

**Preparatory Actions for European Marine Observation and Data  
Network**

**FOURTH PROGRESS REPORT  
FOR THE PERIOD  
DECEMBER 2009-JANUARY 2010**

**Service Contract No. "MARE/2008/03 - Lot 3 Chemistry –  
SI2.531432"**

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## 1. INTRODUCTION

This report gives an overview of the activities undertaken during the two months of the project ( 3<sup>rd</sup> of December 2009 - 4<sup>th</sup> of February 2010).

This period was mainly devoted to the negotiation of local data with the data originators and to start the mapping between the EMODNET parameters to the SDN standard vocabularies (the Parameter Discovery P021 covers all the 17 chemicals, started the work on Parameter Usage P011) according to the spreadsheet defined during the EMODNET coordination group of 24<sup>th</sup> November 2009 in Bruxelles. This in order to harmonize the EMODNET data flow to the SDN infrastructure.

During the 2<sup>nd</sup> Coordination Group meeting of 21<sup>st</sup> January 2010, the status of work done has been presented and we had an open discussion about the mapping done, the searching criteria through the BODC vocabularies, the measurement units included into P061 vocabulary, and new parameters to be added to the P021 vocabulary. A summary of the discussion is presented together with the document produced and circulated to all partners.

All presentations related to EMODNET activities and all documents produced are available on the web site <http://nodc.ogs.trieste.it/nodc/projects/emodnet>.

## 2. SUMMARY OF THE 2<sup>ND</sup> COORDINATION GROUP MEETING

The meeting held in Paris the 21<sup>st</sup> of January 2010 was focused on the discussion of some of the issues related to the Technical set-up of the project activities:

- SDN Vocabulary extension (SDN P021 Parameter Discovery used for CDI and P061 used for units, covers all chemical parameters selected);
- SDN Vocabulary to extend (P011 for Odv4 under request);
- Implementation of SDN CDI interface to access EMODNET data;
- Implementation of SDN Viewing Services for EMODNET products delivery.

The first two elements are necessary to include the EMODNET metadata and data flow into SeaDataNet infrastructure track for:

- CDI mechanism to access data with data policy;
- ODV format for data flow;
- SDN Security Services for users registrations, and SDN Delivery Services for data access and downloading.

The parameters considered in the EMODNET Chemical lot include the groups of chemicals required for monitoring the Marine Strategy Directive:

- synthetic compounds (i.e. pesticides, antifoulants, pharmaceuticals);
- heavy metals;
- radionuclides;
- fertilisers and other nitrogen- and phosphorus-rich substances;
- organic matter;
- hydrocarbons including oil pollution.

On these 8 parameters groups, a set of 17 parameters have been selected in three matrices (water column, sediments, biota).

As a consequence, the mapping between EMODNET parameters and SDN P021 vocabulary has been presented and discussed at the coordination group as divided by matrix.

In particular, the items discussed were:

- the updating of the BODC parameter vocabulary to include the “total metal concentration in the water column”.
- the meaning of the measurements of organic C and organic N in the Biota matrix.
- the proposal to introduce a more analytical classification for the synthetic compounds, mapped as “Concentration of other organic contaminants” in the three matrixes.

The conclusions of the previous discussions related to P021 vocabulary brought:

- to add to the vocabulary the "Total metal concentrations in water bodies";
- the accept and introduce a more analytical classification for the great number of parameters mapped as "Concentration of other organic contaminants" in the three matrixes, adding to the vocabulary the following parameters:
  - "Pesticide concentrations in biota",
  - "Pesticide concentrations in sediment",
  - "Pesticide concentrations in water bodies",
  - "Pharmaceutical concentrations in biota",
  - "Pharmaceutical concentrations in sediments",
  - "Pharmaceutical concentrations in water bodies".

