EMODnet Thematic Lot n° 6 – Human Activities

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EMODnet Phase III – Interim Report

Reporting Period: 03/03/2019 – 02/03/2020

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Executive summary

The objective of EMODnet Human Activities is to become the entry point for data on human activity in EU waters. Special attention is thus given to collating accurate data from official sources, as well as to making user experience as smooth as possible.

In the current phase of EMODnet, the focus is on further developing its operational service where marine data and data products are made interoperable and freely available. EMODnet Human Activities is mandated to build the following data themes:

- Aggregate extraction
- Cultural heritage
- Dredging (e.g. navigational)
- Fisheries zones
- Hydrocarbon extraction
- Ports (traffic and waste)
- Aquaculture (including freshwater)
- Ocean energy facility
- Spatial planning zones
- Pipelines and cables
- Protected areas
- Waste disposal
- Wind farms

Furthermore, even though not requested by the contract, the Human Activities team have also made available a number of additional datasets, such as:

- Algae production facilities
- State of bathing waters
- Fish catches
- Monthly first sales of fish
- Hydrocarbon extraction licences
- Lighthouses

Moreover, one of the key objectives of the new phase is to make available a series of vessel density maps. This was also a requirement of the previous phase, when in fact it turned out impossible to obtain the necessary data to compile the maps. For this reason, with the new phase it was decided to purchase a set of data from a commercial provider. Processing the data to create the maps has proved to be a challenging task. The dataset acquired includes nearly 2.1 billion records for just one-year worth of data. It has been necessary to set up a dedicated machine, purchase new software, write bespoke algorithms, and devise an entirely new method in collaboration with the JRC. At the time of writing, a set of maps for 2017 has been completed and is scheduled to go live on 11 March 2019. Shortly thereafter, the Human Activities team will start working on 2018 data, so to release new maps before the end of the year.

Besides collecting and making available data, other activities have also been carried out.

The team have compared EMODnet data models with INSPIRE's, in view of increasing compliance with INSPIRE standards. In the next step of this task, our findings will be submitted to the INSPIRE working group to agree on what measures might be taken to improve compliance.

In view of fostering cooperation with Regional Sea Conventions, a series of meetings took place between 2017 and 2018. The Human Activities team met the organisations responsible for the implementation of Regional Sea Conventions and discussed how to better liaise in the future to mutual benefit. A structured form of cooperation was formally presented to the Black Sea Commission at their meeting in October 2018. Follow-up meetings will take place in the coming months to assess the progress made.

Further to the release of new visual guidelines, a revamped version of the portal went live in May 2018. The layout is now perfectly consistent with EMODnet's visual identity.

In order to increase the visibility of EMODnet HA and expand its user base, a communication strategy was drafted at the beginning of the project. Amongst other things, communication activities include participation in events, publication of articles and blog posts. The blog that was launched in the previous EMODnet phase has proved to be an effective tool to spread the word about EMODnet outside its inner circle. Blog posts on themes related to EMODnet HA have been shared on social media, attracting users that were previously unaware of the project.

Web statistics show that new users visit the portal each month. Human Activities can now boast a significant share of users from industry, which may lead to conclude that providing harmonised and interoperable data is contributing to generating value added in the blue economy. With the release of the new portal, the team have slightly modified the form that users have to fill out before downloading data. It is now mandatory to leave a name and an email address (personal data are treated in compliance with the GDPR). Users who so wish may also share additional information as to how they plan on using the data. This has made it possible to better understand how and if EMODnet is yielding concrete benefits to its users. A number of use cases, mainly concerning SMEs, has been drafted; more will follow over the course of 2019.

1 Introduction

The contract for the new phase of EMODnet Human Activities was signed in March 2017. The consortium that was awarded the contract is the same that developed the portal in the previous phase:

- Cogea (lead company), Italy
- AND International, France
- AZTI Tecnalia, Spain
- CETMAR, Spain
- Eurofish International Organisation, Denmark
- Lovell Johns, UK

EMODnet Human Activities has been a member of the EMODnet family since September 2013. Since it was not included in the first EMODnet phase from 2009 to 2012, in the previous EMODnet phase (2013-2016) its main objective was to quickly build a base of data, so as to catch up with the other portals.

With the new phase of EMODnet, the focus is on further developing the operational service where marine data and data products on the spatial extent and intensity of human activities in the ocean are made interoperable and freely available. According to the contract, EMODnet Human Activities is mandated to build the following data themes:

- Aggregate extraction
- Cultural heritage
- Dredging (e.g. navigational)
- Fisheries zones
- Hydrocarbon extraction
- Ports
- Aquaculture (including freshwater)
- Ocean energy facility
- Spatial planning zones
- Pipelines and cables
- Protected areas
- Waste disposal
- Wind farms

Compared with the previous phase, there are some new datasets, such as freshwater aquaculture, waste collected in ports and spatial planning zones. Furthermore, even though not requested by the contract, the Human Activities team have also made available a number of additional datasets, such as:

- State of bathing waters
- Fish catches
- Monthly first sales of fish
- Hydrocarbon extraction licences
- Lighthouses
- Algae production facilities (microalgae, macroalgae)

- MSFD Reporting Units
- Urban wastewater treatment facilities
- Urban wastewater discharge points
- Nuclear power plants

Moreover, one of the key objectives of the new phase is to make available a series of vessel density maps. This was also a requirement of the previous EMODnet phase, when in fact it turned out impossible to obtain the necessary data to compile the maps. For this reason, with new phase it was decided to purchase a set of data from a commercial provider. Vessel density maps also happened to be the most requested dataset by users, according to a survey carried out in 2016. The maps were released in March 2019 and quickly became EMODnet Human Activities' most downloaded data sets. An update was released in December 2019. December 2019 also saw the release of route density maps, courtesy of EMSA. A back-of-the-envelope calculation suggests that in just one year the vessel density maps might have saved nearly 3 million euro in costs for EMODnet users.

The general objective of EMODnet Human Activities is to become the entry point for maritime data on the spatial extent and intensity of human activity in the ocean. For this reason, the team developing the pay special attention to collating accurate data from official sources, as well as to making user experience as friendly as possible. With a view to increasing EMODnet visibility, a blog was launched in the previous phase of EMODnet to increase awareness on the work of the Human Activities team and on how its data could be used.

The current phase of EMODnet also takes on some new challenges, such as improving compliance with INSPIRE standards, analyse standards and protocols of non-EU organisations involved in similar initiatives, and better coordinate with Regional Sea Conventions.

Last but not least, special attention is now placed on developing "use cases" to better understand how EMODnet Human Activities creates value for its users.

2 Highlights in this reporting period

Task 1: Develop a common method of access to data held in repositories:

- **All datasets received at least one update.**
- **New data sets were released**: nuclear power plants, urban wastewater treatment facilities and discharge points, MSFD reporting units.
- **New data sets in preparation:** sea basin strategies, fishing effort, fishing intensity, military areas.
- The KIS-ORCA submarine cable dataset had to be removed at the request of the owner (European Subsea Cables Association and Kingfisher).
- **Protected areas**: both 'Nationally designated areas' and 'Natura 2000' ares are now available by category (e.g. 'strict nature reserve', 'wilderness area', 'national park', etc.).
- **Pipelines**: new source was added for UK pipelines (Oil and Gas Authority). Coverage of the North Sea has improved considerably.

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

- The vessel density maps went live on 11 March 2019. The full method used to develop them was published shortly thereafter. It soon became the most downloaded data set from EMODnet Human Activities. The vessel density maps received an update with 2018 data in December 2019. Work on 2020 data has commenced.
- Route density maps developed by EMSA were released in December 2019. The maps complement the existing vessel density maps and are based on an entirely different method. While EMODnet's maps measure density as number of hours spent by ships in a grid cell in a month, EMSA's maps measure density as number of ship routes in a grid cell in a month.

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

- New short web service URLs were created using domain ows.emodnet-humanactivities.eu
- Web Coverage Services (WCS) were implemented to serve raster data sets.

Task 4: Develop a web portal allowing users to find, visualise and download data:

- New features for the map viewer went live: setting layer transparency, printing maps, searching, and exporting tabular data by drawing a rectangle on the map.
- The portal was transferred to a new Linux server for increased performance and security with latest versions of GeoServer and PostgreSQL.
- Implementation of wildcard SSL certificate for emodnet-humanactivities.eu to allow the publishing of the portal and web services via https.
- Website is now fully compliant with EASME's privacy and data protection policy. Privacy statement was updated. A cookie notice, based on the European Commission's cookie notice, was also created.

Task 5: Ensure the involvement of regional sea conventions:

- Nothing to report

Task 6: Facilitate interoperability with data distributed by non-EU organisations:

- Nothing to report.

Task 7: Install a process to monitor performance and deal with user feedback:

- Three use cases were published:
    - EMODnet wind farm and hydrocarbon extraction datasets to support the development of wind farm projects.
    - EMODnet enables its clients to become more efficient, provide better services and remain competitive in the market.
    - EMODnet Human Activities Data Facilitate Business Opportunities.

Task 8: Operate a help desk offering support to users:

- Live chat continues being by far the preferred method to contact the EMODnet Human Activities team.

Other:

- An internal partners meeting took place in Vigo on 26 March 2019. Amongst other things it was discussed which additional products could be developed on top of the vessel density maps, and how to develop a pilot product to identify the most suitable areas for farming certain seaweed species.

3 Summary of the work done

Task 1 - Develop a common method of access to data held in repositories: as usual, all data sets received their yearly update. Some changes occurred, namely: a new source was found for UK pipelines, which considerably improved coverage of the North Sea; protected areas are now available by area category; the wind farm data model was slightly reviewed.

New data sets, not mentioned in the contract, were also added: nuclear power plants, urban wastewater treatment facilities and discharge points, MSFD reporting units.

The work on the Maritime Spatial Planning (MSP) data set has progressed, although not to the point of releasing a data set. The Human Activities team georeferenced the existing spatial plans that are compliant with the MSP directive. Two harmonisation proposals were presented to EASME and DG MARE in view of establishing a consistent nomenclature of ocean uses: one is based on Helcom's base maps[1], the other on EMODnet Human Activities' data themes. A formal decision is yet to be made at the time of writing. Meanwhile, the EU Commission has decided to set up a MSP Data Expert Group, which will include a representative of the EMODnet Human Activities team. It was suggested that the first decision on how to establish a common nomenclature be made within the newly-to-be-created data expert group. However, this might cause delays in completing and making available the data set.

Task 2 - Construct products from one or more data sources that provide users with information about the distribution of parameters in time and space: a set of vessel density maps (2017 data) were made available in March 2019. The release was anticipated by a communication campaign orchestrated with the EMODnet Secretariat to build anticipation. The vessel density maps quickly became EMODnet Human Activities' most downloaded data set. In December 2019, the maps received an update with 2018 data. As of March 2020, work is ongoing to update the maps with 2019 data. The method to create the vessel density maps was developed by the EMODnet Human Activities team together with the JRC of the European Commission, and it is available online at this link.

Furthermore, route density maps were released in December 2019. These maps are developed by EMSA, based on a service level agreement with DG MARE, whereby it is stipulated that the maps be made available on EMODnet Human Activities. The route density maps complement rather than replace the existing vessel density maps: while the vessel density maps show number of hours spent by ships in a 1-square-kilometre grid cell in a month/year, the route density maps show the number of ship routes crossing a 1-square kilometre grid cell (the same grid used for the vessel density maps) in a month/year/season. Thus, the methods are entirely different and so are the results. EMSA's maps cover the entire 2019 and are updated monthly.

Task 3 - Develop procedures for machine-to-machine connections to data and data products: WMS and WFS have been maintained for all data sets. With the release of the vessel and route density maps,

[1] https://basemaps.helcom.fi/

EMODnet Human Activities now also stores raster data sets, which can be served via WCS. Therefore WCS was also implemented.

To improve both user experience and consistency across EMODnet portals, new short web service URLs were created using domain ows.emodnet-humanactivities.eu. In addition, as of March 2019 work is ongoing to also serve metadata via web services.

Task 4 - Develop a web portal allowing users to find, visualise and download data: new features were added to the map viewer: a search facility, a tool to capture features and download tabular data, a print tool and a button to adjust layer transparency. The tool to download tabular data is conceived to improve user experience; several users contacted the EMODnet Human Activities team via live chat to ask data in excel or text format, presumably because many of them are not familiar with geographical data and GIS software. Hence the need for implementing a user-friendly tool to let non-GIS experts download the data in a more familiar format. When browsing the map viewer, it is now possible for users to draw a rectangle with their mouse and download the data within it in text format.

The portal was transferred to a new Linux server for increased performance and security with latest versions of GeoServer and PostgreSQL. A wildcard SSL certificate was implemented for emodnet-humanactivities.eu to allow the publishing of the portal and web services via https. The portal was made compliant with applicable data protection rules. A cookie notice and a data protection notice were rewritten; a plugin mimicking the EC cookie consent kit was also installed.

Task 5 - Ensure the involvement of regional sea conventions: Nothing to report

Task 6 - Facilitate interoperability with data distributed by non-EU organisations: EMODnet Human Activities is part of the EMODnet PACE project to strengthen international ocean data through the EU's ocean diplomacy with China. The success of the project will be dependent on the effective cooperation, dialogue and exchange between experts from the EU and China. The project is an important support for the implementation of global commitments through improved accessibility of ocean marine data and data products. It is funded as part of the Foreign Policy Instrument (FPI) of the European Commission, through EuropeAid/139904/DH/SER/CN.

Task 7 - Install a process to monitor performance and deal with user feedback: user feedback is being monitored consistently across the various portals following the indications from the Secretariat and Trust-IT. In addition, the Human Activities team periodically contact users (with their consent) to enquire about data usage. This led to developing two use cases regarding C2Wind and Cathie Associates. The use cases are available on EMODnet Central Portal.

Task 8 - Operate a help desk offering support to users: a help-desk service was set up shortly after the signature of the contract. Currently, it is possible to request help via email, telephone or live chat. The telephone and live-chat help-desk services are manned Monday through Friday during business hours. Gradually users have grown fond of live chat, which ensures immediate response and now is the preferred method to contact the EMODnet Human Activities team. E-mail requests are generally addressed with 1.5 half days; telephone and chat requests are addressed in real time. Most requests for help are about where and how to download data and how to symbolize raster data sets (the density maps) in ArcGIS, QGIS and Matlab.

