EMSO-ERIC

European Multidisciplinary Seafloor and water column Observatory

Juanjo Dañobeitia, Laura Beranzoli, George Petihakis & EMSO-ERIC CMO

WHAT IS EMSO

EMSO is a strategic Marine European Research Infrastructure Consortium (ERIC), with the capacity to collect high quality environmental parameters

The aims:

- to explore the oceans;
- to gain a better understanding of phenomena happening within and below them;
- to explain the critical role that these phenomena play in the broader Earth systems.

The mission:

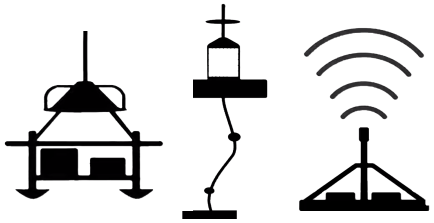
- provide deep sea high quality, long term time series
- develop technology for sensors, communications, offshore operations
- attract scientist, technicians, managers and industries
- collaborate with European and International Organizations and Institutions
- promote innovation and knowledge-sharing
- conduct outreach and communication

REGIONAL FACILITIES AND TEST SITES

8 Regional Facilities & 3 Test sites located at strategic sites from the North Atlantic through the Mediterranean, to the Black Sea

Automated labs

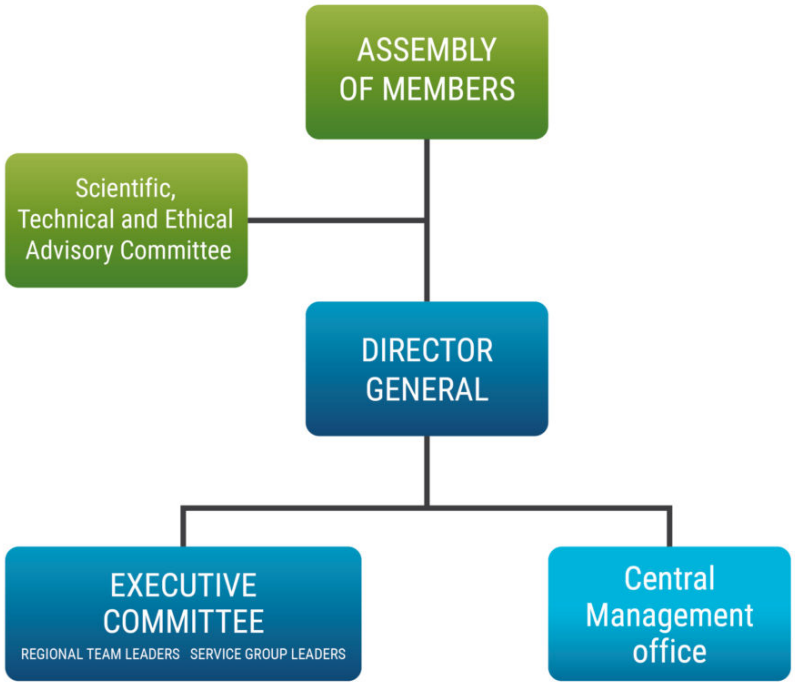
Cabled **Standalone**



Structure

Research consortium:

- Italy
- France
- Ireland
- Spain
- Greece
- United Kingdom
- Portugal
- Romania



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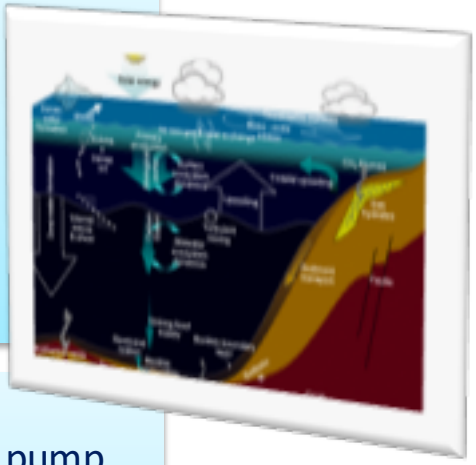
EMSO Key Scientific Objectives

