Biogeographical and Sea Regions Geodatabase Guide

Version 3.0

WP9 Data Management and Synthesis

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Sommario

1. Introduction

CoCoNet is a European project that will produce guidelines to design, manage and monitor network of MPAs and Ocean Wind Farms. The Project covers a high number of Countries and involves researchers covering a vast array of subjects, developing a timely holistic approach and integrating the Mediterranean and Black Seas scientific communities through intense collective activities and a strong communication line with stakeholders and the public at large. Within this project we aim at providing a common framework for marine data management and final synthesis of the outcomes of different scientific topics from heterogeneous sources. An integrated Geodatabase and a WebGIS system will be the linking tool for all partners, regions and thematic research. It will involve the entire consortium at different levels in topics such as data provision and integration, GIS products, GIS interpretation, data archiving and data exchange. The work is organised around the following main objectives:

- assess the rules for data and metadata sharing between partners reviewing the existing common European protocols and standards (INSPIRE);
- design and implement data repositories (Marine Geodatabase) following the INSPIRE Directive, to store and retrieve the spatial data collected during the lifespan of the project for the Mediterranean and Black Sea areas and for the pilot study areas;
- develop the COCONET WebGIS to integrate the multi scale GIS layers derived from all regions going towards an integrated management of the marine resources;
- develop an analytical and evaluative framework for designing, managing and monitoring regional networks of MPAs, including wind farms, centred on science-based guidelines, criteria, concepts and models.

The CoCoNet project produced the architecture of eleven Geodatabases storing data about the major themes starting from the INSPIRE Directive: Protected sites, Habitats and Biotopes, Threats, Geology, Biodiversity, Offshore Wind Farms, Biogeographical and Sea Regions, Elevation, Maritime Units, Oceanography, Socioeconomics.

The final goal will be to deliver digital maps of networks of marine protected areas and offshore wind farms as final synthesis of the outcome from all scientific topics. The integrated Geodatabase will be a fundament tool to produce the guidelines to design, manage and monitor network of MPAs, and an enriched wind atlas for both the Mediterranean and the Black Seas. The Project will identify groups of putatively interconnected MPAs in the Mediterranean and the Black Seas, shifting from local (single MPA) to regional (Networks of MPAs) and basin (network of networks) scales. The identification of physical and biological connections with clear the processes that govern patterns of biodiversity distribution. This will enhance policies of effective environmental management, also to ascertain if the existing MPAs are sufficient for ecological networking and to suggest how to design further protection schemes based on effective exchanges between protected areas.

2. Geodatabase design

The INSPIRE data model is the conceptual model which the Elevation Geodatabase is ispired. The logic model is built in Microsoft Visio 2007 using ESRI classes. The physical model is a ESRI File Geodatabase, with Feature Classes, Object Classes, Domains, Subtypes, Relationship Classes, Feature Dataset and RasterCatalogs.

Feature Class: a collection of geographic features with the same geometry type (such as point, line, or polygon), the same attributes, and the same spatial reference. Feature classes can be stored in geodatabases, shapefiles, coverages, or other data formats. Feature classes allow homogeneous features to be grouped into a single unit for data storage purposes. For example, highways, primary roads, and secondary roads can be grouped into a line feature class named "roads." In a geodatabase, feature classes can also store annotation and dimensions

Object Class: In a geodatabase, a collection of nonspatial data of the same type or class. While spatial objects (features) are stored in feature classes in a geodatabase, nonspatial objects are stored in object classes.

Relationship Class: An item in the geodatabase that stores information about a relationship. A relationship class is visible as an item in the ArcCatalog tree or contents view.

Domains: The range of valid values for a particular metadata element.

Code Value Domain: A type of attribute domain that defines a set of permissible values for an attribute in a geodatabase. A coded value domain consists of a code and its equivalent value. For example, for a road feature class, the numbers 1, 2, and 3 might correspond to three types of road surface: gravel, asphalt, and concrete. Codes are stored in a geodatabase, and corresponding values appear in an attribute table.

Subtype: In geodatabases, a subset of features in a feature class or objects in a table that share the same attributes. For example, the streets in a streets feature class could be categorized into three subtypes: local streets, collector streets, and arterial streets. Creating subtypes can be more efficient than creating many feature classes or tables in a geodatabase.

Feature Dataset: In ArcGIS, a collection of feature classes stored together that share the same spatial reference; that is, they share a coordinate system, and their features fall within a common geographic area. Feature classes with different geometry types may be stored in a feature dataset.

Raster Catalog: A collection of raster datasets defined in a table of any format, in which the records define the individual raster datasets that are included in the catalog. Raster catalogs can be used to display adjacent or overlapping raster datasets without having to mosaic them together into one large file (http://support.esri.com/en/knowledgebase/GISDictionary/term/object%20class).

The Biogeographical and Sea Regions Geodatabase can store spatial data (vector, grid and raster) and nonspatial data (.dbf).

The Biogeographical and Sea Regions Geodatabase is available as .xml file. To use it in ArcGIS, create an empty File Geodatabase and import the .xml file.

3. Geodatabase architecture

The Biogeographical and Sea Regions Geodatabase consists of one Feature Dataset, named SeaRegions, with seven feature classes (MarineCirculationZone, Sea, InterTidalArea, Coastline, ShoreSegment, SeaSurfaceArea, SeaBedArea) and of one feature class, named BiogeographicalRegion. Lastly, in the Geodatabase there are four tables: MarineExtent, ParameterValuePair, RelatedParty and SourceMethodType. The tables are linked to the Feature Classes though Relationship Classes. Domains and Subtypes are present in the Feature Classes and in the Object Classes.

3.1. Feature Dataset– Sea Regions

Physical conditions of seas and saline water bodies divided into regions and sub-regions with common characteristics. (2007/2/EC) (INSPIRE Directive, r4618).The Feature Dataset consists of seven Feature Classes:

- Coastline
- InterTidalArea
- MarineContour
- MarineCirculationZone
- Sea
- SeaBedArea
- SeaSurfaceArea
- ShoreSegment

GeometryType: None
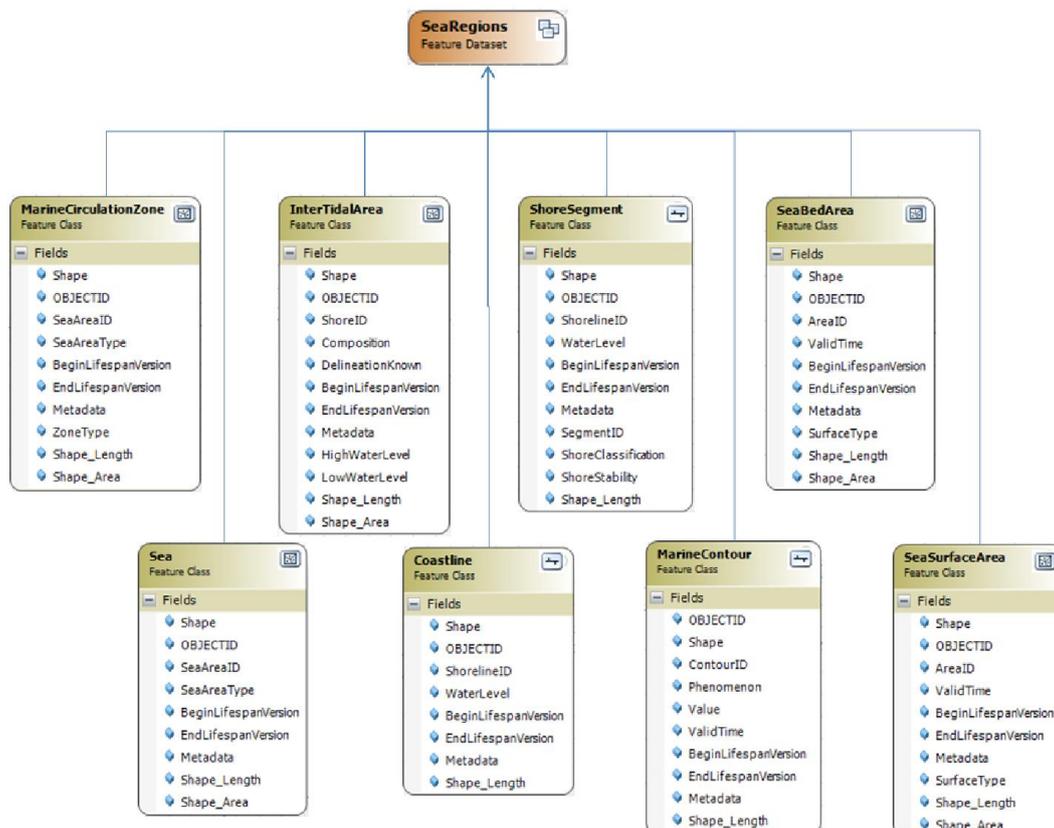
3.1.1. Feature Class: Coastline

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. 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 purpose is to provide a consistent overview of European marine extent and for this reason a single tidal extent is selected. This is consistent with IHO-57 definitions (INSPIRE Directive, r4618).

