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 (Q3.2024)

Reporting Period: 01/10/2024 – 31/12/2024

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1. Highlights in this quarter

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

Task 1 focuses 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. Now, the focus is to keep updating the organization of metadata, data, data collections and products in the Physics backend.

Physics is adopting the following definitions: 1) data is a series of values sampled by an in-situ platform, 2) data collection is a grouping of similar in situ data, 3) product is the outcome of a reprocessing method. The outcome of a numerical model (that uses in situ data) is a product. The result of the QC/QF procedure is a qualified dataset or data collection. In-situ data are harmonized and normalized in terms of metadata, and each new data source may contribute to one or more data collections.

Data collections are organized according to the dedicated controlled vocabulary, P33[1] (hosted in NVS-BODC service), and each P33 data collection includes two (e.g., one for time series, one for profiles) or more P01 collections.

For example, the Water Salinity and Conductivity theme (NVS::P33::WARERSALINITY) includes: sea water salinity (NVS::01::PSAL), sea water electrical conductivity (NVS::01::CNDC), sea water density (NVS::01::DENS), and sound velocity in sea water (NVS::01::SVEL). For each parameter, we may have time series or profiles.

Table 1 describes the published collections (P33 and linked P01). The team is working to publish the missing P01 collections (not ready yet).

Table 1. P33 and related P01 collection in EMODnet Physics

metadata_dataset_id (P33)	Description	metadata_dataset_id (P01)	title
ERD_EP_CARBONSYSTEM_INSITU_METADATA	EMODnet Physics - Collection of Carbon System (SDN:P33::CARBONSYSTEM) variables - MultiPointsObservation - METADATA		
ERD_EP_CURRENTS_INSITU_METADATA	EMODnet Physics - Collection of Currents (SDN:P33::CURRENTS) variables - MultiPointsObservation - METADATA		
ERD_EP_DISSOLVEDOXYGEN_INSITU_METADATA	EMODnet Physics - Collection of Dissolved Oxygen (SDN:P33::DISSOLVEDOXYGEN) variables - MultiPointsObservation - METADATA	ERD_EP_PR_DOXY_NRT	EMODnet Physics - Collection of dissolved oxygen (DOXY) Profiles - MultiPointProfilesObservation
		ERD_EP_TS_DOXY_NRT	EMODnet Physics - Collection of dissolved oxygen (DOXY) TimeSeries - MultiPointTimeSeriesObservation

[1] https://vocab.nerc.ac.uk/collection/P33/current/.

		ERD_EP_TS_DOXY_NRT_METADATA	EMODnet Physics - Collection of dissolved oxygen (DOXY) TimeSeries - MultiPointTimeSeriesObservation - METADATA
		ERD_EP_PR_TEMP_DOXY_NRT	EMODnet Physics - Collection of sea temperature from oxygen sensor (TEMP_DOXY) Profiles - MultiPointProfilesObservation
		ERD_EP_TS_TEMP_DOXY_NRT	EMODnet Physics - Collection of sea temperature from oxygen sensor (TEMP_DOXY) TimeSeries - MultiPointTimeSeriesObservation
		ERD_EP_TS_TEMP_DOXY_NRT_METADATA	EMODnet Physics - Collection of sea temperature from oxygen sensor (TEMP_DOXY) TimeSeries - MultiPointTimeSeriesObservation - METADATA
ERD_EP_METEOROLOGICAL_INSITU_METADATA	EMODnet Physics - Collection of Meteorological (SDN:P33::METEOROLOGICAL) variables - MultiPointsObservation - METADATA		
ERD_EP_OPTICAL_INSITU_METADATA	EMODnet Physics - Collection of Optical Properties (SDN:P33::OPTICAL) variables - MultiPointsObservation - METADATA	ERD_EP_PR_CHLT_NRT	EMODnet Physics - Collection of total chlorophyll (CHLT) Profiles - MultiPointProfilesObservation
		ERD_EP_TS_CHLT_NRT	EMODnet Physics - Collection of total chlorophyll (CHLT) TimeSeries - MultiPointTimeSeriesObservation
		ERD_EP_TS_CHLT_NRT_METADATA	EMODnet Physics - Collection of total chlorophyll (CHLT) TimeSeries - MultiPointTimeSeriesObservation - METADATA
ERD_EP_WATERSALINITY_INSITU_METADATA	EMODnet Physics - Collection of Water Salinity and conductivity (SDN:P33::WATERSALINITY) variables - MultiPointsObservation - METADATA	ERD_EP_PR_PSAL_NRT	EMODnet Physics - Collection of practical salinity (PSAL) Profiles - MultiPointProfilesObservation
		ERD_EP_PR_PSAL_NRT_METADATA	EMODnet Physics - Collection of practical salinity (PSAL) Profiles - MultiPointProfilesObservation - METADATA
		ERD_EP_TS_PSAL_NRT	EMODnet Physics - Collection of practical salinity (PSAL) TimeSeries - MultiPointTimeSeriesObservation
		ERD_EP_TS_PSAL_NRT_METADATA	EMODnet Physics - Collection of practical salinity (PSAL) TimeSeries - MultiPointTimeSeriesObservation - METADATA
		ERD_EP_PR_DENS_NRT	EMODnet Physics - Collection of sea density (sigma-theta) (DENS) Profiles - MultiPointProfilesObservation

