

AGU Grammar and Style Guide

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1. Hyphenation

The main reason for hyphenation is increased clarity.

1.1. Attributive Adjectives

Always hyphen. The following should always be hyphenated as attributive adjectives:

1. Noun + present or past participle

English-speaking people	U-shaped tube
sulfate-containing aerosols	<i>e</i> -folding layer
sediment-filled streams	hand-drawn graphs
V-shaped weir	

If the noun in the combination is modified, AGU preference is no hyphen unless you are trying to match a similar combination elsewhere in the paper; then use a hyphen between the modifier and the noun and between the noun and the participle. For example, if "field-aligned" appears in the paper, you should hyphen "magnetic-field-aligned":

magnetic-field-aligned irregularity or magnetic field aligned irregularity

Office style considers some noun + present or past participle combinations in the predicate to be passive verb forms, so they must be hyphenated to make it clear that they are performing as a unit:

sediment-filled	Fourier-transformed
Doppler-shifted	band-pass-filtered

2. Adjective + present or past participle (except compass directions)

straight-sided vessel	coarse-textured grain
lunar-orbiting satellite	good-sized sample

Do not hyphen if the adjective is modified by an adverb:

more coarse textured grain
very fine grained

3. Verb + preposition or adverb (unless closed up or opened in dictionary (use the current *Webster's Collegiate Dictionary* and then *Webster's Third International Dictionary* and the Addendum)(see pp. 230-231 in *Words Into Type* 1974 edition (WIT))

hollowed-out
speeding-up

4. "Well," "ill," or "little" + past participle

well-known theorem	ill-defined term
little-known derivation	

Do not hyphen if the combination is being used as a predicate adjective or if well (ill, little) is modified by an adverb:

very well known model
less well defined terms

5. Preposition + noun or adjective

near-surface reaction	behind-arc spreading
near-normal wave mode	

6. "Quasi" + adjective or adverb (Also hyphenate as a predicate adjective.)

quasi-linear expression

When quasi is used with a two-part adjective, quasi can stand by itself:

quasi steady state system
quasi self-consistent model

7. "Self" compounds (Also hyphenate as a predicate adjective. Check the dictionary for approved closed forms.)

self-sustaining reaction

8. "Cross" compounds (Check dictionary for approved closed forms.)

cross-*L* sweep cross-section(al) diagram
cross-correlation function

9. "All" compounds (Also hyphen if the combination is being used as a predicate adjective.)

all-inclusive program
all-salt deposit

10. "No" compounds (Also hyphen if the combination is being used as a predicate adjective.)

no-flow boundaries

11. Fractions

two-thirds part

12. Temporary compounds formed by adjective + noun indicating number, dimension, or quality. These examples are not all-inclusive.

Cardinal number + noun or adjective

zero-base budgeting
one-dimensional figure (*k*-dimensional model)
two-fluid response

Ordinal number + noun

*n*th-order equation second-order equation

Single, double, triple, multiple, half, etc., + noun

single-chain reaction
multiple-layer model

High, middle, low, medium, long, short, large, small, intermediate, etc., + noun (but not upper and lower) (hot/cold, narrow/wide, and/or thick/thin may be hyphenated, follow usage)

high-energy particles
middle-latitude stations

Follow the author for combinations such as the following (do not hyphen if adjective is modified by an adverb: very high frequency signals):

low-*P* region
low-Mg samples

If you have both combinations in a paper (one modified by an adverb and one not, such as "high-frequency waves" and "very high frequency waves"), do not treat them similarly (i.e., do not hyphen both or leave both open). The presence of the adverb in the second combination makes the difference. For combinations such

as the following, preference is for no hyphen unless you are trying to match a similar combination elsewhere in the paper; then use two hyphens. For example, if "high-resolution" appears in the paper, hyphen "high-vertical-resolution."

Also hyphen regular -er and -est comparatives and superlatives of these adjectives when they are used in combination with nouns:

higher-energy particles

lowest-latitude sample

13. Colors in combination

bluish-green overlay

blue-gray particle

14. Attributive adjectives formed by a noun plus one of the following or similar words:

-type

-soluble

-specific

-(in)dependent

-rich

-only

-free

-wide(check dictionary for solid words)

-scale

-odd

-synchronous

-variable

-invariant

-inclusive

For example,

pH-dependent finding

Fe-rich deposit (very Fe-rich deposit; very is modifying Fe rich, not just Fe)

C- and N-rich deposits (but do not use C-rich and -poor deposits)

These combinations are not hyphenated if they are used as predicate adjectives.

Never hyphen. The following combinations should never be hyphenated as attributive adjectives:

1. Irregular comparatives or superlative + participles or nouns

better known theorem, best known theorem

worse liked person, worst liked person

less known derivation, least known derivation

2. Foreign phrases

a priori solution

per mille basis

in situ technique

3. Adverbs ending in -ly + adjective or participle

slowly flowing stream

highly complex approach

4. Chemical compounds

ferric oxide layer

sulfuric acid residue

5. Light or dark + colors

light blue house

dark red hue

6. Compounds indicating direction or placement

north central Utah

upper right corner

7. Adverbs ending in -ward + participle
westward moving currents

8. Compass directions + present or past participles

northeast trending
south directed

9. Temporary compounds used as attributive adjectives formed by noun + noun or adjective + noun (see Word List at end of guide and dictionary for exceptions)

plasma flow region
wake surface potential

10. Permanent compounds (formed by noun + noun or adjective + noun that are used so often that they can be considered permanent compounds; many may be listed in the dictionary or the Word List)

solar wind	computer programing	electric field
magnetic field	data processing	ion cyclotron
cosmic ray	pitch angle	steady state
soil water	atomic oxygen	quiet time
linear programing	atomic nitrogen	sporadic <i>E</i>
molecular oxygen	molecular nitrogen	V notch
<i>F</i> region	γ ray	<i>x</i> component
<i>P</i> wave	<i>x</i> axis	

11. Numeral + unit of measure

2 cm pipe	5 foot (1.5 m) booms
1 km wide trench	5 year old record
6 mm diameter tube	9 year old pine plantation
6 mile wide highway	10 to 20 km wide area

Hyphen optional. In a given paper, follow usage to hyphenate or not hyphenate the following categories of attributive adjectives.

1. Phrases that act as attributive modifiers

month-by-month computation
order-of-magnitude change

If phrases are listed in the dictionary with hyphens, the hyphens are mandatory and should be added:

day-to-day variation
one-to-one basis

2. A hyphen in past/present participle + noun combinations should be left to avoid ambiguity:
charged-particle fluxes or charged particle fluxes

1.2. Nouns

In general, new compound nouns are spelled without hyphens. Check dictionary for permanent compounds listed there. If word is not in the dictionary and is not in the "Always hyphenate" or "Close up" categories below, open up as two words.