GeometryType: Polyline

Field	Type	Restriction	Description
ShorelineID	String	None	Identification string of the marine object.
WaterLevel	String	Code Value Domain	The water level used when defining this shoreline (e.g. meanHighWater) (INSPIRE Directive, r4618).
BeginLifespanVersion	Date	None	Date at which this version of the spatial object was inserted or changed in the spatial data set (INSPIRE Directive, r4618-ir).
EndLifespanVersion	Date	None	Date at which this version of the spatial object was superseded or retired in the spatial data set (INSPIRE Directive, r4618-ir).
Metadata	String	None	Name of the metadata file available on the SeaDataNet repository.

Note 1: the ID fields have to be unique in the entire Geodatabase

3.1.2. Feature Class: InterTidalArea

The part of the marine environment that is exposed (not covered in water) during a normal tidal cycle; defined as the difference between any high and any low water level. The part of the marine environment that is exposed (not covered in water) during a normal tidal cycle (INSPIRE Directive, r4618).

GeometryType: Polygon

Field	Type	Restriction	Description
ShoreID	String	None	Identification string of the marine object.
Composition	String	None	The primary type(s) of material composing a spatial object, exclusive of the surface (INSPIRE Directive, r4618).
DelineationKnown	String	Boolean domain	An indication that the delineation (for example, limits and information) of a spatial object in known (INSPIRE Directive, r4618).
BeginLifespanVersion	Date	None	Date at which this version of the spatial object was inserted or changed in the spatial data set (INSPIRE Directive, r4618-ir).
EndLifespanVersion	Date	None	Date at which this version of the spatial object was superseded or retired in the spatial data set (INSPIRE Directive, r4618-ir).
Metadata	String	None	Name of the metadata file available on the SeaDataNet repository.

3.1.3. Feature Class: MarineContour

A set of isolines representing the value of some phenomenon at a particular time. A representation of any physical or chemical phenomenon related to the SeaArea. MarineContour should be derived from an OceanGeographicFeature of the same phenomenon. The source observations used to derive this feature may be linked to via the sourceObservations association. MarineContour is an abstraction of the 'real world' to provide an overview of the expected conditions of a SeaArea. Examples would include salinity contours, depth contours, significant wave height. (INSPIRE Directive, r4618).

GeometryType: Polygon

Field	Type	Restriction	Description
ContourID	String	None	Identification string of the marine object .
Phenomenon	String	None	The property represented by the isolines (INSPIRE Directive, r4618).
Value	Double	None	The value of the property.
ValidTime	String	None	The time at which this contour is represented (INSPIRE Directive, r4618).
BeginLifespanVersion	Date	None	Date at which this version of the spatial object was inserted or changed in the spatial data set (INSPIRE Directive, r4618-ir).
EndLifespanVersion	Date	None	Date at which this version of the spatial object was superseded or retired in the spatial data set (INSPIRE Directive, r4618-ir).
Metadata	String	None	Name of the metadata file available on the SeaDataNet repository.

3.1.4. Feature Class: MarineCirculationZone

A sea area defined by its physical and chemical circulation patterns. Typically used for management and reporting of the marine environment or marine environmental classification (INSPIRE Directive, r4618).

GeometryType: Polygon

Field	Type	Restriction	Description
SeaAreaID	String	None	Identification string of the marine object .
SeaAreaType	String	None	Type of the sea area, e.g. Estuary (INSPIRE Directive, r4618).
BeginLifespanVersion	Date	None	Date at which this version of the spatial object was inserted or changed in the spatial data set (INSPIRE Directive, r4618-ir).
EndLifespanVersion	Date	None	Date at which this version of the spatial object was superseded or retired in the spatial data set (INSPIRE Directive, r4618-ir).
Metadata	String	None	Name of the metadata file available on the SeaDataNet repository.
ZoneType	Integer	None	The type of the Marine Circulation Zone, e.g. sedimentCell (INSPIRE Directive, r4618).

3.1.5. Feature Class: Sea

Extent of sea at High Water (meanHighWater). An area of sea, bounded by land and adjacent sea regions. May contain smaller scale sea regions. Has common large scale circulation patterns, in part defined by its land boundaries. High Water is taken to be mean high water. Applies to common names areas of sea, e.g. North Sea, Agean Sea etc. (Source: IHO S23 SeaRegion) (INSPIRE Directive, r4618).

GeometryType: Polygon

Field	Type	Restriction	Description
SeaAreaID	String	None	Identification string of the marine object.
SeaAreaType	String	None	Type of the sea area, e.g. Estuary (INSPIRE Directive, r4618).
BeginLifespanVersion	Date	None	Date at which this version of the spatial object was inserted or changed in the spatial data set (INSPIRE Directive, r4618-ir).
EndLifespanVersion	Date	None	Date at which this version of the spatial object was superseded or retired in the spatial data set (INSPIRE Directive, r4618-ir).
Metadata	String	None	Name of the metadata file available on the SeaDataNet repository.

3.1.6. Feature Class: SeaBedArea

An area of the sea bed with some identified type of cover. e.g. an area of vegetation or sediment type. This describes a sea region according to the characteristics of the sea bed rather than characteristics of the water column in general. It does not include the subsea geology and is analogous to the concept of LandCover (INSPIRE Annex III) (INSPIRE Directive, r4618).

GeometryType: Polygon

Field	Type	Restriction	Description
AreaID	String	None	Identification string of the marine object.
ValidTime	String	None	The time period for which the marine layer is valid (INSPIRE Directive, r4618).
BeginLifespanVersion	Date	None	Date at which this version of the spatial object was inserted or changed in the spatial data set (INSPIRE Directive, r4618-ir).
EndLifespanVersion	Date	None	Date at which this version of the spatial object was superseded or retired in the spatial data set (INSPIRE Directive, r4618-ir).
Metadata	String	None	Name of the metadata file available on the SeaDataNet repository.
SurfaceType	String	None	Surface type of the sea bed (INSPIRE Directive, r4618).

3.1.7. Feature Class: SeaSurfaceArea

An area of the sea surface with some type of cover e.g. an area of sea ice. This describes a sea region according to the characteristics of the sea surface rather than characteristics of the water column in general. It is analogous to the concept of LandCover (INSPIRE Annex III) (INSPIRE Directive, r4618).

GeometryType: Polygon

Field	Type	Restriction	Description
AreaID	String	None	Identification string of the marine object.
ValidTime	String	None	The time period for which the marine layer is valid (INSPIRE Directive, r4618).
BeginLifespanVersion	Date	None	Date at which this version of the spatial object was inserted or changed in the spatial data set (INSPIRE Directive, r4618-ir).
EndLifespanVersion	Date	None	Date at which this version of the spatial object was superseded or retired in the spatial data set (INSPIRE Directive, r4618-ir).
Metadata	String	None	Name of the metadata file available on the SeaDataNet repository.
SurfaceType	String	None	Surface type of the sea bed (INSPIRE Directive, r4618).

3.1.8. Feature Class. ShoreSegment

A Shore Segment is a section of shore line. Where it is possible to provide attributes about shore stability (eroding, stable etc) and/or shore type (sand, rock, harbour etc). Then the Shore Segment should be used in place of the GML LineString element to describe curve segments. (INSPIRE Directive, r4618).

GeometryType: Polyline

Field	Type	Restriction	Description
ShorelineID	String	None	Identification string of the marine object.
WaterLevel	String	Code Value Domain	The water level used when defining this shoreline (e.g. meanHighWater) (INSPIRE Directive, r4618).
BeginLifespanVersion	Date	None	Date at which this version of the spatial object was inserted or changed in the spatial data set (INSPIRE Directive, r4618-ir).
EndLifespanVersion	Date	None	Date at which this version of the spatial object was superseded or retired in the spatial data set (INSPIRE Directive, r4618-ir).
Metadata	String	None	Name of the metadata file available on the SeaDataNet repository.
SegmentID	String	None	Identification string of the segment.
ShoreClassification	String	None	The primary type of the shore segment (INSPIRE Directive, r4618).
ShoreStability	String	None	The primary stability type of the shore segment segment (INSPIRE Directive, r4618).

