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| **Marine Strategy Framework Directive (MSFD)**  ***Common Implementation Strategy*** |
| **10th meeting of the Working Group on Data, Information and Knowledge Exchange (WG DIKE)**  ***1400-1800: 29 September 2014***  ***0900-1800: 30 September 2014***  *Conference Centre Albert Borschette, Rue Froissart 36, B-1040 Brussels* |

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| Agenda item: | 7 |
| Document: | DIKE\_10-2014-07 |
| Title: | Meeting summary of TG DATA workshop on existing reporting in support of eutrophication (D5) and hazardous substances (D8) |
| Prepared by: | ETC/ICM and EEA |
| Date prepared: | 23/09/2014 |
| Background: | Historically, data flows have been in place to support indicators of eutrophication (D5) and hazardous substances (D8), both in the four Regional Sea Conventions and in the EIONET (see Annex 1 to this paper). The objective of the workshop was to gain a clear understanding of which MSFD indicators under D5 and D8 could be supported by data streams already in place, how they work and what their operational conditions are. |

**WG DIKE is invited to:**

1. Take note of the meeting summary;
2. Comment on the main workshop conclusions summarized on the first page and substantiated by the analysis in the document.

**Summary**

Historically, data flows have been in place to support indicators of eutrophication (D5) and hazardous substances (D8), both in the four Regional Sea Conventions and in the EIONET (see Annex 1 to this paper). The objective of the workshop was to gain a clear understanding of which MSFD indicators under D5 and D8 could be supported by data streams already in place, how they work and what their operational conditions are. The 2 day workshop was split into a eutrophication session on day one and a hazardous substance session on day 2.

In general the outlook for the next 5 years indicates that the current arrangements with the data flows established for MS reporting to ICES under HELCOM/OSPAR obligations for the most commonly used indicators under D5 and D8. Furthermore, mechanisms are in place in these RSCs to agree and establish new data flows in support of MSFD, if desired.

The reporting mechanisms available to countries in UNEP/MAP and in the Black Sea seem to not be as able to support the MSFD obligations, and countries may need to find alternative solutions. Relevant parameters seem to be reported in the context of the BSC, and to a lesser extent MEDPOL, but the restricted access rights means that they cannot be shared easily from the regional level. In fact the Mediterranean countries as well as RO and BG could fulfill their EU reporting obligations to D5 and D8 through the EEA driven EIONET/WISE SoE mechanisms.

In addition, the workshop also discussed alternatives to existing reporting methods. However, except for Germany, countries have not progressed in moving their own systems from a traditional ‘push’ system to a ’pull system based on INSPIRE principles.

Most primary data are at national databases, higher indicator data in RSCs databases and with directions in a catalogue referring to original data. In the future it might be better to have national databases as the main data nodes, in this way progressing towards a ‘pull’ system. In general, a gradual move towards a ‘pull’ system is how some MS would like to operate incorporating the following principles:

* communication should go from MS to RSC and then to EU level
* report once, use many times principle

It was agreed that TG-DATA has an important role to play in the shaping of the future architecture of the European marine data systems.

## Analysis of data flows in support of D5

The reporting stream in place in context of the RSC and the EEA were analysed from the perspective of providing data relevant for MSFD Descriptor 5 indicators. The analysis was based on data reported to the RSCs in 2012 by the contracting parties that are also EU Member States. The contracting parties of the RSCs included in the analysis are listed in Table 1.

