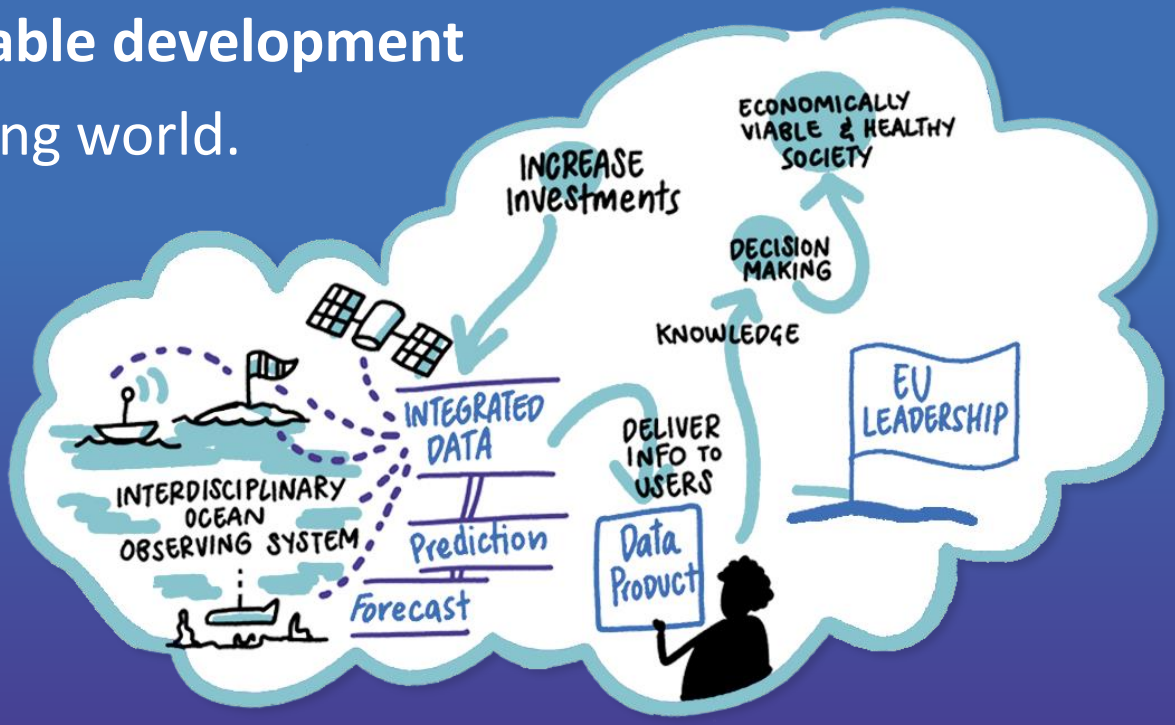
EuroSea

Improving and Integrating European Ocean Observing and Forecasting Systems for sustainable use of the Oceans

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 862626.

Vision

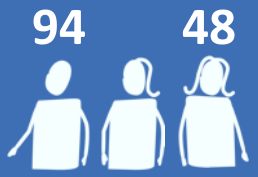
Research and **innovation** towards a user-focused, truly **interdisciplinary**, and responsive European **ocean observing** and **forecasting system**, that delivers the essential information needed for **human wellbeing** and **safety**, **sustainable development** and **blue economy** in a changing world.



