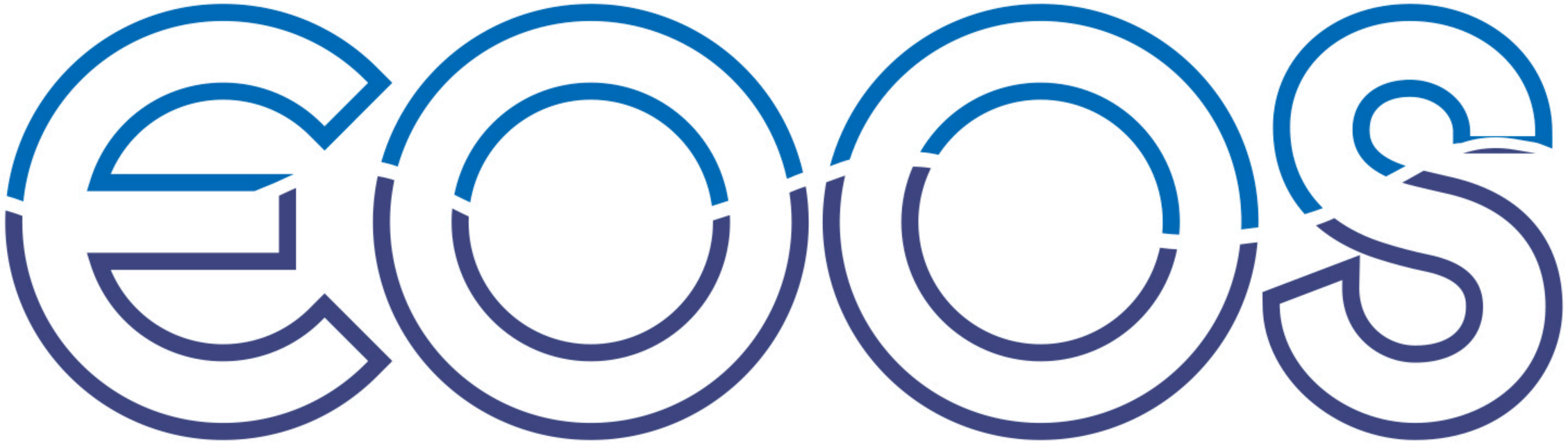
European Ocean Observing System:
Main outcomes of the open stakeholder consultation
(Dec.2016-Jan.2017)



EOOS is a coordinating 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;*
***Underpin sustainable management** of the marine environment and its resources*

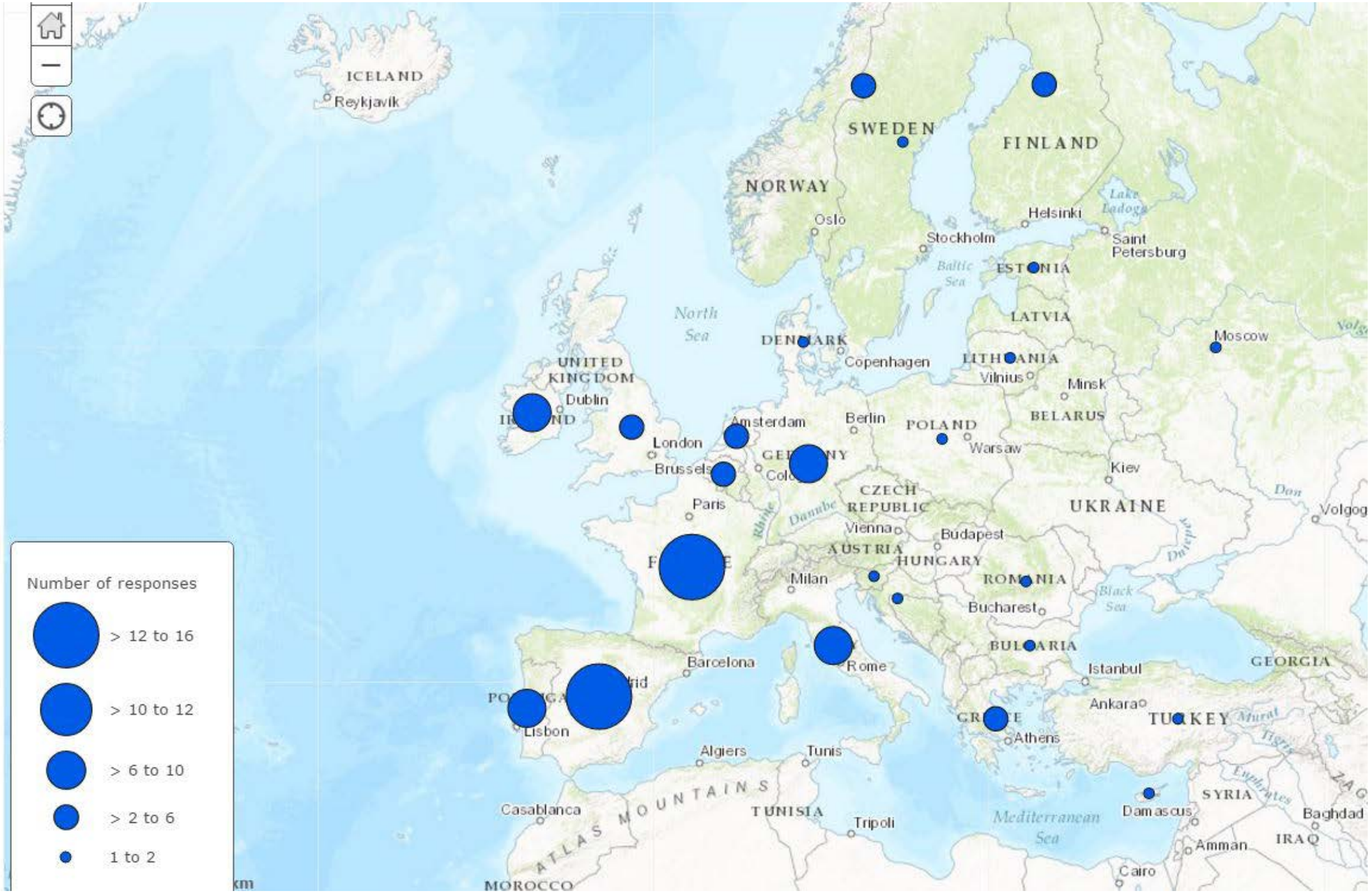
EOOS open stakeholder consultation

- Six weeks, 12 Dec to 22 Jan on www.eoos-ocean.eu
- Aim: (i) Collect feedback on Cons. Doc and suggested early actions; (ii) Gather new ideas; (iii) Demonstrate open and inclusive process
- Disseminated by EuroGOOS and EMB – approx. 800 addresses (mailing, Twitter, website, hard copy dissemination, announcements at meetings, European Parliament event, 8 Sept. 2016, Brussels)
- High rate of responses through direct contacts
- 155 responses from 30 countries, 50% institutional
- Overwhelming support from all respondents – we need an EOOS

EOOS Consultation Document developed by the EOOS Steering Group was presented at the European Parliament event on 8 Sept. 2016. The document served as basis for the stakeholder consultation.

Available at www.eoos-ocean.eu

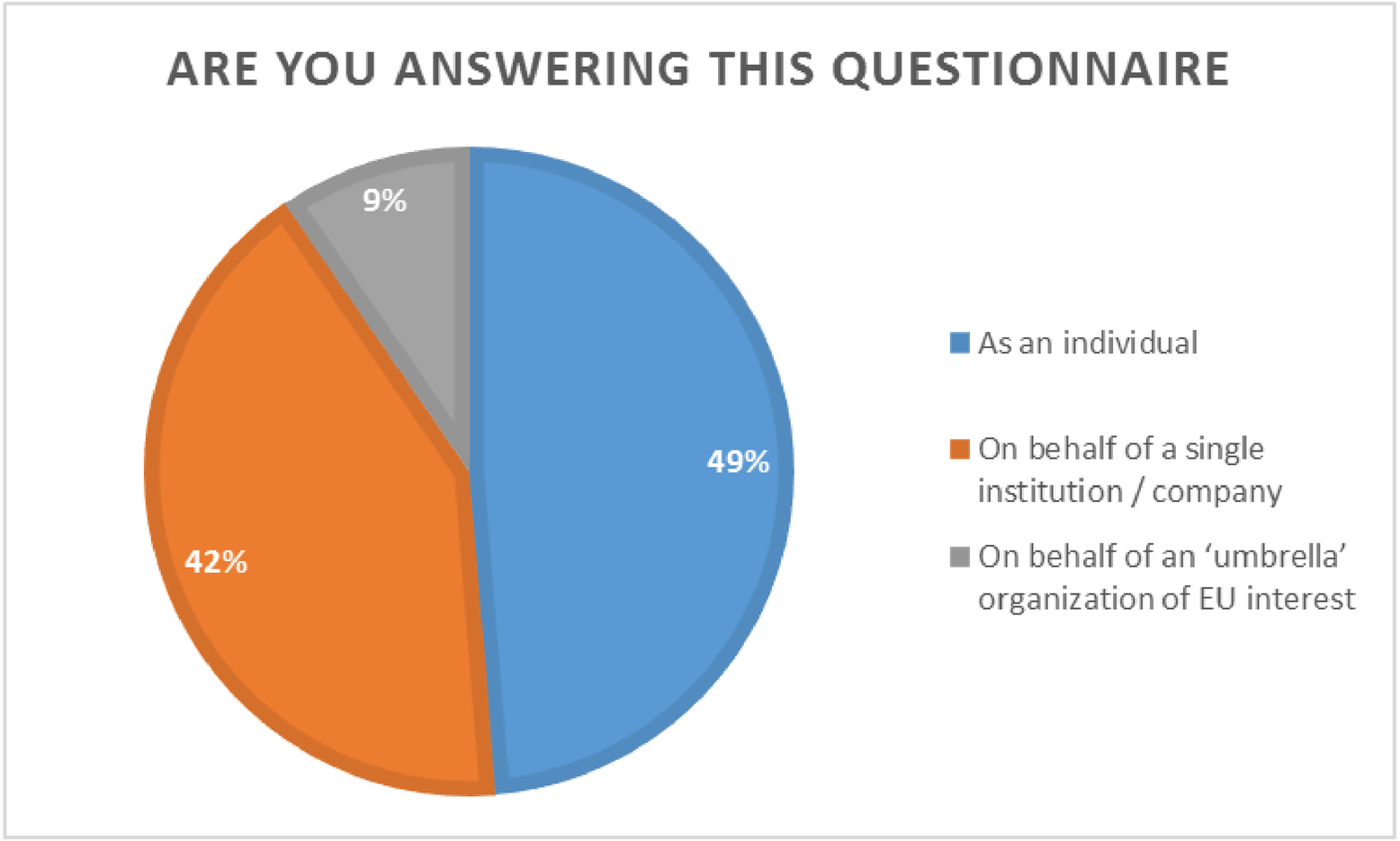
EOOS consultation results: geographical spread - world



