

## **GEOLOGIC NOUNS, VERBS, ADJECTIVES, MODIFIERS, AND QUALIFIERS**

Source: 20-queries exercise, version 1.0

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The following list of English words is an attempt to identify various nouns, verbs, adjectives, modifiers, and qualifiers that occur in the 20-queries responses submitted by Science Language Technical Team participants (20 queries, v. 1.0). Such a list is one step in understanding the nomenclatural ambiguities, clarities, and uncertainties involved in our geo-nomenclature (for example, is there consensus on the meaning of “certain”, “deposit”, “environment”, “lithology”, “low-angle”, “coarse-grained”, “alluvium”, “plutonic”, “mylonitic”, “fabric”, “unit”, “approximate”, “inferred”). The list also helps in understanding the geometric, quantitative, and qualitative relationships that exist among geo-terms (“overlies”, “greater than”, “as young as”, “associated with”, “buried by”, “resting on”, “developed on”, “underlies”, “overtops”, “less than”).

< 2000 years ago

> 3m above

> 50% quartz

1:24,000 scale

2 micas

20 to 80 m above sea level

2-mica granites

90% confidence limits on the location of

abandoned

abundant

acid neutralizing capacity

acid-rock-drainage potential

active

adjacent to

aeromagnetic data

aeromagnetic survey flight lines

age assignments of units

age between 1345 and 1326 Ma

age dates

age determined  
age, how determined  
age, who did  
aggregate  
aggregate deposits  
aggregate resources, crushed-sandstone, economic  
aggregate, concrete, highway-grade  
aligned  
alkalic plutonic  
allochthonous rocks  
alluvial deposits  
alluvial fans  
alluvial thicknesses of 500 ft and greater  
alluvial-fan deposits dominated by debris-flow depositional processes  
alluvium  
alluvium, terrace  
alteration, hydrothermal  
altered rock  
amphibolite facies  
analytical data  
ancient  
andesitic volcanic rocks  
anhydrite  
anticlines, overturned  
anticlines, upright  
apatite fission-track cooling-age  
aquifer  
Archean  
Archean and Proterozoic  
are they any good? (data)  
areas  
arkose  
arkosic wackes

aspect of 135-270 degrees  
aspects, north  
associated with  
at surface  
at the surface  
Atlantic Coastal Plain Province  
attitude data  
attitude symbols, nth generation  
Avalon zone  
average  
average standard-penetration values  
backarc basin  
Baraga Group  
basalt  
basalt units  
basaltic units  
basement  
basin fill  
basin fill units  
basis for the identification of  
beach erosion  
bed thickness less than 1 foot  
bedding attitudes, upright  
bedding dips greater than 30 degrees  
bedding measurements  
bedding measurements for which tops are known  
bedding thickness less than 6 inches  
bedding, overturned  
bedding, sedimentary  
bedrock  
bedrock geologic map  
bedrock geologic units  
bedrock geology

bedrock topography  
bedrock units  
bedrock units, non-intrusive  
bedrock vs. alluvium  
beds, lacustrine  
below other surficial cover  
beneath  
bentonite  
between 10 and 20 m above stream level  
between 25% and 75%  
between 450 and 423 Ma  
between 60 and 75 ppm  
between X and Y Ma  
biota  
biotite  
black shale  
bog or peat deposits  
Bouguer gravity-anomaly contours  
breccia, fault  
brownish-red  
buried beneath  
buried by < 3m of material  
calc-alkalic  
calcrete  
calcrete soil > stage IV  
caldera  
caldera boundaries, approximate  
caldera boundaries, certain  
caldera boundaries, concealed  
caldera margin, outside of  
caldera, intracaldera  
calderas  
caliche

