



## Marine Strategy Framework Directive (MSFD)

### *Common Implementation Strategy*

**11<sup>th</sup> meeting of the  
Working Group on Data, Information and Knowledge Exchange (WG DIKE)  
with Working Group on Good Environmental Status (WG GES)**

**0900-1700: 19 June 2015**

*DG Environment, Room C, Avenue de Beaulieu 5, B-1160 Brussels*

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Document:	DIKE_11-2015-06
Title:	Analysis of requirements that link INSPIRE and MSFD
Prepared by:	JRC
Date prepared:	26/05/2015
Background:	<p>This report is meant to help stakeholders of the Marine Strategy Framework Directive 2008/56/EC (MSFD) to understand how the obligations of the INSPIRE Directive 2007/2/EC relate to the data and information management aspects of the MSFD. It provides an overview of the different INSPIRE components, explains the relationship between the MSFD requirements and those of INSPIRE, and outlines – in general terms – which measures are necessary to implement INSPIRE in a MSFD context.</p> <p>This report is a deliverable of the <i>Marine Pilot</i> project<sup>1</sup>, and it is an important first step for further project definition and execution. It is a living document and will be updated regularly during the execution of the pilot until June 2016.</p>

#### **WG DIKE is invited to:**

- a. take note of the report and share/discuss it with the relevant MSFD and INSPIRE stakeholders;
- b. send comments on the report to the JRC, preferably by using the comment spreadsheet.

<sup>1</sup> See the background document of the 10<sup>th</sup> WG DIKE meeting at <https://circabc.europa.eu/w/browse/bc33dff1-0f8c-467a-8382-7724c5f79d45>



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Digital Earth and Reference Data Unit



## Marine Pilot

### D1.2 Analysis of requirements that link INSPIRE and MSFD

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## Terms and definitions

For the purposes of this document, the following terms (abbreviated or not) and definition apply.

AM	Area management/restriction/regulation zones and reporting unit (INSPIRE theme)
AU	Administrative units (INSPIRE theme)
DG	Directorate General
DIKE	Data, Information and Knowledge Exchange
EEA	European Environment Agency
EF	Environmental monitoring facilities (INSPIRE theme)
EIONET	European Environment Information and Observation Network
E-PRTR	European Pollution and Transfer Register
EULF	European Union Location Framework
GES	Good Environmental Status
HB	Habitats and biotopes (INSPIRE theme)
HELCOM	Baltic Marine Environment Protection Convention (Helsinki Commission)
INSPIRE	Infrastructure for Spatial Information in the European Community (Directive 2007/2)
ISA	Interoperability Solutions for European Public Administrations
JRC	Joint Research Centre
MPA	Marine Protected Area
MDI	Marine Data Infrastructure
MS	Member State
MSFD	Marine Strategy Framework Directive 2008/56/EC
NSDI	National Spatial Data Infrastructures
O&M	Observation and Measurements, ISO 19156:2011
OF	Oceanographic geographical features
OSPAR	Oslo/Paris convention for the Protection of the Marine Environment of the North-East Atlantic
PoM	Programme of Measures
PS	Protected Sites (INSPIRE theme)
RSC	Regional Sea Convention
ROD	Reporting Obligation Database
SD	Species distribution (INSPIRE theme)
SDI	Spatial Data Infrastructure
TG	Technical Guidance
WFD	Water Framework Directive 2000/60/EC
WG	Working Group
WISE	Water Information System for Europe

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## **Purpose of this document and intended readership**

This report is meant to help stakeholders of the Marine Strategy Framework Directive 2008/56/EC (MSFD) to understand how the obligations of the INSPIRE Directive 2007/2/EC relate to the data and information management aspects of the MSFD. It provides an overview of the different INSPIRE components, explains the relationship between the MSFD requirements and those of INSPIRE, and outlines – in general terms – which measures are necessary to implement INSPIRE in a MSFD context, and their respective roadmaps.

The intended readership is people with a responsibility in aspects of MSFD-related data management.

This report is a deliverable of the *Marine Pilot* project, and it is an important first step for further project definition and execution. The Marine pilot is an activity under the European Union Location Framework (EULF) Action of the Commission driven by the Interoperability Solutions for European Public Administrations (ISA) Programme. The pilot runs from August 2014 until mid-2016, and aims to provide guidance and tools for INSPIRE-based marine data management in support of the MSFD reporting.

## 1. Introduction

### 1.1. Marine Strategy Framework Directive

The aim of the European Union's Marine Strategy Framework Directive (MSFD) is to protect more effectively the marine environment across Europe. The Directive was adopted on 17 June 2008 and came into force on 15 July 2008. It was due to be transposed into national legislation by 15 July 2010.

The Directive aims to achieve Good Environmental Status (GES) of the EU's marine waters by 2020 and to protect the resource base upon which marine-related economic and social activities depend. It is the first EU legislative instrument related to the protection of all marine biodiversity, as it contains the explicit regulatory objective that "biodiversity is maintained by 2020"..

The Directive provide formal reporting requirements on the initial assessment of the marine waters, determination of GES, development of environmental targets and indicators, development of monitoring programmes, and Programme of Measures (PoM) that should be applied to marine (sub)-regions. The MSFD reporting obligations started in 2010 with the reporting on the transposition of the Directive in the national legislation and on the competent authorities; it continued in 2012 and 2014 and will further continue reporting on the progress of the strategies and programmes of measures applied, until 2018 when the first 6-year cycle closes (Fig. 1).



Figure 1 - Overview of the stages of the first cycle related to marine strategies

Noteworthy in the context of this report is MSFD Article 19, which states that the data and information resulting from the initial assessment and from the monitoring programmes should be available to the European Environment Agency (EEA) and European Commission using the INSPIRE infrastructure.

## 1.2. INSPIRE

The Infrastructure for Spatial Information in the European Community (INSPIRE) is a set of European Union and national legal acts and their coordinated implementation. Through INSPIRE the EU has created a common standard to make environmental information quickly and easily accessible for integrated policy decision-making at all levels of government while supporting the exchange of information and data between the local, regional, national and European or international levels.

By implementing INSPIRE, Member States, the Commission, and the European Environment Agency are adopting innovative data management practices that greatly improve the consistency, availability and re-use of spatial information. The infrastructure will improve decision making in support of environmental policies, and of policies that have an impact on the environment.

INSPIRE requires EU countries to share spatial environmental data and information according to a number of agreements, laid down in the Directive, in the Implementing Rules Legal Acts (IRs), and in technical guidance (TG). The obligations laid down in the INSPIRE legal acts are independent of any particular reference that thematic environmental legislation may make to INSPIRE. Note that INSPIRE itself does not require Member States to produce new data.

The obligation for a public authority to share spatial information with other public authorities – that need this information for the execution of their public tasks – is in place since 2007 when the Directive entered into force. The obligations related to the other components of the INSPIRE Directive – the metadata, network services, data harmonization, harmonized license conditions, and the monitoring and reporting of the infrastructure – have been following a precise calendar, described in the INSPIRE implementation roadmap (Fig. 2). In 2020 all INSPIRE obligations will need to be implemented by the Member States.

As INSPIRE focusses on decision making in support of environmental policies, and of policies that have an impact on the environment, the thematic scope is broad. The Directive includes three annexes that list 34 data themes that define the scope of INSPIRE. Examples of data themes of relevance to the marine community include Coordinate reference systems, geographical grid system, Hydrography, Protected sites, Area Management/Restriction/Regulation Zones and Reporting Units, Biogeographical Regions, Elevation (which includes bathymetry and shorelines), Environmental monitoring facilities, Habitats and Biotopes, Sea regions, and Oceanographic geographical features<sup>1</sup>.