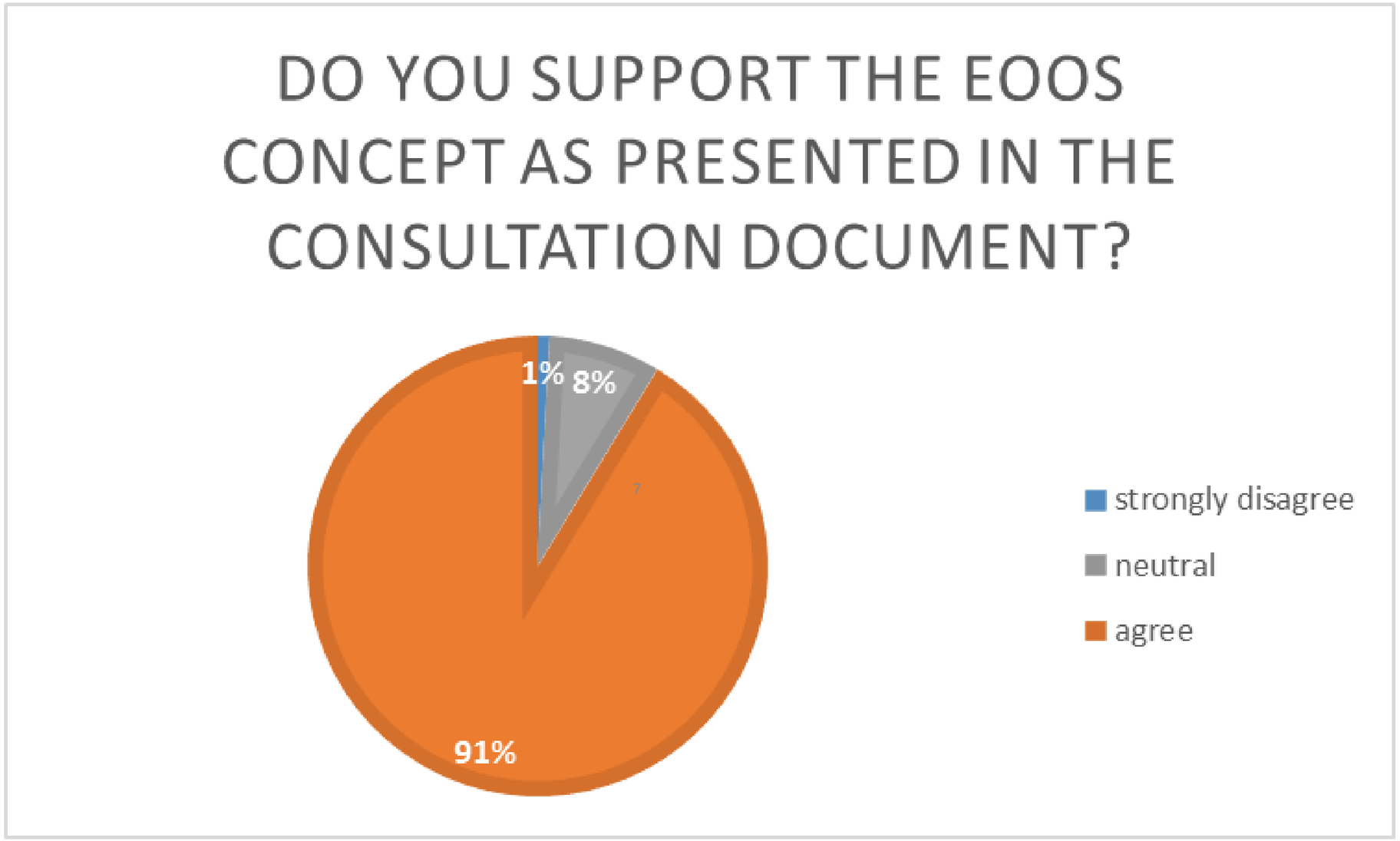
EOOS consultation results: geographical spread – zoom on Europe

EOOS consultation

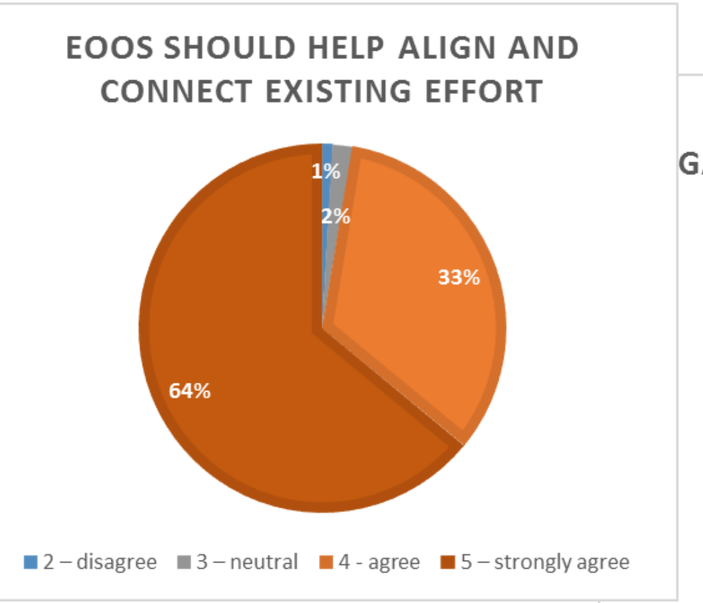
- 115 responses from 30 countries
- 56 individual responses
- 59 institutional responses (institutes, companies, EU umbrella organizations, universities, ministries)

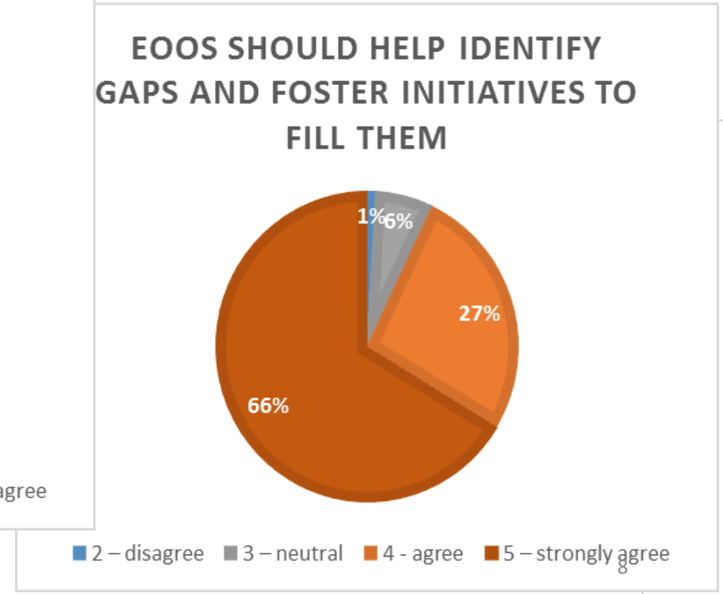


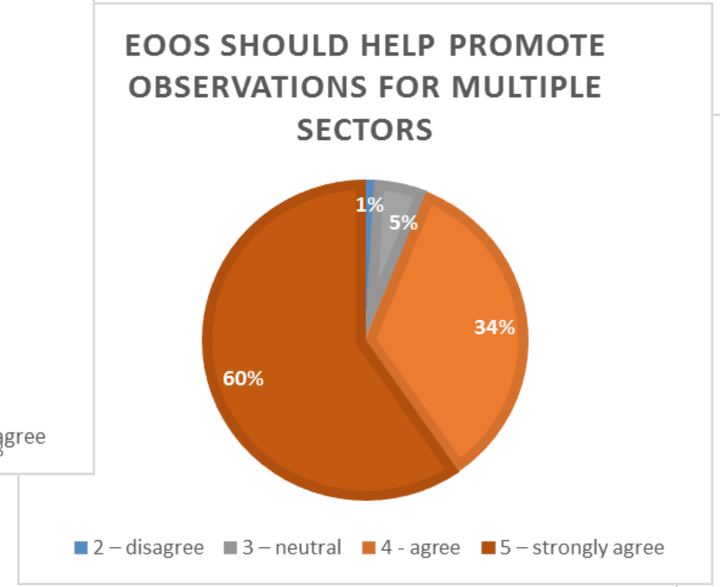
EOOS consultation: Overwhelming agreement with the EOOS concept