		ERD_EP_TS_DENS_NRT	EMODnet Physics - Collection of sea density (sigma-theta) (DENS) TimeSeries - MultiPointTimeSeriesObservation
		ERD_EP_TS_DENS_NRT_METADATA	EMODnet Physics - Collection of sea density (sigma-theta) (DENS) TimeSeries - MultiPointTimeSeriesObservation - METADATA
ERD_EP_RIVER_INSITU_METADATA	EMODnet Physics - Collection of River (SDN:P33::RIVER) variables - MultiPointsObservation - METADATA	ERD_EP_TS_RVFL_NRT	EMODnet Physics - Collection of river flow rate (RVFL) TimeSeries - MultiPointTimeSeriesObservation
		ERD_EP_TS_RVFL_NRT_METADATA	EMODnet Physics - Collection of river flow rate (RVFL) TimeSeries - MultiPointTimeSeriesObservation - METADATA
ERD_EP_SEALEVEL_INSITU_METADATA	EMODnet Physics - Collection of Sea Level (SDN:P33::SEALEVEL) variables - MultiPointsObservation - METADATA		
		ERD_EP_TS_SLEV_NRT_5m	EMODnet Physics, Collection of Water Surface Height Above a Specific Datum (SLEV) TimeSeries, MultiPointTimeSeriesObservation - 5 minutes frequency
		ERD_EP_TS_SLEV_NRT_60m	EMODnet Physics, Collection of Water Surface Height Above a Specific Datum (SLEV) TimeSeries, MultiPointTimeSeriesObservation - 60 minutes frequency
ERD_EP_WATERTEMPERATURE_INSITU_METADATA	EMODnet Physics - Collection of Water Temperature (SDN:P33::WATERTEMPERATURE) variables - MultiPointsObservation - METADATA	ERD_EP_PR_TEMP_NRT	EMODnet Physics - Collection of sea temperature (TEMP) Profiles - MultiPointProfilesObservation
		ERD_EP_PR_TEMP_NRT_METADATA	EMODnet Physics - Collection of sea temperature (TEMP) Profiles - MultiPointProfilesObservation - METADATA
		ERD_EP_TS_TEMP_NRT	EMODnet Physics - Collection of sea temperature (TEMP) TimeSeries - MultiPointTimeSeriesObservation
		ERD_EP_TS_TEMP_NRT_METADATA	EMODnet Physics - Collection of sea temperature (TEMP) TimeSeries - MultiPointTimeSeriesObservation - METADATA
ERD_EP_WAVES_INSITU_METADATA	EMODnet Physics - Collection of Waves (SDN:P33::WAVES) variables - MultiPointsObservation - METADATA	ERD_EP_TS_VDIR_NRT	EMODnet Physics - Collection of wave direction rel. true north (VDIR) TimeSeries - MultiPointTimeSeriesObservation
		ERD_EP_TS_VDIR_NRT_METADATA	EMODnet Physics - Collection of wave direction rel. true north (VDIR) TimeSeries - MultiPointTimeSeriesObservation - METADATA

		ERD_EP_TS_VGHS_NRT	EMODnet Physics - Collection of generic significant wave height (Hs) (VGHS) TimeSeries - MultiPointTimeSeriesObservation
		ERD_EP_TS_VGHS_NRT_METADATA	EMODnet Physics - Collection of generic significant wave height (Hs) (VGHS) TimeSeries - MultiPointTimeSeriesObservation - METADATA
ERD_EP_WINDS_INSITU_METADATA	EMODnet Physics - Collection of Winds (SDN:P33::WINDS) variables - MultiPointsObservation - METADATA		

Regarding in-situ data provision, EMODnet Physics now provides access to: 21305 ARGO profiles (including BioArgo), more than 25000 Drifting Buoys observations, about 2500 Glider missions, about 4000 Moorings datasets, about 2500 operational River Station data, 330 Underway Data Vessels records, 3200 Tide Gauge stations (some duplicates were solved), and more than 5,000,000 data from CTD/XBT/bottles, etc.

The list of in-situ platforms is discoverable by

metadata_dataset_id (P33)	Description
EP_PLATFORMS_METADATA	EMODnet Physics - Collection of platforms metadata
EP_PLATFORMS_METADATA_CTD	EMODnet Physics - Collection of platforms metadata ctd

The annex includes a python script to extract the number of platforms.

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 team is working to make more in-situ layers available, such as temperature and salinity. In addition to layers providing specific parameters, stakeholders have shown increasing interest in layers that depict the trajectories of moving platforms. These are also under development.

Regarding the published products, the annex contains an updated status report and planning details.

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

Activities focused on integrating data from gliders and vessels, importantly some of these data need further work on metadata. Other efforts involved supporting projects working on adopting ERDDAP and other native machine-to-machine tools to facilitate data sharing with EMODnet. Examples from this reporting period include INGV and their new data center, as well as the HE POLARIN project and its Data Management Plan (DMP). The following figures provide the reader an overview of the location and type of data which will be processed further to complete the metadata harmonization and clearance.

