CordLink Digital Library

Geologic Map Data Model Version 5.2

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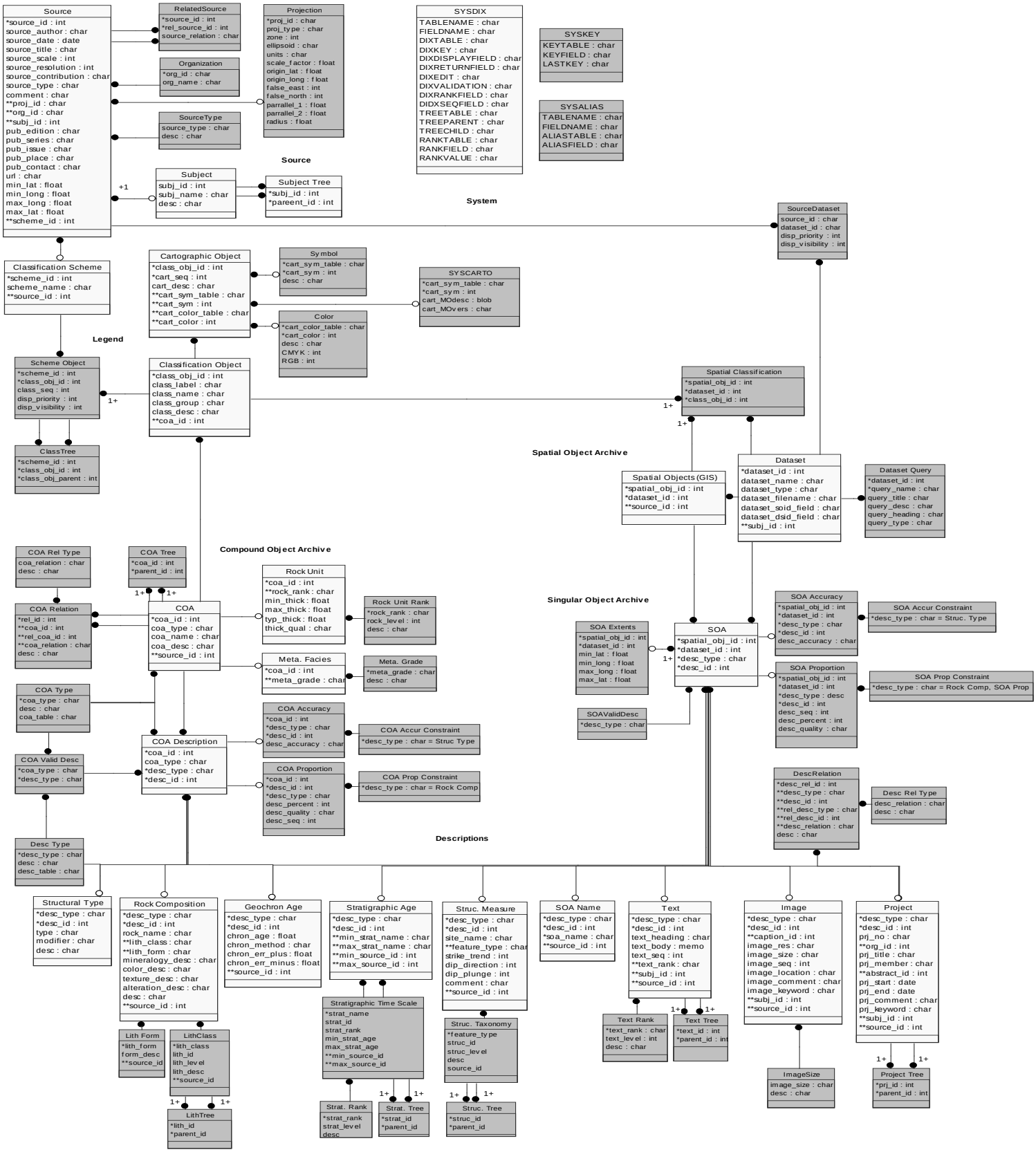

LOGICAL VIEW REPORT

Data Model Tables v5.2

Source

The source table contains general references for data stored in the data model. A source may be a map, report, or a reference to a person. Sources may be published or unpublished -- if published, the pub. attributes are filled in. Sources can be related to one another to indicate sources for sources: e.g. a map and its sources. Sources could be used to track changes to other data stored in the data model -- e.g. a contact is shifted on the map and a new source is added to document this, and is linked to the previous source to provide a history of changes as well as references. Where appropriate, the surrounding geographic rectangle is provided with a source. A source that is a map will posses a classification scheme that effectively acts a legend for the map.

Private Attributes:

***source_id : int**
The unique id for the source, generated by the system.

source_author : char
A list ofone or more authors responsible for the source.

source_date : date
Date of the source.

source_title : char
Title of the source, if applicable.

source_scale : int
Scale denominator of the source; e.g. a 1:24,000 scale map would contain 24000 here.

source_resolution : int
The resolution of the source -- as per Johnson, et. al.

source_contribution : char
The contribution to the object referencing this source; e.g. if the source is documenting a change to a geologic object on the map, then this field would record the nature of the modification.

source_type : char
The type of source. One of 'map', 'text', 'image' or 'project'.

comment : char
A comment about the source.

****proj_id : char**
A projection id linking to a projection definition in the projection table.

****org_id : char**
The id of the agency that created the source.

****subj_id : int**
The id of the subject best associated with this source.

pub_edition : char
For a published source only: this referes to the edition name of the publication.

pub_series : char
For a published source only: this referes to the series name.

pub_issue : char
For a published source only: this referes to the issue identification for the publication.

pub_place : char
For a published source only: this referes to the place of publication.

pub_contact : char
For a published source only: this referes to the contact person.

url : char
A world wide web address for the source.

min_lat : float
The latitude of lower left corner of the bounding rectangle of the source.

min_long : float
The longitude of lower left corner of the bounding rectangle of the source.
The latitude of upper right corner of the bounding rectangle of the source.

max_lat : floatmax_long : float
The longitude of upper right corner of the bounding rectangle of the source
****scheme_id : int**
The id of the classification scheme used as the legend for a map.

Organization

The organization table contains details about the organizations being referred to in the source table. Each organization is given an unique id, and is permitted only one contact address. Thus a organization with branches would need to register each branch as a seperate org. in this scheme; e.g. org_name='GSC' and org_dept='Pacific geoscience center'. Again, the impetus for this is simplicity.

Private Attributes:

***org_id : char**
Unique organization id.
org_name : char
Organization name.

Projection

The projection table contains projection attributes used to define the most common map projections. It used to define the projection of a map (source) or a spatial object when that object does not refer to a map as its source.

