



EMODnet Thematic Lot n° 2 – Seabed Habitats

EMODnet Phase III - Quarterly Report

Reporting Period: 01/10/2017 – 31/12/2017

Date: 15/01/2018

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1. Highlights in this reporting period

- 1. Collaboration within Europe:** in the last three months, we have made great progress in building strong relationships within the EMODnet Seabed Habitats consortium as well as with other EMODnet lots and regional sea commissions:
- On 3-6 October 2017 EMODnet Seabed Habitats held its second partner meeting of phase 3, hosted by HCMR and colleagues in Greece. At the meeting, we made key decisions and held workshops aimed at familiarising partners with the data formats to be used in WP4 and WP5. (*All WPs; all tasks*)
 - Acknowledging the heavy reliance of EMODnet Seabed Habitats on the seabed substrate product of **EMODnet Geology**, JNCC and GTK (Geology coordinator) arranged a face-to-face meeting on 2 October 2017¹. Here, we discussed various points of common interest, including, *inter alia*, (a) how best to communicate about specific issues with the substrate data product, (b) what to do about organogenic sediments and other seabed features that are not included in the substrate data product and (c) confidence assessment. (*WP1; task 2*)
 - Continuing our relationship with **EMODnet Biology**, JNCC sat on the organising committee of the EMODnet Biology [Essential Data Products Workshop](#), which was held in London on 10 October 2017. The JNCC representative presented the EMODnet Seabed Habitats project, its links with EMODnet Biology and its ambitions/possibility regarding the development of data products. Beneficial outcomes include:
 - Relationships have been established or strengthened with the relevant representatives from each of the regional sea convention (RSC) secretariats (*WP7; task 5*).
 - Some specific requirements have been identified, for example HELCOM's desire for broad-scale and Natura 2000 habitat maps, and if possible, maps of biotope distribution maps covering the whole convention area classified to the HELCOM Underwater Biotope classification system (*WP5 and WP7; tasks 2 and 5*).
 - A joint-plan was developed with EMODnet Biology to develop data products related to the Global Ocean Observing System (GOOS) Essential Ocean Variables (EOV). Specifically, EMODnet Seabed Habitats will produce data products showing the current known extent of the three EOVs that are more related to habitats than species (and that occur in Europe): seagrass beds, macroalgal canopies hard coral reefs (*WP5 and WP7; tasks 2, 5, and 6*).

¹ Attended by colleagues at JNCC [SH coordinator], Ifremer [WP1 lead & WP2 lead], HCMR [Geology liaison lead (part of WP1)], ISPRA and Bioconsult.

- Other progress with RSCs (*WP7; task 5*):
 - EMODnet Seabed Habitats partners are already well-integrated into the work of the RSCs (as described on page ten of our technical proposal). Recently we have identified partners within the consortium with specific responsibilities for liaison with each RSC secretariat. These are:
 - Baltic: SYKE
 - Black Sea: IO-BAS
 - Mediterranean: ISPRA
 - North-east Atlantic: JNCC
 - On 5 December 2017, the OSPAR Intersessional Correspondence Group on the Coordination of Biodiversity Assessment and Monitoring (ICG-COBAM) held a workshop to understand and improve the process of data flow for feeding into assessments. One of the data streams of interest was benthic habitat data feeding into assessments BH2 (condition of benthic habitats communities) and BH3 (extent of physical damage). On hearing about this workshop, JNCC highlighted that importance of involving EMODnet Seabed Habitats and Biology in the workshop. As a result, partners from both projects were able to attend (either remotely or in person) and promote the services that the projects can offer in streamlining data flow into these indicator assessments.
- European Environment Agency (EEA):
 - The EEA's "Knowledge Innovation Project" (KIP) to develop an "Integrated system for Natural Capital and ecosystem services Accounting" (INCA) aims to map, assess and value ecosystem services in Europe. They have nearly completed a pilot study focussed on seagrass beds (as a provider of ecosystem services), one focus of which has been data requirements. With the United Nations Environment World Conservation Monitoring Centre (UNEP-WCMC) we discussed how the project and EMODnet Seabed Habitats could collaborate, in terms of (a) coordinating data calls and (b) routing all new data through EMODnet Seabed Habitats so that we can create a product showing the spatial extent of seagrass beds in Europe, which could also be used for their assessments. (*WP4 and WP5; tasks 1 and 2*)
 - The European Topic Centre on Inland, Coastal and Marine waters (ETC/ICM) is a consortium of organisations across Europe who deliver work on behalf of the EEA. Separately to the KIP INCA project, this group is aiming "to provide a suite of holistic assessments on the State of Europe's Seas, drawing on as wide a range of input sources possible. These assessments are going to be used as part of the Marine Messages report which forms part of the European State of the Environment Report to be produced by the EEA in 2022" (ETC/ICM lead, pers. comms.). In conjunction with the discussions described above, JNCC agreed with the ETC/ICM lead, to coordinated data calls and share data wherever possible. (*WP4 and WP5; tasks 1 and 2*)

