Building a bridge between the SeaDataNet data and INSPIRE data models

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SeaDataCloud is a four year Horizon 2020 project, which started in November 2016. The project continues the 20 year long endeavor of the SeaDataNet network to develop a Marine Spatial Data Infrastructure for data providers and users in the marine domain. The present SeaDataCloud project strives, amongst other things, to improve the INSPIRE compliance of the data collected and maintained by SeaDataNet.

In 2017 the first steps towards INSPIRE compliance were made; this work started with a review of the INSPIRE data models of relevance to the SeaDataNet community, the INSPIRE Themes Oceanographic Features (OF), Environmental Monitoring Facilities (EF) as well as the Observational Model provided within the INSPIRE Generic Conceptual Framework (GCM). Once the relevant INSPIRE Themes and classes were identified, an alignment of concepts required by the INSPIRE regulations, as well as those stemming from SeaDataNet, was undertaken.

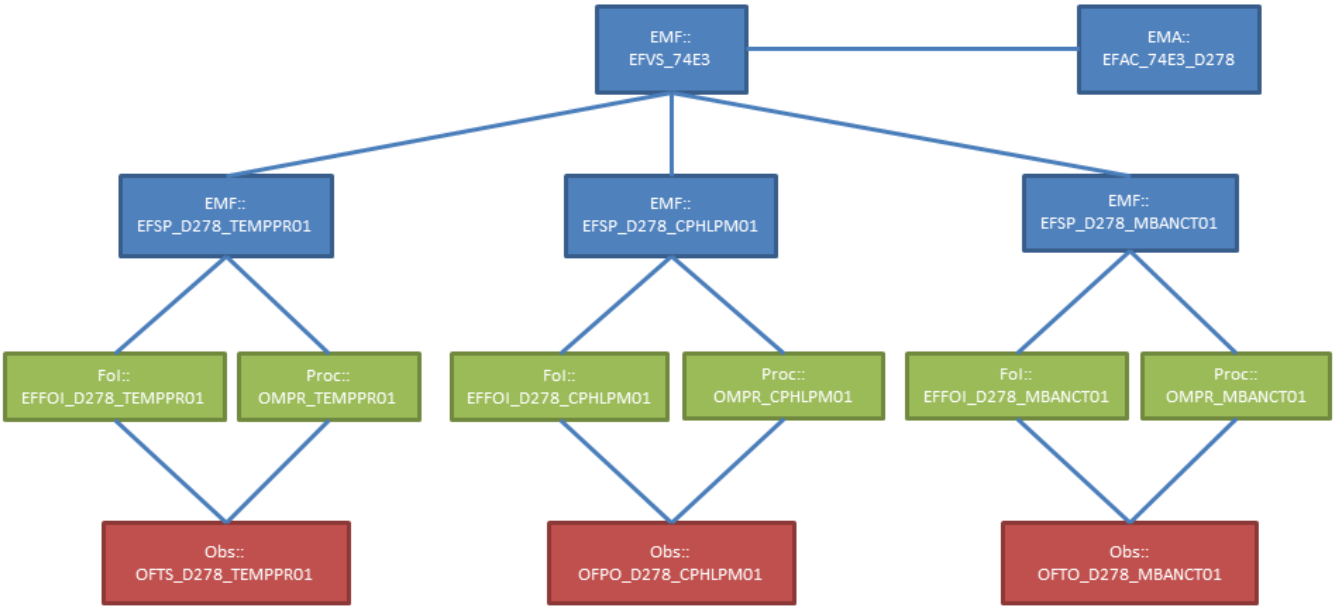

Figure 1: The relationships between the individual GML objects. The objects in blue stem from the INSPIRE Theme EF, the objects displayed in red stem from the specialized observations utilized for the INSPIRE Theme OF; the green objects are the area of overlap, utilized by both INSPIRE Themes.

The alignment is documented in a spreadsheet describing the correspondences between the SeaDataNet data/metadata formats and relevant INSPIRE application schemas; this mapping has been uploaded on the INSPIRE Thematic Clusters platform: https://themes.jrc.ec.europa.eu/file/view/170503/inspire-ef-matching-table. The fully populated examples are also available: https://themes.jrc.ec.europa.eu/file/view/169534/seadatanet-matching-table.