Never hyphenate. The following combinations should always be open when they act as nouns in sentences:

1. Noun + gerund

problem solving
data logging

2. Fractions

one half
two thirds

Always hyphenate. The following combinations should always be hyphenated:

1. "Self" compounds

self-knowledge

2. Quasi + noun (unless open or closed in the dictionary)

quasi-response
quasiperiodic

When quasi is used with a two-part noun, quasi can stand by itself:

quasi steady state
quasi self-help

3. Verb + preposition (unless closed up in the dictionary)

short-out
ramp-up

4. Noun or adjective + "like"

floor-like or floorlike
kelyphite-like or kelyphitelike
but taillike (see dictionary)

Hyphen if the noun ends in "ll" or is a proper noun:

bell-like, not belllike
Mars-like, not Marslike

Close up. The following combinations are always closed up:

1. "Fold" compounds

tenfold multifold

Use numeral and hyphen if a hyphenated number would precede fold:

125-fold

2. "Glow" compounds

dayglow nightglow airglow

3. "Side" compounds

dayside	duskside	frontside
nightside	noonside	backside
downside	topside	underside

1.3. Words Formed With Prefixes

1. The following are some common prefixes:

pre-, post-	un-, non-	re-
intra-, extra-	semi-	multi-
infra-, ultra-	pseudo-	micro-, macro-
sub-, super-	supra-	mini-, maxi-
pro-, anti-	co-	mid- (but mid-ocean)

This is not an inclusive list. Check dictionary for other prefixes and closed up forms. Note that “over” is a prefix, but “under” is not. Also, “fore” is a prefix, but “back” is not. Up and down are not prefixes.

2. Spell all words formed with these prefixes closed unless (1) the prefix precedes a capitalized word or a numeral (mid-Cretaceous, post-1950); (2) a homograph is formed (recover versus re-cover, to cover again; remark versus re-mark, to mark again); or (3) the same vowel would be repeated (intra-aggregate, semi-infinite), except co-, de-, pre-, pro-, and re- may be set closed even when a double vowel forms (preexist); but hyphenate if triple vowel results. Check dictionary for hyphenated words (un-ionized).

3. Use an en dash if the second element is a proper noun or proper adjective consisting of more than one word (pre–World War II, post–Civil War period).

4. Use two hyphens if the second element consists of more than one word (hyphenated) (non-time-homogeneous equation, non-English-speaking people).

5. If the second element contains more than one word and is a combination that we never hyphen, match the solution to the type of prefix:

(1) Post-, pseudo-, and mid- can stand alone if necessary (i.e., can function as adjectives or adverbs); therefore use

pseudo magnetic field
post cosmic ray event

(2) Other prefixes are only in the dictionary as combined forms and cannot stand alone:

In some cases the meaning will permit the prefix to be attached to the first word of the second element: nonsteady state.

In other cases, use an en dash or rephrase: pre–solar wind or before the solar wind. Another option is to use two hyphens even though the element containing two words is not usually hyphenated (e.g., pre-main-sequence).

6. When multiple prefixes precede the same base word, the prefixes should not stand alone; e.g., use preseismic and postseismic, not pre- and postseismic. Change mid- and high-latitude (as adjectives) to midlatitude and high-latitude or middle- and high-latitude.

1.4. Words of Equal Weight

A hyphen is used to connect words of equal weight. Usually, they are connected because they have an "either-or," "from-to," or "between-and" relationship:

wave-particle interaction	noon-midnight value	plant-soil system
air-sea interface	north-south range	time-space plot
desorption-absorption	precipitation-dissolution	

2. Commas

A comma should be used to clarify meaning. AGU uses the open punctuation style, that is, using only as much punctuation as necessary for clarity. Generally, commas are used around, before, and after nonrestrictive clauses and phrases. A nonrestrictive clause or phrases is one that could be omitted without changing the meaning of the sentence. Because of the technical nature of the material in AGU journals, it is sometimes difficult to be sure if a phrase or clause is nonrestrictive; follow usage in these cases. This section lists correct usage examples and house style. See WIT and *Chicago Manual of Style* for grammatical rules concerning comma usage.

2.1. Examples of Correct Usage

Use a comma

After the results were computed, we made a log plot of the data. (introductory adverb clause)

Using the data, we constructed a graph. (participial phrase)

To confirm the results, a second experiment was planned. (infinitive phrase)

The results being in question, the experiment was repeated. (nominative absolute)

In general, the results from the two studies are in agreement. (sentence modifier)

Initially, the current meters produced ambiguous data. (adverb ending in -ly)

In the references above, the reader may find further details of the methodology used here. (could be misread)

After reweighing, the samples were subjected to further tests. (ends in verb form)

We performed the experiment at room temperature, but the results were not as good. (compound sentence)

In the cool, humid climate the plants thrived. (coordinate adjectives)

The samples were collected in a glass beaker, which had been washed, dried, and weighed. (nonrestrictive)

The data, the number of echo soundings per second, were entered into the computer. (nonrestrictive appositive)

The distance per unit time, or velocity, is important to this calculation. (nonrestrictive appositive)

While a few were sandstone, the rocks were mostly granite. (introductory subordinate clause)

Papers based on data from Pioneers 10 and 11 conclude that a magnetic field decreases, while papers based on the data from Voyagers 1 and 2 are consistent with the Parker model. (nonrestrictive clause)

At the mountaintop, where the air is thin, it is necessary to wear oxygen masks.

The altitudes above 120 km, where O₃(v) fluorescence was too weak to be observed, provided data considered irrelevant for this study.

This follows the theory of *Smith and Ames* [1980], who solved the full MHD equations. (nonrestrictive phrase)

We interpreted a measurement of, say, 15 dbar to indicate that the system was at equilibrium. (independent element)

The expedition was a joint effort of American, Canadian, and French scientific societies. (series)

Thus, although in the first case the temperature is lowered, it did not affect the results. (Thus followed by introductory phrase)

If the lava flow were emplaced in this 550-year period, it would also have been entirely submarine. (If, then)

One hundred starting models are generated using a predefined set of velocity nodes, with a fixed window of allowable depth variations between nodes.

Do not use comma

Nappes therefore appear to have common history.

We dismissed data having excessively high or low values and plotted the remaining data on a *T-S* grid. (compound verb)

An examination of Figure 4 indicates that the midlatitude values are relatively low for this parameter and that high-latitude values are quite divergent. (parallel dependent clause)

In the area of the stratosphere where O₃ molecules are densest, damage by aerosols was the greatest. (restrictive phrases)

It was understood that given the above constraints, agreement would be tenuous. (before “that”)

These migmatites remained within the field long enough to deform while they were partially molten. (before a subordinate clause at end of sentence)

Virtually all the Mauna Loa lavas encountered are interpreted to be subaerially emplaced. (exception to after -ly)

2.2. AGU Style

With parameters. It is not necessary to set off variables in text with commas (or parentheses) if they directly follow the parameter for which they stand (follow author if usage is consistent):

The modeling equations can be closed by specifying the constitutive equations for the stress tensor \mathbf{T} of gas and solids, drag D , and heat transfer Q .

