

Hydrological Frequency Analysis Homework 4 Due Dec. 11, 2019

1. Four rainfall stations with the following gamma distributions of the 24-hour annual maximum rainfall (in mm) are located in the same homogeneous region.

	Scale parameter	Shape parameter	Record Length
X_1	460	0.55	28
X_2	400	0.60	42
X_3	380	0.65	34
X_4	420	0.70	52

- (1) For each $X_i (i = 1, 2, 3, 4)$, generate a random sample of the given record length.
- (2) Conduct single-site frequency analysis to estimate 24-hour design rainfalls of the 5, 10, 20, 50, and 100-year return periods for the four stations.
- (3) Conduct a regional frequency analysis to estimate 24-hour design rainfalls of the 5, 10, 20, 50, and 100-year return periods for the four stations.
- (4) Repeat (1) – (3) 10,000 times and conduct a comparative evaluation of the performance of the single-site and regional frequency analyses. [Note: You need to find a measure for performance evaluation of the two approaches.]