

Hydrology Introducing Problems

PROBLEMS

- 1.1 Two cm of runoff result from a storm on a drainage area of 100 km^2 . Convert this amount to cubic meters and acre-feet (1 acre = 43,560 square feet).
- 1.2 Assume you are dealing with a vertical-walled reservoir having a surface area of $500,000 \text{ m}^2$ and that an inflow of $1.0 \text{ m}^3/\text{s}$ occurs. How many hours will it take to raise the reservoir level by 30 cm?
- 1.3 The storage existing in a river reach at a given time is 13 acre-ft, and at the same time, the inflow to the reach is 450 cfs and the outflow is 500 cfs. One hour later, the inflow is 500 cfs and the outflow is 530 cfs. Calculate the change in storage during the hour in cubic meters and acre-feet.
- 1.4 The annual evaporation from a lake is found to be 125 cm. If the lake's surface area is 12 km^2 , what is the daily evaporation rate in centimeters and inches?
- 1.5 If a vertical-walled reservoir having a surface area of 1 mi^2 receives an inflow of 12 cfs, how long will it take to raise the reservoir level by 6 in.?
- 1.6 If the mean annual runoff of a drainage basin of $10,000 \text{ km}^2$ is 140 m^3 , and the average annual precipitation is 105 cm, estimate the ET losses for the area in 1 year. What are your assumptions? How reliable do you think this estimate is?
- 1.7 The evaporation rate from the surface of a 3,650-acre lake is 100 acre-ft/day. Estimate the depth change in the lake in feet during a 1-year period if the net inflow to the lake is 25 cfs. Is the depth increasing or decreasing? What is the change in centimeters?
- 1.8 The storage in a reach of river is $20,000 \text{ m}^3$ at a given time. Determine the storage 1 hr later if the average rates of inflow and outflow during the hour are 20 and $18 \text{ m}^3/\text{s}$, respectively.