Geosciences

- Seismicity
- Gas hydrate stability
- Seabed fluid flow
- Submarine landslides
- Submarine volcanism
- Geo-hazard early warning



Physical Oceanography

- Ocean warming
- Deep-ocean circulation
- Benthic and water column interactions
- Marine forecasting

Biogeochemistry

- Ocean acidification & Solubility pump
- Biological pump
- Hypoxia
- Deep-ocean biogeochemical fluxes
- Continental shelf pump

Marine Ecology

- Climate forcing of ecosystems
- Molecules to microbes
- Fisheries
- Marine noise
- Deep biosphere
- Chemosynthetic ecology

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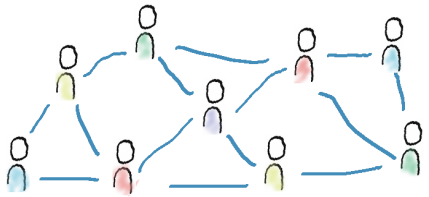
DISTRIBUTED ORGANISATION MODE



EMSO ERIC provides harmonized integration, operation and development of Regional Facilities

It will increase visibility, capacity and research, supported by a distributed strategy, offering integrated services to a broad range of users

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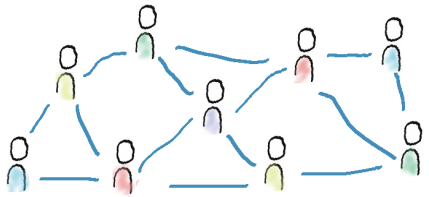

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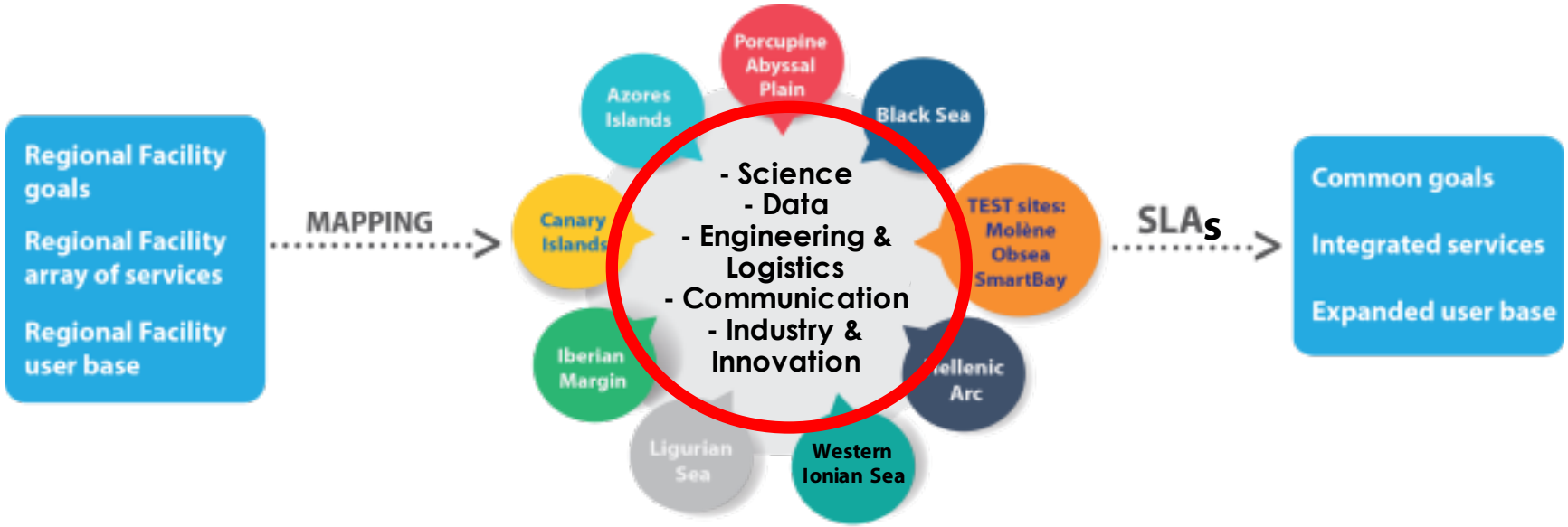

