EMODnet Thematic Lot n°3 – Physics

EASME/EMFF/2020/3.1.11/Lot4/SI2.838612

Start date of the project: 23/08/2023 (24+24 months)

Centralisation Phase

Quarterly Progress Report (Q4.2023)

Reporting Period: *01/10/2023 – 31*/12/*2023*

The European Marine Observation and Data Network (EMODnet) is financed by the European Union under Regulation (EU) 2021/1139 of the European Parliament and of the Council of 7 July 2021 establishing the European Maritime, Fisheries and Aquaculture Fund and its predecessor, Regulation (EU) No. 508/2014 of the European Parliament and of the Council of 15 May 2014 on the European Maritime and Fisheries Fund.

Contents

1. Highlights in this quarter

Task 1: Maintain and improve a common method of access to data held in repositories

Now that the new central portal is operational, Task 1 is primarily focused on improving the data flow towards this new central portal interface. This consists of refining the back-end interfaces to serve the central portal requirements. The primary focus during this phase is to keep updating the organization of metadata, data, data collections and products in the Physics backend.

As already reported, we are considering the following definitions: 1) data is a series of values (e.g., timeseries, profiles) sampled by an in-situ platform, 2) data collection is a grouping of similar in situ data (e.g., all CTD data, all sea level data with a sampling frequency of at least one value every 5 minutes, sea surface currents from HFR, in-situ data from a specific source), 3) product is the outcome of a reprocessing method, such as the PSMSL (monthly means) RLR or the Coriolis Ocean dataset for Reanalysis (CORA). The outcome of a numerical model (that uses in situ data) is a product. The result of QC/QF procedure is not considered a product; instead, it is a qualified dataset or qualified data collection.

This workflow also includes the very important collaboration with Ingestion in order to include and link more sources, where the freshly connected new data (referred “as-is”) are “data” (1) which may have or not applied standards to be included into collections. This is also mirrored into the available endpoints which have been extended with a new one (the ingestion one - hosted by the physics infrastructure). The endpoints are:

1. https://ingestion-erddap.emodnet-physics.eu
2. https://data-erddap.emodnet-physics.eu/erddap
3. https://prod-erddap.emodnet-physics.eu/erddap/index.html

data-erddap hosts data collections, and for each collection there is a 'metadata' dataset to provide the user with information such as the list of platforms available in the datasets, the providers of those platforms, and the first available measurement, etc.

To further improve these catalogues, there is an on-going action to define a dedicated controlled vocabulary (i.e. P033 that will be hosted under NVS-BODC services).

Task 2: Construct products from one or more data sources that provide users with information about the distribution and quality of parameters in time and space

The following products were updated and made available (as links to the Physics Static page): the CORA – Coriolis Ocean datasets for reanalysis (research quality until 2022)[1]; the temperature and salinity along the trajectories (extended with views until 12 months)[2]. Concerning the data collections, they were extended in time and space
(18.080 ARGO, 25.989 Drifting Buoys, 716 Glider missions, 2361 Moorings, 865 operational River Station, 330 Underway data Vessels, 5.173 Tide Gauge, and more than 4.000.000 data from CTD/XBT/bottles etc.)

Task 3. Develop procedures for machine-to-machine connections to data and data products

Activities were focused on actions in support of Task 1 and in promoting the adoption of ERDDAP as the tool for implementing native machine-to-machine interoperability. As anticipated, there is an on going action with new providers

[1] TEMP_001 https://productmaps.s4oceandata.eu/EP_MAP_TEMP_001/;
PSAL_001 https://productmaps.s4oceandata.eu/EP_MAP_PSAL_001/
[2] TEMP_002 https://productmaps.s4oceandata.eu/EP_MAP_TEMP_002/;
PSAL_002 https://productmaps.s4oceandata.eu/EP_MAP_PSAL_002/

from Australia and New Zealand. A first package, from Fishing Vessels participating to the MOANA project[3], have already been integrated "as-is".

https://ingestion-erddap.emodnet-physics.eu/erddap/tabledap/moanaproject.html

Task 4. Contribute data, data products and content to a central portal that allows users to find, view and download data and data products

Task 4 focused on improving the user experience when downloading in situ data from EMODnet Physics layers. When the user selects the 'in situ' layer from Physics, the central viewer displays the positions of the in situ platforms. As already described there EMODnet Physics uses a series of tools to provide the CP with the Physics layers, data, and products.

