STYLE MANUAL

FOR WRITING IN GEOLOGY

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December 1984
Latest Revision March 1996, 2006

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We do much of our thinking with words, and if I have trouble understanding what a geologist writes, I wonder whether he or she THINKS clearly and logically. That is, if he writes badly, does he think badly? Of course it may not matter; I know geologists who are good scientists but poor writers --- but the bad cancels the good. Clumsy wording can mean you won't get the job, the company won't drill the well, or your boss will delay your promotion.

Wendell Cochran
Geological editor, former editor of Geotimes
and Earth Science,
and coauthor of Geowriting and Into Print

INTRODUCTION

Geology cannot be used if it cannot be understood. In addition to being good scientists, geologists have a responsibility to present information clearly and concisely. Whether the information is in a field-trip report, master's thesis, or a paper for publication, the object is the same: to communicate information. Only the type of information and its complexity vary. Clear writing is important not only for academic papers, but also in professional settings. Many employers stress communications skills when considering potential employees. A recent newsletter of the southern California chapter of the Association of Engineering Geologists included a list of job openings - and all the available jobs required "demonstrated writing and oral communications skills." Writing ability is not only a useful talent; it is becoming necessary in finding and keeping a job.

No writing guide can answer all the questions about how to write a paper. This manual is intended to add to other, more general, information and to help organize and present scientific material according to generally accepted practice. The guidelines are not iron-clad rules; logic and consistency will indicate where and when exceptions should be made. Not all this information may be relevant to a particular assignment. For example, a term paper is unlikely to need a discussion of "research methods." This manual does not address the general problem of clear writing either. Two of the best references for this are the classic book by Strunk and White (The Elements of Style) and one by Zinsser (On Writing Well). The reference list at the end of this manual gives full citations for these books and some other worthwhile sources.

The catalyst for compiling this manual was a similar booklet by Daniel F. Merriam of Wichita State University. William Wadsworth of Whittier College contributed to various drafts of this manual, and useful feedback came from students in Whittier College's Geology Department, their January Field Geology course, and the Geological Sciences Department of the California State Polytechnic University, Pomona. The content of the manual has profited greatly from a short course on "Geowriting for Results," sponsored by the Geological Society of America, in November 1979. Conversations with and advice from other members of the 1980-83 Geotimes Advisory Committee and the 1986-1987 Publications Advisory Committee of the American Geological Institute have also been helpful. Any comments, corrections, or suggestions for this manual are welcome.

ORGANIZATION

Style and Mechanics

Most organizations (universities, businesses, and publications) have adopted a uniform style. For a paper to be accepted by the organization, it must be presented in their style. (If you don't believe this, try getting a master's thesis past a graduate school review board sometime.) To follow a particular style, you must be aware of the elements of a style, such as the organization of the report, the use of headings, and proper referencing and citation. The main reason you should follow this style manual is to make you sensitive to these elements of form. The style presented here is almost exactly the same as that used by most major American geological publications, so following it is also good practice. Remember, however that style is just that--style. No single style is absolutely correct. You must adapt your writing to the requirements of the organization or publication that will receive it.

In addition, to a specific style of presentation, certain mechanical aspects of written work are also commonly specified. These mechanical considerations include such things as the size of type (either 10 or 12 characters per inch), the width of the margins, and the proper place for page numbers. For papers written for geology courses, the following "mechanics" should be observed.

Final manuscripts must in black ink on standard white 8.5 x 11 inch bond paper.

Computer-printed manuscripts have become the standard and are capable of producing far better quality print than an office typewriter. However, you should avoid the temptation to use all the tricks available in word processors. A formal manuscript should use a standard type face, preferably 12-point Times, Geneva, or Courier font. If the printer you use has more than one printing mode, always use the one that produces the "best" quality printing.