3.2. Feature Class: BiogeographicalRegion

An area in which there are relatively homogeneous ecological conditions with common characteristics. EXAMPLE Europe is divided into eleven broad bio-geographical terrestrial zones and 5 zones for marine bio-geographical regions (INSPIRE Directive, r4618).
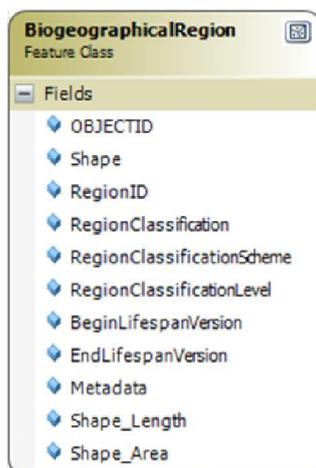
GeometryType: Polygon

Field	Type	Restriction	Description
RegionID	String	None	Identification string of the marine object.
RegionClassification	String	Code Value domain	Regionclass code, according to a classification scheme (INSPIRE Directive, r4618).
RegionClassificationScheme	String	Marine Strategy Framework Directive	Classification scheme used for classifying regions (INSPIRE Directive, r4618).
RegionClassificationLevel	String	Code Value Domain	The classification level of the region class (INSPIRE Directive, r4618).
BeginLifespanVersion	Date	None	Date at which this version of the spatial object was inserted or changed in the spatial data set (INSPIRE Directive, r4618-ir).
EndLifespanVersion	Date	None	Date at which this version of the spatial object was superseded or retired in the spatial data set (INSPIRE Directive, r4618-ir).
Metadata	String	None	Name of the metadata file available on the SeaDataNet repository.

3.3. Object Classes

3.3.1. Object Class: MarineExtent

The extent of a sea area for a given tidal state. The expected 2D geometric extent of a SeaArea for a particular tidal state. (INSPIRE Directive, r4618).

Field	Type	Restriction	Description
ObjectIDfk	String	None	Identification string of the marine object. The field is used as foreign key.
Extent	Double	None	Value of the extent of the sea area.
WaterLevel	String	Code Value domain	The water level at which the extent is valid (INSPIRE Directive, r4618).

3.3.2. Object Class: ParameterValuePair

A parameter value pair contains a value of some observed property. e.g. Annual Mean Sea Surface Temperature (INSPIRE Directive, r4618).

Field	Type	Restriction	Description
ObjectIDfk	String	None	Identification string of the elevation object. The field is used as foreign key.
Parameter	String	None	A definition of the observed parameter (e.g. mean temperature) (INSPIRE Directive, r4618).
Value	Double	None	The value of the observed parameter (INSPIRE Directive, r4618).
UnitOfMeasure	String	None	The unit of measure of the observed parameter, e.g. degree Celsius.
ValidTime	String	None	The time for which the attribute value is valid. This may be a time instant or a duration (INSPIRE Directive, r4618).

3.3.3. Object Class: RelatedParty

An organization or a person with a role related to a re source (INSPIRE Directive, r4618).

Campo	Tipo	Limitazioni	Definizione
ObjectIDfk	String	None	Identification string of the marine object. The field is used as foreign key.
IndividualName	String	None	Name of the related party (INSPIRE Directive, r4618).
PositionName	String	None	Position of the party in relation to a resource, such as head of department (INSPIRE Directive, r4618).
Role	String	Code Value Domain	Role(s) of the party in relation to a resource, such as owner (INSPIRE Directive, r4618).
Contact	String	None	Contact information for the related party (INSPIRE Directive, r4618).
OrganizationCode	String	None	Code of the related organization.
OrganizationName	String	None	Name of the related organization (INSPIRE Directive, r4618).
Country	String	Code Value Domain	Country of the related organization.

3.3.4. Object Class: SourceMethodType

Contains metadata about specific instances of elevation object. Refers to the methods on how observations have been made or recorded.

Campo	Tipo	Limitazioni	Definizione
ObjectIDfk	String	None	Identification string of the marine object. The field is used as foreign key.
InstitutionName	String	None	Name of the owner or operator of the source database.
MethodScheme	String	None	Scheme used to compiling the Method Value field (Article17SourceMethodValue or GeneralSourceMethod).
MethodValue	String	None	Method by which the data on elevation object is collected.
MethodReference	String	None	A reference to a description of the method by which the data on elevation object is collected.
SourceDatabase	String	None	Name of the database where the elevation object data is retrieved from.

