



EMODnet



European Marine
Observation and
Data Network

EMODnet ingestion and safe-keeping of marine data

CINEA/EMFAF/2021/3.4.10/02/SI2.868290

Start date of the project: 30/03/2022 (24 months)

Centralisation Phase

Quarterly Progress Report (8)

Reporting Period: 01/01/2024 – 31/03/2024



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1. Highlights in this quarter

Task 1: Maintain, further develop and migrate a web-portal

During the reporting period the EMODnet Ingestion portal and its services were maintained and care was taken to ensure that all services continued to operate as required. Maintenance involves: content updates; adding new data centres contacts; manual work on submitted metadata mapping and missing values, automatic updating of Submission service vocabularies on a regular basis; exchange (JSON) of Submission service with Summary service; users support; and technical upgrades and improvements.

Two meetings took place between EMODnet Ingestion, Central Portal (CP) technical team, DG MARE and EU IT (23 January 2024 and 4 March 2024) to discuss the progress of the Ingestion migration to the Central Portal (CP). The agreed migration plan includes the following components and activities:

- **Narrative**: The static content of the EMODnet Ingestion website will be moved to a dedicated section of the CP, comparable to the dedicated sections for each of the Thematic Lots. The CP Team has already prepared a draft version on the CP development site, which is under review by EMODnet Ingestion (end of April 2024).
- **Viewing Service**: An earlier analysis (by HCMR) between the metadata of published submissions at the Viewing Service of EMODnet Ingestion (which follow the ISO 19115 model and are enriched with controlled terms from the SeaDataNet vocabularies, EDMO, EDMERP, and CSR) and that of entries in the CP Data Products Catalogue (which is a GeoNetWork deployment), revealed that several fields including vocabs etc. are not supported by the CP Catalogue. All metadata fields of the Viewing Service were formulated (by HCMR, MARIS) in an template XML output using keywords for the not supported fields as a solution. An export generator was developed (by MARIS) to generate XML files for each published Submission (currently circa 1500+). The generated XML files are made available by a GeoNetWork instance at MARIS using the WAF protocol. Tests with CP Catalogue were successful and records are imported very fast, while for updating all records are overwritten, using Datestamp as trigger. The automatic exchange (M2M) from the Viewing Service back-office to the CP Catalogue is now operational.
- **Submission service**: The migration plan includes a clear splitting between the backend and the front-end and establishing an API for their communication. The back end, including the database, cloud storage and API will stay at the servers of HCMR, while the front end will be hosted at the CP servers at VLIZ. The work for the Submission service migration has been divided over four working packages (WP): a) API development, b) frontend development consuming API, c) testing, d) staging/deploy to Production. There is good progress on the API development and the splitting in front office User Interface and back office API at Ingestion, targeting for a first version ready end of April 2024 in the Test Submission service, which will be documented as part of the Final Report to be submitted middle of May 2024. Public deployment requires thorough testing and will depend on ECAS migration.
- **Migration of Marine-ID login to ECAS login**: the ECAS will be adopted as AAI for the Submission service. The incorporation of ECAS has not started yet and migration of the current hundreds of registered to Marine-ID users to ECAS accounts while preserving the relations of each user with the contents in the Submissions database is a complex task and it is not foreseen before summer 2024.
- **Helpdesk**: EMODnet Ingestion Helpdesk will use the overall EMODnet feedback service whereby feedback for EMODnet Ingestion will be guided by the EMODnet Secretariat through JIRA.
- **Realtime viewer service**: The realtime viewer service, as developed and managed by EMODnet Physics together with EMODnet Ingestion, continues to be hosted by ETT, and it now interacts with the Central Portal Map Viewer by means of an OGC WMS – WFS exchange. EMODnet Physics has set up two map folders, one for its mature phase 2 maps of physics stations and access to their metadata and data sets, and another one for the phase 1 maps as part of EMODnet Ingestion. In practice, the functionality

for both types follow a common principle with maps and options for filtering, using ERDDAP and OGC WMS-WFS services. EMODnet Physics has finalized the reorganization of its overall set-up, and the new set-up is ready for going into production.

EMODnet Ingestion is being further developed and expanding through the coupling with The Crown Estate (TCE) Marine Data Exchange (MDE). The latest JSON file with the MEDIN – MDE output has been successfully imported in the Test Submission service. After comparing the JSON file with the Test Submission service, refinements were made to address issues such as appropriate acknowledgement to the TCE – MDE source or the MEDIN unique identifier. The coupling will move soon to production. The exchange of MDE – MEDIN submission to Ingestion will be done in a gradual way, managed by BODC making selections of relevant data sets.

Task 2: Implement pathways for delivering data to final repositories

The total number of received submissions increased from 1548 to 1646, while the number of processed and published data submissions increased from 1411 to 1503, and of which, the number of fully elaborated data submissions went from 639 to 671 data. The KPI excel sheet provides more details.

Task 3: Facilitate machine-to-machine transfers

During the reporting period, big effort was allocated towards the integration of the EMODnet Ingestion tools and outcomes into the CP. One specific action was the implementation of the backend services to enable the central portal geoviewer to present progress towards the operational oceanography data ingestion. As described previously, similar to the “standard” flow the near real time is organized in phases to manage the submission life cycle:

- Phase 1: from data submission to publishing of the submitted datasets package ‘as is’
- Phase 2: further elaboration of the datasets package and integration (of subsets) in operational repositories

The inclusion of the source “as is” (phase one) involves the utilization of machine-to-machine technologies, ranging from FTP file access to web APIs for real-time exchange. It also involves the adoption of services like the Data Access Broker (DAB) or ERDDAP. This data is made available under the “ingestion-erddap.emodnet-physics.eu” that provides the user an easy way to interact with latest ingested RT collections.

Once a new operational data source is integrated into the data layer, and a data collection is added to the ERDDAP data server, the next step is to include the source into a harmonized and validated data collection (phase two) for long-term stewardship. A first step towards this process is the adoption/application of harmonized metadata and vocabularies to make these new data part of EMODnet (Physics) RT data collection, which is offered to CP under a specific (Physics) WMS layer, in parallel data is made available to competence centers for further QC/QF checks and validation.

This step depends on data centers assessing the added value of the submitted data and the efforts required to process the data into common formats, if possible. Elaboration activities include review, validation, conversion to standard formats, and further integration into relevant European infrastructures (e.g. CMEMS INSTAC, ICES, etc). The process depends on the theme, platform, and provider.

The integration of the EMODnet Ingestion “as is” layer into CP is fully described under the JIRA ticket EM-911, the integration is already working under the development.emodnet geoviewer and it is in its validation phase to be mounted on the production CP.

During the period, also two Deliverables D3.4 DAB Installation package and D3.5 SWE to ERDDAP software module were finalized. These Deliverables are included in the Annex.

Connecting more providers and stations:

In the reporting period, several additional operational stations—such as river stations, gliders, and surface unmanned vehicles—have been integrated into the system. This activity is supported by dissemination and engagement efforts in collaboration with other projects and initiatives (such as LandSeaLot, JERICO-S3, Blue-Cloud 2026, etc.) and with actions during workshops, conferences, etc. Some of the most relevant for this period are: OSM24, held in New Orleans, USA, 18-23 February 2024, and Oceanology International in London, UK, 12–14 March 2024. This is facilitating the ingestion/link of new sources and the figure below presents the latest “as is” platforms



Figure 1. newly integrated platforms (ca 250+)

Task 4: Operate a help-service for users to provide their data in the most appropriate format

Users can either email their questions or ask for a call back. All queries are saved and tracked in the Open-source Ticket Request System (OTRS) at Ifremer. In the reporting period three questions were received and answered. As part of the migration the proprietary system at Ifremer will be replaced by using the CP help forms, which are assigned to Thematics / Ingestion by the EMODnet Secretariat. Responses will be given through JIRA tickets.

Task 5: Allow providers of data to track the progress of their data from submission through to their storage in a repository

Data providers can follow the processing of their data submissions in the Submission Service, which is done in several steps each indicated by a status field. Data providers are contacted by assigned data centres, in case there are additional questions about the ingested data sets.

Task 6: Participate in discussions with EMODnet partners in order to improve the efficiency of the whole collection, assembly and dissemination process

All coordinators of EMODnet Thematic projects are partners in EMODnet Ingestion which guarantees a mutual tuning with EMODnet Ingestion. Moreover, EMODnet Ingestion coordinators are involved in the communication of the EMODnet Steering Committee and Technical Working Group.