4 Challenges encountered during the reporting period

Main challenge	Measures taken
KIS-ORCA, owner of a dataset on cables previously made available on EMODnet HA, required that their data be removed.	The data were removed immediately. Negotiations are ongoing with the data source to seek a solution, which however is unlikely to be found.
Aquaculture: improvement of geographical coverage	It remains quite difficult to get data from some Member States, some of which are important producing countries. E.g. there is no data on finfish aquaculture from Italy, France and Portugal. Data from Greece and Spain are incomplete – although negotiations are ongoing with the Spanish authorities. If no progress is made, it might be necessary to make on-site visits to national authorities.
Cultural Heritage: reluctance of data owners to provide precise coordinates of underwater sites/objects	Negotiations ongoing for transmitting layers with no coordinates and/or non downloadable information on site locations.
Data on military areas (request from DG MARE) not easily available. Sometimes they are available from unofficial sources	As a rule of thumb, Hydrographic Offices do have these data. The coordinator of EMODnet Bathymetry was been contacted to facilitate communication with Hydrographic Offices (nearly all of them are partners to EMODnet Bathymetry).
MSP: the few existing plans compliant with the MSP Directive were georeferenced. Feedback from DG MARE is needed on common nomenclature. A MSP Data Expert Group is being set up by the EU Commission; the final decision on nomenclature may be made jointly with the group, but this might cause further delays that would make it impossible to release the data set before the end of the contract.	Two harmonization proposals were put forward: one is to harmonize ocean uses across Member States according to EMODnet Human Activities' data theme; the other is to use the nomenclature developed by Helcom Base Maps. The possibility to address this decision at the level of the newly-to-be-formed data expert group has advantages and disadvantages. The advantage is that the decision would not be top-down; the disadvantage is that it might take a very long time before making a decision, and there is only one year left before the end of the contract.

5 Allocation of project resources

Categories	Resource usage (%)
Making data and metadata interoperable and available	39%
Preparing data products	18.5%
Preparing web-pages, viewing or search facilities	18%
Managing user feedback	3%
Project management	5%
Outreach and communication activities	5.5%
Involvement of Regional Sea Conventions	0%
Analysis of standards and protocols used by non-EU organisations	1%
Other costs	10%

6 Work package updates

WP 2 – Data Collection

Cultural heritage

What's new: web screening is ongoing to identify new online GIS tools and data sources (at national level). Data providers have been contacted in Ireland, France, Croatia. Issues concerning data harmonization are under analysis for these new sources, the key issues being type of objects, historical period covered (archaeological / historical heritage) and the availability / accuracy of coordinates. Negotiations are ongoing with different data providers for getting access to sites/object coordinates, for free or by purchasing datasets (Ireland, EU wrecks, EU lighthouses).

What's next: update due in 2020

Aquaculture

What's new: Data model has been revised to be harmonised with the data model for the marine finfish dataset and improve symbolisation and filtering options, this revision includes the addition of a field for the "type of farm", based on the different species. The typology is still being refined to take into account the different situations encountered. At this stage the typology should include the following type of farms (Mainly mussels, Mainly oysters, Mix mussels-oysters, Clams, Cockles, Other specialised farms or areas, Diversified farms or areas);

Processing of the French data from different sources (cadastre from different departments/regions using different definitions, inventory of production areas) is still in progress: it has been decided to use the production areas and cross it with data from the cadastre to obtain information on species when available. The data from cadastre show the individual parcels and does not provide information on farms or establishments, which is too different from the information used for other countries for this dataset (farms or production areas). However, the cadastral data will be used for a new dataset showing polygons rather than points.

Updated data was processed for Greece, Norway, Slovenia and Poland.

What's next: update due in 2020

Algae production facilities

What's new: the JRC updated the data set and sent it to the EMODnet Human Activities team for validation. Compared with the previous version, the new version includes information on species (previously not available). A new data set was created on spirulina producers.

What's next: the JRC will submit the new data set via the Data Ingestion Portal in the coming weeks.

Aggregate extraction

What's new: data set updated in 2019, with information up to 2018.

What's next: new updated due in 2020.

Dredging

What's new: data set updated in 2019, with information up to 2017.

What's next: new updated due in 2020.

Environment

What's new: nationally designated areas and Natura 2000 areas are now broken down by area category (e.g. strict nature reserve, wilderness area, national park, etc.). In practice, this means that from the map viewer users are now allowed to filter out certain area categories, whereas before they could only view all areas together.

What's next: in the next update, two new classifications might be introduced: stage of establishment and level of protection (https://medpan.org/spotlight-on-strong-protection-zones-in-marine-protected-areas/). Feasibility is under investigation.

Ocean energy facilities

What's new: data set updated in 2019 with latest information available (new projects, changes in existing ones).

What's next: new update due in 2020.

Other forms of area management

What's new: new data set on MSFD supporting units, reporting on the marine regions and subregions listed in Article 4 of the Marine Strategy Framework Directive (MSFD), together with other surrounding seas of Europe. The MSFD marine regions and subregions map was developed to support DG Environment and EU Member States in their implementation of the MSFD. It represents the current state of understanding of the marine regions and subregions and is subject to amendment in light of any new information which may be produced.

What's next: update due in 2020.

Waste disposal

What's new: two new data sets added, one on Urban Waste Water Treatment Plant, the other on discharge points. They are both based on dataset "Waterbase-UWWTD" (Urban Waste Water Treatment Directive - reported data) provided by the European Topic Centre on Inland, Coastal and Marine waters.

What's next: update due in 2020.

Wind farms

What's new: the data set: data set updated in 2019 with latest information available (new projects, changes in existing ones). Minor changes to the data model to streamline projects' statuses.

What's next: mid-term update about to be released due to some discrepancies found across the sources used.

Fisheries

What's new: the current data sets received an update in 2019.

What's next: two new data sets are about to be released. One is on fishing effort (based on the JRC STECF data), the other on fishing intensity in the North Sea and in the Baltic Sea (based on ICES data)-

Oil & Gas (formerly Hydrocarbon extraction)

What's new: data theme renamed. All data sets received an update in 2019. The data set on licences now covers Cyprus, while Portugal was removed, since its licences expired.

What's next: update due in 2020.

Cables

What's new: UK (and surrounding waters) cables had to be removed at the request of the data provider (KIS-ORCA). In practice, North Sea coverage has deteriorated considerably.

What's next: update due in 2020.

Pipelines

What's new: new source for UK pipelines improved coverage of the North Sea considerably.

What's next: update due in 2020.

Major ports

What's new: data set updated in 2019 with latest information available.

What's next: new updated due in 2020.

Major ports – waste collected

What's new: data set updated in 2019 with latest information available.

What's next: new updated due in 2020.

Nuclear power plants

What's new: A geodatabase on coastal Nuclear Power Plants was created in 2019. It is the result of the aggregation and harmonization of datasets provided by several EU and non-EU sources. The geodatabase contains points representing nuclear power plants sites in the following countries: Belgium, Finland, France, Germany, Italy, Netherlands, Romania, Russia, Spain, Sweden, Turkey and UK. Where available each point has the following attributes: EMODnet Code, Plant Name, Country, Status (Operational, Permanently shut down, Planned, Under construction), Number of Reactors, Thermal Capacity (MW), Gross Capacity (MW), Net Capacity (MW), Location (Municipality), Water Source, Latitude, Longitude. Additional informations about reactors are stored in a separated table and are related to the point feature class. Where available for each reactor the following attributes are reported: EMODnet Code, Plant Name, Status (Operational, Permanently shut down, Planned, Under construction), Type, Model, Fuel Type, Thermal Capacity (MW), Gross Capacity (MW), Net Capacity (MW), Operator, Nuclear Steam Supply System (NSSS), Construction Year, Construction Month, Criticality Year, Criticality Month, Connection to the Grid Year, Connection to the Grid Month, Shut Down Year, Shut Down Month. The dataset will be updated every year.

What's next: update due in 2020

Spatial planning zones

What's new: a proposal to create a consistent nomenclature of ocean uses has been put forward.

What's next: waiting feedback from DG MARE. The issue might be addressed through a newly-to-be-created MSP Data Expert Group.

WP 3 – Data Harmonisation

Generally speaking, data harmonisation procedures have remained the same for all datasets, with only few exceptions.

Some new data sets obviously have a new data model as well. However, harmonisation was really necessary only for nuclear power plants, a data set that integrates multiple sources with different information.

As far as macroalgae and microalgae are concerned, together with the JRC it was decided to change the data model and store geographical features in a table, and additional information in related table. This was necessary as the data set got larger.

Wind farms statuses were also simplified to avoid confusion. Available statuses now are: planned, approved, under construction, production,dismantled, test site.

WP4 - Design of the GIS database

In the second phase of EMODnet Human Activities the design and implementation of the geographical database aimed to improve the representation of data, as well as the management and the feeding of the database. In the current phase, there are 17 populated data themes, each organized in one or more geodatabases with their spatial domain and coordinate system (WGS84). Each geodatabase is storing one or more feature classes, tables and relationship classes (if required).

The schemas developed for each geodatabase define not only the physical structure of the database, but also the geometry types (points, polygons, lines), rules, relationships, properties of each dataset, and field types (text, double, short or long integer).

Based on our previous experience, population and harmonisation of the database have been improved by using standardised attributes for both the mandatory fields specified in the Tender Specifications and the additional attributes that are continuously updated.

After defining database schemas, we the data collected, harmonising mandatory and additional attributes. Data were uploaded into each geodatabase after the harmonisation process. Harmonisation mainly consists of projecting raw data in a common coordinate system, editing the attributes of collected shapefiles or tables, and calculating common numeric values like the distance to coast. This procedure made it possible to feed the database without modifying its schema as we did in the past.

16 data themes are currently populated with vector data of one or more geometry types. Each feature class is a collection of geographic features that share the same geometry type (such as point, line, or polygon) and the same attribute fields for a common area.

Generally speaking there are two ways to organise feature classes:

1. E.g. in the case of Hydrocarbon Extraction, after the harmonisation process, data were loaded in their feature class (boreholes or platforms, both point type) where they are automatically organised according to fields properties and several coded values domains.
2. E.g. In the case of Major Ports Traffic, given the amount of information contained in each related table (passengers, goods and vessels traffic) it was decided to keep the geometric (i.e. points representing main ports) and the alphanumeric (i.e. tables containing attributes) components separate. Subsequently, through a relationship class (one-to-many) it was possible to correlate the geometric and the alphanumeric component using a common key field.

A shapefile version of each geodatabase dataset has also been made available, so as to make it easier to read and write geographical datasets using the EMODnet Human Activities data with a wide variety of software.

1 data theme is populated with raster data.

WP 5 – Population of the database

The following datasets were uploaded:

- Aggregate extraction
- Macroalgae (seaweed)
- Microalgae
- Dredging
- Lighthouses
- Wrecks
- Submerged Prehistoric Archaeology and Landscapes
- Natura 2000 areas
- Nationally Designated areas (CDDA)
- State of bathing waters
- ICES Statistical Areas
- FAO Fishery Statistical Areas
- Fish Catches by FAO Fishery Statistical Areas
- Monthly first sales of fish
- Active licences (Oil & Gas)
- Boreholes (Oil & Gas)
- Offshore installations (hydrocarbon extraction)
- Main ports (passengers, goods, vessels traffic)
- Waste in ports (Main ports)
- Nuclear Power Plants
- Finfish production (aquaculture)
- Freshwater production (aquaculture)
- Shellfish production (aquaculture)
- Project locations (ocean energy)
- Test sites (ocean energy)
- Advisory councils

- Exclusive Economic Zones
- International conventions
- Maritime boundaries
- MSFD Reporting Units
- Telecommunication cables (schematic routes)
- Telecommunication cables (actual route locations)
- Cable landing stations
- Pipelines
- Dredge spoil dumping
- Dumped munitions
- Urban wastewater treatment plants
- Urban wastewater discharge points
- Wind farms (points and polygons)
- Vessel density
- Route density

WP 6 – Maintenance of the portal

Content: Textual content was updated to reflect the new contract.

LiveChat: Implementation of LiveChat and associated mobile and desktop help software to allow instant communication with users. LiveChat is available on all pages within EMODnet Human Activities. The Help desk is manned Monday through Friday during business hours, apart from public holidays in Italy. In this case a user can leave a message via the live chat software where a standard holding response will be generated.

WFS/WMS/WCS: Web Feature Services (WFS) were migrated from MapServer to GeoServer to allow greater compatibility with the central portal. WCS was implemented to serve raster data.

Web Map Services (WMS) were made available through GeoServer. Example links and code to implement in OpenLayers were made available in the information pages. To improve both user experience and consistency across EMODnet portals, new short web service URLs were created using domain ows.emodnet-humanactivities.eu. In addition, as of March 2019 work is ongoing to also serve metadata via web services.

Portal: the portal was transferred to a new Linux server for increased performance and security with latest versions of GeoServer and PostgreSQL. A wildcard SSL certificate was implemented for emodnet-humanactivities.eu to allow the publishing of the portal and web services via https. The website is now fully compliant with EASME's privacy and data protection policy. Privacy statement was updated. A cookie notice, based on the European Commission's cookie notice, was also created.

Map viewer: new features implemented:

- Search facility
- Tool to capture features and download tabular data: users are now allowed to draw a rectangle on the map and download all the features in it in tabular format.

- Print tool: it is now possible to print the map as currently viewed by a user. The tool makes it possible to add a title, a legend and any other comment.
- Layer transparency can now be adjusted for polygon layers.
- Improved display of tool and base map selection buttons.

Next steps: map viewer will be fine-tuned to improve user experience.

WP 7 – Development of data products

In December 2019, route density maps were released to complement the existing vessel density maps. These route density maps were created by EMSA and made available on EMODnet Human Activities, based on an agreement with DG MARE.

They are conceived to offer a simple and effective way of displaying ship movement patterns, thereby contributing to a better understanding of maritime traffic. The 'engine' of EMSA's density maps is powered by Automatic Identification System (AIS) data received by EMSA from its data providers (member states from their coastal receivers and commercial and non-commercial providers of signals received from satellites). AIS data are essentially messages sent by ships' on-board transponders transmitting information such as position, speed, ship type, etc. initially conceived to enhance maritime safety and security. EMSA receives near-real-time AIS messages in the framework of the vessel traffic monitoring and information system, SafeSeaNet.

EMSA processed processed its AIS data, in such a way as to rebuild the track of each distinct ship from its recorded positions and to count how many routes are crossing each cell of an EU-wide grid during a given time period. This method can be implemented in all regions (coastal and open sea), using all the available ships' position data and allows ship routes to be connected even within areas with a low coverage. The method, agreed with the member states, is available on EMSA's website.

