Joint European Research Infrastructure network for Coastal Observatories

D8.1 Trans National Access Provision

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Coordination: P. Farcy, IFREMER,

jerico@ifremer.fr, www.jerico-fp7.eu:

Author: Stefania Sparnocchia and Virna Meccia
Involved Institution: CNR
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1. Document description

REFERENCES

Annex 1 to the Contract Description of Work (DoW) version of the 22 Feb. 2011

Document information	
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Diffusion list				
Consortium beneficiaries	X			
Third parties				
Associated Partners				
other				

2. Executive Summary

During its lifetime JERICO offered Transnational Access to a number of unique European Coastal Observatories and Calibration Facilities for international research and technology development.

Access to selected JERICO infrastructures was provided following three open Calls. Selection of user projects was made by a Selection Panel formed by independent experts. The schedule of the Calls, the procedures adopted for selection of user projects and their implementation are described in D1.10 (Second report of access activities).

This report integrates D1.10 with a summary of the Trans National Access provided by facility operators involved in the activities.

3. Objective

The primary objective of the JERICO Transnational Access (TNA) activity was to enable scientists and engineers to freely access coastal infrastructures not available in their own countries. The JERICO Consortium includes research structures such as Ferryboxes, Fixed Platforms, Gliders, and associated support facilities, i.e. Calibration Laboratories.

Access to these facilities will contribute to

- build a long-term collaboration between users and JERICO partners, facilitating staff exchange and scientific cooperation;
- build an European facility for science dedicated to innovation (new sensors, new automated platforms), open to Europe and also to countries of common regional interest (South Mediterranean, Black Sea, Baltic Sea);
- promote the infrastructure by transferring know-how from the partners to users, with a view to future expansion that will include new partners (possibly also from non-European countries).

JERICO has organized three Calls for proposals requesting Transnational Access to targeted facilities. Visiting scientists and technical personnel working on approved projects have been provided assisted access to relevant facilities by their operators.

4. Accessible facilities

Facilities participating to the TNA program form four categories: ferryboxes, fixed platforms, gliders, and associated support facilities, i.e. calibration laboratories.

In the original working plan (ref. JERICO DoW, Version date: 2011-03-16), the Consortium planned to make available to the TNA activity nineteen facilities. Afterwards, five of them became unavailable because of emerged problems in their operation. Consequently only the fourteen facilities listed in Table 1 were offered to users (Ref. JERICO DoW, Version date: 2014-03-24).

A detailed description of these facilities is reported in the Annex.

Facility ID	Facility Provider	Unit of access	Contact
Ferryboxes			
COSYNA_1 (FB)	HZG (Germany)	day (24h)	Wilhelm Petersen, wilhelm.petersen@hzg.de
Colour Fantasy	NIVA (Norway)	day (24h)	Kai Sorensen, kas@niva.no
Fixed Platforms			
ACQUA ALTA	CNR (Italy)	day (24h)	Mauro Bastianini, mauro.bastianini@ve.ismar.cnr.it
MPLS	CNR (Italy)	6 months	Mireno Borghini, mireno.borghini@sp.ismar.cnr.it
MPLC	CNR (Italy)	6 months	Mireno Borghini, mireno.borghini@sp.ismar.cnr.it
MPL Genoa	CNR (Italy)	day (24h)	Pierluigi Traverso, pierluigi.traverso@ge.ismar.cnr.it
POSEIDON BUOYS	HCMR (Greece)	1 buoy for 1 month	Leonidas Perivoliotis, lperiv@hcmr.gr
COSYNA_2 (PILE)	HZG (Germany)	day (24h)	Götz Flöser, goetz.floeser@hzg.de
Gliders			
COBS 4 POL/MARS gliders	NERC (UK)	day (24h)	David White, dwh@noc.ac.uk
COSYNA_3 (GLIDER)	HZG (Germany)	day (24h)	Lucas Merckelbach, lucas.merckelbach@hzg.de
CSIC-Glider	CSIC (Spain)	day (24h)	Simon Ruiz, simon.ruiz@uib.es
CETSM	INSU/CNRS (France)	day (24h)	Pierre Testor, testor@locean-ipsl.upmc.fr
Calibration laboratories			
OGS-CTO	OGS (Italy)	week (5 days)	Rajesh Nair, rnair@ogs.trieste.it
POSEIDON CAL	HCMR (Greece)	week (5 days)	George Petihakis, pet@her.hcmr.gr

Table 1 – Facilities participating to the JERICO TNA program.

5. Access provision

Nineteen out of twenty-four proposals submitted to the three Calls were evaluated and selected by the Selection Panel. Related projects (Table 2) have received support by JERICO. The operators of the targeted facilities (Fig.1) have contributed to these projects by providing all the logistical, technological and scientific support as well as specific training, when needed.

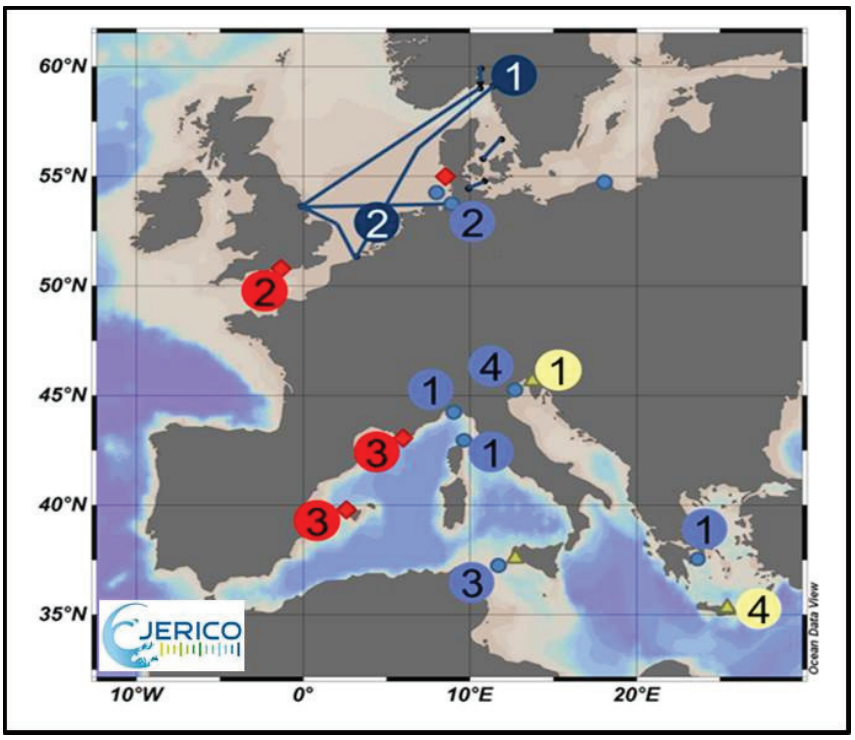


Fig. 1 JERICO facilities targeted by user's proposals: blue lines identify routes of ships carrying ferrybox systems, red circles identify glider land stations, blue circles identify fixed station positions and yellow circles identify calibration laboratories. Numbers inside the circles indicate the number of proposals submitted for the related facility.

Table 3 reports the access time delivered by facilities participating in TNA activity. Converting the delivered access time (5th column of Table 3) from UA to days, the total delivered access corresponds to 2670 calendar days. In the table, the amount of access charged to JERICO and the percentage of unit cost charged to JERICO account for the number of user groups that accessed the facility at the same time. Gliders and calibration laboratories were at exclusive disposition of users, so the amount of access charged to JERICO is 100%.

Org. Short name	Country	Installation	TNA User Project Acronym and Title	Start date	End date
NIVA	Norway	Color Fantasy	o-DGTSPOCME - Organic – Diffusive Gradient in Thin-film for sampling polar organic chemicals in marine environment.	16/09/2013	03/11/2013
OGS	Italy	OGS-CTO	RTC - Reference Temperature Calibration.	25/02/2013	01/03/2013
CNR	Italy	ACQUA ALTA	MAPOM - Marine Aerosols Properties Over the Mediterranean.	05/05/2014	26/09/2014
		ACQUA ALTA	RAD - Radiometry Assessment of optical Data for ocean color applications.	12/03/2014	27/06/2014
		MPLS	METRO - MEditerranean sediment TRap Observatory.	18/10/2013	08/11/2014
		MPLS	ECCECs - Emerging Chemical Contaminants in European Coasts.	02/04/2014	28/06/2014
		MPLS	MOSC - Monitoring oxygen in the Sicily Channel.	02/04/2014	08/11/2014
		MPLC	OXY-COR - Integration of dissolved oxygen concentration measurements in the long term time series data in the Corsica Channel.	20/11/2012	25/11/2014
		MPL Genoa	SESAM - Standardised Electrochemical in Situ Assessment of Metal coatings.	01/07/2013	12/12/2014
HCMR	Greece	POSEIDON BUOYS (1&2)	MEDACID - Mediterranean Sea ocean acidification time series experiment.	04/03/2013	15/10/2014
		POSEIDON CAL			
		POSEIDON CAL	TOFU - New Tools for Oxygen, Fluorescence and tUrbidity sensors testing and intercomparison.	19/07/2014	02/08/2014
		POSEIDON CAL	CIEBIO - Calibration and inter-calibration exercise of bio-geochemical sensors.	26/11/2012	30/11/2012

Table 2 – Facilities targeted by user projects. Start and end dates refer to beginning and completion of user' project, including preliminary work before access provision.