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Services represent EMSO's capacity to address common needs:

Science

Climate Change, ecosystems interactions, Geo/hazards, gas hydrate releases, anthropogenic marine impact

Engineering & Logistics

Testing and demonstration, marine operations, sensor & platform development, maintenance

Data management

Data acquisition, storage, QC and validation, data processing and visualization

Communications

Brand development, organizational cohesion, media, publications, capacity building, education

Industry & innovation

Consultancy & management, commercialization, partnerships, technology transfer

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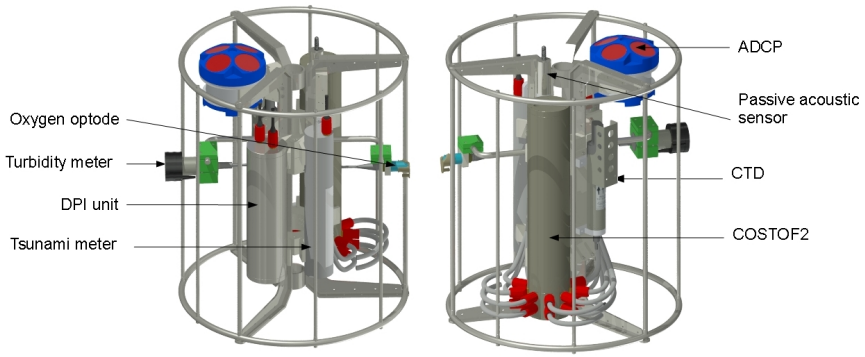
EMSO implementation and operation: DEVelopment of instrument module