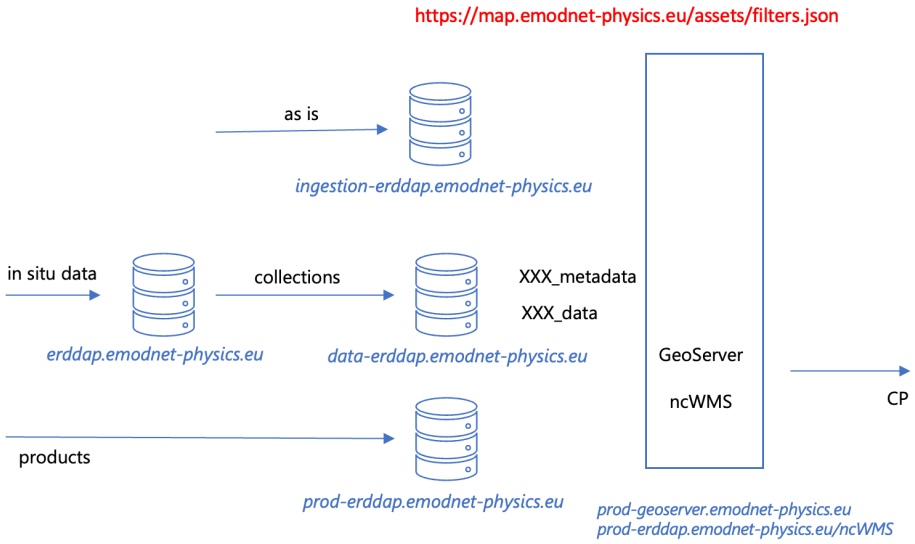


Figure 1. EMODnet Physics Platform page in the Central viewer platform popup feature

As described in Figure 1 EMODnet Geoserver (prod-geoserver.emodnet-physics.eu) provides the CP with layers WMS/WFS. For the in situ data and collections, the layer is offering the position of the platform (type of the platform) and the WFS is offering the platform page html (metadata and charts). The html pages are populated with data from the collections in the ERDDAP. The specific endpoint for harvesting the data collection is:
https://data-erddap.emodnet-physics.eu/erddap

This endpoint is offering the data collection and each data collection, a 'metadata' dataset is published to provide the user with information such as the list of platforms available in the datasets, the providers of those platforms, and the first available measurement, etc. Both the metadata collection and data collection use common standards (e.g. NVS vocabularies for parameters, units, etc). As an example, if we work with river data (RVDS), if we query ERDDAP:

[3] https://www.moanaproject.org/temperature-sensors

Do a Full Text Search for Datasets:
ERD_EP_RVDS_INSITU Search

2 matching datasets, with the most relevant ones listed first.
(Or, refine this search with Advanced Search)

Grid DAP Data	Sub-set	Table DAP Data	Make A Graph	WMS	Source Data Files	Title	Sum-mary	FGDC, ISO, Metadata	Back-ground Info	RSS	E mail	Institution	Dataset ID
	set	data	graph			EMODnet Physics - Collection of river flow (SDN:P02::RVDS) variables - MultiPointsObservation		F I M	background	RSS		EMODnet Physics	ERD_EP_RVDS_INSITU
	set	data	graph		files	EMODnet Physics - Collection of river flow (SDN:P02::RVDS) variables - MultiPointsObservation - METADATA		F I M	background	RSS		EMODnet Physics	ERD_EP_RVDS_INSITU_METADATA

