

BestFit Exercise Overview

DLS-114, Module 1.6

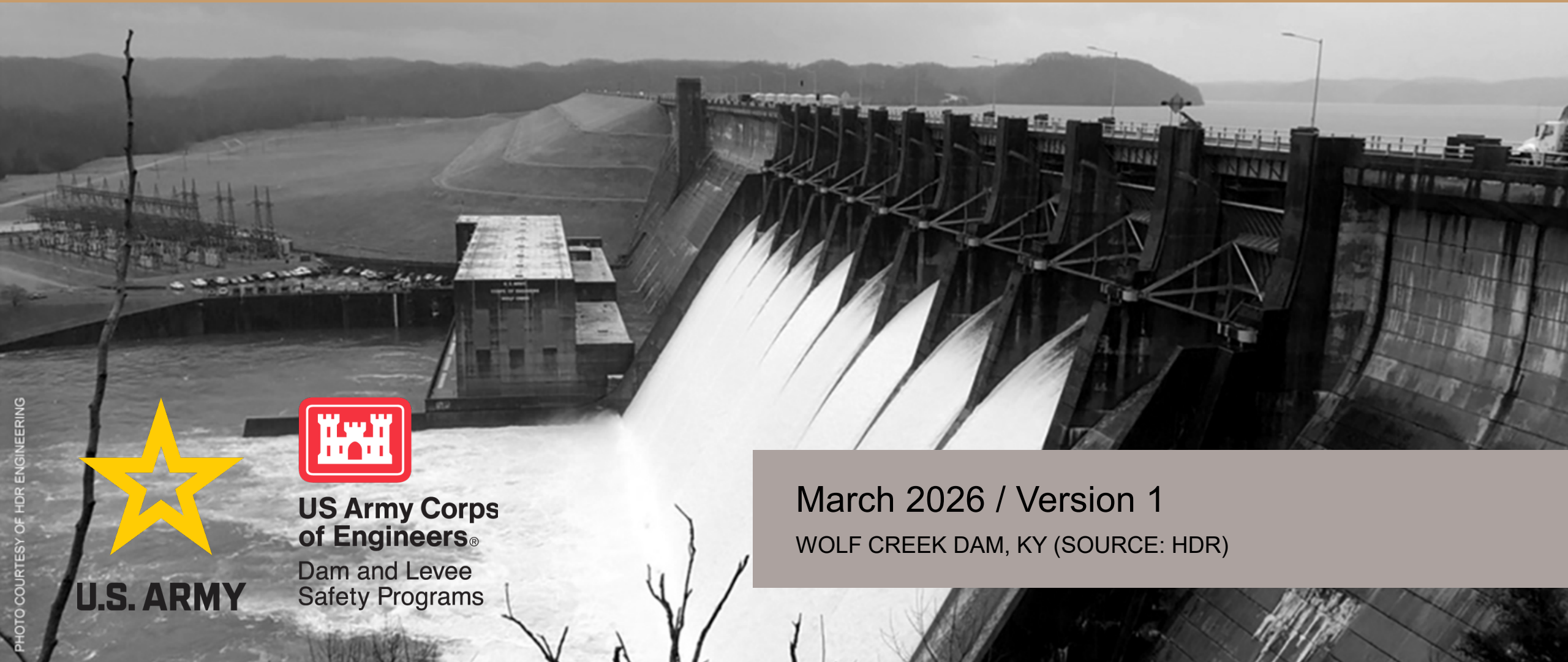


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U.S. ARMY



**US Army Corps
of Engineers®**

Dam and Levee
Safety Programs

March 2026 / Version 1

WOLF CREEK DAM, KY (SOURCE: HDR)