In order to be able to produce the ODV data exchange format, the mapping of the measured parameters with the SDN P011 Parameter Usage vocabulary is necessary and a simple navigation strategy was discussed. Roy Lowry from BODC suggested the following steps:

1. Go to the P011 vocabulary entry in the SeaDataNet Vocabulary client ([http://seadatanet.maris2.nl/v\\_bodc\\_vocab/search.asp?name=%28P011%29%20BODC+Parameter+Usage+Vocabulary&l=P011](http://seadatanet.maris2.nl/v_bodc_vocab/search.asp?name=%28P011%29%20BODC+Parameter+Usage+Vocabulary&l=P011)).
2. Enter a search string into the 'Free search' box containing keywords separated by '%' symbols. The keywords need to be in the order 'what was measured' (e.g. mercury), then the matrix ('water', 'sediment', 'biota'), giving a search string of 'mercury%biota'. Note the search is case-insensitive.
3. Press 'Search' button.
4. Choose from the list of codes offered. Note that you only need to specify the method of measurement if you feel it is important for your data.
5. Contact Roy Lowry ([rkl@bodc.ac.uk](mailto:rkl@bodc.ac.uk)) if you can't find what you need in the resulting list.

### **3. SPECIFICATION FOR EMODNET ACTIVITIES**

The aim of this note is to provide the EMODNET participants with the instruction necessary to start with project activities (from data collection, to data/metadata formatting and parameter mapping).

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## **METADATA AND DATA COLLECTION – TECHNICAL SET-UP**

According to the project proposal, EMODNET will use SeaDataNet V1 infrastructure for the technical set-up. In detail, we will adopt:

- SDN Standards for background data and metadata, and for product data and metadata
- CDI mechanism to access background data with data policy,
- ODV format for background data exchange,
- SDN Security Services for users registrations, and SDN Delivery Services for background data access and downloading,
- DIVA software tool to produce gridded data products and error maps products from the background data as NetCDF files.
- SDN Products catalogue (CAMIOON system) and SDN Products viewing services for free unlimited discovery, access, visualization and downloading of data products

Overall, SeaDataNet is considered as a key element to ensure interoperability and harmonization between the four EMODNET pilots, for data and products compatibility.

If you want additional information, please read the **Technical Tender Form** (Technical\_form4.pdf) and the **Conclusions from TTT Meeting for EMODNET Activity** (Conclusions\_from\_Sept09\_TTT\_meeting\_for\_EMODNET\_Chemical-v3.doc), both available on the EMODNET extranet (<http://nodc.ogs.trieste.it/nodc/projects/emodnet>, to access: user emduser / password 91L07G207).

## **PROGRESS OF REGIONAL POOL DATABASES**

Within the EMODNET project, 3 regional background data pools are defined at:

- NERI-MAR for Greater North Sea (contact awi@dmu.dk)
- MHI for the Black Sea (contact khaliulin@mhi-mist.sevsky.net)
- HCMR for the Mediterranean spots (contact sissy@hnodc.hcmr.gr)

These regional pools are set-up for internal efficiency reasons for the data analyses and the generation of data products. External users will not communicate with the regional pools, because these are only set up for streamlining the data products generation process. However the discovery and access to the distributed background data sources will be provided to users, using the SeaDataNet CDI Service. The discovery and access access to the generated data products, including their error maps, will be provided to users by applying the SeaDataNet product services. Therefore the DIVA generated data products will be managed at a central OpenDAP server as NetCDF files, that can be reached by a WMS viewing service. It can also be reached by the CAMIOON Catalogue of data products. This will include metadata for each product, using a different metadata format as CDI. CAMIOON has been developed and is operated by IFREMER as part of the MERSEA and MyOcean projects.

All partners are required to:

1. **Start the background data collection** for the selected chemicals and following the data inventory. (The updated data inventory is available on the extranet).
2. **Convert the collected background datasets** to SeaDataNet ODV format and gather sufficient metadata from data holders to prepare the associated CDI metadata records, pref. using the MIKADO software
3. **Transfer the collected background data sets** to the 3 regional data pools (NERI-MAR, MHI, HCMR) for inclusion in the regional databases
4. **Transfer the associated CDI records** for these background data sets to MARIS , that will validate and import these into the SeaDataNet CDI system (dedicated import version).

