

JERICO-S3

Proposal for Transnational Access to Coastal Observatories

4th Call

20 October to 21 November 2022

Description of the project to be sent in pdf format to jerico.ta@marine.ie

Please consult access rules at <http://www.jerico-ri.eu> and contact the manager of the infrastructure/installation you wish to use before writing the proposal



PART 1

1. GENERAL INFORMATION

| | |
|--|-------------------------------------|
| Title of the project (255 characters max.) | Sardinia-Mallorca Repeated Transect |
| Acronym (20 characters max.) | SMART |
| Applying Institution | Consiglio Nazionale delle Ricerche |
| Host Institution | SOCIB |
| Host facility(ies) | SOCIB – Glider Facility |

| | | | | |
|--|--|------------------------------|--------------------------|-----------------------------|
| Have you or other members of your user group previously used the requested facility(ies)? | <input checked="" type="checkbox"/> | <input type="checkbox"/> Yes | <input type="checkbox"/> | <input type="checkbox"/> No |
| If yes, please indicate the EU Program(s), the name of the project(s) and year(s) you or other members of your user group have used such facility(ies) | Collaboration within the SOCIB TA framework since 2017 | | | |
| If you have received transnational access support from a previous JERICO project, please list resulting publications, conference contributions, patents. List only the ones that acknowledge the support of the European Commission and JERICO | | | | |



2. USER GROUP DETAILS

Indicate if the proposal is submitted by

☐ an individual

☒ a user group

Principal Investigator (user group leader)

| | | | | | |
|---------------------|--|--|-------------|-----|--|
| First and last name | JACOPO CHIGGIATO | | | | |
| Gender | <input checked="" type="checkbox"/> Male | <input type="checkbox"/> Female | Nationality | ITA | |
| Institution | Consiglio Nazionale delle Ricerche, Istituto di Scienze Marine | | | | |
| Address | Arsenale Tesa 103, Castello 2737/f | | | | |
| Country | ITALY | | | | |
| Email address | jacopo.chiggiato@cnr.it | | | | |
| Telephone | (+39) 041.2407.945 | | | | |
| Fax | | | | | |
| Previous user | <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No | | | |

User group members

Member # 1

| | | | | | |
|---------------------|--|--|-------------|-----|--|
| First and last name | Katrin Schroeder | | | | |
| Gender | <input type="checkbox"/> Male | <input checked="" type="checkbox"/> Female | Nationality | GER | |
| Institution | Consiglio Nazionale delle Ricerche, Istituto di Scienze Marine | | | | |
| Address | Arsenale Tesa 103, Castello 2737/f | | | | |
| Country | ITALY | | | | |
| Email address | katrin.schroeder@cnr.it | | | | |
| Telephone | (+39) 041.2407.946 | | | | |
| Fax | | | | | |
| Previous user | <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No | | | |

Member # 2

| | | | | | |
|---------------------|--|---------------------------------|-------------|-----|--|
| First and last name | Mireno Borghini | | | | |
| Gender | <input checked="" type="checkbox"/> Male | <input type="checkbox"/> Female | Nationality | ITA | |
| Institution | Consiglio Nazionale delle Ricerche, Istituto di Scienze Marine | | | | |





| | | | | |
|----------------------|--------------------------------------|-----|-------------------------------------|----|
| Address | Forte Santa Teresa 19032 Lerici (SP) | | | |
| Country | ITALY | | | |
| Email address | mireno.borghini@sp.ismar.cnr.it | | | |
| Telephone | | | | |
| Fax | | | | |
| Previous user | <input type="checkbox"/> | Yes | <input checked="" type="checkbox"/> | No |

Member # 3

| | | | | |
|----------------------------|--|------|-------------------------------------|--------|
| First and last name | Anna Vetrano | | | |
| Gender | <input type="checkbox"/> | Male | <input checked="" type="checkbox"/> | Female |
| Nationality | ITA | | | |
| Institution | Consiglio Nazionale delle Ricerche, Istituto di Scienze Marine | | | |
| Address | Forte Santa Teresa 19032 Lerici (SP) | | | |
| Country | ITALY | | | |
| Email address | anna.vetrano@cnr.it | | | |
| Telephone | (+39) 0187 1788917 | | | |
| Fax | | | | |
| Previous user | <input type="checkbox"/> | Yes | <input checked="" type="checkbox"/> | No |

(duplicate below for each member of the user group)



