Geology

Geodatabase

Version 3

WP9 Data Management and Synthesis

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January 2016

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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 organized 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, centered on science-based guidelines, criteria, concepts and models.

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

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 Protected Sites Geodatabase is inspired. 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 Geology Geodatabase stores spatial data (vector, grid and raster) and nonspatial data.

The structure with data of the Geodatabase is available as .xml file, OGC services (WFS, WMS) and in the Google Earth file format (.kmz).

3. Geodatabase architecture

The Geology Geodatabase consists of five Feature Datasets (GeologicalSamples, GeologicalStructures, GeologicalUnits, GeomorphologicalFeatures, GeophysicalMeasurements) and twenty-six Feature Classes (Borehole, Sample, Fold, ShearDisplacementStructure, BaseOfPlioQuaternary, BaseOfQuaternary, FST, HST, LIA, LithostratigraphicUnit, SeabedSubstrate, SeismicStratigraphicUnit, TS, TST, areal, linear and punctual AnthropGeomorphologicFeature, areal, linear and punctual NaturalGeomorphologicFeature, GeophProfile, GeophStation, OtherGeophMeasurement, Campaign, Project). The Feature Datasets and the Feature Classes are used to store vector data. In the Geodatabase there are twelve tables: AnalyticalSession. CampaignType, CompositionPart, DepthProfile, GeologicalCollection, GeologicalEvent, Images, PreparationProcess, ProfileType, RelatedParty, SourceMethodType, SurveyType). 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– GeologicalSamples

The Feature Dataset collects all the geological samples, it consist of two Feature Classes, that is, Sample and Borehole.

GeometryType: abstract
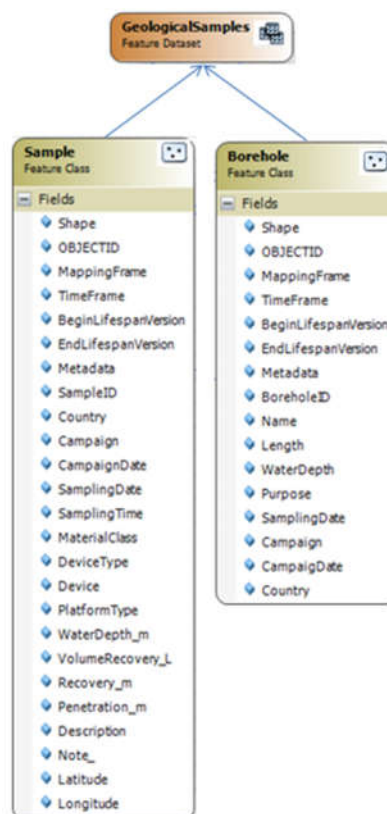
3.1.1. Feature Class: Borehole

A borehole is the generalized term for any narrow shaft drilled in the ground (D2.8.II.4_v3.0).

GeometryType: point

Field	Type	Restriction	Description
MappingFrame	String	Code Value Domain	The surface on which the mapped feature is projected (D2.8.II.4_v3.0).
TimeFrame	String	Code Value Domain	The geologic time to which the mapped feature refers
BeginLifespanVersion	Date	DD/MM/YYYY	Date at which this version of the spatial object was inserted or changed in the spatial data set (D2.8.II.4_v3.0).
EndLifespanVersion	Date	DD/MM/YYYY	Date at which this version of the spatial object was superseded or retired in the spatial data set (D2.8.II.4_v3.0).
Metadata	String	None	The name of the metadata file available on the SeaDataNet repository
BoreholeID	String	None	Identification string of the borehole
Name	String	None	The name of the geologic feature (D2.8.II.4_v3.0).
Length	Double	None	The distance along a borehole (D2.8.II.4_v3.0).
WaterDepth	Double	None	Water depth in the point where the borehole is located measured in meters
Purpose	String	Code Value Domain	The purpose for which the borehole was drilled (D2.8.II.4_v3.0).
SamplingDate	Date	DD/MM/YYYY	Date of the sampling
Campaign	String	None	Name of the campaign
CampaigDate	Integer	HH:MM:SS	Year of the campaign
Country	String	Code Value Domain	Country to which the borehole belongs

3.1.2. Feature Class: Sample

The Feature Class collects punctual geologic samples.

GeometryType: point

Field	Type	Restriction	Description
MappingFrame	String	Code Value Domain	The surface on which the mapped feature is projected (D2.8.II.4_v3.0).
TimeFrame	String	Code Value Domain	The geologic time to which the mapped feature refers
BeginLifespanVersion	Date	DD/MM/YYYY	Date at which this version of the spatial object was inserted or changed in the spatial data set (D2.8.II.4_v3.0).
EndLifespanVersion	Date	DD/MM/YYYY	Date at which this version of the spatial object was superseded or retired in the spatial data set (D2.8.II.4_v3.0).
Metadata	String	None	The name of the metadata file available on the SeaDataNet repository
SampleID	String	None	Identification string of the sample
Country	String	Code Value Domain	Country where the sample was taken
Campaign	String	None	Name of the campaign
CampaigDate	Integer	YYYY	Year of the campaign
SamplingDate	Date	DD/MM/YYYY	Date of the sampling
SamplingTime	String	HH:MM:SS	Time of the sampling

MaterialClass	String	Code Value Domain	Basic classification of the material type of the sample (D2.8.II.4_v3.0)
DeviceType	String	Code Value Domain	Type of the device used to sampling
Device	String	Code Value Domain	Device used to sampling
PlatformType	String	Code Value Domain	Platform from which the measurement was carried out (D2.8.II.4_v3.0)
WaterDepth_m	Double	None	Water depth in the point where the borehole is located measured in meters
VolumeRecovery_L	Double	None	Quantity of the sample recovered expressed in liter (this field is usually used with grabs)
Recovery_m	Double	None	Quantity of the sample recovered expressed meters (this field is usually used with cores)
Penetration_m	Double	None	Penetration of the device in the seefloor expressed in meters (this field is usually used with cores)
Description	String	None	Description of the sample
Note_	String	None	Some notes related to the sample recovery
Latitude	String	XX.xxxxxx	Latitude of the sampling point expressed in geographical coordinates
Longitude	String	YY.yyyyyy	Longitude of the sampling point expressed in geographical coordinates

3.2.   Feature Dataset– GeologicalStructures

A configuration of matter in the Earth based on describable inhomogeneity, pattern, or fracture in an earth material (D2.8.II.4_v3.0).

GeometryType: abstract
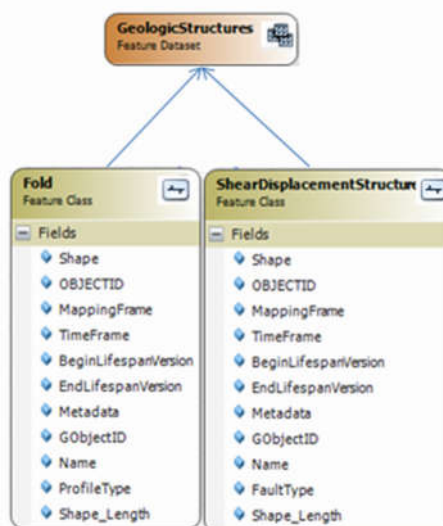
3.2.1. Feature Class: Fold

One or more systematically curved layers, surfaces, or lines in a rock body. A fold denotes a structure formed by the deformation of a Geologic Structure to form a structure that may be described by the translation of an abstract line (the fold axis) parallel to itself along some curvilinear path (the fold profile).

Folds have a hinge zone (zone of maximum curvature along the surface) and limbs (parts of the deformed surface not in the hinge zone) (D2.8.II.4_v3.0).

GeometryType: polyline

Field	Type	Restriction	Description
MappingFrame	String	Code Value Domain	The surface on which the mapped feature is projected (D2.8.II.4_v3.0).
TimeFrame	String	Code Value Domain	The geologic time to which the mapped feature refers
BeginLifespanVersion	Date	DD/MM/YYYY	Date at which this version of the spatial object was inserted or changed in the spatial data set (D2.8.II.4_v3.0).
EndLifespanVersion	Date	DD/MM/YYYY	Date at which this version of the spatial object was superseded or retired in the spatial data set (D2.8.II.4_v3.0).
Metadata	String	None	The name of the metadata file available on the SeaDataNet repository
GObjectID	String	None	Identification string of the geologic object
Name	String	None	Name of the geologic object
ProfileType	String	Code Value Domain	The type of the fold. Folds are typed according to the concave/convex geometry of the fold relative to the earth surface, and the relationship to younging direction in folded strata if known. EXAMPLE: antiform, synform, anticline, syncline, etc. (D2.8.II.4_v3.0)

3.2.2. Feature Class: ShearDisplacementStructure

Brittle to ductile style structures along which displacement has occurred. These range from a simple, single 'planar' brittle or ductile surface to a fault system comprised of tens of strands of both brittle and ductile nature (D2.8.II.4_v3.0).

GeometryType: polyline

Field	Type	Restriction	Description
MappingFrame	String	Code Value Domain	The surface on which the mapped feature is projected (D2.8.II.4_v3.0)
TimeFrame	String	Code Value Domain	The geologic time to which the mapped feature refers
BeginLifespanVersion	Date	DD/MM/YYYY	Date at which this version of the spatial object was inserted or changed in the spatial data set (D2.8.II.4_v3.0)
EndLifespanVersion	Date	DD/MM/YYYY	Date at which this version of the spatial object was superseded or retired in the spatial data set (D2.8.II.4_v3.0)
Metadata	String	None	The name of the metadata file available on the SeaDataNet repository
GObjectID	String	None	Identification string of the geologic object
Name	String	None	Name of the geologic object
FaultType	String	Code Value Domain	Refers to a vocabulary of terms describing the type of shear displacement structure. EXAMPLE: thrust fault, normal fault, wrench fault (D2.8.II.4_v3.0)

3.3. Feature Dataset– GeologicUnits

A volume of rock with distinct characteristics. Includes both formal units (i.e. formally adopted and named in an official lexicon) and informal units (i.e. named but not promoted to the lexicon) and unnamed units (i.e. recognisable and described and delineable in the field but not otherwise formalised).

GeometryType: abstract
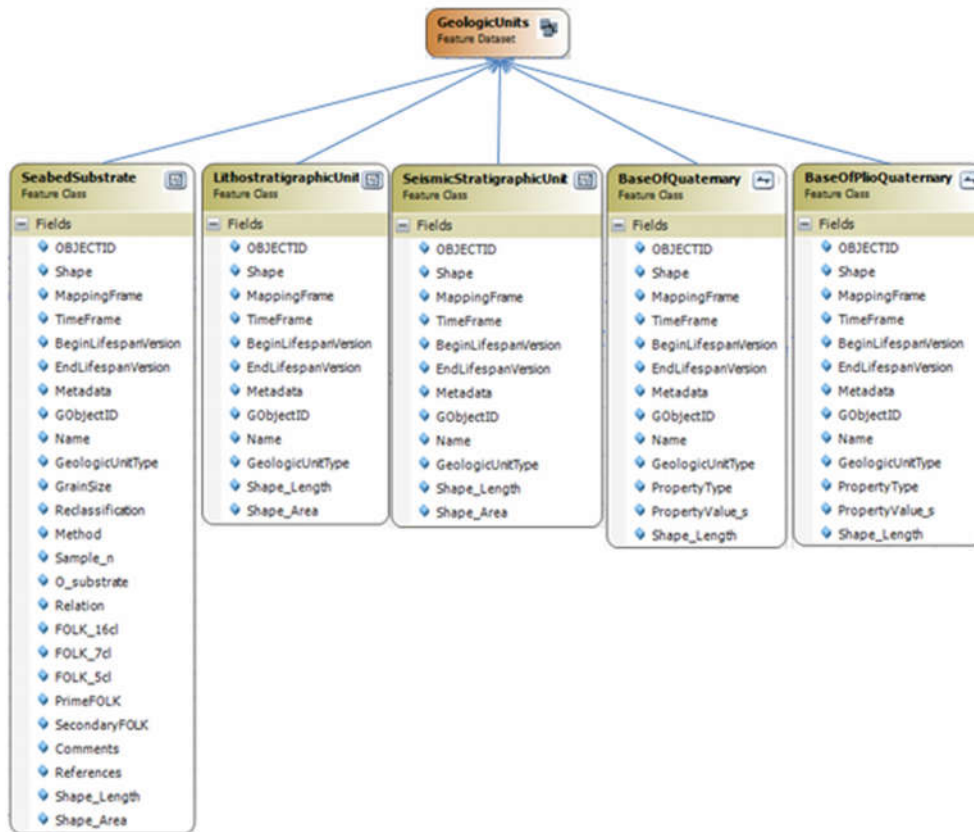
3.3.1. Feature Class: BaseOfPlioQuaternary

Base of the predominantely unconsolidated sedimentary material of Plio-Quaternary age (D2.8.II.4_v3.0).

GeometryType: polyline

Field	Type	Restriction	Description
MappingFrame	String	Code Value Domain	The surface on which the mapped feature is projected (D2.8.II.4_v3.0)
TimeFrame	String	Code Value Domain	The geologic time to which the mapped feature refers
BeginLifespanVersion	Date	DD/MM/YYYY	Date at which this version of the spatial object was inserted or changed in the spatial data set (D2.8.II.4_v3.0)
EndLifespanVersion	Date	DD/MM/YYYY	Date at which this version of the spatial object was superseded or retired in the spatial data set (D2.8.II.4_v3.0)
Metadata	String	None	The name of the metadata file available on the

			SeaDataNet repository
GObjectID	String	None	Identification string of the geologic object
Name	String	None	Name of the geologic object
GeologicUnitType	String	Code Value Domain	The type of geological the unit. Logical constraints of definition of unit and valid property cardinalities should be contained in the definition (D2.8.II.4_v3.0)
PropertyType	String	Code Value Domain	Type of property represented, for example, depth, thickness, time)
PropertyValue_s	Double	None	Value of the property in the field "PropertyType" expressed in seconds

3.3.2. Feature Class: BaseOfQuaternary

The Feature Class collects Base of the predominantely unconsolidated sedimentary material of Quaternary age (D2.8.II.4_v3.0).

GeometryType: polyline

Field	Type	Restriction	Description
MappingFrame	String	Code Value Domain	The surface on which the mapped feature is projected (D2.8.II.4_v3.0)
TimeFrame	String	Code Value Domain	The geologic time to which the mapped feature refers
BeginLifespanVersion	Date	DD/MM/YYYY	Date at which this version of the spatial object was inserted or changed in the spatial data set (D2.8.II.4_v3.0)
EndLifespanVersion	Date	DD/MM/YYYY	Date at which this version of the spatial object was superseded or retired in the spatial data set (D2.8.II.4_v3.0)
Metadata	String	None	The name of the metadata file available on the SeaDataNet repository
GObjectID	String	None	Identification string of the geologic object
Name	String	None	Name of the geologic object
GeologicUnitType	String	Code Value Domain	The type of geological the unit. Logical constraints of definition of unit and valid property cardinalities should be contained in the definition (D2.8.II.4_v3.0)
PropertyType	String	Code Value Domain	Type of property represented, for example, depth, thickness, time)
PropertyValue_s	Double	None	Value of the property in the field "PropertyType" expressed in seconds

3.3.3. Feature Class: FST

Falling-stage Systems Tract (FST). A complete sequence begins at one sequence boundary and ends at the next sequence boundary. A complete sequence consists of four systems tracts, from bottom to top: lowstand systems tract, transgressive systems tract, highstand systems tract, falling-stage systems tract. Although all four systems tracts will be present in the sedimentary basin, not all will be present at any given spot. In particular, falling-stage and lowstand systems tracts are commonly absent in depositionally updip areas. Transgressive and highstand systems tracts may be thin, absent, or difficult to distinguish in depositionally downdip areas (http://strata.uga.edu/sequence/tracts.html).

GeometryType: polygon

Field	Type	Restriction	Description
MappingFrame	String	Code Value Domain	The surface on which the mapped feature is projected (D2.8.II.4_v3.0)
TimeFrame	String	Code Value Domain	The geologic time to which the mapped feature refers
BeginLifespanVersion	Date	DD/MM/YYYY	Date at which this version of the spatial object was inserted or changed in the spatial data set (D2.8.II.4_v3.0)
EndLifespanVersion	Date	DD/MM/YYYY	Date at which this version of the spatial object was superseded or retired in the spatial data set (D2.8.II.4_v3.0)
Metadata	String	None	The name of the metadata file available on the SeaDataNet repository
GObjectID	String	None	Identification string of the geologic object
Name	String	None	Name of the geologic object
GeologicUnitType	String	Code Value Domain	The type of geological the unit. Logical constraints of definition of unit and valid property cardinalities should be contained in the definition (D2.8.II.4_v3.0)
PropertyType	String	Code Value Domain	Type of property represented, for example, depth, thickness, time). In this case the property refers to an interval of values.
PropertyValue_ms	Double	None	Not used
LowerBound_ms	Double	None	Lower value of the of the property in the field "PropertyType" expressed in milliseconds
UpperBound_ms	Double	None	Upper value of the of the property in the field "PropertyType" expressed in milliseconds

3.3.4. Feature Class: HST

Highstand Systems Tract (HST). The end of the depositional sequence is marked by the return of a fall in sea-level and the formation of falling-stage systems tract (http://strata.uga.edu/sequence/tracts.html).