Task 7: Maintain a summary record of data delivered

This function is offered by the View Submissions service. Each completed submission is migrated to that service for publishing as part of a discovery and access service. Distinction is made in phase I and II which is one of the search facets. Editing activities take place aimed at replacing so-called orphan data for organizations from free text into controlled EDMO terms, orphan data for projects into controlled EDMERP terms, and orphan terms for Cruises into controlled Cruise Summary Reports (CSR) terms in order to improve the integrity and richness of the metadata.

Task 8: Engage in outreach activities towards significant holders of marine data whose data are not yet available.

During this reporting period, EMODnet Ingestion involved in two important events:

- An on-line Webinar entitled “**EMODnet for Horizon Europe and EU Mission: restore our Ocean and Waters**” took place on 28 February 2024, co-produced by EMODnet Secretariat and EMODnet Ingestion (MARIS, HCMR, ETT, VLIZ) upon request of EU, for representatives of European Horizon Europe and EU Mission Ocean projects that are and will be collecting in situ marine data (<https://emodnet.ec.europa.eu/en/emodnet-mission-ocean-and-horizon-europe>). The webinar was attended by over 95 participants representing at least 45 EU projects as well as EMODnet. EU R&I projects were advised to adopt community standards, particularly those used by EMODnet, when developing their Data Management Plans (DMPs). By aligning with EMODnet community standards, projects ensure that their data becomes FAIR and machine-readable, enhancing its usability and impact. The R&I projects were also advised to design and implement their DMPs in collaboration with marine data management infrastructures, especially national nodes feeding into EMODnet. The webinar emphasized the adoption of common metadata and data formats aligned with marine community practices for seamless integration into existing data systems. A new [EMODnet guidance document](#) has been prepared and published at the Central Portal primarily aiming at European Research and Innovation projects that seek advice and guidelines on preparing and submitting data to EMODnet. It is designed to inform EU project data management plans, and to optimise the pipeline of marine knowledge from data collection and curation to submission into the EMODnet service, where Europe's in situ marine data capability is offered as pan-European FAIR data, data products and metadata, for open and free use by all.
- EMODnet Ingestion organized the on-line Workshop “**Data Management in Offshore Licensing Procedures**” on 29 February 2024. More info about this Workshop is given under Task 9.

EMODnet Ingestion coordinating team has contributed to meetings in Q1 2024 on EMODnet future governance.

A central document is maintained to compile all outreach activities and events of partners promoting the project with input by all the partners. A full overview will be derived by RBINS for inclusion in the final report.

The poster with the 12 country use cases prepared for the EMODnet Jamboree is being further used for dissemination during other events by the partners, for example during the upcoming first DOORS Stakeholder Conference on 23-24 April 2024 in Bucharest, Romania, where also the available leaflets will be distributed. An overview of outreach material produced during the project, which will be given in the final report, indicates that a lot of material is out of stock and should be revamped for the upcoming phase of the project.

Finally a new promotion video was produced and launched “All data on Deck, Set them free for the blue society”. It illustrates three successful use cases of the project: one on data ingested of the Belgian Navy, the

second on data related to the Chernobyl incident and the third on marine litter data. It is currently being further disseminated via YouTube and other social media channels.

Task 9: Improve and document the availability of data provided for coastal and offshore licensing.

On February 29th 2024 a successful workshop was organized, bringing together stakeholders from 18 countries to examine the practices and approaches in offshore licensing data management, particularly within the sectors of aquaculture and renewable energy. The event drew approximately 65 participants who actively engaged in discussions aimed at understanding the various data management procedures across different countries. Participants discussed the potential for a harmonized strategy for data management within licensing procedures. The workshop featured a series of informative presentations from representatives of Italy, Malta, Estonia, France, Bulgaria, and the United Kingdom, each outlining their respective country's current practices of data management in offshore renewable energy and aquaculture licensing. A significant focus of the discussions was centered on the feasibility and advantages of a harmonized data management approach, with a majority of participants expressing favor towards an EU-level standardization. The discussion highlighted potential benefits of a harmonized approach, such as enhanced data accessibility, comparability, and usability. In addition, EMODnet was recognized as a potential key player in promoting such harmonization by facilitating capacity building, providing best practice guidelines, and promoting a dialogue among member states. The outcomes of the discussions will also inform the next phase of the EMODnet Ingestion project.

A summary of the workshop, along with the PowerPoint slides, has been posted as a dedicated news item on the [EMODnet website](#). The Deliverable D4.7 is included in the Annex of this Q1-2024 report.

Task 10: Service continuity during operation and for transition

Coordination of the consortium is undertaken by MARIS and HCMR to ensure the continuity of the EMODnet Ingestion portal and its array of services. The Q4 report has been prepared and submitted which was accepted by the EU. A plenary meeting for EMODnet Ingestion has been organized at 3 – 5 April 2024 in Malta, serving as a meeting for finalizing the first two years of the Ingestion contract and as kick-off for the new workplan for the coming two years.

Status of the Milestones and Deliverables listed in the workplan					
Milestone/Deliverable in numerical order	WP	Date due	Status (To do/ Delivered/ Delayed)	Date delivered	If Delayed: reason for delay and expected delivery date
D0.1: Quarterly concise progress reports	0.1	M4, M7, M10, M13, M16, M19, M22, M24	D0.1- a,b,c,d,e,f,g, h	M4, M7, M10, M13, M16, M19, M22, M25	
D0.2: Interim report	0.1	M12	Delivered and accepted	27 April 2023; amended 29 June 2023	
D0.3: Final report	0.1	M24	To do		
D0.4: Transition and hand over protocol	0.1	M24	To do		

D0.5i: Agreement and subcontracts	0.1	M1	All done		
D0.6i: Short minutes - action lists of internal coordination meetings	0.1	Regularly	All done		
D1.1: Web portal operational, incl extranet	1.1	M1 – M24	Delivered	Operational since M0	
D1.2: Guidelines, manuals, handbooks on portal	1.1	M1 – M24	Delivered	Operational since M0	
D1.3: User Management service operational (Marine-ID /EU Login)	1.2	M1 – M24	Delivered	Operational since M0	
D1.4: Data Submission Service operational	1.3	M1 – M24	Delivered	Operational since M0	
D1.5: Data Submission Service upgraded	1.3	M1 – M8	Delivered	Operational since M6	
D1.6: Data tracking service operational	1.4	M1 – M24	Delivered	Operational since M0	
D1.7: View Submissions service operational	1.5	M1 – M24	Delivered	Operational since M0	
D1.7: Portal and services moved to Central Portal	1.1 – 1.5	M1 – M12 ¹	Underway		Test configuration will be documented in Final Report; production status is planned in summer 2024.
D2.1: Pathways operational	2.1	M1 – M24	Delivered	Operational since M0	
D2.2: Many submissions processed and published 'as is' (phase 1) and at	2.1	M12, M24	Delivered	M24	See KPI file

¹ Migration process has started in M15 in agreement with Contracting Authority, a Test configuration will be delivered and documented in the Final Report. Deployment into production will take place around summer 2024.

EMODnet thematic services (phase 2)					
D2.3: Help service operational	2.2	M1 – M24	Delivered	Operational since M0	
D3.1: Updated documentation, standards and procedure for NRT and RT data published	3.1	M12, M24	Delivered; integrated as Annex in Interim Report		
D3.2: Connections with new NRT and RT monitoring stations operational	3.1	M12, M24	Delivered; integrated as Annex in Interim Report		Final results will be included in Final Report
D3.3: ERDDAP installation package	3.1	M12	Delivered.	M6	See Interim Report
D3.4: DAB installation package	3.1	M12	Delivered	M24	See Annex Q1-2024
D3.5: SWE to ERDDAP software module	3.2	M22	Delivered	M24	See Annex Q1-2024
D3.6: Upgraded Viewing service for NRT and RT stations	3.2	M12	Delivered		See Interim Report
D4.1: Inventory updated of potential data sources and providers in European countries and priorities	4.1	M8	Delivered	M8	
D4.2: Updated promotion material	4.4	M12, M24	Regularly		
D4.3: Results of marketing and outreach activities	4.2	M12, M20	M12 integrated in Interim Report		M20 to be integrated in Final Report
D4.4: Inventory of identified stakeholders for licensing data	4.3	M6	2 nd and largely improved version Delivered	M6, M8	
D4.5: Inventory of current license data practices	4.3	M14	Delivered	M15	Delivered with Q2-2023 report

D4.6: Database about availability of license data per country	4.3	M18	2 nd and wide populated version Delivered	M18, M21	See Task 9
D4.7: Reporting on license data Workshop	4.3	M22	Delivered	Workshop held at 29 Feb 2024	See Annex Q1-2024

2. Identified issues: status and actions taken

[Provide an overview of issues identified by CINEA/ DG MARE/ Secretariat (Table A) in the past quarter - new as well as pending ones, the status of those issues, and actions taken to address them and/or roadmap with remaining actions planned to resolve the issues. In Table B, provide information about any issues and challenges identified by yourself.]