Everything, including the abstract, references, and figure captions, should be double spaced. Except for the title page, all pages of the manuscript must be numbered. Use only 1 side of the paper, and leave 1-inch margins at the top, bottom, and on both sides of the page. Avoid all gimmicks, including italic or script type styles and colored paper or ink. Making a photocopy for yourself is an excellent idea, but be sure to hand in the original.

Outline

Having an outline is important to clear writing. If you do not have a clear idea of the organization of your paper, you are likely to create a muddled mixture of data, inferences, and conclusions. An outline can help you keep your thoughts straight and your writing succinct.

Begin with a general outline and then expand it into a complete one. Some geological editors believe you must have all the work done and conclusions drawn before you can even begin to think about writing, but most people continue to organize their thoughts as they write. Thinking about the report you expect to produce cannot begin too early. Whatever order you follow in completing your research and organizing your report, you will probably find that your outline follows the general format shown below.

Title
Abstract (sometimes omitted in library-research papers)
Introduction
Body of the paper
    Heading
        Subhead 1
        Subhead 2
    Heading B

Summary or Conclusions
Acknowledgments (if appropriate)
References cited
Appendix (if necessary)

You should clearly distinguish between observations (evidence) and interpretations (deductions and inferences from the data). The difference between these is considered further under the section on "Body of the Text."

Title and Abstract

The part of your paper that the most people will read is the title. It should be both interesting and informative; its purpose is to catch the attention of readers and tell them what the paper is about. Commercial indexing and bibliographic services rely on "key" words in titles, and so you should compose your title with that in mind. Be as brief and descriptive as possible. Try to avoid using colons. They are becoming an academic affectation, and some journals, notably the Journal of Geological Education, are unwilling to accept a manuscript whose title includes a colon.

After the title, the abstract is the next most important part of a paper. For every person who reads an entire published paper, between 10 and 500 people are likely to read the abstract. If you are writing an abstract for a talk you plan to give at a professional meeting the quality of the abstract will influence whether the paper is chosen for presentation - and whether anyone will come to hear you talk if it is selected.

An abstract should tell briefly what the paper is about: why it is important, what the data are, and what the conclusions are. Except in rare circumstances, never cite a reference in an abstract. Be as concise as possible; for most papers, 250 words should be a maximum length.

You should beware of passive verbs in all writing, but especially in abstracts. They weaken the sentences and are usually less informative than active verb forms. Consider these two examples:

> *Passive*: Further limitations on this statistical analysis are seen by examining the fossil records of the Pleistocene mammals of Europe.

> *Active*: Fossil records of the Pleistocene mammals reveal further limits on this statistical analysis. (Note that this results in a net savings of 6 words in just one sentence, too. When your abstract must fit within a defined space, saving a few words may be essential.)

Body of the text

The main body of a paper should include an introduction, a complete statement of the problem and hypotheses, an explanation of the methods used (if the paper involves any data collection beyond library research), the data, and an interpretation and discussion of the results.

The introduction should establish the context for the paper: when, where, how, and why the work was done. Historical perspective (previous work) should be given here, unless it is sufficiently important to deserve a section of its own. The subject of the study should be stated clearly. Is it a literature review? A discussion of one theory about a geologic problem? A report of experimental results or preliminary mapping? Your readers deserve to know what the paper is about.

Observations should be carefully separated from interpretations in any paper. Testing each statement as you write it can help you avoid mixing the two. As you write each sentence, ask "Is this a measurement or observation (fact), or have I inferred this from the data (interpretation)?" The difference may only be in how you arrange your sentence. For example:

> *Observation*: The frequency of bankfull stage on Buffalo Creek is 2.3 times per year.

Interpretation: Buffalo Creek is likely to overflow its banks in the next few years.

The structure of the text should reflect its organization. The best way to do this is by using headings of different weights, showing the importance of the section. A standard format is shown below. A first-order heading would indicate the most important groups, including the abstract, introduction, main points in the body, summary, and references. Note that this manual follows the same system for headings.

