FixO³
FIXED-POINT
OPEN OCEAN
OBSERVATORIES

Are you a European marine enterprise or research organisation interested in open ocean facilities, e.g., for instrument tests or research projects but are short of budget?

Transnational Access

Financial & logistical support for open ocean infrastructures

14 open ocean observatories and **1** shallow-water test-site of the FixO³ fixed point ocean observatory network are open to projects from industry and science

Find out more on www.fixo3.eu/TNA

Transnational Access

Research organisations and marine technology companies are invited to access 15 ocean observatories to conduct scientific studies or to test technology prototypes with full financial and logistical support. Applications are open from the 16 June to the 31 July 2014.

FixO3 FIXED-POINT OPEN OCEAN OBSERVATORIES

The FixO3 project's 'Transnational Access (TNA)' initiative is about supporting, financially and logistically, external scientific users and includes 14 ocean observatories in the open ocean and one shallow water test site in the Western Mediterranean Sea available for access by successful applicants. Observatory locations range from the polar regions of the Antarctic and Arctic, to the Atlantic Ocean and Mediterranean Sea with a choice of seafloor, mid-water and surface infrastructures with varying scientific focus due to each location's characteristics. These observatories were selected as they offer the broadest scientific and technological capabilities for multidisciplinary observations such as atmosphere-ocean interactions at the sea surface and processes in the water column and ocean floor. Gliders are also available for some of the sites. The observatories address a wide range of disciplines such as biology, biogeochemistry, chemistry, physics and geology.

TNA Selection Process

The Evaluation Panel will assess all proposals received and recommend a short-list of the user groups that should benefit from access free of charge. In so doing, it will apply the principles of transparency, fairness and impartiality.

FixO3 will maintain a traceability system by monitoring and documenting the access provided under this project. These activities will be coordinated in WP7.

The Evaluation Panel shall base its selection on scientific merit. The process will also value proposals from user groups composed of users who have not previously used the infrastructure, are working in countries where no such research infrastructures exist or have no prior experience accessing such infrastructures.

The selection process starts as soon as the TNA Office launches a call. The applicant is asked to contact the Observatory Manager for a pre-feasibility evaluation of his/her project. The application should include a confirmation letter / letter of support from the Observatory Manager as part of the application to the TNA office.

The Evaluation Panel, composed of FixO3 Consortium and Advisory board members, will review the applications and establish a ranking based on the evaluation criteria below. Each proposal will be reviewed by three evaluators. The TNA Office will invite specialists from the consortium if specific expertise is missing in the panel.

Evaluation Criteria (& maximum number of pages)	Max Score	Threshold
Scientific and technical objectives (Potential interest to the research/service provider community; Originality and innovation, European relevance) – **2 pages**	5	3
Quality of the methodology and implementation: clarity, adequacy in relation to set objectives, work plan, adequacy with the infrastructure (incl. e.g. prior scientific, technical or logistical arrangements, risk table) – **2 pages plus risk table**	5	3
Scientific Excellence of user group – **2 pages**	5	3
Links or potential for seeding links with Industry (e.g., European enterprises interested in the measurements, participating to the project, e.g. testing new measuring systems or methods, etc.) – **1 page**	3	-
Applications from Member States where similar infrastructures are not available as well as from user groups with no prior experience accessing an infrastructure	2	-
Total score	20	-

A consensus review meeting will be held to finalise the individual review reports and the final consensus review report.

The criteria criteria shown will be used to evaluate the proposals.

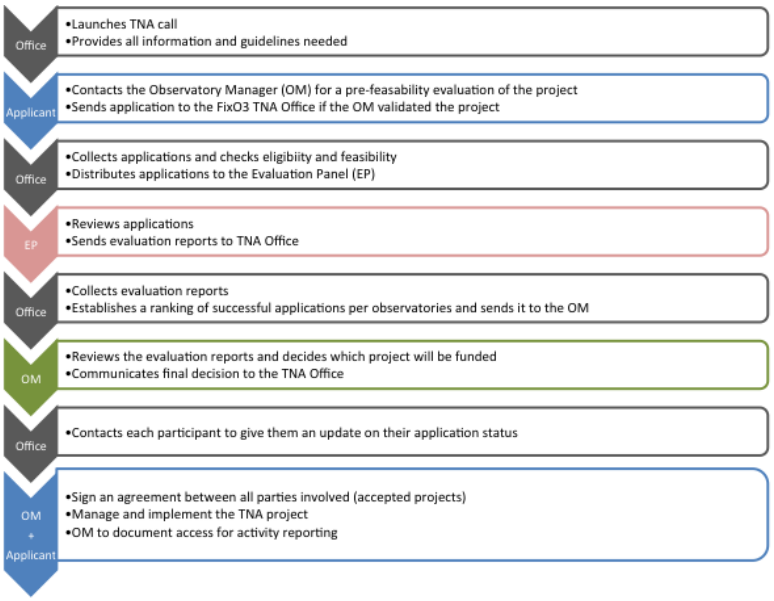
The ranking and final evaluation summary reports will be sent by the TNA Office to the Observatory Manager, who will be responsible for selecting the project(s) requesting the infrastructure, that will be funded. The final ranking of the submitted proposals will be sorted in descending order. Approval will be granted, starting with the proposal that has the highest rating and then working downwards.

Final decision will be addressed to the TNA Office, which will communicate the status of their project to the applicants.

Some projects may be facilitated at an equivalent installation to match scientific ratings and demand, wherever needed and practical, in agreement with the user/user group.

The leader of each selected user group will be contacted directly by the Observatory Manager chosen for its activities to receive additional information/guidelines and to allow the TNA Office to start drafting the TNA grant agreement.

The agreement will delineate the actions to be undertaken, the resources that will need to be allocated, the length of planned user stays if any, and the period of use. It will also define the rights and obligations of the poarties involved, including provisions for force majeure or early termination. In this final agreement phase, the TNA Office may provide support material wherever needed and possible.



ANTARES

West Ligurian ANTARES Secondary Junction Box

The ANTARES infrastructure is a permanent marine observatory providing high-bandwidth real-time data transmission from the deep-sea for geosciences and marine environmental sciences in West Ligurian Mediterranean Sea. It is composed of the Secondary Junction Box (SJB) and an inductive mooring which can host additional instrumentation.

Operated by
Operated by French Marine Research Institute (IFREMER) and National Scientific Research Center (CNRS)

Infrastructure Location
Northwestern Mediterranean Sea
Latitude: 42.8 Longitude: 6.17

Maximum Depth
2475 m

Preferred time period for TNA
During cruises to serve the Antares neutrino Telescope Infrastructure

Services Available
Connection to the Secondary Junction Box (SJB 2500m) and the inductive mooring. A similar surface platform provides free data access.

TNA Information

The EMSO West Ligurian Antares Secondary Junction Box (SJB) is part of the Associated Earth-Sea science extension of the ANTARES NEUTRINO telescope infrastructure. The detector comprises a grid of about one thousand photomultipliers (PMT), sensitive to the Cherenkov light emitted by high energy neutrinos interacting close to the detector. The Secondary Junction Box (SJB) was installed in October 2010 and offers the capabilities to connect new equipment for Earth-Sea science by 2500m depth (6 connectors available). Till 2010 a Geoazur Guralp seismometer is connected to the SJB. In the frame of ESONET an observatory module (the MII Instrumented Interface Module) was also connected to the SJB. It includes a CTD, an Oxygen optode, an Aquadopp ADCP, a BioCAMCamera, a Turbidimeter and a Paroscientific pressure sensor. In 2013 this MII module has been recovered for maintenance, and should be deployed again in 2014. It is planned to interface also an acoustic modem to the SJB; it will communicate with the Instrumented mooring line hosting classical oceanographic instrumentation and new instrumentation such as the IODA6000 (In situ Oxygen Dynamics Auto Sampler), dedicated to oceanic oxygen studies. The infrastructure is expected to offer another similar facility called MEUST in 2014. This facility might be included under the same conditions in the TNA.

Secondary Junction Box

Hosting: the Secondary Junction Box offers 6 general purpose connectors for the connection of equipment under conditions of shared time, power and bandwidth. Each connector provides 100Mb/s data link and a supply of 400 VDC with a maximal power of 0.7 KW (shared with all outputs). At the moment only 1 connector is used by the Geoazur seismometer.

Data: deep-sea for geosciences and marine environmental sciences, seismometer, current meter, Pressure sensor, Oxygen Optode etc..

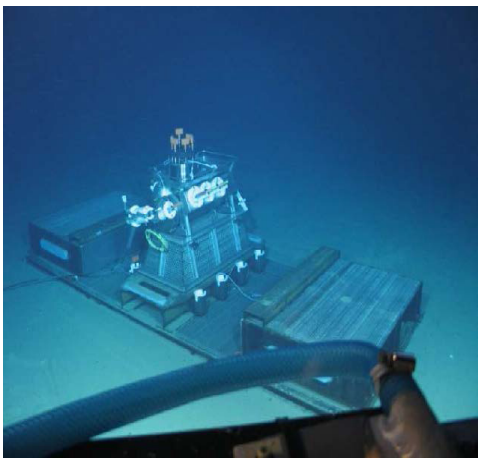
Instrumented mooring line

Hosting : This line can host additional instrumentation

Data: Dissolved Oxygen, current, salinity, temperature

Existing procedure to access to the infrastructure

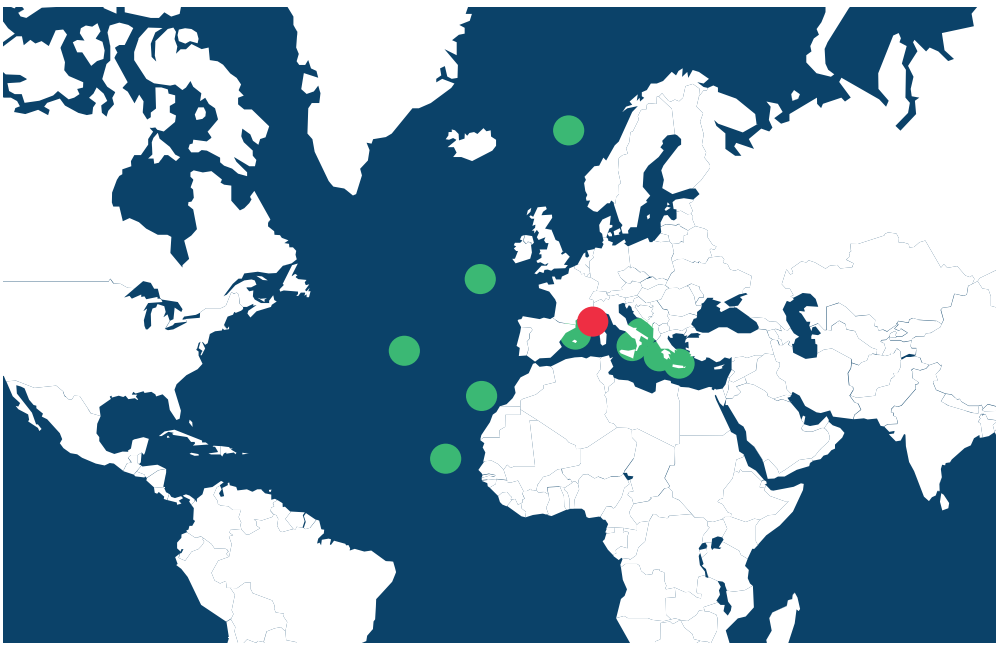
IFREMER and CNRS operate the access to the SJB. The use of Antares-MEUST backbone infrastructure must comply with established rules. Principles, techniques and procedures to access the infrastructure are defined by the GUASA document (User Guide refers to the Access to ANTARES), and are updated by the head of the SAI (access service infrastructure, in charge of managing the ANTARES access by users, for the ANTARES Collaboration).



