

# ESM 202 Environmental Biogeochemistry

## Assignment #5

Due Tuesday 03/14/2007

(via email to Darcie Goodman)

The National Atmospheric Deposition Program has been tracking the deposition of several important atmospheric pollutants that may have a major impact on water quality. You can view the information from 1994 to 2005 (as equal concentration maps or isopleths) at <http://nadp.sws.uiuc.edu/isopleths/annualmaps.asp>. NADP actually began earlier, but these are the maps that are available electronically. There is more info at <http://nadp.sws.uiuc.edu/>.

It is challenging to compare quantitatively these maps, but you should be able to notice important changes from 1994 to 2005. Consider deposition (kg/ha) of sulfate, nitrate, ammonia and inorganic N in particular.

- What are the major sources for sulfate and the inorganic N species?
- Why is the spatial pattern different for the deposition of these pollutants than the spatial pattern of emissions? How is it related to their emission sources?
- Does this information give you the entire deposition picture? Explain.
- How has deposition changed with time?
- How does the total inorganic N wet deposition rate in 2004 compare with typical N fertilization rates for agriculture, on a kg/ha basis? (You should look around in the Internet for typical fertilizer application rates for corn or other crops in lb/acre and convert to kg/ha).
- Briefly, what are some of the potential effects of the deposition of these compounds?

Prepare a short essay (2-3 pages) based on these questions, 12-point font, reasonable margins and double-spaced. Write it as a short analytical paper on the progress that has been made in reducing atmospheric deposition, with a brief introduction, a presentation of the data, a discussion based on these questions, and a short concluding paragraph. You may consider pollution trading as a factor. Your position on the pollutant-trading issue is not in question; we are more interested in your ability to interpret and analyze the scientific data. You can add one extra double-sided page with graphic/maps that you may want to use for comparison purposes. You probably want to download the maps as GIF files to paste into a document, rather than as a PDF.