If yes, please give the exact reference number and submission date. Kindly indicate also what has been achieved in the previous experiment and the reasons why the objectives have not been fully met.

PART 4: Technical information

Wherever possible, please specify your requests regarding the use of your chosen facility's equipment/instruments/sensors, including any additional services, data or other requirements.

System for fastening the passive sampling devices (polymer strips) to the glider. This can be simple and designed to minimise the impact of the samplers on the glider operation and will require discussion between NIVA/RECETOX and the glider operator (NOC).

List all material/equipment you plan to bring to the JERICO facility (if any):

Passive sampling devices. Fastening equipment.
If possible, a separate deployment on a mooring or rig in the area of the glider operation will require us to bring a second set of passive sampling devices and a deployment cage.

Please provide a detailed and realistic budget for the expenses you expect to incur for travel/boarding and the shipment of equipment, if applicable in your case *(note that a maximum of two travel grants will be assigned to each user group, depending on the length of the requested period of stay).*

Return trip Oslo-United Kingdom (+equipment)	*5000 NOK*
Hotel stay in UK for 2 nights	*2500 NOK*
Transportation in the UK	*1000 NOK*
Subsistence	*1000 NOK*
Total:	*9500 NOK (Eu 1500)*

Please tick the appropriate boxes and give detailed information for the kind of risks associated with your proposed activity

☐ Chemical :
☐ Biological :
☐ Radiological :
☐ Other :

Date of compilation **03/04/2012**

Signature of the PI Ian J. Allan

Signature of an appropriate authorised person
(e.g. Head of Department, Research Office) James D. Berg

This section reserved to the JERICO TNA Office

Date of proposal receipt by email

Assigned reference number

Signature of receiving officer