

## WRITING IN THE GEOLOGICAL SCIENCES

*A guide for Geology students in writing papers in for courses in the department*

### INTRODUCTION

The Geology Department uses a specific format for instruction in writing assignments in geology courses. Our guidelines are based on accepted practices and formats used in the *Bulletin of the Geological Society of America*. Specific and accepted formats for abstracts, internal reference citations, and bibliography/reference lists, are each specified in the appendices to this document. Geology faculty normally adhere to these guidelines in typical written assignments in their courses.

Outlined below is a list of guidelines used for writing papers in the Geology Department at SUNY Cortland. The Geology Faculty have adopted these guidelines in an effort to standardize our writing expectations of geology students and to provide assistance in the preparation of research papers. Therefore, the guidelines below are to be used for any paper submitted as part of coursework in the Geology Department at Cortland.

### FINDING INFORMATION

#### **Sources of information.**

The Geology Department has placed restrictions on the type of information that is acceptable to cite in a written assignment. For example, acceptable information sources would be: 1) peer-reviewed journal articles, 2) advanced peer-reviewed textbooks, other peer-reviewed books and monographs, and 3) government web sites or web sites containing peer-reviewed sources. Unacceptable information sources would include: 1) introductory textbooks, 2) magazines or other non-peer reviewed periodicals (e.g., *National Geographic*, *Discover*, *Scientific American*), and 2) non-peer reviewed web sites. Instructors may apply additional restrictions on the types of sources that are acceptable. Acceptable published sources will available in either printed form (physical book, issue of a journal, article reprint) or as a digital copy of the printed source – usually as a pdf file. If you have any question or doubt as to if a particular source does not fulfill the restrictions above, please consult your instructor.

## Locating and obtaining acceptable sources

While it may be helpful to browse issues of journals and books on the library stacks, you will be much more effective to use the literature search engines available online through Cortland's Memorial Library and other online search engines such as Google (especially Google Scholar at scholar.google.com). For access to the library databases off campus you will need to log-in to MyRedDragon with your Cortland Net-ID. There are several types of databases and search engines available through the library, but I would recommend using, at least at first, **GeoRef**. You may have to try using different keywords with the Boolean operators AND and OR, etc... (e.g., Darwin AND Worms) to get desired results. In the results from your searches you will see the full citation and whether Cortland's library has a printed copy (or a link to full-text – as a pdf). There are also full text databases that can return the articles as a pdf to your computer—many full text papers on can be obtained using the other library databases including **GeoScienceWorld**, **ScienceDirect** and **BioOne**. You can access these databases directly through the College's website or follow the link from GeoRef. Lastly, if the article you have identified is not available in the library or as a full text, you are given the ability to request it through the interlibrary loan service (ILL). ILL is a great thing – providing either free paper copies or free pdf of the article, but it sometimes takes up to 1 or 2 weeks.

## CONVEYING INFORMATION

### Citing sources and paraphrasing

In writing anything, it is important to recognize where ideas came from and to give credit where credit is due. Incorporating the text or ideas of someone else into your work without providing explicit credit is a form of plagiarism. Plagiarism is theft; it is a violation of professional ethics; it is a violation of SUNY Cortland's Code of Conduct. In addition, recognizing the source ideas and information of others works through paraphrasing and proper citation also

- shows that you have a clear understanding of the material you've read.
- refers to your sources to support the ideas you have developed.
- distinguishes your analysis of what you've read from the authors' analyses.

When you cite a source, you are using an expert's ideas as proof or evidence of a new idea that you are trying to communicate to the reader.

### What to cite?

- Direct quotes, both entire sentences and phrases
- Paraphrases (rephrased or summarized material)
- Use of an author's argument or line of thinking or ideas
- Historical, statistical, or scientific facts or data
- Graphs, drawings, or other such aggregations of information or data
- Articles or studies you refer to within your text

You do not need to cite things that are **common knowledge**. Common knowledge refers to information that the average, educated reader would accept as reliable without having to look it up.