EuroSea in figures

12 Languages

144 Members



16 Countries

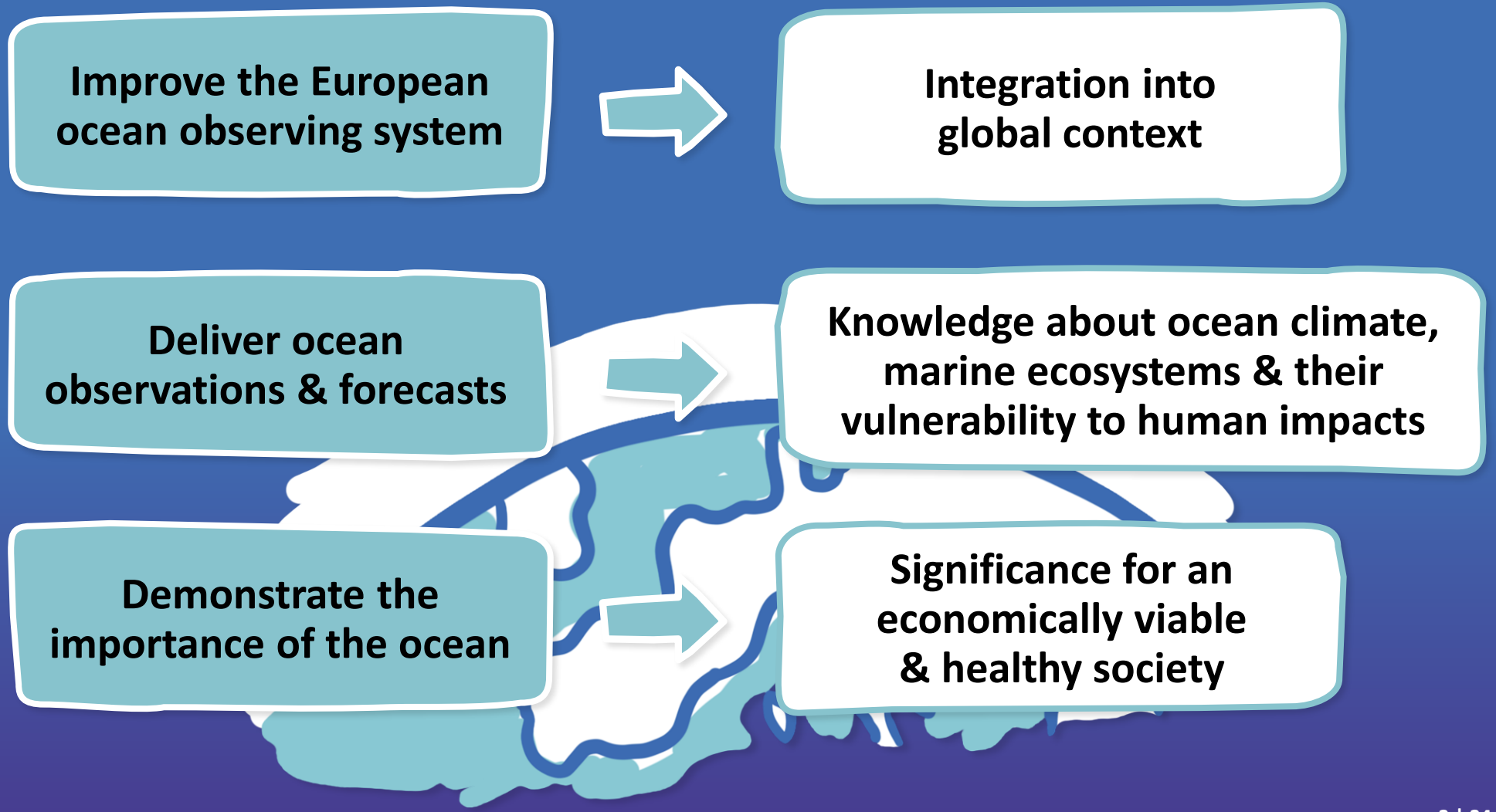
55 Partners

10 Work Packages

>> 31 Milestones >> 62 Tasks >> 84 Deliverables

Budget 12.3 M€

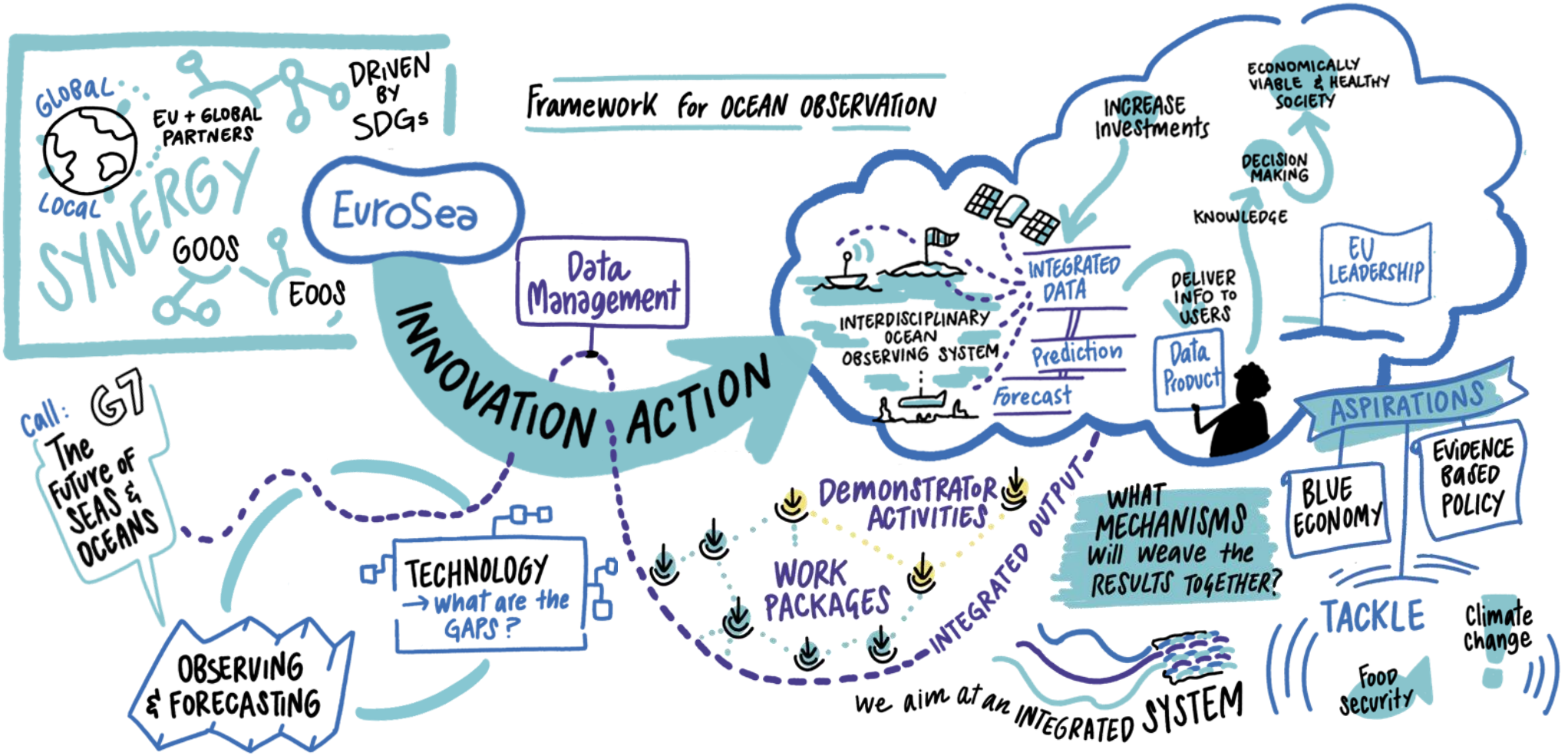
Goals


Improve the European ocean observing system
Integration into global context
Deliver ocean observations & forecasts
Knowledge about ocean climate, marine ecosystems & their vulnerability to human impacts
Demonstrate the importance of the ocean
Significance for an economically viable & healthy society

Mission

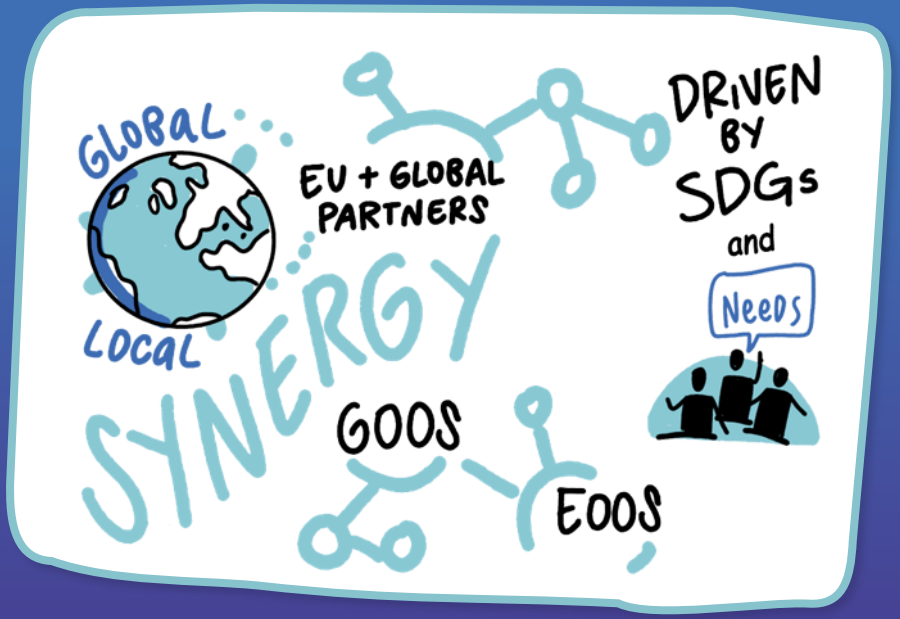
Use a **co-design approach** to significantly improve European ocean observing and forecasting **services and products** by building the **community** needed for a system that delivers services and products on the ocean, **ocean climate**, **marine ecosystems** and their **vulnerability** to human impacts.

Perspectives



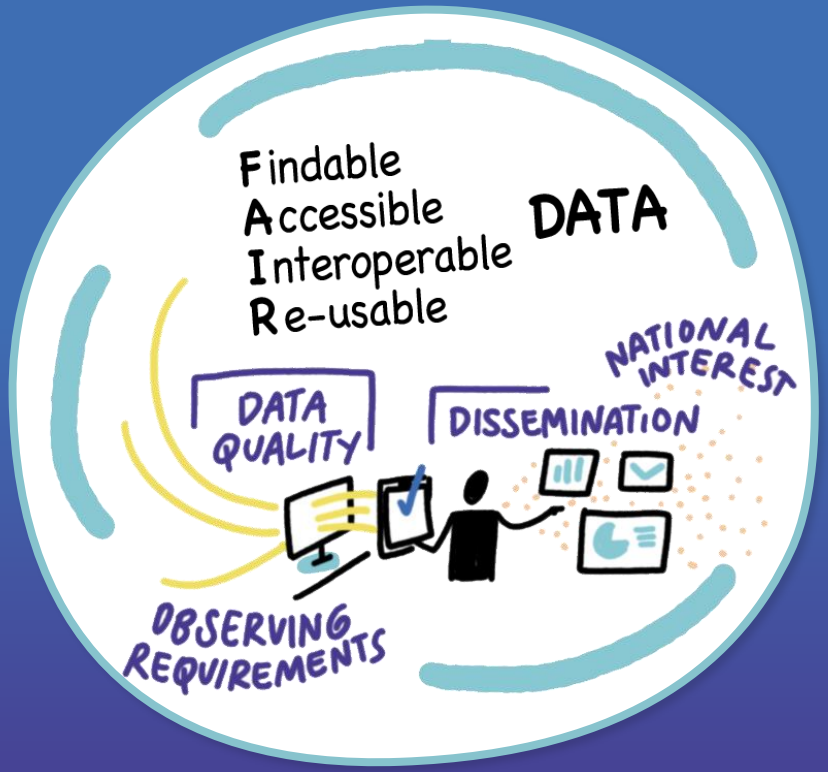
Objectives

1. Strengthen European ocean observing and forecast as an integrated entity within a global context
2. Improve the design for an integrated European ocean observing and forecasting system for the European seas and the Atlantic, including the deep sea
3. Improve and enhance the readiness and integration of ocean observing networks