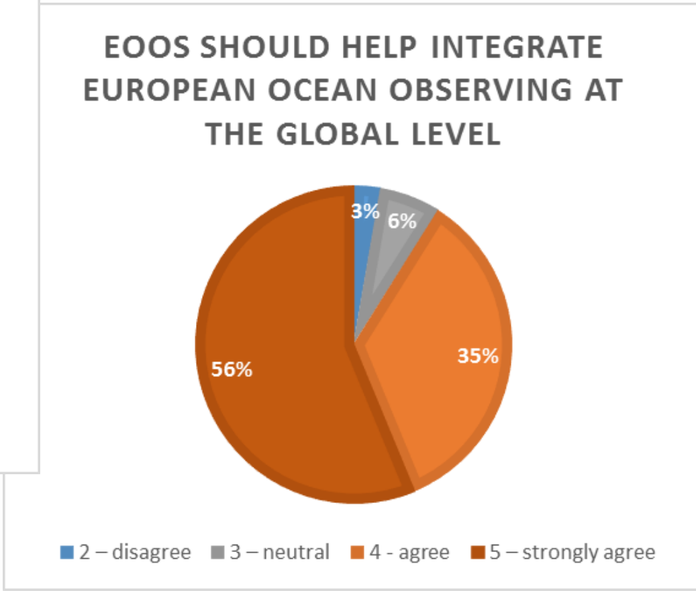


EOOS consultation: Role of EOOS

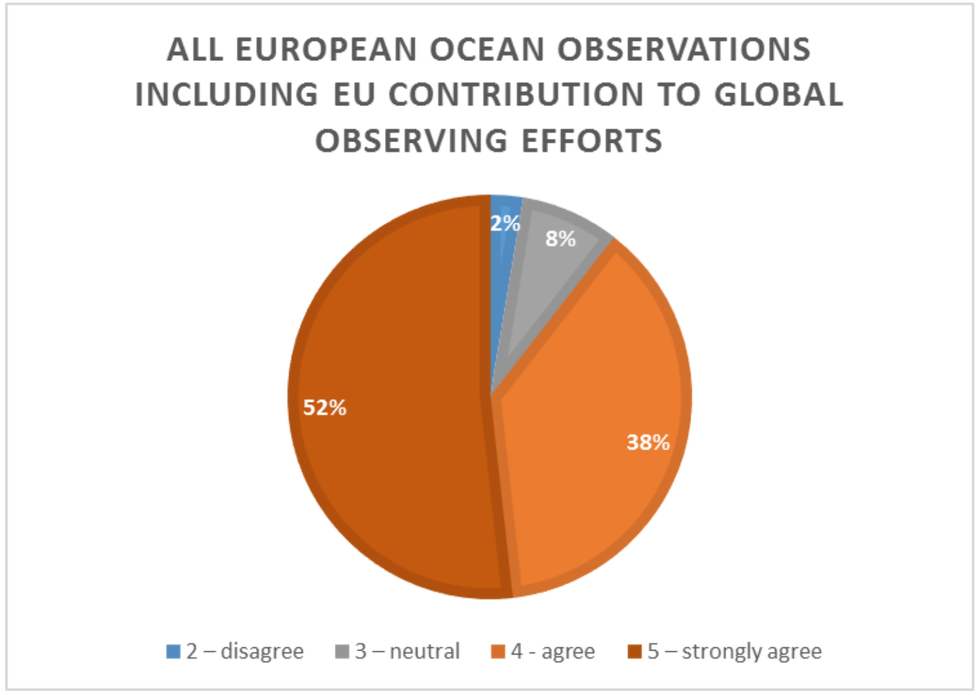


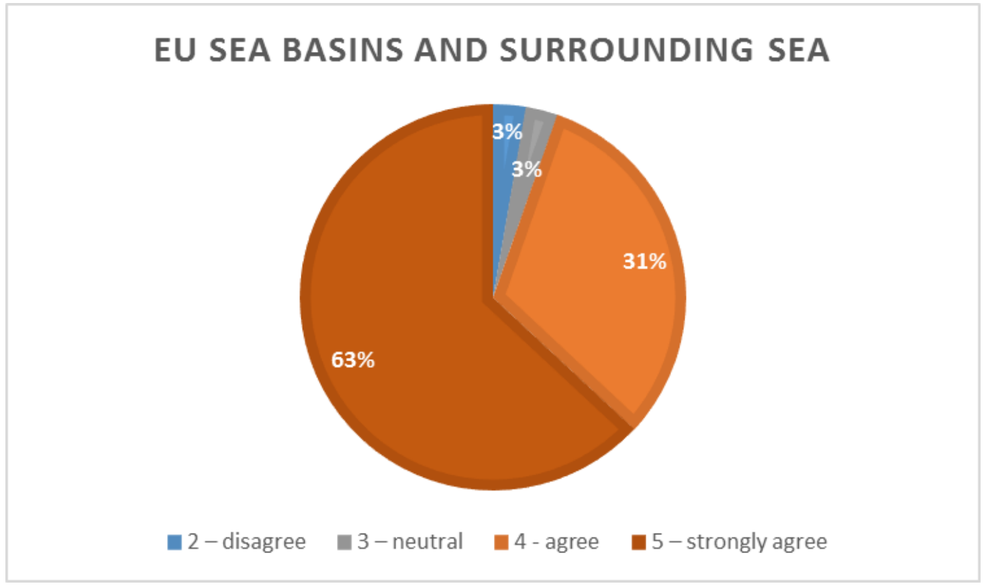


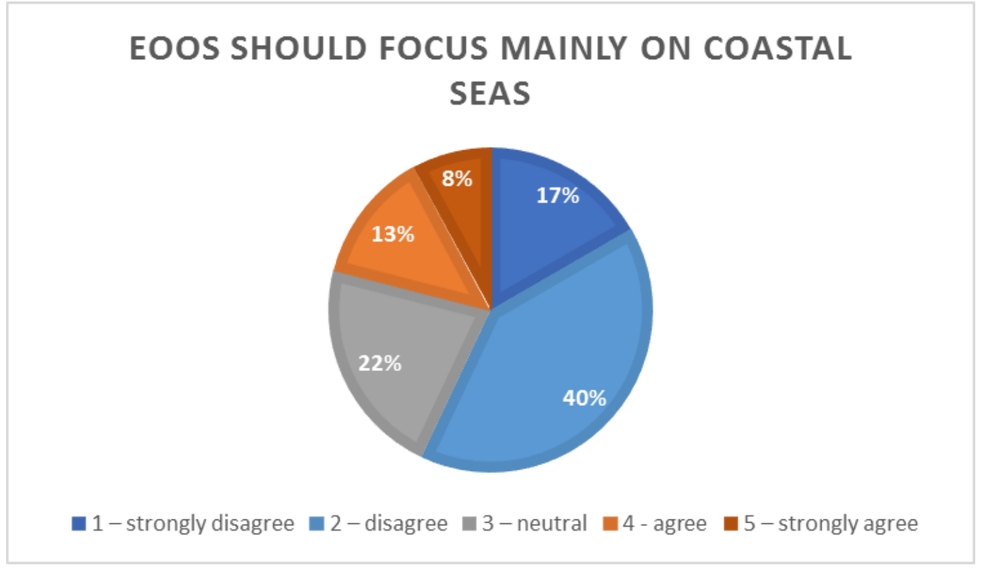




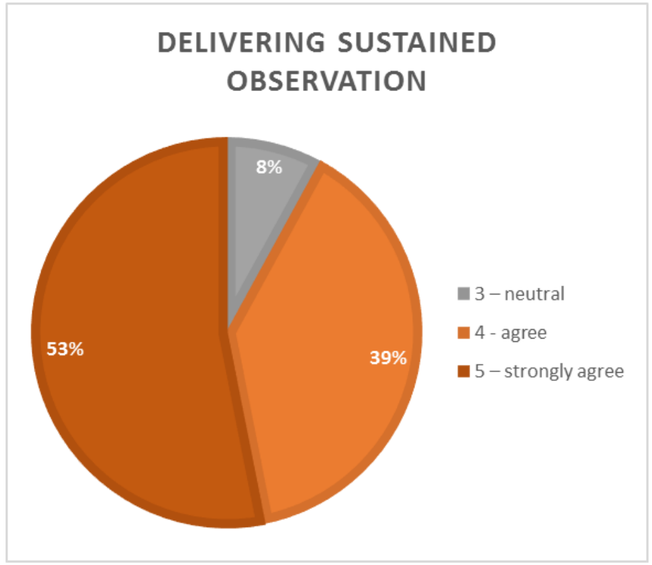
EOOS consultation: Scope of EOOS

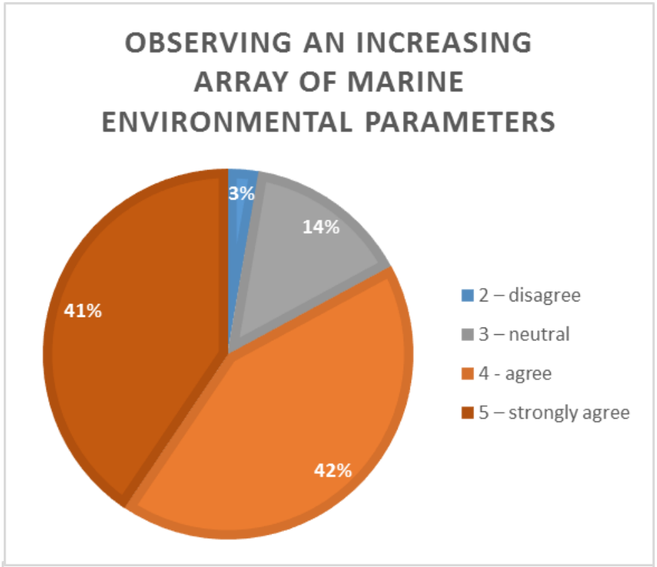


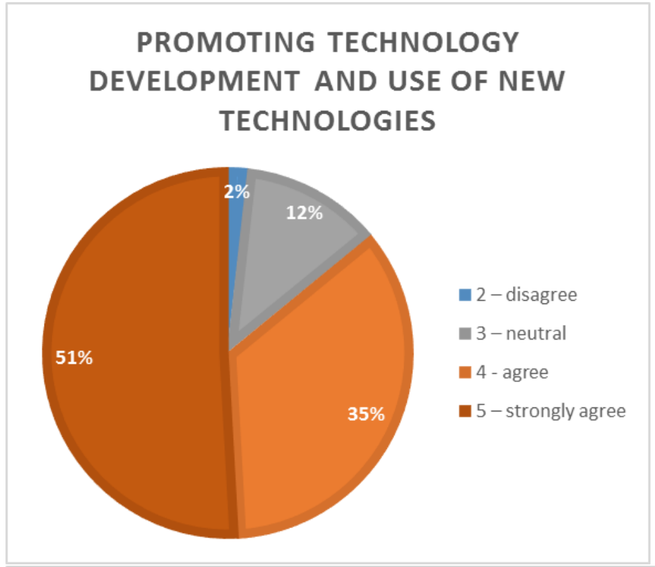


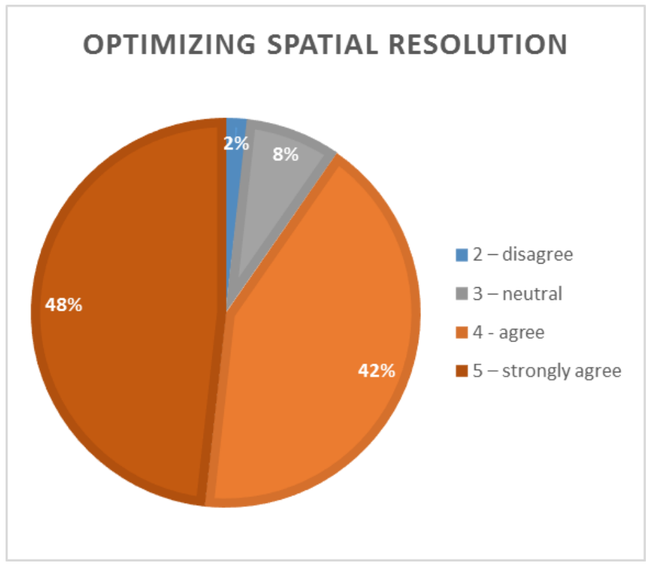


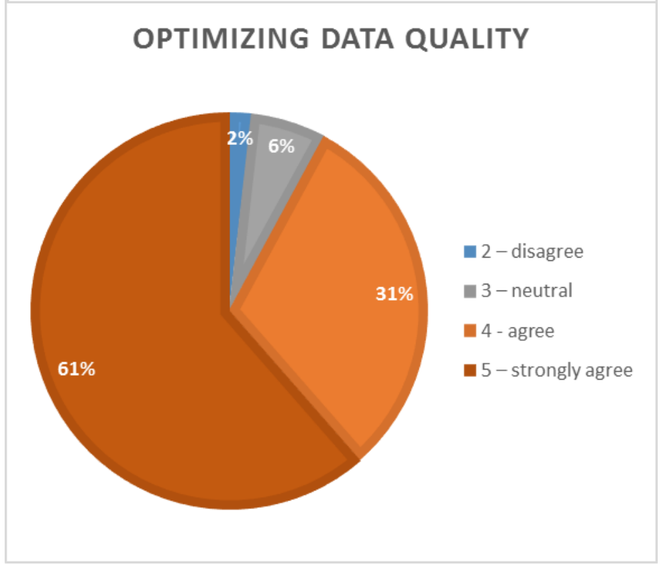
EOOS consultation: Gap analysis

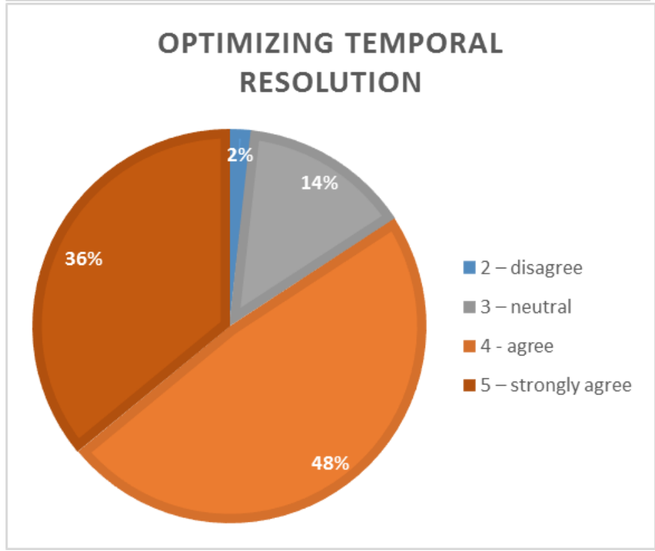




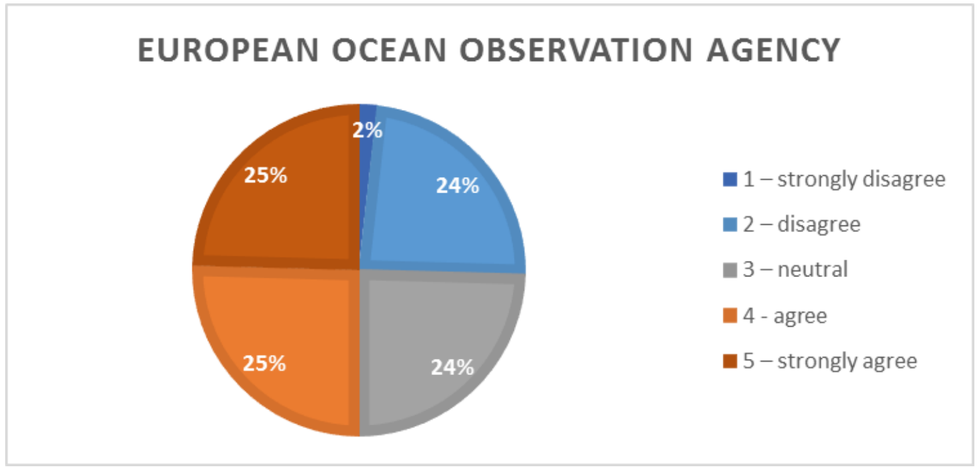


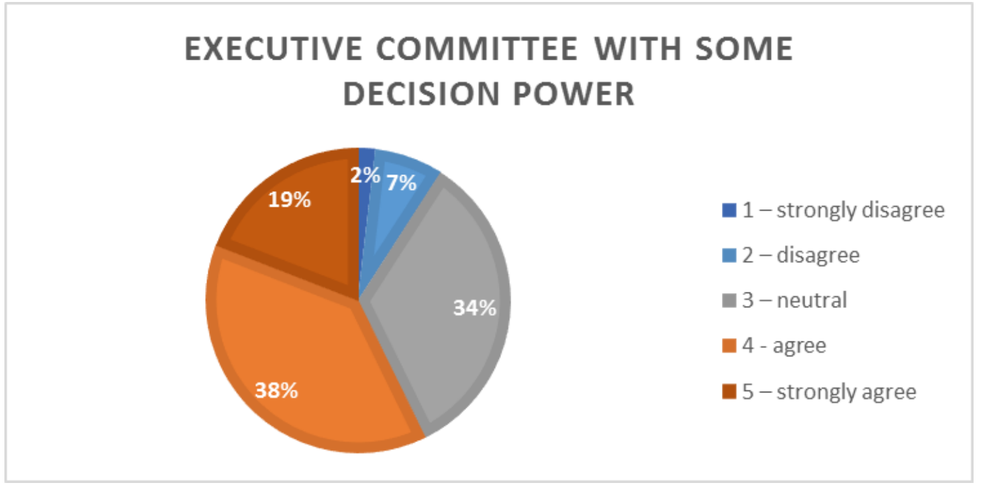


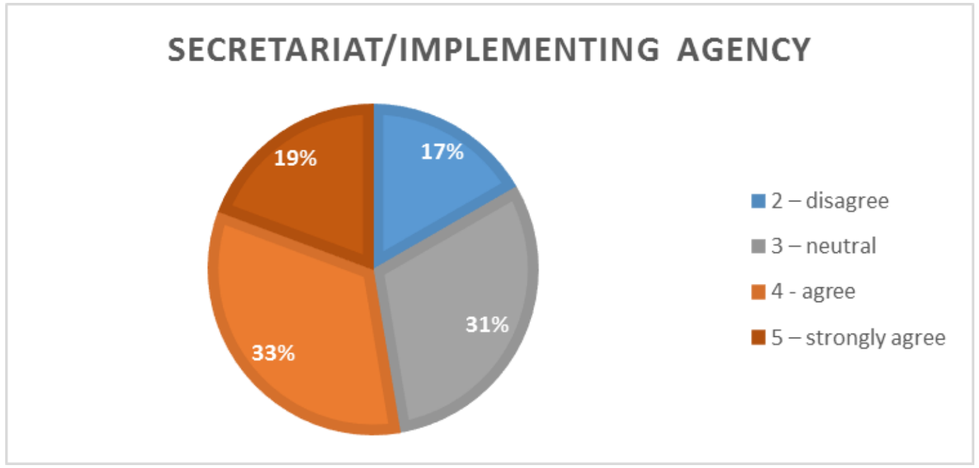


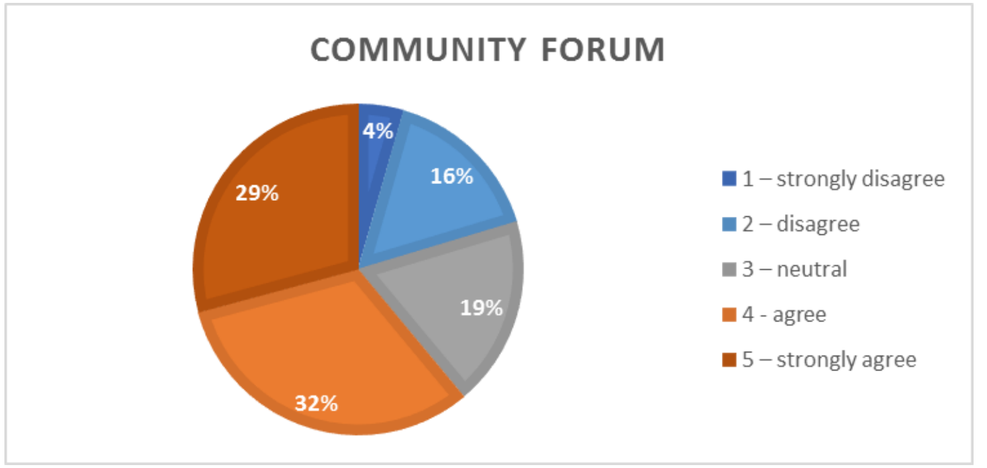


EOOS consultation: Governance

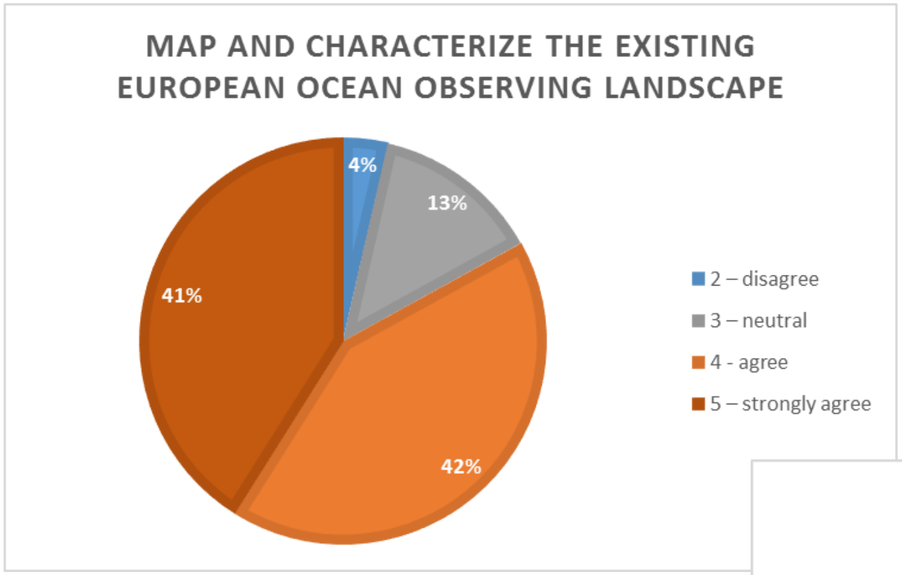


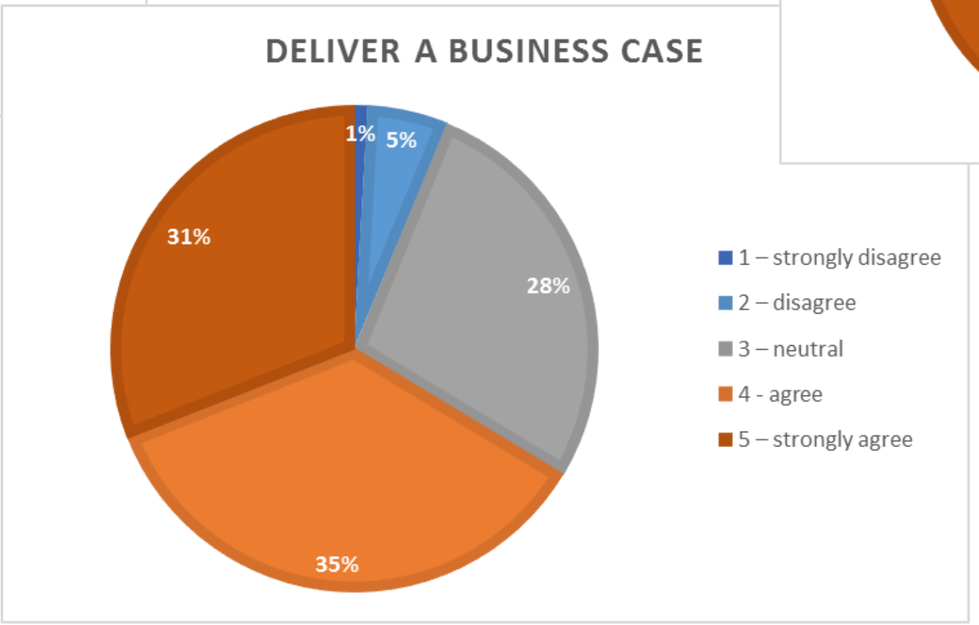


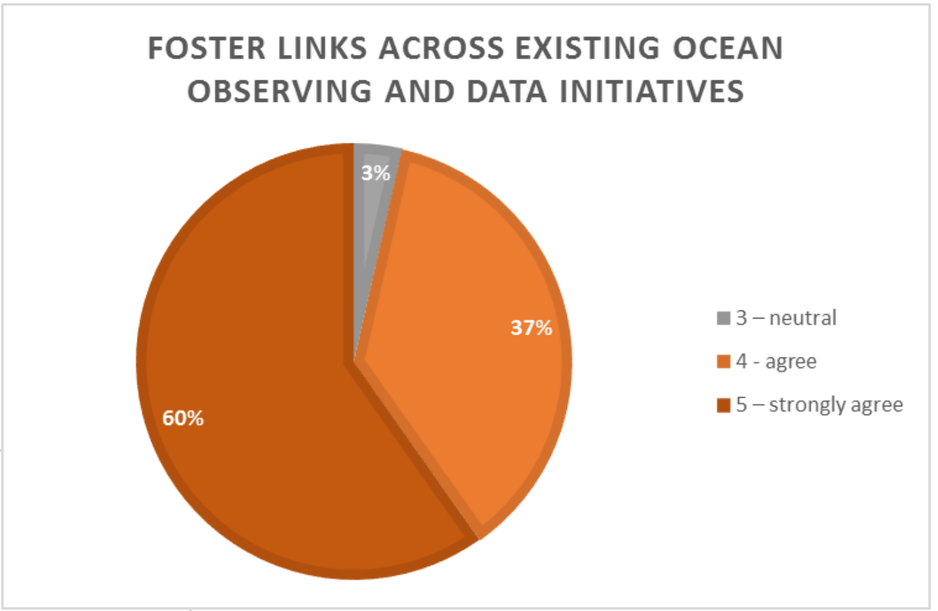




