GeoRef Thesaurus

Eleventh Edition

Barbara A. Goodman
Editor

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Earlier Editions
GeoRef Thesaurus and Guide to Indexing, First Edition

Second Edition, 1978
Third Edition, 1981
Fourth Edition, 1986
Fifth Edition, 1989

GeoRef Thesaurus, Sixth Edition

Seventh Edition, 1994
Eighth Edition, 1997
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Tenth Edition, 2004

GeoRef Thesaurus, Eleventh Edition

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American Geological Institute
4220 King Street
Alexandria, VA 22302-1502
Phone: 703/379-2480; Fax: 703/379-7563
WWW: http://www.agiweb.org
E-mail: georef@agiweb.org
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Members of the Vocabulary Task Force:

Dena Fracolli Hanson (Chair)
Fort Worth, Texas

Raili Aumo
Geologian Tutkimuskeskus
Espoo, Finland

Joachim Gersemann
Bundesanstalt für Geowissenschaften und Rohstoffe
Hannover, Germany

Jani Hurstinen
Geologian Tutkimuskeskus
Espoo, Finland

Dorothy McGarry
University of California, Los Angeles

John Mulvihill
Vienna, Virginia

Patricia Sheahan
Konsult International Inc.
Willowdale, Ontario, Canada

Introduction

This eleventh edition of the GeoRef Thesaurus contains 23,065 valid and 7,740 invalid terms, of which about 1780 are newly added. This Thesaurus is a guide to the index terms used in GeoRef, a database consisting of bibliographic citations and abstracts covering the field of geology and its allied environmental sciences. For each term, the Thesaurus includes, as appropriate, hierarchical and other relationships, usage notes, dates of addition, indexing rules, geographic coordinates, and guidelines for searching. Cross-references from invalid to valid terms are included.

The main section of the Thesaurus consists of term entries and cross-references, arranged alphabetically. Indexing terms and text in this Thesaurus are expressed in American English with limited entry points for variant spellings.

The Thesaurus is generally organized according to the *American National Standard, Guidelines for the Construction, Format, and Management of Monolingual Controlled Vocabularies (ANSI/NISO Z39.19-2005)*.

Source and Development of the Vocabulary

The first edition of the Thesaurus was published in 1977. At that time GeoRef had been in its eleventh year of production at AGI and was using an indexing scheme based on earlier geology bibliographies. In the early editions, many previously valid adjectival terms were converted to nouns, especially composition, (e.g. acidic composition, formerly two terms), deposit, ore, environment, survey, process, and sedimentation terms (Age terms continue to be used in adjectival form). Other major changes in form occurred for geographic terms in 1989-1993, meteorites, and earthquakes: see Searching below.

Impetus and funding to produce the 1977 Thesaurus came from petroleum companies which had begun to search GeoRef on ORBIT in 1973. The 1977 Thesaurus was based on a term frequency list consisting of terms used in GeoRef from 1967-1976.

GeoRef indexers use the terms in the Thesaurus. They also add, as needed, words from source documents, which are not in the Thesaurus. This practice assures that fresh terminology will continue to appear in GeoRef without the delay involved in formally adding a term in the Thesaurus. This practice also means that terms and their variants may have been used in GeoRef, prior to their addition to the Thesaurus

For some terms, a year is given, in parentheses, following the term. This is the year the term first appeared in the Thesaurus. A substantial number of terms which occurred in older GeoRef records, but were not currently valid, have been converted to currently valid terms. Any Broader Terms have also been added. This substitution makes the indexing terminology in GeoRef more consistent, and has prompted us to remove the dates from many terms, as no longer meaningful. The user may assume that if a date is not given, the term will be in the GeoRef file in its currently valid form since 1978.

The substitution of valid for invalid terms has reduced the differences in indexing among the four major bibliographic files which have been combined in GeoRef:

Bibliography of North American Geology (publications from 1785-1970)
Geophysical Abstracts (published from 1966-1971)
Bibliography and Index of Geology Exclusive of North America (published from 1933-1968)
Bibliography and Index of Geology (published from 1969-2005)

The index term vocabulary in all of the above derived, in part, from that in the early volumes of the Bibliography of North American Geology, edited by John M. Nickles and published by the U.S. Geological Survey.

When these old bibliographies were added to GeoRef, the index terms in them were included, without modification. A large number of these terms have been converted to currently valid terms, many other terms have not. Records originally indexed with the terminology of the old bibliographies still comprise 14% of the GeoRef file.

