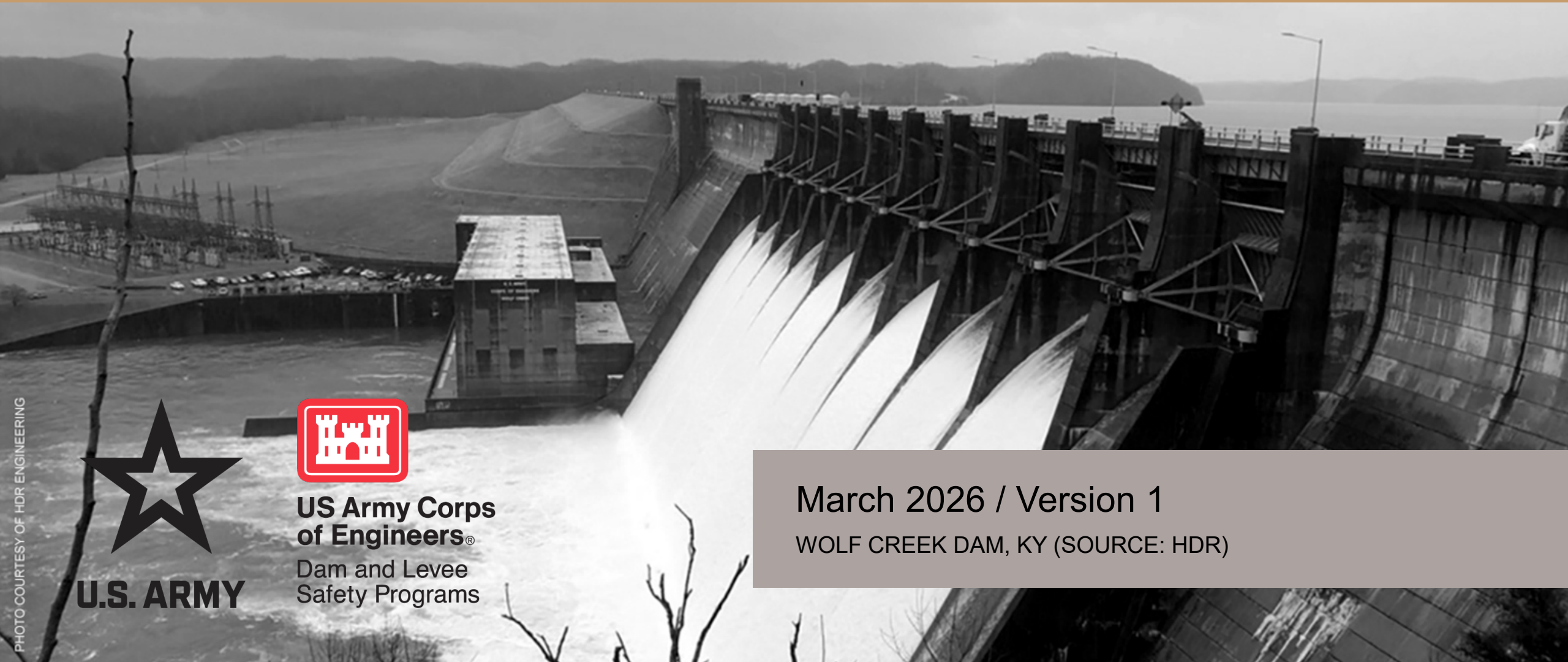


BestFit Exercise Overview

DLS-114, Module 1.25



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. Estimate pseudo-ERL for a dataset
2. Compare effective record length estimates for different datasets

Additional Tasks

3. Estimate the pseudo-ERL for multiple datasets

Task 1 – Estimate Pseudo-ERL (1 of 2)

RMC-BestFit 2.0 Beta - C:\Users\q0rmcrlc\Documents\RMC\DLSCourses\DL_114_BestFit_RFA\FY26\Workshops\E1.25\E1.25_Solution.bestfit