Tasks

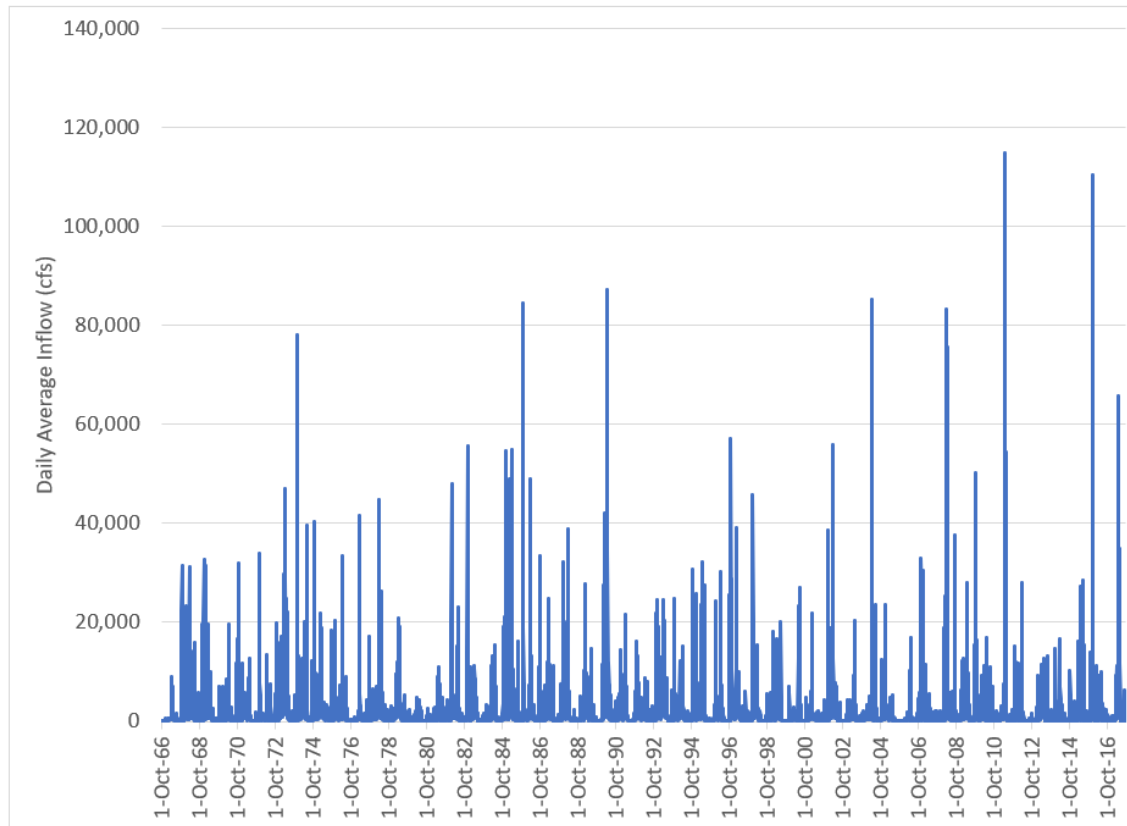
1. Examine the at-site period of record inflow data
2. Estimate the critical inflow volume duration
3. Calculate block annual maximum inflow volumes for the period of record
4. Calculate a flow frequency curve using RMC-BestFit for the period of record

Additional Tasks

5. Extend the period of record using available gage data
6. Calculate a flow frequency curve using RMC-BestFit for the extended period of record
7. Compare the frequency curves

Task 1

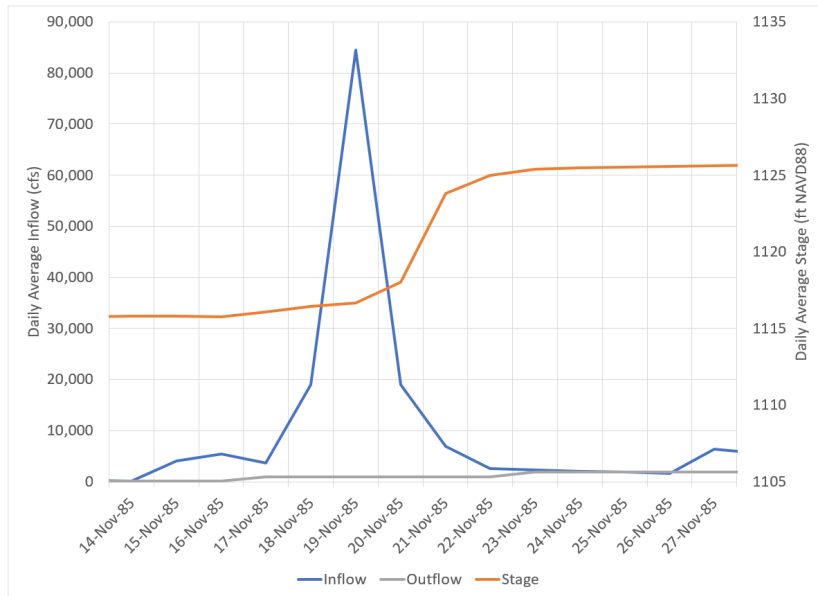
Examine At-site Period of Record Inflow Data