INSPIRE is a distributed infrastructure. Each Member State is responsible for the implementation and operation of their national INSPIRE infrastructure, also referred to as Spatial Data Infrastructure (SDI). By following the common rules in a coordinated implementation of the INSPIRE components, the national infrastructures become interoperable: information can be accessed, exchanged and understood without further interventions across borders, thus creating a European infrastructure.

National coordination is crucial to the successful implementation of INSPIRE, and the Directive dedicates two articles to this aspect. Article 18 requires that Member States shall ensure that appropriate structures and mechanisms are designated for coordinating, across the different levels of government, the contributions of all those with an interest in their infrastructures for spatial information. These structures shall coordinate the contributions of, inter alia, users, producers, added-value service providers and coordinating bodies, concerning the identification of relevant data sets,

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<sup>1</sup> INSPIRE thematic scope can be found at: <http://inspire.ec.europa.eu/index.cfm/pageid/2/list/7>

user needs, the provision of information on existing practices and the provision of feedback on the implementation of this Directive.

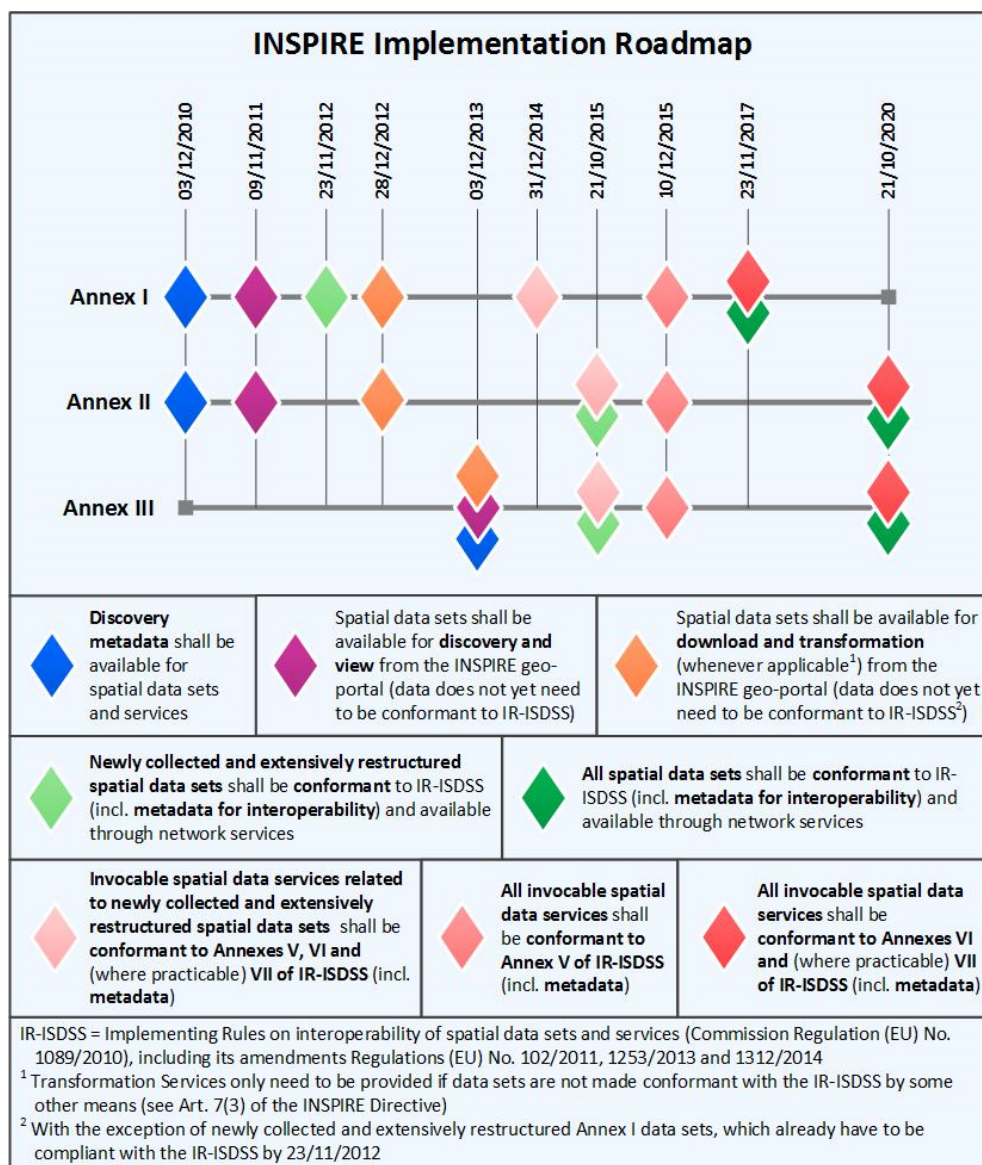


Figure 2 - The INSPIRE implementation roadmap (IR: Implementing Rules. ISDSS: Interoperability of Spatial data and Services)

INSPIRE Art. 19 requires each Member State to designate a contact point, usually a public authority, to be responsible for contacts with the Commission in relation to the Directive. This contact point will be supported by a coordination structure, taking account of the distribution of powers and responsibilities within the Member State.

At EU level the implementation, maintenance and evolution of INSPIRE is governed by the INSPIRE Maintenance and Implementation Framework. Actors in this framework include the formal representation of the Member States in the Maintenance and Implementation Group (MIG) and the European Commission-European Environment Agency INSPIRE Team, which coordinates INSPIRE.



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In summary, spatial data related to the marine environment are in the scope of INSPIRE, and INSPIRE *does* affect public authorities that are managing these data. In theory Member States should have their metadata, and services for discovery, view, download and transformation services for MSFD-related spatial data. In practice only very few data sets can at present be discovered and accessed through the INSPIRE geoportal.

At the same time, the marine community who measure and observe the environment have a long history of international data harmonisation and establishing data delivery services. Many of these pre-date INSPIRE, but are funded by the EC. Examples include the EMODNet and Copernicus programmes. Internationally there is the work of IOC/IODE.

This raises a number of questions, the answers to which determine to a great extent the benefits that the INSPIRE infrastructure will bring to users of the marine data. These include:

- How well are the national marine stakeholders connected to the national INSPIRE coordination structures? What should be done to improve this?
- Are marine data holdings documented in national geoportals, and accessible through webservices? Are the relevant spatial data sets and services discoverable through the EU INSPIRE geoportal? What guidance and tools are needed to facilitate this?
- How easy is it to combine data that neighbouring countries are collecting? How can the common INSPIRE data models be used to exchange spatial information?
- What are the links between INSPIRE, MSFD, and existing data services such as EMODNet?

These and other questions will be addressed in the INSPIRE marine pilot.

### 1.3. INSPIRE marine pilot

In order to facilitate the INSPIRE-related obligations, it is necessary to understand the requirements of the MSFD and INSPIRE Directives and to develop processes which accommodate their respective needs. The aim of the INSPIRE marine pilot is to help improve the understanding of INSPIRE in the management of MSFD-related spatial information, and to provide guidance and tools that facilitate the mentioned obligations.

Involved in the pilot are staff members of the Commission (DG Environment, DG Joint Research Centre), the European Environment Agency (EEA), contractors, and initially a few interested Member States. The practical experiences gained from this Pilot will inform participants about the INSPIRE requirements within MSFD data management and aim to increase the uptake of INSPIRE within the MSFD implementation process.