The procedure followed in adding terms to this edition of the Thesaurus began with the compilation of a list of candidate terms consisting of all non-valid terms used since the previous edition. For this edition, the most recent list of invalid terms used in 2004 through 2007 was compiled. Depending on type and frequency of use, these terms became candidates for the Thesaurus. Each candidate term was then searched to determine how and how often it occurred in GeoRef, and a way of handling it was proposed by the Thesaurus editor. These proposals were discussed within AGI and with the Vocabulary Task Force.

In developing this eleventh edition of the Thesaurus we introduced new terms in each of the years between 2006 and 2009 with a larger number introduced for 2007 and 2009. In this eleventh edition, about 1780 new terms were added. Given the usual three to four years between editions of the Thesaurus, and the requirement of at least ten to thirty postings during the 3-5 recent years considered, by the time a term is added, we have a good idea of the final form the term will take in the literature. In addition, the total postings in GeoRef are now given weight as well. By examining the frequencies of terms over the years, it is usually possible to choose the form which has become generally accepted in the geological literature as the new Thesaurus term.

After this eleventh edition is published, the procedure for adding terms is expected to change. In addition to examining recent usage, we plan to compile lists of terms that have been used steadily over extended periods of time. We also plan to develop new terms more frequently. Corrections and changes to previously-used non-valid terms will continue to be made on an as-needed basis. We do not plan to issue the twelfth or subsequent editions in print.

We do expect to continue the formal designation of an edition for some time and to continue our careful review process with a cycle of up to five years. For this eleventh edition, the hierarchical lists and indexing advice which previously appeared as appendices in our editions, may be found online at www.agiweb.org/georef/lists.html. These lists are still referenced in term notes in the Thesaurus. In summary, the lists and their letter designations are given below.

List A, GeoRef Categories/Subjects covered
List B, Age-dating methods
List C, Commodities
List D, Chemical elements, methods, and data
List E, Geologic ages
List F, Fossils
List G, Meteorites
List H, Igneous rocks
List I, Sedimentary rocks
List J, Metamorphic rocks
List K, Sedimentary structures
List L, Minerals
List M, Soils
List N, Sediments
List O, Geographic terms
List P, Major terms
List R, Rock units

As explained in this section, natural language - the terminology found in the geological literature - has been used in indexing for GeoRef and continues to be used therein. Consequently, to retrieve all papers on a concept before that concept was added as a term in the Thesaurus, it is recommended to search a term's variants found by consulting an alphabetic index of terms in GeoRef through a stemming process involving an "index", "browse", or "expand" on the term. To call attention to this, the following cautionary note has been added at the foot of each page spread in the Thesaurus:

"Prior to its inclusion in the Thesaurus, variants of a term may occur in GeoRef."

Changes in This Edition

As in the previous edition, the main thrust of this edition was the addition of new terms and a number of corrections to existing terms. The 1780 new terms include an estimated 1365 valid terms. All counties in the United States that were not previously included in the Thesaurus have now been added. Most of the remaining terms were developed from recent invalid term vocabulary. Geographic terms were emphasized. Hierarchies for metamorphic rocks, Porifera, Cnidaria, and Mollusca were reviewed. Site and leg terms were added to complete coverage for the Ocean Drilling Program. About 80 Integrated Ocean Drilling Program terms were added. Additional terms will be added as new reports are published.

Some cross-references (See Also term relationships) between geographic and other terms were removed because they were considered to be of limited use. These included cross-references between very general geographic terms and all ocean drilling sites; between geographic terms and meteorites; and between general geographic terms and rock units. Notes were checked to ensure that useful information was retained. Indexers were given newer terms on an annual basis. Where a year is appropriate, these bear the years 2006-2009.

The eleventh edition of the GeoRef Thesaurus was copied for printing from its electronic version on December 8, 2008.

Term Relationships

In the GeoRef Thesaurus, the following relationships may occur for a given term:

Geographic Coordinates (CO) - For a geographic Term, the rectangular area covered by the term, expressed in latitudes and longitudes; degrees, minutes, and seconds.

Used for (UF) - A synonym or alternative form of the term which may have been used prior to the time the term was adopted. Many of these have now been converted to the current term.

Broader Term (BT) - A Broader Term refers to a group of which the term is a member or an area or age of which the term represents a part.