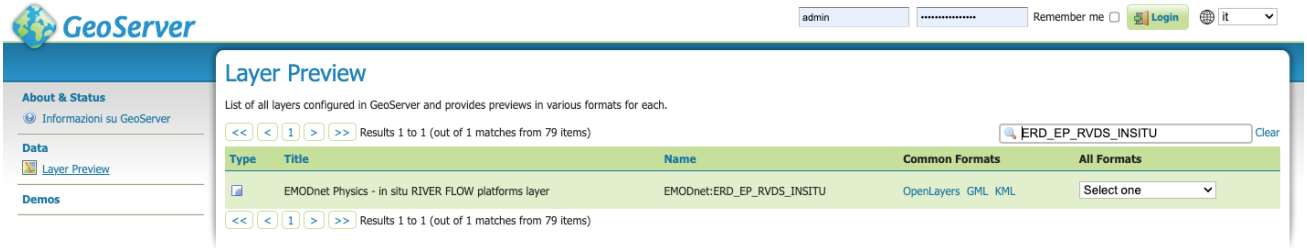
The information in the table above is also available in other file formats (.csv, .htmlTable, .itx, .json, .jsonlCSV1, .jsonlCSV, .jsonlKVP, .mat, .nc, .nccsv, .tsv, .xhtml) via a RESTful web service.

The metadata (e.g. ERD_EP_TS_RVFL_NRT_METADATA) describes the what, when, how, who:
https://data-erddap.emodnet-physics.eu/erddap/tabledap/ERD_EP_RVDS_INSITU_METADATA.html

PLATFORMCODE	call_name	latitude	longitude	fristDateObservation	lastDateObservation	parameters_
		degrees_north	degrees_east	UTC	UTC	
AbbevilleSomme	AbbevilleSomme	50.094498	1.8297544	2022-01-10T12:40:00Z	2022-06-02T11:00:00Z	River
AbromollaVegea	AbromollaVegea	56.07419967651367	12.974499702453613	2022-03-16T00:00:00Z	2023-10-08T23:00:00Z	River
AbzacIsle	AbzacIsle	45.02180480957031	-0.12619030475616455	2021-12-28T00:00:00Z	2023-07-11T14:00:00Z	River
ADN-CURRISO	ADN-CURRISO	45.76167	13.49633	2023-02-12T00:00:00Z	2023-08-04T16:41:09Z	Water Temperature,River
AfonTanat-Llanyblodwel	AfonTanat river at Llanyblodwel station (GRDC code 6609538)	52.79436	-3.11022	2023-02-10T09:00:00Z	2023-09-06T11:00:00Z	River
AgdeHerault	AgdeHerault	43.32531	3.4796884	2021-12-22T00:00:00Z	2023-07-19T18:05:00Z	River
Aire-Kildwick	Aire river at Kildwick station (GRDC code 6605440)	53.9073	-1.98464	2023-02-10T09:00:00Z	2023-09-06T11:00:00Z	River
AkerselvaNordmarkvassdraget	AkerselvaNordmarkvassdraget	59.96883010864258	10.787599563598633	2022-03-12T00:00:00Z	2023-10-10T22:00:00Z	River
AlabaleineAlabaleine	AlabaleineAlabaleine	57.88856	-67.60008	2023-01-19T00:00:00Z	2023-08-24T00:00:00Z	River
AllnabadStrathmore	AllnabadStrathmore	58.34717559814453	-4.644620895385742	2018-01-01T00:00:00Z	2023-10-10T22:00:00Z	River
Almen	Almen	52.1633	6.2	2023-02-12T00:00:00Z	2023-10-05T23:50:00Z	River
AlmondbankAlmond	AlmondbankAlmond	56.415276	-3.5135984	2022-06-08T02:30:00Z	2023-10-06T22:45:00Z	River
AlnessAlness	AlnessAlness	57.69601058959961	-4.258760929107666	2018-01-01T00:00:00Z	2023-10-10T23:00:00Z	River
Amay	Amay	50.53	5.31	2023-02-12T00:00:00Z	2023-10-05T23:00:00Z	River
AnctevilleAy	AnctevilleAy	49.10801	-1.4670926	2021-12-22T00:36:00Z	2023-09-22T01:00:00Z	River
AndelGouessant	AndelGouessant	48.484573	-2.568232	2021-12-22T00:00:00Z	2023-08-23T10:05:00Z	River
Angleur	Angleur	50.61	5.61	2023-02-12T00:00:00Z	2023-10-05T23:50:00Z	River
Anker-Polesworth	Anker river at Polesworth station (GRDC code 6606660)	52.62722	-1.61311	2023-02-10T09:00:00Z	2023-09-06T11:00:00Z	River
Anllons-Carballo	Anllons-Carballo	43.21009826660156	-8.692700386047363	2023-07-18T02:00:00Z	2023-10-06T23:50:00Z	River
AnnevilleSaire	AnnevilleSaire	49.635067	-1.2891345	2021-12-22T00:40:00Z	2023-09-22T00:50:00Z	River
AnthiliSpercheios	AnthiliSpercheios	38.856300354003906	22.466999053955078	2022-03-16T00:00:00Z	2023-10-10T23:00:00Z	River,Water Temperature
AntisantiTavignano	AntisantiTavignano	42.18162155151367	9.386916160583496	2021-12-22T00:00:00Z	2023-10-10T13:00:00Z	River
ArboriLiamone	ArboriLiamone	42.11641311645508	8.818493843078613	2021-12-22T00:00:00Z	2023-08-23T12:00:00Z	River
ArbroathBrothock	ArbroathBrothock	56.567230224609375	-2.5881717205047607	2018-01-01T00:00:00Z	2023-10-10T22:30:00Z	River
ArdalMoisani	ArdalMoisani	58.543670654296875	6.497910022735596	2022-03-12T00:00:00Z	2023-10-10T22:00:00Z	River