## Cambrian rocks

carbon content > 3%

carbonate deposits

carbonate rock, whether dolostone or limestone

carbonate rocks

carbonate, indurated

cataclasis

cataclastic rocks

catastrophic flood deposits

caves

cementation

Cenozoic

certain (as in fault, certain; contact, certain)

channels

characteristics

charnockites

chert

chert and shale combined

chloritized

clast

clast populations

clasts

clay

clay deposits

claystones

cliff forming

closed, partly

coal

coal beds

coal deposits, mined-out

coal fields

coal mines, underground

coal seams

cobbles  
cobbles, basaltic  
coexisting  
cohesive strength  
colluvium  
combined  
commodity  
compile  
compiled from  
compiled sources  
composition  
composition, alkalic  
composition, calc-alkalic  
concrete aggregate  
conglomerates  
conglomeratic  
conodont  
consist mainly of  
consist of two or more  
contact  
contact, approximate  
contact, between  
contact, certain  
contact, concealed  
contact, depositional, overlying angular unconformities  
contact, gradational  
contact, inferred  
contact, separating  
contact, nonconformable  
contact, paraconformable  
contact, unconformable  
contact-metamorphosed zones  
contacts, gradational

contacts, unconformable

contain

contain more than 50% carbonate rock

continental breakup

continental shelf

convergent margin magmatism

cooling-age values between X and Y Ma

copper mines, abandoned (from mineral resource database)

cover (noun)

cover (verb)

Cretaceous

Cretaceous and younger

Cretaceous and younger units

cross section

cross section indices

cross section, geologic

cross-cutting relationships

crushed stone (from mineral resource database)

cut by thrust faults

damage zone

damage zone, not plugged

data

data, analytical

data, density

data, redundancy

data, sufficient

data, sources

debris flow

debris flows

debris-flow deposit

decay constants

deep

deep-seated landslides

define

deformation, syndepositional

denser than

deposited in

depositional processes

deposits

deposits, aggregate

deposits, alluvial

deposits, alluvium, terrace

deposits, bog or peat

deposits, carbonate

deposits, clay

deposits, coal, mined-out

deposits, debris-avalanche

deposits, debris-fan

deposits, debris-flow

deposits, dome

deposits, drift

deposits, eolian

deposits, eolian silt

deposits, evaporite

deposits, flood

deposits, glacial

deposits, glacial bog

deposits, glacial, on specified bedrock unit

deposits, glacial, sandy

deposits, gold, placer

deposits, gravel

deposits, impermeable

deposits, karst

deposits, lacustrine

deposits, lahar

deposits, lake

deposits, lava-flow  
deposits, levee  
deposits, loess  
deposits, massive sulfide  
deposits, moraine  
deposits, mudrock  
deposits, Neogene  
deposits, outwash  
deposits, outwash, Chippewa lobe  
deposits, phosphate  
deposits, playa  
deposits, pull-apart basin  
deposits, pumice  
deposits, pyroclastic-flow  
deposits, sand  
deposits, sand and gravel  
deposits, sandstone  
deposits, sedimentary, nonmarine  
deposits, skarn  
deposits, slope-failure  
deposits, surficial  
deposits, terrace  
deposits, till  
deposits, tsunami  
deposits, unconsolidated  
deposits, volcanic  
depth estimates  
depth to basement  
derived from  
developed over  
devitrified  
Devonian  
Devonian, middle

dextral movement  
diamictons less than 2 m thick  
dikes  
dikes, clastic  
dikes, rhyolite  
dip direction, reversal of  
dip directions  
dip information  
dips greater than 45 degrees  
dips northwestward greater than 25 degrees  
displacement (fault)  
distribution and thickness  
divergent margin magmatism  
distribution of  
documented (confidence measure)  
dolomite  
dolostone  
dominant lithology (> 50%)  
dominated by  
downhill direction  
drain (verb)  
drainage basin  
drainage line  
drainage pattern  
draw a map of my groupings  
drill holes  
dune migrations  
dunes  
earthflows  
economic mineral potential  
edge effects (as in map edge or map boundary)  
ejecta blankets  
element

elemental abundances  
environment  
environments, barrier-bar  
environments, intertidal  
environments, oxygen-deficient  
environments, platform-margin  
environments, strand-plain  
eolian sand  
eolian sand <5%  
epithermal gold systems  
eskers  
excavatable, easily  
exceeds 4.0 degrees C  
exposures  
extensional  
extrapolation  
fault  
fault intersection  
fault movement  
fault rocks  
fault scarps that slope 15 to 25 degrees  
fault system, named  
fault system, transform  
fault zones, Brevard and Mountain Run  
fault zones, named  
fault, named  
fault, normal  
fault, reverse  
fault, specified  
fault, specified, surface trace of  
fault, strike-slip, dextral  
fault, strike-slip, sinistral  
faults

faults (by type)

