

Writing in the Geological Sciences

Rationale and Background: Writing is considered the single most important skill our students master in the course of their preparation as geoscientists and teachers. Through experiences gained during the required composition courses as part of the core curriculum, and in other courses in the General Education program at SUNY Cortland, Geology Majors gain the rudimentary skills required for advanced writing assignments in their science major courses, for independent study, internships and student teaching. Many courses in the department require a combination of research papers, literature reviews, position papers, laboratory write-ups, short essays and full research project reports, all designed with “real-life” experiences in mind, which students require for employment and graduate school opportunities upon graduation. Indeed, the 2002 Geology Department Assessment results revealed that our “practicing” alumni rated “writing skills” as the highest priority for graduates of the program. Toward the goal of giving each of our students experience and opportunity to learn the diverse writing skills needed by geoscience professionals, the combination of core requirements, general education, and departmental offerings insure adequately preparation of each candidate in the department through writing experiences and assessed writing skills. Of the nine key assessment instruments used in the Geology Department Assessment Program, six directly involved faculty evaluation of student performance in writing projects.

Guidelines: 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 that document. Geology faculty normally adhere to these guidelines in typical written assignments in their courses.

Writing Intensive (WI) Courses: The Geology Department offers three courses which have been accepted as meeting the requirements of the College Writing Committee, and are designated “Writing Intensive” (WI). These courses are *GLY 301 (Petrology)*, *GLY 367 (Geomorphology)* and *GLY/ENS 310 (Wetlands Analysis)*. *GLY 367* requires each student to research, collect data and write an extensive “Field Project Report” as a major component of the final course grade. This assignment comes in three sections which build upon the quality of the previous section, culminating in a final field project report which has been extensively reviewed, critiqued and evaluated by the instructor and student together. *GLY/ENS 310 (Wetlands Analysis)* requires each student to produce a semester culminating “Consultant’s Report” designed as the professional report of an outside consultant based on a field project as part of the laboratory section of the course. This project consists of semester-long data collection, synthesis, literature review and a final presentation. Each of these experiences requires substantial rewriting and evaluation in stages to insure a finished product worthy of a graduate in the field. Students are guaranteed to have at least one WI course in the department since all major programs in Geology (*GLY*, *GLY/ENVS*, *GLY/WRES*, *AES*) require the *GLY 367* course.

Guidelines

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.

1) 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, and 3) government web sites or web sites containing peer-reviewed sources. Unacceptable information sources would include: 1) introductory textbooks, and 2) non-peer reviewed web sites.

2) Referencing the work of others.

When 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 a plagiarism.

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.

3) Examples of citation within the text of a paper:

Use the last name(s) of the author(s) and the year of publication when citing in the text of a paper. For more than two authors, use "et al." after the last name of the first author. 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).

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

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*.

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 attached 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.

5) 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 paper you just wrote. It is not a statement of what is to follow; that belongs in the *Introduction*.

Some short discussions of abstract writing are attached 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.

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.

Journal Articles

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.

Books

Cubitt, J. M., and Reymont, R. A., 1982, *Quantitative Stratigraphic Correlation*: New York, John Wiley & Sons, p. 301.

Erwin, D. H., 1993, *The Great Paleozoic Crisis*: New York, Columbia University Press, 327 p.

Book Sections (or chapters)

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.

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 sedimentation and tectonics: Casper, Wyoming Geological Association, 41st 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: New York state Geological Association, 71st Annual Meeting, Guidebook, v. 71, p. B1-B58.

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.

GEOLOGICAL NOTES

A SCRUTINY OF THE ABSTRACT, II¹

KENNETH K. LANDES²
Ann Arbor, Michigan

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."¹ 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.

¹ 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.

² Professor of geology and mineralogy, University of Michigan. Past editor of the *Bulletin*.