FIRST-ORDER HEADING - CENTERED, ALL CAPITALS

Second order - Centered, upper & lower case

Third-order headings - left side of page, upper and lower case, underlined

Fourth order heading. Beginning of paragraph

Summary or Conclusions

A summary is a condensed version of the paper, usually with more detail than an abstract. Reports that involve compiling information from a variety of sources, but with little or no collection of new data, usually end with a summary.

Conclusions reemphasize the results of the paper, and they are most often used when original research is involved or the paper deals with a critical analysis of several theories or groups of data. Conclusions are sometimes numbered in a list or within a paragraph.

A summary is not the same as a conclusion, and you should consider your purpose when you are writing your paper. If you want to review the entire paper, use a summary. If you want to emphasize your results, write a conclusion.

After the title and abstract, your conclusions are the most important part of your paper. A good practice is to try writing your conclusions before any other part of the paper. If you cannot do it, you may not have a clear enough idea of what you want to say.

Acknowledgments

People who have contributed directly to the paper--or the work it discusses--should be acknowledged briefly. This includes people who supplied their data for your use, suggested ideas, helped with field or lab work, read or typed the manuscript, or supplied equipment or financial assistance. Generally, this section is only needed in research papers; reports based on library research seldom require acknowledgments.

Writing acknowledgments may seem awkward at first, but it is a professional courtesy; a formal acknowledgment is sometimes required with research funded by a government agency or a scholarship. It is not professional to acknowledge your dog, even if he did help with the field work. Acknowledging your parents is acceptable, if they helped in the field or provided assistance beyond the normal call of duty.

If your paper is controversial, be sure to show your paper and acknowledgments to everyone you mention, especially if you are submitting it for publication. Some uncomfortable situations have developed when acknowledgments in a paper have implied the approval of the people mentioned. Some authors avoid such misunderstandings by adding a statement saying, "The conclusions expressed here are entirely my own."

Acknowledgments often provide the only personal touch in a scientific paper. They can range from terse to exhaustive to humorous, as illustrated by these examples:

This research was funded in part by NASA grant NSG-7568.

Example from Kochel and Baker (1982, p. 361):

> We thank H. Mills, R.J. Everett, G.C. Marshall, C. Hunt, T.M. White, T. Hayre, J. Martin, H. Hunt, L. Billings, Jr., J. Skiles, M. Rose, W. King, D. Rowland, W.J. Thompson, A.O. Baker, T.J. Jarrett, D. Duncan, F. Ingram, and the E. Hinojosa family for hospitality and access to land along the Pecos and Devils rivers. P.C. Patton and B.L. Kochel assisted in the field work. D.S. Dibble and P.C. Patton provided discussions and data for the Arenosa Shelter. S. Valastro, Jr., offered advice on interpreting radiocarbon dates. We are grateful to P.E. Smith for the loan of a field vehicle and to B.L., D.E., and the late R.I. Kochel for assistance. L.R. Beard, P.C. Patton, A.J. Scott, and E.L. Lundelius provided useful reviews of this manuscript. This work was supported by grant EAR 77-23025 from the National Science Foundation Support for manuscript preparation was provided by the Geology Foundation, University of Texas at Austin.

Example from Blatt and Brown (1974, p. 261):

> During the course of this work we benefited greatly from the comments of our colleagues in the School of Geology and Geophysics of the University of Oklahoma. The insights they provided sustained us through the hours of tedium during data collection and analysis. They gave new meaning to the concept of a community of scholars.
>
> This research was not supported by grants from either the National Science Foundation, National Aeronautics and Space Administration, or Petroleum Research Fund of The American Chemical Society. We do wish, however, to acknowledge the important contribution to our research made by the Cleveland County Health Department.

Documentation

References

References are cited in the text of the paper by the author's last name(s) and the publication date, and then the complete reference is listed at the end of the paper. Any fact, figure, or idea that cannot be considered "obviously common knowledge" should have a citation

showing the source of information. Thus, in a report on the geomorphology of Swedish Lapland, you would need to cite the source of your information on the Arvidsjaur granite as an important type of bedrock in the region; you would not need to indicate the source of information on the fact that the Arctic Circle begins at a latitude of 66˚ 30' north latitude.