A.				
EM-768: An epic to collect together JIRA for the DIP centralisation	Pending	Folder to follow all DIP migration activities	End 2024	Juli
EM-783 Risk Analysis on using ECAS for whole DIP system	Pending	CP Team to analyse; results also relevant for DIP Submission service	End 2024	June
EM-305/322 Content Inventory Data Ingestion	Pending	CP team has made a narrative compilation and composed a first Ingestion narrative at CP test site for check and completion by DIP	End 2024	April
EM-893 Setup EMODnet styled page for the submission service	Pending	CP team to set up an example page with the EMODnet/Europa styling header/footer/page styling	End 2024	Jan
EM-888 Ingestion metadata harvesting by CP Geonetwork - issues to be checked by CP	Resolved	Harvesting of Ingestion XML is operational	Early March 2024	

B. Issues / challenges identified by the thematic assembly group itself				
Priority issue / challenge	Status (Pending/ Resolved)	Action(s) taken / remaining actions planned	Date due	Date resolved

3. Communication assets

[In Table A, list peer reviewed publications directly (co-)authored by consortium and project partners in the reporting period. In Table B, list all non-peer reviewed publications (co-)authored. In all cases, indicate the type of publication, provide the full reference incl. title, volume and issue etc., and whether the publication is open or closed access.]

A. (Co-)Authored peer-reviewed publications in the quarter					
Date of publication	Type of publication	Full reference	ISBN	DOI	Is it open access? Yes/No

B. Other/non-peer reviewed types of publications (co-)authored in the quarter					
Date of publication	Type of publication	Full reference	ISBN	DOI	Is it open access? Yes/No

For a comprehensive overview of publications referring to/making use of EMODnet data and/or data products, please consult [Google Scholar](#).

4. Monitoring indicators

[Refer to the standardised monitoring tool, i.e. Europa Analytics, to complete the indicators excel template, and provide a short explanation in the table below on the numbers and trends for each indicator when possible/applicable. Indicate clearly if monitoring was carried out using tools other than Europa Analytics.]

Comments on the progress indicators in the indicators spreadsheet		
Progress indicator	Means of collecting figures	Comment
1. Current status and coverage of total available thematic data A) Volume and coverage of available data	Submission Viewing service	The total number of new phase 1 + phase 2 submissions in the current quarter is 92 and of this 32 were elaborated to phase 2. The overall number of published submissions went from 1411 to 1503.
B) Usage of data in this quarter	Cloud storage of Submission Viewing service	The total number of download transactions and volume have increased very considerably this quarter.
3. Internal and external organisations supplying/approached to supply data and data products within this quarter	Submission Viewing service	92 new data submissions were received from 44 organisations, mostly academic and research.
9) Visibility & analytics for web pages	Grafana	Grafana does not provide data nor graphics in 2024
10) Visibility & analytics for web sections	Grafana	Grafana does not provide data nor graphics in 2024
11) Average visit duration for web pages	Grafana	Grafana does not provide data nor graphics in 2024

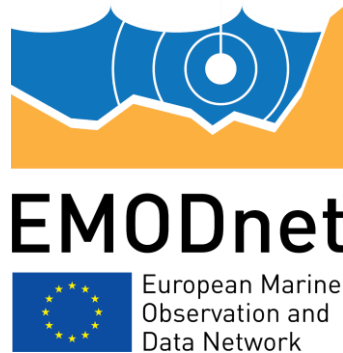
The monitoring numbers reported as part of the progress monitoring of EMODnet performance are collected through Europa Analytics, unless reported otherwise.

5. Annex 1: Deliverables

D3.4: DAB installation package

D3.5: SWE to ERDDAP software module

D4.7: Reporting on license data Workshop



EMODnet Ingestion and safe-keeping of marine data

CINEA/EMFAF/2021/3.4.10/02

Start date of the project: 01/04/2022 (24 months)

Centralisation Phase

Deliverable DAB installation package [D3.4]



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Document info

Title (and reference)	EMODnet Ingestion DAB installation package [D3.4]
WP title (and reference number)	WP3 - Facilitate machine-to-machine transfers
Task (and reference number)	WP3.1 - Connecting more operators and monitoring platforms to the European oceanography data exchange
Authors [affiliation]	Boldrini E [CNR], Novellino A [ETT]
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Near Real Time Data Exchange

1. EMODnet Ingestion

EMODnet Ingestion and safe-keeping of marine data is a trans-thematic platform that seeks to identify and reach out to organisations from research, public, and private sectors who are holding marine datasets and who are not yet connected and contributing to the existing marine data management infrastructures which are driving EMODnet. Those potential data providers should be motivated and supported to release their datasets for safekeeping and subsequent free distribution and publication through EMODnet. EMODnet Ingestion supports two main types of ingestions: the first one concerns delayed mode data for which the Data Ingestion service has been established which forwards ingested data to an expert data center selected from a network of 50 assigned data centers based upon data theme and country of submitter as well as EMODnet specific thematic data centers (ref. HA data, rivers, etc.).

A low threshold is offered by splitting the completion of the submission form in 2 parts, whereby a data submitter only completes a part of the metadata together with the uploading of a data package. Each data submission is then assigned to a competent data centre for completing the metadata of the submission. Thereafter, those completed submissions are published with their data packages “as is” at the portal in the View Submissions service, where users can search, browse and download the data packages.

As a next step, assigned data centres elaborate selected submissions further to make (subsets of) the data fit for population into national, regional, European and EMODnet thematic portals. This depends on data centres assessing the added-value of the submitted data and the efforts needed for elaborating the data to common formats, if anyhow possible. Elaboration includes activities like review, validation, conversions to standard formats, and further population to the relevant European infrastructures such as SeaDataNet, EurOBIS, EGDI, CMEMS, and others, depending of the theme, which then feed into EMODnet data portals.

The second type concerns the real time (RT) and near real time (NRT) data flow from operational oceanographic platforms whose operators would like and include their data and streams in EMODnet Physics offer. Near real time operational ocean data management and exchange processes within this activity are intended to reduce duplication of effort among agencies, to improve quality and reduce costs related to geographic information, thus making oceanographic data more accessible to the public and helping to establish key partnerships to increase data availability.

Within this context, one specific goal of the EMODnet Ingestion is to connect more operators and monitoring platforms to the European oceanography data exchange, by identifying, convincing and supporting more oceanography operators to get connected to the European oceanography data exchange. In practice it implicates two sub-tasks: 1) approaching operators of operational oceanography platforms and networks that are not yet participating in the exchange, and 2) making available (open) tools for facilitating and enabling data sharing.

The EMODnet Ingestion is developing a number of open tools for facilitating and enabling data sharing. One technology is the Discovery and Access Broker (DAB).

2. Discovery and Access Broker (DAB) Framework

The Discovery and Access Broker (DAB) is a set of software technologies developed by CNR-IIA to implement an information Brokering Framework allowing for uniform semantically enriched discovery and access to heterogeneous geospatial data sources, enabling multidisciplinary interoperability integrating GIS and EO data from multiple infrastructures (e.g. INSPIRE compliant, Copernicus services).

The suite is composed of the following macro components:

- Discovery broker: implementing harmonized search from distributed heterogeneous data sources
- Semantic broker: implementing semantic harmonization utilizing distributed ontologies
- Access broker: implementing harmonized access from distributed heterogeneous sources,
- GI-portal: a Web (thin) client to test the suite,
- GI-APIs: high-level JavaScript APIs to make use of the brokering suite.