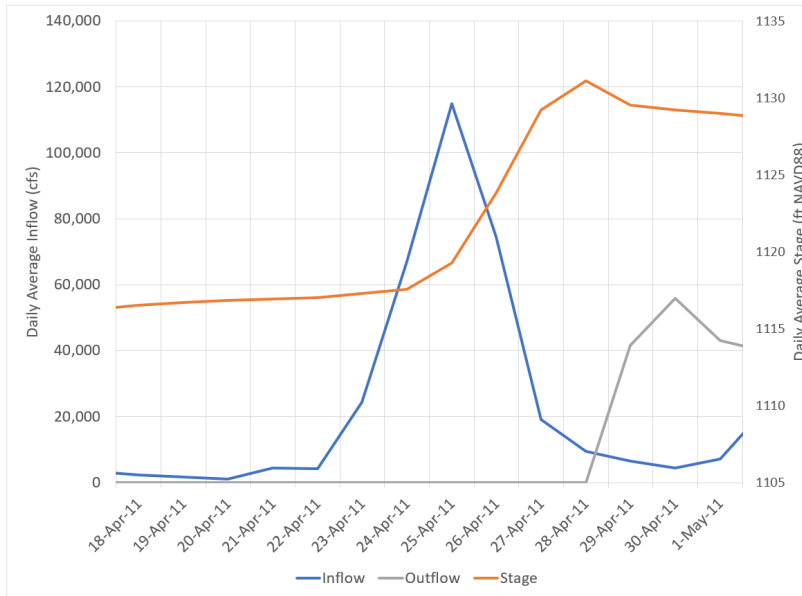
Task 2

Estimate the Critical Inflow Volume Duration

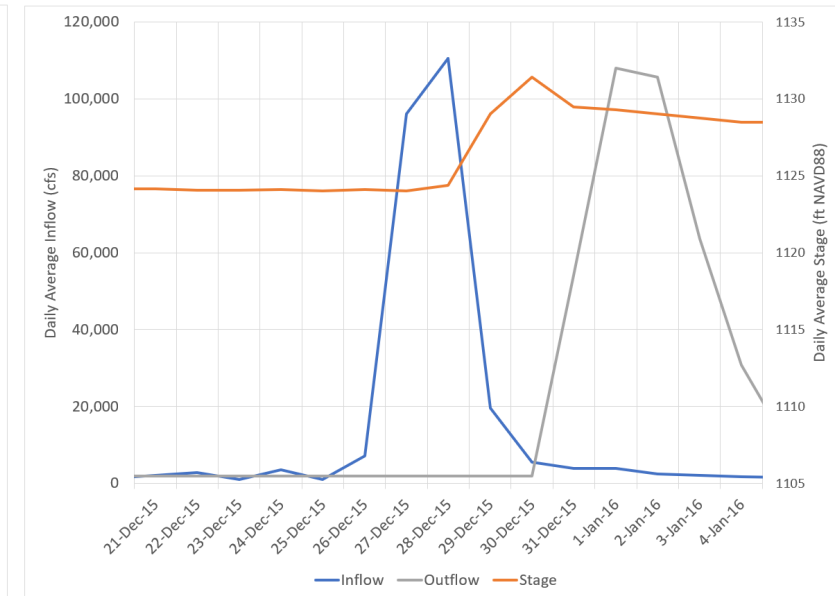
Critical Inflow Volume Duration for Nov 1985:



Critical Inflow Volume Duration for Apr 2011:



Critical Inflow Volume Duration for Dec 2015:



