CRSS/FANR 3060, Soils and Hydrology

Hydrology Discussion Questions

Chapter 9, Soil Water

1. Soil water comprises a very small fraction of water on earth, so why is it important?
2. What physical properties of soil and water allow soil to serve as important water reservoir? Here's another way to think of this question, if the water molecule weren't polar, and if soil particles didn't have negatively charged surfaces, how would the earth be different?
3. What is meant by soil tension, and why is it basically the same thing as negative pressure head?
4. Why is only the water held between field capacity and wilting point considered to be plant available?
5. From a soil water standpoint, how does managing crops differ in a loamy sand, a loam, and a clay loam?
6. What makes soil water flow from one place to another?
7. What types of energy are considered important in soil water movement? (why are kinetic and thermal energies considered unimportant?).
8. What soil characteristics affect the magnitude of the saturated hydraulic conductivity?

Calculations you must know:

1. How to calculate gravimetric water content.
2. How to convert gravimetric water content to volumetric water content.
3. How to calculate porosity from bulk density and vice versa.
4. How to calculate the depth of plant available water in a soil horizon.
5. How to calculate the total head of soil water.

Chapter 10, Precipitation and Evaporation

1. We all know that the amount of rainfall affects vegetation and agriculture, but how might seasonality affect plant growth?
2. Georgia receives more annual rainfall than Seattle, but it seems drier. Why?
3. Why are the upper Great Plains on the east slope of the Rocky Mountains so dry?
4. What general process are common to the occurrence of precipitation?
5. Why does it matter not only how much rainfall an area receives but what type of rainfall?
6. Why does it seem chillier when you get out of the pool than when you got in?
7. Why is actual evapotranspiration less than or equal to potential evapotranspiration?
8. What is the basic law that is the foundation of basin and field water budgets?

Calculations you must know:

1. Basin water budgets
2. Field water budgets