Further details about the pilot are available in project charter documents publicly available on the CIRCA BC website, in the 10th DIKE meeting folder<sup>2</sup>.

### 1.4. Need for the analysis of requirements

INSPIRE is a unique piece of the European environmental legislation, as it affects and underpins data sharing and management practices of all policies and activities which directly or indirectly may have an impact on the environment. This means that the data management in support of thematic

<sup>2</sup> <https://circabc.europa.eu/w/browse/bc33dff1-0f8c-467a-8382-7724c5f79d45>

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environmental policies need to take into account, not only the requirements stemming from the thematic policy at hand, but also those from INSPIRE – and, as noted before, this is independent from any explicit reference to INSPIRE.

The INSPIRE framework has generic requirements that need to be respected, but also data theme-specific requirements that were extracted from numerous environmental policies that have been analyzed during the development of INSPIRE. Getting the full picture of requirements for INSPIRE-based MSFD data management requires a good understanding of both contexts. This is what the INSPIRE marine pilot brings to the table, and will endeavor to codify in guidelines and tools.

The analysis of requirements for complex systems can be done from various viewpoints. Often, the Reference Model for Open Distributed Processing (RM-ODP) is used (Biancalana et al., 2010), which defines the enterprise, information, service, engineering, and technology viewpoints. In this pilot these viewpoints are re-grouped into four, following those defined in the European Interoperability Framework in use by the ISA programme: Legal, Organizational, Semantic and Technical interoperability.

This report focusses primarily on the legal and organizational/process requirements of MSFD and INSPIRE. Reporting actions required by the MSFD, as well as MSFD Art. 19 requirements for data sharing, are listed and linked to the INSPIRE implementation roadmap. The report also illustrates that by introducing INSPIRE components in the marine data management, the MSFD reporting as well as the reporting activities of other, related, policies and treaties is facilitated.

## 1.5. Structure of report

Chapter 2 lists the reporting obligations required by the MSFD. Chapter 3 covers the INSPIRE implementation framework for the period until 2020, and relates the MSFD reporting dates to the INSPIRE implementation roadmap. That chapter also introduces the necessary requirements to comply with the MSFD Article 19(3), which are linked to two reporting obligations 2012 (reporting on the initial assessment given in MSFD Article 8); and 2014 (reporting on MSFD monitoring programmes) – that are also introduced in the context of the INSPIRE implementation roadmap. Chapter 4 illustrates how the use of INSPIRE for marine data management is able to support the reporting activities of multiple policies and treaties. Conclusions and recommendations are provided in chapter 5.

## 2. MSFD spatial data requirements

In the context of this report a distinction is made between two types of requirements for spatial data in the context of MSFD reporting:

- 1) Requirements for the spatial data that need to be exchanged as part of the reporting itself. This regards spatial data that is linked to the reporting sheets.
- 2) Requirements for spatial data that are supporting the assessment and reporting processes. These are spatial data used, for instance, for the assessments and the assessments themselves.

The following subsections will discuss these requirements in more detail.

### 2.1. Reporting spatial data

The 2012 MSFD reporting concerned the initial assessments, GES, environmental targets and indicators and geographic area, which was followed in October 2014 with the reporting on the established MSFD monitoring programmes. By March 2016 Member States should provide the information on the Programmes of Measures (PoM) that will be implemented to achieve or maintain GES, including Marine Protected Areas (MPA) and on exceptions.

Reporting requirements include necessary information required for the development of the marine strategy which should be applied in each region/sub-region to achieve or maintain GES.

The reporting framework and the reporting content/format was agreed within the MSFD Working Group on Data Information and Knowledge Exchange (WG DIKE) and WG GES, under coordination of the Marine Strategy Coordination Group (MSCG), and approved by the Marine Directors. Reporting requirements are specified in reporting sheets and may include spatial data information.

MSFD reporting requirements are determined by the MSFD Directive articles (Articles 7, 8, 9, 10, 11, 13 and 14), and are extensively documented on the European Environment Information and Observation Network (EIONET) website and in the Reporting Obligation Database (ROD). The ROD was established as part of Reportnet, to support international environmental reporting, and it can be consulted for each legislative instrument on the reporting requirements, reporting schedule, frequency and type of information that should be reported (Data, Compliance, Spatial, State of the environment, Text report...).

The Commission Staff Working paper *Relationship between the initial assessment of marine waters and the criteria for good environmental status* (SEC(2011)1255) lists the MSFD reporting requirements for the 1<sup>st</sup> cycle that ends in 2018. They are summarized in Table 1. Table 1 also indicates if the reporting requires spatial data, and if the reported data bear a relationship with terms or objects defined in the INSPIRE data themes. Note that Table 1, as well as the tables that are included in the next chapter, are the result of a first analysis, and will be refined as more insight is gained in the course of the project.

**Table 1 - 1st cycle of MSFD reporting, deadlines, reporting sheet status, and an initial appraisal of the relation with INSPIRE based on the Eionet website. In light blue are the one-time reporting requirements while in dark blue are the cyclic reporting requirements.**

MSFD					Initial appraisal of related INSPIRE data themes
Reporting on	Reporting deadline	Reporting sheet status	Reporting process	Spatial data req. by MSFD (EIONET) <sup>3</sup>	
Notification of subdivision of marine regions/sub-regions (Art. 4.2)	<b>15-Jun-2010</b>	None	Done	No	TBD
MSFD report on competent authority or authorities (Art. 7; Annex II)	<b>1-Jun-2012</b>	Done	Done	No	TBD
MSFD reporting on Initial Assessments (Art. 8, Art. 19),	<b>15-Oct-2012</b>	Done	Done	No	See tables 3 and 4
MSFD reporting on Good Environmental Status (Art.9),				No	TBD
MSFD reporting on Env. targets & associated indicators (Art.10, Annex IV)				No	TBD
MSFD reporting on related reporting on Geographic areas, (Art 3.1, 4; Art. 8; Art.9; Art.10)			Done	<b>Yes</b>	<b>Administrative units</b>
MSFD Monitoring Programmes (Art. 11, Art. 19, annex V)	<b>15-Oct-2014</b>	<b>Done</b>	Done	<b>No</b>	TBD
MSFD Programmes of Measures, including establishment of Marine Protected Areas, and exceptions (Art. 13; Art. 14; Annex VI)	<b>31-Mar-2016</b>	<b>Draft</b>	-	<b>No</b>	<b>TBD</b>

The 2012 reporting obligations on Articles 8, 9 and 10 included spatial data on Geographic Boundaries that covers the reporting of the geographic areas by which Member States will organize the implementation of the MSFD. These spatial data delimit relevant Member State's marine waters, any boundaries of regions, sub-regions and subdivisions within MS's waters, and any additional geographic 'assessment areas' used for reporting under Art. 8, 9 and 10. These geographic data are reused or updated for reporting on Articles 11, 13 and 14.

The development of reporting sheets for PoM (2015/2016) started in November 2013 and is currently available as defined in the PoM Recommendation adopted in November 2014. As the development of the reporting sheets is still on-going it is recommended that - if any spatial data is involved in the

<sup>3</sup> Note that the identifier "MarineUnitID" links all reports a specific reporting area.

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reporting - to use this window of opportunity and to bring the guidelines for the provision of spatial data in line with INSPIRE.

The document *MSFD reporting work flow - Technical guidance on provision of spatial data for MSFD reporting* of October 2012 provides information on how to deliver spatial data files in Reportnet. INSPIRE is currently not fully supported by Reportnet. It is recommended that INSPIRE requirements are taken into account in the mid- and long-term evolution of Reportnet and the relevant guidance documents.