As a general rule, student papers are **NOT** to directly quote passages, phrases, or sentences from other's written works. You will need to paraphrase the information.

In conveying previous knowledge will need to *paraphrase* the ideas or concepts, conclusions from peer-reviewed written sources provided that 1) the original concept/idea/data/conclusions are carefully reworded and text leaves no doubt that it is *your* written work and not copied from the original sources, **and** 2) that the concept/idea/data/conclusions are given proper credit through citation. You can paraphrase by significantly changing the structure of the text and the words used. For example, you might also break up long sentences, combine short ones, expand phrases for clarity, or shorten them for conciseness, or you might do this in an additional step. In this process, you'll naturally eliminate some words and change others. Remember, even if you paraphrase someone else's ideas, concepts, or conclusions, you still need to give credit to the original author through citation – otherwise it's plagiarism.

### **What constitutes plagiarism?**

In addition to the obvious forms of plagiarism such as submitting a paper written by someone else as your own or by copying sentences or passages from any source, (e.g., book or an article, webpage) without citing the source, most acts of plagiarism result because students do not know about the concept of plagiarism, so they plagiarize unintentionally. Here are some further examples of plagiarism:

- Paraphrasing (i.e. rephrasing people's ideas) using your own words without acknowledging the source.
- Paraphrasing and acknowledging the source, but copying whole phrases and changing a few words
- Copying something word for word (i.e. a quotation) from a source without using quotation marks
- When someone else's ideas are used, always acknowledge the sources and tell your reader where the ideas are from

### **Examples of proper citations within the text of a paper:**

The following examples are provided to help you prepare your paper according to required conventions in the geological sciences. Note that citations within the text of a paper consist of **only** the last name(s) and date of publication. The *References Cited* section provides a full listing of source material and is alphabetized according to the first author's last name.

Use the last name(s) of the author(s) and the year of publication when citing in the text of a paper. If citing an article or book which has two authors, use the last names of both in the order they appear. For more than two authors, use "et al." after the last name of the first author. For in-

text citation, do not use authors first name or initial – only the last name(s) and year. Do NOT cite a page number unless you are taking a direct quote from the author(s). Some examples are listed below:

According to McIntyre (1970), there is a relationship.....

New data (Thompson, 1990) on the relationship between .....

Earlier reports of climatic cooling (Jones and Wigley, 1990) demonstrate.....

Shallow sea sediments provide a good sink for carbon (Post, et al., 1972).

Notice that the in-text citations are applied in a couple of different ways. In the first example given above, if you mention the author or authors of a paper directly in the sentence, the year of the article within parentheses are written immediately following the author(s) last names. In the second example, the article, the citation consisting of the author and year of publication, is within parentheses and is referring to the “new data”. The third example is that like the second except that the publication being cited has two co-authors., the last example is citing a publication which has more than two co-authors.

### **Listing references in a *References Cited* section at the end of the paper.**

Most student research papers in the Geology Department will require the last section of the written paper to be a Reference Cited list. This is a listing, written out in full, of all of the sources that were referred to in the main body of the student’s written paper. The references list is different than a bibliography (which includes sources not directly cited in the text).

There must be a one-to-one correspondence between in-text citations and those listed in the References Cited section. Please know there are a number of variations in proper citation depending on the journal, but the Geology Department at Cortland has adopted those of the *Bulletin of the Geological Society of America*, which is similar to, but not identical to, APA style. This format may be different then you have used in other courses or in high school.

Your reference list will summarize all the sources of information used to write your paper. Those sources may be varied and usually include: abstracts, journal articles, book articles, books, maps, guidebooks, etc. Each of these requires a slightly different format for citation. Use the examples below pages (taken from the *Bulletin of the Geological Society of America*) to help you properly cite the source. All references, regardless of format, must be listed alphabetically using the last name of the first (or only) author.