Narrower Term (NT) - A Narrower Term refers to specific member of a group which is represented by the term or an area or age which is part of a larger area or age represented by the term. Note that the Narrower Terms shown under a term in a Thesaurus entry are only the terms narrower by one hierarchical level, not all the Narrower Terms.

See Also (SA) - A valid term which is related to the term in some way other than the above relationships.

a. Geographic Coordinates (CO)

In use since September 1977, Geographic Coordinates have a fixed length of 30 characters. The Coordinates define a rectangular geographic area using latitudes and longitudes. For example, for Brazos County Texas, N lat. 30°20′-30°58′ and W long. 96°5′-96°40′, the coordinates are:

Brazos County Texas
CO N302000N305800
W0960500W0964000

In indexing, coordinates have been assigned at the discretion of the indexer for the principal area or areas which are studied in a document. They are not automatically added for each area term in a citation. Also coordinates are found only in the portion of GeoRef produced from September 1977 on.

For all the citations published prior to September 1977, there are no coordinates and searches for geographic locations are limited to index terms. It is advisable to use coordinates to supplement a search on geographic index terms.

It is the responsibility of the indexer to assign coordinates for the area studied where enough information is provided to define the area. If the area corresponds to an index term, the indexer uses the coordinates for that term in the Thesaurus. Otherwise, the indexer must derive the coordinates from information in the paper or by consulting an atlas. In practice, coordinates are usually assigned for land areas smaller than about five degrees; before 2005, about half a degree. For ocean areas, coordinates are usually assigned for areas smaller than about ten degrees; before 2005, about five degrees.

b. Used For (UF)

Used For relationships direct the Thesaurus user from synonyms and alternate forms to valid terms.

When a term has been added to the Thesaurus, its form and usage are established. But during the years prior to being added, synonyms and variants of the term may have been used in GeoRef. These can be factored into a search by doing an "index", "browse", "expand," or "scan" on a term and including alternate forms in the search. Used Fors have been included from synonyms and alternate forms. If an alternate form can be found in proximity in an alphabetical index of terms through an "index", "browse", or "expand" on the term, it usually does not appear as a Used For. Names of formations, for example, commonly have several variants in the literature. There may not be a Used For in the Thesaurus from each of these variants to the valid term if all forms begin with the same word. More likely, there will be Used Fors from terms which do not sort alphabetically with the valid term. Thus, there may not be a Used For from PCB to PCBs, but there is a Used For from polychlorinated biphenyls to PCBs. Examples of Used Fors are:

muscovite	**Holocene**
UF potash mica	UF Post-glacial
praseodymium	**Brunswick Germany**
UF Pr	UF Braunschweig Germany
greenschist	**neutron probe**
UF prasinite	UF probe, neutron

For every Used For there is a corresponding Use entry in the Thesaurus from the invalid term to the valid term. For example:

bornite	erubescite
UF erubescite	Use bornite

Some of the Used Fors were valid terms, e.g. Abyssinia and spectrometry, and for one reason or another have been replaced by other terms.

c. Broader Term (BT)

Most Broader Terms represent groups of which the term is a member. For example:

peridot
BT olivine group
BT nesosilicates
BT orthosilicates
BT silicates

Broader Terms are listed in order from the most specific to the most general. Thus in the above example, peridot is a member of the olivine group, the olivine group is a member of the nesosilicates, etc.

Two notable exceptions to this member-group relationship are geographic locations and ages. For geographic locations, a part-whole relationship prevails. For example:

Minas Gerais Brazil
State in E central Brazil.
BT Brazil
BT South America

Brazil
BT South America

Specific lakes, rivers, faults and mountains wholly within a country have that country as a Broader Term.

Ocean Drilling Program and the Deep Sea Drilling Project are Broader Terms to the Legs and Sites under them. However Legs and Sites are considered geographic terms and are provided with Geographic Coordinates. Indexers are expected to supplement them with appropriate geographic Broader Terms provided in the See Also.

DSDP Site 610
Feni Ridge, Rockall Trough, NE central Atlantic.
BT Leg 94
BT IPOD
BT Deep Sea Drilling Project

Stratigraphic terms such as formations and groups have ages as Broader Terms. Ages have part-whole relationships. For example:

Lockatong Formation
BT Upper Triassic
BT Triassic
BT Mesozoic

Senonian
BT Upper Cretaceous
BT Cretaceous
BT Mesozoic

All Broader Terms of a term are shown under that term. The country is always added where relevant. North America, however, is not autoposted to Narrower Terms of a country.

