EMSO ERIC
the Pan-European infrastructure of seafloor and water-column observatories around the European seas, extends its coverage to the Arctic

Juan José Dañobeitia, Paolo Favali, Laura Beranzoli, Alan Berry, Jérôme Blandin, Mathilde Cannat, Mafalda Carapuço, Ayoze Castro, Laurent Coppola, Eric Delory, Joaquin del Rio Fernandez, Davide Embriaco, Ilker Fer, Bénédicte Ferré, Maria I. Fredella, Andrew Gates, Alessandra Giuntini, Susan Hartman, Nadine Lantéri, Giuditta Marinaro, Paola Materia, George Petihakis, Vlad Radulescu, Ivan Rodero, Pierre-Marie Sarradin, Zuzia Stroynowski

EMSO ERIC is an integrated and distributed **Research Infrastructure** that provides multidisciplinary **data from the sea surface to the deep seafloor** to increase knowledge on major environmental processes to understand the complex interactions among the geosphere, biosphere, hydrosphere and atmosphere

http://emso.eu

emso ERIC

SCIENCE

Oceans play a crucial role in human wellbeing

- Degradation and loss of biodiversity impacts marine resource exploitation
- Ocean circulation affects climate change
- Natural hazards like tsunamis, earthquakes and volcanic eruptions have socioeconomic impacts

Geohazards: slope stability, hydrothermal vents, tsunami, seismic and volcanic real-time monitoring

Climate Change: ocean acidification, dynamics of water masses, deep underwater circulation, sea level rise

Marine Ecosystems: biodiversity, pollution, sustainable fisheries, anthropogenic noise, marine mammal tracking, algal blooms

DISTRIBUITED RESEARCH INFRASTRUCTURE

Central Hub, Italy

14 FIXED POINT MUTI-SENSORS PLATFORMS:

- ✓ **11 Deep Sea Observatories (green circles) (Cable & Stand-alone)**
- ✓ **3 Test Sites, Shallow water (green dots)**

Access to HIGH-QUALITY MARINE ENVIRONMENTAL INFORMATION

OBSERVING AND MONITORING THE OCEANS

HYDROSPHERE BIOSPHERE GEOSPHERE ATMOSPHERE

IN SITU MEASUREMENTS/ SAMPLING (DATA Collection)