faults, active

faults, approximate

faults, certain

faults, circular pattern

faults, clustered

faults, concealed

faults, dipping 60 degrees or greater

faults, high-angle

faults, historically active

faults, inferred

faults, listric

faults, low-angle

faults, normal

faults, nth generation

faults, reverse

faults, specified age

faults, specified type

faults, strike-slip

faults, strike-slip, left-lateral

faults, strike-slip, right-lateral

faults, thrust

faults, thrust, blind

faults, thrust, reactivated

faunal assemblages

faunal provinciality, Celtic

felsic

field investigation

filled with

fine-grained

fine-grained quartzite

fission-track cooling-age

flanking

flight line  
flood basalt  
flood plain  
flood plain, 100-year  
flow foliation, magmatic  
fluvial deposits  
fold, named  
folds (by type)  
folds, approximate  
folds, certain  
folds, concealed  
folds, inferred  
folds, nth generation  
foliated  
foliation  
foliation measurements  
foliation surface, single  
foliations, regional  
foreland  
formation  
Formation  
formation polygons  
formation x  
Formation Y  
Formations  
formations  
fossil  
fossil clams  
fossil localities  
fossil localities that conflict with age assignments of units  
fossil locations  
fossils  
fossils, trilobite

fracture density  
fracture spacing, close  
fracture spacing, denser than  
fractures  
fractures, in bedrock  
fractures, open  
fractures, partly closed by caliche  
fractures, without calcite fill  
garnet  
garnet, prograde  
gas  
gas fields  
generalize the map  
generalized  
geochemical analyses  
geochemical signature  
geochemically differentiate (verb)  
geochemistry  
geologic belt, regional  
geologic description  
geologic hazard potential  
geologic map, complete  
geologic map, generalized  
geologic province, regional  
geologic quadrangles  
geologic terrane, regional  
geologic zone, regional  
geologic-map units  
geophysical grid  
geothermal gradient  
glacial activity  
glacial limit, all-time  
glacial striae

glacial striae, more than one set  
glacial striae, superimposed  
glauconite  
glauconite-bearing rocks  
gneissose rock  
gold  
gold mines  
gold occurrences  
grain size, sand  
granites  
granites, hypersolvus  
granitic intrusions  
granitic rock  
granitic rocks that have more K<sub>2</sub>O than Na<sub>2</sub>O  
granitoid rocks  
granodiorites  
granulite-facies  
graptolite zone  
gravel  
gravel pits  
gravity analysis  
gravity measurements  
great enough to  
greater than 15 feet thick  
greater than 2 m thick  
greater than 20 feet thick  
greater than 36 inches thick  
greater than 4 feet in thickness  
greater than 5% by volume  
greater than 7% silt  
greater than 10 feet thick  
greater than 2 km in length  
greenschist facies

greenschist facies, at least  
greenschist-facies mafic volcanic rocks  
groove casts  
ground truth  
groundmass, fine-grained  
groundwater flow, shallow  
Group  
Group level or equivalent  
grouped  
guess  
gypsum  
habitat, desert tortoise  
hanging-wall rock units  
hard rocks  
harzburgites, tectonized  
has 25 feet or less of glacial cover  
high-level  
high-sinuosity  
Holocene  
Holocene, late  
hornblende, magmatic  
hornblende, prograde  
hornblende-bearing  
how many different rock types  
hydraulic conductivity  
hydrogeochemical characteristics, general  
hypabyssal rocks  
iceberg scours  
ice-flow directions  
igneous rock units, extrusive  
igneous rock units, intrusive  
igneous rocks  
igneous rocks, basic

ilmenite-bearing  
in the last 12,000 years  
in the upper 10 cm  
in their upper part  
include the  
incremented by 10%  
index map  
indurated  
inferred to be  
inner-gorges (geomorphology)  
interpretive  
intersect  
intersects  
intrude  
intruded by  
intrusions into  
intrusions, granitic  
intrusions, plutonic, felsic  
intrusive contacts  
intrusive rocks  
intrusive rocks, felsic  
intrusive rocks, mafic  
intrusive rocks, subvolcanic  
intrusives/extrusives  
isotope  
isotope systems  
Isotope, radiogenic  
Isotope, stable  
isotopic abundances  
isotopic ratios  
isotopic ratios, initial  
joint sets, orthogonal  
joints