A few terms have multiple sets of Broader Terms. These sets are shown as BT1, BT2, etc. For example:

C-14/C-12
BT1 radioactive isotopes
BT1 isotopes
BT2 stable isotopes
BT2 isotopes
BT3 carbon

In this example, the immediate Broader Terms are the first encountered in each hierarchy: BT1 radioactive isotopes, BT2 stable isotopes, and BT3 carbon.

d. Narrower Term (NT)

These are terms for specific members of the groups represented by the term. For example:

Gymnospermae
NT Bennettitales
NT Caytoniales
NT Coniferae
NT Coniferales etc.

In this example Bennettitales is a member of the group Gymnospermae as are Caytoniales, Coniferae, Coniferales and the other Narrower Terms of Gymnospermae.

For any term, only its Narrower Terms on the next level down are listed. If a Narrower Term itself has Narrower Terms, these will not appear under the term. Thus, in the above example, Pachypteris, a Narrower Term of Caytoniales, will not appear under Gymnospermae as an NT.

Terms which have multiple sets of Broader Terms are displayed as Narrower Terms under each of the immediate Broader Terms. In the example above, the term, C-14/C-12 appears as an NT under radioactive isotopes, stable isotopes and carbon.

Narrower Terms are arranged in alphabetical order.

An important exception to the member-group relationship of Narrower Terms is geographic locations in which the Narrower Terms of a term are in a part-whole relationship. For example:

Missouri
NT Adair County Missouri
NT Andrew County Missouri
NT Atchison County Missouri
NT Audrain County Missouri etc.

Another exception is for ages where stratigraphic terms appear under appropriate ages in Narrower Terms and age terms appear in Narrower Terms under ages of which they are parts. For example:

Devonian
NT Ackley Granite
NT Barre Granite
NT Beaverhill Lake Group
NT Cedar City Formation etc.

Paleozoic
NT Acadian Phase
NT Acatlan Complex
NT Alice Springs Orogeny
NT Ambo Group
. . . . . .
NT Devonian etc.

e. See Also (SA)

The See Also is used to indicate relationships other than Used For, Broader Term and Narrower Term. For DSDP/ODP/IODP Sites, Legs, and Expeditions, See Alsos are provided to the most specific valid geographic term available unless this term is considered very general. For Legs, they are provided to geography for each Site. Examples of See Also relationships are:

Gallup Sandstone
SA Mesaverde Group
SA New Mexico

geochronology
SA absolute age
SA biochronology

periodicity
SA earthquakes
SA frequency
SA Milankovitch theory
SA orogeny

Leg 108
SA Cape Verde Basin
SA Cape Verde Rise
SA Mid-Atlantic Ridge
SA North Atlantic
SA South Atlantic

Notes for Terms

In addition to the above relationships, terms have explanatory notes. There are three kinds: year, general notes, and Indexer Notes (IN).

a. Year

The year in parentheses following some terms is the year the term was introduced as valid in the Thesaurus. For discussion, see Source and Development of the Vocabulary above.

b. General notes

These immediately follow terms and are not prefaced by a caption. Valid terms are underlined in the notes with few exceptions.

- "Also search" - An "also search" statement is included in the Note when it is not possible to suggest searching an alternative term through a UF relationship. These notes are used when the user needs to search on a combination of terms rather than a single term. For the term caliper logging, the Note reads "Before 1978, also search well-logging AND caliper."
- Geographical term locations - Brief notes on the location of many geographical terms are given.
- Scope notes - These define the use of the term in GeoRef. For example:

hydrocarbons
For economic deposits, see petroleum; natural gas; bitumens; asphalt; oil sands; oil shale. For discussion as pollutants, search (hydrocarbons OR petroleum) with pollution; also see petroleum products and oil spills. (Note modified 1995.)

c. Indexer Note (IN)

These notes tell how a term is to be used in both the printed index and in GeoRef.

The phrase "includes use" which occurs frequently in the notes is for examples of current and significant GeoRef usage. It means "this is an important use" but not "this is the only use."

Term Validation

The Thesaurus is used in the production of GeoRef to validate the terms used to index new citations. As each index term is typed, it is compared to a list of valid Thesaurus terms. If the term is found in the validation file, it is accepted. If it is not found, and the term is correctly spelled, the invalid term is accepted for the citation and a record of it is saved. Such invalid terms become candidate terms for the next edition of the Thesaurus.