EGIM

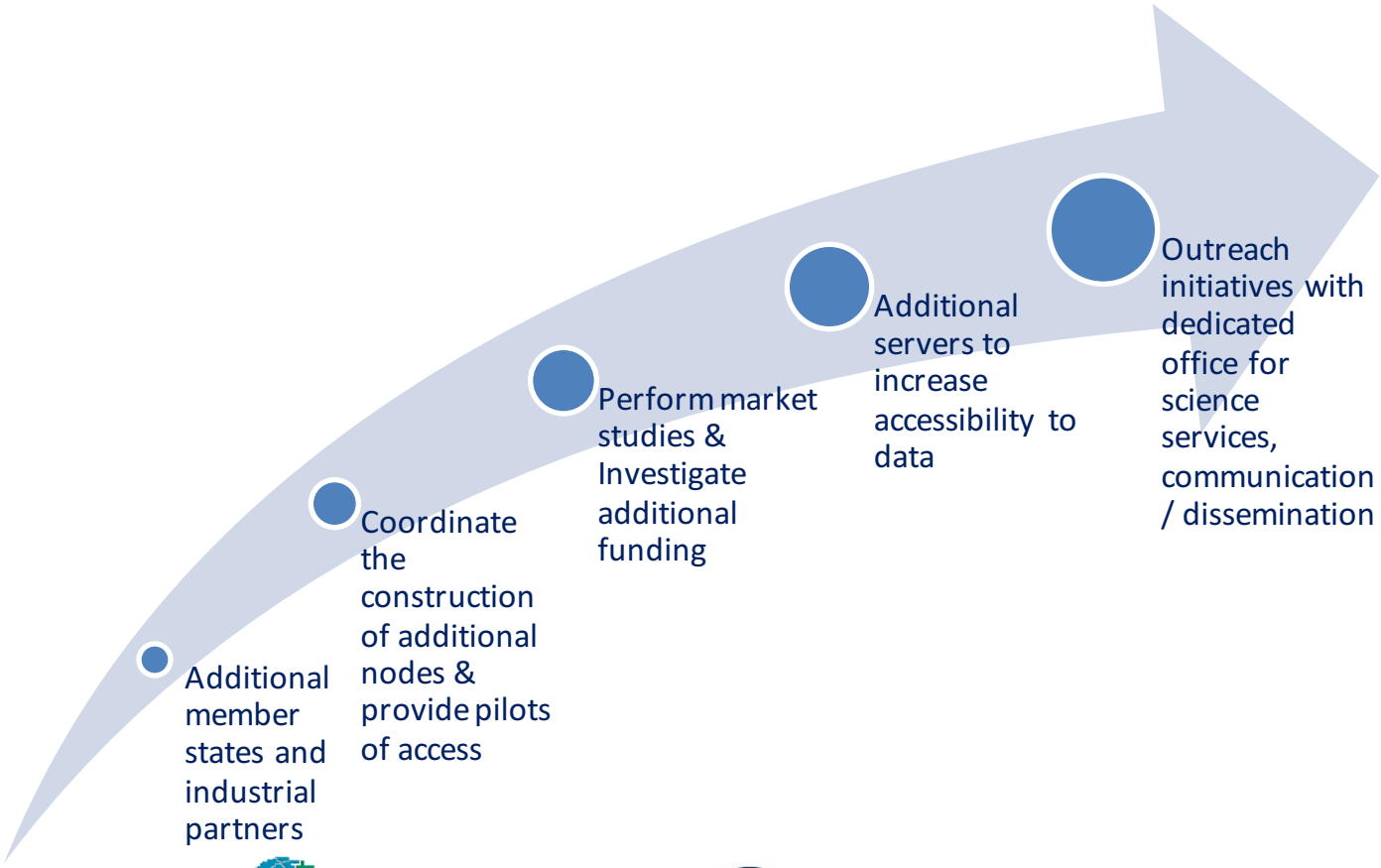
EMSO Generic Instrument Module

is envisioned to ensure increased coordination, integration, interoperability and standardisation across sites and disciplines

Core variables captured by the EGIM and their cross-disciplinary application

Variable	Geosciences	Physical Oceanography	Biogeochemistry	Marine Ecology
Temperature	X	X	X	X
Conductivity	X	X	X	X
Pressure	X	X	X	X
Dissolved O_2	X	X	X	X
Turbidity	X	X	X	X
Ocean currents	X	X	X	X
Passive acoustics	X			X

EMSO-Link EC Project
Enabling EMSO ERIC Objectives



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2020

2017

Istituto Nazionale di Geofisica e Vulcanologia

Ifremer

cnrs CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE

Marine Institute Foras na Mara

NATURAL ENVIRONMENT RESEARCH COUNCIL

hcmr ΕΛΚΕΘΕ

UPC UNIVERSITAT POLITÈCNICA DE CATALUNYA BARCELONATECH

INNOVA CONSORZIO PER L'INFORMATICA E LA TELEMATICA

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OBJECTIVES

- **To enlarge and reinforce the existing membership;**
- To consolidate and promote the partnership between the Commission, Member States, Associated Countries and relevant stakeholders;
- To upgrade the synergy with other related research Infrastructures;
- To enhance the interaction with potential industrial users and technology partners increasing trust and awareness;
- To increase international cooperation linking ocean scientists and engineers into an international team (global dimension).

Link with non-EMSO seafloor & water column observatories

Consolidate relations

- EMSO ERIC countries
- Germany
- The Netherlands
- Turkey
- Norway
- Sweden

Relationships

- Iceland
- Malta
- Slovenia
- Croatia
- Faroes
- Greenland
- Middle East
- Black Sea

emsodev

AtlantOS

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MARSite

nexos

JERICO next

FixO3
FIXED-POINT OPEN OCEAN OBSERVATORIES

Common Issues

Marine Technology

Metrology

Carbon flux

Climate Change

Mechanisms

Strategy Meetings

IEEE Oceanic Engineering Society (OES)

ABERDEEN JUNE 19-22

ANCHORAGE September 18-21

EGU European Geosciences Union

Metrology Activities

Best Practices

Event Mapping

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Link with Data User Organisations

EMSO ERIC seeks efficient mechanisms to connect with organisations designing and implementing policy at EU level

