Fri. Feb. 16, 2018

- Project for last ~2 weeks:
  - Decide on a GIS application / Data Set relevant to your other work.
  - Discuss possible projects using it with me

- USGS GIS Map standards: NGCMP09:
  National Cooperative Geologic Mapping Program
  (2009 workshop)

NGCMP09 Overview

- Work in progress -- will continue to be updated
- Not everyone will use all the listed parts
- Current version based on ArgGIS GeoDatabase
- Tools provided to export above to Open Format Files (shapefiles, textfiles, etc.)
- ESRI (company making ArcGIS) provides toolbox to help create maps using the above standard

Traditional Geologic Map Contents:

- Base Map
- Map Unit Polygons
  No Voids or overlaps. May include unmapped areas
- Contacts and faults which usually bound or separate above polygons
- Additional optional overlays:
  - Overlay polygons: Alteration zones, subsurface indications (mined-out areas), ...
  - Overlay lines: Fold hinges, facies boundaries, cross-section lines, sills, structure contours, ...
- Possible cross-sections
  - Same elements as in map, but in topographic profile
- Correlation of Map Units diagram (CMU): unit designators, brackets, dividing lines, text
- Symbolization for above
  - Map-unit fills (color, patterns), Patterns for overlay polygons, Line symbols, Point markers, text labels and leaders from features to labels,
- Description of Map Units (DMU) or List of Map units with text in associated pamphlet
- Text explanations of line and point symbols
- Map "collar" material including titles, authors, date, publisher, series numbers, specification of spatial reference framework, scale
- Possible additional figures, tables, and subsidary maps
- Extended Text
- References Cited