GeometryType: polygon

Field	Type	Restriction	Description
MappingFrame	String	Code Value Domain	The surface on which the mapped feature is projected (D2.8.II.4_v3.0)
TimeFrame	String	Code Value Domain	The geologic time to which the mapped feature refers
BeginLifespanVersion	Date	DD/MM/YYYY	Date at which this version of the spatial object was inserted or changed in the spatial data set (D2.8.II.4_v3.0)
EndLifespanVersion	Date	DD/MM/YYYY	Date at which this version of the spatial object was superseded or retired in the spatial data set (D2.8.II.4_v3.0)
Metadata	String	None	The name of the metadata file available on the SeaDataNet repository
GObjectID	String	None	Identification string of the geologic object
Name	String	None	Name of the geologic object
GeologicUnitType	String	Code Value	The type of geological the unit. Logical constraints of

		Domain	definition of unit and valid property cardinalities should be contained in the definition (D2.8.II.4_v3.0)
PropertyType	String	Code Value Domain	Type of property represented, for example, depth, thickness, time). In this case the property refers to an interval of values.
PropertyValue_ms	Double	None	Not used
LowerBound_ms	Double	None	Lower value of the of the property in the field "PropertyType" expressed in milliseconds
UpperBound_ms	Double	None	Upper value of the of the property in the field "PropertyType" expressed in milliseconds

3.3.5. Feature Class: LIA

Little Ice Age (LIA), climate interval that occurred from the early 14th century through the mid-19th century, when mountain glaciers expanded at several locations.

GeometryType: polygon

Field	Type	Restriction	Description
MappingFrame	String	Code Value Domain	The surface on which the mapped feature is projected (D2.8.II.4_v3.0)
TimeFrame	String	Code Value Domain	The geologic time to which the mapped feature refers
BeginLifespanVersion	Date	DD/MM/YYYY	Date at which this version of the spatial object was inserted or changed in the spatial data set (D2.8.II.4_v3.0)
EndLifespanVersion	Date	DD/MM/YYYY	Date at which this version of the spatial object was superseded or retired in the spatial data set (D2.8.II.4_v3.0)
Metadata	String	None	The name of the metadata file available on the SeaDataNet repository
GObjectID	String	None	Identification string of the geologic object
Name	String	None	Name of the geologic object
GeologicUnitType	String	Code Value Domain	The type of geological the unit. Logical constraints of definition of unit and valid property cardinalities should be contained in the definition (D2.8.II.4_v3.0)
PropertyType	String	Code Value Domain	Type of property represented, for example, depth, thickness, time). In this case the property refers to an interval of values.
PropertyValue_ms	Double	None	Not used
LowerBound_ms	Double	None	Lower value of the of the property in the field "PropertyType" expressed in milliseconds
UpperBound_ms	Double	None	Upper value of the of the property in the field "PropertyType" expressed in milliseconds

3.3.6. Feature Class: LithostratigraphicUnit

Geologic unit defined on the basis of observable and distinctive lithologic properties or combination of lithologic properties and stratigraphic relationships (D2.8.II.4_v3.0).

GeometryType: polygon

Field	Type	Restriction	Description
MappingFrame	String	Code Value Domain	The surface on which the mapped feature is projected (D2.8.II.4_v3.0)
TimeFrame	String	Code Value Domain	The geologic time to which the mapped feature refers
BeginLifespanVersion	Date	DD/MM/YYYY	Date at which this version of the spatial object was inserted or changed in the spatial data set (D2.8.II.4_v3.0)
EndLifespanVersion	Date	DD/MM/YYYY	Date at which this version of the spatial object was superseded or retired in the spatial data set (D2.8.II.4_v3.0)
Metadata	String	None	The name of the metadata file available on the SeaDataNet repository
GObjectID	String	None	Identification string of the geologic object
Name	String	None	Name of the geologic object
GeologicUnitType	String	Code Value Domain	The type of geological the unit. Logical constraints of definition of unit and valid property cardinalities should be contained in the definition (D2.8.II.4_v3.0)

3.3.7. Feature Class: SeabedSubstrate

Seabed substrate map.

GeometryType: polygon

Field	Type	Restriction	Description
MappingFrame	String	Code Value Domain	The surface on which the mapped feature is projected (D2.8.II.4_v3.0)
TimeFrame	String	Code Value Domain	The geologic time to which the mapped feature refers
BeginLifespanVersion	Date	DD/MM/YYYY	Date at which this version of the spatial object was inserted or changed in the spatial data set (D2.8.II.4_v3.0)
EndLifespanVersion	Date	DD/MM/YYYY	Date at which this version of the spatial object was superseded or retired in the spatial data set (D2.8.II.4_v3.0)
Metadata	String	None	The name of the metadata file available on the SeaDataNet repository
GObjectID	String	None	Identification string of the geologic object
Name	String	None	Name of the geologic object
GeologicUnitType	String	Code Value Domain	The type of geological the unit. Logical constraints of definition of unit and valid property cardinalities should be contained in the definition (D2.8.II.4_v3.0)
GrainSize	String	None	EMODnet-Geology
Reclassification	String	Code Value Domain	EMODnet-Geology
Method	String	Code Value Domain	EMODnet-Geology
Sample_n	Integer	None	EMODnet-Geology
O_substrate	String	None	EMODnet-Geology
Relation	String	Code Value Domain	EMODnet-Geology

Field	Type	Restriction	Description
FOLK_16cl	String	Code Value Domain	EMODnet-Geology
FOLK_7cl	String	Code Value Domain	EMODnet-Geology
FOLK_5cl	String	Code Value Domain	EMODnet-Geology
PrimeFOLK	String	Code Value Domain	EMODnet-Geology
SecondaryFOLK	String	Code Value Domain	EMODnet-Geology
Comments	String	None	EMODnet-Geology
References	String	None	EMODnet-Geology

3.3.8. Feature Class: SeismicStratigraphicUnit

Seismic Stratigraphy is basically a geologic approach to the stratigraphic interpretation of seismic data, this Feature Class represent the thickness of the genetic units.

GeometryType: polygon

Field	Type	Restriction	Description
MappingFrame	String	Code Value Domain	The surface on which the mapped feature is projected (D2.8.II.4_v3.0)
TimeFrame	String	Code Value Domain	The geologic time to which the mapped feature refers
BeginLifespanVersion	Date	DD/MM/YYYY	Date at which this version of the spatial object was inserted or changed in the spatial data set (D2.8.II.4_v3.0)
EndLifespanVersion	Date	DD/MM/YYYY	Date at which this version of the spatial object was superseded or retired in the spatial data set (D2.8.II.4_v3.0)
Metadata	String	None	The name of the metadata file available on the SeaDataNet repository
GObjectID	String	None	Identification string of the geologic object
Name	String	None	Name of the geologic object
GeologicUnitType	String	Code Value Domain	The type of geological the unit. Logical constraints of definition of unit and valid property cardinalities should be contained in the definition (D2.8.II.4_v3.0)

3.3.9. Feature Class: TS

TS system tract (TS).

GeometryType: polyline

Field	Type	Restriction	Description
MappingFrame	String	Code Value Domain	The surface on which the mapped feature is projected (D2.8.II.4_v3.0)
TimeFrame	String	Code Value Domain	The geologic time to which the mapped feature refers
BeginLifespanVersion	Date	DD/MM/YYYY	Date at which this version of the spatial object was inserted or changed in the spatial data set

			(D2.8.II.4_v3.0)
EndLifespanVersion	Date	DD/MM/YYYY	Date at which this version of the spatial object was superseded or retired in the spatial data set (D2.8.II.4_v3.0)
Metadata	String	None	The name of the metadata file available on the SeaDataNet repository
GObjectID	String	None	Identification string of the geologic object
Name	String	None	Name of the geologic object
GeologicUnitType	String	Code Value Domain	The type of geological the unit. Logical constraints of definition of unit and valid property cardinalities should be contained in the definition (D2.8.II.4_v3.0)
PropertyType	String	Code Value Domain	Type of property represented, for example, depth, thickness, time). In this case the property refers to an interval of values.
PropertyValue_ms	Double	None	Not used
LowerBound_ms	Double	None	Lower value of the of the property in the field "PropertyType" expressed in milliseconds
UpperBound_ms	Double	None	Upper value of the of the property in the field "PropertyType" expressed in milliseconds

3.3.10. Feature Class: TST

Transgressive Systems Tract (TST). Eventually the rate of eustatic rise will slow and be outpaced by the rate of sedimentation, leading to progradational stacking in the highstand systems tract. The turnaround from retrogradational stacking in the transgressive systems tract to progradational stacking in the highstand systems tracts generally corresponds to the deepest water depths in a sequence and is called the maximum flooding surface. As estuaries become filled with sediment, rivers build deltas out onto shelves, and this sediment is dispersed by tides and waves to nearby regions. This elevated supply of sediment to the shelves favors the development of progradational stacking (http://strata.uga.edu/sequence/tracts.html).

GeometryType: polygon

Field	Type	Restriction	Description
MappingFrame	String	Code Value Domain	The surface on which the mapped feature is projected (D2.8.II.4_v3.0)
TimeFrame	String	Code Value Domain	The geologic time to which the mapped feature refers
BeginLifespanVersion	Date	DD/MM/YYYY	Date at which this version of the spatial object was inserted or changed in the spatial data set (D2.8.II.4_v3.0)
EndLifespanVersion	Date	DD/MM/YYYY	Date at which this version of the spatial object was superseded or retired in the spatial data set (D2.8.II.4_v3.0)
Metadata	String	None	The name of the metadata file available on the SeaDataNet repository
GObjectID	String	None	Identification string of the geologic object
Name	String	None	Name of the geologic object
GeologicUnitType	String	Code Value Domain	The type of geological the unit. Logical constraints of definition of unit and valid property cardinalities should be contained in the definition (D2.8.II.4_v3.0)
PropertyType	String	Code Value	Type of property represented, for example, depth,

Field	Type	Restriction	Description
		Domain	thickness, time). In this case the property refers to an interval of values.
PropertyValue_ms	Double	None	Not used
LowerBound_ms	Double	None	Lower value of the of the property in the field "PropertyType" expressed in milliseconds
UpperBound_ms	Double	None	Upper value of the of the property in the field "PropertyType" expressed in milliseconds

3.4. Feature Dataset– GeomorphologicalFeatures

The abstract GeomorphologicFeature class is a point, linear or areal landform or landscape. It is a natural or an anthropogenic surface feature and may be erosional, depositional or both. GeomorphologicFeature has two subtypes: NaturalGeomorphologicFeature and AnthropogenicGeomorphologicFeatureGeometryType: abstract (D2.8.II.4_v3.0).

3.4.1. Feature Class: AnthropGeomorphologicFeature

A geomorphologic feature (ie, landform) which has been created by human activity. EXAMPLE: dredged channel, midden, open pit, reclaimed land (D2.8.II.4_v3.0).

GeometryType: polygon, polyline, point

Field	Type	Restriction	Description
MappingFrame	String	Code Value Domain	The surface on which the mapped feature is projected (D2.8.II.4_v3.0)
TimeFrame	String	Code Value Domain	The geologic time to which the mapped feature refers
BeginLifespanVersion	Date	DD/MM/YYYY	Date at which this version of the spatial object was inserted or changed in the spatial data set (D2.8.II.4_v3.0)
EndLifespanVersion	Date	DD/MM/YYYY	Date at which this version of the spatial object was superseded or retired in the spatial data set (D2.8.II.4_v3.0)
Metadata	String	None	The name of the metadata file available on the SeaDataNet repository
GObjectID	String	None	Identification string of the geologic object
Name	String	None	Name of the geologic object
AntGeomorphologicFeatureType	String	Code Value Domain	Terms describing the type of a geomorphologic feature (D2.8.II.4_v3.0)

3.4.2. Feature Class: NaturalGeomorphologicalFeature

A geomorphologic feature (ie, landform) that has been created by natural Earth processes. EXAMPLE: river channel, beach ridge, caldera, canyon, moraine, mud flat (D2.8.II.4_v3.0).

GeometryType: polygon, polyline, point

Field	Type	Restriction	Description
MappingFrame	String	Code Value Domain	The surface on which the mapped feature is projected (D2.8.II.4_v3.0)
TimeFrame	String	Code Value Domain	The geologic time to which the mapped feature refers

BeginLifespanVersion	Date	DD/MM/YYYY	Date at which this version of the spatial object was inserted or changed in the spatial data set (D2.8.II.4_v3.0)
EndLifespanVersion	Date	DD/MM/YYYY	Date at which this version of the spatial object was superseded or retired in the spatial data set (D2.8.II.4_v3.0)
Metadata	String	None	The name of the metadata file available on the SeaDataNet repository
GObjectID	String	None	Identification string of the geologic object
Name	String	None	Name of the geologic object
NatGeomorphologicFeatureType	String	Code Value Domain	The type of the natural geomorphologic feature (D2.8.II.4_v3.0)
Activity	String	Code Value Domain	The level of activity of the natural geomorphologic feature (D2.8.II.4_v3.0)

3.5. Feature Dataset– GeophysicalMeasurements

A generic class for geophysical objects. it models single geophysical entities that are used for spatial sampling either by means of data acquisition or data processing. In the D2.8.II.4_v3.0 this abstract class is named GeophObject.

GeometryType: abstract
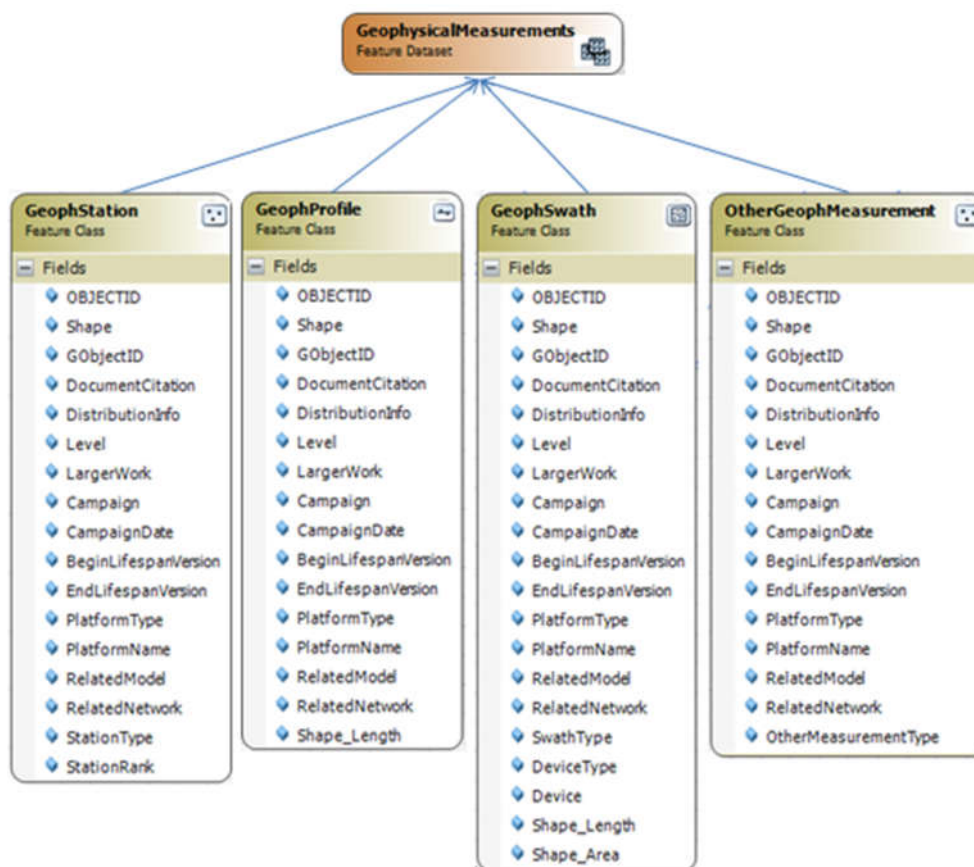
3.5.1. FeatureClass: GeophStation

Geophysical measurement spatially referenced to a single point location. Used to collect data at a single location. The source-sensor setup may be elongated or two dimensional, but the collected data is spatially referenced to a single point. Example: Gravity station, Magnetic station (D2.8.II.4_v3.0).

GeometryType: point

Field	Type	Restriction	Description
GObjectID	String	None	Identification string of the geophysical object
DocumentCitation	String	None	Citation of geophysical documentation. Used for title, date of related documentation and URL for online access. At the minimum a short name (title) shall be given (D2.8.II.4_v3.0)
DistributionInfo	String	None	Distribution metadata. Data providers may use external services to provide access to data or information on a survey. Links to the access points, description of ordering procedures, fees can be added in distributionInfo that is an ISO MD_Distributor record (D2.8.II.4_v3.0)
Level	String	CodeValue Domain	This field indicates if the object refers to deep geology or surface geology.
LargerWork	String	None	Identifier of a larger work dataset. The largerWork identifier points to the parent Campaign or Project (D2.8.II.4_v3.0)
Campaign	String	None	Campaign in which the geophysical object is acquired
CampaignDate	Integer	YYYY	Year of the campaign
BeginLifespanVersion	Date	DD/MM/YYYY	Date at which this version of the spatial object was inserted or changed in the spatial data set (D2.8.II.4_v3.0)
EndLifespanVersion	Date	DD/MM/YYYY	Date at which this version of the spatial object was superseded or retired in the spatial data set (D2.8.II.4_v3.0)
PlatformType	String	CodeValue Domain	Platform from which the measurement was carried out (D2.8.II.4_v3.0)
PlatformName	String	None	Name of the platform from which the measurement was carried out
RelatedModel	String	None	Identifier of the geophysical model that was created from the measurement (D2.8.II.4_v3.0)
RelatedNetwork	String	CodeValue Domain	Name of a national or international observation network to which the facility belongs, or to which measured data is reported (D2.8.II.4_v3.0)
StationType	String	CodeValue Domain	Type of geophysical station (D2.8.II.4_v3.0)
StationRank	String	CodeValue Domain	Geophysical stations may be part of a hierarchical system. Rank is proportional to the importance of a station (D2.8.II.4_v3.0)

3.5.2. Feature Class: GeophProfile

Geophysical measurement spatially referenced to a curve. Used to collect data along a curve. Examples: 2D seismic line (field measurement), borehole logging, airborne geophysical flight line (D2.8.II.4_v3.0).