However, if a phrase separates the variable and the parameter, then retain enclosures (either commas or parentheses but be consistent within a paper):

The enthalpy (h), the thermal conductivity (k), and the volumetric heat transfer coefficient for the exchange of heat between the gas and pyroclasts (Q)....

Serial comma. Use a serial comma; that is, in a list of three or more, use comma before conjunction. In a numbered in-text list, a comma is sufficient to separate parts.

Numerals. Use comma only in numerals with five or more digits, including pages in reference list, except in tables (add comma to four-digit numerals if in column with five- or more digit numerals): 50,000, but use 5000 to 34,000 a in text.

Jr. and III. Do not use commas around or before Jr., Sr., or III except in reference list for first author in inverted order: House, J. H., Jr., and

Such as/as well as. Follow author for comma usage for “such as” and “as well as.” Watch verb form.

2.3. Comma Usage at Beginning of Independent Clause (this list is not inclusive)

<u>Always Use a Comma</u>		<u>Optional</u>	<u>(Almost) Never Use a Comma</u>
Again	In part	For this reason	Here
Also	In particular	In turn	Now
At the same time	In practice	Next	So
For example	In total	Then	Yet
Furthermore	Instead	In this case	
Hence	Moreover	In this study	
However	Nevertheless	In this paper	
In addition	Nonetheless	Thereafter	
In any event	Of course	At this point	
In contrast	On the other hand		
Indeed	Rather		
In essence	So far		
In general	That is		
In fact	Therefore		
In other words	Thus		

2.4. Comma Usage in Middle of Independent Clause (this list is not inclusive)

Some of the above words should also have surrounding commas in the middle of an independent clause: for example, however (but check meaning), namely, in general, etc., e.g., i.e., in fact. Check Chicago if you are not sure.

2.5. Some Parts of Speech and Common Examples

1. Parts of speech (note that some words can function in more than one way) (not inclusive)

<u>Prepositions</u>		<u>Compound Prepositions</u>	<u>Coordinating Conjunctions</u>
about	off	according to	and
above	on	apart from	but
across	onto	owing to	or
after	out	as to	nor
against	outside	on account of	yet
along	over	aside from	so
amid	past	because of	
among	regarding	instead of	<u>Correlative Conjunction</u>
at	respecting	out of	not only....but (also)
before	since		both...and
behind	through	<u>Adverbs</u>	either...or
below	throughout	-ly	neither...nor
beneath	till	hence	whether...(or)
beside	to	thus	
between	toward	therefore	<u>Subordinating Conjunctions</u>
beyond	under	so	although
by	underneath	yet	where
concerning	until	moreover	when
during	up	accordingly	since
except	upon	consequently	though
excepting	with	as	so that
for	within	then	while
in	without		whereas
inside			because
into			if
of			that

2. Strong natural breaks (comma is not required after introductory prepositional phrase followed by a natural break unless ending in a verb form or possible misreading could occur)

indefinite articles:	a, an
definite article:	the
demonstrative or definitive adjectives or pronouns:	this, that, these, those
indefinite adjectives:	each, both, either, such, some, many
distributive pronouns:	each, every, everyone, either, neither
indefinite pronouns:	both, any, few, many, none, one, some, such, several, most
personal pronouns and their declined forms:	I, he, she, it, we, you, they, my, mine, his, her, your, yours, their, theirs, ours, our, his, hers

3. Additional Grammar/Punctuation Rules

3.1. Adjectival/Adverbial Phrases

1. The following are adjectival (adjective + preposition), which can only modify a noun.

Due to: Since due to is an adjective, it needs a noun or pronoun to modify. To assure this functioning, the safest place for due to is after a form of the verb to be because there it always serves as an adjective: "The cancellation was due to bad weather" (due modifies the noun cancellation). "My failure to pay promptly was due to an oversight" (due modifies failure). The most dangerous placement of due to is at the head of a sentence. In "Due to rain" or in "Due to the lateness of the hour" or in "Due to a cold I was unable to attend," due to is treated as an adverbial phrase. This is a misuse. A test to determine whether due to is being used correctly is to replace it with "caused by" or "attributed to," which is what due to means. If the replacements make sense, due to is correctly used, as it is in "The explosion was due to [caused by or attributed to] carelessness."

His failure was due to insufficient study.

Compared to (or compared with): Follow author

2. The following are adverbial (adv + prep), which can modify a verb, an adjective, or another adverb: Owing to (because of, on account of), in comparison to, in relation to

He failed owing to [because of] insufficient study.
This paper was short in comparison with the previous one.
Height in relation to depth was the important factor.

Based on "Based on" phrases should only modify nouns not verbs. Change to "on the basis of" at beginning of sentences and if modifying a verb, e.g., "the results based on Smith's theory..." but not "Based on Smith's theory, we found"

3.2. Comprise Versus Compose

1. Whole (subject) comprises parts (object) (must be active verb): The book comprises five chapters.
2. Parts (subject) compose (make up) a whole (object):

These chapters compose this book.
This book is composed of three chapters.

Never use comprised of; change to composed of.

3.3. Singular Versus Plural With Certain Nouns

1. Number: "A" takes plural verb: A significant number of points are in large disagreement with (2) and (3).
"The" takes singular verb: From Table 3 it is apparent that the number of points over which averages are taken varies considerably between data divisions.
2. Set and group (collective nouns) should take singular verb unless the individuals of the group are to be emphasized. Authors often have either one intention or the other, so it is best to follow the author's usage unless it is found to be totally incorrect.

A set of points, such that N and X are both ... are defined as feasible designs for satisfying the information demand of the n th parameter.

Furthermore, the set of nonzero Lagrange multipliers represents the set of trade-off ratios between the principal objective and each of the constraining objectives.

3. "Data" must take the plural verb; however, "geodetic datum" is singular, and "geodetic datums" is plural.

4. "Series" can take singular verb if individuals in series are not emphasized:

A series of models have been constructed that approximate the measured horizontal disturbance at the Earth's surface derived by *Langel* [1973].

The series that we used helps to identify the position of the vector.

5. "The" percentage always takes a singular verb. "A" percentage can take either a plural or singular verb depending on object of preposition: A substantial percentage of these individuals are quite sure that they have made the best decision.

6. Percent can take either plural or singular verb depending on object of preposition: Roughly 8% of all proton velocities were contoured./About 9% of the field was rejected.

7. Total takes a singular verb:

A total of 98 field stations was established with an elevation range from 4400 to 9000 m.

8. Chain takes a singular verb: The changes in neutral composition trigger a complex chain of events, which affects not only the distributions but also the emission rates.

9. Proportion can take either plural or singular verb depending on object of preposition: A relatively larger proportion of bound H_2 molecules emerge and flow from the hotter dayside to the cooler nightside.

10. Sequence takes a singular verb: The following sequence of boundary conditions is therefore obtained for the free surface geometry.

11. Part (determine singular or plural sense)

Part of the results of the simple model are compared with magnetic field mappings of Imp and Mariner 5.
The part that we used was not properly verified.

12. Fraction (determine singular or plural sense)

A large fraction of the reports available are clustered over the continent.
A fraction will be chosen that is indicative of the actual cost per person.