- JNCC have had discussions with the EEA about the inclusion of distribution maps on the marine EUNIS habitat web pages, hosted by EEA. We plan to work with EEA to feed these maps via machine-to-machine connections directly from the EMODnet Seabed Habitats portals. This work will begin in year 2. *(WP6; task 3)*

2. Collaboration beyond Europe: in the last three months, we have made great progress in reaching out to non-EU projects, initiatives and organisations.

- One of the priority areas of the [Atlantic Ocean Research Alliance \(AORA\)](#) is Seabed Mapping and Characterisation. The Atlantic Seabed Mapping International Working Group (ASMIWG) therefore exists to identify the steps required to implement a seabed mapping strategy to underpin the objectives of the Galway Statement. On 8-9 November 2017 a representative of the JNCC attended their seabed mapping workshop in Bergen, Norway to present the EMODnet Seabed Habitats portal and make proposals for interoperability with their data and their [North Atlantic Data Viewer](#). The portal developers (NOAA) were not present but the attending members of the working group agreed on the need for interoperability between the portals and promised to take the message to NOAA. Discussion at the workshop also brought out an additional source of potential collaboration – with the Horizon 2020-funded [SponGES project](#), who were very keen on data exchange and interoperability between portals. *(WP6 and WP7; tasks 1 and 6)*
- The **Ecological Coastal Units (ECU)** project is led by the United States Geological Survey (USGS) and Esri, and has been commissioned by the Group on Earth Observation (GEO), which aims to use earth observation data to address world problems. The purpose of the project is to produce a global dataset that classifies the world's coastal areas into ecologically-relevant units. They have already completed similar projects for the terrestrial and marine realms². JNCC identified some commonalities between the aims of their coastal and marine units projects and those of EMODnet Seabed Habitats and so initiated contact. We were subsequently invited to the launch workshop of the ECU project on 30-31 October 2017, which was attended in person by colleagues at the JNCC and Ifremer. We presented EUSeaMap and the EUNIS habitat classification and contributed to the definition of the objectives and methods for defining these ECUs based on our experiences and knowledge of marine classification approaches, potential issues and data availability. The work will be carried out by Esri and USGS primarily, and we will act as advisors to the project. *(WP2 and WP7; tasks 2 and 6)*
- UNEP-WCMC “is seeking to convene an international network of intergovernmental and governmental focal points, including the Secretariat of the Convention on Biological Diversity (CBD), the Ramsar Secretariat, and the International Coral Reef Initiative

² Ecological Marine Units: www.esri.com/ecological-marine-units; Ecological Land Units: esriurl.com/globalelu

Secretariat, to transform our understanding of where important habitats—such as seagrasses, warm- and cold-water corals, saltmarshes, and mangroves—can be found, and our ability to track and ground-truth their extent and condition systematically over time. This will involve integrating calls for data across intergovernmental processes... The resulting ocean habitat datasets will be made available online via the [Ocean Data Viewer](#), and will be packaged into an online *Ocean Atlas* showcase and accompanying brochure, to be launched at the CBD’s Conference of the Parties (COP) in November 2018” (UNEP-WCMC Ocean Atlas flyer, 2017). In the last three months JNCC and UNEP-WCMC have agreed to share data from the data calls of this project and EMODnet Seabed Habitats and developed a joint statement to include in those data calls to explain the join-up to data providers. We also discussed the possibility of EMODnet Seabed Habitats acting as a European node for the production of the datasets on the extent of seagrass beds, cold-water coral reefs and saltmarshes. (WP4, WP5 and WP7; tasks 1, 2 and 6)