GeometryType: polyline

Field	Type	Restriction	Description
GObjectID	String	None	Identification string of the geophysical object
DocumentCitation	String	None	Citation of geophysical documentation. Used for title, date of related documentation and URL for online access. At the minimum a short name (title) shall be given (D2.8.II.4_v3.0)
DistributionInfo	String	None	Distribution metadata. Data providers may use external services to provide access to data or information on a survey. Links to the access points, description of ordering procedures, fees can be added in distributionInfo that is an ISO MD_Distributor record (D2.8.II.4_v3.0)
Level	String	CodeValue Domain	This field indicates if the object refers to deep geology or surface geology.
LargerWork	String	None	Identifier of a larger work dataset. The largerWork identifier points to the parent Campaign or Project (D2.8.II.4_v3.0)
Campaign	String	None	Campaign in which the geophysical object is acquired
CampaignDate	Integer	YYYY	Year of the campaign
BeginLifespanVersion	Date	DD/MM/YYYY	Date at which this version of the spatial object was inserted or changed in the spatial data set (D2.8.II.4_v3.0)
EndLifespanVersion	Date	DD/MM/YYYY	Date at which this version of the spatial object was superseded or retired in the spatial data set (D2.8.II.4_v3.0)
PlatformType	String	CodeValue Domain	Platform from which the measurement was carried out (D2.8.II.4_v3.0)
PlatformName	String	None	Name of the platform from which the measurement was carried out
RelatedModel	String	None	Identifier of the geophysical model that was created from the measurement (D2.8.II.4_v3.0)
RelatedNetwork	String	CodeValue Domain	Name of a national or international observation network to which the facility belongs, or to which measured data is reported (D2.8.II.4_v3.0)
ProfileType	String	CodeValue Domain	Type of geophysical profile

3.5.3. Feature Class: GeophSwath

Geophysical measurement spatially referenced to a surface. Used to collect data over a surface. Example: 3D seismic swath (D2.8.II.4_v3.0).

GeometryType: polygon

Field	Type	Restriction	Description
GObjectID	String	None	Identification string of the geophysical object
DocumentCitation	String	None	Citation of geophysical documentation. Used for title, date of related documentation and URL for online access. At the minimum a short name (title) shall be given (D2.8.II.4_v3.0)

DistributionInfo	String	None	Distribution metadata. Data providers may use external services to provide access to data or information on a survey. Links to the access points, description of ordering procedures, fees can be added in distributionInfo that is an ISO MD_Distributor record (D2.8.II.4_v3.0)
Level	String	CodeValue Domain	This field indicates if the object refers to deep geology or surface geology.
LargerWork	String	None	Identifier of a larger work dataset. The largerWork identifier points to the parent Campaign or Project (D2.8.II.4_v3.0)
Campaign	String	None	Campaign in which the geophysical object is acquired
CampaignDate	Integer	YYYY	Year of the campaign
BeginLifespanVersion	Date	DD/MM/YYYY	Date at which this version of the spatial object was inserted or changed in the spatial data set (D2.8.II.4_v3.0)
EndLifespanVersion	Date	DD/MM/YYYY	Date at which this version of the spatial object was superseded or retired in the spatial data set (D2.8.II.4_v3.0)
PlatformType	String	CodeValue Domain	Platform from which the measurement was carried out (D2.8.II.4_v3.0)
PlatformName	String	None	Name of the platform from which the measurement was carried out
RelatedModel	String	None	Identifier of the geophysical model that was created from the measurement (D2.8.II.4_v3.0)
RelatedNetwork	String	CodeValue Domain	Name of a national or international observation network to which the facility belongs, or to which measured data is reported (D2.8.II.4_v3.0)
SwathType	String	CodeValue Domain	Type of geophysical swath (D2.8.II.4_v3.0)
DeviceType	String	CodeValue Domain	Type of the device used to acquired the swath
Device	String	CodeValue Domain	Anme of the device used to acquired the swath

3.5.4. Feature Class: OtherGeophMeasurement

Generic class for any geophysical measurement type that is listed in the GeophMeasurementTypeValue code list (D2.8.II.4_v3.0).

GeometryType: point

Field	Type	Restriction	Description
GObjectID	String	None	Identification string of the geophysical object
DocumentCitation	String	None	Citation of geophysical documentation. Used for title, date of related documentation and URL for online access. At the minimum a short name (title) shall be given (D2.8.II.4_v3.0)
DistributionInfo	String	None	Distribution metadata. Data providers may use external services to provide access to data or information on a survey. Links to the access points, description of ordering procedures, fees can be

			added in distributionInfo that is an ISO MD_Distributor record (D2.8.II.4_v3.0)
Level	String	CodeValue Domain	This field indicates if the object refers to deep geology or surface geology.
LargerWork	String	None	Identifier of a larger work dataset. The largerWork identifier points to the parent Campaign or Project (D2.8.II.4_v3.0)
Campaign	String	None	Campaign in which the geophysical object is acquired
CampaignDate	Integer	YYYY	Year of the campaign
BeginLifespanVersion	Date	DD/MM/YYYY	Date at which this version of the spatial object was inserted or changed in the spatial data set (D2.8.II.4_v3.0)
EndLifespanVersion	Date	DD/MM/YYYY	Date at which this version of the spatial object was superseded or retired in the spatial data set (D2.8.II.4_v3.0)
PlatformType	String	CodeValue Domain	Platform from which the measurement was carried out (D2.8.II.4_v3.0)
PlatformName	String	None	Name of the platform from which the measurement was carried out
RelatedModel	String	None	Identifier of the geophysical model that was created from the measurement (D2.8.II.4_v3.0)
RelatedNetwork	String	CodeValue Domain	Name of a national or international observation network to which the facility belongs, or to which measured data is reported (D2.8.II.4_v3.0)
OtherMeasurementType	String	CodeValue Domain	Type of geophysical measurement

3.6. Feature Class: Campaign

Geophysical activity extending over a limited time range and limited area for producing similar geophysical measurements, processing results or models. Campaigns can be considered as parents of geophysical measurements or models. Children may refer to parent campaigns through the largerWork identifier (D2.8.II.4_v3.0).

GeometryType: polygon

Field	Type	Restriction	Description
ObjectID_	String	None	Identification string of the campaign
Name	String	None	Name of the campaign
Date_	Integer	YYYY	Year of the campaign
Level	String	None	This field indicates if the object refers to deep geology or surface geology.
DocumentCitation	String	None	Citation of geophysical documentation. Used for title, date of related documentation and URL for online access. At the minimum a short name (title) shall be given (D2.8.II.4_v3.0)
VerticalExtent	Integer	None	Vertical extent of the range of interest. This parameter serves discovery purposes. It may refer both to the vertical extent of the setup of measurements within the survey, or the extent of the range where processed data is spatially referenced to (estimated depth of investigation). The aim is to give an idea to the user about the estimated depth of investigation

			(D2.8.II.4_v3.0)
DistributionInfo	String	None	Distribution metadata. Data providers may use external services to provide access to data or information on a survey. Links to the access points, description of ordering procedures, fees can be added in distributionInfo that is an ISO MD_Distributor record (D2.8.II.4_v3.0)
LargerWork	String	None	Identifier of a larger work dataset. The largerWork identifier points to the parent Campaign or Project (D2.8.II.4_v3.0)
Attachment	Raster	None	Attached document related to the campaign, for example the final report
Client	String	None	Party for which data was created (D2.8.II.4_v3.0)
Contractor	String	None	Party by which data was created. Party responsible for creating the data related to the campaign (D2.8.II.4_v3.0)

3.7.   Feature Class: Project

Geophysical activity extending over a longer time range and larger area, containing any number of campaigns or subprojects. In the hierarchy of geophysical data sets projects are parents of geophysical campaigns, and usually cover whole exploration programs (D2.8.II.4_v3.0).

GeometryType: polygon

Field	Type	Restriction	Description
ObjectID_	String	None	Identification string of the campaign
Name	String	None	Name of the campaign
Date_	Integer	YYYY	Year of the campaign
Level	String	None	This field indicates if the object refers to deep geology or surface geology.
DocumentCitation	String	None	Citation of geophysical documentation. Used for title, date of related documentation and URL for online access. At the minimum a short name (title) shall be given (D2.8.II.4_v3.0)
VerticalExtent	Integer	None	Vertical extent of the range of interest. This parameter serves discovery purposes. It may refer both to the vertical extent of the setup of measurements within the survey, or the extent of the range where processed data is spatially referenced to (estimated depth of investigation). The aim is to give an idea to the user about the estimated depth of investigation (D2.8.II.4_v3.0)
DistributionInfo	String	None	Distribution metadata. Data providers may use external services to provide access to data or information on a survey. Links to the access points, description of ordering procedures, fees can be added in distributionInfo that is an ISO MD_Distributor record (D2.8.II.4_v3.0)
LargerWork	String	None	Identifier of a larger work dataset. The largerWork identifier points to the parent Campaign or Project (D2.8.II.4_v3.0)
Attachment	Raster	None	Attached document related to the campaign, for example the final report
PrincipalInvestigator	String	None	Main party responsible for the project

3.8. Object Classes

3.8.1. Object Class: AnalyticalSession

This class describes the time and operator of a particular laboratory analytical session. AnalyticalSession also has associated links to the type of instrument and analytical method used, processing steps applied to data collected during a session, and instrument parameters unique to that session (D2.8.II.4_v3.0).

Field	Type	Restriction	Description
SampleIDfk	String	None	Identification string of the sample involved in the analysis
Operator	String	None	The name of the operator or organization responsible for the analytical session (D2.8.II.4_v3.0)
Parameter	String	None	Environmental or instrument setting parameters that apply to an entire analytical session (D2.8.II.4_v3.0)
TimePeriod	String	None	The time period during which the analysis was performed (D2.8.II.4_v3.0)

3.8.2. Object Class: CampaignType

Type of geophysical campaign (D2.8.II.4_v3.0).

Field	Type	Restriction	Description
ObjectID_fk	String	None	Identification string of the campaign
CampaignType	String	Code Value Domain	Type od campaign

3.8.3. Object Class: CompositionPart

The composition of a geologic unit in terms of lithological constituents (D2.8.II.4_v3.0).

Field	Type	Restriction	Description
ObjectIDfk	String	None	Identification string of the geologic object
Material	String	Code Value Domain	The material that comprises part or all of the geologic unit (D2.8.II.4_v3.0)
Role	String	Code Value Domain	The relationship of the composition part to the geologic unit composition as a whole. EXAMPLE: vein, interbedded constituent, layers, dominant constituent (D2.8.II.4_v3.0)
Proportion	Double	None	Quantity that specifies the fraction of the geologic unit composed of the material (D2.8.II.4_v3.0)
Description	String	None	Short description of the composition part

3.8.4. Object Class: DepthProfile

The table collects profiles of various parameters along the depth component. It refers usually to core samples (D2.8.II.4_v3.0).

Field	Type	Restriction	Description
ObjectIDfk	String	None	Identification string of the geological sample
ObjectType	String	Code Value Domain	Type of the geological sample
Depth_cm	Double	None	Depth to which the value of the parameter refers expressed in centimeters
Parameter	String	Code Value Domain	Parameter to which the value in the field "Measure" refers

Measure	Double	None	Value of the parameter indicated in the field "Parameter" at the depth value reported in the field "Depth_cm)
UnitOfMeasure	String	None	Unit of measure of the value in the field "Measure"
OtherInformations	String	None	Other relevant information
Image_	Raster	None	Attached image of the profile

3.8.5. Object Class: GeologicCollection

A collection of geological or geophysical objects. Geologic objects are commonly grouped into collections such as geological maps, thematic maps, or the required input to a geological model.

Field	Type	Restriction	Description
ObjectIDfk	String	None	Identification string of the geological object
Name	String	None	The name of the collection (D2.8.II.4_v3.0).
CollectionType	String	Code Value Domain	The type of the collection (D2.8.II.4_v3.0)
Reference	String	None	A reference for the collection (D2.8.II.4_v3.0).

3.8.6. Object Class: GeologicEvent

An identifiable event during which one or more geological processes act to modify geological entities. A GeologicEvent should have a specified geologic age and process, and may have a specified environment. An example might be a cratonic uplift event during which erosion, sedimentation, and volcanism all take place. A GeologicEvent age can represent an instant in time or an interval of time (D2.8.II.4_v3.0).

Field	Type	Restriction	Description
ObjectIDfk	String	None	Identification string of the geological object
Name	String	None	The name of the Geologic Event (D2.8.II.4_v3.0)
SystemTract	String	None	System tract
EventEnvironment	String	Code Value Domain	The physical setting within which the geologic event takes place (D2.8.II.4_v3.0)
EventProcess	String	Code Value Domain	The process or processes that occurred during the geologic event (D2.8.II.4_v3.0)
OlderNameAge	String	Code Value Domain	Older boundary of the age of the event (D2.8.II.4_v3.0)
YoungerNameAge	String	Code Value Domain	Younger boundary of the age of the event (D2.8.II.4_v3.0)

3.8.7. Object Class: Images

Attached images.

Field	Type	Restriction	Description
ObjectIDfk	String	None	Identification string of the image
Image	Raster	None	Attached image

3.8.8. Object Class: PreparationProcess

Processes to prepare samples for analysis.

Field	Type	Restriction	Description
SampleIDfk	String	None	Identification string of the geological sample
Operator	String	None	The name of the operator or organization responsible for the analytical session (D2.8.II.4_v3.0)

Activity	String	Code Value Domain	Activity to prepare a sample for analysis
TimePeriod	String	None	The time period during which the analysis was performed (D2.8.II.4_v3.0)

3.8.9. Object Class: ProfileType

Type of geophysical profile (D2.8.II.4_v3.0).

Field	Type	Restriction	Description
ObjectIDfk	String	None	Identification string of the geophysical profile
ProfileType	String	Code Value Domain	Type of geophysical profile (D2.8.II.4_v3.0)
DeviceType	String	Code Value Domain	Type of device with which the geophysical profile has been acquired

3.8.10. Object Class: RelatedParty

An organization or a person with a role related to a resource (D2.5_v3.4).

Field	Type	Restriction	Description
ObjectIDfk	String	None	Identification string of the object. The field is used as foreign key.
IndividualName	String	None	Name of the related party (D2.5_v3.4)
PositionName	String	None	Position of the party in relation to a resource, such as head of department (D2.5_v3.4).
Role	String	Code Value Domain	Role(s) of the party in relation to a resource, such as owner (D2.5_v3.4).
Contact	String	None	Contact information for the related party (D2.5_v3.4).
OrganizationCode	String	None	Code of the related organization (D2.5_v3.4).
OrganizationName	String	None	Name of the related organization (D2.5_v3.4).
Country	String	Code Value Domain	Country of the related organization (D2.5_v3.4).

3.8.11. Object Class: SourceMethodType

Contains metadata about specific instances of the object. Refers to the methods on how observations have been made or recorded (D2.8.III.18_v3.0).

Field	Type	Restriction	Description
ObjectIDfk	String	None	Identification string of the object. The field is used as foreign key.
MethodScheme	String	Subtype	Scheme used to compiling the Method Value field (Article17SourceMethodValue or GeneralSourceMethod) (D2.8.III.18_v3.0).
MethodValue	String	Code Value Domain	Method by which the data is collected (D2.8.III.18_v3.0).
MethodReference	String	None	A reference to a description of the method by which the data on the object is collected (D2.8.III.18_v3.0).
SourceDatabase	String	None	Name of the database where the data is retrieved from (D2.8.III.18_v3.0).

3.8.12. Object Class: SurveyType

Type of geophysical survey (D2.8.II.4_v3.0).