13. "None" may take either plural or singular depending on emphasis:

None of the outliers are from earlier parts of the records.

3.4. Other Rules

1. Retain subjunctive mood, but do not change the verb to the subjunctive: e.g., It is required that the glass container be airtight. (See WIT (3rd ed., pp. 342-343) for a discussion of the subjunctive mood.)

2. Punctuation before i.e. (comma versus semicolon) varies depending on what function the material following i.e. plays in the sentence. If it is a noun or a phrase, a comma should be used. If it is an independent clause, a semicolon is necessary and change i.e. to "that is."

We have used only data in which the difference is larger than 30%; that is, we have used only data...
We have used only data in which the difference is larger than 30%, i.e., only those over 20.3.

The first example is an independent clause, and the second is a noun (the direct object).

3. So that of purpose versus so that of result: So that of purpose (i.e., in order to) is not preceded by a comma ("that" may be understood): Andy put on his sun glasses so that he could see.

So that of result (i.e., as a result) is preceded by a comma ("that" may be understood): John stepped in the wet cement, so he ruined his new shoes.

4. Do not use colons after forms of the verb "to be," after prepositions, or to separate a verb from its object. Colons may be used after forms of "to follow." If you want to retain the colon for any of the above cases, insert "as follows" or "in the following" or "for the following."

5. AGU style is to avoid em dashes. They should be changed to either commas or parentheses if there are two or to a colon if there is one.

6. AGU style does not use understood verbs.

Change the following from "The group of incompatible elements that form ore deposits are related to S-type granites and the more compatible to I-type granites." to "The group of incompatible elements that form ore deposits are related to S-type granites, and the more compatible are related to I-type granites." (Repeat verb and add a comma.)

Also watch for understood verb forms such as infinitives in a series. Change "The electronic data from the abstract will be used to create databases, new alerting services, and to develop products for scientists" either to "The electronic data from the abstract will be used to create databases, to create new alerting services, and to develop products for scientists" or to "The electronic data from the abstract will be used to create databases and new alerting services and to develop products for scientists"

After equations a list variables and their definitions may be given in paragraph format. If "is" or "denotes" is used for the first and last but left out for the in-between ones, add the verb for all or rephrase to delete all. For example,

$$x = (ba + c)/[(d - 1) + m],$$

where x is the random variable, b the balloon, a the area, c the content, d the distance, and m is the mean. Change to "where x is the random variable, b is the balloon, a is the area, c is the content, d is the distance, and m is the mean." Or reword to delete all verbs: "where the variables are defined as follows: x , random variable; b , balloon; a , area; c , content; d , distance; and m , mean." (These can also be changed to in-text notations lists if more than three variables are listed.)

7. Use a semicolon, not a comma, before hence when introducing an independent clause.

The results were uncertain; hence, we did not use them.

4. Spelling

Any variant spelling listed in the dictionary may be used as long as it is consistent throughout the paper. If spelling is not consistent, make it consistent by making all occurrences of the word conform to the spelling used most often. Either spelling in the pairs that follow is acceptable according to the dictionary:

4.1. Alternate Spellings

Acceptable

aesthetic/esthetic	anaerobic/anerobic	matrixes/matrices
alignment/alinement	appendixes/appendices	sulfur/sulphur
analog/analogue	indexes/indices (but always indices for scientific/mathematical indi- cators, dictionary, index 8)	sparce/sparse
supersede/supcede		imbalance/inbalance
subtract/substract		grey/gray
spatial/spacial	synthesize/synthetize	
coterminous/conterminous	terrain/terrane (see dictionary; different meanings)	

Not acceptable (but do not fix figures)

1. Double final consonants before endings (inflections); use the shorter form in text if both forms are given in the dictionary:

equaled	not equalled (but controlling)
focuses, biases	not focusses, biasses
focused, biased	not focussed, biassed
pluses	not plusses
modeling	not modelling

2. Suffixes "-ment" and "-able"; use the shorter form in text if both forms are given in the dictionary:

judgment	not judgement
acknowledgment	not acknowledgement
sizable	not sizeable (but noticeable)

3. American versus British spellings; use the American rather than the British spelling in text:

behavior, favor, color	not behaviour, favour, colour
advertise	not advertize
meter, center	not metre, centre
inflection	not inflexion
analyze	not analyse
draft	not draught

4.2. Commonly Used Proper Names (unusual spellings or accented letters)

If accents are consistently not used, do not add them.

Alfvén	Milankovitch
Avé Lallemand (author)	Mohorovičić (Moho, no accents with "discontinuity")
Bénard (associated with cells or convection)	Murnaghan (as in Birch-Murnaghan equation)
Bouguer (gravity anomaly)	Néel
Chappuis (band)	Poisson (ratio, sigma)
Debye (theory, constants) (in combination w/Scherrer)	Rayleigh (wave, number)
Eötvös	Savonius (rotor)
Grüneisen (parameter - gamma)	Toksöz
Kirchhoff	Larmor
Kolmogorov-Smirnov (goodness of fit test)	Brunt-Väisälä
Lagrange (constant)	von Kármán
Lamé (constant)	Clapeyron
Laplace	Boltzmann
Le Pichon (author: first initial X (Xavier))	Crank-Nicolson (no "h")

4.3. Countries

1. Former Soviet Union Countries

The following is a list of spellings used by Webster's and the State Department for the Baltic States and the Republics which were formerly part of the Soviet Union. Change to these spellings.

<u>Name</u>	<u>Adjective</u>	<u>Capital</u>
Armenia (Hayastan, use Armenia)	Armenian	Yerevan
Azerbaijan	Azerbaijani	Baku
Belarus	Belarus	Minsk
Estonia	Estonian	Tallinn
Georgia	Georgian	Tbilisi
Kazakstan	Kazak	Almaty
Kyrgyzstan	Kyrgyz	Bishkek (formerly Frunze)
Latvia	Latvian	Riga
Lithuania	Lithuanian	Vilnius
Moldova	Moldovan	Chisinau (formerly Kishinev)
Russia	Russian	Moscow
Tajikistan	Tajik	Dushanbe
Turkmenistan	Turkmen	Ashgabad
Ukraine	Ukrainian	Kyyiv (Kiev)
Uzbekistan	Uzbek	Tashkent