Where a reference is cited in the text of a paper, it should be enclosed in parentheses. The examples given below are from Rhodes (1977). Note the two different formats depending on whether the author's name is part of the sentence.

> At-a-station hydraulic geometry describes the manner in which the channel characteristics of width, depth, and velocity adjust to changes in discharge (Leopold and Maddock, 1953).

> Lewis (1966) showed that hydraulic geometry relationships obtained for intermediate to high discharges . . .

References to sources with 3 authors should include all names (e.g., Leopold, Wolman, and Miller, 1964), but those with 4 or more authors can be referred to in the text more briefly (for example, Smith et al., 1982). All the authors should be listed in the reference list at the end of the paper.

Before submitting a paper, always double-check that (1) all sources cited in the text are included in your "References Cited" list and (2) every entry in your citation list is mentioned in the body of the paper. Do not list publications you consulted but did not cite in your paper.

Quotations

Direct quotes should be used sparingly, and only when the original version expresses the idea so much more clearly than you could ever hope to, that it is impossible to paraphrase without loosing information. Your paper will usually be much stronger if you restate what you have read in your own words. If you find an important passage that you simply can't improve, or if you need to show exactly what someone else has stated, then use and acknowledge the quote. NEVER use another author's words without giving full credit. Plagiarism is a serious offense, academically, morally, and legally. One rule of thumb is that if you are using more than 5 consecutive words from another author, put them between quotation marks.

Despite what you may have learned in other disciplines, footnotes are almost never used in scientific papers. They interrupt the flow of the writing (and reading) and should be avoided. Show the source of your information by the methods described above.

If you do use a direct quotation, cite it parenthetically, with author, date, and exact page(s) on which the quote occurred. For example:

> The evolution of our geologic understanding of the San Andreas fault has been "highlighted by a few revelations which resulted in conceptual revolutions" (Hill, 1981, p. 127).

If you omit part of the material you are quoting, use ellipses (". . .") for the omitted words. A quote that is longer than 5 or 6 lines should be indented as a block, with no quotation marks, and the reference should be given before the body of the quotation, as in this example from Hill (1981, p. 127).

> This history of understanding of the San Andreas fault is highlighted by a few revelations which resulted in conceptual revolutions. Obviously, the first revelation was the 320-km zone of ground rupture accompanying the 1906 San Francisco earthquake; this led to the recognition of strike-slip faulting and the elastic-rebound theory of earthquakes. Noble's (1926) suggestion of 38 km of right-slip constituted a new interpretation, partially aborted, that was reintroduced and augmented by Hill and Dibblee (1953). Finally, plate tectonics and Wilson's (1965) introduction of the transform fault gave the first, although partial, explanation for strike-slip displacements of hundreds of miles.

References Cited

At the end of the paper, all the references cited in the paper (including text, tables, and figure captions) should appear in one list, titled "References Cited." They should be arranged alphabetically by the author's last name; if an author has more than one publication, the sources should be further organized by year, from oldest to most recent. For a journal or magazine article, the complete reference should include the author(s)' name, date of publication, title, journal name (spelled out - no abbreviations) with volume (and number, if needed), and pages (starting and ending pages of article). For a book, the reference should include the author(s), date, title, location of publisher, name of the publisher, and number of pages. If you only used part of the book, then list those pages instead. References to published maps follow the form given above but also include the map scale (e.g. Diblee, 1973). If you are writing for publication, you should follow that journal's format for references. The Geological Society of American/U.S. Geological Survey style is commonly accepted. The references at the end of this manual follow that style; refer to these for specific examples of how to list the references.

