

Unit 1 Applications Physical Hydrometeorology

Only solve the problems assigned at your course level.

1. Undergraduate students: Download the topographic map and print it. Find the Goldrun Creek, and manually delineate its watershed above its mouth. Hint: This task works similar to the drawing by numbers except that here you don't look for numbers, but the highest topographic elevation between two adjacent watersheds. The watershed divide line is made up by the highest points everywhere around the river. Determine the highest and lowest elevations in the watershed. You can start at the mouth and find the highest point that divides the creek's watershed from its neighboring watershed. Work your way up to the highest point in the watershed. Then go from the other side of the mouth until your divides close.
2. Graduate students: Download the excel spread sheet. Calculate a duration curve with excel as is explained in the book.
3. All students: The table below gives the drainage area, average precipitation determined from measurements at meteorological stations, and average streamflow measured near the mouths of four large rivers. Assuming no ground-water inputs or outputs, compute the estimated long-term average evapotranspiration, ET, for each watershed. Graduate students only: In addition, calculate the 95% absolute and relative uncertainties in your ET estimates.

Hint: It is easiest to copy the data in an excel spread sheet. Program it for one watershed and then copy paste the formula for the others.

Watershed	Area (km ²)	Average Precipitation (mm/yr)	Relative Error, ϵ_P (%)	Average Streamflow (m ³ /s)	Relative Error, ϵ_Q (%)
Connecticut River	20 370	1 100	10	386	5
Yukon	932 400	570	20	5 100	10
Euphrates	261 100	300	10	911	10
Mekong	663 000	1 460	15	13 200	5