### **Examples of how references should be listed in the *References Cited* section**

Note, although the list below, is organized into publication types, your reference list should only include the citation listed in **alphabetical order with respect to the last name of author(s)** without reference to publication type. There should be a one-to-one correspondence between

references cited in the main text and those in the *References Cited* section. When in doubt, please see a recent issue of the *Geological Society of America Bulletin* for examples or ask your instructor. **Please note that the title of the article and the name of the journal in which the article appears must be spelled out in full and with complete volume and page numbers.**

*Examples of journal article format*

- Abbott, D. H., and Isley, A. E., 2002, Extraterrestrial influences on mantle plume activity: Earth and Planetary Science Letters, v. 205, p. 53-62.
- Bartley, J. K., and Kah, L. C., 2004, Marine carbon reservoir,  $C_{org}$ - $C_{carb}$  coupling, and the evolution of the Proterozoic carbon cycle: *Geology*, v. 32, no. 2, p. 129-132.
- Hamilton, W. B., 1988, Plate tectonics and island arcs: *Geological Society of America Bulletin*, v. 100, p. 1503-1527.
- Lowenstein, T. K., Timofeeff, M. N., Kovalevych, V. M., and Horita, J., 2005, The major-ion composition of Permian seawater: *Geochimica et Cosmochimica Acta*, v. 69, no. 7, p. 1701-1719.
- Martin, G. C., 1926, The Mesozoic stratigraphy of Alaska: U.S. Geological Survey Bulletin, v. 776, p. 1-493.

*Examples of books and monographs format*

- Cubitt, J. M., and Reyment, R. A., 1982, *Quantitative Stratigraphic Correlation*: New York, John Wiley & Sons, 301 p.
- Erwin, D. H., 1993, *The Great Paleozoic Crisis*: New York, Columbia University Press, 327 p.

*Examples for book sections or chapters*

- Brooks, H. C., and Vallier, T. L., 1978, Mesozoic rocks and tectonic evolution of eastern Oregon and western Idaho, *in* Howell, D., and McDougall, K., eds., *Mesozoic Paleogeography of the Western United States, Pacific Coast Paleogeography Symposium 2*: Los Angeles, Pacific Section, Society of Economic Paleontologists and Mineralogists, p. 133-145.
- Vail, P.R., Audemard, F., Bowman, S.A., Eisner, P.N., and Perez-Cruz, C., 1991, The stratigraphic signatures of tectonics, eustasy and sedimentology-An overview, *in* Einsele, G., et al., eds., *Cycles and Events in Stratigraphy*: Berlin, Springer-Verlag, p. 617-659.

*Examples for field guides*

- Blackstone, D.L., Jr., 1990, Rocky Mountain foreland exemplified by the Owl Creek Mountains, Bridger Range and Casper Arch, central Wyoming, *in* Specht, R., ed., *Wyoming Geological Association, 41<sup>st</sup> Annual Field Conference, Guidebook*, p. 151-166.
- Brett, C. E., Goodman, W. M., Loduca, S. T., and Tetreault, D., 2000, Silurian-Early Devonian sequence stratigraphy, events, and paleoenvironments of western New York and Ontario,

Canada, in McKinney, D.B., ed., New York State Geological Association, 71<sup>st</sup> Annual Meeting, Guidebook, v. 71, p. B1-B58.

### *Examples for published abstracts*

Housen, B. A., 2007, Paleomagnetic constraints on paleogeographic reconstructions of Cordilleran terranes: Geological Society of America, Abstracts with Programs, v. 39, no. 4, p. C19.

Sammis, C.G., 1993, Relating fault stability to fault zone structure: Geological Society of America Abstracts with Programs, v. 25, no. 6, p. A115-A116.