## 2.2. Spatial data underpinning the assessment and reporting processes

The MSFD includes the requirement in Art. 19(3) that data resulting from the assessment of the marine environment (region/sub-region) and from the established marine monitoring programmes should be available to the European Commission and the European Environment Agency. Art. 19(3) also makes reference to INSPIRE.

At the time of writing there is no agreement yet in WG DIKE what this means exactly, and it has been agreed with the project partners that the interpretation of this article is not within the scope of the pilot. Having said this, it is important to point out that the added value of using the INSPIRE infrastructure – or marine spatial data infrastructures in general – lies exactly in making spatial data easily accessible and re-usable to those people that are preparing the assessments and the reports.

The report *Development of a shared data and information system between the EU and the Regional Sea Conventions - Regional Sea Conventions data and information flows* (ENV contract 1208955-002, September 12th 2014) is instrumental in this regard, as it describes in detail the data sets – and the related data flows from Member States to the Regional Sea Conventions – needed for the indicators, descriptors and eventually for the assessments and reporting.

The thematic requirements for the spatial data discussed here are driven by the thematic legal framework (the MSFD but potentially also other legislative acts, c.f. chapter 4) and guidance documents. From a data management perspective, the INSPIRE legal and guidance framework applies – which is independent of the interpretation of MSFD Art. 19(3).

Chapter 3 will provide a bird's eye view on INSPIRE requirements for spatial data management.

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### 3. INSPIRE requirements

For the analysis of the link between the MSFD and INSPIRE requirements, the INSPIRE implementation roadmap is taken as a point of departure. It covers the timespan from the entry into force of the INSPIRE Directive (May 2007) until it reaches full implementation in 2020.

First and foremost, INSPIRE is about data sharing. Article 17 of the INSPIRE Directive defines the data sharing requirements. It requires Member States to adopt measures for the sharing of spatial data for the purposes of public tasks that may have an impact on the environment. The measures should preclude any restrictions likely to create practical obstacles to the sharing which might occur at the point of use. For this reason, INSPIRE will make it easier for organizations that require spatial information to perform their duties for reporting activities. The data sharing obligation is in place since the entry into force of the Directive.

The data sharing is further supported by a number of components, the phased implementation of which is gradually completing the infrastructure. The INSPIRE roadmap refers to the components of INSPIRE that are defined in the various articles of the INSPIRE Directive, and that are further specified in the Implementing Rules Legal Acts and in the Technical Guidelines. These are:

- Metadata;
- Network Services for discovery, view, transformation, download, and invoking spatial data services;
- Interoperability of spatial data sets and services;
- Monitoring and Reporting of INSPIRE; and
- Data and Service Sharing.

The type of spatial information that falls under INSPIRE is specified in the three annexes to the Directive. The main difference between these annexes is the time given to Member States to comply with the Metadata Regulation and with the related Implementing Rules for interoperability of spatial data sets and services (Table 2; Figure ).

Since both the INSPIRE and the MSFD obligations for Member States follow a precise calendar, the following subsections relate the MSFD obligations to those of INSPIRE.

Table 2 - INSPIRE roadmap and milestone descriptions

Milestone date	Article	Description
15-May-10	21§1 21§2	Implementation of provisions for monitoring and reporting
03-Dec-10	6(a)	Metadata available for spatial data sets and services corresponding to Annex I and II
09-May-11	16	Member States shall provide the Discovery and View Services with initial operating capability
30-Jun-11	15	The EC establishes and runs a geo-portal at Community level
19-Oct-11	17(8)	Implementation of Regulation as regards the access to spatial data sets and services of the Member States by Community institutions and bodies under harmonised conditions for new arrangements
09-Nov-11	16	Discovery and view services operational
28-Jun-12	16	Member States shall provide the Download Services with initial operating capability
28-Jun-12	16	Member States shall provide the Transformation Services with initial operating capability
23-Nov-12	7§3, 9(a)	Implementation of Commission Regulation (EU) No 1089/2010 of 23 November 2010 implementing Directive 2007/2/EC of the European Parliament and of the Council as regards interoperability of spatial data sets and services for Newly collected and extensively restructured Annex I spatial data sets available
28-Dec-12	16	Download services operational
28-Dec-12	16	Transformation services operational
04-Feb-13	7§3, 9(a)	Implementation of Commission Regulation (EU) No 102/2011 of 4 February 2011 amending Regulation (EU) No 1089/2010 implementing Directive 2007/2/EC of the European Parliament and of the Council as regards interoperability of spatial data sets and services for newly collected and extensively restructured Annex I spatial data sets
19-Oct-13	17(8)	Implementation of Regulation as regards the access to spatial data sets and services of the Member States by Community institutions and bodies under harmonised conditions for existing arrangements
03-Dec-13	6(b)	Metadata available for spatial data sets and services corresponding to Annex III
21-Oct-15	7§3, 9(b)	Newly collected and extensively restructured Annex II and III spatial data sets available
23-Nov-17	7§3, 9(a)	Implementation of Commission Regulation (EU) No 1089/2010 of 23 November 2010 implementing Directive 2007/2/EC of the European Parliament and of the Council as regards interoperability of spatial data sets and services for other Annex I spatial data sets still in use at the date of adoption
04-Feb-18	7§3, 9(a)	Implementation of Commission Regulation (EU) No 102/2011 of 4 February 2011 amending Regulation (EU) No 1089/2010 implementing Directive 2007/2/EC of the European Parliament and of the Council as regards interoperability of spatial data sets and services for other Annex I spatial data sets still in use at the date of adoption
21-Oct-20	7§3, 9(b)	Other Annex II and III spatial data sets available in accordance with IRs for Annex II and III

### 3.1. MSFD reporting deadlines vs INSPIRE implementation roadmap

Figure links the MSFD reporting requirements to the INSPIRE implementation roadmap of Table 2. The figure should be read as the theoretical readiness of the INSPIRE infrastructure to support MSFD reporting processes. For instance, after the 3<sup>rd</sup> of December 2013 all spatial data developed and delivered in the scope of the MSFD reporting, should have been made discoverable and viewable through the INSPIRE geoportal and available for download from the National SDI.



