

Session 1 – Initial mapping of EMODnet data products to INSPIRE objects

Data Specifications
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ECOAQUA
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EMODnet-INSPIRE technical workshop
7-8 December 2015, Brussels

Research and Technology to enhance excellence in maritime development under an Ecosystem approach





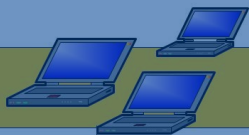
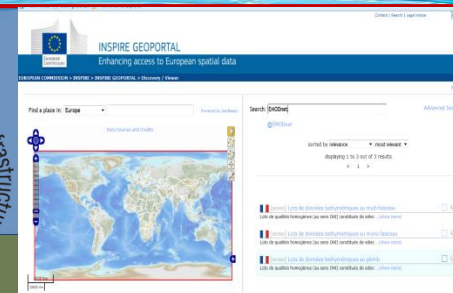
INSPIRE components



EMODnet

European Marine Observation and Data Network

Following INSPIRE principles
(not 100% INSPIRE compliant)



Geoportals and applications

Service Bus

Discovery Service

View Service

Download Service

Transformation Service

Other SDS

Registry Service

Portal level,
EMODnet level? Query Tool

Network services
...Licenses, negotiations

Spatial Data Services

Service Metadata

Data Set Metadata

Spatial Data Set

Registers

Metadata following INSPIRE structure - ISO 19119

Interoperability Target Specifications

Harmonized data sets (products)

SeaDataNet ?

Metadata

Data





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In the scope of the JRC Marine pilot project

- **EMODnet-INSPIRE Meeting 30/06/2015, JRC, Ispra**



Provider of INSPIRE data



Receiver of INSPIRE data



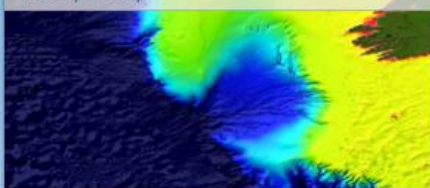
"INSPIRE as a service"



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Initial mapping

Bathymetry



Data on bathymetry (water depth), coastlines, and geographical location of underwater features: wrecks.

[Read more](#) [Portal](#)

Geology



Data on seabed substrate, sea-floor geology, coastal behaviour, geological events, and minerals.

[Read more](#) [Portal](#)

Seabed Habitats



Data on modelled seabed habitats based on seabed substrate, energy, biological zone, and salinity.

[Read more](#) [Portal](#)

Chemistry



Data on the concentration of nutrients, organic matter, pesticides, heavy metals, radionuclides and antifoulants in water, sediment and biota.

[Read more](#) [Portal](#)

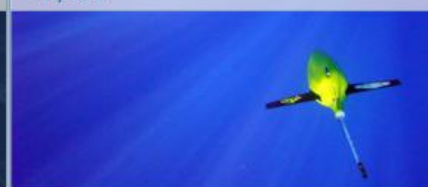
Biology



Data on temporal and spatial distribution of species abundance and biomass from several taxa.

[Read more](#) [Portal](#)

Physics



Data on salinity, temperature, waves, currents, sea-level, light attenuation, and FerryBoxes.

[Read more](#) [Portal](#)

Human Activities



Data on the intensity and spatial extent of human activities at sea.





Draft of the EMODnet mapping

- Draft is done using the **Interactive Data Specifications**
- EMODnet **products** that were available are mapped **into INSPIRE data model** on the level of the INSPIRE features – objects
- Mapping need to be **finalized by EMODnet**
- EMODnet data model of the product need to be analyzed against INSPIRE data model using the **Matching table** provided by Interactive Data Specifications



Interactive data specifications mapping

- Find your scope:

The screenshot shows a web browser window with multiple tabs. The active tab is 'INSPIRE Interactive Data Specifications'. The URL in the address bar is 'inspire-regadmin.jrc.ec.europa.eu/dataspecification/ScopeObjectDetail.action'. The page header includes the European Commission logo and the text 'INSPIRE Interactive Data Specifications'. Below the header, there are navigation buttons: 'Intro', 'Read/Compare Technical Guidelines', and 'Find your scope'. The 'Find your scope' button is highlighted. The main content area displays the following information:

Definition: Geographical areas characterised by specific ecological conditions, processes, structure, and functions that physically support the organisms that live there.

Description: Includes terrestrial and aquatic areas distinguished by geographical, abiotic and biotic features, whether entirely natural or semi-natural [Directive 2007/2/EC]. A Habitat area, line or point may comprise one or more HabitatTypesCoverTypes according to one or more habitat classification schemes, often depending on the data capture process or related to the scale of a map. So a habitat feature might represent a complex of different HabitatTypesCoverTypes. NOTE Although habitats in principle are geographical areas, they may also be depicted as lines or points.