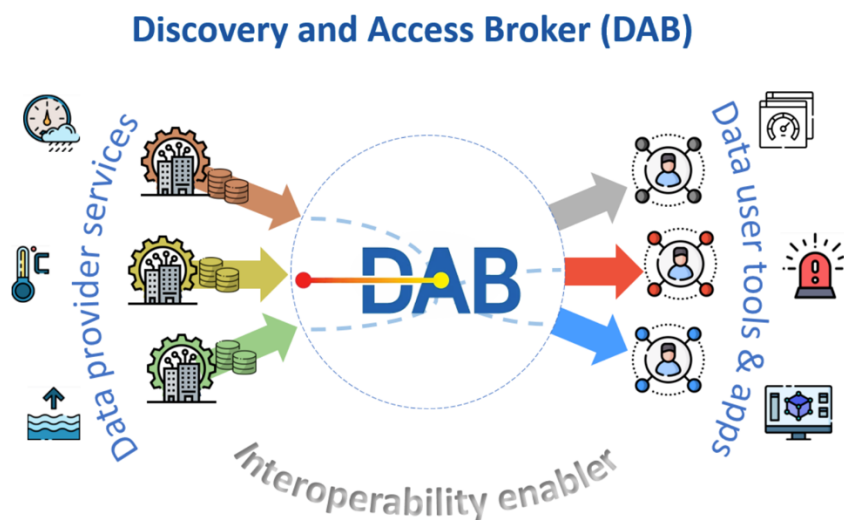


Figure 1. Discovery and Access Broker (DAB) technology to realize a system of systems implementing a brokering approach

The DAB relies on a central harmonized data model composed of more than 400 metadata elements from ISO 19115. Extensions are also available to accommodate community defined additional elements. Heterogeneous data models can thus be mapped against the harmonized model to enable uniform harmonized discovery and access of heterogeneous data resources. DAB is made of pluggable components that can be added to the framework to support additional data provider web service types and additional consumer clients. Different data source types can be accessed by the DAB, having developed and plugged in the DAB framework specific accessor components to provide support for correspondent web service types, including but not limited to ERDDAP, HydroServer, OpenAPI based REST APIs, OGC SOS, etc and one specific use in Ingestion is to leverage the OGC OM-JSON based timeseries API and the (now under definition) OGC Sensor API

The DAB acts as an interoperability enabler between heterogeneous data publication web services and user tools enabling information to flow from providers to consumers. Several discovery and access communication protocols are implemented by the DAB and made available to the user applications including: OpenSearch, OGC CSW, OGC WMS, OGC WFS, OGC WCS, OGC WPS, OGC SOS, CUAHSI WaterOneFlow, ArcGIS REST API, FTP, WAF, THREDDS, OPeNDAP, REST APIs. Several communication protocols are as well

implemented for the connection to the data publication systems, ranging from international, community standards to custom and legacy protocols.

The DAB software has been developed in the context of numerous National, European, and international projects and initiatives, which have been funded and/or operated by different organizations, over the last ten years, including:

- intergovernmental initiatives (GEO, WMO)
- European Union funded projects (e.g. FAIR-EASE, Blue-Cloud2026, TRIGGER, ODIP2, ERA-PLANET, SeaDataCloud, Blue-Cloud, I-CHANGE, EMODNet Ingestion, EuroGEOSS, SeaDataNet II, GEOWOW, ODIP, HMA-IT, ProdTrees, DAB4EDGE, DAB4GPP)
- National and regional agencies (e.g. NSF, MIUR, ARPA-ER, ISPRA)

In 2011, the SeaDataNet data platform started utilizing the DAB technology to enable the discovery and access of different international ocean data sources. The DAB mediation and brokering services were also applied by the ODIP community to interconnect the ocean information system-of-systems from USA, Australia, and Europe.

As from 2012, the DAB technology has been utilized by GEO (the Group of Earth Observation) as the enabling component of the GEO-DAB: the brokerage data services middleware of the GEOSS (Global Earth Observation System of Systems) platform (formerly known as GCI). GEO-DAB is deployed and operated on a scalable cloud infrastructure.

As of 2017, the DAB software has been also adopted by WMO as one of the enabling technologies of the WMO Hydrological Observing System (WHOS): a system of systems capable to share hydrological data, at a global scale.

3. WMO Hydrological Observing System (WHOS) use case

3.1. WHOS

The WMO Hydrological Observing System (WHOS) is the framework for reliable hydrological data exchange and access at national, regional, and international level for all the hydrology data providers and users within and outside the WMO community to achieve interoperability to reduce the barriers to access and use of hydrological data by using standardized and brokering approaches. It plays a key role in providing sustainable data and information exchange infrastructure to support EWS by enabling timely and sustained data access, developing technical capabilities, and promoting the development and implementation of consensus-based data sharing policy. In addition, it supports the WMO Unified Data policy, the Global Basic Observing Network (GBON), and HydroSOS (as a data platform).

WHOS uses open standards and provides a services-oriented framework linking hydrological data providers (heterogeneous sources) and users (multiple uses) through a hydrological information system of systems (SoS) enabling data registration, data discovery and data access as part of the hydrological component of the WMO Integrated Global Observing System (WIGOS) and WMO Information System (WIS). WHOS supports (1) publication of hydrological data on the Internet via web services, (2) brokering and standardization of hydrological data published by heterogeneous data providers, and (3) discovery, access and use of hydrological data within the WHOS network. These WHOS capabilities rely on the use of standardized web services and data formats, such as those stemming from the Open Geospatial Consortium (OGC), International Organization for Standardization (ISO) and World Meteorological Organization (WMO).

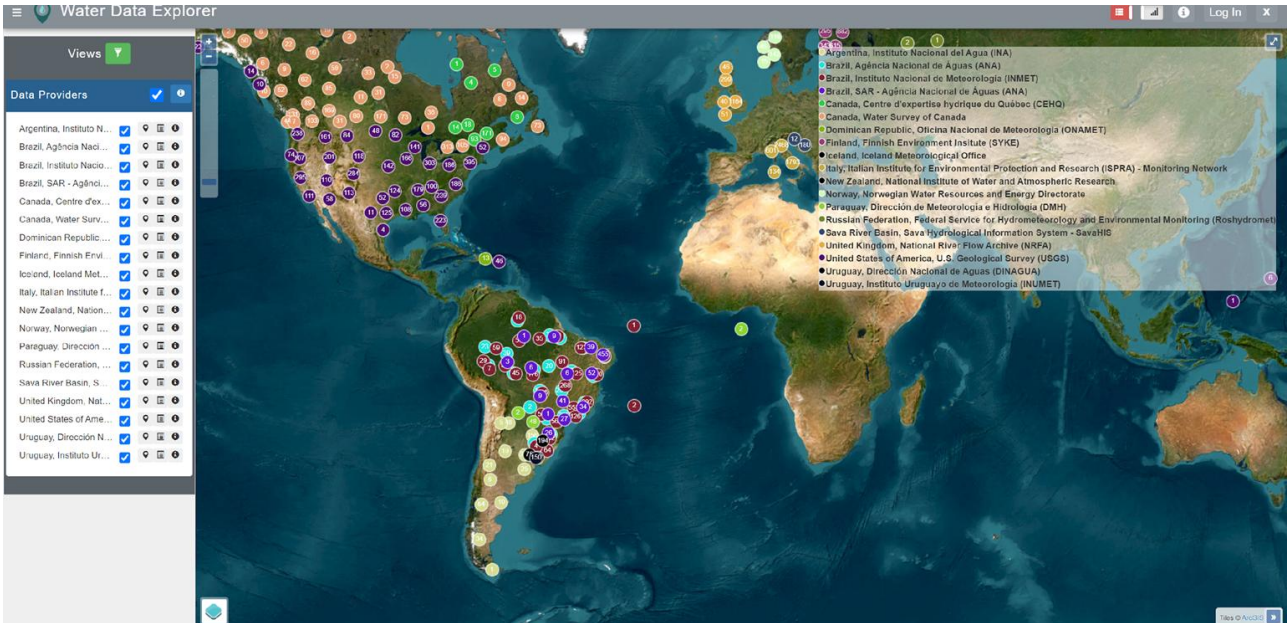


Figure 2. WHOS system

3.2. Integration of the WHOS data into EMODnet Ingestion

In the context of EMODnet ingestion WP3 the DAB is used as an enabling technology to ease pathway of near real time data to the EMODnet Physics portal, as well as other community clients, as shown in the following figure. Different data sources can be accessed by the DAB, including web services implementing ERDDAP, HydroServer and OpenAPI protocols.