TNA Support offered

The scientific group collaborations which are offered to the users are involved in FIXO3, MOOSE, KM3Net, and EMSO. Support will include logistical, technological and scientific to access the SJB: cruise preparation meetings, training, onshore tests and preparation of the equipment to be implemented, assist the deployment by ROV. They will implement their drivers and be able to use the data management infrastructure. The teams involved in transnational access will participate to the deployment and to the recovery cruises.

Further information is available at:
www.fixo3.eu/observatory/antares



CVOO

Cape Verde Ocean Observatory (formerly TENATSO)

Observation is fundamental to understanding global climate change. Atmospheric change impacts marine ecosystems, and the atmosphere is influenced by ocean physical and biogeochemical processes. Many impacts/feedbacks are focused in the Tropics. CVOO is part of the Cape Verde Observatory (17.4°N 24.5°W) which consists of operational atmosphere and ocean monitoring sites for various climate-relevant environmental parameters in the tropical eastern North Atlantic. The entire region, as many tropical areas, is data poor but plays a key role in air-sea interaction.

Operated by
National Institute for Fisheries Development, INDP.

Infrastructure Location
Cape Verde
Latitude: 17.4 Longitude: -24.5

Maximum Depth
3600 m

Preferred time period for TNA
The ship can be accessed all the year round. Mooring services are carried out every 18 months.

Services Available
- Long-term mooring
- Monthly water sampling
- Onshore laboratory facilities
- Ship operations for deployment & recovery of mobile autonomous platforms

TNA Information

Cape Verde is ideally located for both ocean and atmosphere observation. Being downwind of the Mauritanian upwelling, the Observatory will provide unique information linking biological productivity and atmospheric composition. The location is critical for climate and greenhouse gas studies and for investigating dust impacts on marine ecosystems. The co-location of ocean and atmospheric observatories is unique.

At the ocean site measurements of a suite of physical and chemical parameters are carried out from an autonomous long-term mooring maintained uninterruptedly since 2006 as well as a monthly ship-based discrete sampling programme that started in 2008. The local Cape Verdean research vessel Islândia is equipped with state of the art instruments to collect water samples for marine parameters and high resolution measurements in the water column. Novel mobile observational platforms such as gliders or profiling floats are used within the framework of various field studies at CVOO.

Long term

The mooring line is equipped with a suite of physical and biogeochemical instruments for determining the following parameters: conductivity, temperature, pressure, fluorescence, turbidity, currents and downward particle flux. Data are available in a delayed mode (every 18 months). Installation of a surface buoy for real-time data access is scheduled for the next redeployment.

Ship-based Sampling

Monthly site occupations with RV Islândia are used for performing CTD hydrocasts including collection of water samples (0 – 500 m). The CTD rosette hosts sensors for temperature, conductivity, pressure, O2, fluorescence, turbidity and PAR. Discrete water samples are collected for analysis of conductivity, O2, DIC, TA, nitrate, nitrite, phosphate, silicate, TOC/TON, POC/PON and chlorophyll-a.

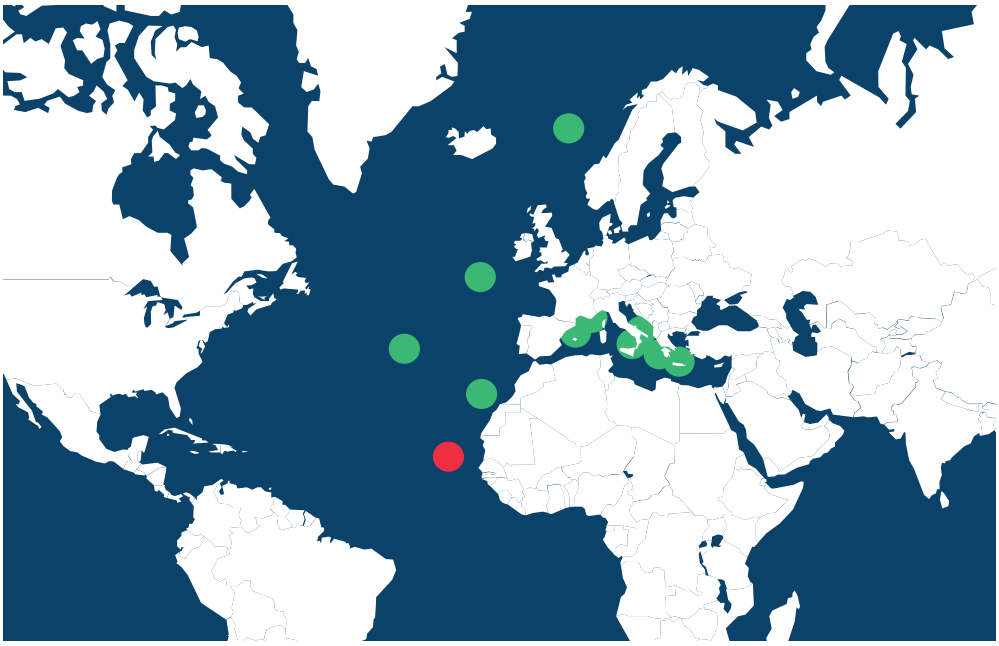
Onshore

A small shore-side laboratory exists with basic equipment for analysis of chemical and biological water samples. Limited space for frozen sample storage (-20 °C) as well as a liquid nitrogen generator exist. New laboratory, workshop and storage facilities will be part of a new building which will be established until late 2016 (Ocean Science Centre Mindelo – OSCM).

TNA support offered

- water sampling during monthly cruises
- technical and logistical on- and offshore support
- hosting additional sensors on the mooring line
- deployment & recovery of autonomous instrumentation

Further information is available at:
www.fixo3.eu/observatory/tenatso



DYFAMED

Dynamique des Flux Atmospheriques en MEDiterranee

Multidisciplinary site included in the national MOOSE network (NW Mediterranean Sea), in passage between eastern and western Mediterranean Sea. The area is submitted to strong atmospheric deposition influencing the oceanic productivity and particle export. Both processes are monitored by one atmospheric survey (Cap Ferrat installation) and two permanent sediment traps since 1988. Physical parameters are recorded from surface to deep waters through monthly visits and a permanent deep mooring. Biogeochemical parameters are obtained during the monthly during ship visits. The site is also a waypoint of gliders and used for cross- validation of bio-parameters (nitrate, oxygen, chlorophyll).

Operated by
Centre National de la Recherche Scientifique et l'Institut National des Sciences de l'Univers (CNRS/INSU), France

Infrastructure Location
Northwestern Mediterranean Sea
Latitude: 43.42 Longitude: 7.87

Maximum Depth
2350 m

Preferred time period for TNA
During annual cruises to serve the mooring. Monthly ship visits are also available with one day per month.

Services Available
Water sampling (surface-bottom) during the monthly visits (R/V TETHYS II) ; Surface platform (above and below water level), sensor frame, sediment traps (200 m & 1000m)

TNA Information

The DYFAMED station has over 25 years of history as a sustained time-series site. There are three main operations that form part of the DYFAMED site.

1) One standalone deep mooring (150-2350 m) with two sediment traps (200 & 1000 m) for physical and carbon fluxes measurements

2) One surface buoy (Meteo France) with surface mooring (upper 250m) for atmospheric and upper ocean measurements

3) Monthly ship visits for water column profiles and seawater sampling

The DYFAMED site has been initiated in 1988 through the JGOFS program to observe the climate and anthropogenic impacts on marine ecosystems. Since the beginning, the site has been regularly visited for water column processes during monthly cruises and for sediment traps time series during annual cruises. Since 1999, the site has been equipped with a surface buoy (Meteo France) to record atmospheric parameters with realtime transmission capability. Since 2009, autonomous sensors have been installed on the deep mooring from sub-surface to bottom levels (EuroSites). More recently, a surface mooring installed under the Meteo France buoy has been implemented in the upper 250m to monitor the thermic and haline content influencing the heat and water budget. Nowadays, the DYFAMED site represents a unique long time series in the Mediterranean Sea for assessing the change of water mass properties (Levantine Intermediate Water and Western Mediterranean Deep Water), the variability of mixed layer depth and atmospheric deposition influencing the oceanic productivity and the carbon sink.

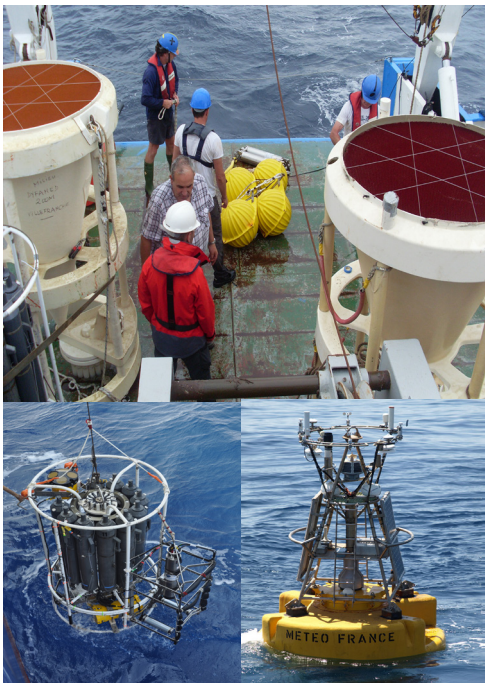
Surface and upper ocean

Hosting: the surface buoy and the surface mooring can host additional instrumentation for upper ocean monitoring.
Data: Atmosphere: Wind speed and direction, Relative humidity, Air temperature, sea temperature, Atmospheric pressure, significant wave height and period. Water column: Salinity, temperature and nitrate

Mooring and sediment traps

Hosting: sediment traps mooring can host additional instrumentation at depth between 150 to 2350 m.
Data: temperature, salinity, dissolved oxygen, particles flux and currents

Monthly ship visits
Hosting: a CNRS vessel is operating every month for CTD profiles and seawater

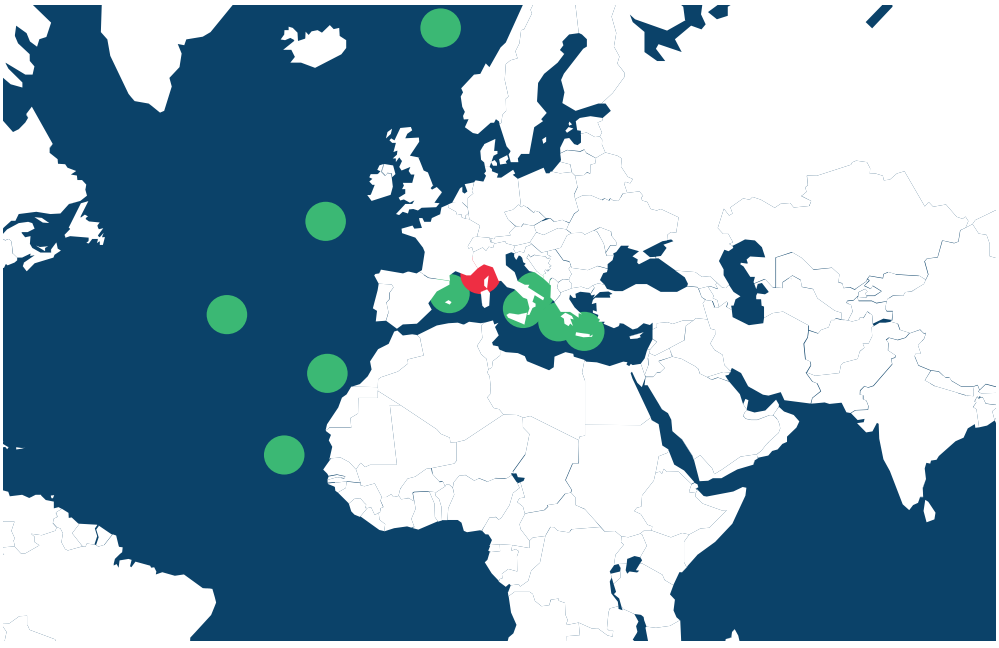


sampling. Additional sensors can be installed on the CTD-rosette frame as well as additional seawater samples
Data: deep CTDO2 profiles, nutrients, dissolved oxygen, dissolved inorganic carbon, pigments, particles and zooplankton.