2. Prefectures of Japan With Their Capitals

<u>Prefecture</u>	<u>Capital</u>	<u>Prefecture</u>	<u>Capital</u>
Aichi	Nagoya	Miyazaki	Miyazaki
Akita	Akita	Nagano	Nagano
Aomori	Aomori	Nagasaki	Nagasaki
Chiba	Chiba	Nara	Nara
Ehime	Matsuyama	Niigata	Niigata
Fukui	Fukui	Oita	Oita
Fukuoka	Fukuoka	Okayama	Okayama
Fukushima	Fukushima	Okinawa	Naha
Gifu	Gifu	Osaka	Osaka
Gunma	Maebashi	Saga	Saga
Hiroshima	Hiroshima	Saitama	Urawa
Hokkaido	Sapporo	Shiga	Otsu
Hyogo	Kobe	Shimane	Matsue
Ibaraki	Mito	Shizuoka	Shizuoka
Ishikawa	Kanazawa	Tochigi	Utsunomiya
Iwate	Morioka	Tokushima	Tokushima
Kagawa	Takamatsu	Tokyo	Tokyo
Kagoshima	Kagoshima	Tottori	Tottori
Kanagawa	Yokohama	Toyama	Toyama
Kochi	Kōchi	Wakayama	Wakayama
Kumamoto	Kumamoto	Yamagata	Yamagata
Kyoto	Kyoto	Yamaguchi	Yamaguchi
Mie	Tsu	Yamanashi	Kofu
Miyagi	Sendai		

5. Capitalization

Because AGU is interdisciplinary, the capitalization scheme of each discipline within the geophysics community cannot be followed. The exception would be a group of papers appearing in a special section (or companion papers). A decision should be made on how to treat certain words, based on office style, or perhaps an editor's preference, and capitalize/lowercase consistently in all papers in the SI. (See *Words Into Type* (WIT) for treatment of questions not considered here.)

5.1. Geographical Terms

1. The following may be either capitalized or lowercased except as indicated under point 2 below: anticline, arc, bank, basin, butte, channel, crater (e.g., on Earth, the Moon, or Mars), fault, fold, formation, geyser, glacier, mount, plate, plateau, ridge, rill, strait, syncline, trench, trough, volcano. If usage in a paper is inconsistent, lowercase such underwater or geological features unless they are part of the legally recognized name of the feature in question; this can be verified by checking Webster's Geographical Dictionary or an atlas. Since terms such as convergence, divergence, currents, swells, water masses, and jets (air currents) have varying degrees of importance to different types of authors (biologists, chemists, geologists), follow the author.

2. The following is AGU style for commonly occurring geographical terms. This is not an inclusive list. Check atlas for recognized geographic features. Note that generic terms such as lake, mountain, river, or valley are capitalized when used with a proper name no matter how they are listed in an atlas or gazetteer, except if "the/a river" precedes the proper name: the river Elbe. Also, Hudson River valley. Lowercase plurals of geographic features, e.g., Atlantic and Pacific oceans, even if they are capitalized when singular.

Africa, North, East, West, but central (south except country)	Mars, Martian
Alps, Southern, Eastern, and Western, but northern and central; also Southern Alps for New Zealand	Mediterranean Sea
Andes, sub-Andes, central Andes, inter-Andean	Mediterranean, western/eastern, but Arctic mediterranean seas (mediterranean in this case is generic in meaning, i.e., land-locked or mostly land-locked, here referring to several seas within the Arctic as a group)
Arctic Ocean	Middle East (or Mideast)
Asia, South, Southeast, central, southeastern, East	Midwest
Atlantic Ocean, North, South, but northern, southern, central	Mojave Desert
Caspian Sea (not divided, east, west, north, south)	the Moon, but lunar
China, south	Negev (desert, if used, is lowercased)
Coastal Plain (U.S.)	New York City (but follow author for adding "City")
Earth (as planet rather than substance), but earthward and terrestrial	Nordic seas
East Africa	Northern Hemisphere (Earth only)
East Antarctica	North Pole (Earth's only)
East Antarctic Ice Sheet	North Sea
East China Sea	open ocean
east coast, but West Coast	Pacific Northwest (but northwest Pacific)
Eastern Hemisphere (Earth only)	Pacific Ocean, North, South, but northern, southern
eastern Mediterranean Sea	Pan-African
east Greenland	Pan-American
East Sea, change to Sea of Japan (East Sea)	plate (follow author within paper for capitalization):
East Siberian Sea	African, Antarctic, Arabian, Australian, Caribbean,
equator, equatorial	Cocos, Eurasian, Farallon, Indian, Juan de Fuca,
Europe, central, eastern, and western (capitalize Eastern and Western Europe only in political sense, rare)	Nazca, North American, Pacific, Philippine, Scotia
Faeroe Islands (or Färoe)	Sahara (desert, if used, is lowercased)
Gobi desert	Sea of Japan (preferred), or Japan Sea
the Himalayas (or the Himalaya), Outer, Greater, Lesser, but central, middle, lower	solar system
Iceland-Greenland-Norwegian Seas (order may vary)	Southern Hemisphere (Earth only)
Indo-Pacific	south China
island of Hawaii (or Hawai'i) (follow au for accent except when referring to the state of Hawaii, no accent)	South China Sea
Jupiter, Jovian, Jovicentric, Jovigraphic	Southeast Asia, but southeastern Asia
	Southern Ocean
	South Indian Ocean
	South Pole (and South Pole Station) (Earth's only)
	South Shetland Islands

the Southwest (only when referring to southwestern United States)
 sub-Saharan, subalpine, sub-Andean
 the Sun, but sunward and solar
 Takla Makan, use Taklimakan
 Taklimakan desert
 Tibetan Plateau or Plateau of Tibet (aka Qinghai-Xizang Plateau) but not Tibet Plateau
 transatlantic
 Venus, Venusian, Venus's
 Victoria Land

West Antarctica
 West Africa
 west Australia
 Western Australia (if state meant)
 Western Hemisphere (Earth only)
 western Siberia
 west Greenland
 world ocean
 the West (of U.S.) the North, the South, the East, and West Coast

3. Use the following for both nouns and adjectives: Arctic and Antarctic (however, arctic may be lowercased in papers that do not use Antarctic; follow author). Use subarctic and subantarctic as adjectives, but sub-Arctic and sub-Antarctic as nouns. Note that Antarctica is the continent and Antarctic is the region.

4. Use state of Washington, but use Washington State.

5.2. Text Capitalization

1. In level 1-4 heads, capitalize all words of more than three letters, lowercase 1-3 letter articles, prepositions, and conjunctions..

2. Capitalize adjectives derived from proper names: Kelvin, Martian, Lambertian, Stokes.

3. In text, capitalize Figure 2 and Table 1 but lowercase model 1, section 1, and equation (2) (and related examples). However, follow usage for capitalization of Ocean Drilling Program's (formerly Deep Sea Drilling Project) Hole, Site, Leg when used with number, e.g., Site 43, Hole 128, Leg 26.

4. Protected trademarks are capitalized (Teflon, Plexiglas, Pyrex, Freon, etc.). When a trademark is used, do not capitalize the common noun portion (Pyrex beaker). See WIT, 3rd ed., p. 172 for now unprotected former trademarks (use lowercase).

5. Lowercase law, such as Snell's law.

6. Lowercase is preferred for experiments, watersheds, instruments, models, and the like, but follow usage for well-known experiments. The general rule for instruments is to lowercase them when they are generic terms (i.e., there are several of such instruments). If unique, capitalize (usually on satellites).

7. Follow usage for rock names. Both capital and lowercase may be used for the same rock within a paper, as they have different connotations. For example, Westerly Granite is a granite with a specific chemical composition, whereas Westerly granite is a more generic term. Also, follow author for Groups and Members.