PHYSICAL-BIOCHEMICAL - BIOLOGICAL/ECOLOGICAL parameters

⇒ INFORMATION PROCESSING ACCESS AND SHARING ⇒ NEW KNOWLEDGE

TRANSPARENT AND ACCESSIBLE OCEAN

EMODnet

EUROPEAN OPEN SCIENCE CLOUD

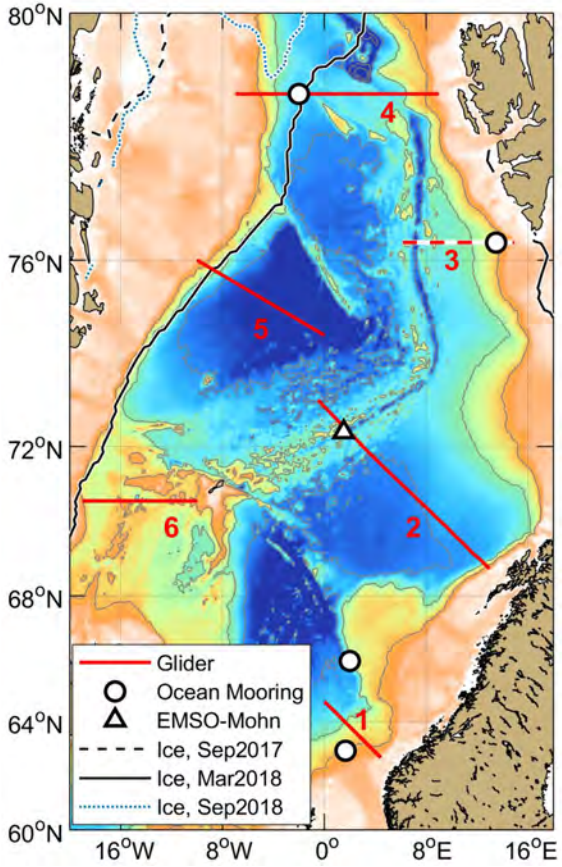
http://emso.eu

RESEARCH CONSORTIUM

emso ERIC

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

NorEMSO will fill the gap in the Nordic Seas



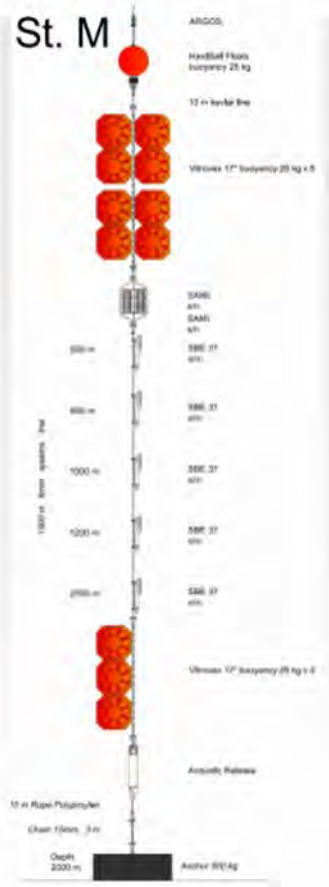
NorEMSO has 3 main components:

Glider sections (red): (1) Svinøy, (2) Gimsøyand (3) South Cape West, (4) FramStrait, (5) Greenland Sea and (6) Iceland Sea

Moored observation systems (circles): Svinøy, Station M, South Cape, and Fram Strait

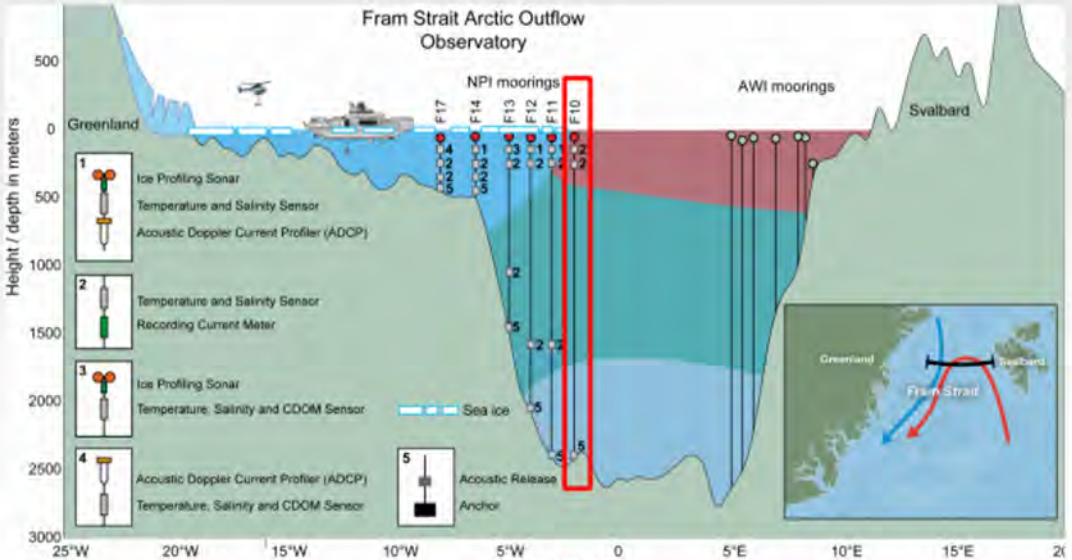
The EMSO Mohn observatory over the Mohn Ridge (triangle)

