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Centralisation Phase

Focused study on Ocean observation coordination and marine data pipeline [D5.1]

Disclaimer

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Focused study on Ocean observation coordination and marine data pipeline

1 Introduction

In 2020 the European Commission (EC) Directorate-General for Maritime Affairs and Fisheries (DG MARE) launched the EC Ocean Observation – sharing responsibility initiative with a key objective to stimulate European Member States to increase their levels of coordination and efficiency in Ocean observation, marine monitoring and data collection. This took forward key recommendations and a call to action from the European Ocean Observing Conference in 2018. An EC consultation launched in 2020-2021 in the framework of the EC Ocean Observation initiative gathered feedback from over 150 stakeholders, including the European Marine Observation and Data Network (EMODnet) Secretariat[1] on the needs, requirements and opportunities for strengthened coordination at national level across marine and coastal data collection efforts.

To support these endeavours, EMODnet has over the past few years continued to strengthen the connection and dialogue with the European Ocean observation community and stakeholders across the marine knowledge value chain, including the co-organisation of joint activities such as the EC Ocean Observation workshop (18 June 2021), dedicated sessions on Ocean observation in the context of EMODnet flagship events (e.g., EMODnet Open Conference 2021) and engagement of the EMODnet Secretariat and wider EMOD-network in wider activities and events organised by the wider European Ocean Observing system (EOOS) community, spanning EOOS governance meetings to the EOOS Technology Forum and including interaction with European Horizon Europe projects active in this area e.g., EuroSea.

EMODnet's support to the EC Ocean Observation initiative continues in the EMODnet Secretariat workplan 2022-2023 Work Package 5 which includes three tasks that firstly assess the benefits of the EMODnet Sea-basin Checkpoint exercises (Task 5.1), secondly conduct focused studies and targeted assessments related to European Ocean Observation governance and coordination (Task 5.2) and thirdly strengthen the representation of EMODnet at relevant Ocean observation fora (Task 5.3).

This report focuses on Task 5.2 which has the overarching focus to map and assess levels of national coordination of Ocean observation and marine data pipelines across EU Member States, in the context of other national activities (see Task 5.2 Concept note, presented at the 16th EMODnet Steering Committee on 27-28 April 2022). The Task spans two years 2022-2023 with the main aim to provide key information on how Ocean observations and marine data are coordinated at a national level in EU Member States, to further inform the EC Ocean Observation Initiative for which further communication is expected in 2023. The EMODnet Task 5.2 activities consist of two related strands. The first strand is on EU Ocean observation coordination for which EMODnet works closely with the European Marine Board (EMB), in collaboration with other relevant initiatives e.g., EuroGOOS and EOOS. The second strand is on the marine data pipeline that is conducted by the EMODnet Secretariat, in collaboration with the wider EMOD-network and other relevant initiatives at National e.g., National Oceanographic Data Centres, Regional e.g., Regional Sea Conventions, European e.g., SeaDataNet, and International e.g., The Organisation for Economic Cooperation and Development (OECD).

This report summarises the work conducted in the first year (2022) which conducted a focused study on these two topics/strands. The report also proposes the methodology (including online survey) for the targeted assessment (interviews and case study development), to be conducted in 2023, including

[1] https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/12539-Ocean-observation-sharing-responsibility/F1263204_en

recommendations for countries to focus on for these more in-depth assessments. This work draws upon a number of recent external activities and reports by the wider community including, amongst others, the evaluation of EMODnet report conducted by Deloitte (2020); The Report and Community Recommendations from the EC Ocean Observation workshop, 18 June 2021; An initial scoping of national coordination of marine observation and monitoring capability, and strengthening the structured dialogue between EMODnet, data collection implementers and the wider EOOS community (2019); The European GOOS-EuroGOOS National Focal Points Survey on national coordination in Ocean observation (2021) and ongoing assessments by OECD in collaboration with National stakeholders on the value chains in public marine data e.g., A UK case study, published in 2021[2].

The objectives and execution of Deliverable 5.1 are set in the wider context of strengthening and diversifying the links with the Ocean observation and marine monitoring communities, to improve the efficiency of the marine knowledge pipeline and value chain. For this, the EMODnet Secretariat remains active and up-to-date in developments in the European Ocean observing landscape which includes dialogue both across European actors (e.g., through EOOS) and also with European and global actors to consolidate and strengthen the European contribution to international efforts in the context of the United Nations (UN) Decade of Ocean Science for Sustainable Development e.g., EU4OceanObs, GEO Blue-Planet European and international offices, GEOSS/GEO and others.