Field	Type	Restriction	Description
ObjectID_fk	String	None	Identification string of the campaign
SurveyType	String	Code Value Domain	Type of geophysical survey (D2.8.II.4_v3.0)

3.9.   Relationship Classes
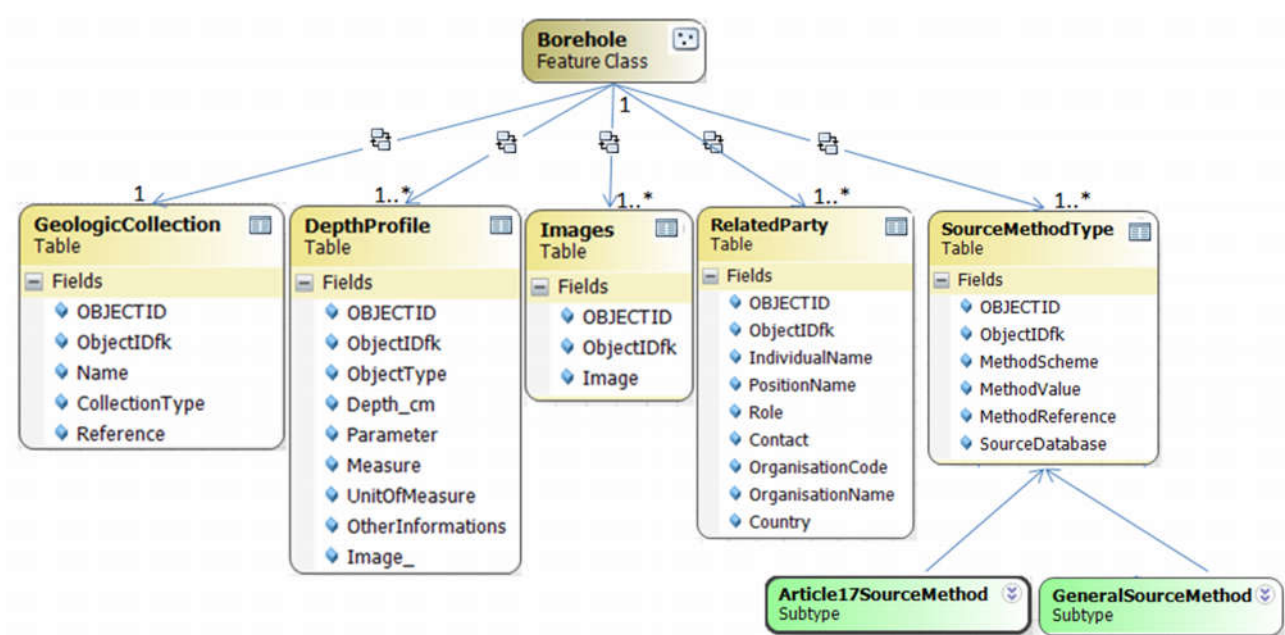
Name	Multiplicity	Origin class	Destination class	Primary key	Foreign key
BoreholeHas GeologicalCollection	1→1	Borehole	GeologicalCollection	Borehole ID	ObjectIDfk
BoreholeHas Images	1→1..*	Borehole	Images	Borehole ID	ObjectIDfk
BoreholeHas DepthProfile	1→1..*	Borehole	DepthProfile	Borehole ID	ObjectIDfk
BoreholeHas SourceMethodType	1→1..*	Borehole	SourceMethodType	Borehole ID	ObjectIDfk
BoreholeHas RelatedParty	1→1..*	Borehole	RelatedParty	Borehole ID	ObjectIDfk
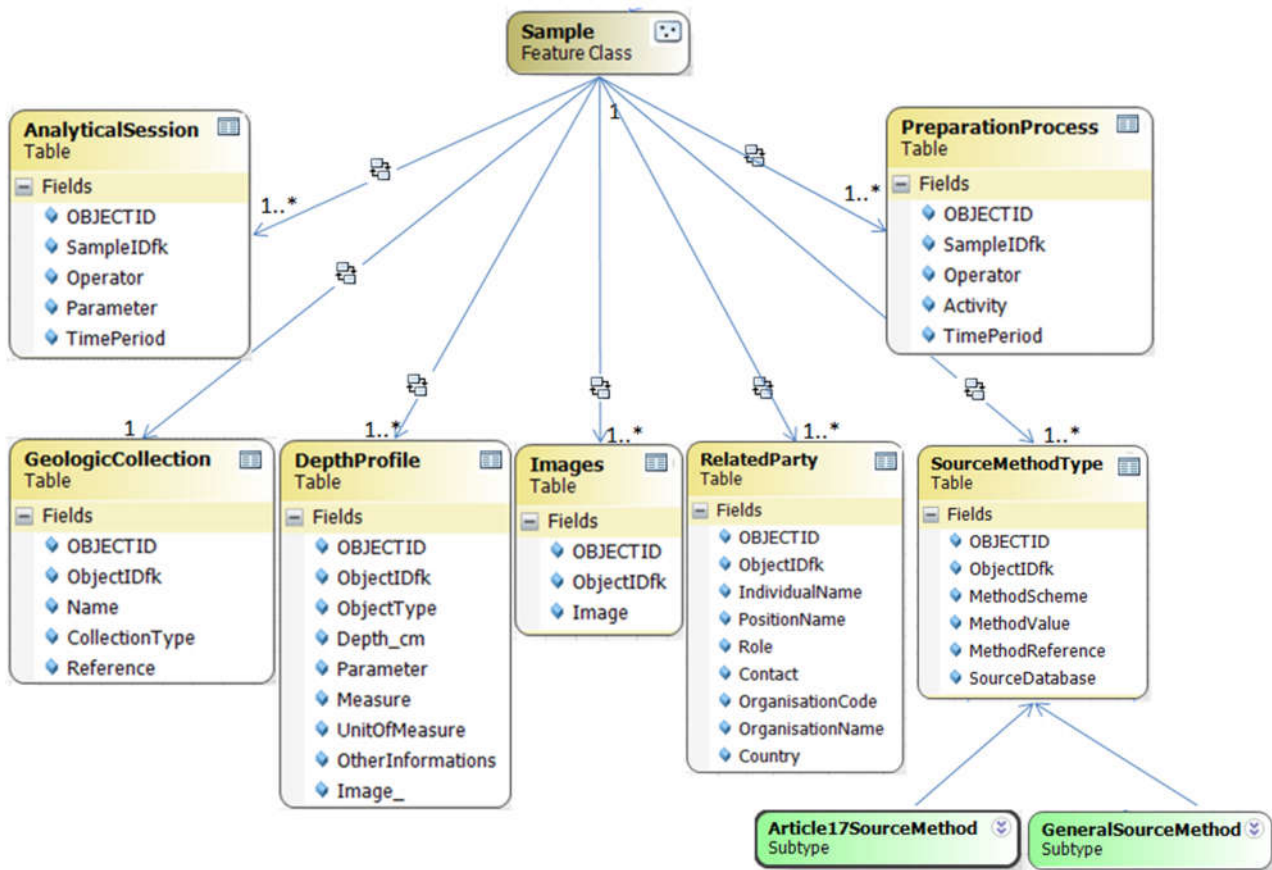
Name	Multiplicity	Origin class	Destination class	Primary key	Foreign key
SampleHasAnalyticalSession	1→1..*	Sample	AnalyticalSession	SampleID	SampleIDfk
SampleHasDepthProfile	1→1..*	Sample	DepthProfile	SampleID	ObjectIDfk
SampleHasGeologicalCollection	1→1	Sample	GeologicalCollection	SampleID	ObjectIDfk
SampleHasImages	1→1..*	Sample	Images	SampleID	ObjectIDfk
SampleHasPreparationProcess	1→1..*	Sample	PreparationProcess	SampleID	SampleIDfk
SampleHas SourceMethodType	1→1..*	Sample	SourceMethodType	SampleID	ObjectdIDfk
SampleHas RelatedParty	1→1..*	Sample	RelatedParty	SampleID	ObjectdIDfk
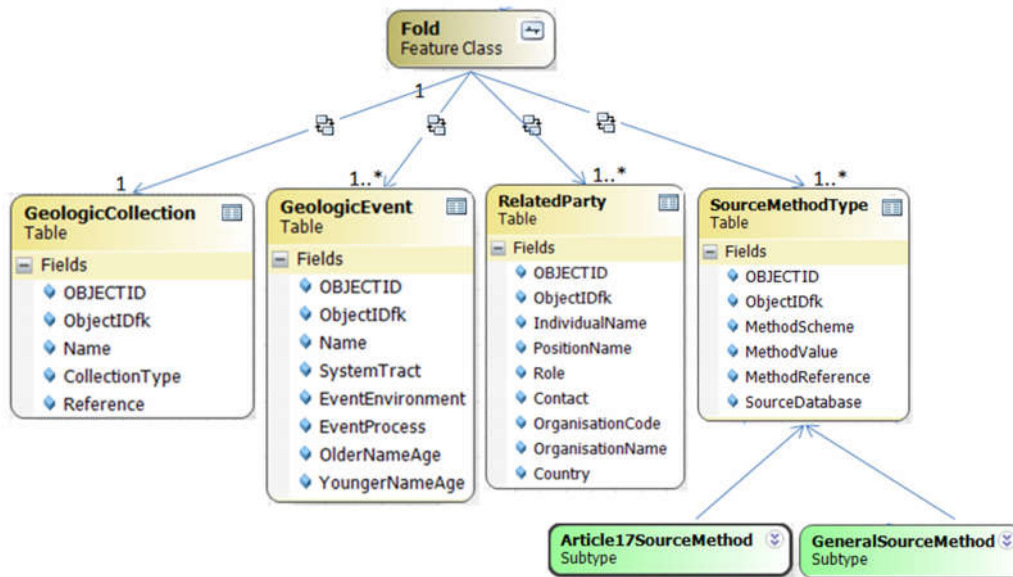
Name	Multiplicity	Origin class	Destination class	Primary key	Foreign key
FoldHasGeologicalCollection	1→1	Fold	GeologicalCollection	GObjectID	ObjectdIDfk
FoldHasGeologicalEvent	1→1..*	Fold	GeologicalEvent	GObjectID	ObjectdIDfk
FoldHasSourceMethodType	1→1..*	Fold	SourceMethodType	GObjectID	ObjectdIDfk
FoldHasRelatedParty	1→1..*	Fold	RelatedParty	GObjectID	ObjectdIDfk
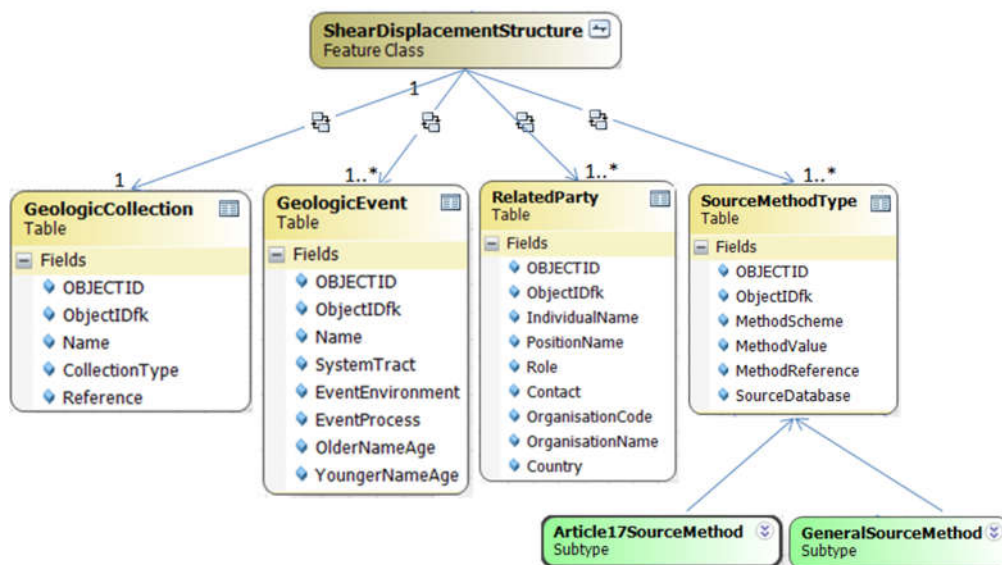
Name	Multiplicity	Origin class	Destination class	Primary key	Foreign key
ShearDisplacementStructure HasGeologicalCollection	1→1	ShearDisplacement Structure	Geological Collection	GObject ID	ObjectdID fk
ShearDisplacementStructure HasGeologicalEvent	1→1..*	ShearDisplacement Structure	Geological Event	GObject ID	ObjectdID fk
ShearDisplacementStructure HasSourceMethodType	1→1..*	ShearDisplacement Structure	SourceMethod Type	GObject ID	ObjectdID fk
ShearDisplacementStructure HasRelatedParty	1→1..*	ShearDisplacement Structure	RelatedParty	GObject ID	ObjectdID fk
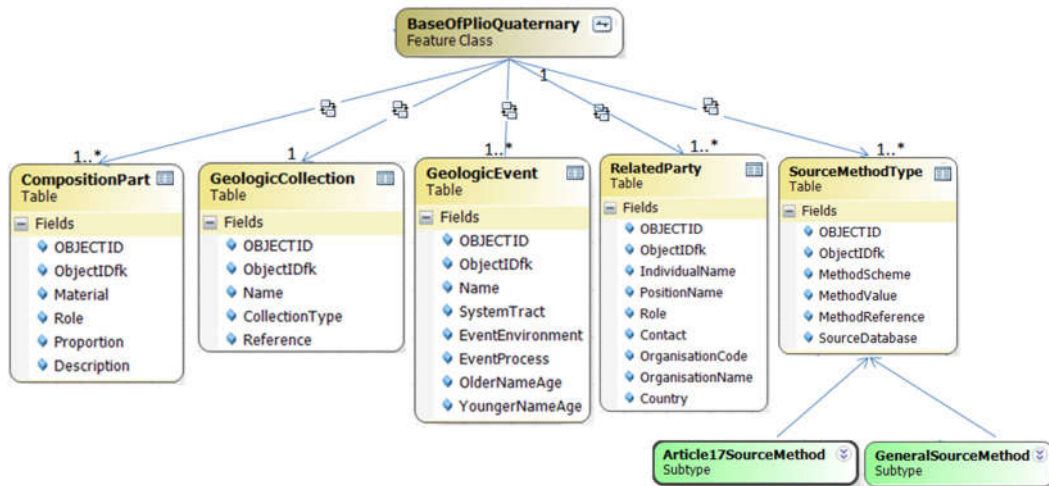
Name	Multiplicity	Origin class	Destination class	Primary key	Foreign key
BaseOfPlioQuaternary HasCompositionPart	1→1..*	BaseOfPlio Quaternary	CompositionPart	GObjectID	ObjectdIDfk
BaseOfPlioQuaternary HasGeologicalCollection	1→1..*	BaseOfPlio Quaternary	GeologicalCollection	GObjectID	ObjectdID fk
BaseOfPlioQuaternary HasGeologicalEvent	1→1..*	BaseOfPlio Quaternary	GeologicalEvent	GObjectID	ObjectdID fk
BaseOfPlioQuaternary HasSourceMethodType	1→1..*	BaseOfPlio Quaternary	SourceMethodType	GObjectID	ObjectdIDfk
BaseOfPlioQuaternary HasRelatedParty	1→1..*	BaseOfPlio Quaternary	RelatedParty	GObjectID	ObjectdIDfk
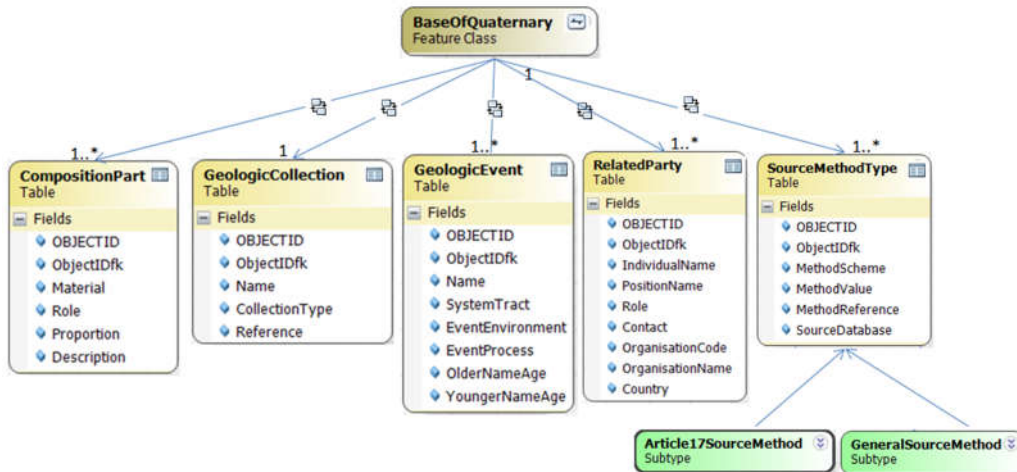
Name	Multiplicity	Origin class	Destination class	Primary key	Foreign key
BaseOfQuaternary HasCompositionPart	1→1..*	BaseOf Quaternary	CompositionPart	GObjectID	ObjectdIDfk
BaseOfQuaternary HasGeologicalCollection	1→1	BaseOf Quaternary	GeologicalCollection	GObjectID	ObjectdID fk
BaseOfQuaternary HasGeologicalEvent	1→1..*	BaseOf Quaternary	GeologicalEvent	GObjectID	ObjectdID fk
BaseOfQuaternary HasSourceMethodType	1→1..*	BaseOf Quaternary	SourceMethodType	GObjectID	ObjectdIDfk
BaseOfQuaternary HasRelatedParty	1→1..*	BaseOf Quaternary	RelatedParty	GObjectID	ObjectdIDfk
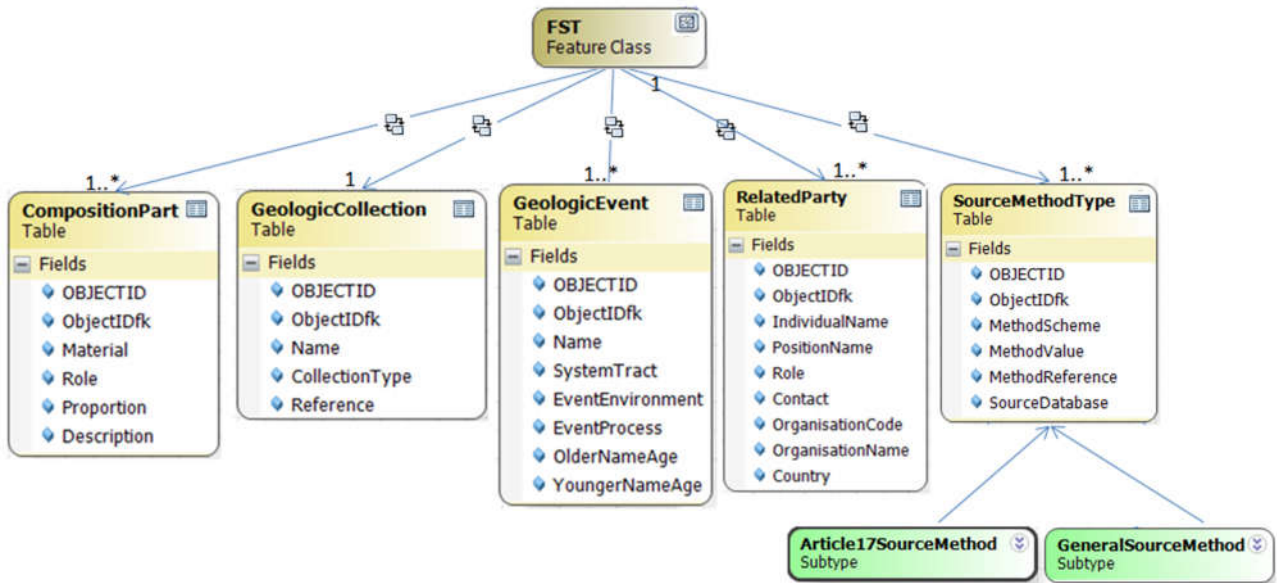
Name	Multiplicity	Origin class	Destination class	Primary key	Foreign key
FSTHasCompositionPart	1→1..*	FST	CompositionPart	GObjectID	ObjectdIDfk
FSTHasGeologicalCollection	1→1	FST	GeologicalCollection	GObjectID	ObjectdIDfk
FSTHasGeologicalEvent	1→1..*	FST	GeologicalEvent	GObjectID	ObjectdIDfk
FSTHasSourceMethodType	1→1..*	FST	SourceMethodType	GObjectID	ObjectdIDfk
FSTHasRelatedParty	1→1..*	FST	RelatedParty	GObjectID	ObjectdIDfk
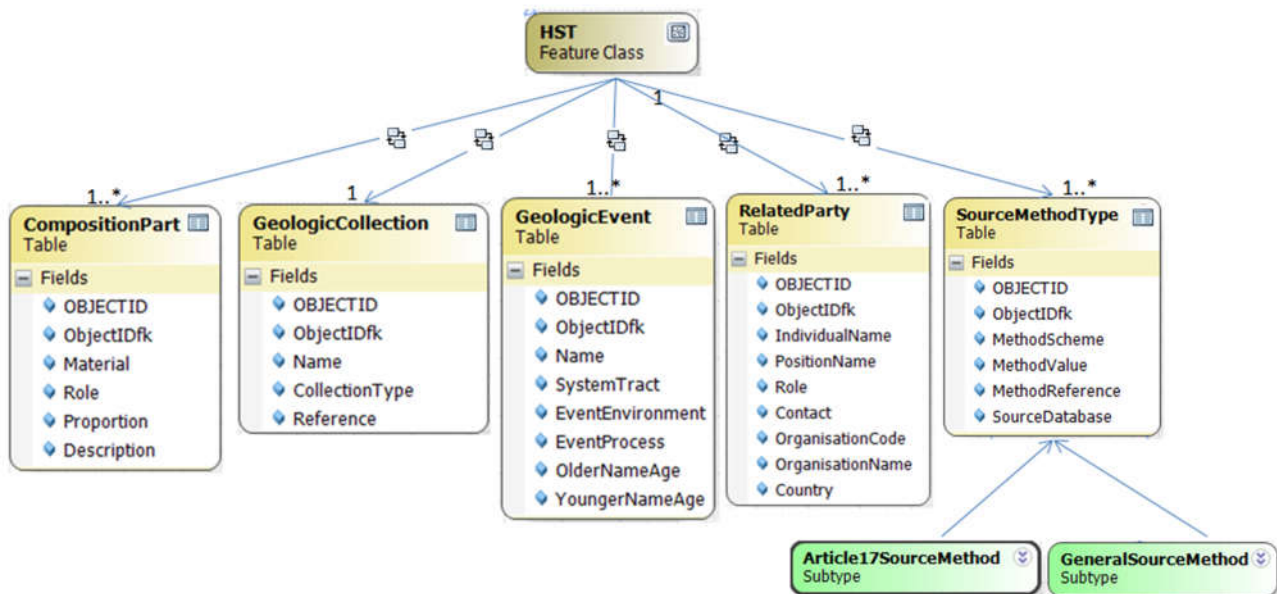
Name	Multiplicity	Origin class	Destination class	Primary key	Foreign key
HSTHasCompositionPart	1→1..*	HST	CompositionPart	GObjectID	ObjectdIDfk
HSTHasGeologicalCollection	1→1	HST	GeologicalCollection	GObjectID	ObjectdIDfk
HSTHasGeologicalEvent	1→1..*	HST	GeologicalEvent	GObjectID	ObjectdIDfk
HSTHasSourceMethodType	1→1..*	HST	SourceMethodType	GObjectID	ObjectdIDfk
HSTHasRelatedParty	1→1..*	HST	RelatedParty	GObjectID	ObjectdIDfk