Org. Short name	Country	Installation	TNA User Project Acronym and Title	Start date	End date
NERC	United Kingdom	COBS 4 POL/MARS GLIDERS	GLISS – Passive sampling and glider technologies for depth-integrated contaminant concentrations in the ocean.	02/09/ 2013	21/10/2013
HZG	Germany	COSYNA_1 (FB)	ECCECs - Emerging Chemical Contaminants in European Coasts.	30/09/2014	27/10/2014
		COSYNA_1 (FB)	FITO MicroLFA - Field Test Of MicroLFA nutrients monitoring device for Ferrybox systems.	16/07/2014	25/09/2014
		COSYNA_2 (PILE)	o-DGTSPOCME - Organic – Diffusive Gradient in Thin-film for sampling polar organic chemicals in marine environment.	19/09/2013	29/10/2013
		COSYNA_2 (PILE)	FITO MicroLFA - Field Test Of MicroLFA nutrients monitoring device for Ferrybox systems.	09/05/2014	04/07/2014
CSIC	Spain	CSIC-Glider	ABACUS - Algerian BAsin Circulation Unmanned Survey.	01/09/2014	19/12/2014
		CSIC-Glider	FRIPP - FRontal dynamics Influencing Phytoplankton Production and distribution during DCM period.	25/05/2014	30/05/2014
		CSIC-Glider	GABS - Deep Glider Acquisitions between Balears and Sardinia.	23/10/2012	29/11/2013
INSU	France	CETSM	MUSICS - Multi Sensor Investigation in the Channel of Sardinia.	15/08/2014	23/09/2014
			GESEBB - Glider campaign to estimate the 3D structure of an Eddy in the South-eastern Bay of Biscay.	23/07/2013	24/09/2013

Table 2 – Facilities targeted by user projects. Start and end dates refer to beginning and completion of user' project, including preliminary work before access provision.

Org. Short name	Country	Installation	Unit of access (UA)	Delivered access time (UA units)	Amount charged to JERICO	Percentage of unit cost charged to JERICO
NIVA	Norway	Color Fantasy	24 HOUR DAY	49	24.5	50%
OGS	Italy	OGS-CTO	WEEK OF 5 DAYS OF 8 HOURS	1	1	100%
CNR	Italy	ACQUA ALTA	24 HOUR DAY	177	88.5	50%
		MPLS	6 MONTHS	2.12	1.30	61%
		MPLC	6 MONTHS	4	2	50%
		MPL Genoa	24 HOUR DAY	418	209	50%
HCMR	Greece	POSEIDON BUOYS (1&2)	1 BUOY FOR 1 MONTH	10.7	5.35	50%
		POSEIDON CAL	WEEK OF 5 DAYS OF 8 HOURS	6	6	100%
NERC	United Kingdom	COBS 4 POL/MARS GLIDERS	24 HOUR DAY	42	42	100%
HZG	Germany	COSYNA_1 (FB)	24 HOUR DAY	100	50	50%
		COSYNA_2 (PILE)	24 HOUR DAY	146	73	50%
		COSYNA_3 (GLIDER)	24 HOUR DAY	-	-	-
CSIC	Spain	CSIC-Glider	24 HOUR DAY	171	171	100%
INSU	France	CETSM	24 HOUR DAY	104	104	100%

Table 3 – Access time delivered by facilities participating in TNA activity (5th column expressed in the units indicated in the 4th column).The access time is calculated as calendar days/months from the start to the end of the access. The amount of access charged to JERICO and the percentage of unit cost charged to JERICO account for the number of users that accessed the facility at the same time.

Fixed platforms and ferryboxes generally hosted at least two users at the same time: the JERICO user and the facility operator. This reflects in half-time of access and 50% of unit cost charged to JERICO. An exception happened for MPLS, which in the period from 18 October 2013 to 8 November 2014 hosted three JERICO projects in addition to the regular user, CNR. The amounts reported in column 6 and 7 have been calculated considering the shared periods. .

Conclusion

JERICO established concepts and procedures for the transnational access to coastal observatories. In general, a set of distributed infrastructures and facilities aimed at in-situ observation of the coastal oceans. Coastal observatories are quite complex, including different types of observing systems (e.g. ferryboxes, fixed platforms, gliders, among others) and supporting facilities (e.g. calibration laboratories), and offered a challenge to JERICO to define a general scheme helpful for sharing the existing resources with a wide user community.

Thirteen facilities hosted JERICO user groups during the project life-time, delivering 2670 calendar days of access. This is an important result, which demonstrates the interest of the community involved, also outside the Consortium.

Moreover, the activities developed in the framework of the TNA program in JERICO are helping to build long-term collaborations between users and access providers, and are serving to promote innovation and the transfer of know-how in the marine sector. Besides extending the influence of the networked coastal infrastructures beyond national borders, the outcomes of the TNA calls evidence the major existing client communities and their scientific and technological needs. Moreover, TNA highlights the services amongst those offered that are the most in demand at the present time. This information can help to set priorities for future developments of the network, but it should also pave the way for services and marketing strategies to attract new user communities.

The JERICO TNA program will be improved and consolidated in the newly awarded H2020 project, JERICO-NEXT, widening the offer of observing infrastructure to target more users (novel observing technologies and different monitored environments, including physical, chemical and biological components).

Annex

Infrastructure (short name)	Coastal Observation System for Northern and Arctic Seas (COSYNA)
Installation (short name)	FerryBox (COSYNA_1 FB)
Location	North Sea
Routes	**Selandia Seaways**: Cuxhaven <-> Immingham **LysBris**: Halden -> Zeebrugge -> Immingham -> Moss -> Halden **FunnyGirl**: Summer: Buesum <-> Helgoland; Winter: Cuxhaven <-> Helgoland

Legal name of organization	Helmholtz-Zentrum Geesthacht, Institute of Coastal Research
Location of organization	Geesthacht, Germany
Contact	Dr. Wilhelm Petersen (wilhelm.petersen@hzg.de)
Web site address	http://www.cosyna.de and http://www.ferrybox.de

Description

COSYNA (Coastal Observation System for Northern and Arctic Seas) is an operational coastal monitoring, forecasting and information system for the North Sea. It is being developed by institutes of the German Marine Research Consortium (KDM) and collaborating institutions and is operated by the HZG Research Centre. The infrastructure represents an investment of 9 M €. It is build up in two phases over 6 years:

COSYNA_1 (FB) is based on 3 FerryBox lines. The FerryBoxes are equipped with hydrographical sensors to measure temperature, salinity, oxygen, chlorophyll-a fluorescence, turbidity, pH and nutrients (partly). The three FerryBoxes are installed on three ships on different routes. The Selandia Seaways is an Ro/Ro-Ship and cruises from Cuxhaven (Germany) to Immingham in England towards and back in three days.

The cargo ship Lysbris cruises in a circle from Halden (NO) Cuxhaven (DE) – Zeebrugge (BE) – Immingham (GB) – Moss (NO) –and back to Halden on a weekly basis. The passenger ferry Funnygirl cruises on different routes dependent on season. In summer it departs from Buesum (DE) and in winter from Cuxhaven (DE). The destination is always the island Helgoland. The ship drives toward and back on a daily basis in summer and 3 times per week in winter.

Service offered

HZG will give access to three ferryboxes. The access will consist in hosting visitors for

experiments onboard the ships and also for installation of users' equipment on FerryBoxes.

The support team consists of technicians and scientists who prepare the instrumentation and service the instrumented ferry.

Instruments/Sensors

The following instrumentation is already onboard the ferry and will be available to the JERICO users

Selandia Seaways

Instrument	Measured Parameter(s)	Elevation/Depth	Sampling frequency	Transmission frequency
ETSG 2 - M, Falmouth Scientific	Temperature	**5 m water depth**	**10 sec.**	**2 times in 3 days**
ETSF2-M, Falmouth Scientific	Conductivity	**5 m water depth**	**10 sec.**	**2 times in 3 days**
ETSF2-M, Falmouth Scientific	Salinity	**5 m water depth**	**10 sec.**	**2 times in 3 days**
SCUFA-II, Turner Designs	Turbidity	**5 m water depth**	**10 sec.**	**2 times in 3 days**
SCUFA-II Turner Designs	Chlorophyll-a fluorescence	**5 m water depth**	**10 sec.**	**2 times in 3 days**
Algae-Online-Analyser, bbe moldaenke	Chlorophyll-a fluorescence	**5 m water depth**	**10 sec.**	**2 times in 3 days**
Oxygen optode 4330, Aandera	diss. oxygen	**5 m water depth**	**10 sec.**	**2 times in 3 days**
EGA140 SMEK, Sensortechnik Meinsberg	pH	**5 m water depth**	**10 sec.**	**2 times in 3 days**
µMac 1000, Systea	Ammonium, Nitrate, Phosphate, Silicate	**5 m water depth**	**20 min.**	**2 times in 3 days**

Lysbris

Instrument	Measured Parameter(s)	Elevation/Depth	Sampling frequency	Transmission frequency
ETSG 2 - M, Falmouth Scientific	Temperature	**5 m water depth**	**20 sec.**	**weekly**
ETSF2-M, Falmouth Scientific	Salinity	**5 m water depth**	**20 sec.**	**weekly**
ETSF2-M, Falmouth Scientific	Conductivity	**5 m water depth**	**20 sec.**	**weekly**
SCUFA, Turner Designs	Turbidity	**5 m water depth**	**20 sec.**	**weekly**
SCUFA, Turner Designs	Chlorophyll-a fluorescence	**5 m water depth**	**20 sec.**	**weekly**
Algae-Online-Analyser, bbe moldaenke	Chlorophyll-a fluorescencel	**5 m water depth**	**20 sec.**	**weekly**
Algae-Online-Analyser, bbe moldaenke	Yellow substance	**5 m water depth**	**20 sec.**	**weekly**
Oxygen optode 4330, Aandera	diss. oxygen	**5 m water depth**	**20 sec.**	**weekly**
CPS11, Endress + Hauser	pH	**5 m water depth**	**20 sec.**	**weekly**
EGA140 SMEK, Sensortechnik Meinsberg	pH	**5 m water depth**	**20 sec.**	**weekly**
µMac 1000, Systea	Ammonium, Nitrate, Phosphate, Silicate	**5 m water depth**	**20 min.**	**weekly**

Funny Girl

Instrument	Measured Parameter(s)	Elevation/Depth	Sampling frequency	Transmission frequency
ETSG 2 - M, Falmouth Scientific	Temperature	**5 m water depth**	**60 sec.**	**2 per day**
ETSF2-M, Falmouth Scientific	Conductivity	**5 m water depth**	**60 sec.**	**2 per day**
ETSF2-M, Falmouth Scientific	Salinity	**5 m water depth**	**60 sec.**	**2 per day**
SCUFA, Turner Designs	Turbidity	**5 m water depth**	**60 sec.**	**2 per day**
SCUFA, Turner Designs	Chlorophyll-a fluorescence	**5 m water depth**	**60 sec.**	**2 per day**
Cyclops-7_U, Turner Designs	CDOM	**5 m water depth**	**60 sec.**	**2 per day**
Oxygen optode 4330, Aandera	Oxygen	**5 m water depth**	**60 sec.**	**2 per day**
EGA140 SMEK, Sensortechnik Meinsberg	pH	**5 m water depth**	**60 sec.**	**2 per day**
EGA140 SMEK, Sensortechnik Meinsberg	pH	**5 m water depth**	**60 sec.**	**2 per day**

Additional services/data

Other activities within the observatory COSYNA are linked to the pile and glider activities.