Objectives

4 Enable FAIR data, support integration of ocean data into Copernicus Marine Service, EMODnet and SeaDataNet portfolios

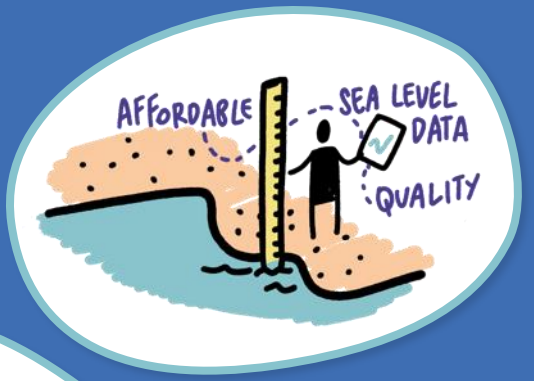


Objectives

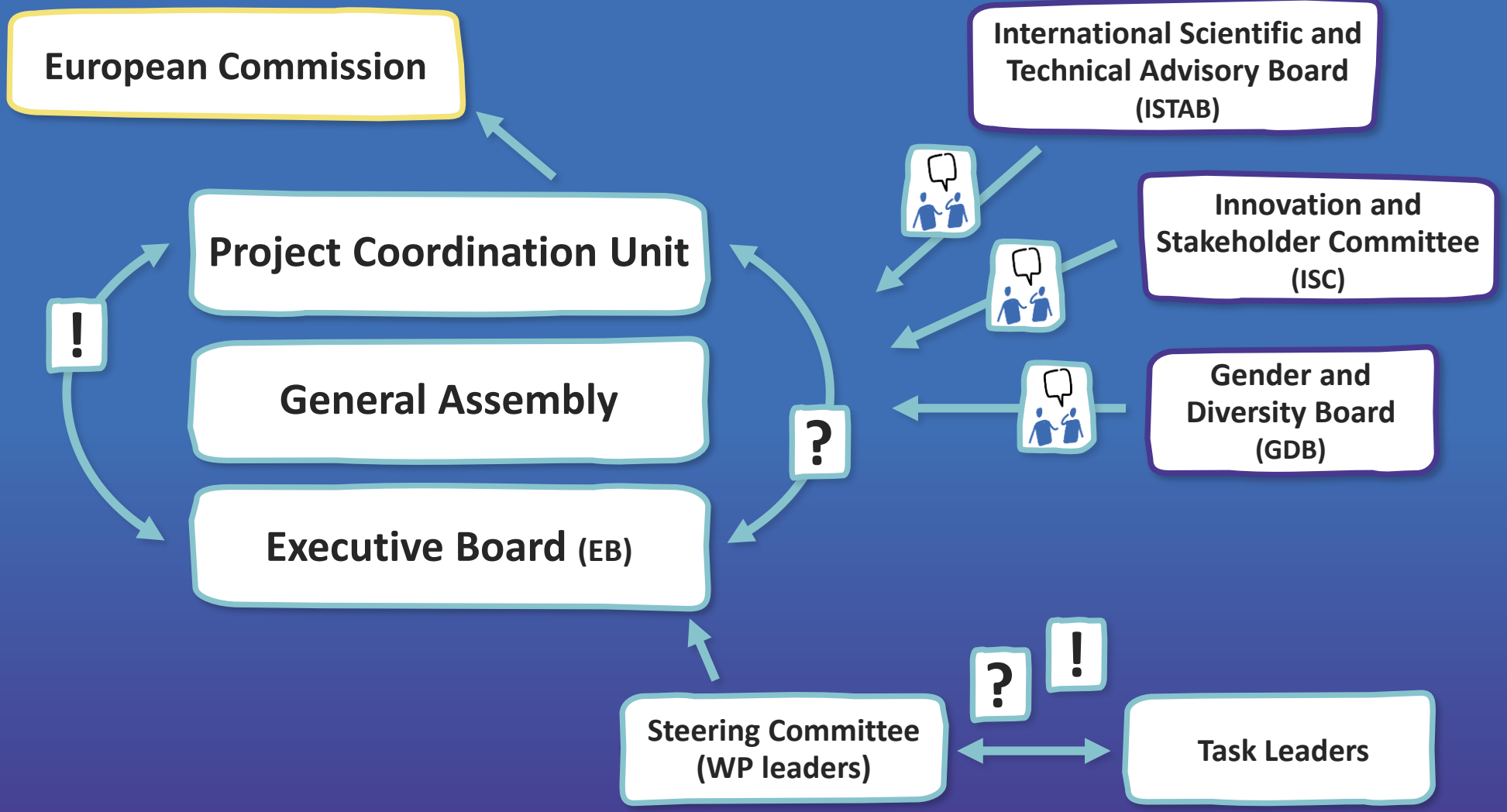
5 Deliver improved forecasts and new information synthesis products by better use of data in models

6 Develop novel services, demonstrate the value of the ocean observing system to users

7 Support of an integrated, sustainable and fit-for-purpose ocean observing system by engaging with a range of end-users and other stakeholders