LIA — Feature Class

CompositionPart (Table) — Fields: OBJECTID, ObjectIDfk, Material, Role, Proportion, Description

GeologicCollection (Table) — Fields: OBJECTID, ObjectIDfk, Name, CollectionType, Reference

GeologicEvent (Table) — Fields: OBJECTID, ObjectIDfk, Name, SystemTract, EventEnvironment, EventProcess, OlderNameAge, YoungerNameAge

RelatedParty (Table) — Fields: OBJECTID, ObjectIDfk, IndividualName, PositionName, Role, Contact, OrganisationCode, OrganisationName, Country

SourceMethodType (Table) — Fields: OBJECTID, ObjectIDfk, MethodScheme, MethodValue, MethodReference, SourceDatabase

Article17SourceMethod (Subtype), GeneralSourceMethod (Subtype)

Name	Multiplicity	Origin class	Destination class	Primary key	Foreign key
LIAHasCompositionPart	1→1..*	LIA	CompositionPart	GObjectID	ObjectdIDfk
LIAHasGeologicalCollection	1→1	LIA	GeologicalCollection	GObjectID	ObjectdIDfk
LIAHasGeologicalEvent	1→1..*	LIA	GeologicalEvent	GObjectID	ObjectdIDfk
LIAHasSourceMethodType	1→1..*	LIA	SourceMethodType	GObjectID	ObjectdIDfk
LIAHasRelatedParty	1→1..*	LIA	RelatedParty	GObjectID	ObjectdIDfk

LithostratigraphicUnit — Feature Class

CompositionPart (Table) — Fields: OBJECTID, ObjectIDfk, Material, Role, Proportion, Description

GeologicCollection (Table) — Fields: OBJECTID, ObjectIDfk, Name, CollectionType, Reference

GeologicEvent (Table) — Fields: OBJECTID, ObjectIDfk, Name, SystemTract, EventEnvironment, EventProcess, OlderNameAge, YoungerNameAge

RelatedParty (Table) — Fields: OBJECTID, ObjectIDfk, IndividualName, PositionName, Role, Contact, OrganisationCode, OrganisationName, Country

SourceMethodType (Table) — Fields: OBJECTID, ObjectIDfk, MethodScheme, MethodValue, MethodReference, SourceDatabase

Article17SourceMethod (Subtype), GeneralSourceMethod (Subtype)

Name	Multiplicity	Origin class	Destination class	Primary key	Foreign key
LithostratigraphicUnit HasCompositionPart	1→1..*	Lithostratigraphic Unit	CompositionPart	GObject ID	ObjectdID fk
LithostratigraphicUnit HasGeologicalCollection	1→1	Lithostratigraphic Unit	GeologicalCollection	GObject ID	ObjectdID fk
LithostratigraphicUnit HasGeologicalEvent	1→1..*	Lithostratigraphic Unit	GeologicalEvent	GObject ID	ObjectdID fk

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LithostratigraphicUnit HasSourceMethodType	1→1..*	Lithostratigraphic Unit	SourceMethodType	GObject ID	ObjectdID fk
LithostratigraphicUnit HasRelatedParty	1→1..*	Lithostratigraphic Unit	RelatedParty	GObject ID	ObjectdID fk
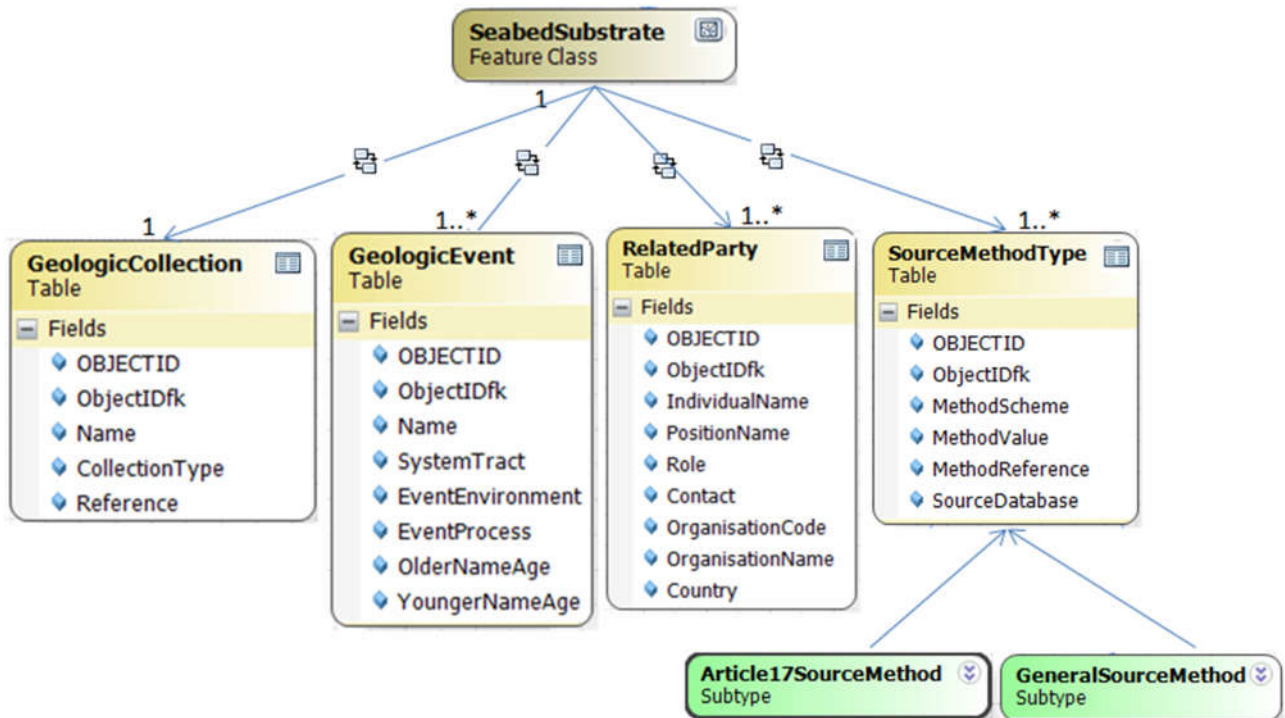
Name	Multiplicity	Origin class	Destination class	Primary key	Foreign key
SeabedSubstrate HasGeologicalCollection	1→1	SeabedSubstrate	GeologicalCollection	GObjectID	ObjectdIDfk
SeabedSubstrate HasGeologicalEvent	1→1..*	SeabedSubstrate	GeologicalEvent	GObjectID	ObjectdIDfk
SeabedSubstrate HasSourceMethodType	1→1..*	SeabedSubstrate	SourceMethodType	GObjectID	ObjectdIDfk
SeabedSubstrate HasRelatedParty	1→1..*	SeabedSubstrate	RelatedParty	GObjectID	ObjectdIDfk
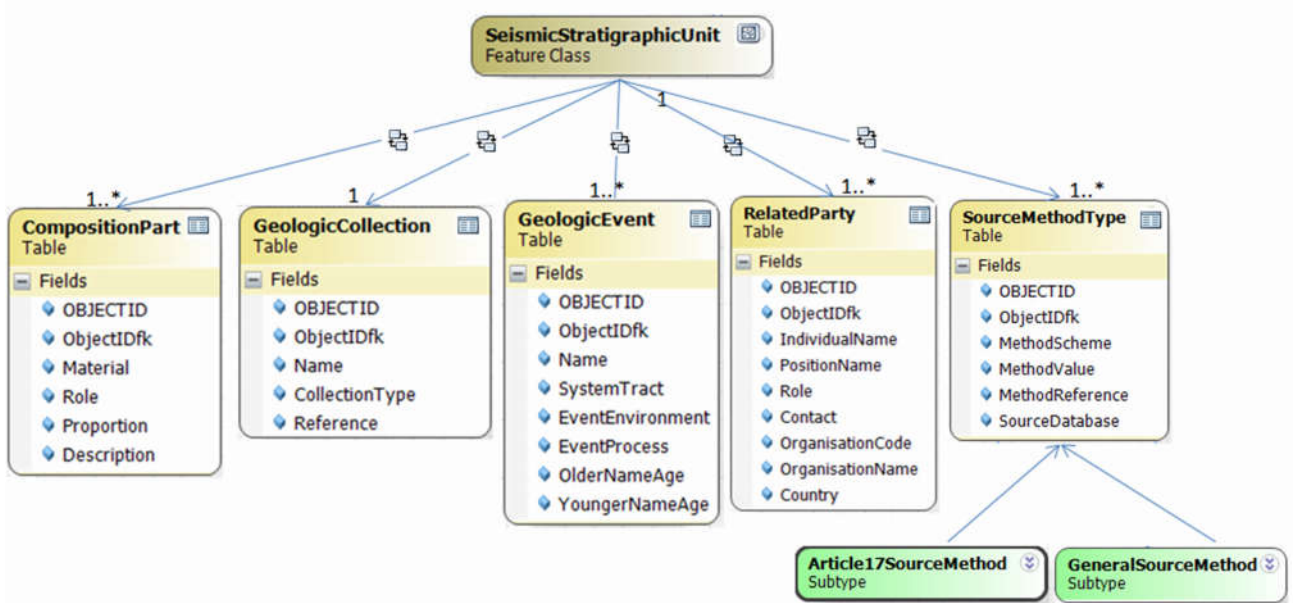
Name	Multiplicity	Origin class	Destination class	Primary key	Foreign key
SeismicStratigraphicUnit HasCompositionPart	1→1..*	SeismicStratigraphicUnit	CompositionPart	GObjectID	ObjectdIDfk
SeismicStratigraphicUnit HasGeologicalCollection	1→1	SeismicStratigraphicUnit	GeologicalCollection	GObjectID	ObjectdIDfk
SeismicStratigraphicUnit HasGeologicalEvent	1→1..*	SeismicStratigraphicUnit	GeologicalEvent	GObjectID	ObjectdIDfk
SeismicStratigraphicUnit HasSourceMethodType	1→1..*	SeismicStratigraphicUnit	SourceMethodType	GObjectID	ObjectdIDfk
SeismicStratigraphicUnit HasRelatedParty	1→1..*	SeismicStratigraphicUnit	RelatedParty	GObjectID	ObjectdIDfk
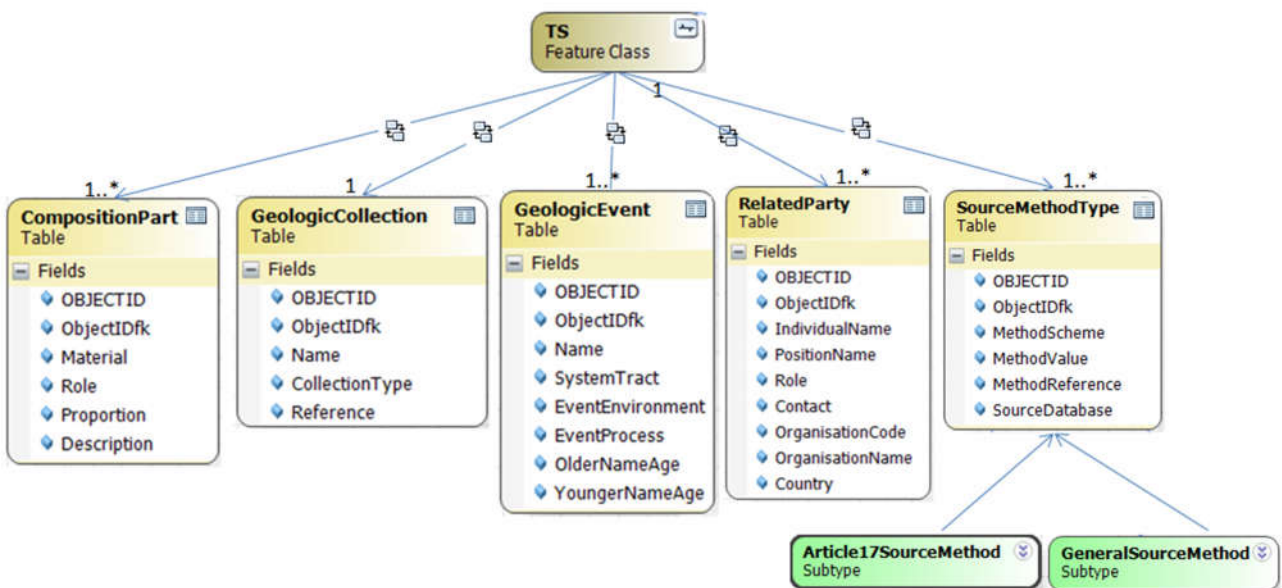
Name	Multiplicity	Origin class	Destination class	Primary key	Foreign key
TSHasCompositionPart	1→1..*	TS	CompositionPart	GObjectID	ObjectdIDfk
TSHasGeologicalCollection	1→1	TS	GeologicalCollection	GObjectID	ObjectdIDfk

TSHasGeologicalEvent	1→1..*	TS	GeologicalEvent	GObjectID	ObjectdIDfk
TSHasSourceMethodType	1→1..*	TS	SourceMethodType	GObjectID	ObjectdIDfk
TSHasRelatedParty	1→1..*	TS	RelatedParty	GObjectID	ObjectdIDfk

Name	Multiplicity	Origin class	Destination class	Primary key	Foreign key
TSTHasCompositionPart	1→1..*	TST	CompositionPart	GObjectID	ObjectdIDfk
TSTHasGeologicalCollection	1→1	TST	GeologicalCollection	GObjectID	ObjectdIDfk
TSTHasGeologicalEvent	1→1..*	TST	GeologicalEvent	GObjectID	ObjectdIDfk
TSTHasSourceMethodType	1→1..*	TST	SourceMethodType	GObjectID	ObjectdIDfk
TSTHasRelatedParty	1→1..*	TST	RelatedParty	GObjectID	ObjectdIDfk