Special owner rules

none

Infrastructure (short name)	Norwegian Ferrybox Network (NorFerry)	
Installation (short name)	M/S Color Fantasy	
Location	Oslo fjord, Skagerrak, Kattegat, and Kiel bight.	
Route	Oslo –Kiel	
Legal name of organization	Norsk Institutt for Vannforskning, NIVA	
Location of organization	Oslo, Norway	
Contact	Kai Sørensen, kas@niva.no NIVA, Gaustadalléen 21, NO-0349 OSLO Direct/Mobile: + 47 90732129 Telephone: + 47 22185100 Fax: + 47 22185200	
Web site address	www.ferrybox.no	

Description

The Norwegian Ferrybox network (NorFerry) consists of three ships operated by the Norwegian Institute for Water Research (NIVA). Together, these vessels cover 80% of the Norwegian coast.

M/S Color Fantasy is operated by Color Line and is the world's largest cruise ship with a car deck. The ship cruises between Oslo (Norway) and Kiel (Germany) in the Oslo fjord, Eastern Skagerrak, Kattegat and Baltic Sea entrance regions. One return trip lasts for about 44 hours.

The Ferrybox core installations include the following sensors: thermosalinograph, inlet temperature, AADI oxygen, Polymetron turbidity sensor and TriOS Chl-a fluorescence. M/S Color Fantasy is equipped in addition with TriOS yellow substance, TriOS cyanobacteria fluorescence, and TRIOS hydrocarbon sensors. NIVA is also involved in the development of a new type of pCO2 sensor with Franatech for integration on the same ferrybox platform during the first part of 2013. Also one photometric pH system will be installed in early 2013. A system for automatic extraction and pre-concentration unit of chemical compounds in water was installed in the end of 2012. An automatic water sampler of 24*1 liter is also installed. Finally, TriOS radiance and irradiance sensors are mounted on deck for the measurements of solar irradiance, sky and water-leaving radiance.

Service offered

Users are invited onboard for one or repeated periods of trips (days to weeks, for installation and testing of new sensors (contaminants, carbon cycle, acidification, algae discrimination), inter-calibration of sensors, as well as testing of new monitoring approaches, taking advantage of the high-frequency 2D sampling of the infrastructure.

We invite in particular (but not only) researchers interested in investigating methods for vertical profiling from ferries (e.g. XBT/XCTD experts) to apply for accessing the infrastructure and take part in gathering a unique dataset of simultaneous Ferrybox and underway profiles.

Access to the ferry requires that NIVA personnel, both scientific and technical, are on-board with

the guest scientists. Personnel from NIVA will be in charge of the integration of guest's sensors into the NIVA's Ferrybox system. Inter-calibration, data acquisition and other experiments will preferably be jointly made by NIVA and guest users.

The access to the ship is simple and can be done both in Oslo and Kiel. One can bring the equipment with own car onboard the ship and there are easy access to the installation. A small laboratory bench with warm and cold water, refrigerator and freezers are available as well as tools for repair of instruments e.g. there are also internet access by the system. The accommodation onboard is excellent with good capacity.

Instruments/Sensors

The following instrumentation is already onboard the ferry and will be available to the JERICO users

Instrument	Measured Parameter(s)	Elevation/Depth	Sampling frequency	Transmission frequency
SBE45	Temperature	4m depth	1 minute under normal conditions. Can be increased up to 10s for a short period if required.	Once a day. Can be improved to real time transmission for a short period if required.
SBE38	Inlet temperature	4m depth		
SBE45	Salinity	4m depth		
AADI optode	Dissolved oxygen	4m depth		
AADI optode	Inlet dissolved oxygen	4m depth		
Polymetron	Turbidity	4m depth		
TriOS	Chl-A fluorescence	4m depth		
TriOS	Yellow substance fluorescence	4m depth		
TriOS	Cyanobacteria fluorescence	4m depth		
TriOS	Hydrocarbon	4m depth		
TriOS	Irradance	4m depth	1 minute under normal conditions. Can be increased up to 30s for a short period if required.	
TriOS	Sky radiance starboard	30m above sealevel		
TriOS	Sky radiance port	30m above sealevel		
TriOS	Water leaving radiance starboard	30m above sealevel		
TriOS	Water leaving radiance starboard	30m above sealevel		
ISCO-sampler	Water samples	4m depth	Not relevant	

The following instrumentation will be installed during 2013 and will also be made available to the JERICO users.

Instrument	Measured Parameter(s)	Elevation/Depth	Sampling frequency	Transmission frequency
Franatech/NIVA	pCO2	4m depth	1 minute (TBC)	Once a day. Can be improved to real time transmission for a short period if required
NIVA	Photometric pH	4m depth	1 minute (TBC)	Once a day. As above

Additional services/data

Routine discrete samplings for long-term series

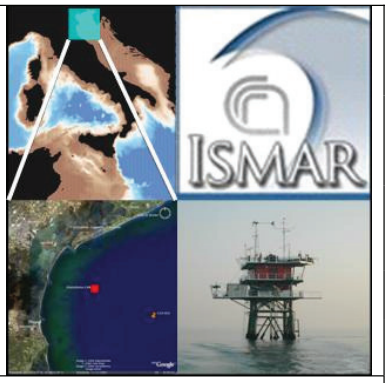
The following parameters are obtained from regular automatic sampling onboard and laboratory analysis and will be available to the JERICO users on specific request.

Parameter(s)	Elevation/Depth	Sampling frequency	Sampling Technique/Analytical method
Phytoplankton	4m depth	14days but can be increased up to 1day on request (up to 24 samples/stations per trip)	Phytoplankton counting on some station
Particulate (TSM)	4m depth	14days but can be increased up to 1day on request (up to 24 samples/stations per trip)	On request and are done for satellite calibration
Nutrients	4m depth	14days but can be increased up to 1day on request (up to 24 samples/stations per trip)	Standard water sampling and analysis in NIVA laboratory on request.
Contaminants	4 m depth	TBD	Automatic extraction and pre-concentration unit of chemical compounds
Chlorophyll (Other pigments on request). Pigment and detrital absorption spectra	4m depth	14days but can be increased up to 1day on request (up to 24 samples/stations per trip)	HPLC and/or spectrophotometric Absorption spectra on water samples on request.

Special owner rules

NIVA's personnel will join the trips as a minimum of the installation and introduction to the ship, crew and system.

Infrastructure (short name)	CNR-Marine Platforms and Laboratories (CNR-MPL)
Installation (short name)	Acqua Alta Oceanographic Tower (ACQUA ALTA)
Location	Mediterranean Sea, Northern Adriatic, Gulf of Venice
Coordinates	45°18.83'N – 12°30.53'E
Bottom depth	16 m
Legal name of organization	Consiglio Nazionale delle Ricerche CNR
Location of organization	Rome, Italy
Contact	Mauro Bastianini, mauro.bastianini@ismar.cnr.it Institute of Marine Sciences, National Research Council (ISMAR CNR) Castello 2737/f Tesa 104, 30122 Venezia, Italy Phone: +39 041 2407982 - Fax: +39 041 2407940
Web site address	http://www.ismar.cnr.it/infrastructures/piattaforma-acqua-alta?set_language=en&cl=en



Description

The "Acqua Alta" research tower was installed on January 1970 15 km off the city of Venice, Italy, in 16 m of water (MLLW). This tower consists of a platform containing an instrument house, supported by a steel pipe structure, similar to that of an oil well derrick. The pipe structure is hammered 22 m into the bottom through each of its four hollow legs. Energy is supplied at 125, 220, 380 VAC (50 Hz – remote activation), along with continuous voltage 12 and 24 VDC.

The tower can host two technicians and three scientists for several days and allows specific dedicated campaigns and long-term measurements.

A broadband wireless communication system between the tower and the operating Institute allows 10 Mb/s data communication rate and real time data availability. The bridge allows the tower to be part of the Institute LAN so all the scientists on board can access internet and potentially all the instruments could be controlled remotely.

Measurements routinely acquired with periodic sampling concern biology, chemistry, physical oceanography. Autonomous instrumentations cover atmospheric and hydrological parameters with a series of meteorological stations (wind, air and water temperature, atmospheric pressure, humidity, rain) and a series of oceanographic instruments (waves, currents along the column with ADCP, temperature,, salinity, turbidity, oxygen, chlorophyll *a* at surface -7m and bottom and sea level). A direct view of the sea condition around the tower is available continuously by the three high resolution webcams installed on the roof. Two underwater webcams are installed at -3 and -12 m to observe biological populations and to monitor potentially critical phenomena such as jellyfish swarms and mucilaginous macro aggregates.