To access data the user needs to use the datacollection and query by the “platformname”:
https://data-erddap.emodnet-physics.eu/erddap/tabledap/ERD_EP_RVDS_INSITU.html

The same metadata are available from the geoserver:



https://prod-geoserver.emodnet-physics.eu/geoserver/EMODnet/wms?service=WMS&version=1.1.0&request=GetMap&layers=EMODnet%3AERD_EP_RVDS_INSITU&bbox=-180.0%2C-90.0%2C180.0%2C90.0&width=768&height=384&srs=EPSG%3A4326&styles=&format=application/openlayers

Given that in situ layers are multidimensional and may require additional filtering options, EMODnet Physics is prepared to supply the CP with a JSON (named after each layer/product) for the existing workflow. This JSON will encompass all possible queries for that specific layer. As previously mentioned in previous reports, all exchanges are tracked using Jira tickets. Some tickets require follow-up by the Physics team, while others are managed by the Central Portal team. It's important to note that while JIRA is an excellent tool for listing and tracking tickets and issues, it doesn't provide an overview of the schedule for actions. For instance, as already reported, there is a ticket aimed at improving the usability of the platform popup, which is currently very small when loaded and covers the in situ layer filters (all displayed in the top right of the page). As described earlier, the Physics team updated the service that offers the HTML page wrapped in the box. However, we currently lack information about when (and if) the box will be modified to meet Physics' requests and needs.

Task 5. Contributing content to dedicated spaces in Central Portal

Static contents on EMODnet Physics consolidated and published: https://emodnet.ec.europa.eu/en/physics
Other means of supporting the central space include contributing news, posting on social media, organizing events, and providing materials (documents, presentations, feedback) when necessary. Notably, during the period all the lots were involved in the EMODnet Jamboree[4].

