

**GG425 -- ENVIRONMENTAL GEOCHEMISTRY**  
**Spring 2008 Take home final project instructions:**  
*due by 15 Dec (Fri) at 1 PM (i.e., just after the scheduled exam)*  
Please email it to me if you can

Your final project is to write a description and analysis of the environmental geochemistry of one or two contaminants in one or two environments. This should fit into 10 pages or less.

Some general example topics are given below. You can also propose something different if you don't see something you like, but check it out with me first. I would like each person to do a different topic so please let me know what you've chosen by next week (last week of April).

I would like your discussion to include a comparison/contrast of the contaminants and/or their behaviors in the environment(s) in multiple different ways, including biological interactions. You will want to pick specific examples of the contaminant types rather than discuss the entire class of contaminants. Hopefully, this will be fun for you to work on. You can stop by my office and ask questions whenever you like but I would also like to talk with each of during the last week of the semester to make sure things are progressing smoothly and took look over your paper outline. I will try to make a shorter lecture for the last class period to do some of these discussions then. Alternatively you may schedule another time with me at your convenience

### Logistics

- I would like your paper to be quantitative when possible (e.g., make calculations and provide numerical data for things like concentrations, equilibria, and rates of processes) and to use as much geochemical/ geological knowledge as you have at your disposal. If you have to make approximations, explain and justify them.
- it must be *less than* 10 pages long, double-space, and *laser-printed or typed*. Nothing hand written-please (except for any illustrations you may wish to include; these can be computer generated or drawn by hand, as long as they are legible). I am making no minimum length requirement. It is up to you to decide how thorough you do or don't want to be. This project should be a scholarly treatise in which you cover each essential topic in a manner that leaves out no major facts or explanations.
- include references for all of the data cited. There should be at least 3 besides class notes or the text book. Internet citations are acceptable. Provide complete references in a list and cite them in the text in either footnote<sup>1,2</sup>, bracket note [1,2] or abbreviated author (Smith et al., 1995) style.
- provide a summary at the beginning of the paper of 150 or so words that encapsulates your findings.
- be creative. If you have a hypothesis about something, tell it to me, but use all of your collective geochemical and geological knowledge to justify your suggestion.
- include graphical items (figures, plots, etc..) when necessary to illustrate a point but please don't load up your document with unnecessary display items.
- I will only grade on content, but please try to use complete sentences and proper grammar.

### Example Topics

*(many of these topics are current events discussed in the local and national news. You may want to visit some web sites to find recent articles and general info)*

One contaminant in 2 or more environments...

- Acid constituents in the troposphere, in rainwater, and in fresh surface water
- Organic contaminants in groundwater and fresh surface water
- Heavy metal contaminants in groundwater and fresh surface water
- Heavy metal contaminants in seawater and estuarine/marine sediments
- Fertilization of soils/groundwater
- One contaminant in Wastewater discharging into both fresh water and seawater
- Atmospheric and hydrologic effects of deforestation by biomass burning
- Pesticides in the geosphere and biosphere.
- Treatment of polluted input water for urban use (ground or surface) and treatment of output water back into that environment
- Radioactive waste in soils and plants

Two contaminants in 1 or more environments

- Interaction between metals, DOC and particles in rivers and/or wastewater
- Heavy metal and refractory organic contaminants in Wastewater discharge into fresh water or seawater
- Pesticides and nitrate in well water for urban use.
- Bio-accumulation of heavy metals and organic contaminants in marine fish or seabirds