Table 1. Contracting Parties of the RSCs included in the analysis

|  |  |
| --- | --- |
| Regional Sea Convention | Contracting parties that are also members of the EU |
| HELCOM | DE, DK, EE, FI, LT, LV, PL, SE |
| OSPAR | BE, DE, DK, ES, FR, IE, NL, SE, PT, UK |
| UNEP/MAP | CY, EL, ES, FR, HR, IT, MT, SI |
| BSC | BG, RO |
| EIONET | BE, BG, ,CY DE, DK, EE, EL, ES, FI, FR, HR, IE, IT, LT, LV, MT, NL, PL, PT, SE, SI, RO, UK |

Overviews of data reported to HELCOM and OSPAR was obtained from ICES, UNEP/MAP data were obtained from the MED POL data base and of BSC data were provided by the IRIS SES project, not the RSC. Overviews of the data that are submitted via EIONET Central Data Repository (CDR) were provided by ICES. The countries reporting via EIONET CDR that are EU MS were included in the analysis (23 EU MS). If a country has already reported its data through an RSC mechanism, it is not necessary to report again through the EIONET, hence 100% coverage is not expected.

The inventory of data flows used for the analysis including information on sampling frequencies, monitoring programmes, period of data flows, data provider, database name, database holder etc. can be found in RSC data and information flows report, Annex 2.

Table 2: Overview of results of D5 analysis (figures indicate proportion of countries reporting, i.e. 6/8 means six of the eight countries reported in 2012).

| Indicator | HELCOM | OSPAR | UNEP/MAP  MEDPOL | Black Sea | EIONET |
| --- | --- | --- | --- | --- | --- |
| 5.1.1: Nutrients concentration in the water column | 6/8 | 7/10 | 2/8 | 2/2 | 19/23 |
| 5.1.2: Chlorophyll concentration in the water column | 7/8 | 7/10 | 1/8 | 2/2 | 18/23 |
| 5.2.2: Water transparency | 5/8 | 1/10 | 0 | 2/2 | 7/23 |
| 5.2.3: Abundance of opportunistic macroalgae | 0 | 0 | 0 | 0 | 0 |
| 5.2.4: Species shift in floristic composition | 4/8 | 0 | 0 | 2/2 | 0 |
| 5.3.1: Abundance of perennial seaweeds and seagrasses | 0 | 0 | 0 | 2/2 | 0 |
| 5.3.2 Dissolved oxygen | 6/8 | 7/10 | 0 | 2/2 | 16/23 |
| Nutrient loads | 8/8 | 7/10 | 0 | 0 | 0 |
| Atmospheric deposition | Based on NILU models | Based on NILU models | 0 | 0 | 0 |
| Access rights | No restrictions | No restrictions | restricted | restricted | No restrictions |
| Programme | Combine/PLC | CEMP/RID | MEDPOL | BSIMAP | WISE-SoE |
| Data holder | ICES/SYKE | ICES/ODIMS | MEDPOL | BSIMAP | EEA/waterbase |

## Summary Eutrophication

An overview of data relevant to MSFD eutrophication indicators reported to the RSCs by the contracting parties and at what frequencies across RSCs is shown in Table 2. Nutrients, chlorophyll-a and oxygen are adopted by Helcom, OSPAR, BSC and the EIONET and are hence reported by most contracting parties and members of the EIONET. In these contexts the data are used to support indicators, but the indicators are not the same. In UNEP/MAP only chlorophyll-a has recently been adopted as a reported parameter, and hence reporting of it and other parameters is currently more limited. It was a clear message from the workshop that the contracting parties of HELCOM and OSPAR were happy with the existing arrangements and did not feel that there was a need to change them. As access to the reported data is unrestricted, there is already corporation with EEA on avoiding double reporting.

In the workshop, HELCOM explained that the latest assessment of eutrophication was based on COMBINE data and had had to incorporate more data from the Baltic Nest Insitute. This initiated the EUTRO-OPER project to make sure that all the needed parameters and measurements actually go to the ICES database. In that process there is also planned to be a reporting mechanism for earth observation data and transects measured by ships of opportunity.