Given the high level of security on board and wide desk space, sophisticated instruments can be hosted on board reducing drastically the risk of loss (when not in service the tower is locked and a video surveillance is active). The good level of logistic support allows the setup of in situ experiments.

The wave measurements provide the longest European directional time series (29 years). The

worst storm ever experienced was on December 22, 1979, when heavy damage was found up to 9 metres above the mean sea level.

The tower has been used as calibration point for instruments on board of the ERS-1 and SEAWIFS satellites and it's part of the LTER (Long Term Ecological Research) network.

Service offered

The "Acqua Alta" tower is a wet and dry laboratory able to host three scientists supported by one technician and two seamen. The high degree of safety (Video surveillance onboard) allows the setup and deployment of high-cost instruments; furthermore with the availability of wideband connection, instruments can be remotely controlled.

The installation is available for Trans National Access to JERICO users for specific experiments, tests of sensors and in-situ validation.

A support team formed by one technician and two sea-men, coordinated by a head scientist will assist the user group, helping during installing/uninstalling operations.

The user will have access to the infrastructure by boat, this service will be arranged by the operator.

The data will be immediately available to the user accessing the laboratory or also remotely in case of protracted installation of user's instrumentation.

Instruments/Sensors

The following instrumentation is already onboard the tower and will be available to the JERICO users

Instrument	Measured Parameter(s)	Elevation/Depth	Sampling frequency	Frequency of data recovery
Meteo station Davis Vantage Pro2	Wind speed and direction Air temperature Humidity	+ 17 m	30 min	30 min
Nortek Awac	Current Profiles	from -1 to -15 m	30 min	30 min
Nortek Awac	Waves (high, dir period)	sea surface	30 min	30 min
SeaCAT	Temperature Oxygen Conductivity/Salinity Turbidity	- 3 m, -7 -13 m	60 min	60 min

Additional services/data

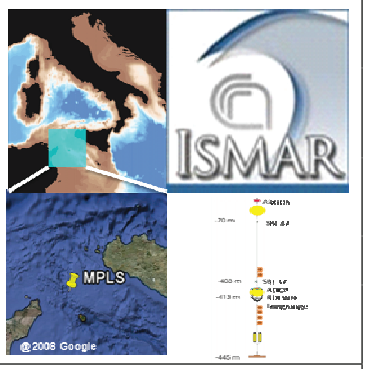
Routine discrete samplings for long-term series

The following parameters are obtained from regular manual sampling and laboratory analysis and will be available to the JERICO users on specific request:

Parameter(s)	Elevation/Depth	Sampling frequency	Sampling Technique /Analytical method
Particulate flux	+ 13 m	30 days	Deposimeter
Phytoplankton	-1 and -15 m	30 days	Utermohl
Particulate	-1 and -15 m	30 days	Gravimetric CHN
Nutrients	-1 and -15 m	30 days	Autoanalyzer
Clorophyll	-1 and -15 m	30 days	Fluorimetric

Special owner rules

Researchers must provide an insurance statement. All lodging, meals and travel (from CNR Institute) to the tower coasts are covered by CNR, no smoking is allowed on board, safety equipment is not provided.

Infrastructure (short name)	CNR-Marine Platforms and Laboratories (CNR-MPL)	
Installations (short name)	Sicily Channel mooring (MPLS)	
Locations	Mediterranean Sea, Tyrrhenian Sea, Sicily Channel	
Coordinates	S: 37°23.00'N - 11°35.50'E	
Bottom depth	S: 500 m	
Legal name of organization	Consiglio Nazionale delle Ricerche CNR	
Location of organization	Rome, Italy	
Contact	Mireno Borghini, mireno.borghini@sp.ismar.cnr.it, Phone: +39 0187978313 Katrin Schroeder, katrin.schroeder@ismar.cnr.it, Phone: +30 041 2407946 Institute of Marine Sciences, National Research Council (ISMAR CNR) Forte Santa Teresa, 19036 Pozzuolo di Lerici (SP), Italy	
Web site address	http://www.ismar.cnr.it/infrastructures/observational-sites/catene-correntometriche/il-canale-di-sicilia	

Description
Sicily Channel, MPLS: Underwater installation moored at about 500 m depth between Sicily and Tunisia, out of the wide Sicilian continental shelf and on the western sill of the Sicily Channel. It performs continuous monitoring of the surface and intermediate exchange of water masses between eastern and western basins of the Mediterranean Sea. Equipped with traditional current meters and ADCP, it has been operative since 1993. At great depths it is furnished by high precision CTD probes for continuous measurement of hydrological parameters. The site is part of the CIESM Hydro-Changes Programme. Maintenance and data recovery are managed twice per year. Developments towards real time data transmission are planned for both installations. In occasion of the 6-month maintenance, which is done using a fully equipped research vessel, along the transect connecting the edges of the channel, additional measurements are carried out, which will be available to the JERICO users on specific request. Those are physical (CTD stations, vessel mounted ADCP, lowered ADCP profiles) and chemical (dissolved oxygen, dissolved inorganic nutrients) measurements.
Service offered
The underwater installation in the Sicily Channel is available for Trans National Access to JERICO users for specific experiments, tests of sensors and in-situ validation. The access is offered for multiples of a 6 month period, corresponding to the periodic maintenance operations. A support team formed by one technician, one sea-man and one head scientist will assist the user group, taking also care of installing/uninstalling operations. The user will have access to the infrastructure by boat, this service will be arranged by the operator. The data will be available to the user in delayed mode at the end of the 6 month access period.

Instruments/Sensors

The following instrumentation is installed in the mooring and will be available to the JERICO users

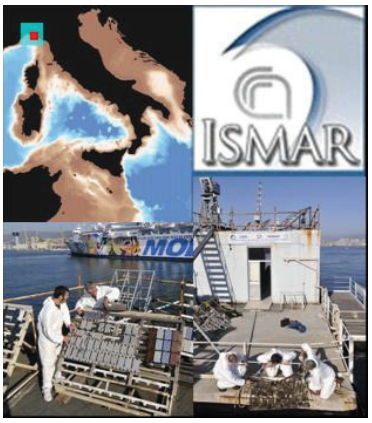
Sicily Channel, MPLS

Instrument	Measured Parameter(s)	Elevation/Depth	Sampling frequency	Frequency of data recovery
ADCP RDI 75kHz longrange	Current Profiles Temperature	from -415 to -10 m -415 m for T	2 hours	ca. every 6 months
SBE37	Temperature Conductivity Pressure	-400 m	5 min	ca. every 6 months
SBE37	Temperature Conductivity	-80 m	30 min	ca. every 6 months

Special owner rules

Researchers accessing the installation by boats must provide an insurance statement and must bring their own safety equipment.

Whenever possible, the start and end of an access interval will be set to coincide with times scheduled for the ordinary maintenance of the installation in the interests of financial economy (e.g. limiting the costs of boat-time, etc.).

Infrastructure (short name)	CNR-Marine Platforms and Laboratories (CNR-MPL)	
Installation (short name)	Genoa Marine Station (MPL Genoa)	
Location	Mediterranean Sea, Ligurian Sea, Genova harbour	
Coordinates	44°24' N 8°56' E	
Legal name of organization	Consiglio Nazionale delle Ricerche CNR	
Location of organization	Rome, Italy	
Contacts	Pierluigi Traverso, pierluigi.traverso@ge.ismar.cnr.it, Tel. +39 010 6475432 Paola Letardi, paola.letardi@ismar.cnr.it, Tel. +39 010 6475434 Institute of Marine Sciences, National Research Council (ISMAR CNR) Genoa Branch Via De Marini, 6 – IV p – 16149 – Genova – Italia Fax: +39 010 6475400	
Web site address	http://www.ismar.cnr.it/infrastructures/experimental-stations/experimental-marine-station-of-genoa/index_html?set_language=en&cl=en	

Description

This coastal station is placed inside the Genoa harbour, with the possibility of monitoring environmental and biological parameters. The building has an indoor surface of 100 sqm, available for pilot plants and services, a 30 KW electrical system, an internet connection (5 Mb/s), a drinkable water pipe and a natural seawater circuit powered by a pump which draws the water at a depth of 2,5 meters, with a 12 liters for minute flow.

A floating wharf (8,30x2,40 meters), used for the static immersion (Raft-test) of samples, is anchored in the Harbour area in front of the marine station.

A weather station measures air temperature, atmospheric pressure, relative humidity, solar irradiance, rain rate, wind speed and direction, dew point temperature and presence of wet film. Data are stored on a computer system and transmitted daily by wireless communication. These data are used for the ageing tests in marine atmosphere (following ISO 8565) performed by the CNR ISMAR staff, and are available to companies and other interested parties on demand.

These structures allow the Institute and agencies or companies which make request to do several tests for material degradation behaviour and the antifouling technologies performance (efficacy and ecocompatibility) using natural seawater (corrosion resistance measurement, paint antifouling performance, biocide efficacy, biofilm development, microbial influenced corrosion (MIC), sensor performance, ballast water treatment, etc.) and to expose samples in standard conditions for ageing tests in marine atmosphere (coatings protective power evaluation, corrosion processes study, patinas monitoring, etc.).

This experimental station belongs to MARS Network - The European Network of Marine Research Institutes and Stations (http://www.marsnetwork.org/).

Service offered

The shore station in the harbour of Genoa is available 24 hour day for corrosion tests on

infrastructure materials and for the evaluation of the protective and antifouling performances of coatings using suitable devices for exposition in immersed or in atmospheric marine environment.