8. Explosions are initial cap only, e.g., Cowboy, Salmon, Sterling.

9. Capitalize Hurricane/Typhoon when used with a specific name: Hurricane Andrew, Typhoon June.

10. Lowercase "earthquake": western Tottori earthquake.

5.3. Stratigraphic Divisions

Capitalize the attributive adjective (e.g., early, lower) only if it appears here as an officially recognized subdivision; otherwise, use lowercase: late Cenozoic, early Paleozoic, early Pleistocene, Late Jurassic, Upper Permian. See p. 949 of *Webster's Third International Dictionary* for spelling of smaller units.

Era	Period	Epoch
Cenozoic (variation: Cainozoic)	Quaternary	Recent (Holocene) Pleistocene
	Tertiary	Pliocene } Neogene[Neocene] Miocene } Oligocene
70 m.y. ago (70 Ma)		Eocene Paleogene Paleocene
Mesozoic	Cretaceous	Upper (Late) Lower (Early)
	Jurassic	Upper (Late) Middle (Middle) Lower (Early)
	Triassic	Upper (Late) Middle (Middle) Lower (Early)
Paleozoic 230 m.y. ago	Permian	Upper (Late) Lower (Early)
	Pennsylvanian	Upper (Late) Middle (Middle) Lower (Early)
	Mississippian	Carbonif- erous Systems Upper (Late) Lower (Early)
	Devonian	Upper (Late) Middle (Middle) Lower (Early)
390 m.y. ago	Silurian	Upper (Late) Middle (Middle) Lower (Early)
	Ordovician	Upper (Late) Middle (Middle) Lower (Early)
	Cambrian	Upper (Late) Middle (Middle) Lower (Early)
500 m.y. ago		
Precambrian 620-2300 m.y. ago	Proterozoic Archeozoic	Upper (Late) Middle (Middle) Lower (Early)

6. Numbers

6.1. Cardinal Numbers/Arabic Numerals

Use numerals

1. For 10 or higher; write out under 10, except as indicated below.
2. With units of measure (abbreviate units if possible).
3. To make numbers under 10 consistent with larger numbers in a series:

We used data from 6 experiments in the first graph and from 12 to 14 experiments in the second and third graphs, respectively.

4. With divisions (part, paragraph, section, rule, model): model 1, section 2, log 1, case 1 (do not change from roman to arabic if roman numerals are used in figures or if from a non-AGU source).
5. When implying an arithmetical manipulation: a factor of 7, 4 orders of magnitude, magnification of 50 (50X, use capital "ex" closed up to number), 5 times the height; use either 2 or two standard deviations (follow usage but be consistent).

Write out

1. For one through nine except as indicated above.
2. At the beginning of sentences, a head, or a title (if followed by a unit of measure, spell it out too: Ten kilometers...; or rephrase so that the number (and its unit of measure) does not begin the sentence, head, or title). If necessary to write out, hyphenate (both as noun and adjective) cardinal and ordinal numbers if compound: e.g., twenty-one, twenty-first. However, one hundred is not hyphenated (see number table in the dictionary). For plurals, e.g., tens, not 10s.

6.2. Ordinal Numbers

Spell out ordinal numbers (first, second, third, etc.) unless hyphenated (e.g., twenty-first, use 21st) in text. If nonhyphenated form used in conjunction with hyphenated, use numbers for all: 21st, 50th, 92nd. Use the numeral and suffix form (1st, 2nd, 3rd, etc.) in references (e.g., 1st ed.). Use *n*th, (*n* - 1)th, etc. (i.e., "th" is on line and not italic).

6.3. Miscellaneous Style for Numbers

1. Give full ranges for pages or years; for example, change 801-6 to 801-806 and change 1979-80 to 1979-1980.
2. Mixed forms are permissible for very large numbers: 5 million; 2.3 billion. If units of measure are included, use scientific notation: e.g., $5 \times 10^6 \text{ m}^3$; $2.3 \times 10^9 \text{ L}$.
3. Insert a zero before the decimal point in a numeral less than unity; 0.002, not .002. However, do not add a zero after decimal point (e.g., 20.), but do retain decimal; adding a zero would change the degree of precision of the measurement.
4. Do not use roman numerals in names of artificial satellites, rockets, etc.: Explorer 8, Vanguard 3, Surveyor 1, OGO 3.
5. Do not use roman numerals for figure numbers or table numbers: Figure 5 and Table 2.
6. Spell out a number that directly precedes or follows a numeral: ten 2-m strips; 136 two-hour lectures (see WIT, p. 127)

7. In text, write out scientific notation; that is, change 1.365(-3) or 1.365E-3 to 1.365×10^{-3} (note that the abbreviated format is permissible in tables).

7. Miscellaneous Style Rules

1. For direct questions it is okay to capitalize the question: The question is raised, How reliable are the results?

2. Do not begin sentences with lowercase Roman or Greek letters or numerals. Enclosures are ok, e.g., [, < , (, as are capital Greek letters, e.g., Δ, Φ.

3. Latin phrases are not italicized except genus and species names. Use a priori, a posteriori, in situ, ad hoc, ab initio, but translate sensu (in the sense of), sensu strictu (in a strict sense), inter alia (among other things), and nota bene or N.B. (note that). This is not a complete list.

4. Italics may be used for emphasis, but sparingly; remove italics from long phrases, complete sentence, and whole paragraphs. Do not use boldface or all capitals for emphasis or definition (double quotes may be used for definition; see below).

5. Use double quotes, not single quotes. If used frequently, delete after first use around a specific word or phrase in both abstract and text.

6. Periods and commas go inside closing quotes; semicolons and colons go outside.

7. AGU date format. Never use, e.g., 1/3/80, 010380, or 1-3-80. Use 1 March 1980 (not the 1st of March):

1–3 March 1980,
between 1 and 3 March 1980, we observed...
1 March to 1 April(not 1 March–1 April)
March 1980 to August 1981
March–April 1991

En dashes should only be used between like things: 1–12 March 1983; but change 1 March–10 April to 1 March to 10 April. Can retain decimal in year, e.g., 1982.7; it is not necessary to convert to months.

8. Use 1980s for decades (not 1980's or 80s).

9. Do not use the word “number” (or no. or #) if it can be avoided without affecting meaning. However, for sand or grit it is permissible to use #: #5 sand and #3 grit. Another permissible use is for Mg #. In most usages, number can be eliminated, e.g., for run no. 5, run 5 is quite sufficient. Use, e.g., model 1, run 5, experiment 3, well 5, sample 2568D5, borehole 356, Site/Hole 835. Sometimes context may indicate a substitute for “number,” e.g., for “Three earthquakes occurred in the 1980s, #385, #886, and #589,” the term “event” can be substituted for #: “Three earthquakes occurred in the 1980s, events 385, 886, and 589.”

10. It is permissible to use “(?)” after stratigraphic division (closed up).

11. Use “the notation section.”

12. When an author cross-references numbered observations, trends, etc., parentheses are not used (i.e., “observation 1,” not “observation (1)”). Parentheses are reserved for equations and reactions.