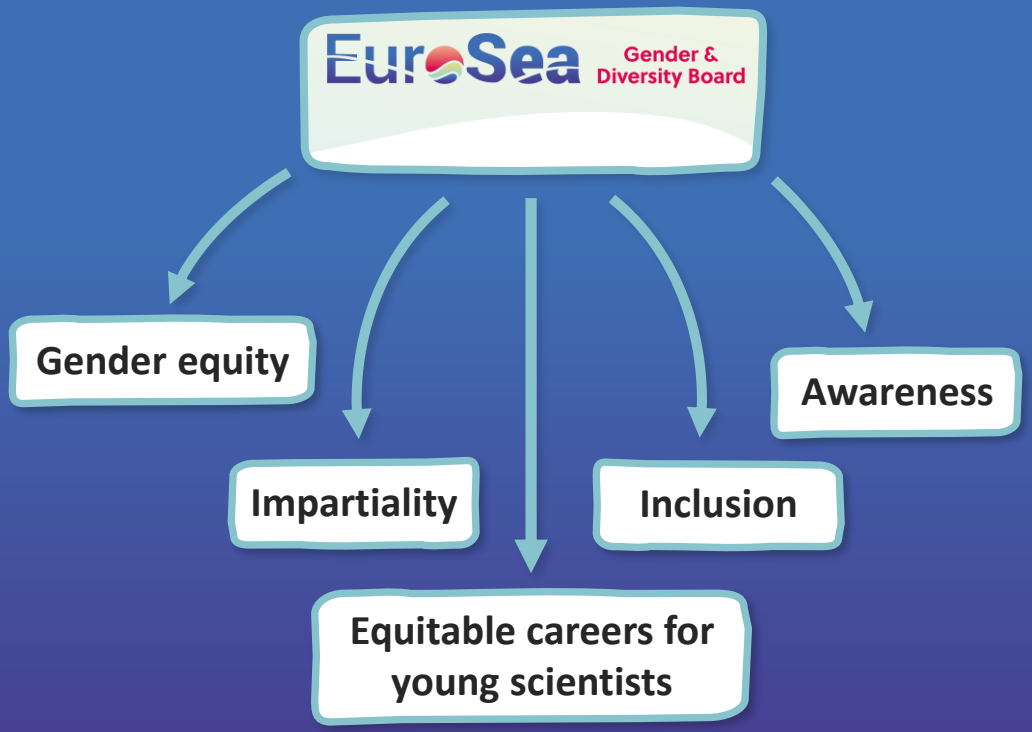


Governance Structure

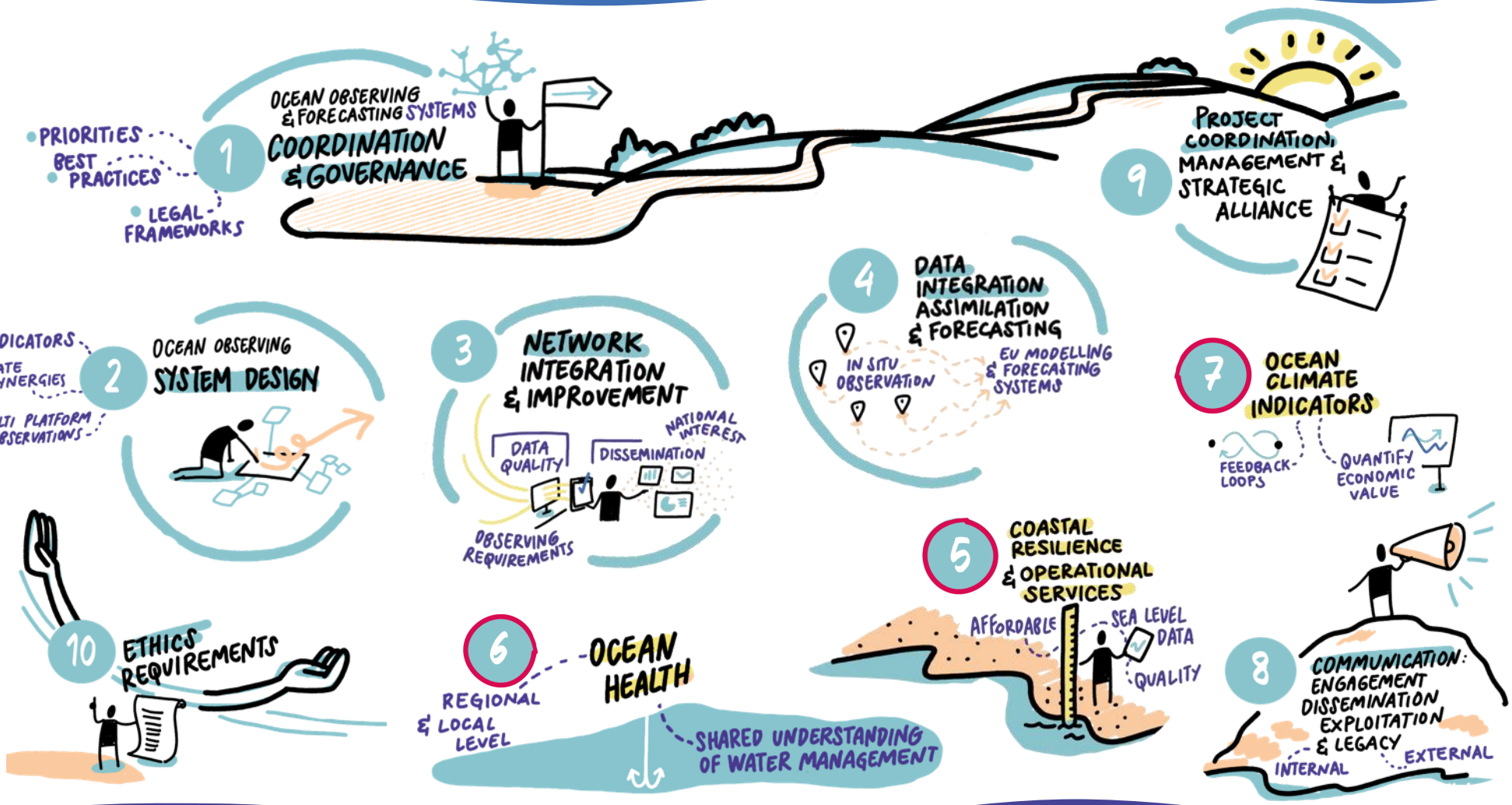


Is Science Equitable?

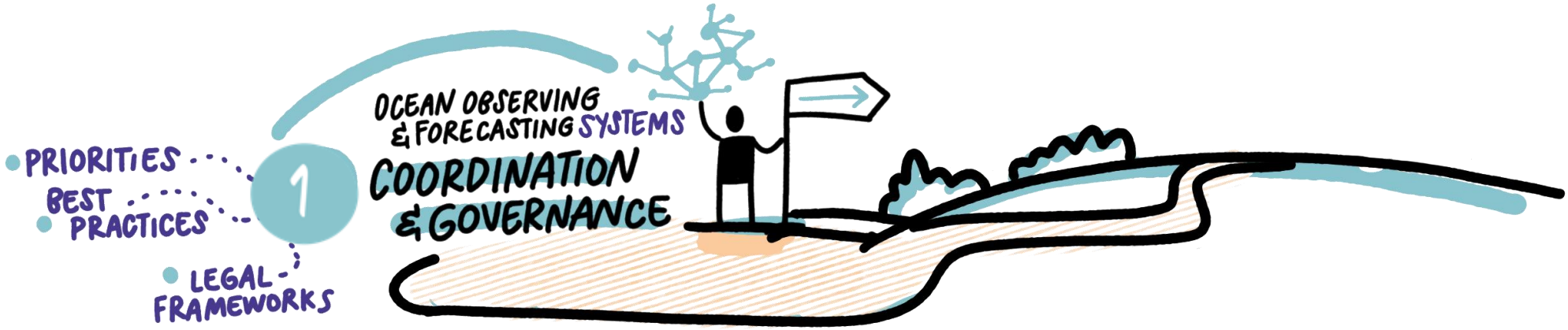
"Without inclusion, diversity initiatives may not be enough" *(Purity et al, Science 2017)*