A support team formed by one young researcher and one head scientist will assist the user group, taking also care of installing/uninstalling operations. The station is on-land, so the user will have direct access. The data will be available to the user as soon as the user's experiment is completed.

Instruments/Sensors

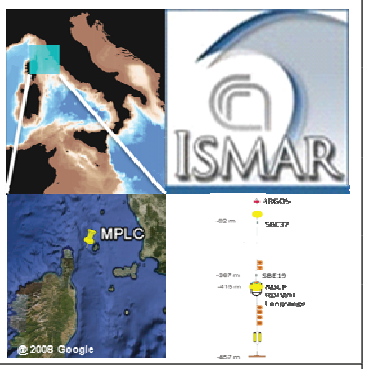
The following instrumentation is installed at the station and data will be available to the JERICO users

Instrument	Measured Parameter(s)	Elevation/Depth	Sampling frequency	Frequency of data recovery
Weather station	air temperature, atmospheric pressure, relative humidity, solar irradiance, rain rate, wind (speed and direction), dew point temperature and presence of wet film	+ 5 m	5 min	5 min

Transmission: via internet connection

Special owner rules

The access to the harbour area is controlled by Genoa Harbour Authority whereas the access to Marine Station is regulated by the safety rules of CNR I.S.MAR.- U.O.S of Genoa.

Infrastructure (short name)	CNR-Marine Platforms and Laboratories (CNR-MPL)	
Installations (short name)	Corsica Channel mooring (MPLC)	
Locations	Mediterranean Sea, Ligurian Sea, Tyrrhenian Sea, Corsica Channel	
Coordinates	43° 1.50'N, 9° 41.0'E	
Bottom depth	C: 440 m	
Legal name of organization	Consiglio Nazionale delle Ricerche CNR	
Location of organization	Rome, Italy	
Contact	Mireno Borghini, mireno.borghini@sp.ismar.cnr.it, Phone: +39 0187978313 Katrin Schroeder, katrin.schroeder@ismar.cnr.it, Phone: +30 041 2407946 Institute of Marine Sciences, National Research Council (ISMAR CNR) Forte Santa Teresa, 19036 Pozzuolo di Lerici (SP), Italy	
Web site address	http://www.ismar.cnr.it/infrastructures/observational-sites/catene-correntometriche/il-canale-di-corsica?set_language=en&cl=en	

Description
Corsica Channel, MPLC: Underwater station at about 450 m depth moored between the islands of Capraia and Corsica, at the sill of the Corsica Channel. Operative since July 1985, it continuously measures ocean currents and thermohaline properties of water masses in predetermined depths, for the monitoring of the surface and the intermediate circulation of the Mediterranean Sea, and exchanges between the two adjacent basins (Tyrrhenian Sea and Ligurian Sea). The site is part of the CIESM Hydro-Changes Programme. Maintenance and data recovery are managed twice per year. Developments towards real time data transmission are planned for both installations. In occasion of the 6-month maintenance, which is done using a fully equipped research vessel, along the transect connecting the edges of the channel, additional measurements are carried out, which will be available to the JERICO users on specific request. Those are physical (CTD stations, vessel mounted ADCP, lowered ADCP profiles) and chemical (dissolved oxygen, dissolved inorganic nutrients) measurements.
Service offered
The underwater installation in the Corsica Channel is available for Trans National Access to JERICO users for specific experiments, tests of sensors and in-situ validation. The access is offered for a 6 month period, staring from April 2014 corresponding to the periodic maintenance operation. A support team formed by one technician, one sea-man and one head scientist will assist the user group, taking also care of installing/uninstalling operations. The user will have access to the infrastructure by boat, this service will be arranged by the operator. The data will be available to the user in delayed mode at the end of the 6 month access period.

Instruments/Sensors

The following instrumentation is installed in the mooring and will be available to the JERICO users

Corsica Channel, MPLC

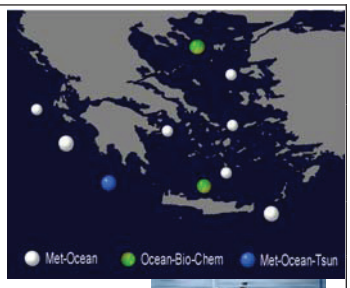
Instrument	Measured Parameter(s)	Elevation/Depth	Sampling frequency	Frequency of data recovery
ADCP RDI 75kHz longrange	Current Profiles Temperature	from -415 to -10 m -415 m for T	2 hours	ca. every 6 months
SBE37	Temperature Conductivity	-400 m	5 min	ca. every 6 months
SBE39	Temperature	-80 m	5 min	ca. every 6 months

Special owner rules

Researchers accessing the installation by boats must provide an insurance statement and must bring their own safety equipment.

Whenever possible, the start and end of an access interval will be set to coincide with times scheduled for the ordinary maintenance of the installation in the interests of financial economy (e.g. limiting the costs of boat-time, etc.).

Infrastructure (short name)	POSEIDON Observatory (POSEIDON)
Installations (short name)	POSEIDON BUOYS NETWORK & SOUTH AEGEAN BUOYS (POSEIDON BUOYS)
Location	Eastern Mediterranean Sea
Legal name of organization	Hellenic Center for Marine Research HCMR
Location of organization	Athens GREECE
Contact	Leonidas Perivoliotis, lperiv@hcmr.gr Hellenic Centre for Marine Research 46.7 km Athens-Sounio Ave. PO Box 712 Anavyssos, Attica GR-190 13, Greece Phone: +30-22910 76400 Fax:+30-22910 76323
Web site address	http://www.poseidon.hcmr.gr



hcmr
ΕΛΚΕΘΕ

Description

POSEIDON is an operational marine monitoring, forecasting and information system for the Greek Seas. It was developed by the Hellenic Centre for Marine Research (HCMR, www.hcmr.gr) and collaborating institutes in four phases over the past 12 years. The basic monitoring infrastructure of POSEIDON comprises of a fleet of 15 oceanographic buoys (SeaWatch and Wavescan types) as well as maintenance and calibration facilities that support the operation of 10 fixed positions in the Aegean and Ionian Seas. The buoys (POSEIDON BUOYS) are permanently moored in the Aegean and Ionian Seas, 3 of which are moored in the south Aegean Sea (POSEIDON SOUTH AEGEAN BUOYS).

POSEIDON BUOYS NETWORK: 7 SeaWatch and Wavescan buoys, permanently deployed in Aegean and Ionian Seas.

POSEIDON SOUTH AEGEAN BUOYS: 3 SeaWatch and Wavescan buoys, deployed in Saronikos, Santorini and Cretan Sea

Both the components of POSEIDON routinely monitor

- atmospheric conditions at sea level (wind speed and direction, atmospheric pressure, air temperature at all sites as well as relative humidity, precipitation and radiation components at selected sites)
- surface wave conditions (height, period, direction)
- surface currents (speed and direction) and hydrological (temperature, salinity) conditions

The exact number and position of moored buoys may alter depending on operational limitations during the access period.

Service offered

The TNA offered by the POSEIDON system to the project includes access to the coastal moored buoys of the network, i.e. to 8 out of the 10 operating sites. Depending on user needs the access can be offered either for one of the existing stations of the network or for several stations for a

smaller time period each.

The buoys are offered as a test bench for existing and new sensors. Spare buoys stored at HCMR premises can also be used as test bench (e.g. for interface with new sensors).

Access to moored buoys will be made during the regular maintenance visits (2-4 per year) on-board the R/V Aegaeo. Access to stored buoys has no time limitations. All operations will be carried out by the scientific and technical personnel of POSEIDON. In case of integration of new sensors, the user will be responsible for the software and hardware adaptations and the relevant costs, but the POSEIDON personnel will assists when necessary and will have the responsibility for on-buoy operations.

Instruments/Sensors

Athos Station, 39° 58' 4.8"N, 24° 43' 44.4"E

Instrument	Measured Parameter(s)	Elevation/Depth	Sampling frequency	Frequency of data recovery
Young 04106	Wind speed/dir.,	+3	3h	3h
Vaisala PTB 220A	Air Pressure,	3	3h	3h
Omega	Air temperature,	3	3h	3h
Seatex MRU	Wave Height, direction, period	0	3h	3h
Aanderaa 3919A	SST, SSS surface,	-1	3h	3h
Nortek Aquadopp 400 kHz	Currents	-1	3h	3h
Seabird 16plus-IMP C-T Seabird 37-IM C-T Aanderaa 3919A (surface)	Temperature	-1, -20, -50, -75, -100	3h	3h
Seabird 16plus-IMP C-T Seabird 37-IM C-T Aanderaa 3919A (surface)	Salinity	-1, -20, -50, -75, -100	3h	3h

Lesvos Station, 39° 09' 28.79"N, 25° 48' 46.79"E

Instrument	Measured Parameter(s)	Elevation/Depth	Sampling frequency	Frequency of data recovery
Young 04106	Wind speed/dir.,	+3	3h	3h
Vaisala PTB 220A	Air Pressure,	3	3h	3h
Omega	Air temperature,	3	3h	3h
Seatex MRU	Wave Height, direction, period	0	3h	3h
Aanderaa 3919A	Temperature, Salinity	-1	3h	3h
Nortek Aquadopp 400 kHz	Currents	-1	3h	3h

Skyros Station, 39° 06' 58.3194"N, 24° 27' 46.44"E

Instrument	Measured Parameter(s)	Elevation/Depth	Sampling frequency	Frequency of data recovery
Young 04106	Wind speed/dir.,	+3	3h	3h
Vaisala PTB 220A	Air Pressure,	3	3h	3h
Omega	Air temperature,	3	3h	3h
Seatex MRU	Wave Height, direction, period	0	3h	3h
Aanderaa 3919A	Temperature, Salinity	-1	3h	3h
Nortek Aquadopp 400 kHz	Currents	-1	3h	3h