Although water transparency (indicator 5.2.2) is used by several contracting parties in HELCOM who also has an indicator based on it, it was not viewed by the workshop as a relevant parameter across Europe. In particular the OSPAR countries; BE, UK, EI, and NL expressed that it could not be used as an indicator of eutrophication in their waters because turbidity from mineral substances was too high. The indicator abundance of opportunistic macroalgae (indicator 5.2.3) and abundance of perennial seaweeds and seagrasses (indicator 5.3.1) was not used at all in the RSC context, principally because they focus on offshore waters which are too deep for macrophytes, and species shift in floristic composition (indicator 5.2.4) was only used on an experimental basis in HELCOM.

All Regional Sea Conventions have worked with reporting of nutrient loads, but in UNEP/MAP and the Black Sea Commission only point sources have been reported, and only historical data are available. Atmospheric deposition of nitrogen is determined by European Monitoring and Evaluation Programme (EMEP) on the basis of emission data officially submitted by contracting parties to CLRTAP Convention.

OSPAR and HELCOM calculate indicator nutrient ratios (5.1.2) from reported parameters and so it is not directly reported by their contracting parties. Although OSPAR Monitoring guidelines for biological variables relevant to MSFD indicators 5.2.3, 5.2.4 and 5.3.1 are developed under the JAMP programme for OSPAR CPs, at this stage, no such data are gathered at OSPAR level, but may be available at national level.

# Summary Hazardous substances

The reporting stream in place in context of the RSC and the EIONET were analysed from the perspective of providing data relevant for MSFD Descriptor 8 indicators which are primarily linked to environmental quality standards of the WFD. The analysis was based on data reported to the RSCs in 2012 by the contracting parties that are also EU Member States. The contracting parties of the RSCs included in the analysis are listed in Table 1.

Although a large number of priority substances are reported in the context of HELCOM, OSPAR, UNEP/MAP, the BSC, and the EIONET, observations are also made in three different matrixes (water, sediment or biota), that are not comparable. This means that the data streams are very inhomogeneous and no substances are reported using the same matrix by all countries in any of the four conventions (Table 3). Very few substances are reported to MEDPOL. The hazardous substances reported were grouped into 21 ICES chemical groups before further analysis. Substances were reported in all chemical groups, but for any one matrix and region a maximum of 7 chemical groups were used by more than 50% of countries. This was the case for chemicals in sediments reported to the EIONET, and chemicals in biota reported to OSPAR and the EIONET.

Pollution loads of some substances (in particular metals) are also reported. Oil spills are not handled in OSPAR, the three other conventions all report on number of spills. HELCOM also operates a programme for monitoring illegal operational discharges.

Also for the hazardous substances, it was a clear message from the workshop that the contracting parties of HELCOM and OSPAR were happy with the existing arrangements and did not feel that there was a need to change them. As access to the reported data is unrestricted, there is already corporation with EEA on avoiding double reporting. In the case of the Black Sea actually both Romania and Bulgaria monitor similar groups of chemicals, and use the EIONET for reporting some of them. Bulgarian data were not available from the IRIS/SES project, but were available from the EEA.

Table 3: ICES chemical groups of hazardous substances reported by more than 50% of EU member countries in an RSC (or the EIONET), depending on matrix