Autoposting

Whenever terms are used by an indexer their Broader Terms are added in the record through an automated lookup. For example, whenever an indexer uses Atchison County Kansas the terms Kansas and United States are added as index terms in the record. This is referred to as autoposting. Kansas, and United States are Broader Terms (BTs) of the term Atchison County Kansas. All BTs are autoposted, except for North America and a few general terms, not shown as BTs, such as the terms, minerals, processes, properties, and Western Hemisphere. Sometimes BTs will not be added automatically if the terms span two or more major geologic eras or occur in several geographically separated locations. Here, the indexer is required to decide and add the appropriate Broader Terms.

Singular and Plural Terms

In deciding whether an index term should be singular or plural in GeoRef, the guideline followed is that individual entities - C-14, bayerite, etc., are

singular. All other terms, for which the plural form makes sense, particularly classes of entities, e.g. rocks, minerals, etc., are plural. The plural form is used for nearly all non-geographic and non-proper noun terms in GeoRef. Significant exceptions occur in Meteorites and Rock types. See Lists G, H, I, and J at http://www.agiweb.org/georef/lists.html

Searching

General guidance for searching of index terms and Categories is given below. As well, the reader is referred to notes in specific index terms and to the hierarchical lists, e.g. List C, Commodities, which are posted on the GeoRef website at http://www.agiweb.org/georef/lists.html.. All GeoRef records contain index terms and Categories. The terms chosen from the Thesaurus and from the terminology in the documents indexed as well as Categories are assigned by GeoRef indexers with geoscience degrees. Subject and geographic locations of documents are indexed with specific terms, to which Broader Terms are autoposted. This in-depth indexing enables one to search with confidence. If the Thesaurus is carefully consulted in constructing a search, the results should meet expectations.

For specific field identifiers, and also for specific direction on searching variant concepts and constructing search statements, see the documentation for the individual retrieval system.

Basic Search

Words and concepts are also searchable as free text. This is sometimes displayed as an index or called a Basic Search. The Basic Search usually contains words and phrases from titles and abstracts, as well as index terms. For some searches, index terms, used alone, provide the best results because of their greater precision. The Thesaurus indicates term limits through hierarchies or term relationships and notes. It provides an historical record of the index term vocabulary of GeoRef. See Source and Development of the Vocabulary, above.

Since there was no Thesaurus before 1978, variant forms of terms are likely to have been used then. The major terms (See List P, at http://www.agiweb.org/georef/lists.html) in the older GeoRef records were controlled, and many of them have been converted to currently valid terms. But there were many other terms in the older records which were uncontrolled and have not been converted to currently valid terms or even to the current style of valid terms.

When searching GeoRef, be aware that variants of a term may have been used in GeoRef prior to its inclusion in the Thesaurus. Variants can be searched as follows:

To retrieve citations entered into GeoRef before the year a term was introduced search variants in the Basic Search.

Subject Categories

One or more of 30 Subject Categories (also called broad disciplines or subject headings) are assigned to each reference. The codes may be used in searching both as words (phrases) or codes. For each of the 30 Subject Categories and its subdivisions, the specific codes used, topics covered, and related topics in other fields see List A, at http://www.agiweb.org/georef/lists.html. Additional search hints are also provided on the web site.

The 30 general categories include:

01 Mineralogy
02 Geochemistry
03 Geochronology
04 Extraterrestrial geology
05 Igneous and metamorphic petrology
06 Sedimentary petrology
07 Oceanography
08 Paleontology, general studies of both fossil plants and animals
09 Paleontology, paleobotany
10 Paleontology, invertebrate
11 Paleontology, vertebrate
12 Stratigraphy, historical geology and paleoecology
13 Areal geology, general
14 Areal geology, maps and charts
15 Miscellaneous and mathematical geology
16 Structural geology
17 Geophysics, general
18 Geophysics, solid-Earth
19 Geophysics, seismology
20 Geophysics, applied
21 Hydrogeology and hydrology
22 Environmental geology
23 Surficial geology, geomorphology
24 Surficial geology, Quaternary geology
25 Surficial geology, soils
26 Economic geology, general — geology of deposits
27 Economic geology of metal ore deposits
28 Economic geology of non-metal deposits
29 Economic geology of energy sources
30 Engineering geology

Boolean operators especially with Subject Categories may also be used to eliminate unwanted as-

pects from a search. A search on magmas, for example, could be restricted to Earth-bound processes by using the Boolean Not with Extraterrestrial as a Subject Category.