Mykonos Station, 37° 31' 1.2"N, 25° 27' 50.4"E

Instrument	Measured Parameter(s)	Elevation/Depth	Sampling frequency	Frequency of data recovery
Young 04106	Wind speed/dir.,	+3	3h	3h
Vaisala PTB 220A	Air Pressure,	3	3h	3h
Omega	Air temperature,	3	3h	3h
Seatex MRU	Wave Height, direction, period	0	3h	3h
Aanderaa 3919A	Temperature, Salinity	-1	3h	3h
Nortek Aquadopp 400 kHz	Currents	-1	3h	3h

Saronikos Station, 37° 36' 29.16"N, 23° 33' 52.56"E

Instrument	Measured Parameter(s)	Elevation/Depth	Sampling frequency	Frequency of data recovery
Young 04106	Wind speed/dir.,	+3	3h	3h
Vaisala PTB 220A	Air Pressure,	3	3h	3h
Omega	Air temperature,	3	3h	3h
Seatex MRU	Wave Height, direction, period	0	3h	3h
Aanderaa 3919A	Temperature, Salinity	-1	3h	3h
Nortek Aquadopp 400 kHz	Currents	-1	3h	3h

Santorini Station, 36° 15' 25.2"N, 25° 30' 10.79"E

Instrument	Measured Parameter(s)	Elevation/Depth	Sampling frequency	Frequency of data recovery
Young 04106	Wind speed/dir.,	+3	3h	3h
Vaisala PTB 220A	Air Pressure,	3	3h	3h
Omega	Air temperature,	3	3h	3h
Seatex MRU	Wave Height, direction, period	0	3h	3h
Aanderaa 3919A	Temperature, Salinity	-1	3h	3h
Nortek Aquadopp 400 kHz	Currents	-1	3h	3h

Zakynthos Station, 37° 57' 32.4"N, 25 20° 36' 10.8"E

Instrument	Measured Parameter(s)	Elevation/Depth	Sampling frequency	Frequency of data recovery
Young 04106	Wind speed/dir.,	+3	3h	3h
Vaisala PTB 220A	Air Pressure,	3	3h	3h
Omega	Air temperature,	3	3h	3h
Seatex MRU	Wave Height, direction, period	0	3h	3h
Aanderaa 3919A	Temperature, Salinity	-1	3h	3h
Nortek Aquadopp 400 kHz	Currents	-1	3h	3h

Kalamata Station, 36° 58' 21.72" N, 22° 6' 24.8394"E

Instrument	Measured Parameter(s)	Elevation/Depth	Sampling frequency	Frequency of data recovery
Young 04106	Wind speed/dir.,	+3	3h	3h
Vaisala PTB 220A	Air Pressure,	3	3h	3h
Omega	Air temperature,	3	3h	3h
Seatex MRU	Wave Height, direction, period	0	3h	3h
Aanderaa 3919A	Temperature, Salinity	-1	3h	3h
Nortek Aquadopp 400 kHz	Currents	-1	3h	3h

The adobe described configuration of buoys is subject to modifications due to operational constrains.

Additional services/data

In situ measurements such as CTD casts as well as lab analysis can be arranged.

Special owner rules

The time schedule for the access will be defined by the owner based on the R/V availability.

Infrastructure (short name)	Coastal Observation System for Northern and Arctic Seas (COSYNA)	
Installation (short name)	Fixed Stations – Pile + Shore Station (COSYNA_2 PILE)	
Location	North Sea	
Coordinates	Waddensea Pile: 54° 47.65' N 8° 27.083' E Shore Station: 53° 52.620' N 8° 42.292' E	
Bottom depth	5 m	
Legal name of organization	HZG Research Centre	
Location of organization	Geesthacht, Germany	
Contact	Götz Flöser (goetz.floeser@hzg.de) Wilhelm Petersen (wilhelm.petersen@hzg.de)	
Web site address	http://www.cosyna.de and http://www.coastlab.org/	

Description

COSYNA (Coastal Observation System for Northern and Arctic Seas) is an operational coastal monitoring, forecasting and information system for the North Sea. It is being developed by institutes of the German Marine Research Consortium (KDM) and collaborating institutions and is operated by the HZG Research Centre. The infrastructure represents an investment of 9 M €. It is built up in two phases over 6 years:

COSYNA PILE is based on one shallow-water Wadden Sea pile and a fixed station. The pile is equipped with hydrographical and meteorological sensors and deliver the datasets every 10 minutes via mobile phone connection to the HZG database. The maintenance interval varies with the season: in autumn / winter, maintenance can be done once in three weeks, in spring / summer it is required to be done every five days. The pile can not resist sea ice, thus he must be removed during winter months December – February. The fixes station is based on a FerryBox system installed in a container on shore at the mouth of the Elbe River (Cuxhaven)

Service offered

HZG will give access to one wadden sea pile and the container station in Cuxhaven. The access will consist in hosting visitors for experiments and for installation of users' equipment on piles.

The support team consists of technicians and scientists who prepare the instrumentation and take care of its installation and un-installation on the piles and in the container.

Instruments/Sensors

Pile:

Instrument	Measured Parameter(s)	Elevation/Depth	Sampling frequency	Frequency of data recovery
Hydrographical sensors:				
ADCP	Current velocity, direction and backscatter intensity	1 m water depth	10 minutes	10 minutes
Optical backscatter sensor	Backscatter intensity, proxy for suspended matter concentration	1 m water depth	10 minutes	10 minutes
Temperature sensor	Water temperature	1 m water depth	10 minutes	10 minutes
Acoustic Doppler velocimeter	Current velocity, direction and backscatter intensity	1 m water depth	10 minutes	10 minutes
Optode	Oxygen saturation	1 m water depth	10 minutes	10 minutes
Conductometer	Electrical conductivity	1 m water depth	10 minutes	10 minutes
Fluorometer	Chlorophyll fluorescence	1 m water depth	10 minutes	10 minutes
PAR sensor	Photosynthetically active radiation	1 m water depth	10 minutes	10 minutes
Pressure sensor	Water pressure, proxy for water depth	1 m water depth	10 minutes	10 minutes
Meteorological sensors:				
Temperature sensor	Air temperature	5 m height	10 minutes	10 minutes
Anemometer	Wind speed and direction	5 m height	10 minutes	10 minutes
Pressure sensor	Air pressure	5 m height	10 minutes	10 minutes
Pyranometer	Solar radiation power	5 m height	10 minutes	10 minutes
Precipitation sensor	Precipitation	5 m height	10 minutes	10 minutes
Hygrometer	Relative humidity	5 m height	10 minutes	10 minutes

Container (FerryBox Cuxhave)

Instrument	Measured Parameter(s)	Elevation/Depth	Sampling frequency	Transmission frequency
ETSG 2 - M, Falmouth Scientific	Temperature	**1 m water depth**	**10 min**	**10 min**
ETSF2-M, Falmouth Scientific	Conductivity	**1 m water depth**	**10 min**	**10 min**
ETSF2-M, Falmouth Scientific	Salinity	**1 m water depth**	**10 min**	**10 min**
SCUFA-II, Turner Designs	Turbidity	**1 m water depth**	**10 min**	**10 min**
SCUFA-II Turner Designs	Chlorophyll-a fluorescence	**1 m water depth**	**10 min**	**10 min**
Algae-Online-Analyser, bbe moldaenke	Chlorophyll-a fluorescence	**1 m water depth**	**10 min**	**10 min**
Oxygen optode 4330, Aandera	diss. oxygen	**1 m water depth**	**10 min**	**10 min**
EGA140 SMEK, Sensortechnik Meinsberg	pH	**1 m water depth**	**10 min**	**10 min**
µMac 1000, Systea	Ammonium, Nitrate, Phosphate, Silicate	**1 m water depth**	**10 min**	**10 min**

Additional services/data

Other activities within the observatory COSYNA are linked to the FerryBox and glider activities.

Special owner rules

None

Infrastructure (short name)	NOC Coastal Observatory (COBS)	 
Installation (short name)	NOC Marine Autonomous and Robotic Systems (MARS)	
Location	Based in Southampton	
Legal name of organization	Natural Environment Research Council NERC	
Location of organization	Southampton, UK	
Contact	David White, dwh@noc.ac.uk MARS Glider Manager National Oceanography Centre, Southampton European Way Southampton SO14 3ZH UK Tel +44 2380 596154	
Web site address	http://noc.ac.uk/research-at-sea/nmfss/mars	

Description

The MARS glider group provides support for and operates the NOC glider fleet for NERC funded scientific programs. In recent years, NOC glider operations have been in the north Atlantic, Mediterranean and Irish seas.

We have strong links to the other major glider groups in the UK, at UEA, SAMS and BAS, as well as the scientists at both NOC sites at Liverpool and Southampton.

We carry out trials, deployment, piloting and recovery of our own and other groups' gliders as required, as well as refurbishment, repair and modification of both Slocums and Seagliders.

The MARS glider group:

- 4 Seagliders
- 4 deep Slocum gliders
- 3 shallow Slocum gliders (general purpose)
- 1 shallow Slocum glider (turbulence probe)

Service offered

The MARS gliders are available for use in Trans National Access projects in JERICO. Where science projects welcome added value measurements using added-on sensors, small programmes can piggy-back on larger or more established programmes. The MARS glider group will liaise with PIs where this is possible.

Where trials are programmed by MARS, other trials or short missions can be accomodated.

The support team consists of the NOC engineers and scientists who regularly prepare the instrumentation and install/uninstall or deploy the gliders (four people) and process the data.