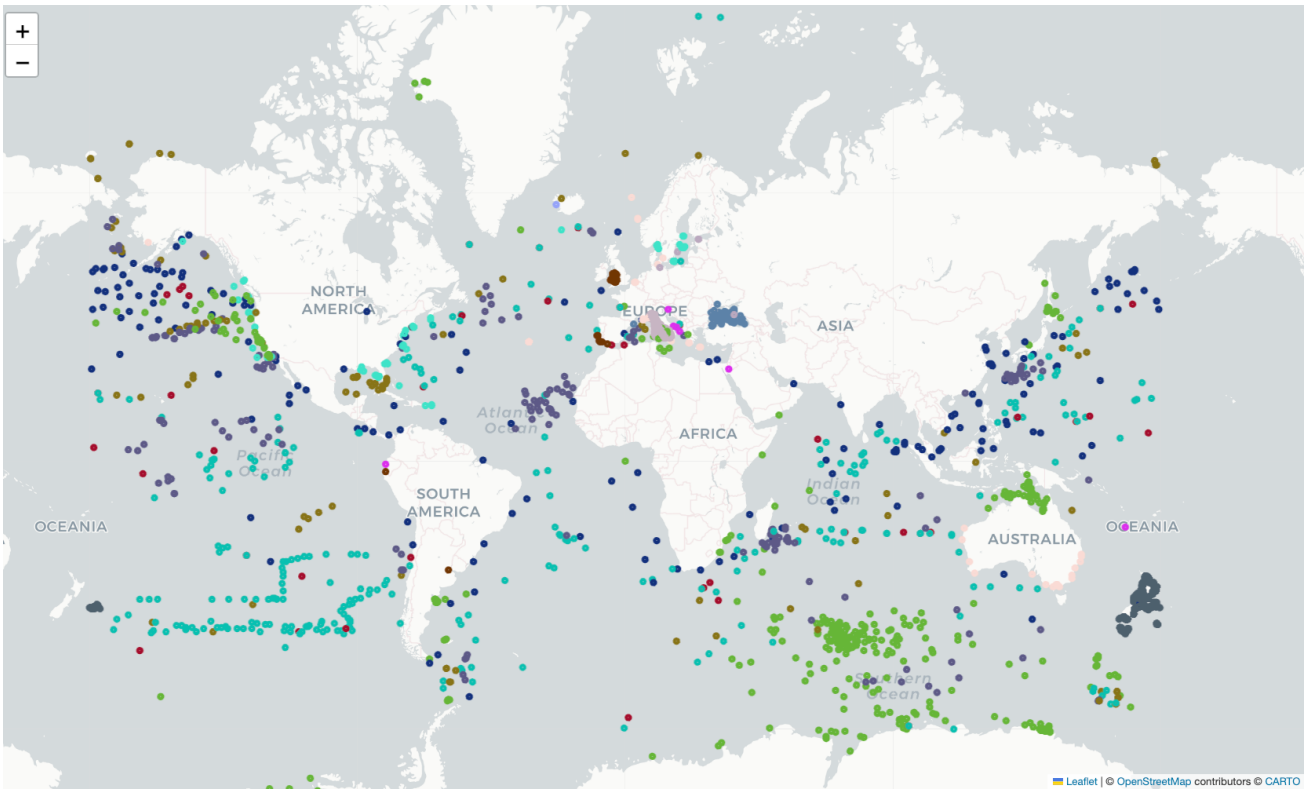

Figure 1. newly integrated platforms . During the reporting period it was possible to link many sea mammals based data (green), fishing vessels data (dark green), glider data (cyan) and data from ships (fishing vessels/XBT) (dark pink))

data_owner_longname	ADCP	Argo BGC	Argo/Profile	Bottle Data	Drifting Buo	Ferrybox/Shi	Fishing Vess	Gliders	Mooring	River Station	Sea Mamma	Thermosalin	Tide Gauge	Voluntary Ot	XBT or XCTD
ALFRED WEGENER INSTITUTE HELMHOLTZ CENTRE FOR POLAR AND MARINE RESEARCH	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
ATLANTIC OCEANOGRAPHIC AND METEOROLOGICAL LABORATORY , NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION	0	0	0	0	13	0	0	0	0	0	0	0	0	0	0
BRITISH OCEANOGRAPHIC DATA CENTRE	0	0	0	0	0	0	0	0	0	0	152	0	0	0	0
CENTRE FOR BIOLOGICAL STUDIES OF CHIZE	0	0	0	0	0	0	0	0	0	0	42	0	0	0	0
CNR, INSTITUTE FOR THE STUDY OF ANTHROPIC IMPACTS AND SUSTAINABILITY IN THE MARINE ENVIRONMENT, GENOVA	0	0	0	0	0	0	0	0	7	0	0	0	0	0	0
COMMONWEALTH SCIENTIFIC AND INDUSTRIAL RESEARCH ORGANISATION	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0
DANMARKS TEKNISKE UNIVERSITETET	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
DIPARTIMENTO SCIENZE DELLA TERRA E GEOAMBIENTALI - UNIVERSITA DI BARI (ITALY)	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
DIRECCION GENERAL DE INFRAESTRUCTURAS DEL AGUA, JUNTA DE ANDALUCIA	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
ECUADORIAN NAVY OCEANOGRAPHIC INSTITUTE	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
ENEA CENTRO RICERCHE AMBIENTE MARINO (LA SPEZIA)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3778
EUROPEAN ORGANIZATION FOR THE EXPLOITATION OF METEOROLOGICAL SATELLITES	0	0	0	0	12	0	0	0	0	0	0	0	0	0	0
FEDERAL MARITIME AND HYDROGRAPHIC AGENCY	0	13	15	0	0	0	0	0	0	0	0	0	0	0	0
FIRST INSTITUTE OF OCEANOGRAPHY, MINISTRY OF NATURAL RESOURCES	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0
FISHERIES AND OCEANS CANADA	0	3	0	0	0	0	0	2	0	0	0	0	0	0	0
GULF OF MAINE LOBSTER FOUNDATION, NOAA FISHERIES	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
HELLENIC CENTRE FOR MARINE RESEARCH, INSTITUTE OF OCEANOGRAPHY	0	0	0	0	0	0	0	0	33	0	0	0	0	0	0
HYDROGRAPHIC AND OCEANOGRAPHIC SERVICE OF THE FRENCH NAVY	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
IEO-CSIC, SPANISH OCEANOGRAPHIC INSTITUTE	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0
IFREMER HEAD OFFICE	0	4	15	0	0	0	0	0	1	0	0	0	0	0	0
IMEV VILLEFRANCHE-SUR-MER	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
INDIAN NATIONAL CENTRE FOR OCEAN INFORMATION SERVICES	0	1	9	0	0	0	0	0	0	0	0	0	0	0	0
INSTITUTE FOR ENVIRONMENTAL PROTECTION AND RESEARCH	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
INSTITUTE OF MARINE RESEARCH	0	0	2	0	0	0	0	0	2	0	0	0	0	0	0
INSTITUTO NACIONAL DEL AGUA (INA)	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
INTEGRATED MARINE OBSERVING SYSTEM	0	0	0	0	0	0	0	0	0	0	182	0	0	0	0
INTERNATIONAL ARCTIC BUOY PROGRAM	0	0	0	0	6	0	0	0	0	0	0	0	0	0	0
IPGP JFREMER, INSTITUT FRANCAIS DE RECHERCHE POUR L'EXPLOITATION DE LA MER	0	0	0	0	0	0	0	0	21	0	0	0	0	0	0
ISTITUTO NAZIONALE DI GEOFISICA E VULCANOLOGIA (ITALY)	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0
ISTITUTO NAZIONALE DI GEOFISICA E VULCANOLOGIA, GEOMAGNETISM, AERONOMY AND ENVIRONMENTAL GEOPHYSICS DEPARTMENT	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0
JAPAN AGENCY FOR MARINE-EARTH SCIENCE AND TECHNOLOGY	0	2	3	0	0	0	0	0	0	0	0	0	0	0	0
KYOTO UNIVERSITY	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0
LABORATORY OF OCEANOGRAPHY OF VILLEFRANCHE	0	2	1	0	0	0	0	0	1	0	0	0	0	0	0
MEDITERRANEAN INSTITUTE OF OCEANOGRAPHY (MARSEILLE)	0	0	0	0	0	0	0	0	20	0	0	0	0	0	0
MET OFFICE, EXETER	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0
METEOROLOGICAL SERVICE OF NEW ZEALAND LTD	0	0	0	0	0	0	1183	0	0	0	0	0	0	0	0
NATIONAL INSTITUTE OF OCEANOGRAPHY AND APPLIED GEOPHYSICS - OGS, DIVISION OF OCEANOGRAPHY	0	5	5	0	0	0	0	0	8	0	0	0	0	0	0
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION	0	0	0	0	0	0	0	0	0	0	33	0	0	0	0
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, NATIONAL DATA BUOY CENTER (NOAA NDBC)	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, PACIFIC MARINE ENVIRONMENTAL LABORATORY	0	2	40	0	0	0	0	0	0	0	0	0	0	0	0
NATIONAL OCEANOGRAPHY CENTRE (SOUTHAMPTON)	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
NATURAL RESOURCES WALES	0	0	0	0	0	0	0	0	0	33	0	0	0	0	0
NAVAL OCEANOGRAPHIC OFFICE	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0
NORCE UIB-GFI	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
OCEAN NETWORKS CANADA	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0
OCEANOVOX	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
OREGON STATE UNIVERSITY, COLLEGE OF EARTH, OCEAN, AND ATMOSPHERIC SCIENCES	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
PILOT (QINGDAO) NATIONAL LABORATORY FOR MARINE SCIENCE AND TECHNOLOGY (QNLM)	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
PLYMOUTH MARINE LABORATORY	0	4	5	0	0	0	0	0	0	0	0	0	0	0	0
PORTUGUESE ENVIRONMENT AGENCY	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0
ROYAL NETHERLANDS METEOROLOGICAL INSTITUTE	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0
RUTGERS, THE STATE UNIVERSITY OF NEW JERSEY, INSTITUTE OF MARINE AND COASTAL SCIENCES	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
SCRIPPS INSTITUTION OF OCEANOGRAPHY	0	1	15	0	0	0	0	0	0	0	0	0	0	0	0
SEA MAMMAL RESEARCH UNIT	0	0	0	0	0	0	0	0	0	0	51	0	0	0	0
SERVICIO NACIONAL DE METEOROLOGIA E HIDROLOGIA DEL PERU (SENAMHI), PERU	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
THE AGENCY FOR METEOROGY, CLIMATOLOGY AND GEOPHYSICS	0	0	1	0	4	0	0	0	0	0	0	0	0	0	0
U.S. INTEGRATED OCEAN OBSERVING SYSTEM	0	0	0	0	0	0	0	43	0	0	5	0	0	0	0
UNIVERSITY OF GOTHENBURG	0	0	0	0	0	0	0	0	0	0	31	0	0	0	0
UNIVERSITY OF WASHINGTON	0	16	14	0	0	0	0	0	0	0	0	0	0	0	0
UNKNOWN	237	10	112	67	69	5	0	0	24	0	107	176	2	0	0
VOICE OF THE OCEAN FOUNDATION	0	0	0	0	0	0	0	20	0	0	0	0	0	0	0
WOODS HOLE OCEANOGRAPHIC INSTITUTION	0	9	38	0	0	0	0	0	0	0	0	0	0	0	0

