

CE 3354 Engineering Hydrology
Exercise Set 7

Exercises

1. Figure 1 The following data represent gage height and annual peak discharge for some gaging station in Oklahoma. The stage is in feet and the discharge is in cubic feet per second. The data are sequential from 1923 through 1971.

Use the data to:

- (a) Plot year versus stage (x-axis is year).
- (b) Plot year versus discharge (x-axis is year).
- (c) Plot the discharge versus stage.
- (d) Using the Weibull plotting position formula, determine the distribution parameters that fit the data for a log-normal distribution.
- (e) Using the Weibull plotting position formula, determine the distribution parameters that fit the data for a Gumbell distribution.
- (f) Using the Weibull plotting position formula, determine the distribution parameters that fit the data for a Gamma distribution.
- (g) Estimate the discharge associated with a 25-percent chance exceedence probability (i.e. the value that is equal to or exceeded with a 1 in 4 chance).
- (h) A resident claims that in the early 1900's a flood corresponding to a stage of 30 feet occurred at the gage location. Estimate the exceedence probability (return period) of the flow associated with this event.

Stage	Discharge	Stage	Discharge
23.0	200,000	18.50	114,000
11.8	42,000	14.93	70,200
6.4	11,300	15.30	70,700
10.4	32,400	17.60	92,800
18.7	108,000	21.45	135,000
15.0	73,000	10.48	25,800
15.3	76,500	8.80	17,500
12.1	47,800	9.07	18,700
9.5	28,200	12.71	36,300
10.6	33,700	14.64	49,200
9.3	25,700	21.41	120,000
6.4	11,700	14.86	56,800
16.0	77,800	14.65	54,800
9.9	26,600	21.62	158,000
13.0	47,500	21.22	165,000
16.44	75,600	17.83	103,000
8.48	19,200	8.76	19,700
10.26	27,800	9.00	21,100
13.59	51,000	22.60	171,000
18.54	94,000	6.74	10,400
18.12	97,200	12.54	42,000
22.82	179,000	14.10	52,800
19.55	124,000	16.42	77,000
19.48	110,000	18.33	101,000
		8.14	17,100

Figure 1: Data from Oklahoma Gaging Station

2. Use the Oklahoma data you just prepared and analyze using the Bulletin 17C procedure (using the HEC-SSP software tool - use station skew option).
3. Locate USGS Station 08144800 Brady Creek near Eden, TX. and analyze the historical peaks using the Bulletin 17C procedures (use the PeakFQ software tool use station skew option). Determine the median discharge predicted for this station by PeakFQ. Also determine the discharge per square mile of contributing drainage area.¹

¹Download the annual peaks from NWIS in the tab-delimited format for use in peakFQ; The example in the instructor notes is this particular site.