Type : Environmental Monitoring Facility - Vessel

Attribute Association role Constraint	Values/Enumerations	Multiplicity	Voidable/ Non-voidable	Example	Source	Path	Comment
				Application Schema <provide the name of the application schema>			
gml:id	NCName	1		EFVS_74E3	BODC Vocab C17	EFVS_ + [ConceptID]	
inspire Id	Identifier	1					
localId	CharacterString	1		EFVS_74E3	BODC Vocab C17	EFVS_ + [ConceptID]	
namespace	CharacterString	1					
additionalDescription				NERC research vessel. Rebuilt (including hull lengthening by 10m) in 1991-1992. Decommissioned in December 2012 for disposal in March 2013. She will be replaced by a new vessel of the same name.	BODC Vocab C17	Definition.notes	
name	CharacterString	0...*	v	Discovery	BODC Vocab C17	Preferred label	
media Monitored	MediaValue	1...*		water	constant for SDN		Assuming usually water, but could also be sediment or biota
geometry	GM_Object	0...1					Geometry is optional in order to support mobile facilities (i.e. ships, trucks, drones, satellites); if no explicit geometry is provided, representative Point must be provided
gml:id	NCName	1		EFVS_PT_74E3	BODC Vocab C17	EFVS_PT_ + [ConceptID]	Suggestion: base gml:id with GM_ prefix
srsDimension	positiveInteger	1		2			
srsName	anyURI	1		urn:ogc:def:crs:EPSG::4326			

Figure 2: The EF spreadsheet describing the correspondence between SeaDataNet data and INSPIRE schemas.

Once the alignment process was complete, sample XML/GML files were created to illustrate how SeaDataNet data could be provided in an INSPIRE compliant manner.

	CDI	ODV	GML Encoding	Matching Tab
Platform			SDN_EF_Vessel_EFVS_74E3	EF Vessel
Cruise			SDN_CruiseActivity_EFAC_74E3_D278	Activity
Time Series Data			**Temperature values, half daily**	
• **Sampling Point**	2075842	b0686762	SDN_EF_SamplingPoint_EFSP_D278_TEMPPR01	EF SamplingPoint
• **FeatureOfInterest**	2075842	b0686762	SDN_FOI_EFFOI_D278_TEMPPR01	FoI
• **Process**	2075842	b0686762	SDN_Process_OMPR_TEMPPR01	Process
• **Observation**	2075842	b0686762	SDN_PointTimeSeriesObservation_OFTS_D278_TEMPPR01	TimeSeriesObservation
Profile Data			**Chlorophyl at pressure/depths**	
• **Sampling Point**	1597207	b1061981	SDN_EF_SamplingPoint_EFSP_D278_CPHLPM01	EF SamplingPoint
• **FeatureOfInterest**	1597207	b1061981	SDN_FOI_EFFOI_D278_CPHLPM01	FoI
• **Process**	1597207	b1061981	SDN_Process_OMPR_CPHLPM01	Process
• **Observation**	1597207	b1061981	SDN_ProfileObservation_OFPO_D278_CPHLPM01	ProfileObservation
Trajectory Data			**Sea-floor depth {bathymetric depth}**	
• **Sampling Point**	2034903	b1051624	SDN_EF_SamplingPoint_EFSP_D278_MBANCT01	EF SamplingPoint
• **FeatureOfInterest**	2034903	b1051624	SDN_FOI_EFFOI_D278_MBANCT01	FoI
• **Process**	2034903	b1051624	SDN_Process_OMPR_MBANCT01	Process
• **Observation**	2034903	b1051624	SDN_ProfileObservation_OFTO_D278_MBANCT01	TrajectoryObservation

Figure 3: An overview of all GML examples created, together with references to their source data.

In our presentation we will present the work done, issues encountered and the recommendations for future topics for the INSPIRE and SeaDataNet communities. The results of the SeaDataCloud project have already been re-used in the TG-DATA group, outlining the guidelines for the usage of INSPIRE in the Marine Strategy Framework Directive reporting.