TNA Support offered

Logistical, technological and scientific support will be provided to access all DYFAMED installations.

Further information is available at:
www.fixo3.eu/observatory/dyfamed



E1-M3A

POSEIDON E1-M3A

Multidisciplinary mooring located at the eastern Mediterranean off shore Crete island, an area of open sea conditions, characterised as extremely oligotrophic where dense waters with intermediate and deep characteristics are formed. A dipole gyre system in combination with the presence of a number of water masses creates a unique ecosystem governed mainly by physical processes.

Operated by
Hellenic Centre for Marine Research

Infrastructure Location
Cretan Sea
Latitude: 35.44 Longitude: 25.07

Maximum Depth
1440 m

Preferred time period for TNA
During the cruises to serve the mooring (every 6 month for 2-3 days)

Services Available
Surface platform and mooring line with instruments

TNA Information

The station has been operational since January 2000 with significant upgrades through research projects. The new POSEIDON E1-M3A system operates at the same site (1440m depth) and has a single mooring line configuration that hosts sensors for temperature and salinity at several depths as well as chl-a, dissolved oxygen, PAR and light attenuation.

The surface buoy hosts a complete set of sensors for air-sea interaction studies (wind speed and direction, air pressure, air temperature, wave height and direction, relative humidity, precipitation, radiance, irradiance, radiometer and pyrometer) as well as an ADCP for current speed measurements in the upper 100m and a CO2 sensor. The station was upgraded with a mooring of two sediment traps (200 & 1400m) close to the buoy deployed in January 2011. Moreover a monthly in situ sampling program has been established since March 2009. In the framework of this sampling program a wide range of physicochemical and biological parameters in the euphotic zone are measured in the field or in the laboratory.

The location of the buoy is an area of open sea conditions, characterised as extremely oligotrophic where dense waters with intermediate and deep characteristics are formed.

Hosting:

- Buoy can host additional instrumentation for atmospheric and air-sea interface.
- Mooring lines can host both real-time as well as autonomous systems. Clamp systems and other mechanical adapters can be manufactured locally upon request.

Data:

- Atmosphere: air temperature, air pressure, wind speed/direction, precipitation, humidity, radiance, irradiance, pyrometer PSP, radiometer PIR
- Ocean-Air interface: Wave height, salinity, temperature, CO
- Water column: Salinity and temperature (20, 50, 75, 100, 250, 400, 600, 1000m), turbidity, chl-a, oxygen, PAR (20, 50, 75, 100m), currents (5-50, 10 bins of 5m)
- Sediment traps: OC, ON (C13, N15), TC, TN, (C13, N15), Si, Al, Ca, Ti, V, Cr, Mn, Fe, Ni, Cu, Zn, As, Cd and Pb, Biochemical (proteins, sugars, lipids), Biomarkers, Black Carbon.

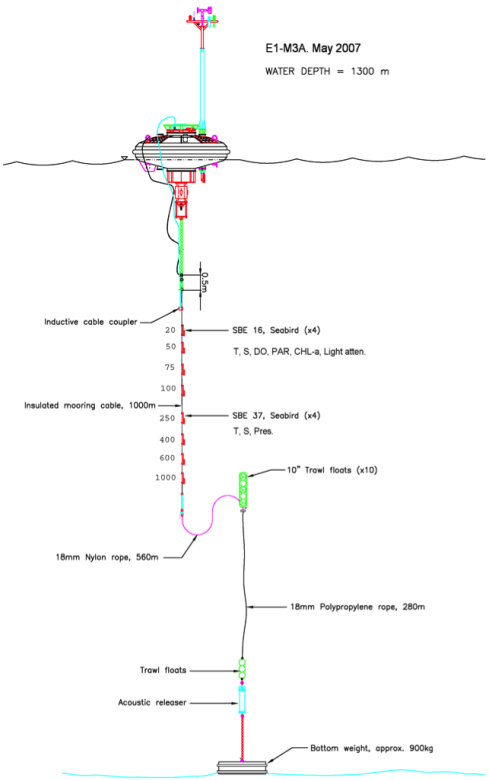
TNA Support Offered

Logistical, technological and scientific support for all components. For more information

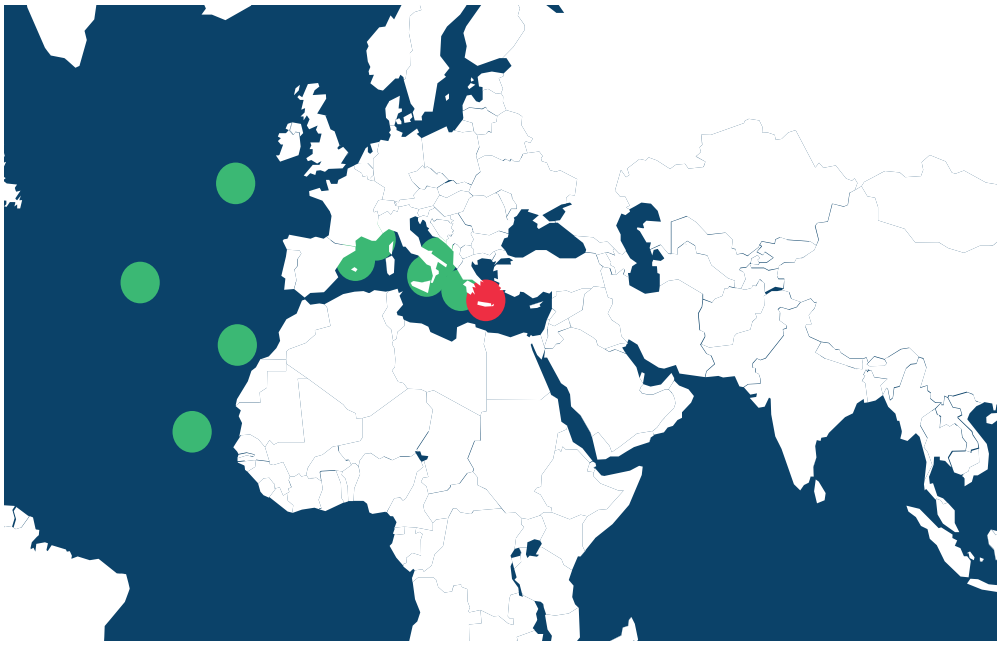
http://www.poseidon.hcmr.gr.

Other capabilities and services:

- Data and sensor inter-comparison tests and validation missions.
- Other parameters can be measured during trips and sensors can be tested, calibrated, etc. CTD, light, Oxygen, Chl-a (0-150 CTD casting), NH4, NO3, NO2, PO4, SiO4, Chl (4 size fractions), microbial stock, phytoplankton stock (surface, 10, 20, 50, 75, 100m), zooplankton stock (0-100m).



Further information is available at:
www.fixo3.eu/observatory/e1-m3a



E2M3A

Eastern Mediterranean Multidisciplinary Moored Array

The E2-M3A observatory is located in the centre of the Southern Adriatic, where deep convection and cascading of dense water take place, involving both the atmosphere and the ocean dynamics, and triggering the solubility and the biological pumps. The E2-M3A observatory is particularly devoted towards studies that characterise the long-term changes of the Adriatic Sea in response to local climatic forcing.

Operated by
Istituto Nazionale di Oceanografia e di Geofisica Sperimentale (OGS)

Infrastructure Location
South Adriatic (Eastern Mediterranean Sea)
Latitude: 41.52 Longitude: 18.08

Maximum Depth
1250 m

Preferred time period for TNA
Simultaneously to the scheduled maintenance

Services Available

- Calibration facilities: intercalibration, pre- and post-calibration
- Maintenance on the installation
- Resources sharing
- Data intercomparison with external devices
- Data delivery (near-real-time, delayed-mode)
- Glider surveys

TNA Information

The observatory has worked continuously since 2006. The E2M3A system is characterised by a surface buoy and a subsurface single mooring line.

- A surface buoy equipped for air/sea interaction studies (meteorological parameters), physical and biochemical (CO2 and pH) measurements of the surface layer (15 m depth).
- A secondary fully equipped mooring line with the current meters, CTD's with Dissolved Oxygen and optical sensors.

The surface buoy hull of welded steel construction has a discus shape (diameter 2 m), which provides three main compartments, provision for installation of sensors, ballast compartments provision for the attachment of the superstructure. Inside there is a Control Panel that manages the acquisition and system electronics (power management, solar panels, GPS, battery voltage and current, internal temperature, orientation, etc.). The position of the buoy is controlled with GPS and monitored by Argos beacon (ARGOS 1-way comm) that transmit the position if the anchor line is accidentally severed. A Globalstar satellite link in turn enables the real-time transmission from the platform to the ground station.

The secondary mooring line houses a chain of instruments with sensors at different depths to measure physical and chemical characteristics from intermediate layer to the bottom.

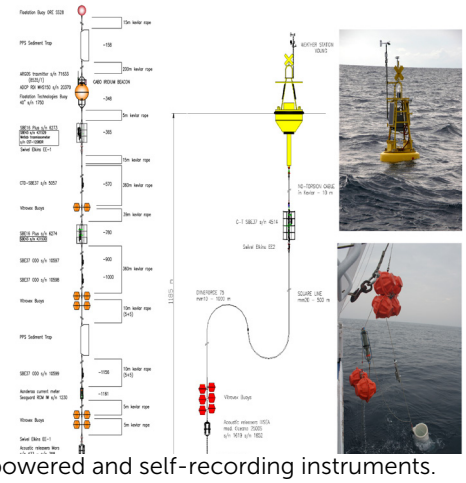
An Iridium SBD beacon is installed to transmit the position during the recovery operations and in case of breakage of the mooring rope. Each anchor line is equipped with double releasers to allow easy retrieval of the system.

Surface Buoy

Hosting: the Electronic Control Panel can accommodate up to 6 communication ports. Currently there are no available ports. It is however always possible to accommodate self-powered and self-recording instruments both in air (on the superstructure) than in water (on the cage). Data: Atmosphere- Wind speed and direction, Relative humidity, Air temperature, Sea temperature, Atmospheric pressure, Solar radiation. Water column: Salinity, Temperature, pCO2, Dissolved oxygen, pH.

Sub-surface mooring

Hosting: compatibly with the installation limits is possible to host several self-

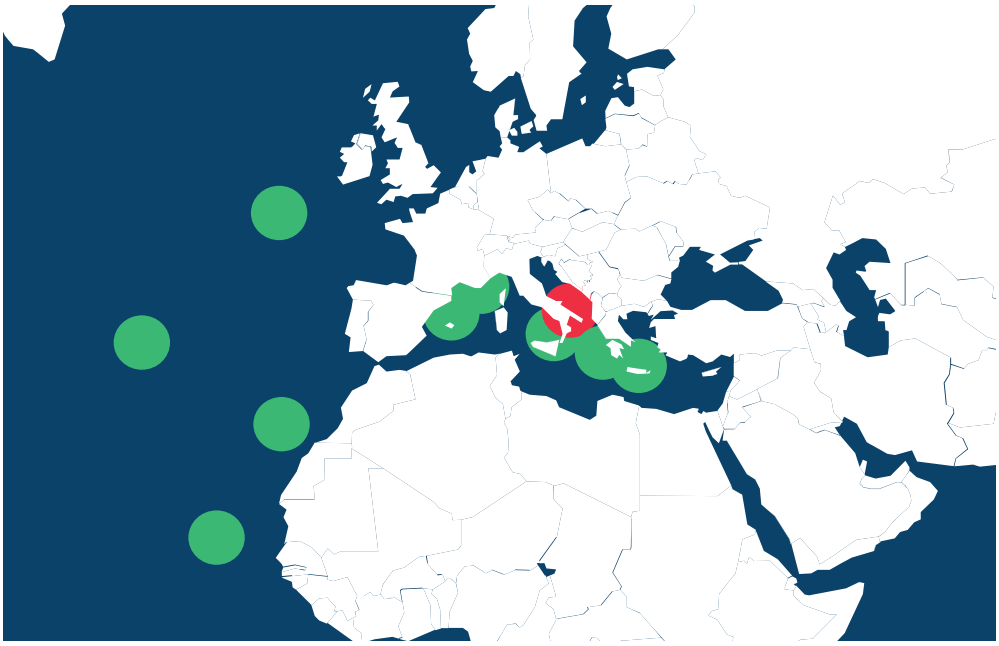


powered and self-recording instruments. Data: Temperature, Salinity, Transmittance, Dissolved oxygen, Currents, Turbidity.