EOOS consultation: Early coordination actions under EOOS

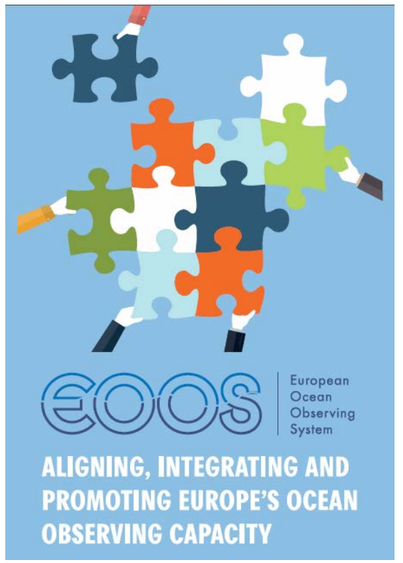


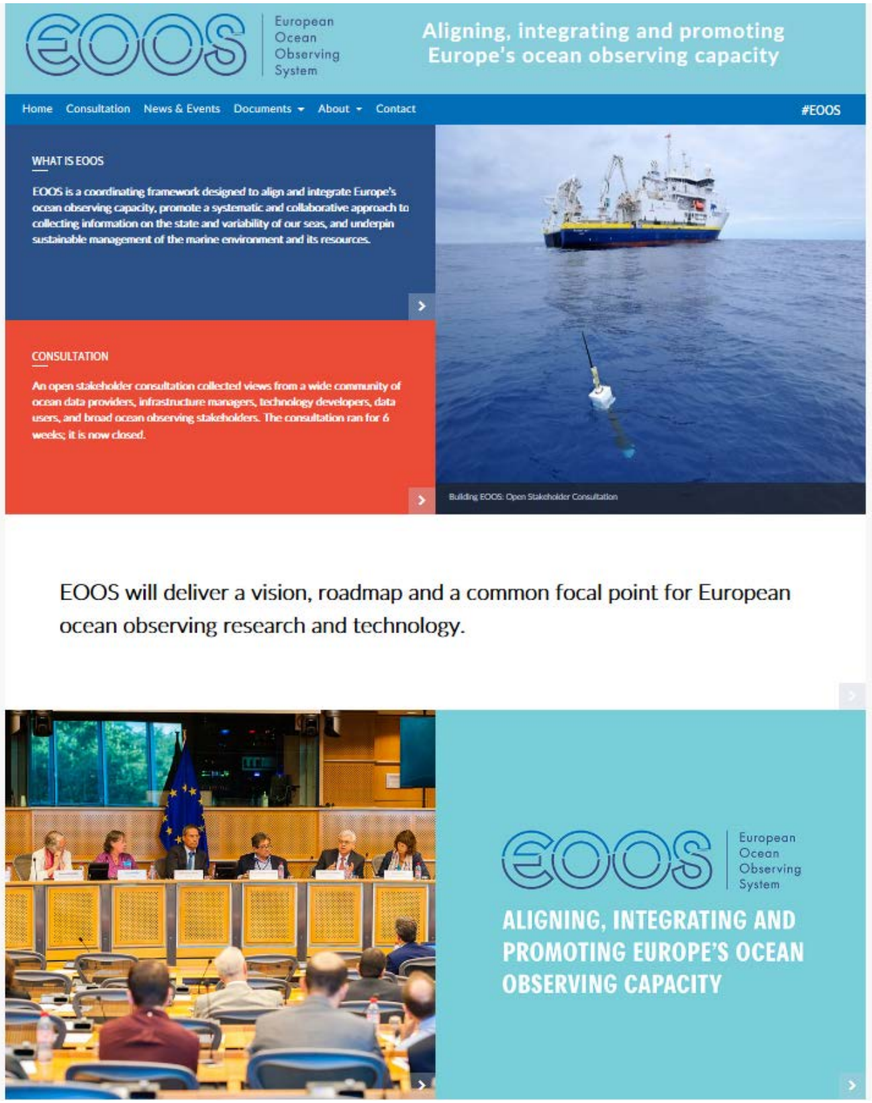


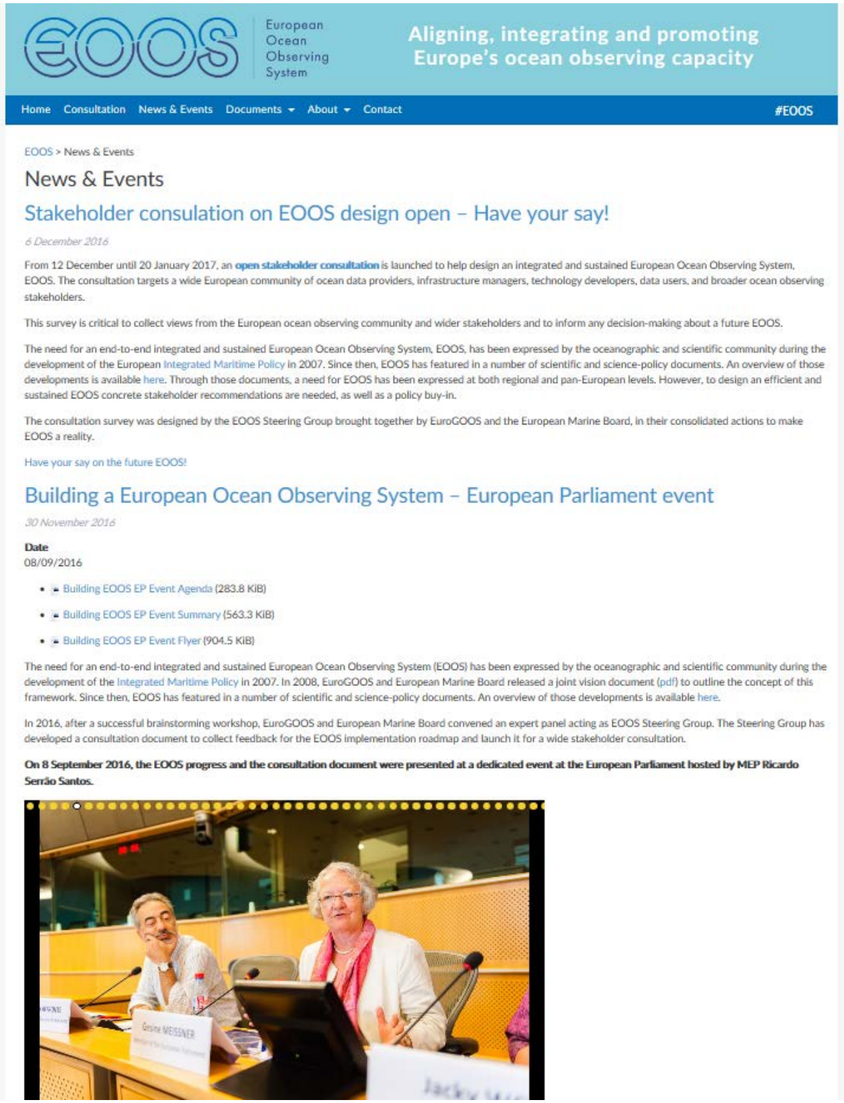


Communication and Promotion

- Logo and Flyer: March 2016
- Poster: May 2016
- Cons. Document brochure: November 2016
- Website: December 2016







+

- Relevant Materials
- About: What is EOOS, Why, EOOS Progress

www.eoos-ocean.eu

EOOS

- **GOOS** Regional Alliances Forum
- **GEO**: Board, Projects Conference
- Meetings with **Commissioner Vella**
- **Galway**: Seabed Mapping WG
- **EOOS event** at the European Parliament
- **CIESM** Congress
- **COLUMBUS** Conference
- **MRI meetings**: Jerico, AtlantOS, Euro-Argo, FixO3, GAIC, ENVRI+
- **Exhibitions**: EMD, UNESCO IOC World Oceans Day, EGU, AGU, IMDIS
- **EC Science and Business Forum**