Rock Units, Geologic Age Terms

Stratigraphic formations are particularly fluid entities. Since any author can propose a new formal name with proper documentation, the searcher is cautioned to use every possible variant, e.g. Smith Formation, Smith Sandstone, Smith Group, etc., even after the year GeoRef established a valid term. Indexers are instructed to use the GeoRef term (see List R); however, in some cases it may not fit, most often because of lithologic (sand versus siltstone) variation. In a few cases, the same geographic name occurs in unrelated locations, e.g. Windermere System in Canada and the Windermere Group in England. In most of these cases, the ages will also differ and the unwanted age or geography may be excluded. Occasionally official changes are made in stratigraphic nomenclature. These are incorporated in the controlled vocabulary as they are identified.

Age terms may be searched individually. A high degree of specificity is often possible, especially if the term is included in the Thesaurus. For age terms considered major (see List E at http://www.agiweb.org/georef/lists.html such as Cretaceous, it suffices to use the term as is and not worry about subdivisions, since those generally autopost Cretaceous. For information on autoposting see specific terms.

Age-dating Methods

The specific methods can be searched in combination with a specific age term (see List E), or a material. For references to methodology search in combination with "methods"; for references to actual date measurements, search "absolute age" or a specific absolute age method in combination with "dates". Some of the relative age methods may be used for other purposes besides dating. To limit a search to age-dating, search in combination with geochronology in the Category. See Searching Subject Categories above.

Fossils

In a search for paleontology papers on a fossil group, search the systematic name. To exclude stratigraphy papers, add NOT stratigraphy to the search strategy. Broader Terms in the list are autoposted to their Narrower Terms, except for Hemichordata which is not autoposted. For stratigraphic papers on a fossil group search the systematic name AND biostratigraphy. For paleoecology, biogeography, ecology and biochemistry papers, it is best to search systematic names, in combination with the appropriate topic term.

For searches on specific taxa, the species and/or genus name may be used in searching. Keep in mind that general studies discussing more than 10 taxa will rarely be indexed using the specific terms. A more general strategy is advisable for such searches.

For further discussion, see List F Fossils at the GeoRef website http://www.agiweb.org/georef/lists.html

Geochemistry and Commodities

For complete retrieval of commodities, search both specific and general terms. For example, a search on sillimanite deposits should include a search on ceramic materials, excluding andalusite deposits and kyanite deposits.

To isolate economic papers from non-economic, it is advisable to coordinate pre-1981 commodity terms with the economic geology Category or with ore deposits (for metals) or deposits (for nonmetals). See specific term entries or List C at http://www.agiweb.org/georef/lists.html. The term metal ores is autoposted to all the specific metal ore terms.

Minerals

To search for a particular mineral species, the common name of that species must be used bearing in mind possible varieties (agate, chalcedony... or titanite and sphene...) and that the American f is used for the British ph. See List L at http://www.agiweb.org/georef/lists.html.

Some mineral species may not be treated from a mineralogical point of view. It is advisable therefore to search for mineralogic papers using the mineral species together with the general term mineralogy or the mineralogy category.

To search a group of minerals, search for the group name (e.g., for pyrite and all other sulfides, search the group name "sulfides"). For more information see specific minerals in the main body of the Thesaurus. For papers dealing with gemmological aspects, search for a mineral in combination with "gems". For mineral collecting search a mineral in combination with (collecting OR popular geology).

Clay mineralogy as a discipline is treated separately. A search of the term "clay mineralogy" will retrieve papers dealing with all aspects of clays: mineralogy, structure, composition, occurrence as constituents of rocks, etc.

Rocks, Sedimentary Structures, Sediments, and Soils

Search for specific rocks, sediments, or sedimentary structures by name, including singular and plural forms. Stemming or truncation may be used. See list H for igneous rocks, list I for sedimentary rocks, list J for metamorphic rocks, list K for sedimentary structures, list N for sediments, and list M for soils. For example, to retrieve papers in which igneous or metamorphic rocks were a major topic, search igneous and metamorphic petrology as a category with igneous rocks or metamorphic rocks as desired. For more information on autoposted terms see the indexing terms for specific rock, sediment or sedimentary structure names in the body of the Thesaurus. For composite rock names, e.g. biotite gneiss, it is advisable to search both the specific rock name and the separate parts of the name truncated and combined. Related topics such as intrusions or diagenesis, are listed by subject in Subjects Covered. For sedimentary or metamorphic rocks which are commodities see List C.