Figure 2. Details about source and type of platform

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 continued improving the user experience when downloading in situ data from EMODnet Physics layers. Obsolete products were removed. All these activities are reported on JIRA tickets. (see section 2)

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.

Task 6. Ensure the involvement of regional sea conventions

The "Catalogue of Underwater Sound Signatures from Shallow Seas" (CINEA/2022/OP/0019 – ECoSS) project outcomes have been integrated under EMODnet (a dedicated community) and the EMODnet Physics (ERDDAP): https://prod-erddap.emodnet-physics.eu/erddap

datasetID	title
ecoss_db_annotated_sounds_data	ECoSS - DB of annotated sounds - DATA
ecoss_db_annotated_sounds_metadata	ECoSS - DB of annotated sounds - METADATA
ecoss_db_enhanced4AI_sounds_data	ECoSS - DB of enhanced4AI sounds - DATA
ecoss_db_enhanced4AI_sounds_metadata	ECoSS - DB of enhanced4AI sounds - METADATA
ecoss_db_sounds_singatures_data	ECoSS - DB of sound signatures - DATA
ecoss_db_testing_sounds_data	ECoSS - DB of sounds for testing - DATA
ecoss_db_testing_sounds_metadata	ECoSS - DB of sounds for testing - METADATA
ecoss_db_training_sounds_data	ECoSS - DB of sounds for training - DATA
ecoss_db_training_sounds_metadata	ECoSS - DB of sounds for training - METADATA

During the period there was the periodic TG NOISE meeting, the minute is attached to the report.

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

We continued the dialogue with the Ocean Best Practice System (OBPS) [2] to facilitate clearer connections between the data and products (accessible under the Physics section) and the application of OBP for data collection. Under the framework of the OBSSEA4CLIM project (https://obssea4clim.eu/), the reanalysis of the available data in EMODnet Physics is going to contribute to the Rolling Review of Requirements (RRR) process to provide a systematic and transparent process to support the high-level design and evolution of the WMO Integrated Global Observing System (WIGOS) aligned with its Vision in 2040.