emso ERIC



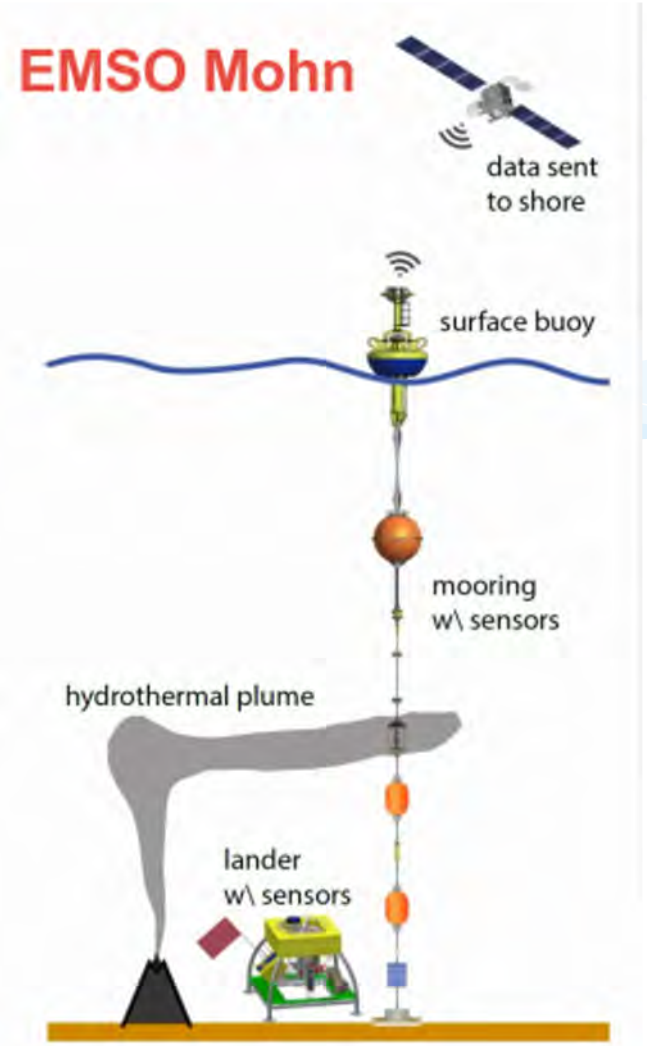
Continuation of long-term observations

Station M (only subsurface); Svinøy; Fram Strait



Courtesy of Norwegian Polar Institute

- At a hydrothermal vent side on Mohn Ridge, co-located with a glider section
- A fixed-point seabed-based compact and wireless observatory with a multidisciplinary approach –from geophysics and physical oceanography to ecology and microbiology
- Sensors include an Acoustic Doppler Current Profiler, a pressure gauge, a temperature probe, a conductivity sensor, a turbidity meter, an optode, and a hydrophone
- Acoustic modems enable wireless communications
- Data Processing Unit for on board data reduction