File View Project Tools Window Help

Project Explorer

- E1.25_Solution
 - Time Series Data
 - Input Data
 - Period of Record
 - DS_USGS_Area_Adjusted_POR
 - Extended Period of Record
 - Historical
 - Paleoflood
 - Distribution Fitting Analysis
 - Univariate Distribution Analysis
 - Period of Record
 - Extended Period of Record
 - Historical
 - Paleoflood
 - Regional Skew
 - Precipitation Frequency**
 - Precipitation Frequency Sensitivity
 - Bivariate Distribution Analysis
 - Rating Curve Analysis

Precipitation Frequency

Distribution Results

Frequency Plot Tabular Results

Parameter Sets

Kernel Density

Histogram

Bivariate

Mean Likelihood

Autocorrelation

Markov Chain Traces

Frequency Curve Results					Summary Statistics	
Probability	95.0% CI	5.0% CI	Posterior Predictive	Posterior Mean	Measure	Posterior Mean
1E-06	425,741.1	158,727.61	335,014.62	252,311.95	Mean (of log) (μ)	4.2159
2E-06	383,848.33	151,509.94	299,916.4	234,876.53	Std Dev (of log) (σ)	0.2794
5E-06	333,682.85	141,979.88	259,155.06	212,774.93	Skew (of log) (γ)	-0.1445
1E-05	299,645.16	134,697.49	232,033.5	196,762.63	Minimum	0.0000
2E-05	267,943.78	127,454.12	207,683.33	181,350.95	Maximum	120765462.8522
5E-05	229,743.28	117,728.72	179,188.2	161,886.3	Mean	20094.5217
0.0001	202,943.29	110,511.14	160,054.63	147,838.56	Std Dev	13627.2478
0.0002	179,026.04	102,654	142,723.4	134,364.1	Skewness	2.0363
0.0005	150,567.29	92,629.85	122,195.16	117,415.73	Kurtosis	10.7100
0.001	131,293.09	85,267.62	108,208.59	105,235.11	AIC	2073.0631
0.002	113,858.6	77,514.75	95,352.24	93,593.29	BIC	2080.8180
0.005	93,230.56	67,200.92	79,817.28	79,007.46	DIC	2072.5320
0.01	79,229.71	59,415.09	68,990.14	68,560.27	RMSE	1515.8712
0.02	66,679.35	51,593.35	58,824.32	58,594.05		

Message Window

0 Errors 0 Warnings 0 of 13 Messages 0 of 5 Events

Time	Description	Source	Name	Parameter
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Properties

General Options Output

UNIVARIATE ANALYSIS PROPERTIES

Name: Precipitation Frequency

Description:

Created On: 1/28/2026 3:00:58 PM

Last Modified: 1/31/2026 9:54:54 AM

Input Data: Paleoflood

Distribution: Log-Pearson Type III

PARAMETER PRIORS

Parameter	Distribution
Mean (of log) (μ)	U (0, 6)
Std Dev (of log) (σ)	U (0, 2)
Skew (of log) (γ)	N (-0.17, 0.346)

Use Default Flat Priors: ☐

Use Jeffreys' Rule for Scale: ☒

QUANTILE PRIORS

Ex. Probability	Distribution
0.1	LN (40500, 5800)
0.01	LN (65100, 9700)

Univariate Distribution Analysis

Uses Bayesian MCMC to estimate distribution parameters from input data based on a specified parent distribution, providing point estimates and quantifying uncertainty.

Task 1 – Estimate Pseudo-ERL (2 of 2)

Step 1: Enter the input parameters for the analysis

Input Parameter	Value
Mean of $\text{Log}_{10}(\mu)$	4.2159
Standard Deviation of $\text{Log}_{10}(\sigma)$	0.2794
Skew of $\text{Log}_{10}(\gamma)$	-0.1445
Effective Record Length (Years)	