Instruments/Sensors

Instrument	Measured parameters	Depth range	Sampling frequency	Frequency of data recovery
3 x Teledyne Webb Research Slocum Electric glider (G2)	Two pumped and one non-pumped CT from Seabird, Anderaa Oxygen optode and Wetlabs triplet puck measuring Chl-a, CDOM and 650nm turbidity	0-200m	various	Data subset at user selected intervals via Iridium, full dataset after recovery.
1 x Teledyne Webb Research Slocum Electric glider (G2)	Non-pumped CT from Seabird, Rockland Scientific MicroRider turbulence probe (micro conductivity, shear and temperature up to 512Hz)	0-200m	various	Data subset at user selected intervals via Iridium, full dataset after recovery.
4 x Teledyne Webb Research Slocum Electric glider (G2)	Non-pumped CT from Seabird, Anderaa Oxygen optode and Wetlabs triplet puck measuring Chl-a, CDOM and 650nm turbidity	0-1000m	various	Data subset at user selected intervals via Iridium, full dataset after recovery.
4 x iRobot 1kA Seaglider	Non-pumped CT from Seabird, Anderaa Oxygen optode and Wetlabs triplet puck measuring Chl-a, CDOM and 700nm turbidity	0-1000m	various	Data subset at user selected intervals via Iridium.

Special owner rules

None.

Infrastructure (short name)	Coastal Observation System for Northern and Arctic Seas (COSYNA)	
Installation (short name)	Mobile Platforms - gliders (COSYNA_3 GLIDER)	
Location	North Sea	
Legal name of organization	Helmholtz-Zentrum Geesthacht, Institute of Coastal Research	
Location of organization	Geesthacht, Germany	
Contact	Lucas Merckelbach, lucas.merckelbach@hzg.de Institute of Coastal Research/Operational Systems Helmholtz-Zentrum Geesthacht Max Planck Str. 1, D-21502 Geesthacht, Germany Phone: +49 (0) 4152 87 1515 Fax: +49 (0) 4152 87 1525	
Web site address	http://www.hzg.de/institute/coastal_research/cosyna/011312/index_0011312.html	

Description

COSYNA (Coastal Observation System for Northern and Arctic Seas) is an operational coastal monitoring, forecasting and information system for the North Sea. It is being developed by institutes of the German Marine Research Consortium (KDM) and collaborating institutions and is operated by the HZG Research Centre. The infrastructure represents an investment of 9 M €. It is build up in two phases over 6 years:

COSYNA GLIDER is based on 2 Slocum gliders rated at 100 m water depth. The first glider was ready for deployment by the start of 2011, where as the second glider was delivered by March 2011. Since conditions in the German Bight, as opposed to normal oceanic conditions, pose additional challenges such as strong tidal currents, high shipping intensity and large density differences, three one-month deployments were aimed at assessing the practical feasibility of flying gliders and its constraints. At the time of writing the third mission is underway, however, the preliminary conclusion is that using gliders is feasible, provided that the region of operation excludes coastal waters of 10m and less, and (the crossing of) main shipping lanes. Following the completion the third glider mission, the experience gained will be evaluated and a schedule for 2012 will be formulated.

Service offered

HZG will give access to two gliders. The access will consist in planning and performing assisted glider missions on user demand.

The support team consists of technicians and scientists who prepare the instrumentation, deploy the gliders and pre-process the data.

It is noted that deployments of gliders in the German Bight require written permission from the responsible shipping authorities (WSA Tönning). Whether permission is granted or not is beyond the control of HZG, however, HZG can assist with or take care of the application process.

The table below lists the instruments available per glider. Glider Sebastian is labelled (1), and glider Amadeus is labelled (2). The depth rating of the gliders is 100m. For North Sea conditions however, it means the whole water column can be sampled. Sample frequencies given are typical, but are user configurable (1Hz is maximum).

Instrument	Measured Parameter(s)	Elevation/Depth	Sampling frequency	Frequency of data recovery
CTD (1&2)	**Conductivity, temperature, pressure**	**Full-depth range**	**0.5 Hz**	
Optical backscatter (1)	**Backscatter at 470, 532 and 660 nm**	**Full-depth range**	**Typical 0.125 Hz**	
BBFLCD (1)	**Optical backscatter (532 nm), Fluorescence and Coloured dissolved organic matter**	**Full-depth range**	**Typical 0.125 Hz**	
FLNTU (2)	**Fluorescence and turbidity**	**Full-depth range**	**Typical 0.125 Hz**	

Special owner rules

HZG requires a proposal to be submitted for each requested glider operation. The proposal will be evaluated internally. The main criteria are availability of resources for requested period, feasibility and risk assessment.

Infrastructure **(short name)**	CSIC-IMEDEA Glider facility	
Installation (short name)	CSIC-IMEDEA Glider (CSIC Glider)	
Location	Western Mediterranean	
Legal name of organization	Consejo Superior de Investigaciones Cientificas CSIC-IMEDEA	
Location of organization	Esporles, Spain	
Contact	Simon Ruiz, simon.ruiz@uib.es (and/or Joaquín Tintoré, jtintore@uib.es) TMOOS, IMEDEA (CSIC-UIB) c/ Miquel Marques, 21, 07190 Esporles, Spain http://www.imedea.uib-csic.es Tel.: +34 971 611231 Fax.: +34 971 611761	
Web site address	http://imedea.uib-csic.es/tmoos/gliders/	

Description

CSIC-IMEDEA has been operating SLOCUM Webb Research gliders since 2005 and at present, 2 Deep (1.000 m) gliders and 1 Coastal glider (200m) exist (http://www.imedea.uib-csic.es/tmoos/gliders). New facilities have been also established (electronics, ballasting and AUV's/Gliders laboratories, and 1000 depth pressure chamber).

Gliders are underwater autonomous vehicles designed to observe vast areas of the interior ocean (Stommel, 1989). They make use of their hydrodynamic shape and small fins to induce horizontal motions, while controlling their buoyancy. Buoyancy control also allows vertical motions in the water column. The nominal horizontal speed is about 1 km/h. Coastal versions of gliders are limited to operate between 10 and 200 m depth whereas Deep versions can dive down to 1000 m. The long autonomy period at sea is the main advantage of this platform.

Gliders allow autonomous and sustained collection of CTD data and biogeochemical measurements (fluorescence, oxygen, etc) at high spatial resolutions (1km) and at low costs compared to conventional methods. Novel studies carried out in the Mediterranean Sea have confirmed the feasibility of using coastal and deeps gliders to monitor the variability of the coastal ocean (Alvarez et al., 2007; Ruiz et al., 2009a; Ruiz et al., 2009b). Gliders have proved to be highly robust platforms to monitor the ocean even under adverse meteorological conditions and/or in really challenging oceanic areas such as the Alborán Sea (Ruiz et al., 2009c).

CSIC-IMEDEA glider team has carried out about 22 gliders missions in the western Mediterranean Sea obtaining, so far, about 17,000 CTD casts plus oxygen, chlorophyll and turbidity (Ruiz et al., 2012; Tintoré et al., 2013).

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Service offered

CSIC-IMEDEA can provide access to the IMEDEA gliders facilities, including the use of one glider unit (after a carefully peer-review of proposed missions – feasibility, mission definition, benefits, etc…).

Additionally real-time data from all IMEDEA glider missions carried out under the project will be available in real-time.

The proposed mission can consist of:

- Preparation and mission setup of 1 glider (including pressure chamber tests) and its sensors for a specific task and for the area to operate.

- Logistics from the operator facility to the operation site and return

- Launch and recovery of the gliders

- Remote control and programming of the gliders by the operational team, including navigation and near real time data real time download

- Data recovery and delivery to the user.

There is a dedicated team composed of technician who prepare and operate the gliders, program and supervise the cruise, format and distribute the data at the end of the cruise.

Instruments/Sensors

Instrument	Measured Parameter(s)	Depth range	Sampling frequency	Frequency of data recovery
1 x 1000m rated glider (Seaglider)	**conductivity, temperature, pressure, oxygen, fluorescence and turbidity**	**0-1000 m**	**0.5 Hz**	**To be determined by operator and user (balance between user needs and energy consumption)**

Special owner rules

Carefully peer-review of proposed missions – study area, feasibility, mission definition, benefits.

Infrastructure (short name)	National Glider facility	
Installation (short name)	National Glider facility (CETSM)	
Location	Western Mediterranean	
Legal name of organization	Institut National des Sciences de l'Univers/ Centre National de la Recherche Scientifique INSU/CNRS	
Location of organization	La Seyne sur mer, France	
Contact	Pierre Testor, testor@locean-ipsl.upmc.fr Laboratoire d'Océanographie et de Climatologie : Expérimentation et Approches Numériques (LOCEAN, ex LODYC) Institut Pierre Simon Laplace, Université Pierre et Marie Curie, aile 45-55, 4ème étage, case 100 4 Place Jussieu, 75252 Paris cedex 05, France Phone: +33 1 44 27 72 75 Fax: +33 1 44 27 38 05	
Web site address	http://www.ego-network.org	

Description
The French National Glider facility is held by DT-INSU in La Seyne sur mer. It is part of and supports a larger group so-called EGO (Everyone's Glider Observatories). This glider facility started in September 2008, and is now composed of 5 engineers and technicians operating, by the end of 2011, 14 operational gliders, 4 of them being shallow gliders rated to 200m depth maximum but ideal for operations on the shelf. The facility is fully equipped to prepare, operate and maintain gliders: - A glider ballasting tank in order to prepare the glider, - An electronic lab for battery change and maintenance - Servers and modems for communications with the gliders - The ego-network.org web server which allows the real-time display of the collected data a and containstools for piloting gliders (monitoring and mission changes) through the web, in a collaborative way The glider staff is fully trained (preparation and piloting) and is working on shift for continuous service. Among the gliders one can find the following available sensors: - CTD - Oxygen Optode - Fluorimeters (ChlA, CDOM, Phycoerythrine,) - Back scattering (from 470 to 880 nm), turbidity
Service offered
INSU can provide access to users to the DT-INSU gliders facilities, including the use of one or

more glider units (after a carefully peer-review of proposed missions – feasibility, mission definition, benefits, etc…)

The proposed services can consist of:

- Preparation of a fleet of gliders (1 to 3 gliders) and its sensors for a specific task and for the area to operate, including new sensors to integrate and test

- Logistics from the operator facilities to the operation site and return as well as launch/recovery operations of the gliders, if the operation site is in the vicinity of DT-INSU gliders facilities (NW Mediterranean, otherwise only assistance will be provided).