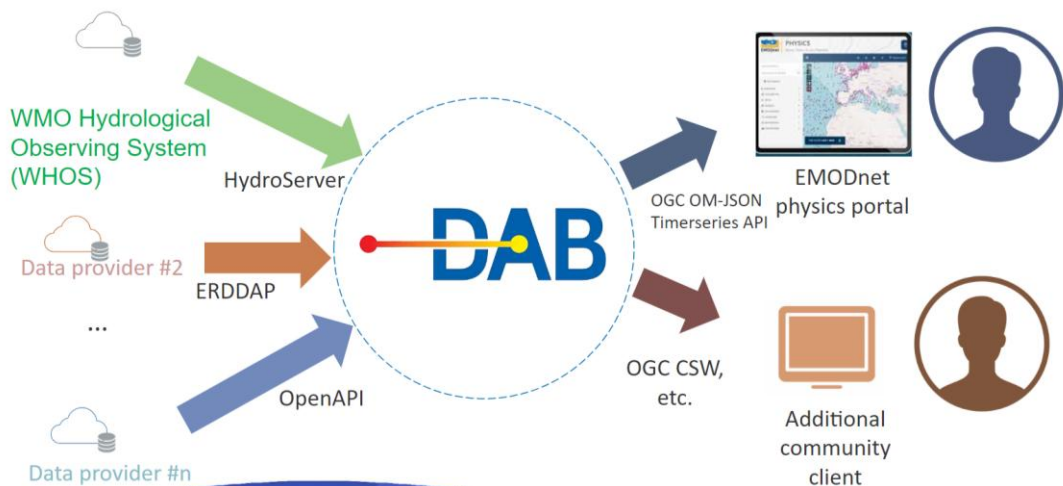


Figure 3. DAB deployment for EMODnet Ingestion

The current work has focused on integration of the World Meteorological Organization (WMO) Hydrological Observing System (WHOS), a system of systems for hydrology data at global scale. This data is relevant also for the marine domain (e.g. considering river-sea interactions such as salinity, littering from rivers), especially interesting are stations at river mouths.

WHOS is the framework for reliable hydrological data exchange and access at national, regional, and international level for all the hydrology data providers and users within and outside the WMO community to achieve interoperability to reduce the barriers to access and use of hydrological data by using standardized and brokering approaches. It plays a key role in providing sustainable data and information exchange infrastructure to support EWS by enabling timely and sustained data access, developing technical capabilities, and promoting the development and implementation of consensus-based data sharing policy. In addition, it supports the WMO Unified Data policy, the Global Basic Observing Network (GBON), and HydroSOS (as a data platform).

Regional WHOS prototypes located in the La Plata Basin in South America (WHOS-Plata), Arctic Region (WHOS-Arctic), and SAVA river basin have now reached their final stage of implementation. National implementations have been carried in the UK, Italy, Dominica Republic, etc.

To easily leverage common WHOS functionalities such as data discovery and data access on the web by means of common web browsers, WHOS web portals are available online. The WHOS-Arctic web portal is implemented using ArcGIS Online for the map interface and USGS GWIS (Graphing Water Information System) for the time-series plots. The WHOS Global portal and La Plata uses the Water data explorer. The Global portal is shown in the following figure, showing the countries currently sharing hydrological data to WHOS.

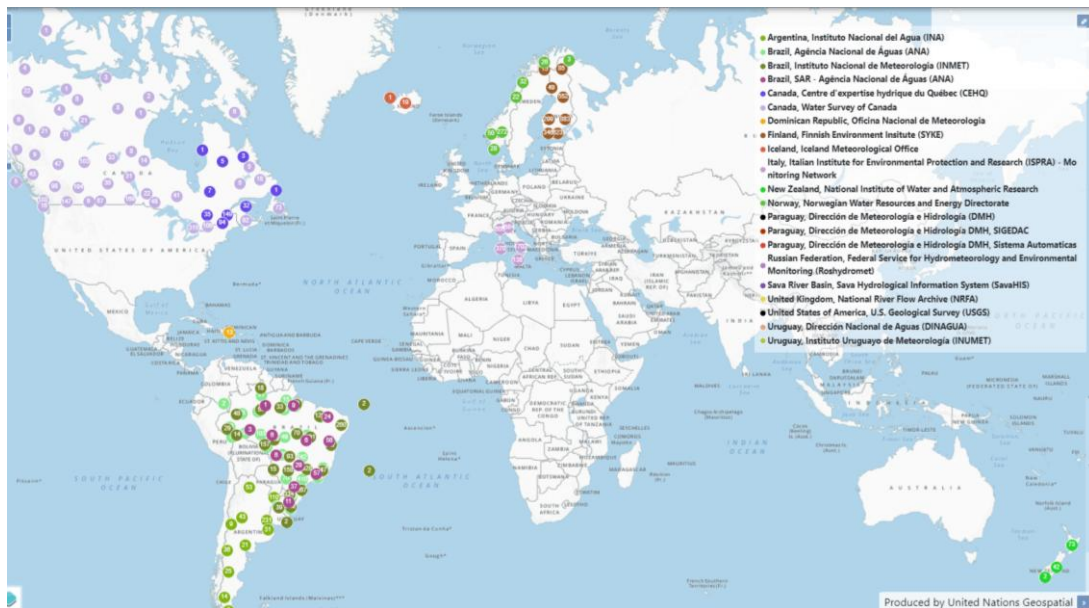


Figure 4. WHOS Global Portal

Data shared by the DAB is accessed by the EMODnet portal through the OGC OM-JSON based timeseries API, described using OpenAPI initiative, as shown in the following figure.

The DAB O&M REST API eases the discovery and access of observation data (both timeseries and trajectories). It has been designed to be compliant with GeoJSON1 and OGC Observations and Measurements – JSON implementation (OM-JSON)².

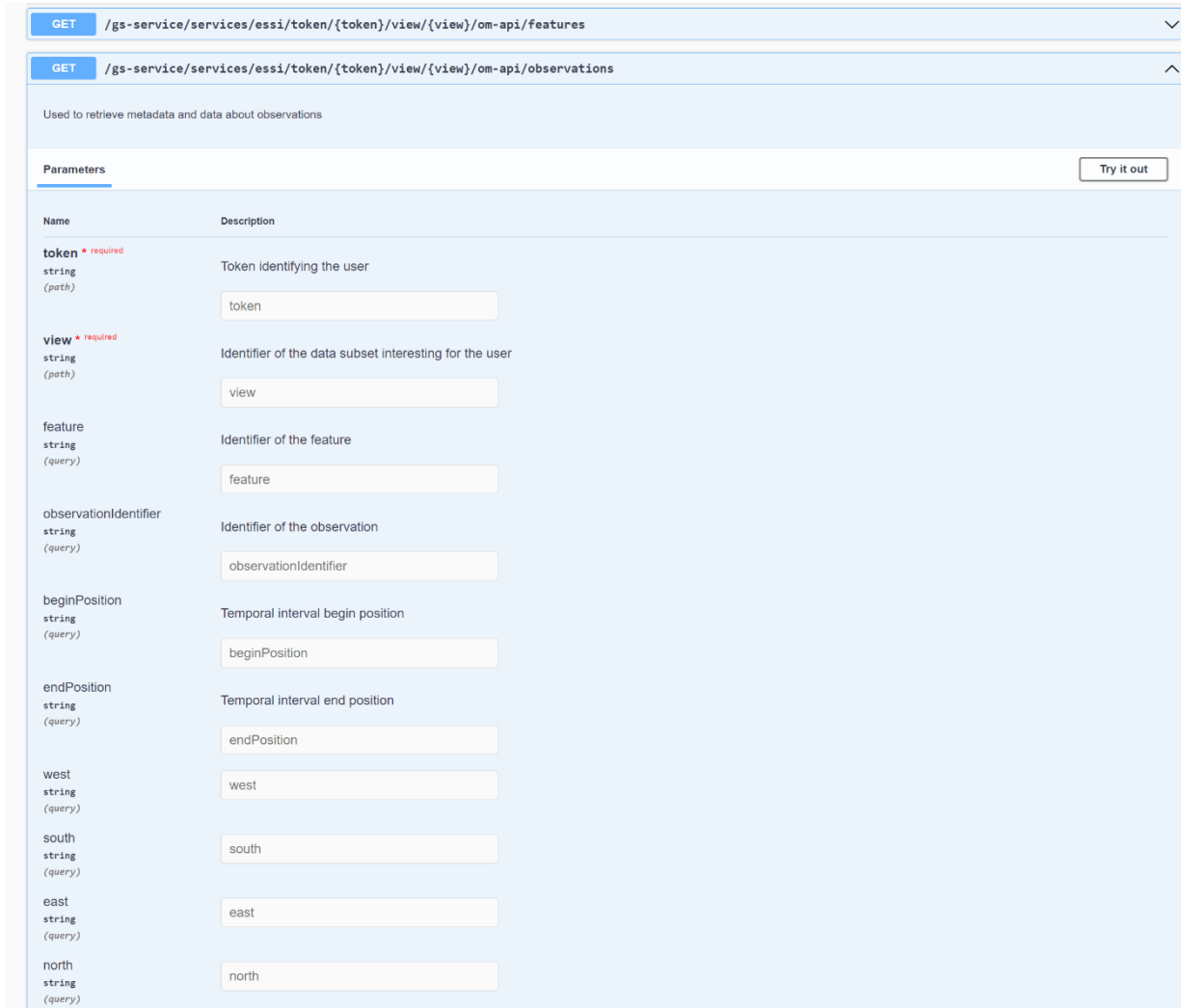


Figure 5 Discovery and access API for Observations & Measurements

This RESTful API contains two paths based on two main resource types:

- **Features:** used to search and list information about the available features; they can be filtered by feature identifier, observation identifier, spatial bounding box, country, and responsible data provider.
- **Observations:** used to retrieve metadata and data about observations; they can be filtered by features, observation identifier, observed property, ontology, time interpolation, etc. Data points can also be optionally included in the response, as well specifying a temporal subset.

