Notes from CDEFG 3/8/21

* How do you define and use basement, bedrock, and surficial in GeMS maps? The following are some ways different state geological survey (SGS) and other groups use these terms:
	+ SGS – Basement is used in cross sections below well logs. Bedrock is defined as hard rocks on the surface. Surficial is generally classified as Quaternary.
	+ SGS – State is mapping primarily surficial units with minor bedrock. Coastal plain is mapped as surficial. They do not map basement.
	+ SGS – State is mapped as bedrock and surficial. Bedrock is defined as Tertiary and older units and Quaternary units that are rocks, such as basalt. Surficial is defined as Quaternary units unit, except competent volcanic rocks.
	+ USGS group – Basement is defined as non-cover units. Bedrock is cover rock. Quaternary is surficial.
	+ SGS – Basement is defined as pre-Cambrian metamorphic rocks. Not sure how to define non-metamorphic Neoproterozoic rocks. Bedrock is Phanerozoic section excluding Neogene. Tertiary unconsolidated rocks are surficial. Volcanic rocks are bedrock. Definitions are easier where the geology is less complicated.
	+ USGS group – Basement is used as a geophysical term.
	+ SGS – We do not use “basement” as a term in mapping.
	+ SGS – How do other coastal states define surficial and bedrock when they have continuous coastal units spanning Quaternary and Tertiary?
* Examples of other geologic data in GeMS-ish databases - landslides, engineering-materials data, etc.

In this landslide scenario, where would you put the features in GeMS?

scarp

Removed material (scarped area)

Landslide deposit

* + SGS – Would probably call scarped area a surficial unit, and put into GeMS as map unit; for engineering units, use areas of similar textures/patterns (overlay poly)
	+ SGS – Would put fault scarp in contacts and faults if lithology separation or in geologic lines if same unit; have made landslide map by exporting out Qls map units and published as land slide hazard map
	+ SGS – Scarp in geologic lines; landslide as map unit
	+ USGS – Would put scarped area in overlay polygon as pattern and then still see geo unit underneath; this would be useful, divorcing geomorphic feature from geologic unit
	+ SGS – Scarp in geologic lines, unless it is a contact too; scarped area in geologic polygons as a pattern with map unit underneath it; landslide deposit as map unit
	+ SGS – Landslide as separate map unit; scarp as geologic line

Other GeMS-ish map ideas

* + SGS – Coal bed mapping: beds that are not units would be in geologic lines, some are interunit beds; using map unit lines is an option for key beds in the DMU
	+ SGS – Geologic lines: for folding, dikes, anything that is geologic but not a unit and doesn’t split lines. Previously they split out symbolized planes vs linear features into different feature classes; now that they have GeMS and symbols, they don’t see a need to separate it this way and put everything in the sample feature class
	+ SGS – We will probably deal with depth to bedrock maps and water table maps in the future. How to do we make this level-3 GeMS compliant? Suggest using "IsoValueLines"; these have been used for drift thickness maps in another state. We had a grant project for depth to Precambrian that asked for data in GeMS format.
	+ How about using GeMS fields for things like NGGDPP non-map data? For example, using the general fields of GeMS to capture metadata information about something; could be considered “in the spirit of GeMS”. Do we need a compliance tool for checking tables or features classes that aren’t for a traditional geologic map? If it's not a "Geologic Map", does it really need to be GeMS compliant? For example, I was asked by a mapper if there was GeMS recommendations for a raster because of the Earth MRI requirement. There may be a standard for the non-map data type that is more appropriate than GeMS.

New Questions

* SGS – Level 2 GeMS requirement. Level 2 = Level 1 "plus GeMS schema implemented for the map". What does this mean? Do I have to do a new map layout with the GeMS version of the data? Does it mean I have to have all the data layers for the map (beyond ContactsAndFaults and polys) in the GeMS format? More guidance on what this means would be lovely.
	+ Valid topology (polygon boundaries are covered by contacts and faults lines) and GeMS schema with mandatory fields filed out
	+ <https://github.com/usgs/gems-tools-arcmap/wiki/GeMS_ToolsDocumentation>
	+ Run the validation tool to see what you are missing
	+ Databases with a variety of schema may meet these criteria. Validate Database cannot confirm LEVEL 1 compliance.Level 2:2.1 Has required elements: nonspatial tables DataSources, DescriptionOfMapUnits, GeoMaterialDict; feature dataset GeologicMap with feature classes ContactsAndFaults and MapUnitPolys2.2 Required fields within required elements are present and correctly defined2.3 GeologicMap topology: no internal gaps or overlaps in MapUnitPolys, boundaries of MapUnitPolys are covered by ContactsAndFaults2.4 All map units in MapUnitPolys have entries in DescriptionOfMapUnits table2.5 No duplicate MapUnit values in DescriptionOfMapUnit table2.6 Certain field values within required elements have entries in Glossary table2.7 No duplicate Term values in Glossary table2.8 All xxxSourceID values in required elements have entries in DataSources table2.9 No duplicate DataSources\_ID values in DataSources table
	+ The results from the tool are VERY helpful. I ran it on a Level 1 compliant GDB and the reports tell you what you're missing, where you're missing it
* SGS – How are states handling water, e.g., lakes, quarries? On our maps, lakes are a map unit.
* SGS – Interested to see Evan Thoms’ talk about many-to-many relationships for data sources
* Reach out to Dave and others and talk to them about GeMS compliance vs GeMS-ish data – USGS mapping folks will reach out
* Multi-map compilations at the state level: Aside from Alaska, is anyone else using GeMS for a multi-map compilation?
* GeMS Glossary compilation
	+ Is there a compilation of Glossary terms somewhere that I can pull from? Yes, we are working on making a “work-in-progress” compilation available.
	+ How many terms can you have from the Glossary of Geology before copyright is an issue? Dave Soller asked them, and they said that AGI permission is needed for more than 100 definitions.
	+ What open-source dictionaries are available?