Task 6. Ensure the involvement of regional sea conventions

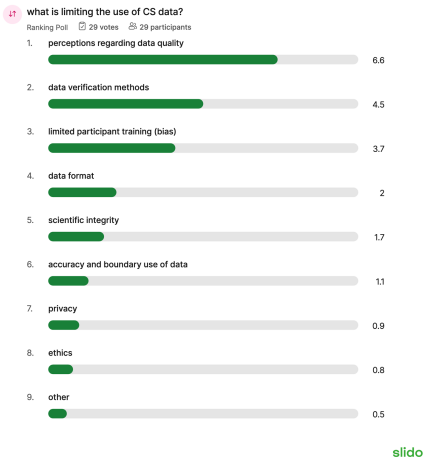
The EMODnet Jamboree also showcased and explored EMODnet's key partnerships with Regional Sea Conventions and for the Physics lots it was reported (ICES)[5] the support and synergies on under water noise data management.

Task 7. Contribute to the implementation of EU legislation and broader initiatives for open data

Besides the EMODnet Jamboree, the team continued its promotional activity for contributing and using EMODnet as a service for EU legislation and broader initiatives, as well as the promotion for open data (CC-BY). The team actively participated in key events to promote and contribute to open data, including the EuroGOOS Conference[6], TG NOISE, the EMODnet Technical Working Group, and the annual assemblies of SOCHIC and OCEAN:ICE. These latter two projects, focusing on studying the interaction of the Southern Ocean and climate change, depend on EMODnet. They contribute, among other things, to the application of new standards and open data principles. Furthermore, an open dialogue is ongoing with the Ocean Best Practice System (OBPS) [7] to facilitate clearer connections between the data and products (accessible under the Physics section) and the application of OBP for data collection. Updates will be presented in the next periodic reports.

Task 8. Monitor quality/performance and deal with user feedback

The current monitoring system is mainly focused on the static page and EMODnet Physics never collected big number in that section, it would be much more interesting to see the visits and interactions on the CP Geoviewer.
While the EMODnet Physics section (accessible at https://emodnet.ec.europa.eu/en/physics) may not be the most visited among EMODnet sections, direct feedback collected during the EMODnet Jamboree confirms significant interest and appreciation for the activities and topics covered, with the most mentioned ones being rivers, waves, sea level, and the involvement of citizen science actions (the following figures shows some outcomes from the interactions with audience during the Jamboree).



[4] https://emodnet.ec.europa.eu/en/emodnet-partner-jamboree-2023
[5] SESSION 4: EMODnet, Ocean Observation and the marine knowledge value chain
[6] https://eurogoos-conference2023.marine.ie/event/133655:eurogoos-international-conference-2023
[7] https://www.oceanbestpractices.org/

Table 1. Milestones and Deliverables - EASME/EMFF/2020/3.1.11/Lot4/SI2.83861

Status of the Milestones and Deliverables listed in the workplan					
Deliverable #	**Deliverable Title**	**WP**	**Delivery Date (by)**	**Status (Delivered/Delayed)**	**If Delayed: reason for delay and expected delivery date**
D1.01	Annual assembly (Q2.2024)	1	31/12/24	Delivered	27th Nov 2023, back-to-back the EMODnet Jamboree
D1.02	Annual assembly (Q2.2025)	1	31/12/25		
D1.03	EMODnet SC (Q4.2023)	1	31/12/23	Delivered	1st Dec 2023, back-to-back the EMODnet Jamboree
D1.04	Quarterly report Q3.2023	1	15/10/23	Delivered	
D1.05	EMODnet TWG (Q4.2023)	1	31/12/23	Delivered	18th Oct on line.
D1.06	EMODnet SC (Q4.2024)	1	31/12/24		
D1.07	EMODnet TWG (Q4.2024)	1	31/12/24		
D1.08	EMODnet SC (Q2.2025)	1	31/07/25		
D1.09	EMODnet TWG (Q2.2025)	1	31/07/25		
D1.10	EMODnet event (Q4.2025)	1	31/07/25		
D1.11	Quarterly report Q4.2023	1	15/01/24	Delivered	This report
D1.12	Quarterly report Q1.2024	1	15/04/24		
D1.13	Quarterly report Q2.2024	1	15/07/24		
D1.14	Quarterly report Q3.2024	1	15/10/24		
D1.15	Quarterly report Q4.2024	1	15/01/25		
D1.16	Quarterly report Q1.2025	1	15/04/25		
D1.17	Quarterly report Q2.2025	1	15/07/25		
D1.18	Annual progress report	1	23/08/24		
D1.19	Final progress report	1	22/08/25		
D1.20	Handover note	1	22/08/25		

