emso®

ERIC

EUROPEAN RESEARCH INFRASTRUCTURE CONSORTIUM

Observing the ocean to save the earth


MARE NIGRUM
CONSTANTA

# A NEW LARGE-SCALE MARINE RESEARCH INFRASTRUCTURE

## NOW AVAILABLE FOR ACCESS TO SCIENTIFIC COMMUNITIES

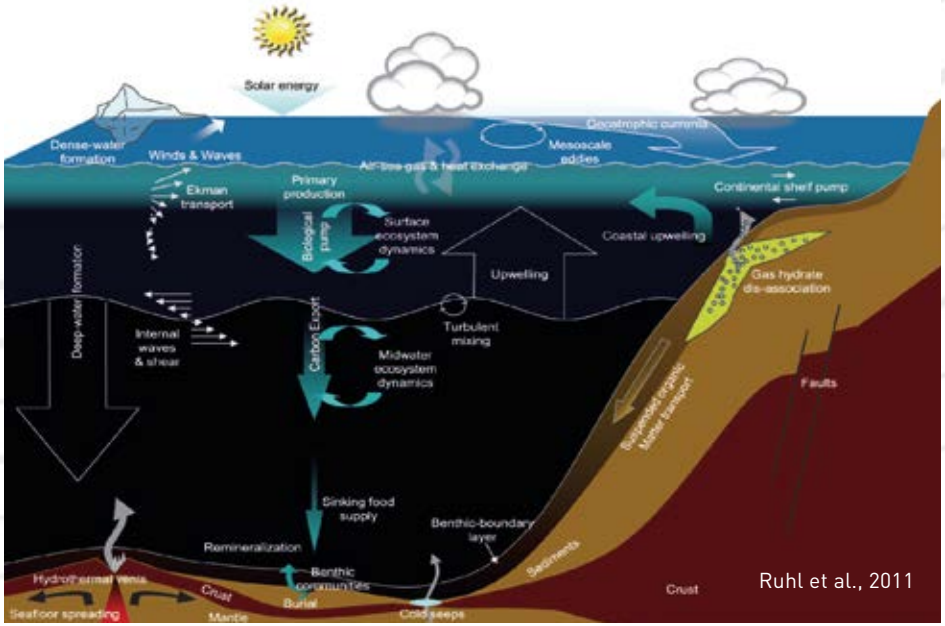


**The European Multidisciplinary Seafloor and water column Observatory (EMSO)** is a distributed research infrastructure consisting of fixed seafloor and water column observatory nodes for deep ocean observations. EMSO observatories are deployed at key sites around Europe and have long-term, high-resolution, (near)-real-time capabilities to address environmental processes such as climate change, natural hazards and marine ecosystem changes.

**The EMSO European Research Infrastructure Consortium (EMSO ERIC),** an intergovernmental organisation hosted by Italy, facilitates the operation and the development of state-of-the-art facilities serving a wide range of stakeholders. Countries participating in the consortium include France, Greece, Ireland, Italy, Norway, Portugal, Romania and Spain.

# EMSO ERIC OUTSTANDING SCIENCE






Ruhl et al., 2011

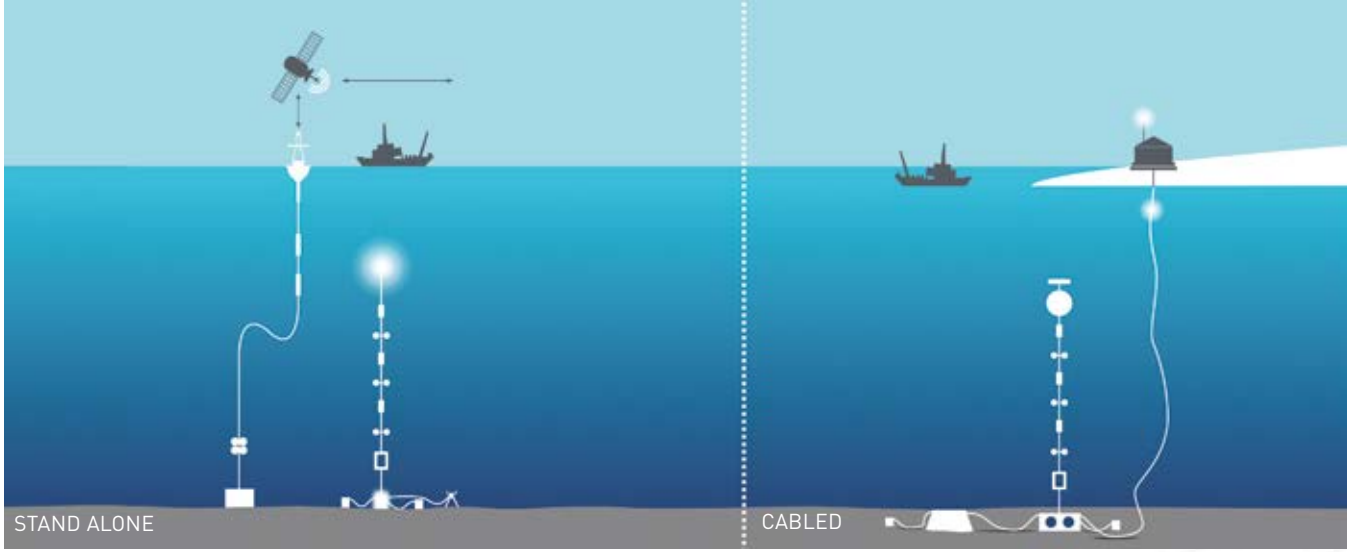
**EMSO covers a wide range of interdisciplinary areas including biology, geology, chemistry, physics, engineering and computer science, from polar to tropical environments, down to the abyss.**
The data generated in EMSO, enables analysis over different space and time scales, overcoming the traditional approach of focusing on limited single data streams.