TNA Support Offered

- Ship opportunities
- Logistics
- Party chief
- Engineer
- Technicians
- Oceanographic Calibration Centre

Further information is available at:
www.fixo3.eu/observatory/e2m3a



ESTOC

European Station for Time series in the Ocean Canary Islands (ESTOC)

An infrastructure for the continuous monitoring of the Central Eastern North Atlantic. Located to the east of the subtropical gyre, this deep observatory holds a multidisciplinary mooring measuring meteorological, physical and biogeochemical ocean data in real-time and delayed mode. Associated ship campaigns and operations, and seasonal glider missions are currently taking place.

Operated by
Oceanic Platform of the Canary Islands (PLOCAN)

Infrastructure Location
Northeast Atlantic
Latitude: 29.17 Longitude: -15.5

Maximum Depth
3615 m

Preferred time period for TNA
Coinciding with annual or bi-annual mooring maintenance cruises, and seasonal glider missions

Services Available
1) Buoy can host additional instrumentation for atmospheric and air-sea interface,
2) Mooring can host autonomous systems
3) Some of our gliders have an open architecture, thus can host a variety of sensors and communication systems.
4) Autonomous systems can also be deployed on the seafloor (e.g. seismic and acoustics monitoring, multidisciplinary sensor packages, etc.)

TNA Information

The ESTOC/PLOCAN has been running for more than 20 years in different modes and providing sustained time series data. The main continuous mode includes:

1) A mooring to the ocean floor with surface buoy, atmospheric measurements, surface measurements and an upper ocean frame with a set of sensors.

2) From 2012 the ESTOC station is regularly visited on a seasonal basis by gliders, which integrate a set of sensors to collect physical and biogeochemical ocean data at depths ranging from surface to 1000m.

3) The "in situ" sampling consists of CTD and oxygen and nutrients sampling in the water column down to 200m, including chlorophyll "a". From September 1995 periodic measurement of the carbon dioxide system variables has also taken place.

Operational since 1994 and part of the EU projects ANIMATE (since 2001), MERSEA (from 2004), EuroSITES (2008) and FixO3 (2013).

Buoy and Mooring

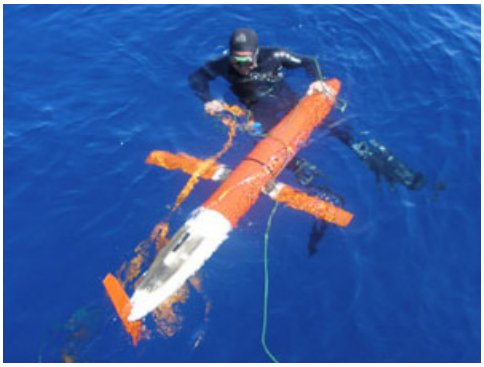
Hosting: Buoy can host additional instrumentation for atmospheric and air-sea interface. Mooring can host autonomous systems (real-time communication between midwater and surface is not yet implemented). Clamp systems and other mechanical adapters can be manufactured locally upon request. Satellite link is Argos 3 for low data rate systems. More information on the station will be made available on the PLOCAN and FixO3 web sites.

Data

Atmosphere: Wind, temperature, humidity, pressure, solar radiation
Ocean-Air interface: pH, CO2, Chl-a, salinity, temperature, dissolved oxygen, turbidity and hydrocarbon
Water column: Salinity, temperature, dissolved oxygen, currents

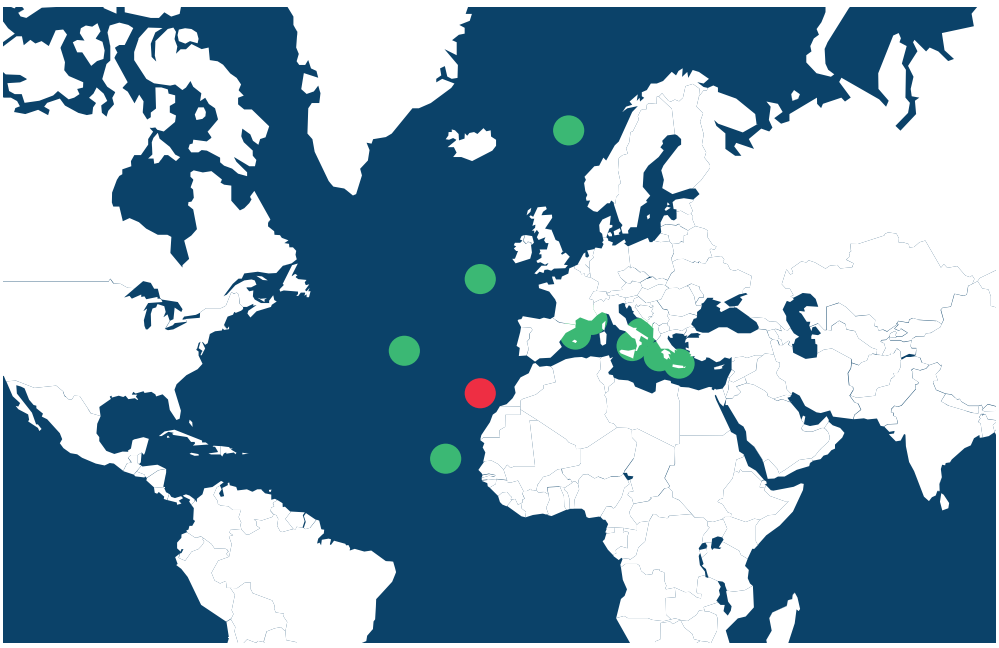
Gliders

Besides logistical, technological and scientific support for all installations, gliders are available for complementary measurements in the vicinity of the station. Our gliders operate four times a year to and from the ESTOC site, allowing for sensor inter-comparison and validation. Variables measured include salinity, temperature, current, depth, turbidity, CDOM, chlorophyll-a, oxygen.



Hosting of additional instruments: some of our gliders have an open architecture, thus can host a variety of sensors and communication systems, e.g. hydrophone, radiometer, PAR, modem and small autonomous instruments. As part of TNA, the preparatory work may include test of equipment at the PLOCAN shore-side and offshore facilities, support on the interfacing, cruise preparation meetings. The teams involved in transnational access will participate to the deployment and to the recovery cruises.

Further information is available at:
www.fixo3.eu/observatory/estoc



FILCHNER RONNE

Filchner-Ronne Antarctica

The S2 observatory at the Filchner sill (74° 40' S, 33° 30' W) was established in 1977 (NARE 76/77) and is today the longest existing marine time series from Antarctica. The position for the mooring S2 is in the core of the super cold water (Ice Shelf Water) spilling over the Filchner Sill and descending down the continental slope to the deep Weddell Sea.

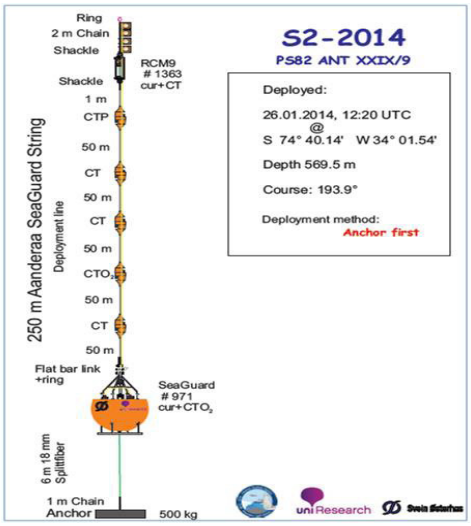
Operated by
Uni Research AS

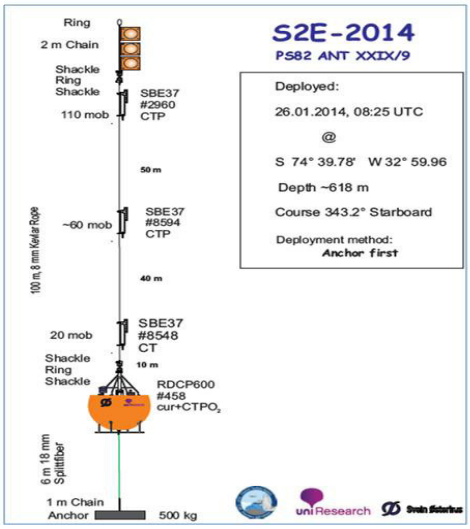
Infrastructure Location
Northeast Atlantic
Latitude: -74.65 Longitude: -33.55

Maximum Depth
600 m

Preferred time period for TNA
September 2015 to March 2017

Services Available
Basic infrastructure. Technical assistance adding additional sensors or complete monitoring system to the site.





TNA Information

Long term observations of the flow of dense waters from their area of formation to the abyss of the World Ocean, and the return flow of warm waters, are central to climate research for the Weddell Sea an important component of such a system entails monitoring the formation of High Salinity Shelf Water (HSSW) on the continental shelf north of Ronne Ice Front, the transformation to Ice Shelf Water (ISW) beneath the floating Filchner-Ronne ice shelf, and the flux of ISW overflowing the shelf break to the deep Weddell Sea. Equally important is the return flow of warm water toward the Filchner-Ronne Ice Shelf system.

The S2 observatory is one of a number of monitoring stations we operate in the southern Weddell Sea. The systems build upon techniques and methods developed over several decades and have a proven record of high data return.

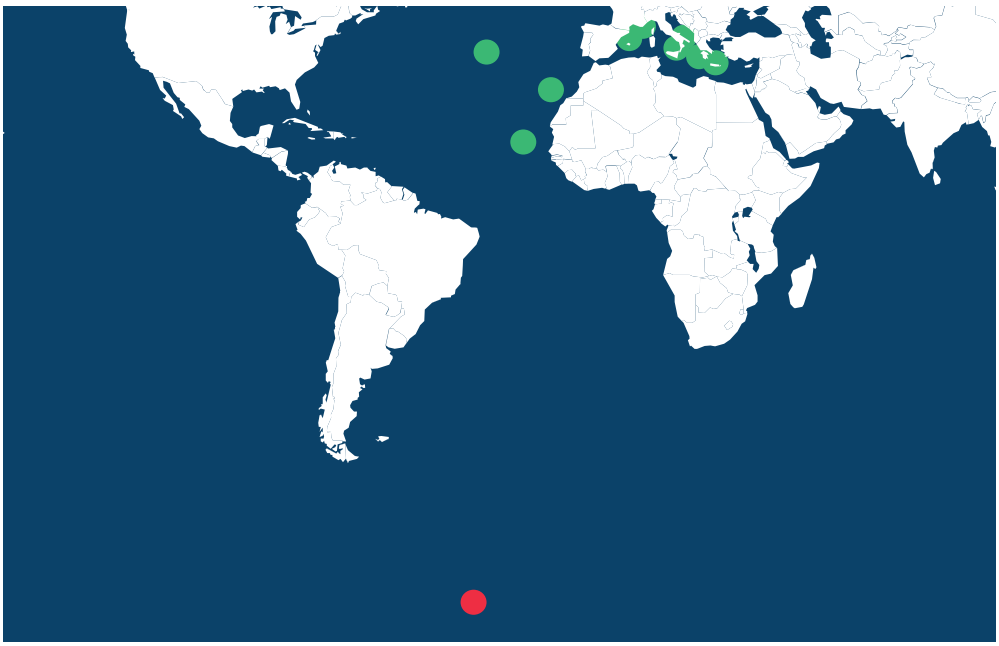
The S2 observatory at the Filchner sill was established in 1977 and continues to deliver the longest existing marine time series from Antarctica. The existing S2 observatory consists of a sub-surface mooring carrying sensors for current velocity, temperature, salinity and dissolved oxygen measurements.