¹ <https://www.rfc-editor.org/rfc/rfc7946>

² <https://www.ogc.org/standard/om/>

Both operations support resource pagination. The interaction with this API made by the EMODnet portal is detailed in the following steps:

- At regular intervals (e.g. one week) all WHOS metadata is collected by the EMODnet portal. The features and their metadata are retrieved using the first path (e.g., this information includes the fixed station names and their location). Information about observations acquired over a specified feature is retrieved using the second endpoint. These metadata elements include for each observation the observed parameter, temporal extent, originator organization, etc.
- At this point the EMODnet portal has all the information needed to display station locations on its map and available observations at this site.

Time series are retrieved using the second path specifying the parameter to include data, as well as the period of interest. These are plotted in an appropriate panel in consequence of a user clicking on a plotting button.

4. Outcomes

Technically the integration was successfully demonstrated as the following figures show, however data policies need to be carefully investigated and a meeting arranged between EMODnet and WHOS secretariat to approve the connection and distribution modalities on the whole or a subset of data shared by WHOS.



EMODnet



European Marine
Observation and
Data Network

EMODnet Ingestion and safe-keeping of marine data

CINEA/EMFAF/2021/3.4.10/02

Start date of the project: 01/04/2022 (24 months)

Centralisation Phase

Deliverable SWE to ERDDAP module [D3.5]



Disclaimer

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Document info

Title (and reference)	EMODnet Ingestion SWE to ERDDAP module [D3.5]
WP title (and reference number)	WP3 - Facilitate machine-to-machine transfers
Task (and reference number)	WP3.1 - Connecting more operators and monitoring platforms to the European oceanography data exchange
Authors [affiliation]	Alba M, Viglino P, Novellino A[ETT]
Dissemination level	Public (CC-BY)
Submission date	30/03/2024
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2. Join the European operational oceanography exchange	3
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4. Launching an ERDDAP server and loading the data.....	7

Near Real Time Data Exchange

1. EMODnet Ingestion

EMODnet Ingestion and safe-keeping of marine data is a trans-thematic platform that seeks to identify and reach out to organisations from research, public, and private sectors who are holding marine datasets and who are not yet connected and contributing to the existing marine data management infrastructures which are driving EMODnet. Those potential data providers should be motivated and supported to release their datasets for safekeeping and subsequent free distribution and publication through EMODnet. EMODnet Ingestion supports two main types of ingestions: the first one concerns delayed mode data for which the Data Ingestion service has been established which forwards ingested data to an expert data center selected from a network of 50 assigned data centers based upon data theme and country of submitter as well as EMODnet specific thematic data centers (ref. HA data, rivers, etc.).

A low threshold is offered by splitting the completion of the submission form in 2 parts, whereby a data submitter only completes a part of the metadata together with the uploading of a data package. Each data submission is then assigned to a competent data centre for completing the metadata of the submission. Thereafter, those completed submissions are published with their data packages “as is” at the portal in the View Submissions service, where users can search, browse and download the data packages.

As a next step, assigned data centres elaborate selected submissions further to make (subsets of) the data fit for population into national, regional, European and EMODnet thematic portals. This depends on data centres assessing the added-value of the submitted data and the efforts needed for elaborating the data to common formats, if anyhow possible. Elaboration includes activities like review, validation, conversions to standard formats, and further population to the relevant European infrastructures such as SeaDataNet, EurOBIS, EGDI, CMEMS, and others, depending of the theme, which then feed into EMODnet data portals.

The second type concerns the real time (RT) and near real time (NRT) data flow from operational oceanographic platforms whose operators would like and include their data and streams in EMODnet Physics offer. Near real time operational ocean data management and exchange processes within this activity are intended to reduce duplication of effort among agencies, to improve quality and reduce costs related to geographic information, thus making oceanographic data more accessible to the public and helping to establish key partnerships to increase data availability.

2. Join the European operational oceanography exchange

EMODnet Ingestion aims at making marine data part of the European data management infrastructures. This concerns marine data from the European seas and coastal waters from diverse governmental, research and private sources. It concerns data that have been collected by all kinds of surveys, campaigns, and projects.

It also concerns operational oceanography that is the systematic and long-term routine measurements, interpretation and dissemination of the ocean (and atmosphere) data. These data are collected by fixed and moving platforms such as fixed stations, moorings, buoys, tide gauges, surface drifters, ferryboxes, argo floats, gliders, HF radars and other platforms.

Making operational data available in the EMODnet Map Viewing service under EMODnet Physics and EMODnet Ingestion themes is particularly important to provide users a single place where to see what, where, how is collected at the sea as well as to reduce duplication of effort among agencies, to improve quality and reduce costs related to geographic information, thus making oceanographic data more accessible to the public and helping to establish key partnerships to increase data availability.

At present EMODnet provides access to data timeseries of more than 25.000 platforms as illustrated in the map above.

Each platform may provide one or more physical parameters of the sea, namely sea surface temperature, temperature in the water body column, sea surface salinity, sea salinity in the water column, sea surface currents, sea level, wave direction, wave peak, waves frequency, atmospheric pressure at sea level, sea turbidity, and chlorophyll(a).

Operators of physical oceanography monitoring platforms that are not yet available in EMODnet Physics portal are encouraged to get connected and make their data streams available in near real time, as monthly time series, and as archived and validated long timeseries.

To facilitate this data sharing action, EMODnet Ingestion is adopting and developing a number of tools to facilitate the M2M across marine data services such as ERDDAP, Data Access Broker (DAB) and the Sensor Web Enablement.

In line with planned action, the centralization phase, and the fact that since the GOOS OCG group indicated and promoted ERDDAP as the tool for facilitating FAIRness interoperability (end of 2020), ERDDAP recorded a massive adoption among data providers, EMODnet Ingestion planned a dedicated action to desing a SOS SWE to ERDDAP module.

This deliverable presents the SWE to ERDDAP module and an “how to” guide to implement locally this service.

SWE to ERDDAP module

This section illustrates a software module's workflow that gathers data from a Sensor Observation Service and creates a CSV file that will be loaded into ERDDAP.