- **GEO-XIII Plenary**
- …

European Maritime Day 2017

"*The Future of our Seas*"

18-19 May, Poole, UK

EOOS Next steps

- Presentations at EMODnet Stakeholder Confernece, Feb. 2017, and JPI Oceans Management Board Meeting, March 2017
- EOOS Stakeholder Consultation Report, Spring 2017
- Inform, receive feedback and gain buy-in from European Member and Associated State representatives, Spring-Summer 2017
- Deliver a Vision for EOOS (long-term), Autumn 2017
- Deliver an EOOS implementation plan (short-term), Autumn 2017
- Organize an open stakeholder forum on EOOS, early 2018

EOOS Stakeholder consultation: overview of the results, v.1

Intro and methodology

This document is an attempt to provide an overview of the main findings, both regarding a general agreement with the Steering Group suggestions outlined in the Consultation Document, and regarding any 'new' ideas and opinions, revealing the granularity of the submissions to the Steering Group.

- Statistics of the totality of responses are given to demonstrate the general trend. This should be considered together with a full quantitative analysis presented separately.
- The granularity is reflected through a summary of free text submissions to the survey; institutional responses are analysed as a start but individual submissions will be added. Linked ideas are grouped and organizations' names are added to reflect commonalities among the respondents.

Out of the total of 115 responses, 57 were submitted as institutional (about 85% of those included free text boxes reflected in the bullets below).

This is a first draft of the document to be completed with the individual free text submissions and further revised.