Work Packages

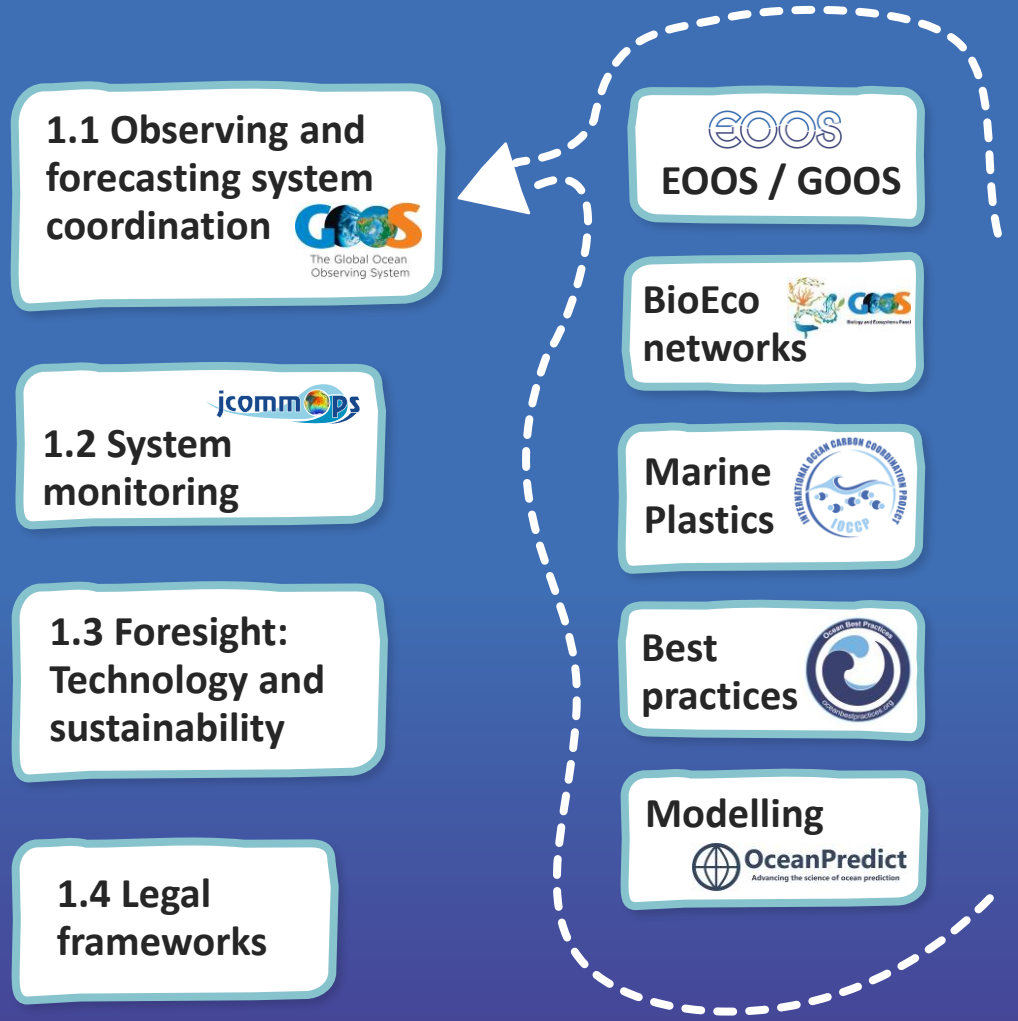


Coordination and Governance

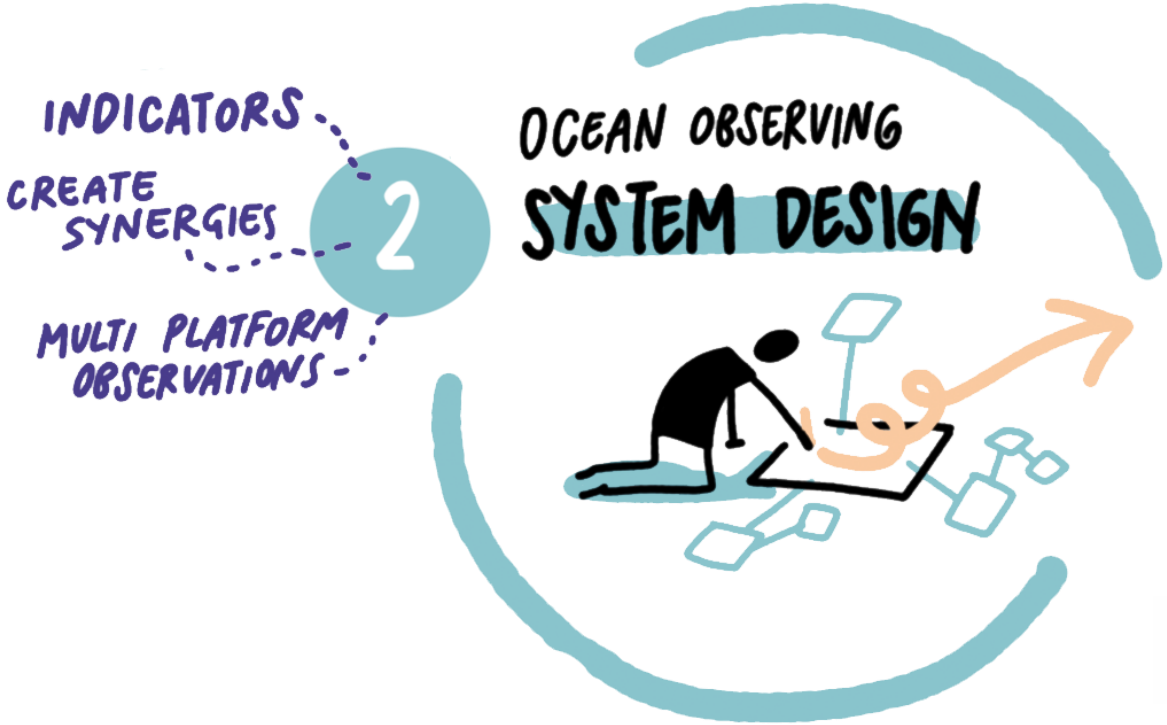


Coordination and Governance

- Strengthen EOOS & connection to national ocean observing priorities
- Connect observing & modelling communities
- Develop marine debris observing network
- Strengthen EU biological networks
- Extend ocean best practice
- Visualise observing system performance
- Insight on legal issues
- Orientation for the future



Ocean Observing System Design



Ocean Observing System Design

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Societal benefits of Ocean Observing

Societal challenges

Requirements towards EuroSea

European Blue Growth strategy

Strategy for sustained EOV monitoring

Identification of requirements in existing observing networks

Support of demonstrators (WP5, 6, 7)

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Accurate estimates for indicators

Improve existing elements

Implementation of new Ocean Observing components

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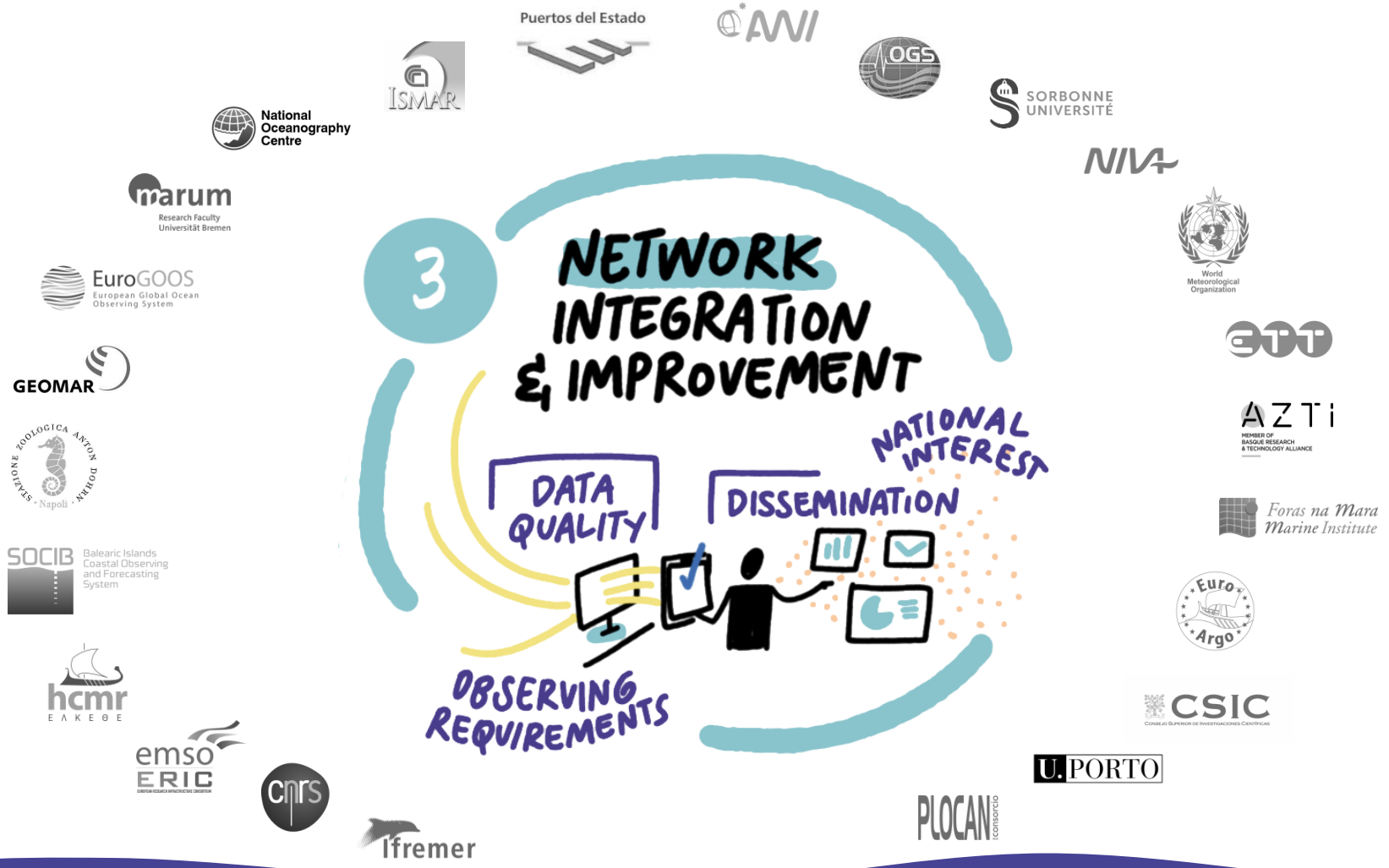
Network Integration and Improvement