INSPIRE Data Theme: Habitats and Biotopes - [INSPIRE Data Theme Habitats and Biotopes]

INSPIRE Application schema: Habitats and Biotopes - [INSPIRE Application schema Habitats and Biotopes]

Below this text is a table with two columns: 'Attributes' and 'Content'. The 'Attributes' column contains a list of items:

Attributes	Content
▸ inspire Id	
▸ geometry	
▸ habitat	
▸ habitat Species	
▸ habitat Vegetation	

At the bottom of the page, there are three buttons: 'Add Favorites', 'PDF', and 'Matching Table'.



Bathymetry

EMODnet Bathymetry			
EMODnet product	INSPIRE theme	Spatial Object	Comments
coastlines	Sea Regions	CoastLine	
Sea Names	Sea Regions	Geographical name	
Depth contours	Elevation	ElevationVectorObject	
GEBECO Undersea Features	Geographical Names	NamedPlace	
Wrecks	Protected sites	ProtectedSite	
Source references			TBD
Survey tracks/polygons	Environmental Monitoring Facilities	EnvironmentalMonitoringActivity	
Land Geogarphy	Land cover	LandCoverDataset	
Mean depth	Elevation	ElevationGridCoverage	

- Depth contours, mean depth, survey tracks polygons





Physics

		EMODnet - Physics			
		EMODnet product	INSPIRE theme	Spatial Object	Comments
EMODnet - Physics	platform type	Argo floats	Environmental Monitoring Facilities	EnvironmentalMonitoringFacility	
		drifting bouys	Environmental Monitoring Facilities	EnvironmentalMonitoringFacility	
		ferrybox/ship	Environmental Monitoring Facilities	EnvironmentalMonitoringFacility	
		gliders	Environmental Monitoring Facilities	EnvironmentalMonitoringFacility	
		Morring time series	Environmental Monitoring Facilities	EnvironmentalMonitoringFacility	
		profiling floats	Environmental Monitoring Facilities	EnvironmentalMonitoringFacility	
		Radar	Environmental Monitoring Facilities	EnvironmentalMonitoringFacility	
	parameters	Water Temperature	Oceanographic Geographical Features	PointTimeSeriesObservation	
		Waves and...	Oceanographic Geographical Features	PointTimeSeriesObservation	
		...and wind	Meteorological Geographical Features	PointTimeSeriesObservation	
		Sea Level	Oceanographic Geographical Features	PointTimeSeriesObservation	
		Water Salinity/ Conductivity/ Density	Oceanographic Geographical Features	PointTimeSeriesObservation	
		Currents (time series)	Oceanographic Geographical Features	PointTimeSeriesObservation	
		Currents (coverage)	Oceanographic Geographical Features	GridSeriesObservation	
		Light Attenuation/ Absorpition/ Fluorescence/ Back Scattering	Oceanographic Geographical Features	PointTimeSeriesObservation	
		Atmosphere	Meteorological Geographical Features	PointTimeSeriesObservation	
	Chemical Parameters	Oceanographic Geographical Features	PointTimeSeriesObservation		
		SEA BASIN	Sea Regions	Sea	
	DATA PROVIDERS	Environmental Monitoring Facilities		Included in the EF model	
	INITIATIVES	Environmental Monitoring Facilities		Included in the EF model	