3. HOST INFRASTRUCTURE

Indicate the JERICO-S3 host facility(ies) offered in Chapter 1 (Observing systems) you are interested in

(Tick more than one boxes if it is useful for your project)

| | Short name | Requested access time (UA*) |
|--------------------------|---------------------|-----------------------------|
| <input type="checkbox"/> | Cabled observatory | |
| <input type="checkbox"/> | Ferrybox | |
| <input type="checkbox"/> | Fixed platform | |
| <input type="checkbox"/> | Fishing vessel | |
| <input type="checkbox"/> | Glider | Complementary Services 45 |
| <input type="checkbox"/> | Supporting facility | |
| <input type="checkbox"/> | Special equipment | |

*UA: please refer to the Infrastructure description in the JERICO-S3 website

Modality of access

| | | |
|-------------------------------------|--------------------|---|
| <input checked="" type="checkbox"/> | remote | <i>the measuring system is implemented by the operator of the installation and the presence of the user group is not required</i> |
| <input type="checkbox"/> | partially remote | <i>the presence of the user group is required at some stage e.g. installing and un-installing</i> |
| <input type="checkbox"/> | in person/hands on | <i>the presence of the user group is required/recommended during the whole access period</i> |

If you wish to avail also of a support facility from Chapter 2, please fill in the table below

| | Short name | Requested access time (UA*) |
|--------------------------|---|-----------------------------|
| <input type="checkbox"/> | Supporting facilities and specialized equipment | |

*UA: please refer to the Infrastructure description in the JERICO-S3 website

Modality of access

| | | |
|--------------------------|--------------------|---|
| <input type="checkbox"/> | remote | <i>the measuring system is implemented by the operator of the installation and the presence of the user group is not required</i> |
| <input type="checkbox"/> | partially remote | <i>the presence of the user group is required at some stage e.g. installing and un-installing</i> |
| <input type="checkbox"/> | in person/hands on | <i>the presence of the user group is required/recommended during the whole access period</i> |



| | |
|--|--|
| Explain briefly why you think your project will be best carried out at the specified host facility(ies) | |
| If possible, list other JERICO-S3 facility(ies) where you think your experiment could alternatively be carried out | |

| | | | | |
|--|--|-----|---|----|
| Is there a facility similar to one/all those you wish to utilize in your country? | | Yes | x | No |
| If yes, please indicate your reasons for requesting access to the JERICO-S3 facility(ies) you have chosen and also exist in your country | | | | |

4. REQUEST FOR A JERICO-S3 GRANT

(tick the box)

| | |
|-------------------------------------|---|
| <input checked="" type="checkbox"/> | Travel grant (*) |
| <input type="checkbox"/> | Shipment of your equipment, if applicable |

(*) travel, hotel and meals

Please provide a detailed and realistic budget for the expenses you expect to incur, including the number of people and days required. Explain clearly the role of each person for which a travel grant is requested.

Please note that a base amount of 6000 € has been set for each facility involved in a TA project. The effective grant assigned to a project will be considered case- by-case depending on the type of access, the types and number of facilities requested, the length of stay, and the costs in the visited country.

| |
|---|
| <ul style="list-style-type: none"> • Travel : 1, 500 euros, 1 technician < number, costs, persons' role > • Hotel : 7 nights, 560 euros, 1 technician < number, costs, persons' role > • Meals : 14 meals, 420 euros, 1 technician < number, costs, persons' role > • Shipment of equipment : none, as the glider will travel along with the technician <type of carrier, costs> <p>Total requested about 1480 euros</p> |
|---|



PART 2

Note: This part contains material for the evaluation

1. SCIENTIFIC EXCELLENCE OF USER GROUP (maximum score: 5)

Short biography of the PI

(half a page)

Jacopo Chiggiato: Laurea (M. Sc. equiv.) in Environmental Science (1998), University of Venice. Ph.D. in Numerical Modelling for Environmental Protection (2004), University of Bologna. Amongst several experiences after the Ph.D., he was Scientist at the NATO Undersea Research Centre (2009-2011). He is Research Scientist CNR-ISMAR since 2012 and member of the Advisory Board of the Institute (2016-2018 and 2019-now). Research interests are data analysis and numerical modelling in coastal meteorology and oceanography, air-sea interactions, atmosphere-ocean coupled systems, climate variability of regional oceans and R&D in operational oceanography. He authored and co-authored more than 60 papers in refereed International Journals JCR (google scholar profile: https://scholar.google.it/citations?user=5_A4NKEAAAAJ&hl=it) and participated to several sea trials in the Mediterranean. Associate Editor for the Journal of Operational Oceanography, Taylor and Francis Group, and Frontiers in Marine Science (Frontiers Media), Guest Editor for Marine Geology, Elsevier and Ocean Science, Copernicus. Scientific Achievement Award 2014, issued by the Science and Technology Organization of the NATO on research using underwater gliders. Member of the Steering Committee of the Boundary Ocean Observing Network (BOON) of the OCEANGLIDERS initiative.