Never cite a reference that you have not looked at yourself; it is lazy and you cannot trust other authors to have understood the original reference. If you absolutely must use a reference that you cannot locate, then show the source that you used. For example, if writing about the interpretation of the San Andreas fault as a transform fault, you could show your source of information as Wilson (1965, in Hill, 1981, p. 127). Do not cite Wilson (1965) directly if you did not look read the original paper.

Occasionally, you may want to include other sources of information on a subject which you did not cite in the text of a paper. This can be done by adding a list of "Other References," following and separate from the "References Cited." Generally, this will only be useful when you are writing the definitive work on a topic and want to show other major references; do not be tempted to list uncited books and articles just to expand your references. There should be a reason every reference is listed.

An annotated bibliography includes, besides the standard citation, a few sentences about the source material. Annotations may mention important data, unusual or innovative methods, unique illustrations, pertinent results, or whether the references are particularly useful. This type of reference can be extremely helpful while you are doing research, writing a paper, or preparing a seminar presentation, but they are seldom included in manuscripts for publication.

Appendices

Any supporting material that you want to include with your paper but which does not fit into the text should go into an appendix (note that two of them are appendices). Long tables of untreated data belong in an appendix, as do lengthy calculations. The appendix can be cited in the body of the paper, and it should follow the references.

Figures and Tables

A picture may be worth a thousand words, but a poorly executed one may only be a waste of space. Only use illustrations that add to the text. Figures increase the work involved in manuscript preparation, and if the paper is published, illustrations can increase printing costs dramatically.

Illustrations come in three forms. Figures are either black-and-white photographs or line drawings, including graphs, maps, and charts. Figures should be freshly drafted for the paper, never photocopied from another publication. Tables are columns of numbers or other information that take the place of text. Plates are either photographs or drawings that are so large they must be put into a pocket at the back of the paper.

As with information used anywhere in the paper, the sources of information should be shown clearly in the figures and tables (unless you collected the data yourself). This includes figures you have almost copied from other papers; at the very least, you should acknowledge this, "(Redrawn from Rhodes, 1977)." This simple acknowledgment is usually acceptable for a paper written for a course. For publication, you must show that you have received written permission to use any copied or redrafted figures.

Illustrations are referred to in the order in which they are mentioned in the text. For example, Figure 1 comes before Figure 2, Table 1 comes before Table 2, and Plate 1 comes before Plate 2. [The same rules are true for equations, if you are including them in your paper.] If any of the illustrations have several parts, they should be labelled 1a, 1b, and so on. The references to illustrations mentioned in the text should be spelled out, but they are abbreviated if they are cited in parentheses. The example shown below is from Wadsworth (1975, p. 272); this passage appears near the end of the paper, and therefore, both figures referenced here have already been introduced in their proper numerical order in the paper.

> Figure 1 can be reoriented to show the geologic features in their prefaulting attitudes, and Figure 11 has been prepared to aid this procedure. Restoration requires that the map (Fig. 11) be tilted toward the observer . . . .

Figures and plates should have captions that explain them, including explanations (not legends) for symbols and unusual abbreviations. Maps should include a north arrow, scale (metric), contour interval (if appropriate), and latitude and longitude. An index map of the locations should also be included, if needed.

Limit the illustrations to one per page. Figures and plates have captions below them (or on the preceding page); titles for tables go at the top of the table. Concentrate on a few good illustrations, instead of graphs and tables showing large quantities of data. For a lengthy paper, a list of figures, tables, and plates should follow the table of contents, as an aid to the reader.

HELPFUL HINTS

"English is the most valuable tool we have. Use it with precision."
Dr. Sigfried Muessig, Getty Minerals

Capitalization

All proper names are capitalized, including geographic names:

Puente Hills
Mount St. Helens
Trinity Alps
San Joaquin Valley
Coast Ranges

Structural names are capitalized, as illustrated below:

San Andreas fault
Newport-Inglewood zone of deformation

Stratigraphic names:

Upper Cretaceous Series
Late Cretaceous Epoch
Artists Drive Formation
Eureka Valley Tuff

Check Lists

A check list is an excellent means of assuring that everything required in a writing assignment is included and is prepared in the required form. Do not think that formal check lists are used only in academic assignments. The National Science Foundation (NSF), for example, includes a long and detailed check list in its grant-application instructions. In a sense, the various "Instructions to Authors" used by many publications are check lists of what to include in a manuscript and how to prepare it. Preparing a check list for any formal written work is an excellent idea, because it will help you avoid oversights that may cause the manuscript to be returned to you. Appendix 1 is a general check list used by the Whittier College geology department for the preparation of all written work. It may serve as a model for how to prepare your own check lists.