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

[2] https://www.oceanbestpractices.org/

EMODnet Physics contents (accessible at https://emodnet.ec.europa.eu/en/physics) are of interest, but these static contents are not the most visited among EMODnet sections. Internal monitoring indicates that users interacting with EMODnet Physics data (every time a platform page is presented, we record a request to ERDDAP, which is monitored by logs) are about 10 times more numerous than those interacting with the static content pages. Concerning the requests for support that are coming from the CP, these are tracked and managed with the JIRA system (see section 2 for details).

As anticipated in the previous report, during the MONGOOS event (Malaga, Spain, 1-3 October 2024), we gathered some valuable feedback for improving the system. Following the AMRIT project workshop—a key new stakeholder in Physics, with interactions already established—a clear request emerged to expand the EMODnet Physics metadata model to include information on sensor sensitivity and accuracy. This is essential to enable end-users to apply filtering options to consume datasets (from EMODnet Physics) that best-fit their downstream applications. This also highlights that harmonized data collections are among the most valuable and sought-after products for Physics. The community also emphasized the importance of demonstrating the system and showcasing the connections between marine data actors, particularly how interoperability is implemented. Another well-appreciated aspect is providing a clear understanding of the different data versions (a good example is the Uni. Hawaii Sea Level Center: operational, fast delivery and research quality). Last but not least, providers are keen to receive statistics on how much the data from their platforms are discovered/downloaded.

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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**
D1.01: Annual assembly (Q2.2024)	WP1	31/12/2024	Delivered	27/11/2023	27th Nov 2023, back-to-back the EMODnet Jamboree
D1.02: Annual assembly (Q2.2025)	WP1	31/12/2025	Postponed (new delivery date – spring 2025)		We agreed to prioritize events where EMODnet can engage with new providers and stakeholders. These events also offer opportunities for in-person cross-checks of ongoing activities
D1.03: EMODnet SC (Q4.2023)	WP1	31/12/2023	Delivered	01/12/2023	1st Dec 2023, back-to-back the EMODnet Jamboree
D1.04: Quarterly report Q3.2023	WP1	15/10/2023	Delivered	15/10/2023	
D1.05: EMODnet TWG (Q4.2023)	WP1	31/12/2023	Delivered	18/10/2023	18th Oct online
D1.06: EMODnet SC (Q1.2024)	WP1	31/12/2024	Delivered	29/04/2024	
D1.07: EMODnet TWG (Q1.2024)	WP1	31/12/2024	Delivered	13/03/2024	
D1.06.2: EMODnet SC (Q2.2024)	WP1	31/12/2024	Delivered	07/10/2024	
D1.07.2: EMODnet TWG (Q2.2024)	WP1	31/12/2024	Delivered	08/10/2024	
D1.08: EMODnet SC (Q2.2025)	WP1	31/07/2025	Planned 7-8/5/2025		
D1.09: EMODnet TWG (Q2.2025)	WP1	31/07/2025			
D1.10: EMODnet event (Q4.2025)	WP1	31/07/2025			
D1.11: Quarterly report Q4.2023	WP1	15/01/2024	Delivered	15/01/2024	

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**
D1.12: Quarterly report Q1.2024	WP1	15/04/2024	Delivered	15/04/2024	
D1.13: Quarterly report Q2.2024	WP1	15/07/2024	Delivered	15/07/2024	
D1.14: Quarterly report Q3.2024	WP1	15/10/2024	Delivered	15/10/2024	
D1.15: Quarterly report Q4.2024	WP1	15/01/2025	Delivered	15/01/2025	This report
D1.16: Quarterly report Q1.2025	WP1	15/04/2025			
D1.17: Quarterly report Q2.2025	WP1	15/07/2025			
D1.18: Annual progress report	WP1	23/08/2024	Delivered	13/08/2024	
D1.19: Final progress report	WP1	22/08/2025			
D1.20: Handover note	WP1	22/08/2025			
D1.21: Guideline on data ingestion procedures for new real time and near real time streams v.2024	WP1	23/08/2024	Delivered	13/08/2024	
D1.22: Guideline on data ingestion procedures for new real time and near real time streams v.2025	WP1	22/08/2025			
D1.23: Contribution to central space with background information and EMODnet Physics contents, Contribution to the EMODnet Annual report	WP1	22/08/2025			
D1.24: TGs - RSCs events attendance	WP2	22/08/2025			
D2.01: Data sources gap analysis v.2024	WP2	22/08/2024	Delivered	13/08/2024	
D2.02: Data sources gap analysis v.2025	WP2	22/08/2025			

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**
D2.03: EMODnet Physics data management including metadata and metadata governance v.2024	WP2	22/08/2024	Delivered	13/08/2024	
D2.04: EMODnet Physics data management including metadata and metadata governance v.2025	WP2	22/08/2025			
D2.05: EMODnet Physics List of products v.2024	WP2	22/08/2024	Delivered	13/08/2024	
D2.06: EMODnet Physics List of products v.2025	WP2	22/08/2025			
D3.01: Tools and methods to implement interoperability v.2024	WP3	22/08/2024	Delivered	13/08/2024	
D3.02: Tools and methods to implement interoperability v.2025	WP3	22/08/2025			
D3.03: Maintenance and update of the back-end services and infrastructure	WP3	-			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

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-145: Physics Quality of Service Monitoring	Pending	This ticket deals with a continous monitoring of the EMODnet OGC services. Problems and solutions are tracked by tickets.		
EM-87: Some layers are missing a metadata URL.	Pending	Working on it		
EM-957: EMODnet lots to check if filter values are displayed in the preferred order	Done	Instruction provided		14/01/2025
EM-1015: EMODnet Ingestion layers: wrong urls for filters	Pending	To test the updated version		
EM-1018: Physics layer animations not working	Pending	Problem with the definition and use of the timestamp between the CP and Physics. Under discussion		
EM-1019: EMODnet Physics - Absolute Sea Level trend map	Closed	Fixed		18/11/2024
EM-1021: EMODnet Physics - Change layer - Absolute Sea Level Trend (GLORYS12V) (m).	Closed	Fixed		18/11/2024
EM-1050: Provide ECAS	Pending	Collecting the info		
EMODNET – 1938: EMODnet Impulsive Noise layer	Closed	Provided the requested info		13/12/2024