To be noted that EMSA's maps are inherently different from EMODnet Human Activities' vessel density maps. Whereas EMODnet's maps report number of hours spent by certain ship types in a grid cell in a month/year, EMSA's maps report number of routes crossing a grid cell in a month/year/season. That is, EMODnet's maps measure density of vessels – because hours can be immediately converted into average number of vessels per unit measure per time – and EMSA's maps measure density of vessel routes. However, the two sets of maps share the same area of interest and the same grid, which was prepared by the EMODnet Human Activities team.

At the same time, EMODnet's vessel density maps received an update in December 2019. They now cover 2017 and 2018. As of March 2020, the EMODnet Human Activities team have acquired AIS data for the year 2019, and so a new update is being prepared.

As anticipated, the vessel density maps quickly became EMODnet Human Activities' most downloaded data set (or data product). They were downloaded more than 1450 times from March 2019 to March 2020; twice as much as wind farms, the second most downloaded data set. To be noted that this figure does not include web services requests, so the total number of users who took an interest in the maps is likely to be underestimated. Assuming a cost of € 2,000 for the whole set of density maps and multiplying it by

1,450 downloads, making the maps available on EMODnet saved nearly € 3,000,000 in costs for EMODnet users. Again € 2,000 is likely an underestimation and is based on the assumption that the maps are bought from a single provider that has achieved economies of scale. If one were to build the maps by themselves, € 2,000 would not even cover the cost of acquiring the raw data, even less so the time needed to process them.

WP 8 – Involvement of regional sea conventions

Nothing to report

WP 9 – Analysis of standards and protocols used by non-EU organisations

EMODnet Human Activities is involved in EMODnet Partnership for China and Europe (EMODnet-PACE), a funded under the Partnership Instrument on 31 October 2019 (EuropeAid/139904/DH/SER/CN 'Strengthening international ocean data through the EU's ocean diplomacy with China'). The project aims to deliver a major part of the EU contribution to the EU-China Blue Partnership for the Oceans.

The project kick-off meeting took place in Brussels, Belgium on the 19th February 2020 marking the start of the project with an initial duration of 30 months. The kick-off meeting will be followed by an inception meeting in China which will take place later in 2020 with a large and specialised European and Chinese expert participation.

The shared objective of this EU-China Partnership is to ensure a well-supported and effective ocean governance structure for the conservation and sustainable use of the oceans and their resources. These efforts will support sustainable fisheries, a thriving and sustainable maritime economy combined with good environmental status for a healthy ocean. This EMOD-PACE project involves 17 EU partner organisations in a collaborative effort to promote international ocean governance with China as well as directly support the implementation of global commitments, primarily but not exclusively through enhanced accessibility of marine data and data products and by providing better data and data products.

The EMODnet Human Activities will mainly work on common standards for vessel density and aquaculture.

WP 10 – Monitoring of effectiveness in addressing users' needs

The EMODnet Human Activities team constantly monitor user feedback, which is collected mostly through live chat and participation in events.

Users who reach out via live chat mainly ask technical questions related to portal usage. At events, on the other hand, it often happens to meet people who are completely unaware of EMODnet and so enquire about data coverage. Their feedback is especially important to formulate recommendations as to how extend the service in the future to better meet user needs.

Furthermore, every month the EUMOFA team analyze user statistics to understand what users download data for. Upon downloading a data set or making a web service requests, users are asked to fill out a form with some basic information. A non-mandatory field asks about reasons for downloading the data (see *Indicator 7 - List of what the downloaded data has been used for* below). Special attention is placed on users from the private sector, which, as of March 2020, make up for 25.4% of total users, a slight decline compared with March 2019.

Some of these users are contacted by the EMODnet Human Activities team to further enquire about data usage. If they agree, the process culminates in the publication of a use case on EMODnet Central Portal, as well as on EMODnet Human Activities' blog. In the past year, two case studies were published:

- **C2Wind**, an innovative Danish company employing ten specialists divided between its two offices located in Copenhagen and Fredercia, aims to **reduce the cost of energy associated with offshore wind power** by providing a holistic approach to the design of offshore wind turbines. Operating in a country which is regarded as the home of modern wind energy and a world leader in research and development of wind energy, C2Wind draws on all resources including EMODnet Human Activities to get the job done. For the last several years, the EMODnet Human Activities portal has become a vital tool for C2Wind. Wind farm and hydrocarbon extraction datasets are the most commonly explored datasets, identifying locations of already existing structures. Additional datasets on occasion are surveyed to provide the full extent of human activities. This crucial information is used in the preliminary phases of projects, determining areas of interest for the development of wind farm projects. Another positive according to C2Wind, is accessing EMODnet Human Activities actually saves time and money, as mentioned the great combination of datasets and C2Wind's confidence reduces the need of individual database searches.

- **Cathie Associates** is a leading international geoscience and geotechnical engineering consultancy providing bespoke and objective solutions to the offshore and near-shore oil, gas and renewable energy industries. For over 50 technical experts, operating from offices across Europe (Belgium, France, UK, Germany and Italy) and the USA (Boston and Houston), EMODnet Human Activities database has become an important addition, especially in their early phases, to current projects and tenders, with cables, pipelines and hydrocarbon extraction being the main data sets downloaded.
  Cathie Associates explains that "*The advantage of using EMODnet data is that it helps in double checking the data supplied by others and in consolidating all the information*", thus reducing time and costs and enabling users to become more efficient, provide better services and remain competitive in the market.

WP 11 – Setting-up and operation of a help-desk

A help-desk service was set up shortly after the signature of the contract. Currently, it is possible to request help via email, telephone or live chat. The telephone and live-chat help-desk services are manned Monday through Friday during business hours. While initially users seemed to still prefer email, the number of requests for help via live chat has increased steadily over time. No user has ever requested help via telephone. E-mail requests are generally addressed with 1.5 half days; telephone and chat requests are addressed in real time.

Most requests for help are about where and how to download data and how to symbolize raster data sets (the density maps) in ArcGIS, QGIS and Matlab. Other requests concern the possibility to download data in excel or text format. For this reason, the EMODnet Human Activities team decided to implement a new feature for the map viewer that enables users to draw a rectangle on the map and download the data within it in tabular format. For technical reasons, the feature cannot work with too large data extractions;

in these cases, the EMODnet Human Activities team normally provides users with a bespoke extraction of a data set in the desired format.

More detail on user requests is available in Chapter 7 – User feedback.

WP 13 – Dissemination and communication

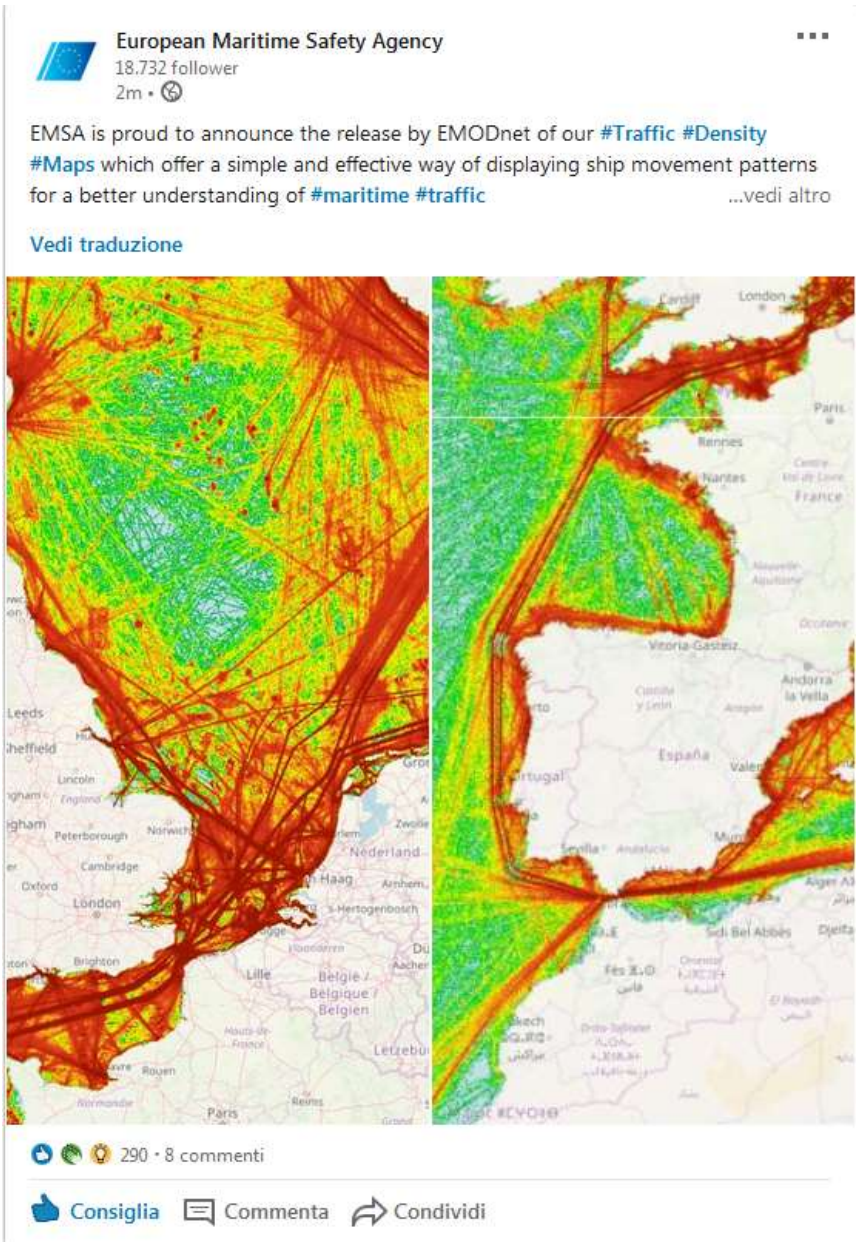
A detailed Dissemination and Communication plan was drafted at the beginning of the project and is updated yearly. It analyses the opportunity and feasibility of further improving the current layout of the portal, identification, and selection of additional communication channels (print media, news and communications agencies, social media, audio-visual media, and specialized websites), identification and selection of sector events where EMODnet Human Activities may be promoted, and creation of synergies with national and regional initiatives and events.

The EMODnet Human Activities team regularly attends events whenever there is an opportunity for raising awareness about the project.

Furthermore, since the blog section has proved to be an effective tool to increase the visibility of the project, posts related to topics covered by EMODnet Human Activities are published regularly, in accordance with a plan that covers the entire duration of the project.

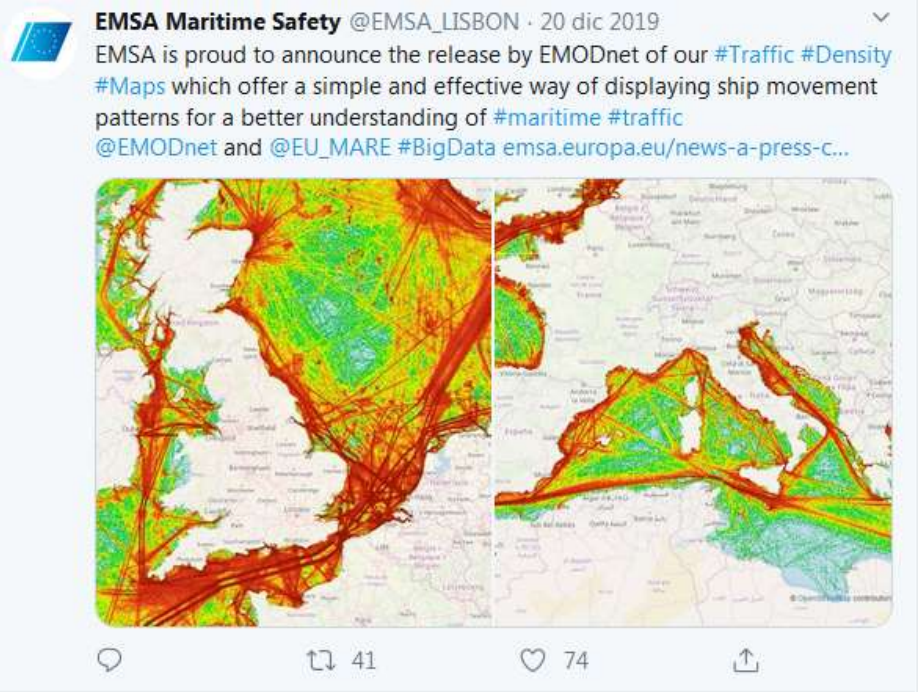
Upon releasing the vessel and route density maps, press releases were published on EMODnet Central Portal and passed on to sector media. The press release for the route density maps was written together with EMSA's communication experts, and published on their website. The release of the route density maps was also announced on EMSA's social media accounts. The posts on Twitter and LinkedIn totalled a surprisingly high number of 'likes', much higher than what is totalled on EMODnet's social media account. Most certainly this is due to the fact that EMSA caters to a wider community than EMODnet. This is particularly evident on LinkedIn, where EMODnet has nearly 500 followers and EMSA has nearly 20,000. The LinkedIn post totalled 290 'reactions':

Figure 1 - EMSA announces the release of the route density maps on LinkedIn



On Twitter EMODnet has about 4,400 followers, while EMSA has nearly 7,000, so the difference is less evident:

Figure 2 - EMSA announces the release of the route density maps on Twitter



Further analysis might be needed, but it would seem that by exploiting EMSA's social media accounts, EMODnet Human Activities became known to a circle of professional who might have been unaware of it. This suggests there might be room for cooperation with similar entities to increase visibility and raise awareness about EMODnet.

Last but not least, upon releasing the vessel density maps in March 2019, together with the EMODnet Secretariat it was decided to organise a webinar to present the new data product. The webinar was fairly successful and overall 46 users signed up for it. It was the first time an EMODnet Human Activities webinar was organized and it turned out to be a good instrument to promote the project and reach out to users. In the first part of the webinar, the EMODnet Human Activities team presented the long-awaited data product; in the second part users asked questions to the team via live chat. The webinar was recorded and uploaded on YouTube: https://www.youtube.com/watch?v=gf1XBZ010dU.