3.4. Relationship Classes
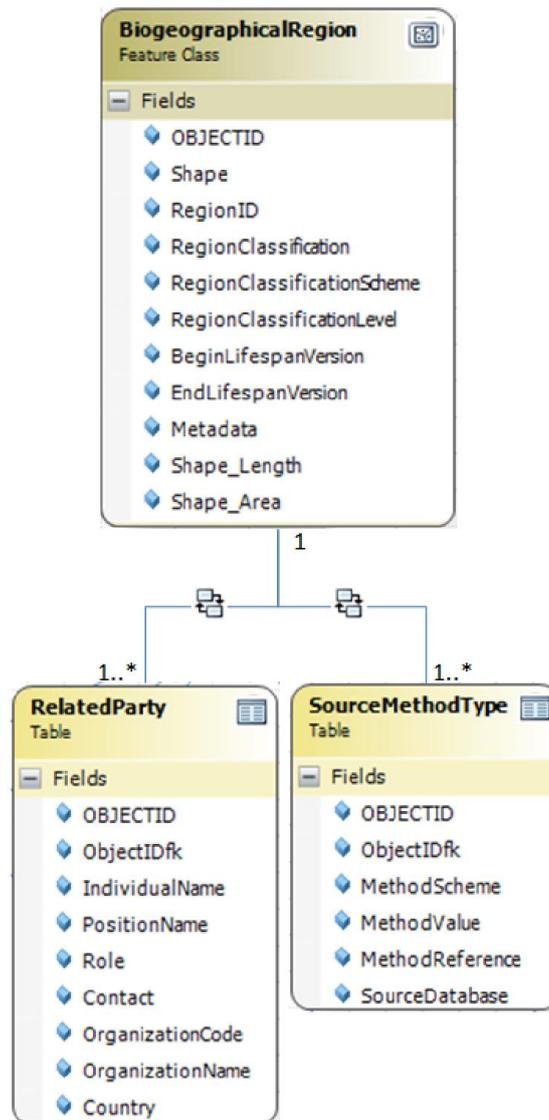
Nome	Molteplicità	Classe di origine	Classe di destinazione	Chiave primaria	Chiave esterna
BiogeographicalRegionHas RelatedParty	1→1..*	Biogeographical Region	RelatedParty	RegionID	AreaIDfk
BiogeographicalRegionHas SourceMethodType	1→1..*	Biogeographical Region	SourceMethodType	RegionID	ObjectdIDfk
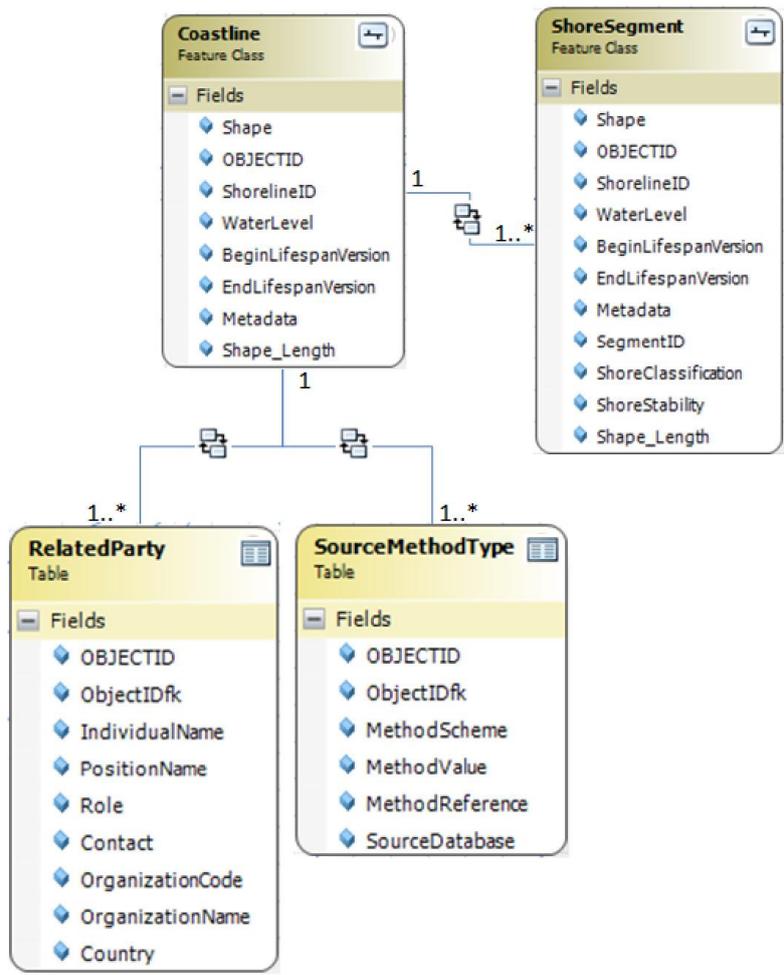
Nome	Molteplicità	Classe di origine	Classe di destinazione	Chiave primaria	Chiave esterna
CoastlineHas SourceMethodType	1→1..*	Coastline	SourceMethodType	ShorelineID	ObjectIDfk
CoastlineHas RelatedParty	1→1..*	Coastline	RelatedParty	ShorelineID	ObjectIDfk
CoastlineHas ShoreSegment	1→1..*	Coastline	ShoreSegment	ShorelineID	ShorelineID
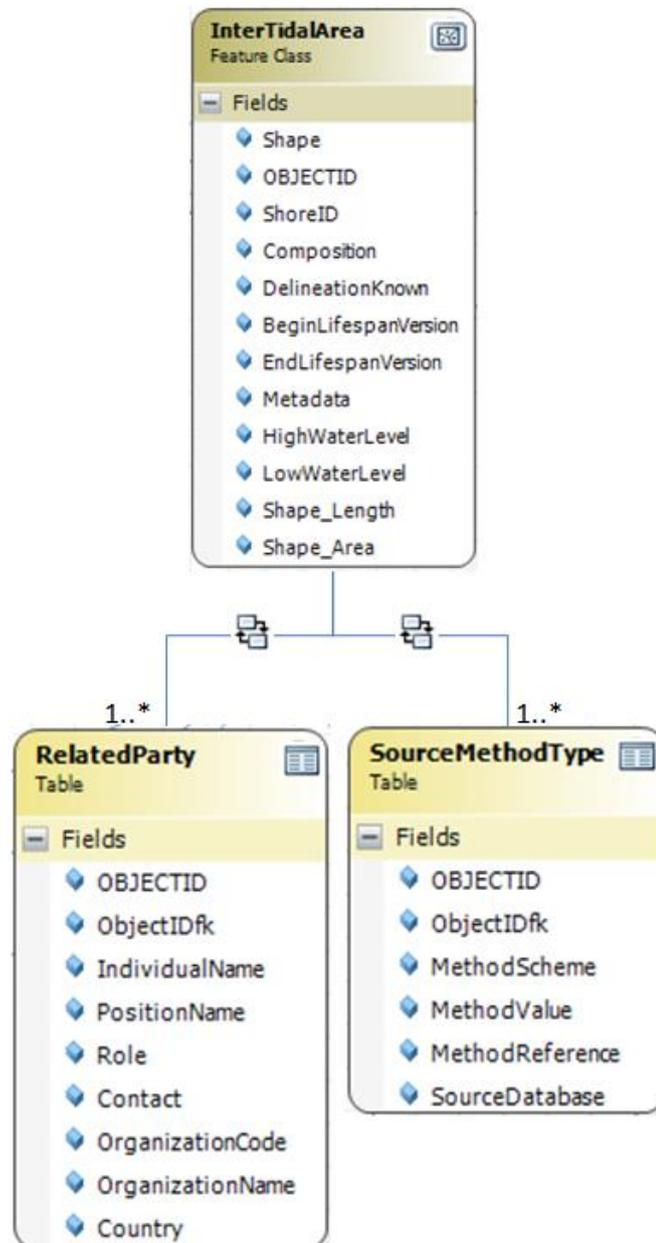
Nome	Molteplicità	Classe di origine	Classe di destinazione	Chiave primaria	Chiave esterna
InterTidalAreaHas SourceMethodType	1→1..*	InterTidalArea	SourceMethodType	ShoreID	ObjectIDfk
InterTidalAreaHas RelatedParty	1→1..*	InterTidalArea	RelatedParty	ShoreID	ObjectIDfk
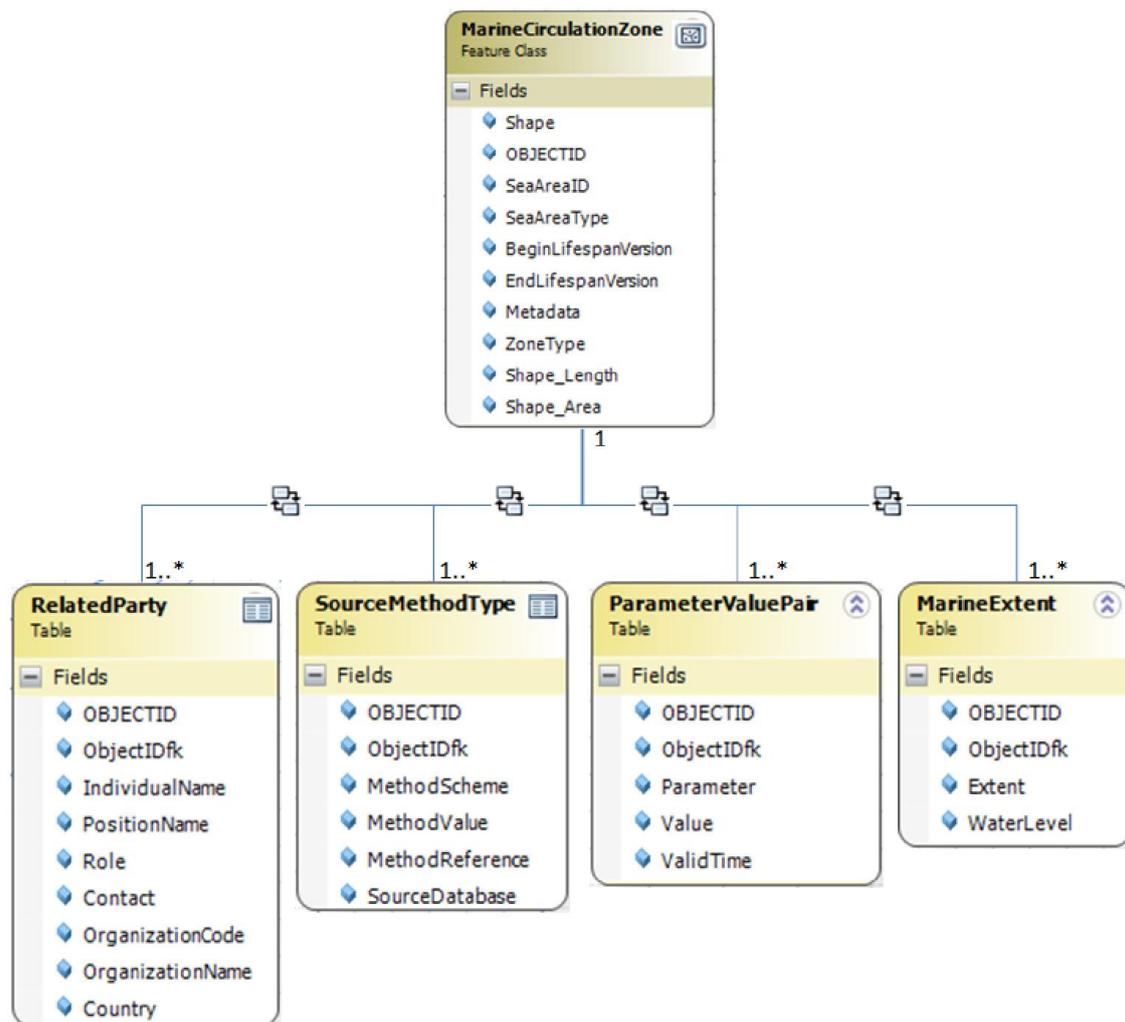
Nome	Molteplicità	Classe di origine	Classe di destinazione	Chiave primaria	Chiave esterna
MarineCirculationHas SourceMethodType	1→1..*	MarineCirculation	SourceMethodType	SeaAreaID	ObjectIDfk
MarineCirculationHas RelatedParty	1→1..*	MarineCirculation	RelatedParty	SeaAreaID	ObjectIDfk
MarineCirculationHas ParameterValuePair	1→1..*	MarineCirculation	ParameterValuePair	SeaAreaID	ObjectIDfk