Expertise of the user group in the domain of the application

(half a page)

The group is very active since many years on physical oceanography of the Mediterranean sea. We organized/participated to tens of oceanographic field cruises and have experiences of several platforms, e.g., moored instruments, drifters, shipborne instruments, gliders. Our scientific aims are related to dynamic processes influencing the water mass characteristics and distribution, interannual variability of the physical and biogeochemical properties of Mediterranean water masses, the propagation of perturbations from the eastern to the western Mediterranean and their influence on dense water formation processes via multiplatform data integration and numerical modelling.

A list of 5 recent, relevant publications of the user group in the field of the project

Testor et al., 2019. OceanGliders: A Component of the Integrated GOOS. Front. Mar. Sci. 6:422. doi: 10.3389/fmars.2019.00422

Tintorè et al., 2019. Challenges for Sustained Observing and Forecasting Systems in the Mediterranean Sea. Front. Mar. Sci. 6:568. doi: 10.3389/fmars.2019.00568

Schroeder, K. et al. 2017. "Rapid Response to Climate Change in a Marginal Sea." Scientific Reports 7(1).

Schroeder, K., Chiggiato, J., Bryden, H. L., Borghini, M., Ben Ismail, S. (2016) Abrupt climate shift in the Western Mediterranean Sea Scientific Reports 6 Article Number: 23009;



Alvarez, A., Chiggiato, J., Schroeder, K. (2013) Mapping sub-surface geostrophic currents from altimetry and a fleet of gliders Deep-Sea Research Part I: Oceanographic Research Papers, 74: 115-129.

2. SCIENTIFIC AND TECHNICAL VALUE OF THE PROJECT (maximum score: 5)

Description of the project

Main objectives

(half a page)

Following the successful collaboration between CNR-ISMAR and SOCIB in 2017, 2018, 2020 and 2022, with several SMART missions completed, we plan to continue in order to sustain a long-term repeated transect Mallorca-Sardinia to monitor medium-to-long-term variability of surface and intermediate water masses. The transect is now officially included in the OceanGliders program (see Testor et al., 2019 above) and meant to be sustained over years. Investigation of turbulence structures in the WEST MED by means of a microstructure profiler (MicroRider) mounted on the glider. The glider will also be able to reach the transitional layer between intermediate and deep water, which is subject to the effects of the WMT and where thermohaline staircase are likely to form. These features are of special interest when observed with a microstructure profiler. In past missions several technical issues with the microrider prevented to collect data and upcoming missions will allow for collecting microstructure data.

Scientific background and rationale

(one page)

The Mediterranean Sea has been identified as a hot spot for climatic change, i.e., a region most impacted by ongoing warming trend and increase in extreme events. What makes the Mediterranean Sea very useful for climate change research is that it behaves like a miniature ocean (Berthoux, 1999, Schroeder et al., 2012) with a well-defined overturning circulation and time scale much shorter than for the global ocean, with a turnover of only several decades. Change can happen fast, on the time scale of a human lifetime. The Mediterranean is therefore a potential model for global patterns that will be experienced in the next decades worldwide not only regarding ocean circulation, but for the marine biota as well (Lejeusne et al., 2010). The Mediterranean Sea provides a laboratory-type environment for documenting changes within it and for understanding the role of key processes involved making inferences on processes occurring also at the global scale. Evidence of warming trend in the region has been already documented by the scientific community, in particular for the surface layer (Berthoux et al. 1990) as well as deep layer (Rixen et al., 2005). In addition to long-term trends, Schroeder et al (Sci. Rep., 2016) reported an abrupt shift in terms of temperature, salinity and density in the deep Western Mediterranean. This shift, originally called "Western Mediterranean Transition", is actually moving the basic physical properties of the Western Mediterranean from an old equilibrium to a new, different, one. The warming and salinification, with faster increase than in the past, is also present in the intermediate waters, with signals coming from the eastern Mediterranean that are now propagating into the western Mediterranean (Schroeder et al, Sci. Rep. 2017). The transect is now included in the OceanGlider initiative (Testor et al., 2019) belonging to the Boundary Ocean Observing Network (BOON).