7 User Feedback

Date	Organisation	Type of user feedback (e.g. technical, case study, etc.)	Response time
28/03/19	Columbia University	Enquiry on data	Same day
27/03/19	Private individual	Technical	Immediate (live chat)
260/3/19	European Subsea Cables Association	Data policy issue	Same day
26/03/19	Next Geosolutions	Technical	Immediate (live chat)
25/03/19	Private individual	Technical	Immediate (live chat). User redirected to EMODnet Bathymetry.
22/03/19	4COffshore	Technical	Same day
22/03/19	NavD	Exploring forms of cooperation	Same day
20/03/19	Gavin & Doherty Geosolutions	Enquiry on data	Immediate (live chat)
19/03/19	Private individual	Technical	Immediate (live chat). User redirected to EMODnet Bathymetry.
13/03/19	Maritime Institute in Gdańsk	Technical	Immediate (live chat)
13/03/19	Cathie Associates	Technical	Same day
12/03/19	ISMAR	Technical	Same day
12/03/19	Private individual	Enquiry on data	Immediate (live chat)
12/03/19	JRC	Technical	Immediate (live chat)
7/03/19	University of York	Enquiry on data	Immediate (live chat)
06/03/19	Private individual	Enquiry on data	Immediate (live chat)
26/02/19	Private individual	Technical	Immediate (live chat)
25/02/19	VLIZ	Enquiry on data	Immediate (live chat)
25/02/19	University of York	Technical	Immediate (live chat)
21/02/19	Private individual	Technical	Immediate (live chat)
15/01/19	Private individual	Enquiry on data	Immediate (live chat)
07/01/19	University of Hannover	Technical	Same day
03/01/19	EC's Knowledge Centre for Bioeconomy	Technical	Same day

Date	Organisation	Type of user feedback (e.g. technical, case study, etc.)	Response time
02/04/2019	PhD student (via EMODnet Secretariat)	Case study	Immediate (e-mail)
03/04/2019	Individual (live chat)	Technical	Immediate (live chat)
03/04/2019	Individual (live chat)	Technical	Immediate (live chat)
04/04/2019	Individual (live chat)	Technical	Immediate (live chat)
07/04/2019	Individual (live chat)	Technical	Immediate (live chat)
09/04/2019	Individual (live chat)	Technical	Immediate (live chat)
10/04/2019	Individual (live chat)	Technical	Immediate (live chat)
11/04/2019	Individual (live chat)	Technical	Immediate (live chat)
25/04/2019	Individual (live chat)	Technical	Immediate (live chat)
03/04/2019	Individual (live chat)	Case study	Immediate (live chat)
09/05/2019	University of York (via EMODnet Secretariat)	Technical	Immediate (e-mail)
17/05/2019	Individual (live chat)	Technical	Immediate (live chat)
22/05/2019	Individual (live chat)	Technical	Immediate (live chat)
24/05/2019	Individual (live chat)	Technical	Immediate (live chat)
30/05/2019	Individual (live chat)	Technical	Immediate (live chat)
31/05/2019	Individual (live chat)	Technical	Immediate (live chat)
04/06/2019	Individual (live chat)	Technical	Immediate (live chat)
11/06/2019	Individual (live chat)	The user needed information from EMODnet Bathymetry	Immediate (live chat)
12/06/2019	Oceana (live chat)	Case study	Immediate (live chat)
14/06/2019	Individual (live chat)	Technical	Immediate (live chat)
27/06/2019	Individual (live chat)	Technical	Immediate (live chat)
27/06/2019	Individual (live chat)	Case study. The user needed information from EMODnet Physics	Immediate (live chat)
27/06/2019	Intern from CEREMA and World Bank	Case study	1 day (e-mail)
10/07/19	Individual	Technical	Immediate (live chat)
10/07/19	Individual	Technical	Immediate (live chat)
12/07/19	Individual	Technical	Immediate (live chat)
19/07/19	Scottish Government	Technical	Immediate (live chat)
23/07/19	Individual	Technical	Immediate (live chat)
26/07/19	ISMAR	Technical	Immediate (live chat)
29/07/19	Mocean energy	Technical	Immediate (live chat)

Date	Organisation	Type of user feedback (e.g. technical, case study, etc.)	Response time
02/08/19	Scottish Association for Marine Science	Technical	Immediate (live chat)
30/08/19	Vattenfall	Technical	Same day (e-mail)
02/09/19	Individual	Technical	Immediate (live chat)
03/09/19	Individual	Technical	Immediate (live chat)
14/09/19	Individual	Technical	Immediate (live chat)
20/09/19	Individual	Technical	Same day (e-mail)
22/09/19	Shell	Technical	Immediate (live chat)
23/09/19	CTAqua	Technical	Immediate (live chat)
24/09/19	Individual	Technical	Same day (e-mail)
27/09/19	INGV	Technical	Immediate (live chat)
01/10/2019	Individual	Technical (shellfish aquaculture)	Half a day (email)
04/10/2019	Individual	Information on data (algae production)	Immediate (live chat)
07/10/2019	Individual	Technical	Immediate (live chat)
10/10/2019	Individual	Information on data (submerged archaeology)	Immediate (live chat)
16/10/2019	Individual	Information on data (vessel density)	Half a day (email via EMODnet Secretariat)
18/10/2019	Individual	Information on data (main ports)	Immediate (live chat)
18/10/2019	Individual	Information on data (vessel density)	Half a day (email via EMODnet Secretariat)
22/10/2019	EMODnet Secretariat	Technical (map viewer down)	Immediate (live chat)
23/10/2019	Individual	Technical (use of web services)	Immediate (live chat)
24/10/2019	Individual	Technical (vessel density)	Immediate (live chat)
25/10/2019	Individual	Information on data (vessel density)	Immediate (live chat)
25/10/2019	Individual	Information on data (vessel density)	Immediate (live chat)
25/10/2019	Individual	Technical (vessel density)	Immediate (live chat)
06/11/2019	Individual	Technical (vessel density)	Immediate (live chat)
18/11/2019	Individual	Information on controlled vocabularies	Immediate (live chat)
20/11/2019	Individual	Technical (tabular data download)	Immediate (live chat)
10/12/2019	Individual	Technical (vessel density)	Immediate (live chat)
12/12/2019	Individual	Information on data (vessel density)	Immediate (live chat)
18/12/2019	Individual	Information on website	Immediate (live chat)
21/12/2019	Individual	Technical (vessel density)	Half a day (email)
30/12/2019	Individual	Feedback	Half a day (email)
02/01/2020	Individual	Technical	Immediate (live chat)

Date	Organisation	Type of user feedback (e.g. technical, case study, etc.)	Response time
08/01/2020	Individual	Information on data (vessel density)	Immediate (live chat)
08/01/2020	Individual	Information on data (vessel density)	Immediate (live chat)
09/01/2020	Individual	Technical (vessel density)	Immediate (live chat)
09/01/2020	Individual	Technical (vessel density)	Immediate (live chat)
09/01/2020	Individual	Technical (data download)	Immediate (live chat)
17/01/2020	Individual	Information on data (wind farms)	Immediate (live chat)
23/01/2020	Individual	Technical (major ports)	Immediate (live chat)
27/01/2020	EU Commission	Technical	Immediate (live chat)
01/02/2020	Individual	Information on data (vessel density)	Same day (email)
03/02/2020	Individual	Technical (vessel density)	Immediate (live chat)
05/02/2020	Individual	Technical (aquaculture)	Same day (email)
05/02/2020	Individual	Information on data (wind farms)	Same day (email)
12/02/2020	Individual	Information on data (vessel density)	Immediate (live chat)
14/02/2020	Individual	Information on data (vessel density)	Immediate (live chat)
15/02/2020	Individual	Technical (vessel density)	Same day (email)
17/02/2020	Individual	Technical	Immediate (live chat)
02/03/2020	Individual	Information on data (wind farms)	Immediate (live chat)

8 Meetings held/attended since last report

Date	Location	Type event (meeting, training (workshop), etc.)	Attended (A) / Organised (O)	Short description and main results (# participants, agreements made, etc.)
26/3/2019	Vigo (ES)	EMODnet HA partners meeting	O	The meeting aimed to assess the progress of the project and to discuss potential developments. 12 participants.
15/3/2019	n.a.	Webinar	O	Webinar on how to use the vessel density maps. 46 participants
14-15/03/2019	Tenerife (ES)	MarSP 2nd Capacity Building Workshop: MSP INSPIRE data model	A	Technical workshop to discuss INSPIRE data models for MSP
27/2/2019	Brussels (BE)	Workshop	A	Algae production in Europe: status, challenges and future developments. The dataset on algae production available on EMODnet HA was presented to producers, who agreed on sharing information on species and quantities harvested/cultivated
15/01/2019	Roma (IT)	Meeting	O	Meeting with ISMAR to explore forms of cooperation. 4 participants
24/06/2019	Athens (EL)	SEALINES Workshop	A	Presentation of EMODnet Human Activities to Mediterranean stakeholders. No of participants: 35
17/05/2019	Lisbon (PT)	Digitalisation, AI & Big Data for Maritime Applications: workshop	A	Discussion on how the vessel density map was built on big data, and what can be done with it. No of participants: unknown
17/05/2019	Lisbon (PT)	MarSP: EMD2019 Workshop	A	EMD2019 Workshop - Innovative tools & transferability in MSP EASME projects. No of participants: unknown
3/10/19	Brussels (BE)	Workshop on data for MSP implementation	A	Presentation of EMODnet HA
2-3/9/19	Ghent (BE)	EMODnet Steering Committee meeting	A	
4-6/9/19	Ghent (BE)	OpenSeaLab	A	

Date	Location	Type event (meeting, training (workshop), etc.)	Attended (A) / Organised (O)	Short description and main results (# participants, agreements made, etc.)
18/2/2020	Brussels (BE)	Meeting with EASME and DG MARE	A	Meeting to discuss next steps for the data set on MSP
SUM			**O**	**Total # of meetings organised = 3**
SUM			**A**	**Total # of meetings attended = 9**

9 Outreach and communication activities

Table 1 – List of outreach and communication activities

Date	Communication action/material	Short description (of the material, title, ...) and/or link to the activity	Main results (# participants, # views, # press clippings, etc.)
28/3/2019	Blog post	EMODnet Human Activities Data Facilitate Business Opportunities	
21/3/2019	Blog post	Detailed method of EU vessel density map	83 views
15/3/2019	Webinar	Webinar on how to use the vessel density maps	46 participants
15/2/2019	Blog post	Working towards INSPIRE Directive compliance	29 views
17/05/2019	Workshop at EMD 2019	Discussion on how the vessel density map was built on big data, and what can be done with it.	No of participants: unknown
17/05/2019	Workshop at EMD 2019	EMD2019 Workshop - Innovative tools & transferability in MSP EASME projects. No of participants: unknown	No of participants: unknown
24/06/2019	SEALINES workshop	Presentation of EMODnet Human Activities to Mediterranean stakeholders.	No of participants: 35
19/9/19	Blog post	Where does our wastewater go? https://www.emodnet-humanactivities.eu/blog/?p=1159	9 views
18/7/19	Blog post	Why are there so many nuclear power plants located on the coast? https://www.emodnet-humanactivities.eu/blog/?p=1118	38 views
10/10/2019	Blog	New map tools allow greater flexibility when interrogating data	51 views
20/12/2019	Press release	Traffic Density Maps for a better understanding of maritime traffic	n.a. (published on EMSA's website)
SUM ...	Blog		**Total # of 291 users reached**

Table 2 - List of known publications using EMODnet data or data products.

Date	Name of journal, conference, …	Publication title	Authors	Organisation(s)
07/03/2019	Marine Policy	Communicating Maritime Spatial Planning: The MSP Challenge approach	Abspoel L. et al.	n.a.
24/02/2109	Science of the Total Environment	A modelling approach for offshore wind farm feasibility with respect to ecosystem-based marine spatial planning	Pınarbaşı K. et al.	n.a.
04/02/2019	North Sea Wind Power Hub Consortium	Cost Evaluation of North Sea Offshore Wind Post 2030	Ruijgrok E.C.M. et al.	Witteveen+Bos, ECN, TNO
24/01/2019	Maritime Spatial Planning	Stakeholder Processes in Marine Spatial Planning: Ambitions and Realities from the European Atlantic Experience	Twomey S., O'Mahony C.	n.a.
24/01/2019	Maritime Spatial Planning	Challenges and Opportunities for Ecosystem-Based Management and Marine Spatial Planning in the Irish Sea	O'Higgins T. et al.	n.a.
01/12/2019	The Techno-Economic Potential of Offshore Wind Energy with Optimized Future Turbine Designs in Europe	The Techno-Economic Potential of Offshore Wind Energy with Optimized Future Turbine Designs in Europe	Caglayan D. et al.	n.a.
10/01/2019	Proceedings of the Maritime Big Data Workshop	The European Marine Observation and Data Network (EMODnet) and big data for Blue Growth	Pititto A., Novellino A.	NATO/CMRE
01/08/2019	Marine Policy	Habitat mapping in the European Seas - is it fit for purpose in the marine restoration agenda?	Gerovasileiou V. et al.	Hellenic Centre for Marine Research et al.

