

An example of adopting and adapting SeaDataCloud and INSPIRE data models to map EMODnet nutrients data.

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In this paper we describe an example of use of INSPIRE Data Specifications to model nutrients data acquired in the Mediterranean Sea.

This work was done to support the obligations defined in the Directive 2008/56/EC (Marine Strategy Framework Directive–MSFD) for the implementation of strategies for achieving or maintaining good environmental status in the marine environment. One of these obligations, described in the article 19(3), prescribes that Member State (MS) shall make data resulting from Article 8 and Article 11 available in agreement with the Directive 2007/2/EC (INSPIRE).

In this context, we contributed, in collaboration with the Technical Group on Marine Data (TG DATA), to realize the recommendations for the publication of datasets under the MSFD Article 19(3). These recommendations include guidelines and propose some examples and best practices (<http://cdr.eionet.europa.eu/help/msfd>).

The use case builds on the Technical Guidelines related to Environmental Monitoring Facilities (EF) and Oceanographic Geographical Features (OF) themes and to the Observations and Measurements (O&M) data model, and is developed in collaboration with SeaDataCloud (<https://www.seadatanet.org>) and MEDCIS projects.

The data used for this case study are provided by Croatian Institute of Oceanography and Fisheries (IOF) and are collected and available on the EMODnet Chemistry infrastructure. The metadata format is the SeaDataNet Common Data Index (CDI), while data are provided in Ocean Data View (ODV) format. The CDI provides an ISO19115-ISO19139 based index to individual data sets. The solution proposed in the SeaDataCloud project (we use as guideline the WP8 - Deliverable 8.6 - Part a “Review of data formats, also considering INSPIRE data models (O&M)”) was adopted and adapted to deliver data in a INSPIRE-compliant way.

The classes used in this work are (see figure below):

- Environmental Monitoring Facility (EMF);
- Feature of Interest (FoI);
- Procedure (Proc) and
- Observed Property (Obs).

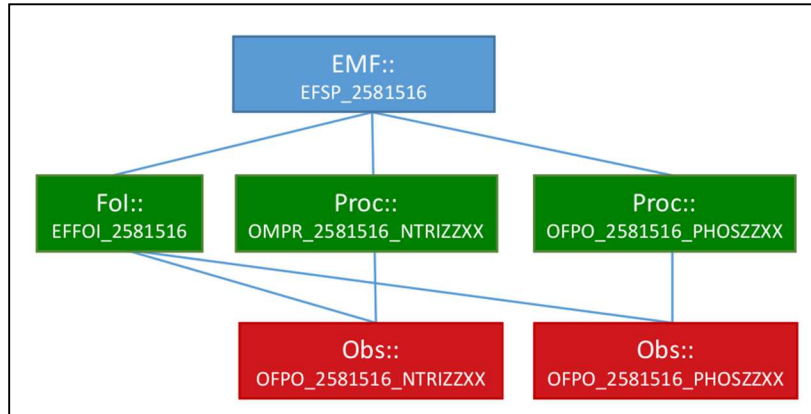


Figure 1: Relationship between different INSPIRE classes: in blue stem from the INSPIRE Theme EMF, the objects displayed in red stem from the specialized observations utilized for the INSPIRE Theme OF. The green objects are the area of overlap, utilized by both INSPIRE Themes.

The mapping between SeaDataCloud and INSPIRE elements was done using as source of metadata the CDI and ODV for data (see figure below)

http://nodc.ogs.trieste.it/INSPIRE_compliant/INSPIREmatching_MEDCIS.xlsx

Attribute Association role Constraint	Values/ Enumerations	Multiplicity	Example	Source	Path
Application Schema 'Environmental Monitoring Facilities' (version 4.0)			Application Schema <provide the name of the application schema>		
gml:id	NCName	1	EFSP_2581516	CDI	EFSP_ + [CDI-record id]
inspire Id	Identifier	1			
localId	CharacterString	1	EFSP_2581516	CDI	EFSP_ + [CDI-record id]
namespace	CharacterString	1			
additional Description	CharacterString	0..1		CDI	gmd:MD_Metadata/gmd:identificationInfo/sdn:SDN_DataIdentification/gmd:abstract/gco:CharacterString

Figure 2: The mapping between the source data (CDI and ODV format) and the target EF, OF and O&M schemas.

This mapping has been developed using the matching tables for the EF theme, as improved by SeaDataCloud and uploaded in the INSPIRE Thematic Clusters platform:

<https://themes.jrc.ec.europa.eu/file/view/170503/inspire-ef-matching-table>.



Figure 3: GML available on WMS service (nodc.ogs.trieste.it/geoserver/Nodc/wms?service=WMS&version=1.1.0&request=GetMap&layers=Nodc:INSPIRE-test&styles=&bbox=15.6768,43.1265,16.7054,44.1716&width=755&height=768&srs=EPSG:4326&format=application/openlayers)

A complete version of XML files is downloadable at the following link: http://nodc.ogs.trieste.it/INSPIRE_compliant, where an example of nutrients data acquired in Mediterranean Sea is described by INSPIRE standards.

Moreover, the GML file was converted and published on the OGS/NODC Geoserver (Fig. 3). It is accessible by WMS and WFS services (http://nodc.ogs.trieste.it/geoserver/Nodc/ows?service=WFS&version=1.0.0&request=GetFeature&typeName=Nodc:test_inspire_2581516)

This use case is a first practical example of compliance between INSPIRE themes and SeaDataCloud data and metadata. In the future, it is interest of EMODnet Chemistry to extend the type of data (e.g. contaminants) and contribute to establish together with SeaDataCloud a workflow, developing a centralized tool, to transform data formats in a compliant way.