Jurassic

Jurassic/Cretaceous

karst areas, probable

kimberlites

Kimmeridgian

Kiokee belts

known (adjective)

known age

Kyanite

laboratory, chemical

laboratory, dry chemistry

laboratory, isotope

laboratory, wet chemistry

lacustrine beds

lacustrine origin

lahars

lake, bed of

lakes

lakes, modern

landforms

landforms, glacial, streamlined

landforms, glacially streamlined

landslide deposits

landslide scarps, approximate

landslide scarps, certain

landslide scarps, concealed

landslides

Laramide

larger than 0.5 ha

latitude

Lava Creek B tephra

lava flows, basalt

layering, cumulus

layering, macrorhythmic  
less than 10,000 yrs old  
less than 3 m of  
less than 50 feet  
less than 500lb/square ft  
lie within 50 km of  
likely to have  
limestone  
limestone, high-calcium  
limestone, moldic  
limestones  
limestones, lacustrine  
lineaments, regional  
lineation measurements  
lines  
lines and polygons, map units mapped as both  
lines only, map units are mapped as  
liquid  
lithochemical map  
lithologic characteristics, general  
lithologic classification, customized  
lithologic classification, standard  
lithologic map  
lobe (glacial)  
locate themselves (geology allows users to)  
location of  
locations  
logs  
longitude  
lower than  
made up  
mafic  
mafic to ultramafic

magmatism, convergent margin  
magmatism, divergent margin  
magnetic analysis  
magnetic anomalies with amplitudes of 100 nT and greater  
magnetic survey location, ground based  
magnetic susceptibility  
magnitude 6 or greater earthquake  
map area  
map element  
map legend  
map notes cited  
map set  
map units  
map-unit identification  
map-unit identification is little more than a guess  
marble  
marine  
marine, deep  
marine, nearshore  
marine, shallow  
Marquette Range Supergroup  
massive  
material  
material properties  
maximum areal limits within which  
maximum extent  
maximum extent of  
mean density, bulk  
measured sections  
measurements, accuracy of  
measurements, precision of  
Member  
members

## Members

Mesoproterozoic

Mesozoic

metacarbonate rock

metadata

metamorphic

metamorphic rocks

Metamorphic Suite

metamorphic terrane

metamorphic terrane, granulite facies

metamorphism, retrogressive

metamorphosed

metasedimentary rocks

meteor impacts, buried

Mid-continent rift

mine tailings

mineral

mineralization, sulfide

mineralogic data

mineralogy

mines

mines, abandoned

mines, active

mining sites, surface, abandoned

Miocene

Mississippian

modal analysis

moisture content, bedrock

molybdenite prospects (from mineral resource database)

molybdenite traces (from mineral resource database)

moraine, terminal

moraines

moraines, end

moraines, recessional, large  
more K<sub>2</sub>O than Na<sub>2</sub>O  
more than 1 m thick  
more than 15% clay  
more than 5 meters  
more than 50% carbonate rock  
more than 50% of the map unit  
more than 100 feet from the high water mark  
movement within the last 100 years, documented  
movement, during the Holocene  
mudrock  
multiple  
multiple structural orientations  
muscovite, magmatic  
muscovite, prograde  
mylonitic fabrics  
names of all Eocene units  
Neogene  
nickel in lake sediments  
nonmarine  
obsidian  
occurrences  
occurs within 1 km  
offset  
offset, unknown amount of  
oil fields  
oil well locations  
oil-stained rock  
older than  
on slopes steeper than 10 degrees  
only the youngest  
ophiolite  
ophiolite assemblage

organic terrane  
organic-rich  
orientation of  
orientation, preferred  
origin  
orogeny  
orthogneisses  
outcrop identification  
outcrop pattern  
outcrops  
overlie  
overlie angular unconformities  
overlie units  
overturned  
Oxfordian Stage  
paleontological analysis  
paleontological data  
paleontological studies  
paleostress indicators  
Paleozoic  
Paleozoic and older rocks  
parent rock type, originating  
part of an  
particle-size distribution  
patterns resemble  
peat  
peat deposits, organic-rich  
Pennsylvanian  
percent gravel  
performed at the Royal Ontario Museum geochronology lab  
permafrost  
permafrost, discontinuous  
permeabilities over 1 md