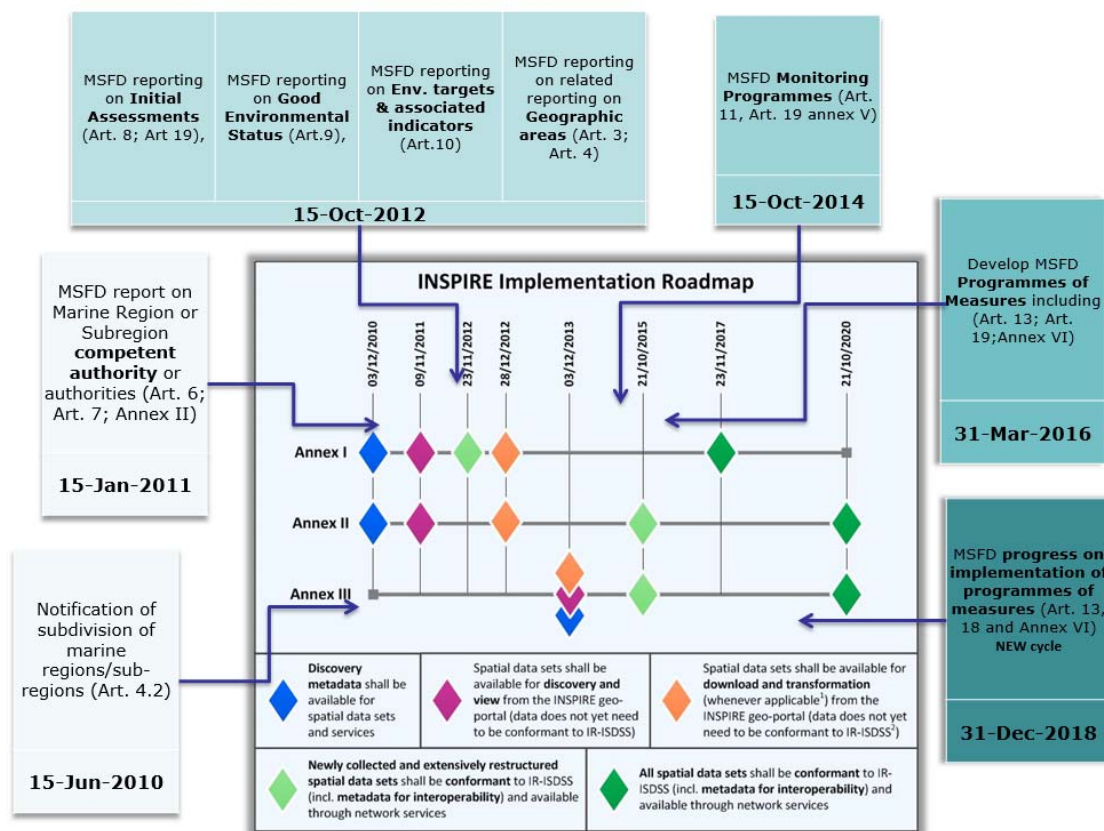


Figure 3 -MSFD reporting requirements VS INSPIRE implementation roadmap (schematic view)

At the time of writing, the next upcoming milestone in the INSPIRE roadmap is 21<sup>st</sup> October 2015. On this date all newly collected or extensively restructured spatial data should be available, not only through INSPIRE network services, but also according to the INSPIRE data models as per Commission Regulation (EU) No 1089/2010.

### 3.2.MSFD Article 19(3) - INSPIRE and the MSFD

Applying an ecosystem-based approach to the management of human activities, GES must be determined at the level of marine regions or sub regions, on the basis of 11 qualitative descriptors of the marine environment specified in the Annex I of the MSFD. MSFD Article 19 includes a requirement that data resulting from the initial assessment and from monitoring programmes should be available to EC/EEA through INSPIRE.

#### MSFD Article 19(3)

In accordance with Directive 2007/2/EC, Member States shall provide the Commission, for the performance of its tasks in relation to this Directive, in particular the review of the status of the marine environment in the Community under Article 20(3)(b) (EC review of status), with access and use rights in respect of data and information resulting from the initial assessments made pursuant to Article 8 and from the monitoring programmes established pursuant to Article 11.

No later than six months after the data and information resulting from the initial assessment made pursuant to Article 8 and from the monitoring programmes established pursuant to Article 11 have



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become available, such information and data shall also be made available to the European Environment Agency, for the performance of its tasks.

According to the deliberations of WG DIKE at its 7<sup>th</sup> meeting, fulfilment of the requirements of Article 19(3) can be considered to have four elements:

- The need to comply with the INSPIRE Directive 2007/2/EC;
- Identification of the data and information resulting from the initial assessment and from monitoring programmes (e.g. a list of the data sets and information sources);
- The need to indicate where the data and information can be accessed (e.g. internet sites where the data and information can be viewed);
- The provision of permission (use rights) to use the data and information.

Compliance with the INSPIRE Directive was identified as first element/requirement of the Article 19(3). It is noted that compliance with INSPIRE is strongly linked to at least two of the other three elements: by complying with INSPIRE data will be discoverable from INSPIRE geoportal, accessible through network services, and license-related information about the data will be included in the metadata.

The current approach taken in WG DIKE may give the impression that extra INSPIRE-related work is needed to fulfil the Art. 19(3) requirement. What the INSPIRE-marine pilot will be trying to demonstrate is that by using INSPIRE-like infrastructures for marine data management, such as the German Marine data infrastructure (MDI-DE) or the Dutch Waterhouse, the indicator and assessment work will be facilitated. Less work will be needed because the data can be easily accessed and re-used for multiple purposes.

### 3.2.1. Initial assessment & Article 19 (3)

The aim of this subsection is to draw some lessons from the initial assessment of 2012, and to understand what is needed to facilitate similar future reporting.

The reporting regarding the MSFD Article 8 (Initial assessment of the marine waters) was due on 15 October 2012, and the related Article 12 assessment study within 6 months of receiving all the MS reports. The data that resulted from the initial assessments was to be made available to EC/EEA as stated in MSFD Art. 19 within 6 months (i.e. by January 2013).

In October 2013, the EEA presented to WG DIKE a technical report on the implementation of Article 19(3), which related to the initial assessment titled “MSFD article 19.3 analysis of 2013 notifications”. The report showed that there was a wide variation of metadata. Most information was in the national languages. There was not enough information provided to locate the matching datasets/reports.

If we go beyond the metadata and take a closer look at the other INSPIRE obligations that were already applicable at that time (c.f. Figure 3), we can see that the reporting process should have been supported by the national INSPIRE infrastructures in terms of metadata, discovery, view and download services.

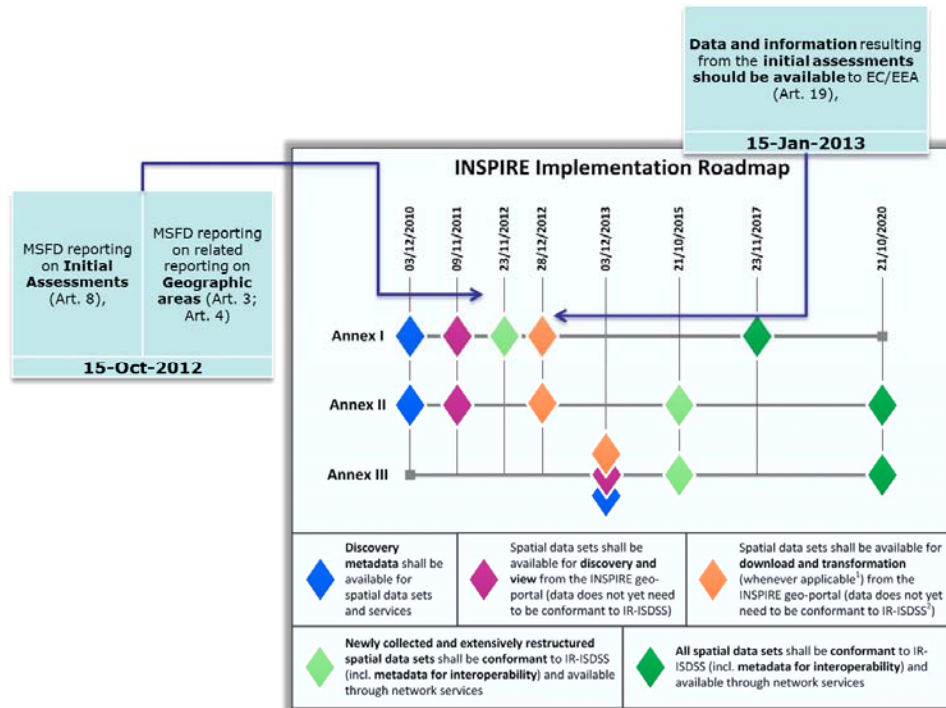


Figure 4 - INSPIRE roadmap & Article 19 requirements regarding the initial assessment

The deadline for making newly collected and extensively restructured data interoperable – i.e., conformant to Regulations No 1089/2010, 102/2011, and 1253/2013 which are related to the INSPIRE data models) is 23 November 2012 (INSPIRE Annex I data themes) and 21 October 2015 (INSPIRE Annex II and III), respectively. All data sets need to be made interoperable by 23 November 2017 (Annex I) and 21 October 2020 (Annex II and III).