Observations at the Filchner sill also show a seasonal inflow of relatively warm water that is able to reach Filchner Ice Front. New model results indicate that this flow of water might increase in the future and we have deployed a number of instrumented moorings in the Filchner Depression to estimate the heat flux towards the ice shelf.

In 1999 we established Site 5 on Ronne Ice Shelf using a hot-water drill to access the 402 m of water underlying the 763-m thick ice. Results from the multiyear time series show the sensitivity of the sub-ice shelf circulation to changes in conditions over the continental shelf and highlight the importance of monitoring the ice shelf cavity. We will reoccupy Site 5 in 2014/15 to deploy a suite of observing systems for long time monitoring of the circulation below Ronne Ice Shelf. The systems will consist of sub-ice shelf oceanographic moorings instrumented with high quality sensors. They will transmit in real-time and are designed to operate for more than 10 years. In 2015/16 we will extend the observing network by deploying observatories on Filchner Ice Shelf.

The Filchner-Ronne Ice Shelf and S2 observatories will provide the first ever concurrent observations from the ice-shelf cavity where ISW is formed, and the sill where it starts its descent towards the deep Weddell Sea will provide a unique dataset allowing us to link processes and variability within the cavity directly to overflow properties and deep water formation.

Further information is available at:
www.fixo3.eu/observatory/filchner-ronne



FRAM

FRontiers in Arctic marine Monitoring

Array of moorings and permanent sampling sites across the Fram Strait. Installed to capture the exchange of Atlantic and Arctic waters, and to study the temporal development of an Arctic marine ecosystem. Enables year-round multidisciplinary long-term observations by means of moorings and benthic observatories and annual ship based measurement and sampling campaigns.

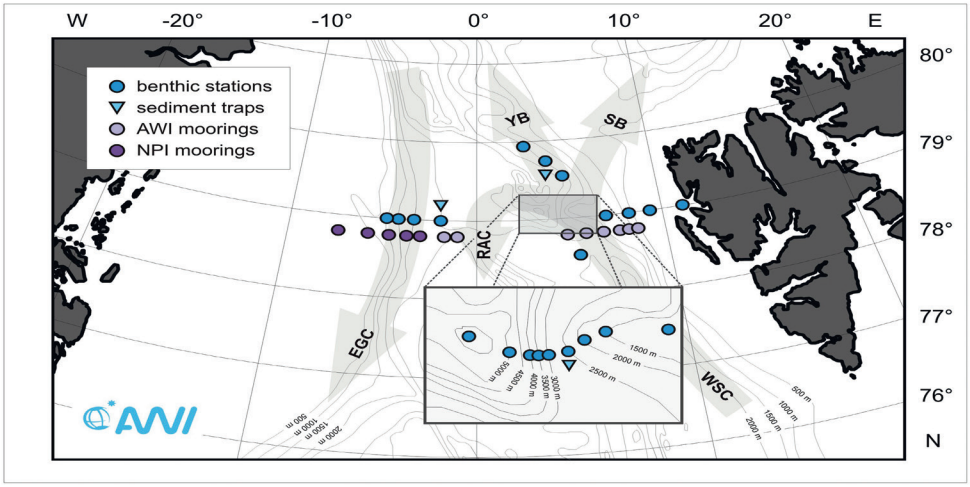
Operated by
Alfred Wegener Institute
Helmholtz Centre for Polar and Marine Research
Bremerhaven, Germany

Infrastructure Location
Fram Strait, Arctic Ocean
Latitude: 78°N-80°N, Longitude: 8°W-11°E

Maximum Depth
5500 m

Preferred time period for TNA
Extended Research Icebreaker expeditions scheduled for summer 2015 and 2016

Services Available
Moorings and vehicles can host a variety of additional sensors and communication systems
(e.g. hydrophones, radiometer, PAR-sensors, and small autonomous instruments or experiments)



TNA Information

The open-ocean infrastructure FRAM (FRontiers in Arctic marine Monitoring) is located in the gateway between the North Atlantic and the Central Arctic, representing a highly climate-sensitive and rapidly changing region of the Earth system. The open-ocean observatory serves national and international tasks towards a better understanding of the effects of change in ocean circulation, water mass properties and sea-ice retreat on Arctic marine ecosystems and their main functions and services. FRAM integrates long-term sustained physical oceanography and ecology observations, including the entire water column and the seafloor.
The observatory system covers moorings and benthic observatories as well as measurements, sampling, and experimental work carried out during annual expeditions. It provides data on Earth system dynamics, climate variability and ecosystem change, and is currently upgraded in terms of technology, spatial and temporal coverage, and near real-time data access. Products of the infrastructure are long-term data with appropriate resolution in space and time, as well as ground-truthing information for ocean models and remote sensing.

Surface and midwater

Hosting: Additional sensor packages and experiments can be mounted on oceanographic and sediment-trap moorings. Annual ship operations are used for sensor installation, maintenance and data download (real-time communication projected).
Measurements and sampling: CTD, water sampling, plankton hauls, detection of zooplankton by optical systems like LOKI (Lightframe On-sight key-species Investigation).
Data: Temperature, salinity, currents, dissolved oxygen, pCO2, pH, Chlorophyll-a, fluorescence; derived data products: nutrient budgets, plankton productivity, POC export, plankton diversity, ground truthing for remote sensing.

Seafloor

Hosting: Additional sensor packages and experiments can be mounted on moored lander systems. Annual ship operations are used for sensor installation, maintenance and data download.
Measurements, sampling and observation: Oxygen microprofiler and SCOC measurements; Sediment sampling with multiple and box corer; ROV-based sampling upon request; seafloor imaging (camera systems).
Data: Temperature, salinity, currents, dissolved oxygen, pCO2, particle flux; derived data products: benthic biomass and diversity, respiration, nutrient fluxes, seafloor images.

Modality of Access

- Remote: specific sensors or equipment provided for deployment or attachment to existing moorings and landers by FRAM personnel, sample requests;
- Partially remote: on shore adaptation of autonomous instruments for integration into the infrastructure involving TNA users, deployment or installation by FRAM personnel;
- In person: installation and deployment of complex systems, ship-based measurements and sampling that require TNA user presence at the observatory site

Further information is available at:
www.fixo3.eu/observatory/fram

NEMO-SN1

The NEutrino Mediterranean Observatory—Submarine Network 1 (NEMO-SN1)

A multidisciplinary (geophysics, oceanography, bio-acoustics) observatory, located in Western Ionian Sea, offshore Catania (Sicily), deep-sea real-time multi-parameter observatory is currently being re-deployed after refurbishment and installations of new electronics.

Operated by
Istituto Nazionale di Geofisica e Vulcanologia

Infrastructure Location
Northeast Atlantic
Latitude: 37.5 Longitude: 15.4

Maximum Depth
2036 m

Preferred time period for TNA
Starting from January 2015

Services Available
Logistical, technological and scientific support will be provided to access all fixed-point installations. Data acquired from new systems will be integrated in NEMO-SN1 data server and distributed to user communities.

TNA Information

The NEutrino Mediterranean Observatory—Submarine Network 1 (NEMO-SN1) seafloor observatory is located in the central Mediterranean Sea, Western Ionian Sea, off Eastern Sicily (Southern Italy) at 2100 m water depth, 25 km from the harbor of the city of Catania.

It is a cabled deep-sea multi-parameter observatory and the first one operating with real-time data transmission in Europe since 2005. NEMO-SN1 is also a node of the European Multidisciplinary Seafloor Observatory (EMSO), one of the incoming European large-scale research infrastructures included in the Roadmap of the European Strategy Forum on Research Infrastructures (ESFRI) since 2006.

NEMO-SN1 is specifically designed for long-term monitoring of environmental processes related to marine ecosystems, climate change, and geohazards. NEMO-SN1 is performing geophysical, bio-acoustic and environmental long-term monitoring

Description of the Infrastructure

In Western Ionian Sea (2100 m depth, 25 km off-shore the harbour of Catania) a multidisciplinary cabled deep-sea observatory was set up and is operational in real time since 2005: the cabled deep-sea multi-parameter station NEMO-SN1 (@ TSN branch), equipped with geophysical, bio-acoustic and environmental sensors and the cabled NEMO-OvDE station (@ TSS branch), equipped with 4 wide-band hydrophones.

The site infrastructure consists of a shore laboratory, a 28 km long electro-optical cable connecting the shore lab to the deep-sea lab. The shore laboratory hosts the land termination of the cable, the on-shore data acquisition system and power supplies for underwater instrumentation.

The deployment/recovery and connection of the deep-sea structures is performed using the Deep Sea Shuttle (DSS) handling facility (max weight 40 kN) and a dedicated ROV.

Current status of infrastructure

The seafloor observatory NEMO-SN1 is currently being re-deployed after refurbishment and installations of new electronics. Seafloor modules will be made accessible for TNA starting from the year 2015.

Seafloor

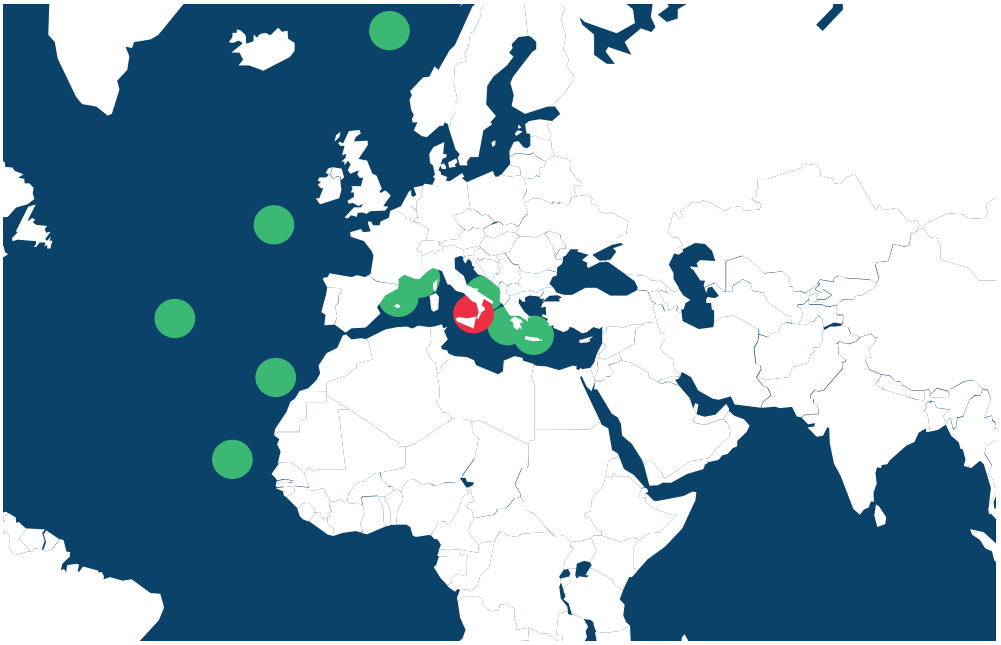
NEMO-SN1 modules have spare connectors to host other systems for long term real-time data acquisition. The TSN cable branch has 2 conductors and 4 fibres directly connected to shore, the TSS branch has 4 conductors and 6 fibres.

Data: temperature, conductivity, pressure, punctual vector current speed, current profile, seismics, acoustics, magnetics,


SN1 recovery – 21 july 2013

gravity. Data acquired from new systems will be integrated in NEMO-SN1 data server and distributed to user communities.