D1.21	Guideline on data ingestion procedures for new real time and near real time streams v.2024	1	23/08/24		
D1.22	Guideline on data ingestion procedures for new real time and near real time streams v.2025	1	22/08/25		
D1.23	Contribution to central space with background information and EMODnet Physics contents, Contribution to the EMODnet Annual report	1	22/08/25		
D1.24	TGs - RSCs events attendance	2	22/08/25		
D2.01	Data sources gap analysis v.2024	2	22/08/24		
D2.02	Data sources gap analysis v.2025	2	22/08/25		
D2.03	EMODnet Physics data management including metadata and metadata governance v.2024	2	22/08/24		
D2.04	EMODnet Physics data management including metadata and metadata governance v.2025	2	22/08/25		
D2.05	EMODnet Physics List of products v.2024	2	22/08/24		
D2.06	EMODnet Physics List of products v.2025	2	22/08/25		
D3.01	Tools and methods to implement interoperability v.2024	3	22/08/24		
D3.02	Tools and methods to implement interoperability v.2025	3	22/08/25		
D3.03	Maintenance and update of the back-end services and infrastructure	3	-		This activity is continuous and special actions or issues (if any) will be reported in the quarterly reports.

2. Identified issues: status and actions taken

Table 2. Priority issues identified by CINEA/ DG MARE/ Secretariat

A. Priority issue(s) identified and communicated by CINEA/ DG MARE/ SECRETARIAT				
Priority issue	**Status (Pending/ Resolved)**	**Action(s) taken/ remaining actions planned**	**Date due**	**Date resolved**
EM-907	Done		12/12/23 16:18	12/12/23 16:18
EM-890	in Review	Waiting for feedback from CP	22/11/23 15:25	23/11/23 18:12
EM-873	In Progress	obsolete	17/10/23 15:06	27/10/23 16:10
EM-863	Done		13/10/23 00:00	10/11/23 00:00
EM-843	Done		11/08/23 18:32	15/08/23 21:51
EM-842	In Progress	Working on rearranging the dimension	11/08/23 13:50	09/11/23 15:43
EM-840	Done		10/08/23 14:42	10/08/23 16:37
EM-839	Done		10/08/23 14:33	10/08/23 16:39
EM-833	Done		31/07/23 00:00	10/11/23 00:00
EM-829	Done		19/07/23 13:27	14/11/23 00:00
EM-590	Done		17/06/22 00:00	21/01/00 00:00
EM-210	Done		11/05/21 15:59	23/11/23 11:23

Table 3. Priority issues group

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
EM-912	To Do	Critical to include Ingestion “as is” layer	2024-01-09 16:03	2024-01-09 16:05
EM-911	To Do		2024-01-09 15:57	2024-01-10 13:51
EM-909	To Do		2023-12-19 11:17	2024-01-09 15:57
EM-908	To Do		2023-12-13 16:08	2023-12-19 11:17
EM-896	In Review		2023-11-28 12:38	2023-12-01 17:42
EM-892	In Review		2023-11-23 16:08	2023-12-01 14:23
EM-724	In Progress		2023-01-20 13:04	2023-11-23 17:03

EM-908 to EM-912 are very urgent for updating Physics (and Ingestion) layers and improve user experience on Central Portal

3. Communication assets

Table 4. Communication assets

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**

Table 5. Other publications

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
	Proceeding	EuroGOOS International Conference		*	Yes

To facilitate the management of Physics related publication we set up a Zenodo Community – https://zenodo.org/communities/emodnetphysics/

* https://eurogoos.eu/download/10th-eurogoos-international-conference-proceedings/?wpdmdl=14224&refresh=65a15f59078f91705074521

For a compressive overview of publications referring to/making use of EMODnet data and/or data products, please consult Google Scholar.