Data and information used for the initial assessment comprise essential features and characteristics, based on the indicative lists of elements set out in Table 1 of the MSFD Annex III and predominant pressures and impacts listed in the Table 2 of MSFD Annex III. In the frame of the initial analysis carried out for this report, all features, characteristics, pressures and impacts have been associated with spatial data requirements and an INSPIRE data theme that includes an applicable data model (see Table 3 and Table 4). Note that not all the spatial data information listed in the tables are explicitly specified in the Directive or in the reporting sheets, but they are deemed important as input in preparing the reports. It is based on the experience of other projects and of the pilot partners. **This is a first, coarse, relation and that further analysis at the spatial object level needs to be carried out as part of the pilot.**

**Table 3 – Initial analysis of essential features and characteristics regarding the analysis of marine waters (Article 8, 9, 10) and related spatial data**

MSFD reporting on Initial Assessments (Art. 8),		Related spatial data	INSPIRE theme/Annex	
<b>Analysis of essential features and characteristic</b>	<b>Physical and chemical features</b>	Topography and bathymetry of the seabed	Map of seabed bathymetry	Elevation/II
		Annual and seasonal temperature regime and ice cover, current velocity, upwelling, wave exposure, mixing characteristics, turbidity, residence time,	Maps of seasonal temperature regime and ice cover, current velocity, upwelling...	Sea Regions /III
		Spatial and temporal distribution of salinity	Salinity concentrations time series - related to the monitoring stations	Oceanographic Geographical Features/III
		Spatial and temporal distribution of nutrients and oxygen	Nutrients/Oxygen concentrations time series - related to the monitoring stations	Oceanographic Geographical Features/III
		pH, pCO2 profiles or equivalent information used to measure marine acidification	pH, pCO2 time series - related to the monitoring stations	Oceanographic Geographical Features/III
		The predominant seabed and water column habitat type with description of Physical and chemical features	Maps of habitat distribution	Habitats and Biotopes/III
	<b>Habitat types</b>	Identification and mapping of special habitat types	Maps of habitat distribution	Habitats and Biotopes/III
		Habitats in areas which by virtue of their characteristics, location or strategic importance merit a particular reference (intense or specific	Maps of habitat distribution	Habitats and Biotopes/III

MSFD reporting on Initial Assessments (Art. 8),		Related spatial data	INSPIRE theme/Annex
	pressures or areas which merit a specific protection regime)		
<b>Biological features</b>	A description of the biological communities associated with the predominant seabed and water column habitats (seasonal and geographical variability)	Maps of habitat distribution	Habitats and Biotopes/III
	Angiosperms, macro-algae and invertebrate bottom fauna	Maps of habitat distribution	Species Distribution/III
	Fish populations, marine mammals, seabirds	Maps of fish populations, marine mammals, seabirds distribution	Species Distribution/III
	Distribution of nonindigenous, exotic species	Maps of non-indigenous species distribution	Species Distribution/III
	<b>Other features</b>	Situation with regard to chemicals, sediment contamination, hotspots, health issues and contamination of biota	Concentrations of contaminants (e.g. priority substances) time series (for water, sediment, biota)

**Table 4 – Initial analysis of the relation between pressures and impacts of marine waters and INSPIRE themes**

MSFD reporting on Initial Assessments (Art. 8)			Related spatial data	INSPIRE theme/Annex <sup>4</sup>
<b>Pressures and Impacts</b>	<b>Physical loss</b>	Smothering (e.g. by man-made structures, disposal of dredge spoil),	Maps on areas with significant anthropogenic influence (exploitation, construction, dredging, fishing....)	Hydrography/I, Geology/II, Sea Regions/III, Area Management Restriction and Regulation Zones/III
		Sealing (e.g. by permanent constructions).		
	<b>Physical damage</b>	Changes in siltation (e.g. outfalls, dredging...)		
		Abrasion (commercial fishing, boating, anchoring...)		
		Selective extraction (explotation of living and non-living resoureces...)		
	<b>Other physical disturbance</b>	Underwater noise	Maps on noise distribution	Area Management Restriction and Regulation Zones/III, Sea Regions/III
		Marine litter	Maps on areas affected by litter	Sea Regions/III
	<b>Interference with hydrological processes</b>	Significant changes in thermal regime (outfalls from power stations)	Maps of areas with significant changes in thermal regimes	Sea Regions/III
		Significant changes in salinity regime (submarine outfalls...)	Maps of areas with significant changes in salinity regimes	Sea Regions/III
	<b>Contamination by hazardous substances</b>	Systematic and/or intentional release of substances	Maps with the point and distributed pollution sources regarding hazardous substances	Utility and Government Services/III, Production and Industrial Facilities/III, Agricultural and aquaculture facilities/III,

<sup>4</sup> This initial analysis will be refined during the pilot.

MSFD reporting on Initial Assessments (Art. 8)		Related spatial data	INSPIRE theme/Annex <sup>4</sup>	
	<b>Nutrient and organic matter enrichment</b>	Nutrients (e.g. from point and diffuse sources, including agriculture, aquaculture, atmospheric deposition, sewers, mariculture, riverine inputs)	Maps with the point and distributed pollution sources regarding nutrients and organic matter	Utility and Government Services/III, Production and Industrial Facilities/III Agricultural and aquaculture facilities/III,
	<b>Biological disturbance</b>	Introduction of microbial pathogens	Maps with the point pollution sources regarding microbial pathogens	Utility and Government Services/III
Introduction of non-indigenous species		Maps of areas with risk on introduction of non-indigenous species	Sea Regions/III	
Selective extraction of species		Maps of areas of extraction of species	Sea Regions/III	

### 3.2.2. Monitoring programmes & Article 19(3)

The MSFD and the associated Commission Decision 2010/477/EU, makes very precise reference to observations, related criteria and methodological standards linked to the state of the marine environment and GES. For each of the 11 descriptors a monitoring programme and associated sub-programmes (Figure ) should be developed for the ongoing assessment of the marine environment. Data from the monitoring programmes/sub-programmes should be available and discoverable, through INSPIRE services, no later than six months after establishing an environmental survey of the marine area. The definition of data and the interpretation of Art. 19(3) are still under discussion.

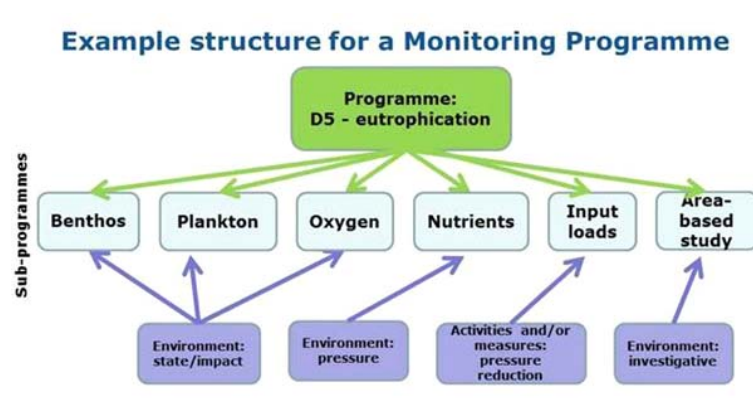


Figure 5 - Structure for a monitoring programme for a particular descriptor – From Recommendation on PoMs

The deadline to establish integrated monitoring programmes was in July 2014 which defines the date to make the spatial data available (at least six months later). The INSPIRE Directive defines spatial data as any data with a direct or indirect reference to a specific location or geographical area, so this applies

on observations provided by all 11 integrated monitoring programmes and associated sub-programmes (Figure ).