Further information is available at:
www.fixo3.eu/observatory/nemo-sn1



OBSEA

Western Mediterranean Shallow Water Cabled Observatory

The main objective of this site located in the Western Mediterranean is to be a test bed for the development of oceanographic instrumentation while being a shallow-water observatory providing real-time data and database with historical values.

Operated by
Universitat Politècnica de Catalunya (UPC)
SARTI Research Group
Barcelona, Spain

Infrastructure Location
Western Mediterranean
Lat: 41.18 Lng: 1.75

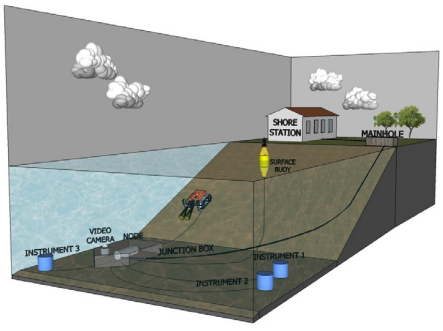
Maximum Depth
20m

Preferred time period for TNA
Full year.

Services Available
Seafloor observatory with 16 watemate connectors.
Surface Platform (above and below water level)
Real time communications.

TNA Information

OBSEA was deployed in 2009. The OBSEA underwater observatory (www.obsea.es) is connected with 4 km of cable to the coast of Vilanova i la Geltrú (Barcelona, Spain) and placed at a depth of 20 m in a fishing protected area.
Operations are done by scuba divers and small boats.



Seafloor

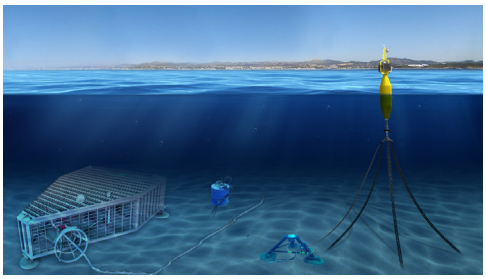
The main advantage of the cabled observatory at seafloor is the capacity to feed the station from land with up to 3.6kW and the high bandwidth communication link of 1 Gbps. This link gives the information in real time and avoids the drawbacks of battery powered systems. The implemented solution is an optical ethernet network that continuously transmits data from the connected oceanographic instruments. With OBSEA we can observe in real-time multiple parameters of the marine environment.

The Shore Station provides power to feed all the devices and the fiber optic link to establish communications. At the same time from land we manage alarms and data storage. With a length of 1000 metres the terrestrial cable connects the Ground Station to the Beach Manhole where the submarine cable begins its route to the node location at 4 km from the coast and 20 m depth.

Surface Buoy

The buoy is an extension of the OBSEA observatory that works as surface platform for measuring oceanographic and environmental parameters. In addition it is also a test bed for sensors and oceanographic equipment that takes advantage of the OBSEA infrastructure and connectivity. The buoy is located at 40 m from the underwater observatory OBSEA, and is subjected to three anchors of 1200 kg that are attached to the buoy with chains.

The communication links between the ground station and the buoy are done via a wireless 3G connection and through a cable connected to the observatory. The electronic system is flexible and allows increasing or replacing the types of instruments and sensors installed. Currently the buoy is equipped with a weather station, a GPS and an IP video camera providing images of the buoy and the


Vilanova coast.

Time series and Data Availability

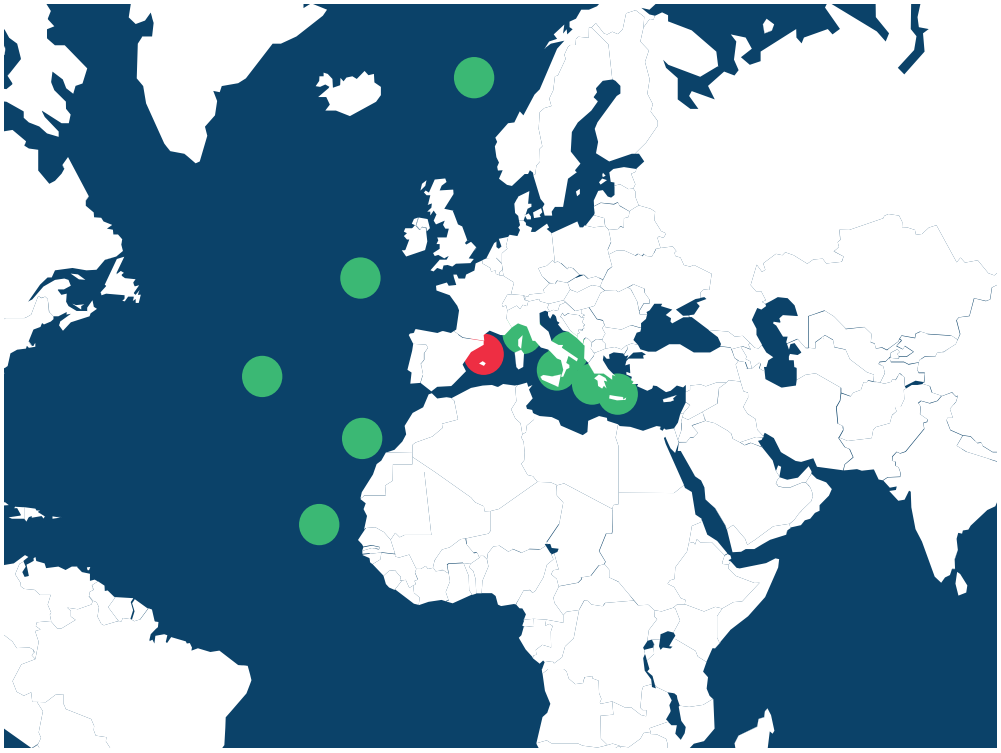
Permanent instruments are: CTD, Hydrophone, Seismometer, Video Camera, AWAC, Meteo Station. Quality controlled data available in real time.

Data from CTDs and Meteorological buoy are available in real time through as OGC SOS, IEEE 1451 and .csv or .txt files. Hourly data average with QC/QA are available in .csv and netCDF format. The data can be accessible in EMODnet Physics ,OGC SOS, IEEE 1451, and RAW data in .csv, .txt format through OBSEA web page and FTP server.

TNA Support Offered

Logistical, technological and scientific support will be provided to access OBSEA installations for instrument deployment and test.

Further information is available at:
www.fixo3.eu/observatory/obsea



PAP

Porcupine Abyssal Plain Observatory

An array of moorings covering the entire water column and benthos with associated repeat ship occupations for process studies and collections not possible autonomously (eg benthic megafauna) The longest running multidisciplinary North Atlantic open ocean sustained observatory delivering atmospheric and physical and biogeochemical ocean datasets in near real-time.

Operated by
Natural Environmental Research Council (NERC) - National Oceanography Centre (NOC), Southampton, UK.

Infrastructure Location
Northeast Atlantic
Latitude: 49.0 Longitude: -16.5

Maximum Depth
4850 m

Preferred time period for TNA
During annual cruises to serve the mooring

Services Available
Surface platform (above and below water level), sensor frame, sediment trap (3000 m), benthic system (4850 m)

TNA Information

The PAP-SO has over 20 years of history as a sustained time-series site. There are three main installations that form part of the PAP-SO.

1. Full depth mooring (0 m - 4850 m) with surface buoy, atmospheric measurements, upper ocean measurements
2. Sub-surface sediment trap mooring (3000 m - 4850 m)
3. Seafloor Bathysnap lander system for time-lapse photography and related seafloor studies

Since 1989 the site has been the focus for routine sampling for water column processes and benthic time-series during annual cruises. Autonomous installations offering year-round measurements began in 1989 including a sub-surface sediment trap mooring and a Bathysnap time-lapse camera system. Since 2002, a full depth ocean mooring has been in place, producing multidisciplinary time-series data from the upper water column (~30m) and offering satellite transmission capability for near realtime delivery of datasets. The unique suite of multidisciplinary time-series datasets are vital for assessing the ocean health and have led to fundamental discoveries about biogeochemical fluxes (e.g. assessments of the North Atlantic carbon sink and productivity estimates) and deep-sea ecology. In addition, the site also has a complementary suite of sensors measuring atmospheric variables. These are managed separately by the UK Met Office. The installation for providing these datasets is not costed here, but the meteorological datasets add value to ocean datasets, increasing the demand from users of the infrastructure.

Surface and upper ocean

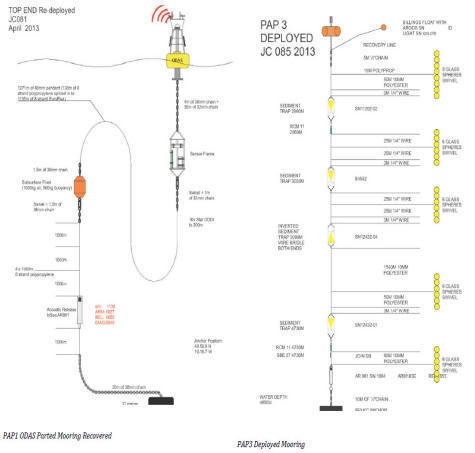
Hosting: The surface buoy and full depth mooring can host additional instrumentation for atmospheric, air-sea interface and upper ocean monitoring.
Data: Atmosphere: Wind speed and direction, Relative humidity, Air temperature, sea temperature, Atmospheric pressure, significant wave height and period. Water column: Salinity, temperature, currents, pCO2, dissolved oxygen, nutrients, Chlorophyll-a

Sub-surface sediment trap mooring

Hosting: The sub-surface sediment trap mooring can host additional instrumentation at depths between 3000 m – 4800 m depth
Data: particle flux and currents

Seafloor

Hosting: Lander system with Bathysnap time-lapse camera positioned on the seafloor at 4850m depth.
Additional sensors can be mounted on module and a complete description will be provided to this aim during FixO3.
Communication with surface via acoustic modem is planned during FixO3.
Data: time-lapse photography for seafloor ecosystem studies.

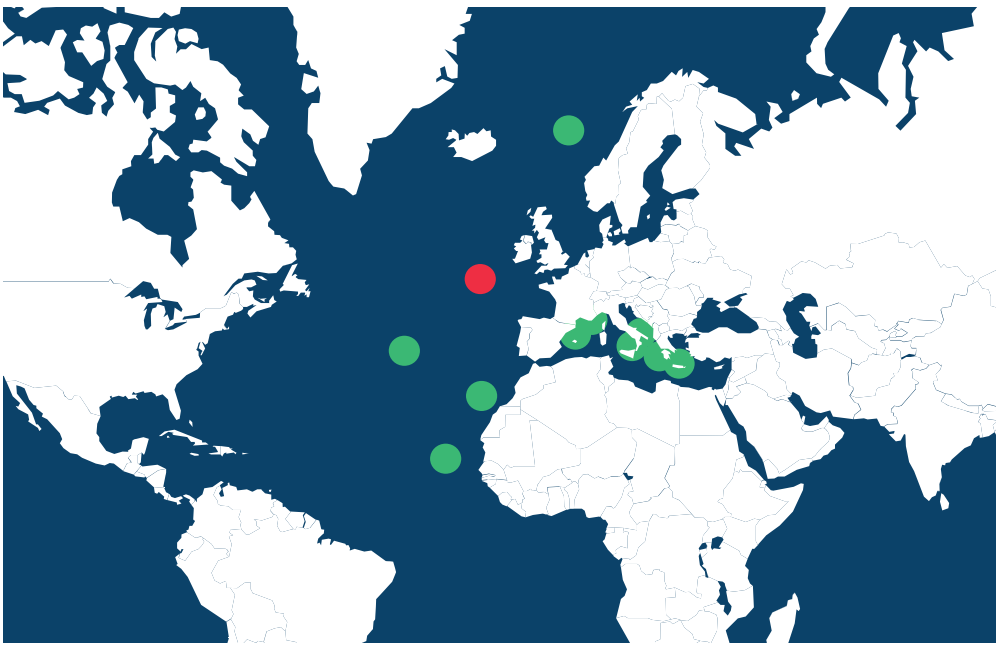


PAP1 0DAS Ported Mooring Recovered — PAP3 Deployed Mooring

TNA Support offered

Logistical, technological and scientific support will be provided to access all PAP fixed-point installations. In addition, glider campaigns are planned for the PAP site during 2012 – 2014. These are not sustained/routine operations so are not costed into the annual operating costs for the observatory but these platforms will complement the fixed-point infrastructures and may also offer increased access to the site during FixO3 through increased frequency of cruises.

