GLY-4822

Assignment 2

1. The average rainfall of west central Florida is 53 inches a year. Thirty nine inches per year go to evapotranspiration and 9 inches go to runoff. How much goes to ground water?

Note that these 'depth' of precipitation, evaporation, etc., numbers are like the little *q* we discussed in class; when you multiply them by the area they become volume per unit time. So for example, that 1 m annual global average precipitation (i.e., 1 m y^{-1}) equates to 1 cubic meter of water per year on a 1 square meter patch of your backyard: 1 m $y^{-1} \times$ 1 m^2 = 1 m^3 y^{-1}. If all of the water balance components are available on this 'per unit area' basis and all of the areas being considered are the same, the area drops out of the balance. You can simply add and subtract the 'depths'.

2. The per capita water consumption in Florida is 180 gallons per day. The population of the Tampa Bay Metropolitan Statistical Area (MSA) was 2.44 million in 2001. The total area of the MSA is 2538 square miles. Incorporating the data from Problem 1, compute the total ground water recharge and the total demand. Show and keep track of all units. Is the demand less than or greater than the ground water recharge and by how much?

3. Do the following Exercise 1.1 from the textbook "Fundamentals of Ground Water" by Schwartz and Zang, Wiley, 2003:

Ten-year averages (1981-1991) for a groundwater inventory for the San Fernando Basin are as follows: Recharge from precipitation and other sources, 79.3×10^6 m^3 per year, recharge from injection wells, 38×10^6 m^3 per year, groundwater inflow 1.01×10^6 m^3 per year, groundwater pumping 120.55×10^6 m^3 per year, groundwater outflow, 0.521×10^6 m^3 per year, and baseflow to streams, 3.8×10^6 m^3 per year. Calculate groundwater storage change based on the ten-year averages.