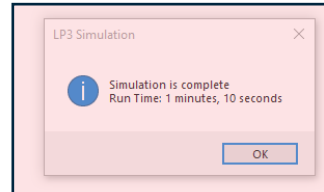
Step 5: Run the simulation

Click Here to
RUN SIMULATION

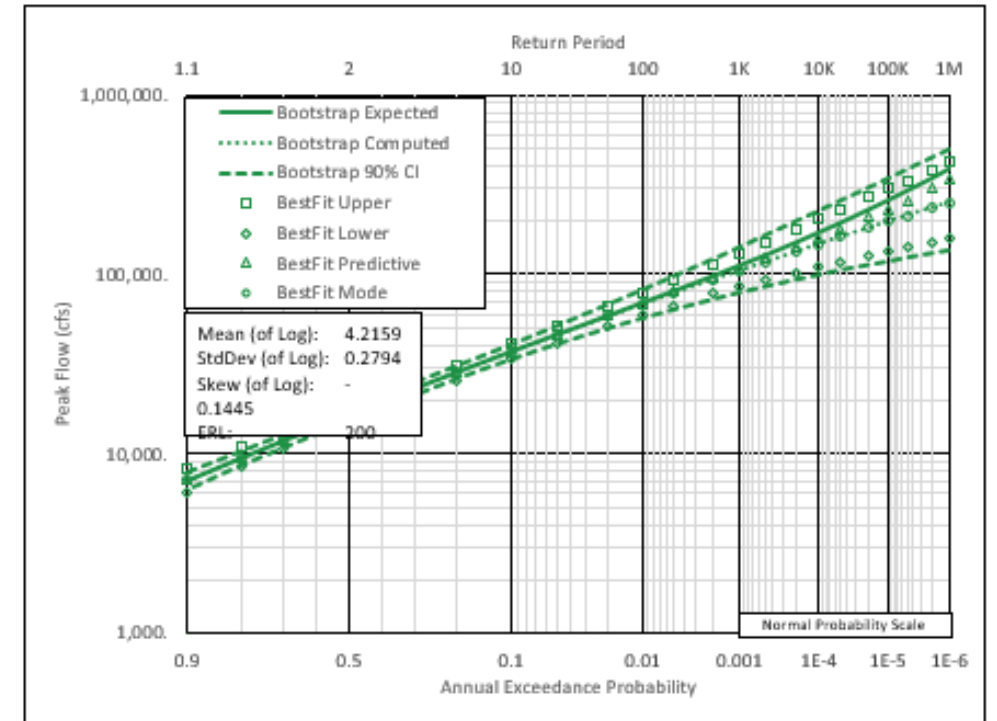
◀ Progress is displayed on the application status bar in the lower left corner

Step 6: Output table

4-Day Volume (cfs)						
Z	Return Period	AEP	Upper 95%	Expected	Computed	Lower 5%
4.753	1,000,000	1E-06	428,000.	339,000.	269,000.	173,000.
4.611	500,000	2E-06	385,000.	304,000.	249,000.	164,000.
4.417	200,000	5E-06	334,000.	263,000.	223,000.	152,000.
4.265	100,000	1E-05	299,000.	235,000.	205,000.	143,000.
4.107	50,000	2E-05	267,000.	210,000.	188,000.	134,000.
3.891	20,000	5E-05	228,000.	181,000.	166,000.	122,000.
3.719	10,000	1E-04	202,000.	162,000.	151,000.	113,000.
3.540	5,000	2E-04	178,000.	144,000.	136,000.	105,000.
3.291	2,000	5E-04	149,000.	122,000.	118,000.	93,800.
3.090	1,000	0.001	129,000.	108,000.	105,000.	85,600.
2.878	500	0.002	112,000.	94,700.	93,100.	77,600.
2.576	200	0.005	90,800.	78,800.	78,100.	67,200.
2.326	100	0.01	76,800.	67,800.	67,500.	59,300.
2.054	50	0.02	64,100.	57,700.	57,600.	51,700.
1.645	20	0.05	49,100.	45,200.	45,200.	41,600.
1.282	10	0.1	39,000.	36,400.	36,400.	34,000.
0.842	5	0.2	29,600.	27,900.	27,900.	26,300.
0.000	2	0.5	17,700.	16,700.	16,700.	15,900.
-0.842	1.25	0.8	10,600.	9,940.	9,930.	9,360.
-1.282	1.11	0.9	8,090.	7,540.	7,540.	7,020.