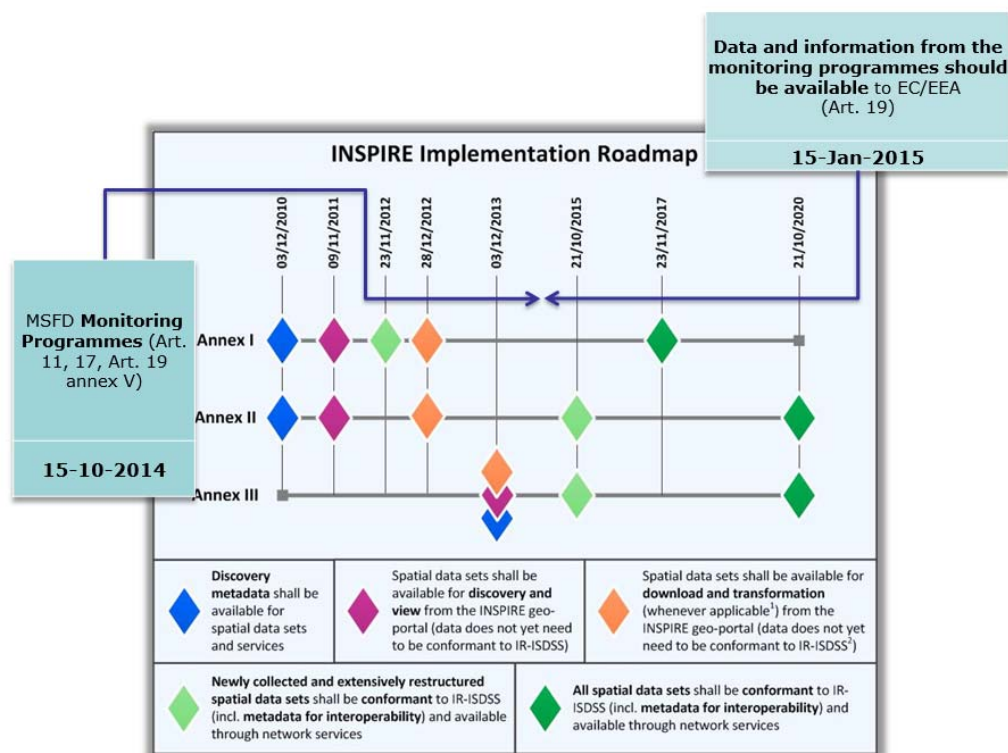


Figure 6 -INSPIRE roadmap & Article 19 requirement regarding the monitoring programmes <sup>5</sup>

Data from the monitoring programmes have to be available to EEA starting from the 15<sup>th</sup> January 2015<sup>5</sup> "In accordance with Directive 2007/2/EC" - MSFD Article 19. By that time the INSPIRE roadmap requires conformant metadata, conformant network services and after 21<sup>st</sup> October 2015 conformance with the INSPIRE data model given in IR-ISDSS. MSFD descriptors and related criteria (listed in the Commission Decision 2010/477/EU) for the purpose of this report are linked to required spatial data and related INSPIRE theme (see Table 5 – Initial analysis of 11 descriptors (MSFD Annex I) and related criteria (Com. Dec. 2010/477/EU) in relation to spatial data. Some indicators for the assessment of the descriptors/criteria need to be further clarified and links with potential spatial data are difficult to be defined.).

The interpretation of the MSFD Article 19 is still an ongoing process and is being discussed under the MSFD common implementation strategy at WG DIKE meetings. Reacting to interpretation of the MSFD Article 19 and related discussions are not in the scope of the Marine pilot and this process will

<sup>5</sup> This interpretation of the Article 19 stated in the document does not need to be a final one. As discussions on the interpretation of the requirements regarding the Article 19 are still ongoing, this document could possibly be modified during the project time period.

not have any implications on the project development, but if the process of interpretation will be finalized during the project time frame, then this document can be modified to incorporate any final outcomes.

**Table 5 – Initial analysis of 11 descriptors (MSFD Annex I) and related criteria (Com. Dec. 2010/477/EU) in relation to spatial data. Some indicators for the assessment of the descriptors/criteria need to be further clarified and links with potential spatial data are difficult to be defined.**

MSFD descriptor	Criteria(s)	Spatial data regarding the GES criteria	Relevant INSPIRE themes
<b>Biological diversity</b>	Species distribution	Species distribution map	Species distribution
	Population size		
	Population condition		
	Habitat distribution	Habitats and biotopes distribution map	Habitats and biotopes
	Habitat extent		
	Habitat condition		
Ecosystem structure	Assessment map regarding species and habitat distribution	Species distribution & Habitats and biotopes	
<b>Non-indigenous species (abundance and env. Impact)</b>	Abundance and state characterisation	Non-indigenous species distribution map	Species distribution
	Environmental impact of invasive non-indigenous species	Non-indigenous species Impact Assessment map	Sea regions
<b>Populations of all commercially exploited fish and shellfish</b>	Level of pressure of the fishing activity	Species distribution map (of the fishing stocks), including data on the maximum sustainable yield	TBD
	Reproductive capacity	Species distribution map, including data on reproductive activity	Species distribution
	Population age and size distribution	Species distribution map, including data on population and age	Species distribution
<b>Elements of the marine food webs</b>	Productivity of key species	Species distribution map, including data on productivity	Species distribution
	Proportion of selected species	Species distribution map, including data on proportions	Species distribution
	Abundance/distribution of key species	Species distribution map	Species distribution
<b>Human-induced eutrophication</b>	Nutrients levels	Nutrients concentrations time series - related to the monitoring stations	Environmental monitoring facilities, Oceanographic geographical features
	Direct effects of nutrient enrichment	Chlorophyll a & water transparency time series data-related to the monitoring stations; opportunistic species distribution maps	Environmental monitoring facilities, Oceanographic geographical features, Species distribution
	Indirect effects of nutrient enrichment	Dissolved oxygen time series data - related to the monitoring stations; distribution map of seagrasses	Environmental monitoring facilities, Oceanographic geographical features, Species distribution
<b>Sea-floor integrity</b>	Physical damage	Maps with extent of biogenic substrate; Maps with seabed areas significantly affected	Sea regions
	Condition of benthic community	Maps of tolerant/sensitive species distribution	Species distribution



<b>MSFD descriptor</b>	<b>Criteria(s)</b>	<b>Spatial data regarding the GES criteria</b>	<b>Relevant INSPIRE themes</b>
<b>Permanent alteration of hydrographical conditions</b>	Spatial characterisation of permanent alterations	Maps of areas affected by permanent alterations	Sea regions
	Impact of permanent hydrographical changes	Maps of affected habitats	Habitats and biotopes
<b>Concentrations of contaminants</b>	Concentration of contaminants	Concentrations of contaminants (e.g. priority substances) time series (for water, sediment, biota)	Environmental Monitoring Facilities, Oceanographic Geographical Features
	Effects of contaminants	Contaminants Impact Assessment Maps; Map of occurrence/origin of pollution events	Sea regions
<b>Contaminants in fish and other seafood</b>	Levels, number and frequency of contaminants	Time series of the amount (mass or moles) of the contaminates per unit weight of the specified organism.	Environmental Monitoring Facilities, Oceanographic Geographical Features
<b>Properties and quantities of marine litter</b>	Characteristics of litter	Maps with identified levels of pressure for sea area, coast line or water column.	Sea regions
	Impacts of litter	Maps of the litter Impact Assessment	Sea regions
<b>Introduction of energy</b>	Distribution in time and place of loud, low and mid frequency impulsive sounds	Noise map distribution (various levels)	Sea regions
	Continuous low frequency sound	Noise map distribution	Sea regions