4. Monitoring indicators

Table 6. Indicators

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	*Number of platforms*	EMODnet Physics input data is sparse, and for this indicator, we consider the "platform" as the "unit" for monitoring assessment. A platform is a logical system that hosts data, where data may consist of a single dataset (e.g., a profile in the case of CTD), a time series (e.g., a sea-level station), or a series of profiles (e.g., ARGO). For indicator 1.A, we report the percentage variation in the number of platforms for the given basin. It's worth noting that some platforms may move from one basin to another. Since we report figures based on the latest position, the percentages are significantly influenced by this movement. EMODnet Physics integrates data from several sources, which can result in duplicates in the system. Cleaning duplicates is an ongoing activity and also affects the percentage of available platforms. When a duplicate is identified, the two sources are linked to the same dataset to show full provenance. Some of the platforms that were originally categorized under 'Other Seas' are now classified under the Caribbean Sea. As anticipated, during the period, we continued cleaning duplicates, and we are in the process of reorganizing the parameters that are mapped under the themes. This process is not yet completed.
What is your opinion on the data coverage within EMODnet for your thematic?		The available coastal data is still very limited and new data sources (e.g. Citizen Science projects) have to be approached. Metadata on Wind data should be improved. In situ underwater noise is still very limited. Data on Ice should include new data type (e.g. cameras). We need some focus actions to link in some other integrators (e.g. SIOS). During this period, the service that connects EMODnet Physics to PANGAEA and ARICE was updated and it linked in a large amount of new CTDs. During last MIC meeting it was identified that INSTAC can provide Physics with about 7M more CTDs (action is started).

B) Usage of data in this quarter	*Server logs*	Now that the CP (Central Portal) is up and running, the Physics team can only report on the overall volume of downloaded data when it is mediated by the EMODnet Physics backend (as some products are cached centrally, EMODnet Physics cannot track this volume). Previously, the volume of data downloaded for each theme was calculated using an algorithm that considered the number of viewed map pages. However, since EMODnet Physics is no longer hosting the map viewer, this calculation can no longer be applied. From now on, EMODnet Physics will report on the number of available platforms (units - col C) and the overall volume of downloaded gigabytes (col D) from ERDDAP, which is hosting the in-situ data
2. Current status and coverage of total number of data products A) Volume and coverage of available data products	*Matomo and server logs*	The EMODnet Physics backend has been reorganized to better serve the central portal with products and data collections. Table 2A now lists the products available at prod-erddap.emodnet-physics.eu, which are linked through the central portal (plus the underwaternoise products that are availble on prod-geoserver)
B) Usage of data products in this quarter	*Matomo and server logs*	As described in the report, Physics is continuing the updates of the backend to serve the central portal. In this report, we updated the definition of data, data collection, and product, and improved the quality of the monitoring. From now on, the products available in the prod-env are the ones listed in table 2A. With this update, it will be easier to have a common understanding of progress. In the coming month, data-env will be updated with consolidated data collections. We have yet to decide if we should report stats on these data collections under indicator 1 or indicator 2 (2 seems more fitting)
3. Internal and external organisations supplying/approached to supply data and data products within this quarter	*Please specify*	There are a number of new sources integrated (some are old provders that inlcuded new sources in the package). During the period we organized a series of events to unlock new data sources (Southern Ocean providers). Most of these data are not yet in the system but teams are working to ingest it, one example is data from the MOANA project (New Zeland) that is now availble in the ingestion-erddap.emodnet-physics.eu, but it is not fully included in the Physics collections hence it is not available yet on the CP.