Map Unit Polygon Relationships

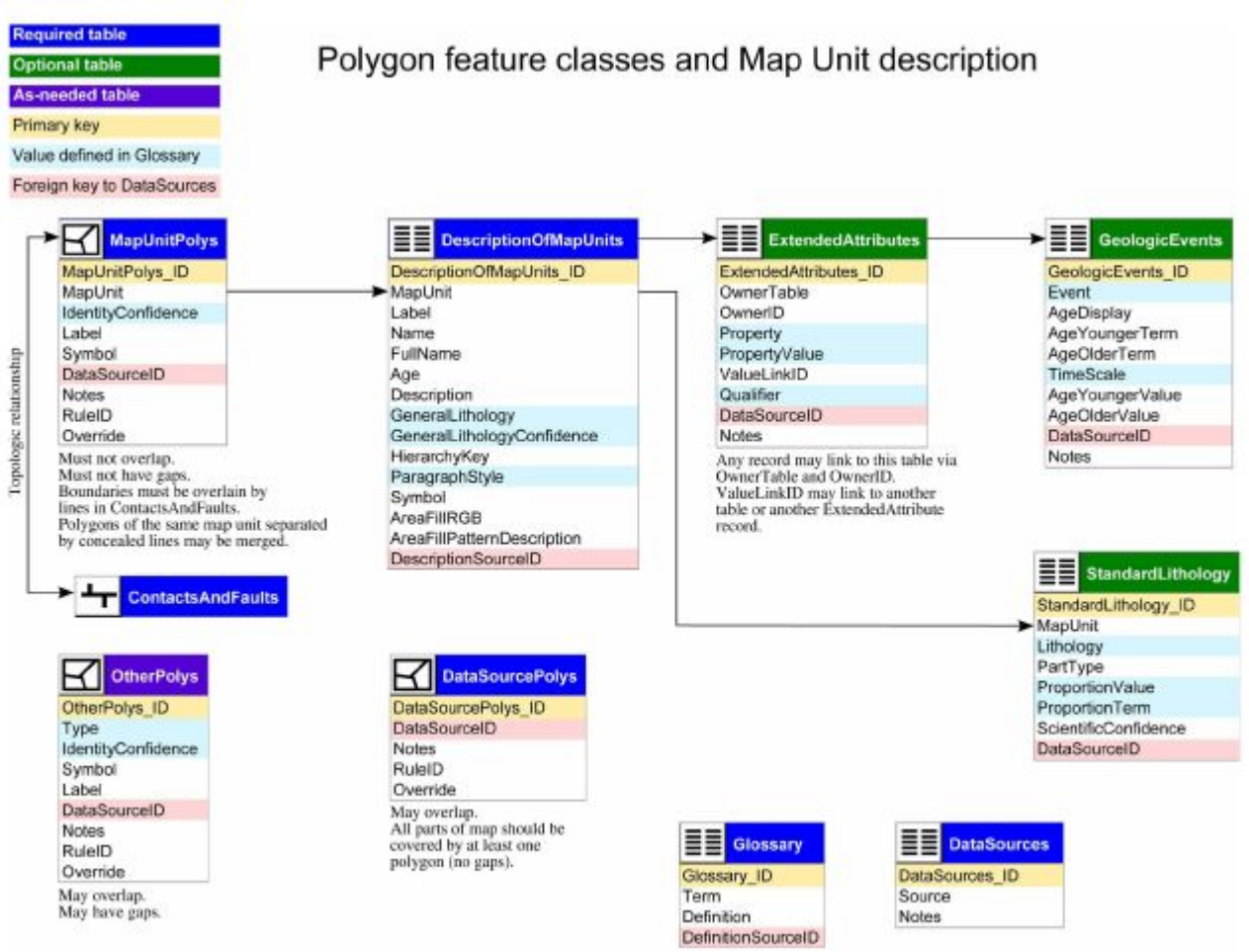

Figure 2A. Entity-relationship diagram of NCGMP09 polygon feature classes and Map Unit description. A higher resolution version is available at *http://ngmdb.usgs.gov/Info/standards/NCGMP09/*.

Map Unit Polygon Relationships

MapUnitPolys (polygon feature class)

Fields:

MapUnitPolys_ID	*Primary key. Example Values = MUP1, MUP2, MUP3, and so on. Values must be unique in database as a whole*
MapUnit	*Short plain-text key (identifier) for the map unit. Example values: Qal, Tg, Kit, water, Trc3, and so on. Foreign key to DescriptionOfMapUnits table. Null values not permitted—a mapped polygon must have an assigned map unit*
IdentityConfidence	*How confidently is this polygon identified as MapUnit? Value is usually "certain", "questionable", or "unspecified". Null values not permitted. Suggest setting default value to 'certain'*
Label	*Calculated from MapUnit//Label and IdentityConfidence: if IdentityConfidence = "questionable", then append "?" to MapUnit//Label. Allows for subscripts and special characters. Null values OK*
Symbol	*References an area fill symbol (background color + optional pattern). Area fill symbols must be defined in an accompanying style file. If cartographic representations are used to symbolize map units, the value may be null or blank. Null values permitted*
RuleID	*Data type = integer. If Cartographic Representations are used, this field is required; otherwise it is not included in the table (see* Symbolization *section, below)*
Override	*Data type = blob. If Cartographic Representations are used, this field is required; otherwise it is not included in the table (see* Symbolization *section, below)*
Notes	*Null values OK. Free text for additional information specific to this polygon*
DataSourceID	*Foreign key to DataSources table, to track provenance of each data element. Null values not permitted*

Topology rules:

- Polygons must not overlap
- Polygons must not have gaps
- Boundaries must be overlain by lines in ContactsAndFaults
- Not all lines in ContactsAndFaults necessarily bound polygons: polygons separated by concealed contacts or faults may have been merged during construction of the database
- Some faults, concealed contacts, and concealed faults may dangle (terminate within polygons) and thus not separate polygons.

Note that open water (lakes, double-line rivers), glaciers, and unmapped areas are polygons, and so have non-null MapUnit values (perhaps water, glacier, unmapped). Water and glacier areas commonly are not labeled (Label=null).