**EMSO ERIC OFFERS:**

- long-term time-series of multidisciplinary, high resolution, (near)-real-time high-quality marine data;
- power, communications, a broad range of sensors and shallow water facilities for testing new devices through interactive ocean observations and
- access to observatory-nodes for developing new experiments.

EMSO ERIC leads European technological and scientific research to improve the investigation and knowledge of climate change, ocean acidification, geohazards and the sustainable management of the marine resources.


OBSEA






# EMSO OCEAN
## OBSERVATORIES

**EMSO facilities are high technology automated fixed platforms, powered by submarine cables or stand-alone devices.**
They are equipped with a standardised suite of sensors assembled into an EMSO Generic Instrument Module (EGIM), and with additional 'site-specific' sensors. The observatory design allows interdisciplinary objectives to be addressed simultaneously across temporal and spatial scales.

Time-series of measurements performed by the nodes are homogeneously managed and made accessible through the EMSO Data Portal in the EMSO ERIC webpage.

EMSO ERIC supports and ensures sustained, reliable, quality-controlled and interoperable time series data.

# SCIENTIFIC DATA RECORDED
AT THE EMSO FACILITIES

## SENSORS AND DEVICES

### GEOPHYSICS/GEOLOGY

- Seismometer
- Accelerometer
- Hydrophone
- Gravimeter
- Magnetometer
- Pressure sensor
- Piezometer



### BIOCHEMISTRY

- pH, eH and alkalinity sensors
- Oxygen sensor
- Dissolved iron, manganese and sulphides
- Methane sensor
- Carbon dioxide sensor
- Multispectral radiometer
- Mass spectrometer
- Nutrient analysers
- Chlorophyll Sensor
- Particle flux detector
- Particle velocity sensors
- Turbidity meter
- Array of temperature probes
- Benthic Biogeochemical Experiment System

### MARINE ECOLOGY

- Acoustic receiver
- Plankton sampler
- Water sampler
- Fluorescence sensor
- Time-lapse camera
- Video

### PHYSICAL OCEONOGRAPHY

- Conductivity, Temperature vs Depth (CTD)
- Acoustic Doppler Current Profiler (ADCP)
- Currentmeter
- Pore pressure
- Carbon dioxide partial pressure ($pCO_2$) sensor
- Thermosalinograph

# FROM LOCAL OBSERVATIONS
## TO GLOBAL CONNECTIONS

**EMSO aims to harmonize and integrate the different research interests of several European nations.** EMSO is part of the European Ocean Observing System (EOOS), a coordinated framework designed to align and integrate Europe's ocean observing capacity, promote a systematic and collaborative approach to collecting information on the state and variability of our seas and underpin sustainable management of the marine environment and its resources.

EMSO ERIC provides valuable experience in implementing external relations activities aimed at establishing links with similar subsea observatory programs around the world.
EMSO ERIC strives to transfer knowledge and practices, align strategies and encourages new developments towards a global marine research infrastructure.

# LIST OF REPRESENTING ENTITIES

| | | |
|---|---|---|
| **FRANCE** | **IFREMER**<br>**CNRS** | L'Institut Français de Recherche pour l'Exploitation de la Mer<br>Le Centre National de la Recherche Scientifique |
| **GREECE** | **HCMR** | Hellenic Centre for Marine Research |
| **IRELAND** | **MI** | Marine Institute |
| **ITALY**<br>Host Country | **INGV** | Istituto Nazionale di Geofisica e Vulcanologia |
| **NORWAY** | **RCN** | The Research Council of Norway |
| **PORTUGAL** | **FCT** | Fundação para a Ciência e a Tecnologia |
| **ROMANIA** | **GeoEcoMar** | Research and Development Institute for Marine Geology and Geoecology |
| **SPAIN** | **PLOCAN** | Plataforma Oceánica de Canarias |




Observing the ocean to save the earth


Nordic Seas
Smartbay
Porcupine Abyssal Plain
Motene Island
Western Mediterranean Sea
Black Sea
Ligurian Sea
South Adriatic Sea
Obsea
Hellenic Arc
Azores Islands
Iberian Margin
Western Ionian Sea
Cretan Sea
Canary Islands
design by Laboratorio grafica & immagini NGV

www.emso.eu

EMSO ERIC
**Headquarters** Via di Vigna Murata, 605 | 00143 Rome Italy

**Operative office** Via Giunio Antonio Resti, 63 | 00143 Rome Italy
phone: +39 06 45431040

**www.emso.eu**

EMSO ERIC was established as a European Research Infrastructure Consortium by the European Commission in 2016
Decision of September 29th 2016 - 2016/1757/EU
Fiscal Code 97908370584 VAT Number 14062811006