Private Attributes:

***proj_id : char**
The unique id assigned to the projection.
proj_type : char
The type of projection; e.g. Geographic, UTM, TM, Lambert, Polar, etc.
zone : int
The grid zone spec. for a UTM projection.
ellipsoid : char
The name of the ellipsoid used.
units : char
The units: e.g. feet, survey feet, meters, degrees, etc.
scale_factor : float
The scale factor of the projection: usually applied to the origin meridian.
origin_lat : float
The latitude of the origin of the projection.
origin_long : float
The longitude of the origin of the projection.
false_east : int
The offsett in the x direction in units.
false_north : int
The offset in the y direction in units.
parrallel_1 : float
The first standard parrallel for a Lambert projection.
parrallel_2 : float
The second standard parrallel for a Lambert projection.
radius : float
The radius associated with some polar-type projections.

RelatedSource

The RelatedSource table relates one source to another. This could be to indicate a source's source, or to track a history of changes to an object in the database.

Private Attributes:

***source_id : int**
Originating source.

***rel_source_id : int**
Related source.

source_relation : char
The type of relationship the first source has with the second.

Scheme Object

The data model uses the idea of a 'legend' to filter the database for spatial and descriptive objects in order to create/retrieve a map. Thus a map is defined by a description (in the metadata -- Source, Author, ...) and by its legend. A legend is named in Classification Scheme table and consists of Classification Objects (i.e. legend items) each of which posesses symbol, spatial and descriptive characteristics. Classification Schemes can be re-used on different maps; likewise, Classification Objects can be defined generally and re-used with many schemes. The Scheme Object table connects specific Classification Objects table to a specific Classification Scheme. In this way a Class. object can belong to many schemes.

Private Attributes:

***scheme_id : int**
The unique id for a classification scheme.

***class_obj_id : int**
The unique id for a Classification object.

class_seq : int
A number defining the sequential position of the object in the legend (class. scheme) for a specific map.

disp_priority : int
A priority number which allows the user to specify the order in which objects are drawn when the map is displayed.

disp_visibility : int
A toggle which indicates whether the object is displayed in the legend or remains hidden from view whenthe legend is displayed.

Classification Object

The data model uses the idea of a 'legend' to filter the database for spatial and descriptive objects in order to create/retrieve a map. Thus a map is defined by a description (in the metadata -- Source, Author, ...) and by its legend. A legend consists of Classification Objects (i.e. legend items) each of which posesses symbol, spatial and descriptive characteristics. These Classification Objects can be defined generally and re-used with many maps. Thus, the Classification Object Table is used to define the objects that are to appear on a map and
therefore, on the map legend. This table also defines the labeling that is used for each object, and permits the assignment of a name. In order for an object to appear on the map it must be related to a Classification object -- i.e. all objects on a map are classified and assigned symbology. The description of the classification is stored in the COA table, and the symbology is defined via the Cartographic Object table. Thus each Class. Object contains one associated entry in the COA, and one or more entries in the Carto. Object table.

Private Attributes:

***class_obj_id : int**
The unique id for a Classification object.

class_label : char
The character symbol for the object. For a rock unit, this would be the unit label, such as TKgr.

class_name : char
The name applied to the class. object, usually when it is necessary to distinguish it on the legend from the coa name.

class_group : char
Class_group permits classification objects to be grouped into categories that resemble main titles/headings typically found on a geological legend.

class_desc : char
An English language description of the classification, when it differs from the description in the COA table.

****coa_id : int**
Unique identification number of a item in the Compound Object Archive. This connects the classification object with its description (in the COA).

Cartographic Object

Cartographic objects define the symbology for legend items. Each Classification Object in the legend may be associated with one or more Carto. Object symbol descriptions: e.g. a point symbol and color, or for instance, two superimposed area hatch patterns. A Cartographic object consists of a symbol and color specification. The symbol specification can refer either an area, point or line symbol. The description of these symbols can be found in the Symbol table. Only a text description of the symbol and its position within a particular library is recorded in the Symbol table. Thus, in order to identify a symbol for the Carto. Object, the symbol library name and symbol number within that library must be specified. Note that each carto. object can contain symbols from one or more libraries.

Private Attributes:

***class_obj_id : int**
The unique id for the Classification object that is being symbolized.

***cart_seq : int**
A number representing the drawing sequence of the symbols: a value of 1 is the top symbol, 2 is the next down, etc.

cart_desc : char
A text description of the symbol.

****cart_sym_table : char**
The name of the symbol library containing the symbol. Each symbol table can contain one or more symbol libraries, which in turn contain one or more symbol definitions. This attribute identifies the symbol library from which the symbol is to be drawn.

****cart_sym : int**
The the unique numeric identifier of the symbol within a symbol library.

****cart_color_table : char**
The name of the color library containing the specific color.

****cart_color : int**
The number of the color within the color library.

Symbol

The Symbol table is a collection of area, line and point symbol definitions that are grouped into various libraries within the table. Each symbol belongs to a library (cart_sym_table), is identified within that library with a number (cart_sym), and is described textually: the actual graphic representation of the symbol is not specified in the data model but is implementation specific and will vary from one system to the next.

Private Attributes:

***cart_sym_table : char**

The name of the symbol library that this symbol belongs to. Each symbol table is a collection of area symbols which are grouped into various libraries -- this attribute specifices the name of the library to which the symbol belongs.

***cart_sym : int**

The unique numeric identifier of the symbol within the symbol library.

desc : char

A text description of the symbol.

Color

The color table is a collection of color definitions which are grouped into various libraries within the table.

Private Attributes:

***cart_color_table : char**

The name of the color library that this color belongs to. The color table is a collection of color definitions which are grouped into various libraries -- this attribute specifices the name of the library to which the color belongs.

***cart_color : int**

The unique numeric identifier of the color within the color library.

desc : char

A text description of the symbol.

CMYK : int

The Cyan/Magenta/Yellow/Black designation of the color.

RGB : int

The Red/Blue/Green designation for the coloe.

Spatial Classification

The Spatial Classification table associates symbol and content information with spatial features in the GIS. Each spatial spatial feature in the GIS may possibly be classified in more than one way, on the same map (e.g. as contact and fault) or perhaps on different maps (e.g. bedrock vs tectonic); in addition its possible that the same polygon may be symbolized differently on different maps. The Spatial Class. table connects a spatial feature to its various classifications (Class. Objects).

Private Attributes:

***spatial_obj_id : int**

A unique identifier of each feature in an individual GIS data layer/coverage/file.

***dataset_id : int**

The unique id of the specific GIS dataset: layer/file/coverage.

***class_obj_id : int**

The unique id for a Classification object. Each spatial feature in the GIS is classified/symbolized via this classification object..

Spatial Objects (GIS)

A polygon type GIS dataset that is normally used to store the geographic coordinates and topologic definitions
which make up the spatial description of rock units and other areal data. Each feature is uniquely identified by the spatial_obj_id and cover_id attributes, while the attribute source_id, provides a link back to the original source.