To search for a soil group, search for all possible variations, including different names in different classifications and in different languages. For example, to search for Latosols, you must also search for Sol-ferralitique. The American names have been used most commonly in GeoRef indexing. See List M at http://www.agiweb.org/georef/lists.html.

Meteorites

To search for meteorites use the specific term such as 'Allende Meteorite' or the general term 'meteorites'. To search records before 1981, also search the name, such as Allende and meteorites. Truncation or stemming to find variants or searching using the basic search is advisable. Indexers do not always have access to the spelled-out form of the name, so for Antarctic meteorites and other meteorites with groups named with a geographic location, it is a good idea to search both the complete name and the abbreviation in combination with the number as well, e.g. (Elephant Moraine or EET or EETA) AND 79001. See List G at http://www.agiweb.org/georef/lists.html.

Geographic Locations

Geographic searching is best achieved by using all variants of an area name including political, physiographic and geologic. It is possible to be as specific as a town or county, and as general as a country or continent. For oceans and continental margins, it is advisable to use the coordinates as well. For information on searching coordinates, see the instructions for the search platform that you are using.

The basic geographic unit of the Thesaurus is the country name. In the United States, Australia, Canada, and China, the states and provinces are used; in the United Kingdom, the large subdivisions are used. For geographic terms which were never valid, the searcher must search our current coordinated forms for U. S. cities since 1989, and the city with the state before that date e.g. Alexandria Virginia; OR Alexandria and Virginia. For cities and administrative areas outside the United States, the search is similar, before 1993 and after, e.g. Keswick AND Great Britain; OR Keswick England; Cherepovets AND USSR; OR Cherepovets Russian Federation. Users searching the former Soviet republics, may retrieve material going back to 1978 by searching on the modern country name, e.g. Russian Federation. However, they are cautioned that USSR was treated as the country name, and the republics may not have been indexed for all records. Since 1992, the term USSR is generally only used for older articles on the whole former Soviet Union territory. Since 2007, Yugoslavia has also been used for older articles where individual republics cannot be determined. Consult the entry for the country to determine variations of the form. For information on major geographic terms and hierarchy see List O at http://www.agiweb.org/georef/lists.html.

Directionals such as terms beginning with "northern", "eastern", "northwestern", "south-central", etc., may be searched. These terms are often used informally in addition to broader valid terms in indexing, especially in combination with state names in the United States and province names in Canada, e.g. southern Kansas, south-central Ontario. They are used with country names outside the U.S. and Canada, except for Great Britain, e.g. eastern Malawi, northeastern England.

In GeoRef searching and indexing, terms for cities refer not only to the area within the city limits, but also to the immediately surrounding region.

Alphabetization

Terms are sorted in a modified word-by-word pattern rather than letter-by-letter. Specifically:

- The sort is on actual spaces, punctuation, letters, and numerals in that order.
- If the first or last character is punctuation, it is treated as if it does not exist.
- Punctuation is addressed so it will be grouped in ASCII order: space, apostrophe, open parenthesis, closed parenthesis, comma, hyphen, slash, or virgule.
- Number sequences in terms are sorted numerically.

- All letters are treated as if they are capitalized. Therefore, acronyms sort as words.
- Terms with initial numerals follow the letter "Z".

Sources

The following publications were consulted for identifying and determining term hierarchies for new GeoRef index terms for this edition of the Thesaurus. Publications are listed according to subject headings and within subject headings.