Further information is available at:
www.fixo3.eu/observatory/pap



PYLOS

PYLOS Observatory

A Southern Ionian Sea water column and seabed observatory to access deep thermohaline circulation. A multidisciplinary observatory located in the crossroad of Adriatic, Aegean Ionian basins. Situated in a geologically active area with earthquakes and landslides, it is a potential source area for Tsunamis that may impact the Eastern Mediterranean Sea.

Operated by
Hellenic Center for Marine Research (HCMR)

Infrastructure Location
Southern Ionian Sea
Latitude: 36.8 Longitude: 21.6

Maximum Depth
1670 m

Preferred time period for TNA
During maintenance cruises (every ~ 6 months)

Services Available
Data and sensor inter-comparison and validation missions

TNA Information

The Pylos observatory has been operating since May 2007 in the SE Ionian Sea at a depth of 1670m. The observatory includes a water column component and an autonomous seabed platform. The site location is on the pathway of the Aegean Sea dense water that travels to the north along the western Greek coast, while it is also located in a very geologically active area with lots of earthquakes and landslides as well as a potential source for Tsunamis that may affect the Eastern Mediterranean Sea.

The water column component consists of a surface Wavescan type buoy equipped with sensors for meteorological, waves and surface oceanographic parameters as well as a suite of CTD sensors attached on the inductive mooring line down to 1000 m depth. All sensors provide real time hydrological observations of this key-area where the Cretan Intermediate and Deep Waters (CIW, CDW) spread northwards towards the Adriatic and meet with the Eastern Mediterranean Deep Waters (EMDW). The seabed component consists of an autonomous platform equipped with a high accuracy and sampling frequency pressure sensor for tsunami detection as part of an early warning system. The platform is also equipped with a CTD probe and dissolved oxygen sensor, offering at the same time near-floor deep observations in the Eastern Mediterranean sea.

The mooring line also hosts a set of Passive Aquatic Listeners (PALs) for rainfall estimates and marine mammal acoustic detection. The PAL systems have been recently evaluated against X-band radar measurements in this area and were found to provide very realistic estimates of precipitation.

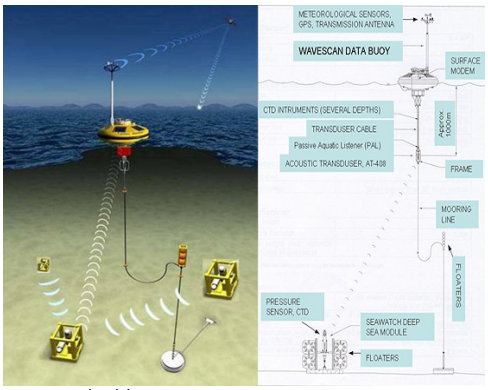
The observatory is located 8 miles off the SW Peloponnese coast, while in a nearby location a cabled observatory funded by EMSO-HELLAS project, is currently under construction and is expected to turn into operation in mid-2015.

Hosting:

- Buoy can host additional instrumentation for atmospheric and air-sea interface.
- Mooring lines can host both real-time as well as autonomous systems. Clamp systems and other mechanical adapters can be manufactured locally upon request.

Data:

- Atmosphere: Air temperature, Air pressure, Wind speed/direction.
- Ocean-Air interface: Wave height/ direction, Salinity, Temperature
- Water column: Salinity and Temperature (20, 50, 75, 100, 250, 400, 600, 1000 m).
- Passive Acoustic Listener (PAL) at 500 m depth providing sound signal classifications for further analysis (rainfall, waves, mammal detection, background noise, etc).
- Seafloor: Salinity, Temperature, Depth, Dissolved oxygen, CO2, CH4, Turbidity and pH.



TNA Support offered

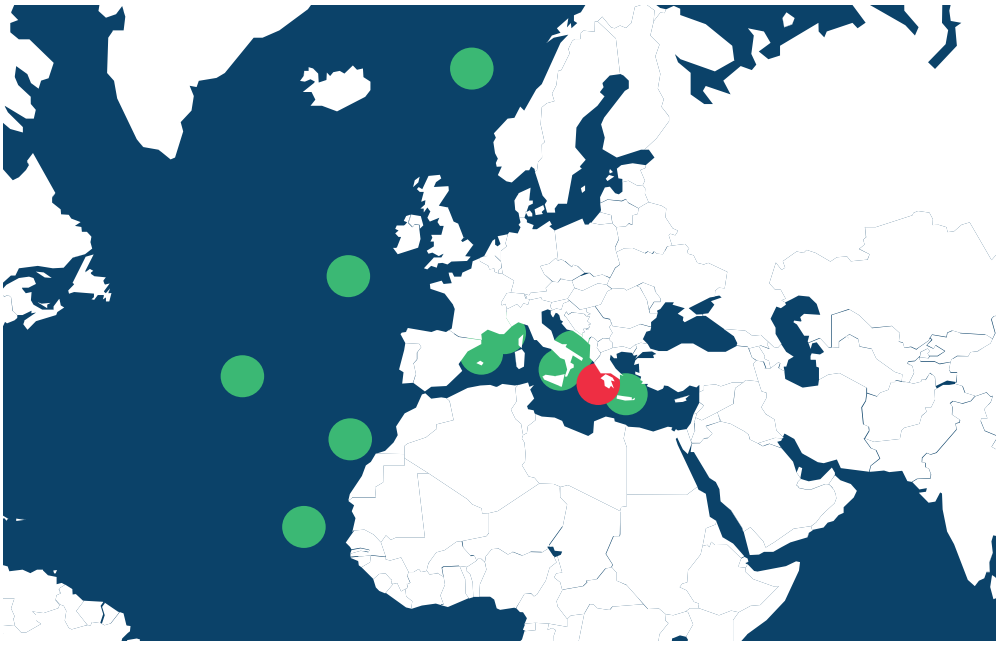
Logistical, technological and scientific support for all components. For more information:

http://www.poseidon.hcmr.gr.

Other capabilities and services:

- Data and sensor inter-comparison tests and validation missions.

Further information is available at:
www.fixo3.eu/observatory/pylos



MOMAR

MoMAR EMSO Azores

Multidisciplinary observatory (fauna, fluid chemistry, seismicity and ground deformation) situated at the mid-Atlantic hydrothermal vent field Lucky Strike ; communication through acoustic link, buoy and satellite. EMSO node, comprises an oceanographic mooring and seafloor probes some of them in vent fluids, a camera and colonization devices. Daily satellite transmission of a data subset.

Operated by
Ifremer

Infrastructure Location
Northeast Atlantic
Latitude: 37.5 Longitude: -33.0

Maximum Depth
1700 m

Preferred time period for TNA
One cruise per year in summer season

Services Available
Cruise preparation, compatibility tests, implementation on site, data transmission, archiving and dissemination.

TNA Information

The Lucky Strike hydrothermal vent site situated near the Azores Archipelago has been selected for the integrated study of mid-ocean ridge processes, from the subseafloor to the water column. The choice came from an international program , MOMAR ("Monitoring the Mid-Atlantic Ridge") initiated by the international InterRidge Programme. It is set atop an active volcano, which hosts one of the largest active ridge hydrothermal vent sites. The main scientific objectives are:

1) to study hydrothermal heat and chemical fluxes to the ocean in relation with seismicity, volcanic
activity and ground deformation at a diverging plate boundary

2) to study the impact of telluric, climatic and anthropogenic changes on deep seafloor ecosystems
and hydrothermal communities

3) to study the dynamics of water masses in relation to the steep axial valley topography, and their impact on the dispersion of hydrothermal effluents.

Since 2010, an observatory was installed and provides data from the seafloor and the surface. It consists in two seafloor monitoring nodes and one surface buoy. One monitoring node (SEAMON West) is dedicated to geophysical studies. One monitoring node (SEAMON East) is devoted to deep sea ecosystem processes studies. The buoy (BOREL) is a data transmission relay between acoustics and satellite segments, it can host atmospheric and near surface sensors.

On this EMSO Azores site, the SEAMON system includes two nodes, both on top of the volcano near hydrothermal vents. One is linked to geophysical instruments (permanent instruments are: a 3-components seismometer and an hydrophone for seismic event detection, two pressure probes for geodetic measurements) and the other is devoted to ecology (permanent instruments are: a video camera, a dissolved-iron analyzer, and an optode). The BOREL transmission buoy is equipped with GPS (geodetic experiment and buoy location) and meteorological station.

TNA will consist in plugging additional sensors, recording data, partly transmitted in near real time and/or deploying additional mooring or autonomous benthic instruments.

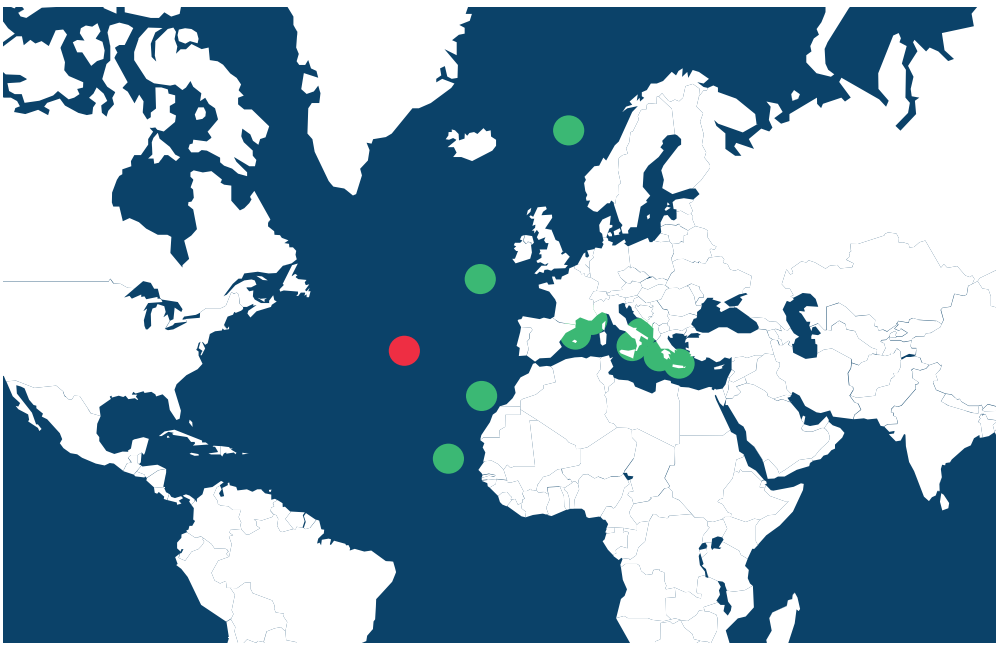
TNA Support offered

Underwater connections are available for Fix03/TNA experiments on Seamon West. They consist in free wet-mateable connectors providing 12V and an RS232 link to a host instrument. It is planned to offer more capacities on both Seamon east and Seamon west in the summer cruise of 2015. Opportunities are also offered for the deployment of water column moorings or autonomous benthic instruments during the maintenance cruises.

For the cruise preparation and the deployment follow-up, logistic, technical and scientific support will be provided.

Simulation tests will take place onshore. All data will be made available after the recovery cruise.