Private Attributes:

***spatial_obj_id : int**

A unique identifier of each feature in an individual GIS data layer/coverage/file..

The unique id of the specific GIS dataset: layer/file/coverage.

****source_id : int*dataset_id : int**

A reference to the source (in the metadata) of the spatial feature. This could refer to a specific map, report, author or projection definition.

SOA

The SOA (Singular Object Archive) associates a specific spatial feature (from the GIS) to the description specific to its occurence. This is in contrast to its classification: e.g. a polygon may classified as being 'Dakota Sandstone' but may have a particular lithologic description which differs from the generic 'Dakota Sandstone' description; likewise a point feature may be classified as the generic class 'foliation' but the details of its measurement are accessed via the SOA. SOA details are specific to an occurance, whereas COA details apply to many occurences.

Private Attributes:

***spatial_obj_id : int**

A unique identifier of each feature in an individual GIS data layer/coverage/file.

***dataset_id : int**

The unique id of the specific GIS dataset: layer/file/coverage.

***desc_type : char**

The description table type (i.e. 1=RockComp., 2= rad.Age, 3=Strat.Age,
4=Struc.Measure, 5=Fossil Detail,
6=Struc Type,
7=SOA Prop,
8=MapIndex..) Descriptions are uniquely identified by their table type and unique id within that table.

***desc_id : int**

The unique identifier of a description within a specific description table. Descriptions are uniquely identified by description type (i.e. 1=RockComp., 2= rad.Age, 3=Strat.Age, 4=Struc.Measure, 5=Fossil Detail,..) and the description id unique to each table type.

SOA Name

Contains one or names associated with an individual occurrence (e.g. a polygon feature or point feature) on a map, and the source of each name.

Private Attributes:

***desc_type : char**

The unique identifier of a description within a specific description table. Descriptions are uniquely identified by description type (i.e. 1=RockComp., 2= rad.Age, 3=Strat.Age, 4=Struc.Measure, 5=Fossil Detail,..) and the description id unique to each table type.

***desc_id : int**

The unique identifier of a struc. measurement. Descriptions are uniquely identified by description type (i.e. 1=RockComp., 2= rad.Age, 3=Strat.Age, 4=Struc.Measure, 5=Fossil Detail,..) and the description id unique to each table type.

***soa_name : char**

The name associated with a specific occurrence.

****source_id : int**

A reference to the source (in the metadata) of the name. This could refer to a specific map publication, author or projection definition.

SOA Proportion

When a spatial feature is described by many descriptions then this table permits each description to be further annotated according to its sequential priority and its percentage

composition of the spatial feature; e.g. a polygon may contain more than lithology, each with a volume percent composition estimate.

Private Attributes:

***spatial_obj_id : int**
A unique identifier of each feature in an individual GIS data layer/coverage/file.

***dataset_id : int**
A unique identifier of each feature in an individual GIS data layer/coverage/file.

***desc_type : desc**
The description table type (i.e. 1=RockComp., 2= rad.Age, 3=Strat.Age,
4=Struc.Measure, 5=Fossil Detail,
6=Struc Type,
7=SOA Prop..) Descriptions are uniquely identified by their table type and unique id within that table

***desc_id : int**
The unique identifier of a description within a specific description table. Descriptions are uniquely identified by description type (i.e. 1=RockComp., 2= rad.Age, 3=Strat.Age, 4=Struc.Measure, 5=Fossil Detail,..) and the description id unique to each table type.

desc_seq : int
A number descibing the priority sequence of the descriptions associated with a spatial feature.

desc_percent : int
An estimate of the percent composition of the description within the spatial feature: e.g. if the description is lithologic then this would represent the volume percent that the lithology composes the spatial feature.

desc_quality : char
Quality of the percent estimate.

Geochron Age

The Geochron Age Table descibes a geochronological age date. Geochron Ages can be associated with any COA (e.g. a rock unit or structure) as well as any SOA (e.g. a sample location).

Private Attributes:

***desc_type : char**
The unique identifier of a description within a specific description table. Descriptions are uniquely identified by description type (i.e. 1=RockComp., 2= rad.Age, 3=Strat.Age, 4=Struc.Measure, 5=Fossil Detail,..) and the description id unique to each table type.

***desc_id : int**
The unique identifier of a rad. age. Descriptions are uniquely identified by description type (i.e. 1=RockComp., 2= rad.Age, 3=Strat.Age, 4=Struc.Measure, 5=Fossil Detail,..) and the description id unique to each table type.

chron_age : float
The geochron age date.

chron_method : char
Method used to acquire the rad. date.

chron_err_plus : float
The +'ve error for the geochron date.

chron_err_minus : float
The -'ve error for the geochron date.

****source_id : int**
A reference to the source(in the metadata) of the rad. age. This could refer to a specific map, report or author.

Stratigraphic Age

Describes a time-stratigraphic age range. When a range is inappropriate the min. and max. ages are identical. Stratigraphic age ranges are most commonly applied to rock units, but may be associated with any COA or SOA.

Private Attributes:

***desc_type : char**

The unique identifier of a description within a specific description table. Descriptions are uniquely identified by description type (i.e. 1=RockComp., 2= rad.Age, 3=Strat.Age, 4=Struc.Measure, 5=Fossil Detail,..) and the description id unique to each table type.

***desc_id : int**

The unique identifier of a strat. age. Descriptions are uniquely identified by description type (i.e. 1=RockComp., 2= rad.Age, 3=Strat.Age, 4=Struc.Measure, 5=Fossil Detail,..) and the description id unique to each table type.

****min_strat_name : char**

The minimum time-stratigraphic age selected from the Stratigraphic Time Scale Table.

****max_strat_name : char**

The maximum time-stratigraphic age selected from the Stratigraphic Time Scale Table.

****min_source_id : int**

A reference to the source(in the metadata) of the min. strat. age . This could refer to a specific map, report or author

****max_source_id : int**

A reference to the source(in the metadata) of the max. strat. age . This could refer to a specific map, report or author

Rock Composition

Decribes a lithologic composition by specifying a user-defined rock name and by selecting the best matching rock name from the standard lith_class and lith_form word lists. The remaining rock description is entered into the description attribute. Rock Composition are typically associated with a rock unit (in the COA) or with a specific spatial feature (in the SOA -- e.g. a polygon or an point representing an outcrop).

Private Attributes:

***desc_type : char**

The unique identifier of a description within a specific description table. Descriptions are uniquely identified by description type (i.e. 1=RockComp., 2= rad.Age, 3=Strat.Age, 4=Struc.Measure, 5=Fossil Detail,..) and the description id unique to each table type.