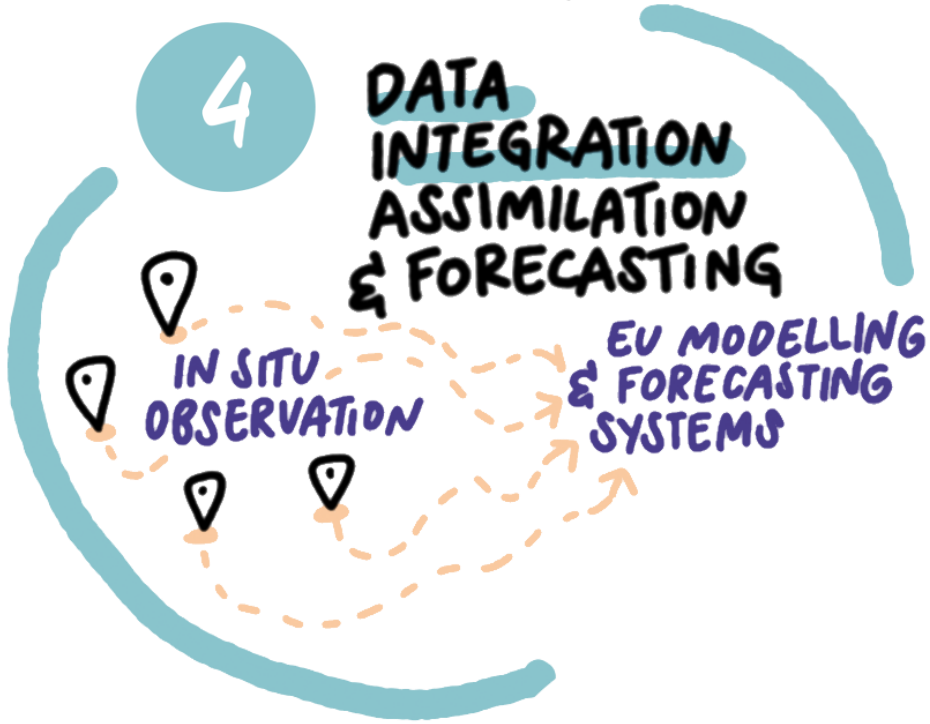


Network Integration and Improvement

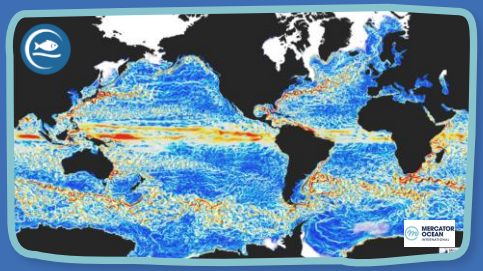
- Make European observing networks fit for global integration
- Ensure that European observing efforts are visible and accessible at a global level
- Ensure **seamless flow of data** with know quality from observations to data centres
- **Incorporate augmented/OMICS** observations into the European ocean observing network landscape
- Develop **multidisciplinary and multiplatform observing strategies** and guidelines

	European networks	Global networks
HF Radar	HFRadar EuroGOOS Task Team	Global HF Radar Network
Glider	Glider EuroGOOS Task Team	Ocean Gliders
Fixed platforms	*in progress…*	OceanSITES
Surface vehicle	*in progress…*	
Profiling floats	Euro-Argo	Argo
Research ships	*in progress…*	GO-SHIP
Commercial ships	FerryBox EuroGOOS Task Team + …	SOOP
Tide gauges	Tide Gauge EuroGOOS Task Team	GLOSS

Data Integration, Assimilation & Forecasting



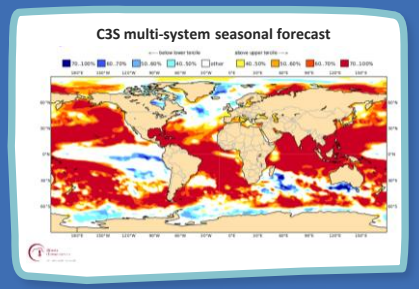
Data Integration, Assimilation & Forecasting



Data assimilation

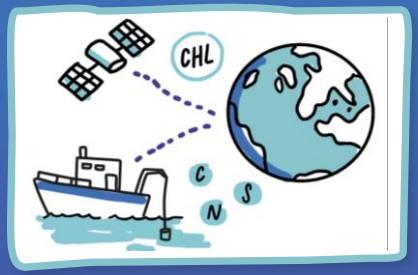
Copernicus Marine global and regional monitoring and forecasting systems