Directions

North, south, east, west, and northwest are all directions and treated as nouns. Northeastern, southwestern, and southern are all adjectives. None of them is capitalized, unless they are the first word in a sentence.

Trends of lines can be described with only one direction; north-south and east-west are redundant. For example:

a south-trending fracture trace
beds dipping to the northwest
the southern California climate

Geologic Time

Time-stratigraphic and rock-stratigraphic units are distinctly different. Note the correlations - and differences - in the table below:

TIME	TIME-ROCK
Era	---
Period	System
Epoch	Series
Age	Stage
---	Zone

Beware of having "late" rocks or "upper" time. Keep your rock units and their ages separate (see Cluff, 1961). For a detailed explanation of proper usage, consult the "North American Stratigraphic Code" (The North American Commission on Stratigraphic Nomenclature, 1961).

Hyphens

Compound adjectives are hyphenated; for example, you could describe an iron-bearing member or coarse-grained sandstone. Placement of the hyphen can change the meaning of sentence completely: would you rather carry 10 gallon jugs or 10-gallon jugs? Only compound adjectives that come before a noun have hyphens; note the use of the hyphen in these two examples:

> The coarse-grained sandstone was deposited.
> The sandstone is well sorted.

Adverbs modifying adjectives, including most words that end in -ly are not hyphenated. Thus, the phrases "poorly sorted sandstone" or "steeply plunging anticline" have no hyphens.

Italics

Because most typewriters and many computer printers do not have *italic characters*, words that would appear in *italics* in type-set print are underlined. Italics are commonly used for titles of completed creative works, including books (Principles of Geology), magazines (Geotimes), and newspapers (Los Angeles Times). Note, however that the titles of unpublished manuscripts are given in quotation marks ("Student Writing Style Manual"). Words from other languages that are not incorporated into English are also italicized. The names of individual vessels, including aircraft, spacecraft, and ships, appear in italics (Glomar Challenger). The formal names of genera, species, and subspecies are given italics (Bulimina elongata subulata). Family and higher order biologic names are rendered in standard type (Phylum Brachiopoda).

Numbers

A number should always be given in numeric form, unless it is the first word in a sentence (and even then it should not be a measurement or a number larger than 20). Reorganizing a sentence will usually avoid the problem of beginning with a number. Units are abbreviated with no periods, according to international agreement (see section on "Units of Measurement" for further information here).

2 sec	8.9 m/sec	2.1415 m	76.98 m^2
65.5 km	354 kg	42.3 g	2.65 g/cm^3
98 cm/sec	32 lb	16 ft	3 x 10^8 ergs

Generally, any number larger than 1,000 can be given in scientific notation, but beware of the problems associated with this if you are using a word processor. Many computers and printers are unable to cope with exponential notation.

Plurals

Use the singular as much as possible. When in doubt about the plural form of a word, check the dictionary. Common usage can be misleading, so look it up for yourself. For example, Sierra Nevada is already a plural; don't do like most newscasters and reporters and refer to the "Sierras." English incorporates many words that come from other languages. These borrowed words, especially technical, geological terms, often have unusual plural forms. Note the few examples listed below:

SINGULAR	PLURAL
colloquium	colloquia
criterion	criteria
datum	data
formula	formulae
phenomenon	phenomena
palsa	palsen
pingo	pingos
symposium	symposia
tsunami	tsunami

One place where it is worthwhile to use plurals is with personal pronouns. Instead of using "he or she," using "they" is a great deal simpler.