permeability  
permeable  
Permian  
perturb  
petrologic classification based on modal analysis  
Phanerozoic  
pillow lavas  
pillows  
plagiarized  
planar point features  
playas  
Pleistocene  
Pleistocene, early  
Pleistocene, middle  
Pliocene sediments  
Pliocene, late  
Pliocene, late or younger  
plutonic  
plutonic felsic rocks  
plutonic igneous rocks  
plutonic intrusions  
plutonic intrusions, felsic  
plutonic intrusions, intermediate  
plutonic intrusions, mafic  
plutonic rocks  
plutonic rocks, porphyritic  
plutonic, alkalic  
plutons  
polygons  
polygons mapped as (each map unit symbol in turn)  
polygons mapped as open water  
polygons that contain sample points  
polyphase

poor conditions for  
porosity  
porous  
porphyritic  
Precambrian  
predominantly composed of  
primary  
primary porosities  
Proterozoic  
Proterozoic rocks  
Proterozoic rocks, early  
Proterozoic, early  
protoliths, igneous plutonic, felsic  
provenances  
published after 1985  
pull-apart basin  
pumice  
pyroclastic flow  
quarries, abandoned Berea Sandstone  
quarries, sand and gravel, active  
quartzite  
Quaternary  
Quaternary alluvium  
Quaternary cover  
Quaternary fault  
radiogenic isotope ratios (initial)  
radiometric age data  
radiometric ages  
radon gas  
rake of 45 to 60 degrees  
range  
ratio is greater than 2:1  
ratio, mudrock:grainrock, greater than 2:1

reactivated  
reasonably close  
recent  
recharge areas  
reclamation  
reclassification of rock units, customized  
reclassification of rock units, standard  
reclassifying surficial deposits  
recreational gold panner  
red  
references  
references cited  
references for U-Pb zircon dates by ion microprobe (from national geochronological database)  
regional extent  
regional geologic belt  
regional geologic province  
regional geologic terrane  
regional geologic zone  
relative movement  
reliability  
reliable  
relict  
reversely polarized  
reversely-magnetized  
reversely-magnetized basalt flows  
rhyolite  
rip-rap sources  
river plains  
river plains, high-sinuosity  
rivers, modern  
rock bodies (map units)  
rock outcrops

rock type  
rock types in a list  
rock units  
rock units denser than 2.67 g/cc  
rockfall potential  
rumor  
sample localities  
samples  
sand  
sand and gravel  
sand sources  
sandstone  
sandstone, clean  
sandstone, coarse  
sandstone, conglomeratic  
sandstone, pebbly conglomeratic, constitutes more than 50% of the map unit  
sandstone-mudrock sequences  
sandstones  
sandy glacial deposits  
sanidine  
sanidine  $^{40}\text{Ar}/^{39}\text{Ar}$   
scale of data validity  
scarps, fault  
scarps, landslide  
scarps, slope-movement  
scratch boundaries  
Section (PLSS unit)  
sedimentary  
sedimentary bedding  
sedimentary rocks  
sedimentary rocks  
sediments, marine  
sediments, terrestrial

sediments, unconsolidated

seeps, oil

seismicity, alignments of

selenite

separating

sequences deposited in

shale

shale, black

shale, combined with

shale, dips northwestward greater than 25 degrees on slopes steeper than 10 degrees

shales

shaly facies

shear strengths (phi values)

shear zones

shearing (noun)

shear-wave velocity less than 200 meters per second

shoreface units, lower

shorelines, glacial lake

shorelines, marine, raised

shorelines, recent

shrink-swell (adjective)

silicic plutonic rocks

silicic volcanic rocks

siliciclastic

sillimanite

sills

silt

silt >5%

siltstone

similar to a particular rock

sinistral movement

sinkholes

sites

skarn deposits  
slope exceeds 20%  
slope more steeply than  
slope movement  
slope movements  
slope-failure deposits  
slopes less than 3%  
slopes steeper than 10 degrees  
slump blocks  
smectite  
soil development, significant lack of  
soil, residual  
soils  
soils, Av horizons  
soils, Av horizons, weak  
soils, cryptogamic  
soils, liquefiable  
soils, serpentine  
sources for compilation  
spatial variation (semi-variance?)  
specify groupings  
springs  
stacked units  
stained brownish-red  
standard-penetration values  
stations  
statistical error in the data  
steep  
steep terrain, areas containing  
steeper than 15 degrees  
steeply dipping  
stock (igneous)  
stratigraphic