Name	Multiplicity	Origin class	Destination class	Primary key	Foreign key

AnthropGeomorphologicalFeatureHasCompositionPart	1→1..*	AnthropGeomorphologicalFeature	CompositionPart	GObjectID	ObjectdIDfk
AnthropGeomorphologicalFeatureHasGeologicalCollection	1→1	AnthropGeomorphologicalFeature	GeologicalCollection	GObjectID	ObjectdIDfk
AnthropGeomorphologicalFeatureHasGeologicalEvent	1→1..*	AnthropGeomorphologicalFeature	GeologicalEvent	GObjectID	ObjectdIDfk
AnthropGeomorphologicalFeatureHasSourceMethodType	1→1..*	AnthropGeomorphologicalFeature	SourceMethodType	GObjectID	ObjectdIDfk
AnthropGeomorphologicalFeatureHasRelatedParty	1→1..*	AnthropGeomorphologicalFeature	RelatedParty	GObjectID	ObjectdIDfk
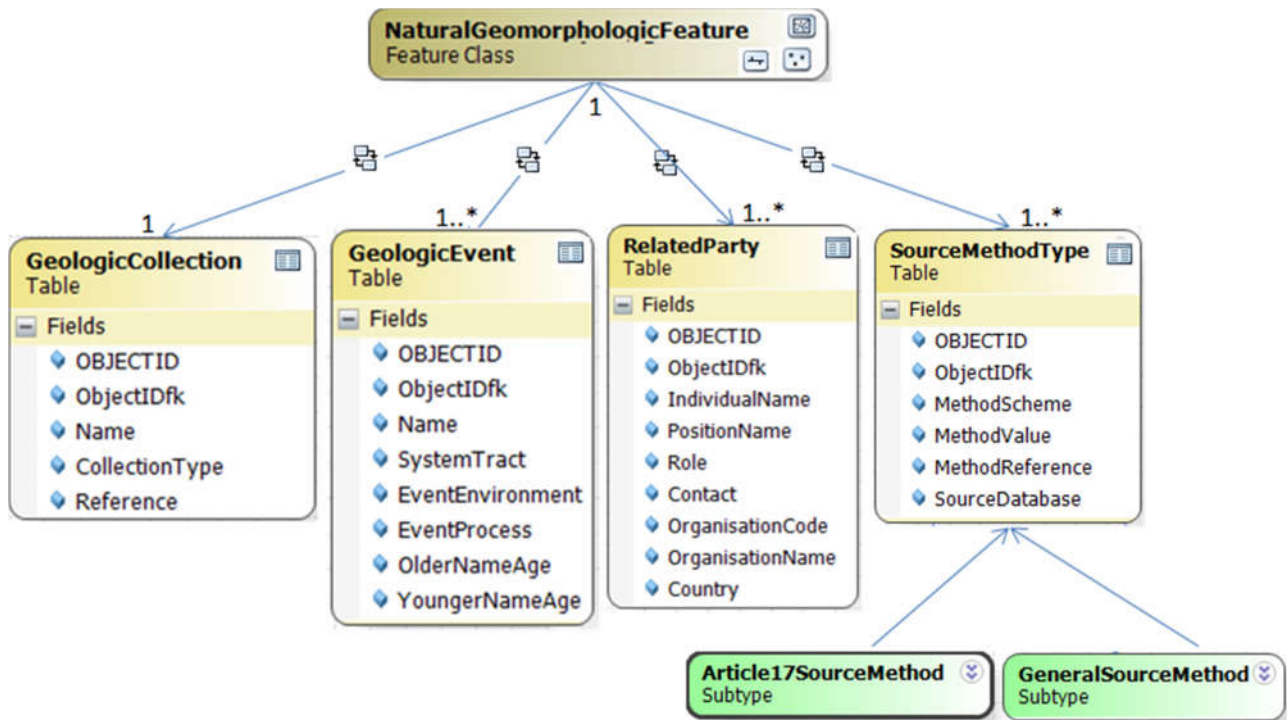
Name	Multiplicity	Origin class	Destination class	Primary key	Foreign key
NaturalGeomorphologicalFeatureHasCompositionPart	1→1..*	NaturalGeomorphologicalFeature	CompositionPart	GObjectID	ObjectdIDfk
NaturalGeomorphologicalFeatureHasGeologicalCollection	1→1	NaturalGeomorphologicalFeature	GeologicalCollection	GObjectID	ObjectdIDfk
NaturalGeomorphologicalFeatureHasGeologicalEvent	1→1..*	NaturalGeomorphologicalFeature	GeologicalEvent	GObjectID	ObjectdIDfk
NaturalGeomorphologicalFeatureHasSourceMethodType	1→1..*	NaturalGeomorphologicalFeature	SourceMethodType	GObjectID	ObjectdIDfk
NaturalGeomorphologicalFeatureHasRelatedParty	1→1..*	NaturalGeomorphologicalFeature	RelatedParty	GObjectID	ObjectdIDfk
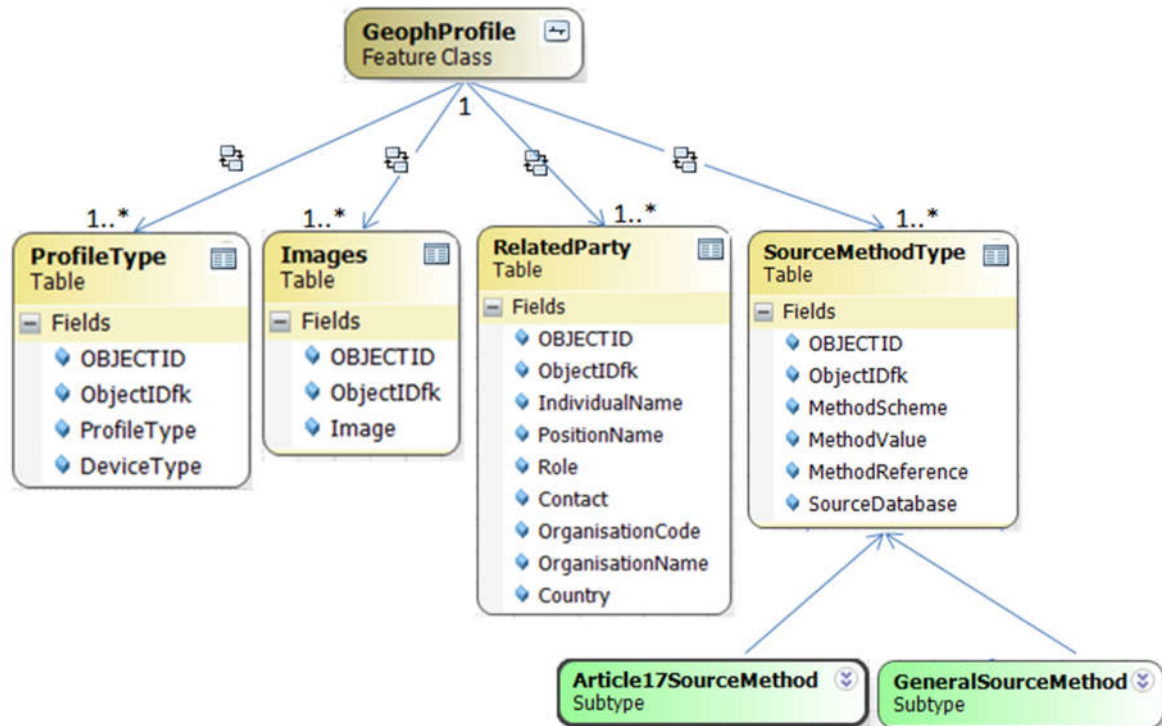
Name	Multiplicity	Origin class	Destination class	Primary key	Foreign key
GeophProfileHas Images	1→1..*	GeophProfile	Images	GObjectID	ObjectdIDfk
GeophProfileHas ProfileType	1→1..*	GeophProfile	ProfileType	GObjectID	ObjectdIDfk
GeophProfileHas GeologicalEvent	1→1..*	GeophProfile	GeologicalEvent	GObjectID	ObjectdIDfk
GeophProfileHas SourceMethodType	1→1..*	GeophProfile	SourceMethodType	GObjectID	ObjectdIDfk
GeophProfileHas RelatedParty	1→1..*	GeophProfile	RelatedParty	GObjectID	ObjectdIDfk
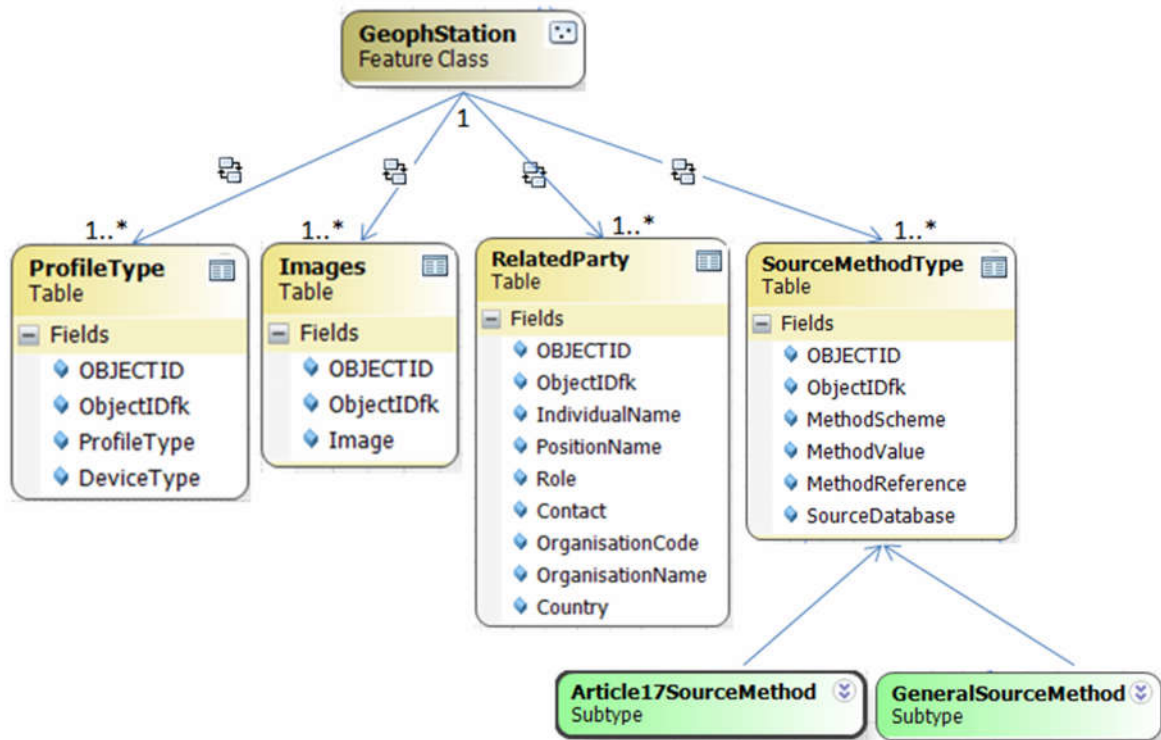
Name	Multiplicity	Origin class	Destination class	Primary key	Foreign key
GeophStationHasImages	1→1..*	GeophStation	Images	GObjectID	ObjectdIDfk
GeophStationHas SourceMethodType	1→1..*	GeophStation	SourceMethodType	GObjectID	ObjectdIDfk
GeophStationHas RelatedParty	1→1..*	GeophStation	RelatedParty	GObjectID	ObjectdIDfk
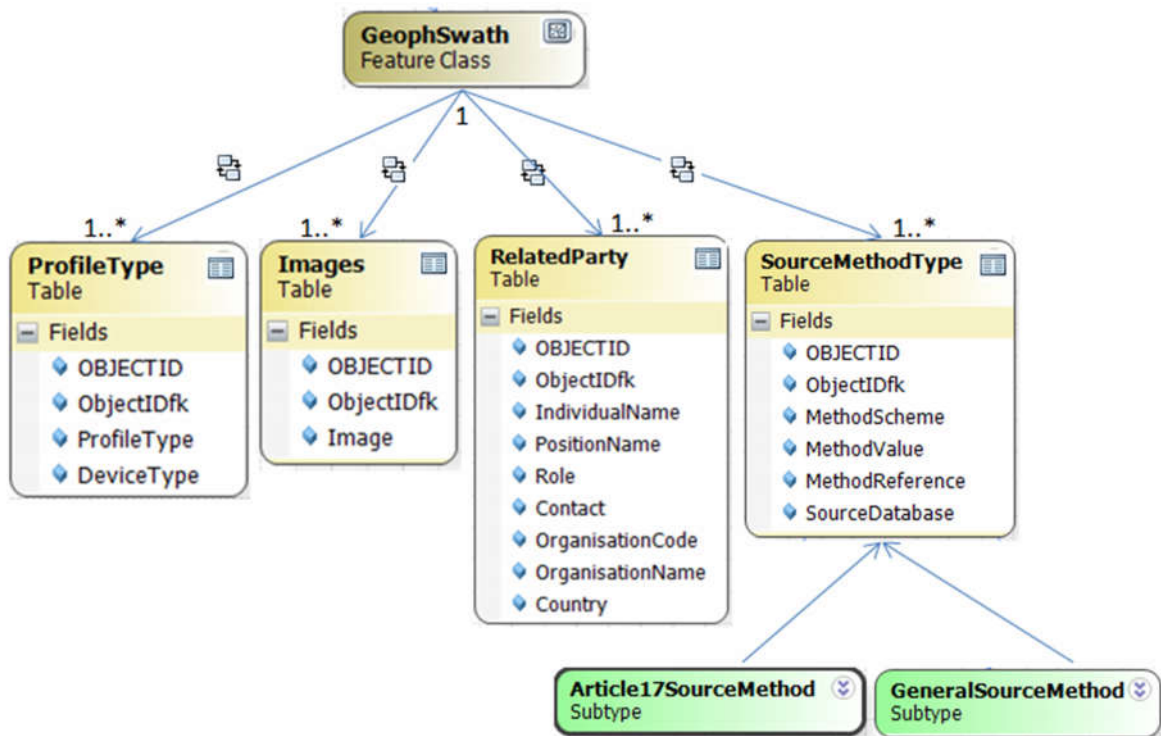
Name	Multiplicity	Origin class	Destination class	Primary key	Foreign key
GeophSwathHasImages	1→1..*	GeophSwath	Images	GObjectID	ObjectdIDfk
GeophSwathHas SourceMethodType	1→1..*	GeophSwath	SourceMethodType	GObjectID	ObjectdIDfk
GeophSwathHas RelatedParty	1→1..*	GeophSwath	RelatedParty	GObjectID	ObjectdIDfk
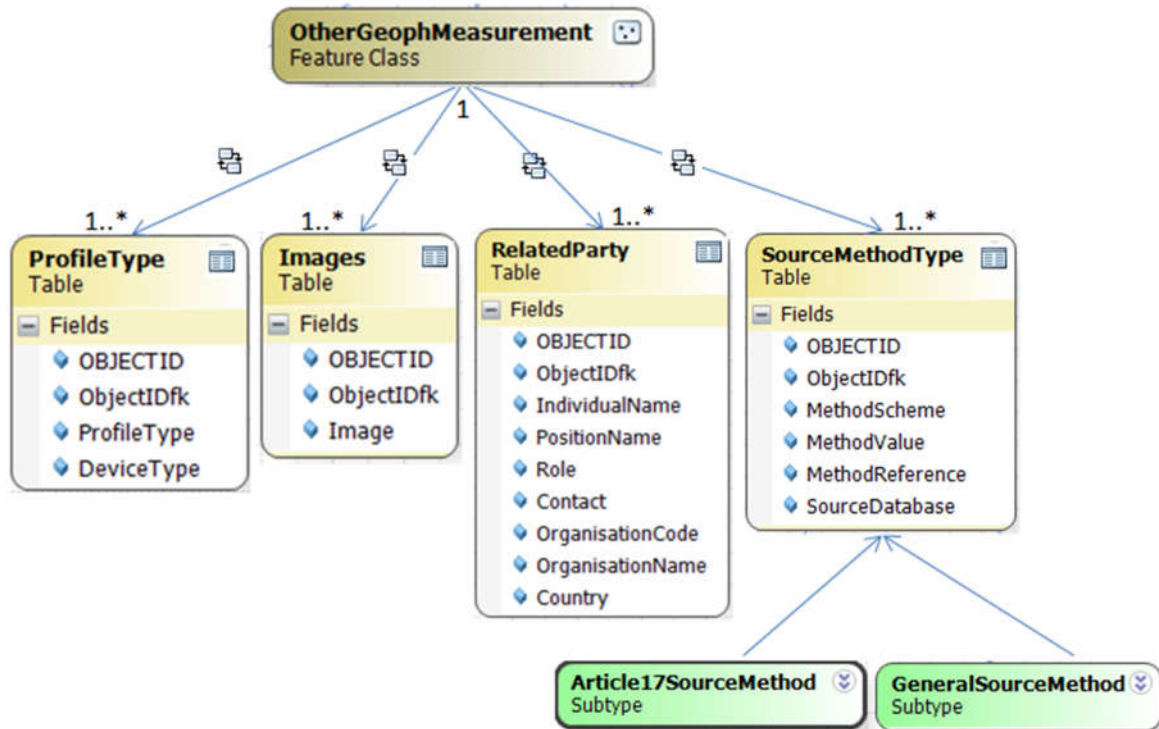
Name	Multiplicity	Origin class	Destination class	Primary key	Foreign key
OtherGeophMeasurement HasImages	1→1..*	OtherGeoph Measurement	Images	GObjectID	ObjectdIDfk
OtherGeophMeasurement HasSourceMethodType	1→1..*	OtherGeoph Measurement	SourceMethodType	GObjectID	ObjectdIDfk
OtherGeophMeasurement HasRelatedParty	1→1..*	OtherGeoph Measurement	RelatedParty	GObjectID	ObjectdIDfk
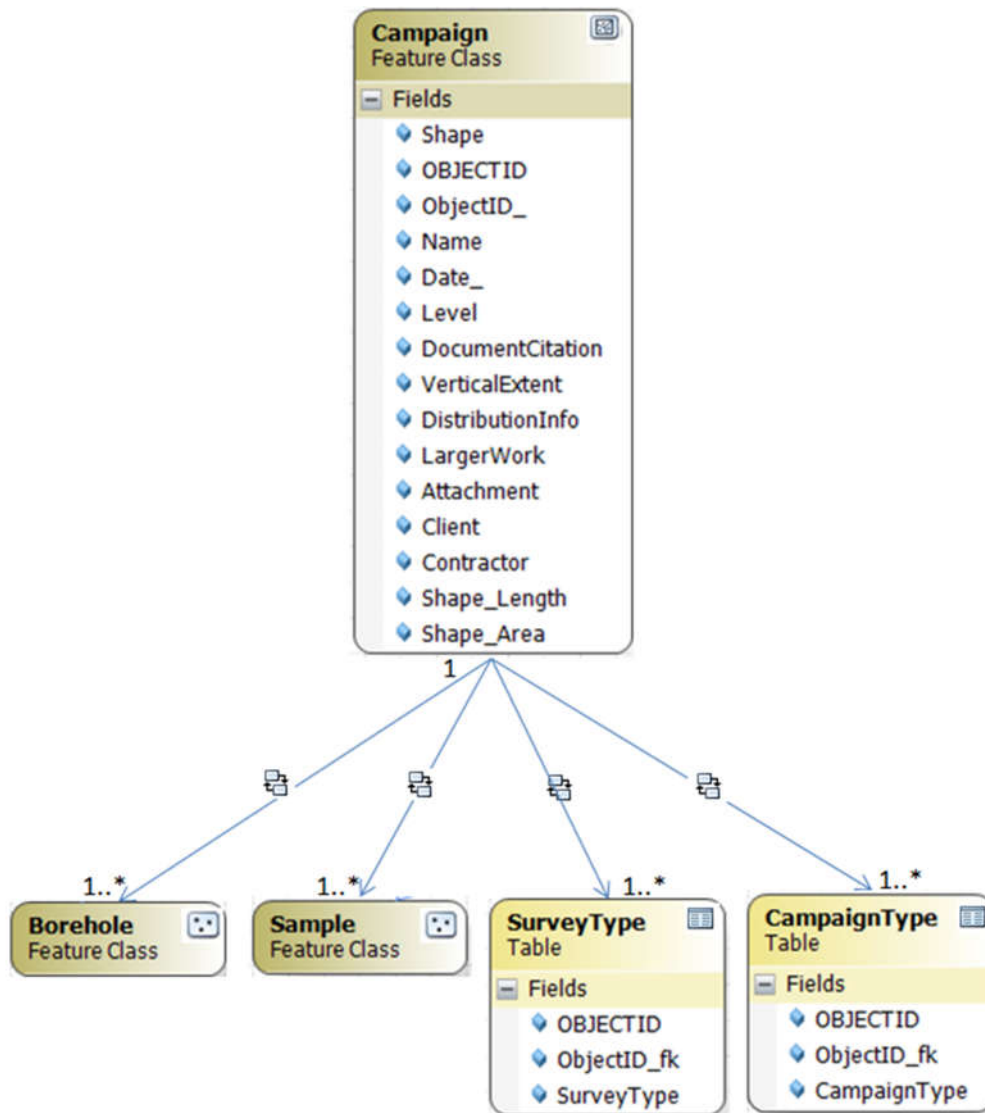
Name	Multiplicity	Origin class	Destination class	Primary key	Foreign key
Campaign HasBorehole	1→1..*	Campaign	Borehole	Name	Campaign
Campaign HasCampaignType	1→1..*	Campaign	CampaignType	ObjectID_	ObjectdID_fk
Campaign HasSample	1→1..*	Campaign	Sample	Name	Campaign
Campaign HasSurveyType	1→1..*	Campaign	RelatedParty	ObjectID_	ObjectdID_fk