***desc_id : int**

The unique identifier of a rock composition. Descriptions are uniquely identified by description type (i.e. 1=RockComp., 2= rad.Age, 3=Strat.Age, 4=Struc.Measure, 5=Fossil Detail,..) and the description id unique to each table type.

rock_name : char

A text description of the rock type.

****lith_class : char**

A lithologic classification term taken from the Lithology word list which best suits the rock type being described.

****lith_form : char**

A form or morphology term selected from the Form table.

mineralogy_desc : char

A text description of the minerology.

color_desc : char

A text description of the color.

texture_desc : char

A text description of the texture.

alteration_desc : char

A text description of the alteration.

A text description of the lithology.

****source_id : intdesc : char**

A reference to the source (in the metadata) of the rock composition. This could refer to a specific map, report or author.

Struc. Measure

Describes a structural measurement by indicating the trend and plunge for linear data and the strike/dip_direction and dip for planar data. A station or sample name can also be specified as well as type of structural measurement.

Private Attributes:

***desc_type : char**

The unique identifier of a description within a specific description table. Descriptions are uniquely identified by description type (i.e. 1=RockComp., 2= rad.Age, 3=Strat.Age, 4=Struc.Measure, 5=Fossil Detail,..) and the description id unique to each table type.

***desc_id : int**

The unique identifier of a struc. measurement. Descriptions are uniquely identified by description type (i.e. 1=RockComp., 2= rad.Age, 3=Strat.Age, 4=Struc.Measure, 5=Fossil Detail,..) and the description id unique to each table type.

site_name : char

A site or sample name representing the location of the struc. measurement.

****feature_type : char**

The type of structral measurement drawn from the hierarchical Struc. Taxonomy word list.

strike_trend : int

The strike of a planar feature or the trend of a linear feature, using the right-hand-rule.

dip_direction : int

Ameasurement of the angle of the dip projected to the horizontal -- used instead of the strike. The strike can calculated from this by subtracting 90 degrees -- this calculation should be performed and the strike attribute filled when this method is used.

dip_plunge : int

The dip of a planar feature or the plunge of a linear feature, using the right-hand-rule.

comment : char

A comment on the struc. measurement.

****source_id : int**

A reference to the source (in the metadata) of the struc. measurement. This could refer to a specific map, report or author.

COA

The primary use of the
COA Table is to specify which type of unit is being described and, therefore, which additional tables should be consulted for the remainder of the description of the unit. The coa_type attribute specifies which type of object is being defined and the coa_id attribute is used as a unique identifier for each unit within the archive. There is also an attribute, coa_name for the name of the unit and provision for a text description of the object (coa_desc attribute) which would normally contain the text that would be used in the map legend to describe this unit. Finally, the COA
Table contains attributes for linking each object in the archive back to its original source.

Private Attributes:

***coa_id : int**

Unique identification number of a item in the Compound Object Archive.

coa_type : char

Specifies whether the COA item is a 'Rock Unit' or 'Structure'.

coa_name : char

The name of the COA item: e.g. 'Dakota Sandstone', or 'San Andreas Fault System', or 'Dextral Strike-Slip Fault', or 'Foliation'.

coa_desc : char
A text description of the item.
****source_id : int**
A reference to the source (in the metadata) of the COA. This could refer to a specific map, report, author or projection definition.

COA Description

The COA Description table links a COA object to one or more descriptions (Rock Composition, rad.Age, Strat.Age,...) which describe it. Each description is identified by a desc_id, unique within a table, and a desc_type which identifies the table (i.e. 1=RockComp., 2= rad.Age, 3=Strat.Age, 4=Struc.Measure, 5=Fossil Detail,...)

Private Attributes:

***coa_id : int**
Unique identification number of a item in the Compound Object Archive.
coa_type : char
***desc_type : char**
The desc_type id identifes the table hosting the description (e.g. 1=RockComp., 2= rad.Age, 3=Strat.Age,..). In combination with the desc_id it forms a unique id for any description (in any desc. table).
***desc_id : int**
The identifier for a description -- it is unique within a description table. A description is made unique across all desc. table by combining the desc_id with a desc_type id which identifes the table hosting the description (e.g. 1=RockComp., 2= rad.Age, 3=Strat.Age,..).

COA Relation

The COA Relation Table (table 2-27) is used to store information about the relationships between objects that occur in the COA Table. For example, relationships can be temporal or structural: 'contemporaneous' or 'overlies'. The coa_id attribute refers to an item defined in the
COA Table. The rel_coa_id attribute refers to a second item defined in the COA Table. The direction of the relation
is from the unit represented by the coa_id to the unit represented by the rel_coa_id. Therefore, the relation,
'"overlies', means that the coa_id unit overlies the rel_coa_id unit.

Private Attributes:

***rel_id : int**
Unique identification number for each relationship in this table.
****coa_id : int**
Unique identification number of an item in the Compound Object Archive.
****rel_coa_id : int**
Unique identification number of a second unit in the COA Table to which the first object is related in some fashion.
****coa_relation : char**
A broad category of temporal, structural or other relationships between units.
desc : char
Text description of the relationship.

COA Tree

The COA Tree Table is used to store information about parent-child relationships between

units that occur in the COA Table. The coa_id attribute refers to an object in the COA Table. The parent_id attribute refers to the coa_id of a second object in the COA Table, which is a parent of the first object. The purpose of
defining the relationships in this table is to allow automated simplification of geologic maps. For example,
formations in a map area may be defined as parts of a group and the group may be further defined as a part of a
supergroup. Then, in this table there would be two records for the formation, one showing the group as a parent and the other showing the supergroup as a parent. With this data in the archive, simplifying the map to the group or supergroup level becomes a simple table look-up operation. Another purpose of this table is to permit queries into the archive that would return data
belonging to any unit or linear feature, including references to its subdivisions. Thus, a search for a specific group could return also its composing formations, members, beds, etc. A search for a specific linear feature such as the San
Andreas Fault could return it and all its separately described segments.

Private Attributes:

***coa_id : int**
Unique identification number of an item in the Compound Object Archive.

***parent_id : int**
Unique identification number of a second unit in the COA Table which is the parent of the unit identified in coa_id.

Rock Unit

The Rock Unit Table is used to assign a rank to each unit and may contain other attributes specific to rock units. The rock_rank attribute contains a keyword that defines the rank or lithostratigraphic or lithodemic level of each defined unit. The keyword list is store in the Rock Unit Rank table and will contain words such as, supergroup, group, formation, member, bed, etc., as well as suite, complex, etc.

Private Attributes:

***coa_id : int**
Unique identification number of the rock unit's description in the Compound Object Archive.

****rock_rank : char**
The rock_rank attribute contains a keyword that defines the rank or lithostratigraphic or lithodemic level of each defined unit. The keyword list is store in the Rock Unit Rank table and will contain words such as, supergroup, group, formation, member, bed, etc., as well as suite, complex, etc

min_thick : float
Min. thickness of the rock unit in meters.

max_thick : float
Max. thickness of the rock unit in meters.

typ_thick : float
Typical or average thickness of the rock unit in meters.

thick_qual : char
Quality of the typical thickness estimate as a percent.