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**
EM-1038: EMODnet Physics - New layer - "ECoSS - Database of annotated data"	Done	Added		02/12/24
EM-1021: EMODnet Physics - Change layer - Absolute Sea Level Trend (GLORYS12V) (m)	Done	Fixed		18/11/24
EM-1015: EMODnet Ingestion layers: wrong urls for filters	In Review	CP team is working on it		18/11/24

3. 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**
	e.g. paper; conference proceedings; book chapter; …				

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**
	e.g. paper; conference proceedings; book chapter; …				

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**

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

4. Monitoring 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 the 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. This process is ongoing and continuous, forming a major activity for the team. During the quarter, we adopted a new tool to track the figures more effectively. Specifically, we developed a script that consumes information presented in the ERD_EP_CARBONSYSTEM_INSITU_METADATA and ERD_EP_CARBONSYSTEM_INSITU_METADATA (CSV) datasets. This enables us to provide an easy-to-check and automated way to count and manage the information.
What is your opinion on the data coverage within EMODnet for your thematic?		The available coastal data is still very limited. We are continuing the identification and actions on new data sources (e.g. Citizen Science projects). 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. as anticipated CS actins). We are keeping working on synchronization of complemtary source already available in INSTAC.
B) Usage of data in this quarter	*Server logs*	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

Comments on the progress indicators in the indicators spreadsheet		
Progress indicator	**Means of collecting figures**	**Comment**
		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 indicator can no longer be applied. EMODnet Physics reports 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	*Number of platforms*	Table 2A lists the products available in the Central Portal Geoviewer. These products are made available by the backend infrastructure were gridded and externally produced datasets are organized under the prod-erddap.emodnet-physics.eu, and operational data collections are organized under the data-erddap.emodnet-physics.eu,
B) Usage of data products in this quarter		As reported previously, we are implementing the following concepts: data, data collections, and products. Indicator 2A reports on the products available in the Central Portal, where concepts are mapped using the controlled vocabulary (NVS::P33). As mentioned above, some products are organized under the EMODnet Physics ERDDAP, some under ERDDAP/ncWMS, and others under GeoServer. Indicator 2B captures the interaction with those services. Figures show some fluctuations, but overall indicate a positive increase in the use of the services.
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) this activity goes back to back with metadata normalization and data cleaning (duplicates removal).
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 the previous periods (peaks are twice the previous period, but the overall interaction is steady). According to Matomo stats (internal monitoring) on the HTML populating the geoviewer contents, we record from 3 to 5 times more traffic on Physics. If we look at the interaction on the ERDDAP that populates the in situ Physics layers, we recorded about ten times more interactions. The current version of the Europe Analytics

Comments on the progress indicators in the indicators spreadsheet		
Progress indicator	**Means of collecting figures**	**Comment**
		report monitors the geoviewer, which is the most visited 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 the previous period (a bit lower due to the Xmas break). It would be more interesting to observe user interaction with the GeoViewer (the Physics segment), 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

EMODnet Physics data and products (on CP geoviewer) status and planning:

Theme	Product name	status	Planned actions/next delivery
Carbon Cycle	Seawater alkalinity - GLODAPv2_2016b (micro-mol kg-1)	This product is presenting the Alkalinity. GLODAP Data is gridded by DIVA.	None.
River outflow	River outflow	This product layer groups all the platforms collecting river outflow. The layer shows the position of the recording station and on clicking the platform page (presenting station metadata and latest data) is popped up. The product layer offers filtering options.	None.
Sea level	In situ platform	This product layer groups all the platforms collecting sea level (frequency 5m). The layer shows the position of the recording station and on clicking the platform page (presenting station metadata and latest data) is popped up. The product layer offers filtering options.	None
Sea level	In situ platform	This product layer groups all the platforms collecting sea level (frequency 60m). The layer shows the position of the recording station and on clicking the platform page (presenting station metadata and latest data) is popped up. The product layer offers filtering options.	None
Sea level	Absolute Sea Level Trend (GLORYS12V) (m)		None.
Sea level	Absolute Sea Level Trend (DUACS) (mm/yr)		None.
Sea level	SONEL - In situ Absolute Sea Level Trends		SONEL published a new API to interoperate with data, the team is planning to update the services and product accordingly.
Sea level	Monthly maps of Absolute Sea Level data (DUACS) (m)		None.
Sea Optical Properties	In situ platform	This product layer groups all the platforms collecting sea optical properties. The layer shows the position of the recording station and on clicking the platform page (presenting station metadata and latest data) is popped up. The product layer offers filtering options.	To be added to the CP staging system.
Sea Optical Properties	TSM Baltic Sea (%)		None.
Sea Optical Properties	TSM Mediterranean Sea (%)		None.

Sea Optical Properties	TSM North Sea (%)		None.
Salinity and Conductivity	In situ platforms	This product layer groups all the platforms collecting sea surface salinity and salinity in the water column. The layer shows the position of the recording station and on clicking the platform page (presenting station metadata and latest data) is popped up. The product layer offers filtering options.	To be added to the CP staging system.
Salinity and Conductivity	Monthly climatology (SDN.V2)	Updated the product (now global instead of many regionals). Template changed: the user can select the specific month to be loaded.	None
Salinity and Conductivity	Climatology (CORA)	Made available in two versions, one to be visualized in the geoviewer and one to be offered for download.	
Salinity and Conductivity	Sea surface Salinity annual anomaly [base line 1990-2020] (PSU)		None.
Salinity and Conductivity	Seawater Practical Salinity from GLODAPv2_2016b (PSU)		None.
Salinity and Conductivity	SMOS BEC global SSS product v2 L4 (Psu)		None.
Temperature	In situ platforms	This product layer groups all the platforms collecting sea surface temperature and temperature in the water column. The layer shows the position of the recording station and on clicking the platform page (presenting station metadata and latest data) is popped up. The product layer offers filtering options.	To be added to the CP staging system.
Temperature	Monthly climatology (SDN.V2)	Updated the product (now global instead of many regionals). Template changed: the user can select the specific month to be loaded.	published
Temperature	Climatology (CORA)	Made available in two versions, one to be visualized in the geoviewer and one to be offered for download.	None.
Temperature	Sea Temperature Anomaly 30 Years (ºC)		None.
Temperature	Seawater Temperature from GLODAPv2_2016b (ºC)		None.