stratigraphic contact  
stratigraphic equivalents  
stratigraphic order  
stratigraphic relationship of all units  
stratigraphic units  
stratigraphic units, named  
stratigraphically above  
stream deposits  
strike & dip  
strike is between 80 and 110 degrees  
structural trends, regional  
structures, sedimentary  
subdivisions  
sulfur attribute values  
Supergroup  
superimpose all (verb)  
superimposed  
surface armor  
surface materials  
surface materials map  
surface rocks  
surface roughness value  
surface, upper  
surficial deposits  
surficial geologic map  
surficial material  
surficial materials  
surficial sediments  
susceptible  
susceptible to landslides  
suspected age  
syenitic rocks  
symbols

symbols, geologic  
symbols, linear  
symbols, lineations, mineral elongation  
symbols, lineations, stretching  
symbols, planar  
symbols, strike/dip  
synclines, overturned  
synclines, upright  
talc  
techniques  
tectonized harzburgites  
tephra  
terrace deposits  
terraces  
terraces, marine  
terrane  
terrane, Carolina  
terrane, metamorphic  
terranes  
Tertiary  
Tertiary, middle  
textual descriptions  
textural properties (fractal dimension)  
textures, cumulate  
textures, porphyritic  
that contain  
the most biotite  
thicker than one meter  
thickness of  
thrust faults  
thrust faults, blind  
thrust faults, of the Penokean orogen  
thrust faults, reactivated

thrust, low-angle

till

till bluffs over 15 feet high

till deposits

till, calcareous

till, clayey lodgement

till, clay-rich

till, lodgement

till, thick

time slice

titanite

TOC (total organic carbon) attribute values in excess of 1%

too small to show as

topographic relief

Township (PLSS)

trace amounts of

transport direction of

trend

trend, NW-SE

Triassic

Triassic age

triggered by

trilobite

truncate or offset (verb)

tsunami deposits

tuffs

tuffs, ashflow, welded

turbidite

turbidites

Tyee Sandstone, dipping west

type section

type section locality

U/Pb age determinations

U/Pb method  
ultrabasic rocks  
ultramafic  
unconformable contacts  
unconformities  
unconformities, angular  
unconformity  
unconformity, angular, specified  
unconsolidated  
unconsolidated deposits  
under  
underlain by  
underlie  
undivided Supergroups or Groups  
unit  
unit boundaries  
unit Tvb  
unit, separate (adjective)  
units  
units, basalt  
units, basaltic  
units, basin fill  
units, bedrock  
units, Cambrian  
units, cyclic  
units, granitic  
units, grouping of customized  
units, grouping of, standard  
units, limestone  
units, mapped undivided  
units, non-metamorphic  
units, Quaternary  
units, sand and gravel

units, sedimentary  
units, stratified  
units, surficial geologic  
U-Pb zircon ages  
uranium, whole-rock  
useable scale range of the data  
user geographic reference  
U-series dates < 130 ka  
valleys, buried  
values between X and Y Ma  
various parts  
vegetation  
vergence  
volcanic breccia  
volcanic deposits  
volcanic eruptions, recent  
volcanic flows, recent  
volcanic rocks  
volcanic rocks, andesitic  
volcanic rocks, basaltic  
volcanic rocks, bimodal  
volcanic rocks, mafic  
volume  
wackes, arkosic  
water levels  
water table  
water wells  
wavelet (geophysics)  
weak  
weathered, highly  
weathered, moderately  
welded  
well bedded

well data  
well preserved  
well sorted  
well-developed  
wells  
wells, active  
wells, gas  
wells, oil  
well-sorted  
well-sorted, clean  
wetlands  
what is the definition of?  
what orientations?  
what probability?  
what scale?  
White River Group  
white rocks  
who mapped?  
who?  
wider than 2 m  
Wisconsin age  
with greater than  
with immediately younger  
within 1.5 m of the surface  
within 10 feet of the surface  
within 150 feet of the surface  
within 2 km of  
within 2 km of  
within 2 m of the surface  
within 2 m of the surface  
within 20 degrees of east-west orientation  
within 3 m of a stream  
within 3 m of the surface

written communication

x,y,z information

younger

younger than

younger than 10 Ma

younger than 28 Ma

zoned