Lines

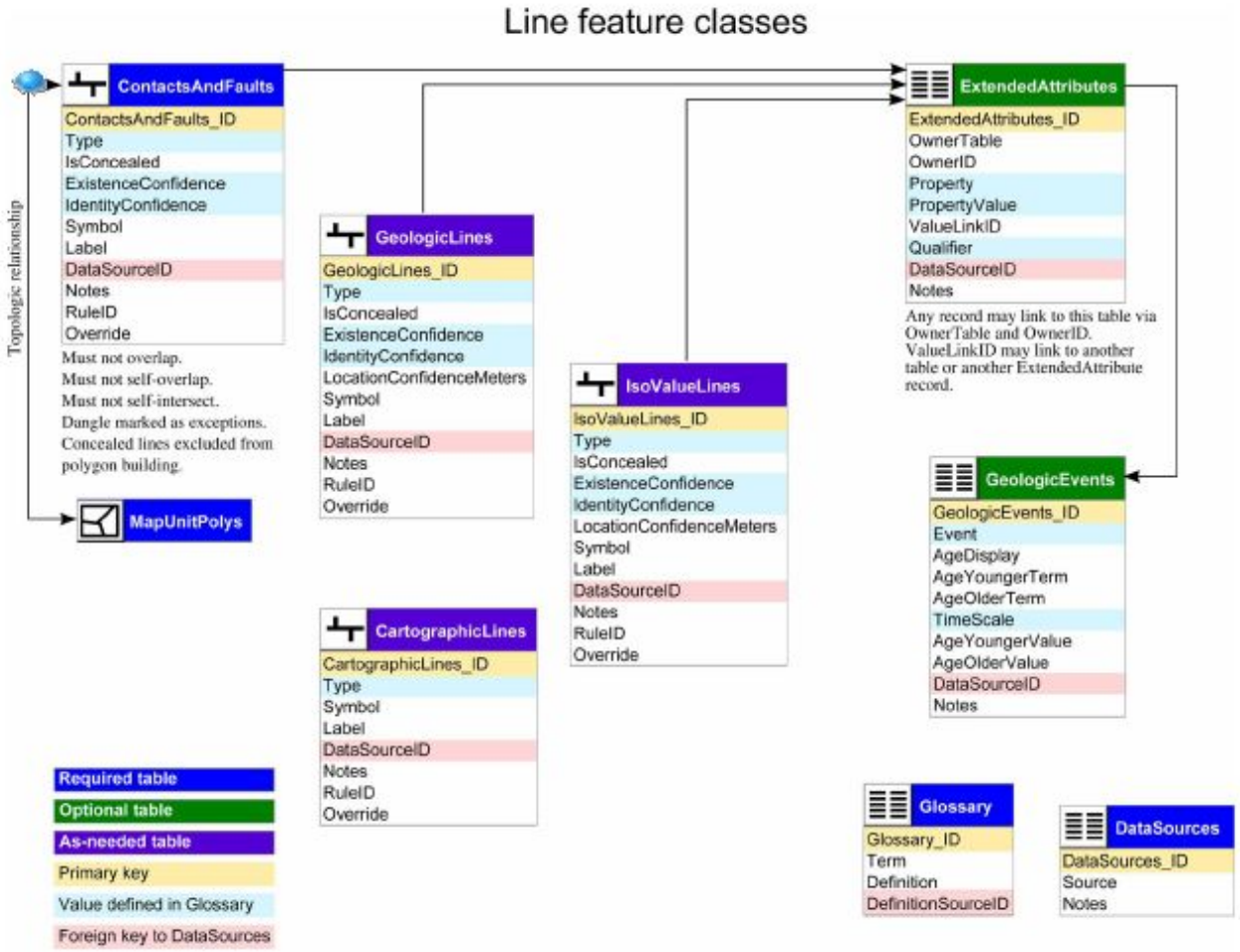

Figure 2B. Entity-relationship diagram of NCGMP09 line feature classes. A higher resolution version is available at *http://ngmdb.usgs.gov/Info/standards/NCGMP09/*.