MARE

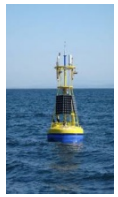
European Commission Environment

European MARINE BOARD Advancing Seas & Ocean Science

EuroGOOS European Global Ocean Observing System

JPI OCEANS

EOOS European Ocean Observing System



Fixed Platform TT

Contribution to MSFD indicators

Delivering the Marine Strategy Framework Directive
WHY
WHAT
HOW
MSFD

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Contribution to EOOS

An Integrated and Sustained European Ocean Observing System (EOOS)

Addressing the Seas and Oceans Grand Challenge

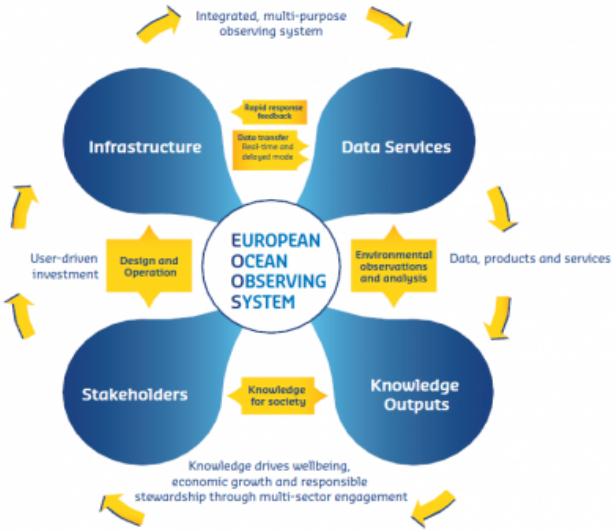
The EurOCEAN 2010 Conference identified priority marine and maritime research challenges and opportunities in areas such as food, global environmental change, energy, marine biotechnology, maritime transport and marine spatial planning, including seabed mapping. The Conference delivered an unequivocal message on the societal and economic benefits Europe derives from the seas and oceans and of the crucial role that research and technology must play in addressing the Seas and Oceans Grand Challenge.

The European marine science and technology community, building on existing achievements and initiatives, is ready to address this challenge in partnership with industry and the public sector, and call upon the European Union and its Member and Associated States to facilitate this response by delivering the following proactive and integrating actions:

1. **Joint Programming**
   Develop an integrating framework, combining the assets of European programmes with those of Member States, to address the Grand Challenge of the Seas and Oceans, including the identification and delivery of critical marine research infrastructures. The **Joint Programming Initiative on "Healthy and Productive Seas and Oceans"** has the appropriate scale of integration and should be actively supported by the European Commission and Member States.

2. **European Ocean Observing System**
   Support the development of a truly integrated and sustainably funded **"European Ocean Observing System"** to (i) re-establish Europe's global leading role in marine science and technology; (ii) respond to societal needs by supporting major policy initiatives such as the **Integrated Maritime Policy** and the **Marine Strategy Framework Directive;** and (iii) support European contributions to global observing systems. This could be achieved through better coordination of national capabilities with appropriate new investments, in coordination with relevant initiatives (e.g. ESFRI, EMODNET, GMES) and the engagement of end-users.

3. **Research to Knowledge**
   Establish appropriate mechanisms to keep under review current marine and maritime research programmes and projects with a view to enhancing their impact by (i) exploiting the results of this research; and (ii) identifying existing and emerging gaps. This should be supported by **a repository for the reports and findings of national and EU marine and maritime research projects, programmes and initiatives**, with capacity for archiving, translating, analysing, reporting and developing integrated knowledge products to facilitate policy development, decision making, management actions, innovation, education and public awareness.