- Remote control and programming of the gliders

- Data recovery and delivery to the user.

As long as the iridium link between the gliders and land make it possible, eal-time data will be available in real-time. There is a dedicated team composed of technicians who prepare and operate the gliders, program and supervise the cruise, format and distribute the data at the end of the cruise.

Instruments/Sensors

Instrument	Measured Parameter(s)	Elevation/Depth	Sampling frequency	Frequency of data recovery
glider1	**T, S, O2+other biogeochemical sensors**	**0-200m or 0-1000m (min of ~50m waterdepth)**	**4-8s**	**~5h**
glider2	**T, S, O2+other biogeochemical sensors**	**0-200m or 0-1000m (min of ~50m waterdepth)**	**4-8s**	**~5h**
glider3	**T, S, O2+other biogeochemical sensors**	**0-200m or 0-1000m (min of ~50m waterdepth)**	**4-8s**	**~5h**

Special owner rules

Carefully peer-review of proposed missions – study area, feasibility, mission definition, benefits.

Infrastructure (short name)	OGS-North Adriatic Coastal Observatory (OGS-NACObs).
Installation (short name)	OGS-Oceanographic Calibration Centre (OGS-CTO).
Location	Mediterranean Sea, Adriatic Sea, Trieste.
Legal name of organization	Istituto Nazionale di Oceanografia e di Geofisica Sperimentale - OGS.
Location of organization	Trieste, Italy.
Contact	Rajesh Nair, rnair@ogs.trieste.it Department of Oceanography Istituto Nazionale di Oceanografia e di Geofisica Sperimentale - OGS Borgo Grotta Gigante 42/C, 34010 Sgonico (TS), Italy Phone: +39 040 2140323 - Fax: +39 040 2140266
Web site address	http://nettuno.ogs.trieste.it/jungo/cto/index_eng.html

Description
The OGS-Oceanographic Calibration Centre (OGS-CTO) is the oceanographic testing and calibration facility of the Department of Oceanography of the Istituto Nazionale di Oceanografia e di Geofisica Sperimentale (OGS). It provides the Department with the scientific and technical infrastructure necessary for making and guaranteeing high-quality observations of the marine environment in a way that continuously meets recognized international standards of excellence. A critical element of the services offered is the ability to calibrate and maintain sea-going instrumentation efficiently. The facility is run applying relevant international guidelines and protocols as much as practically possible in order to assure conformity or, at least, compatibility, with the regulatory standards governing this kind of activity worldwide. The OGS-CTO is supervised and manned by a small team of experienced technicians, the Department of Oceanography's Calibrations & Testing Operations Group (CTO Group) headed by Mr. Nevio Medeot, which also oversees the facility's scientific and technological development. Currently, the OGS-CTO can provide high-calibre temperature and conductivity calibrations able to meet the demanding oceanographic measurement specifications for these parameters. It is also capable of performing functional tests, evaluations and validations of instrumentation used for measuring other commonly monitored parameters like turbidity, pH, etc.
Service/s offered
Marine temperature and conductivity sensor calibrations (with the support of OGS-CTO personnel). *Kindly note that the calibration of one pair of temperature and conductivity sensors normally takes about five working days*.

Instruments/Sensors

Current capabilities for temperature and conductivity calibrations:

Table 1. The laboratory instrumentation and reference material constituting the calibration set-up for **conductivity**.

Test instrumentation	Specifications
Hart 7052 Seawater Calibration Bath	Range: -10.00 - 110.00℃ Stability: >±0.001℃
Guildline 5010 Seawater Calibration Bath	Range: -9.90 - 65.00℃ Stability: ±0.002℃ over 24 hours
Hart 1590 Precision Digital Thermometerwith Metal-sheath SPRT (Rosemount 162CE / Hart 5699)	Range: 0.00 – 30.00℃ Accuracy: > ±0.0015℃
SBE41 CP-OGS Conductivity & Temperature Monitor	Range: 0.00 – 60.00 mS/cm Accuracy: > ±0.003 mS/cm
Laboratory Salinometer (Guildline Autosal 8400B)	Range: 0.005 - 42 psu salinity Accuracy: > ±0.002 PSU over 24 hours
Portable Salinometer (Guildline model 8410)	Range: 0.004 - 76 mS/cm Accuracy: ±0.003 PSU

Reference Material
IAPSO Standard Seawater

Table 2. The laboratory instrumentation and reference material constituting the calibration set-up for **temperature**.

Test instrumentation	Specifications
Hart 1590 Precision Digital Thermometer with Metal-sheath SPRT (Rosemount 162CE / Hart 5699)	Range: 0.00 – 30.00℃ Accuracy: > ±0.0015℃
SBE41 CP-OGS Conductivity & Temperature Monitor	Range: 0.00 – 30.00℃ Accuracy: > ±0.003℃
Hart 7312TPW Maintenance Bath	Range: -5 – 110℃ Stability: ±0.001℃ at 0℃
Hart 9230 Ga Cell Maintenance Bath	Range: 15 – 35℃ Stability: ±0.02 ℃

Reference Material
Two Jarrett B13 and one Hart 5901, TPW Cells Hart 5943,Melting Point of Gallium Cell Standard resistors(L&N 4030B / Guildline 9330 series)

Uncertainty:

Temperature:
Expanded Measurement Uncertainty (95% level of confidence; k = 2) for reference temperature: 0.0030 °C (ITS-90).

Conductivity:
Expanded Measurement Uncertainty (95% level of confidence; k = 2) for reference conductivity: 0.00034 Siemens/m (0.0034 mS/cm).

Special owner rules

- The responsibility of the OGS-CTO shall be limited to the correct and scrupulous execution of the requested service/s, including the supervision of consigned sensors/instrumentation when they are on its premises. The OGS-CTO shall not be held liable for any other kind of responsibility relating to defects, faults or malfunctions of the delivered sensors/instrumentation, including those that may arise from packing/unpacking, handling by unauthorized persons and shipping operations.

- The OGS-CTO shall not be held liable for any damage that may occur to consigned sensors/instrumentation during the execution of the requested service/s resulting from pre-existing defects, faults or malfunctions of the same (for example, corroded connectors, defective o-rings, improper maintenance, etc.). Any extraordinary repair or maintenance requirement arising in the performance of the specified service/s shall be communicated immediately to the TNA Beneficiary; all such requirements will be itemized and costed separately, and action will be undertaken only upon receiving express permission to proceed from the Beneficiary.

- In case of unexpected or unpredictable events that could render temporarily impossible the completion of the services requested in the assigned time-frame, the resulting delay will be communicated to the TNA Beneficiary, without this being the reason or motive for claims for damages or any other similar initiatives on the part of said Beneficiary.

Infrastructure (short name)	POSEIDON Observatory (POSEIDON)	
Installation (short name)	POSEIDON CALIBRATION LABORATORY (POSEIDON CAL)	
Location	Eastern Mediterranean Sea-Crete	
Legal name of organization	Hellenic Center for Marine Research HCMR	
Location of organization	Athens GREECE	
Contact	George Petihakis, gpetihakis@hcmr.gr Institute of Oceanography HCMR Thalassocosmos, Former US base at Gournes P.O. Box 2214 HERAKLION CRETE, GR 71 003 GREECE Phone: +30 2810 337755 - Fax: +30 2810 337822	
Web site address	http://www.poseidon.hcmr.gr	

Description

The calibration facilities at the HCMR Thalassocosmos complex in Crete include a fully equipped laboratory with a special designed large calibration tank, two smaller glass tanks and a number of reference sensors and equipment for temperature, salinity, chlorophyll-a, turbidity and dissolved oxygen sensors calibration.

Service offered

The TNA offered by the POSEIDON system to the project includes:

Calibration laboratory: It can be used for calibration of sensors (temperature, salinity, chl-a, turbidity, dissolved oxygen).The support team consists of the HCMR technicians and scientists who regularly prepare the instrumentation, perform field experiments, service and maintain the instruments and assist the users during the experiments in the calibration facility.

Field experiments: Calibrated sensors can be tested in the field.

Instruments/Sensors

Reference Sensors and Instruments

Instrument	Measured Parameter	Range	Accuracy	Resolution
Deep Ocean Standards Thermometer *SBE 35*	Temperature (ITS-90)	-5 to +35 °C	0.001 °C	0.000025 °C
AutoSal 8400A	Conductivity Ratio (Salinity)	0.005 to 42 ppt	0.003 ppt	0.0002 ppt

Furthermore a variety of sensors (Seabird 37 SIP, Aanderaa 3919B, Aanderaa 3975) are used in order to monitor the measurement parameters inside the calibration tanks during the experiments. For the calibration of the DO sensors samples are collected during the experiment and analyzed later using the Winkler methodology. Regarding fluorometer and turbidity sensor the sensors are calibrated against known concentrations and particles dimensions of reference solutions.

Additional service/data

Discrete samplings for long-term series

Parallel to the calibration laboratory HCMR operates a fixed observatory (M3A) where a large number of parameters are monitored (3h – real time). In addition, during monthly visits, in situ samplings are also performed.

Special owner rules

Requests for calibration services must be made at least 1 month in advance.
The user should provide the measured parameters range of the area where the sensors will be deployed.
The calibration lab of HCMR DOES NOT use formazin for turbidity sensors calibration.