2 European Ocean observation coordination

2.1 Methodology

This section reports on the first year of the EMODnet Secretariat workplan 2022-2023 Task 5.2 desk study to assess the status of national coordination for Ocean observation, with a focus on European Member States. This was conducted by the European Marine Board (EMB) Secretariat in collaboration with EMODnet Secretariat. The work included desk study and literature searches and targeted stakeholder interaction. It builds upon the information and experience gathered from a similar study done under the EMFF funded tender EASME/EMFF/2017/005[3] Task 4.3, when an initial survey on national coordination of Ocean observation in Europe was conducted in Spring 2019.

The Ocean observation coordination desk study included targeted stakeholder interaction with members of the EOOS Operations Committee (OC). Established in 2020, the EOOS OC forms part of the EOOS governance bringing together representatives of Ocean observing implementers at national, regional and pan-European levels with the aim to help with the long-term sustainability of the Ocean observing efforts in Europe and to implement EOOS progressively. An innovative aspect of the EOOS OC is that it brings together the Global Ocean Observing System (GOOS) National Focal Points (NFP)[4] for European countries. GOOS Focal Points are nominated via one of three channels: Intergovernmental Oceanographic Commission of UNESCO (IOC) National Focal Point, Ministry of Foreign Affairs or Permanent Delegation to UNESCO. The GOOS NFP are the principal liaison points to each nation towards the implementation of GOOS, and its within their remit to report to the IOC on the status of national Ocean observing system activities that contribute to GOOS. For this reason, the European GOOS NFP were invited via individual email exchanges to provide an overview of the status of national Ocean observation coordination in their Member State or country, as they would have a good awareness of their national landscape. 23 European GOOS NFPs were contacted and responses were received in the form of online interviews and written responses from 13 of the NFPs (see results in Table 1 below).

[2] https://www.oecd.org/unitedkingdom/value-chains-in-public-marine-data-d8bbdcfa-en.htm
[3] Secretariat for EMODnet and European Ocean observing system
[4] https://www.goosocean.org/index.php?option=com_oe&task=viewGroupRecord&groupID=231

In addition, the desk study included the investigation of literature (peer-reviewed or non-peer reviewed) related to national Ocean Observation coordination to complement the information gathered via the GOOS NFPs. Awareness of publications and key-word search were used, mainly in Frontiers in Marine Science[5], the OECD iLibrary[6], the Ocean Best Practices System repository[7], publications from EOOS[8] and Mercator Ocean international[9], and on the websites of EU-funded projects EuroSea[10] and EU4OceanObs[11].

2.2 Outputs and results

Responses are summarised in Table 1 below. An important note is that in this study, the term Ocean observing refers to the scientific (research-driven) data collection, whilst marine monitoring refers to ocean data collection for legislative purposes e.g. for the Marine Strategy Framework Directive (MSFD).

The first finding is that it is very **difficult to access comprehensive information about national Ocean observing coordination**. Most of the countries in Europe have identified a GOOS NFP, but the final Terms of Reference for this position has not yet been approved, so these contact points don't have a clear mandate yet, or an indication of what they should do. The EOOS OC offers a platform to bring together these national contact points and wider Ocean observation and marine data experts e.g., from Marine Research Infrastructures, EuroGOOS, EMODnet and EMB. As a result, some GOOS NFPs have started connecting with experts within their country and across nations to exchange with other GOOS NFPs, as indicated later in this report explicitly in the case of Finland. Currently, only one country from this study (Ireland) has a published literature on their national coordination efforts, and some others (Belgium, Bulgaria, Germany, Finland, Ireland) have websites where some information is publicly available. Still, accessing this information was only possible through knowledge obtained from the GOOS NFP, highlighting the added value of the EOOS OC.