Note: Part of the background data sets will be managed at the SeaDataNet data centres and these can be retrieved via the CDI service and associated Shopping and Downloading mechanism, after agreement on access. Another part of the background data sets will come from external parties, that are not yet connected to the CDI service and shopping mechanism. In that case users will be enabled to discover the data sets in the EMODNET CDI service, but their requests for access will have to be forwarded by e-mail to their owners. The owners then will deal with the users outside the CDI system. MARIS will extend the present CDI service to include this extra functionality.

The final deadline for data collection and metadata compilation is the **14th of February 2010**.

If you want additional information, please read at the **Proposal for Metadata and Data Collection Methodology for EMODNET Chemical Lot** (EMODNET-data\_collection\_methodology\_16july-revdick.doc available on extranet).

#### **PARAMETER RANGE AND PARAMETER MAPPING**

Based upon the Marine Strategy Framework Directive (MSFD) requirements, detailing what the end users (in this case the EEA and Commission) are expecting to use the dataset for, on the time and space distribution of data reported in the data inventory, the following 17 parameters have been selected in three different matrices (water column, sediment, biota) for the EMODNET Chemical pilot:

<b>EMNC id</b>	<b>Chemical group</b>	<b>Parameter</b>
C1	Pesticides	Dichlorodiphenyltrichloroethane(DDT)
C2	Pesticides	Hexachlorobenzene (HCB)
C3	Antifoulants	Tributyltin (TBT)



C4	Antifoulants	Triphenyltin (TPT)
C5	Pharmaceuticals	Oxytetracycline (C <sub>22</sub> H <sub>24</sub> N <sub>2</sub> O <sub>9</sub> )
C6	Heavy metals	Mercury (Hg)
C7	Heavy metals	Cadmium (Cd)
C8	Heavy metals	Lead (Pb)
C9	Hydrocarbons	Anthracene (C <sub>14</sub> H <sub>10</sub> )
C10	Hydrocarbons	Fluoranthene (C <sub>16</sub> H <sub>10</sub> )
C11	Radionuclides	Tritium
C12	Radionuclides	Cesium 137
C13	Radionuclides	Plutonium 239
C14	Fertilisers/Nitrogen	Nitrate (NO <sub>3</sub> )
C15	Fertilisers/Nitrogen	Phosphate (PO <sub>4</sub> )
C16	Organic matter	Organic Carbon (C)
C17	Organic matter	Organic Nitrogen (N)

To produce the **CDI XML files** (metadata) the SDN P021 vocabulary has to be used. For this purpose a small core group has evaluated the SDN P021 Vocabulary and has extended this Parameter Discovery Vocabulary (**SDN P021 vocabulary**) to cover all 17 chemical parameter selected. To help you in preparing the CDI records the parameter mapping for the three matrices (water column, sediment, biota) has been defined and is included in the Excel file attached (**EMODNET\_Parameter\_Units\_P021\_P061.xls**).

To produce the **ODV4 data files** the SDN P011 vocabulary has to be used. The SeaDataNet Parameter Usage Vocabulary (**SDN P011 vocabulary**) contains over 20,000 entries of which only several hundred are of interest to the EMODNET pilot. To help you again with the mapping, all the parameters in the current P011 that are of interest to EMODNET have been extracted and included in the Excel file attached (**Parameter\_mappings\_P011.xls**). The spreadsheet has three sheets. The first sheet lists all the parameters. The second lists the model behind these names for water plus sediment. The third lists the model behind the biota names.