3. QUALITY OF THE WORK PLAN

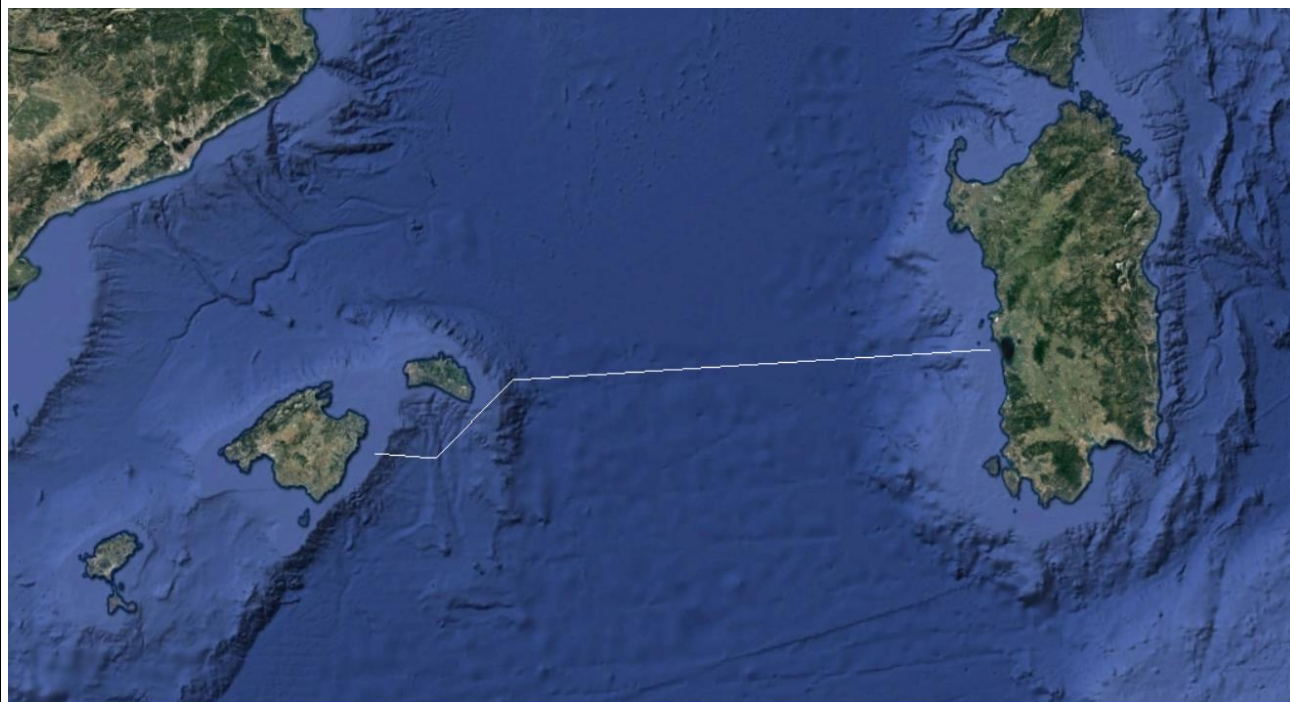
(maximum score: 5)

Experimental method and work plan

*Describe below the proposed method and work plan for the project. Please note, **all proposed projects must be scheduled to complete the experiment by September 2023 with the final report submitted no later than October 2023.***

(one page)

Two-way mission along the transect Sardinia-Mallorca, with deployment and recovery by SOCIB in Spanish waters. The glider will perform dives down to 1000m collecting CTD and microstructures data. Piloting will be done by CNR-ISMAR, with expert check by SOCIB. Resulting CTD data will be processed and quality controlled by SOCIB and eventually released to the community via open data servers



Proposed time schedule

Provide below a clear schedule for your project including interruption, restarts and expected duration of access time

(half a page)

April 2023: deployment offshore Palma
April/May 2023: glider mission to Oristano and way back
May 2023: recovery offshore Palma (total 45 days)





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

We provide the glider (1000m) with standard CTD and equipped with a microrider.