Rock Unit Rank

The Rock Unit Rank Table is used as a look-up table to correlate the rank, given in the Rock Unit Table as a word, with a numeric level number. Each rank term will be assigned a number in this table to improve the ease of searching, sorting and simplifying the database based on rank.

Private Attributes:

***rock_rank : char**
A keyword for a lithostratigraphic/lithodemic level or rank: e.g. group, formation, suite, complex, etc.

rock_level : int
A number indicating the rank.

desc : char
A text description of the rank.

Structural Type

The Structural Type table contains a keyword list of the kinds of structural features. Each structural feature is described as a type and modifier pair, as well as a full text description.

Private Attributes:

***desc_type : char**
The desc_type id identifes the table hosting the description (e.g. 1=RockComp., 2= rad.Age, 3=Strat.Age,..). In combination with the desc_id it forms a unique id for any description (in any desc. table).

***desc_id : int**
The unique identifier of a rock composition. Descriptions are uniquely identified by description type (i.e. 1=RockComp., 2= rad.Age, 3=Strat.Age, 4=Struc.Measure, 5=Fossil Detail,..) and the description id unique to each table type.

type : char
A major category of types of geologic structures.

modifier : char
A modifier to the major structure type specifying the specific type of structure.

desc : char
A text description of the structural feature type.

LithClass

The Lithology Table is used as a look-up table for lithologic terms (lith_class) used in the Rock Composition Table.

Private Attributes:

***lith_class :**
A lithologic term from a predefined list which best describes the rock composition.

lith_id :
A unique identifier for the lithologic term -- it is used in the Lithology Tree Table to store parent-child relations and thus define a hierarchy for the lith. terms.

lith_level :
A numeric value representing the hierachical level of the lithologic term: e.g. Igneous = 1, Plutonic=2, ...

lith_desc :
A text description of the lithologic term.

****source_id :**
A reference to the source (in the metadata) of the lithologic term. This could refer to a specific map, report or author.

LithTree

The Lithology Tree table arranges terms from the Lithology Table into a hierarchy by listing all the parents for every lithologic term in the Lithology Table.

Private Attributes:

***lith_id :**
A unique identifier for a lithologic term from the Lithology Table.

A unique identifier for a second lithologic term from the Lithology Table which is the parent of the first term.

***parent_id :**

Stratigraphic Time Scale

The Stratigraphic Time Scale Table is used as a look-up table for time-stratigraphic intervals in the Stratigraphic Age Table. It is essentially a word list containing the names of the time-stratigraphic ages found in geologic time scales.

Private Attributes:

***strat_name :**
The time-stratigraphic name for the time interval.

strat_id :
A unique identifier for the strat_name.

strat_rank :
A keyword representing the rank of the time-stratigraphic term: e.g. era, epoch, period, ... Must be defined in the Stratigraphic Rank Table.

min_strat_age :
Minimum numerical age, in millions of years.

max_strat_age :
Minimum numerical age, in millions of years.

****min_source_id :**
A reference to the source(in the metadata) of the min. strat. age . This could refer to a specific map, report or author.

****max_source_id :**
A reference to the source(in the metadata) of the max. strat. age . This could refer to a specific map, report or author.

Strat. Tree

The Stratigraphic Tree Table is used to store information about parent-child relationships between time-stratigraphic intervals that occur in the Stratigraphic Time Scale Table. This permits the Time Scale to organized into a hierarchy.

Private Attributes:

***strat_id :**
A unique identifier for a time-stratigraphic interval from the Stratigraphic Time Scale Table.

***parent_id :**
A unique identifier for a second time-stratigraphic interval from the Stratigraphic Time Scale Table which is a parent of the first interval.

Strat. Rank

The Stratigraphic Rank Table is a look-up table, which lists the possible stratigraphic ranks (e.g. era, eon, epoch, period,...) and provides a numeric value for these key words.

Private Attributes:

***strat_rank :**
A keyword representing the rank of the time-stratigraphic term.

strat_level :
A numeric value representing the hierarchical level of time-stratigraphic rank term.

desc :

Struc. Taxonomy

The Struc. Taxonomy table is a word list containing structural measurement types. It is arranged hierarchically in conjunction with the Struc. Tree.

Private Attributes:

***feature_type :**
The name of the struc. measurement: e.g. foliation, lineation, cleavage, bedding, etc.

struc_id :
The unique identifier of a struc. measurement.

struc_level :
A numeric value representing the hierachical level of the structural term: e.g. Planar = 1, Foliation=2, S1=3, S2=3, S3=3,...

desc :
A text description of the structural measurement type.

source_id :
A reference to the source (in the metadata) of the structural term. This could refer to a specific map, report or author.

Struc. Tree

The Struc. Tree table arranges terms from the Struc. Tax. Table into a hierarchy by listing all the parents for every term in the Struc. Tax. Table.

Private Attributes:

***struc_id :**
The unique identifier of a struc. measurement.

***parent_id :**
A unique identifier for a second stru. meas. term which is the parent of the first term.

Meta. Facies

This table is used to describe units of a metamorphic character, which overlie or are superimposed on pre-existing rock units. These units are different in that they are represented on a map as polygonal shapes that are superimposed on and crosscut the underlying rock units. Examples would include metamorphic gradient zones, metamorphic aureoles, etc.

Private Attributes:

***coa_id : int**
Unique identification number of a item in the Compound Object Archive.

****meta_grade : char**
The metamorphic grade of the metamorphic overlay: e.g. amphibolite, greenschist, ...

Meta. Grade

The Metamorphic Grade table contains a keyword list of metamorphic grade terms; e.g. amphibolite, greenschist, ...

Private Attributes:

***meta_grade : char**
The metamorphic grade of the metamorphic overlay: e.g. amphibolite, greenschist, ...

desc : char
A text description of the metamorphic grade term.

COA Proportion

The COA Proportion table modifies a description to indicate it composes a percentage of the COA:
when a COA is described by many descriptions then this table permits each description to be further annotated according to its sequential priority and its percentage composition of the COA; e.g. a rock unit may contain more than lithology, each with a volume percent composition estimate.

Private Attributes:

***coa_id : int**
Unique identification number of a item in the Compound Object Archive.

***desc_id : int**
The identifier for a description.

***desc_type : char**
The desc_type identifes a type of description table (e.g. 1=RockComp., 2= rad.Age, 3=Strat.Age,..)

desc_percent : int
The percentage amount that the COA is composed of by the description.

desc_quality : char
A certainty measure of the percentage.

desc_seq : int
The sequence order of this description, relative to others, for a specific COA.