|  | HELCOM | OSPAR | UNEP/Map  (Medpol) | Black Sea | EIONET |
| --- | --- | --- | --- | --- | --- |
| Water | none | none | none | Metals and metalloids  Organo-chlorines  PAHs | Chlorobi-phenyls  Cyclodienes  DDTs  Metals and metalloids  Organo-chlorines  PAHs |
| Sediment | Metals and metalloids | Chlorobi-phenyls  Metals and metalloids  PAHs | Cyclodienes  DDTs  Hexachloro-cyclohexanes | Metals and metalloids | Chlorobi-phenyls  Cyclodienes  DDTs  Hexachloro-cyclohexanes  Metals and metalloids  Organo-chlorine  PAHs |
| Biota | DDTs  Hexachloro-cyclohexanes  Metals and metalloids  Organo-chlorines | DDTs  Hexachloro-cyclohexanes  Metals and metalloids  Organo-bromines  Organo-chlorines  Organo-metallic compounds  PAHs | Hexachloro-cyclohexanes  Metals and metalloids | None | Chlorobi-phenyls  Cyclodienes  DDTs  Hexachloro-cyclohexanes  Metals and metalloids  Organo-chlorines  PAHs |
| Loads |  | Metals, HCH and PCBs | Multiple substances in point sources |  | None |
| Access rights | No restrictions | No restriction | restricted | restricted | No restrictions |
| Programme | Combine/PLC | CEMP | MEDPOL | BSIMAP | WISE-SoE |
| Data holder | ICES/SYKE | ICES | MEDPOL | BSIMAP | EEA/waterbase |
| 8.2.2 Occurrence, origin, and extent of oil spills | Number of spills  Illegal discharges  Amount released |  | Number of spills  Amount released | Number of spills | None |

## Discussion on future reporting mechanisms and INSPIRE

In addition to confirming the overviews the workshop also discussed alternatives to existing reporting methods. However, except for Germany, countries have not progressed in moving their own systems from a traditional ‘push’ system to a ’pull system based on INSPIRE principles.

Most primary data are at national databases, higher indicator data in RSCs databases and with directions in a catalogue referring to original data. In the future it might be better to have national databases as the main data nodes, in this way progressing towards a ‘pull’ system. In general, a gradual move towards a ‘pull’ system is how some MS would like to operate incorporating the following principles:

* communication should go from MS to RSC and then to EU level
* report once, use many times principle

It was agreed that TGDATA has an important role to play in the shaping of the future architecture of the European marine data systems.

In this context it was found very helpful that JRC has initiated a marine pilot project on INSPIRE. While the obligation to implement INSPIRE is with Member States there seemed to be interest in working towards a system where the RSC provide INSPIRE services; it was suggested that national, regional and EU level use cases should be developed. For now the national level will be addressed. MS were invited to express interest in participation in the pilot, and at this point DK, DE and NL have volunteered.

**EMODnet** was reflected upon, and Italy presented how EMODnet Chemistry was being used as the national system for the provision of the evidence base for a number of the MSFD descriptors. It was generally thought that the European Data system could play a role in providing informational ‘state’ products and as a reference point for understanding the general availability and distribution of available data. The workshop also expressed interest in learning more about the ways in which Emodnet can support MSFD. This was discussed in a follow-up workshop organized by the Emodnet secretariat in September 2014. In particular Italy and Slovenia were interested in alternative approaches to reporting through the regional level.

In general the outlook for the next 5 years indicates that the current arrangements with the dataflows established for MS reporting to ICES under HELCOM/OSPAR obligations for the most commonly used indicators under D5 and D8. Furthermore, mechanisms are in place in these RSCs to agree and establish new data flows in support of MSFD, if desired.

The reporting mechanisms available to countries in UNEP/MAP and in the Black Sea seem to not be as able to support the MSFD obligations, and countries may need to find alternative solutions. Relevant parameters seem to be reported in the context of the BSC, and to a lesser extent MEDPOL, but the restricted access rights means that they cannot be shared easily from the regional level. In fact the Mediterranean countries as well as RO and BG could fulfill their EU reporting obligations to D5 and D8 through the EEA driven EIONET/WISE SoE mechanisms.

# Annex 1

# Existing Reporting mechanisms to the RSC and the EEA

## HELCOM

HELCOM operates multiple data flows agreed through the HELCOM COMBINE or HELCOM Pollution Load Compilation activities. Specific data reporting streams include. PLC reporting is managed by SYKE wheras reporting under COMBINE is managed by ICES.