It is requested only:

- Deployment and Recovery of the glider by SOCIB
- Support of SOCIB personnel during missions (co-piloting, CNR to manage and lead the glider piloting, SOCIB to provide support and back-up on-mission and in pre-mission preparation of mission scripts, liaison on way points for glider recovery and launch)
- Real Time and Delayed Mode (full dataset) data processing of the glider data using the SOCIB operational system, mission visible in DAPP and data available in THREDDS and delivery to OCEANGLIDER repository

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

- Glider equipped with Lithium batteries (Teledyne, 11 V)
- Glider equipped with Rockland's microrider

Other scientific sensors: CTD



Risks, contingencies and mitigation measures

Describe below the potential risks and contingencies that might occur during the project and how do you plan to avoid, mitigate or resolve them

| # | Risk / Contingency | Prevention / Mitigation / Corrective action |
|---|---------------------------------|--|
| 1 | Risk of ship collision | Avoid the most intense traffic lines of cruisers |
| 2 | Risk of instrument loss | Expert piloting |
| 3 | Bad weather conditions | Careful check of weather forecasts and subsequent real time adjustments to the mission if needed |
| 4 | Risks due to fishing activities | Avoid intensively exploited fishing grounds. Consider to reduce the number of surfacing |
| | | |
| | | |
| | | |



4. POTENTIAL FOR SEEDING LINKS WITH INDUSTRY

(maximum score: 5)

Do you think that this proposal has potential for seeding links with Industry? If so, how?

(half page)

Ocean observation serves to enable us to better understand ocean functions and to meet the societal needs related to these activities (coastal protection, tourism, search and rescue, defense and security, shipping, aquaculture and fisheries, offshore industry and marine renewable energy). More in general, the oil and gas industry, like sea mining, are quite interested in quantifying the environmental impact of certain activities and gliders contribute to allow this to be assessed.

Over the years we have been collaborating with Rockland Scientific International Inc., to refine the way the Microrider was acquiring data on turbulence. At the beginning of our collaboration, there were no possibility to real-time check the functioning of the Microrider during missions. Now this functionality has been implemented by the new firmware, thanks also to our feedbacks. The last mission we have done, was planned in tight collaboration with them, and is providing them the longest Microrider record ever.

5. EUROPEAN RELEVANCE AND INTERESTS FOR THE SCIENTIFIC COMMUNITY

(maximum score: 5)

Describe the relevance of your proposal at the European level and the potential interests for the research community

(half page)

This activity is carried out in the framework of the Mediterranean Operational Network for the Global Ocean Observing System – MonGOOS (<https://mongoos.eurogoos.eu/>) and effectively part of a (building-up) long-term operational observing system of the European waters.

This glider mission is also part of the OceanGliders Program, glider component of the Global Ocean Observing System (<https://www.goosocean.org/>) Data from the missions are open and downloadable by any interested scientist through SOCIB data server, as well as from the OceanGliders website.



GDPR Consent:

Personal data : I hereby understand that the JERICO-S3 project - through the Marine Institute, acting as the Work Package Leader for TransNational Access has needed to collect some of my personal information and data for the means of processing my application for Funding under the Jerico S3 project TransNational Access funding call.

Application processing: The Marine Institute will gather and securely store your data. Access will be restricted to required personnel as well as selected qualified external evaluators who will determine successful applicants. Data will be stored on Marine Institute servers onsite at the Marine Institute, Rinville, Oranmore, Galway, Ireland for the duration of this project which should last 4 years. The data will be deleted thereafter. Your data will not be used for any other purpose without your consent.

1. Privacy Policy: *JERICO-S3 is the data controller pursuant to article 28 of the EU GDPR (EU 2016/679), – Ifremer Brest Centre, CS 10070 29280 Plouzané France, the Project Coordinator is Laurent DELAUNEY. MAIL Jerico-S3@ifremer.fr JERICO-S3: If you change your mind at any time, you can unsubscribe by contacting us at mailto: Jerico-S3@ifremer.fr. We will treat your information with respect.*
2. *TYPES OF DATA PROCESSED Personal and identification data - Personal data, any information relating to an individual, identified or identifiable, even indirectly, through reference to another piece of information, including a number of personal identification; Identifying data, personal data that includes the direct information of the interested party (such for example name, surname, e-mail address, address, number of telephone, etc ...). Defence in court - The User's Personal Data may be used for defence purposes on the part of the Owner in court or in the preparatory phases to his possible establishment, from abuse in the use of the same or the connected services by the User.*

Date of compilation _____ 14/11/2022 _____

Signature of the PI



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





This section is reserved to the JERICO-S3 TA Office

Date of proposal receipt by email _____

Assigned reference number _____

Signature of receiving officer _____