COA Prop Constraint

Limits only certain description tables to be assigned in proportional amounts to a specific COA: currently only 'Rock Comp. is valid.

Private Attributes:

***desc_type : char = Rock Comp**
The desc_type identifes a type of description table: only 1=Rock Comp is thus far valid here.

COA Accuracy

The COA Accuracy table indicates the certainty of the description. It is currently applied only to the Struc Type table to indicate inferred, approx., etc.

Private Attributes:

***coa_id : int**
Unique identification number of a item in the Compound Object Archive.

***desc_type : char**
The desc_type identifes a type of description table (e.g. 1=RockComp., 2= rad.Age, 3=Strat.Age,..)

***desc_id : int**
The identifier for a description.

desc_accuracy : char
Desc accuracy indicates the certainty of the description. It is currently applied only to the Struc Type table to indicate inferred, approx., etc.

COA Accur Constraint

Limits accuracy statements only to be made w.r.t. to certain description tables: currently only to 'Struc Type'.

Private Attributes:

***desc_type : char = Struc Type**
The desc_type identifes a type of description table: only 6=Struc Type is thus far valid here.

COA Type

The COA Type table is a lookup table which contains a list of the valid COA table types: currently this includes 'Rock Unit' and 'Meta Facies'.

Private Attributes:

***coa_type : char**

The type of COA: currently this only includes 'Rock Unit' and 'Meta Facies'.

desc : char

A text description of the COA type.

coa_table : char

The name of the table corresponding to a coa type: e.g. for rock_unit its 'Rock Unit', for 'meta_facies' its 'Meta. Facies'.

COA Valid Desc

The COA Valid Desc table contains a list of valid descriptions for each COA table: e.g. a rock unit may be described by 'Struc Type' or 'Rock Comp' or 'Geochron Age' or 'Strat Age'. This prevents improper associations between COAs and Descriptions to be specified.

Private Attributes:

***coa_type : char**

The type of COA : currently this only includes 'Rock Unit' and 'Meta Facies'.

***desc_type : char**

The desc_type identifes a type of description table (e.g. 1=RockComp., 2= rad.Age, 3=Strat.Age,..)

Desc Type

The Desc Type table is a lookup table which contains a list of the valid Description table types: currently this includes 'Struc Type', 'Rock Comp', 'Geochron Age', 'Strat Age', 'Struc Measure', 'SOA Proportion', SOA Name, Text, Image, Project.

Private Attributes:

***desc_type : char**

The description table type (i.e. 1=RockComp., 2= rad.Age, 3=Strat.Age, 4=Struc.Measure, 5=Fossil Detail,..)

desc : char

desc_table : char

The name of the description table represented by the desc_type.

SOA Prop Constraint

Limits only certain description tables to be assigned in proportional amounts to a specific spatial objects: currently only 'Rock Comp. and SOA prop are valid.

Private Attributes:

***desc_type : char = Rock Comp, SOA Prop**

The description table type: only valid for 'Rock Comp' and 'SOA Prop'.

SOA Accuracy

The SOA Accuracy table indicates the certainty of the description. It is currently applied only to the Struc Type table to indicate inferred, approx., etc.

Private Attributes:

***spatial_obj_id : int**

A unique identifier of each feature in an individual GIS data layer/coverage/file.

***dataset_id : int**

A unique identifier of each feature in an individual GIS data layer/coverage/file.

***desc_type : char**

The description table type (i.e. 1=RockComp., 2= rad.Age, 3=Strat.Age, 4=Struc.Measure, 5=Fossil Detail, 6=Struc Type, 7=SOA Prop..) Descriptions are uniquely identified by their table type and unique id within that table.

***desc_id : int**

The unique identifier of a description within a specific description table. Descriptions are uniquely identified by description type (i.e. 1=RockComp., 2= rad.Age, 3=Strat.Age, 4=Struc.Measure, 5=Fossil Detail,..) and the description id unique to each table type.

desc_accuracy : char

Desc accuracy indicates the certainty of the description. It is currently applied only to the Struc Type table to indicate inferred, approx., etc.

SOA Accur Constraint

Limits accuracy statements only to be made w.r.t. to certain description tables: currently only to 'Struc Type'.

Private Attributes:

***desc_type : char = Struc. Type**

The description table type: only valid for 'Struc Type'.

DescRelation

The DescRelations table permits a relationship to be defined for any two descriptions: e.g. a fossil and a rock comp.

Private Attributes:

***desc_rel_id : int**

Unique identification number for each relationship in this table.

****desc_type : char**

The description table type of the first description (i.e. 1=RockComp., 2= rad.Age, 3=Strat.Age, 4=Struc.Measure, 5=Fossil Detail, 6=Struc Type, 7=SOA Prop..) Descriptions are uniquely identified by their table type and unique id within that table.

****desc_id : int**

The unique identifier of the first description within a specific description table.

****rel_desc_type : char**

The description table type of the second description (i.e. 1=RockComp., 2= rad.Age, 3=Strat.Age, 4=Struc.Measure, 5=Fossil Detail, 6=Struc Type, 7=SOA Prop..) Descriptions are uniquely identified by their table type and unique id within that table.

****rel_desc_id : int**

The unique identifier of a second description within a specific description table.

****desc_relation : char**

The type of relationship between the two descriptions.

desc : char

A text description of the relationship.

Classification Scheme

The data model uses the idea of a 'legend' to filter the database for spatial and descriptive objects in order to create/retrieve a map. Thus a map is defined by a description (in the metadata -- Source, Author, ...) and by its legend. A legend is named in Classification Scheme table and consists of Classification Objects (i.e. legend items) each of which posesses symbol, spatial and descriptive characteristics. In effect, the classification scheme table acts as a legend for the map: it identifies which class. objects are associated with the map, and this in turn determines how spatial objects are symbolized on the map and which database information is associated with those spatial objects. Classification Schemes can be re-used on different maps; likewise, Classification Objects can be defined generally and re-used with many schemes.

Private Attributes:

***scheme_id : int**

The unique id for a classification scheme.

scheme_name : char

The text name of the class. scheme.

****source_id : int**

A source id that is the reference for the class. scheme; this is usually refers to a source designating the origin of the class. scheme.

Lith Form

Contains form or morphology terms.

Private Attributes:

***lith_form :**

A form or morphology term.

form_desc :

A text description of the form.

****source_id :**

A reference to the source (in the metadata) of the lithologic term. This could refer to a specific map, report or author.

Subject

The subject table contains al ist of categories used to thematically index the data; e.g. bedrock geology, geochemistry, etc. These subject categories can be arranged hierarchically via the Subject Tree table.

Private Attributes:

subj_id : int

The unique numeric id of a subject.

subj_name : char

The name of the subject as taken from GeoRef; e.g. Bedrock Geology.