EuroOcean 2010 Ostend Declaration

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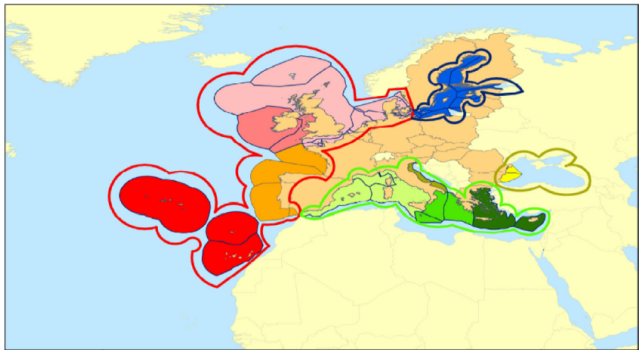

- Different directives, legislative tools and governance among EU States.
- Very little harmonization at national and international levels in the collection of marine data

EuroGOOS - MoU between EuroGOOS and EMSO will be signed this week

JPI Oceans – Discussions towards a common meeting to explore future possibilities of cooperation.

DG MARE - A white paper on the contribution of EMSO nodes to the MSFD.

✓ EMSO is a powerful, large-scale, strategically distributed world-class ERIC

✓EMSO allows the pooling of resources and coordination to assemble harmonised data into a comprehensive regional ocean picture / EGIM

✓ EMSO makes available outcomes on an open and interoperable access basis

A white paper on the capacity of EMSO nodes to **contribute to the MSFD**

OBJECTIVES

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- To increase international cooperation linking ocean scientists and engineers into an international team (global dimension).

integrated carbon observation system

Formal agreements with particular emphasis on infrastructural synergies and data sharing

ENVRI-FAIR
New possibilities

http://emso.eu

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Meetings with potential industrial users and technology partners.

- Cluster initiated by FixO3
- Forum for Coastal Technology (J-N)
- Alliance for Coastal Technology - ACT

Use of the EMSO ERIC nodes as test beds for industrial equipment through TNA

Long-term sustainability plan for ESONET Yellow Pages

Participation of industry in the user community of EMSO ERIC (ESONET-Vi and to STEAC- Scientific,

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Alternative ways to involve industry

- Service Group on Industry & Innovation
- Include Industry People in EMSO-ERIC bodies
- Promote regulation regarding the production of marine products in EU

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Why is it important ?

Global challenges must be addressed in a coordinated manner

Climate

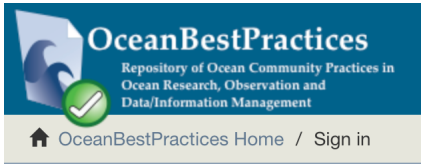
Operational Services

Marine Ecosystem Health

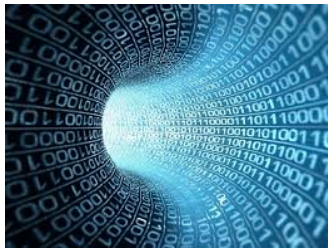
Need to strengthen the dialogue between international RI's

Technology exchange

Common practices



Data
- ✓ QC
- ✓ Access
- ✓ Sharing



Links with International Observatory Programs

AIM:

- exchange know-how,
- align strategies & practices
- encourage new developments
- promote a global dimension.

Establishment of an international board, which will among other things, will organise a biennial EMSO ERIC scientific and technical conference

workshops focusing on the exchange of best practices between node operators

Common science-policy and technology briefing papers as an outcome of meetings enhancing the role of the EU in international organisations and multilateral fora.

Communication platform/ forum in the EMSO ERIC webpage for interaction, exchange of experience and material such as operating protocols.