13. Delete “s” in -ward words: toward, northward, etc.

14. In text, spell out fractions. Use "two thirds of the people" (noun form) and "two-thirds the width of the table" (attributive adjective).

15. Always use degree sign with N, S, E, W: 24°N not 24N.

16. Write out N, S, E, and W when used alone (N-S, E-W okay). Okay to use NNW, etc. (don't change to N-NW; see the dictionary), e.g., air masses from the east, SE, and NW; also N20°E okay.

17. "Not only" must be followed by "but [also]" (the "also" is optional):

Correct: The day is not only long but also very hot.

Incorrect: The day is not only long, but also it is very hot.

Note that the "but also" may be interrupted. Use comma only if independent clause. Be sure "also," if used, is placed correctly, i.e., parallel construction.

18. Use "between..and": between 5 and 10 days but not between 5-10 days.

Use "from...to": from 5 to 10 days, not from 5-10 days.

19. "Respectively" (surrounded by commas) should be as close to the end of the statement as possible:

H and *D* are the height and depth, respectively, of the trench.

Not

H and *D*, respectively, are the height and depth of the trench.

20. Further versus farther: Use farther when indicating a physical direction or movement:

The point is farther from *x* than it is from *y*.

Use further otherwise:

Further research should explain this discrepancy.

21. Don't use contractions.

22. Use of "a" versus "an" before abbreviations: follow usage before an abbreviation that would take an "an" if pronounced as the abbreviation, e.g., FFT, but would take an "a" if full form used, e.g., fast.

23. Use "of the order of" for mathematical usages indicating. e.g., order, rank, category. Use "on the order of" only to mean "approximately" or "similar to."

24. Change firstly, secondly, thirdly, etc. to first, second, third, etc.

8. Word List

The following is a list of words commonly occurring in AGU papers and their treatment (hyphenation, spelling, capitalization, etc.) according to AGU style. This is meant as a quick reference (versus researching meaning and consulting dictionaries, atlases, source books, etc.). Note that (n, adj) should be assumed if not otherwise indicated. If (adj) given, assume open as noun and verb.

aboveground (adj)	best fit (adj)	computer programing
above mentioned	best-case (adj)	convection-diffusion (n)
acoustic-gravity wave	bio-optical	convective-dispersive (adj)
advection-dispersion (n)	blackbody	core hole
advective-dipersive (adj)	blowup (n) blow up (v)	cosmic ray
airborne (adj)	body wave	cost-effective (adj)
air fall	borehole	cost-effectiveness (n)
airflow	bottom hole (n)	counterexample
airglow	bottomhole (adj)	counterstreaming
air gun	bottomset	country rock
air mass	bottom water	coworker
airstream	boundary element (adj)	creepmeter
all-sky (adj)	boundary layer	crisscross (n, adj, v)
alongshore (adj)	bow shock	cross-correlated
along track (n) along-track (adj)	breakout (n, adj), break out (v)	cross correlation (n)
a priori	breakpoint	cross-correlation (adj)
arc length	breakup (n, adj) break up (v)	crosscut (n, adj, v)
ashfall	bright-field (adj)	cross-fold
ash flow	broadband (frequency)(adj)	crossover
aspect angle	broadleaf	crossplot
atomic nitrogen	buildup (n, adj) build up (v)	cross section (n),
atomic oxygen	bull's-eye	cross-section (adj, v)
back arc (n), back-arc (adj)	burnout (n) burn out (v)	cross-sectional (adj)
backprojection (time)	burn-out (adj)	cross track (n) cross-track (adj)
back projection (space)	bypass (n, adj, v)	cutbank
backscatter (n)	by-product	cutoff (n, adj) cut off (v)
backshore	calc-alkaline (adj)	dark field (n), darkfield (adj)
back slip	caprock	dashpot
back thrust (n)	centerline	database
back thrusting (adj)	centroid depth	data logger
back trail (n, adj) backtrail (v)	centroid moment	data pool
back trajectory	check shot	data processing
band-pass (adj), band pass (n)	chi-square (not "squared")	data set
bandwidth	claystone	datasonde
bankfull (adj)	clear-cut (n, adj, v)	date line vs. dateline (n, ✓
base flow	clear-sky (adj)	meaning), dateline (v)
baseline	close-up	day-to-day (adj)
beam width	cloud base	dead end (n) dead-end (adj)
bed form	cloud top	deacrate (v)
bed load	cold-core (adj)	de-air (adj)
belowground (adj)	(also warm-core)	décollement
bench mark vs. benchmark	colocate vs. collocate	deep sea (n) deep-sea (adj)
(see the dictionary)	(follow au)	deep water (n), deepwater vs.

deep water (adj)(✓ meaning)	fiber-optic (adj)	gyro- (closeup, prefix)
Digisonde (instrument, cap)	field of view (n)	gyrofrequency
dipmeter	(follow au as adj)	gyroperiod
dip slip (n) dip-slip (adj)	fine structure (adj)	gyroradius
Doppler radar	finite difference	half-cell
double couple (n)	finite element	half-length
double-couple (adj)	fission track	half-life
downdip	flare-up	half plane
downgoing (adj)	floodplain	half-space
downhole	flowchart	halfway (adj, adv)
downleg	flow field	half width (n) half-width (adj)
downrange	flow line	H alpha, use H α
downscale	flowmeter	hanging wall
downslope	flow path	headcut
downwelling	flow rate	head-on (adj, adv)
drawdown (n, adj),	fluxgate	headwall
draw down (v)	flyby	headwater
drill hole	foot points	head wave
dropoff (n, adj), drop off (v)	footwall	heat flow
dropout	fore arc (n), fore-arc (adj)	heavy-duty
dropsonde, dropwinsonde	foredeep	hillslope
dry land (n, adj) dry-land (adj)	foreset	highstand
or dryland (adj) (see Web)	free air (n) free-air (adj)	hot spot
earth-atmosphere (adj)	free fall (n) free-fall (adj, v)	hourglass
easting (see Web 10)	freezeup	ice core
echolocation	<i>F</i> region	ice raft (n, adj), ice-raft (v)
echo sounder	frequency domain	ice sheet
electric field	freshwater (adj) (also as	ice stream
e-mail	noun meaning lake)	in-between (n, adj)
end-member	<i>F</i> test	in between (adv, prep)
end point vs. endpoint	γ ray (gamma ray)	in-depth (adj)
(see Web 10)	gasdynamics	infill (v)
en echelon (adj, adv)(not	Geodimeter (trademark)	in-flight
italic)	(hyphenate as Geo-dim-eter)	inflow
equal-area (adj)	Geodolite (trademark)	in-house
exceedance (n)	goodness of fit (n)	in-phase (adj) (inphase, adj,
falloff (n) fall off (v)	gradient drift	electrical only)
far-field (adj)	gravel bed	in-place (adj)
far-reaching (adj)	gravity-capillary wave	inshore
farside	gray body	in situ (not italic)
(however, ✓ meaning)	gray scale	intermediate-depth (adj)
fast spreading (adj)	great circle	intra-aggregate
fault plane	grid point	Invar (trademark)
fault slip	groundmass	ion cyclotron
fault trench	ground track	island arc
fault zone	groundwater	jet stream
fiber optic (n),	ground wave	Kapton (protected