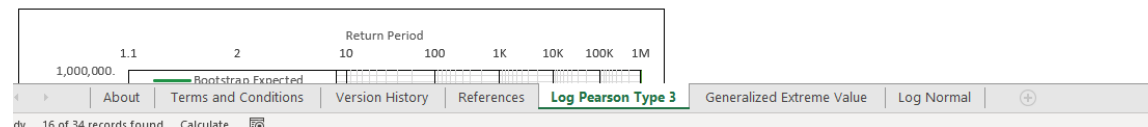


Step 7: Output Chart



Click Here to
COPY CHART TO CLIPBOARD

Step 7: Output Chart



Task 2 – Compare Pseudo-ERL Estimates

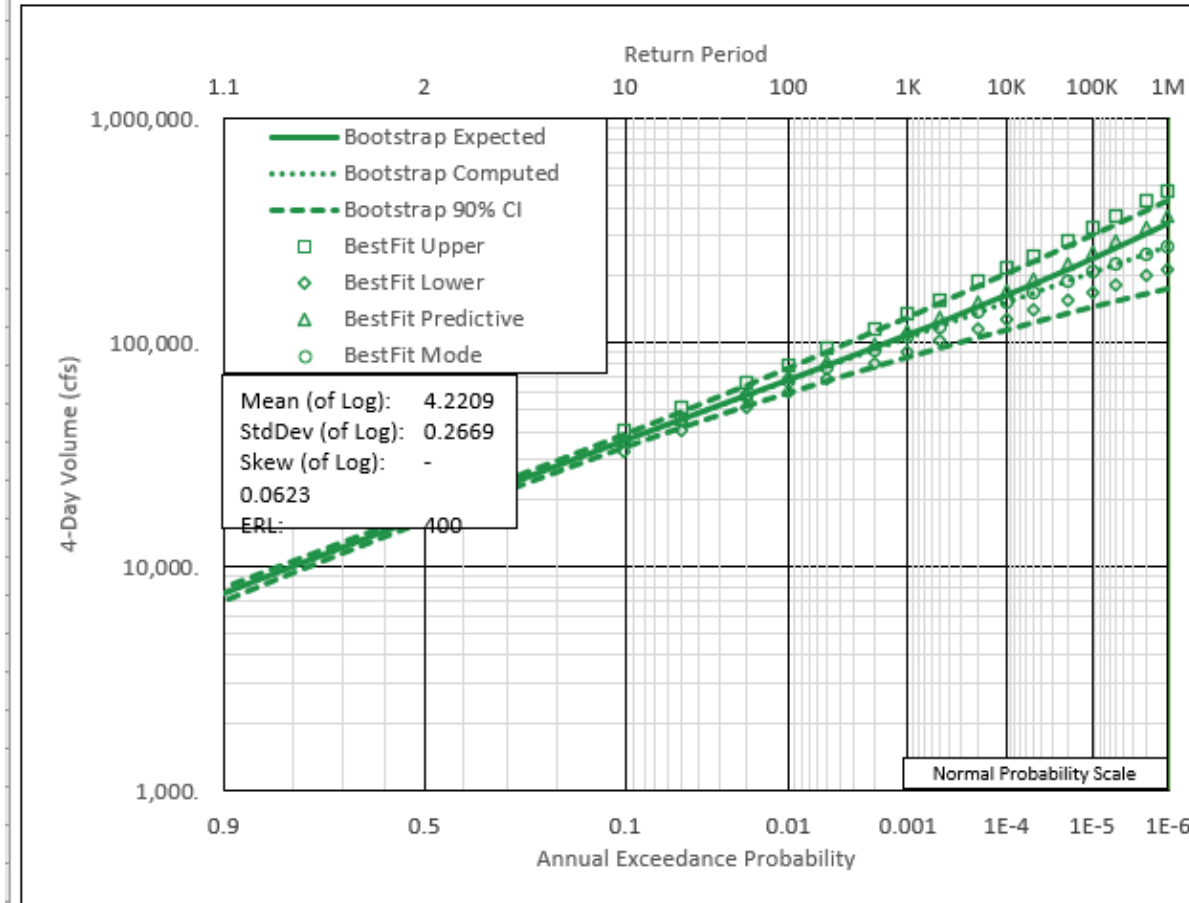
Simulation	pERL (years)
Systematic	80
Historic	135
Paleoflood	155
Regional Skew	170
Precipitation Frequency	

Additional Tasks



Task 3 – Estimate Pseudo-ERL for Other Datasets and Compare to Previous Table

Step 7: Output Chart



? Questions