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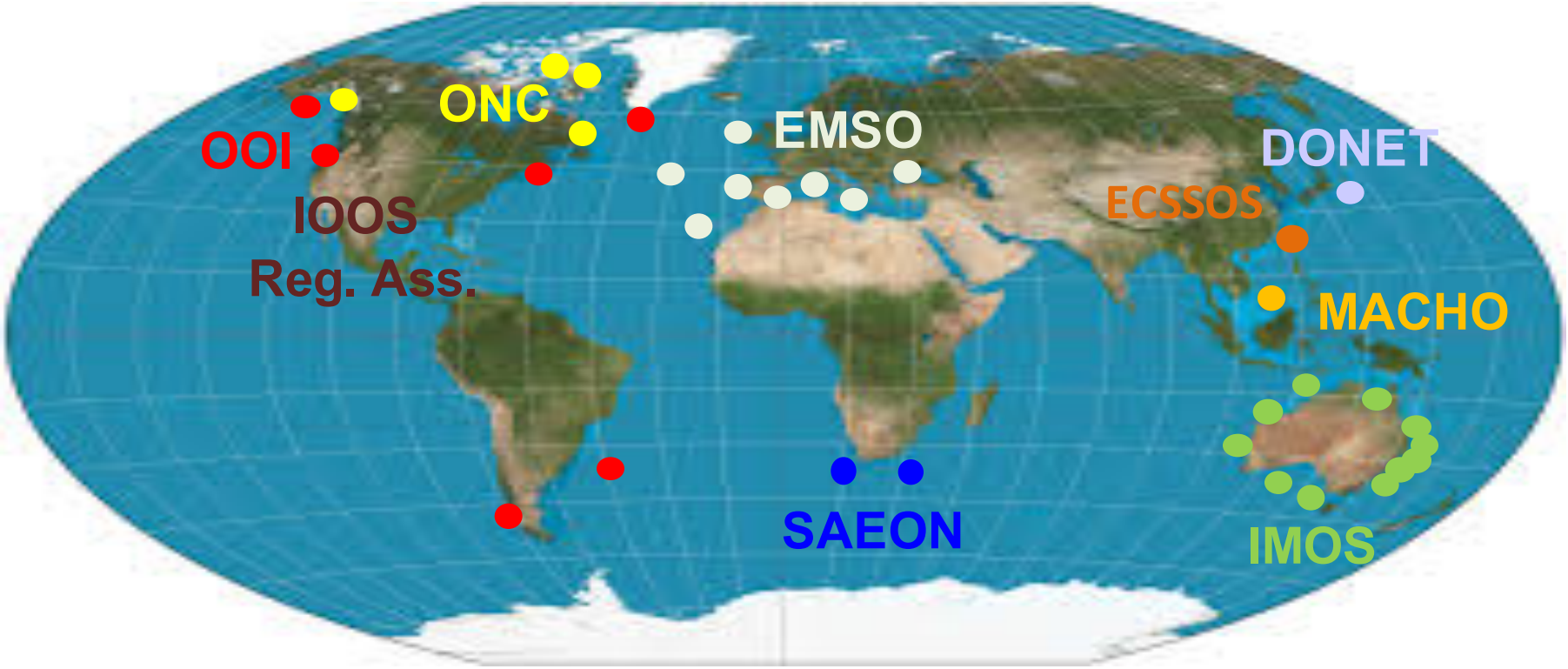
The International Observatory Programs



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EU seafloor and water column observatories challenges and opportunities towards integration

EMSO ERIC ALL REGIONS WORKSHOP
9-11 OCTOBER 2017

ROME HOTEL VILLA EUR "PARCO DEI PINI" Piazzale Marcellino Champagnat n.2

OCTOBER 9TH
MONDAY

RECEPTION AREA

09:00-09:30 Registration | 30 min.

09:30-10:30 General Introduction
60 min. Chair: Paolo Favali | EMSO ERIC

SALA UMANESIMO

09:30-09:45 Welcome
15 min. Juanjo Danobeitia | EMSO ERIC Director General

09:45-10:00 Event framework and expected outcomes
15 min. Paolo Favali | EMSO-LINK Project Coordinator

10:00-10:15 Results and Recommendations from FIXO3
15 min. Richard Lampitt | NERC | EMSO ERIC AoM Chair

10:15-10:30 Science Services Concept and Themes
15 min. Henry Ruhl | NERC

10:30-11:00 Coffee break

11:00-13:15 EMSO ERIC nodes: STATUS | 135 min.
135 min. Chair: Jerome Blandin | IFREMER