Copernicus Climate seasonal forecasts



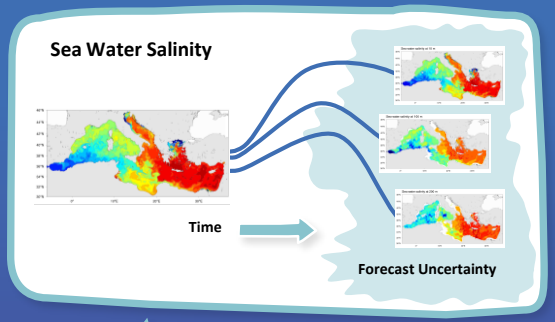
Quality assessment

Long term validation of satellite observations



Improving the use of in-situ observations

Synthesis product development based on ship-based in situ biogeochemical data

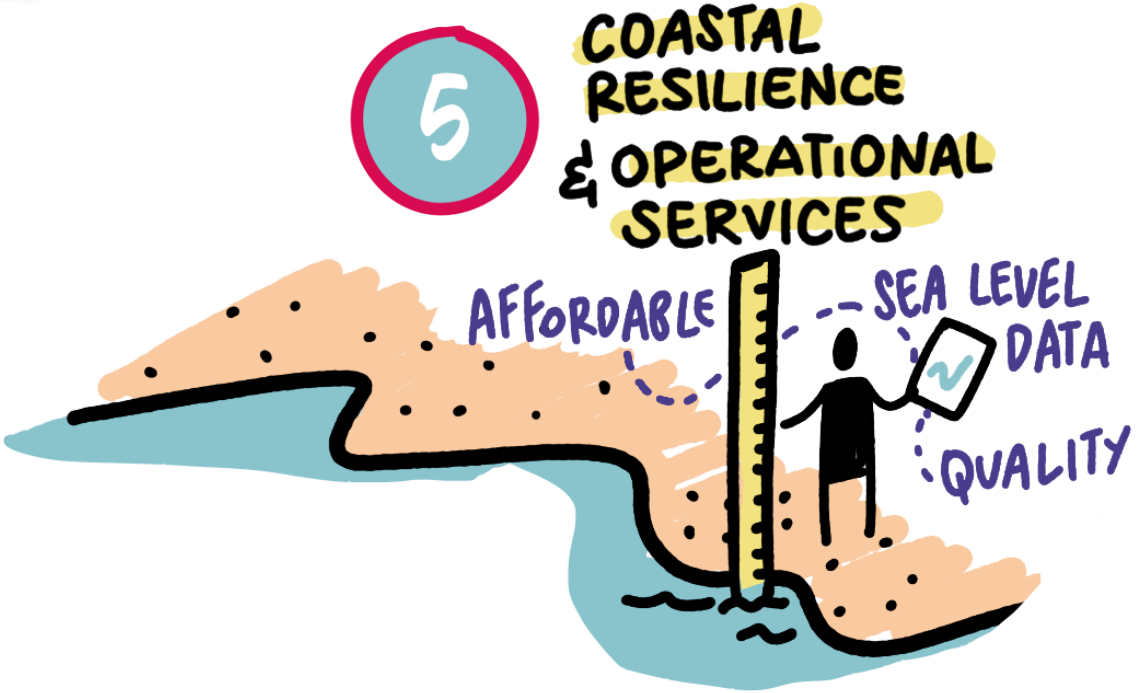


Model development and validation

Improved forecasting

Coastal Resilience and Operational Services

DEMONSTRATOR



cmcc Centro Euro-Mediterraneo sui Cambiamenti Climatici

Puertos del Estado

nologin

UNIVERSITY OF CAMBRIDGE

Laboratori d'Enginyeria Marítima
UPC - BARCELONATECH

ARUP

National Oceanography Centre

Coastal Resilience and Operational Services

Demonstration end-to-end connection

New measuring instruments

Observations

Novel decision making tools

Pollution

Sea level

3 case studies

Barcelona

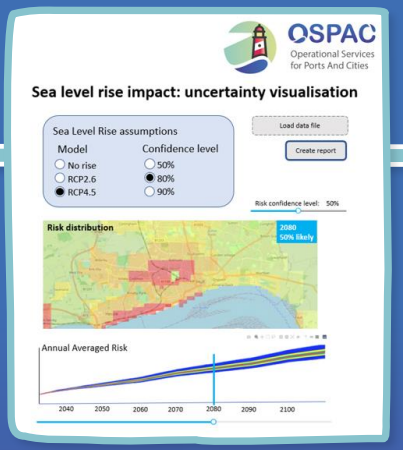
Alexandria

Taranto

Operational Services

Cities

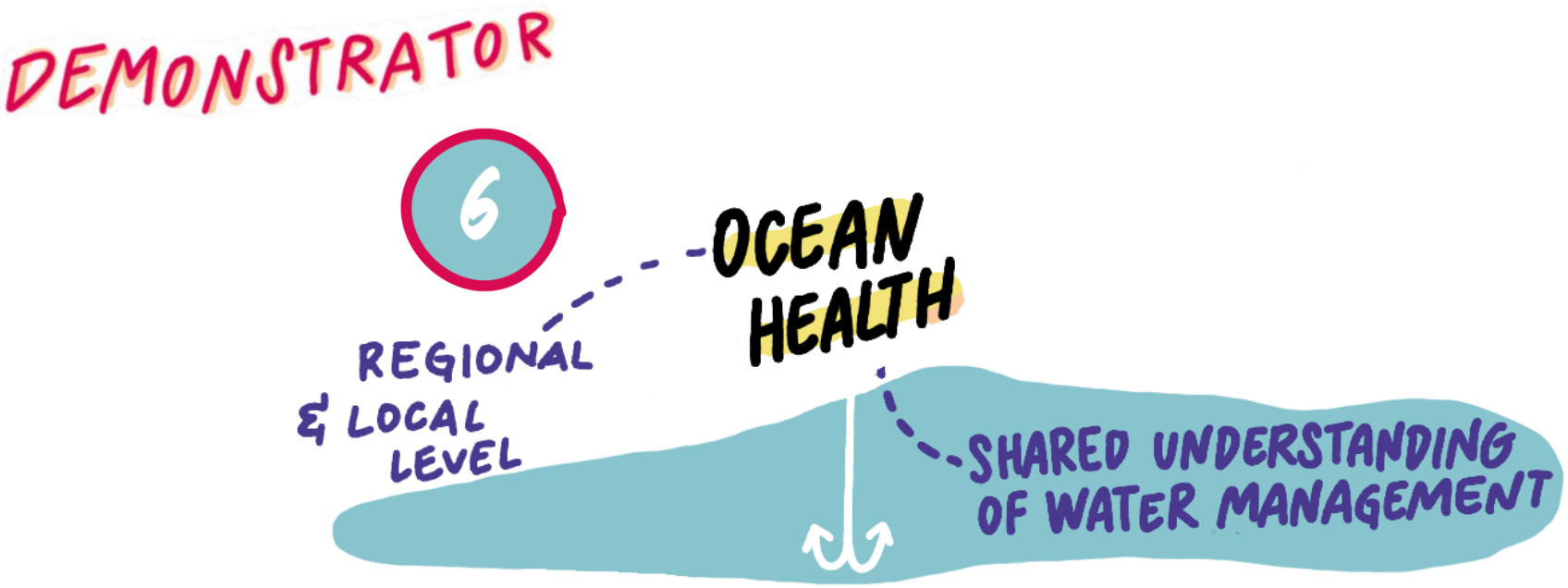
Ports



Risks

Environmental management

Ocean Health



AANDERAA a xylem brand

CSIC Consejo Superior de Investigaciones Científicas

Marine Institute Foras na Mara

SOCIB Balearic Islands Coastal Observing and Forecasting System

TAL TECH

Danmarks Meteorologiske Institut

Ocean Health

EuroSea

6.1 Extreme Marine Events & 6.4 System Operation

Connecting Observations and Modelling

Early Warning

Mitigation Strategies

6.3 Integrating BOOS and HELCOM

Observational Networks

Reduce Uncertainty of Eutrophication Assessment

Adapt and Manage

6.2 Connecting CMEMS and Small Pelagics

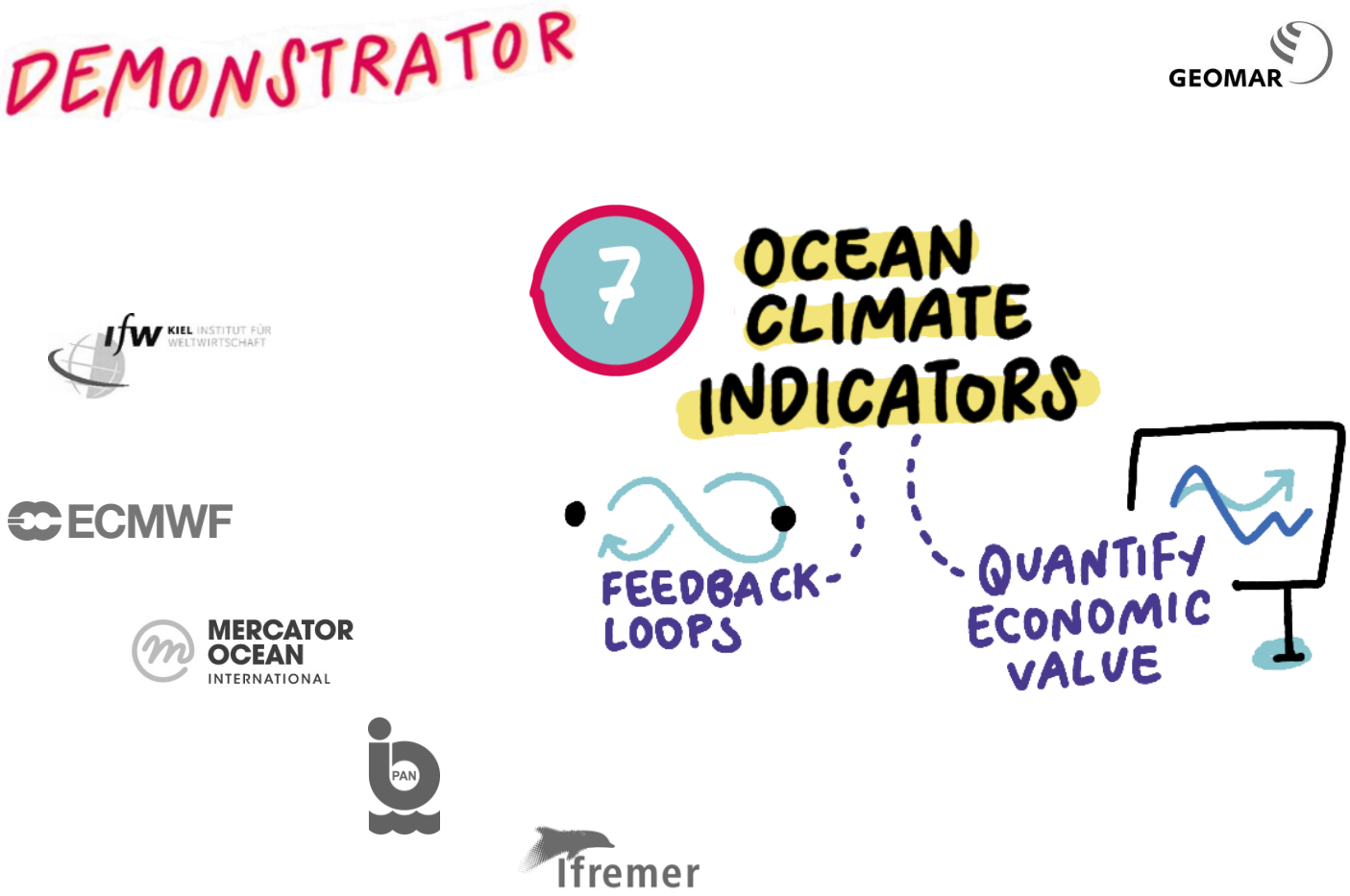
Copernicus Europe's eyes on Earth

Forcings on Fish Life-Cycles

Stock Assessment Models with Oceanographic Forcing

Total Allowable Catch

Ocean Climate Indicators



Ocean Climate Indicators

EuroSea

7.1 Carbon in deep convection regions & 7.3 tropical carbon fluxes

Tropical Atlantic

Gulf of Lion

Labrador Sea

Optimizing the observing system to monitor long-term changes in ocean carbon

Upscale spatio-temporal coverage

Reduce key uncertainties & quantify natural variability

Impact assessment of observational uncertainties & natural variability on the economic value of ocean carbon uptake