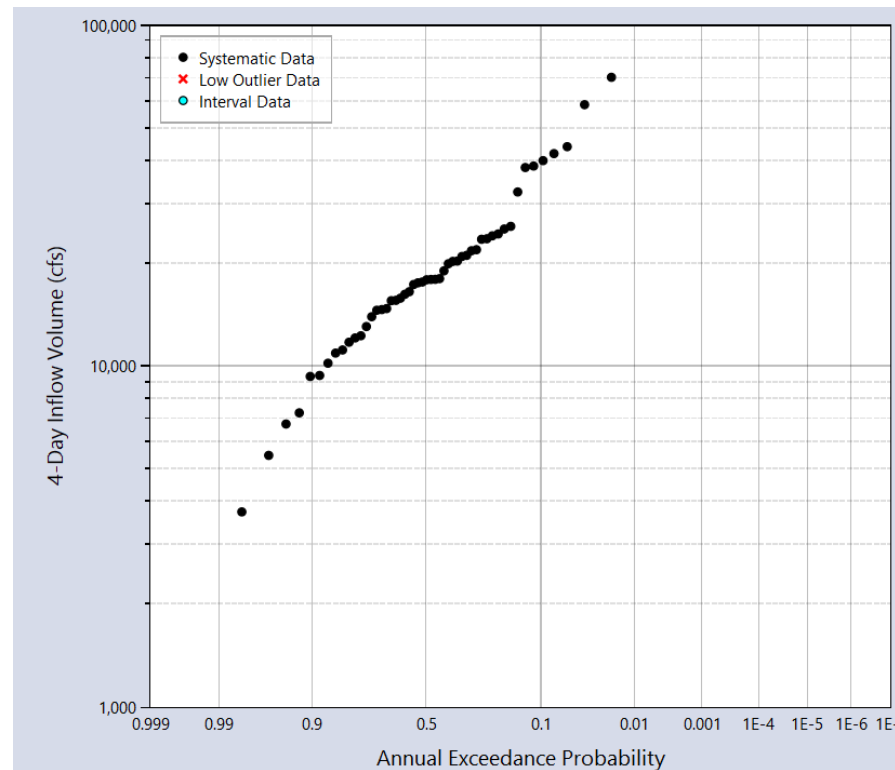
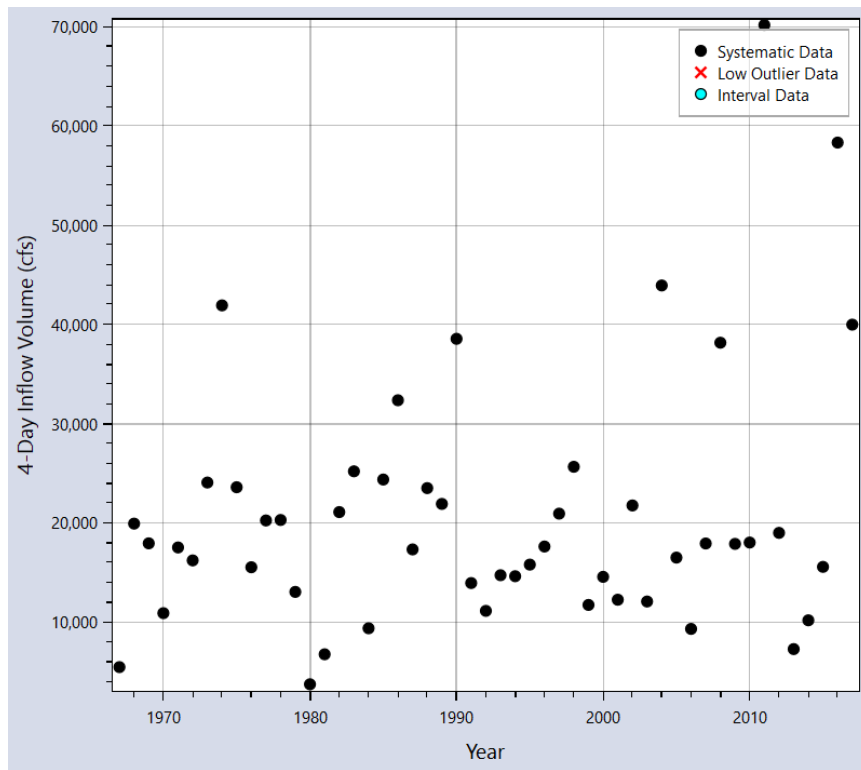
Task 3

Estimate Block Annual Maximum Inflow Volumes for the Critical Duration

	A	B	C	D	E	F	G	H	I	J	K
1	Example Dam										
2	Date	Water Year	Daily Average Inflow	Daily Average Outflow	Daily Average Stage		Volume Duration		Water Year	Annual Maximum	
3			(cfs)	(cfs)	(ft NAVD88)		(cfs)				
4	1-Oct-66	1967	20	225	1,112.36				1967		
5	2-Oct-66	1967	20	225	1,112.33				1968		
6	3-Oct-66	1967	20	225	1,112.29				1969		
7	4-Oct-66	1967	20	225	1,112.26				1970		
8	5-Oct-66	1967	20	225	1,112.23				1971		
9	6-Oct-66	1967	20	225	1,111.84				1972		
10	7-Oct-66	1967	20	225	1,111.81				1973		
11	8-Oct-66	1967	15	9007	1,111.78				1974		
12	9-Oct-66	1967	15	225	1,111.39				1975		
13	10-Oct-66	1967	15	225	1,111.35				1976		
14	11-Oct-66	1967	15	8827	1,111.32				1977		
15	12-Oct-66	1967	15	225	1,111.29				1978		

Task 4

Calculate a Flow Frequency Curve Using RMC-BestFit for the Systematic Data



Mean (of log) (μ) = ?
Std Dev (of log) (σ) = ?
Skew (of log) (γ) = ?