## **WRITING AN ABSTRACT**

The abstract is usually the **FIRST** thing listed after the title of your paper, but it should be the **LAST** thing you write. An abstract is short summary of the *main points* of the completed written paper you just wrote. It is not a statement of what is to follow; that belongs in the *Introduction*. Abstracts should express your thesis (or central idea), the methods, and your key findings; it should also suggest any implications or applications of the research you discuss in the paper. Under most circumstances, abstracts do not contain citations to other works. To get the abstract right, you need to have an idea that is worth shareable and then clearly describe:

- The problem statement
- Why it's important to be probed?
- What was done to understand it? and
- What was found as a result?

Abstract don'ts:

- Do not commence the abstract with "this paper...", "this report..." or similar. It is better to write about the research than about the paper.
- Do not explain the sections or parts of the paper.
- Avoid sentences that end in "...is described", "...is reported", "...is analyzed" or similar.
- Do not repeat or rephrase the title.
- Do not refer in the abstract to information that is not in the document.

A short paper describing effective abstract writing is appended at the end of this handout. Please note that guidelines for submitting abstracts for professional conferences may be different than those normally used for papers. Please consult your instructor for further instruction on preparing your abstract.

## GEOLOGICAL NOTES

### A SCRUTINY OF THE ABSTRACT, II<sup>1</sup>

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#### ABSTRACT

A partial biography of the writer is given. The inadequate abstract is discussed. What should be covered by an abstract is considered. The importance of the abstract is described. Dictionary definitions of "abstract" are quoted. At the conclusion a revised abstract is presented.

For many years I have been annoyed by the inadequate abstract. This became acute while I was serving a term as editor of the *Bulletin* of The American Association of Petroleum Geologists. In addition to returning manuscripts to authors for rewriting of abstracts, I also took 30 minutes in which to lower my ire by writing, "A Scrutiny of the Abstract."<sup>1</sup> This little squib has had a fantastic distribution. If only one of my scientific outpourings would do as well! Now the editorial board of the Association has requested a revision. This is it.

The inadequate abstract is illustrated at the top of the page. The passive voice is positively screaming at the reader! It is an outline, with each item in the outline expanded into a sentence. The reader is told what the paper is about, but not what it contributes. Such abstracts are merely overgrown titles. They are produced by writers who are either (1) beginners, (2) lazy, or (3) have not written the paper yet.

To many writers the preparation of an abstract is an unwanted chore required at the last minute by an editor or insisted upon even before the paper has been written by a deadline-bedeveled program chairman. However, in terms of market reached, the abstract is *the most important part of the paper*. For every individual who reads or

listens to your entire paper, from 10 to 500 will read the abstract.

If you are presenting a paper before a learned society, the abstract alone may appear in a pre-convention issue of the society journal as well as in the convention program; it may also be run by trade journals. The abstract which accompanies a published paper will most certainly reappear in abstract journals in various languages, and perhaps in company internal circulars as well. It is much better to please than to antagonize this great audience. Papers written for oral presentation should be *completed prior to the deadline for the abstract*, so that the abstract can be prepared from the written paper and not from raw ideas gestating in the writer's mind.

My dictionary describes an abstract as "a summary of a statement, document, speech, etc. . . ." and that which *concentrates in itself the essential information* of a paper or article. The definition I prefer has been set in italics. May all writers learn the art (it is not easy) of preparing an abstract containing the *essential information* in their compositions. With this goal in mind, I append an abstract that should be an improvement over the one appearing at the beginning of this discussion.

#### ABSTRACT

The abstract is of utmost importance, for it is read by 10 to 500 times more people than hear or read the entire article. It should not be a mere recital of the subjects covered. Expressions such as "is discussed" and "is described" should *never* be included! The abstract should be a condensation and concentration of the *essential information* in the paper.

<sup>1</sup> Revised from K. K. Landes' "A Scrutiny of the Abstract," first published in the *Bulletin* in 1951 (*Bulletin*, v. 35, no. 7, p. 1660). Manuscript received, June 3, 1966; accepted, June 10, 1966.

Editor's note: this abstract is published together with The Royal Society's "Guide for Preparation

and Publication of Abstracts" to give *Bulletin* authors two viewpoints on the writing of abstracts.

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