3. Preparation of data and data products for publishing on the portal

- Under the guidance of WP5 leader Marine Institute (MI), all partners have continued their efforts to prepare habitat maps from surveys for upload to the portal. This involves acquiring the datasets, filling in INSPIRE-compliant metadata, getting the datasets into a standard format, checking for geometry errors and carrying out confidence assessments. In the last three months MI has produced guidance and had one-to-one conversations with every data partner to ensure they are on track to submit correctly-formatted habitat maps in time to upload the first tranche of around 200 habitat maps to the portal by the end of year 1. (WP5; tasks 1 and 2)
- Following feedback from partners, WP4 leaders at ISPRA, have finalised a template to help partners format their point habitat data for upload to EurOBIS. Additionally, they have produced a separate guidance document for people outside of the project to follow when they wish to include habitat data with their species occurrence data submission to EurOBIS. This will encourage a more standard approach to recording habitat types in such a flexible schema as that used by EurOBIS. Using these templates and guidance documents, all partners have begun preparing habitat point data for upload to the portal. In the last three months ISPRA have had multiple web-based conversations with every data partner to ensure that they are on track to submitting correctly-formatted data in time to upload the first tranche (all partner-owned data) to the portal by the end of year 1. (WP4; tasks 1, 2 and 6)
- Initial contact has been made with over 40 potential third-party data providers in at least ten countries to explore what data exists and what can be shared with the project. This work will continue in earnest in year 2. (WP4, WP5; tasks 1 and 2)

4. Preparation for EUSeaMap update in year 2:

- Under leadership from the WP1 leader, Ifremer, and colleagues at ISPRA have been making progress modelling kinetic energy at the seabed in the Black Sea. *(WP1; task 2)*
- In preparation for the year 2 update of EMODnet Seabed Habitats' flagship data product, EUSeaMap, the WP2 leader from Ifremer has worked with regional leads under this WP to produce a list of boundaries to review and reanalysis (for example, the boundary between the infralittoral and circalittoral zones in polyhaline regions of the Baltic Sea). The review and reanalysis work will commence early in year 2 as planned. *(WP2; task 2)*
- Furthermore, colleagues from Bioconsult have compared options for translating the model from proprietary software, ArcGIS, to open source software, R, as well as altering one of the steps of the process to allow a multi-resolution output. Work to implement the recommendations of this review will begin shortly. *(WP2; task 2)*

- 5. Habitat modelling:** under the steerage of WP3 leader at SYKE, all partners have contributed to the production of a list of nearly 200 seabed habitat modelling studies in Europe. This list has a dual purpose of
- Identifying sources of external data products to try to acquire and publish via the portal. Collation activity will mostly occur in year 2. *(WP3; task 1)*
 - Identifying studies to include in a written review of habitat modelling activities in Europe. Further to this, colleagues at SKYE have identified around 400 papers to inform this review, which they have begun to read and categorise, and have drafted an outline for the paper. *(WP3; task 2)*

2. Specific challenges or difficulties encountered during the reporting period

- 1. Engagement with RSCs:** finding the best way to engage with the RSCs has been a challenge – while it is important to involve the secretariats, it is often the working groups/expert groups who can really define the requirements. In addition, it seems like with all the effort made to date, more work is needed to promote the offerings of EMODnet. For example, we had good engagement from a member of the OSPAR secretariat at the EMODnet Biology workshop in October (mentioned above), and got the impression that they had a good understanding of what we could offer. We were then surprised to hear that they had neglected to invite anyone from EMODnet Seabed Habitats or Biology to the ICG-COBAM workshop in December (mentioned above) until a week before, and only when JNCC prompted them. *(WP7; task 5)*
- 2. Preparation of point data for publishing on the portal:** in developing the templates and guidance for publishing habitat point data we found that most habitat classification systems were not represented online as standard controlled vocabularies. While we are now in contact

with the BODC about generated controlled vocabularies for the most common classification systems, there will be a delay until this is complete. In the meantime, we are having to refer to other web pages and PDF reports when providing a unique resource identifier (URI) for a habitat type or classification system. We will then have to edit the URIs once the controlled vocabularies are published. A related issue is that biotopes or communities are sometimes attributed to points based on ad hoc statistical analyses, and therefore they do not correspond to any particular classification system. (*WP4; tasks 1 and 3*)