Further information is available at:
www.fixo3.eu/observatory/momar



Station M

Ocean Weather Station M (OWS M) has been an ocean weather station since 1948. At present there is a mooring and a surface buoy at the site, which measures hydrography, O2, chlorophyll and carbon parameters. Located in the Norwegian Sea with real-time and delayed mode capabilities. The site present the longest existing homogeneous time series from deep ocean. The facility presented here is the mooring situated betveen 150 and 2000 m.

Operated by
Uni Research

Infrastructure Location
Northeast Atlantic
Latitude: 66.0 Longitude: 2.0

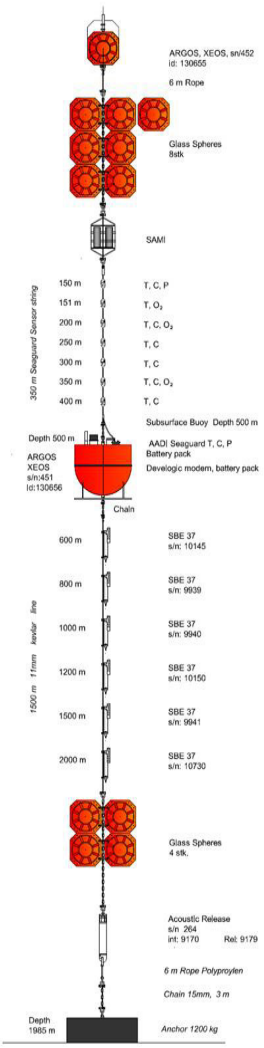
Maximum Depth
2000 m

Preferred time period for TNA
During retrieving and re-deployment cruised generally in March and June.

Services Available
Basic infrastructure is offered. Technical assistance adding additional sensors or complete monitoring system to the site. Additional sensors can be added to the docking stations (limit of 30 sensors for 50-600 m) and clamp-on instruments can be added to the deeper part and use the Argo data communication to the data storage at 500 m and future transmission to the surface unit. Our research vessels will visit the site regularly and ship time will be available for TNA.

international oceanographical research programme for the weather ships and a routine programme within physical oceanography was implemented at station M, including serial observations of temperature, salinity, and (since 1953) oxygen weekly at standard depths to 2000 metres, and serial observations of temperature and salinity at standard depths down to 1000 metres 3 or 4 times per week. This programme has been running continuously since 1 October 1948 until the end of November 2009 when the weather ship service on the station was terminated. The method of obtaining temperature and salinity observations (Nansen bottles with reversing thermometers) has not changed significantly either so the time series are indeed homogeneous.

Since 2010 the station M has been occupied regularly by research vessels and two instrumented moorings have been employed to obtain high frequent (hourly to daily) data.



Further information is available at:
www.fixo3.eu/observatory/station-m

TNA Information

Having performed daily oceanographic measurements in the deep Norwegian Sea since 1 October 1948 until the end of November 2009, Ocean Weather Ship Station (OWS) M, at 66°N, 2°E, can present the longest existing homogeneous time series from the deep ocean. Today this time series is extended by means of instrumented moorings.

With the expansion of civil aviation and growing understanding of the impact of aerological observations on weather forecasts after World War II, ICAO (The International Civil Aviation Organization) demanded a greater network of aerological stations, primarily in the North Atlantic. In 1946 a plan for a network of 13 (A-M) ocean weather stations in the North Atlantic was set forth under the auspices of ICAO. The stations were to supply meteorological services, search and rescue services, and navigational aids to aircraft. Station M in the Norwegian sea was establish in 1948.

ICAO attempted to organise an

W1-M3A

Western 1 – Mediterranean Moored Multi-sensor Array

A multidisciplinary observatory mooring located in the Ligurian Sea. It is composed by a large spare buoy and a sub-surface mooring periodically deployed close to the main buoy depending on specific research needs. It delivers atmospheric, physical and biogeochemical measurements of the ocean, from the surface down to the ocean interior.

Operated by
National Research Council of Italy

Infrastructure Location
Northwestern Mediterranean Sea (Ligurian Sea)
Latitude: 43.79 Longitude: 9.16

Maximum Depth
1200 m

Preferred time period for TNA
Access to the infrastructure is only conditioned by the weather state. No other limits exist.

TNA Information

The W1-M3A observatory is one of the most important infrastructure of the National Research Council.

The W1-M3A observatory operates in the Ligurian basin at the centre of the Gulf of Genoa, 80 Km far from the coast on a 1200 m deep seabed. It is a combination of a large spar buoy and a sub-surface mooring deployed close-by.

The observatory allows the monitoring of the conditions and the sea state of the Ligurian basin by continuously acquiring meteorological, physical, bio-geochemical and wave measurements.

Over the years, this infrastructure demonstrated its capability for a long term monitoring of the ecosystem from the upper atmosphere to the ocean interface and down to the ocean interior. Indeed, the observing system payload has been recently updated in order to provide biogeochemical data of the euphotic zone and physical parameters of the upper thermocline down to the sea bottom.

Data from sensors installed or deployed on the W1-M3A surface buoy are available in near real-time.

Surface meteorological measurements

Near surface atmospheric (meteorological) parameters are monitored by a set of sensors (precision spectral pyranometer, precision infrared radiometer, sonic anemometer, barometer, thermo-hygrometer, compact meteorological station) installed on the "ODAS Italia 1" surface buoy.

Oceanographic measurements

In the upper ocean, temperature, salinity, oxygen, fluorescence, turbidity, nutrient content, and carbon dioxide are measured. In the dark region, measurements can be collected by sensors deployed on the sub-surface mooring. The mooring line can be equipped with several conductivity-temperature-pressure sensors at different depths. Sensors on the mooring line operate in an autonomous way and their measurements are periodically available after the recovery and the maintenance operations.

TNA Support offered

The W1-M3A observatory can host on the surface buoy additional instrumentation for atmospheric, air-sea interface and upper ocean measurements, and on the subsurface mooring autonomous systems.

New instrumentation can be integrated into the existing acquisition and control system making the new measurements available in near real time. The setup and deployment of even high-cost relatively large and power consuming is possible.

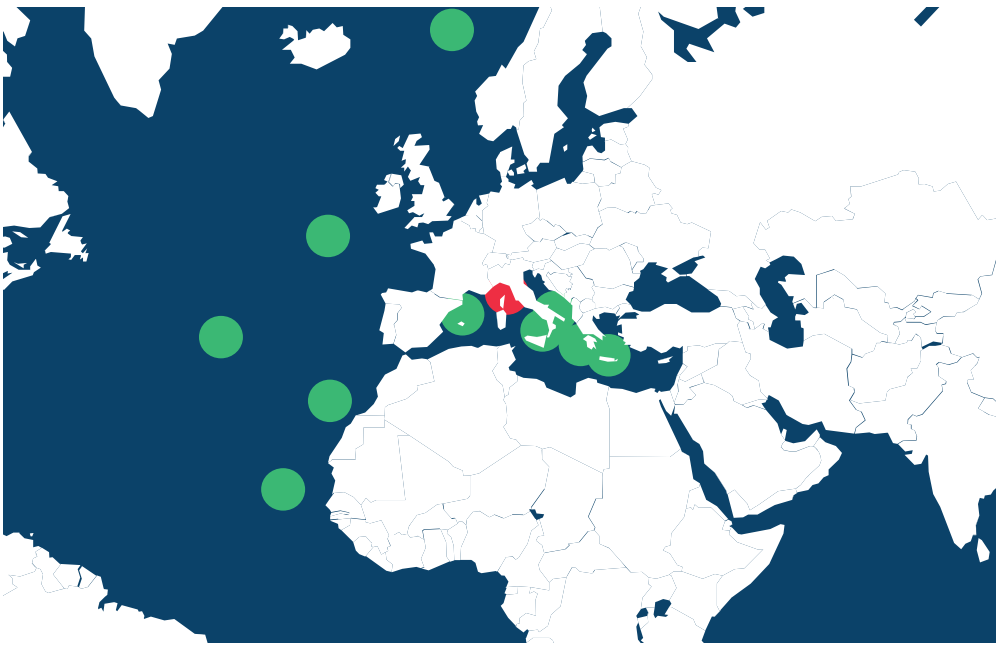
The availability of a satellite data connection offers the chance to collect data and/or to control the instrument in near real time.

A support team formed by one technician and two scientists will assist the user group in logistical, technological and scientific

issues for the observatory access, as well as they will support and services during the integration phase and the installing/ uninstalling operations.

The hosting is generally offered for long-time periods and access to the observatory will be provided during the regular maintenance visits (3-6 per year).

Further information is available at:
www.fixo3.eu/observatory/w1-m3a



FixO3

FIXED-POINT OPEN OCEAN OBSERVATORIES

FixO³ Objectives

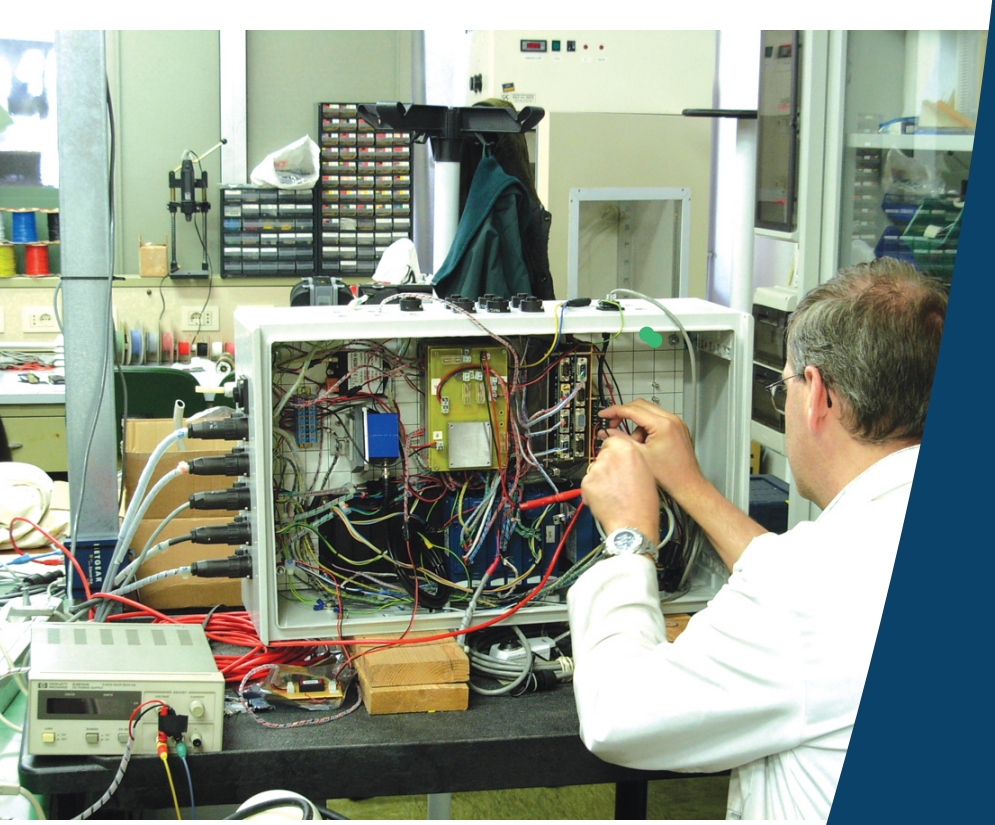
- to **integrate** European open ocean fixed-point observatories
- to **improve** access to these key installations for the broader community
- to **provide** multidisciplinary observations in all parts of the oceans from the air-sea interface to the deep seafloor

FixO³ Activities

Coordination to integrate and harmonise current procedures and processes

Support actions to offer
Access to observatory infrastructures
OPEN data services and products

Joint research activities to enhance the current capability for multidisciplinary in situ ocean observations



29 partners

11 European countries

23 fixed point observatories

12 work packages

4 years

7 million Euros

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