MarineCirculationHas MarineExtent	1→1..*	MarineCirculation	MarineExtent	SeaAreaID	ObjectIDfk
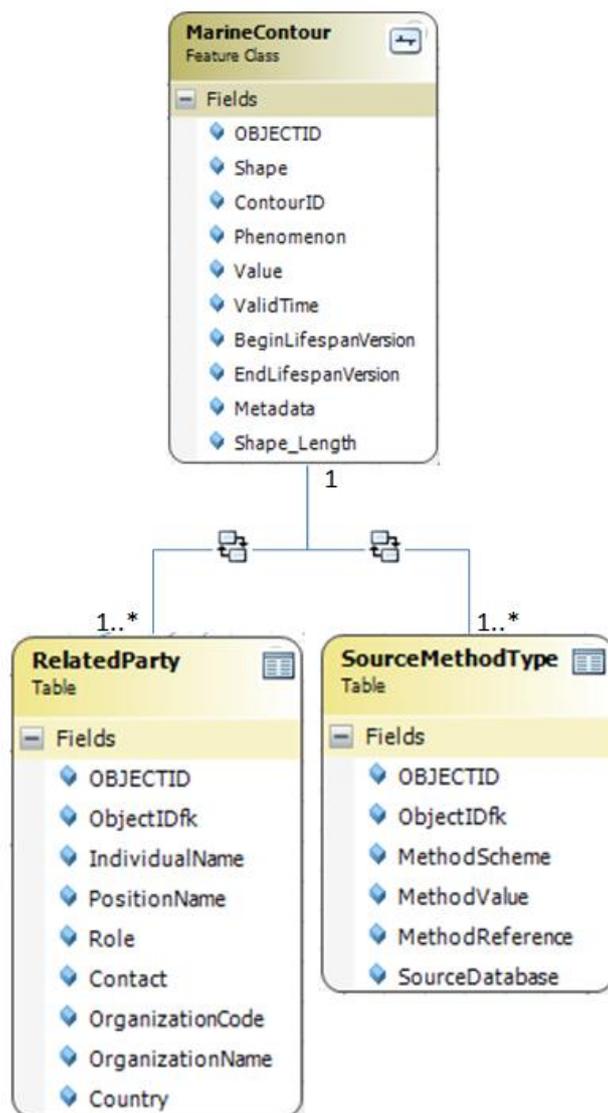
Nome	Molteplicità	Classe di origine	Classe di destinazione	Chiave primaria	Chiave esterna
MarineContourHas SourceMethodType	1→1..*	MarineContour	SourceMethodType	ContourID	ObjectIDfk
MarineContourHas RelatedParty	1→1..*	MarineContour	RelatedParty	ContourID	ObjectIDfk
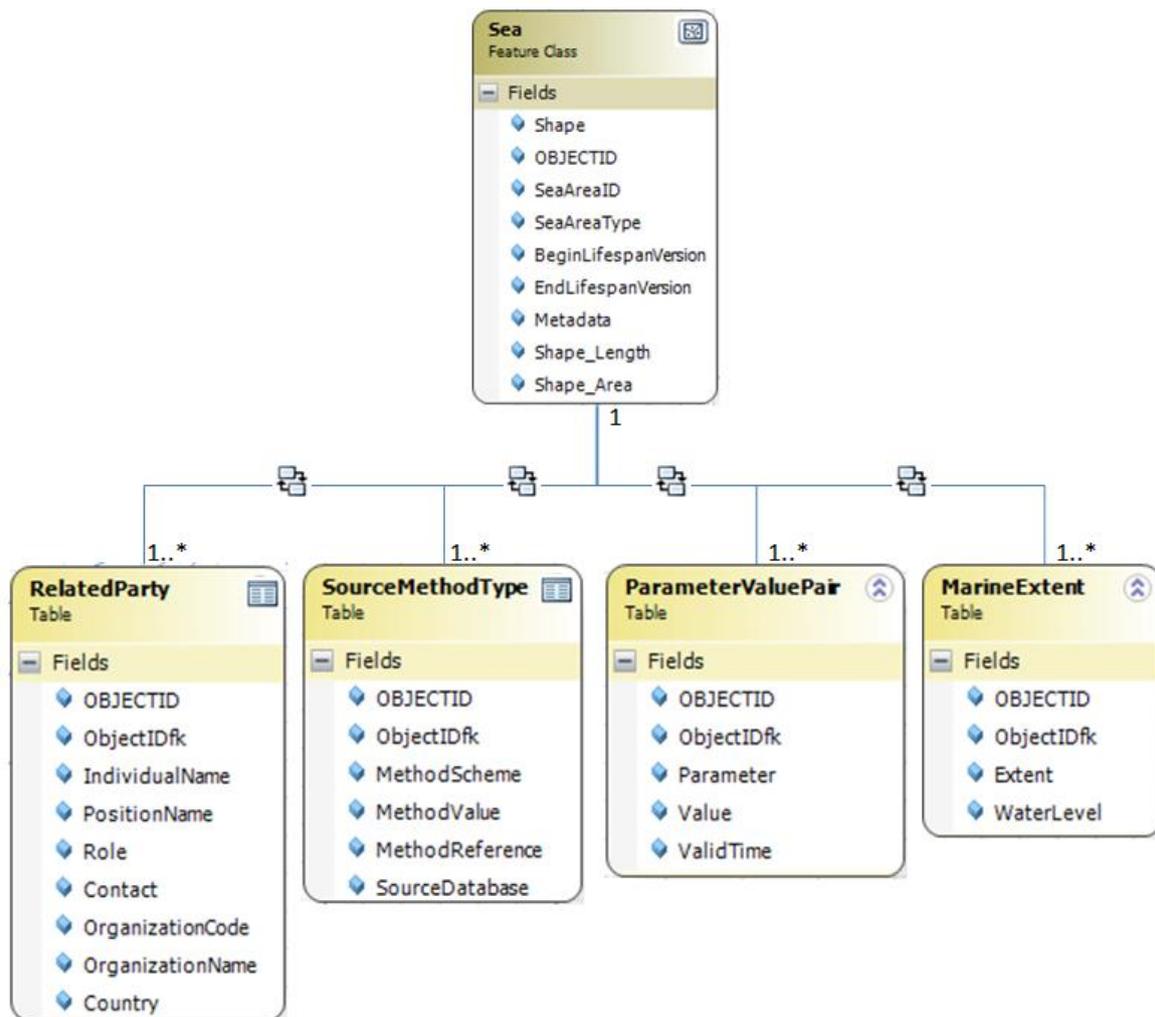
Nome	Molteplicità	Classe di origine	Classe di destinazione	Chiave primaria	Chiave esterna
SeaHas SourceMethodType	1→1..*	Sea	SourceMethodType	SeaAreaID	ObjectIDfk
SeaHas RelatedParty	1→1..*	Sea	RelatedParty	SeaAreaID	ObjectIDfk
SeaHas ParameterValuePair	1→1..*	Sea	ParameterValuePair	SeaAreaID	ObjectIDfk
SeaHas MarineExtent	1→1..*	Sea	MarineExtent	SeaAreaID	ObjectIDfk
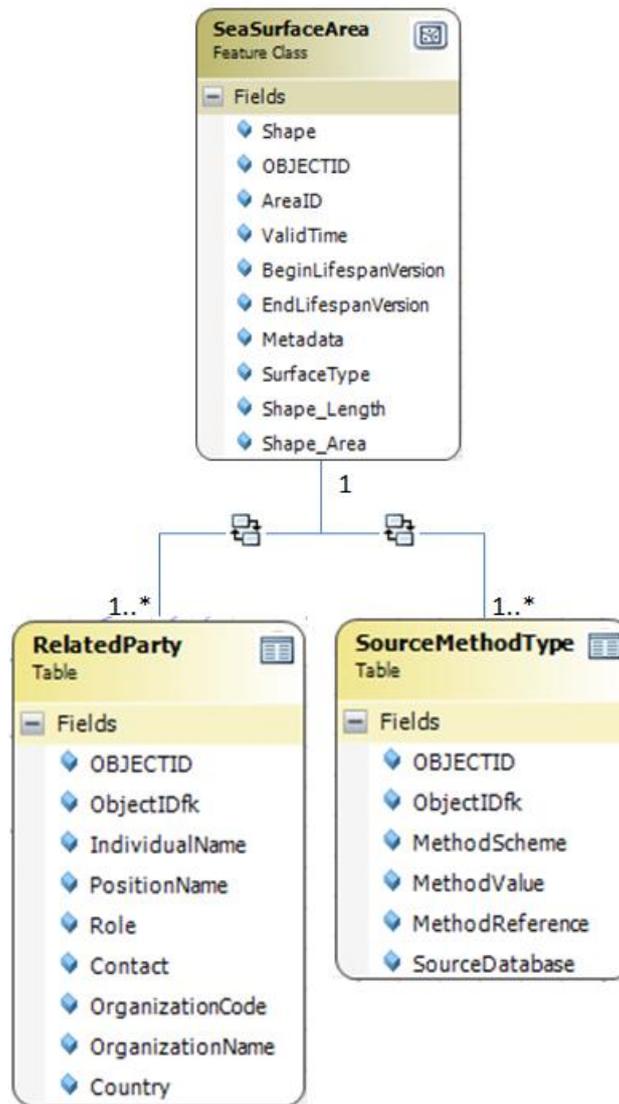
Nome	Molteplicità	Classe di origine	Classe di destinazione	Chiave primaria	Chiave esterna
SeaSurfaceAreaHas SourceMethodType	1→1..*	SeaSurfaceArea	SourceMethodType	AreaID	ObjectIDfk
SeaSurfaceAreaHas RelatedParty	1→1..*	SeaSurfaceArea	RelatedParty	AreaID	ObjectIDfk
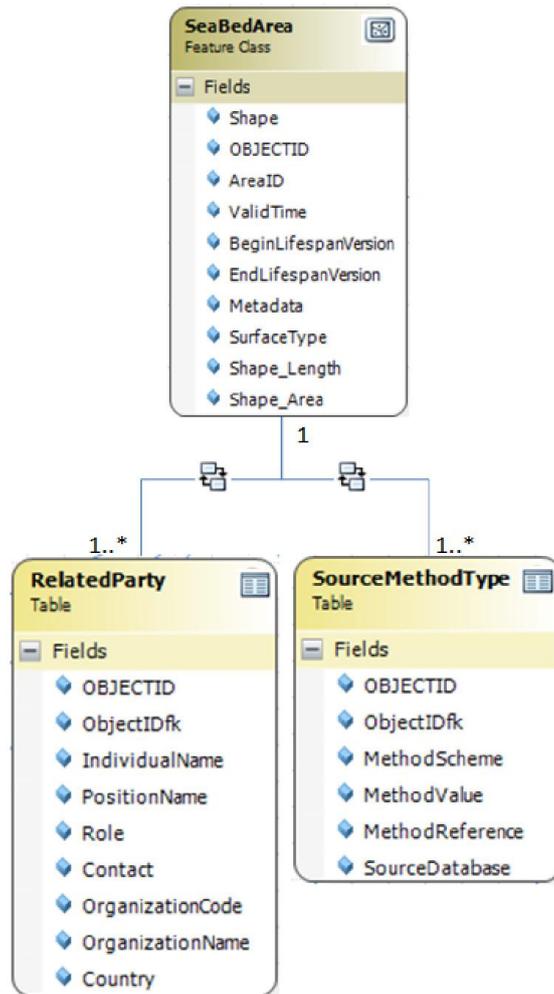
Nome	Molteplicità	Classe di origine	Classe di destinazione	Chiave primaria	Chiave esterna
SeaBedAreaHas SourceMethodType	1→1..*	SeaBedArea	SourceMethodType	AreaID	ObjectIDfk
SeaBedAreaHas RelatedParty	1→1..*	SeaBedArea	RelatedParty	AreaID	ObjectIDfk
SeaBedAreaHas ParameterValuePair	1→1..*	SeaBedArea	ParameterValuePair	AreaID	ObjectIDfk
SeaBedAreaHas MarineExtent		SeaBedArea	MarineExtent	AreaID	ObjectIDfk