Additional Tasks



Task 5

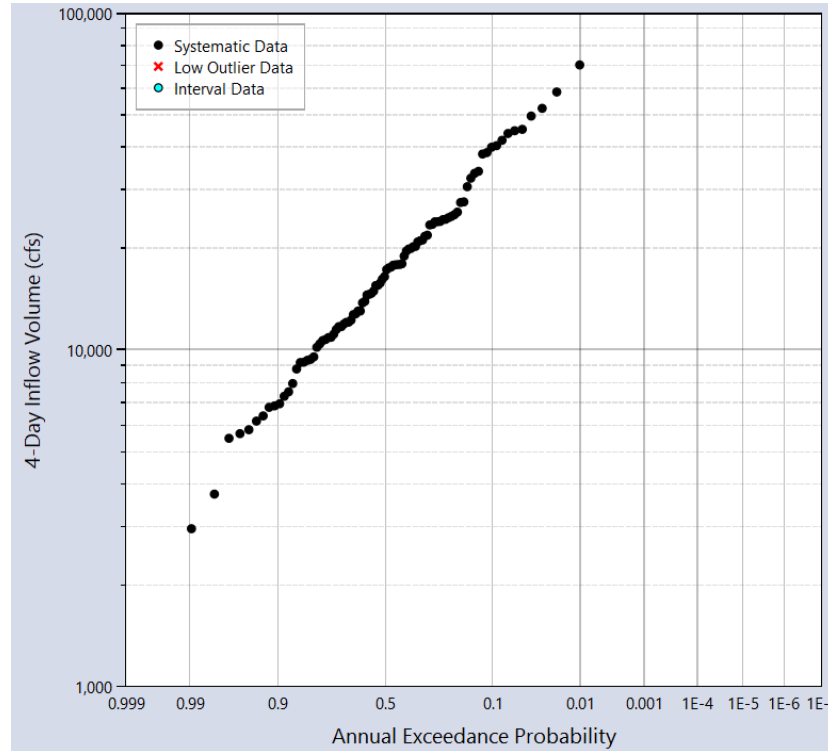
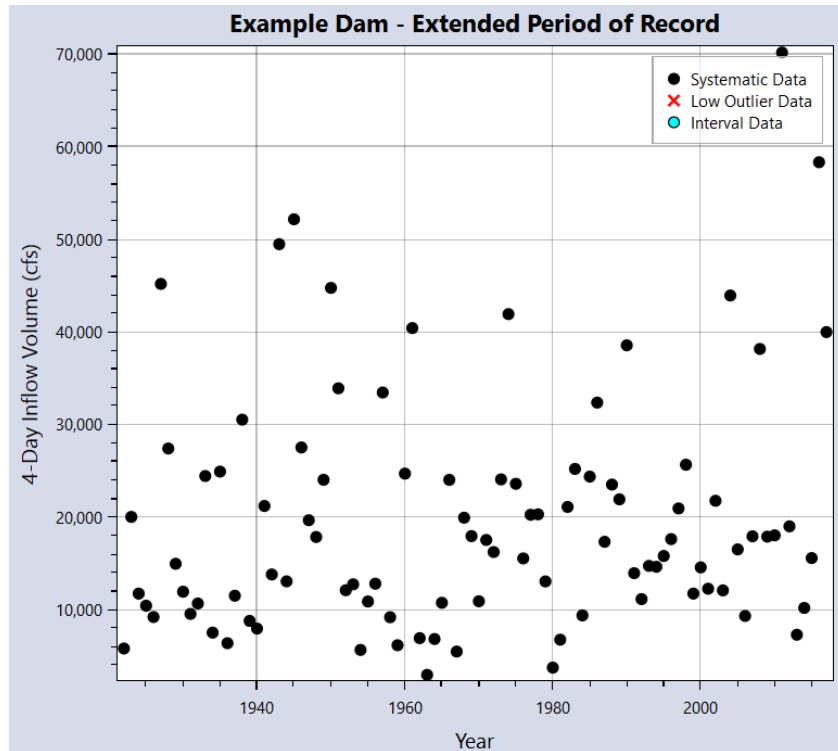
Extend the Period of Record Using Available Gage Data

Drainage area regression equation

$$Q_2 = Q_1 \left(\frac{A_2}{A_1} \right)^\phi$$

Task 6

Calculate a Flow Frequency Curve Using RMC-BestFit for the Extended Period of Record



Mean (of log) (μ) = ?
Std Dev (of log) (σ) = ?
Skew (of log) (γ) = ?

Extended Period of Record:
01 OCT 1921 – 30 SEP 2017

Task 7

Compare the Frequency Curves

Question: Did the posterior mode curve change? How much?

Question: Did the posterior predictive curve change? Why?

Question: Did the credible intervals change? Why?

? Questions