Overview

EOOS concept, drivers, role

Agreement with – total respondents:
Need for better coordination: 95%
EOOS concept: 91%
Drivers outlined: 95%
Role outlined: vast majority

- **One voice**, Link activities, Limit competition, Accepted by researchers, Align
  COVARTEC, NUI Galway, AWI, NUI Galway
- Enhance, broaden, coordinate **existing obs networks**
  Irish Marine Institute, EurOcean, INGV/EMSO, EuroGOOS Gliders Task Team
- **Identify priorities**; **funding** priorities; better **knowledge** of interactions at ecosystem level
  Marine Hydrophysical Institute Russian Academy of Sciences, COVARTEC

- **'Future of the oceans' in the G7 ministers' Tsukuba communique**
  Juelich/German Res Ministry
- **Contribute to SDGs**
  Irish Marine Institute
- **Ocean Governance**
  Government of Azores

- **Sustained** obs for innovation and to meet societal challenges; Adapting to oscillations of funding, crowdsourcing (Slovenian National Institute of Biology); develop broad-based multisectoral support for ocean obs
  COVARTEC, Jerico-Next, MEOPAR, GOOS bio, MEOPAR, IEO, Slovenian National Institute of Biology
- **Main focus – sustained obs, not be too broad** in objectives
  EuroGOOS Gliders Task Team

- **Member States:** existing obs system supported through national/regional funds; Lack of funding for national obs; Regional specificities, EU outermost regions and overseas countries and territories, peripheral maritime regions, help poor regions
  IEO, Puertos del Estado, SOCIB, CNRS/INSU, Gov. of Azores
- **New and interdisciplinary**: engage with non-traditional stakeholders, novel partnerships, synergies across various disciplines; new ways to support obs (esp in-situ)
  MEOPAR, EUMETNET, INGV/EMSO

- **Communication tool for European Ocean Observing** and a contact point for other international ocean observing networks (MEOPAR, NOAA, Blue Link,...)
  EuroGOOS Gliders Task Team
- **Promote:** sustainability of the observing system; **usefulness of observations**, public awareness, towards **EU agencies** and **MS**
  IEO, EurOcean, EMODnet SEC, Irish Marine Institute, EuroGOOS Gliders Task Team
- **Promote: Open data** - a change of culture re open access
  Develogic, ILVO, SeaDataNet, SLGO, Ifremer, JERICO-Next, SLGO, Geological Survey of Finland, Puertos del Estado, VLIZ, Euro-Argo ERIC, SGS
- **Promote:** development of **ocean services**
  ENSTA-Paristech
- **Promote: technology** development and use of new technologies
  AWI

- **Data:** acquisition, management, harmonization, standardized metainformation protocols, new data types, interoperability, visualisation, data exchange, integrated data system, IT capacity, European Open Science Cloud (Ifremer), open data policy, coord. of infrastructures, data hubs
  ILVO, SeaDataNet, SLGO, Ifremer, JERICO-Next, SLGO, Geological Survey of Finland, Puertos del Estado, VLIZ, Euro-Argo ERIC, SGS, EMODnet SEC, AWI; EurOcean, Government of Azores
- **Robust and integrated ocean models, modelling at all timescales**
  COVARTEC, Irish Marine Institute

- **Capacity building, knowledge and tech transfer; education and training; citizen science**
  GOOS Bio, Slovenian National Institute of Biology, AWI, EuroGOOS Gliders Task Team

- **Link to AtlantOS**
  Juelich/German Res Mininstry
- **Align and avoid duplication with Copernicus, EMODnet**, build on them
  Puertos del Estado, VLIZ, AWI, Geological Survey of Finland
- **Link ocean obs community and science/policy** (EuroGOOS, EMB, JPI Oceans, EC)
  EuroGOOS Gliders Task Team

- **Maritime security, safe navigation, traffic activity**
  NUI Galway, Commissioners of Irish Lights, EUMETNET, Gov. of Azores
- **Communications, connectivity and telemetry systems, e-infrastructures**
  Commissioners of Irish Lights, SeaDataNet
- **Reducing the needs for maintenance and replacement**; **help lower costs through synergies and coop**
  COVARTEC, EUMETNET

- **Marine related hazards**
  EMODnet SEC

- **Deep sea, seabed and sub-seafloor (should be an EOV)**
  Geological Survey of Finland, EuroGeoSurvey

- **Climate change**
  NUI Galway, SeaDataNet
- **Cumulative impact**
  VLIZ
- **Automation**
  VLIZ, IEO
- **Water column**
  EuroGOOS Gliders Task Team

Scope, Parameters

Agree with – total respondents:
All EU efforts + global: 89%
Seabasins and surrounding seas: 94%
Mainly coastal: 22%
Data coordination: 72%
All parameters: majority

- **EU and global**
  Euro-Argo, SGS
- **European EEZ**
  ENSTA-Paristech, EuroGOOS Gliders Task Team
- **Impossible to coordinate all EU obs all over the world** without stepping on others the toes of regional OOS and non-EU nations
  MEOPAR

- **Interface land and sea; connection between coastal seas and open/deep ocean**
  Jerico-next, Irish Marine Institute, EurOcean, SeaDataNet, EuroGOOS Gliders Task Team

- **Four-fold: ocean, atmosphere, biodiv, surveillance**
  EUMETNET

- **Coastal seas**; coordination between bordering countries
  Jerico-next, GOOS Biology Panel, Slovenian National Institute of Biology, Res. Council of Norway, EUMETNET, Ifremer
- **Shore / river** data, discharge
  DMI, NUI Galway

- **Exploitation of resources**
  Gov. of Azores

- **Ocean acoustics and seismics, electromagnetic fields**
  SGS, NUI Galway

- **Biological and biogeochemical**
  VLIZ, Euro-Argo ERIC, Ifremer, ILVO

- **Bio-optics**
  Marine Hydrophysical Institute Russian Academy of Sciences

- **Pollution and marine litter**
  Gov. of Azores

- **Ensure parameters collected meet policy and scientific objectives**
  EU DG ENV

- **Identify/fill the gaps based on requirements** (science, oceanographic products)
  EuroGOOS Gliders Task Team

Governance

Agree with – total respondents:
Agency: 50%
Secretariat/implementing agency: 52%
ExCom w. community reps: 57%
Community forum: 62%

- **Light and flexible**, open and inclusive, less layers the better, bottom up
  SLGO, IEO, RCN, EurOcean
- **Delegated to existing bodies**
  SeaDataNet, Irish Marine Institute, Euro-Argo, EurOcean
- **Member states** should have a role; federative structure
  Geological Survey of Finland, EuroGeoSurvey, INGV/EMSO, IEO, EMODnet SEC, Juelich (direct control of MS)
- **Supervised by a board or steering group** of experts / community reps; thematic advisory committees e.g. Research, Technology, Societal, Environment, Policy, to guide executive committee
  Geological Survey of Finland, EuroGeoSurvey, Ifremer, AWI, RCN, Gov. of Azores
- **Evolving to an ocean agency**
  EMODnet SEC, MEOPAR
- **Place oceans high within EU and have a budget**
  NUI Galway

Links with users, through

- EMODnet
- Copernicus
- ICES
- GEOSS
- JPIs
- Marine ERICs
- Future Earth
- National network management and data providers
- Regional conventions
- GOOS
- INSPIRE

Users in / out governance structure

Agree with – total respondents:
Involved as advisors: approx. 70%

- **In but as advisers**
  IEO, Euro-Argo, AWI
- **Fully in, co-design**
  Ifremer, EMODnet, Irish Marine Institute, EurOcean

Early and pilot actions

Agree with – total respondents:
Map existing landscape: 84%
Business case: 67%
Foster links across existing initiatives: 96%

Recommendations:

- In the **comms strategy, identify decision makers at national level** (esp if they aren't the same as those responsible for the implementation of **MSFD**)
- Gain a commitment from **EC and MS for annual investment** in EOOS
- Organize **local meetings** for discussions and programming actions
- Show the added value of EOOS through pilot **projects that incorporate many different measurements, technologies and stakeholders**; demonstrate value of EOOS in a given shelf region; towards cross-cutting activities
- Transfer the **AtlantOS test case** to other regions
- Take on **EMODnet checkpoint results** as pilot actions
- Community **forum**
- **Promote** multidisciplinary sustained ocean obs needed for society (why a taxi driver in Paris should contribute tax money for ocean obs)

Ides for projects:

- **Gap analysis** in **integrated obs** for physics, chemistry and biology; efficiency of the systems; bring in the **elements that aren't currently in the system**; identify **funding problems** in the existing networks
- Coordinate **infrastructures** (in link with ESFRI) and **technologies**
- Determine a **suitable** level of **coordination within each obs domain**; **harmonize gap analysis** in the different European Seas; identify gaps important to **specific parties**/ groups / countries
- Assess **ship-time** needs and technical capacities; improve **near-real-time** delivery of information (RVs)
- **Data:** gaps, recommendations on recognized standards for obs and data management, products accessibility, interoperability, user friendly access; EOOS-experiment (OSE/OSSE)
- Identify gaps with regard to key **climate variables**
- European **benthic survey**
- **Coastal modelling**, interface with regional seas and open ocean
- Evolution and monitoring of **carbon pump**
- **Sea bottom ecosystem** (required for MSFD, Habitat Dir, WFD) – current lack of harmonized monitoring and assessment methods
- underwater noise pilot monitoring infrastructures along all European coastal regions to create a common **European sound map**

EOOS Stakeholder consultation

Free text boxes – Individual responses, V.2

Total individual responses: 56

Question with the maximum number of answers (pilot project-most timely actions) was filled by 44% of respondents.

The answers are grouped under the same concepts as in the consultation

Agreement with the EOOS concept

4 individuals wrote skeptical comments about the **problem of increasing the complexity** and the issue of **creating a new entity** when there are already **coordination bodies existing**; the problem of the sustainability if EOOS has no **control of funding.** EOOS should be more a **bottom-up approach than top-down**.

Additional comments

- Importance of the **regional knowledge**
- importance **of Ships coordination** as a key element of observations
- lack of **stress of the importance of Biodiversity and ecosystem functioning (BEF)**
- lack of stress of the importance of **increase (lift) the technological standards**
- use more the wording '**marine environment'**
- should mention the challenging of generating datasets of important **coast dynamics and shoreline erosion**.