* COMBINE database holding CP data on Temperature, Salinity, Oxygen, Phosphate, Total Phosphorus, Silicate, Nitrate, Nitrite, Ammonium, Total Nitrogen, Hydrogen Sulphide, pH, Alkalinity, Chlorophyll a, Secchi depth. This database is hosted by ICES.
* HELCOM Pollution Load Compilation 5.5 (PLC 5.5) dataset containing all waterborne nutrient and hazardous substances loads gathered by HELCOM contracting parties within pollution load monitoring;
* HELCOM Pollution Load Compilation 6 (PLC 6) ongoing comprehensive assessment of water- and airborne inputs and their sources to the Baltic Sea during the period 1994-2014 with more detailed assessment for 2014;
* Ship-of opportunity (Ferry-box) DIN, DIP & chl-a
* Ship-of opportunity (Ferry-box) in situ fluorescence-based chl-a (validated)
* Earth observation-based chl-a (validated);

## OSPAR

Information on the parameters relevant to eutrophication indicators that the OSPAR data streams include can be found below:

* “Comprehensive Atmospheric Monitoring Programme (CAMP)” includes data and model results on wet and dry deposition of nitrogen compounds (oxidized and reduced).
* “Comprehensive Study of Riverine Inputs and direct Discharges (RID)” includes data compilations of yearly loads from nitrogen (NH4, NO3, TotN) and phosphorus (PO4, TP) compounds, based on measurements (large rivers) and estimates (smaller tributaries).
* “Models used for quantification and reporting of nutrient discharges and losses”. This datastream is currently under development. It is anticipated that model results will provide information on source appointments and trans-boundary nutrient transport of nutrients, that can be used in eutrophication assessments and plans of measures.
* “Comprehensive Environmental Monitoring Programme (CEMP)” contains data on NH4, NO3, NO2, PO4, SiO4, TotN, TotP, Dissolved Oxygen and Chlorophyll-a, as well as a limited amount of data on phytoplankton species counts.

## ICES

ICES is the responsible data centre for the marine environmental monitoring data of HELCOM and OSPAR. Contracting Parties are obliged to report COMBINE (HELCOM Cooperative Monitoring in the Baltic Marine Environment) and CEMP (Comprehensive Environmental Monitoring Programme) monitoring data to ICES on an annual basis by 15 September every year using the agreed reporting formats. The submission is done by email. Data are organized in relational data base and the metadata are ISO19115 compliant. Both data and their metadata are available on-line through Web Services. Further details on data management aspects such as stewardship, quality control, updates of the data sets, reusage of the data etc. can be found in RSC data and information flows report, Annex 1.

## UNEP/MAP

MED POL monitoring data reported by the Contracting Parties to UNEP/MAP-Barcelona Convention are held in the MED POL database (http://195.97.36.231/medpol/). The data are reported by the end of the year by email. However not all Contracting Parties report data on a regular basis and there are gaps both in terms of temporal and spatial coverage. The data are held in excel format. Metadata are standardized using internal conventions and rules. Further details on data management aspects such as stewardship, quality control, updates of the data sets, reusage of the data etc. can be found in RSC data and information flows report, Annex 1.

The MED POL Info System is a networked information system intended to provide the Contracting Parties and MED POL Unit with the tools to manage, share, preserve and analyse MED POL data to MED POL users. The Info System is not yet operational but it will soon be available.

Information on the parameters relevant to eutrophication indicators that the UNEP/MAP data streams include can be found below:

* MED POL data base holding data on NO3, NO2, NH4, PO4 (or Total N, Total P) and SiO4 (occasionally) and general oceanographic parameters (temperature, salinity, dissolved oxygen)
* Land-based pollution sources database holding national data on pollutants industrial and municipal discharges collected by national surveys

## Black Sea Commission

The Black Sea Integrated Monitoring and Assessment Programme (BSIMAP) provides common data/information reporting formats and the contracting parties have the obligation to report to the BSC on an annual basis using these agreed formats. Data are annually collected, though with a different observation frequency per year.