All the Python code used in this document can be found and run at the Colab:

<https://colab.research.google.com/drive/16sXe3KyIKrJ35Gr0A2Sdi-KQwZZVn3Of>

3. Connecting to SOS service, gathering and elaborating data

The first required steps are the installation of the sos4py package (with pip install sos4py) and its import along with other necessary packages:

```
from sos4py.main import connection_sos
import datetime as dt
```

After installing and importing the necessary packages and the 'connection_sos' method from sos4py.main it is possible to establish a connection to a SOS server by passing the URL as parameter to the method:

```
fluggs_sos = connection_sos('https://fluggs.wupperverband.de/sws5/service')
```

The sos connection methods

```
sosPhenomena()
```

and

```
sosFeaturesOfInterest()
```

return two lists containing respectively all the available phenomena (observed properties) and all the available features of interest (sites).

sosPhenomena:

```
['Abfluss', 'Elektrische_Leitfaehigkeit', 'Luftfeuchte', 'Lufttemperatur', 'Niederschlagshoehe']
```

sosFeaturesOfInterest:

```
['Barmen_Wupperverband_Hauptverwaltung', 'BayerSportpark__Berger_Gruppe', 'Bever-Talsperre', 'Bever-Talsperre_Absperrbauwerk', 'Bever-Talsperre_Windenhaus']
```

By using values from this lists it is possible to get the data from the established connection by passing the desired sites and observations as parameters (in lists):

```
phenomena = ['Wassertemperatur']
sites = ['Bever-Talsperre_Absperrbauwerk']

data_frame = fluggs_sos.get_data(sites=sites,
                                phenomena=phenomena,
                                procedures=['Oberflaeche'],
                                begin='2019-01-01T10:00:00Z',
                                end='2019-06-01T10:00:00Z')
data_frame = data_frame.dropna(axis=1)
data_frame.head()
```

	site	procedure	phenomenon	result_time	value	unit
0	Bever-Talsperre_Absperrbauwerk	Oberflaeche	Wassertemperatur	2019-01-01 23:00:00+00:00	5.2	°C
1	Bever-Talsperre_Absperrbauwerk	Oberflaeche	Wassertemperatur	2019-01-02 23:00:00+00:00	5.0	°C
2	Bever-Talsperre_Absperrbauwerk	Oberflaeche	Wassertemperatur	2019-01-03 23:00:00+00:00	5.0	°C
3	Bever-Talsperre_Absperrbauwerk	Oberflaeche	Wassertemperatur	2019-01-06 23:00:00+00:00	4.9	°C
4	Bever-Talsperre_Absperrbauwerk	Oberflaeche	Wassertemperatur	2019-01-07 23:00:00+00:00	5.2	°C

Once the data is gathered it can be elaborated by using pandas:

```
def iso_to_timestamp(iso_date):
    return dt.datetime.timestamp(iso_date)

data_frame = data_frame.drop(columns=['phenomenon', 'procedure',
                                     'site', 'unit'],
                             axis=1)
data_frame['DEPTH'] = 0 # Oberflaeche = surface
data_frame['result_time'] = data_frame['result_time'].apply(iso_to_timestamp)

data_frame.rename(columns={"result_time": "TIME", "value": "TEMP"},
                  inplace=True)
data_frame.head()
```

	TIME	TEMP	DEPTH
0	1.546384e+09	5.2	0
1	1.546470e+09	5.0	0
2	1.546556e+09	5.0	0
3	1.546816e+09	4.9	0
4	1.546902e+09	5.2	0

After the data has been elaborated a CSV can be created by calling the pandas.DataFrame method

to_csv():

```
filename = sites[0].lower()
data_frame.to_csv(f'{filename}.csv', index=False)
```

The first 5 lines of the csv file will be:

```
TIME,TEMP,DEPTH
1546383600.0,5.2,0
1546470000.0,5.0,0
1546556400.0,5.0,0
1546815600.0,4.9,0
```

4. Launching an ERDDAP server and loading the data

The next step is cloning the repository EMODnet-Physics/erddap-docker-generic with:

```
git clone https://github.com/EMODnet-Physics/erddap-docker-generic.git
```

Once the repository has been cloned a ERDDAP server can be launched by following the instructions found at the repository:

[EMODnet Physics erddap-docker-generic](#)
or in the README.md file in the cloned repository.

After the ERDDAP has been launched the next step is adding the configuration file so that the ERDDAP server will load the data from the CSV file.

The XML configuration file for this example is:

```
<dataset type="EDDTableFromAsciiFiles" datasetID="bever-talsperre_absperrebauwerk" active="true">
  <reloadEveryNMinutes>10080</reloadEveryNMinutes>
  <updateEveryNMillis>10000</updateEveryNMillis>
  <fileDir>/Data/others/</fileDir>
  <fileNameRegex>.*\.csv</fileNameRegex>
  <recursive>true</recursive>
  <pathRegex>.*</pathRegex>
  <metadataFrom>last</metadataFrom>
  <standardizeWhat>0</standardizeWhat>
  <charset>UTF-8</charset>
  <columnSeparator>,</columnSeparator>
  <columnNamesRow>1</columnNamesRow>
  <firstDataRow>2</firstDataRow>
  <sortedColumnName></sortedColumnName>
  <sortFilesBySourceNames></sortFilesBySourceNames>
```



```
<fileTableInMemory>false</fileTableInMemory>
<addAttributes>
  <att name="cdm_data_type">Other</att>
  <att name="Conventions">COARDS, CF-1.10, ACDD-1.3</att>
  <att name="infoUrl">??</att>
  <att name="institution">??</att>
  <att name="keywords">data, depth, local, source, TEMP, temperature, time</att>
  <att name="license">[standard]</att>
  <att name="sourceUrl">(local files)</att>
  <att name="standard_name_vocabulary">CF Standard Name Table v70</att>
  <att name="summary">Data from a local source.</att>
  <att name="title">Data from a local source.</att>
</addAttributes>
<dataVariable>
  <sourceName>TIME</sourceName>
  <destinationName>time</destinationName>
  <dataType>double</dataType>
  <!-- sourceAttributes>
</sourceAttributes -->
  <addAttributes>
    <att name="long_name">TIME</att>
    <att name="units">seconds since 1970-01-01T00:00:00Z</att>
  </addAttributes>
</dataVariable>
<dataVariable>
  <sourceName>DEPTH</sourceName>
  <destinationName>depth</destinationName>
  <dataType>float</dataType>
  <!-- sourceAttributes>
</sourceAttributes -->
  <addAttributes>
    <att name="long_name">Depth</att>
    <att name="standard_name">depth</att>
    <att name="units">m</att>
  </addAttributes>
</dataVariable>
<dataVariable>
  <sourceName>TEMP</sourceName>
  <destinationName>TEMP</destinationName>
  <dataType>float</dataType>
  <!-- sourceAttributes>
</sourceAttributes -->
  <addAttributes>
    <att name="long_name">Temperature</att>
  </addAttributes>
</dataVariable>
</dataset>
```

This XML will be then copied and inserted into

```
erddap-docker-generic\customdocker\erddap-docker\volumes\Content\datasets.xml
```

before the last line

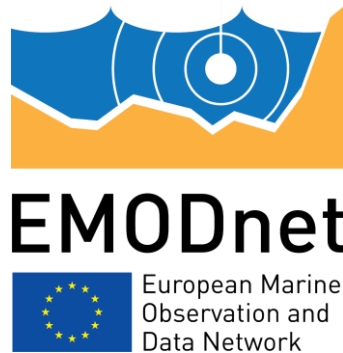
```
</erddapDatasets>
```

After this has been done the ERDDAP server will be ready to load the data from the CSV file.

The next step is moving the CSV file (in this example: bever-talsperre_abspernbauwerk.csv) into the folder:

```
erddap-docker-generic\customdocker\erddap-docker\volumes\Data
```

And start the ERDDAP server.



EMODnet Ingestion and safe-keeping of marine data

CINEA/EMFAF/2021/3.4.10/02/SI2.868290

Start date of the project: 30/03/2022 (24 months)

Centralisation Phase

D4.7 - Report on Workshop about initiating a Roadmap towards more harmonised approach for license data



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Document info

Title (and reference)	D4.7 - Report on Workshop about initiating a Roadmap towards more harmonised approach for license data
WP title (and reference number)	Marketing and Outreach (WP 4)
Task (and reference number)	Task 9 - Improving and documenting the availability of data for coastal and offshore licensing procedures
Authors [affiliation]	David Geurts (Deltares), Sonja Wanke (Deltares),
Dissemination level	
Submission date	March 2024
Deliverable due date	March 2024

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D4.7 - Report on Workshop about initiating a Roadmap towards more harmonised approach for license data

1 Introduction and Background

On February 29, 2024, stakeholders from 18 different countries gathered for the EMODnet Ingestion workshop, focusing on data management in offshore licensing procedures. The workshop, organized by EMODnet and facilitated by Deltares, aimed to provide an overview of the diverse approaches and practices surrounding marine data management in offshore licenses, particularly in the aquaculture and renewable energy sectors. In addition to this, it was explored if a harmonized approach for data management in offshore licensing procedures is desirable. With around 65 participants (also see Annex 2 for list of registrations) actively engaging in discussions, the workshop laid the foundation for the development of a roadmap towards more coherent data management within offshore licensing procedures.

Participants were welcomed to the workshop by Zoi Konstantinou, a policy officer at DG MARE representing the European Commission. She stressed the importance of harmonized data management within licensing procedures and highlighted the advantages thereof. Subsequently, Dick Schaap, the coordinator of EMODnet Ingestion, delivered an introductory presentation on the scope and objectives of EMODnet. Please see Annex 1 for an overview of the agenda and background information.