05/07/2019	Technical report	Havhingsten Fibre Optic Telecommunication Cable. Foreshore License Application for Cable Installation - Planning Report	Paula Daglish & Charlie Cameron	Intertek, ALCATEL SUBMARINE NETWORKS
01/03/2019	Marine Policy	Communicating Maritime Spatial Planning: The MSP Challenge approach	Abspoel L. et al.	Ministry for Infrastructure and Water Management (NL)
01/12/2019	Applied Energy (journal)	The Techno-Economic Potential of Offshore Wind Energy with Optimized Future Turbine Designs in Europe	Dilara Gulcin Caglayan, Severin Ryberg, Heidi Heinrichs, Jochen Linßen, Detlef Stolten, Martin Robinius	
31/12/2019	Ecological Indicators	Assessing marine ecosystem services richness and exposure to anthropogenic threats in small sea areas: A case study for the Lithuanian sea space	Daniel Depellegrin, Stefano Menegon, Laura Gusatu, Sanjoy Roy, Ieva Misiunė	
03/02/2020	Journal of Marine Science and Engineering	The Nagoya Protocol and Its Implications on the EU Atlantic Area Countries	Joana Martins, Diogo Cruz, Vitor Vasconcelos	

10 Updates on Progress Indicators

Indicator 1 - Volume of data made available through the portal

Table 3 – Volume of data made available through the portal

Activity		Type/format					
		Points	Lines	Polygons	Related tables/records	Raster tiles/ cells	OGC Web Services
Cultural heritage	Lighthouses	4.062					WMS/WFS
	Ship Wrecks						
	Submerged Prehistoric Archaeology and Landscapes						
Aquaculture	Shellfish	2.169			1 table containing 2.191 records		WMS/WFS
	Finfish	2.561					WMS/WFS
	Freshwater	6.898					WMS/WFS
Algae production	Macroalgae	73					WMS/WFS
	Microalgae	57					WMS/WFS
Aggregate extraction		390		997	1 table (rel. points) containing 2.818 records		WMS/WFS
Dredging		1.659			1 table containing 5.931 records		WMS/WFS
Ocean energy facility	Projects	157			1 table containing 239 records		WMS/WFS
	Test sites			37			WMS/WFS
Other forms of area management/designation	International conventions			8			WMS/WFS
	Maritime boundaries		198				WMS/WFS
	Advisory councils			11			WMS/WFS
	EEZ areas			21			WMS/WFS
	MSFD reporting units			20			WMS/WFS
Waste disposal	Dumped munitions	198		163			WMS/WFS

Activity			Type/format					
			Points	Lines	Polygons	Related tables/records	Raster tiles/ cells	OGC Web Services
	Dredge spoil dumping		686		437			WMS/WFS
	Waste at Ports		59			2 tables containing 310 records		WMS/WFS
	Urban Waste Water Treatment Directive		Discharge Points	10.558				WMS/WFS
			Treatment Plants	8.871				WMS/WFS
Wind farms			354		137			WMS/WFS
Nuclear power plants	45			1 table containing 121 records				WMS/WFS
Fisheries	Fishery zones (FAO and ICES)	FAO Fishery Statistical Areas			324			WMS/WFS
		ICES Statistical Areas			65			WMS/WFS
	Fishery catches by FAO statistical area				137	5 tables containing 83.831 records		WMS/WFS
	Monthly first sales of fish, EUMOFA		2.164			1 table containing 3.171.123 records		WMS/WFS
	Fishing effort				*137*	*5 tables containing 22.245 records*		
	Fishing intensity				*3*			
Hydrocarbon extraction	Boreholes		25.645					WMS/WFS
	Active licenses				2.104			WMS/WFS
	Offshore installations		1.904					WMS/WFS
Cables	Landing stations (schematic cables)		415					WMS/WFS
	Schematic cables			166				WMS/WFS

Activity			Type/format					
			Points	Lines	Polygons	Related tables/records	Raster tiles/ cells	OGC Web Services
	Actual route locations (cables)			209				WMS/WFS
Pipelines				3.933				WMS/WFS
Environment	Protected areas	Nationally designated areas (CDDA)			99.094, 12.590 of which are coastal and/or marine			WMS/WFS
		Natura 2000			27.856, 4.794 of which are coastal and/or marine			WMS/WFS
	State of bathing waters		21.233, 15.116 of which are coastal or transitional			1 table containing 615.467 records, 428.620 of which are coastal or transitional		WMS/WFS
Shipping density	Vessel density						364 GeoTIFF, 7.633 million of cells	WMS/WFS/WCS
	Route density						81 GeoTIFF, 2.013 million of cells	WMS/WFS/WCS
Major ports traffic	Goods		2440			1 table containing 247,160 records		WMS/WFS
	Passengers					1 table containing 148,311 records		WMS/WFS

Activity		Type/format					
		Points	Lines	Polygons	Related tables/records	Raster tiles/ cells	OGC Web Services
	Vessels				1 table containing 3,394,944 records		WMS/WFS

Indicator 2 - Organisations supplying each type of data broken down into country and organisation type (e.g. government, industry, science)

Table 4 – List of data sources

Organisation	Country	Type
Administration of the Republic of Slovenia for Food Safety, Veterinary Sector and Plant Protection	SI	Government
Amateur Radio Lighthouse Society	US	Association
APA-APFF	PT	Government
Aquakultur Register	AT	Government
Associazione Mediterranea Aquacoltori	IT	Producers organisation
Autoridad Portuaria Almeria	ES	Government
Autoridad Portuaria Avilés	ES	Government
Autoridad Portuaria de Bilbao	ES	Government
Autoridad Portuaria de Huelva	ES	Government
Autoridad Portuaria de la Bahia de Algeciras	ES	Government
Autoridad Portuaria de Marín	ES	Government
Autoridad Portuaria de Vigo	ES	Government
Autoridad Portuaria Vilagarcia	ES	Government
Autoridade Portuaria de A Coruña	ES	Government
Autoritat Portuària Tarragona	ES	Government
Autorità Portuale di Genova	IT	Government
Autorità Portuale di Piombino	IT	Government
Basin Directorate for Water Management in the Black Sea Region	BG	Government
Basque Government	ES	Government
Belgian Federal Government	BE	Government
Biuletyn Informacji Publicznej	PL	Government
Black Sea Basin Directorate	BG	International Organisation
Black Sea Commission	TR	International Organisation
Boletín Oficial del Estado	ES	Government
Bollettino Ufficiale della Regione Campania	IT	Government
BSH Contis	DE	Government

Organisation	Country	Type
Bulgarian Food and Safety Agency	BG	Government
Bureau de Recherches Géologiques et Minières	FR	Research
Capitaneria di Porto di Monfalcone	IT	Government
Capitaneria di Porto di Roma	IT	Government
CEREMA	FR	Research
CETMEF	FR	Government
CHR	DK	Government
CINSEDO	IT	Research
Clarkson Research	UK	Industry
CLS	FR	Industry
Comité National de la Conchyliculture	FR	Producers organisation
Comune di Ragusa	IT	Government
Croatian Hydrocarbon Agency	HR	Government
Crown Estate, The	UK	Government
Cyprus Port Authority	CY	Government
CVO	DK	Government
Danish Energy Agency	DK	Government
Danish Environmental Protection Agency	DK	Government
DEME-Group	BE	Industry
Department of Agriculture, Food and the Marine	IE	Government
Department of Communication, Energy and Natural Resources	IE	Government
Department of Energy & Climate Change	UK	Government
Department of Environment - Marine Division	UK	Government
DRAVOSA	ES	Industry
Dutch Ministry of Economic Affairs	NL	Government
EMEC Orkney	UK	Industry
EMODnet Bathymetry	EU	Research
EMSA		
EnergiData	DK	Government
Energistyrelsen	DK	Government
ENMC	PT	Government
Environment and Resources Authority	MT	Government
EUMOFA	EU	EU-funded project
European Environment Agency	EU	Research
Euroshell	EU	FP7 Project
European Market Observatory for Fisheries and Aquaculture Products	EU	Research
Eurostat	LU	DG of the EU
Falmouth Bay Test Site	UK	Industry
FAO	IT	International Organisation
Faroese Geological Survey	FO	Research
Fiskeridirektoratet	NO	Government

Organisation	Country	Type
Francesco Baittiner & Figli	IT	Industry
Geological Survey of Montenegro	ME	Research
Global Energy Observatory	US	Research
Governmental online platform for open data	FR	Government
Greg's Cable Map	ZA	Individual
HELCOM	FI	International Organisation
ICES	DK	International Organisation
Ifremer	FR	Science
IGME	ES	Research
Instituto de Estadística y Cartografía de Andalucía	ES	Government
International Atomic Energy Agency,	AT	International organisation
International Ocean Institute	MT	Research
ISPRA	IT	Research
Italia Nostra	IT	Association
Joint Research Centre	EU	Research
Latvian Environment, Geology and Meteorology Centre	LV	Research
LBEG Geozentrum Hannover	DE	Research
MACHU	EU	FP7 Project
MAGRAMA	ES	Government
Malta Environment & Resources Authority	MT	Government
MAPAMA	ES	Government
Marine and Hydrokinetic Technology Database	US	Research
Marine Scotland	UK	Government
Marine Traffic	EL	Industry
Maritime Administration of Latvia	LV	Government
Middlebury Institute of International Studies at Monterey	US	Research
Ministère de la Transition écologique et solidaire	FR	Government
Ministerium frauen Gesundheit	AT	Government
Ministero dello Sviluppo Economico	IT	Government
Ministry for Environment	PT	Government
Ministry for Infrastructures	ES	Government
Ministry for Transport and Infrastructure - Continental Shelf Department	MT	Government
Ministry of Agriculture and Forestry	FI	Government
Ministry of Agriculture, Rural Development and Environment	CY	Government
Ministry of Defence	CY	Government
Ministry of Defence	ES	Government
Ministry of Defence	BE	Government
Ministry of Defence	HR	Government
Ministry of Energy, Commerce, Industry and Tourism	CY	Government
Ministry of Energy, Tourism and Digital Agenda	ES	Government

Organisation	Country	Type
Ministry of Environment, Energy and Climate Change	EL	Government
Ministry of Environmental Protection and Regional Development	LV	Government
Ministry of Rural Development and Food	EL	Government
MUMM	BE	Science
Nantes Port	FR	Government
Nature Agency	DK	Government
NIBIS	DE	Government
Ocean Energy Systems	PT	Industry
Oil & Gas Authority	UK	Government
Oljedirektoratet	NO	Government
Open Power System Data	DE	Research
Orange	FR	Industry
OSPAR	UK	International Organisation
Packet Clearing House	US	Research
Polish Geological Institute	PL	Research
Port Authorities Constance	RO	Government
Port Authorities Galati	RO	Government
Port Authorities Skellftea	SE	Government
Port Authority Alexandroupolis	EL	Government
Port Authority Dubrovnik	HR	Government
Port Authority Esbjerg	DK	Government
Port Authority Le Havre	FR	Government
Port Authority Loviisa	FI	Government
Port Authority of Kemi	FI	Government
Port Authority Rafina	EL	Government
Port Authority Rijeka	HR	Government
Port Authority Rotterdam	NL	Government
Port Authority Rouen	FR	Government
Port Authority Rovinj	HR	Government
Port Authority Thesalonik	EL	Government
Port Authority Trieste	IT	Government
Port Castello	ES	Government
Port de Barcelona	ES	Government
Port of Tallinn	EE	Government
Port of Turku Finland	FI	Government
Porto de Aveiro	PT	Government
Porto de Lisboa	PT	Government
Ports de la Generalitat	ES	Government
Puerto de Málaga	ES	Government
Puerto de Santander	ES	Government
Préfecture de la Région Languedoc-Roussion	FR	Government
Préfecture des Alpes Maritimes	FR	Government

Organisation	Country	Type
Préfecture du l'Herault	FR	Government
Préfecture du Var	FR	Government
Provincia di Pescara	IT	Government
Puertos del Estado	ES	Government
Queen's University Belfast	UK	Research
Regione Emilia Romagna	IT	Government
Regione Lazio	IT	Government
Regione Siciliana	IT	Government
Rijkswaterstaat Nordzee	NL	Government
Scottish Government Spatial Data Infrastructure	UK	Government
SEDNET	NL	Research
SHAPE Project	IT	FP7 Project
SHOM	FR	Research
SOWFIA	EU	EU-funded project
SPLASHCOS	EU	FP7 Project
Státní veterinární správa	CZ	Government
Swedish Energy Agency	SE	Government
Telegeography	US	Industry
The European Atlas of the Seas	EU	Research
The Wind Power	FR	Industry
Thetys	US	Research
TNO	NL	Industry
Transport Malta	MT	Government
Trasporto Europa	IT	Industry
UNEP-MAP	EL	International Organisation
Valencia Port	ES	Government
Veterinary Services	CY	Government
Wageningen UR	NL	Research
WindEurope	BE	Industry
World Energy Council	UK	NGO
World Nuclear Association	UK	Industry

Indicator 3 - Organisations that have been approached to supply data with no result

Nothing to report.

Indicator 4 - Volume of each type of data and of each data product downloaded from the portal

Included are instances of downloads and initial requests for web service links. Statistics exclude Human Activities and Central Portal partners.

3rd March 2019 to 2nd March 2020

Dataset	# of downloads
Vessel Density	1457
Wind farms	676
Route Density	308
Schematic Cables	283
Main Ports	255
Hydrocarbon Extraction - Offshore Installations	215
Cables - Actual Route Locations	209
Pipelines	176
Aggregate extraction	153
Natura 2000 Areas	137
Aquaculture - Shellfish	132
Nationally Designated Areas (CDDA)	121
Aquaculture- Finfish	114
Dredging	111
Hydrocarbon extraction - Active Licences	108
Maritime Boundaries	96
Dredge Spoil Dumping	92
Ocean Energy Facilities - Projects	89
Macroalgae and Microalgae	88
Boreholes	84
Dumped munitions	81
Exclusive Economic Zone	69
Lighthouses	61
State of bathing waters	58
Fishery catches by FAO statistical area	56
Ocean Energy Facilities - Test sites	43
Urban Waste Water Treatment Directive - Discharge Points	39
Waste at Ports	34
Nuclear Power Plants	31
Monthly first sales, EUMOFA	30
Freshwater Aquaculture	29
International Conventions	24
Advisory Councils	24
Urban Waste Water Treatment Directive - Treatment Plants	22
Cable Landing Stations	12
FAO Fishery Statistical Areas	11
MSFD Reporting Units	11
ICES Statistical Areas	7
Ship Wrecks	n.a.
Submerged Prehistoric Archaeology and Landscapes	n.a.

Total	5546

Indicator 5 - Organisations that have downloaded each data type

Users must select their sector when downloading data or requesting web service links

3rd March 2019 to 2nd March 2020

Academia/Research	54.9%
Consultancy	14.6%
Government/Public Administration	8.3%
Other	7.3%
Large Enterprise	5.6%
Small & Medium Enterprise	5.2%
Non-profit Organisation	3.3%
Policy/Funding Agency	0.5%
Data Provider	0.4%

Indicator 6 - User statistics to determine the main pages utilised and identify user navigation routes

Statistics include all visitors including partners.

3rd March 2019 to 24th February 2020

View Data

Month	Unique Page Views	Avg. Time on Page (mm:ss)	Page Views	New Visitors	% New Visitors

Month	Unique Page Views	Avg. Time on Page (mm:ss)	Page Views	New Visitors	% New Visitors

Home

Month	Unique Page Views	Avg. Time on Page (mm:ss)	Page Views	New Visitors	% New Visitors

Search Data

Month	Unique Page Views	Avg. Time on Page (mm:ss)	Page Views	New Visitors	% New Visitors

Month	Unique Page Views	Avg. Time on Page (mm:ss)	Page Views	New Visitors	% New Visitors

3rd March 2019 to 24th February 2020

Page	Unique Page Views	Avg. Time on Page (mm:ss)	Page Views
View data			
Search data			
Submit data			
Documents			
Home page			

3rd March 2019 to 24th February 2020

Page	Unique Page Views	Avg. Time on Page (mm:ss)	Page Views
View data			
Search data			
Submit data			
Documents			
Home page			

October to December 2018

Page	Unique Page Views	Avg. Time on Page (mm:ss)	Page Views

View data			
Search data			
Submit data			
Documents			
Home page			

The monitoring numbers reported as part of the progress monitoring of EMODnet performance are collected using different monitoring tools (e.g. Matomo, Awstats, Google Analytics, etc.) which use different technical approaches and which each have their strengths and shortcomings. Therefore, results are indicative and care should be taken with interpreting absolute numbers or comparing results from different tools. It is often more sensible to consider trends over time collected by the same monitoring tool.