The BSC Regional Database on Pollution is a component of the Black Sea Information System (BSIS) held by the Regional Activity Center for Pollution Monitoring and Assessment (RAC PMA). Nutrients data constitute the major part of the database.The Black Sea Regional Database is available through the web site:http://rdbp.sea.gov.ua. Password is required for external users to access it. The database is built using a relational database management system (RDBMS). Metadata descriptions and their standards follow the SeaDataNet approach. Further details on data management aspects such as stewardship, quality control, updates of the data sets, reusage of the data etc. can be found in Annex 1. Detailed description of the BSC database can be found in the report “The development of a new version of the Regional Data base on Pollution of BSIS” prepared by the RAC PMA under the BSC-Baltic2Black Service contract (rdbp.sea.gov.ua/docs/FINAL\_REPORT\_RDB.doc)

Information on the parameters relevant to eutrophication indicators that the BSC data streams include can be found below:

* Regional Data base on Pollution holding data on NO2, NO3, NH4, Total N, PO4, Total P, SiO4, Chl a, Т, Salinity, O2, O2 %.
* Data on input of nutrients from direct sources. The data are stored in the BSC information system as excel files and are not accessible online.

## EEA

EEA has organized its data flows with the European environment information and observation network (EIONET), a partnership network of the EEA and 33 members and 6 cooperating countries. EIONET consists of the EEA itself, a number of European Topic Centres (ETCs) – ETC/ICM (Inland, Coastal and Marine Waters) being the water thematic center - and a network of National Focal Points (NFPs) and National Reference Centres (NRCs).

In the context of the implementation of the Water Framework Directive (WFD), EEA´s EIONET-Water annual data flow for waters was transferred into the WISE ‘State of the Environment’ (SoE) data flow in 2008 and gained full integration into the reporting under WISE complementary with data reported under the WFD (i.e. information reported already under the WFD obligatory reporting would not be required again, but used as available in WISE).

The WISE SoE TCM (Transitional, Coastal and Marine Waters) dataset results from data collected annually both from EEA member countries and from the RSCs through the WISE-SoE TCM data collection process.

WISE-SoE data collection process is based on the existing monitoring networks in the EEA member countries, where a representative sub-sample of national monitoring sites in rivers, lakes, groundwater and transitional, coastal and marine waters were selected for the European network with no additional demands for new data gathering. WISE-SoE data collection runs annually and traditionally starts at the end of July/beginning of August.

WISE SoE data on transitional, coastal and marine waters (WISE SoE TCM) is reported annually to the EEA by the EIONET countries using the Reportnet tools based on agreed set of specifications, schemas, templates and common dictionaries available to countries for structuring and formatting their deliveries. Countries are responsible for the quality control and assurance of their national datasets. WISE SoE datasets are then further handled by the European Topic Centre on Inland, Coastal and Marine waters (ETC/ICM), where a series of QA and validation routines are performed in order to ensure that the data delivered to the EEA are comparable at the European level.

To manage the duplicate submissions within the WISE SoE TCM data flow, an agreement was reached whereby countries were to provide only data that had not already been submitted to the RSC. Data submitted to the RSC is obtained from ICES directly.

Data and information obtained through the above processes are used to produce indicators upon which EEA assessment reports are based. Collected data are also published in Waterbase, a series of water topic-specific databases and web pages, publicly accessible via the EEA Data Service's web site. The most recent WISE SoE TCM data can be viewed, analysed and downloaded from the Waterbase – TCM, an EEA data service available at the following website: http://www.eea.europa.eu/data-and-maps/data/waterbase-transitional-coastal-and-marine-waters-9

The WISE SoE TCM dataset contains data on physical characteristics of the transitional, coastal and marine water monitoring and flux stations, proxy pressures on the upstream catchment, basin and River Basin District associated with transitional and coastal waters, chemical quality data on nutrients in seawater and hazardous substances in biota, sediment and seawater, as well as data on direct discharges and riverine input loads.