From all the responses, **national Ocean observing coordination efforts are generally voluntary, dependant on the willingness of the community to work together, and mainly focused on the coordination of the scientific component** (Ocean observation, as opposed to marine monitoring). The lack of institutional support or a framework to operate, appears to delay or halt coordination, as it depends on the personal motivation and time available of the people involved, as in the case of Finland or Spain. In contrast, countries with (upcoming) formal agreements or initiatives with institutional support (France, Sweden, UK) show some coordination of Ocean observing. It should be highlighted that countries that show relatively good existing coordination and awareness of their national Ocean observing landscape often display a long history of Ocean exploration and international leadership roles in Ocean observation, ranging from larger EU Member States e.g., France and Germany to comparatively smaller countries e.g., Portugal and Ireland. For other countries e.g., Belgium, Croatia, Estonia, Iceland, Latvia, more intrinsic connections exist and a general awareness of the Ocean observation and marine monitoring conducted by national authorities is present. Still, and as one of the respondents highlighted, in many countries "*the vertical coordination exists [from Ministry to competent authority or organisation], but horizontal interaction/coordination [between authorities or organisations] is poor*". For many countries, Ocean observing coordination efforts do not really translate into institutional changes, as this coordination is mainly *ad hoc* (on a certain topic, technology, area, etc.), informal or project based, e.g. via the European Research Infrastructure Consortium (ERIC).

The EOOS OC, mainly thanks to support received by the EU-funded EuroSea project via the EuroGOOS Secretariat, has contributed greatly in the community awareness of the GOOS NFPs (see the EOOS website[12]).

[5] https://www.frontiersin.org/journals/marine-science
[6] https://www.oecd-ilibrary.org/
[7] https://www.oceanbestpractices.org/repository/
[8] https://www.eoos-ocean.eu/publications/
[9] https://www.mercator-ocean.eu/en/guide-etoofs/
[10] https://eurosea.eu/
[11] https://www.eu4oceanobs.eu/
[12] https://www.eoos-ocean.eu/approach/governance/operations-committee/

The efforts related to the UN Ocean Decade and the G7 Future of the Seas and Oceans Initiative (FOSI) have also triggered coordination efforts and pooled resources in the case of Sweden and Germany, with further collaboration stimulated by EU-funded projects AtlantOS, EuroSea and ERICs (JERICO, EMSO, EuroArgo).

One important matter is the use of the term 'coordination'. The Cambridge Dictionary definition of coordination is "*the act of making all the people involved in a plan or activity work together in an organised way*". From the current analysis, **the countries in this study (with the exception of Iceland) may not be really coordinating their Ocean observation in a systematic way (even if only considering the research component)**. Thus, in Table 1 (see Annex I) which summarises the findings from the different countries, the term "awareness" is used, following the Cambridge Dictionary definition of awareness as the "*knowledge that something exists, or understanding of a situation or subject at the present time based on information or experience*".

3 Marine data pipeline

3.1 Methodology

The full methodological approach for the Task 5.2 focused study on the marine data pipeline is outlined in the Task 5.2 Concept note, presented at the 16th EMODnet SC on 27-28 April 2022.

The approach consisted of a literature and desk review of existing studies and publications relevant to the topic, including interaction and dialogue with EC DG MARE and CINEA, EMODnet SC, EOOS and wider European (e.g., EU4OceanObs) and international (e.g., OECD) and Global Ocean Observing (e.g., GOOS, GEO Blue-Planet) stakeholders to gather input on the current landscape and knowledge in the topic area and further input in terms of the methodological approach, key actors to engage, format, etc.

Initial stakeholder mapping of key actors and experts as contacts for both the focused study and the targeted assessment were undertaken, building on existing contacts from previous EMODnet mapping, contacts via EOOS governance meetings and open access online information including IODE National Oceanographic Data Committee (NODC) list[13] (see links in sections below).

In Year 1, the focus was on desk study and targeted consultation via email with key contacts e.g., IODE NODC representatives, amongst others. Information was also gathered at relevant meetings including the International Ocean Data Conference – 1 in February 2022.

Year 1 (2022) output: A short report with Results and a Forward look with recommendations for future activity, including the proposed methodological approach and expected outputs from the targeted assessment, to be conducted in 2023.

Year 2 (2023) output: A report on the targeted assessments with concrete case studies.

Communication and Dissemination of results is an ongoing process and in 2022 has included dialogue at multiple EOOS governance meetings, IODC-1 and other events. The year 1 output (this report) will not be fully public as it is a preliminary report. The year 2 report will be produced for open, public distribution so it can be communicated through EMODnet public platforms e.g., EMODnet Central Portal, EMODnet Newsletter and EMODnet social media (twitter), at EMODnet flagship events e.g., EMODnet Open Conference 2023, and in Ocean observing fora and via relevant European (Horizon 2020 and Horizon Europe) projects.