Indicator 7 - List of what the downloaded data has been used for

Since May 2018, users who download data have been asked to report the reason for download. It is a non-mandatory field, so only a fraction of total users actually provides information.

Below is a list of reasons for download:

- Academic research
- Undergraduate project for mapping fish catches with cetacean strandings
- Add web services to the platform
- Educational book publication
- Analyses of marine litter sources
- Analyses on main marine litter sources
- Analysis of the Human activities in the Marine Protected Areas
- Analysis to find ports that overlap Network Rail Ownership
- Assess offshore areas to help ensure safe operations
- Assess potential locations for offshore fish telemetry study sites
- Assess which wind farms are within UK 12NM zone
- Assessment of potential wind parks
- Assessment of anchor penetration
- Background GIS info for a Master's Thesis in Maritime Spatial Planning
- Background in figure for a scientific publication on seagulls movement
- Background information for internal webmap
- Background mapping for internal use in site selection
- Book reference
- Build a GIS map of oil and gas exploration
- Calculate shipping emissions
- Correlate density with acoustic noise

- Creation of human impacts proxies to improve marine species distribution models
- Creation of route of the international inland waterway E60
- Data on some types of Vessel Density will be used for Ireland's Marine Atlas to identify coastal areas where relevant types of boating activities take place
- Data will be used in a project to understand where the End of Life plastic Waste (EoLPW) is located, stored and or sorted in the UK, the relationship of EoLPW to the transport network in the UK
- Developing a map for the shorelines book publication on the coast of Ireland
- Dutch newspaper Trouw is planning to report about the refugees crossing the Mediterranean. Trouw wants to illustrate this by showing all European harbours that have been closed off to refugees
- Make a map to illustrate the human pressures in the Baltic sea
- To improve sailing directions
- To develop underwater noise modelling
- Research on the interaction of bottlenose dolphin with vessel
- Joint advocacy project on the reduction of ship collisions with sperm whales in the Hellenic Trench and Mapping shipping data in the area (in addition to the Natura 2000 sites and territorial waters)
- Maps creation
- Offshore survey planning
- Overlaying GPS tracks of seabirds and waterbirds
- Perform underwater noise modelling
- Require access to existing and proposed Windfarm boundaries to aid cooperation with regards to infrastructure planning
- Site feasibility study
- Educational poster for a university module
- To help a series of offshore wind developers identify areas of interest by non-UK fishing vessels in the North sea
- To compare with density maps developed by CEDEX and used in Spanish Marine Strategies
- To give the locations of offshore wind installations, for publication within a passage planning guide for ships transiting the English Channel
- To introduce a project on the effects of the Belt and Road Initiative on the arctic region
- University course
- Urban planning
- Using data to investigate AIS data for the EU RAGES project
- Vessel Density for Cable Burial Assessment
- Vessel traffic density to assess nautical charts coverage
- To create a predictive model of Pinna Nobilis distribution (Mediterranean seashell) in the Aegean Sea
- To calculate a risk for the north sea due to coalition with existing oil and gas assets
- AIS data to plan where to safely deploy an acoustic mooring arrays
- To assess any heavily used navigation routs to estimate safety risks to avoid certain areas at sea

Indicator 8 - List of web-services made available and organisations connected through these

List of Web Feature Services (WFS)

WFS are available as XML format, or JOSN format.

Active Licences

https://ows.emodnet-humanactivities.eu/wfs?SERVICE=WFS&VERSION=1.1.0&request=GetFeature&typeName=activelicenses&OUTPUTFORMAT=json

Advisory Councils

https://ows.emodnet-humanactivities.eu/wfs?SERVICE=WFS&VERSION=1.1.0&request=GetFeature&typeName=southwesternwaters&OUTPUTFORMAT=json

Advisory Councils - Aquaculture

https://ows.emodnet-humanactivities.eu/wfs?SERVICE=WFS&VERSION=1.1.0&request=GetFeature&typeName=aquaculture&OUTPUTFORMAT=json

Advisory Councils - Baltic

https://ows.emodnet-humanactivities.eu/wfs?SERVICE=WFS&VERSION=1.1.0&request=GetFeature&typeName=baltic&OUTPUTFORMAT=json

Advisory Councils - Black Sea

https://ows.emodnet-humanactivities.eu/wfs?SERVICE=WFS&VERSION=1.1.0&request=GetFeature&typeName=blacksea&OUTPUTFORMAT=json

Advisory Councils - Long Distance Fleet

https://ows.emodnet-humanactivities.eu/wfs?SERVICE=WFS&VERSION=1.1.0&request=GetFeature&typeName=longdistancefleet&OUTPUTFORMAT=json

Advisory Councils - Market

https://ows.emodnet-humanactivities.eu/wfs?SERVICE=WFS&VERSION=1.1.0&request=GetFeature&typeName=market&OUTPUTFORMAT=json

Advisory Councils - Mediterranean

https://ows.emodnet-humanactivities.eu/wfs?SERVICE=WFS&VERSION=1.1.0&request=GetFeature&typeName=mediterranean&OUTPUTFORMAT=json

Advisory Councils - North Sea

https://ows.emodnet-humanactivities.eu/wfs?SERVICE=WFS&VERSION=1.1.0&request=GetFeature&typeName=northsea&OUTPUTFORMAT=json

Advisory Councils - North Western Waters

https://ows.emodnet-humanactivities.eu/wfs?SERVICE=WFS&VERSION=1.1.0&request=GetFeature&typeName=northwesternwaters&OUTPUTFORMAT=json

Advisory Councils - Outermost Regions

https://ows.emodnet-humanactivities.eu/wfs?SERVICE=WFS&VERSION=1.1.0&request=GetFeature&typeName=outermostregions&OUTPUTFORMAT=json

Advisory Councils- Pelagic Stocks

https://ows.emodnet-humanactivities.eu/wfs?SERVICE=WFS&VERSION=1.1.0&request=GetFeature&typeName=advisorycouncils&OUTPUTFORMAT=json

Aggregate Extraction

https://ows.emodnet-humanactivities.eu/wfs?SERVICE=WFS&VERSION=1.1.0&request=GetFeature&typeName=aggregates&outputformat=json

Aggregate Extraction Areas

https://ows.emodnet-humanactivities.eu/wfs?SERVICE=WFS&VERSION=1.1.0&request=GetFeature&typeName=aggregateareas&OUTPUTFORMAT=json

Barcelona Convention

https://ows.emodnet-humanactivities.eu/wfs?SERVICE=WFS&VERSION=1.1.0&request=GetFeature&typeName=barcelona&OUTPUTFORMAT=json

Boreholes

https://ows.emodnet-humanactivities.eu/wfs?SERVICE=WFS&VERSION=1.1.0&request=GetFeature&typeName=hydrocarbons&OUTPUTFORMAT=json

BSH CONTIS Cables

https://ows.emodnet-humanactivities.eu/wfs?SERVICE=WFS&VERSION=1.1.0&request=GetFeature&typeName=bshcontiscables&OUTPUTFORMAT=json

Bucharest Convention

https://ows.emodnet-humanactivities.eu/wfs?SERVICE=WFS&VERSION=1.1.0&request=GetFeature&typeName=bucharest&OUTPUTFORMAT=json

Discharge Points

https://ows.emodnet-humanactivities.eu/wfs?SERVICE=WFS&VERSION=1.1.0&request=GetFeature&typeName=dischargepoints&OUTPUTFORMAT=json

Dredge Spoil Dumping (Points)

https://ows.emodnet-humanactivities.eu/wfs?SERVICE=WFS&VERSION=1.1.0&request=GetFeature&typeName=dredgespoil&OUTPUTFORMAT=json

Dredge Spoil Dumping (Polygons)

https://ows.emodnet-humanactivities.eu/wfs?SERVICE=WFS&VERSION=1.1.0&request=GetFeature&typeName=dredgespoilpoly&OUTPUTFORMAT=json

Dredging

https://ows.emodnet-humanactivities.eu/wfs?SERVICE=WFS&VERSION=1.1.0&request=GetFeature&typeName=dredging&OUTPUTFORMAT=json

Dumped Munitions (Points)

https://ows.emodnet-humanactivities.eu/wfs?SERVICE=WFS&VERSION=1.1.0&request=GetFeature&typeName=munitions&OUTPUTFORMAT=json

Dumped Munitions (Polygons)

https://ows.emodnet-humanactivities.eu/wfs?SERVICE=WFS&VERSION=1.1.0&request=GetFeature&typeName=munitionspoly&OUTPUTFORMAT=json

Exclusive Economic Zone

https://ows.emodnet-humanactivities.eu/wfs?SERVICE=WFS&VERSION=1.1.0&request=GetFeature&typeName=eez&OUTPUTFORMAT=json

FAO Fishery Statistical Areas

http://www.fao.org:80/figis/geoserver/area/ows?service=WFS&request=GetFeature&version=1.0.0&typeName=area:FAO_AREAS&outputFormat=SHAPE-ZIP

Finfish Production

https://ows.emodnet-humanactivities.eu/wfs?SERVICE=WFS&VERSION=1.1.0&request=GetFeature&typeName=finfish&OUTPUTFORMAT=json

First Sales of Fish

https://ows.emodnet-humanactivities.eu/wfs?SERVICE=WFS&VERSION=1.1.0&request=GetFeature&typeName=fishsales&OUTPUTFORMAT=json

Fish Catches by FAO Fishery Statistical Areas

https://ows.emodnet-humanactivities.eu/wfs?SERVICE=WFS&VERSION=1.1.0&request=GetFeature&typeName=majorcatches&OUTPUTFORMAT=json

Freshwater Production

https://ows.emodnet-humanactivities.eu/wfs?SERVICE=WFS&VERSION=1.1.0&request=GetFeature&typeName=freshwater&OUTPUTFORMAT=json

HELCOM Maritime Area

https://ows.emodnet-humanactivities.eu/wfs?SERVICE=WFS&VERSION=1.1.0&request=GetFeature&typeName=helcom&OUTPUTFORMAT=json

ICES Statistical Areas

https://ows.emodnet-humanactivities.eu/wfs?SERVICE=WFS&VERSION=1.1.0&request=GetFeature&typeName=icesareas&OUTPUTFORMAT=json

Kis Orca Subsea Cables

https://ows.emodnet-humanactivities.eu/wfs?SERVICE=WFS&VERSION=1.1.0&request=GetFeature&typeName=kisorcacables&OUTPUTFORMAT=json

Landing Stations

https://ows.emodnet-humanactivities.eu/wfs?SERVICE=WFS&VERSION=1.1.0&request=GetFeature&typeName=landingstations&OUTPUTFORMAT=json

Lighthouses

https://ows.emodnet-humanactivities.eu/wfs?SERVICE=WFS&VERSION=1.1.0&request=GetFeature&typeName=lighthouses&OUTPUTFORMAT=json

Macroalgae (seaweeds)

https://ows.emodnet-humanactivities.eu/wfs?SERVICE=WFS&VERSION=1.1.0&request=GetFeature&typeName=macroalgae&OUTPUTFORMAT=json

Main Ports (Goods)

https://ows.emodnet-humanactivities.eu/wfs?SERVICE=WFS&VERSION=1.1.0&request=GetFeature&typeName=portgoods&OUTPUTFORMAT=json

Main Ports (Passengers)

https://ows.emodnet-humanactivities.eu/wfs?SERVICE=WFS&VERSION=1.1.0&request=GetFeature&typeName=portpassengers&OUTPUTFORMAT=json

Main Ports (Vessels)

https://ows.emodnet-humanactivities.eu/wfs?SERVICE=WFS&VERSION=1.1.0&request=GetFeature&typeName=portvessels&OUTPUTFORMAT=json

Maltese Telecommunication Cables

https://ows.emodnet-humanactivities.eu/wfs?SERVICE=WFS&VERSION=1.1.0&request=GetFeature&typeName=maltacables&OUTPUTFORMAT=json

Maritime Boundaries

https://ows.emodnet-humanactivities.eu/wfs?SERVICE=WFS&VERSION=1.1.0&request=GetFeature&typeName=maritimebnds&OUTPUTFORMAT=json

Microalgae

https://ows.emodnet-humanactivities.eu/wfs?SERVICE=WFS&VERSION=1.1.0&request=GetFeature&typeName=microalgae&OUTPUTFORMAT=json

MSFD Reporting Units

https://ows.emodnet-humanactivities.eu/wfs?SERVICE=WFS&VERSION=1.1.0&request=GetFeature&typeName=reportingunits&OUTPUTFORMAT=json

Nationally Designated Areas

https://ows.emodnet-humanactivities.eu/wfs?SERVICE=WFS&VERSION=1.1.0&request=GetFeature&typeName=cddaareas&OUTPUTFORMAT=json

Natura 2000

https://ows.emodnet-humanactivities.eu/wfs?SERVICE=WFS&VERSION=1.1.0&request=GetFeature&typeName=natura2000areas&OUTPUTFORMAT=json

Nuclear Power Plants

https://ows.emodnet-humanactivities.eu/wfs?SERVICE=WFS&VERSION=1.1.0&request=GetFeature&typeName=nuclear&OUTPUTFORMAT=json

Offshore Installations

https://ows.emodnet-humanactivities.eu/wfs?SERVICE=WFS&VERSION=1.1.0&request=GetFeature&typeName=platforms&OUTPUTFORMAT=json

OSPAR Maritime Area

https://ows.emodnet-humanactivities.eu/wfs?SERVICE=WFS&VERSION=1.1.0&request=GetFeature&typeName=ospar&OUTPUTFORMAT=json

Pipelines

https://ows.emodnet-humanactivities.eu/wfs?SERVICE=WFS&VERSION=1.1.0&request=GetFeature&typeName=pipelines&OUTPUTFORMAT=json

Project Locations

https://ows.emodnet-humanactivities.eu/wfs?SERVICE=WFS&VERSION=1.1.0&request=GetFeature&typeName=oenergy&OUTPUTFORMAT=json

Shellfish Production

https://ows.emodnet-humanactivities.eu/wfs?SERVICE=WFS&VERSION=1.1.0&request=GetFeature&typeName=shellfish&OUTPUTFORMAT=json