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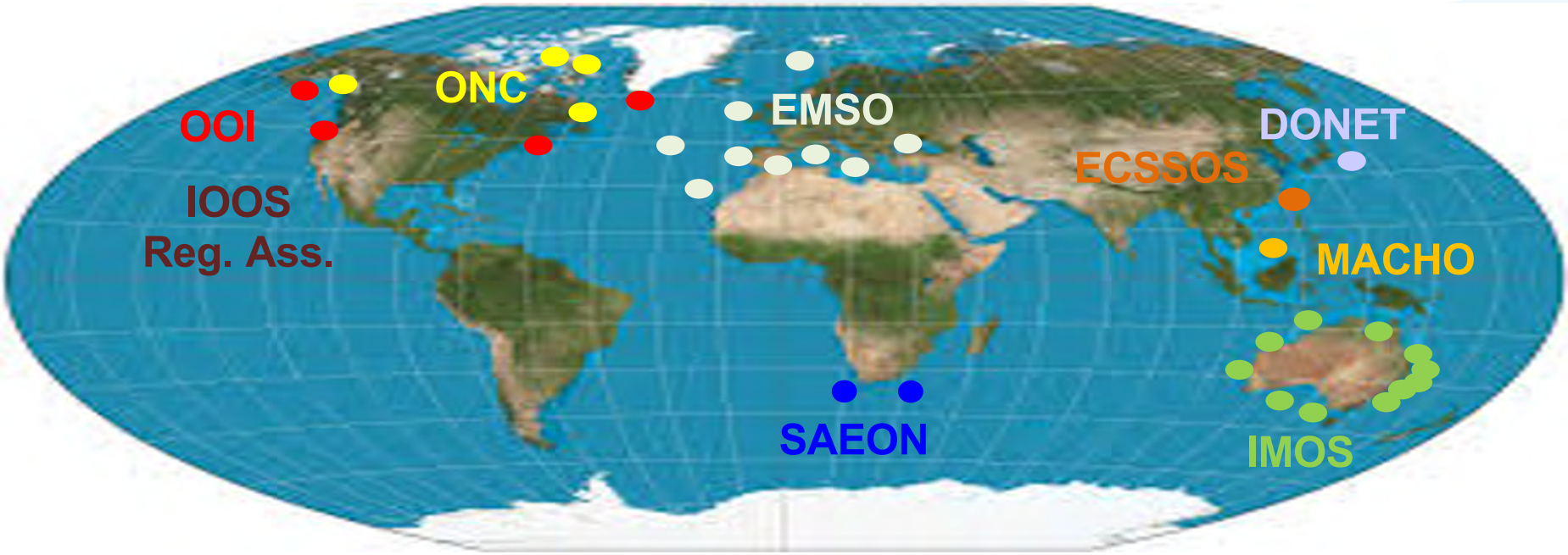
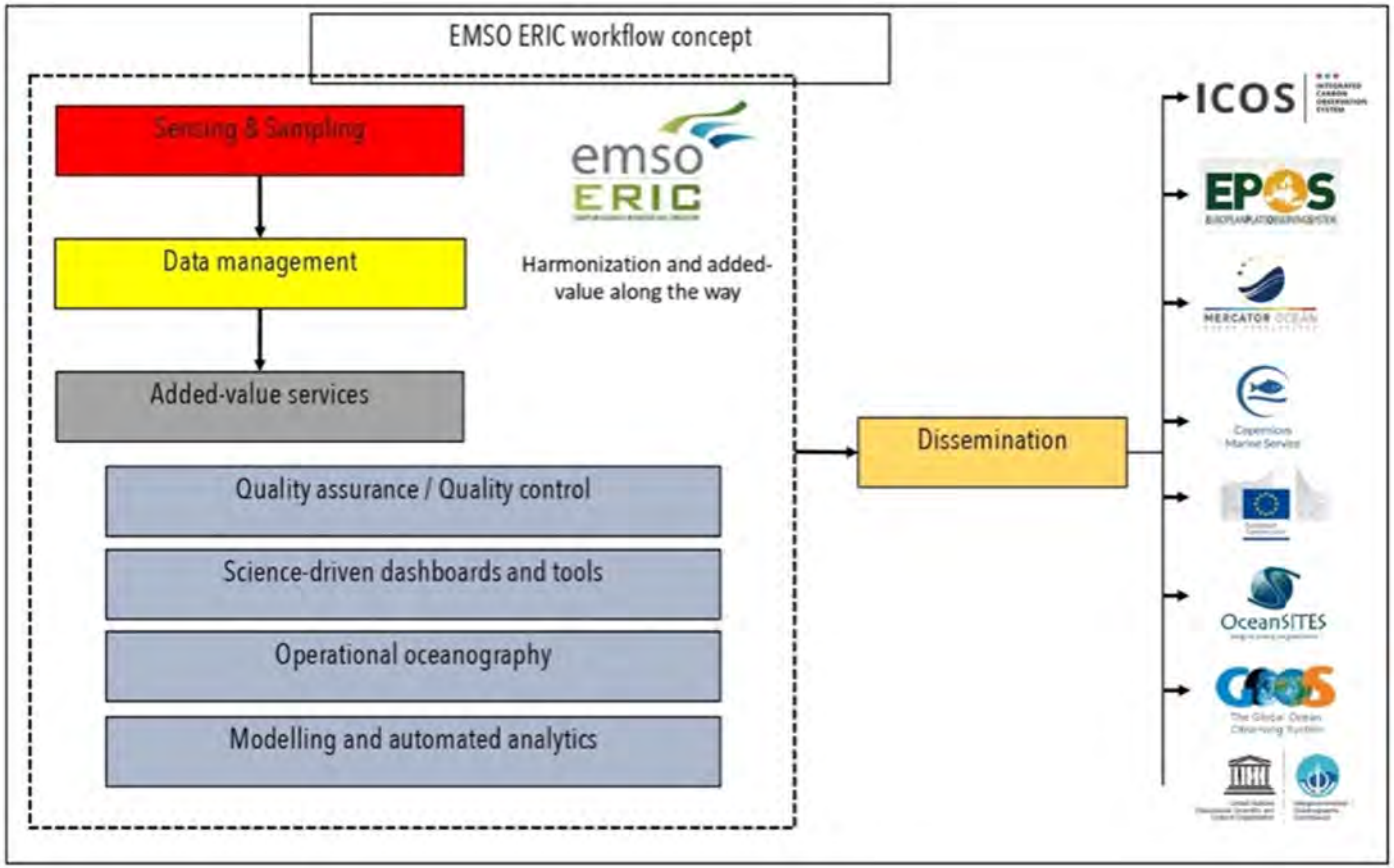
LINK WITH INTERNATIONAL OBSERVATORY PROGRAMS AND DATA USER ORGANISATIONS