The complete SeaDataNet Parameter Usage Vocabulary (SDN P011 vocabulary) can be found from SDN Web interface. A navigation strategy is required and the following is recommended:

1. Go to the P011 vocabulary entry in the SeaDataNet Vocabulary client ([http://seadatanet.maris2.nl/v\\_bodc\\_vocab/search.asp?name=%28P011%29%20BODC+Parameter+Usage+Vocabulary&l=P011](http://seadatanet.maris2.nl/v_bodc_vocab/search.asp?name=%28P011%29%20BODC+Parameter+Usage+Vocabulary&l=P011)).
2. Enter a search string into the '**Free search**' box containing keywords separated by '%' symbols. Keep in mind that the parameter description is the textual realisation of a semantic model that is the simple concatenation of three 'themes', specifying what was measured (What Theme), the medium in which it was measured (Where Theme) and how the measurement was made (How Theme) thus the keywords need to be in the order:

What theme%Where theme%How theme

For example: *Concentration%dichlorodiphenyltrichloroethane%biota*

Note the search is case-insensitive.

3. Press the '**Search**' button.
4. Choose from the list of codes offered. Note that you only need to specify the method of measurement if you feel it is important for your data.
5. If you cannot find the parameter term, please contact Roy Lowry ([rkl@bodc.ac.uk](mailto:rkl@bodc.ac.uk)) for support. Also in our opinion most EMODNET parameters are already available in the P011 Vocabulary, but it might be that you need extra.

More sophisticated searching based on keywords up to five keywords (which MUST be in the list order) is possible, but probably won't be necessary:

1. Measurement – description of the measurement (e.g. 'concentration', 'activity')
2. Measurand – what was measured (e.g. 'nitrate', 'mercury')
3. Measurand to matrix relationship (e.g. 'per unit dry weight', 'per unit volume', 'per unit mass')
4. Matrix – what the measurand was measured in (e.g. 'water', 'biota', 'sediment')
5. Method – analytical procedure

## **PRIORITIES AND DEADLINES**

All partner should start the data collection from the water column, and first with the nutrients in the water column: Nitrate, Phosphate. For the deadline of the **14th of February 2010**, we have to start the generation of data products and we must show our abilities. It is then planned to go from parameter to parameter group to produce the other data products. The contract with the EU has a very important deadline of end May 2010, on which date we will have to launch the first version of the EMODNET Chemical portal including at least 50% of the agreed data products. This implicates that all partners really must undertake urgently activities to gather relevant data sets and to compile these into CDI metadata records and ODV4 files!!

## **CDI METADATA FILES**

Metadata will be transferred using SDN CDI XML metadata files. CDI entries will be produced and managed by NODCs using information from original data providers. It is recommended to use the MIKADO software tool and the SeaDataNet Common Vocabulary (in particular P021 Parameter Discovery Vocabulary) at [http://www.seadatanet.org/standards\\_software/common\\_vocabularies](http://www.seadatanet.org/standards_software/common_vocabularies) with the mapping as indicated above. Please send the produced CDI XML files to MARIS ([peter@maris.nl](mailto:peter@maris.nl)), however with a small note that it concerns CDI records for the EMODNET Chemical Lot.

**ODV DATA FILES**

The data files have to be converted to SDN ODV4 format, e.g. using the NEMO software tool. All partners should start by converting nutrients and organic matter in the water column. Looking at the other parameters and matrices (sediment/biota) you have to find the corresponding measured parameter in the SeaDataNet Parameter Usage Vocabulary P011, using SDN Web interface and/or contacting Roy Lowry ([rkl@bodc.ac.uk](mailto:rkl@bodc.ac.uk)). Please send the produced SDN ODV4 data files to your regional task leader ([awi@dmu.dk](mailto:awi@dmu.dk) for the Greater North Sea, [khaliulin@mhi-mist.sevsky.net](mailto:khaliulin@mhi-mist.sevsky.net) for the Black Sea, [sissy@hnodc.hcmr.gr](mailto:sissy@hnodc.hcmr.gr) for the Mediterranean spots).