[13] https://www.iode.org/index.php?option=com_content&view=article&id=61&Itemid=100057

3.2 Outputs and results

This section reports on the first year of the EMODnet Secretariat workplan 2022-2023 Task 5.2 desk study to assess the marine data pipeline, with a focus on European Member States. This was conducted by the EMODnet Secretariat, in collaboration with the wider EMOD-network and initiatives at National, Regional and European levels.

The year 1 (2022) activities focused on a preliminary mapping and data gathering exercise. Since a large proportion of EMODnet's marine data community currently remains from the public sector, the initial focus of mapping was to contact members of the International Oceanographic Data and Information Exchange (IODE) of IOC UNESCO National Oceanographic Data Centres (NODC) and IODE Associate Data Units (ADU)[14]. From this list and via additional contacts, 21 European Member States were subsequently contacted and 6 Associated Countries (ACs) from the wider Council of Europe[15] that also feature on the IODE NODC and ADU lists were also contacted (namely Georgia, Iceland, Norway, Turkey, Ukraine and the United Kingdom). 14 responses (10 MSs and 4 ACs) responded. Results were also supplemented by a desk study and literature searches where possible which included gathering knowledge from recent Conferences including the International Oceanographic Data Conference – 1 which took place in February 2022 in Sopot, Poland.

The results are presented in Table 2 (Annex II) which indicates if the results come directly from a IODE NODC or ADU contact (marked with *) or are from a desk study due to no response from the IODE contact. Below is a summary of key findings:

- IODE NODC and ADU contacts are generally very knowledgeable about their national marine data landscape, particularly in terms of the publicly funded marine data collection and management, but also including some private sector initiatives;
- Many countries have a large variety of organisations that are involved in the marine data pipeline as research facilities, governmental organisations and independent private organisations. Nevertheless, most countries lack a framework of coordination group that connect marine data across sectors;
- France, Germany, Italy, Norway, Spain, Sweden and the UK show a very extensive list of organisations involved in the marine data pipeline.

In general, the responses display a wide diversity in the level of national marine data coordination in EU Member States and Associated Countries. This is dependent on the size of country, size and complexity of the oceanographic community and other factors. Some key insights are provided below:

1. **Coordination by single institutes:** In some countries there is no coordination group/network but rather a single organization taking on the competency for coordination. In some cases e.g., Austria, Bulgaria, Republic of Cyprus, Greece, this is due to the small size of the country and/or the oceanographic community meaning that one institute leads the coordination of all oceanographic research and public data efforts. In others e.g., Ireland, an institute (in this case Marine Institute) has been designated as the National Correspondent Agency for the DCF (data collection framework) on behalf of the Department of Agriculture, Food and the Marine;
2. **Informal coordination across multiple organisations and national data repositories:** In other countries there are multiple institutions active in marine data management, with many interactions and exchanges but at this stage no official coordination structure for marine data, despite operational data flows between organisations and other national coordination bodies e.g., the national representation at IOC-UNESCO e.g., Belgium, Germany, Italy.

[14] https://www.iode.org/index.php?option=com_content&view=article&id=61&Itemid=100057
[15] https://www.coe.int/en/web/portal/46-members-states