SIGCables Submarine Cables Routes

https://ows.emodnet-humanactivities.eu/wfs?SERVICE=WFS&VERSION=1.1.0&request=GetFeature&typeName=sigcables&OUTPUTFORMAT=json

State of Bathing Waters

https://ows.emodnet-humanactivities.eu/wfs?SERVICE=WFS&VERSION=1.1.0&request=GetFeature&typeName=bathingwaters&OUTPUTFORMAT=json

Telecommunication Cables (schematic routes)

https://ows.emodnet-humanactivities.eu/wfs?SERVICE=WFS&VERSION=1.1.0&request=GetFeature&typeName=cablesschematic&OUTPUTFORMAT=json

Test Sites

https://ows.emodnet-humanactivities.eu/wfs?SERVICE=WFS&VERSION=1.1.0&request=GetFeature&typeName=oenergytests&OUTPUTFORMAT=json

Treatment Plants

https://ows.emodnet-humanactivities.eu/wfs?SERVICE=WFS&VERSION=1.1.0&request=GetFeature&typeName=treatmentplants&OUTPUTFORMAT=json

UK Fibre Cables

https://ows.emodnet-humanactivities.eu/wfs?SERVICE=WFS&VERSION=1.1.0&request=GetFeature&typeName=ukfibrecables&OUTPUTFORMAT=json

Waste at Ports

https://ows.emodnet-humanactivities.eu/wfs?SERVICE=WFS&VERSION=1.1.0&request=GetFeature&typeName=wasteatports_m3&OUTPUTFORMAT=json

Wind Farms (Points)

https://ows.emodnet-humanactivities.eu/wfs?SERVICE=WFS&VERSION=1.1.0&request=GetFeature&typeName=windfarms&OUTPUTFORMAT=json

Wind Farms (Polygons)

https://ows.emodnet-humanactivities.eu/wfs?SERVICE=WFS&VERSION=1.1.0&request=GetFeature&typeName=windfarmspoly&OUTPUTFORMAT=json

List of Web Map Services (WMS)

Active Licences

https://ows.emodnet-humanactivities.eu/wms?LAYERS=activelicenses&FORMAT=image/png&TRANSPARENT=TRUE&SERVICE=WMS&VERSION=1.1.1&REQUEST=GetMap&STYLES=&SRS=EPSG:4326&BBOX=-30.4269,23.7383,42.3846,72.2793&WIDTH=650&HEIGHT=400

Advisory Councils - Aquaculture

https://ows.emodnet-humanactivities.eu/wms?LAYERS=aquaculture&FORMAT=image/png&TRANSPARENT=TRUE&SERVICE=WMS&VERSION=1.1.1&REQUEST=GetMap&STYLES=&SRS=EPSG:4326&BBOX=-30.4269,23.7383,42.3846,72.2793&WIDTH=650&HEIGHT=400

Advisory Councils - Baltic

https://ows.emodnet-humanactivities.eu/wms?LAYERS=baltic&FORMAT=image/png&TRANSPARENT=TRUE&SERVICE=WMS&VERSION=1.1.1&REQUEST=GetMap&STYLES=&SRS=EPSG:4326&BBOX=-30.4269,23.7383,42.3846,72.2793&WIDTH=650&HEIGHT=400

Advisory Councils - Black Sea

https://ows.emodnet-humanactivities.eu/wms?LAYERS=blacksea&FORMAT=image/png&TRANSPARENT=TRUE&SERVICE=WMS&VERSION=1.1.1&REQUEST=GetMap&STYLES=&SRS=EPSG:4326&BBOX=-30.4269,23.7383,42.3846,72.2793&WIDTH=650&HEIGHT=400

Advisory Councils - Long Distance Fleet

https://ows.emodnet-humanactivities.eu/wms?LAYERS=longdistancefleet&FORMAT=image/png&TRANSPARENT=TRUE&SERVICE=WMS&VERSION=1.1.1&REQUEST=GetMap&STYLES=&SRS=EPSG:4326&BBOX=-30.4269,23.7383,42.3846,72.2793&WIDTH=650&HEIGHT=400

Advisory Councils - Market

https://ows.emodnet-humanactivities.eu/wms?LAYERS=market&FORMAT=image/png&TRANSPARENT=TRUE&SERVICE=WMS&VERSION=1.1.1&REQUEST=GetMap&STYLES=&SRS=EPSG:4326&BBOX=-30.4269,23.7383,42.3846,72.2793&WIDTH=650&HEIGHT=400

Advisory Councils - Mediterranean

https://ows.emodnet-humanactivities.eu/wms?LAYERS=mediterranean&FORMAT=image/png&TRANSPARENT=TRUE&SERVICE=WMS&VERSION=1.1.1&REQUEST=GetMap&STYLES=&SRS=EPSG:4326&BBOX=-30.4269,23.7383,42.3846,72.2793&WIDTH=650&HEIGHT=400

Advisory Councils - North Sea

https://ows.emodnet-humanactivities.eu/wms?LAYERS=northsea&FORMAT=image/png&TRANSPARENT=TRUE&SERVICE=WMS&VERSION=1.1.1&REQUEST=GetMap&STYLES=&SRS=EPSG:4326&BBOX=-30.4269,23.7383,42.3846,72.2793&WIDTH=650&HEIGHT=400

Advisory Councils - North Western Waters

https://ows.emodnet-humanactivities.eu/wms?LAYERS=northwesternwaters&FORMAT=image/png&TRANSPARENT=TRUE&SERVICE=WMS&VERSION=1.1.1&REQUEST=GetMap&STYLES=&SRS=EPSG:4326&BBOX=-30.4269,23.7383,42.3846,72.2793&WIDTH=650&HEIGHT=400

Advisory Councils - Outermost Regions

https://ows.emodnet-humanactivities.eu/wms?LAYERS=outermostregions&FORMAT=image/png&TRANSPARENT=TRUE&SERVICE=WMS&VERSION=1.1.1&REQUEST=GetMap&STYLES=&SRS=EPSG:4326&BBOX=-30.4269,23.7383,42.3846,72.2793&WIDTH=650&HEIGHT=400

Advisory Councils - Pelagic Stocks

https://ows.emodnet-humanactivities.eu/wms?LAYERS=pelagicstocks&FORMAT=image/png&TRANSPARENT=TRUE&SERVICE=WMS&VERSION=1.1.1&REQUEST=GetMap&STYLES=&SRS=EPSG:4326&BBOX=-30.4269,23.7383,42.3846,72.2793&WIDTH=650&HEIGHT=400

Advisory Councils - South Western Waters

https://ows.emodnet-humanactivities.eu/wms?LAYERS=southwesternwaters&FORMAT=image/png&TRANSPARENT=TRUE&SERVICE=WMS&VERSION=1.1.1&REQUEST=GetMap&STYLES=&SRS=EPSG:4326&BBOX=-30.4269,23.7383,42.3846,72.2793&WIDTH=650&HEIGHT=400

Aggregate Extraction

https://ows.emodnet-humanactivities.eu/wms?LAYERS=aggregates&FORMAT=image/png&TRANSPARENT=TRUE&SERVICE=WMS&VERSION=1.1.1&REQUEST=GetMap&STYLES=&SRS=EPSG:4326&BBOX=-11,35,14,60&WIDTH=600&HEIGHT=600

Aggregate Extraction Areas

https://ows.emodnet-humanactivities.eu/wms?LAYERS=aggregateareas&FORMAT=image/png&TRANSPARENT=TRUE&SERVICE=WMS&VERSION=1.1.1&REQUEST=GetMap&STYLES=&SRS=EPSG:4326&BBOX=-30.4269,23.7383,42.3846,72.2793&WIDTH=650&HEIGHT=400

Barcelona Convention

https://ows.emodnet-humanactivities.eu/wms?LAYERS=barcelona&FORMAT=image/png&TRANSPARENT=TRUE&SERVICE=WMS&VERSION=1.1.1&REQUEST=GetMap&STYLES=&SRS=EPSG:4326&BBOX=-30.4269,23.7383,42.3846,72.2793&WIDTH=650&HEIGHT=400

Boreholes

https://ows.emodnet-humanactivities.eu/wms?LAYERS=hydrocarbons&FORMAT=image/png&TRANSPARENT=TRUE&SERVICE=WMS&VERSION=1.1.1&REQUEST=GetMap&STYLES=&SRS=EPSG:4326&BBOX=-11,35,14,60&WIDTH=600&HEIGHT=600

BSH CONTIS Cables

https://ows.emodnet-humanactivities.eu/wms?LAYERS=bshcontiscables&FORMAT=image/png&TRANSPARENT=TRUE&SERVICE=WMS&VERSION=1.1.1&REQUEST=GetMap&STYLES=&SRS=EPSG:4326&BBOX=-30.4269,23.7383,42.3846,72.2793&WIDTH=650&HEIGHT=400

Bucharest Convention

https://ows.emodnet-humanactivities.eu/wms?LAYERS=bucharest&FORMAT=image/png&TRANSPARENT=TRUE&SERVICE=WMS&VERSION=1.1.1&REQUEST=GetMap&STYLES=&SRS=EPSG:4326&BBOX=-30.4269,23.7383,42.3846,72.2793&WIDTH=650&HEIGHT=400

Discharge Points

https://ows.emodnet-humanactivities.eu/wms?LAYERS=dischargepoints&FORMAT=image/png&TRANSPARENT=TRUE&SERVICE=WMS&VERSION=1.1.1&REQUEST=GetMap&STYLES=&SRS=EPSG:4326&BBOX=-30.4269,23.7383,42.3846,72.2793&WIDTH=650&HEIGHT=400

Dredge Spoil Dumping (Points)

https://ows.emodnet-humanactivities.eu/wms?LAYERS=dredgespoil&FORMAT=image/png&TRANSPARENT=TRUE&SERVICE=W

MS&VERSION=1.1.1&REQUEST=GetMap&STYLES=&SRS=EPSG:4326&BBOX=-11,35,14,60&WIDTH=600&HEIGHT=600

Dredge Spoil Dumping (Polygons)

https://ows.emodnet-humanactivities.eu/wms?LAYERS=dredgespoilpoly&FORMAT=image/png&TRANSPARENT=TRUE&SERVICE=WMS&VERSION=1.1.1&REQUEST=GetMap&STYLES=&SRS=EPSG:4326&BBOX=-30.4269,23.7383,42.3846,72.2793&WIDTH=650&HEIGHT=400

Dredging

https://ows.emodnet-humanactivities.eu/wms?LAYERS=dredging&FORMAT=image/png&TRANSPARENT=TRUE&SERVICE=WMS&VERSION=1.1.1&REQUEST=GetMap&STYLES=&SRS=EPSG:4326&BBOX=-11,35,14,60&WIDTH=600&HEIGHT=600

Dumped Munitions (Points)

https://ows.emodnet-humanactivities.eu/wms?LAYERS=munitions&FORMAT=image/png&TRANSPARENT=TRUE&SERVICE=WMS&VERSION=1.1.1&REQUEST=GetMap&STYLES=&SRS=EPSG:4326&BBOX=-11,35,14,60&WIDTH=600&HEIGHT=600

Dumped Munitions (Polygons)

https://ows.emodnet-humanactivities.eu/wms?LAYERS=munitionspoly&FORMAT=image/png&TRANSPARENT=TRUE&SERVICE=WMS&VERSION=1.1.1&REQUEST=GetMap&STYLES=&SRS=EPSG:4326&BBOX=-30.4269,23.7383,42.3846,72.2793&WIDTH=650&HEIGHT=400

Exclusive Economic Zone

https://ows.emodnet-humanactivities.eu/wms?LAYERS=eez&FORMAT=image/png&TRANSPARENT=TRUE&SERVICE=WMS&VERSION=1.1.1&REQUEST=GetMap&STYLES=&SRS=EPSG:4326&BBOX=-30.4269,23.7383,42.3846,72.2793&WIDTH=650&HEIGHT=400

Finfish Production

https://ows.emodnet-humanactivities.eu/wms?LAYERS=finfish&FORMAT=image/png&TRANSPARENT=TRUE&SERVICE=WMS&VERSION=1.1.1&REQUEST=GetMap&STYLES=&SRS=EPSG:4326&BBOX=-11,35,14,60&WIDTH=600&HEIGHT=600

Freshwater Production

https://ows.emodnet-humanactivities.eu/wms?LAYERS=freshwater&FORMAT=image/png&TRANSPARENT=TRUE&SERVICE=WMS&VERSION=1.1.1&REQUEST=GetMap&STYLES=&SRS=EPSG:4326&BBOX=-11,35,14,60&WIDTH=600&HEIGHT=600

HELCOM Maritime Area

https://ows.emodnet-humanactivities.eu/wms?LAYERS=helcom&FORMAT=image/png&TRANSPARENT=TRUE&SERVICE=WMS&VERSION=1.1.1&REQUEST=GetMap&STYLES=&SRS=EPSG:4326&BBOX=-30.4269,23.7383,42.3846,72.2793&WIDTH=650&HEIGHT=400

ICES Statistical Areas

https://ows.emodnet-humanactivities.eu/wms?LAYERS=icesareas&FORMAT=image/png&TRANSPARENT=TRUE&SERVICE=WMS&VERSION=1.1.1&REQUEST=GetMap&STYLES=&SRS=EPSG:4326&BBOX=-30.4269,23.7383,42.3846,72.2793&WIDTH=650&HEIGHT=400

Kis Orca Subsea Cables

https://ows.emodnet-humanactivities.eu/wms?LAYERS=kisorcacables&FORMAT=image/png&TRANSPARENT=TRUE&SERVICE=WMS&VERSION=1.1.1&REQUEST=GetMap&STYLES=&SRS=EPSG:4326&BBOX=-30.4269,23.7383,42.3846,72.2793&WIDTH=650&HEIGHT=400

Landing Stations

https://ows.emodnet-humanactivities.eu/wms?LAYERS=landingstations&FORMAT=image/png&TRANSPARENT=TRUE&SERVICE=WMS&VERSION=1.1.1&REQUEST=GetMap&STYLES=&SRS=EPSG:4326&BBOX=-11,35,14,60&WIDTH=600&HEIGHT=600

Lighthouses

https://ows.emodnet-humanactivities.eu/wms?LAYERS=lighthouses&FORMAT=image/png&TRANSPARENT=TRUE&SERVICE=WMS&VERSION=1.1.1&REQUEST=GetMap&STYLES=&SRS=EPSG:4326&BBOX=-11,35,14,60&WIDTH=600&HEIGHT=600