**PROJECT DOCUMENTS**

All presentations and documents produced are available in the EMODNET extranet:

<http://nodc.ogs.trieste.it/nodc/projects/emodnet>

To access, user: emduser

Password: 91L07G207

**GENERAL INFORMATION**

For general information about the EMODNET Chemical lot please contact Alessandra Giorgetti ([agiorgetti@ogs.trieste.it](mailto:agiorgetti@ogs.trieste.it))

#### 4. PARAMETER MAPPINGS P021 AND P061

##### WATER MATRIX

EMNC	Chemical group	Parameter	SDN P021 CODE	SDN PARAMETERS P021 vocab TERM	SDN P061
C1	Pesticides	Dichlorodiphenyltrichloroethane (DDT)	PEWB	Pesticide concentrations in water bodies	UNGL
C2	Pesticides	Hexachlorobenzene (HCB)	PEWB	Pesticide concentrations in water bodies	UNGL
C3	Antifoulants	Tributyltin (TBT)	WCOC	Concentration of other organic contaminants in the water column	UNGL
C4	Antifoulants	Triphenyltin (TPT)	WCOC	Concentration of other organic contaminants in the water column	UNGL
C5	Pharmaceuticals	Oxytetracycline (C <sub>22</sub> H <sub>24</sub> N <sub>2</sub> O <sub>9</sub> )	PHWB	Pharmaceutical concentrations in water bodies	
C6	Heavy metals	Mercury (Hg)	MTWD	Dissolved metal concentrations in the water column	UNGL
C6	Heavy metals	Mercury (Hg)	MTWT	Total metal concentrations in the water column	UNGL
C6	Heavy metals	Mercury (Hg)	MTWP	particulate metal concentrations in the water column	UNGL
C7	Heavy metals	Cadmium (Cd)	MTWD	Dissolved metal concentrations in the water column	UNGL
C7	Heavy metals	Cadmium (Cd)	MTWT	Total metal concentrations in the water column	UNGL
C7	Heavy metals	Cadmium (Cd)	MTWP	particulate metal concentrations in the water column	UNGL
C8	Heavy metals	Lead (Pb)	MTWD	Dissolved metal concentrations in the water column	UNGL
C8	Heavy metals	Lead (Pb)	MTWT	Total metal concentrations in the water column	UNGL
C8	Heavy metals	Lead (Pb)	MTWP	particulate metal concentrations in the water column	UNGL
C9	Hydrocarbons	Anthracene (C <sub>14</sub> H <sub>10</sub> )	PCHW	Concentration of polycyclic aromatic hydrocarbons (PAHs) in the water column	UNGL
C10	Hydrocarbons	Fluoranthene (C <sub>16</sub> H <sub>10</sub> )	PCHW	Concentration of polycyclic aromatic hydrocarbons (PAHs) in the water column	UNGL
C11	Radionuclides	Tritium	WRAD	Radioactivity in the water column	UUBQ
C12	Radionuclides	Cesium 137	WRAD	Radioactivity in the water column	UUBQ
C13	Radionuclides	Plutonium 239	WRAD	Radioactivity in the water column	UUBQ
C14	Fertilisers/Nitrogen	Nitrate (NO <sub>3</sub> )	NTRA	Nitrate concentration parameters in the water column	UPOX
C15	Fertilisers/Nitrogen	Phosphate (PO <sub>4</sub> )	PHOS	Phosphate concentration parameters in the water column	UPOX
C16	Organic matter	Organic Carbon (C)	CORG	Particulate total and organic carbon concentrations in the water column	UPOX
C17	Organic matter	Organic Nitrogen (N)	NTOT	Particulate total and organic nitrogen concentrations in the water column	