3. **National coordination groups, committees or networks:** Finally a number of countries already have existing or emerging coordination groups for marine data, with a focus on publicly funded marine data (from scientific/research driven and/or legislative monitoring). These include:
    a. **France:** A French Ocean Observing System (FOOS) coordination group is being initiated. It is anticipated this will provide further coordination for marine data and will link with existing entities and networks including the French Information system for Marine Environment (SIMM) supports the implementation in France of the European Environmental Directives (including the Water Framework Directive, Marine Strategy Framework Directive, Marine Spatial Planning Directive);
    b. **Poland:** The Polish National Oceanographic Data (NOD) Committee consists of the Polish scientific consortium consisting of Institute of Oceanology Polish Academy of Sciences, Polish Geological Institute National Research Institute, National Marine Fisheries Research Institute, University of Gdańsk, Maritime Institute of Maritime University in Gdynia, Pomeranian Academy in Słupsk and University of Szczecin, being involved in marine research for a long time have consolidated efforts and undertook actions to make Polish oceanographic scientific data resources accessible for public from one national repository. The Polish NOD Committee is collaborating through the funded eCUDO.pl (Oceanographic Data and Information System) project to harmonize Polish oceanographic data, make them interoperable through implementation of committed standards for information structure and communication protocols (see presentation 63 of the IODC-1 Conference);
    c. **Sweden:** The Swedish Meteorological and Hydrological Institute (SHMI) has a pre-project (until the end of 2023) with funds from the Swedish Government to have a better coordinated marine data system in Sweden. They have built momentum and a network with many national public and private actors engaged and Marine Directors and representatives of relevant Ministries are also supportive. Long-term funding is being explored to continue the network and expand the initiative, aiming to have something functional by 2030;
    d. **United Kingdom:** The UK has a complex and well coordinated marine data landscape with the British Oceanographic Data Centre (BODC) as the national marine data centre and the Marine Environmental Data and Information Network (MEDIN) that provides a framework for coordination of data, in addition to other coordination frameworks e.g., Marine Management Organisation for legislative monitoring.

The 2022 mapping focused on publicly funded scientific/research-driven ocean observation and marine data management/coordination. There were however some interesting findings related to data flows and coordination from legislative monitoring and the private sector:

1. Some countries already identified specific EMODnet data flows for marine monitoring data collected for legislative purposes e.g., the Danish Environmental Protection Agency (EPA) and a link to the relevant Regional Sea Convention (in this case OSPAR) and flow to EMODnet;
2. The UK Crowne Estate has an active data flow including data collected by Offshore Renewable Energy companies to EMODnet (via EMODnet Data Ingestion).

OECD: In July 2021, the OECD published a Science, Technology and Industry Working Paper on "Value chains in public marine data: A UK case study". The report focused on exploring pathways through which marine data are used and transformed into actionable information, creating synthesised value chains and looking at trends in current marine data uses in the UK and key benefits of data uses. EMODnet has followed these developments, interacting with OECD at community events and meetings e.g., attending a series of webinars where the OECD UK case study has been presented (2021-2022), inviting OECD as a speaker to the EMODnet

Open Conference 2021, exchanging as EMODnet and OECD speakers at the EOOS Resource Forum 2nd meeting in December 2022. The results of this study are not presented in Table 2 since this study was a third party activity. It can however be brought into national case studies in the 2023 activities, together with any other national consultations conducted by OECD that EMODnet have been made aware of through ongoing dialogues e.g., Belgium (survey closed end 2022, results expected mid 2023) and Portugal (survey planned for Spring 2023).

4 Recommendations for future work

The year 1 (2022) focused studies have provided valuable information on the current status and landscape of both Ocean observation coordination and the marine data pipeline at national level across the EU. These EMODnet Secretariat workplan 2022-2023 activities were communicated at EOOS governance meetings in November 2022, including the EOOS Resource Forum, to raise awareness of the ongoing activity and of plan for further stakeholder consultation in 2023.

In year 2 (2023) of this activity, more in-depth targeted assessments will be conducted to produce concrete examples and case studies of the status and latest developments in both national Ocean observation coordination and the marine data pipeline. Targeted assessments will include a survey and development of case studies through interviews with key representatives.

A strategy for achieving concrete results will be vital to deliver in the time-frame and according to the conservative funding and staff effort allocated to these tasks. It will not be possible to produce case studies and detailed information on each European Member State or Associated Country. Rather, a minimum of one case study per sea basin will be produced to ensure that a pan-European context is retained. Where possible, two examples from a sea basin will be included to highlight the diversity of marine data coordination efforts.

The proposed activities for 2023 are outlined below for each of the two strands of work, including recommendations for which countries may be best suited to develop in-depth case studies.