Macroalgae (seaweeds)

https://ows.emodnet-humanactivities.eu/wms?LAYERS=macroalgae&FORMAT=image/png&TRANSPARENT=TRUE&SERVICE=WMS&VERSION=1.1.1&REQUEST=GetMap&STYLES=&SRS=EPSG:4326&BBOX=-30.4269,23.7383,42.3846,72.2793&WIDTH=650&HEIGHT=400

Main Ports

https://ows.emodnet-humanactivities.eu/wms?LAYERS=portlocations&FORMAT=image/png&TRANSPARENT=TRUE&SERVICE=WMS&VERSION=1.1.1&REQUEST=GetMap&STYLES=&SRS=EPSG:4326&BBOX=-11,35,14,60&WIDTH=600&HEIGHT=600

Maltese Telecommunication Cables

https://ows.emodnet-humanactivities.eu/wms?LAYERS=maltacables&FORMAT=image/png&TRANSPARENT=TRUE&SERVICE=WMS&VERSION=1.1.1&REQUEST=GetMap&STYLES=&SRS=EPSG:4326&BBOX=-30.4269,23.7383,42.3846,72.2793&WIDTH=650&HEIGHT=400

Maritime Boundaries

https://ows.emodnet-humanactivities.eu/wms?LAYERS=maritimebnds&FORMAT=image/png&TRANSPARENT=TRUE&SERVICE=WMS&VERSION=1.1.1&REQUEST=GetMap&STYLES=&SRS=EPSG:4326&BBOX=-30.4269,23.7383,42.3846,72.2793&WIDTH=650&HEIGHT=400

Microalgae

https://ows.emodnet-humanactivities.eu/wms?LAYERS=microalgae&FORMAT=image/png&TRANSPARENT=TRUE&SERVICE=WMS&VERSION=1.1.1&REQUEST=GetMap&STYLES=&SRS=EPSG:4326&BBOX=-30.4269,23.7383,42.3846,72.2793&WIDTH=650&HEIGHT=400

MSFD Reporting Units

https://ows.emodnet-humanactivities.eu/wms?LAYERS=reportingunits&FORMAT=image/png&TRANSPARENT=TRUE&SERVICE=WMS&VERSION=1.1.1&REQUEST=GetMap&STYLES=&SRS=EPSG:4326&BBOX=-30.4269,23.7383,42.3846,72.2793&WIDTH=650&HEIGHT=400

Nationally Designated Areas

https://ows.emodnet-humanactivities.eu/wms?LAYERS=cddaareas&FORMAT=image/png&TRANSPARENT=TRUE&SERVICE=WMS&VERSION=1.1.1&REQUEST=GetMap&STYLES=&SRS=EPSG:4326&BBOX=-30.4269,23.7383,42.3846,72.2793&WIDTH=650&HEIGHT=400

Natura 2000

https://ows.emodnet-humanactivities.eu/wms?LAYERS=natura2000areas&FORMAT=image/png&TRANSPARENT=TRUE&SERVIC

E=WMS&VERSION=1.1.1&REQUEST=GetMap&STYLES=&SRS=EPSG:4326&BBOX=-30.4269,23.7383,42.3846,72.2793&WIDTH=650&HEIGHT=400

Nuclear Power Plants

https://ows.emodnet-humanactivities.eu/wms?LAYERS=nuclear&FORMAT=image/png&TRANSPARENT=TRUE&SERVICE=WMS&VERSION=1.1.1&REQUEST=GetMap&STYLES=&SRS=EPSG:4326&BBOX=-30.4269,23.7383,42.3846,72.2793&WIDTH=650&HEIGHT=400

Offshore Installations

https://ows.emodnet-humanactivities.eu/wms?LAYERS=platforms&FORMAT=image/png&TRANSPARENT=TRUE&SERVICE=WMS&VERSION=1.1.1&REQUEST=GetMap&STYLES=&SRS=EPSG:4326&BBOX=-11,35,14,60&WIDTH=600&HEIGHT=600

OSPAR Maritime Area

https://ows.emodnet-humanactivities.eu/wms?LAYERS=ospar&FORMAT=image/png&TRANSPARENT=TRUE&SERVICE=WMS&VERSION=1.1.1&REQUEST=GetMap&STYLES=&SRS=EPSG:4326&BBOX=-30.4269,23.7383,42.3846,72.2793&WIDTH=650&HEIGHT=400

Pipelines

https://ows.emodnet-humanactivities.eu/wms?LAYERS=pipelines&FORMAT=image/png&TRANSPARENT=TRUE&SERVICE=WMS&VERSION=1.1.1&REQUEST=GetMap&STYLES=&SRS=EPSG:4326&BBOX=-30.4269,23.7383,42.3846,72.2793&WIDTH=650&HEIGHT=400

Project Locations

https://ows.emodnet-humanactivities.eu/wms?LAYERS=oenergy&FORMAT=image/png&TRANSPARENT=TRUE&SERVICE=WMS&VERSION=1.1.1&REQUEST=GetMap&STYLES=&SRS=EPSG:4326&BBOX=-11,35,14,60&WIDTH=600&HEIGHT=600

Shellfish Production

https://ows.emodnet-humanactivities.eu/wms?LAYERS=shellfish&FORMAT=image/png&TRANSPARENT=TRUE&SERVICE=WMS&VERSION=1.1.1&REQUEST=GetMap&STYLES=&SRS=EPSG:4326&BBOX=-11,35,14,60&WIDTH=600&HEIGHT=600

SIGCables Submarine Cables Routes

https://ows.emodnet-humanactivities.eu/wms?LAYERS=sigcables&FORMAT=image/png&TRANSPARENT=TRUE&SERVICE=WMS&VERSION=1.1.1&REQUEST=GetMap&STYLES=&SRS=EPSG:4326&BBOX=-30.4269,23.7383,42.3846,72.2793&WIDTH=650&HEIGHT=400

State of Bathing Waters

https://ows.emodnet-humanactivities.eu/wms?LAYERS=bathingwaters&FORMAT=image/png&TRANSPARENT=TRUE&SERVICE=WMS&VERSION=1.1.1&REQUEST=GetMap&STYLES=&SRS=EPSG:4326&BBOX=-11,35,14,60&WIDTH=600&HEIGHT=600

Telecommunication Cables (schematic routes)

https://ows.emodnet-humanactivities.eu/wms?LAYERS=cablesschematic&FORMAT=image/png&TRANSPARENT=TRUE&SERVICE=WMS&VERSION=1.1.1&REQUEST=GetMap&STYLES=&SRS=EPSG:4326&BBOX=-30.4269,23.7383,42.3846,72.2793&WIDTH=650&HEIGHT=400

Test Sites

https://ows.emodnet-humanactivities.eu/wms?LAYERS=oenergytests&FORMAT=image/png&TRANSPARENT=TRUE&SERVICE=WMS&VERSION=1.1.1&REQUEST=GetMap&STYLES=&SRS=EPSG:4326&BBOX=-30.4269,23.7383,42.3846,72.2793&WIDTH=650&HEIGHT=400

Treatment Plants

https://ows.emodnet-humanactivities.eu/wms?LAYERS=treatmentplants&FORMAT=image/png&TRANSPARENT=TRUE&SERVICE=WMS&VERSION=1.1.1&REQUEST=GetMap&STYLES=&SRS=EPSG:4326&BBOX=-30.4269,23.7383,42.3846,72.2793&WIDTH=650&HEIGHT=400

UK Fibre Cables

https://ows.emodnet-humanactivities.eu/wms?LAYERS=ukfibrecables&FORMAT=image/png&TRANSPARENT=TRUE&SERVICE=WMS&VERSION=1.1.1&REQUEST=GetMap&STYLES=&SRS=EPSG:4326&BBOX=-30.4269,23.7383,42.3846,72.2793&WIDTH=650&HEIGHT=400

Waste at Ports (locations)

https://ows.emodnet-humanactivities.eu/wms?LAYERS=wasteatports&FORMAT=image/png&TRANSPARENT=TRUE&SERVICE=WMS&VERSION=1.1.1&REQUEST=GetMap&STYLES=&SRS=EPSG:4326&BBOX=-30.4269,23.7383,42.3846,72.2793&WIDTH=650&HEIGHT=400

Wind Farms (Points)

https://ows.emodnet-humanactivities.eu/wms?LAYERS=windfarms&FORMAT=image/png&TRANSPARENT=TRUE&SERVICE=WMS&VERSION=1.1.1&REQUEST=GetMap&STYLES=&SRS=EPSG:4326&BBOX=-11,35,14,60&WIDTH=600&HEIGHT=600

Wind Farms (Polygons)

https://ows.emodnet-humanactivities.eu/wms?LAYERS=windfarmspoly&FORMAT=image/png&TRANSPARENT=TRUE&SERVICE=WMS&VERSION=1.1.1&REQUEST=GetMap&STYLES=&SRS=EPSG:4326&BBOX=-30.4269,23.7383,42.3846,72.2793&WIDTH=650&HEIGHT=400

Route Density

https://ows.emodnet-humanactivities.eu/wms?LAYERS=2019_01_rd_All&FORMAT=image/png&TRANSPARENT=TRUE&SERVICE=WMS&VERSION=1.1.1&REQUEST=GetMap&STYLES=&SRS=EPSG:4326&BBOX=-30.4269,23.7383,42.3846,72.2793&WIDTH=650&HEIGHT=400

The Route Density data is provided monthly and seasonal by vessel type along with a total for the whole year. Downloads are provided by month, season and total.
The names of the downloadable files are -

- 'wid5-<vessel type>-all_europe-monthly-YYYYMMDDhhmmss_YYYYMMDDhhmmss-tdm-grid' Eg. 'wid5-cargo-all_europe-monthly-20190101000000_20190131235959-tdm-grid' for all cargo vessels during Januar 2019.
- 'wid5-<vessel type>-all_europe-<season name>-YYYYMMDDhhmmss_YYYYMMDDhhmmss-tdm-grid' Eg.'wid5-cargo-all_europe-autumn-20190901000000_20191130235959-tdm-grid' for all cargo vessels during Autumn 2019
- 'wid5-<vessel type>-all_europe-yearly-YYYYMMDDhhmmss_YYYYMMDDhhmmss-tdm-grid' Eg. 'wid5-cargo-all_europe-yearly-20190101000000_20191231235959-tdm-grid' for all cargo vessels during 2019.

The names of the web service layers are -

- '<year>_<month>_rd_<vessel code>' Eg. '2019_01_rd_All' for all vessels during January 2019
- '<year>_<season>_rd_<vessel code>' Eg. '2019_spring_rd_All' for all vessels during Spring 2019
- '<year>_yearly_rd_<vessel code>' Eg. '2019_yearly_rd_All' for the total of all vessels during 2019.

The vessel codes are as follows:

All - All types

01 - Cargo

02 - Fishing

03 - Passenger

04 - Tanker

05 - Other

Available data: January 2019 - December 2019

Vessel Density

https://ows.emodnet-humanactivities.eu/wms?LAYERS=2017_01_st_All&FORMAT=image/png&TRANSPARENT=TRUE&SERVICE=WMS&VERSION=1.1.1&REQUEST=GetMap&STYLES=&SRS=EPSG:4326&BBOX=-30.4269,23.7383,42.3846,72.2793&WIDTH=650&HEIGHT=400

The Vessel Density WMS are provided monthly by vessel type.

The name of a specific layer is '<year>_<month>_st_<vessel code>' Eg. '2017_01_st_All' for all vessels during January 2017.

The vessel codes are as follows:

All - All types

00 - Other

01 - Fishing

02 - Service

03 - Dredging or underwater ops

04 - Sailing

05 - Pleasure Craft

06 - High speed craft

07 - Tug and towing

08 - Passenger

09 - Cargo

10 - Tanker

11 - Military and Law Enforcement

12 - Unknown

Available data: January 2017 - December 2018

11 Recommendations for follow-up actions by the EU

- Extend the scope of the project to neighbouring countries: EMODnet Human Activities already covers some non-EU countries on a voluntary basis. However, in certain areas (e.g. in the Mediterranean) it is paramount to also include neighbouring countries to give a better picture of human activity. Data might not be easily available, and additional financial resources might thus be required.
- Organise a meeting with various DGs and agencies of the EU Commission potentially interested in AIS data analysis and vessel density maps (e.g. MARE, ENV, CLIMA, MOVE, JRC). AIS data are not easily available and require time and money to be acquired and process. Therefore, it might be useful to explore what other uses can be made.
- Consider introducing an obligation to share data with EMODnet. The example of the Marine Cadastre in the US – where the initiative is implemented through a federal act – shows that implementation through hard law instruments may make it easier to collect and make available data. This might be especially true for human activity in the ocean, for which there is no scientific community of reference, and data are gleaned from multiple sources on an entirely voluntary basis. A legal obligation would make it possible to improve the coverage of critical datasets such as aquaculture, pipelines and cables. The US Marine Cadastre also gives free access to AIS data, something which would bring enormous added value to the EU marine data community.
- Develop an action plan to liaise with other EU bodies and EC agencies to exploit synergies. Working with EMSA was a boon in terms of visibility and made it possible to reach out new users. Similar initiatives should be fostered in view of catering to a wider audience.
- Include historical vessel density maps in the next phase of EMODnet. Several users have enquired about historical vessel density maps to show evolution of traffic over time. This cannot be done under the current contract, because the cost of acquiring the necessary AIS data and the time to process it would have a considerable impact on the budget.

12 List of abbreviations and acronyms

AAC	Aquaculture Advisory Council
AIS	Automatic Identification System
BSC	Black Sea Commission
CDDA	Common Database on Designated Areas
CEO	Chief Executive Officer
CO_2	Carbon Dioxide
CSV	Comma Separated Variable
EEZ	Exclusive Economic Zone
EMODnet	European Marine Observation and Data Network
EMSA	European Maritime Safety Agency
EU	European Union
EUMOFA	European Market Observatory on Fisheries and Aquaculture
FAO	Food and Agriculture Organisation
GIS	Geographic Information System
HA	Human Activities
HELCOM	Helsinki Commission
JRC	Joint Research Centre
MARPOL	Marine Pollution
MS	Member State
MSEG	Member States' Expert Group
MSFD	Marine Strategy Framework Directive
MSP	Maritime Spatial Planning
OSPAR	Oslo-Paris Convention/Commission
PCI	Project of Common Interest
RSC	Regional Sea Convention
SCR	Système de Coordonnées de Référence
SMEs	Small and Medium Enterprises
UNESCO	United Nation Educational, Scientific and Cultural Organization
WCS	Web Coverage Service
WFS	Web Feature Service
WGS	World Geodetic System
WMS	Web Map Service