4. Metadata

In the framework of the CoCoNet project, metadata are produced by Mikado software. Each Feature Class and raster layer has a CDI (Common Data Index) accessible though the SeaDataNet portal (http://seadatanet.maris2.nl/v_cdi_v3/search.asp). The CDIs are also available on the webpage http://coconetgis.ismar.cnr.it/ as .xml files, grouped by Geodatabase. Lastly, the metadata file is linked to the feature or to the raster file though a field in the attribute table.

ALLEGATO 1 - Acronyms and References

Acronyms

CDI – Common Data Index

FC – Feature Class

FD – Feature Dataset

OC - Object Class

fk – foreign key

References

Directive 2007/2/EC of the European Parliament and of the Council of 14 March 2007 establishing an Infrastructure for Spatial Information in the European Community (INSPIRE)

D2.8.III.16 Data Specification on Sea Regions – Technical Guidelines

D2.8.III.17 Data Specification on Bio-geographical Regions – Technical Guidelines

http://inspire.ec.europa.eu/data-model/approved/r4618-ir/html/

http://inspire.ec.europa.eu/data-model/approved/r4618/html/

http://coconetgis.ismar.cnr.it/

http://seadatanet.maris2.nl/v_cdi_v3/search.asp

ALLEGATO 2 – Domains

Article17SourceMethodValue_v3

Type: Code Value Domain

Description: The methods that have been used in the sources for compiling the information about the occurrences of the habitats within an aggregation unit for article 17 purposes. Describes how the information about the occurrences of the habitats within a unit has been compiled (INSPIRE Directive, r4618).

Value	Code	Definition
Absent data	absentData	Absent data
Complete survey	complateSurvey	Complete survey
Estimate expert	estimateExpert	Estimate based in expert opinion with no or minimal sampling
Estimate partial	estimatePartial	Estimate based on partial data with some extrapolation and/or modeling

Created: 11/05/2015
Modified: none
Author: CNR-ISMAR
State: approved
Used in: SourceMethodType (OC)
Extensibility: none
Note 1: The values of the list are found here:

http://circa.europa.eu/Public/irc/env/monnat/library?l=/habitats_reporting/reporting_2007-2012/reporting_guidelines/reporting-formats_1/_EN_1.0_&a=d (D2.8.II.1_v3.0).

Boolean_v3

Type: Code Value Domain

Definition: Most valuable in the predicate calculus, where items are either True or False, unless they are ill formed (INSPIRE Directive, r4618).

Value	Code
TRUE	true
FALSE	false

Created: 11/05/2015
Modified: none
Author: CNR-ISMAR
State: approved
Used in: InterTidalArea (FC)
Extensibility: none
Note 1: none

CountryCode_v3

Type: Code Value Domain

Description: Country code as defined in the Interinstitutional style guide published by the Publications Office of the European Union (INSPIRE Directive, r4618).

Value	Code
Albania	AL
Algeria	ZD
Bosnia and Herzegovina	BA
Bulgaria	BG
Cyprus	CY

Croatia	HR
Egypt	EG
France	FR
Georgia	GE
Gibraltar	GI
Greece	EL
Israel	IL
Italy	IT
Lebanon	LB
Libya	LY
Malta	MT
Monaco	MC
Morocco	MA
Montenegro	ME
Romania	RO
Russia	RU
Slovenia	SI
Spain	ES
Syria	SY
Tunisia	TN
Turkey	TR
Ukraine	UA
United Kingdom	UK

Created: 11/05/2015
Modified: none
Author: CNR-ISMAR
State: approved
Used in: RelatedParty (OC)
Extensibility: none
Note 1: none

GeneralSourceMethodValue_v3

Type: Code Value Domain

Description: What are the methods that have been used in the sources for compiling the information about the elevation objects (INSPIRE Directive, r4618).

Value	Code	Definition
Collection examination	collectionExamination	Data collected from examinations of collections
Grid mapping	gridMapping	Data observations collected by systematic surveys in grid cells
Line sampling	lineSampling	Data collected by systematic surveys along linear transects
Literature examination	literatureExamination	Data collected from literature examinations like printed maps, tables
Prediction modeling	predictionModeling	Data from prediction modeling
Ramdom observation	ramdomObservation	Data collected by randomly distributed collection/observation sites randomly outside a systematic survey
Remote sensing observation	remoteSensingObservation	Data collected by the Remote Sensing Observation method

| Statistical sampling | statisticalSampling | Data collected on locations selected by statistical sampling methods |

Created: 11/05/2015
Modified: none
Author: CNR-ISMAR
State: approved
Used in: SourceMethodType (OC)
Extensibility: yes
Note 1: none

PartyRoleValue_v3

Type: Code Value Domain

Description: Roles of parties related to or responsible for a resource (INSPIRE Directive, r4618).

Value	Code	Definition
Author	author	Author of the data
Custodian	custodian	Guardian or keeper responsible for maintaining data
Distributor	distributor	Person or organisation who distributes the data
Originator	originator	Responsible party who created the dataset or metadata
Owner	owner	Person who owns the data
Point of contact	pointOfContact	Responsible party who can be contacted for acquiring knowledge about or acquisition of the data
Principal investigator	principalInvestigator	Key person responsible for gathering information and conducting research
Processor	processor	Responsible party who has processed the data in a manner in which data has been modified
Publisher	publisher	Responsible party who published the data
Resource provider	resourceProvider	Party that supplies the data
User	user	Person who uses the data

Created: 11/05/2015
Modified: none
Author: CNR-ISMAR
State: approved
Used in: RelatedParty (OC)
Extensibility: yes
Note 1: none

RegionClassificationLevelValue_v3

Type: Code Value Domain

Description: Codes defining the classification level of the region class (INSPIRE Directive, r4618).

Value	Code	Definition
International	international	This is a region classification on the international level
Local	local	This is a region classification on the local level
National	national	This is a region classification on the national level
Regional	regional	This is a region classification on the regional level

Created: 11/05/2015
Modified: none
Author: CNR-ISMAR
State: approved
Used in: BiogeographicalRegion (FC)
Extensibility: yes

Note 1: none

RegionClassificationValue_v3

Type: Code Value Domain

Description: Codes defining the various bio-geographical regions (INSPIRE Directive, r4618). The two values come from the Marine Strategy Framework Directive scheme.