- 3. Preparation of habitat maps for publishing on the portal:** many partners have had difficulty producing INSPIRE-compliant metadata. We have found that metadata created on the INSPIRE geoportal editor does not pass its own validation test. (*WP5; task 1*)
- 4. Preparation for EUSeaMap update in year 2:** we have been unsurprised to find that:
 - There is limited full-coverage environmental data available to use in the extension of EUSeaMap to the full Barents Sea. We may have to produce a relatively simple model for this area that is more reliant on using depth proxies for defining the boundaries of biological zones, and excludes any distinction between high, moderate and low energy areas. (*WP1; task 2*)
 - Achieving the requested resolution for EUSeaMap will be difficult in many areas due to the resolution of the available environmental datasets. For example, EMODnet Geology expect to achieve the 1:100,000 scale for less than 10 % of European seas for its seabed substrate data product (a key input to EUSeaMap). (*WP2; task 2*)

3. User Feedback

Nothing to report

Annex 1 Updates on Progress Indicators

Indicator 1 - Volume of data made available through the portal

The following data products created by EMODnet Seabed Habitats phase 2 have been made available to view and download through the portal – note that these three products are visible as a single layer on the interactive map³:

- Kinetic energy at the seabed due to currents in the Black Sea - derived from the Copernicus CMEMS project archives, (resolution 10km; years 1971-1984 and 1990-2001).
- Kinetic energy at the seabed due to currents in the Mediterranean Sea - derived from the Copernicus CMEMS project (resolution 7 km; years 1999-2011).
- Kinetic energy at the seabed due to currents in the Adriatic Sea - derived from the Tessa project archives (resolution 2.2 km; years 2011-2014).

The following external data products have been made available to view through the portal, with direct links to download them from their original source⁴:

- Habitats Directive – Official 2013 reported distribution: 1110 Sandbanks which are slightly covered by sea water all the time
- Habitats Directive – Official 2013 reported distribution: 1120 Posidonia beds
- Habitats Directive – Official 2013 reported distribution: 1130 Estuaries
- Habitats Directive – Official 2013 reported distribution: 1140 Mudflats and sandflats not covered by seawater at low tide
- Habitats Directive – Official 2013 reported distribution: 1150 Coastal Lagoons
- Habitats Directive – Official 2013 reported distribution: 1160 Large shallow inlets and bays
- Habitats Directive – Official 2013 reported distribution: 1170 Reefs
- Habitats Directive – Official 2013 reported distribution: 1180 Submarine structures made by leaking gases

³ Environmental variables that influence habitat type > Currents > Kinetic energy at the seabed due to currents (Mediterranean, Black Sea): http://www.emodnet-seabedhabitats.eu/access-data/launch-map-viewer/?LAYERS=EUSMCURR_medBS&zoom=3&Y=40&X=-11

⁴ Composite data products > Habitats Directive – Official 2013 reported distribution: http://www.emodnet-seabedhabitats.eu/access-data/launch-map-viewer/?LAYERS=ANXI_1110,ANXI_1120,ANXI_1130,ANXI_1140,ANXI_1150,ANXI_1160,ANXI_1170,ANXI_1180&zoom=3&Y=40&X=-11

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

The external data products (Habitats Directive – Official 2013 reported distribution) have been obtained directly from the European Environment Agency (Government).

Indicator 3 - Organisations that have been approached to supply data with no result, including type of data sought and reason why it has not been supplied

Nothing to report.

