Stable Isotopes in the Environment
GEOL 426/526, Spring 2010
Paper Guidelines and Grading Rubric

Paper and Presentation: You will write a research paper (~ 4,000 – 5,000 words [double spaced], plus figures; the paper will be formatted according to the *Geochimica et Cosmochimica Acta* [GCA] style) on an isotope system of your choice that is relevant to environmental studies. Paper topics must be discussed and approved by the instructor. An outline of your paper will be required. In addition, you will give a conference-style talk (10 minute presentation; 2-3 minutes for questions) in class. The final exam will be based on these talks. So, in short, your classmates are counting on you to do a good job!

Details: In your paper, you should investigate an isotope system in detail that complements our discussion in class. You will need to highlight the nature of the problem and describe what you are trying to learn. In other words, what scientific question or problem are you going to address? Here are two examples that might be helpful: "How can the stable isotopic composition of bison teeth help constrain past ranges and migration patterns of bison?" or "How can deuterium excess values be used to track storm events in the upper Midwest?" The questions are meant to drive the "background" and significance of the research (i.e., the Introduction section of a journal). Describe how your chosen isotopic system will help address your major research question. You will then need to describe the methods of preparation and the analytical methods used to measure the selected isotope system. You will need to describe and summarize the evidence (data) available in peer-reviewed studies related to your research problem. Your paper should follow the typical style of journal articles (e.g., Introduction, Methods, Results, Discussion, Conclusion). Because you are not presenting new data, this is not always easy, so use the above format as a rough guide. Summarizing previously accomplished work is a bit more like a "review" article. If this format is better for you and your topic, that is fine. A major goal of this paper is for you to communicate your understanding of a "new" isotopic system and its utility in environmental sciences as effectively as possible.

Outline: You will need to provide an outline (1 page; single spaced; size 12 font) of your paper. The outline should include a title, and an abbreviated introduction section that highlights your research question and the isotopic system of your choice. The purpose of this outline is to get you thinking about your topic, and for me to "guide" you in the right direction.

Important dates:
February 4th, paper topic due.
February 18th, paper outline due.
April 8th, paper due (1st draft).
April 29th, paper due (final draft).

Paper Grading rubric

Background research (development of the nature of the problem; depth of topic understanding displayed in paper)

Few references, poor understanding	1 2 3 4 5 6 7 8 9 10	*Well-referenced, comprehensive understanding*

Description of methodology and analytical techniques (depth of explanation of methods and techniques used to collect and measure selected isotopes)

Incomplete/poor description of methods and techniques	1 2 3 4 5 6 7 8 9 10	*Complete/excellent description of methods and techniques*

Synthesis and interpretation (use of relevant isotope concepts)

Simple description of existing data/ processes	1 2 3 4 5 6 7 8 9 10	*Complex interpretation of existing data/processes*

Technical details (grammar, punctuation, spelling, sentence structure, *GCA* format)

Many mistakes	1 2 3 4 5 6 7 8 9 10	*No mistakes*

Scientific writing style (word use, voice, organization, use of figures)

Vague and difficult	1 2 3 4 5 6 7 8 9 10	*Concise and well-written*