Value	Code	Definition
Mediterranean Sea	Mediterranean Sea	Marine waters covered by the sovereignty or jurisdiction of Member States. It includes the subregions of the Western Mediterranean Sea, the Adriatic Sea, Ionian Sea, Central Mediterranean Sea and the Aegean-Levantice Sea. For more information read the Marine Strategy Framework Directive, specifically Article 4
Black Sea	Black Sea	The entire extent of marine waters covered by the sovereignty or jurisdiction of Bulgaria and Romania

Created: 11/05/2015
Modified: none
Author: CNR-ISMAR
State: approved
Used in: BiogeographicalRegion (FC)
Extensibility: yes
Note 1: none

WaterLevelValue_v3

Type: Code Value Domain

Description: The tidal datum / waterlevel to which depths and heights are referenced.
SOURCE [Codelist values based on DFDD] (INSPIRE Directive, r4618).

Value	Code	Definition
Equinoctial spring low water	equinoctialSpringLowWater	The level of low water springs near the time o fan equinox
Higher high water	higherHighWater	The highest of the high waters (or single high water) of any specific tidal day due to the declaration A1 effects of the moon and sun
Higher high water large tide	higherHighWaterLargeTide	The average of the highest high waters, one from each of 19 years of observations
Highest astronomical tide	highestAstronomicalTide	The highest tidal level, which can be predicted to occur under average meteorological conditions andunder any combination of astronomical conditions
Highest high water	highestHighWater	The highest water level observed at a location
High water	highWater	The highest level reached at a location by the water surface in one tidal cycle
High water springs	highWaterSprings	An arbitrary level, approximating that of mean high water springs
Indian spring high water	indianSpringHighWater	A tidal surface datum approximating the level of the mean of the higher high water at spring tides
Indian spring low water	indianSpringLowWater	A tidal surface datum approximating the level of the mean of the lower low water at spring tides
Local datum	localDatum	An arbitrary datum defined by an authority of a local harbour, from which levels and tidal heights

		are measured by that authority
Lower low water	lowerLowWater	The lowest of the low waters (or single low water) of any specified tidal day due to the declination A1 effects of the moon and sun
Lower low water large tide	lowerLowWaterLargeTide	The average of the lowest low waters, one from each of 19 years of observations
Lowest astronomical tide	lowestAstronomicalTide	The lowest tide level that can be predicted to occur under average meteorological conditions and under any combination of astronomical conditions
Lowest low water	lowestLowWater	An arbitrary level conforming to the lowest tide observed at a location, or somewhat lower
Lowest low water springs	lowestLowWaterSprings	An arbitrary level conforming to the lowest water level observed at a location at spring tides during a period shorter than 19 years
Low water	lowWater	An approximation of mean low water adopted as the reference level for a limited region, espective of better determinations later
Low water datum	lowWaterDatum	An approximation of mean low water that has been adopted as a standard reference for a limited area
Low water springs	lowWaterSprings	A level approximating that of mean low water springs
Mean higher high water	meanHigherHighWater	The average height of higher high waters at a location over a 19-year period
Mean higher high water springs	meanHigherHighWaterSprings	The average height of higher high water at spring tides at a location
Mean higher low water	meanHigherLowWater	The average of the higher low water height of each tidal day observed over a National Tidal Datum Epoch
Mean high water	meanHighWater	The average height of all high waters at a location over a 19-year period
Mean high water neaps	meanHighWaterNeaps	The average height of the high waters of the neap tide
Mean high water springs	meanHighWaterSprings	The average height of the high waters of spring tides
Mean lower high water	meanLowerHighWater	The average of the lower high water height of each tidal day observed over a National Tidal Datum Epoch
Mean lower low water	meanLowerLowWater	The average height of the lower low waters at a location over a 19-year period
Mean lower low water spring	meanLowerLowWaterSprings	The average height of lower low water at spring tides at a location
Mean low water	meanLowWater	The average height of all low waters at a location over a 19-year period
Mean low water neaps	meanLowWaterNeaps	The average height of the low waters of the neap tide
Mean low water springs	meanLowWaterSprings	The average height of the low waters of spring tides
Mean sea level	meanSeaLevel	The average height of the sea at a tide station

		measured from a fixed predetermined reference level
Mean tide level	meanTideLevel	The arithmetic mean of mean high water and mean low water
Mean water level	meanWaterLevel	The average of all hourly water levels over the available period of record
Nearly highest high water	nearlyHighestHighWater	An arbitrary level approximating the highest water level observed at a location, usually equivalent to the high water springs
Nearly lowest low water	nearlyLowestLowWater	A level approximating the lowest water level observed at a location, usually equivalent to Indian spring low water.
Tropic higher high water	tropicHigherHighWater	The highest of the high waters (or single high water) of the tides occurring semimonthly when the effect of the Moon's maximum declination is greatest
Tropic lower low water	tropicLowerLowWater	The lowest of the low waters (or single low water) of the tides occurring semimonthly when the effect of the Moon's maximum declination is greatest

Created: 11/05/2015
Modified: none
Author: CNR-ISMAR
State: approved
Used in: Coastline (FC), ShoreSegment (FC), MarineExtent (OC)
Extensibility: yes
Note 1: none

ALLEGATO 3 – UML diagram

Feature classes
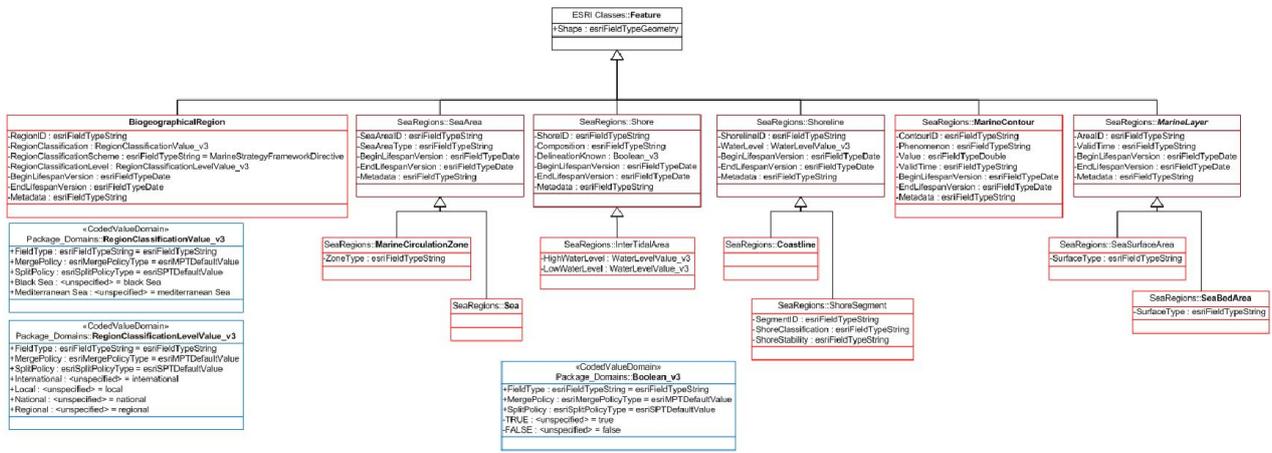
Feature Class (abstract): brown, Feature Class: red, Domain: blue.

