Guide to using the Geologic Names Check's Report

The Geologic Names Check Tool provides a cursory check of formal geologic names applied to geologic units in a GeMS-compliant DescriptionOfMapUnits table (DMU). It allows for the semi-automated comparison of the usage, age, and extent (to the State level) of the unit names in the DMU with the information compiled in Geolex.

This tool is a python script intended to be executed along with the GeMS Validate Database script, both of which are in the GeMS Tools toolbox of ArcGIS geoprocessing tools. The results of these two scripts provide the information necessary for map authors and managers of the U.S. National Geologic Map Database to determine whether a geologic map database is in compliance with the GeMS schema (see https://ngmdb.usgs.gov/Info/standards/GeMS/).

The script first queries the DMU for the map unit names and related content. The script then queries the U.S. Geologic Names Lexicon (Geolex, https://ngmdb.usgs.gov/Geolex/) to identify possible matches with any formal geologic names that are among the map unit names in the DMU. Finally, the script creates a spreadsheet for review by the map author. After inspection and author comments have been completed, the spreadsheet is to be submitted to USGS along with the results of the GeMS Validate Database script. The secretary of the Geologic Names Committee (GNC) will then evaluate and compile into the U.S. geologic names lexicon (Geolex) information from the author-provided comments and references and(or) from the map (when published).

The Geologic Names Check report spreadsheet

The output of the tool is an Excel spreadsheet that reports the results of checking the names in the DMU table against the Geolex database (an example, "Geolex_DMU_namescheck.xlsx", can be found in the Resources folder of the GeMS Tools toolbox). The spreadsheet is named the same as the geodatabase which contains the input DMU table, and is saved in the same directory as the input DMU. This tool also can process a file (e.g., Excel or CSV) as input. The spreadsheet provides space for authors to comment upon and(or) justify the use of their chosen names. It is organized into three sections:

DMU Contents (green section):
This section shows selected fields from the DMU (i.e., *HierarchyKey*, *MapUnit*, *Name*, *FullName*, *Age*, and *Extent*). *Name* is the field first evaluated by the script, but if no Geolex names are found there, *Fullname* will be evaluated. The other fields are for use by the author when comparing geologic age and extent to the values in Geolex, and to assist in providing some context if clarification of author comments is needed. The values reported in this section, except for *Extent*, come verbatim from the DMU. *Extent* is currently collected

at runtime through the tool parameter form although it may, in the future, be calculated from features in the geodatabase. Selected content for this section is shown below; to view results for the entire DMU, please see example spreadsheet noted above.

[Geolex_DMU_namescheck.xlsx is provided to show examples of the results to expect from the tool depending on different map unit names, and does not represent a realistic stratigraphy.]

DMU Contents					
HierarchyKey	MapUnit	Name	Fullname	Age	Extent
01		NO GEOLEX NAMES IN NAME OR FULLNAME			VA, WV
01-01	Qal	Alluvium	Alluvium	Holocene	VA, WV
01-02	Qs	Sand	Sand	Holocene	VA, WV
01-03	Qls		Landslide debris	Holocene	VA, WV
01-04	Qac		Alluvium and colluvium	Holocene	VA, WV
02		NAME EQUALS FULLNAME WITH GEOLEX NAMES			VA, WV
02-01	Dh	Hampshire Formation	Hampshire Formation	Devonian	VA, WV
02-02	Dmn	Marcellus Shale and Needmore Formation, undivided	Marcellus Shale and Needmore Formation, undivided	Middle and Lower Devonian	VA, WV

Geolex Results (yellow section):
The tool searches for geologic names recorded in Geolex that are included in each DMU *Name* (but moves to *Fullname* if no names are found), and reports results of the search. This section shows selected fields from Geolex: *GeolexID*, *Name* (the geographic part of the geologic name), *Usage*, *Age*, *Extent*, and *Geolex URL*. If multiple usages recorded in Geolex are associated with a single name found in the DMU, all usages and the states in which they are used (i.e., the *Extent*) are reported. Where that occurs, the value for the DMU *HierarchyKey* is repeated with an appended incrementing character; those characters serve only to properly re-sort the spreadsheet if the user were to reorganize it. The *URL* and *Age* are listed once for each Geolex *Name*.

The value in *Usage* comes verbatim from Geolex, so it may include parenthetical phrases or symbols which clarify some property of the usage. These are explained in a footnote that appears below the Web search results after entering a name at https://ngmdb.usgs.gov/Geolex/ but are included here as well:
- Asterisk (*) indicates published by U.S. Geological Survey authors.
- "No current usage" (†) implies that a name has been abandoned or has fallen into disuse. Former usage and, if known, replacement name given in parentheses ( ).
- Slash (/) indicates name does not conform with nomenclatural guidelines (CSN, 1933; ACSN, 1961, 1970; NACSN, 1983, 2005). This may be explained within brackets ([ ]).