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

The table below summarises the data products downloaded from the EMODnet Seabed Habitats portal in the period 01/10/2017 to 31/12/2017

layer	number of downloads
342 Individual EUNIS maps from Survey	3467 over 61 download sessions ⁵
25 Individual non-EUNIS maps from survey	29 over 29 download sessions ⁵
Broad-scale habitat map (EUSeaMap)	159
OSPAR database of threatened and/or declining habitats	47
EU Sea Map 2016 - Fraction of light reaching the seabed	15
EU Sea Map 2016 - Photosynthetically Active Radiation at the surface	13
EU Sea Map 2016 - Photosynthetically Active Radiation at the seabed	15
Energy - North Sea and Celtic Sea	31
EU Sea Map 2016 - Coefficient of light attenuation in water (KDPAR)	10
Energy/Wave Exposure - Baltic Sea	9
Halocline - Baltic Sea	6
Salinity - Baltic Sea	9
EU Sea Map 2016 - Number of satellite images for each pixel of KDPAR	5
EUSeaMap 2016 higher resolution case study for east of Angus and Aberdeenshire	5

Indicator 5 - Organisations that have downloaded each data type

The following is a list of organisations that have downloaded data from the EMODnet Seabed Habitats download page (<http://www.emodnet-seabedhabitats.eu/access-data/download-data/>) in the period 01/10/2017 to 31/12/2017:

⁵ Habitat maps from surveys are available as individual downloads, with the option for the user to “Download All”. The number presented in the table is the number of individual habitat maps.

<p>Aberystwyth University AECOM Alfred Wegener Institute Artdatabanken, SLU Bangor University Biopol ehf. BODC CAU Kiel CCMAR Cefas Cerema CIIMAR CNR-Italy Cranfield University Deltares DEME Department of Agriculture, Env & Rural Affairs, N.Ireland DGRM DHI DTU Aqua, Denmark EA EBD-CSIC Ecopath International Initiative Edinburgh Napier University European Commission DG ENV European Institute for Energy Research FGBML Finnish Environment Institute Flanders Marine Institute Fugro Genesis Oil and Gas Ltd GMIT Hampshire County Council Heriot-Watt University ICNF, IP Ifremer IMAR - Mare Instituto espanol de oceanografia IPMA ISPRA IST JNCC Klaipeda University</p>	<p>Maplango MariLim Marine Institute Marine Scotland MMT NAFC Marine Centre Natural England Newcastle University Orkney Fisheries Association OTN Parque Natural da Arrábida Pesquera Añncora, S.L.U. Plymouth University Port of London Authority RNLI Royal Belgian Institute of Natural Sciences RPS Scottish Sea Farms Sea Going Green SENERGY, Bangor University Sun Yat-sen University TU BERLIN UCD UNEP-WCMC UN-IHE Delft University of Bristol University of Bucharest University of Exeter University of Gothenburg University of Hull University of Porto university of salento University of South Carolina University of Southampton University of St Andrews University of Technology in Wroclaw University of the Algarve University of the Highlands and Islands University of Ulster uvigo waterinnovate Wildlife Trusts</p>
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Lancaster University Leidos LUC	WSP WWF Canada ZSL
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Indicator 6 - Using user statistics to determine the main pages utilised and to identify preferred user navigations routes

This information is gathered by Google Analytics describing the user statistics for key web pages in the period 01/10/2017 to 31/12/2017.

page description	page address	Number of unique visitors	How many users end their visit on this page	Average residence time on page (mm:ss)
Home page	www.emodnet-seabedhabitats.eu	19	5	00:20
View data	http://www.emodnet-seabedhabitats.eu/access-data/launch-map-viewer/	769	637	03:57
Download data	http://www.emodnet-seabedhabitats.eu/access-data/download-data/	467	377	02:12
Build custom map	Page no longer available	156	26	00:54
Search metadata	http://www.emodnet-seabedhabitats.eu/access-data/search-metadata/	92	37	00:33

Indicator 7 - List of what the downloaded data has been used for (divided into categories e.g. Government planning, pollution assessment and (commercial) environmental assessment, etc.)

This information is collected from the form that users fill out when downloading data from the download page (<http://www.emodnet-seabedhabitats.eu/access-data/download-data/>) in the period 01/10/2017 to 31/12/2017.

Reason	Proportion of total
Commercial/industry	6%
Education	34%
Exploration/Exploitation surveys	0%
Fisheries	1%
Government	8%
NGO/Charity	0%
Personal use	45%
Research	0%
Other	5%

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

No change from the previous reporting period. Data on organisations connecting to web services is not currently available.

Metadata is available through a Catalogue Service for the Web via the ICES GeoNetwork. Mapping data are available through an OGC-compliant Web Mapping Service:

<http://www.emodnet-seabedhabitats.eu/access-data/web-services/>