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 user of the WebGIS platform can find the name of the metadata file, which the object refers, in the field named "Metadata" in the attribute table.

The metadata for this Geodatabase are also in the CoCoNet Geoportal for metadata:
http://gp.sea.gov.ua:8082/geoportal/

ANNEX 1

Acronyms

CDI – Common Data Index

FC – Feature Class

FD – Feature Dataset

FST - Falling-Stage Systems Tract

HST - Highstand Systems Tract

fk – foreign key

kmz - Keyhole Markup Language

OC - Object Class

TS -

TST – Transgressive System Tract

xml – eXtensible Markup Language

LIA – Little Ice Age

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)

D2.5: Generic Conceptual Model, Version 3.4 (D2.5_v3.4)

D2.8.II.4 INSPIRE Data Specification on Geology – Technical Guidelines (D2.8.II.4_v3.0)

D2.8.III.18 INSPIRE Data Specification on Habitats and Biotopes – Technical Guidelines (D2.8.III.18_v3.0)

http://inspire.ec.europa.eu/data-model/

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

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

http://gp.sea.gov.ua:8082/geoportal/

ANNEX 2 – Domains

AnthropogenicGeomorphologicTypeValue_v3

Type: Code Value Domain

Description: The types of anthropogenic geomorphologic feature (D2.8.II.4_v3.0).

Value	Code	Definition
Dredged channel	dredgedChannel	A roughly linear, deep water area formed by a dredging operation for navigation purposes
Dump	dump	An area of smooth or uneven accumulations or piles of waste rock, earthy material, or general refuse that without major reclamation are incapable of supporting plants.
Fill	fill	Human-constructed deposits of natural earth materials and/or waste materials used to fill a depression, to extend shore land into a body of water, or in building dams.
Impact crater anthropogenic	impactCraterAnthropogenic	A generally circular or elliptical depression formed by hypervelocity impact of an experimental projectile or ordnance into earthy or rock material.
Pit	pit	A depression, ditch or pit excavated to furnish gravel, sand or other materials for roads or other construction purposes; a type of borrow pit.
Submerged breakwater	submergedBreakwater	

Created: 20/05/2015
Modified: none
Author: CNR-ISMAR
State: approved
Used in: AnthropGeomorphologicFeature (Areal, Linear, Punctual)
Extensibility: open
Note 1: http://inspire.ec.europa.eu/codelist/AnthropogenicGeomorphologicFeatureTypeValue

Article17SourceMethodValue_v3

Type: Code Value Domain

Description: The methods that have been used in the sources for compiling the information for article 17 purposes. Describes how the information has been compiled (D2.8.III.18_v3.0)

Value	Code	Definition
Absent data	absentData	Absent data (D2.8.III.18_v3.0)
Complete survey	completeSurvey	Complete survey (D2.8.III.18_v3.0)
Estimate expert	estimateExpert	Estimate based in expert opinion with no or minimal sampling (D2.8.III.18_v3.0)
Estimate partial	estimatePartial	Estimate based on partial data with some extrapolation and/or modeling (D2.8.III.18_v3.0)

Created: 20/05/2015
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

BoreholePurposeValue_v3

Type: Code Value Domain

Description: Purposes for which a borehole was drilled (D2.8.II.4_v3.0).

Value	Code	Definition
Geological survey		
Exploration raw material		
Exploration energy resources		
Hydrocarbon production		
Hydrocarbon exploration		
Hydrocarbon appraisal		
Geothermal energy		
Disposal		
Exploration natural underground storage		
Water supply		
Geophysical survey		
Shot hole		
Hydrogeological survey		
Geotechnical survey		
Environmental monitoring		

Created: 20/05/2015
Modified: none
Author: CNR-ISMAR
State: approved
Used in:
Extensibility: open
Note 1: http://inspire.ec.europa.eu/codelist/BoreholePurposeValue

CampaignTypeValue_v3

Type: Code Value Domain

Description: Type of geophysical campaign (D2.8.II.4_v3.0).

Value	Code	Definition
Measurement		
Processing		
Interpretation		

Created: 20/05/2015
Modified: none
Author: CNR-ISMAR
State: approved
Used in:
Extensibility: open
Note 1: http://inspire.ec.europa.eu/codelist/CampaignTypeValue

CollectionTypeValue_v3

Type: Code Value Domain

Description: Types of collections of geological and geophysical objects (D2.8.II.4_v3.0).

Value	Code	Definition

Borehole collection		
Geological model		
Geological map		
Geophysical object collection		
Geological object collection		

Created: 20/05/2015
Modified: none
Author: CNR-ISMAR
State: approved
Used in:
Extensibility: open
Note 1: http://inspire.ec.europa.eu/codelist/CollectionTypeValue

CompositionPartRoleValue_v3

Type: Code Value Domain

Description: Roles that a compositional part plays in a geologic unit.

Value	Code	Definition
Only part		
Part of		
Facies		
Inclusion		
Lithosome		
Stratigraphic part		
Unspecified part role		

Created: 20/05/2015
Modified: none
Author: CNR-ISMAR
State: approved
Used in:
Extensibility: open
Note 1: http://inspire.ec.europa.eu/codelist/CompositionPartRoleValue

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 ()

Value	Code
Albania	AL
Algeria	ZD
Bosnia and Herzegovina	BA
Bulgaria	BG
Cyprus	CY
Croatia	HR
Egypt	EG
France	FR
Gaza Trip	PS
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: 20/05/2015
Modified: none
Author: CNR-ISMAR
State: approved
Used in: RelatedParty (OC)
Extensibility: none
Note 1: none

DeviceTypeValue_v3
Type: Code Value Domain

Description: list of types of device used for sampling or acquired data.

Value	Code	Definition
Box corer		
Corer		
Chirp		
Dredge		
Grab		
Lander		
Multi Beam		
Multi channel seismic		
ROV		
Side Scan Sonar		
Single Beam		
Sparker		
Sub Bottom Profiler		
Uniboom		

Created: 20/05/2015
Modified: none
Author: CNR-ISMAR
State: approved
Used in:
Extensibility: open
Note 1:

DeviceValue_v3

Type: Code Value Domain

Description: list of device used for sampling or acquired data.

Value	Code	Definition
Box corer		
Calypso corer		
Chirp II		
Chirp III		
Chirp Datasonic		
Epibenthic dredge		
Grab 40		
Grab 60		
Geologic dredge		
Gravity corer		
Gravity corer 1.5		
Gravity corer 2		
Gravity corer 2.8		
Gravity corer 3		
Gravity corer 4		
Gravity corer 6		
Gravity corer 9		
Gravity corer 10		
Gravity corer 12		
Gravity corer sediment-water interface		
Jumbo Piston corer		
Kaster corer		
Kaster corer 9		
Kaster corer 12		
Kaster corer 15		
Multi Beam EM 300 Kongsberg Simrad		
Multi Beam EM 302 Kongsberg Simrad		
Multi Beam EM 710 Kongsberg Simrad		
Multi Beam EM 2040 Kongsberg Simrad		
Multi Beam EM 3000 Kongsberg Simrad		
Multi Beam EM 3002 D Kongsberg Simrad		
Multi Beam RESON 7125		
Multi Beam RESON 8125		
Multi Beam RESON 8160		
Multi corer		
Piston corer		
Piston corer 5		
Piston corer 6		
Piston corer 9		
Piston corer 10		
Piston corer 12		
Piston corer 15		
Piston corer 20		
Rock dredge		
ROV Pollux II		
ROV Pollux III		
Sediment dredge		

Trigger corer		
Trigger corer 2.8		
Trigger corer 4		
Trigger corer 6		
Vibro corer		
Vibro corer 6		
Well		

Created: 20/05/2015
Modified: none
Author: CNR-ISMAR
State: approved
Used in:
Extensibility: none
Note 1:

EventEnvironmentValue_v3
Type: Code Value Domain
Description: Terms for the geologic environments within which geologic events take place
(D2.8.II.4_v3.0).

Value	Code	Definition
Earth interior setting		
Earth surface setting		
Tectonically defined setting		
Abandoned river channel setting		
Above carbonate compensation depth setting		
Abyssal setting		
Active continental margin setting		
Active spreading center setting		
Aeolian process setting		
Algal flat setting		
Alluvial plain setting		
Anoxic setting		
Back arc setting		
Backreef setting		
Barrier beach setting		
Barrier island coastline setting		
Basin plain setting		
Bathyal setting		
Beach setting		
Below carbonate compensation depth setting		
Biological reef setting		
Braided river channel setting		
Carbonate dominated shoreline setting		
Carbonate shelf setting		
Cave setting		
Coastal dune fiel setting		
Coastal plain setting		
Collisional setting		
Contact metamorphic setting		
Continental borderland setting		

Continental rift setting		
Continental shelf setting		
Crustal setting		
Cutoff meander setting		
Deep sea trench setting		
Delta distributary channel setting		
Delta distributary mouth setting		
Delta front setting		
Delta plain setting		
Delta slope setting		
Deltaic system setting		
Dunefield setting		
Epicontinental marine setting		
Estuarine delta setting		
Estuarine lagoon setting		
Estuary setting		
Fan delta setting		
Fast spreading center setting		
Floodplain setting		
Forearc setting		
Foreland setting		
Forereef setting		
Foreshore		
Graben		
Half graben		
Hot spot setting		
Hypabyssal setting		
Inactive spreading center setting		
Inner neritic setting		
Interdistributary bay setting		
Intertidal setting		
Intraplate tectonic setting		
Lagoonal setting		
Low energy shoreline setting		
Lower bathyal setting		
Lower delta plain setting		
Lower oceanic crustal setting		
Marginal marine sabkha setting		
Marine carbonate platform setting		
Marine setting		
Meandering river channel setting		
Medium rate spreading center setting		
Mid ocean ridge setting		
Middle bathyal setting		
Middle continental crust setting		
Middle neritic setting		
Mud flat setting		
Neritic setting		
Ocean highland setting		
Oceanic plateau setting		

Oceanic crustal setting		
Outer neritic setting		
Passive continental margin setting		
Plate margin Setting		
Plate spreading centercetting		
Prodelta setting		
Rocky coastal setting		
Salt pan		
Sand plain setting		
Seamount setting		
Shoreline setting		
Slope rise setting		
Slow spreading center setting		
Sprint setting		
Strandplain setting		
Subaqueous setting		
Subduction zone setting		
Submarine fan setting		
Supratidal setting		
Swamp or marsh setting		
Tidal channel setting		
Tidal flat setting		
Tidal marsh setting		
Tidal setting		
Transform plate boundary setting		
Transitional crustal setting		
Upper bathyal setting		
Upper delta plain setting		
Volcanic arc setting		
Wetland setting		

Created: 20/05/2015
Modified: none
Author: CNR-ISMAR
State: approved
Used in:
Extensibility: open
Note 1: http://inspire.ec.europa.eu/codelist/EventEnvironmentValue

EventProcessValue_v3
Type: Code Value Domain
Description: Terms specifying the process or processes that occurred during an event (D2.8.II.4_v3.0).

Value	Code	Definition
Bolide impact		
Deep water oxygen depletion		
Deformation		
Diagenetic process		
Geomagnetic process		
Human activity		
Magmatic process		
Metamorphic process		
Sea level change		

Sedimentary process		
Speciation		
Tectonic process		
Accretion		
Alteration		
Biological precipitation		
Chemical precipitation		
Chemical weathering		
Cometary impact		
Debris flow deposition		
Deposition		
Deposition from air		
Deposition from fluid		
Deposition from moving fluid		
Deposition from water		
Diffusion creep		
Dissolution		
Dissolution creep		
Ductile flow		
Dumping		
Effusive eruption		
Erosion		
Eruption		
Excavation		
Faulting		
Folding		
Fracturing		
Geologic process		
Grading		
Haloclasty		
Hawaiian eruption		
In situ organismic growth		
Intrusion		
Magmatic crystallisation		
Magnetic field reversal		
Mass wasting		
Mass wasting deposition		
Material transport and deposition		
Mechanical deposition		
Mixing		
Organic accumulation		
Orogenic process		
Oxidation		
Plinian eruption		
Pyroclastic eruption		
Reworking		
Rifting		
Sea level fall		
Sea level rise		
Sealing		

Value	Code	Definition
Spreading		
Strombolian eruption		
Subduction		
Transform faulting		
Turbidity current deposition		
Vulcanian eruption		
Water erosion		
Wind erosion		

Created: 20/05/2015
Modified: none
Author: CNR-ISMAR
State: approved
Used in:
Extensibility: open
Note 1: http://inspire.ec.europa.eu/codelist/EventProcessValue

FaultTypeValue_v3
Type: Code Value Domain
Description: Terms describing the type of shear displacement structure (D2.8.II.4_v3.0).

Value	Code	Definition
Fault		
Extraction fault		
High angle fault		
Low angle fault		
Oblique slip fault		
Reverse fault		
Scissor fault		
Strike slip fault		
Detachment fault		
Dextral strike split fault		
High angle reverse		
High angle normal fault		
Horizontal fault		
Left normal fault		
Left reverse fault		
Low angle normal fault		
Mixed extraction fault		
Normal fault		
Pure extraction fault		
Right normal fault		
Right reverse fault		
Sinistral strike slip fault		
Thrust fault		
Wrench fault		

Created: 20/05/2015
Modified: none
Author: CNR-ISMAR
State: approved
Used in:
Extensibility: open
Note 1: http://inspire.ec.europa.eu/codelist/FaultTypeValue

FoldProfileTypeValue_v3

Type: Code Value Domain

Description: Terms specifying the type of fold (D2.8.II.4_v3.0).