2 Results and Outcomes

2.1 Current Practices in Offshore Renewable Energy and Aquaculture Licensing

As part of EMODnet Ingestion, an analysis was conducted on the offshore licensing procedures, with a specific focus on offshore aquaculture and renewable energy activities. This analysis revealed diverse approaches and practices related to data management within these processes. During the workshop, a total of six current practices in offshore renewable energy and aquaculture licensing were introduced.

Italy

Ing. Alessandro Severini, Founder and Project Manager of iL Studio srl (Studio Severini), highlighted the current permitting practices for offshore wind farms in Italy. He also voiced his concern about the amount of data that is marked as confidential by offshore operators due to the high costs associated with data collection.

Malta

Francesco Lombardo, Chief Scientific Officer at the Department of Fisheries and Aquaculture from the Aquaculture Directorate, presented the licensing process for offshore aquaculture in Malta. He also provided an overview of the relevant stakeholders in this process.

Estonia

Merilin Kraun from the Consumer Protection and Technical Regulatory Authority introduced Estonia's licensing procedures for offshore aquaculture and renewables. Estonia currently has an identical licensing procedure for offshore renewables and offshore aquaculture. Additionally, the number of permits for offshore wind farms will be reduced from three to one to expedite planning.

France

Fanny Faure, Head of the Aquaculture Office from France's Ministry of the Sea, introduced the offshore licensing procedures for France and presented the platform that is used to visualize the location of offshore activities.

Bulgaria

Mira Robinson, Head of Department Marine Waters Conservation and Monitoring from Bulgaria's Black Sea Directorate, introduced the data management procedures that are in place for the Black Sea.

United Kingdom

For the UK, an overview of the licensing procedures for aquaculture and renewable energy was provided by Mark Hebden from the British Oceanographic Data Centre. In the UK, data management is supported via the Marine Data Exchange platform of The Crown Estate.

The presentations are made available at a dedicated page at the [Ingestion portal](#).

2.2 Discussion on Harmonization of Data Management in Offshore Licensing Procedures

The presentations from country representatives on current licensing procedures in various member states were utilized to initiate discussions on the feasibility and desirability of a harmonized approach. During the discussion, it became apparent that the majority of the participants were in favor of a more harmonized approach for data management in offshore licensing procedures. They also agreed, that efforts for harmonization should primarily focus on the EU level. Only a limited number of participants indicated that the focus should be more on the national level.

In addition to this, attendees identified various potential benefits of harmonization in data management. These benefits included improved accessibility, comparability and usability of data.

Furthermore, it was discussed which role EMODnet could play in supporting activities towards a harmonized approach. In this regard, participants indicated that EMODnet could play a role in capacity building. This can be achieved by contributing to training activities and providing guidance and examples of best practices. Additionally, EMODnet can also promote awareness on data collection. Lastly, participants considered EMODnet as a potential facilitator of dialogues between countries.



Figure 1. Overview of benefits of a harmonized approach for data management in offshore licensing according to workshop participants.

3 Next steps

The workshop served as a first step in exploring the opportunities for a more harmonized approach in data management within licensing procedures. The outcomes are used as input to define the scope and activities of the next phase of the EMODnet Ingestion project. As part of this, a roadmap will be developed to promote the harmonization of data management within offshore licensing procedures. The full details of the next steps are described in the Proposal for EMODnet Ingestion Phase IV.

Annex 1: Invitation and Agenda

Stakeholder Workshop EMODnet Ingestion:

Data Management in Offshore Licensing Procedures

We are pleased to invite you to participate in an insightful workshop organized by EMODnet, the European Union's central hub for in situ data, data products, and services related to the ocean, marine, and coastal waters. This workshop is specifically focused on advancing management practices across member states for marine data acquired as part of offshore license procedures.

Background and Purpose:

EMODnet plays a pivotal role in shaping the landscape of marine data practices within the European Union. The recent analysis conducted as part of EMODnet Ingestion, with a specific focus on offshore aquaculture and renewable energy activities, has revealed diverse approaches and practices related to the availability of marine datasets collected in the framework of offshore licenses. This diversity presents an excellent opportunity to refine our understanding and explore the feasibility of a more harmonized approach.

Objectives:

1. **Presentation and Discussion of Current Practices:** Findings on current practices in different Member States will be presented and discussed.
2. **Exploration of Harmonization Feasibility:** Initiate a discussion and brainstorming to assess whether a harmonized approach is desirable and feasible, both between and within Member States.
3. **Initiate the Development of a Roadmap:** The workshop aims to lay the groundwork for a roadmap towards a more harmonized approach to data acquisition and management within license procedures.

Date and Format:

- **Date:** February 29, 2024
- **Time:** 14.00 to 16.30 CET
- **Format:** Online and moderated by Deltares

Draft Agenda:

14:00 - 14:15 | Welcome and Introduction of Workshop Goals (EC and Deltares)

14:15 - 14:30 | Overview of EMODnet and activities of EMODnet Ingestion (MARIS)

14:30 - 16:00 | Current Practices in Offshore Renewable Energy and Aquaculture Licensing

- **Estonia – Aquaculture**
- **United Kingdom – Renewable Energy**
- **Malta – Aquaculture**
- **Bulgaria – Aquaculture**
- **Italy – Renewable Energy**
- **France - Aquaculture**

16:00 - 16:20 | Exploration of Roadmap and Next Steps

16:20 - 16:30 | Closing Remarks and Acknowledgements (Deltares)

Annex 2: List of Registrations

Organisation	Country
EMODnet	Belgium
European Commission	Belgium
OD Nature - MUMM	Belgium
RBINS	Belgium
FPS Economy	Belgium
MUMM/KBIN	Belgium
RBINS	Belgium
VLIZ	Belgium
IO-BAS	Bulgaria
TSU - Iv.Javakhishvili Tbilisi State University	Bulgaria
Black Sea Basin Directorate	Bulgaria
Executive Agency for Fisheries and Aquaculture	Bulgaria
ICES	Denmark
Estonian Consumer Protection and Technical Regulatory Authority	Estonia
TUT Department of Marine Systems	Estonia
general directory for maritime affairs, fishery and aquaculture, state secretariat for the sea	France
DGEC	France
DGAMPA	France
Ministry of Economy / DGEC	France
Shom	France
Shom	France
Shom	France
DGAMPA - BAQUA	France
DG Maritime Affairs, fisheries and aquaculture	France
National Environmental Agency	Georgia
Tbilisi State University, TSU/DNA	Georgia
HCMR	Greece
Icelandic Food And Veterinary Authority - MAST	Iceland
Icelandic Food And Veterinary Authority - MAST	Iceland
Environment Agency of Iceland	Iceland

MFRI - Marine and Freshwater Research Institute in Iceland	Iceland
Marine Institute	Ireland
Marine Institute	Ireland
Marine Institute	Ireland
Marine Institute	Ireland
Marine Institute	Ireland
National Institute of Oceanography and Applied Geophysics - OGS	Italy
ETT	Italy
INGV	Italy
ENEA	Italy
ETT S.p.A.	Italy
iLStudio Engineering & Consulting Studio srl	Italy
EMODnet	Italy
iLStudio Engineering & Consulting Studio srl	Italy
MAL	Latvia
Maritime administration of Latvia (MAL)	Latvia
Ministry of Agriculture of Latvia	Latvia
Ministry of Agriculture	Latvia
Ministry of Climate and Energy	Latvia
Latvian Institute of Aquatic Ecology	Latvia
Environment State Bureau	Latvia
Latvian Institute of Aquatic Ecology	Latvia
Latvian Institute of Aquatic Ecology	Latvia
Latvian Institute of Aquatic Ecology	Latvia
University of Malta	Malta
Department of Fisheries and Aquaculture	Malta
Environment and Resource Authority	Malta
Ministry for Agriculture, Fisheries and Animal Rights (MAFA) - Department of Fisheries and Aquaculture (DFA)	Malta
Department of Fisheries and Aquaculture " MAFA	Malta
Environment Resource Authority	Malta
Institute of Marine Research	Norway
ICM-CSIC	Spain

SMHI	Sweden
SMHI	Sweden
EMODnet	The Netherlands
Deltares	The Netherlands
Deltares	The Netherlands
Marine data and information center NL	The Netherlands
MARIS	The Netherlands
National Oceanography Centre (NOC) - British Oceanographic Data Centre (BODC)	UK
JNCC	UK