General

Jackson, J. A., ed., Glossary of Geology, 4th ed. (Am. Geol. Inst., Alexandria, VA, 1997)

McGraw-Hill editorial staff, McGraw-Hill Dictionary of Scientific and Technical Terms, 6th ed. (McGraw-Hill, New York, NY, 2002)

Neuendorf, K. K. E., et. al., eds., Glossary of Geology, 5th ed. (Am. Geol. Inst., Alexandria, VA, 2005)

Geography

Central Intelligence Agency, The 2008 World Factbook, <https://www.cia.gov/library/publications/the-world-factbook/index.html> Accessed Nov. 26, 2008

Cohen, S. B. (ed.), Columbia Gazetteer of the World (3 vols.) (Columbia Univ. Press, New York, NY, 1998)

Geoscience Australia, Place Names, < http://www.ga.gov.au/maps/names/ > Accessed on Nov. 26, 2008

Geoscience Australia, ProvExplorer -- Geological Provinces Interactive Mapping System, <http://www.ga.gov.au/provexplorer/ > accessed on Nov. 26, 2008

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Integrated Ocean Drilling Program, United States Implementing Organization, <http://www.oceandrilling.org/default.html> Accessed Nov. 26, 2008

JOIDES, Proceedings of the Ocean Drilling Program, Initial Reports <http://www-odp.tamu.edu/publications/> Accessed Dec. 8, 2008

Merriam Webster's Geographic Dictionary, 3rd ed. (Merriam-Webster, Inc., Springfield, MA, 1997)

National Imagery and Mapping Agency, NGA GEONet Names Server (GNS), <http://earth-info.nga.mil/gns/html/index.html> Accessed Nov. 26, 2008

National Informatics Centre, India, Districts of India, <http://districts.nic.in/> Accessed Dec. 8, 2008

The New International Atlas, 25th anniv. ed. (Rand McNally and Co., 1999)

The Times Atlas of the World, Comprehensive Edition, 9th ed, with revisions (Times Books, New York, NY, 1994)

U.S. Geological Survey, Geographic Names Information System, <http://geonames.usgs.gov/domestic/> Accessed Dec. 8, 2008

Geomorphology

Earth Impact Database, 2008. University of New Brunswick, Planetary and Space Science Centre, <http://www.unb.ca/passc/ImpactDatabase/ > (Accessed Nov. 26, 2008)

Metamorphic Rocks

Fettes, D., et. al., eds., Metamorphic Rocks; a Classification and Glossary of Terms, Recommendations of the International Union of Geological Sciences Subcommission on the Systematics of Metamorphic Rocks, (Cambridge Univ. Press, New York, 2007)

Meteorites

Grady, M. M., Catalogue of Meteorites, 5th ed., rev. and enlarged, (Cambridge Univ. Press, Cambridge, UK, 2000) and The Natural History Museum's Meteorite Catalogue Database <http://www.nhm.ac.uk/jdsml/research-curation/research/projects/metcat/> Accessed Nov. 26, 2008

Mineralogy (Nonsilicates)

Clark, A. M., Hey's Mineral Index; minerals, mineral species, varieties and synonyms, 3rd ed. (Chapman & Hall, New York, 1993)

Mineralogy (Silicates)

Strunz, H., and Nickel, E. H., Strunz Mineralogical Tables; chemical structural mineral classification system, 9th ed. (E. Schweizerbart'sche Verlagsbuchhandlung (Naegele u. Obermiller), Stuttgart, 2001)

Paleontology

Paleobiology Database <http://paleodb.org> Accessed Dec. 8, 2008

Treatise on Invertebrate Paleontology, 1st ed. and 2nd eds. and revisions where available. (Geol. Soc. Am./Univ. Kansas Press)

Zoological Record Thesaurus (Thomson Reuters, 2008)

Stratigraphy

U. S. Geological Survey, National Geologic Map Database, Geologic Names Lexicon, "GEOLEX" <http://ngmdb.usgs.gov/Geolex/geolex.html> Accessed Dec. 8, 2008; last modified Feb. 16, 2007

Geoscience Australia, Stratigraphic Units Database, <http://www.ga.gov.au/oracle/stratnames/geodxbib.jsp> Accessed on Nov. 26, 2008)

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Abbreviations

Entries for index terms listed in the main body of the Thesaurus contain abbreviations, most of which indicate relationships between terms. They are as follows:

IN Indexer Note
CO Geographic Coordinates
UF Used for
BT Broader Term, of a term with one hierarchy
BT1,BT2, etc. Broader Term, of a term with multiple hierarchies
NT Narrower Term
SA See Also

For a detailed explanation of the above, see the Introduction.

Suggestions and Corrections

You may send suggestions for new terms and term corrections to the attention of the GeoRef Thesaurus Editor at the American Geological Institute, 4220 King Street, Alexandria, VA 22302.
E-mail: georef@agiweb.org

Corrections for individual or groups of records in the GeoRef file as well as general comments may be sent to Monika Long: ml@agiweb.org.