Underwater Noise	EMODnet Physics Continuous Noise fix platforms		None.
Underwater Noise	EMODnet Physics European Impulsive Noise Events Registry		None.
Waves	In situ platform	This product layer groups all the platforms collecting waves. The layer shows the position of the recording station and on clicking the platform page (presenting station metadata and latest data) is popped up. The product layer offers filtering options.	None.
Wind	In situ platform	This product layer groups all the platforms collecting waves. The layer shows the position of the recording station and on clicking the platform page (presenting station metadata and latest data) is popped up. The product layer offers filtering options. This product should replace the current available one (In situ wind speed and direction)	None.

Meeting and events organised and attended in the reference period and planned for next months

A. Meetings/events organised and attended							
From	To	Location	Type event (internal or external meeting, training/ workshop)	PPT given	A/O	Link ppt doi/ web	Short description and main results (# participants, agreements made, etc.)
30/09/2024	04/10/2024		Workshop		A		GOOS Ocean Decade Workshop
01/10/2024	03/10/2024	Barcelona, Spain	Workshop	Y	A		MONGOOS - The workshop provided a forum for researchers and developers to present their work and discuss their ideas with MonGOOS experts, including technological innovations in operational oceanography such as Artificial Intelligence, Machine Learning methods, Digital Twins and Zero Pollution initiative
03/10/2024	04/10/2024	Venice, Italy	External meeting		A		LandSealot Steering Committee meeting. EMODnet is a key stakeholder for the project.
23/09/2024		Copenhagen, Denmark	Internal meeting		A		EMODnet Chemistry – General Assembly. Chemistry, Ingestion and Physics are working together to ease data flow towards EMODnet and serve common products.
24/09/2024		Copenhagen, Denmark	External meeting		A		OCEAN:ICE – General Assembly and Workshop. The HE OCEAN:ICE project is an important stakeholder for EMODnet. Data management and sharing was largely discussed during the meeting.
30/09/2024		Malaga, Spain	External meeting		A		MONGOOS General Assembly. MONGOOS is a key stakeholder community for the EMODent implementation. Updates, how to, etc was largely discussed
01/10/2024		web	External meeting		A		SEA2SEE – General assembly project – Advisor. Synergies and data path towards EMODnet were discussd.
07/10/2024		Brussels, Belgium	Internal meeting		A		EMODnet Steering Committee – periodic meeting
08/10/2024		Brussels, Belgium	Internal meeting		A		EMODnet TWG – periodic meeting
16/10/2024		web	External meeting		A		FAIR-IMPACT Champions all-hands meeting – the meeting discusses how to improve data FAIRness

28/10/2024		Paris, France	External meeting		A		SO-CHIC – General Assembly and Workshop. The H2020 SO-CHIC project is an important stakeholder for EMODnet. Data management and sharing was largely discussed during the meeting
29/10/2024		web	External meeting		A		NAUTILOS – General Assembly and Workshop. The H2020 NAUTILOS is an important stakeholder for EMODnet. Data management and sharing was largely discussed during the meeting
31/10/2024		Genova, Italy	External meeting		A		Science Festival Genoa (Italy) – demonstrations, labs, and presentations were including an introduction of EMODnet as the EU house for in situ data.
5/11/2024		Lisbon, Portugal	External meeting		A		BlueCloud2026 - General Assembly and Workshop. The BlueCloud2026 is an important stakeholder for EMODnet. Data management and sharing was largely discussed during the meeting
5/11/2025	6/11/2025	Web/Brussels, Belgium	External meeting		A		TG NOISE – periodic meeting
8/11/2024		Lisbon, Portugal	External meeting		O		Meeting with APA (Portuguese Water Agency) to discuss how to implement operational river water quality into EMODnet
11/11/2024		Bologna, Italy	External meeting		A		IQuOD/SOOPIP/GTSPP/XBT Science meeting. Data interoperability and standards with the global scientific community
12/11/2024		web	Internal meeting		A		EMODnet Ingestion – Central Portal periodic coordination meeting
13/11/2024		Bologna, Italy	External meeting		A		EuroGOOS DATAMEQ meeting
18/11/2024		Paris, France	External meeting		A		OceanPrediction Symposium. A poster about in situ data flow and relationship between EMODnet (ingestion and Physics) and Copernicus Marine Service INSTAC was presented
27/11/2024		Lisbon, Portugal	External meeting		A		AIVP Conference – International Conference of Port Cities. EMODnet was presented and discussed in round tables
02/12/2024		Brussels, Belgium	External meeting		O		SoundSignature Catalogue project Workshop – the project is contributing to EMODnet as a new community organized to collect and organize underwater sounds
11/12/2024		Venice, Italy	External meeting		A		Winter School Marine Data Management Data Quality Control - ITINERIS. Lessons discussed about data management, data quality and data flow. EMODnet was discussed and presented during several talks