## 4. Marine data management for multiple reporting obligations

Marine areas are bound to various directives of environmental EU legislation and international treaties. Exposing the data included in this pilot project is an opportunity for MSs to report and implement the MSFD and INSPIRE requirements, but also to explore overlaps with other environmental legislation and requirements that refers to the marine environment. Sharing MSFD-related spatial data via national INSPIRE network services would make it possible to easily create views that combine spatial data of various EU environmental Directives (Water Framework Directive 2000/60/EC, Habitat Directive 92/43/EEC, Birds Directive 2009/147/EC, Urban Waste-Water Treatment Directive 91/271/EEC and others, see Figure ).

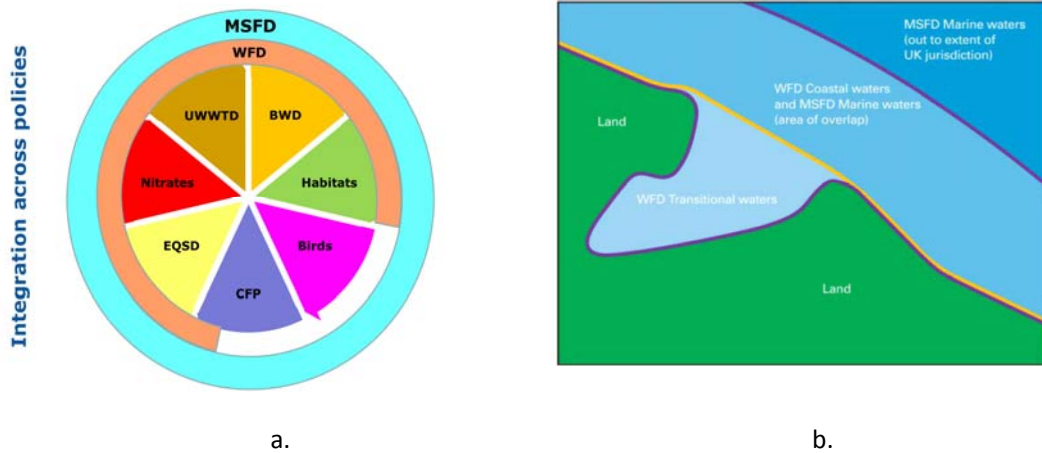


Figure 7 - Towards integrated marine environmental information; overlaps of MSFD and WFD (sources: a. DIKE WG; b. UK Department for Environment Food & Rural Affairs)

MSFD monitoring programmes that have a high potential of re-use across different environmental policy areas are:

1. human induced eutrophication;
2. concentrations of contaminants; and
3. biological diversity.

The monitoring programme on human-induced eutrophication is related to various sub-programmes that survey nutrient levels (concentrations and mutual ratios of nitrogen, phosphorus and silica); direct effect of nutrient enrichment (chlorophyll-*a* concentrations, water transparency ...); indirect effects of eutrophication (dissolved oxygen, abundance of seagrass). Chlorophyll-*a* and nutrients concentrations are indicators that are well monitored due to the implementation of WFD, Nitrates Directive, E-PRTR, UWWT... (see Table 6).

A monitoring programme on concentrations of contaminants includes priority substances listed in Annex X of the WFD and further regulated in Environmental Quality Standards Directive 2008/105/EC, for water, sediments and biota. There are a number of the European directives that require monitoring of the priority substances in marine waters (see Table 6).

Monitoring programmes on biological diversity deals with distribution, condition and size of the habitats and species (given at MSFD, Annex III). Maps of species and habitats distribution are also required by the Habitat Directive and the Birds Directive ( see Table 6).

**Table 6- Overview of monitoring overlaps MSFD VS environmental legislation on marine waters.**

MSFD Monitoring programme on	Water Framework Directive	Nitrate Directive	Environmental Quality Standards Directive	European Pollutant Release and Transfer Register	Dangerous Substances Directive	Urban waste water treatment Directive	Habitat Directive	Birds Directive	EEA Annual Management Plan
Human induced eutrophication	yes	yes	no	yes	no	yes	no	no	yes
Biological diversity	yes	no	no	no	no	no	yes	yes	yes
Concentrations of contaminates	yes	yes	yes	yes	yes	yes	no	no	yes

## 5. Conclusions and recommendations

This report focused on the legal and organizational/process requirements of the MSFD and INSPIRE Directives. It sets the scene for a more detailed analysis of the semantic and technical links between INSPIRE and MSFD-related data management.

From the analysis of the preceding chapters, we conclude that in order to address the added value of INSPIRE for MSFD-related data management, the pilot project should focus primarily on the data management, and less on the MSFD reporting aspects. However, the pilot work should not forget the link between the data and the reporting. For instance, it should be made clear how a specific data sets or service, used for an assessment, can be referenced in the context of a report.

A few recommendations have surfaced that are listed in table 8, along with the suggested target group(s). The understanding of the requirements – and consequently of the recommendations – evolves as the pilot project partners mature their understanding of INSPIRE and the MSFD. For this reason, this report will remain a living document to be updated on a regular basis during the lifespan of the pilot project.

**Table 8- Overview of recommendations resulting from the initial appraisal of the requirements of the INSPIRE and MSFD Directives**

<b>Recommendation</b>	<b>Target group</b>
Marine data management is in the scope of INSPIRE, independent of any reference to the INSPIRE Directive. Improve the understanding of what this means for data management.	ENV, JRC, EEA, MSFD WG DIKE and TG DATA
The mechanism to link a data set or service, made available through the INSPIRE infrastructure and used for an assessment, and a formal reporting is closely related to the concept of the Structured Implementation and Information Frameworks (SIIFs) and should be better understood.	JRC, ENV, EEA
The national INSPIRE and MSFD stakeholders should organize a series of discussions on the use of the national INSPIRE infrastructure in support of marine data management.	INSPIRE National Contact Points & coordinating structure, national MSFD representatives.

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## Further reading

The INSPIRE stakeholder community, coordinated by JRC, developed Technical Guidance (TG) documents to support implementation of the INSPIRE Directive. TG documents are developed for all INSPIRE components and are available on the INSPIRE website: <http://inspire.ec.europa.eu/>

Other important resources are:

Project Charter for the Marine pilot [online] <https://circabc.europa.eu/w/browse/bc33dff1-0f8c-467a-8382-7724c5f79d45>

Catherine Tsangaris, Willem Stolte et al., 2014. *Development of a shared data and information system between the EU and the Regional Sea Conventions - Regional Sea Conventions data and information flows*. [online] [https://circabc.europa.eu/sd/a/aff9880d-df5e-44ec-854e-8f098fcff2e5/DIKE\\_10-2014-05b\\_RSCDataReporting\\_Report.pdf](https://circabc.europa.eu/sd/a/aff9880d-df5e-44ec-854e-8f098fcff2e5/DIKE_10-2014-05b_RSCDataReporting_Report.pdf)

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