**Problem set 6 (Due Thursday, November 13, 2014)**

1. What are the most important structure features of the organic compounds that affect the volatility, water solubility, respectively? What is Henry’s constant and how is Henry’s constant related to vapor pressure and solubility? What are the key factors affecting the affinity of an organic compound to soils? Based on the equations we use to calculate the partition of organic pollutants in air, water and soils, list the key parameters that will favor enhanced partitioning of an organic compound to air, water and soils in an aquifer system.
2. Give at least one example of each of the following compound types – please use ones that are commonly used domestically or industrially if possible: Hydrocarbons; Carboxylic acids; Alcohols; ketones; Aldehydes; Ethers; Esters; Amines; Halides. Draw their structures, provide their names, and explain their uses briefly. For a compound containing four carbon atoms, how would you rank the volatility and water solubility of hydrocarbons, carboxylic acids, alcohols and esters?
3. What is co-metabolism? Explain the potential use of microbial cometabolism to biodegrade PCE and TCE in the groundwater systems.
4. Please make a cursory reading of a recent review article on endocrine disruptors that I placed on Canvas (you do not need to worry about detailed biochemical pathways), and answer the following questions: 1) what are endocrine disruptors? 2) make a short list of things you are in contact with in daily lives that could potential lead you to the ingestion of endocrine disruptors. 3) Pay attention to part 4 of the review article that documents the difficulties in fairly assessing the risks of endocrine disruptors. If you were to design a program to systematically assess the risks of endocrine disruptors, what would you like to do (you may use the ideas from the paper or, best, invent new ideas of your own)?

The CBC documentary I played in class can be found at:

<http://topdocumentaryfilms.com/the-disappearing-male/>

The website for U.S. EPA Endocrine Disruptor Screening Program can be found at:

<http://www.epa.gov/endo/>