4.1 Assessing national Ocean observation coordination: proposed activities 2023

The proposed activities for 2023 include:

- Further investigation of case studies of national Ocean observation coordination (1 per sea basin): France (Mediterranean Sea, Atlantic Ocean), Sweden (Baltic Sea), Bulgaria (Black Sea), Ireland (Atlantic Ocean). Investigate past and future evolution of coordination: main challenges, key elements for success, opportunities, etc.
- Methodology:
    - Interviews of GOOS National Focal Points and other relevant national or European stakeholders (e.g. ERIC coordinators);
    - Engagement with the beneficiaries of CINEA/EMFAF/2021-3.4.9 (Study for Reporting Obligations for Ocean Observation) to exchange progress and considerations;
    - Coordinate with EU project EuroSea task on foresight benefiting from:
        - A foresight workshop on sustainable Ocean observing system, targeting the members of the EOOS Operations Committee and Resources Forum, among others;
        - Engage with the Chairs of the Council of the EU Working Party on Maritime Issues (representatives from France and Sweden).
- Connection and promotion of early findings of Task 5.2 with other on-going initiatives and stakeholders, with the aim to increase understanding of the landscape and situation in different countries, and raise awareness for the need of better coordination of national Ocean observing coordination:
    - EOOS governance bodies

        - Operations Committee, incl. GOOS National Focus Points (participation and presentation in meetings, 1-to-1 dialogue);
        - Resources Forum (participation and presentation in meetings, 1-to-1 dialogue);
    - G7 FSOI – European countries: France, Italy, UK (dialogue with Focal Points and European coordinators);
    - European Maritime Day workshops related to Ocean observations and participants (24-25 May 2023);
    - EU project EuroSea final conference (21 September 2023);
    - Other relevant on-going initiatives.

4.2 Marine data pipeline: proposed activities 2023

Year 1 (2022) activities focused on mapping the marine data landscape at national level in European Member States, with a focus on publicly funded research-derived marine data. This was planned as a preliminary study to inform year 2 (2023) activities.

Year 2 activities will further expand this mapping and conduct stakeholder consultation, including targeted assessments and case studies e.g., one EU Member State per regional sea basin and 1-2 Associated Countries.

Key stakeholder groups that the EMODnet Secretariat will forge closer interaction and dialogue with for this exercise in year 2 include:

- EMODnet thematic and data ingestion Coordinators and wider partners;
- EMODnet Associated Partners and the EC Marine Knowledge Expert Group (particularly for private sector marine data information);
- IODE of UNESCO IOC (particularly for contacts at National Oceanographic Data Centres and for the latest information on national committees/groups);
- National Oceanographic Data Centres and their IODC representatives;
- SeaDataNet and where relevant/possible Marine Research Infrastructures (in collaboration with the EMODnet WP3 (Monitoring EMODnet outputs, performance and progress) targeted assessments to capitalise on stakeholder contacts and to add value);
- OECD (to assess their relevant on assessing the value chain in public marine data);
- UN Ocean Decade Data Coordination Group and a related group focused on the private sector data will be established in 2023.

Mapping: There are a number of ways in which the mapping can be further developed:

a) Expand the countries that are mapped (21/27 Member States were contacted in year 1 due to lack of contacts (or inactive contacts) from the remaining 6 Member States. Further contacts and information can be sought to produce a high-level picture of the marine data landscape in all 27 Member States. Where possible additional information for Associated Countries that are involved in the European Ocean Observing activities will also be included;

b) For all countries gather a more holistic picture of how marine data are managed and coordinated at national level. In year 1, the focus was on publicly funded marine data and where possible information gathering can be expanded to cover four key categories:

- Marine data from scientific (research-driven) Ocean observation (including both sustained observations and *ad hoc* sampling for research purposes);
- Marine data from marine monitoring for legislative purposes e.g., a national competent authority collecting marine environmental data for their national Marine Strategy Framework Directive Good Environmental Status Assessment;
- Marine data collected by the private sector / blue economy for operational and business purposes;
- Marine data collected from other sources e.g., civil society, citizen science.

More information could be found in future work on the public marine monitoring for legislative purposes conducted by competent authorities and data derived from private sector/blue economy data collection efforts, to see for instance if there are any national committees for marine data (and/or ocean observation) that include private sector representatives;

c) Add further information on the marine data pipeline connecting from national to Regional and European, with a focus on EMODnet.

Stakeholder consultation and targeted assessments

A bilateral meeting in early Spring 2023 with IODE will be useful to exchange on the EMODnet activities related to the marine data pipeline and to understand where contacts for the further 9 EU Member States can be sourced (e.g., are more IODE NODC contacts foreseen or should the central IODE contacts be utilised (e.g., there are 10 contacts for Finland on the online IODE searchable contacts[16] but these are all from the Finnish Meteorological Institute)):

- Contacting (and where necessary re-contacting) IODE NODC and other national marine data representatives to gather more information on the marine data landscape in each EU Member State;
- Targeted interaction with the EMODnet Associated Partnership of 28 organisations, many of which are private or private-public.