Object classes
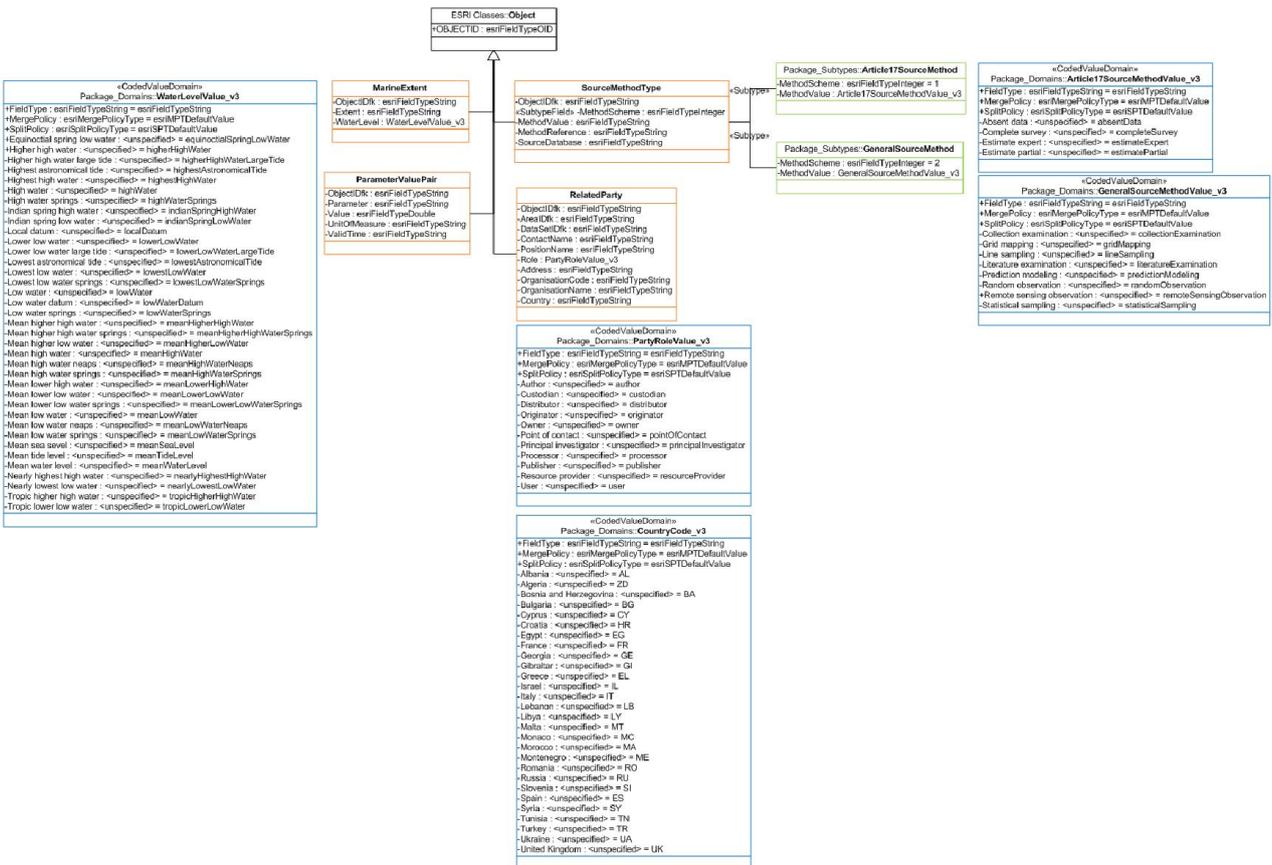
Object Class: orange, Subtype: green, Domain: blue.

Relationship classes

SeaRegions::Sea

Package_Objects::**RelatedParty**
- ObjectIDfk : esriFieldTypeString
- AreaIDfk : esriFieldTypeString
- DataSetIDfk : esriFieldTypeString
- ContactName : esriFieldTypeString
- PositionName : esriFieldTypeString
- Role : PartyRoleValue_v3
- Address : esriFieldTypeString
- OrganisationCode : esriFieldTypeString
- OrganisationName : esriFieldTypeString
- Country : esriFieldTypeString

Package_Objects::SourceMethodType
- ObjectIDfk : esriFieldTypeString
- «SubtypeField» -MethodScheme : esriFieldTypeInteger
- MethodValue : esriFieldTypeString
- MethodReference : esriFieldTypeString
- SourceDatabase : esriFieldTypeString

Package_Objects::**ParameterValuePair**
- ObjectIDfk : esriFieldTypeString
- Parameter : esriFieldTypeString
- Value : esriFieldTypeDouble
- UnitOfMeasure : esriFieldTypeString
- ValidTime : esriFieldTypeString

Package_Objects::**MarineExtent**
- ObjectIDfk : esriFieldTypeString
- Extent : esriFieldTypeString
- WaterLevel : WaterLevelValue_v3

SeaRegions::MarineCirculationZone
- ZoneType : esriFieldTypeString

Package_Objects::**RelatedParty**
- ObjectIDfk : esriFieldTypeString
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- DataSetIDfk : esriFieldTypeString
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Package_Objects::**ParameterValuePair**
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- Parameter : esriFieldTypeString
- Value : esriFieldTypeDouble
- UnitOfMeasure : esriFieldTypeString
- ValidTime : esriFieldTypeString

Package_Objects::MarineExtent
- ObjectIDfk : esriFieldTypeString
- Extent : esriFieldTypeString
- WaterLevel : WaterLevelValue_v3

SeaRegions::InterTidalArea
- HighWaterLevel : WaterLevelValue_v3
- LowWaterLevel : WaterLevelValue_v3

SeaRegions::Coastline

SeaRegions::ShoreSegment
- SegmentID : esriFieldTypeString
- ShoreClassification : esriFieldTypeString
- ShoreStability : esriFieldTypeString

Package_Objects::**RelatedParty**
- ObjectIDfk : esriFieldTypeString
- AreaIDfk : esriFieldTypeString
- DataSetIDfk : esriFieldTypeString
- ContactName : esriFieldTypeString
- PositionName : esriFieldTypeString
- Role : PartyRoleValue_v3
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- OrganisationCode : esriFieldTypeString
- OrganisationName : esriFieldTypeString
- Country : esriFieldTypeString

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- Role : PartyRoleValue_v3
- Address : esriFieldTypeString
- OrganisationCode : esriFieldTypeString
- OrganisationName : esriFieldTypeString
- Country : esriFieldTypeString

Package_Objects::SourceMethodType
- ObjectIDfk : esriFieldTypeString
- «SubtypeField» -MethodScheme : esriFieldTypeInteger
- MethodValue : esriFieldTypeString
- MethodReference : esriFieldTypeString
- SourceDatabase : esriFieldTypeString

SeaRegions::MarineContour
- ContourID : esriFieldTypeString
- Phenomenon : esriFieldTypeString
- Value : esriFieldTypeDouble
- ValidTime : esriFieldTypeString
- BeginLifespanVersion : esriFieldTypeDate
- EndLifespanVersion : esriFieldTypeDate
- Metadata : esriFieldTypeString

Package_Objects::**RelatedParty**
- ObjectIDfk : esriFieldTypeString
- AreaIDfk : esriFieldTypeString
- DataSetIDfk : esriFieldTypeString
- ContactName : esriFieldTypeString
- PositionName : esriFieldTypeString
- Role : PartyRoleValue_v3
- Address : esriFieldTypeString
- OrganisationCode : esriFieldTypeString
- OrganisationName : esriFieldTypeString
- Country : esriFieldTypeString

Package_Objects::**SourceMethodType**
- ObjectIDfk : esriFieldTypeString
- «SubtypeField» -MethodScheme : esriFieldTypeInteger
- MethodValue : esriFieldTypeString
- MethodReference : esriFieldTypeString
- SourceDatabase : esriFieldTypeString

SeaRegions::SeaSurfaceArea
- SurfaceType : esriFieldTypeString

Package_Objects::RelatedParty
- ObjectIDfk : esriFieldTypeString
- AreaIDfk : esriFieldTypeString
- DataSetIDfk : esriFieldTypeString
- ContactName : esriFieldTypeString
- PositionName : esriFieldTypeString
- Role : PartyRoleValue_v3
- Address : esriFieldTypeString
- OrganisationCode : esriFieldTypeString
- OrganisationName : esriFieldTypeString
- Country : esriFieldTypeString

Package_Objects::**SourceMethodType**
- ObjectIDfk : esriFieldTypeString
- «SubtypeField» -MethodScheme : esriFieldTypeInteger
- MethodValue : esriFieldTypeString
- MethodReference : esriFieldTypeString
- SourceDatabase : esriFieldTypeString

SeaRegions::SeaBedArea
- SurfaceType : esriFieldTypeString

Package_Objects::**RelatedParty**
- ObjectIDfk : esriFieldTypeString
- AreaIDfk : esriFieldTypeString
- DataSetIDfk : esriFieldTypeString
- ContactName : esriFieldTypeString
- PositionName : esriFieldTypeString
- Role : PartyRoleValue_v3
- Address : esriFieldTypeString
- OrganisationCode : esriFieldTypeString
- OrganisationName : esriFieldTypeString
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- «SubtypeField» -MethodScheme : esriFieldTypeInteger
- MethodValue : esriFieldTypeString
- MethodReference : esriFieldTypeString
- SourceDatabase : esriFieldTypeString

Package_Features::**BiogeographicalRegion**
- RegionID : esriFieldTypeString
- RegionClassification : RegionClassificationValue_v3
- RegionClassificationScheme : esriFieldTypeString = MarineStrategyFrameworkDirective
- RegionClassificationLevel : RegionClassificationLevelValue_v3
- BeginLifespanVersion : esriFieldTypeDate
- EndLifespanVersion : esriFieldTypeDate
- Metadata : esriFieldTypeString

Package_Objects::**RelatedParty**
- ObjectIDfk : esriFieldTypeString
- AreaIDfk : esriFieldTypeString
- DataSetIDfk : esriFieldTypeString
- ContactName : esriFieldTypeString
- PositionName : esriFieldTypeString
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- Address : esriFieldTypeString
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Package_Objects::SourceMethodType
- ObjectIDfk : esriFieldTypeString
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- MethodValue : esriFieldTypeString
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ALLEGATO 4 – Layer visualization