9TH EUROGOOS
INTERNATIONAL CONFERENCE
ADVANCES IN
OPERATIONAL OCEANOGRAPHY:
EXPANDING EUROPE'S OCEAN OBSERVING AND
FORECASTING CAPACITY
EuroGOOS
Ifremer
SHOM


EMSO ERIC workflow concept
Sensing & Sampling
Data management
Added-value services
Quality assurance / Quality control
Science-driven dashboards and tools
Operational oceanography
Modelling and automated analytics
emso
ERIC
Harmonization and added-value along the way
Dissemination
ICOS
EPOS
MERCATOR OCEAN
Copernicus Marine Service
OceanSITES
GOOS

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FAIRE ENVRI

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EMODnet

EUROPEAN OPEN SCIENCE CLOUD

Euro Argo

integrated carbon observation system

eccsel

SIOS

ACTRiS

EPOS EUROPEANPLATEOBSERVINGSYSTEM

ERIC FORUM

DANUBIUS-RI

JERICO RI
SCIENCE - SERVICES - SUSTAINABILITY

KM3NeT

Eurofleets+
An alliance of European marine research infrastructure

AtlantECO
Atlantic ECOsystems Assessment, Forecasting & Sustainability

EuroSea

MINKE

GeoEcoMar

DOORS

Formal agreements with particular emphasis on infrastructural synergies and data sharing

EOOS

JPI OCEANS

MoU with EuroGOOS

EuroGOOS
European Global Ocean Observing System

EMBRC
EUROPEAN MARINE BIOLOGICAL RESOURCE CENTRE

LifeWatch ERIC

http://emso.eu

- To strengthen coordination, strategy and sustainability in ocean observations fully supporting the EOOS vision
- To strengthen the coordination with programmes worldwide
- To contribute to the implementation of the SDGs (Sustainable Development Goals, https://sdgs.un.org/goals) of the "UN Decade of Ocean Science for Sustainable Development " (http://oceandecade.org)

2021 2030 United Nations Decade of Ocean Science for Sustainable Development

frontiers in Marine Science

MINI REVIEW

Toward a Comprehensive and Integrated Strategy of the European Marine Research Infrastructures for Ocean Observations

OPEN ACCESS

Research Infrastructures (RIs) are large-scale facilities encompassing instruments, resources, data and services used by the scientific community to conduct high level research in their respective fields. The development and integration of marine environmental RIs as European Research Vessel Operators [ERVO] (2020) is the response of the European Commission (EC) to global marine challenges through research, technological development and innovation. These infrastructures (EMSO ERIC, Euro Argo ERIC, ICOS ERIC Marine, LifeWatch ERIC, and EMBRC ERIC) include specialized vessels, fixed-point monitoring systems, Lagrangian floats, test facilities, genomics observatories, bio-sensing, and Virtual Research Environments (VREs), among others. Marine ecosystems are vital for life on Earth. Global climate change is progressing rapidly, and geo-hazards, such as earthquakes, volcanic eruptions, and tsunamis, cause large losses of human life and have massive worldwide socio-economic impacts. Enhancing our marine environmental monitoring and prediction capabilities will increase our ability to respond adequately to major challenges and efficiently. Collaboration among European marine RIs aligns with and has contributed to the OceanObs'19 Conference statement and the objectives of the UN Decade of Ocean Science for Sustainable Development (2021–2030). This collaboration actively

https://www.frontiersin.org/articles/10.3389/fmars.202000180/full

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