trademark)	melt-rock (adj)	payback (n, adj) pay back (v)
<i>k</i> -means (always hyphenated, always plural)	meltwater	peatland
knickpoint	midlatitude	pickup (n, adj), pick up (v)
kriging	mid-ocean	piecewise
lab frame	midpoint	piggyback
lag gravel	molecular nitrogen	pileup
landfill	molecular oxygen	pitch angle
landform	monthlong	pitch-up
landmass	moveout (n, adj), move out (v)	plane-parallel
land use (adj)	mudflow	plane wave
latewood	mudstone	planform
leapfrog (n, adj, v)	multi-instrument	plan view
least cost	narrow band (n)	plasmopause
least squares (not "square")	narrowband (adj)	plasma sheet
left-lateral (adj)	near-field (adj)	plasmosphere
light-duty	nearshore	playback (n, adj) play back (v)
linear programing	nearside	Plexiglas (trademark)
line of sight (n) (follow au for adj)	needleleaf	pore fluid
line source	the Net	pore pressure
log conductivity	Netherlands (no "The" per research 1/26/93)	pore size
log likelihood	nighttime	pore water
log linear	non-ice (adj)	power law
log-log	nonsteady state	present-day (adj)
lognormal	northing (see Web 10)	pull-apart
log-periodic (antenna)(adj)	nowcast	pulse width
log transmissivity	nowcasting (v)	<i>P</i> wave
long-lived	null-space	quasiperiodic
longwave/long wave (n) longwave/long-wave (adj) (follow au)	oceangoing	quick flow
loss cone	Octol (trademark)	quiet time
low-pass (adj)	off-line (adj, adv)	radio astronomy
lowstand	offshore	radio decay
lunisolar	onboard (adj)	radio echo
magnetic field	on board (otherwise)	radiolocation
main shock	online	radio physics
main stem	ongoing	radio source
mainstream	O-ring	radio wave
makeup (n, adj) make up (v)	output	rainband
man-made	outward-bound (adj)	raindrop
mass balance	ovendry (adj) oven-dry (v)	rainfall-runoff
mass transfer	ozonesonde	rain flag
Matlav (trademark)	paddy land	rain forest
mean square	passband	rain gauge
	pastureland	rain splash
	path length	rainwater
	pathline	rare earth
	path loss	raypath
		readout (n, adj) read out (v)

real time (n) real-time (adj)	setup (n) set up (v)	stair-step (adj)
real-world (adj)	shallow mixing layer	standoff (n, adj)
red beds	shear hole	stand off (v)
reefal (adj) (don't use reef)	shear wave	standpipe
resource management	ship track	state of the art (n)
rest frame	short-lived	(follow au for adj)
ridgetop	short-period (adj)	state space (adj)
right-hand (adj)	shortwave/short wave (n) &	steady state
right-lateral (adj)	shortwave/short-wave (adj)	stemflow
ring beam	(follow au)	step-by-step (adj)
ring current	shot point	step over
ring width	shut-in (n, adj) shut in (v)	stepwise
risetime	sidearm (except guns)	stick slip (n) stick-slip (adj)
river flow	sideband	stillstand (n, adj, v)
rock burst	sidelobe	stockwork
rocket-borne	side-looking (adj)	stormflow
rocketsonde	side scan	storm time
rockfall	side-scan sonar	storm water
rock mass	side scatter	straight line (n)
rock salt	sidewall	straight-line (adj)
roll-off	signal-to-noise ratio	strainmeter
rollover (n, adj) roll over (v)	siltstone	strain rate
room temperature	sine taper	strandline
Rossby-gravity wave	sky wave	stream bank
round off (v)	slack water (n)	streambed
runoff (n, adj), run off (v)	slack-water (adj, v)	streamflow
runout (n, adj), run out (v)	slipstream	stream function
runup	slope wash	streamline (n, adj, v)
saltwater (adj) salt water (n)	slow spreading (adj)	stream sediment
sandbar	snow cover	stream water
sandblow	snowline	strike slip (n)
sandshale (adj)	snowmelt	strike-slip (adj)
sandstone	snowpack	strong motion
saw cut	so-called (adj)	Sun photometer
sawtooth, sawtoothed (adj)	soft water	sunspot
scale length	solar-terrestrial (adj)	surface water
scatterplot	solar wind	<i>S</i> wave
SeaBeam	solid-state (adj)	tailrace
seabed	source time	tailwater
seafloor	spaceborne (adj)	takeoff (n, adj) take off (v)
sea level	spacecraft (sing, pl)	terrain vs. terrane (see AGI
SeaMARC I and II	spatiotemporal (adj)	Glossary of Geology)
seamounts	spillover	test ban
sea salt (n) sea-salt (adj)	spin-up	test bed
seawater	sporadic <i>E</i>	thermite (generic)
seismic reflection	stage-by-stage (adj)	thermomechanical (adj)
semi-infinite	stage-discharge (adj)	

thin sheet	vice versa	X-ray
throughfall	volcanos (or volcanoes)	x, y, z (axis coordinates)
throughflow	wall rock	yearlong (adj)
throughgoing	wastewater	year-round (adj)
tie line (or tie-line for phone lines)	water mass	zeros or zeroes (spelling)
tiltmeter	water rights	
time-consuming (adj)	watershed	
time delay	water table	
time domain	wave band	
time-lapse photography	wavefield	
time period	waveform	
timescale (historic, geologic, cosmic)/time scale (otherwise)	wavefront	
time series	wave function	
time step	wave group	
topset	waveguide	
topsoil	wavelength	
Tovex	wave mode	
trace element	wave number	
track line	wave packet	
trade-off (n, adj)	wave path	
trade off (v)	wave power	
trade winds	waveshape	
traveltime (geologic)	wave speed	
travel time (otherwise)	wave train	
tree line	wave vector	
tree ring	weighted-residual	
trimline	well-being	
t test	wellbore	
turnoff (n) turn off (v)	wellhead	
turn-on (n) turn on (v)	wellhole (n) well-hole (adj)	
tweeks (JGR-A)	well-known (adj)	
Umkehr (return reversal effect)	well known (otherwise)	
under way (adv)	well water	
underway (adj)	whistler mode	
un-ionized	whole rock (n), whole-rock (adj)	
upcrossing	wide-angle	
updip	wideband (adj)	
upgoing	wide-ranging	
upleg	wind-borne (adj)	
upscale (n, adj, v)	wind field	
up-to-date	wind forcing (adj)	
V notch	wind speed	
velocity-depth (adj)	wind stress	
velocity space	wind-wave tank (only)	
	wireline	
	World Wide Web (the Web)	
	worst-case (adj)	