The International Ocean Data Conference – II (IODC – II)[17], 20-21 March 2023, Paris, France, will be a very useful meeting to meet with key contacts and experts in the marine data domain and to arrange for interviews that can contribute to targeted assessments and initial case study development.

The EOOS governance meetings e.g., EOOS Steering Group, Advisory Committee, Operations Committee and Resource Forum continue to offer important platforms for dialogue and communication on EMODnet and wider marine data and ocean observation activities.

A survey will also be designed (for release in Q2-Q3 of 2023) to capture wider stakeholder input to the marine data pipeline into EMODnet.

Further exchanges including a tele-meeting and interview will be arranged with the OECD, in particular the Ocean Economy Group in OECD's Directorate for Science, Technology and Industry. The meeting will be designed to:

1. Exchange information on the activities of EMODnet related to the marine data pipeline (namely WP5 Task 5.2) and on the OECD ongoing activities on assessing the value chains of public data, including an understanding of how the OECD work done to date can be utilised by EMODnet and the scope (including which countries) OECD will be assessing in 2023 and beyond;
2. Identify areas of complementarity to help define the EMODnet stakeholder consultation on the marine data pipeline in 2023 so that it adds value to existing knowledge;
3. Identify opportunities for further exchange e.g., at the EMODnet Open Conference 2023.

The proposed selection of countries to focus on for targeted interviews case studies is based upon the results from the year 1 mapping exercise and on information from related projects and initiatives.

Firstly, at least 1 from each of the three categories of coordination (identified in section 3.2 above) will be assessed to show the diversity in scale, maturity and appropriateness of coordination of marine data across different European Member States and Associated Countries:

1. Coordination by single institutes;

16 https://www.iode.org/index.php?option=com_oe&task=search&searchText=6172&field=institutionID&title=Members%20of%20Finnish%20Meteorological%20Institute&orderby=name

17 https://oceandataconference.org/

2. Informal coordination across multiple organisations and national data repositories;
3. National coordination groups, committees or networks.

In addition, at least one nation (Member State where possible, and/or Associated Country) for each of the six regional sea basins will be contacted.

To help inform the final selection, information will also be gathered from related projects and initiatives. For example, an EMFF Ocean Observation reporting contract is developing templates to standardize ocean observation reporting. France and Sweden have been selected as the two countries where more detailed interviews and case studies will be produced. For this reason, and in combination with the fact that both countries have relatively mature Ocean observation coordination and emerging national marine data coordination committees, these two countries have been selected for targeted interviews in 2023.

Based on these factors and information, the following preliminary list of countries are proposed for targeted assessment and case studies in the 2023 activities on marine data:

- Arctic Ocean: Norway
- North Sea: Belgium (complimenting OECD) and/or The Netherlands
- Baltic Sea: Sweden and/or Poland
- Atlantic Ocean: France
- Mediterranean Sea: Greece
- Black Sea: Bulgaria

These proposals will be discussed with EC DG MARE in Q1 of 2023 before targeted assessment and case study development.

5 Annex

Annex I: List of publications from literature search

Other annexes have been removed from the published version of the report.

5.1 List of publications from literature search

Agentschap MDK. (n.d.). Flemish Hydrography. https://www.agentschapmdk.be/en/flemish-hydrography

Arctic Data Centre | Arctic Data Centre. (n.d.). https://pm.met.no/arctic-data-centre

AZTI - Ciencia y tecnología marina y alimentaria. (n.d.). AZTI. https://www.azti.es/

Bjerknes Climate Data Centre. (n.d.). https://www.bcdc.no/about.html

BRGM. (2022, November 28). Service géologique national. https://www.brgm.fr/fr

CCAMLR Commission for the Conservation of Antarctic Marine Living Resources CCAMLR. (n.d.). https://www.ccamlr.org/

Cerema, climate and regions, the future. (n.d.). https://www.cerema.fr/en

cnes | Le site du Centre national d'études spatiales. (n.d.). https://cnes.fr/en

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