- Platform type – EF's
- Parameters – Observations – point time series

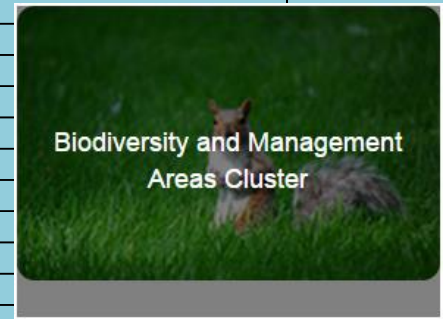




Biology

EMODnet - Biology

	EMODnet product	INSPIRE theme	Spatial Object	Comments	
EMODnet Biology	Taxa:				
	Benthos	Species Distribution	SpeciesDistributionUnit		
	Zooplankton	Species Distribution	SpeciesDistributionUnit		
	Phytoplankton	Species Distribution/Oceanographic Geographical Features	SpeciesDistributionUnit/PointTimeSeriesObservation	CHL a	
	Fish	Species Distribution	SpeciesDistributionUnit		
	Birds	Species Distribution	SpeciesDistributionUnit		
	Mammals	Species Distribution	SpeciesDistributionUnit		
	Reptiles	Species Distribution	SpeciesDistributionUnit		
	Algae	Species Distribution	SpeciesDistributionUnit		
	Angiosperms	Species Distribution	SpeciesDistributionUnit		
	Data sets				
	Pigments	Oceanographic Geographical Features	GridSeriesObservation		
	Benthos	Species Distribution	SpeciesDistributionDataSet ,		
	Zooplankton	Species Distribution	SpeciesDistributionDataSet ,		
	Phytoplankton	Species Distribution	SpeciesDistributionDataSet ,		
	Fish	Species Distribution/Oceanographic Geographical Features	SpeciesDistributionDataSet/PointTimeSeriesObservation	CHL a (colour) is co	
	Birds	Species Distribution	SpeciesDistributionDataSet ,		
	Mammals	Species Distribution	SpeciesDistributionDataSet ,		
	Reptiles	Species Distribution	SpeciesDistributionDataSet ,		
	Algae	Species Distribution	SpeciesDistributionDataSet ,		
	Angiosperms	Species Distribution	SpeciesDistributionDataSet ,		
	Administrative boundaries				
	EEZ	Administrative units	MaritimeZone		
	ICES Ecoregion & IHO Sea areas	Area Management Restriction and Regulation Zones	ManagementRestrictionOrRegulationZone		



- Data sets – mainly the Species distribution (Unit) – time series – observations
- On the “observation” cluster discussion on the Spices distribution VS O&M



Chemistry

	EMODnet - Chemistry			
	EMODnet product	INSPIRE theme	Spatial Object	Comments
EMODnet Chemistry	for all parameters			
	EMODNET Chemistry - Map Server /products	Oceanographic Geographical Features	GridSeriesObservation	
	EMODNET Chemistry - Dynamic Plots	Oceanographic Geographical Features	PointTimeSeriesObservation	
	EMODNET Chemistry - Static Plots	Oceanographic Geographical Features	PointTimeSeriesObservation	

- Mapping into OF theme –grid/point time series observations



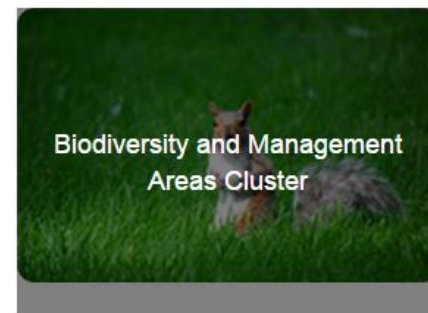


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Habitats

EMODnet -Habitats				
	EMODnet product	INSPIRE theme	Spatial Object	Comments
EMODnet Seabed Habitats	Broad-scale habitat mapping (EUSeaMap)			
	Habitat maps (EUNIS-based)	Habitat and biotopes	Habitat	
	Habitat maps (simplified classification)	Habitat and biotopes	Habitat	
	Input physical data (categorised)	Sea regions	SeaBedArea	
	Input physical data (quantitative)	TBD		
	Baltic Sea bathymetry (2012)	Elevation	ElevationVectorObject	
	Baltic Sea water depth:secchi depth ratio (2012)	Oceanographic Geographical Features	GridObservation	
	Celtic & North Seas light at seabed (2012)	Oceanographic Geographical Features	GridObservation	
	W Med, Celtic & North Seas bathymetry	Elevation	ElevationGridCoverage	
	Confidence in boundaries (quantitative)	TBD		
	Confidence in data sources (qualitative)	TBD		
	EUNIS habitat maps from surveys			
	Habitat maps (polygons)	Habitat and biotopes	Habitat	
	Confidence in habitat maps	TBD		
	Study Areas			
	Survey sample points (UK)	Environmental Monitoring Facilities	EnvironmentalMonitoringFacility	
	Other habitat maps from surveys	no data		
	Modelled maps of specific habitats			
	Probability of coralligenous habitat (MEDISEH)	Habitat and biotopes	HabitatDistributionDataSet	
	Probability of maerl habitat (MEDISEH)	Habitat and biotopes	HabitatDistributionDataSet	
	Probability of Posidonia oceanica (MEDISEH)	Species Distribution	SpeciesDistributionUnit	
	OSPAR habitats (public reference dataset)	Habitat and biotopes	Habitat	
	Boundaries			
	EUSeaMap 1 regions	Bio-geographical Regions	Bio-geographicalRegion	
	ICES ecoregions	Bio-geographical Regions	Bio-geographicalRegion	
	MAIA project Marine Protected Areas	Protected sites	Protected site	
	MESH project area (2004-2008)	TBD	TBD	
MESH regional seas	Bio-geographical Regions	Bio-geographicalRegion		