Value	Code	Definition
Anticline		
Antiform		
Syncline		
Synform		

Created: 20/05/2015
Modified: none
Author: CNR-ISMAR
State: approved
Used in:
Extensibility: open
Note 1: http://inspire.ec.europa.eu/codelist/FoldProfileTypeValue

FOLK_16clValue_3

Type: Code Value Domain

Description:

Value	Code	Definition
Mud		
(gravelly) Mud		
sandy Mud		
(gravelly) sandy Mud		
muddy Sand		
(gravelly) muddy Sand		
Sand		
(gravelly) Sand		
gravelly Sand		
sandy Gravel		
Gravel		
gravelly Mud		
muddy Gravel		
gravelly muddy Sand		
muddy sandy Gravel		
Rock & boulders		
no data at this level		

Created: 20/05/2015
Modified: none
Author: CNR-ISMAR
State: approved
Used in:
Extensibility: none
Note 1:

FOLK_5clValue_v3

Type: Code Value Domain

Description:

Value	Code	Definition
Mud to muddy Sand		
Sand		

Coarse-grained sediment		
Mixed sediment		
Rocks & boulders		

Created: 20/05/2015
Modified: none
Author: CNR-ISMAR
State: approved
Used in:
Extensibility: none
Note 1:

FOLK_7clValue_v3
Type: Code Value Domain
Description:

Value	Code	Definition
Mud		
sandy Mud		
muddy Sand		
Sand		
Coarse-grained sediment		
Mixed sediment		
Rock & boulders		
no data at this level		

Created: 20/05/2015
Modified: none
Author: CNR-ISMAR
State: approved
Used in:
Extensibility: none
Note 1:

GeneralSourceMethodValue_v3
Type: Code Value Domain
Description: What are the methods that have been used in the sources for compiling the information about the objects (D2.8.III.18_v3.0).

Value	Code	Definition
Collection examination	collectionExamination	Data collected from examinations of collections (D2.8.III.18_v3.0)
Grid mapping	gridMapping	Data observations collected by systematic surveys in grid cells (D2.8.III.18_v3.0)
Line sampling	lineSampling	Data collected by systematic surveys along linear transects (D2.8.III.18_v3.0)
Literature examination	literatureExamination	Data collected from literature examinations like printed maps, tables (D2.8.III.18_v3.0)
Prediction modeling	predictionModeling	Data from prediction modeling
Random observation	ramdomObservation	Data collected by randomly distributed (D2.8.II.4_v3.0-ir)collection/observation sites randomly outside a systematic survey (D2.8.III.18_v3.0)

| Remote sensing observation | remoteSensingObservation | Data collected by the Remote Sensing Observation method |
| Statistical sampling | statisticalSampling | Data collected on locations selected by statistical sampling methods (D2.8.III.18_v3.0) |

Created: 20/05/2015
Modified: none
Author: CNR-ISMAR
State: approved
Used in: SourceMethodType (OC)
Extensibility: yes
Note 1: none

GeochronologicEraValue_v3
Type: Code Value Domain
Description: Terms specifying recognized geological time units (D2.8.II.4_v3.0).

Value	Code	Definition

Created: 20/05/2015
Modified: none
Author: CNR-ISMAR
State: approved
Used in:
Extensibility: open
Note 1: http://inspire.ec.europa.eu/codelist/GeochronologicalEraValue

GeologicSpecimenPreparationTerm_v3
Type: Code Value Domain
Description: Refers to a vocabulary of terms to describe sample preparation applied to geologic specimens, typically in preparation for analytical processes like geochemistry or microscopy (GeoSciML).

Value	Code	Definition
Acid digestion		
Crush		
Cut		
Mineral separation		
Mount		
Polish		
Thin section		

Created: 20/05/2015
Modified: none
Author: CNR-ISMAR
State: approved
Used in:
Extensibility:
Note 1:

GeologicUnitTypeValue_v3

Type: Code Value Domain

Description: Terms describing the type of geologic unit (D2.8.II.4_v3.0).

Value	Code	Definition
Geologic unit		
Allostratigraphic unit		
Alteration unit		
Biostratigraphic unit		
Chronostratigraphic unit		
Geophysical unit		
Magnetostratigraphyc unit		
Lithogenetic unit		
Artificial ground		
Excavation unit		
Mass movement unit		
Lithologic unit		
Lithostratigraphic unit		
Lithodemic unit		
Lithotectonic unit		
Deformation unit		
Pedostratigraphic unit		
Polarity chronostratigraphic unit		
Seismo-stratigraphic unit		

Created: 20/05/2015

Modified: none

Author: CNR-ISMAR

State: approved

Used in:

Extensibility: none

Note 1: http://inspire.ec.europa.eu/codelist/GeologicUnitTypeValue

GeomorphologicActivityValue_v3

Type: Code Value Domain

Description: Terms indicating the level of activity of a geomorphologic feature (D2.8.II.4_v3.0).

Value	Code	Definition
Active		
Dormant		
Reactivated		
Stabilised		
Inactive		

Created: 20/05/2015

Modified: none

Author: CNR-ISMAR

State: approved

Used in:

Extensibility: open

Note 1: http://inspire.ec.europa.eu/codelist/GeomorphologicActivityValue

LevelValue_v3

Type: Code Value Domain

Description: type of geology

Value	Code	Definition
Deep geology		
Surface geology		

Created: 20/05/2015
Modified: none
Author: CNR-ISMAR
State: approved
Used in:
Extensibility:
Note 1:

LithologyValue_v3
Type: Code Value Domain
Description: Terms describing the lithology (D2.8.II.4_v3.0).

Value	Code	Definition
Compound material		
Anthropogenic material		
Anthropogenic consolidated material		
Anthropogenic consolidated material		
Anthropogenic unconsolidated material		
Rock		
Sedimentary rock		
Sedimentary material		
Carbonate sedimentary material		
Chemical sedimentary material		
Clastic sedimentary material		
Non clastic siliceous sedimentary material		
Organic rich sedimentary material		
Igneous material		
Unconsolodated material		
Natural unconsolidated material		
Sediment		
Biogenic sediment		
Biogenic silica sedimentary rock		
Carbonate mud		
Carbonate rich mud		
Carbonate sediment		
Clastic sediment		
Clay		
Diamicton		
Gravel size sediment		
Hybrid sediment		
Mud		
Mud size sediment		
Non clastic siliceous sediment		
Organic rich sediment		
Peat		
Pebble gravel size sediment		
Sand		

Sapropel		
Silt		
Tephra		
Waste		
Mixed		

Created: 20/05/2015

Modified: none

Author: CNR-ISMAR

State: approved

Used in:

Extensibility: open

Note 1: http://inspire.ec.europa.eu/codelist/LithologyValue

MappingFrameValue_v3

Type: Code Value Domain

Description: Terms indicating the surface on which the MappedFeature is projected (D2.8.II.4_v3.0).

Value	Code	Definition
Base of Quaternary		
Surface geology		
Top of basement		
Top of bedrock		
Base of Plio-Quaternary		
Tectonic structure		
Sub-surface geology		

Created: 20/05/2015

Modified: none

Author: CNR-ISMAR

State: approved

Used in:

Extensibility: open

Note 1: http://inspire.ec.europa.eu/codelist/MappingFrameValue

MaterialClassValue_v3

Type: Code Value Domain

Description: type of sample.

Value	Code	Definition
Image		
Marine sediment		
Rock		

Created: 20/05/2015

Modified: none

Author: CNR-ISMAR

State: approved

Used in:

Extensibility:

Note 1:

MethodValue_v3

Type: Code Value Domain

Description:

Value	Code	Definition
Automatic interpolation of reclassified samples		
Automatic interpolation of reclassified samples and acoustic-seismic surveys		
Reclassification on the grounds of samples		
Reclassification on the grounds of expert-based prediction		

Created: 20/05/2015
Modified: none
Author: CNR-ISMAR
State: approved
Used in:
Extensibility:
Note 1:

NaturalGeomorphologicFeatureTypeValue_v3
Type: Code Value Domain
Description: Terms describing the type of natural geomorphologic feature (D2.8.II.4_v3.0).

Value	Code	Definition
Alluvial fluvial		
Buried feature		
Constructional feature		
Crest		
Degradation feature		
Depression		
Destructional feature		
Erosion surface		
Erosional		
Exhumed feature		
Head slope		
Hydrothermal		
Impact		
Karst chemical weathering		
Marine littoral coastal wetland		
Plain		
Relic		
Side slope		
Slope gravitational		
Tectonic structural		
Volcanic		

Created: 20/05/2015
Modified: none
Author: CNR-ISMAR
State: approved
Used in:
Extensibility: open
Note 1: none

NetworkNameValue_v3
Type: Code Value Domain
Description: Name of geophysical network (D2.8.II.4_v3.0).

Value	Code	Definition

GSN		
IMS		
INTERMAGNET		
UEGN		
WDC		
Other		

Created: 20/05/2015
Modified: none
Author: CNR-ISMAR
State: approved
Used in:
Extensibility: open
Note 1: http://inspire.ec.europa.eu/codelist/NetworkNameValue

ObjectTypeValue_v3

Type: Code Value Domain

Description:

Value	Code	Definition
Borehole		
Core		
CTD-profile		

Created: 20/05/2015
Modified: none
Author: CNR-ISMAR
State: approved
Used in:
Extensibility: open
Note 1:

OtherMeasurementTypeValue_v3

Type: Code Value Domain

Description: other types of geophysic measurement methods.

Value	Code	Definition
3D Multielectrode DC		

Created: 20/05/2015
Modified: none
Author: CNR-ISMAR
State: approved
Used in:
Extensibility: open
Note 1:

ParameterValue_v3

Type: Code Value Domain

Description: list of parameters.

Value	Code	Definition
Temperature		
Conductivity		
Magnetic susceptibility		
Resistance		

Turbidity		
Lithology		
Granulometry		
Geologic formation age		
Geologic formation name		
System tract		

Created: 20/05/2015
Modified: none
Author: CNR-ISMAR
State: approved
Used in:
Extensibility: open
Note 1:

PartyRoleValue_v3

Type: Code Value Domain

Description: Roles of parties related to or responsible for a resource (D2.5_v3.4)

Value	Code	Definition
Author	author	Author of the data (D2.5_v3.4)
Custodian	custodian	Guardian or keeper responsible for maintaining data D2.5_v3.4)
Distributor	distributor	Person or organisation who distributes the data (D2.5_v3.4)
Originator	originator	Responsible party who created the dataset or metadata (D2.5_v3.4)
Owner	owner	Person who owns the data (D2.5_v3.4)
Point of contact	pointOfContact	Responsible party who can be contacted for acquiring knowledge about or acquisition of the data (D2.5_v3.4)
Principal investigator	principalInvestigator	Key person responsible for gathering information and conducting research (D2.5_v3.4)
Processor	processor	Responsible party who has processed the data in a manner in which data has been modified (D2.5_v3.4)
Publisher	publisher	Responsible party who published the data (D2.5_v3.4)
Resource provider	resourceProvider	Party that supplies the data (D2.5_v3.4)
User	user	Person who uses the data (D2.5_v3.4)

Created: 20/05/2015
Modified: none
Author: CNR-ISMAR
State: approved
Used in: RelatedParty (OC)
Extensibility: yes
Note 1: none

PlatformTypeValue_v3

Type: Code Value Domain

Description: Platform on which data acquisition was carried out (D2.8.II.4_v3.0).

Value	Code	Definition
Seafloor		
Research vessel		
Satellite		
Other		

Created: 20/05/2015
Modified: none
Author: CNR-ISMAR
State: approved
Used in:
Extensibility: open
Note 1: http://inspire.ec.europa.eu/codelist/PlatformTypeValue

PrimeFOLKValue_v3
Type: Code Value Domain

Description:

Value	Code	Definition
Mud to sandy mud		
Sand to muddy sand		
Mixed sediment		
Boulder		
Till		
Coarse sediment		
Bedrock and boulders		

Created: 20/05/2015
Modified: none
Author: CNR-ISMAR
State: approved
Used in:
Extensibility: none
Note 1:

ProfileTypeValue_v3
Type: Code Value Domain

Description: Terms specifying the type of fold (D2.8.II.4_v3.0).

Value	Code	Definition
Borehole logging		
Multielectrode DC profile		
Seismic line		
Cone penetration test		
Sonar line		

Created: 20/05/2015
Modified: none
Author: CNR-ISMAR
State: approved
Used in:
Extensibility: open
Note 1: http://inspire.ec.europa.eu/codelist/FoldProfileTypeValue

PropertyTypeValue_v3
Type: Code Value Domain

Description: list of properties useful to define geologic unit map.

Value	Code	Definition
Depth		
Height		

Thickness		
Time		

Created: 20/05/2015
Modified: none
Author: CNR-ISMAR
State: approved
Used in:
Extensibility: open
Note 1:

ReclassificationValue_v3
Type: Code Value Domain
Description:

Value	Code	Definition
Sample -based		
Expert -based prediction		

Created: 20/05/2015
Modified: none
Author: CNR-ISMAR
State: approved
Used in:
Extensibility: none
Note 1:

RelationValue_v3
Type: Code Value Domain
Description:

Value	Code	Definition
=		
~		
>		
<		
#		

Created: 20/05/2015
Modified: none
Author: CNR-ISMAR
State: approved
Used in:
Extensibility: none
Note 1:

SecondaryFOLKValue_v3
Type: Code Value Domain
Description:

Value	Code	Definition
Mud to sandy mud		
Sand to muddy sand		
Coarse sediments		
Mixed sediment, multimodal		
Glacial clay		

Hard bottom complex		
Patchy seafloor		
Till		
Mixed, subcategory undefined		
Bedrock		
Boulders		

Created: 20/05/2015
Modified: none
Author: CNR-ISMAR
State: approved
Used in:
Extensibility: none
Note 1:

StationRankValue_v3
Type: Code Value Domain
Description: Rank of geophysical station (D2.8.II.4_v3.0).

Value	Code	Definition
Observatory		
Secular station		
1st order base		
2nd order base		
Survey station		

Created: 20/05/2015
Modified: none
Author: CNR-ISMAR
State: approved
Used in:
Extensibility: open
Note 1: http://inspire.ec.europa.eu/codelist/StationRankValue

StationTypeValue_v3
Type: Code Value Domain
Description: Type of geophysical station (D2.8.II.4_v3.0).

Value	Code	Definition
Gravity station		
Magnetic station		
Seismological station		
Vertical electric sounding		
Magnetotelluric sounding		
Time domain EM sounding		
Frequency domain EM sounding		
Radiometric station		

Created: 20/05/2015
Modified: none
Author: CNR-ISMAR
State: approved
Used in:
Extensibility: open
Note 1: http://inspire.ec.europa.eu/codelist/StationTypeValue

SurveyTypeValue_v3

Type: Code Value Domain

Description: Type of geophysical survey or dataset

Value	Code	Definition
2D seismic survey		
3D seismic survey		
Borehole logging survey		
CPT survey		
Multibeam survey		
ROV survey		
Sampling survey		

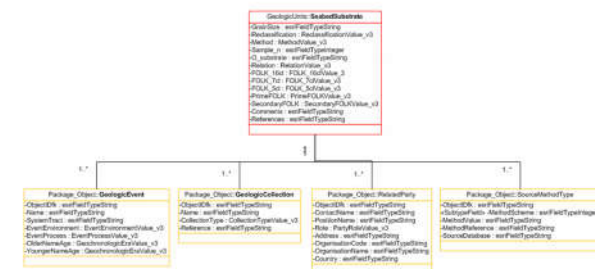Created: 20/05/2015

Modified: none

Author: CNR-ISMAR

State: approved

Used in:

Extensibility: open

Note 1: http://inspire.ec.europa.eu/codelist/SurveyTypeValue

SwathTypeValue_v3

Type: Code Value Domain

Description: Type of geophysical swath (D2.8.II.4_v3.0).

Value	Code	Definition
3D seismics		
Sonar		

Created: 20/05/2015

Modified: none

Author: CNR-ISMAR

State: approved

Used in:

Extensibility: open

Note 1: http://inspire.ec.europa.eu/codelist/SwathTypeValue

Annex 3 –UML diagram

Feature classes

Abstract Feature Class: brown
Feature Class: red
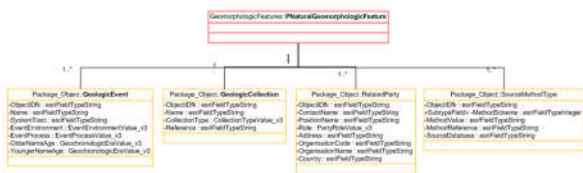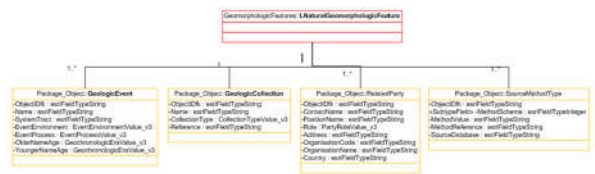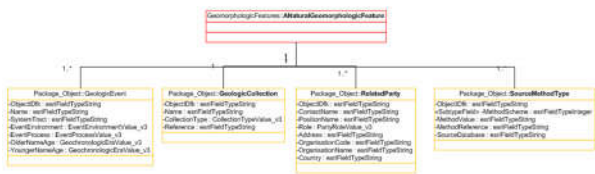Domain: blue

Object classes

Object Class: orange
Subtype: green
Domain: blue

Relationship classes

Feature Class: red

Object Class: orange

Annex 4 – Layer visualization