Points

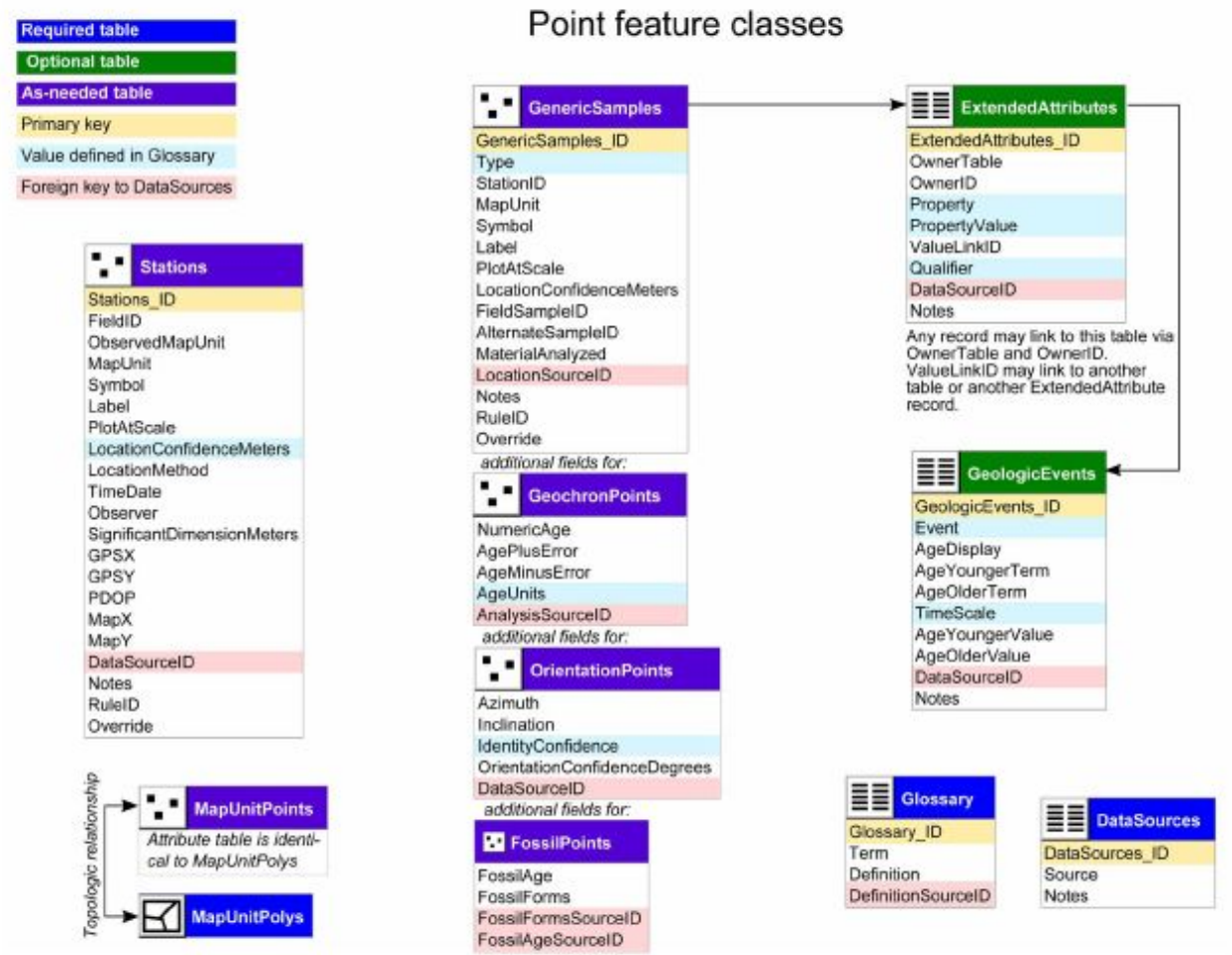

Figure 2C. Entity-relationship diagram of NCGMP09 point feature classes. A higher resolution version is available at *http://ngmdb.usgs.gov/Info/standards/NCGMP09/.*