A text description of the subject.

desc : char

Subject Tree

The Subject Tree table is used to store information about parent-child relationships between

subjects found in the Subject table.

Private Attributes:

***subj_id : int**

***pareent_id : int**

Dataset

The dataset table contains information about a specific encapsulated set of data. In most GIS this will correspond to a map layer (e.g. for ESRI ArcInfo it would equate to a coverage).

Private Attributes:

***dataset_id : int**
A unique numeric id for the dataset. In most GIS systems the dataset will be a layer and this id would represent a unique number for a layer.

dataset_name : char
The name for the dataset.

dataset_type : char
The type of dataset = { "point", "line", "polygon","ratser" }

dataset_filename : char
The full path and filename location of the dataset.

dataset_soid_field : char
The name of the attribute in the dataset containing the spatial object id.

dataset_dsid_field : char
The name of the attribute in the dataset contaiing the dataset id.

****subj_id : int**
The id of a subject best associated with the dataset (map layer).

Dataset Query

The Dataset Query table lists and describes the queries that can be applied to a map layer within a web module.

Private Attributes:

***dataset_id : int**
Unique id for the dataset to which a query applies.

***query_name : char**
The name of query as it appears in the database system.

query_title : char
The title of the query.

query_desc : char
A text description of the query as it is to be displayed to a user.

query_heading : char
A heading under which the query is grouped; for constructing a list that contains two levels: the headings at one level and associated queries under them at another level.

query_type : char
The type of query. Queries are applied to at most one layer and one web site module. Query types include: map_reclass, map_select, map_text, map_image, etc.

SOA Extents

Private Attributes:

***spatial_obj_id : int**
A unique identifier of each feature in an individual GIS data layer/coverage/file.

***dataset_id : int**
The unique id of the specific GIS dataset: layer/file/coverage.

min_lat : float
The latitude of lower left corner of the bounding rectangle of the source.

min_long : float
The longitude of lower left corner of the bounding rectangle of the source.

max_long : float
The latitude of upper right corner of the bounding rectangle of the source.

max_lat : float
The longitude of upper right corner of the bounding rectangle of the source

Text

The text table contains bodies of text from various documents (e.g. DNAG) or other tables (e.g. image, project or source descriptions). Each record represents an individual text body, a heading for it and a sequence number within that heading.

Private Attributes:

***desc_type : char**
The unique identifier of a description within a specific description table. Descriptions are uniquely identified by description type (i.e. 1=RockComp., 2= rad.Age, 3=Strat.Age, 4=Struc.Measure, 5=Fossil Detail,..) and the description id unique to each table type.

***desc_id : int**
The unique identifier of a fossil detail. Descriptions are uniquely identified by description type (i.e. 1=RockComp., 2= rad.Age, 3=Strat.Age, 4=Struc.Measure, 5=Fossil Detail,..) and the description id unique to each table type.

text_heading : char
The heading for the text.

text_body : memo
The body of the text.

text_seq : int
The sequence of the text within its hierarchical level.

****text_rank : char**
The rank of the text; e.g. volume, chapter, section, subsection, caption, abstract, misc.

****subj_id : int**
The id of the most applicable subject.

****source_id : int**
An id of a source in the metadata. This could refer to a specific map publication, author or projection definition.

Image

The image table records details about a specific image including caption, location and sequence. It is assumed the actual image is not stored in this table.

Private Attributes:

***desc_type : char**
The unique identifier of a description within a specific description table. Descriptions are uniquely identified by description type (i.e. 1=RockComp., 2= rad.Age, 3=Strat.Age, 4=Struc.Measure, 5=Fossil Detail,..) and the description id unique to each table type.

***desc_id : int**
The unique identifier of a fossil detail. Descriptions are uniquely identified by description type (i.e. 1=RockComp., 2= rad.Age, 3=Strat.Age, 4=Struc.Measure, 5=Fossil Detail,..) and the description id unique to each table type.

****caption_id : int**
The id of a body of text in the Text table that represents the image caption.

image_res : char
The resolution of the image: e.g. '400x600'.

image_size : char
The size of the image selected form: 'thumbnail', 'half-size' or 'full-size'.

image_seq : int
A numeric value representing the sequential order of the image relative to related images.

image_location : char
Designates the physical location of the image.

image_comment : char
A text comment about the image.

image_keyword : char
Keywords associated with the image.

****subj_id : int**
The id of the most applicable subject.

****source_id : int**
An id of a source in the metadata. This could refer to a specific map publication, author or projection definition

Project

The project table documents details about specific field and other projects. Project can be grouped hierarchically: a project is part of another project, which is part of another,...

Private Attributes:

***desc_type : char**
The unique identifier of a description within a specific description table. Descriptions are uniquely identified by description type (i.e. 1=RockComp., 2= rad.Age, 3=Strat.Age, 4=Struc.Measure, 5=Fossil Detail,..) and the description id unique to each table type.

***desc_id : int**
The unique identifier of a fossil detail. Descriptions are uniquely identified by description type (i.e. 1=RockComp., 2= rad.Age, 3=Strat.Age, 4=Struc.Measure, 5=Fossil Detail,..) and the description id unique to each table type.

prj_no : char
The project number -- a alphanumeric text string identfying the project to its participants.

****org_id : int**
The agency originating the project.

prj_title : char
The project title.

prj_member : char
The participating members of the project.

****abstract_id : int**
The id of a body of text in the Text table that represents the project abstract.

prj_start : date
The start date for the project.

prj_end : date
The expected or actual end date for the project.

prj_comment : char
A comment about the project; e.g. progress to date.

prj_keyword : char
Keywords related to the project.

****subj_id : int**
The id of the most applicable subject.

****source_id : int**
An id of a source in the metadata. This could refer to a specific map publication, author or projection definition

Text Rank

The text Rank Table is a look-up table, which lists the possible text ranks (e.g. volume, chapter, secdtion, subsection,,...) and provides a numeric value for these key words.

Private Attributes:

***text_rank : char**
The rank of the text; e.g. volume, chapter, section, subsection, caption, abstract, misc

text_level : int
A numeric value representing the hierarchical level of text rank term.

desc : char
A description of the text rank.

Text Tree

The text Tree Table is used to store information about parent-child relationships between bodies of text. This permits the text documents to organized into hierarchies.

Private Attributes:

***text_id : int**

A unique identifier for a body of text from the Text Table.

***parent_id : int**

A unique identifier for a second body of text from the Text Table.

Project Tree

The Project Tree table arranges terms from the Project Table into a hierarchy by listing all the parents for every project in the Project Table.

Private Attributes:

***prj_id : int**

The unique id of a project.

***parent_id : int**

A second unique id of a project which is a parent of the first project.

Desc Rel Type

A lookup table containing the possible types of relaionships between descriptions.