11:15-11:55 Azores Islands
40 min. Pierre-Marie Sarradin | IFREMER

11:55-12:35 Hellenic Arc
40 min. Vasilios Lykousis | HCMR

12:35-13:15 Ligurian Sea
40 min. Laurent Coppola | CNRS

13:15-14:15 Lunch

14:15-16:30 EMSO ERIC nodes: Status | 135 min.
135 min. Chair: Jerome Blandin | IFREMER

14:30-15:10 Canary Islands
40 min. Eric Delory | PLOCAN

15:10-15:50 Porcupine Abyssal Plain
40 min. Richard Lampitt | NERC

15:50-16:30 Western Ionian
40 min. Danilo Embriaco | INGV

16:30-18:00 SESSION on Industry Interests | 90 min.
90 min. Chair(s): Henry Ruhl | NERC

16:45-17:20 Oil Spill Response Limited / Andy Gates
35 min. SEA SRL / Riccardo Papaleo
RTSYS / Corentin Troussard
AANDERA / Anders Tengberg
Seabed Mining / TBD
Fishing Industry / TBD

17:20-18:00 Open Discussion - Wrap-up and conclusions
40 min. Henry Ruhl | NERC

SALA GARDEN

18:00-19:30 SESSION on EMSO ERIC nodes in operation | 90 min.
Regional teams and service level agreement
15 min. Chair: Paolo Favali | EMSO ERIC

18.15-18.30 Service Level Agreement | Draft Presentation
15 min. TBD | EMSO ERIC

18.30-19.30 Open Discussion
60 min. Paolo Favali | EMSO ERIC

RECEPTION AREA

18:00-19:30 Poster Session | Conveners:
90 min. Jerome Blandin | IFREMER
Paolo Favali | EMSO ERIC
George Petihakis | HCMR
Henry Ruhl | NERC

19:30 End of day

20:00 Joint dinner

OCTOBER 10TH
TUESDAY

RECEPTION AREA

09:00-09:15 Registration | 15 min.

SALA UMANESIMO

09:15-10:35 EMSO ERIC Test Sites
80 min. Chair: Jerome Blandin | IFREMER

09:15-9:35 Kolja Fjord
20 min. Anders Tengberg | University of Gothenburg

09:35-9:55 Molène
20 min. Nadine Lanteri | IFREMER

09:55-10:15 OBSEA
20 min. Joaquin Del Rio | Universitat Politecnica de Catalunya

10:15-10:35 Smartbay
20 min. Diarmuid O'Conchubhair | Marine Institute

10:35-11:00 Coffee Breack

4th All Regions meeting, Rome Oct 2017

- 3 days, 120+ participants, 56 presentations, 33 posters
- chief scientists and engineers from 4 International RI's (IMOS, OOI, DONET, ONC)

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The International Observatory Programs

Scientific Committee

ONC

OOI

IOOS Reg. Ass.

EMSO

DONET

ECSSOS

MACHO

SAEON

IMOS

ONC and **EMSO**
MoU signed May 2018

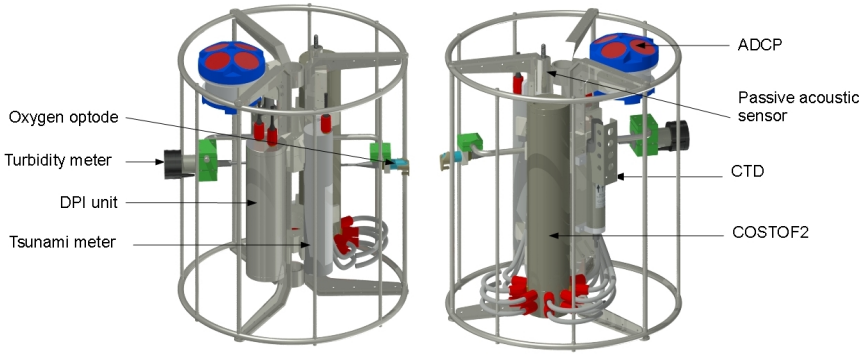
http://emso.eu

Opportunities

coop+
Promoting collaboration among RIs

CERTIFICATION / LABELING

EGIM



2.4bn€ under Open Science Pillar on Research Infrastructures

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Thank you for your attention.

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