Units of Measurement

Use metric units for all measurements. Metric units may feel awkward and unfamiliar, but their use conforms to international standards. If you are quoting data from an older publication (before the use of metric units became common), you should give the data in their original units and then give the metric equivalent. For example, you would write "Smith and Jones (1895) found this unit to be 10 ft (3 m) thick." When converting from English to metric units, pay attention to significant figures. For example, convert 3 ft to 1 m, not 0.9144 m.

Unnecessary words

Eliminating unnecessary words can sharpen your writing. An effective way to improve your writing is to avoid beginning a sentence with "It is . . ." or any similar weak construction such as "Some were . . ." or "They are . . ." Sometimes the decision is a judgement call between conciseness and active versus passive voice. Note the two versions below:

> It is possible to improve almost any sentence beginning with "It is . . ." by rewording it.

> Almost any sentence beginning with "It is . . ." can be improved by rewording.

Other words that take more space than they deserve include:

along these lines (omit)
and/or (a legal term; use "and," "or," or "or both" to convey your precise meaning)
as follows (omit)
due to the fact that (= because)
hopefully (see separate section in "Word usage")
in the case of (if)
it is interesting to note that (omit)
located or situated at (at)
needless to say (omit)
of distinctive character (distinctive)
on the order of (about or approximately)
thing (be specific)
were engaged in the study of (studied)
whether or not (whether)

These words can usually be deleted to improve a sentence:

certainly
merely

quite
rather
simply
undoubtedly
unquestionably
very

Word Usage

Many pairs of words differ only in a shade of meaning, and that slight variation can change the entire meaning of a sentence. Your time and effort will be well spent choosing the right word. Some often-confused words are listed in this section. You will probably want to add some of your own candidates to this list.

AERIAL vs. AREAL - Aerial photographs are taken from airplanes; areal refers to surface area (as in a square meter).

AFFECT vs. EFFECT - The moon affects (verb, meaning influences) the Earth by producing an important effect (noun, meaning result): tides.

AMONG vs. BETWEEN - You divide something between two people, but among three or more.

AS and BECAUSE vs. SINCE - As refers to a similar or relative characteristic shared by several things; because gives a direct reason; since only refers to time.

COMPARE vs. CONTRAST - Two items are compared with each other when their similarities are pointed out. They are contrasted when their differences are stressed.

COMPOSE vs. COMPRISE - This granite comprises (includes) feldspar, but quartz, feldspar, and biotite compose (make up) the rock.

FARTHER vs. FURTHER - Farther refers to distance. Further is abstract and cannot be measured. Example: We will need to hike farther today if we are going to pursue our theory any further.

FORWARD vs. FOREWORD - Forward is a direction you can move in; a foreword is an introductory comment, usually at the beginning of a book.

GEOLOGIC vs. GEOLOGICAL - Geologic refers to a natural feature or phenomenon; geological refers to something made by man. Thus, you can have a geological map depicting geologic features.

HARD vs. DIFFICULT - Hardness can be measured on Moh's scale, but if you can't do it easily, then it's difficult.

HOPEFULLY - Do not confuse with "I hope." Properly speaking, it means that some action is being done with hope. Saying "Hopefully, we will be finished mapping soon," is wrong (unless

you have great expectations of the mapping process). One of the few ways in which the word is used correctly is saying, "Hopefully, she opened the fat envelope from the college of her choice (or the Irish Sweepstakes or her long-lost uncle)."

IMPLY vs. INFER - Do you mean to imply (suggest) that you can infer (conclude or deduce) the origin of ophiolites?

IT'S vs. ITS - It's incredible that so many people still don't know the difference between it's, the contraction for "it is" and its, a possessive pronoun meaning "belonging to."

LIE vs. LAY - During the spring floods, the river will lay (actively deposit) new sediments on the flood plain, but right now the older materials just lie (passively rest) there.