**SEDIMENT MATRIX**

EMNC	Chemical group	Parameter	P021 CODE	SDN PARAMETERS P021 vocab TERM	SDN P061
C1	Pesticides	Dichlorodiphenyltrichloroethane (DDT)	PESD	Pesticide concentrations in sediment	UUKG
C2	Pesticides	Hexachlorobenzene (HCB)	PESD	Pesticide concentrations in sediment	UUKG
C3	Antifoulants	Tributyltin (TBT)	SCOC	Concentration of other organic contaminants in sediment samples	UUKG
C4	Antifoulants	Triphenyltin (TPT)	SCOC	Concentration of other organic contaminants in sediment samples	UUKG
C5	Pharmaceuticals	Oxytetracycline (C <sub>22</sub> H <sub>24</sub> N <sub>2</sub> O <sub>9</sub> )	PHSE	Pharmaceutical concentrations in sediments	
C6	Heavy metals	Mercury (Hg)	MTSD	Metal concentrations in sediment	UUKG
C7	Heavy metals	Cadmium (Cd)	MTSD	Metal concentrations in sediment	UUKG
C8	Heavy metals	Lead (Pb)	MTSD	Metal concentrations in sediment	UUKG
C9	Hydrocarbons	Anthracene (C <sub>14</sub> H <sub>10</sub> )	SCAH	Concentration of polycyclic aromatic hydrocarbons (PAHs) in sediment samples	UUKG
C10	Hydrocarbons	Fluoranthene (C <sub>16</sub> H <sub>10</sub> )	SCAH	Concentration of polycyclic aromatic hydrocarbons (PAHs) in sediment samples	UUKG
C11	Radionuclides	Tritium	SRAD	Radioactivity in sediment	UBQK
C12	Radionuclides	Cesium 137	SRAD	Radioactivity in sediment	UBQK
C13	Radionuclides	Plutonium 239	SRAD	Radioactivity in sediment	UBQK
C14	Fertilisers/Nitrogen	Nitrate (NO <sub>3</sub> )	---	---	
C15	Fertilisers/Nitrogen	Phosphate (PO <sub>4</sub> )	---	---	
C16	Organic matter	Organic Carbon (C)	CBSD	Carbon concentrations in sediment	UPCT
C17	Organic matter	Organic Nitrogen (N)	NTSD	Nitrogen concentrations in sediment	UPCT

**BIOTA MATRIX**

EMNC	Chemical group	Parameter	P021 CODE	SDN PARAMETERS P021 vocab TERM	SDN P061
C1	Pesticides	Dichlorodiphenyltrichloroethane (DDT)	PEBI	Pesticide concentrations in biota	UUKG
C2	Pesticides	Hexachlorobenzene (HCB)	PEBI	Pesticide concentrations in biota	UUKG
C3	Antifoulants	Tributyltin (TBT)	BCOC	Concentration of other organic contaminants in biota	UUKG
C4	Antifoulants	Triphenyltin (TPT)	BCOC	Concentration of other organic contaminants in biota	UUKG
C5	Pharmaceuticals	Oxytetracycline ( <a href="#">C<sub>22</sub>H<sub>24</sub>N<sub>2</sub>O<sub>9</sub></a> )	PHBI	Pharmaceutical concentrations in biota	*Not in ICES database
C6	Heavy metals	Mercury (Hg)	BCMT	Metal concentrations in biota	UUKG
C7	Heavy metals	Cadmium (Cd)	BCMT	Metal concentrations in biota	UUKG
C8	Heavy metals	Lead (Pb)	BCMT	Metal concentrations in biota	UUKG
C9	Hydrocarbons	Anthracene (C <sub>14</sub> H <sub>10</sub> )	BCAH	Concentration of polycyclic aromatic hydrocarbons (PAHs) in biota	UUKG
C10	Hydrocarbons	Fluoranthene (C <sub>16</sub> H <sub>10</sub> )	BCAH	Concentration of polycyclic aromatic hydrocarbons (PAHs) in biota	UUKG
C11	Radionuclides	Tritium	BRAD	Radioactivity in biota	*Not in ICES database
C12	Radionuclides	Cesium 137	BRAD	Radioactivity in biota	UBQK
C13	Radionuclides	Plutonium 239	BRAD	Radioactivity in biota	*Not in ICES database
C14	Fertilisers/Nitrogen	Nitrate (NO <sub>3</sub> )	---		
C15	Fertilisers/Nitrogen	Phosphate (PO <sub>4</sub> )	---		