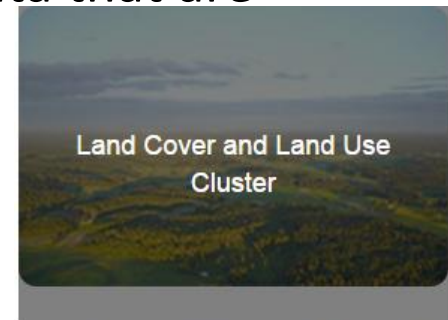




Human Activities

EMODnet -Human activities				
	EMODnet product	INSPIRE theme	Spatial Object	Comments
Human Activities	Aggregate Extraction	Land (marine) use	Existing Land Use Object	HILUCS
	Cultural Heritage	Protected sites	Protected site	
	Dredging	Land (marine) use	Existing Land Use Object	HILUCS
	Environment/Protected areas	Protected sites	Protected site	
	Environment/State of bathing water	Oceanographic Geographical Features	Point Observation	
	Fishery Zones	Land (marine) use	Existing Land Use Object	
	Hydrocarbon Extraction	Land (marine) use	Existing Land Use Object	
	Main Ports	Transport networks	PortArea	
	Mariculture	Agricultural and Aquaculture Facilities	Holding	
	Ocean Energy Facilities	Energy resources	Renewable And Waste Resource	
	Other Forms of Area Management/Designation	Area Management, Restriction and Regulation Zones/AdministrativeUnits	Management Restriction or Regulation Zone/Maritime Units	
	Pipelines and Cables	Utility and Governmental Services	Duct	
	Waste Disposal	Land (marine) use	Existing Land Use Object	
	Wind Farms	Energy resources	Renewable And Waste Resource	

- All of the objects can be mapped with *Land/marine use* theme – as existing Land Use Object
- More precise mapping provided – depending on the data that are available





Geology

		EMODnet -Geology			
		EMODnet product	INSPIRE theme	Spatial Object	Comments
EMODnet Geology		Sediment accumulation rate	Geology		
		Sea-floor geology	Geology		
		Seabed lithology	Geology		
		Stratigraphy	Geology		
		Coastline migration	Geology		
		Aggregate resources	Geology		
		Geological events	Geology		



- Needed mapping on the spatial object level
- Geology theme is covering all objects



Mapping need to be finalized by EMODnet

Application Schema 'Sea Regions' (version 4.0)							Application Schema <provide name of the application schema>										
Type	Documentation	Attribute Association role Constraint	Attribute Association role Constraint documentation	Vaues/ Enumerations	Multiplicity	Voidable/ Non-voidable	Type	Documentation	Attribute Association role Constraint	Attribute Association role Constraint documentation	Vaues/ Enumerations	Multiplicity	Voidable/ Non-voidable	Status	Remarks		
Coastline Subtype of: Shoreline Supertype of: Coastline	-- Definition -- A special case of a shoreline defined as the shoreline at Mean High Water (MHW). Where there is not significant variation in water level, Mean Sea Level (MSL) can be used as a substitute for MHW. -- Description -- This feature type is designed for the general use case where the land:sea boundary is required to support general discovery and viewing of datasets. It is not designed to infer any political boundaries. The	segment - Shoreline	A section of shoreline.	ShoreSegment	1..*												
		water Level - Shoreline	The water level used when defining this shoreline (e.g. meanHighWater)	WaterLevelValue		1	voidable										
		geographical Name - HydroObject	A geographical name that is used to identify a hydrographic object in the real world. It provides a 'key' for implicitly	GeographicalName	0..*		voidable										
		hydro Id - HydroObject	An identifier that is used to identify a hydrographic object in the real world. It provides a 'key' for implicitly associating	HydroIdentifier	0..*		voidable										
		coastline is special case of shoreline at Mean High Water Level	/*Coastline is a special case of shoreline at Mean High Water Level. Coastline is the boundary between land and sea to be used for viewing, discovery and general purpose applications where a land/marine boundary is required. Where there is not significant variation in water level, MSL can be used as a substitute for MHW */														

- Mapping with a Interactive data spec. provide Matching table of INSPIRE feature/object that should be analyzed VS EMODnet data model (sometimes available)
- Confirm the mapping for the transformation in the INSPIRE data model



Thank you for your attention



....and patience