PRESENTLY vs. CURRENTLY - Presently usually means "in the near future." Currently means now. They should not be used interchangeably.

PRINCIPAL vs. PRINCIPLE - The principal (main or primary) concept to remember is the principle (law or generalization) of cross-cutting relationships.

STILL vs. YET - Still is quiet. Yet refers to time. Example: Is the water still yet?

SURFICIAL vs. SUPERFICIAL - Surficial features occur on the Earth's surface; superficial features are trivial.

UNIQUE vs. VERY (OR QUITE) UNIQUE - Something either is or is not unique. No modifiers apply.

VARY vs. RANGE - A rock can range in color from white to black, but it can only vary (change) if it's a chameleon (or pleochroic). Range implies a continuum of values. Your data may range, but they should not vary.

WHICH vs. THAT - That begins a restrictive clause; which is nonrestrictive and refers to a less important trait. Thus, "the sediment that fills the basin" means that specific sediment. "The sediment, which fills the basin," suggests that some other aspect of the sediment is a more important characteristic. The most useful test for the which/that question is to see if the sentence means the same thing without the phrase. If so, use a "which." If the phrase needs to be there, use "that."

REFERENCES CITED IN QUOTED EXAMPLES

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Appendix 1

SAMPLE CHECK LIST OF DEADLY ERRORS

_____ Is the paper typed double spaced on bond (not “erasable”) paper?

_____ Does the report have a cover page with:

____ title

____ author’s name and address

____ date

_____ Are the pages numbered?

_____ Is the paper organized by headings and subheadings as specified in this manual?

_____ Are all the measurements in metric units and properly abbreviated, as specified in this manual?

_____ Are all the references cited and listed in the style described in the reference section of the manual?

_____ Are all the pages in correct order and paper-clipped together? Do not submit report in any type of binder or cover.

IF ANY OF THESE THINGS ARE NOT DONE OR ARE DONE INCORRECTLY, THE PAPER WILL BE RETURNED IMMEDIATELY. PENALTIES FOR LATENESS WILL ACCUMULATE UNTIL THE PAPER IS SUBMITTED IN THE PROPER FORM.

Appendix 2

TECHNICAL WRITING RULES

All technical writers in this department will use the following rules when preparing their documents.

1. Each pronoun must agree with their antecedent.
2. Just between you and I, case is important.
3. Verbs has to agree with their subjects.
4. Watch out for irregular verbs which have crept into our language.
5. Don't use no double negatives.
6. A writer mustn't shift your point of view.
7. When dangling, don't use participles.
8. Join clauses good, like a conjunction should.
9. Don't write a run-on sentence you have to punctuate it.
10. About sentence fragments.
11. In letters reports articles and other writing we use commas to separate items.
12. Don't use commas, which aren't necessary.
13. Use the apostrophe in it's proper place and omit it when its not needed.
14. Don't abbrev
15. Check to see if you any words out.
16. As far as incomplete constructions, they are wrong.
17. Never use a preposition to end a sentence with.
18. It is important to never under any circumstances split an infinitive.
19. Last but not least, avoid cliches like the plague.
20. Don't use a foreign term when there is an adequate English quid pro quo.
21. If you must use a foreign term, it is *de rigor* to spell it correctly.
22. It behooves the writer to avoid archaic expressions.
23. Do not use hyperbole; not one writer in a million can use it effectively.
24. Mixed metaphors are a pain in the ass and ought to be thrown out the window.
25. Placing a comma between subject and predicate, isn't correct.
26. Parenthetical words however should be enclosed in commas.
27. Consult the dictionary frequently to avoid mispelling.
28. Don't use tautological, repetitive, or redundant statements.
29. Puns are for children--not for readers who are groan.
30. The passive voice should not be used.
31. Hopefully, you will use words correctly irregardless of how others use them.
32. Never use a long word when a diminutive one will do.
33. Avoid colloquial stuff.
34. Remember to finish what you