4. Online 'Web' interfaces to access or view data		The monitoring of WMS, WFS, and other services that offer data and products to CP is now centralized and conducted every 10 minutes. The web page https://monitor.emodnet.eu/resources?lang=en&tag=Physics presents real-time status. It would be very useful to have the option to download statistics for a custom period and conduct a more in-depth analysis of the instantaneous status.
5.1 Daily number of page views of EMODnet Thematic entry page	*Europa Analytics*	We monitor the typical working hours' usage of the portal. The system tracks the EMODnet Physics static page, which provides a general overview of the activity and is in line with previous period. Traffic remains quite limited, and we need to plan extra efforts to increase interaction and promote the recently activated links for advanced products. Additionally, since the map viewer was the most frequently used page in Physics, we suggest monitoring the CP GeoViewer, particularly focusing on thematic sessions. The current version of Europe Analytics report is monitoring the geoviewer, which is indeed the most used page, but it does not give details on specific themes.
5.2 Quarterly total number of visitors, page views, unique page views and percentage of returning visitors	*Europa Analytics*	We recorded interactions similar to (slighlty higher than) the previous period. It would be more interesting to observe user interaction with the GeoViewer, where data are not as static as on the static Physics presentation page.

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

5. Annex: Other documentation attached

5.1 Attached docs

- **A1_NOISE_25-2023_MOM**

5.2 Events

A. Meetings/events Organized and attended							
from	to	Location	Type event (internal or external meeting, training/work shop)	PPT given	A/O	link ppt doi/ web	Short description and main results (# participants, agreements made, etc.)
3/10/2023	5/10/2023	Galway, Ireland	conference	Yes	A		EuroGOOS Conference 2023
5/10/2023	6/10/2023	The Hague, The Netherlands	workshop	No	A		FAIR-IMPACT
18/10/2023	18/10/2023	web	internal - tech meeting	Yes	A		EMODnet Technical working group
16/10/2023	17/10/2023	Brussels, Belgium	technical working group	No	A		TG NOISE
23/10/2023	26/10/2023	Paris, France	meeting	Yes	A		SO-CHIC and OCEAN:ICE General Assemblies and joint workshop
26/10/2023	26/10/2026	Valencia, Spain	workshop	Yes	A		ERASMUS MARIS Days
1/11/2023	1/11/2023	web	forum	No	A		Polar Data Forum
7/11/2023	9/11/2023	Rome, Italy	Technical meeting	No	A		BlueCloud2026 technical meetings and General Assembly
15/11/2023	15/11/2023	Madrid, Spain (+web)	workshop	Yes	A		CRUISING FOR OCEANS - SHARING EFFORTS TO RESTORE OUR SEAS
16/11/2023	17/11/2023	Venice, Italy	conference	No	A		AIVP Conference
16/11/2023	16/11/2023	Brussels, Beljum + web	meeting	no	A		25th TG NOISE meeting
27/11/2023	27/11/2023	Brussels, Belgium	Meeting	Yes	A		EMODnet Physics Annual Meeing
29/11/2023	30/11/2023	Brussels, Belgium	conference	Yes	A		EMODnet Jamboree
1/12/2023	1/12/2023	Brussels, Belgium	Meeting	No	A		EMODnet SC
27/11/2023	30/11/2023	Faro, Portugal	meeting	no	A		NAUTILOS General Assembly - EMODnet is a key stakeholder and was invited to present and discuss on metadata, ingestion and data flow
19/12/2023	19/12/2023	Rome, Italy	workshop	no	A		ONTM annual conference

Planned

A. Meetings/events planned							
from	to	Location	Type event (internal or external meeting, training/work shop)	PPT given	A/O	link ppt/ doi/web	Short description and main results (# participants, agreements made, etc.)