validate ocean indicators

7.2 Societal benefit of Ocean Monitoring

Observable and user-relevant ocean climate and forecasting indicators

Records of EOVs from OO systems, CMEMS and ESA-CCI to verify forecast

Stakeholder engagement

Create user driven forecasting indicators and products

Communication:
Engagement, Dissemination, Exploitation & Legacy

Communication: Engagement, Dissemination, Exploitation & Legacy

Messages

- Need for sustained information → **Forecasts**
- Economic value of ocean observing → **Products & Services**
- Knowledge → **Information & Best practices**
- European Ocean Observing as part of Global Ocean Observing → **Integration**

How

- Promotion of work and results
- Engagement and Co-design
- Sharing
- Expanding capacities
- Raise awareness for importance of ocean observing

Stakeholders

- Policy
- Industry
- Society
- Science

Project Coordination, Management and strategic ocean observing alliance

Science Ethics

GEOMAR

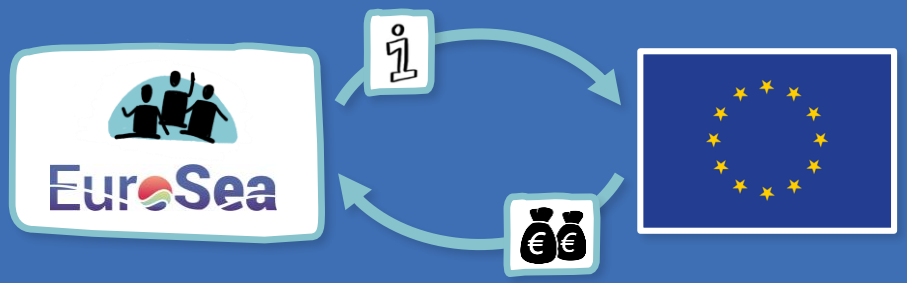
Ifremer

National Oceanography Centre

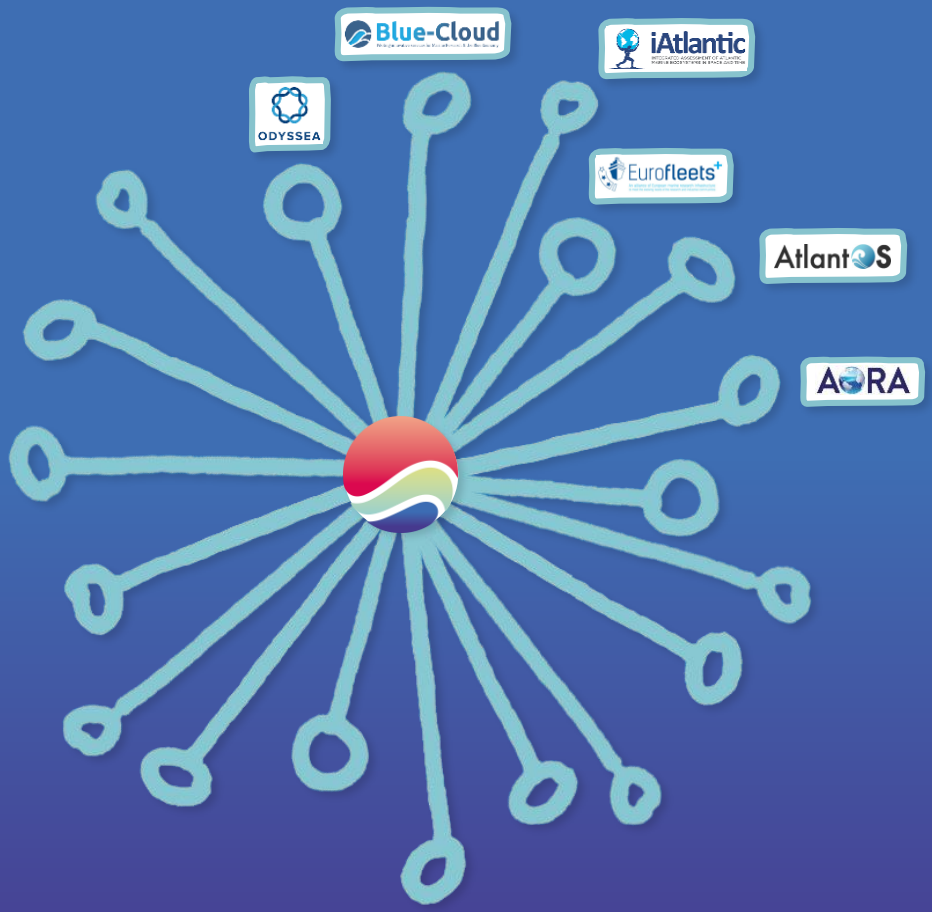
Puertos del Estado

hcmr ΕΛΚΕΘΕ

Project Coordination, Management and strategic ocean observing alliance



- Day-to-day management
- Monitoring of planning and progress
- Coordination of reporting
- Proposals for corrective and preventive actions
- Financial monitoring
- Facilitation of internal communication
- Building interfaces to other projects



Legacy

User-friendly ocean information products will serve communities and citizens in Europe after the project

Improved ocean observing and forecasting

Ocean information becomes a public utility

Partners


hcmr
ΕΛΚΕΘΕ
SOCIB
ISMAR
UNIVERSITAS BERGENSIS
DMI
Euro Argo
World Meteorological Organization
OceanNext
Hydrosphere Data & Numerics
cmcc
Centro Euro-Mediterraneo sui Cambiamenti Climatici
CSIC
ENS
PSL
Foras na Mara
Marine Institute
NIVA
EuroGOOS
European Global Ocean Observing System
marum
PLOCAN
consorcio
OGS
CLS
COLLECTE LOCALISATION SATELLITES
cnrs
Puertos del Estado
UERJ
UNIVERSIDADE DO ESTADO DO RIO DE JANEIRO
UFPE
Met Office
emso
ERIC
National Oceanography Centre
SORBONNE UNIVERSITÉ
GEOMAR
MERCATOR OCEAN
INTERNATIONAL
AWI
Laboratori d'Enginyeria Marítima
UPC - BARCELONATECH
STAZIONE ZOOLOGICA ANTON DOHRN
Napoli
ETT
PAN
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MEMBER OF BASQUE RESEARCH & TECHNOLOGY ALLIANCE
MEMORIAL UNIVERSITY
TAL TECH
Ifremer
ARUP
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IOC
IRD
Institut de Recherche pour le Développement
FRANCE
ACRI ST
DALHOUSIE UNIVERSITY
ECMWF
UNIVERSITY OF CAMBRIDGE
AANDERAA
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museum
NATURALSCIENCES.BE
ifw
KIEL INSTITUT FÜR WELTWIRTSCHAFT
ISPRA
Istituto Superiore per la Protezione e la Ricerca Ambientale
Sistema Nazionale per la Protezione dell'Ambiente
European
MARINE BOARD
Advancing Seas & Oceans Science
Institut Mines-Télécom
IEEE
Science
Ethics

Thank you

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