Private Attributes:

desc_relation : char

The type of relation between two descriptions.

desc : char

A text description of the relationship type.

COA Rel Type

The COA Rel Type table is a lookup table for containing possible types of relations between COAs; e.g. overlies, contemporaneous, etc.

Private Attributes:

coa_relation : char

A broad category of temporal, structural or other relationships between units.

desc : char

A text description of the relatoinship type.

SourceType

A lookup table containing the types of possible sources: map, image, project and text.

Private Attributes:

source_type : char

The type of source: 'map','image','text' or 'project'.

desc : char

A text description of the source type.

ImageSize

The image size table is a lookup table containing all the possible names for image sizes: e.g. 'thumbnail', 'half-size' or 'full-size'.

Private Attributes:

image_size : char
A name for the image size: one of 'thumbnail', 'half-size' or 'full-size'.

desc : char
A text description of the image size.

ClassTree

The ClassTree arranges the items (class objects) in a legend (scheme) into a hierararchy by listing every parent for each legend item.

Private Attributes:

***scheme_id : int**
The unique id for the legend (classification scheme).

***class_obj_id : int**
The unique id for the legend item (class. object).

***class_obj_parent : int**
The unique id for a hierarchical parent of the legend item. All parents must be listed for each legend item.

SourceDataset

The SourceDataset table correlates sources to datasets, usually for 'Map' sources.

Private Attributes:

source_id : char
The unique id of the source.

dataset_id : char
The unique id of the dataset.

disp_priority : int
An integer representing the display sequence priority of a dataset -- usually for 'layer' datasets where feature level display priority cannot be assigned.

disp_visibility : int
An integer representing the visibility of a dataset= on/OFF.

SOAValidDesc

The SOAValidDesc table acts as a contraint on the SOA table, constraing the Description tables that an SOA may connect to.

Private Attributes:

***desc_type : char**
A description type -- refers to a description table that is valid for SOAs.

SYSTEM TABLES

SYSCARTO

Documents the system specific symbolization parameters; in this case oriented to ESRI's MapObjects.

Private Attributes:

***cart_sym_table : char**
The name of the symbol library that the symbol belongs to.

***cart_sym : int**
The index of the symbol within the symbol library.

cart_MOdesc : blob
An implementation specific description of the symbol; in this case, for ESRI's MapObjects software.

cart_MOvers : char
The version number of ESRI's MapObjects software.

SYSKEY

SYSKEY manages the incrementing of key attributes; upon insertion of a new record in a table, SYSKEY is consulted for the next key value.

Private Attributes:

KEYTABLE : char
The name of the table containing the key attribute.
KEYFIELD : char
The name of the field containing the key attribute.
LASTKEY : char
The last value used in the key field.

SYSALIAS

SYSALIAS contains a list of tables and fields whose contents are to be substitued by the contents of an alias table and field in the display of data; e.g. in COARelations, instead of displaying the rel_coa_id as a numerid is, the coa text name will be shown.

Private Attributes:

TABLENAME : char
The name of the table containing the field to be aliased.
FIELDNAME : char
The name of the field whose contents are to be aliased; i.e. displayed in text vs numeric form.
ALIASTABLE : char
The name of the table containing the alias field.
ALIASFIELD : char
The name of the field whose value will be used as the alias in the display.

SYSDIX

5.1 The Tree Manager manages look-up tables that are lists and hierarchies. A general mechanism is introduced that allows a hierarchy (or just a list) to be built from the database, and an item(s) to be selected from a hierarchical list and returned to a database field(s). A system table - SYSDIX -- defines the components. When the interface encounters a column that is associated with a look-up table it dynamically displays a […] icon to permit selection from the icon. This should be done dynamically so that the SYSDIX table could be edited on-the-fly. Not all elements must be filled - a non-hierarchical list will not have any rank or tree information, but may have a sequence

Private Attributes:

TABLENAME : char
5.1.1 TableName: the name of the table containing a field linked to a look-up list.
FIELDNAME : char
5.1.2 FieldName: the names of the fields linked to the look-up table. Only the first field name activates the pop-up. Therefore the SYSDIX table cannot duplicate the TableName and the first FieldName, as this would lead to conflicting dictionaries pop-ups for a field. E.g. look at the SpatialComposition example below. The number of FieldNames must match the number of DixReturnFields, in the same order
DIXTABLE : char
5.1.3 DixTable: the name of the look-up table. If one more than one table is listed then the tables are (outer) joined on primary key (DixKey).
DIXKEY : char
5.1.4 DixKey: the primary key(s) for the dix lookup tables; used to (outer) join the DixTables.

DIXDISPLAYFIELD : char

5.1.5 DixDisplayField: the names of dictionary fields whose values are displayed in the interface.

DIXRETURNFIELD : char

5.1.6 DixReturnField: the names of the dictionary fields whose values are returned from the look-up into the FieldName. May be one or many names, and the order of the return fields corresponds to the order of the fieldnames.

DIXEDIT : char

5.1.7 DixEdit: yes/no toggle indicating whether the dictionary can be edited (Additions, Deletions, Moves). If editing is enabled, and more than one DixTable is listed, edits must be saved to all the dix tables. DixEdit=no means display only lookup for the listed FieldNames.

DIXVALIDATION : char

5.1.8 DixValidation: a yes/no toggle that determines whether the FieldName contents MUST come from the look-up.

DIXRANKFIELD : char

5.1.9 DixRankField: the name of field(s) that specifies the rank (hierarchical level) of the item. If the specified field is not numeric then its numeric value is found in the RankTable.

DIDXSEQFIELD : char

5.1.10 DixSeqField: the name of the field that provides a sorting scheme for the dictionary: the items of the dictionary are sorted on this column. The sequence and the rank value (hierarchical level) allows a hierarchy to be reconstructed. If no sort order is given (DixSeqField is empty), then sorting must occur starting with to lowest rank values.

TREETABLE : char

5.1.11 TreeTable: the name of the table that organizes the lookup table (DixTable) into a hierarchy.

TREEPARENT : char

5.1.12 TreeParent: the name of the field containing the parent item.

TREECHILD : char

5.1.13 TreeChild: the name of the field containing the child item

RANKTABLE : char

5.1.14 RankTable: the name of the table that provides numeric values for qualitative ranks (e.g. formation = 400, group=300, supergroup=200). Normally the qualitative rank is listed in the dixTable. Its numeric value denotes hierarchical depth and is found in the rank table. When the rank table is not specified, then it is assumed the numeric rank is found directly in the DixTable.

RANKFIELD : char

5.1.15 RankField: the name of the field that contains the qualitative rank name and which corresponds with the DixRankField.

RANKVALUE : char

5.1.16 RankValue: the name of the field in the RankTable that contains the numeric rank value.

TOTALS:

70 Classes