			Geolex Results		
GeolexID	**Name**	**Usage**	**Age**	**Extent**	**URL**
1955	Hampshire	Hampshire Formation	Late Devonian*	MD, PA, VA, WV	https://ngmdb.usgs.gov/Geolex/Units/Hampshire_1955.html
		Hampshire Group	Late Devonian*	WV	
2635	Marcellus	Marcellus Formation	early Middle Devonian (Eifelian)*	WV	https://ngmdb.usgs.gov/Geolex/Units/Marcellus_2635.html
		Marcellus Formation of Hamilton Group	early Middle Devonian (Eifelian)*	NY, PA	
		Marcellus Member of Millboro Shale	early Middle Devonian (Eifelian)*	VA	
		Marcellus Shale	early Middle Devonian (Eifelian)*	KY, NJ, OH, TN, VA, WV	
		Marcellus Shale of Hamilton Group	early Middle Devonian (Eifelian)*	MD, NY, OH, PA, TN, VA, WV	
		Marcellus Shale Member of Romney Formation	early Middle Devonian (Eifelian)*	MD	
2961	Needmore	Needmore Shale	early Middle Devonian (Eifelian)*	MD, PA, VA, WV	https://ngmdb.usgs.gov/Geolex/Units/Needmore_2961.html
		Needmore Shale of Onondaga Group	early Middle Devonian (Eifelian)*	PA	
		Needmore Shale Member of Romney Formation	early Middle Devonian (Eifelian)*	MD	

Author Review (orange section):
This section includes five columns: *Extent Match?*, *Usage Match?*, *Age Match?*, *Remarks*, and *References*. If any of the state abbreviations in the DMU *Extent* value are found in the extent for a usage in Geolex, *Extent Match?* will be "yes" and, otherwise, "no".

Usage Match? will need to be evaluated by the author. Enter "yes" for the usage that exactly, or most closely (e.g., is of the same nomenclatural rank), matches the name on the map.

With this version of the tool, the logic for checking matches of age and status (formal vs informal usages) has not been devised. Therefore, the author is responsible for determining if a map unit's geologic age is within the age range specified in Geolex, and for evaluating only those map units that include formal geologic nomenclature.

NOTE: If there are no exact matches for *Usage*, please fill out the row that has the closest match, and indicate *Extent/Usage/Age* discrepancies in the *Remarks* field.

The *Remarks* field is for the author to explain discrepancies between Geolex and a unit name shown in their DMU. The *References* field is for citations that support the explanation.

Author Review				
Extent Match?	Usage Match?	Age Match?	Remarks	References
no				
no				
no				
no				
no				
no				
yes				
yes				
yes				
no				
yes				
yes				
yes				
no				
yes				

Guidance for the Remarks and Reference(s) fields

If formally named geologic units in the DMU are missing from Geolex:
Please include the original or principal reference[1] and, if applicable, a reference[2] to the current definition of the geologic unit (e.g., perhaps there have been changes to boundaries, rank, assignment to larger units, subdivisions).

If, in your DMU or accompanying report or pamphlet, you are already citing any of the references requested here, rather than copy/pasting the information into the References field, please simply note "reference(s) cited in map."

If you are proposing a new formal geologic unit, Congratulations! Please also separately notify the Geologic Names Committee (GNC) at gnc@usgs.gov, and estimate when your map will be published.

Differences in Usage:
- If there are differences in rank, or in the larger unit—please include the reference(s)[3] in which the formally named geologic unit changed rank or was assigned to (or unassigned from) a larger unit.

[1,2] References should be formal publications, as defined in Article 4 of the 2005 Code (p. 1561), available online at https://ngmdb.usgs.gov/Geolex/resources/docs/AAPG_Bull-89_NACSN2005-rev2016.pdf.

[3,4,5] References should be formal publications, as defined in Article 4 of the 2005 Code (p. 1561), available online at https://ngmdb.usgs.gov/Geolex/resources/docs/AAPG_Bull-89_NACSN2005-rev2016.pdf.

- If there are differences in usage, notably for formation-rank units (e.g., Dakota Sandstone, Dakota Formation), please indicate if the usage is local or regional.

If you find a complete match, but you are revising the unit (e.g., changing the upper or lower boundaries), please indicate the nature of the revision in the *Remarks* field.

Note that if your map unit name includes two or more formal geologic names (e.g., indicated as "undivided" or "undifferentiated"), they should be listed separately in the results. Please evaluate each geologic name.

If the Extent does not match:
Please indicate if the formal geologic unit is local (occurs in and around your study area) or regional, and if the State in which you mapped the unit should be added to Geolex's *Extent* field.

If the geologic Age indicated in the DMU is not within the age range indicated in Geolex:
Please include the reference(s) in which the age of the formal geologic unit was changed.

Regarding whether a unit has Formal or Informal status:
- If Informal in the DMU but Formal in Geolex—please include the reference [4]in which the formally named geologic unit was abandoned. If the geologic unit has never been formally abandoned and is considered informal by your agency, please briefly state reasons.
- If Formal in the DMU but Informal in Geolex—please include the original or principal reference and, if applicable, a reference[5] to the current definition of the geologic unit (e.g., perhaps there have been changes to boundaries, rank, assignment to larger units, subdivisions).