EOOS drivers

Some respondents asked to put more stress on the following drivers:

- **Marine Safety and security** (raised by 2 respondents)
- **Education** and **outreach** to link society to ocean knowledge
- **Natural hazards** prevention and/mitigation (storm surges, tsunamis) – extreme events
- **Pollution forecasting**
- Technology driver: **Control is not included in challenges**
- In "Technology Drivers" "Cost effectiveness" should also be explicitly expanded to "**Big data**" processing and more general **High Performing Computing**.
- multidisciplinary research that covers not only the environment, but also technology including **hardware** (sensors) **and software** (ocean data processing).
- needs to include **coastal and shallow water issues,** and **shoreline dynamics**.
- **water quality and quantity**
- The upgrade of current observing systems for **BEF (Biodiversity and ecosystem functioning**). **Restoration** is missing.

Additional comments:

- **Funding and long-term planning** should be the main driver.
- To directly **engage data originators** on a regular basis
- To advocate for a dedicated European Directive on this topic (that makes observations mandatory)
- strong incorporation of users: especially **industry**
- key role in understanding where/what additional data would help improve **model performance and forecast** (added value of observations)

- We need expertise on **biodiversity**
- **big data** is currently not the highest priority, but data sharing
- **technology as a major driver of EOOS** is not correctly reflected in the document

EOOS Should play a role in:

4 individuals stressed the role of **promotion of open access to data** as a key role

Other priorities stressed:

- **identifying R& D priorities**, using the membership of the European Marine Board
- support **GOOS/JCOMMS**,
- Establishing a regional platform for **cooperation on the technological and technical aspects Quality control and consistency** is a key component of data value
- identify and promote the need to close existing gaps between needed and available capable **ships for deployment, service and recovery of EOOS systems**
- **More bottom-up** support for existing organisations
- promoting **capacity building international cooperation and sharing of resources**
- support the **trans-national focus of national and EU funding towards common themes**.

Scope (geographical and coastal-open)

- Emphasis on **European waters first, global issue comes later on automatically**
- balanced distribution of EOOS systems in the **European waters from deep oceans to the coastal regions**

Parameters

4 responses ask for **more focus on biological / biodiversity** and one individual about **pelagic, sediments and habitats distribution measurements**

One individual stress the importance of **underwater noise**

Other comments:

- EOOS should be **more than physics and operational**
- **First physical and BGC** and later other more difficult variables
- **All parameters** should be taken into account **dependent on the wishes of users**
- for **geological priorities** links are obviously advantageous but the priorities are not the same.

Gaps: what are the major gaps EOOS should address

Mentions about funding:

- EOOS cannot do governance of observations being done by institutions unless they also **provide the money for them.**
- One of **the major gaps in ocean observations and observing frameworks as per today is the funding structure and the lack of long-term funding strategies**. Lobbying for improving this situation might be an arena for EOOS.

Other comments:

- **Support institutions** and encourage them to do or continue observations
- **Combining modelling and observational** skills to identify key sensitivities
- support to the **established time-series programs**, the **promotion of new technology** and **the** harmonization **of the quality control**
- a **better coordination** between **existing initiatives**
- **regional institutions** should work out how best to implement or adjust for the oceanographic processes and societal stakeholders in their region**.**
- establish a **strong relationship with the European Research Vessel Operators (ERVO)** group to develop a gap analysis regarding **"EOOS support ships"**
- **Importance of human capital**
- **consolidating the use of current tools and methods**
- promotion of **software tools (ocean models**)

Governance

Arguments for the light- touch:

- In the current geopolitical situation within Europe it will be **difficult to have a single over-arching ocean observing agency**.
- There are already other coordinating activities
- **community to identify gaps and deliver advice is more achievable**, but may s**truggle to have authority over nations s**eeking a more independent approach to marine science.

Arguments for a secretariat:

- Secretariat would be the most realistic/efficient option for the time being**.**
- **The risk in establishing a largely independent agency** is that it will become too independent of needs as expressed by society at large. Therefore, **an efficient organisation (hence: with a secretariat)** that is basically run by an executive committee with strong links to research, policy, business and other sectors, is probably preferable.

Arguments for a Strong European Agency:

- A strong **European maybe virtual Institute is needed**. **Support should be given by the EU and the national institutes or agencies**, including environmental ministries or hydrographic and weather services
- It would also be very helpful if an **international agency stressed the need for observations to the national governments**. However, an agency that tell PIs where to go do observations is likely to fail unless it also provides the **actual funding** for the observations.
- The stakeholders will be very keen on "**having a hand on the steering wheel**" if they are going to invest directly in EOOS systems and to deploy, service and recover them on their own cost. If the decision making is too centralized it can be much more complicated to reach agreements if EOOS is to be a coordinating framework rather than an **executing agency**.

Arguments for NOT creating a new layer:

- Explore whether **OSPAR or EuroGOOS can already do this**
- **More bottom-up approach** supporting the individual organisation doing the observations would be more beneficial - more cooperation would follow in a more natural way.

Other comments:

- **flatter governance**, just as strong but without the complexity of so many layers: A **rotating council of member organisations** could be one type of flatter model. It is important that all EU institutions that want to be involved in EOOS and who stand by the principles of EOOS should be able to play a role for some period of time, no matter what their size.
- final decision is in the hands of the **funding agencies**
- it should take a **wider form with some decision power working closely with advisory/expert groups.**
- be sure that **all fields of expertise are equally represented in the governance bodies**.

User engagement and links to existing institutions

Mentioned links to:

- **UK's marine science coordination committee**
- **Industry organizations relevant to marine technology and services, regional/local/national monitoring programs**
- existing initiatives within **EuroGOOS** should be used were possible. (**WGs, Task Teams etc**.).
- local tides observations networks

Other comments:

- EOOS should work with groups already providing open data (databases like OceanSites) to promote the use of data.
- Very important to get the **user community on board** and being responsible as well.
- **Funding agencies** should retrieve the **data and make them available on open platforms**. **Data mining in previous projects should be carried out.**

Early coordination actions

- Making/produce a **strong business case** taking forward the scientific and environmental reasons for sustained ocean observations and which encourages investment by government and industry.
- Promote **optimal use of existing infrastructure**
- **Map and characterize the technical base**, including supporting infrastructure (e.g. laboratories) and expertise.
- Define clear **common objectives,** that are sufficiently attractive for existing initiatives to join up.
- Founding a **living, creative and purposeful community** is much more urgent
- Business case and on fostering links between observations and data initiatives.
- Observing systems must be **holistic, integrative, ecosystem based.**

Pilot projects – most timely actions

- **sustain and promote cases of existing observing systems** that are in the process of being coordinated at European level (e.g. European HF Radar coastal network)
- **Show the need for observations and where the gaps are** in collaboration with the **AtlantOS** effort
- **Identify key ocean monitoring requirements** to be useful from a global/climate change perspective
- Provide an **audit of biogeochemical observations** ecosystem budgets (particularly carbon)
- Identify the **forecasting requirements of the European Seas users**
- Lay down the **foundations for a coordinated calibration and assessment system** that will include links to National Metrological Institutions;
- develop and apply **objective tools to monitor and assess the reliability of the observing network**.
- **increasing array of marine environmental parameters** (organic pollutants)
- **optimizing spatial resolution**.
- Overarching pan European initiative to collect timely **benthic information** to be used to fill the existing knowledge gaps on the distribution of benthic assemblages to support the modelling of benthic habitats
- to favour the **support of the current observational programs**
- to find the **appropriate data formats and free** tools in order to any user have the possibility of using data for research or other social or economic activities
- **To help the technological companies** to address new developments which solve current difficulties in the observations
- Providing consistent base maps reflecting the **current state of the sea** for as many variables as possible.
- A Europe-wide campaign to **establish the state of the living part of the sediments**.
- **Prepare a CSA project where ESFRI, EC relevant project, national and international initiatives and programs meet** (similar to ENVRI+ but more strategic)
- **Going out to the regions**, at a basin to sub-basin/regional coastline to open ocean scale and understanding what they perceive as the gaps in ocean observing, for science and for stakeholders needs, Reviewed by a mixed panel of experts physics, chemical, biology and ecosystems to catch the bigger picture. The needs of the modelling community should also be considered.
- **Harmonization** of:
  a) existing **operational downscaled sub-regional and coastal forecasting systems** with the Copernicus marine service
  b) existing **operational monitoring systems** with the Copernicus marine service and with EMODNET
  c) the **existing monitoring infrastructure**
- **Identify** existing observation and data networks, and identify **data and knowledge gaps** that need to be filled.
- to establish a working relationship between EOOS and **ERVO**
- put into practice the so often invoked holistic, integrative, ecosystem-based, and cross cutting approaches, building a conceptual framework that goes beyond the simple accumulation of data.
- Promote a **meeting for users to present their needs**

- **produce specific technology efforts to reduce challenges for atmospheric measurements** over the seas and **improve number, quality and spatial/temporal resolution of atmospheric parameters observed at the ground.**
- Collaboration with **similar structures of similar disciplines, including legal and socio-economic aspects**
- **Integrate,** in a coherent system**, physical, biogeochemical and biological variables.**
- **harmonization / intercomparability of data collection methodologies & protocols** for new and internationally by contracts not yet implemented technologies; harmonized protocols for uncertainty estimations of measurements;
- **Improving the links between ship-based ocean observations, and sensor-based ocean observations (floats, moorings, etc)**.
- **A**ssist in, and strongly **support**, the work being done by **EMODnet teams in the identification of gaps in "fitness for purpose"**. Once the gaps are better understood EOOS can start directing efforts to address them
- Influence and advise the EC in the provision of more support to **bio, geo and chemical low cost sensor research and development.**