B. Meetings/events planned							
From	**To**	**Location**	**Type event (internal or external meeting, training/ workshop)**	**PPT given**	**A/O**	**Link ppt doi/ web**	**Short description and main results (# participants, agreements made, etc.)**
13/1/2025		web					DATAMEQ
19/1/2025		Lisbon, Portugal					LandSeaLot

```
import pandas as pd
import folium

csv_url = 'https://data-erddap.emodnet-physics.eu/erddap/tabledap/EP_PLATFORMS_METADATA.csv?'
csv_url = csv_url + 'PLATFORMCODE%2C'
csv_url = csv_url + 'call_name%2C'
csv_url = csv_url + 'latitude%2Clongitude%2C'
csv_url = csv_url + 'dataFeatureType%2C'
csv_url = csv_url + 'firstDateObservation%2ClastDateObservation%2C'
csv_url = csv_url + 'data_owner_longname%2Cdata_owner_country_code%2C'
csv_url = csv_url + 'data_assembly_center_longname%2C'
csv_url = csv_url + 'platform_type_longname%2Cintegrator_id%2CIntegrationDate'
csv_url = csv_url + '%2Cingestion'
csv_url = csv_url + '%2Cofficial_repository'
csv_url = csv_url + '%2Cparameters_group_P33%2Cparameters%2Cparameters_P01'

all_points = csv_url

#ALL STATIONS
try:
    all_points = pd.read_csv(all_points, skiprows=[1])
    print("Successfully all loaded data")
    print(len(all_points))
except Exception as e:
    print("Error loading data:", e)
    print("csv_url:", all_points)

#ALL STATIONS TYPE
platform_type_counts = all_points['platform_type_longname'].value_counts()

print(platform_type_counts.to_string())
```

Script to extract the number of stations measuring a given parameter in a given seabasin (e.g. NWS)

```
!pip install mapclassify
!pip install geodatasets
!pip install polar

%matplotlib inline
from shapely.geometry import Point
import os
import geodatasets
import pandas as pd
#import polar as pd
import geopandas as gpd
from geopandas import GeoDataFrame, read_file
import folium
import matplotlib as plt
import mapclassify

csv_url = 'https://data-erddap.emodnet-physics.eu/erddap/tabledap/EP_PLATFORMS_METADATA.csv?'
csv_url = csv_url + 'PLATFORMCODE%2C'
csv_url = csv_url + 'call_name%2C'
csv_url = csv_url + 'latitude%2Clongitude%2C'
csv_url = csv_url + 'dataFeatureType%2C'
csv_url = csv_url + 'firstDateObservation%2ClastDateObservation%2C'
csv_url = csv_url + 'data_owner_longname%2Cdata_owner_country_code%2C'
csv_url = csv_url + 'data_assembly_center_longname%2C'
csv_url = csv_url + 'platform_type_longname%2Cintegrator_id%2CIntegrationDate'
csv_url = csv_url + '%2Cingestion'
csv_url = csv_url + '%2Cofficial_repository'
csv_url = csv_url + '%2Cparameters_group_P33%2Cparameters%2Cparameters_P01'

all_points = csv_url

try:
    #new_points = pd.read_csv(new_points, skiprows=[1])
    new_points = pd.read_csv(all_points, skiprows=[1])
    print("Successfully loaded data")
```

```
    print(len(new_points))
except Exception as e:
    print("Error loading data:", e)
    print("csv_url:", new_points)

new_points['parameters_group_P33'] = new_points['parameters_group_P33'].str.replace(r"[\[\]']", '', regex=True)

#you have the shp in the working dir
shapefile_path = "World_Seas_IHO_v3.shp"
seas = gpd.read_file(shapefile_path)
NWS = seas[seas['ID']=='4']

geometry = [Point(xy) for xy in zip(new_points['longitude'], new_points['latitude'])]
# Create the GeoDataFrame
geo_df = gpd.GeoDataFrame(new_points, geometry=geometry, crs="EPSG:4326")

ins_NWS=ins_NWS.dropna(subset=['parameters_group_P33'])

# Initialize counters
biochemical_count = 0
watertemperature_count = 0
watersalinity_count = 0
dissolvedoxygen_count = 0
opt_count = 0
cs_count = 0
curr_count = 0
waves_count = 0
wind_count = 0
meteo_count = 0
sl_count = 0
river_count = 0
seaice_count = 0
uwn_count = 0
none_count = 0
index = 0

# Iterate through each line in 'parameters_table' column
for line in ins_NWS['parameters_group_P33']:
    index+=1
    # Count occurrences of each parameter
    if line.find("WATERTEMPERATURE") > -1:
        watertemperature_count+=1
    if line.find("WATERSALINITY") > -1:
        watersalinity_count+=1
    if line.find("SEALEVEL") > -1:
        sl_count+=1
    if line.find("CURRENTS") > -1:
        curr_count+=1
    if line.find("WAVES") > -1:
        waves_count+=1
    if line.find("WINDS") > -1:
        wind_count+=1
    if line.find("BIOCHEMICAL") > -1:
        biochemical_count+=1
    if line.find("DISSOLVEDOXYGEN") > -1:
        dissolvedoxygen_count+=1
    if line.find("OPTICAL") > -1:
        opt_count+=1
    if line.find("CARBONSYSTEM") > -1:
        cs_count+=1
    if line.find("METEOROLOGICAL") > -1:
        meteo_count+=1
    if line.find("RIVER") > -1:
        river_count+=1
    if line.find("SEAICE") > -1:
        seaice_count+=1
    if line.find("UNDERWATERSOUND") > -1:
        uwn_count+=1
    if line.find(" ") > -1:
```

```
        none_count+=1

print(index)
print(f"WATERTEMPERATURE count: {watertemperature_count}")
print(f"WATERSALINITY count: {watersalinity_count}")
print(f"CURRENTS count: {curr_count}")
print(f"OPTICAL count: {opt_count}")
print(f"SEALEVEL count:{sl_count}")
print(f"METEOROLOGICAL count: {meteo_count}")
print(f"BIOCHEMICAL count: {biochemical_count}")
print(f"CARBONSYSTEM count: {cs_count}")
print(f"DISSOLVEDOXYGEN count: {dissolvedoxygen_count}")
print(f"WAVES count: {waves_count}")
print(f"WINDS count: {wind_count}")
print(f"RIVER count: {river_count}")
print(f"UNDERWATERSOUND count: {uwn_count}")
print(f"SEAICE count: {seaice_count}")
print(f"NONE count: {none_count}")
```